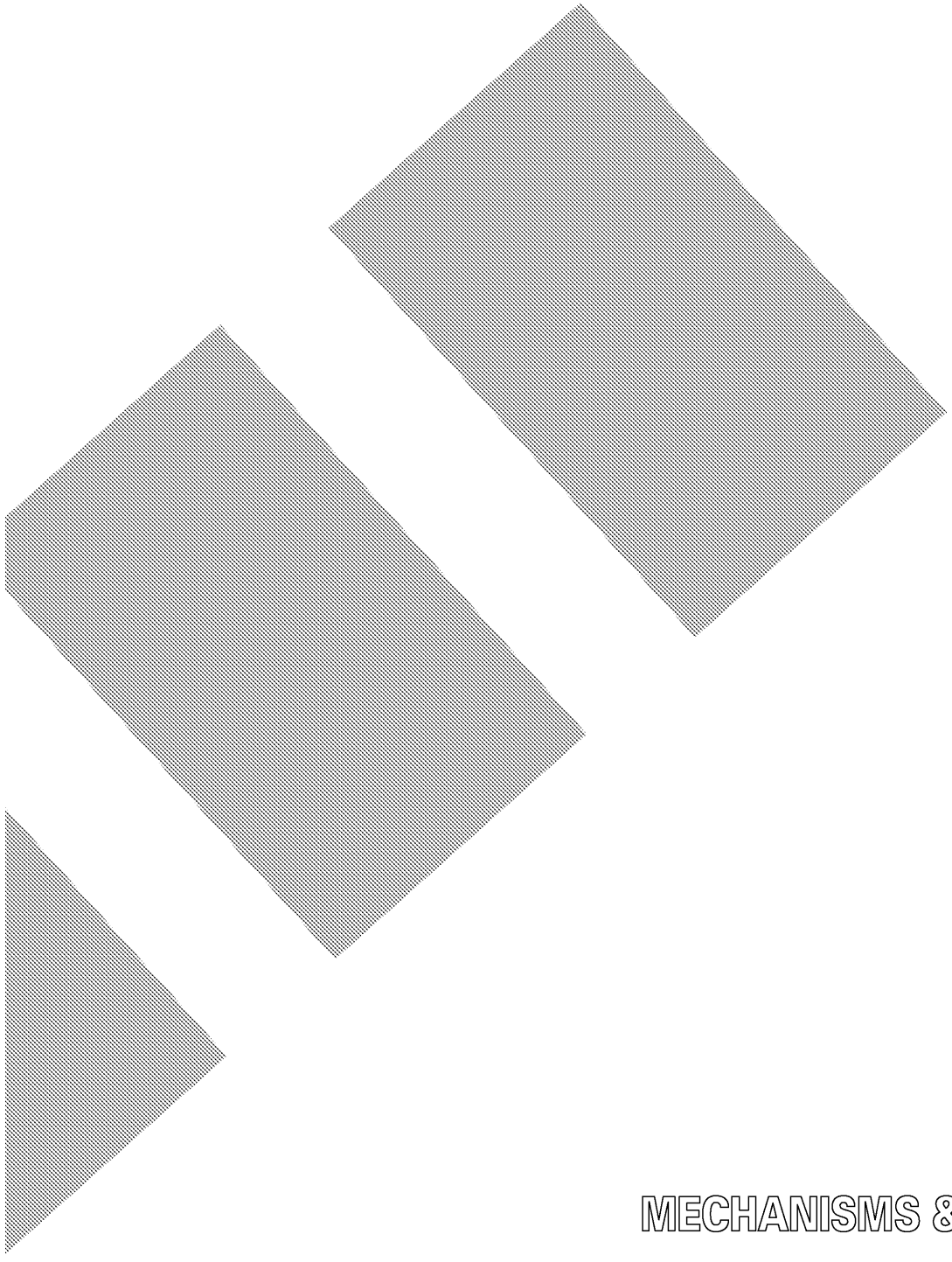
brother®

SERVICE MANUAL

MODEL: PT-2500PC



MECHANISMS & ELECTRONICS

brother

SERVICE MANUAL

MODEL: PT-2500PC

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PREFACE

This publication is a service manual covering the specifications, theory of operation, disassembly/ reassembly procedure, and troubleshooting of the Brother label printer PT-2500PC. It is intended for service personnel and other concerned persons to accurately and quickly provide after-sale service for our PT-2500PC.

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 appendices.

CHAPTER I

SPECIFICATIONS

CONTENTS

CHAPTER I SPECIFICATIONS

1.1 MECHANICAL SPECIFICATIONS

1.1.1 External View

(1) Dimensions (W × D × H) 75 mm × 232 mm × 159 mm

(2) Weight

Machine proper	Approx. 1.0 kg
In package	Approx. 2.4 kg

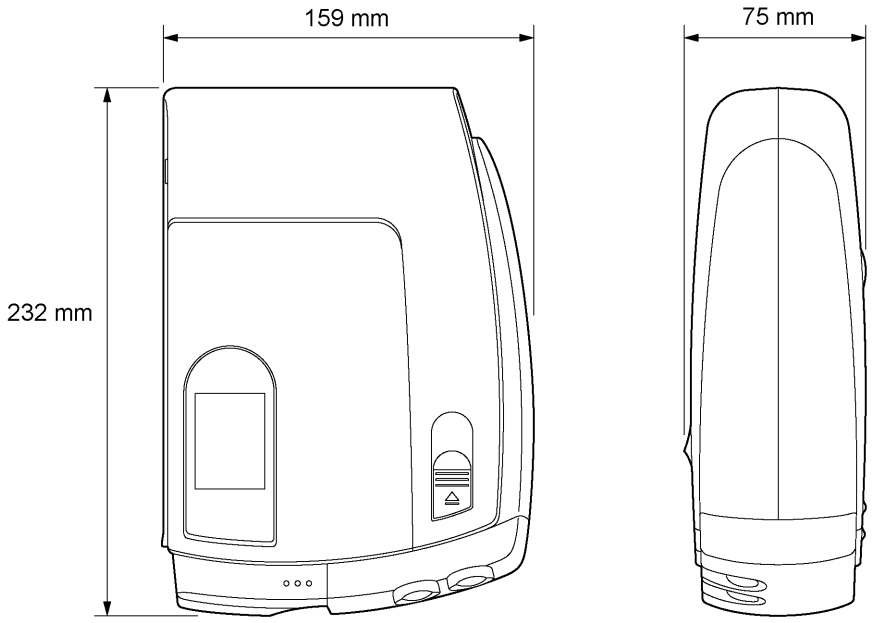


Fig. 1.1-1 External View

1.1.2 Control Buttons

(1)	Number of buttons	2 (ON/OFF (⏻) and FEED/CUT (✂) buttons)
(2)	Layout	See Fig. 1.1-2.

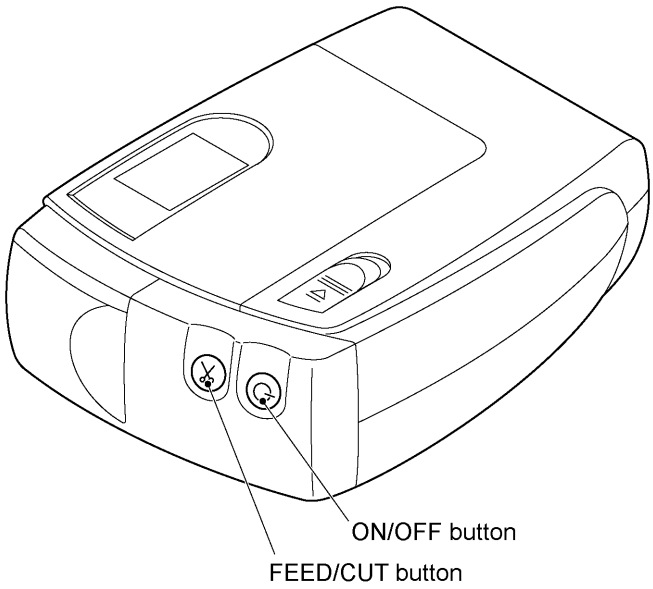


Fig. 1.1-2 Layout

1.1.3 Display

(1)	Display type	LEDs (green/red)

1.1.4 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, iron-on transfer tape, and porous-stamp tape) (Fixed thermal print head and tape feed mechanism)
(2)	Printing speed	10.3 mm/sec
(3)	Print head	
	Type	Thermal print head
	Heat generator	Consisting of 128 heating elements vertically aligned
	Size of a heating element	0.175 mm wide by 0.127 mm high

1.1.5 Tape Cassette

(1) Cassette — Cartridge type

(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 tape and ink ribbon
- Stamp tape cassette — Porous-stamp tape and base paper

(3) Tape size

	Width	**Length**
Laminate tape	6, 9, 12, 18, 24 mm	8 m (5 m for fluorescent coating tapes)
Non-laminate tape	6, 9, 12, 18, 24 mm	8 m
Instant lettering tape	18 mm	8 m
Iron-on transfer tape	18 mm	8 m
Porous-stamp tape	18 mm	8 m

1.1.6 Tape Cutter

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

1.1.7 PC Interface

(1) Transmission

Serial interface (RS-232C complient)

Transmission speed — Max. 115200 bps

(2) Attachments

Interface cable — Dedicated cable

Editor — Dedicated editor

1.2 ELECTRONICS SPECIFICATIONS

1.2.1 Power Supply

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

CHAPTER II

MECHANISMS

CONTENTS

CHAPTER II MECHANISMS

2.1 THEORY OF OPERATION

2.1.1 Print Mechanism

n 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. Each heating element is 0.195 mm wide by 0.141 mm high.

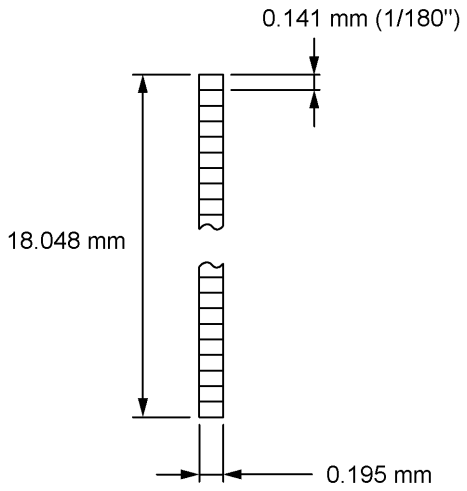


Fig. 2.1-1 Heat Generator of Thermal Head

n 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.
Porous-stamp tape when using stamp 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 stamp tape cassettes]

If the selected heating element(s) generates heat, the porous-stamp tape will be melted so that a pore(s) will be formed in the tape. The tape is advanced and the next heating cycle is repeated, thus forming a character of pores in the tape. The printed stamp tape can be used as the face of a stamp. When the stamp is pressed against the ink-pad, it will absorb ink through the pores.

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.

n Character Formation

While the tape feed motor (stepping motor) feeds the tape and ink ribbon (tape only when using non-laminated thermal film tape cassettes or stamp tape cassettes) by 0.141 mm for 5.6 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 release lever, release rod, and roller holder ASSY.

The roller holder ASSY incorporates the platen holder and the sub roller holder. These holders support the platen and the tape feed sub roller so that they can move perpendicularly to the thermal head and the tape feed roller, respectively, as well as rotating freely.

Loading a tape cassette and closing the cassette cover pushes down the release lever which moves the release rod to the left (when viewed from the front of the machine). 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 or stamp tape cassettes) sandwiched inbetween under a uniform load by the platen spring. At the same time, the platen gear becomes engaged with the platen 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 or stamp tape cassettes) sandwiched inbetween under a uniform load by the sub roller holder springs. At the same time, the sub roller gear becomes engaged with the tape feed gear.

If you open the cassette cover, the release lever pops up by pivoting around its center shaft since its bottom end is pulled down by the release lever spring. This retracts the roller holder ASSY from the thermal head, providing you with enough space to replace the tape cassette.

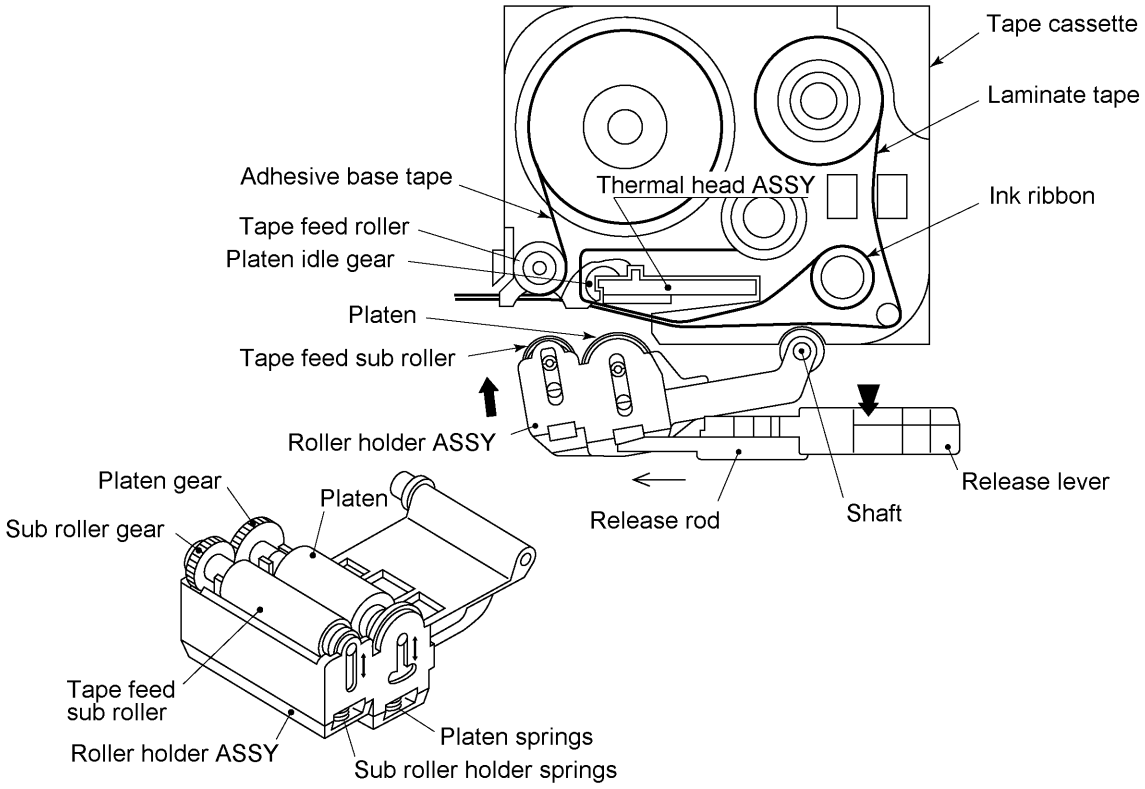


Fig. 2.1-2 Roller Holder ASSY Setting & Retracting Mechanism

2.1.3 Platen-head Contact Switching Mechanism According to Tape Cassette

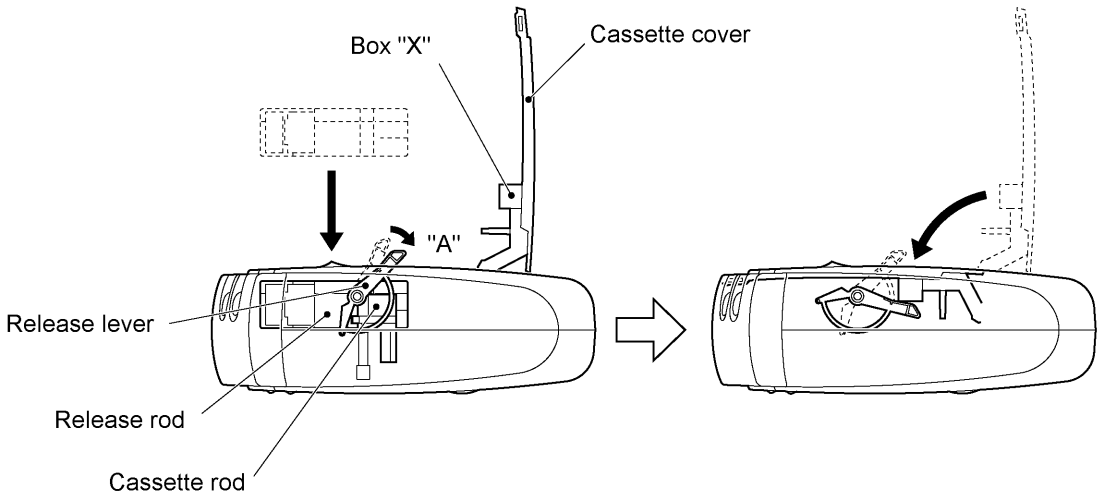
This mechanism consists of the cassette rod, release lever, and release rod.

As described in Subsection 2.1.2, loading a tape cassette and closing the cassette cover pushes down the release lever which presses the roller holder ASSY against the thermal head. If the roller holder ASSY is kept pressed against the thermal head for a long time, however, the platen could be deformed. To avoid it, this mechanism switches the pivot angle of the roller holder ASSY so that the roller holder ASSY does not come into contact with the thermal head when no tape cassette is loaded.

If you load a tape cassette, the cassette edge presses the cassette rod to turn it clockwise (when viewed from the top). Engaged with the cassette rod, the release lever tilts ("A" in the illustration below) so that closing the cassette cover presses the release lever at the lower end of box "X." Accordingly, the roller holder ASSY pivots at a great angle, pressing the platen against the thermal head.

If no tape cassette is loaded, the release lever stands straight ("B"). When you close the cassette cover, the release lever comes into box "X." so that the roller holder ASSY pivots at a slight angle, preventing the platen from coming into contact with the thermal head.

When a tape cassette is loaded



When no tape cassette is loaded

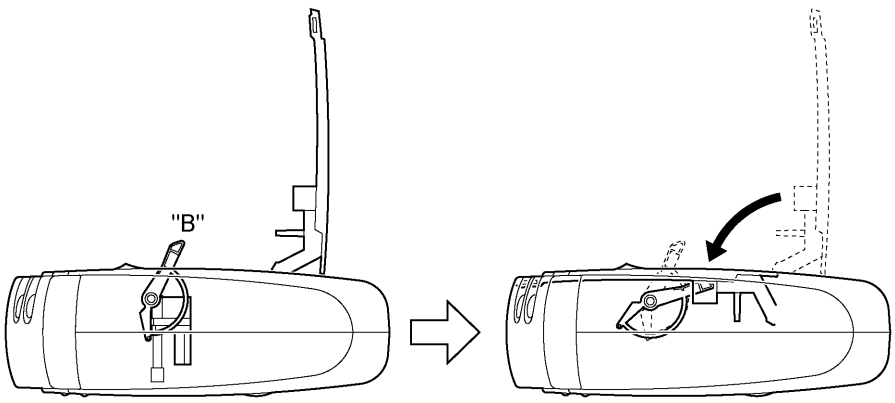


Fig. 2.1-3 Platen-head Contact Switching Mechanism According to Tape Cassette

2.1.4 Tape & Ribbon Feed Mechanism

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

n 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 or stamp 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 or stamp tape cassettes) inbetween, as described in Subsection 2.1.2.

As the tape feed motor (stepping motor) rotates, the rotation is transmitted via the gear train to the platen idle gear (which rotates the platen gear) and the tape feed gear (which rotates the tape feed roller and the 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 slightly less than that of the tape feed sub roller.

