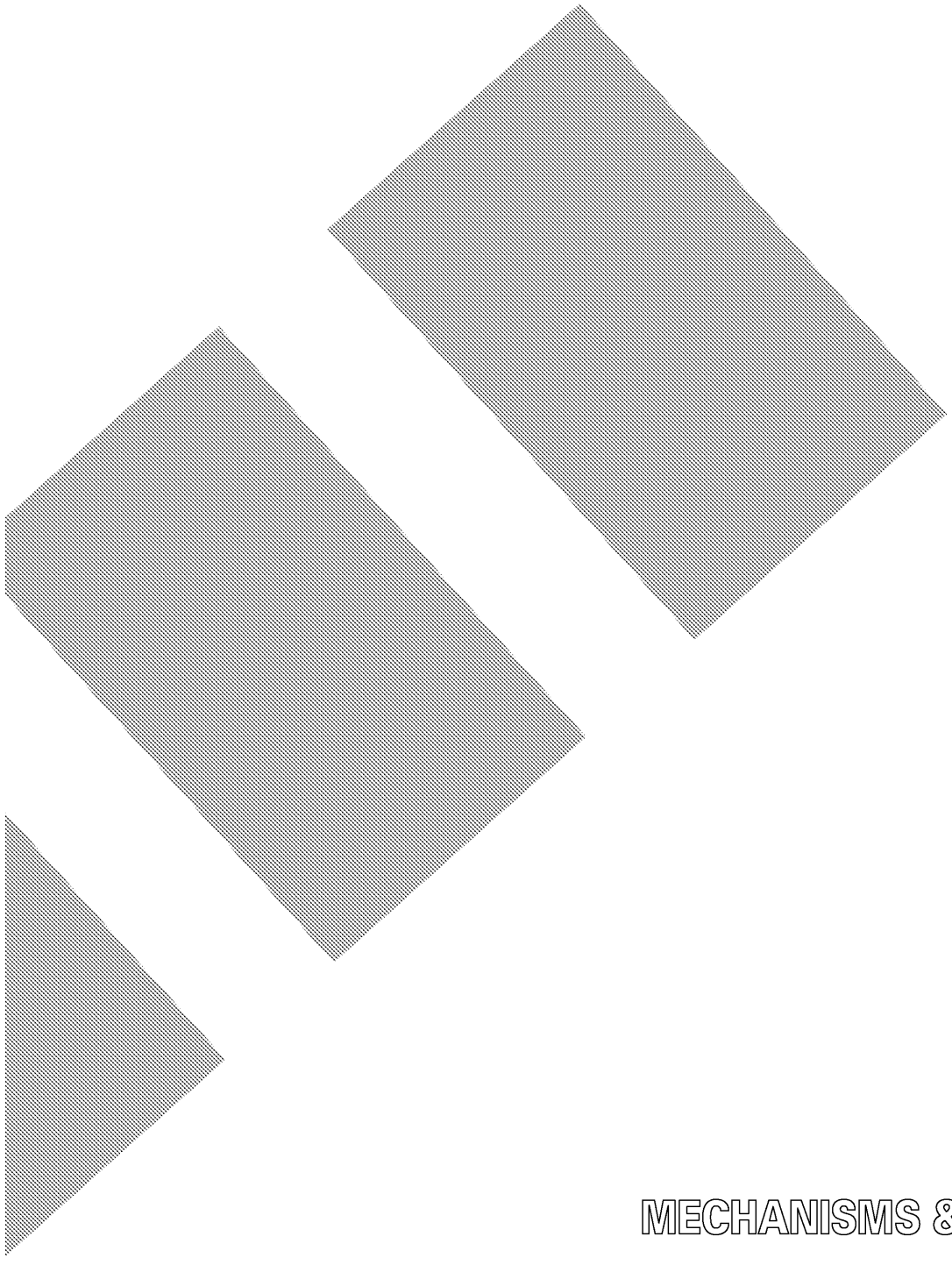
brother®

SERVICE MANUAL

MODEL: PT-2420PC



MECHANISMS & ELECTRONICS

PREFACE

This publication is a service manual covering the specifications, general mechanism, disassembly/reassembly procedure, and troubleshooting of the Brother PT-2420PC.
It is intended for service personnel and other concerned persons to accurately and quickly provide after-sale service for our PT-2420PC.

To perform appropriate maintenance so that the machine is always in best condition for the customer, the service personnel must adequately understand and apply this manual.

This manual is made up of four chapters and appendixes.

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CHAPTER II **GENERAL MECHANISM**

CHAPTER III **DISASSEMBLY & REASSEMBLY PROCEDURE**

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[1] Main PCB

CHAPTER I SPECIFICATIONS

1.1 MECHANICAL SPECIFICATIONS

1.1.1 External View

(1) Dimensions (W x D x H) 66 x 145 x 123 mm

(2) Weight

Machine proper	Approx. 0.4 kg
In package	Approx. 1.5 kg

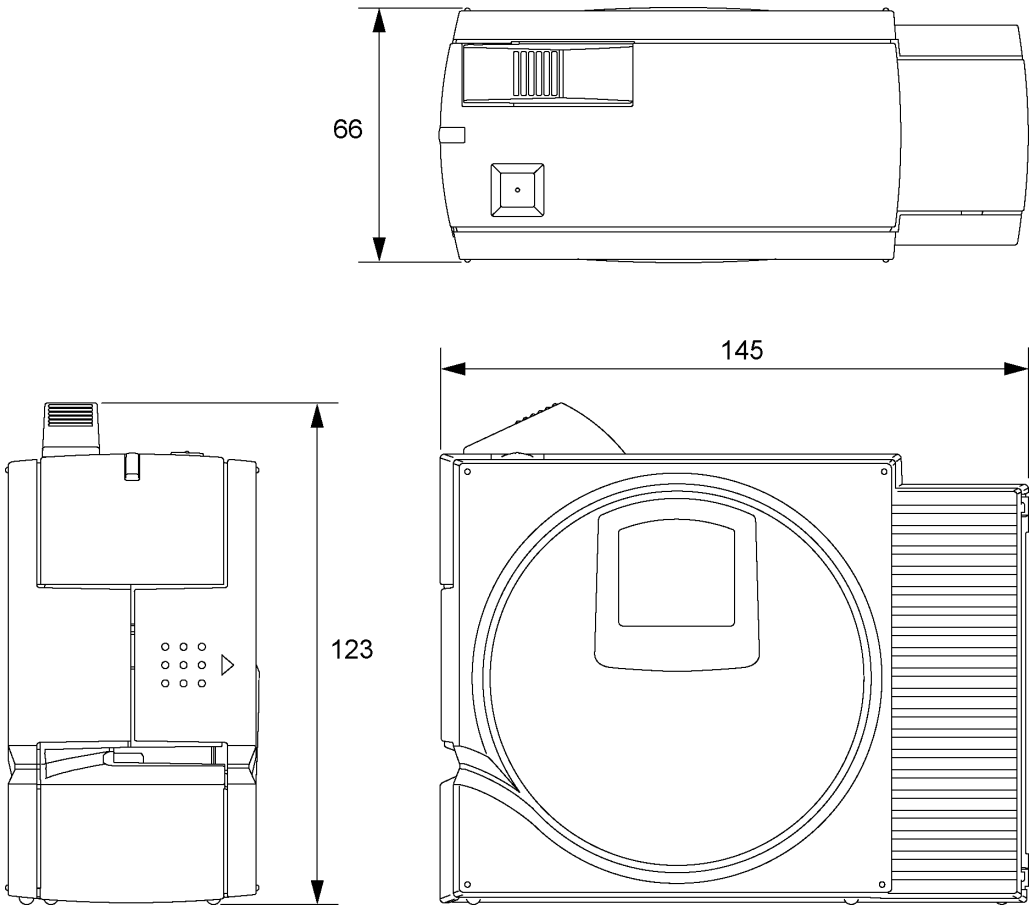


Fig. 1.1-1 External View

1.1.2 Control Button and LED

(1)	Number of buttons	1 (ON/OFF (⏻) and FEED)
(2)	LED	Green
(3)	Layout	See Fig. 1.1-2.

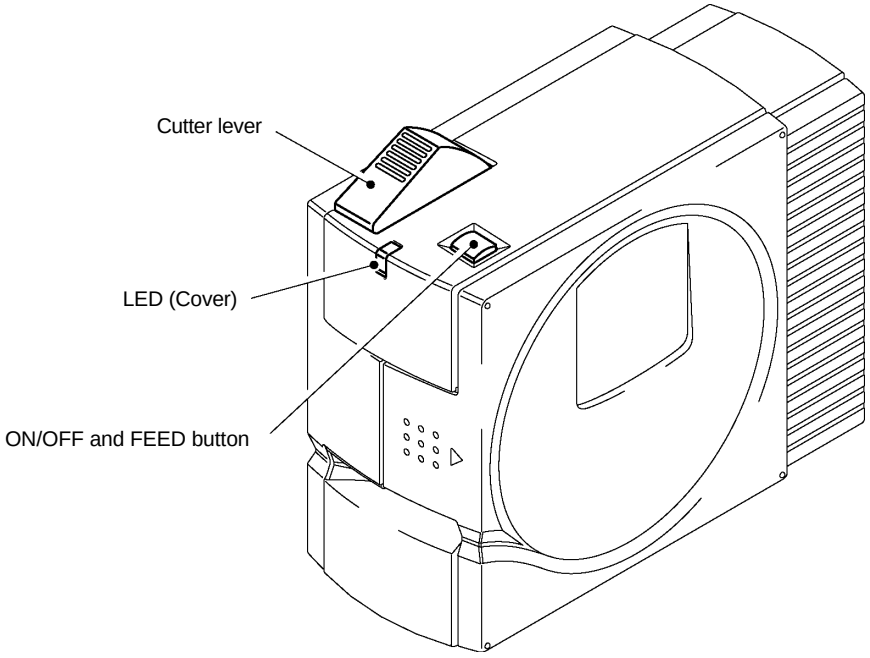


Fig. 1.1-2 Layout

1.1.3 Printing Mechanism

(1)	Printing method	Thermal transfer onto plastic tapes (laminate tape and non-laminate tape) or special tapes (instant lettering tape, non-laminate thermal film tape, and iron-on transfer tape) (Fixed thermal print head and tape feed mechanism)
(2)	Printing speed	10.2 mm/sec
(3)	Print head	
	Type	Thermal print head
	Heat generator	Consisting of 128 heating elements vertically aligned
	Size of a heating element	0.195 mm wide by 0.141 mm high

1.1.4 Tape Cassette

(1) Cassette — Cartridge type (TZ cassette) (AL cassette)

(2) Types of tape cassettes

- Laminated tape cassette — Laminate tape, ink ribbon, and adhesive base tape
- Non-laminated tape cassette — Non-laminate tape and ink ribbon
- Instant lettering tape cassette — Instant lettering tape and ink ribbon
- Iron-on transfer tape cassette — Iron-on transfer tape and ink ribbon

(3) Tape size

	Width	Length
Laminate tape	6, 9, 12, 18, 24 mm	8 m (5 m for the fluorescent coating tape)
Non-laminate tape	6, 9, 12, 18, 24 mm	8 m
Instant lettering tape	18 mm	8 m
Non-laminate thermal film tape	12, 18 mm	8 m
Iron-on transfer tape	18 mm	6 m

1.1.5 Tape Cutter

(1) Tape cutting method — Manual cutter (Not user-replaceable)

1.1.6 PC Interface

(1) Communication interface — USB

(2) Attachments

Interface cable — Dedicated cable

Editor — Dedicated editor

1.2 ELECTRICAL SPECIFICATIONS

1.2.1 Power Supply

(1)	Power supply	Dedicated AC adapter (9.5 VDC, 1.3A) provided as attachment

CHAPTER II GENERAL MECHANISM

2.1 MAIN MECHANISM

2.1.1 Print Mechanism

(1) Structure of Thermal Head

This machine uses thermal transfer printing. The thermal print head has a heat generator consisting of 128 heating elements which are vertically aligned as shown in Fig. 2.1-1. Out of those 128 heating elements. Each heating element is 0.195 mm wide by 0.141 mm high.

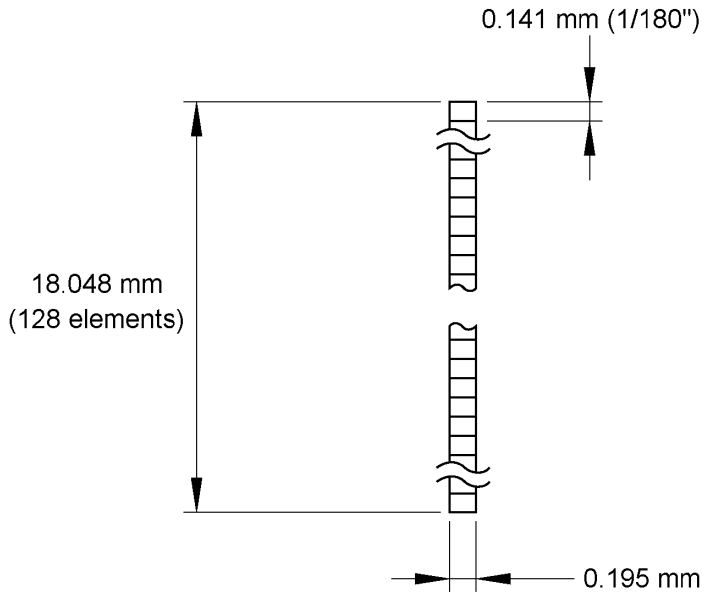


Fig. 2.1-1 Heat Generator of Thermal Head

(2) Printing Process

When the cylindrical rubber platen is pressed against the thermal print head with the tape* and ink ribbon** sandwiched inbetween, the CPU applies electric power to the selected ones of those 128 heating elements.

* Laminate tape when using laminated tape cassettes.
Non-laminated tape when using non-laminated tape cassettes.
Instant lettering tape when using instant lettering tape cassettes.
Iron-on transfer tape when using iron-on transfer tape cassettes.

** When using non-laminated thermal film tape cassettes, no ink ribbon is sandwiched.

[For tape cassettes except non-laminated thermal film tape cassettes]

If the selected heating element(s) generates heat, the ink on the sandwiched ribbon will be melted and transferred to the tape, producing a dot(s) on the tape. The ink ribbon and the tape are advanced and then the next heating cycle is repeated, thus forming a character on the tape.

[For non-laminated thermal film tape cassettes]

If the selected heating element(s) generates heat, the thermal film tape develops itself to produce a dot(s) on the tape. The tape is advanced and the next heating cycle is repeated, thus forming a character on the tape.

For laminated tape cassettes, instant lettering tape cassettes, and iron-on transfer tape cassettes, the CPU processes the print data to generate a mirror image so that the printed character can be seen normally when viewed from the other side of the printed face of the tape.

(3) Character Formation

While the tape feed motor (DC motor) feeds the tape and ink ribbon (tape only when using non-laminated thermal film tape cassettes) by 0.141 mm for 13.8 ms, the thermal head generates heat once. The feed amount of 0.141 mm is smaller than the width (0.195 mm) of the heating elements so that the heat generated at one heating cycle will overlap with the next heating cycle. This forms a character having no gap between adjacent printed dots.

2.1.2 Roller Holder ASSY Setting & Retracting Mechanism

This mechanism consists of the roller release lever, roller release rod, and roller holder ASSY.

The roller holder supports the platen and tape feed sub roller so that they can move perpendicularly to the thermal head and tape feed roller built in the tape cassette, respectively, as well as rotating freely.

Loading a tape cassette and closing the cassette cover pushes down the roller release lever which moves the roller release rod to the left as illustrated below. This pivots the roller holder ASSY around the shaft provided on the chassis so as to press the roller holder ASSY against the thermal head side.

The platen is pressed perpendicularly against the thermal head with the tape and ink ribbon (only the tape when using non-laminated thermal film tape cassettes) sandwiched inbetween under a uniform load by the roller holder springs. At the same time, the platen gear becomes engaged with the P idle gear.

Also, the tape feed sub roller is pressed perpendicularly against the tape feed roller built in the tape cassette with the tape (and base paper when using laminated tape cassettes) sandwiched inbetween under a uniform load by the roller holder springs. At the same time, the sub roller gear becomes engaged with the tape idle gear.

If you open the cassette cover, the roller release lever pops up so that the roller release rod retracts the roller holder ASSY from the thermal head, providing you with enough space to replace the tape cassette.

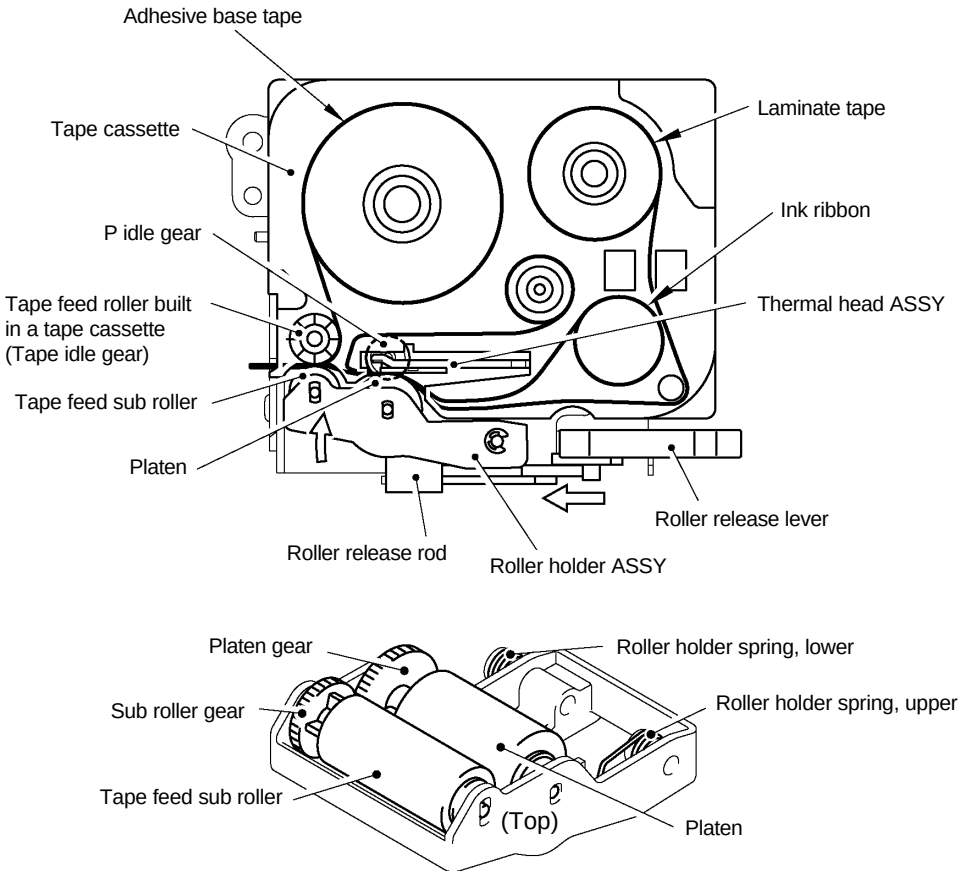


Fig. 2.1-2 Roller Holder ASSY Setting & Retracting Mechanism

2.1.3 Roller Holder ASSY & Cassette Cover Interlocking Mechanism

Closing the cassette cover pushes down the roller release lever and brings the top of the lever into the box provided on the inside of the cassette cover.

As described in Subsection 2.1.2 “Roller Holder ASSY Setting & Retracting Mechanism”, the roller release lever shifts the roller release rod so that the roller holder ASSY is pressed towards the thermal head side.

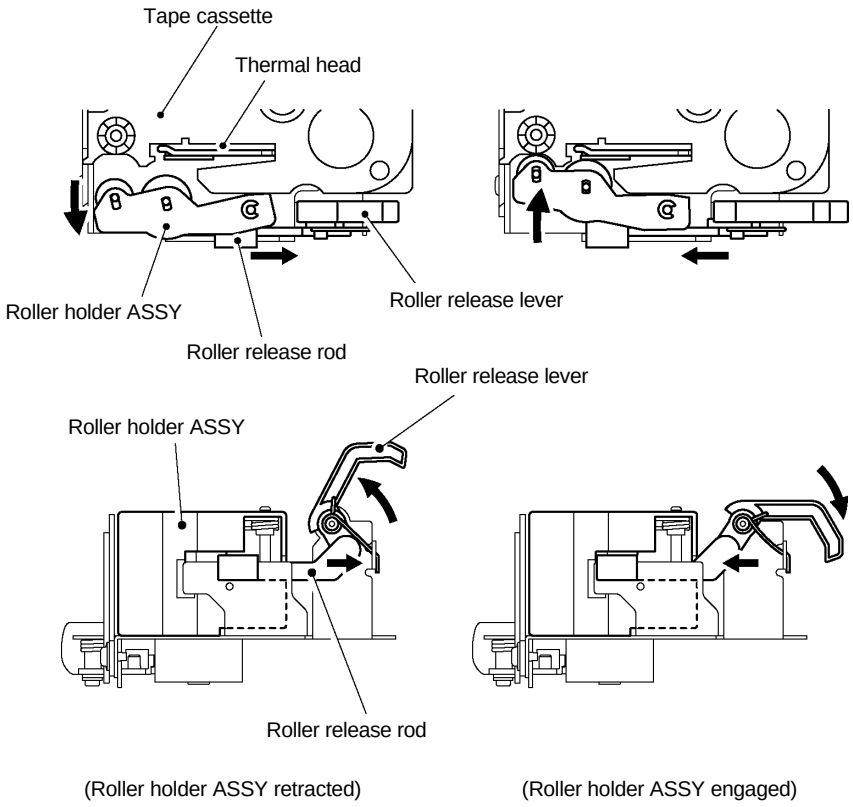


Fig. 2.1-3 Roller Release Lever and Roller Release Rod

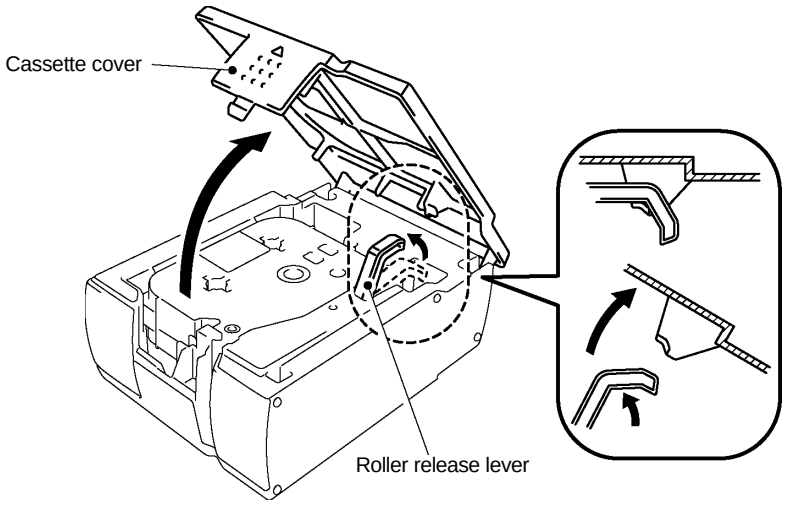


Fig. 2.1-4 Roller Holder ASSY & Cassette Cover Interlocking Mechanism

If you open the cassette cover, the roller release lever will pop up, shifting the roller release rod so that the roller holder ASSY will be retracted from the thermal head side.

2.1.4 Tape & Ribbon Feed Mechanism

This mechanism consists of a DC motor, gear train, and roller holder ASSY.

(1) Tape Feeding

When you load a tape cassette and close the cassette cover, the platen and the thermal head sandwich the tape and ink ribbon (only the tape when using non-laminated thermal file tape cassettes) inbetween. Also, the tape feed sub roller in the roller holder ASSY and the tape feed roller inside the tape cassette sandwich the tape (and base paper when using laminated tape cassettes) inbetween, as described in Subsection 2.1.2.

As the DC motor rotates, the rotation is transmitted via the gear train to the P idle gear (which rotates the platen gear) and the tape idle gear (which rotates the tape feed roller and tape feed sub roller at the same rotation speed).

Accordingly, the sandwiched tape and ink ribbon will be advanced. (When a laminated tape cassette is mounted, the sandwiched laminate tape, adhesive base tape, and ink ribbon will be advanced together.)

The feeding amount of the platen is slighty less than that of the tape feed sub roller.

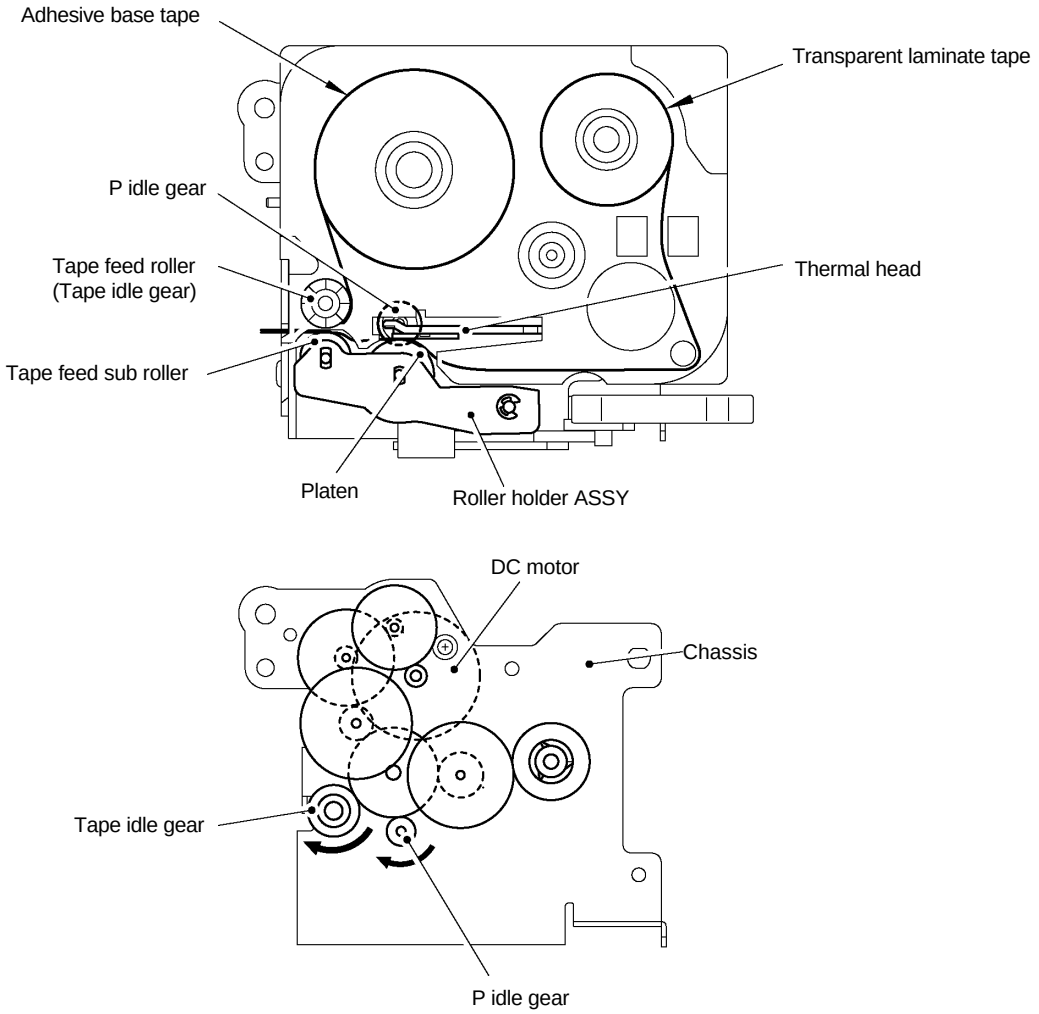


Fig. 2.1-5 Tape Feeding Mechanism

(2) Adhesive Base Tape Feeding (only for laminated tape cassettes)

A laminated tape cassette contains both a transparent laminate tape roll and a separate adhesive base tape roll.

When a transparent laminate tape and adhesive base tape pass through the contact point (between the tape feed roller and tape feed sub roller), they are then bonded together into a single, printed tape. The ink printed on the laminate tape is, therefore, sealed up with the adhesive base tape.

(3) Ink Ribbon Feeding (except for non-laminated thermal film tape cassettes)

As the DC motor rotates, the ribbon drive cam located at the middle of the gear train rotates counterclockwise. When fitted on the ribbon drive cam, the ribbon take-up roll in the tape cassette also rotates to take up the ink ribbon.
To apply proper tension to the ink ribbon between the platen and the ribbon drive cam, the feed amount of the ribbon drive cam is slightly greater than that of the tape feed gear. The difference between the tape feed speeds at the platen and at the ribbon drive cam is absorbed by the clutch spring which is integrated in the ribbon drive cam and allows the cam to slip.
This way, the ink ribbon is kept tense, which enables the ribbon to clearly separate from the tape at the stabilized angle after printing.

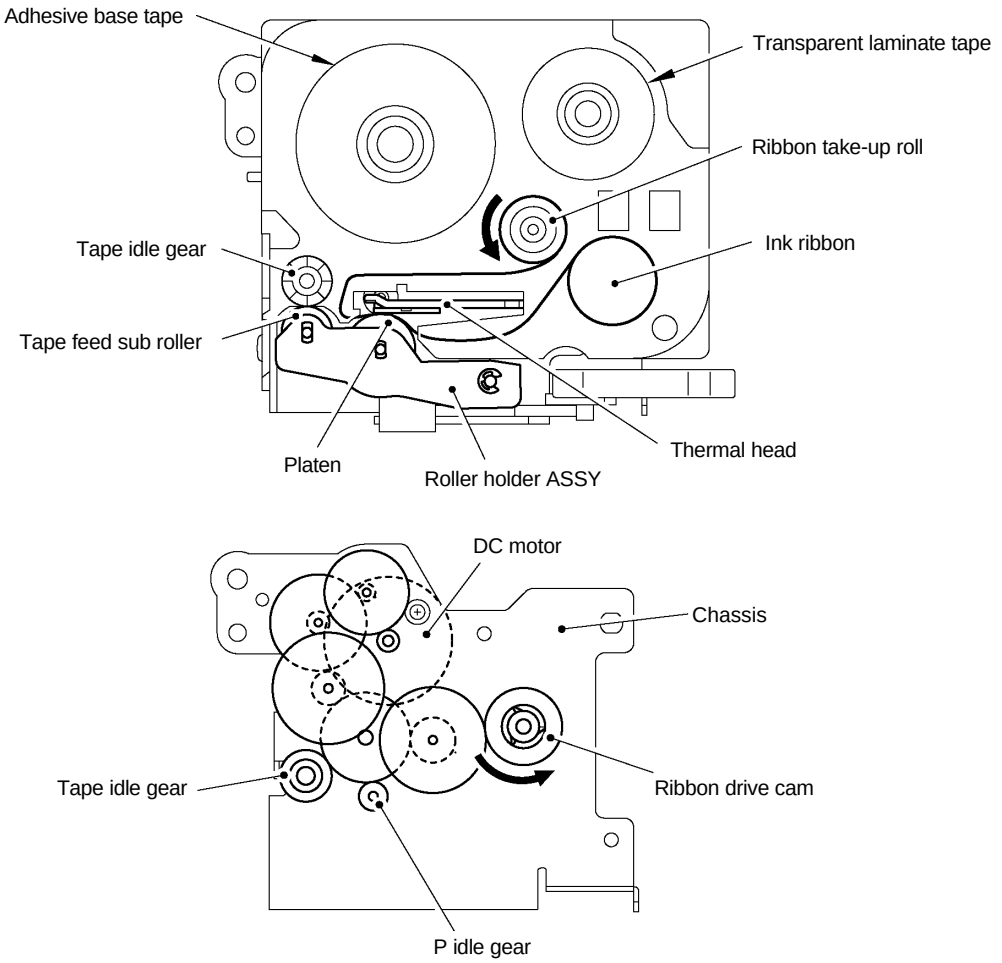


Fig. 2.1-6 Ribbon Feeding Mechanism

2.1.5 Tape Cutter Mechanism

The tape cutter ASSY consists of a stationary blade and movable blade.

The printed tape will come through those blades. Pressing the cutter lever will drive the cutter drive gear whose pin will move the movable blade, cutting the printed tape, just like a scissors.

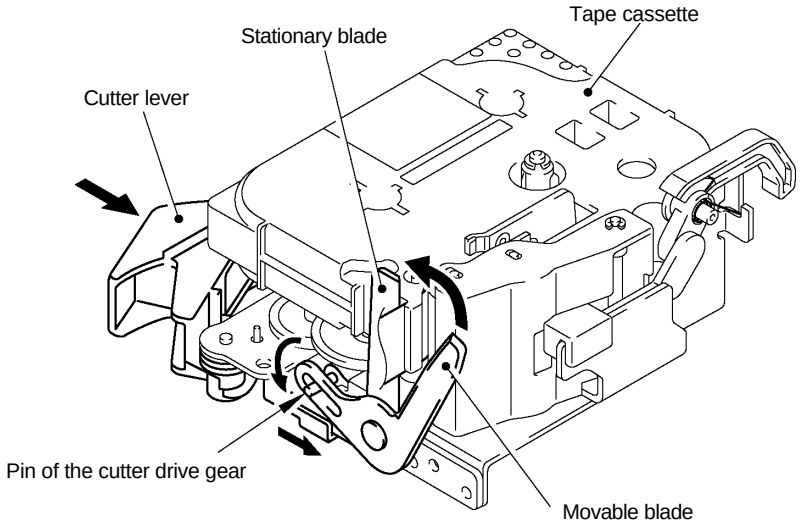


Fig. 2.1-7 Tape Cutter Mechanism

2.2 OUTLINE OF ELECTRONIC CONTROL

2.2.1 Configuration

Fig. 2.1-1 shows a block diagram of the control electronics of this machine. The control electronics consists of a main PCB, DC motor, and thermal print head ASSY.

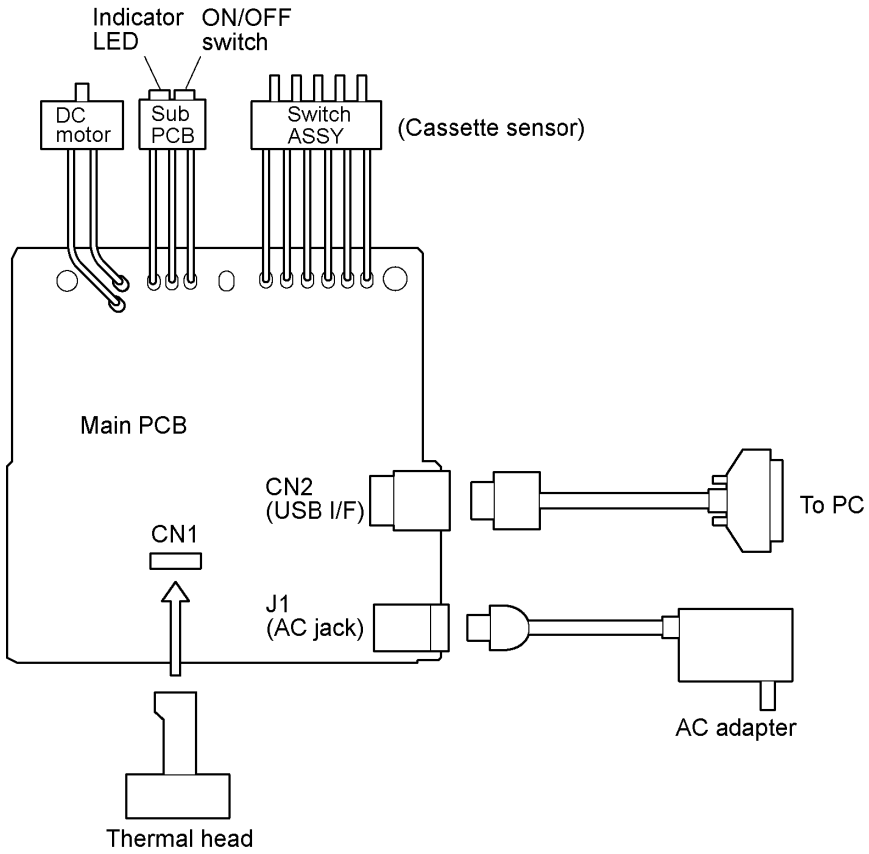


Fig. 2.2-1 Control Electronics of PT-2420PC

(1) Main PCB

This manages all the components including an LED, ON/OFF switch, DC motor, thermal print head ASSY, and USB interface.

(2) Sub PCB

This holds the ON/OFF switch (ON/OFF and FEED) and an indicator LED (green).

(3) DC Motor

The DC motor is a power source to advance tape (and ink ribbon).

(4) Thermal Print Head

This is a thick-film thermal print head which integrates a heat generator (consisting of 128 heating elements vertically aligned in 180 dpi) and driver circuitry.

(5) Switch ASSY (cassette sensor)

According to the states of the five sensor switches on the switch ASSY, the CPU may identify the tape width and type of the tape cassette loaded.

2.2.2 Main PCB

Fig. 2.2-2 shows a block diagram of the main PCB. The main PCB consists of the following:

(1) CPU (including a ROM and RAM)
(2) SRAM (256-kilobyte)
(3) EEPROM (1-kilobit)
(4) USB interface circuit
(5) LED ON/OFF circuit, thermal head control circuit, and motor driver circuit
(6) Reset circuit
(7) Oscillator circuit
(8) Cassette sensor circuit and cutter sensor circuit
(9) Head property detector circuit
(10) Voltage detector circuit and ambient temperature detector circuit
(11) ON/OFF switch circuit

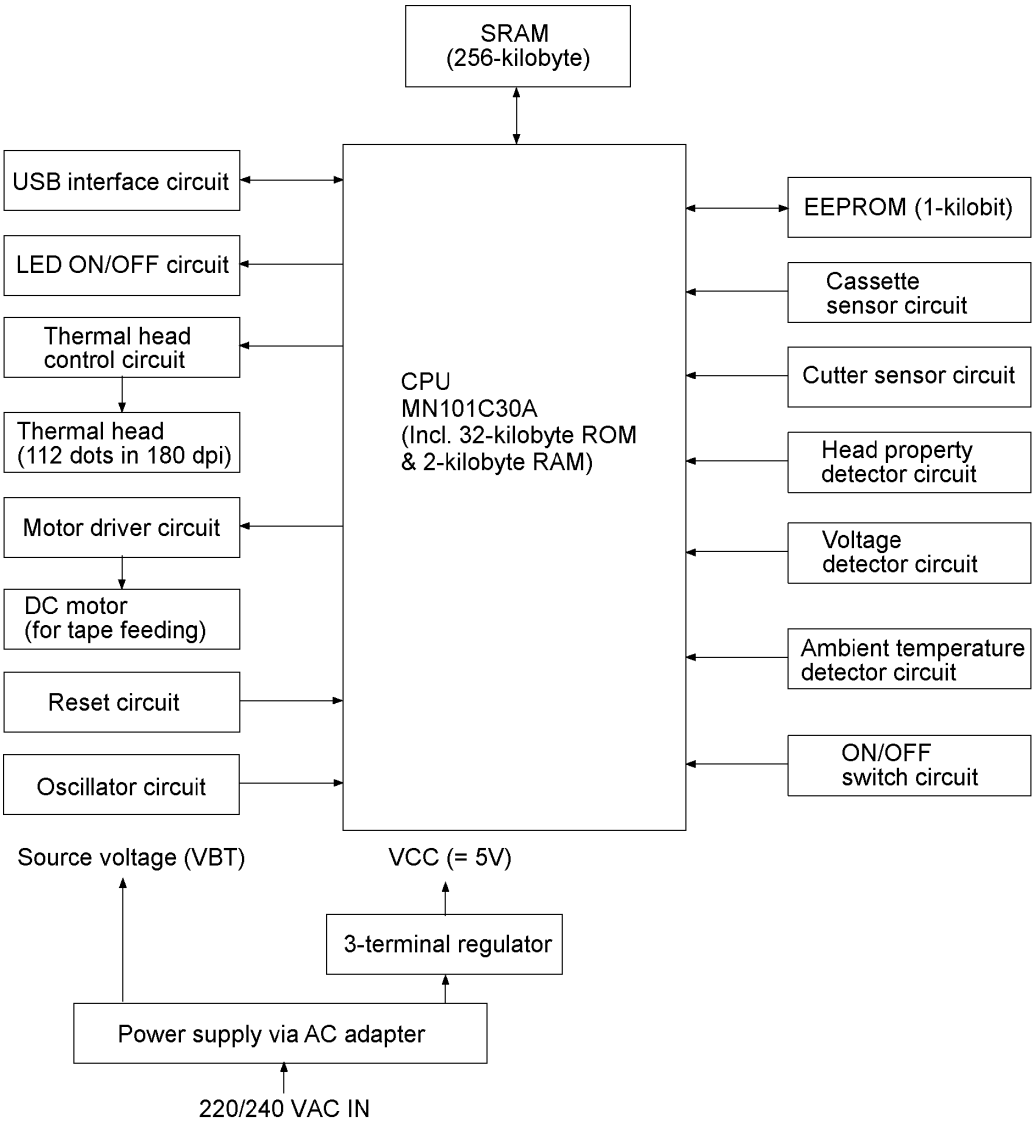


Fig. 2.2-2 Block Diagram of Main PCB

CHAPTER III DISASSEMBLY & REASSEMBLY PROCEDURE

■ Safety Precautions

(1) You should carry out disassembly & reassembly jobs on an anti-static sheet grounded correctly. Otherwise, the LSI and other electronic devices will be damaged due to the electricity charged in your body.

(2) When transporting PCBs, be sure to wrap them in conductive sheets such as aluminum foil.

(3) When using soldering irons and other heat-generating tools, take care not to damage the resin parts such as wires, PCBs, and covers.

(4) Be careful not to lose screws, washers, or other parts removed for parts replacement.

(5) Tighten screws to the torque values listed below.