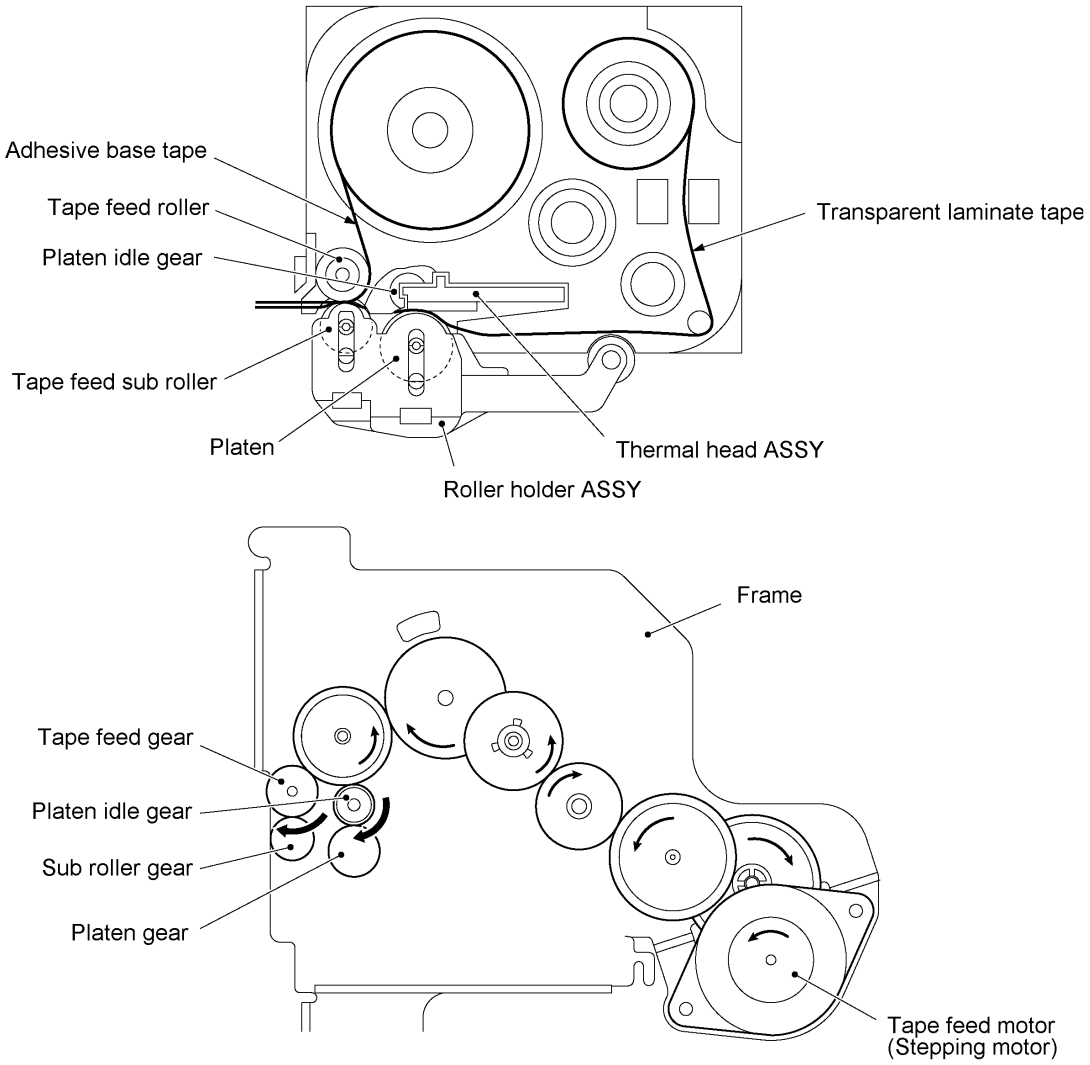


Fig. 2.1-4 Tape Feeding Mechanism

n 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 an 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.

n Ink Ribbon Feeding (except for non-laminated thermal film tape cassettes and stamp tape cassettes)

As the tape feed 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 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.

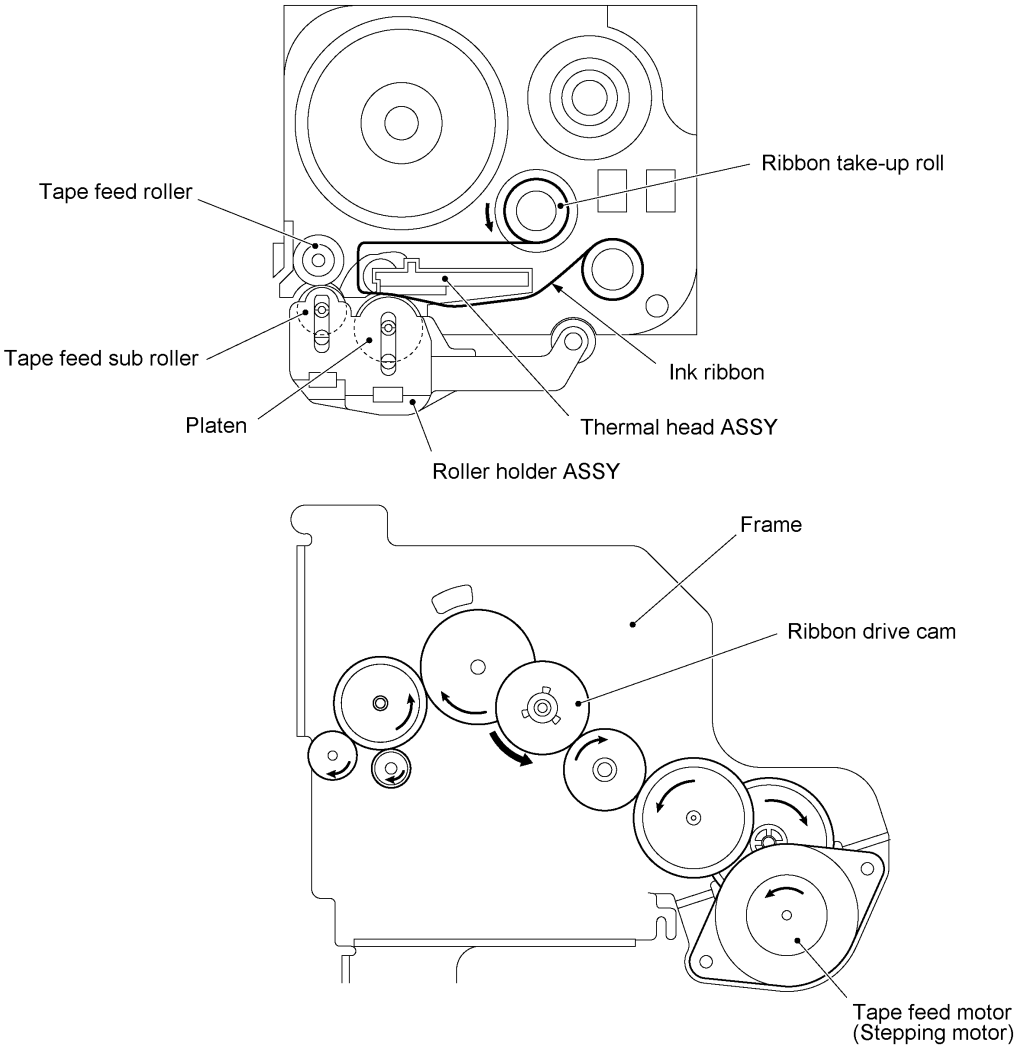


Fig. 2.1-5 Ribbon Feeding Mechanism

2.1.5 Automatic Tape Cutter Mechanism

The tape cutter unit consists of a stationary blade and a movable blade driven by the cutter motor.

Upon completion of printing and tape feeding, the CPU activates the cutter motor (DC motor) whose clockwise rotation is transmitted via the idle gears to the cutter moving gear.

As the cutter moving gear rotates counterclockwise, its boss "X" (which is fitted in the opening of the movable blade) actuates the movable blade to pivot it around shaft "Y." Consequently, the cutter cuts the printed tape routing through the movable and stationary blades, just like a scissors.

After that, the CPU keeps the cutter motor on. When the movable blade comes back to the home position, its end "Z" activates the cutter sensor actuator which presses the cutter sensor switch. The moment the CPU receives the sensor signal, it stops the cutter motor.

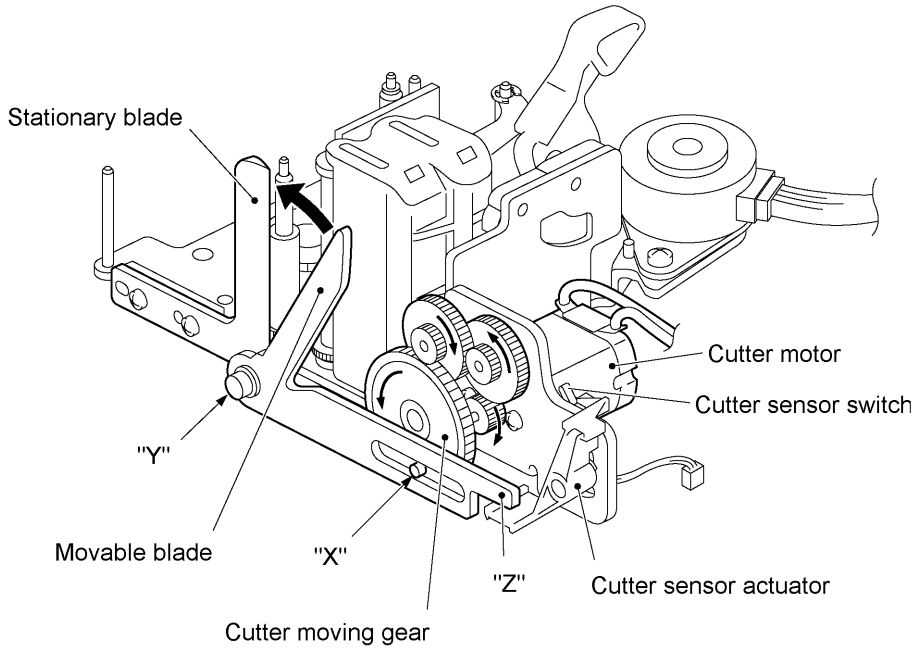


Fig. 2.1-6 Automatic Tape Cutter Mechanism

2.1.6 Open Button

Sliding the open button turns the cover lock lever as illustrated below, releasing the cassette cover.

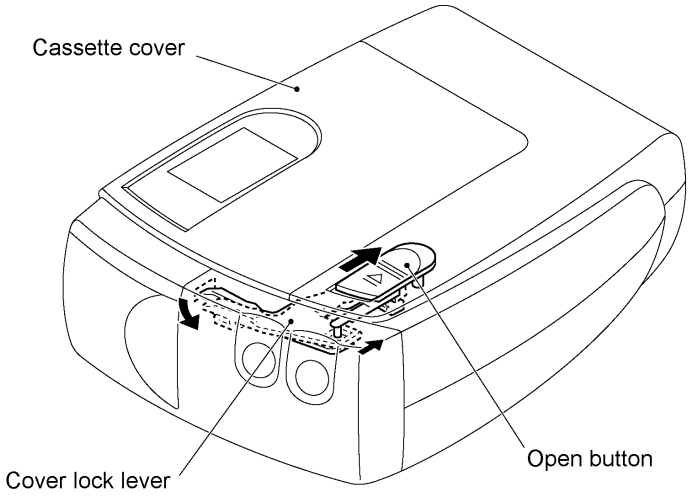


Fig. 2.1-7 Open Button

2.1.7 Cassette Cover Sensor

The cassette cover sensor is provided on the sensor PCB. If you close the cassette cover, its sensor tab pushes down the sensor, signaling that the cassette cover is closed.

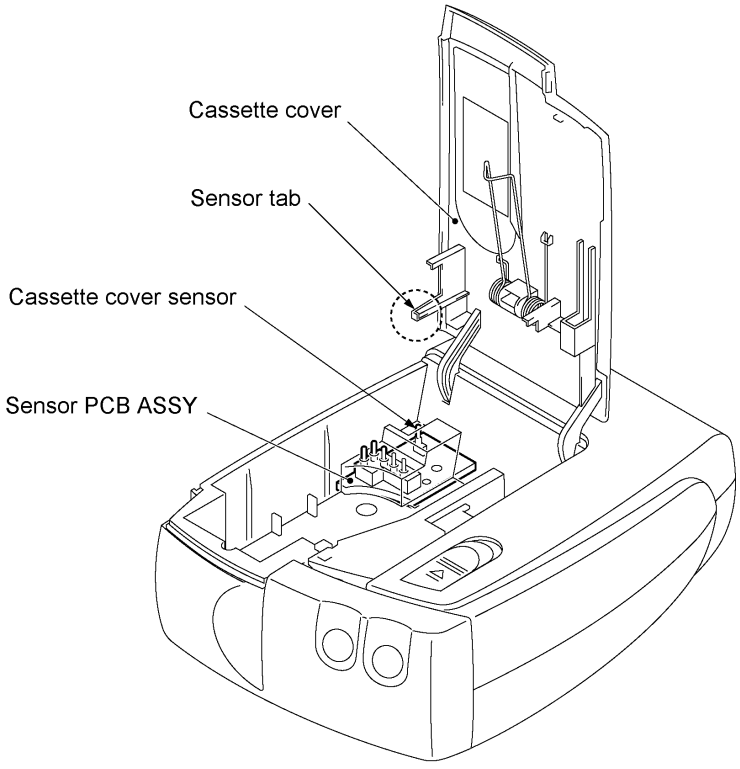


Fig. 2.1-8 Cassette Cover Sensor

2.2 DISASSEMBLY AND REASSEMBLY PT99010

■ Safety Precautions

(1) The disassembly or reassembly work should be carried out on a grounded antistatic sheet. Otherwise, the LSIs and electronic parts may 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 N•cm (kgf•cm)
Thermal head unit	Screw, bind M3 x 5	2	58.8 ±9.8 (6 ±1)
Tape feed motor	Screw, pan M2.6 x 3.5	2	39.2 ±9.8 (4 ±1)
Cutter motor	Screw, pan M2.6 x 3.5	2	39.2 ±9.8 (4 ±1)
Cutter sensor ASSY	Screw, pan M1.7 x 6	1	19.6 ±9.8 (2 ±1)
Cutter ASSY	Screw, bind M3 x 5	2	58.8 ±9.8 (6 ±1)
Frame ASSY	Taptite, bind B M3 x 8	1	39.2 ±9.8 (4 ±1)
Tape end sensor ASSY	Taptite, bind B M2.6 x 8	1	39.2 ±9.8 (4 ±1)
Sensor PCB ASSY	Taptite, bind B M2.6 x 8	1	39.2 ±9.8 (4 ±1)
Cassette cover bracket	Taptite, bind B M2.6 x 8	4	39.2 ±9.8 (4 ±1)
OPEN button	Taptite, cup P M2.6 x 8	1	49.0 ±9.8 (5 ±1)
Cover lock lever	Taptite, cup P M2.6 x 8	1	39.2 ±9.8 (4 ±1)
Lock lever return spring	Taptite, cup P M2.6 x 8	1	39.2 ±9.8 (4 ±1)
Main PCB ASSY	Taptite, bind B M2.6 x 6	3	29.4 ±9.8 (3 ±1)
Power supply PCB ASSY	Taptite, bind B M2.6 x 6	2	29.4 ±9.8 (3 ±1)
Grounding wire	Screw, bind M3 x 4	1	39.2 ±9.8 (4 ±1)
Sub PCB ASSY	Taptite, bind B M2.6 x 8	2	39.2 ±9.8 (4 ±1)
Body cover	Taptite, bind B M3 x 12	2	39.2 ±9.8 (4 ±1)
Front cover	Taptite, bind B M2.6 x 8	3	29.4 ±9.8 (3 ±1)

2.2.1 Disassembly Procedure

[1] Removing the Tape Cassette

(1) Slide the open button and open the cassette cover fully as shown below.

(2) Pull the tape cassette up and out of the machine.

TIP: Opening the cassette cover releases the platen from the thermal head, providing you with enough space to replace the tape cassette.

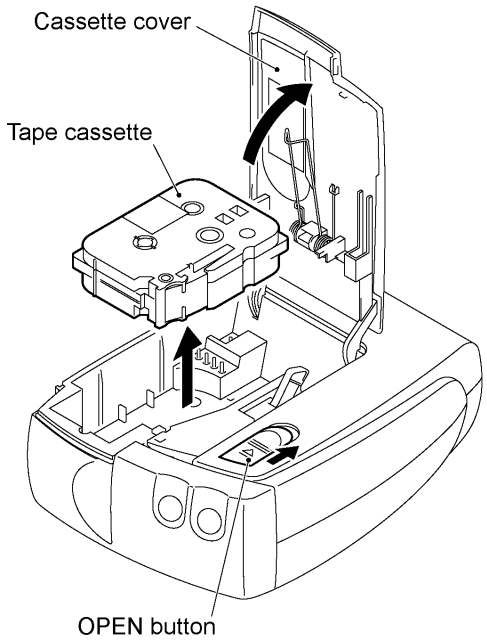


Fig. 2.2-1 Removing the Tape Cassette

[2] Removing the Front Cover and Body Cover

(1) Remove three screws "a" (securing the front cover) and two screws "b" (securing the body cover).

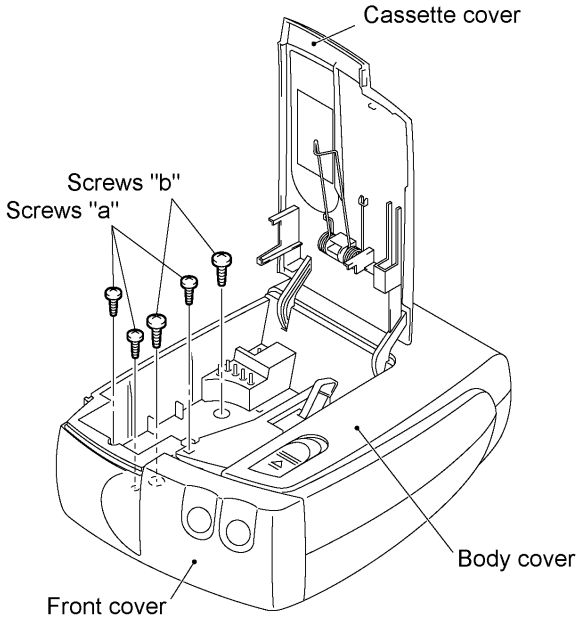


Fig. 2.2-2 Removing the Screws from the Body Cover

(2) Hold sections "X" of the front cover and pull out the front cover.

NOTE: Do not pull the front cover away from the machine. The sub PCB flat cable fixed to the front cover is connected to the main PCB mounted in the bottom cover.

(3) Unhook the sub PCB flat cable from the cable guide on the cover lock lever mounted on the inside the body cover.

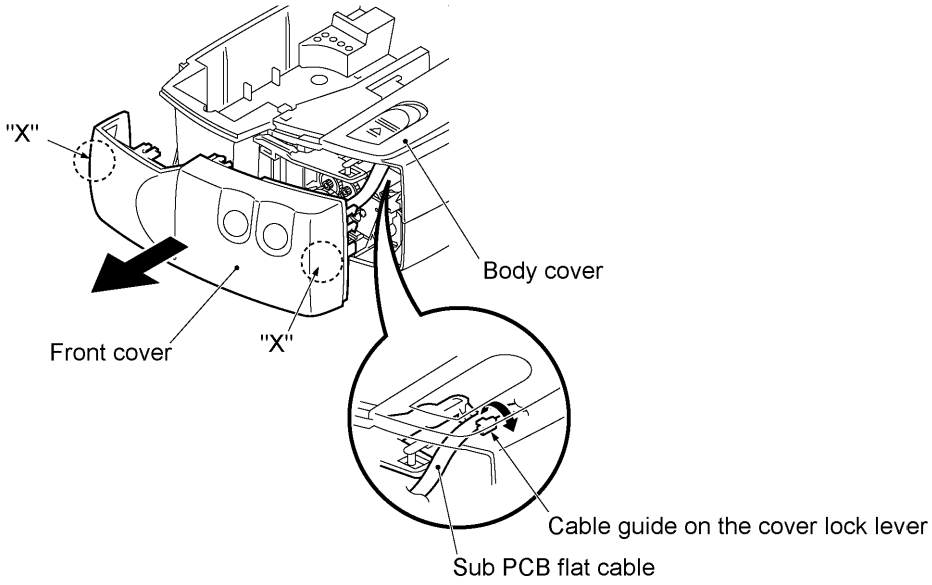


Fig. 2.2-3 Disconnecting the Front Cover

(4) Disengage the body cover from the bottom cover.

NOTE: Do not pull the body cover away from the bottom cover. The sensor PCB flat cable and tape end sensor harness fixed to the body cover are connected to the main PCB mounted in the bottom cover.

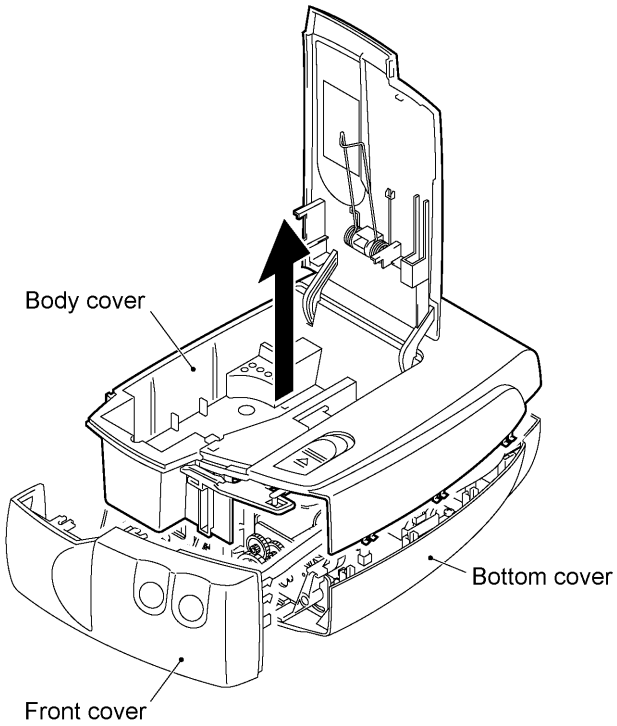


Fig. 2.2-4 Disengaging the Body Cover from the Bottom Cover

(5) Disconnect the sensor PCB flat cable and the tape end sensor harness from the main PCB.

NOTE: When disconnecting the harness connector, hold the connector body not the cable.

(6) Disconnect the sub PCB flat cable from the main PCB.