■ Tightening Torque List

Location	Screw type	Q'ty	Tightening torque
Middle cover	Taptite, bind B M2.6 x 8	5	0.39 ±0.10 N•m (4 ±1 kgf•cm)
Chassis sub ASSY	Taptite, bind B M2.6 x 6	2	0.39 ±0.10 N•m (4 ±1 kgf•cm)
DC motor	Screw, pan M1.7x2.5	2	0.15 ±0.05 N•m (1.5 ±0.5 kgf•cm)
Cutter ASSY	Taptite, cup S M3x5	1	0.59 ±0.10 N•m (6 ±1 kgf•cm)
Head ASSY	Screw, bind M3x4	1	0.59 ±0.10 N•m (6 ±1 kgf•cm)
Sub PCB ASSY	Taptite, bind B M2.6 x 8	1	0.39 ±0.10 N•m (4 ±1 kgf•cm)
Main PCB	Taptite, bind B M2.6 x 8	1	0.39 ±0.10 N•m (4 ±1 kgf•cm)
Ground wire	Taptite, bind B M2.6 x 6	1	0.39 ±0.10 N•m (4 ±1 kgf•cm)

3.1 DISASSEMBLY PROCEDURE

[1] Removing the Tape Cassette

(1) Open the cassette cover while holding down the section “A” of the cassette cover.

(2) Take the tape cassette out of the machine by holding both sides of the cassette.

Note: When opening the cassette cover, the platen is released from the thermal head so that there is a gap between them to make possible to replace the tape cassette.

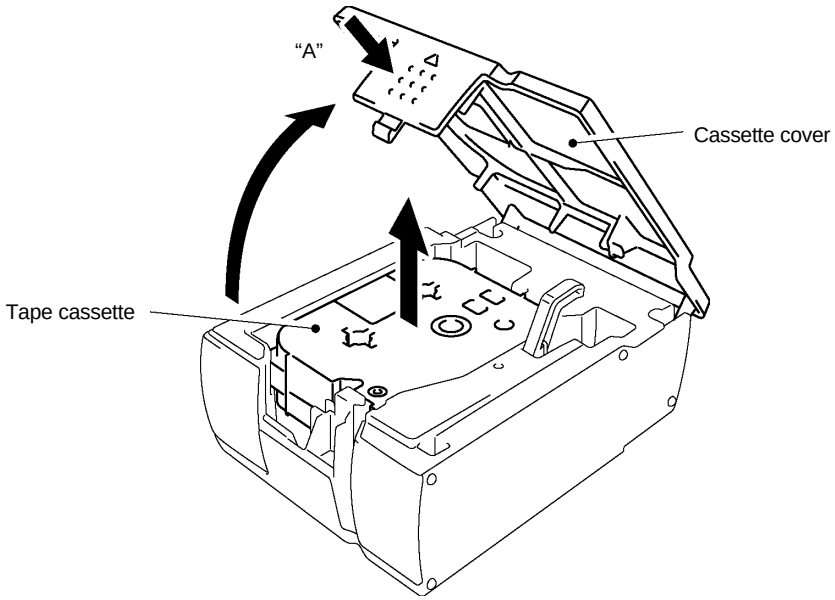


Fig. 3.1-1 Removing the Tape Cassette

[2] Removing the Cassette Cover and Bottom Cover

(1) Pull the arms of the cassette cover outwards to remove the cassette cover from the middle cover.

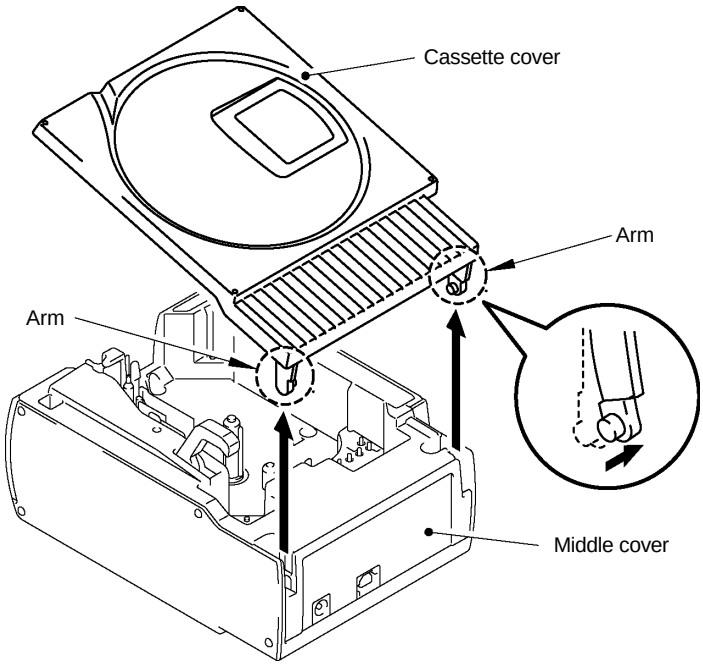


Fig. 3.1-2 Removing the Cassette Cover

(2) Remove the five screws securing the bottom cover.

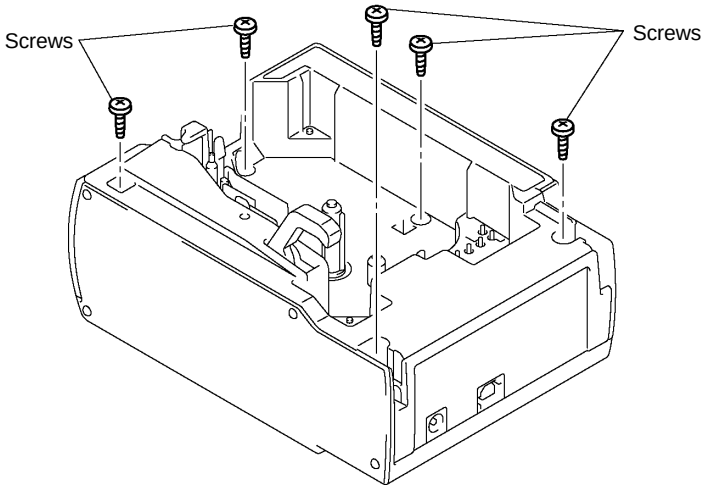


Fig. 3.1-3 Removing the Bottom Cover (1)

(3) Turn the machine upside down so that the bottom cover is at the top. Remove the bottom cover.

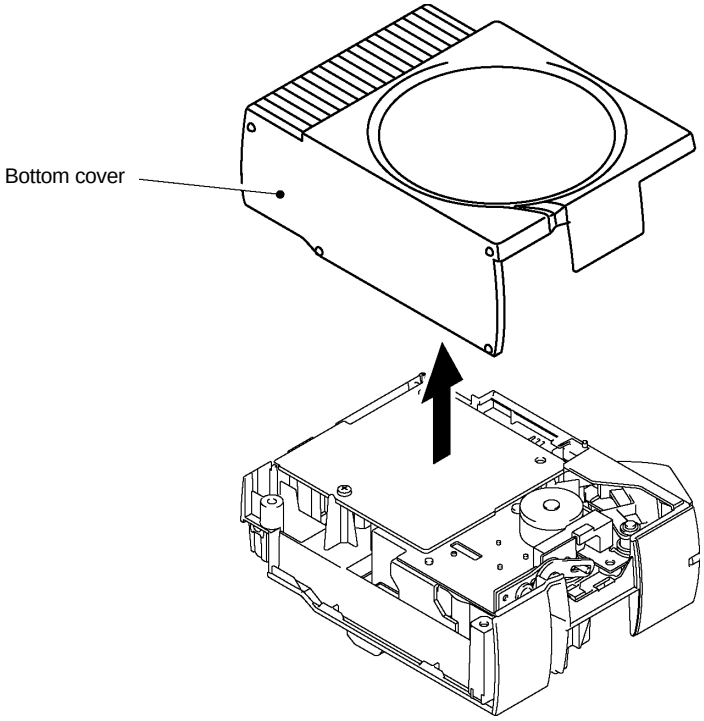


Fig. 3.1-4 Removing the Bottom Cover (2)

[3] Removing the Main PCB ASSY

(1) Remove the one screw securing the main PCB ASSY.

(2) Disconnect the thermal head flat cable from the main PCB ASSY.

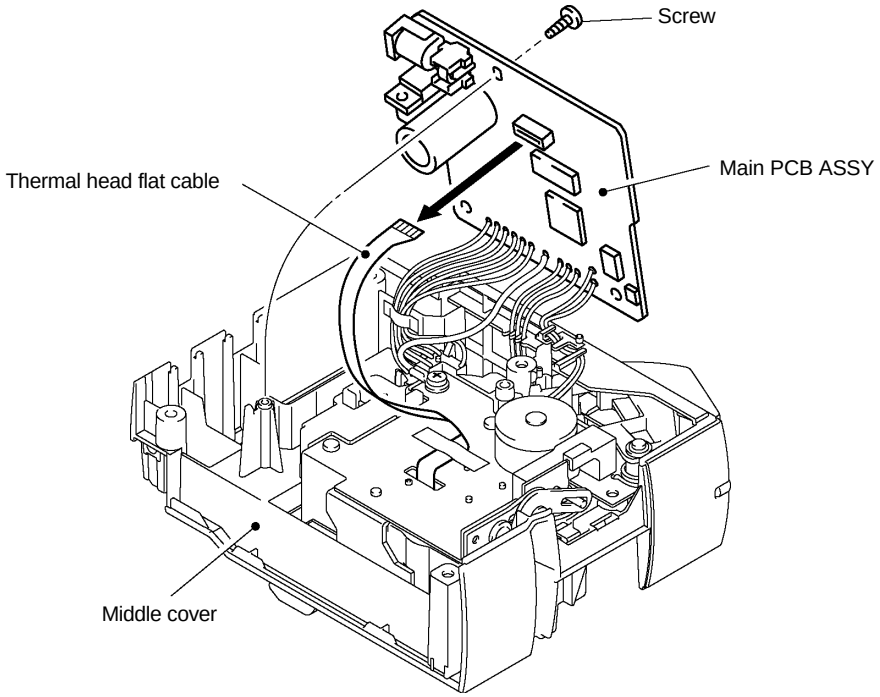


Fig. 3.1-5 Removing the Main PCB ASSY (1)

(3) Remove the eleven harnesses (six for the cassette sensor, three for the sub PCB ASSY, two for the DC motor) soldered onto the main PCB ASSY.

(4) Remove the one screw securing the FG harness from the chassis ASSY.

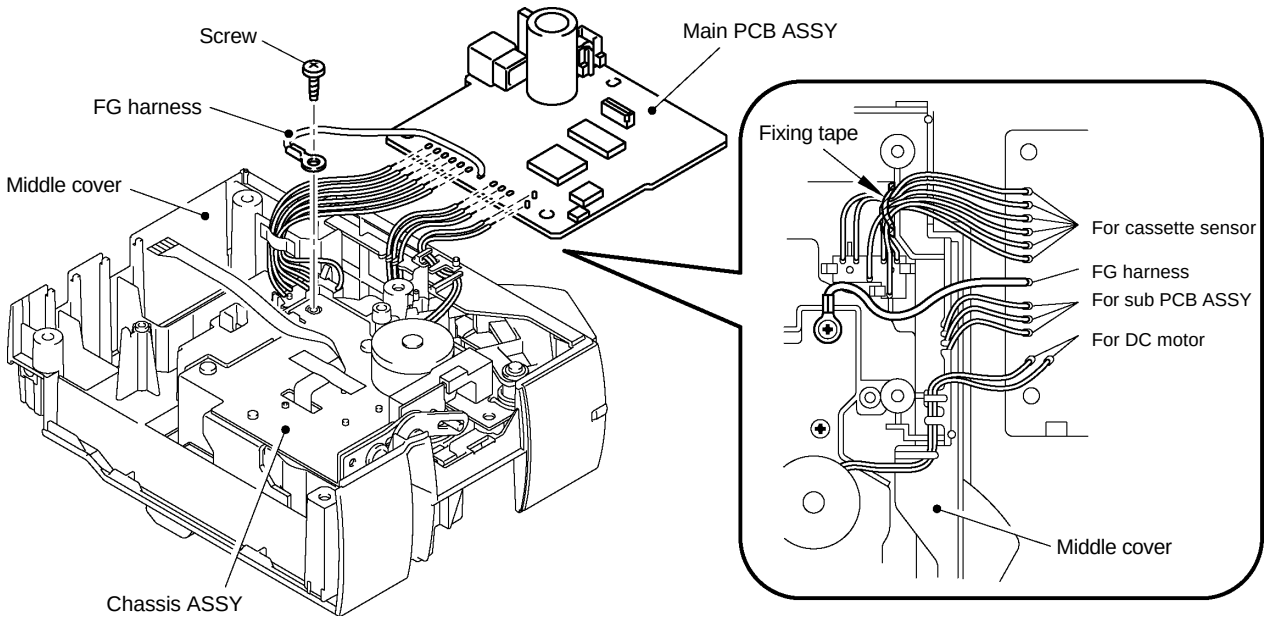


Fig. 3.1-6 Removing the Main PCB ASSY (2)

[4] Removing the Top Cover, Sub PCB ASSY, Power Supply Actuator and LED Cover

(1) Press the cutter lever in the direction of the arrow “A” to remove the top cover.

CAUTION: When removing the top cover, ensure not to pull the three harnesses for the sub PCB ASSY.

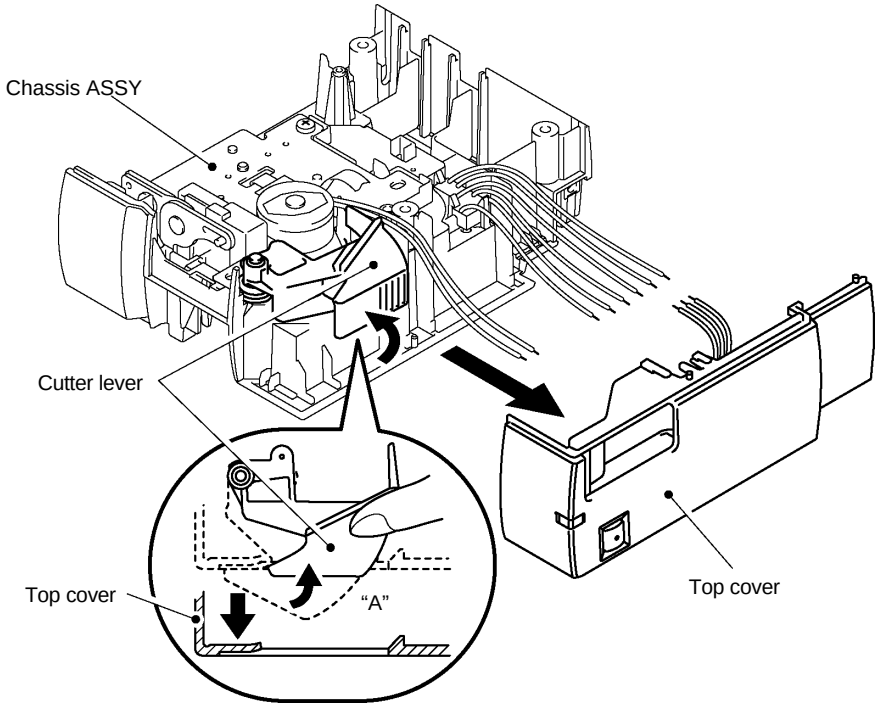


Fig. 3.1-7 Removing the Top Cover

(2) Remove the one screw securing the sub PCB ASSY to remove the sub PCB ASSY.

CAUTION: When pulling the sub PCB out of the top cover, ensure not to break the two positioning pins on the top cover.

(3) Remove the power supply actuator and LED cover from the top cover.

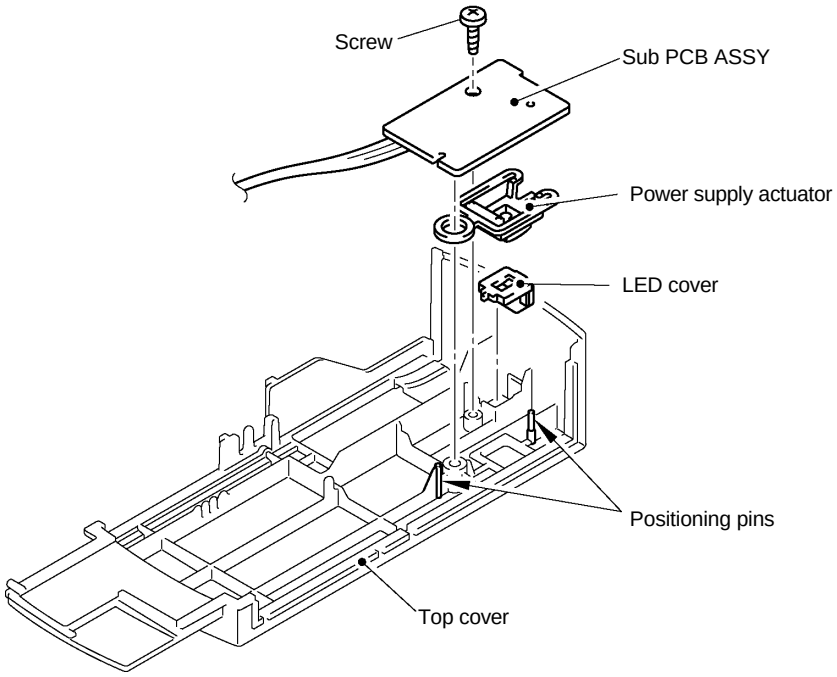


Fig. 3.1-8 Removing the Sub PCB ASSY, Power Supply Actuator and LED Cover

[5] Removing the Chassis ASSY

(1) Remove the two screws securing the chassis ASSY.

(2) Release the roller release lever as shown in the figure below.

(3) Pull the chassis ASSY out of the middle cover.

Warning: When removing the chassis ASSY, take care not to get injured in your fingers with the cutter blade.

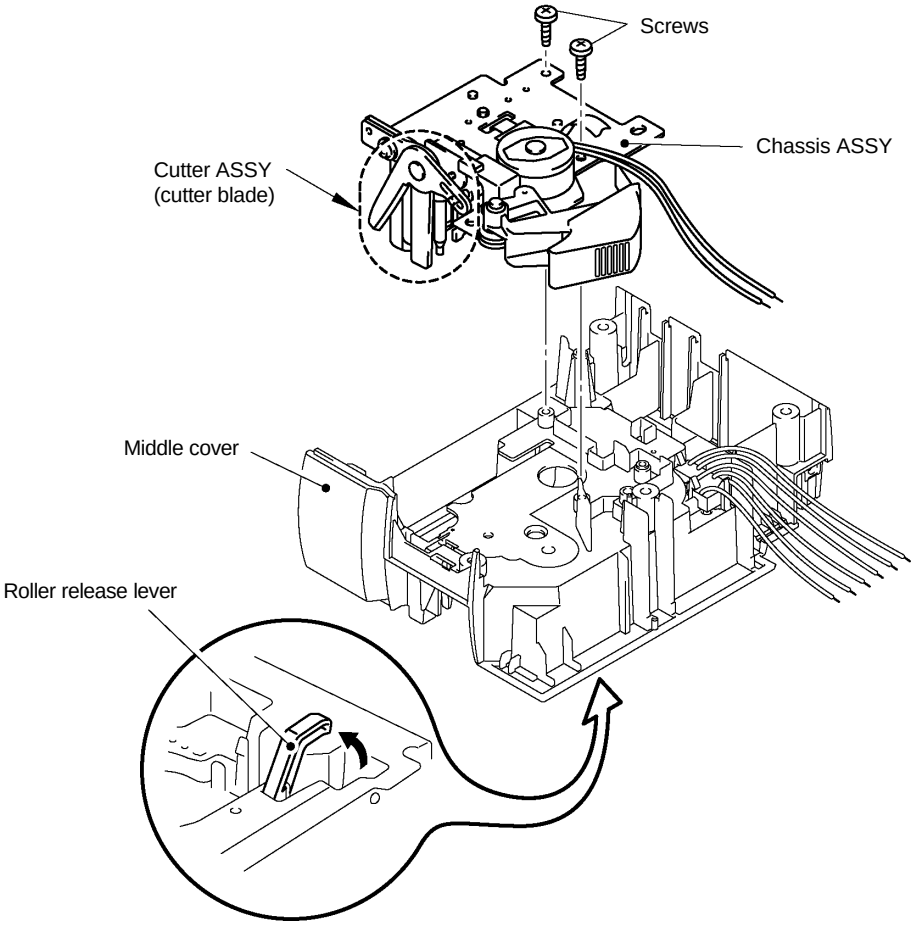


Fig. 3.1-9 Removing the Chassis ASSY

[6] Removing the DC Motor ASSY and Cutter ASSY

(1) Remove the washer 2.6 and double gear 3 from the chassis sub ASSY.

(2) Remove the two screws to remove the DC motor ASSY from the chassis sub ASSY.

(3) Remove the one retaining ring to remove the cutter lever and cutter return spring from the chassis sub ASSY.

(4) Remove the one screw to remove the cutter ASSY from the chassis sub ASSY.

Warning: When removing the cutter ASSY, take care not to get injured in your fingers with the cutter blade.

(5) Remove the one retaining ring to remove the cutter rack gear and cutter drive gear ASSY from the chassis sub ASSY.

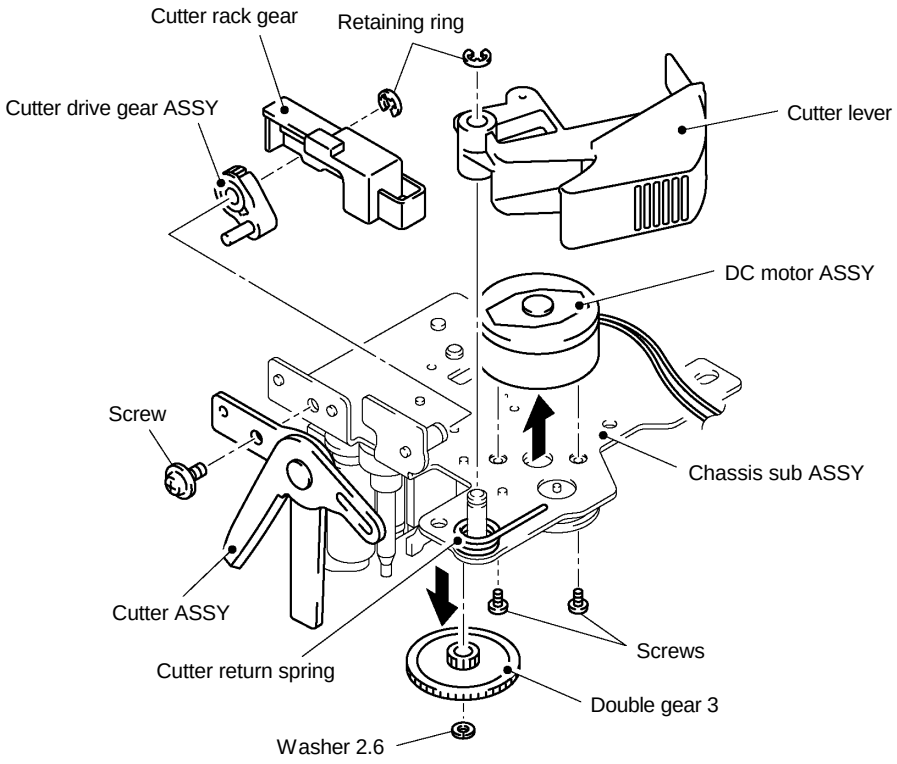


Fig. 3.1-10 Removing the DC Motor ASSY and Cutter ASSY

[7] Removing the Roller Holder ASSY and Termal Head ASSY

Caution: When handling the thermal head ASSY, ensure not to touch the thermal head with your hand. If touching the thermal head before discharge static electricity charged in your body, the thermal head may be damaged.

(1) Make sure that the roller holder ASSY is released from the thermal head.

(2) Unhook the release spring from the hook to remove it from the roller release lever.

(3) Pull the release rod in the direction of the arrow to remove its boss from the roller release lever.

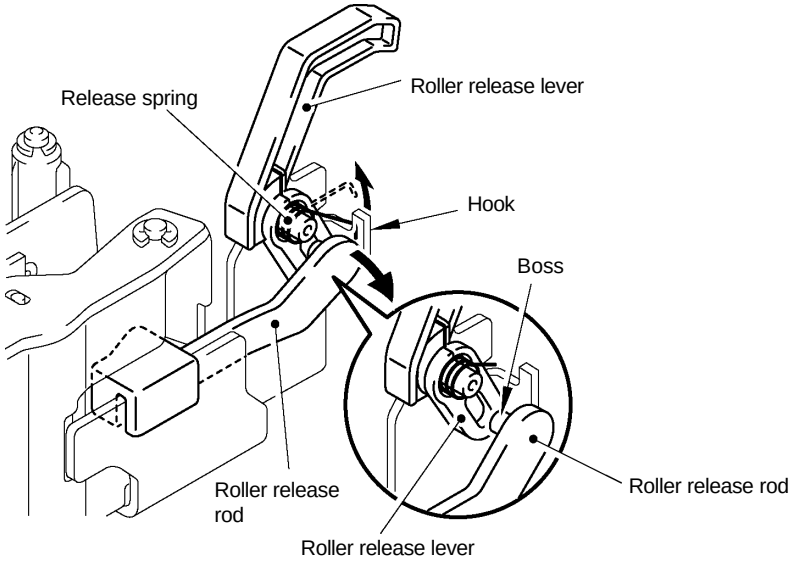


Fig. 3.1-11 Removing the Roller Release Rod

(4) Turn the roller release lever in the direction of the arrow to align its boss with the hole on the chassis sub ASSY. Then, remove the roller release lever.

(5) Remove the retaining ring to remove the roller holder ASSY and roller release rod from the chassis sub ASSY.

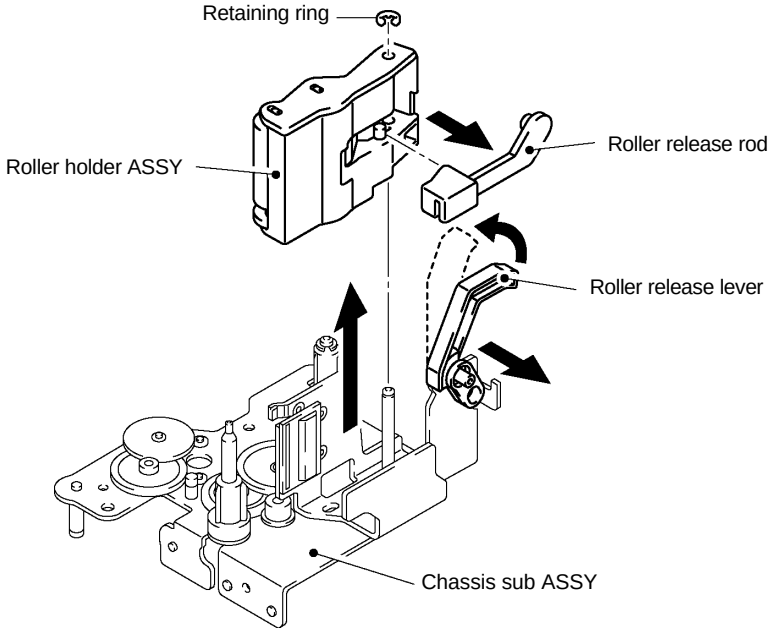


Fig. 3.1-12 Removing the Roller Release Lever and Roller Holder ASSY

(6) Remove the tape fixing the thermal head flat cable. Remove the one screw to remove the thermal head ASSY from the chassis sub ASSY.

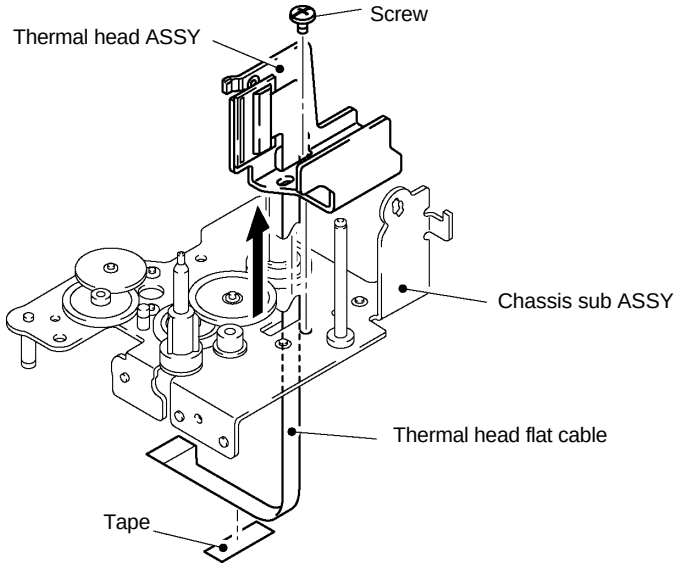


Fig. 3.1-13 Removing the Thermal Head ASSY

[8] Removing the Gears

(1) Remove the two washers 1.7 to remove the double gears 1 and 4 from each of their shafts. Then, remove the double gear 2, idle gear, tape idle gear and P idle gear.

(2) Remove the one retaining ring to remove the ribbon drive cam, ribbon clutch spring and ribbon drive gear in this order.

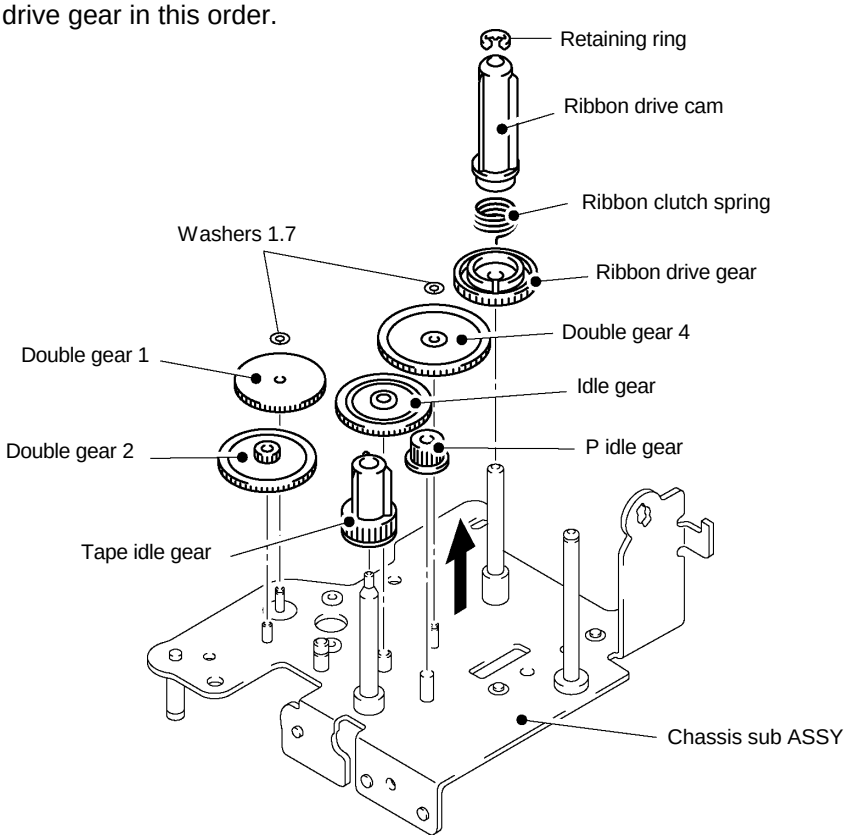


Fig. 3.1-14 Removing the Gears

[9] Removing the Switch ASSY

(1) Pull the three hooks on the middle cover outwards slightly to remove the switch ASSY.
Caution: Make sure not to break the hooks on the middle cover.

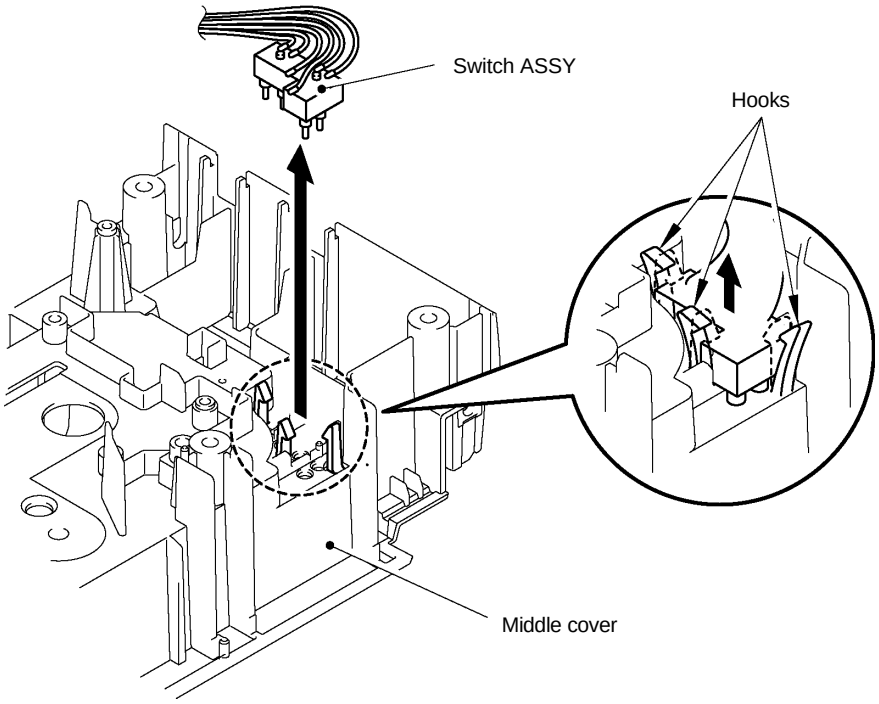


Fig. 3.1-15 Removing the Switch ASSY

3.2 REASSEMBLY PROCEDURE

[1] Assembling the Switch ASSY

(1) Pull the three hooks on the middle cover outwards slightly to assemble the switch ASSY.
Caution: Make sure not to break and deform the hooks.

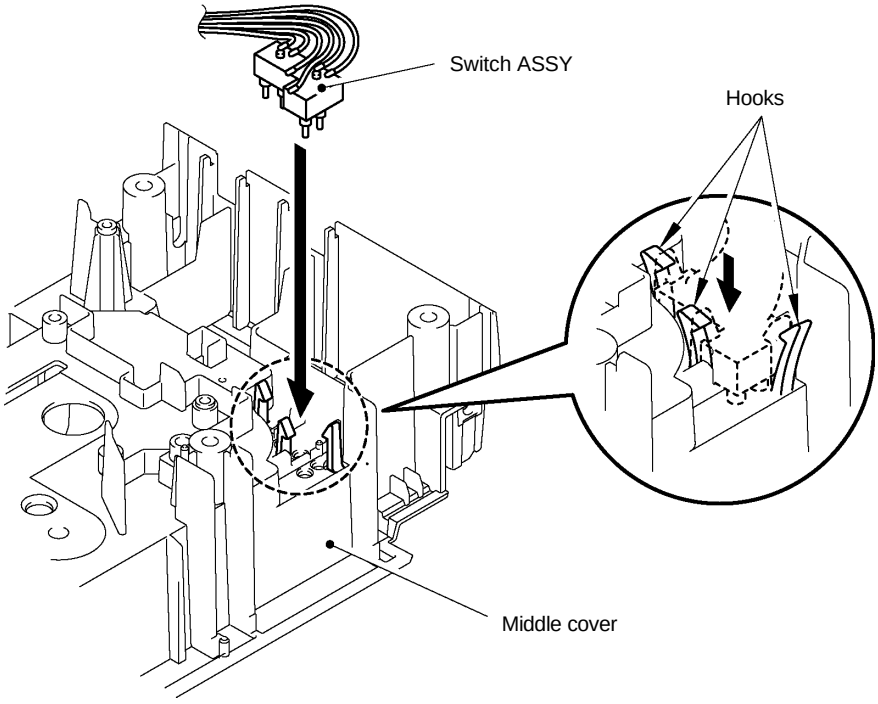


Fig. 3.1-16 Assembling the Switch ASSY

[2] Assembling the Gears

(1) Install the P idle gear, tape idle gear, idle gear and double gear 2 onto the chassis sub ASSY. Install the double gears 1 and 4 onto each of their shafts and assemble the two washers 1.7.

Note: Before installing the double gear 1, apply half of a rice-grain size of the grease onto its shaft.

Grease: Shinetsu Silicon silicon grease G501

(2) Install the ribbon drive gear.

(3) Assemble the ribbon clutch spring onto the ribbon drive cam. Set the ribbon drive cam onto the shaft on the chassis sub ASSY and assemble the one retaining ring.

Note: When assembling the ribbon clutch spring, ensure that the straight end is at thebottom and install it into the slit on the ribbon drive gear.

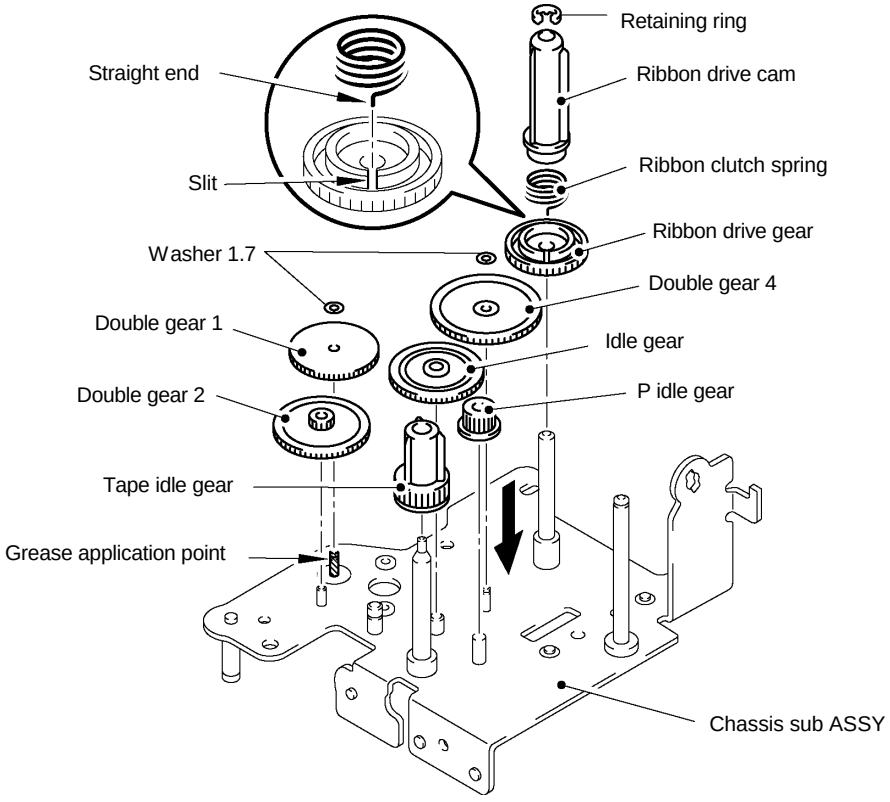


Fig. 3.1-17 Assembling the Gears

[3] Assembling the Thermal Head ASSY and Roller Holder ASSY

(1) Pass the thermal head flat cable through the oblong hole on the chassis sub ASSY.

(2) Align the thermal head ASSY with the positioning boss on the chassis sub ASSY and secure the thermal head ASSY with the one screw.

Note: When assembling the thermal head ASSY, secure the screw so that it is at the center of the oblong hole.

(3) Fix the thermal head flat cable with the tape (filamate tape #9510) and bend the cable slantly as shown in the figure below.

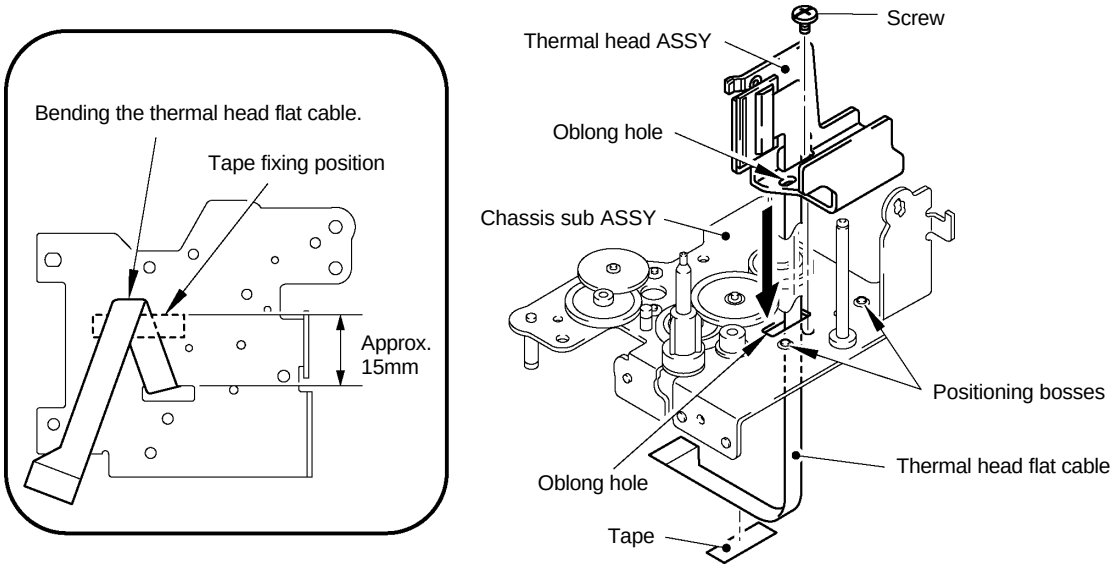


Fig. 3.1-18 Assembling the Thermal Head ASSY

(4) Apply half of a rice-grain size of the grease onto the slideway at the rear of the roller holder ASSY, where the roller release rod slides.

Grease: Shinetsu Silicon silicon grease G501

(5) Assemble the roller release rod onto the pin on the roller holder ASSY. Assemble the roller holder ASSY onto the shaft on the chassis sub ASSY and fix it with the retaining ring.