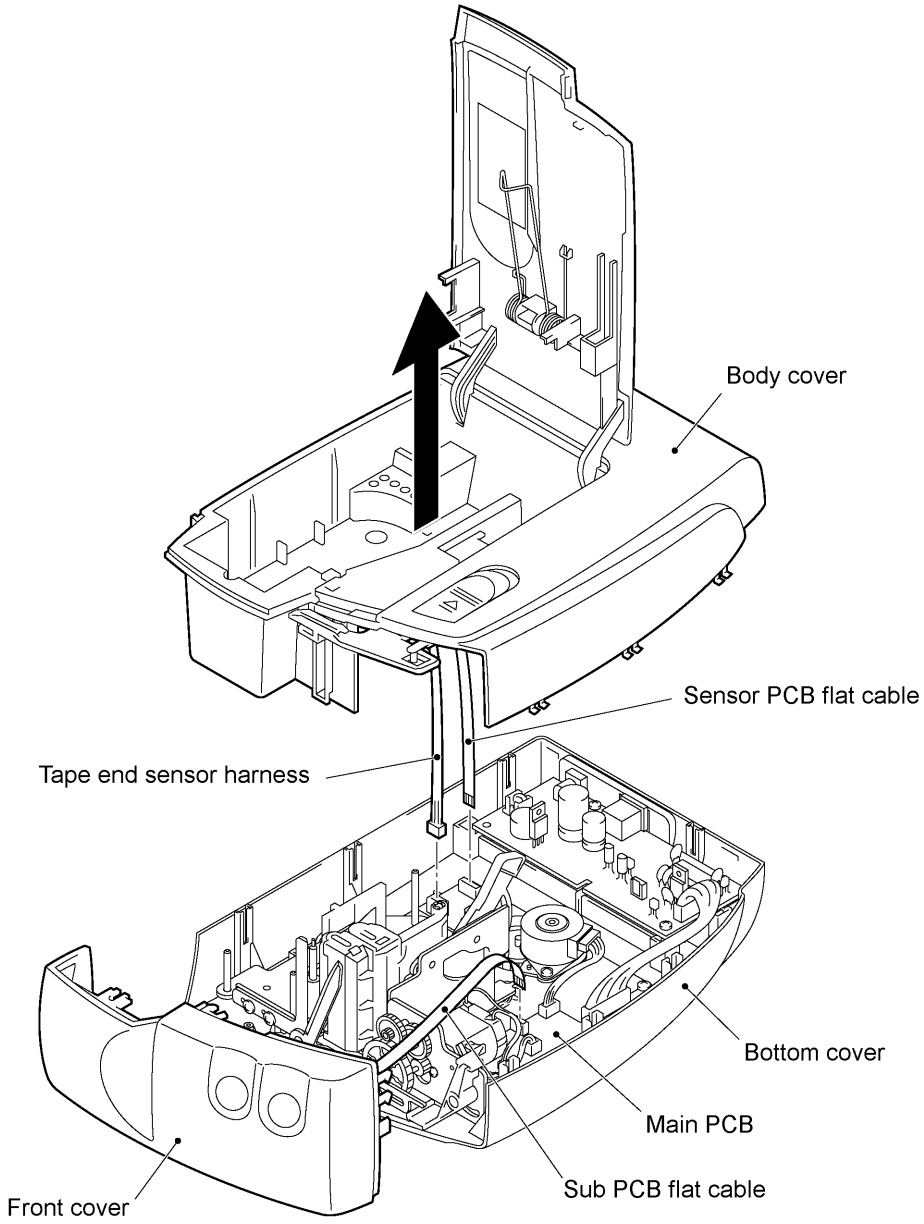


Fig. 2.2-5 Disconnecting the Sensor PCB Flat Cable, Tape End Sensor Harness, and Sub PCB Flat Cable from the Main PCB

[3] Removing the Tape End Sensor ASSY, Sensor PCB ASSY, Cover Lock Lever, and Open Button from the Body Cover

(1) Close the cassette cover and place the body cover upside down.

(2) Take out the tape end sensor ASSY by removing the screw.

(3) Take out the sensor PCB ASSY by removing the screw.

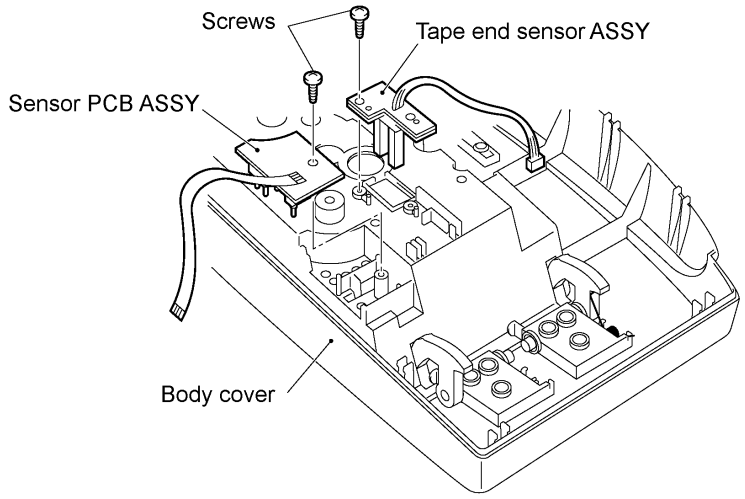


Fig. 2.2-6 Removing the Tape End Sensor ASSY and Sensor PCB ASSY

(4) Remove the screw from the cover lock lever.

(5) Unhook the lock lever spring from the boss provided on the body cover, then take the cover lock lever and the spring out of the body cover.

(6) Remove the screw from the open button, then press the latches inwards and push down the open button.

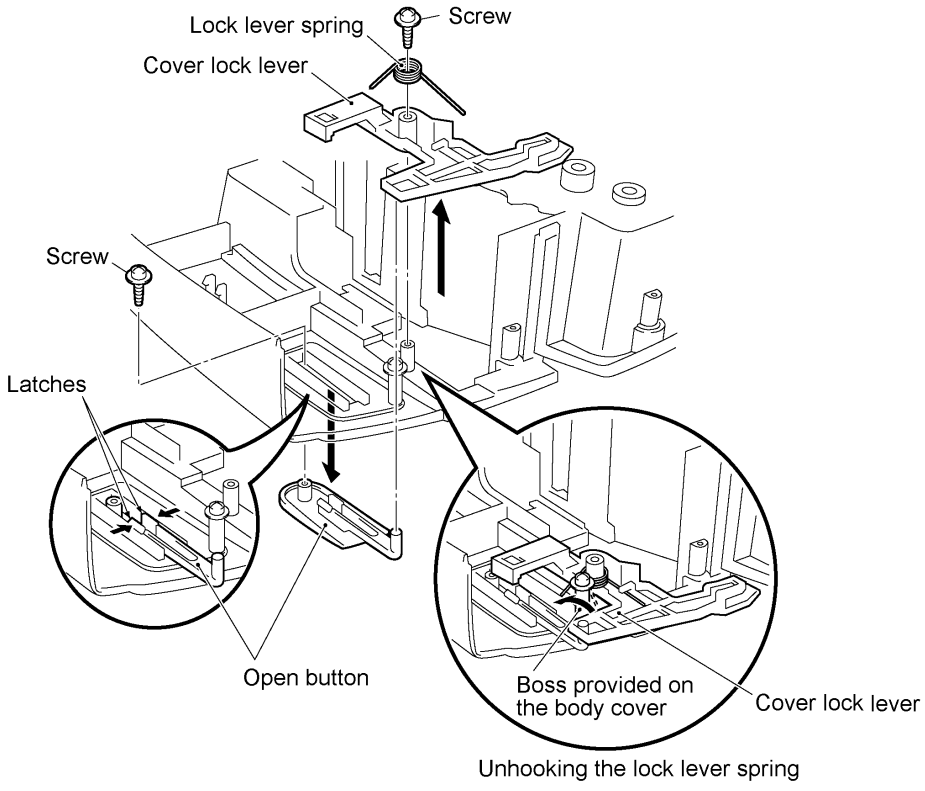


Fig. 2.2-7 Removing the Cover Lock Lever and Open Button

[4] Removing the Cassette Cover

(1) Twist off the long end of the cover open spring from the cassette cover arm and remove the spring from the cassette cover bracket.

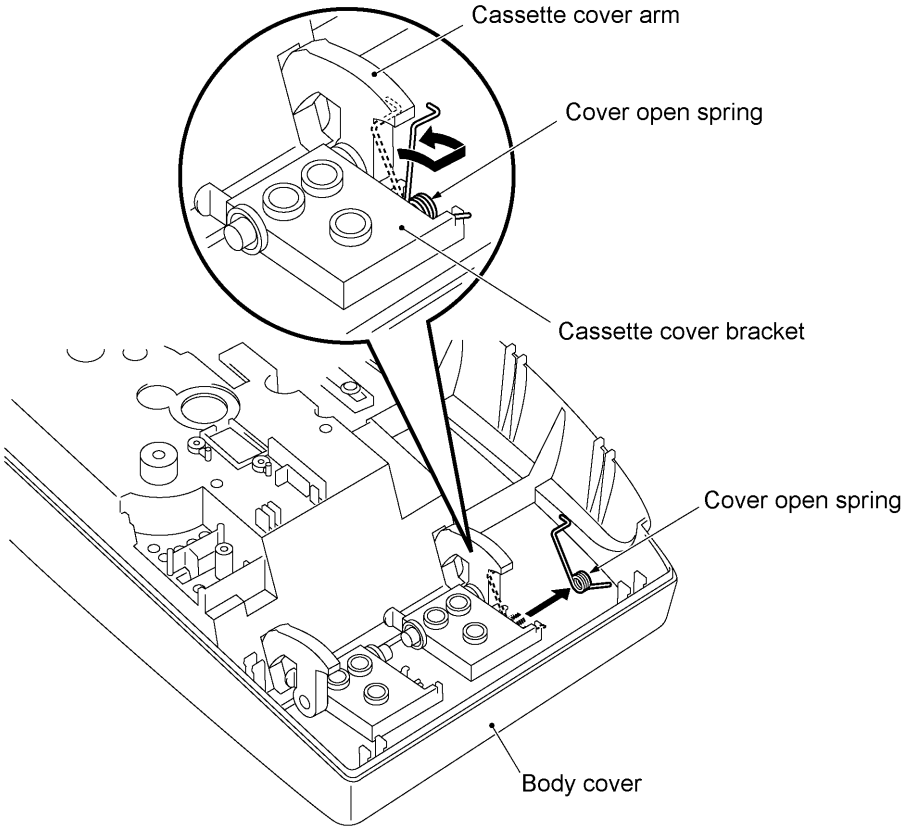


Fig. 2.2-8 Twisting off the Cover Open Spring

(2) Remove two screws each from the two cassette cover brackets.

(3) Remove the cassette cover brackets while pushing the cassette cover arms outwards.

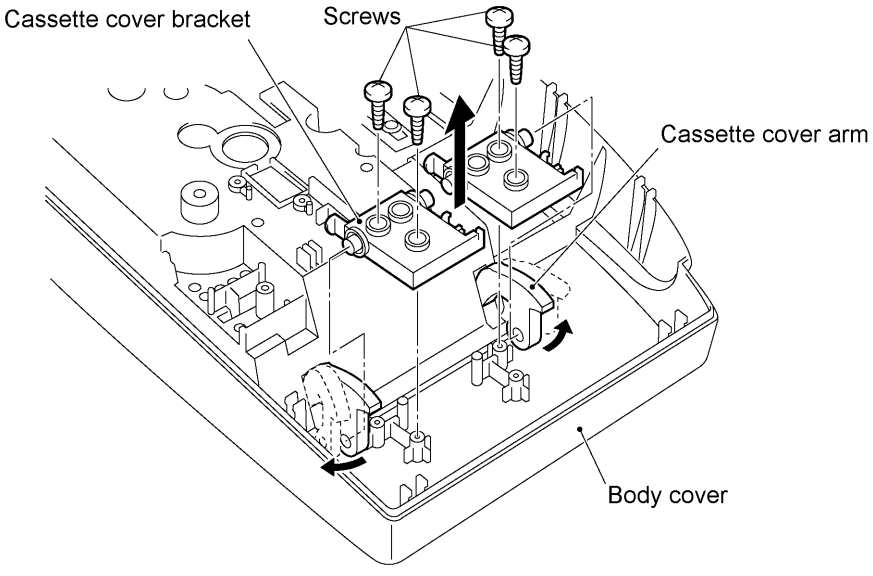


Fig. 2.2-9 Removing the Cassette Cover Brackets

(4) Open the cassette cover fully.

(5) As shown below, pull out the cassette cover arms from the body cover.

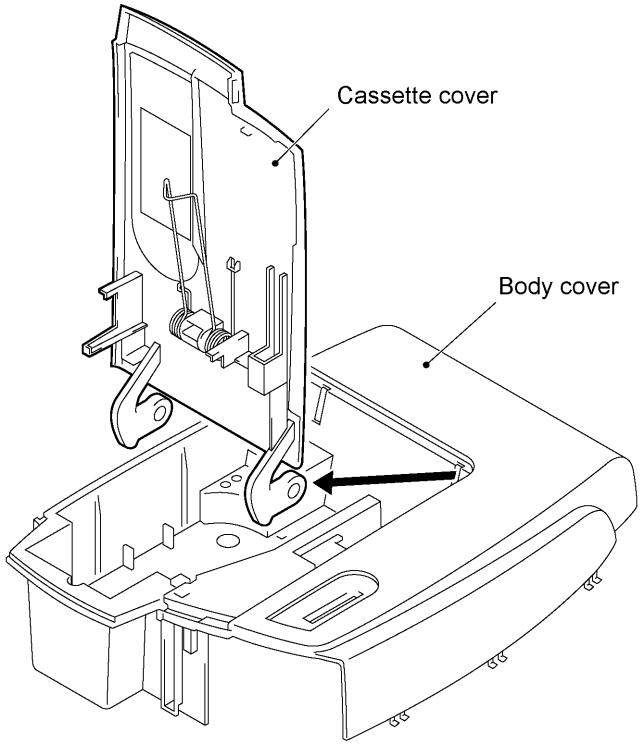


Fig. 2.2-10 Removing the Cassette Cover

(6) Remove the cassette hold spring by unhooking it in the order of •, ❟, ❟, ƒ, and „.

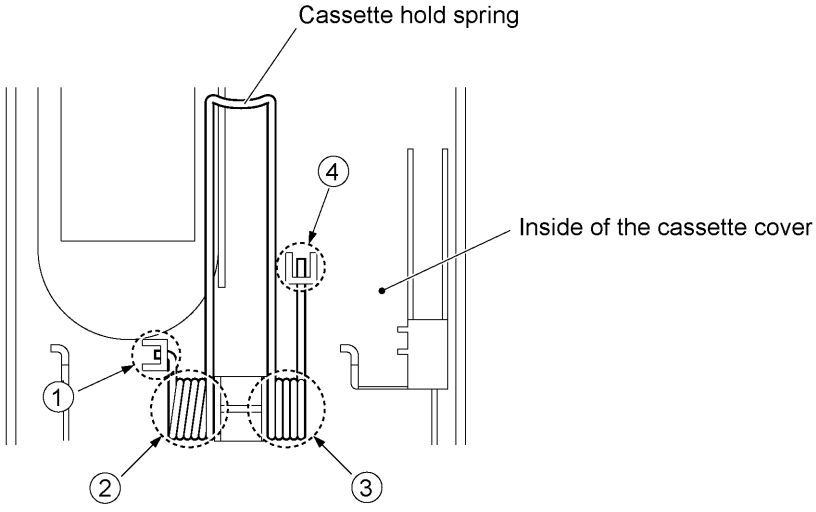


Fig. 2.2-11 Removing the Cassette Hold Spring

[5] Removing the Sub PCB ASSY, FEED/CUT Button, and ON/OFF Button from the Front Cover

(1) Take off the sub PCB ASSY from the front cover by removing the two screws.

(2) Lift up the FEED/CUT button together with the key return spring.

(3) Lift up the ON/OFF button together with the key return spring and reflection sheet. As illustrated below, remove the reflection sheet from the button's guides.

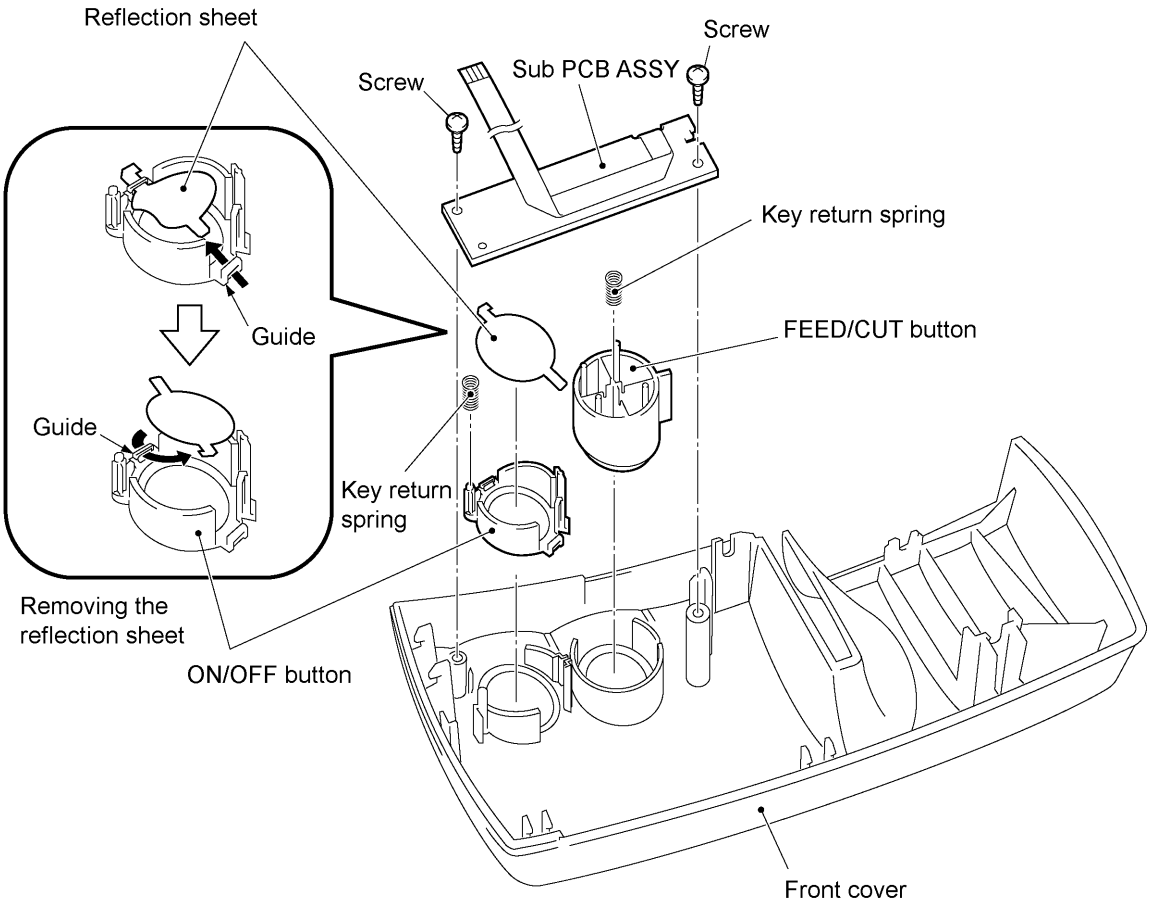


Fig. 2.2-12 Removing the Sub PCB ASSY, FEED/CUT Button, and ON/OFF Button

[6] Removing the Mechanical Unit Together with the Cutter-related Components

(1) Remove the screw from the grounding wire.

(2) Remove the screw that secures the mechanical unit to the bottom cover.

(3) Disconnect the following from the main PCB:

- Tape feed motor harness (P5)
- Cutter sensor harness (P3)
- Cutter motor harness (P4)
- Head flat cable (P8)

NOTE: Gently handle the harnesses and flat cable.

(4) Take the mechanical unit together with the cutter-related components up and out of the bottom cover.

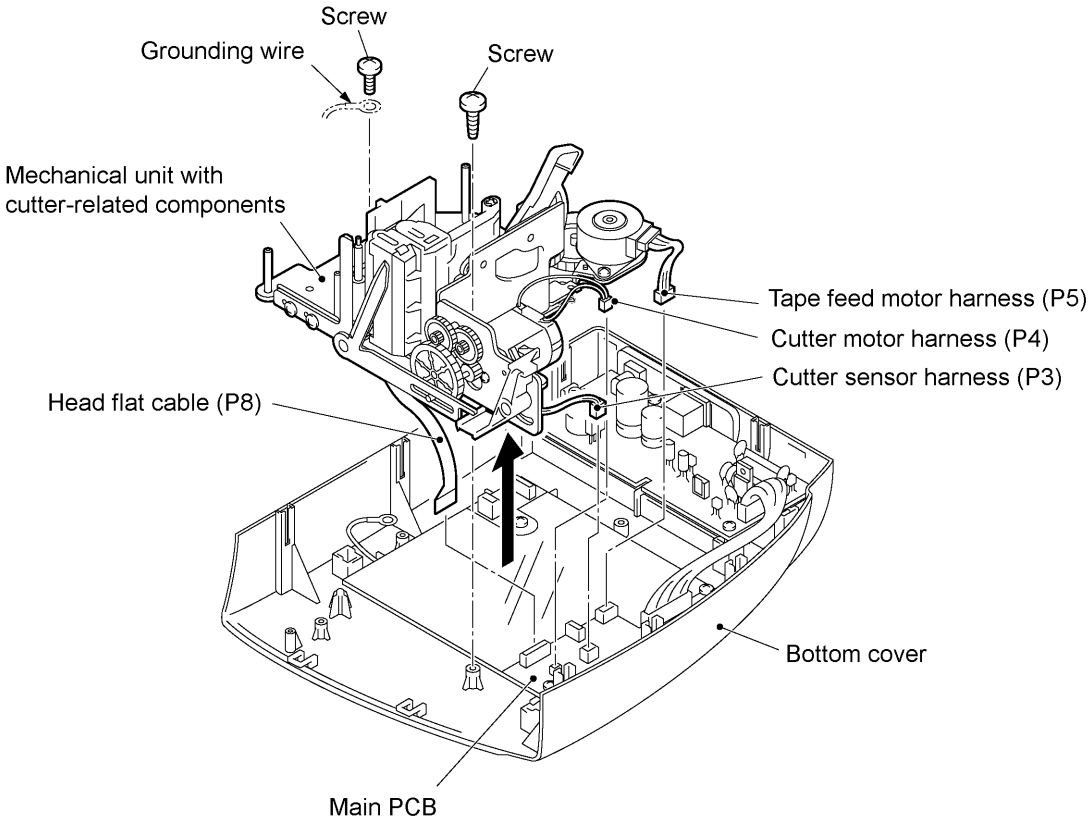


Fig. 2.2-13 Removing the Mechanical Unit Together with Cutter-related Components

[7] Removing the Cutter-related Components

(1) Take off the cutter ASSY by removing two screws "a."