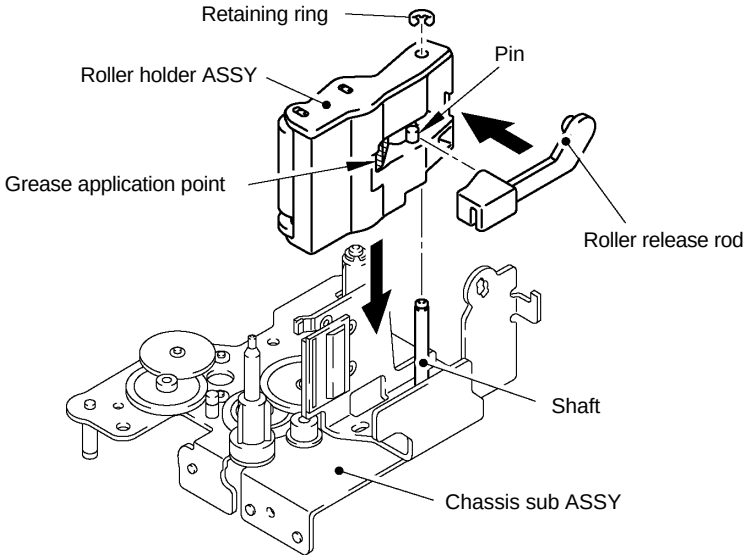


Fig. 3.1-19 Assembling the Roller Holder ASSY

(6) Align the roller release lever with the hole on the chassis sub ASSY to insert the lever into the hole and turn the lever in the direction of the arrow to assemble it onto the chassis sub ASSY.

(7) Pull the roller release rod outwards in the direction of the arrow to insert it into the hole on the roller release lever. (Refer to Fig.3.1-21.)

(8) Fix the end “A” of the release spring into the hole on the roller release lever and hook the end “B” of the release spring onto the position “C” on the chassis to assemble the release spring. (Refer to Fig.3.1-20.)

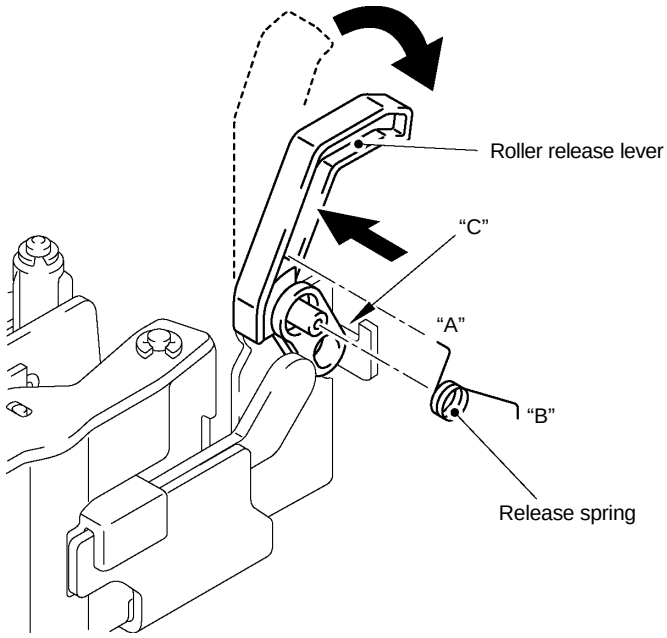


Fig. 3.1-20 Assembling the Roller Release Lever and Release Spring

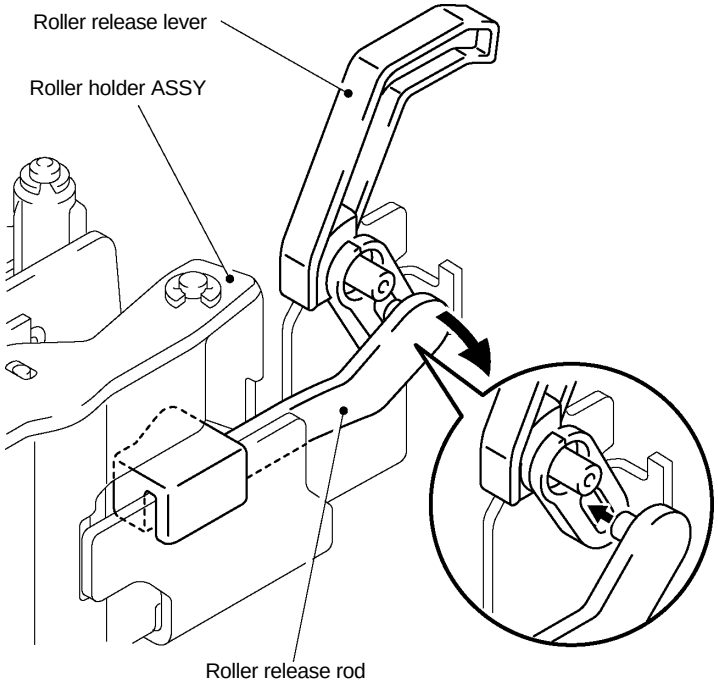


Fig. 3.1-21 Assembling the Roller Release Rod

[4] Assembling the Cutter ASSY and DC Motor ASSY

(1) Apply half of a rice-grain size of the grease onto the slideway and gear on the cutter rack gear.

Grease: Shinetsu Silicon silicon grease G501

(2) Insert the cutter drive gear ASSY onto the shaft on the chassis sub ASSY and turn it in the direction of the arrow to assemble it. (Refer to the figure indicating the assembled position of the cutter drive gear ASSY and cutter rack gear ASSY.) Then, fix the cutter drive gear ASSY with the retaining ring.

(3) Insert the end "A" of the cutter return spring into the hole on the chassis sub ASSY and assemble the other end into the cutter lever. Assemble the cutter lever onto the shaft on the chassis sub ASSY and fix it with the retaining ring.

Note: When assembling the cutter lever, ensure to fix the boss "B" of the cutter lever into the frame "C" on the cutter rack gear.

(4) Insert the pin of the cutter drive gear ASSY into the oblong hole on the cutter ASSY and install the cutter ASSY into the positioning bosses on the chassis sub ASSY to secure it with the one screw.

Warning: When assembling the cutter ASSY, take care not to get injured in your fingers with the cutter blade.

(5) Apply half of a rice-grain size of the grease onto the pin of the cutter drive gear ASSY.

Grease: Shinetsu Silicon silicon grease G501

(6) Move the cutter lever to check that the cutter ASSY works correctly.

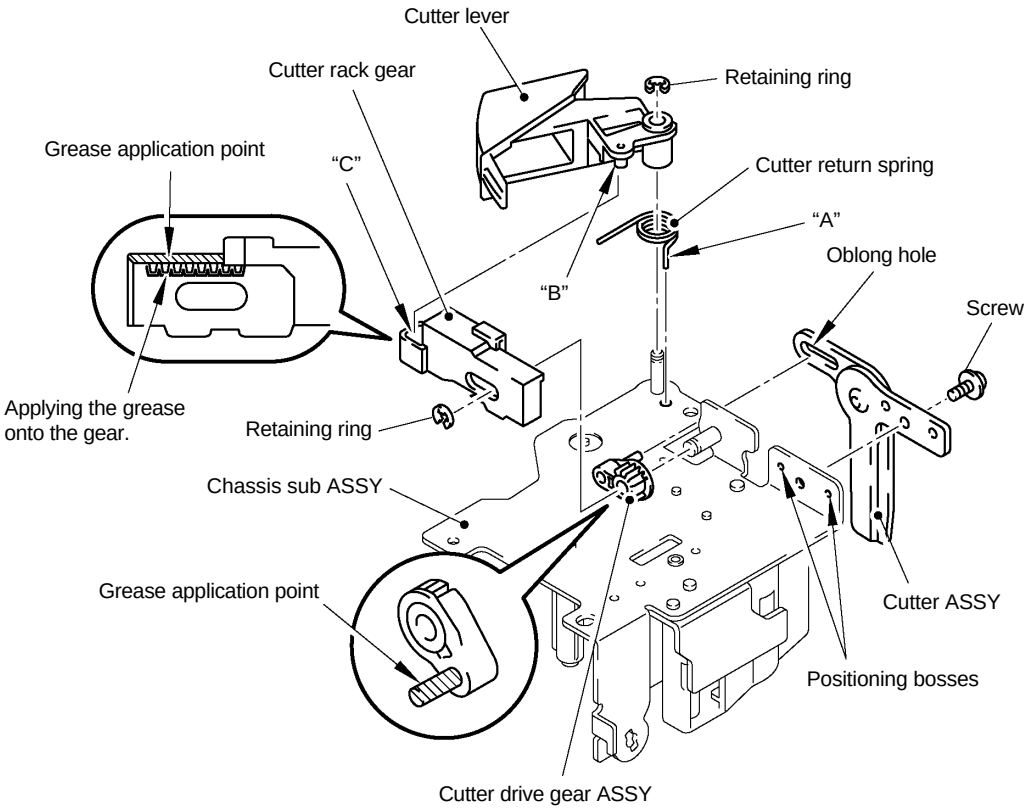


Fig. 3.1-22 Assembling the Cutter ASSY and Cutter Lever (1)

[Assembled position of the cutter drive gear ASSY and cutter rack gear]

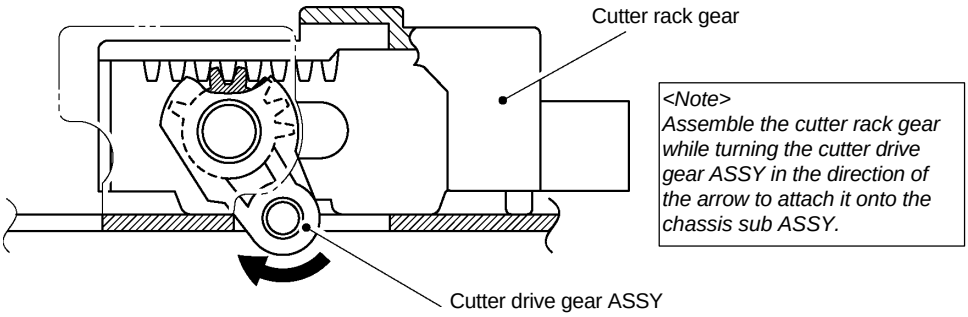


Fig. 3.1-23 Assembling the Cutter ASSY and Cutter Lever (2)

(7) Secure the DC motor ASSY onto the chassis sub ASSY with the two screws. Make sure to fix the motor harness as shown in the figure below.

(8) Assemble the double gear 3 onto the chassis sub ASSY and fix it with the washer 2.6.

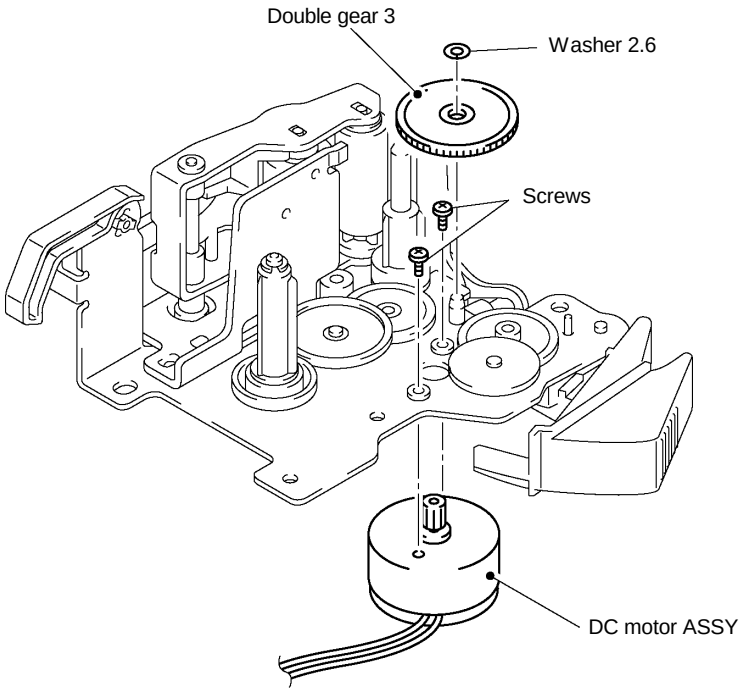


Fig. 3.1-24 Assembling the DC Motor ASSY

[5] Assembling the Chassis ASSY

(1) Release the roller release lever to insert the chassis ASSY into the middle cover by aligning it with the slit, one boss and two ribs on the middle cover.

Warning: Take care not to get injured in your fingers with the cutter blade.

Note: When assembling the chassis ASSY onto the middle cover, make sure that there is no gap between them.

(2) Secure the chassis ASSY with the two screws.

Caution: When securing the chassis ASSY, make sure not to catch the harnesses of the switch ASSY and DC motor.

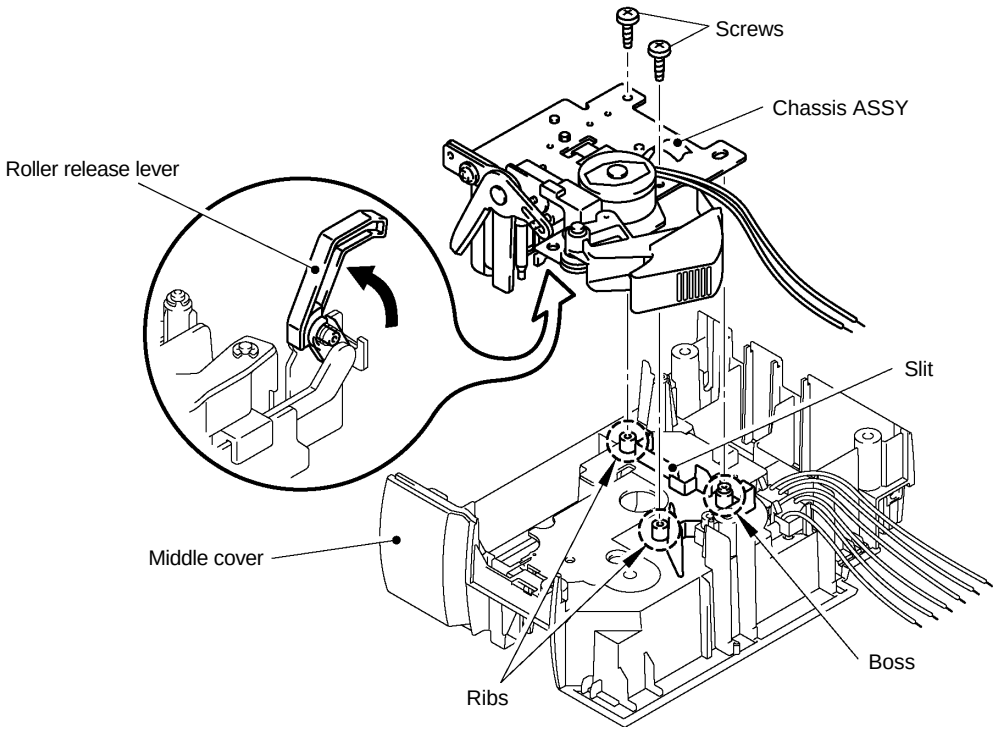


Fig. 3.1-25 Assembling the Chassis ASSY

[6] Assembling the LED Cover, Power Supply Actuator, Sub PCB ASSY and Top Cover

(1) Assemble the LED cover and power supply actuator onto the top cover.

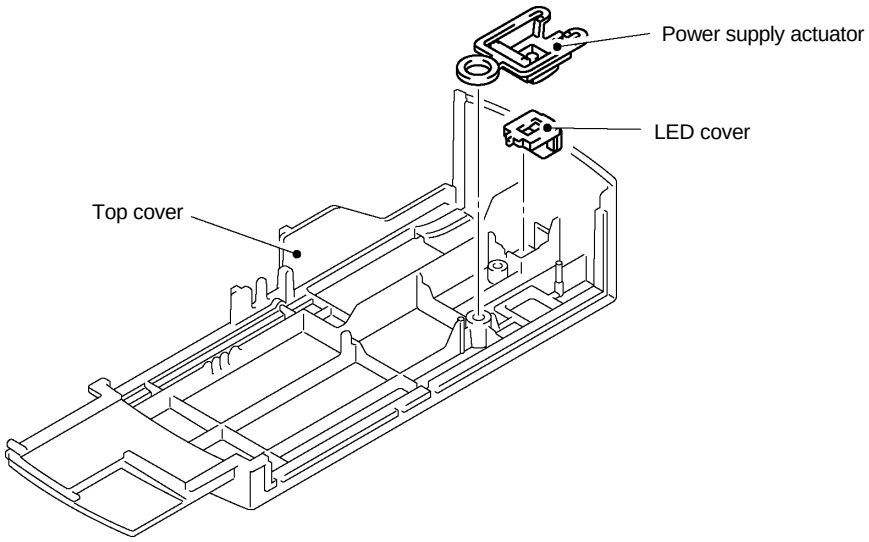


Fig. 3.1-26 Assembling the LED Cover and Power Supply Actuator

(2) Set the sub PCB ASSY onto the two positioning pins on the top cover and secure the one screw to assemble the sub PCB ASSY onto the top cover.

Note: When assembling the sub PCB ASSY onto the top cover, ensure not to break the two positioning pins on the top cover.

(3) Fix the three harnesses of the sub PCB ASSY into the slits A on the top cover.

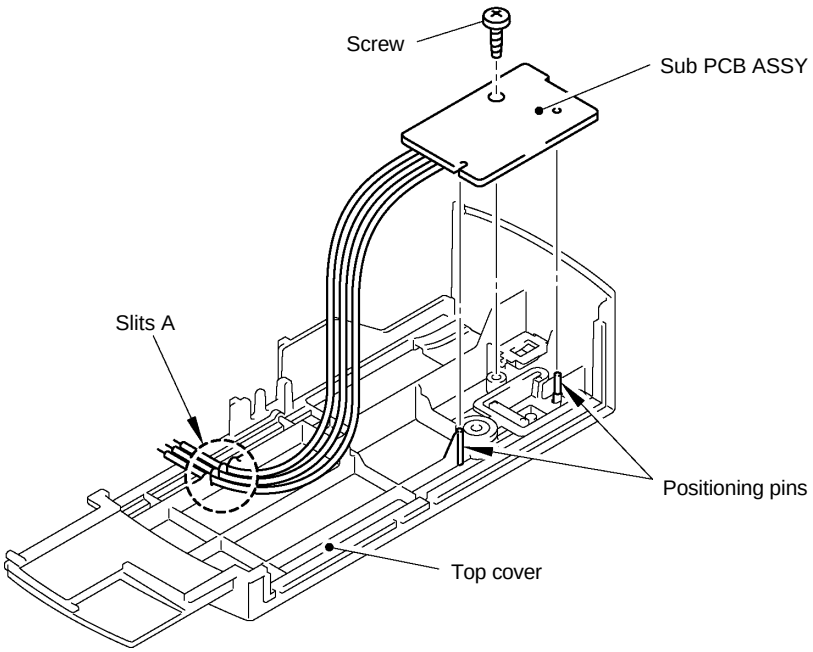


Fig. 3.1-27 Assembling the Sub PCB ASSY

(4) Insert the cutter lever into the section “B” on the top cover.

(5) Align the concave on the top cover with the convex on the middle cover to assemble the top cover onto the middle cover.

Note: Make sure not to catch the harness of the sub PCB ASSY between the covers.

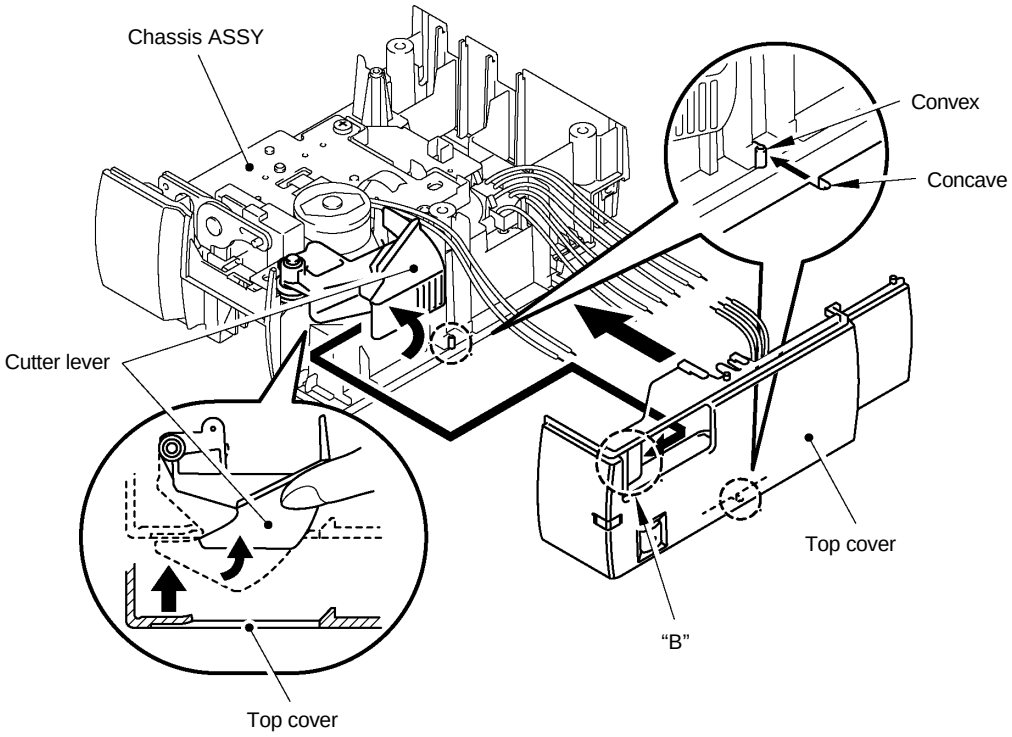


Fig. 3.1-28 Assembling the Top Cover

[7] Assembling the Main PCB

(1) Make sure to fix the three harnesses of the sub PCB ASSY into the slits on the top cover.

(2) Fix the two harnesses of the DC motor ASSY into the slits on the top cover.

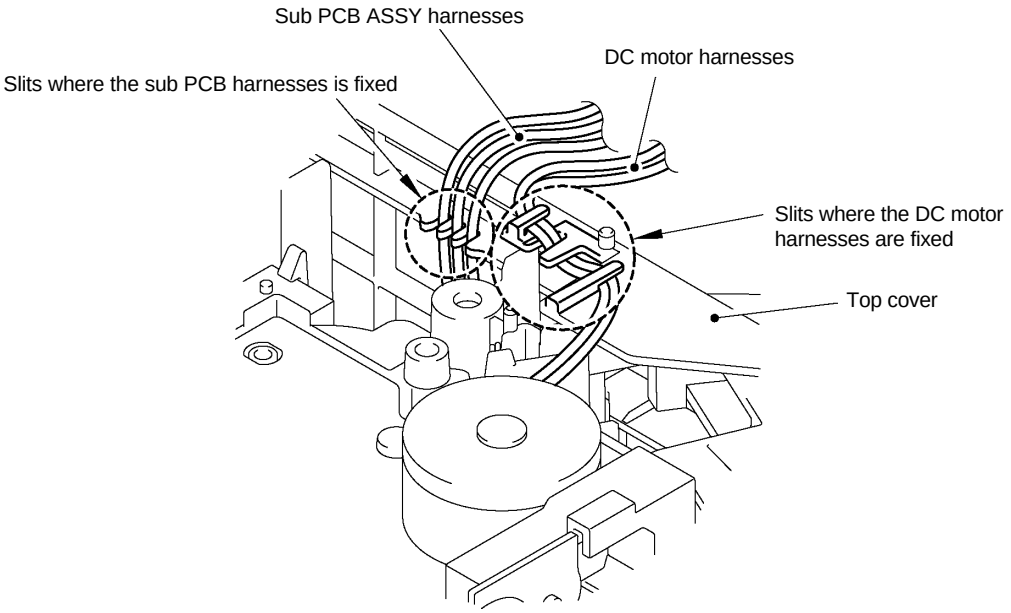


Fig. 3.1-29 Assembling the Main PCB ASSY (1)

(3) Solder the harnesses of the switch ASSY onto the six soldered points on the main PCB ASSY.

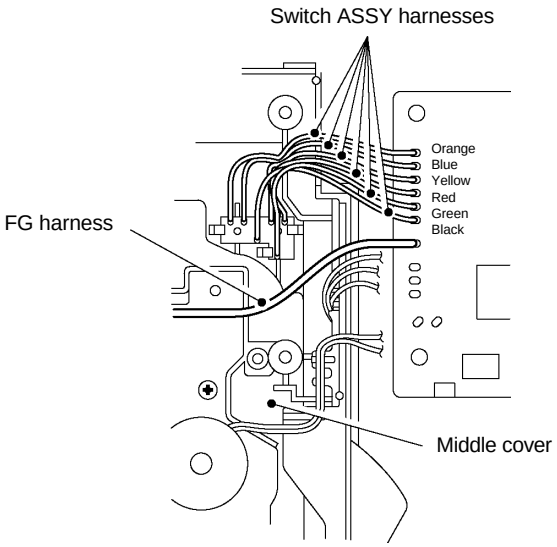


Fig. 3.1-30 Assembling the Main PCB ASSY (2)

(4) Solder the harnesses of the sub PCB ASSY onto the three soldered points on the main PCB ASSY.

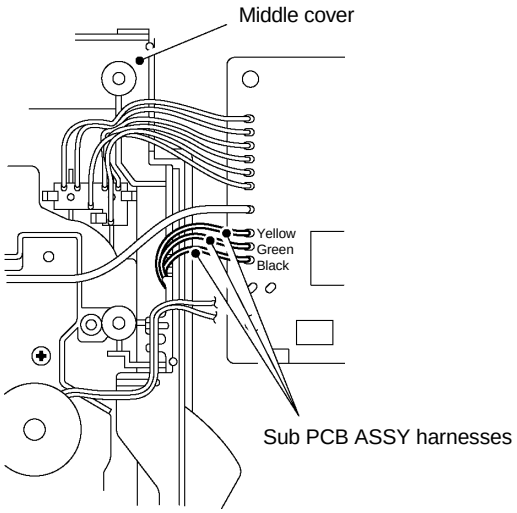


Fig. 3.1-31 Assembling the Main PCB ASSY (3)

(5) Solder the harnesses of the DC motor ASSY onto the two soldered points on the main PCB ASSY.

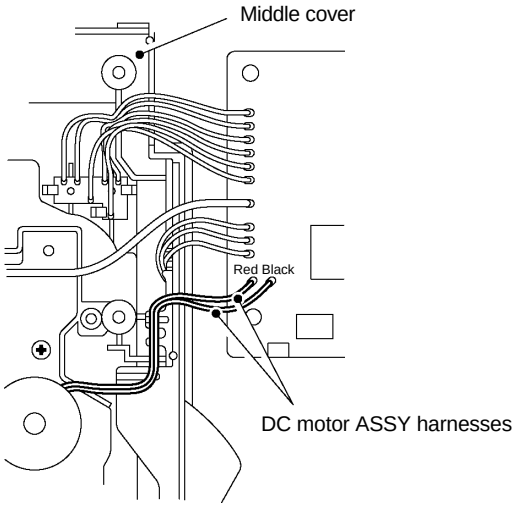


Fig. 3.1-32 Assembling the Main PCB ASSY (4)

(6) Bind the six harnesses of the switch ASSY at the center of the harness with the fixing tape.

Note 1: Use the transparent tape whose width is 12mm to bind the harness.

Note 2: When the harnesses have been already bound with the tape, check that they are bound correctly. If not, bind the harnesses again with a new tape.

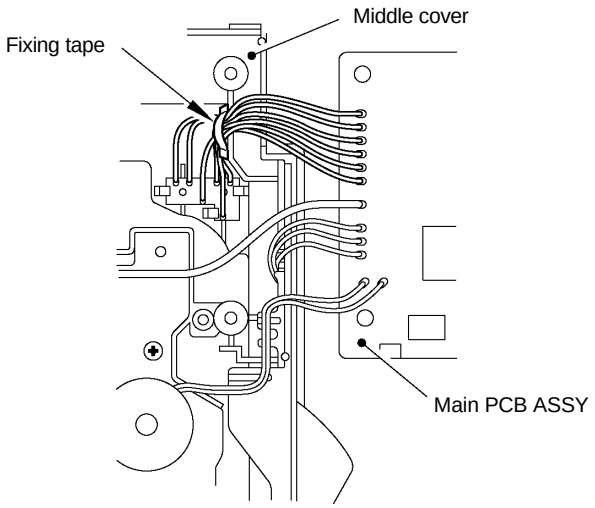


Fig. 3.1-33 Assembling the Main PCB ASSY (5)

(7) Secure the FG harness onto the chassis ASSY with the one screw.

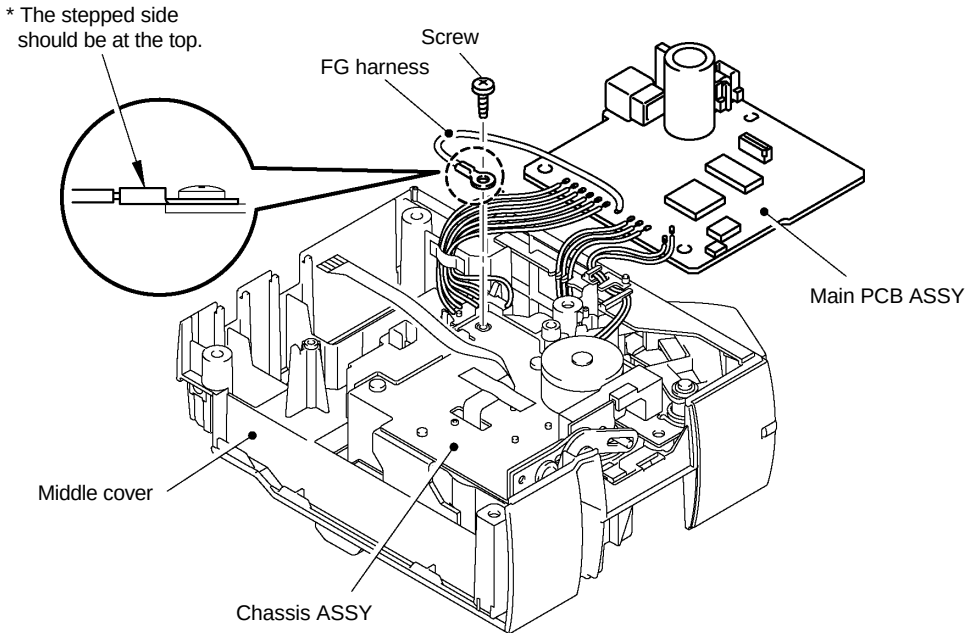


Fig. 3.1-34 Assembling the Main PCB ASSY (6)

(8) Connect the thermal head flat cable to the connector on the main PCB ASSY.

(9) Align the holes on the main PCB ASSY with the one boss and one pin on the middle cover and secure the one screw to assemble the main PCB ASSY.

Caution: When replacing the main PCB with a new one, always write the serial number into the new PCB following the flow described in Appendix 1. 'Maintenance Software'.

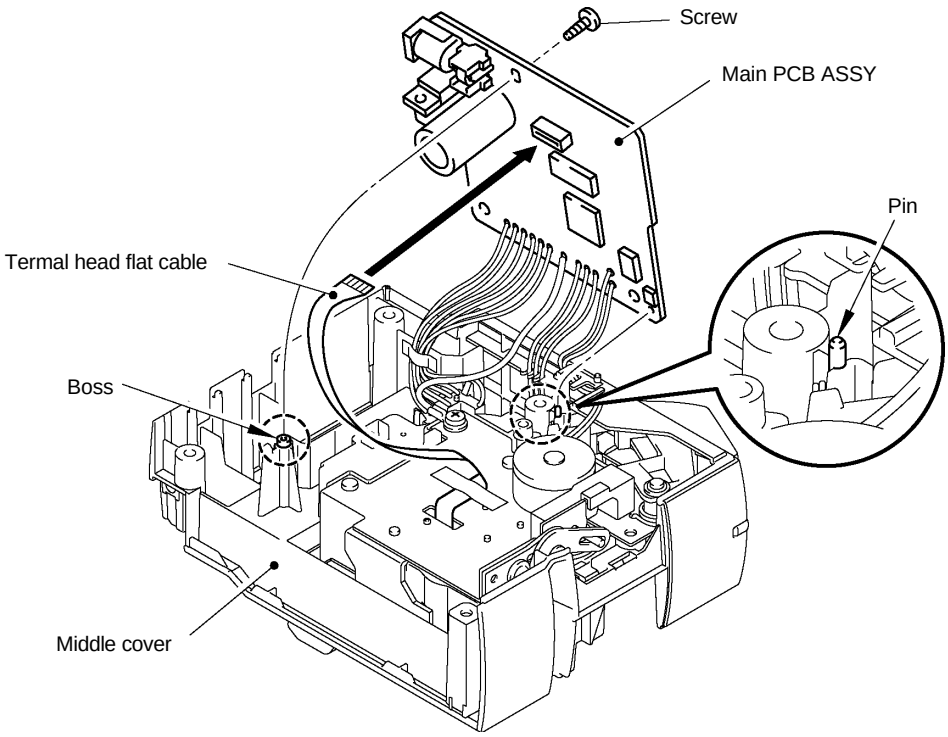


Fig. 3.1-35 Assembling the Main PCB ASSY (7)

[8] Assembling the Bottom Cover, Cassette Cover and Tape Cassette

(1) Align the seven ribs and two holes on the bottom cover with the middle cover and top cover to assemble the bottom cover.

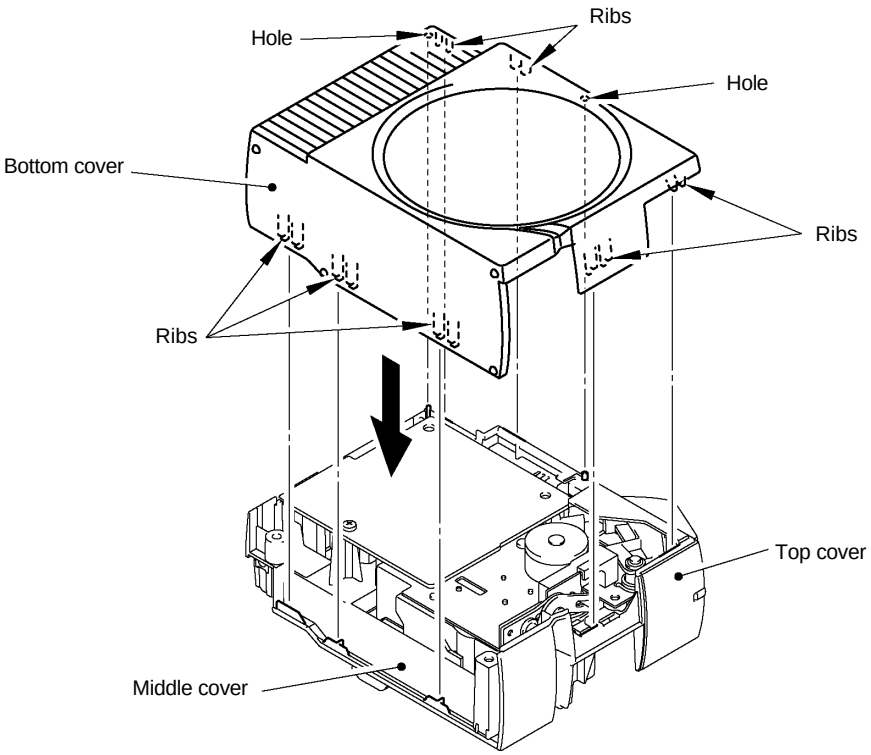


Fig. 3.1-36 Assembling the Bottom Cover (1)

(2) Turn the machine upside down so that the bottom cover is at the bottom. Secure the bottom cover with the five screws.

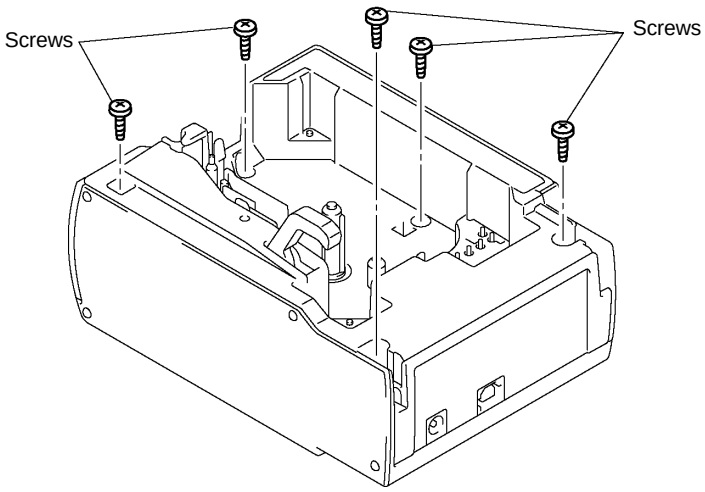


Fig. 3.1-37 Assembling the Bottom Cover (2)

(3) Pull the two arms on the cassette cover outwards to assemble the cassette cover onto the middle cover.

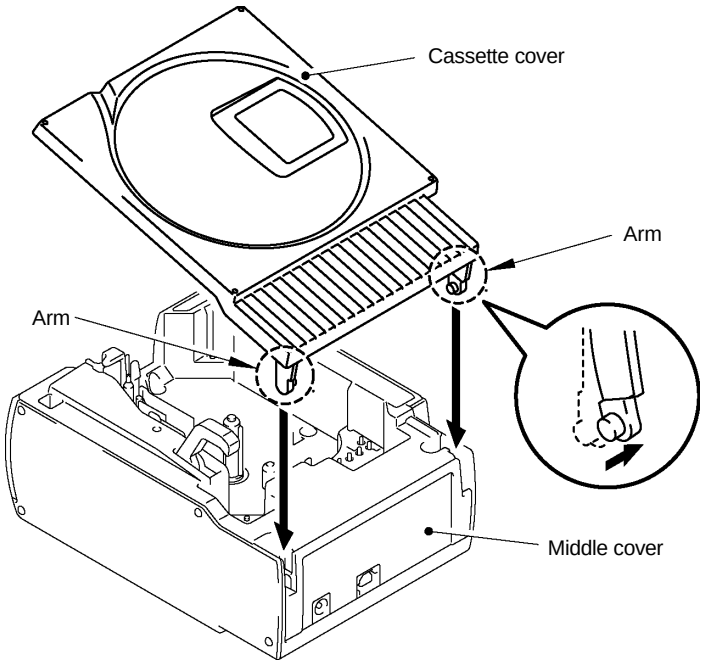


Fig. 3.1-38 Assembling the Cassette Cover

(4) Open the cassette cover and install the tape cassette.

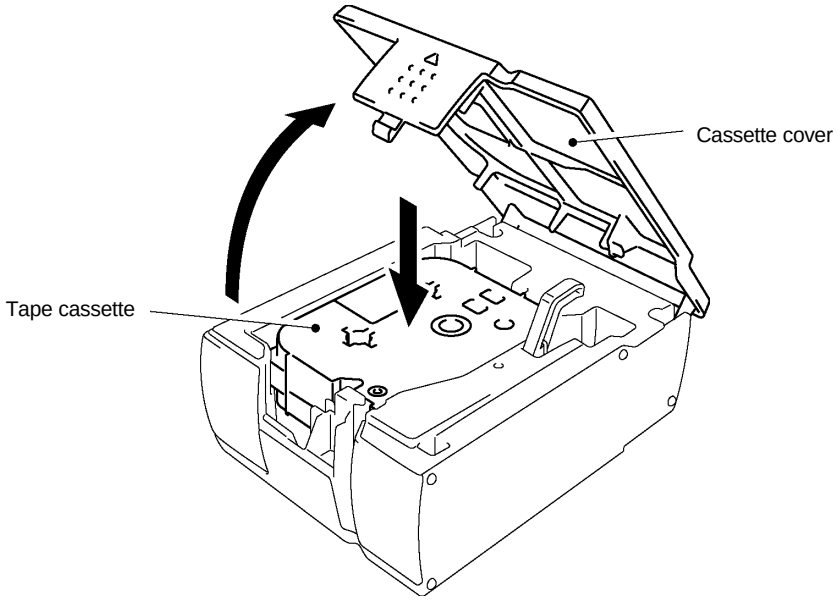


Fig. 3.1-39 Installing the Tape Cassette

[9] Self Print Test

You may make a self print test according to the following procedure without using a PC.

Caution: Even if no problem is found in this self print test, however, you need to connect the machine to a PC, enter texts from the PC, and output them to the machine.

(1) Plug the AC adapter into the machine.
The indicator LED comes on.

(2) Set a tape cassette.

(3) Press the ON/OFF switch to turn the power off.

(4) While pushing down the cutter lever, hold down the ON/OFF switch for 2 seconds or more.
The indicator LED starts flashing slowly and then quickly.

(5) If the indicator LED flashes quickly, release the cutter lever and ON/OFF switch.
The self print test will start.

(6) Check the print quality and tape length.

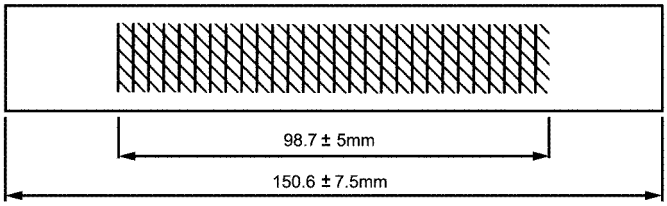


Fig. 3.1-40 Print Sample

Note: If the printout horizontally shows non-print sections just like horizontal white leaks, then lightly wipe off the heat generator of the thermal head with a cotton swab.

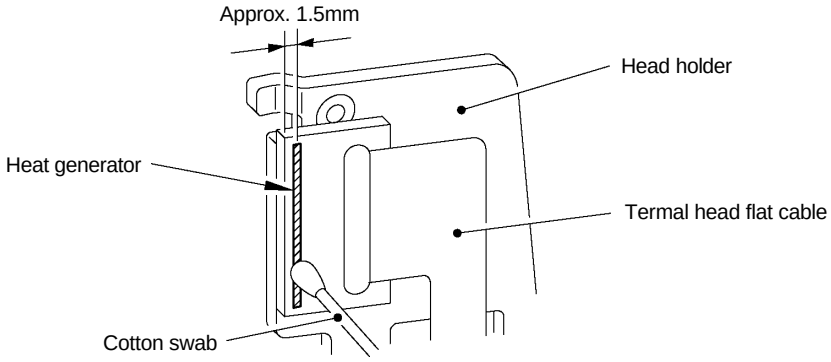


Fig. 3.1-41 Heat Generator of the Thermal Head

Note: If any problem is found in the print quality or tape length, go to Chapter IV "ERROR INDICATION AND TROUBLESHOOTING."