WARNING: Be careful with the cutter blades.

(2) Remove the washer (by using a pin) and take off the cutter moving gear and cutter double gears.

NOTE: Once deformed excessively, the washer becomes unusable and a new one should have to be put back in.

(3) Take off the cutter motor ASSY by removing two screws "b."

(4) Take off the cutter sensor ASSY by removing screw "c."

(5) Remove the cutter sensor actuator.

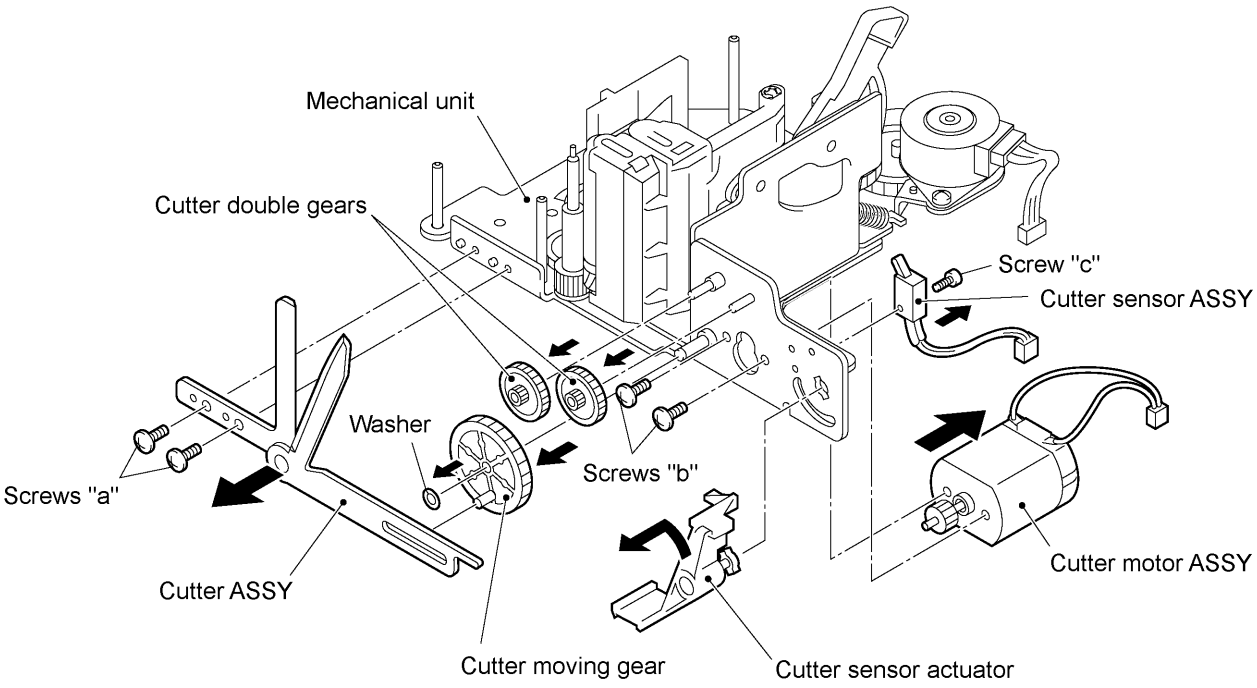


Fig. 2.2-14 Removing the Cutter-related Components

[8] Removing the Roller Holder ASSY, Thermal Head Unit, and Tape Feed Motor from the Frame ASSY

(1) Remove the retaining ring and pull up the cassette rod.

(2) Remove the retaining ring from the roller holder ASSY.

(3) Unhook the roller holder release spring from the roller holder ASSY and take out the ASSY and the spring.

NOTE: When unhooking the spring, take care not to scratch the thermal print head and its flat cable.

(4) Remove two screws "b" and take off the thermal head unit.

CAUTION: Do not loosen or remove screws "X."

(5) Remove the retaining ring from the release lever, then take out the release lever, release rod, and spring.

(6) Push the release rod roller out of the release rod.

(7) Remove two screws "a" and take off the tape feed motor.

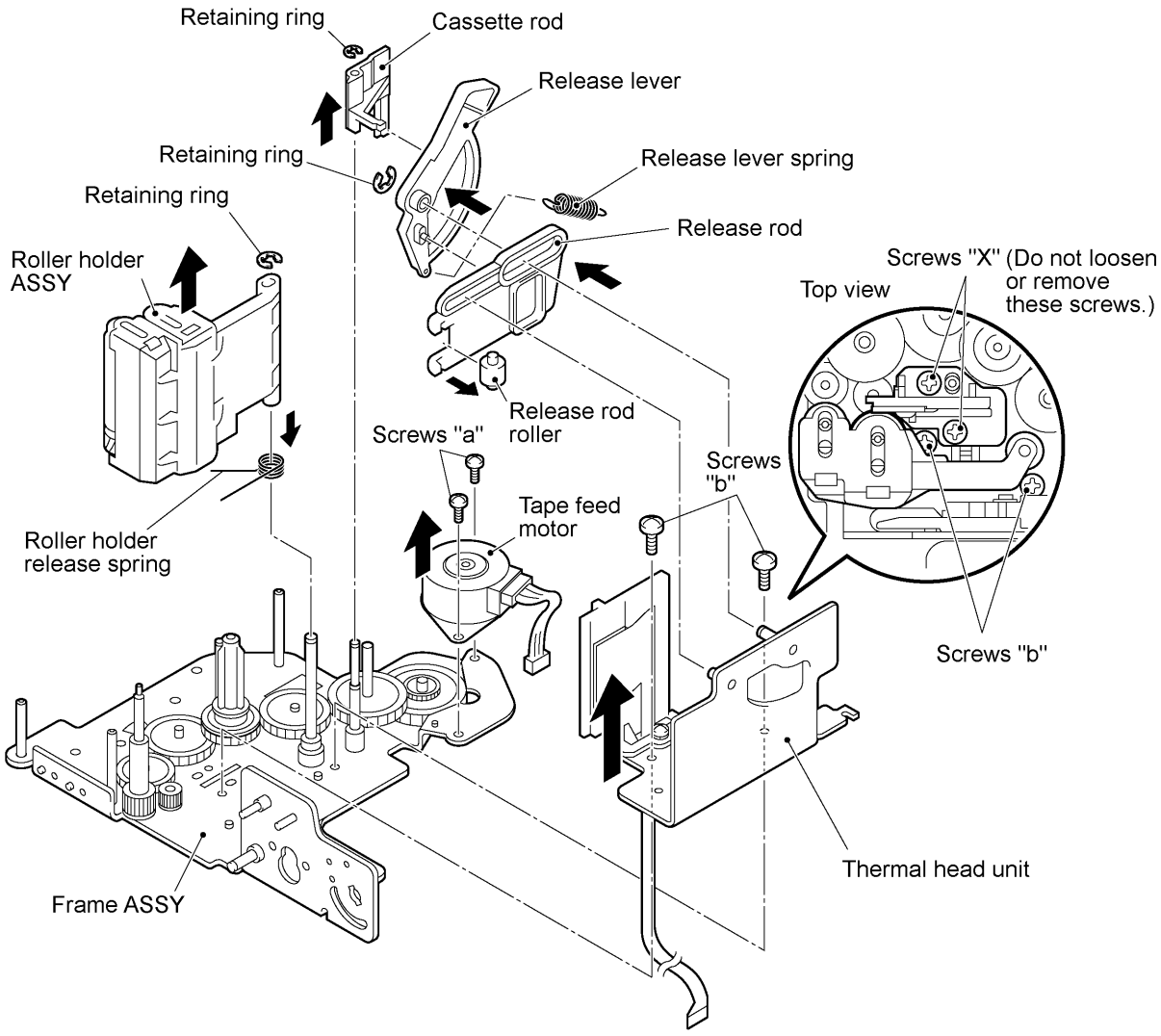


Fig. 2.2-15 Removing the Roller Holder ASSY, Thermal Head Unit, and Tape Feed Motor

[9] Removing the Main PCB ASSY and Power Supply PCB ASSY

(1) Disconnect the power supply harness from the main PCB.

(2) Remove the three screws from the main PCB ASSY and take it off.

(3) Remove the two screws from the power supply PCB ASSY. Slightly lift up the inner edge of the PCB and take it out in the direction of the arrow as shown below.

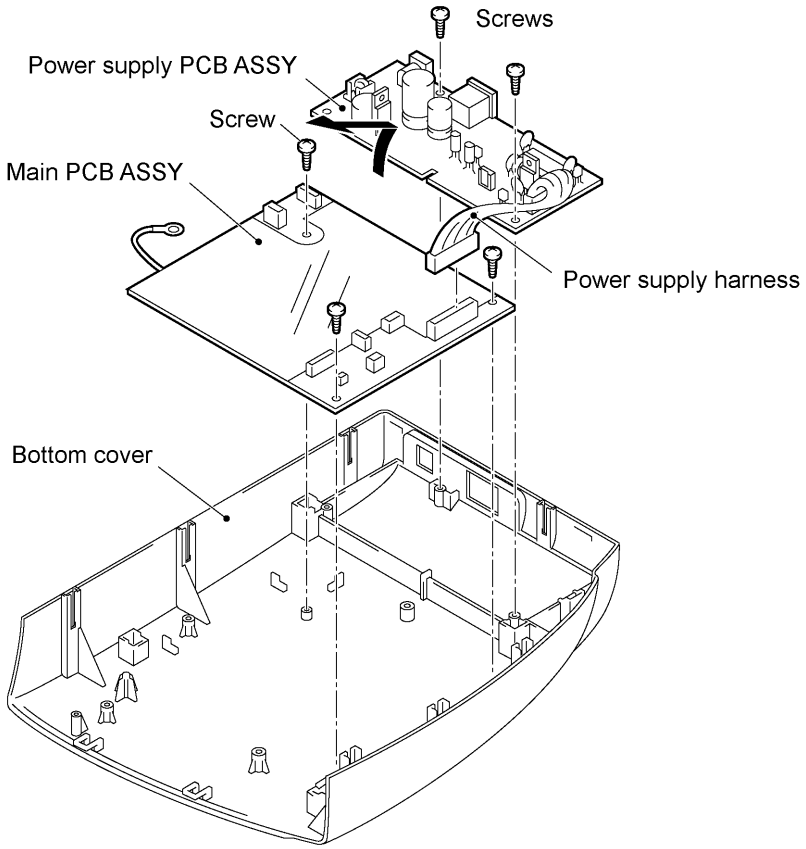


Fig. 2.2-16 Removing the Main PCB ASSY and Power Supply PCB ASSY

2.2.2 Reassembly Procedure

[1] Installing the Main PCB ASSY and Power Supply PCB ASSY

(1) Secure the main PCB ASSY to the bottom cover with the three screws.

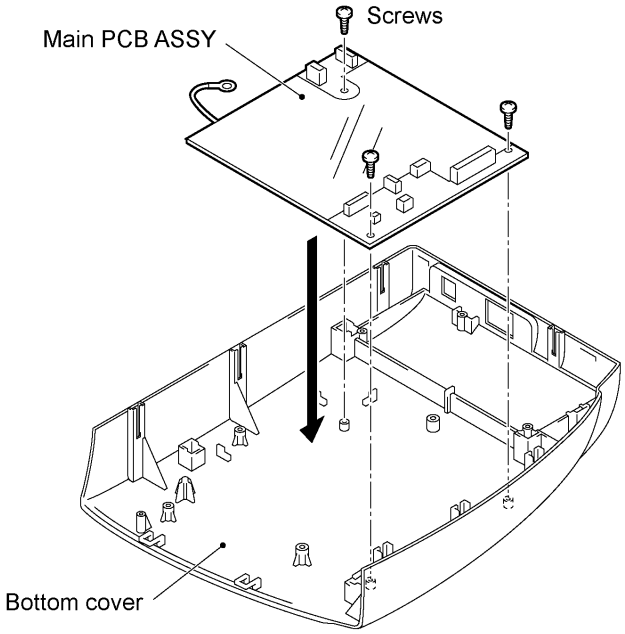


Fig. 2.2-17 Installing the Main PCB ASSY

(2) Fit the interface connector and DC jack of the power supply PCB into the cutouts provided in the bottom cover, and then fit the notch over the rib on the bottom cover.

(3) Secure the power supply PCB ASSY with the two screws.

(4) Connect the power supply harness to the main PCB.

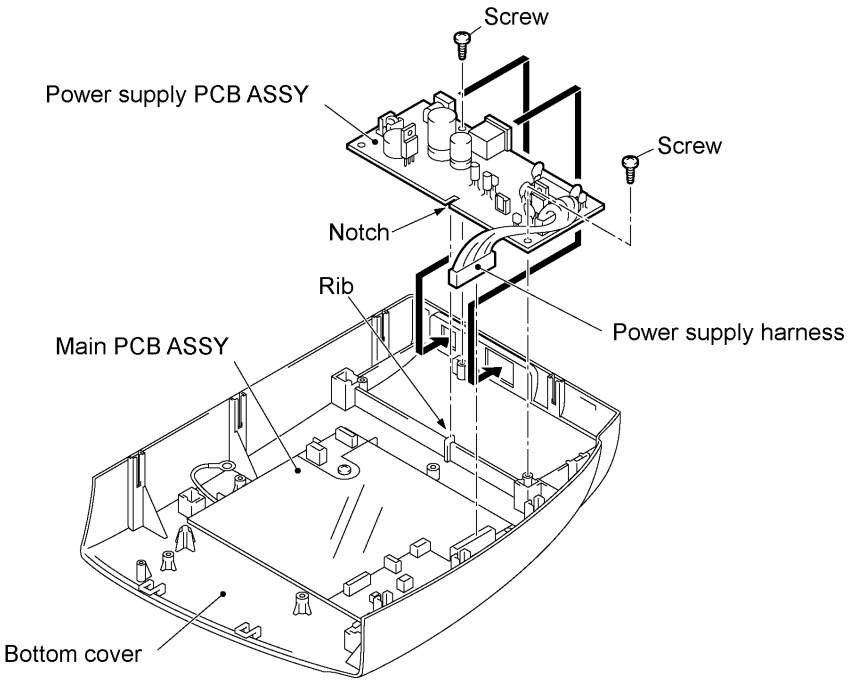


Fig. 2.2-18 Installing the Power Supply PCB ASSY

[2] Installing the Thermal Head Unit, Roller Holder ASSY, and Tape Feed Motor onto the Frame ASSY

(1) Fit the release rod roller into the release rod.

(2) Apply grease (Silicone grease G501) to the inside edge of the square hole provided in the release rod and the surface of the release rod roller.

(3) Install the release rod on the head frame so that the guide slits become fitted over the guide shafts provided on the head frame.

(4) Install the release lever to the head frame so that hole "a" becomes fitted over the longer guide shaft on the head frame and boss "b" becomes fitted in the square hole in the release rod.

(5) Secure the release lever with the retaining ring.

(6) Hook the release lever spring over the release lever and head frame.

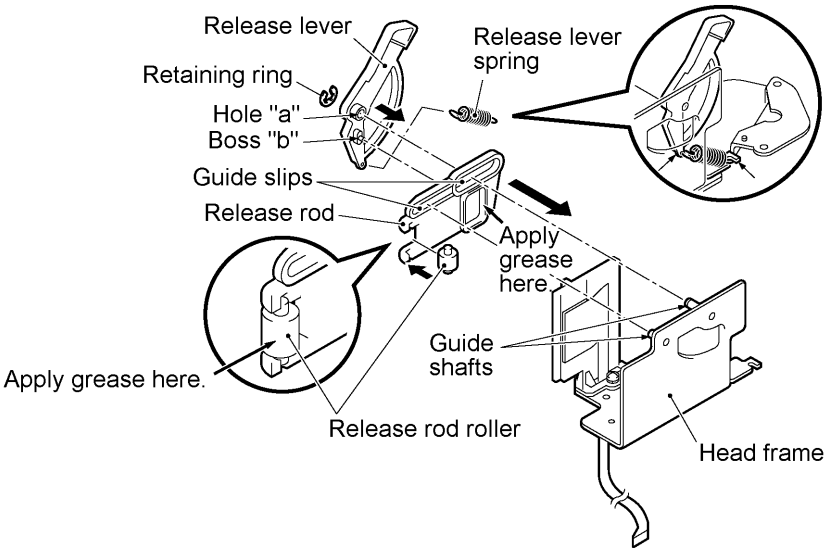


Fig. 2.2-19 Installing the Release Rod and Release Lever onto the Head Frame

(7) Pass the head flat cable through the slot provided in the frame ASSY, then secure the thermal head unit with the two screws.

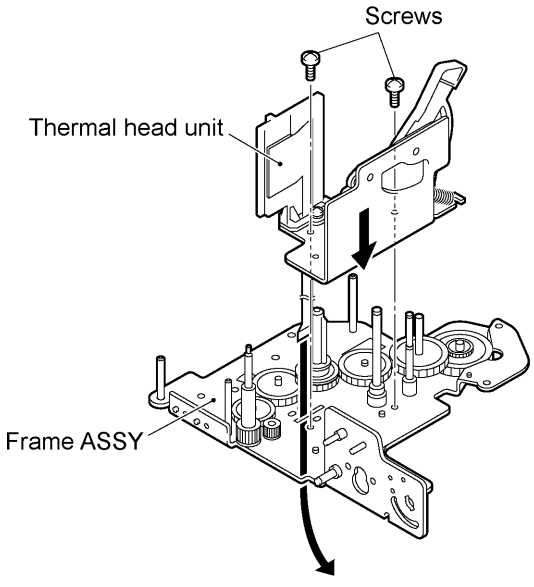


Fig. 2.2-20 Installing the Thermal Head Unit

(8) Set the roller holder release spring on the roller holder ASSY so that its straight end is fitted to section "A" on the ASSY, and install the ASSY with the spring to the head frame. Then hook the spring's bent end on section "B" provided on the head frame.

NOTE: Take care not to let the roller holder release spring scratch the thermal head and flat cable.

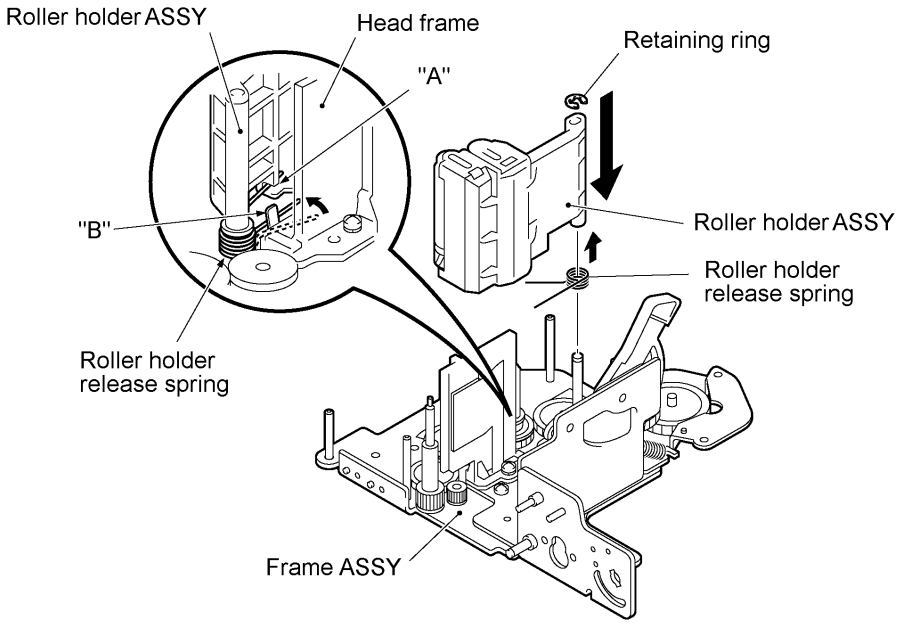


Fig. 2.2-21 Installing the Roller Holder ASSY

(9) Fit the arm of the cassette rod in the sector hole of the release lever and set the cassette rod on the shaft of the frame ASSY.

(10) Secure the cassette rod with the retaining ring.

(11) Put the tape feed motor on the frame ASSY and bring its edge into contact with the boss. Then secure the motor with the two screws.

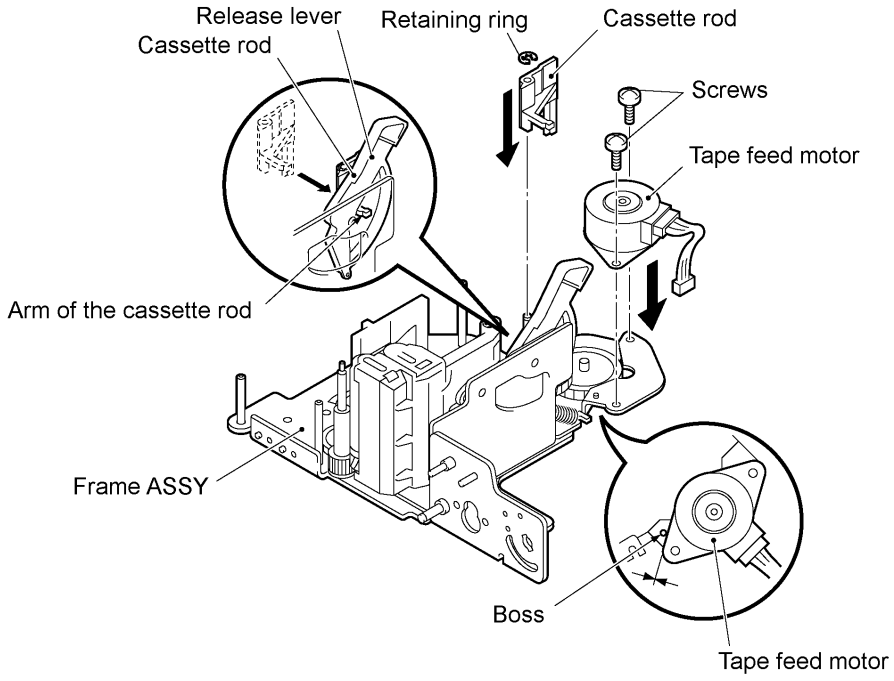


Fig. 2.2-22 Installing the Cassette Rod and Tape Feed Motor

(12) Move the release lever up and down to make sure that the roller holder pivots smoothly.

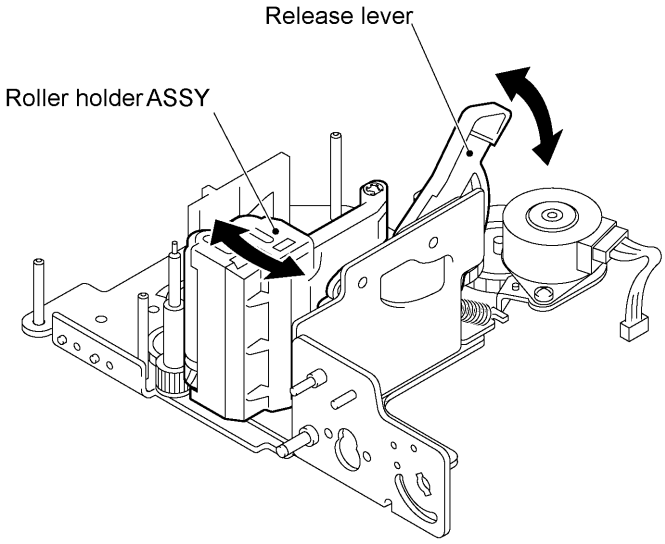


Fig. 2.2-23 Checking the Release Lever

[3] Installing the Cutter-related Components

(1) Set the cutter sensor actuator on the mechanical unit as illustrated below.

(2) Secure the cutter sensor ASSY with the screw.

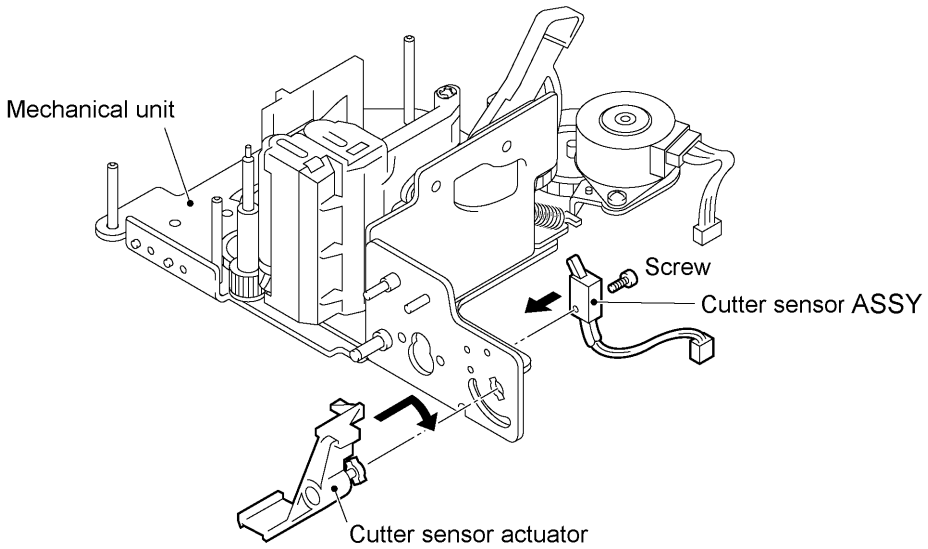


Fig. 2.2-24 Installing the Cutter Sensor Actuator and Cutter Sensor ASSY

(3) As shown below, set the cutter motor ASSY on the mechanical unit with the harness facing up. While pulling up the motor, secure it with the two screws.

(4) Set the cutter double gears and cutter moving gear in place, then fit the washer in the cutter moving gear.

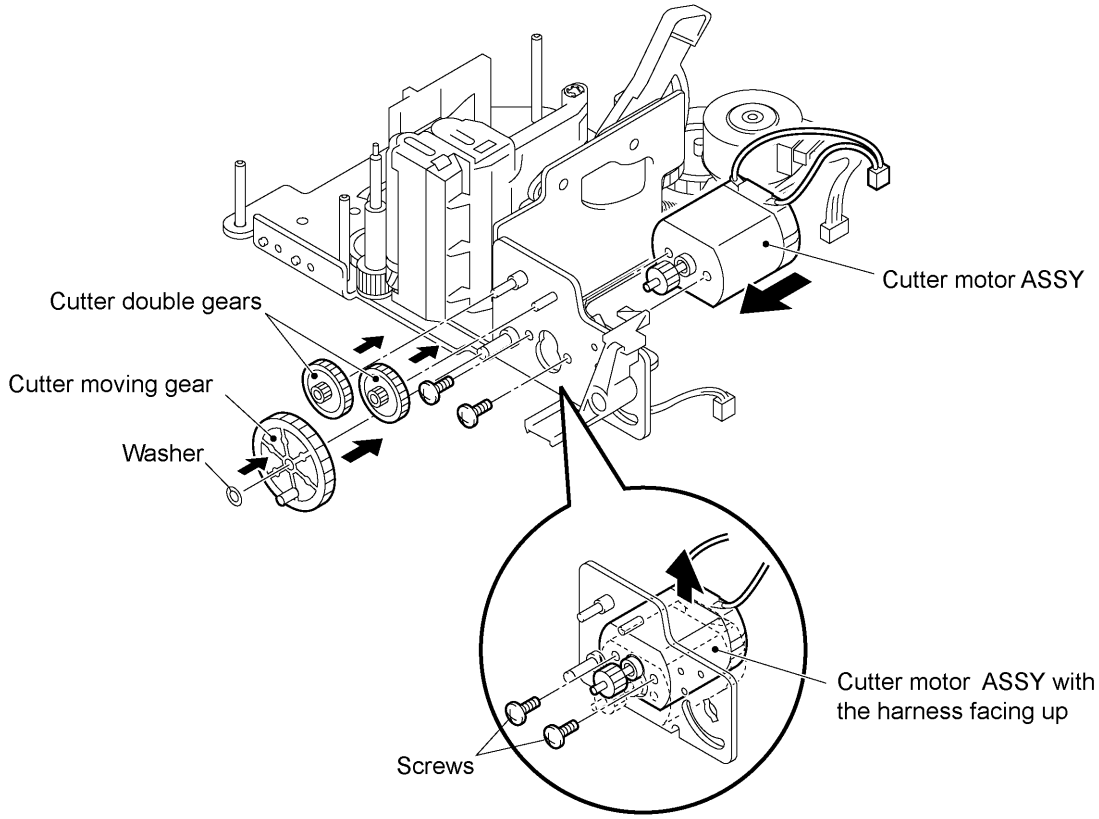


Fig. 2.2-25 Installing the Cutter Motor ASSY

(5) Secure the cutter ASSY with the two screws so that the long hole provided in the moving blade becomes fitted over the boss of the cutter moving gear.

WARNING: Be careful with the cutter blades.

(6) Apply grease (Silicon grease G501) to the inside edge of the long hole provided in the moving blade.

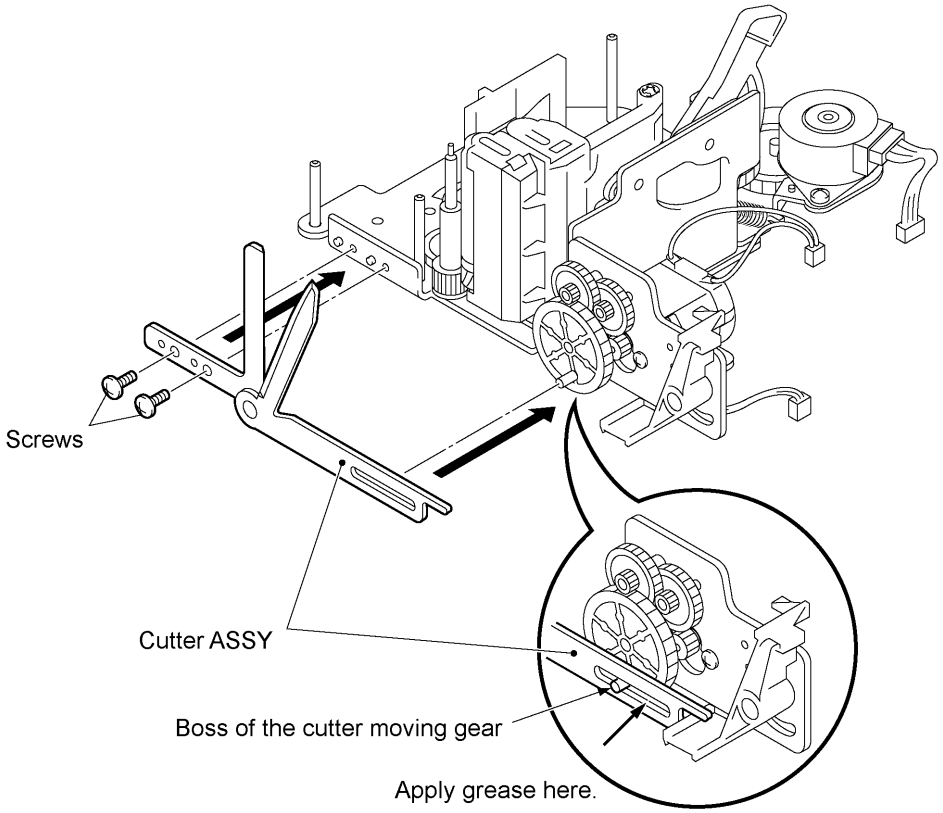


Fig. 2.2-26 Installing the Cutter ASSY

[4] Installing the Mechanical Unit Together with the Cutter-related Components

(1) While holding up the mechanical unit as illustrated below, connect the head flat cable (P8) to the main PCB.

(2) Put the mechanical unit into place.

(3) Align the frame edge below the cutter motor with the rib of the bottom cover, then secure the mechanical unit with the screw.

(4) Secure the grounding wire to the frame with the screw.

(5) Connect the following harnesses to the main PCB:

- Cutter motor harness (P4)
- Cutter sensor harness (P3)
- Tape feed motor harness (P5)

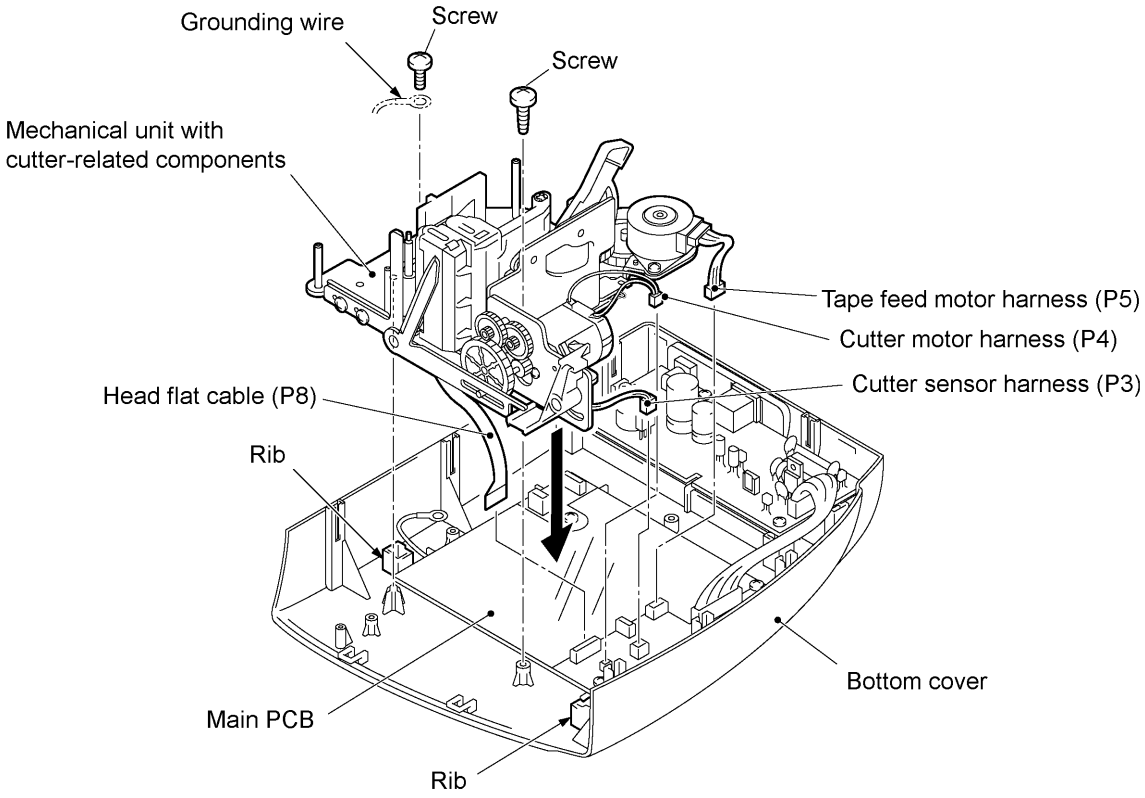


Fig. 2.2-27 Installing the Mechanical Unit

[5] Installing the ON/OFF Button, FEED/CUT Button, and Sub PCB ASSY to the Front Cover

(1) As illustrated below, insert the tabs of the reflection sheet in the two guide of the ON/OFF button.

(2) Set the key return spring on the ON/OFF button and put them back into place.

(3) Set the key return spring on the FEED/CUT button and put them back into place.

(4) Secure the sub PCB ASSY with the two screws.

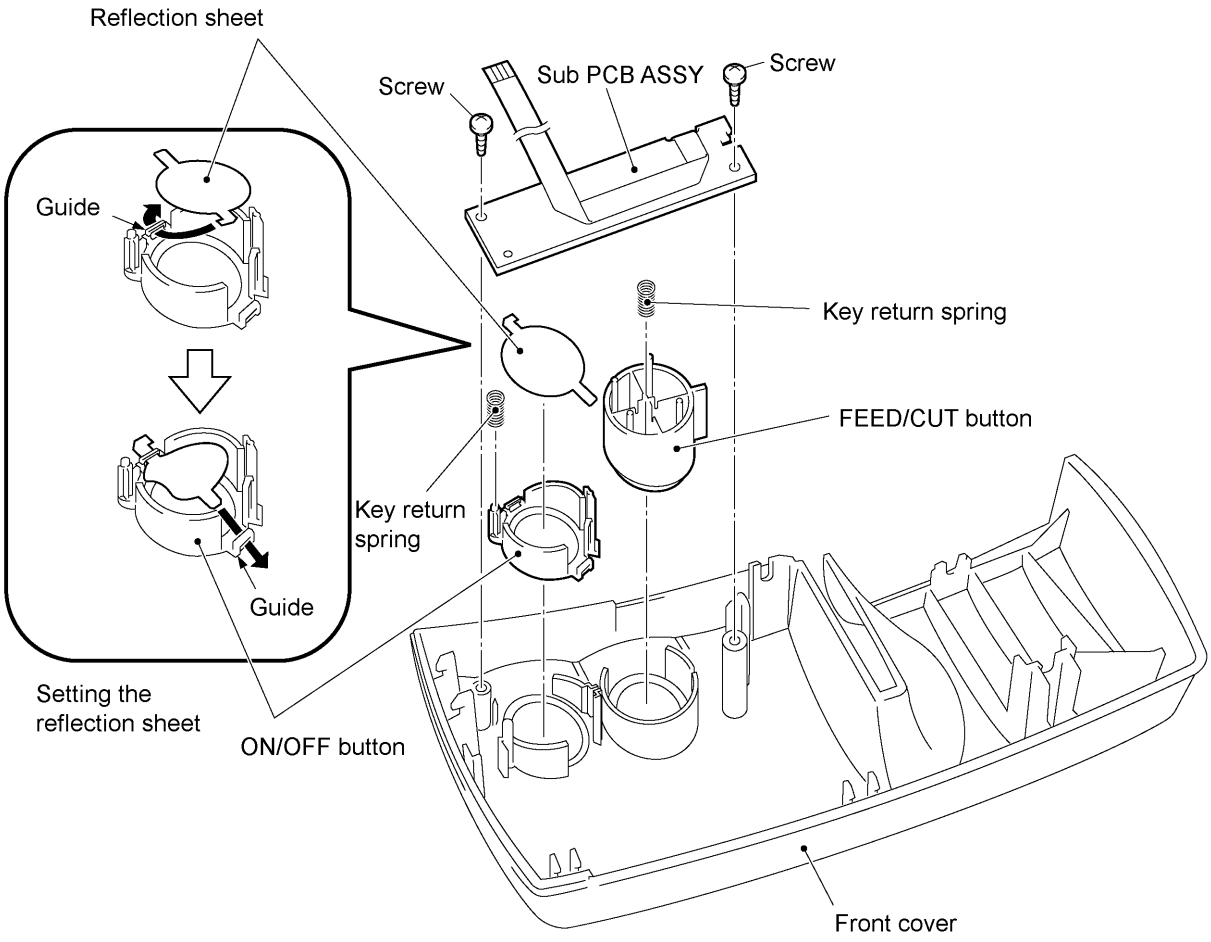


Fig. 2.2-28 Installing the ON/OFF Button, FEED/CUT Button, and Sub PCB ASSY

[6] Installing the Cassette Cover

(1) Set the cassette hold spring to the cassette cover in the order of •, ❟, ƒ, and „.

• : Insert the long spring end into the hole.
❟ : Fit the coil over the rib.
ƒ : Fit the coil over the rib.
„ : Insert the short spring end into the hole.

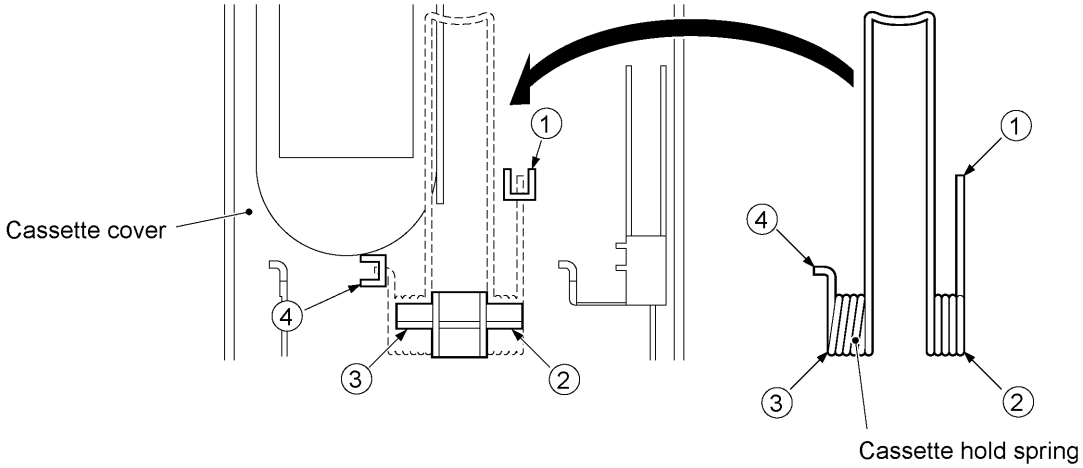


Fig. 2.2-29 Setting the Cassette Hold Spring

(2) Place the body cover rightside up.
(3) Insert the arms of the cassette cover into the openings provided in the body cover.
(4) Close the cassette cover.