(7) Press the ON/OFF switch to turn the power off.

CHAPTER IV ERROR INDICATION AND TROUBLESHOOTING

4.1 OVERVIEW

This section gives the service personnel some of the troubleshooting procedures to be followed if an error or malfunction occurs with this machine. It is impossible to anticipate all of the possible troubles which may occur in future and determine the troubleshooting procedures, so this chapter covers some sample troubles. However, those samples will help service personnel pinpoint and repair other defective elements if he/she analyzes and examines them well.

Precautions

(1) Before testing electric conductivity with a circuit tester, unplug the AC adapter and check that power is not supplied to the machine.

(2) If a printing problem occurs, unplug the thermal head flat cable and check the thermal head and related circuits. Until they come to operate normally, do not plug the thermal head flat cable.

(3) To supply power to the machine, use the dedicated AC adapter. If you need to use a regulated DC power supply, its specifications should be 11 VDC with minimum 5A supply.

After repairing

After repairing the defective section, be sure to check again to see if the repaired section works correctly. Also make a note of the troubleshooting procedure so that it will be handy should problems occur in the future.

4.2 TROUBLESHOOTING GUIDE

■ If the indicator LED on the PT-2420PC lights or flashes	Go to Section 4.3.
■ If any error message is displayed on the computer screen	Go to Section 4.4.
■ If any of the following problems occurs: - Tape feeding failure - Printing failure - The indicator LED will not come on - Interface malfunctions	Go to Section 4.5.

4.3 IF THE INDICATOR LED ON THE PT-2420PC LIGHTS OR FLASHES

Check the LED state that shows the current machine status as listed below.

Indicator LED	Machine status	Remarks
ON	In the standby mode for data reception.	
Flashing slowly (In a cycle of 0.3-second ON and 0.3-second OFF)	The machine has received data.	Upon receipt of a print command, the machine will start printing.
Flashing quickly (In a cycle of 0.1-second ON and 0.1-second OFF)	No tape cassette is loaded. (The controller checks the cassette loading state at the start of data reception and printing. During printing, no check is made.)	Remove the error factor and press the ON/OFF button. The machine will switch to the standby mode for data reception.
	The tape has run out. Tape replacement is required. (The controller checks the tape state at the start of printing.)	
	Communications error.	
	Cutter sensor error. (The controller checks the sensor state at the start of data reception and printing, and during printing.)	
Flashing intermittently (In a cycle of 0.1-second ON and 0.3-second OFF)	EEPROM error.	If this error occurs, only the ON/OFF button is enabled. This error will not be signaled to the connected computer.
Flashing very slowly (In a cycle of 1.0-second ON and 1.0-second OFF)	On halt for cooling down the print head.	

4.4 IF ANY ERROR MESSAGE IS DISPLAYED ON THE COMPUTER SCREEN

Check the error message table given below and take any necessary action.

If you press the Detail button when an error message is displayed, then the Monitor Help will start and show Advice.

If this message appears on the computer screen:	**Do this:**
No errors.	—
Cassette not installed.	Load a tape cassette specified in the P-touch monitor screen and click the Resume button.
Buffer full error in the P-touch.	Turn the P-touch off and then on. Click the Resume button in the P-touch monitor screen.
P-touch tape cutter not operating.	(1) Turn the P-touch off and unplug the AC adapter from the P-touch. (2) Remove the jammed tape and print again.  Take extra care not to get injured in your fingers with the cutter blades.
Cannot change cassette while printing.	Turn the P-touch off and then on. Click the Resume button in the P-touch monitor screen.
Appropriate cassette not installed.	Load a tape cassette specified in the P-touch monitor screen and click the Resume button.
P-touch may have invalid data in memory.	Turn the P-touch off and then on.
Connected P-touch is not PT-2420PC.	Choose the correct printer port specifying the model name, PT-2420PC. If more than one P-touch is connected to your computer via the USB interface, then you need to choose the correct printer port specifying the model name and serial number (e.g., "PTUSB (PT-2420PC-xxxxxxxxx):"), instead of the default printer port"PTUSB:." Where, xxxxxxxxx is a serial number.
Wrong AC adapter connected.	Use an AC adapter exclusively designed for the P-touch.

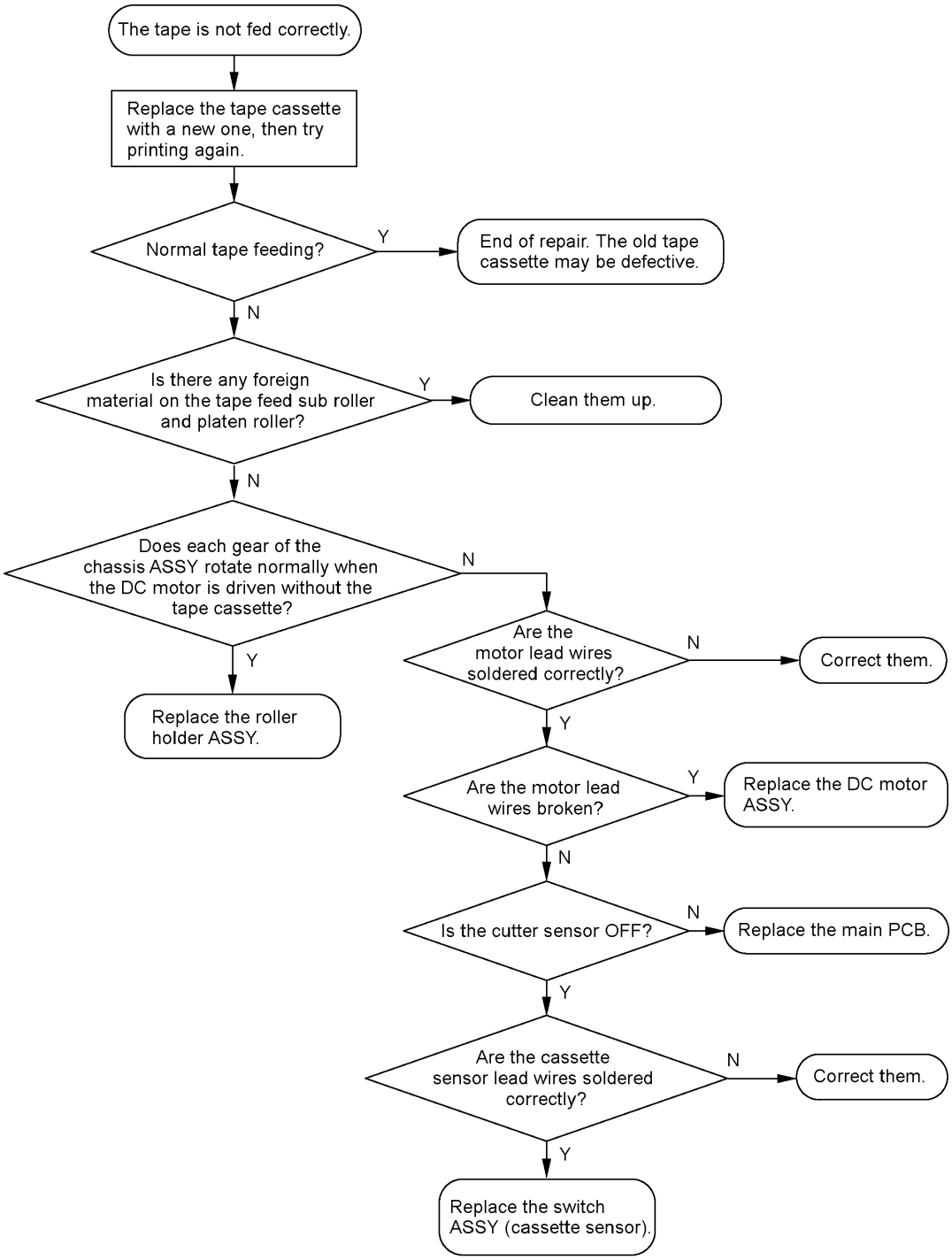
If this message appears on the computer screen:	Do this:
Communication error between PC and P-touch.	(1) Check that the P-touch is connected to your computer with the USB interface cable (that comes with the P-touch). Also check the cable for weak connection. (2) Make sure that the P-touch is turned on. If any communications error has occurred, turn the P-touch off and then on. (3) If more than one P-touch is connected to your computer via the USB interface, then you need to choose the correct printer port specifying the model name and serial number (e.g., "PTUSB(PT-2420PC-xxxxxxxxx):"), instead of the default printer port "PTUSB:." Where, xxxxxxxxx is a serial number. *NOTE: More than one P-touch may be connected to your computer, but only one P-touch may print at one time.*
Communication error in the P-touch.	Delete the current job and then start the Change Baud Rate wizard.
Not enough memory to print document.	Wait until any other application(s) is finished and then try to print again.
Not enough disk space to spool document.	Ensure sufficient disk space.
Invalid port was specified.	Choose a valid printer port and try to print again.
Port being used for another application.	Wait until any other application(s) is finished and then try to print again. ⚠ If this error persists, - A communication application (e.g., mail application) that uses the same I/O port as the P-touch may be running. With the P-touch being connected to your computer, restart your computer. - Check whether the same port is selected by more than one P-touch.
Cooling. Please wait a while.	The P-touch is cooling down the print head. Wait a while.
The P-touch is being used. After waiting a short while, click the Resume button in the P-touch monitor.	The machine is occupied with any other job. Wait a while and then click the Resume button in the P-touch Monitor.
Error of unknown cause occurred.	An unexpected error has occurred. Make a copy of the Fault Report, fill it in, and fax it to your service representative.

4.5 IF ANY OF THE FOLLOWING PROBLEMS OCCURS

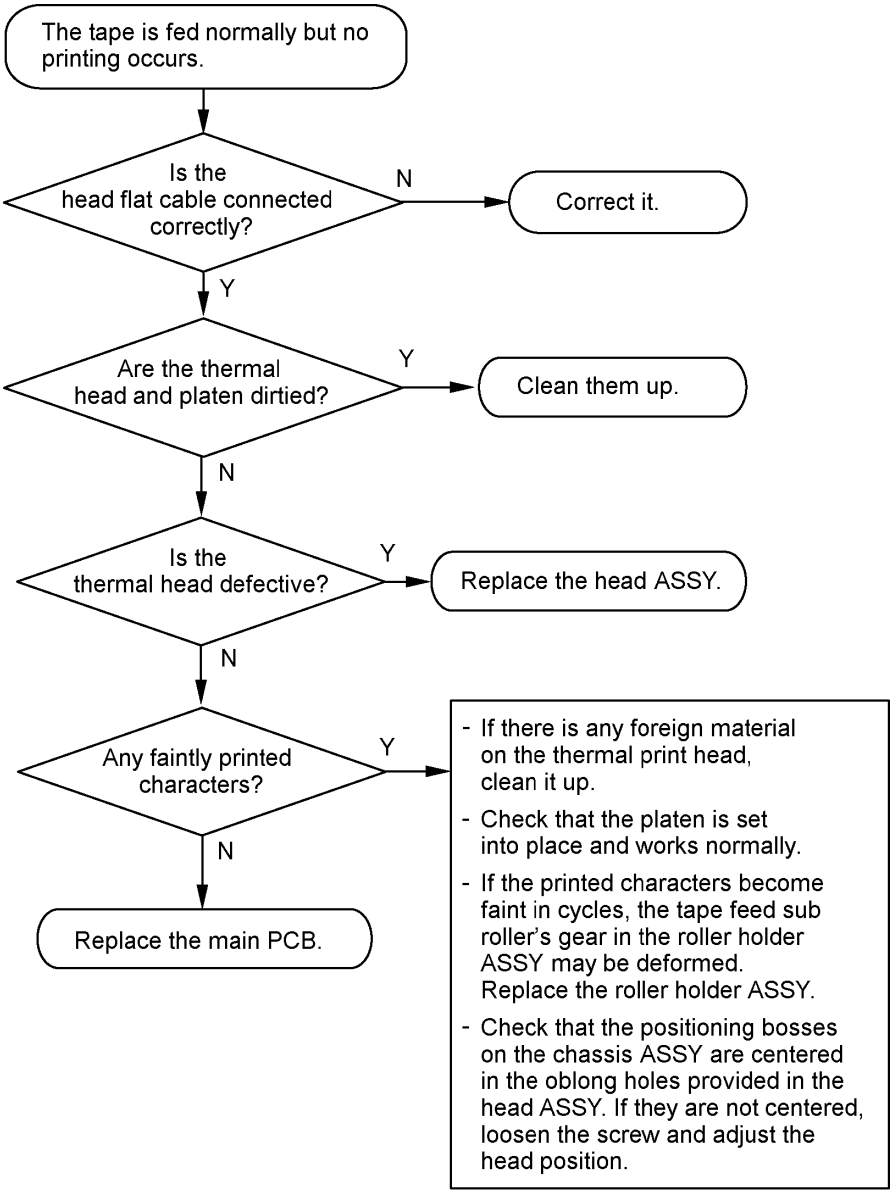
- Tape feeding failure
- Printing failure
- The indicator LED will not come on
- Interface malfunctions

Follow the related troubleshooting flows given below.

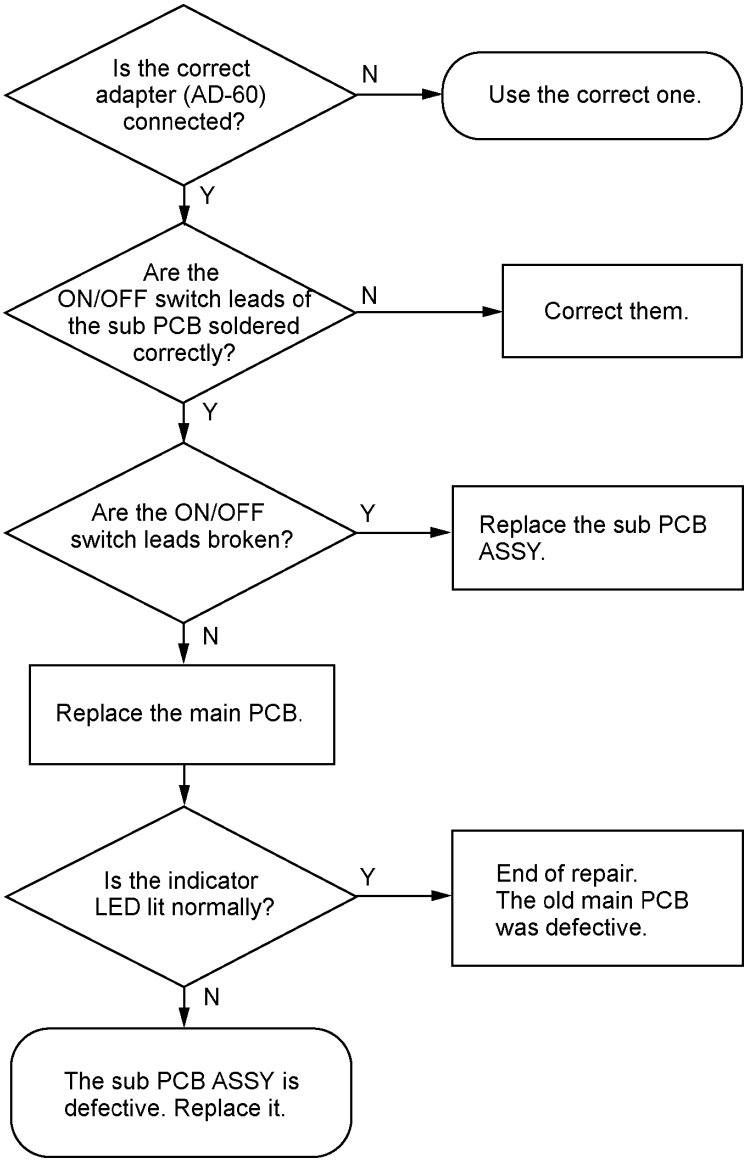
[1] Tape Feeding Failure



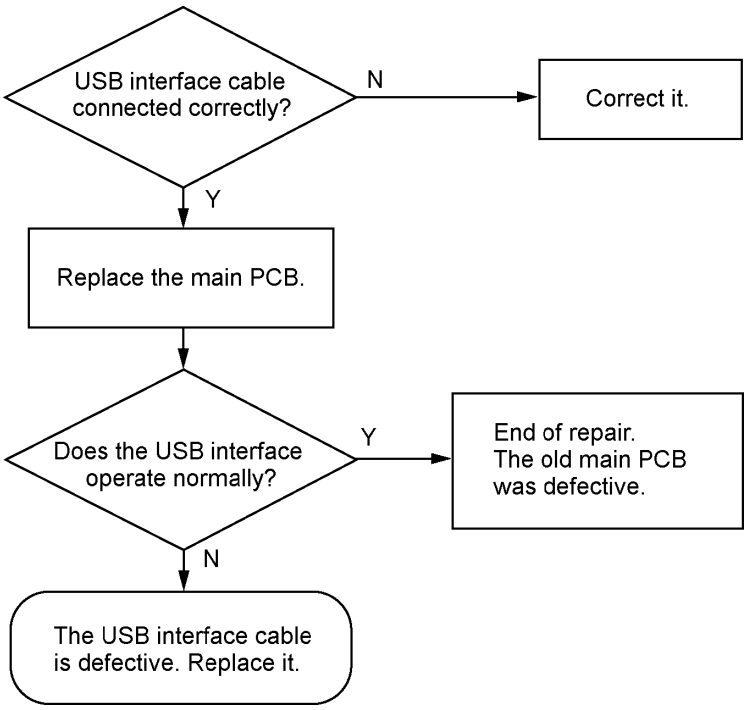
[2] Printing Failure



[3] The Indicator LED will not come on



[4] Interface Malfunctions



Appendix 1. MAINTENANCE SOFTWARE

Appendix 1.1 OVERVIEW

The maintenance software contains the test program (PT15TESTSE.EXE and patern01.prn) and EEPROM initialization program (PT15RESET.EXE).

The test program may check the cassette sensor, tape feeding & cutting function, and printing function, as well as writing a serial number onto the EEPROM mounted on the main PCB in the PT-2420PC. The test results and serial number will be stored in the EEPROM.

If you run the test program again for the PT-2420PC tested once, the test program will skip already tested items. To test all of those items, you need to initialize the test results and serial number stored in the EEPROM by using the EEPROM initialization program and then run the test program.

Appendix 1.2 SETTING UP THE TEST ENVIRONMENT

Installing the maintenance software to your computer

- Make sure that the OS of your computer is Windows98 or Windows98SE.
- Make sure that the PT-2420PC printer driver has been installed to your computer.
- Test program: Install the PT15TESTSE.EXE and patern01.prn to your computer. Both should be located in a same directory.
- EEPROM initialization program: Install the PT15RESET.EXE to your computer.

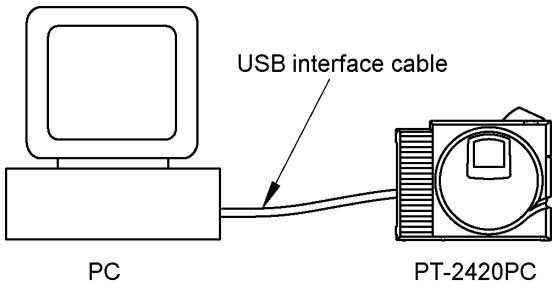
Connecting the PT-2420PC to your computer

(1) Plug an AC adapter into the AC jack of the PT-2420PC and a power outlet.

Note: Use an AC adapter exclusively designed for the PT-2420PC.

(2) Make sure that the PT-2420PC and your computer are turned off.

(3) Connect the PT-2420PC to your computer with a USB interface cable.

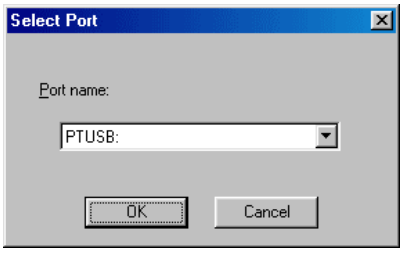


Appendix 1.3 RUNNING THE TEST PROGRAM

(1) Turn on your computer.

(2) After the OS has started up, press the ON/OFF switch of the PT-2420PC to turn it on.