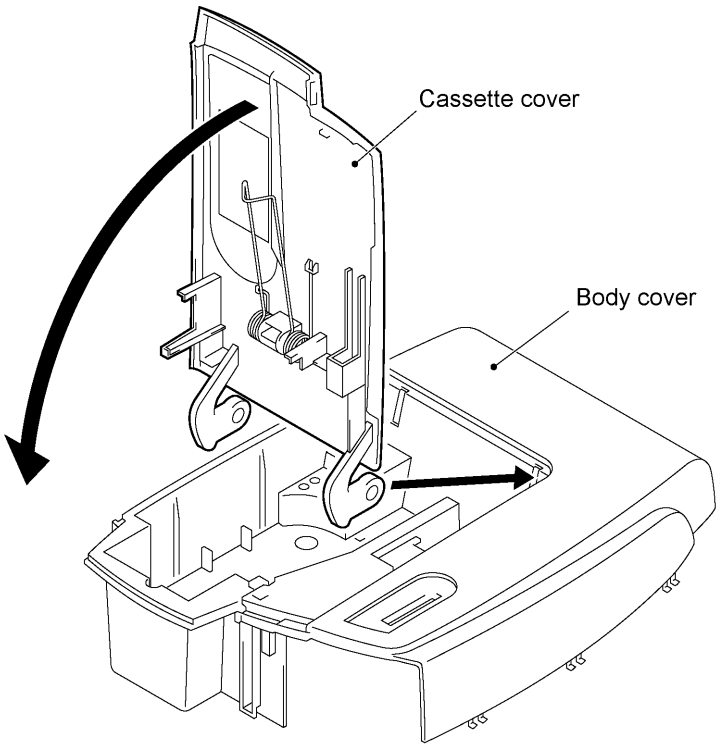


Fig. 2.2-30 Installing the Cassette Cover

(5) Turn the body cover upside down.

(6) While pushing the cassette cover arms outwards, set the cassette cover brackets into place, each at one time.

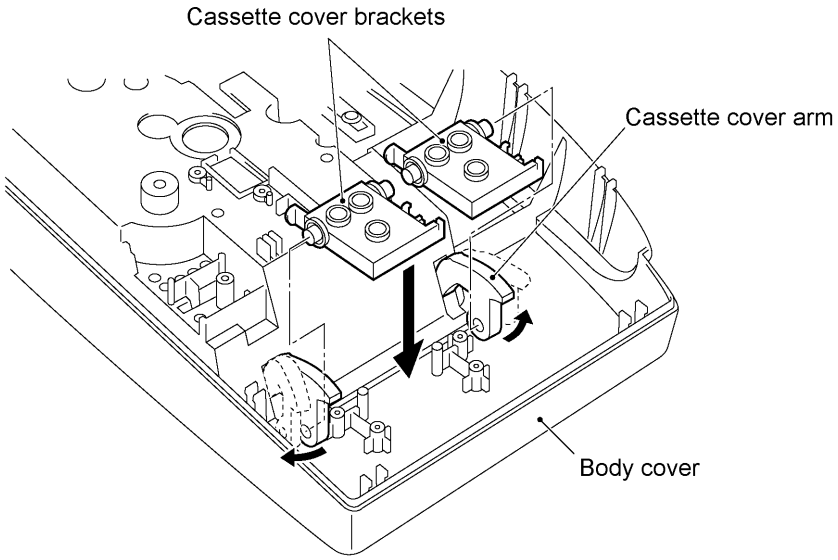


Fig. 2.2-31 Setting the Cassette Cover Brackets

(7) Set the cover open spring to the right-hand cassette cover bracket. Hook short end "a" of the spring on the bracket and long end "b" on the cassette cover arm as shown below.

(8) Secure the cassette cover brackets with the four screws.

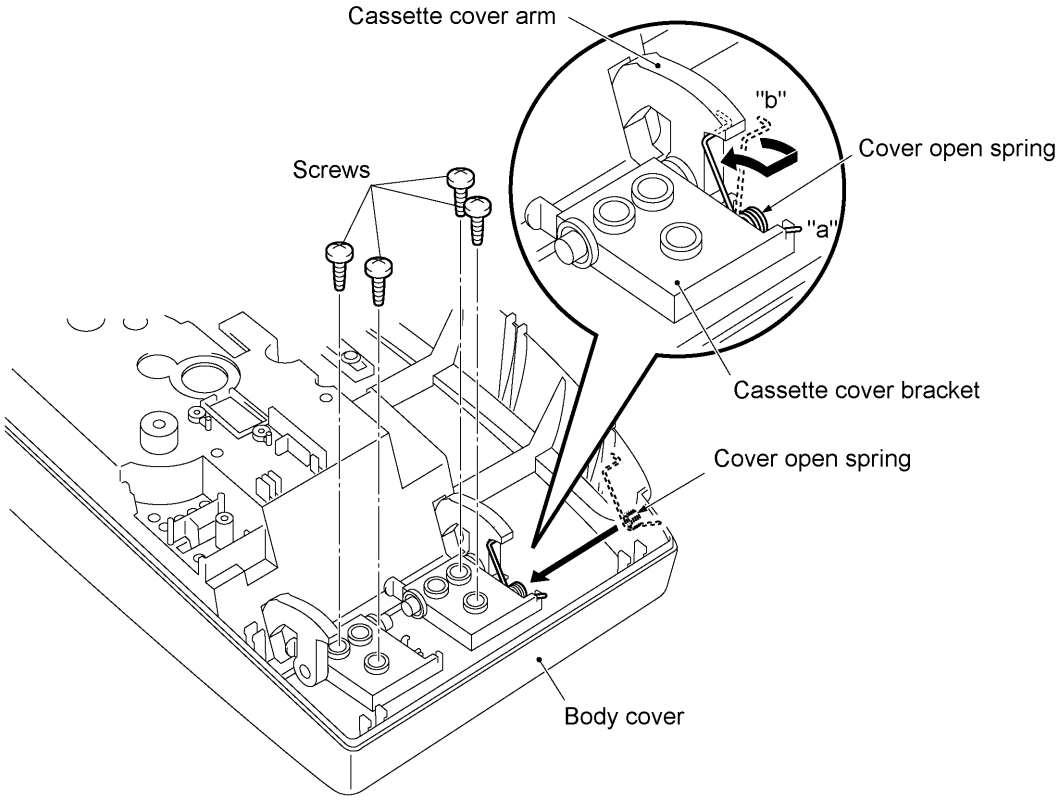


Fig. 2.2-32 Setting the Cover Open Spring and Securing the Cassette Cover Brackets

[7] Installing the Open Button, Cover Lock Lever, Sensor PCB ASSY, and Tape End Sensor ASSY to the Body Cover

(1) Snap the open button into the slot provided in the body cover, then secure the open button with the screw.

(2) Set the lock lever spring on the cover lock lever and install them on the body cover so that the square opening becomes fitted over the boss of the open button.

(3) Hook the lock lever spring on the boss provided on the body cover.

(4) Secure the cover lock lever with the screw.

(5) Apply grease (Silicone grease G501) to the square opening of the cover lock lever and boss of the open button.

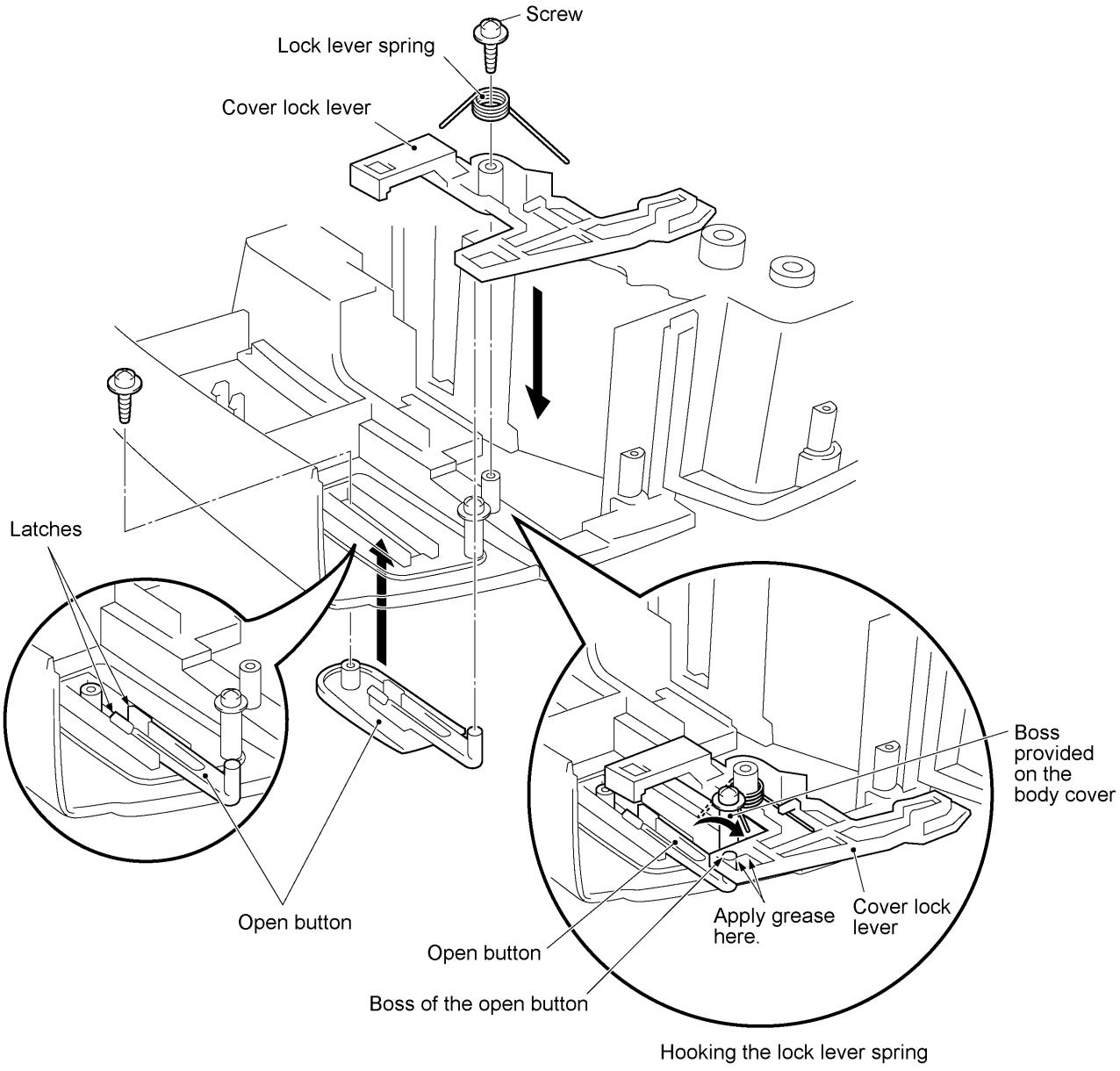


Fig. 2.2-33 Installing the Open Button and Cover Lock Lever

(6) Secure the sensor PCB ASSY with the screw. Route the flat cable as illustrated below.

(7) Secure the tape end sensor ASSY with the screw. Route the lead wires through the grooves of the rib as illustrated below.

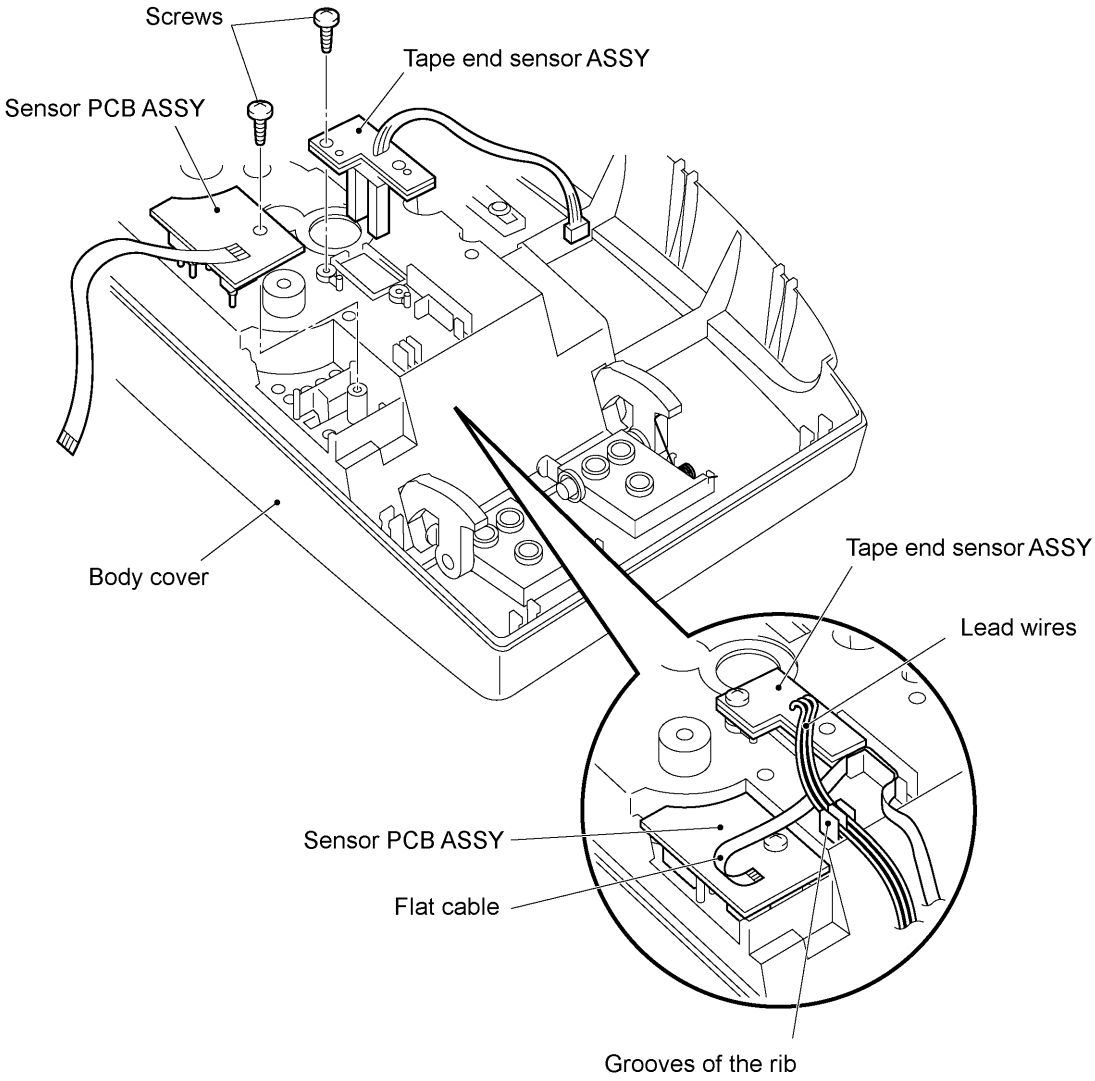


Fig. 2.2-34 Installing the Sensor PCB ASSY and Tape End Sensor ASSY

[8] Installing the Body Cover and Front Cover

(1) Connect the sub PCB flat cable to the main PCB.

NOTE: Insert the cable end into the connector with the solder side facing towards the cutter motor.

(2) Fully open the cassette cover. and hold the body cover as shown below.

(3) Hold the body cover as shown below, then connect the sensor PCB flat cable and tape end sensor harness to the main PCB.

NOTE: Insert the cable end into the connector with the solder side facing towards the power supply PCB.

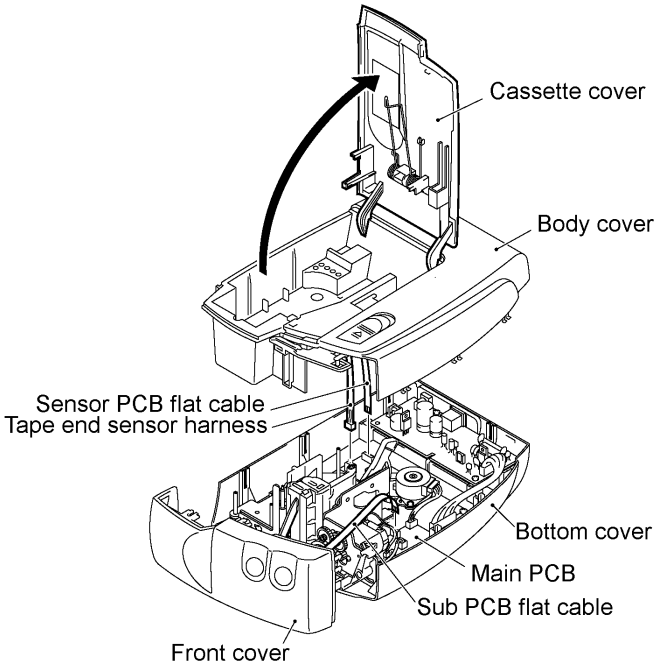


Fig. 2.2-35 Connecting the Sub PCB Flat Cable, Sensor PCB Flat Cable, and Tape End Sensor Harness

(4) Align the four holes provided in the body cover with the four poles provided on the frame ASSY, then fit the body cover and bottom cover together.

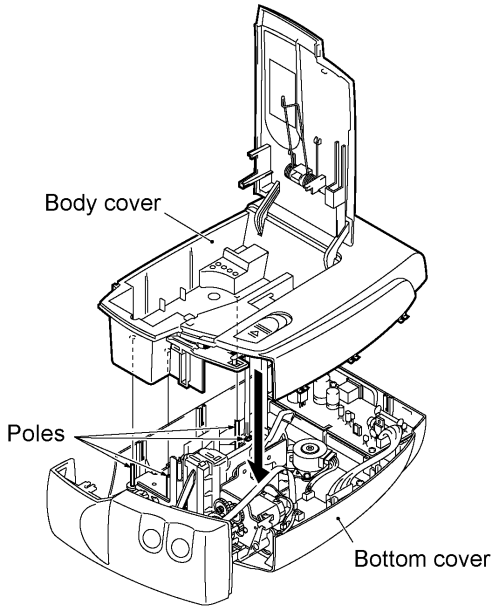


Fig. 2.2-36 Fitting the Body Cover and Bottom Cover Together

(5) Route the sub PCB flat cable on the cable guide provided on the cover lock lever.
(6) Install the front cover to the body cover and bottom cover.
(7) Secure the front cover with three screws "a" and the body cover with two screws "b."

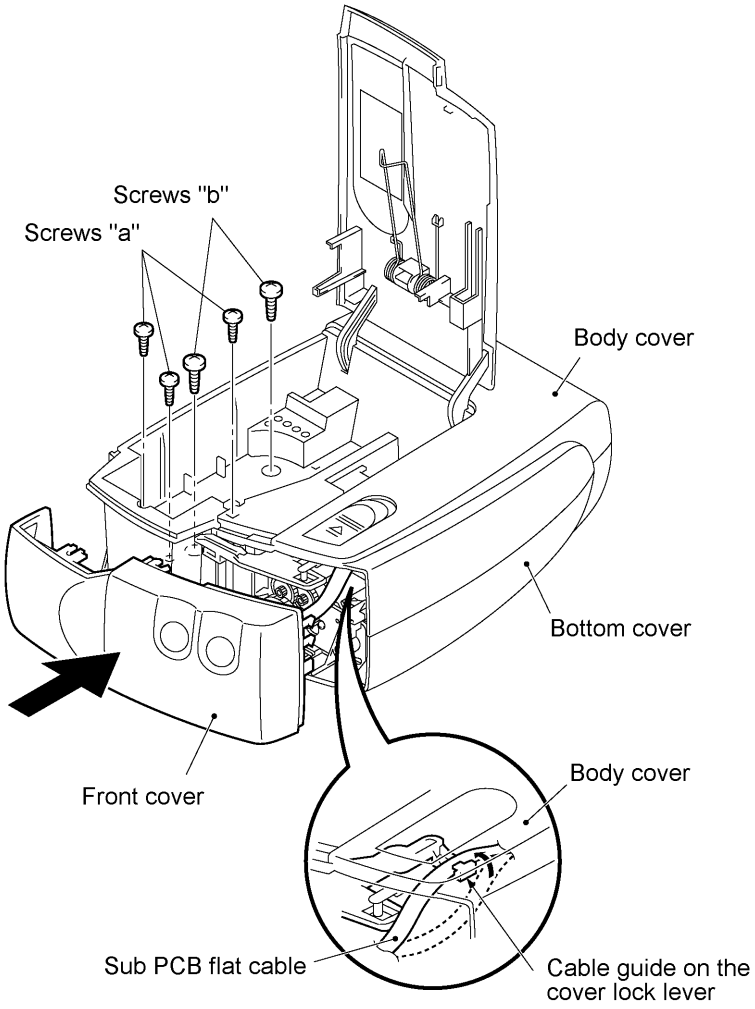


Fig. 2.2-37 Routing the Sub PCB Flat Cable and Securing the Front Cover and Body Cover

[9] Loading a Tape Cassette

(1) Load a tape cassette and close the cassette cover.