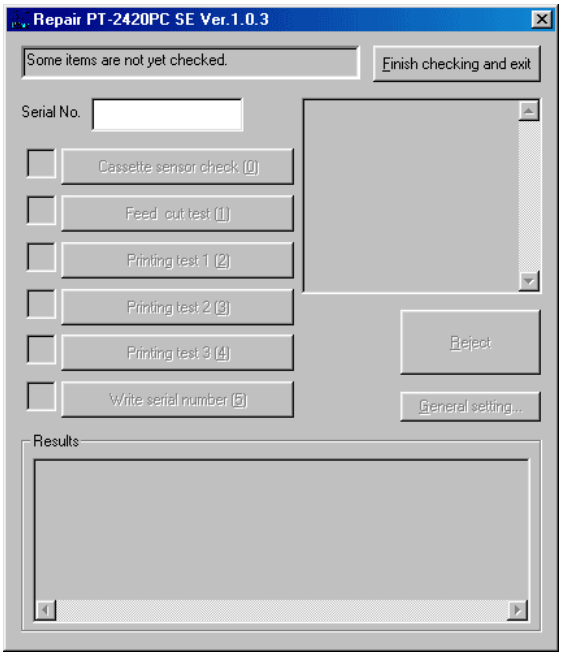
(3) Double-click the test program named PT15TESTSE.EXE to start it up.
The following window will appear.



Note: If the dialog "The Port Monitor not loaded!" displays, install the PT-2420PC printer driver, restart your computer, and go back to step (2) above.

(4) Open the Port list, select the PTUSB (PT-2420PC-000000001), and then click the **OK** button.

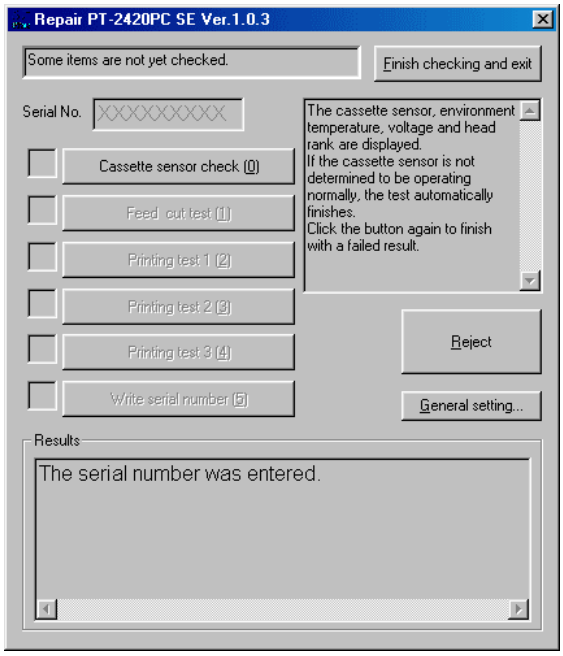
The following window will appear.



(5) Type the lower nine digits of the serial number printed on the nameplate of the PT-2420PC in the Serial No. box.

If "E52827-D0A322331" is printed on the nameplate, for example, type D0A322331.

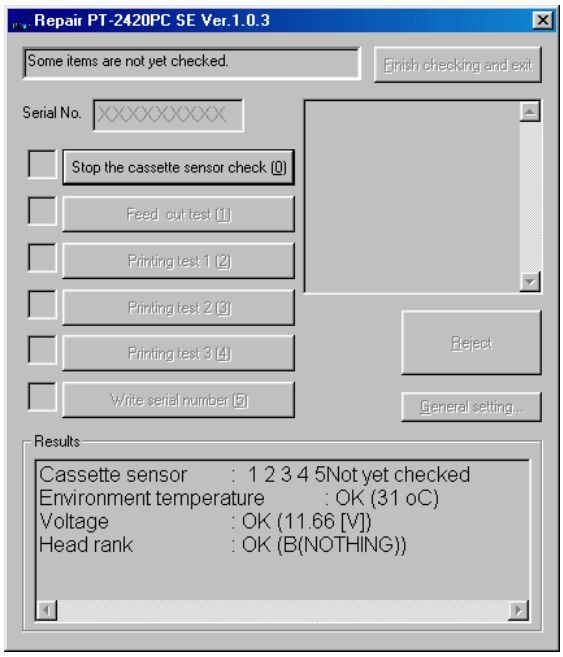
The display will change to the following:



*Note: If the Results area shows any message other than "The serial number was entered.", then click the **Finish checking and exit** button to abort the test program. Check the power supply and connection between your computer and PT-2420PC. Go to the recovery procedure given in Appendix 1.5.*

(6) Click the **Cassette sensor check** button.

The display will change to the following:

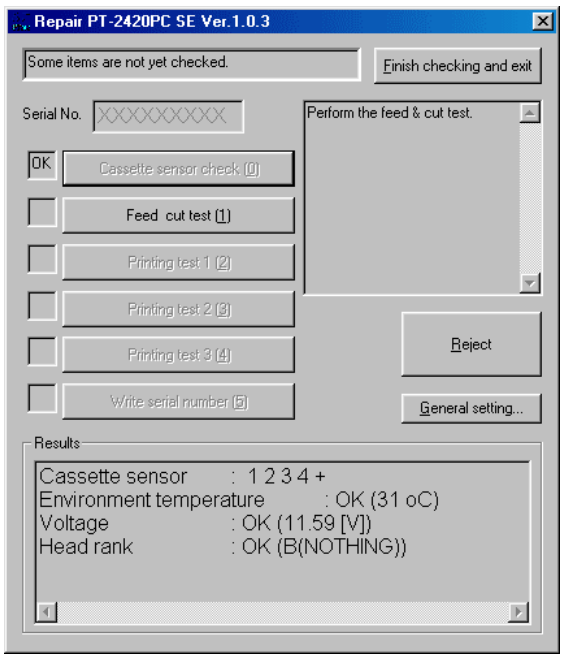


*Note: If the Results area shows any error message, click the **Stop the cassette sensor check** button and the **Finish checking and exit** button in this order to abort the test program. Go to the recovery procedure given in Appendix 1.5.*

(7) Check the cassette sensor according to the following instructions:

Open the cassette cover, remove the tape cassette, and press five sensor switches one by one. Each time one of them is pressed, the related number of the Cassette sensor shown in the Results area will change to "+."

If all of those five sensor switches are pressed, the cassette sensor check will complete and the display will automatically change to the following:

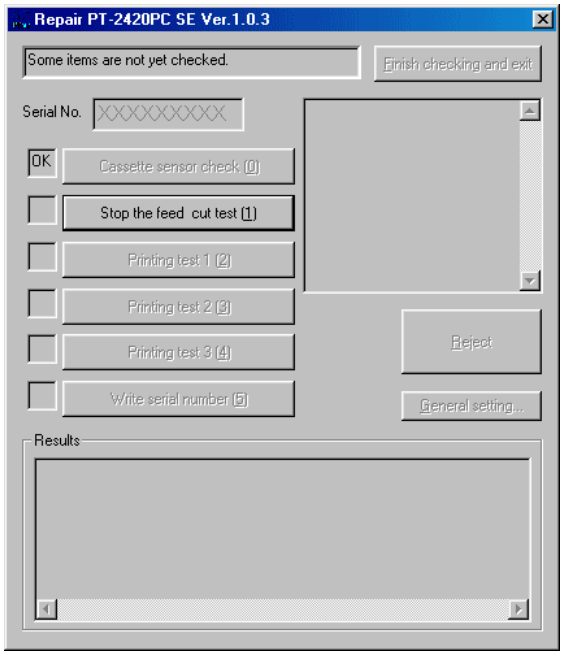


Note: If the cassette sensor check will not finish even after you press all of those five sensor switches, then the cassette sensor may be defective. Click the ***Stop the cassette sensor check*** *button to quit the check and then click the* ***Finish checking and exit*** *button to abort the test program.*

(8) Open the cassette cover and load a 24-mm tape cassette.

(9) Click the **Feed cut test** button.

The PT-2420PC will feed the tape and changes the display as shown on the next page.



*Note: If any error message appears in the Results area, click the **Stop the feed cut test** button and then click the **Finish checking and exit** button to abort the test program. Go to the recovery procedure given in Appendix 1.5.*

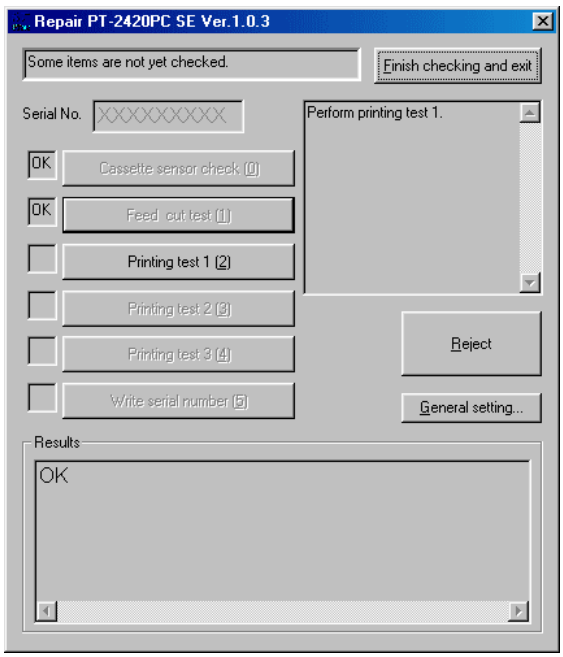
(10) Push down the cutter lever to cut the tape.

The PT-2420PC will feed the tape again.

*Note: If the tape will not feed, click the **Stop the feed cut test** button to stop the test. Then check the tape cassette. If the tape has run out, remove the cassette and go back to step (8). If not so, the cutter sensor may be defective. Click the **Finish checking and exit** button to abort the test program.*

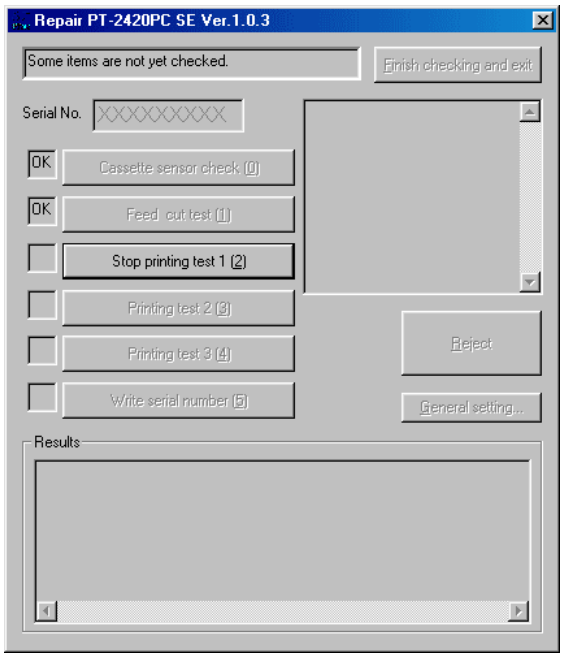
(11) Repeat tape feeding and cutting three times.

Then the feed cut test will automatically finish and the display will change to the following:



(12) With the tape cassette being loaded, click the Printing test 1 button.

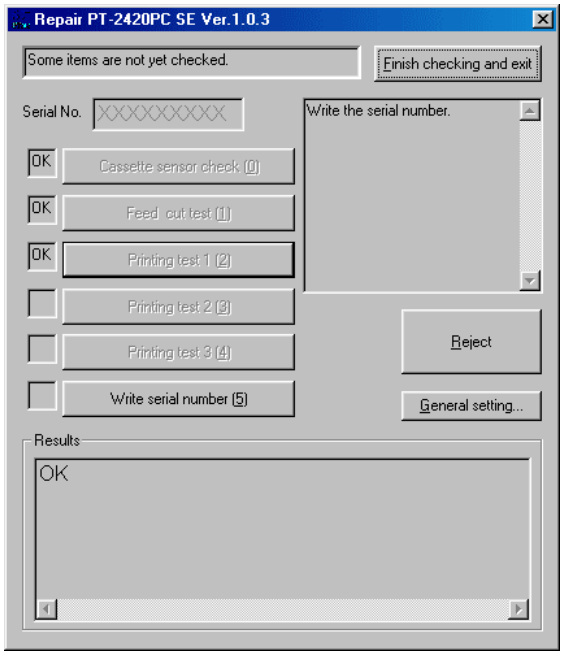
The tape will feed and the display will change to the following:



Note: If any error message appears in the Results area, click the Stop printing test 1 button and the Finish checking and exit button in this order to abort the test program. Then check the tape cassette. If no tape cassette is loaded or the tape has run out, replace the tape cassette with a new one and go back to step (12). If not so, go to the recovery procedure given in Appendix 1.5.(1)

(13) Push down the cutter lever to cut the tape.

The PT-2420PC will start printing. If printing finishes, the display will change as shown below.



*Note: If any error message appears in the Results area, click the **Stop printing test 1** button and the **Finish checking and exit** button in this order to abort the test program. Check the tape cassette. If no tape cassette is loaded or the tape has run out, load a new tape cassette and go back to step (12).*
*If not so, click the **General setting** button to call up the Setting dialog.*
*In the Setting dialog, if the right-hand Printing test 1 area does not show"\patern01.prn," then select it, click the **OK** button to close the Setting dialog, and go back to step (12).*
If the "\patern01.prn" is shown but the patern01.prn is not located in the same directory where the PT15TESTSE.EXE exists, then copy the patern01.prn to the same directory and go back to step (12).
In any other cases, go to the recovery procedure given in Appendix 1.5.

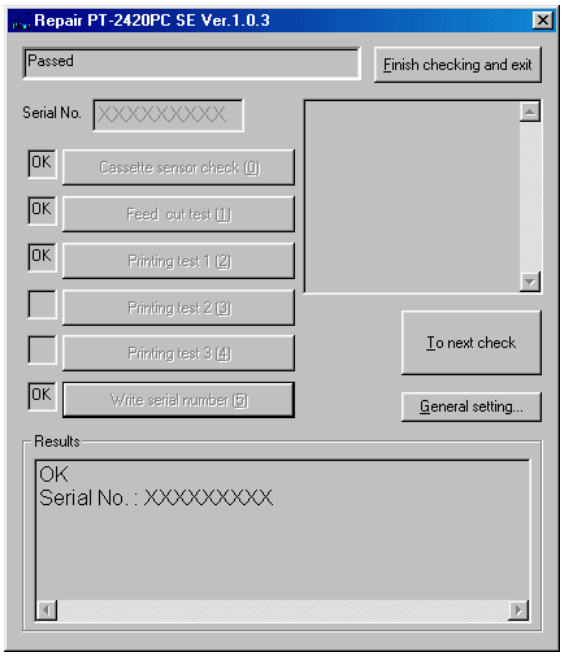
(14) Check the print quality and print size of the printed tape.

If any of the print problems is noticed, go to Chapter IV, Section 4.5.

(15) Click the **Write serial number** button.

The serial number entered into the Serial No. area will be written into the PT-2420PC.

The display will change to the following:



Note: If any error message appears in the Results area, go to the recovery procedure given in Appendix 1.5.

(16) Check that the serial number you entered is displayed in the Results area, then click the **Finish checking and exit** button.

The test program will terminate.

(17) Turn the PT-2420PC off and unplug the USB interface cable.

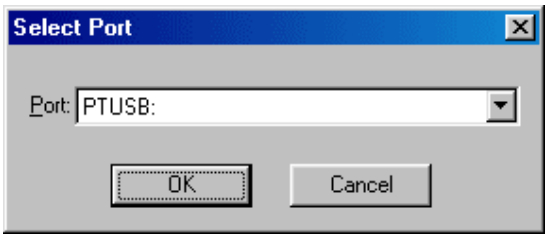
Appendix 1.4 RUNNING THE EEPROM INITIALIZATION PROGRAM

(1) Turn on your computer.

(2) After the OS has started up, press the ON/OFF switch of the PT-2420PC to turn it on.

(3) Double-click the EEPROM initialization program named PT15RESET.EXE to start it up.

The following window will appear.

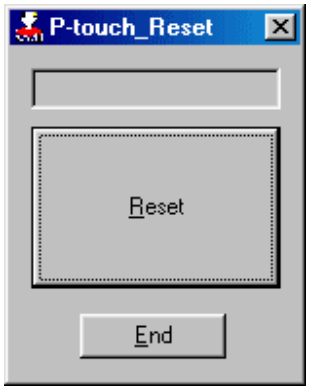


Note: If the dialog "The Port Monitor not loaded!" displays, install the PT-2420PC printer driver, restart your computer, and go back to step (2) above.

(4) Open the Port list, select the port that includes the current serial number* and character string "PT-2420PC," and then click the **OK** button.

(*Lower nine digits of the serial number printed on the nameplate of the PT-2420PC if the serial number has been written, or 0000000001 if no serial number has been written)

The following window will appear.



(5) Click the **Reset** button.

*Note: If "NG" appears, click the **End** button to abort the EEPROM initialization program and go to the recovery procedure given in Appendix 1.5.*

(6) Click the **End** button to terminate the program.

(7) Turn the PT-2420PC off and unplug the USB interface cable.

Appendix 1.5 RECOVERING FROM RUN-TIME ERRORS

(1) Click the **Finish checking and exit** button to abort the running program.

(2) Check that the PT-2420PC is turned on.

(3) Check the USB interface cable connection at both the PT-2420PC and your computer.

(4) Start the program again.
If no error occurs at the same testing process, proceed to the subsequent testing process.

(5) If an error persists at the same testing process, abort the program, turn the PT-2420PC and your computer off, and unplug the USB interface cable from the PT-2420PC.

(6) Restart your computer.

(7) Carry out steps (2) through (5).

(8) From the Printers Folder on the computer screen, remove the PT-2420PC Printer to uninstall the PT-2420PC printer driver and then restart your computer.

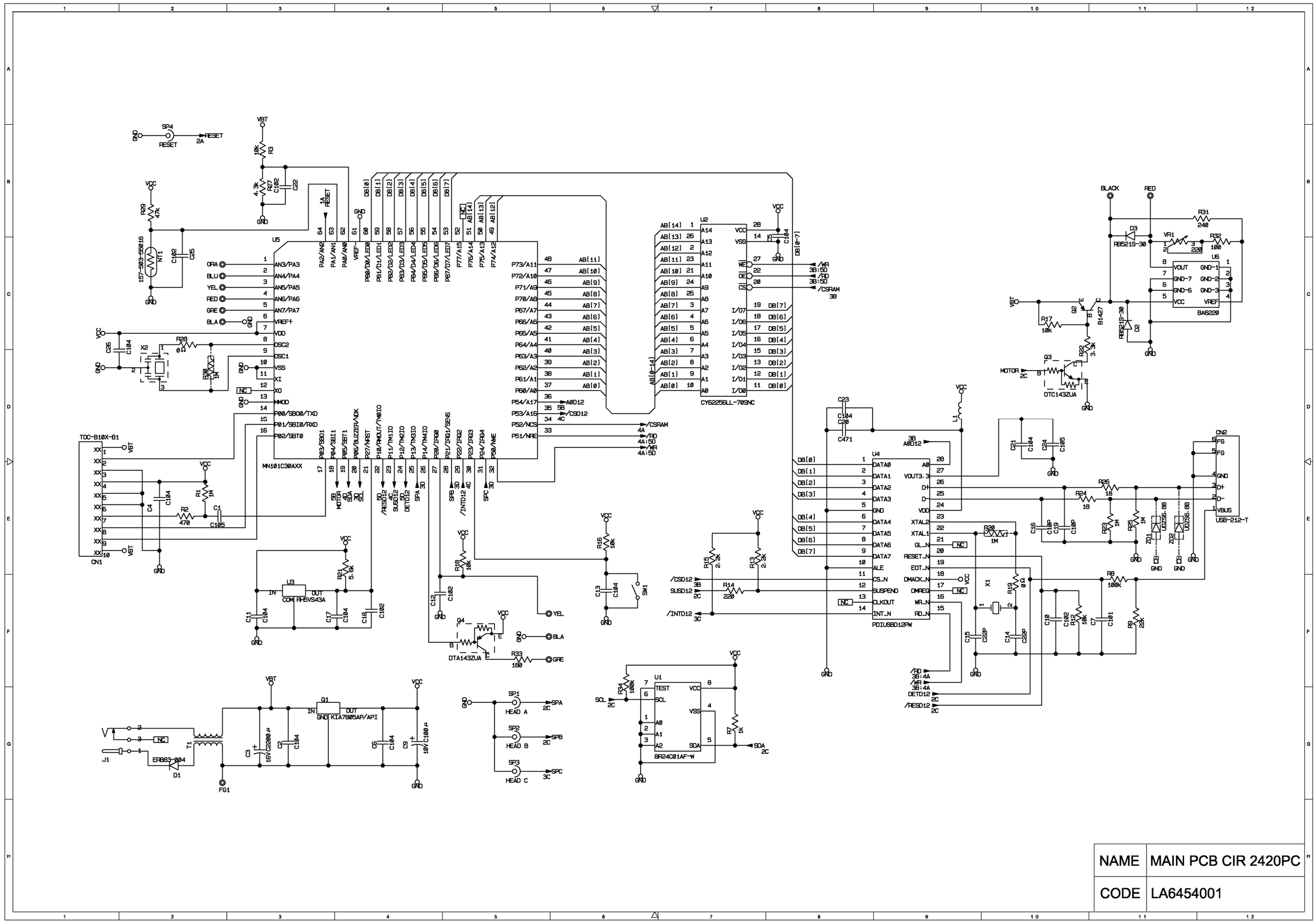
(9) Install the PT-2420PC printer driver again.

(10) Restart your computer.

(11) Carry out steps (2) through (5).

(12) If an error persists at the same testing process, your computer may be faulty.

Appendix 2. Main PCB



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