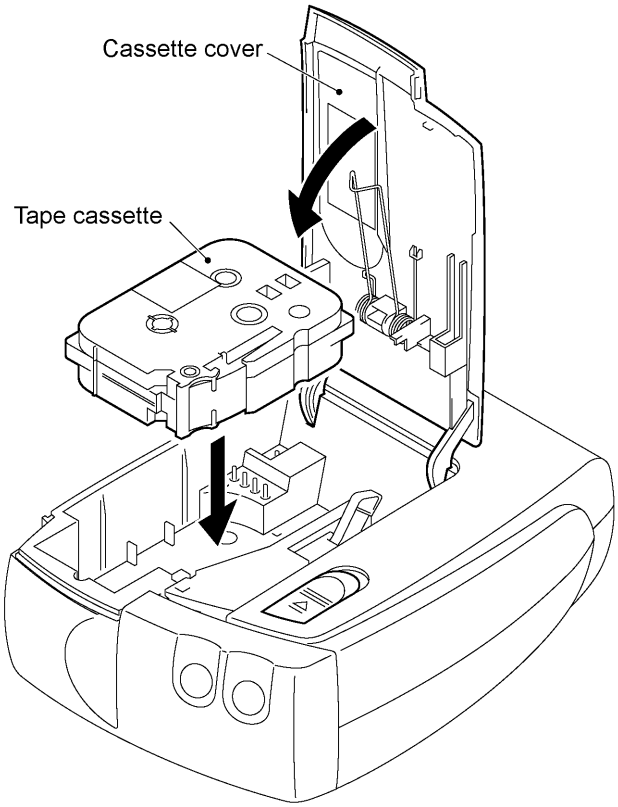


Fig. 2.2-38 Loading Tape Cassette

[10] Demonstration Print and Final Check

(1) Plug the adapter cord in the DC jack of the machine.

(2) While holding down the ON/OFF button, press the FEED/CUT button twice to start demonstration print.

(3) During the demonstration print, check that the machine prints data and then feeds and cuts the tape correctly.

If any problem is found, go to the troubleshooting in Chapter IV.

(4) Open the cassette cover to check that it retracts the roller holder ASSY from the thermal head. Close the cassette cover to check that it presses the roller holder ASSY against the thermal head.

(5) Check that pressing the FEED/CUT button causes correct cutting operation.

(6) Check that the ON/OFF button operates correctly.

n ON/OFF lamp states and machine status

ON/OFF lamp	Machine status
Illuminates in green.	In the standby mode for data reception.
Flashes in green.	The machine has received data.
Illuminates in orange.	- No tape cassette is loaded when the machine is in the standby mode. - The cassette cover is opened when the machine is receiving data but does not start printing yet.
Flashes in orange.	The cassette cover is opened when the machine is in the standby mode.
Flashes in red.	- No tape cassette is loaded when the machine is in the printing mode. - The tape cassette has run out. Replace the tape cassette. - The cassette cover is opened during printing. - Communications error. - Buffer error.
Illuminates in red.	- The cutter has jammed before starting printing, during printing, or when the power is turned on. - EEPROM error. - RAM error.

CHAPTER III

ELECTRONICS

CONTENTS

CHAPTER III ELECTRONICS

3.1 OUTLINE OF CONTROL ELECTRONICS

Fig. 3.1-1 shows a block diagram of the control electronics of this machine. The control electronics consists of the components given below.

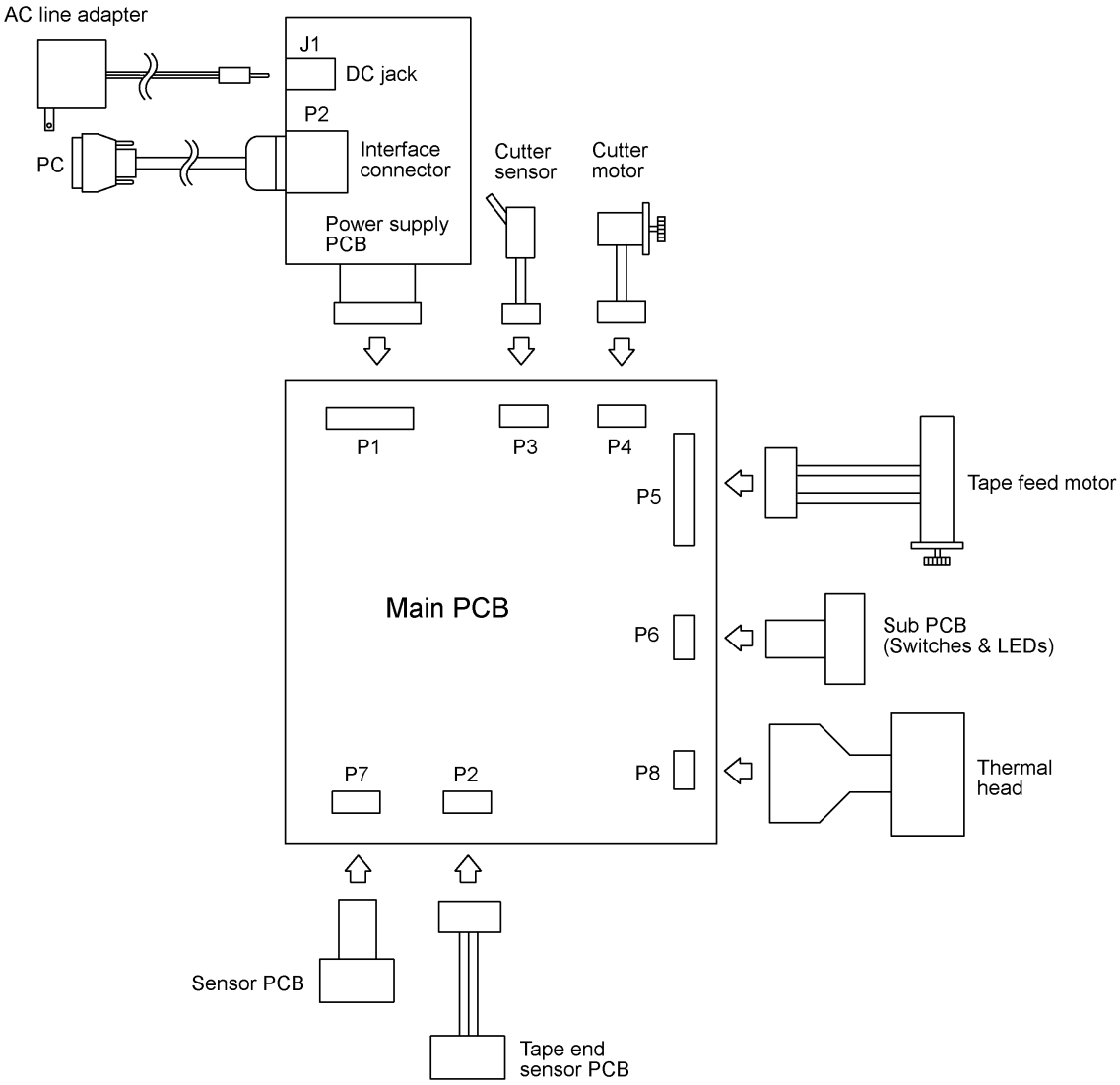


Fig. 3.1-1 Control Electronics of PT-2500PC

3.1.1 Main PCB

The main PCB controls all electronic operations.

This PCB consists of a CPU, RAM, EEPROM, and motor drivers.

3.1.2 Power Supply PCB

This PCB generates the 5 VDC and 12 VDC from the unstabilized DC voltage supplied through the AC line adapter.

3.1.3 Sensor PCB

This PCB holds two mechanical sensors; a cassette sensor that detects the tape width and ink ribbon type in a tape cassette loaded and a cover open sensor that detects the opened/closed state of the cassette cover.

3.1.4 Tape End Sensor PCB

The tape end sensor uses a photo-interrupter to detect a zebra pattern provided at the end of tape.

3.1.5 Sub PCB

The sub PCB holds the FEED/CUT switch (FEED/CUT button) and the ON/OFF switch (ON/OFF button) with the lamp (green and red LEDs).

3.1.6 Cutter Sensor

The cutter sensor is a mechanical switch which detects the home position of the cutter.

3.1.7 Cutter Motor

The cutter motor is a DC motor which drives the cutter to cut the tape. This motor operates on 12V.

3.1.8 Tape Feed Motor

The tape feed motor is a Ø30 stepping motor which drives the tape feeding mechanism to feed both the tape and ribbon. This motor operates on 12V.

3.1.9 Thermal Head

The thermal head is a driver-integrated thick-film head having 128 heating element aligned in 180 dpi. The drive voltage is 12V.

3.2 MAIN PCB

Fig. 3.2-1 shows a block diagram of the main PCB. The PCB consists of the following components:

(1) CPU (including the ROM and RAM)
(2) SRAM (32-kilobyte)
(3) EEPROM (1-kilobit)
(4) Power ON/OFF circuit, thermal head control circuit, FEED/CUT switch ON/OFF circuit, and LEDs ON/OFF circuit
(5) Cutter motor drive circuit and tape feed motor drive circuit
(6) Cassette sensor circuit, cover open sensor circuit, cutter sensor circuit, and tape end sensor circuit
(7) Head property detection circuit
(8) Head voltage detection circuit and ambient temperature detection circuit
(9) Oscillation circuit
(10) Reset circuit

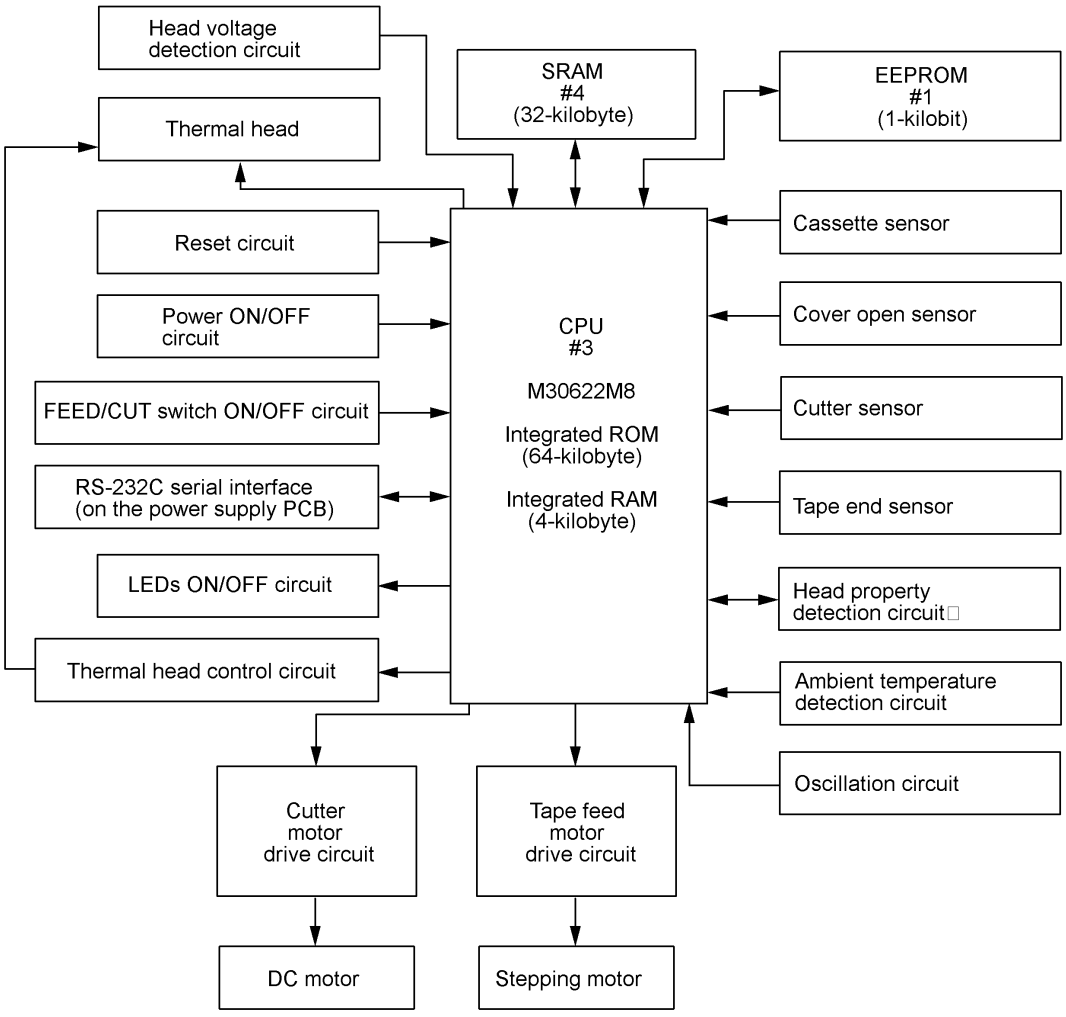


Fig. 3.2-1 Block Diagram of the Main PCB

3.2.1 Logic Components

[1] CPU (M30622M8)

The CPU (#3) is a 16-bit microprocessor manufactured by Mitsubishi Electric Corp., which controls and manages the entire system.

This CPU integrates a 64-kilobyte ROM which stores all programs and a 4-kilobyte RAM.

[2] RAM (SRAM)

The RAM is a 32-kilobyte SRAM (#4) which is used as a data buffer.

[3] ROM (EEPROM)

The ROM is a 1-kilobit EEPROM (#1) which stores the transmission speed and mechanical information.

3.2.2 Solder Points

Fig. 3.2-2 shows a circuit diagram relating to solder points. Solder points A to C are soldered according to the resistance property of the thermal head.

The CPU reads the status of the solder points once in the powering-on sequence to recognize the customization.

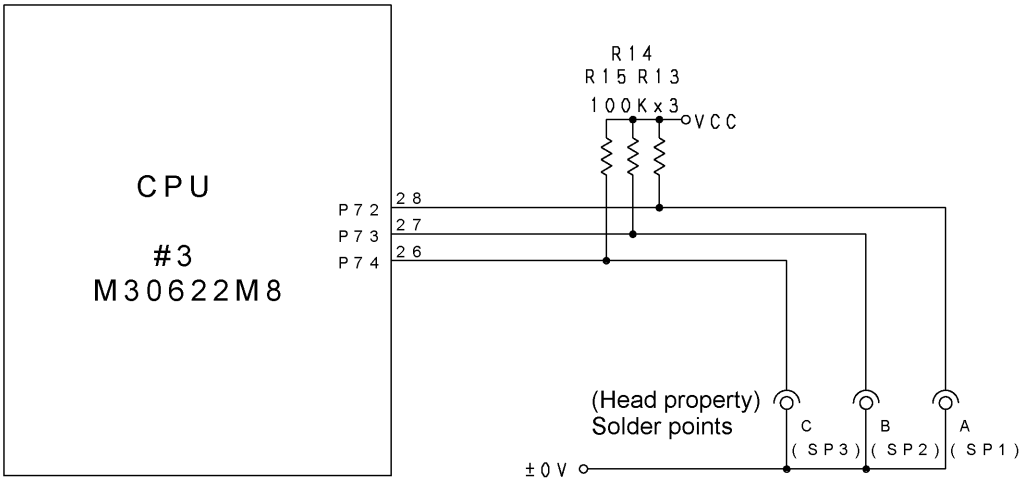


Fig. 3.2-2 Solder Points

3.2.3 Logic and VH Power, and Related Circuits

If the AC line adapter is plugged in the machine, the power supply PCB supplies Vcc (+5V) to the main PCB. Vcc is a power source to the logic circuitry.

The moment Vcc is supplied, the reset IC (Q2) operates to turn the $\overline{\text{RESET}}$ signal from Low to High, starting the CPU to run. The CPU initializes its ports and then enters the sleep mode (power-off).

Pressing the ON/OFF switch in the sleep mode causes $\overline{\text{NMI}}$ interrupt to start the CPU.

Pressing the ON/OFF switch with power on places the CPU in the sleep mode (Power off).

To drive the mechanism, the CPU turns P83 High to turn on Q5 (FET) on the power supply PCB, supplying VH to the thermal head, cutter motor, and tape feed motor.

3.2.4 Tape Feed Motor Drive Circuit

Fig. 3.2-3 shows a drive circuit of the tape feed motor which feeds tape and ink ribbon. The motor is a 30-mm in diameter, 24-pole, and 108-internal resistance stepping motor. This circuit drives the motor with a bipolar 2-2 phase excitation.

The CPU (#3) controls the motor rotation direction with signals on P104 and P105 and turns the motor on and off with an activation signal of the driver IC (TA7774F, #2). When P106 is High, the motor rotates in the direction defined by the signals on P104 and P105.

(1) Printing in a constant speed

For regular printing in a constant speed, the CPU drives the motor at the rate of 144 pps. To provide buffered starting and stopping for the motor, the gradual acceleration and deceleration are programmed to consume 8 and 3 pulses, respectively.

(2) Printing interrupt (margin cutting drive and buffer full drive)

After completion of the current printing, the CPU brakes the motor with 3-pulse gradual deceleration and then counter-drives it by 20 pulses to stop the motor.

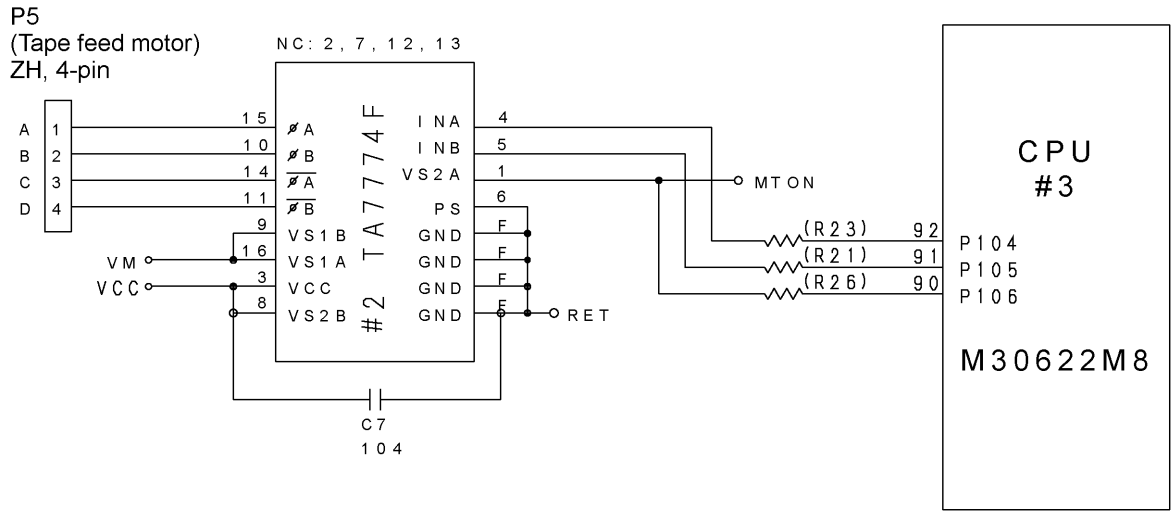


Fig. 3.2-3 Tape Feed Motor Drive Circuit

3.2.5 Cutter Motor Drive Circuit

Figs. 3.2-4 and 3.2-5 show the cutter motor drive circuit and the cutter sensor circuit, respectively. The cutter motor is a DC motor.

The CPU (#3) activates the transistor array (TA7291F, #5) through P86 and P87 to drive the cutter motor.

Table 3.2-1 shows the motor control logic.

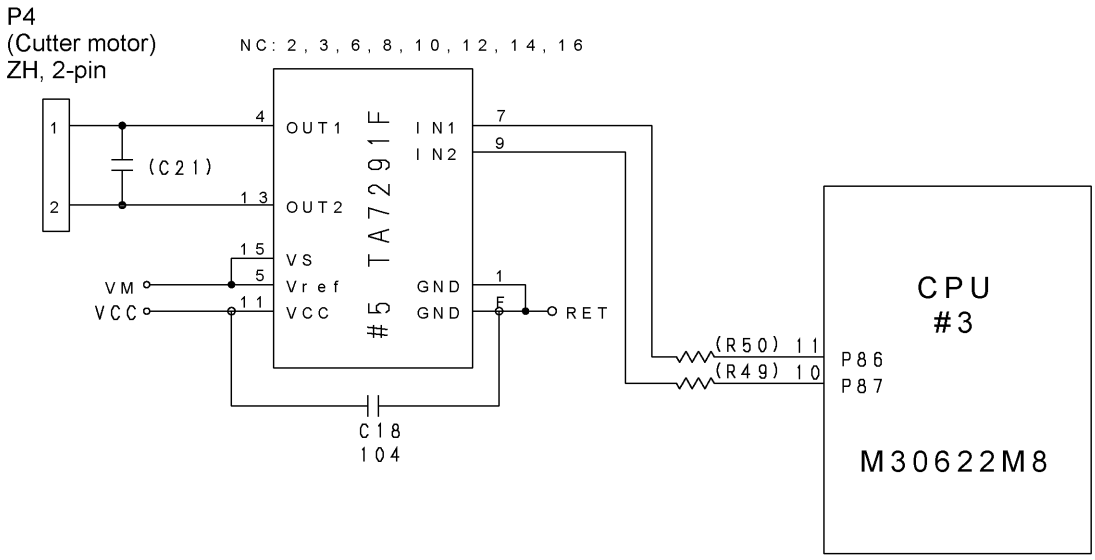


Fig. 3.2-4 Cutter Motor Drive Circuit

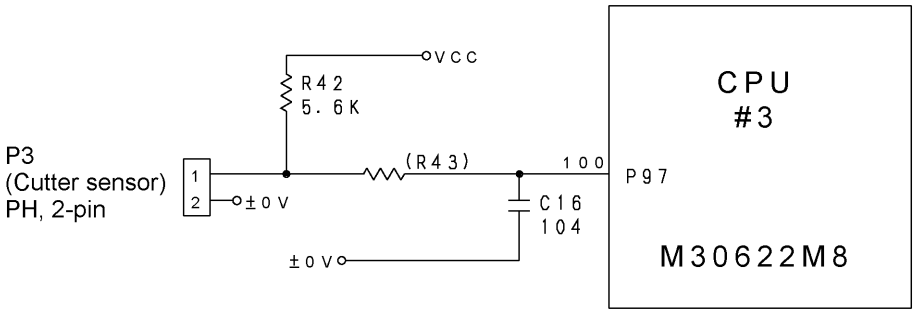


Fig. 3.2-5 Cutter Sensor Circuit

Table 3.2-1 Motor Control Logic

State	P86	P87
On standby	0	0
Clockwise rotation	1	0
Counterclockwise rotation	0	1
Braking	1	1

[1] Circuit operation

The cutter motor drive sequence is described below.

The cutter stays in the home position when it is not in operation (The cutter sensor input level is Low).

If the CPU issues a tape cutting command, this drive circuit rotates the DC motor clockwise for cutting the tape. The moment the cutter starts and goes out of the home position, the cutter sensor level goes High. When this sensor level goes Low again, the CPU recognizes that the cutter has returned to the home position after cutting the tape and then applies brake to the DC motor.

If the sensor level goes High again during braking, it indicates that the cutter has passed through the home position. So the CPU rotates the DC motor counterclockwise and applies brake when the sensor level goes Low.

This way, when the sensor level goes High or Low, the CPU rotates the DC motor clockwise or counterclockwise, respectively. If the sensor level remains Low for 100 ms when the brake is applied, the CPU judges that the cutter stops in the home position.

If the cutter lies out of the home position due to abnormal end of the previous operation, the CPU rotates the DC motor counterclockwise to return the cutter to the home position (initializing the cutter) before printing.

If the cutter sticks in the home position for 300 ms or does not return to the home position for 1000 ms after the DC motor starts rotating clockwise, the CPU regards it as an error and starts error processing.

If the cassette cover is opened (which is detected by the cover open sensor), the DC motor does not operate.

[2] Error processing

If a cutter error occurs, the CPU turns the LED1 (red) on and disables all operations.

Turning the ON/OFF switch off and on will start error processing to return the cutter to the home position.

3.2.6 Cassette Sensor Circuit

Fig. 3.2-6 shows the cassette sensor circuit which reads the five sensor switches.

Loading a tape cassette pushes down some of those five switches to turn them on while keeping other switches off depending upon the ID holes provided in the tape cassette. If a certain ID hole is closed, the corresponding sensor switch goes on.

By receiving the states of those sensor switches, the CPU identifies the tape width and ink ribbon type of the tape cassette, as listed in Table 3.2-2.

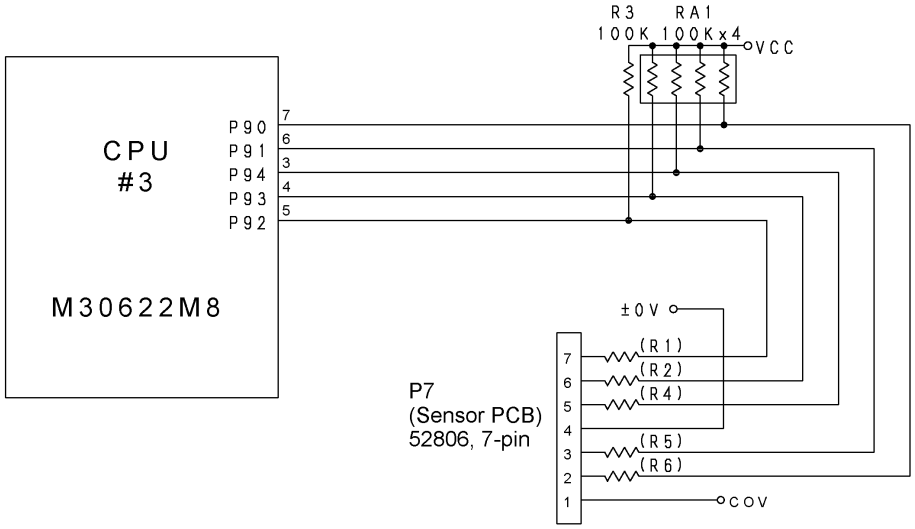


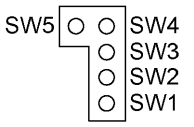
Fig. 3.2-6 Cassette Sensor Circuit

Table 3.2-2 Coded Values for Identifying Tape Cassette

1: Switch ON (ID hole closed) 0: Switch OFF (ID hole opened)

Cassette type		SW1	SW2	SW3	SW4	SW5
	No cassette	0	0	0	0	0
6 mm	Laminated	0	0	1	0	0
	Non-laminated	0	0	1	1	0
9 mm	Laminated	1	1	1	0	0
	Non-laminated	1	1	0	0	0
12 mm	Laminated *	0	1	0	0	0
	Non-laminated and iron-on	0	1	1	1	0
18 mm	Laminated **	1	0	1	1	0
	Non-laminated and YS	1	0	0	0	0
	Lettering and iron-on	1	1	1	0	1
24 mm	Laminated	1	0	1	1	1
	Non-laminated	1	0	0	0	1

Position of sensor switches



*The stamp tape cassette M is included in this type.
**The stamp tape cassette L is included in this type.

3.2.7 Thermal Head Control Circuit

Fig. 3.2-7 shows the thermal head control circuit. The print head integrates a heat generator (consisting of 128 heating elements vertically aligned in 180 dpi) and a pair of built-in driver ICs which are designed for 64-element control.

Synchronizing with the clock on P61, the CPU outputs serial print data containing 128-dot frame (8 x 16 bit map) through P63 to the drivers.

If the CPU runs out of control, this circuit cuts off the strobe signal (P80) to the thermal head after the specified time length by the CR time constant of C17•R46.

Fig. 3.2-8 shows the head drive timing scheme.

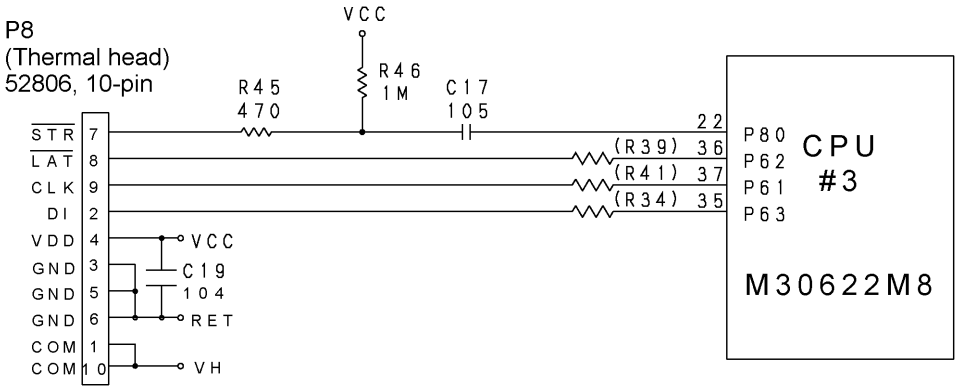


Fig. 3.2-7 Thermal Head Control Circuit

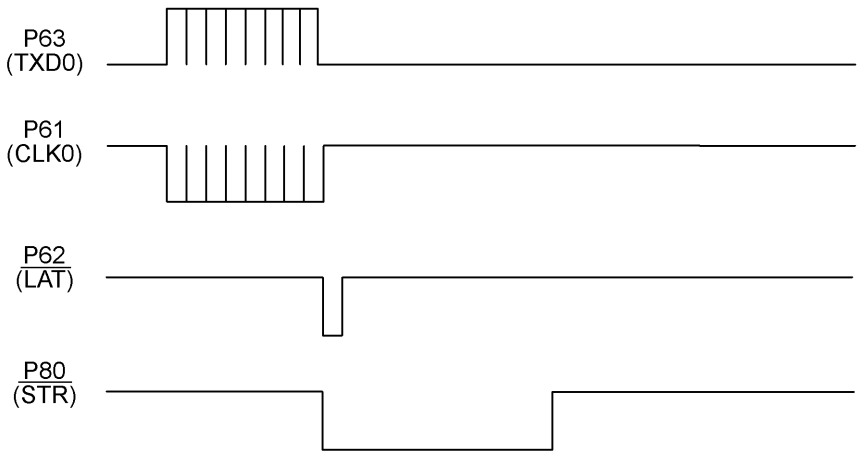


Fig. 3.2-8 Head Drive Timing Scheme

3.2.8 Head Voltage Detection Circuit and Ambient Temperature Detection Circuit

Fig. 3.2-9 shows the head voltage detection circuit and ambient temperature detection circuit. Through these circuits, the CPU monitors the voltage applied to the thermal head and the ambient temperature and then controls the STR pulse width.

(1) Head voltage detection circuit

This circuit, which is composed of divider resistors R30 and R29, steps down the power source VH and then feeds the output to the analog input port AN1 of the CPU. According to the sensed voltage, the CPU controls the STR pulse width.

(2) Ambient temperature detection circuit

This circuit consists of thermistor TH2 which is pulled up to Vcc through resistor R25. It converts the resistance of the thermistor (which will vary depending upon the ambient temperature) to the voltage level and then feeds its output to the analog input port AN0 of the CPU. According to this data, the CPU determines the optimum STR pulse width.

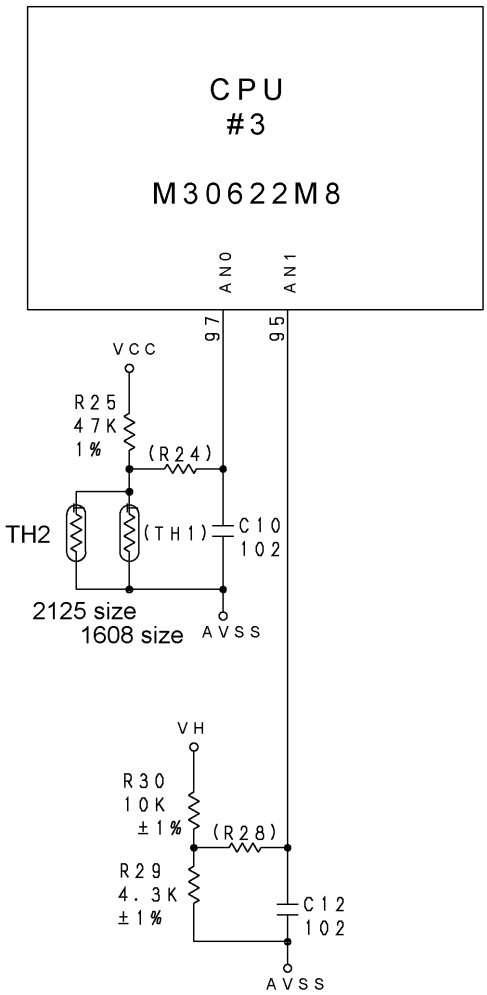


Fig. 3.2-9 Head Voltage Detection Circuit and Ambient Temperature Detection Circuit

3.2.9 Oscillation Circuit

Fig. 3.2-10 shows the oscillation circuit. It generates 14.74 MHz source which acts as a CPU basic clock. The CPU synchronizes its internal operations.

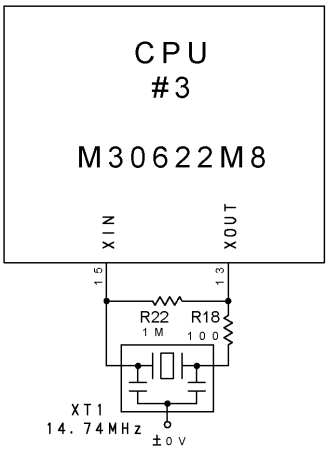


Fig. 3.2-10 Oscillation circuit

3.2.10 Tape End Sensor Circuit

Fig. 3.2-11 shows the tape end sensor circuit.

To detect the tape end, the CPU monitors the voltage level on AN2. If the zebra tape (black/transparent) provided at the end of tape passes through the tape end photosensor, the CPU recognizes that the tape runs out according to the voltage change.

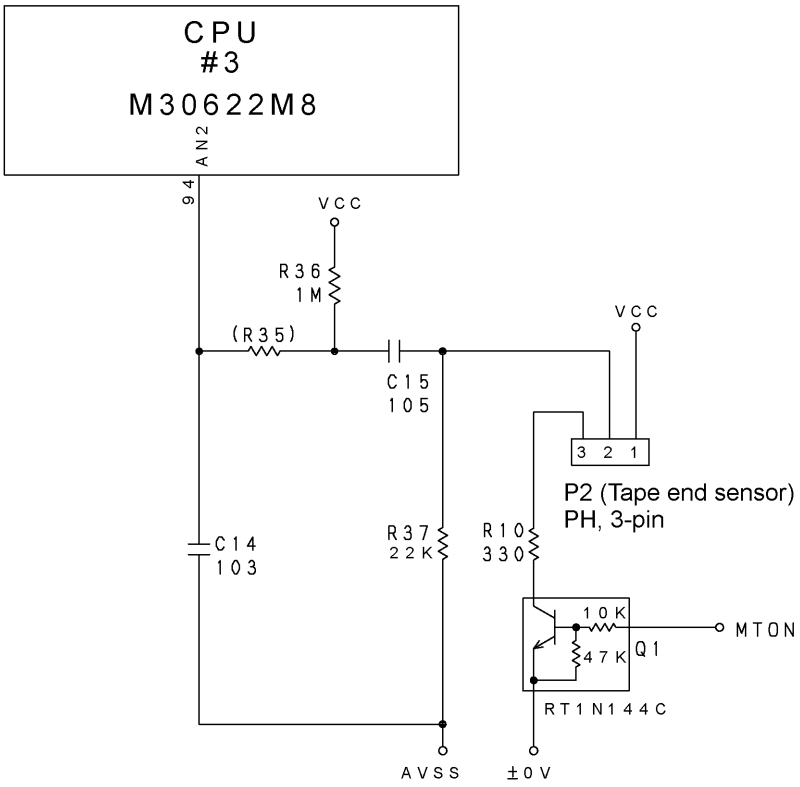


Fig. 3.2-11 Tape End Sensor Circuit

3.2.11 Switches & LEDs Circuit

Fig. 3.2-12 shows the switches & LEDs circuit which manages the ON/OFF switch and its two LEDs, and FEED/CUT switch.

Pressing the FEED/CUT switch turns the CPU's $\overline{\text{INT2}}$ Low, signaling that the FEED/CUT switch is pressed. Then the CPU activates the tape feeding and cutting mechanisms.

The two LEDs show the machine status by illuminating or flashing. For the relationship between the LED states and machine status, refer to Chapter II, Section 2.2.2, [10].

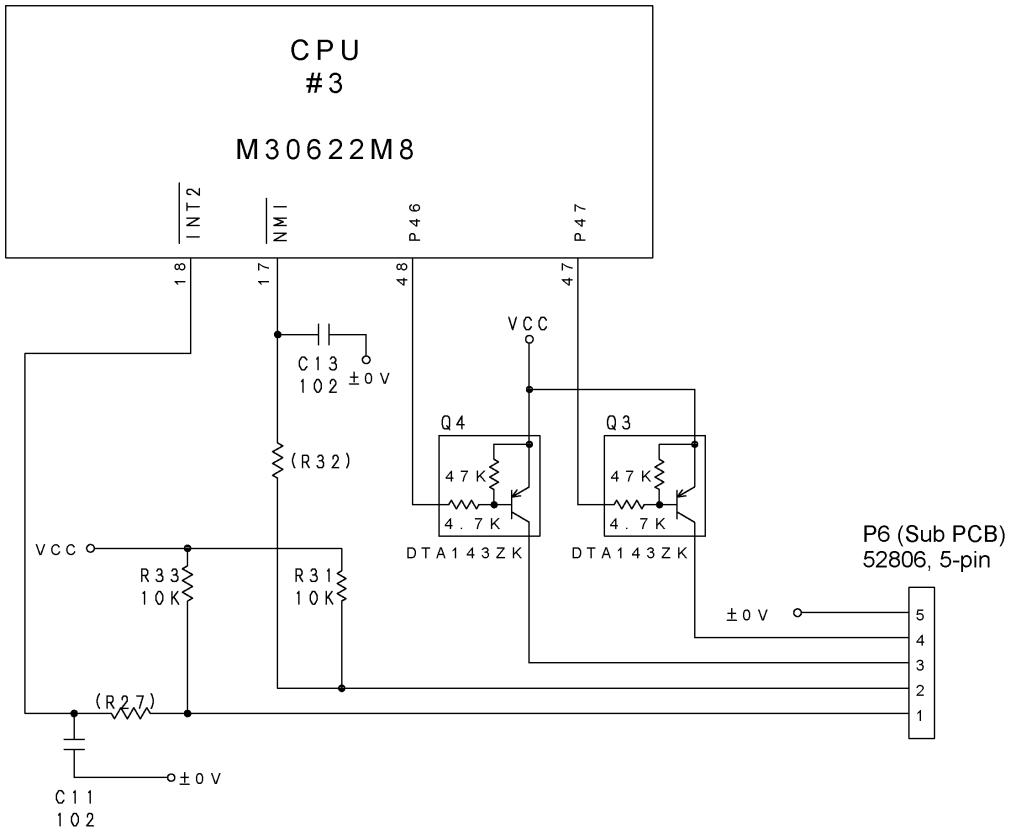


Fig. 3.2-12 Switches & LEDs Circuit

3.2.12 Cover Open Sensor Circuit

Fig. 3.2-13 shows the cover open sensor circuit which detects whether the cassette cover is opened or closed.

When the cassette cover is closed, the sensor input level is Low; when it is opened, it goes High.

If the sensor input level is High, the CPU disables all drive sources.

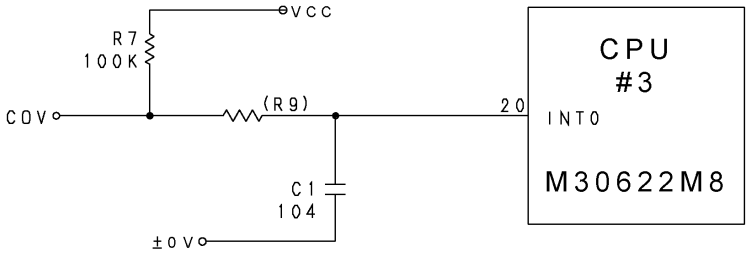


Fig. 3.2-13 Cover Open Sensor Circuit

3.2.13 Reset Circuit

Fig. 3.2-14 shows the reset circuit. This circuit prevents the CPU and logic circuitry from malfunctioning in powering-on and -off sequences.

Fig. 3.2-15 shows the reset timing when the power is first applied or cut off.

Plugging the AC line adapter in the DC jack raises the Vcc which feeds power to the CPU and the logic circuitry. When the Vcc reaches approx. 4.2V (point "A" in Fig. 3.2-15), the reset IC (S-80842ANUP, Q2) operates to turn the $\overline{\text{RESET}}$ from Low to High.

When the power is cut off so that the Vcc drops below approx. 4.2V (point "B"), the $\overline{\text{RESET}}$ turns from High to Low.

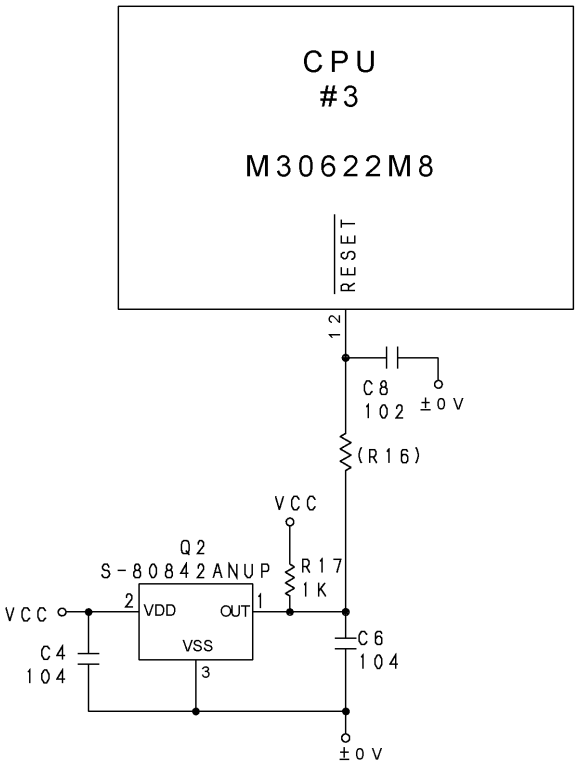


Fig. 3.2-14 Reset Circuit

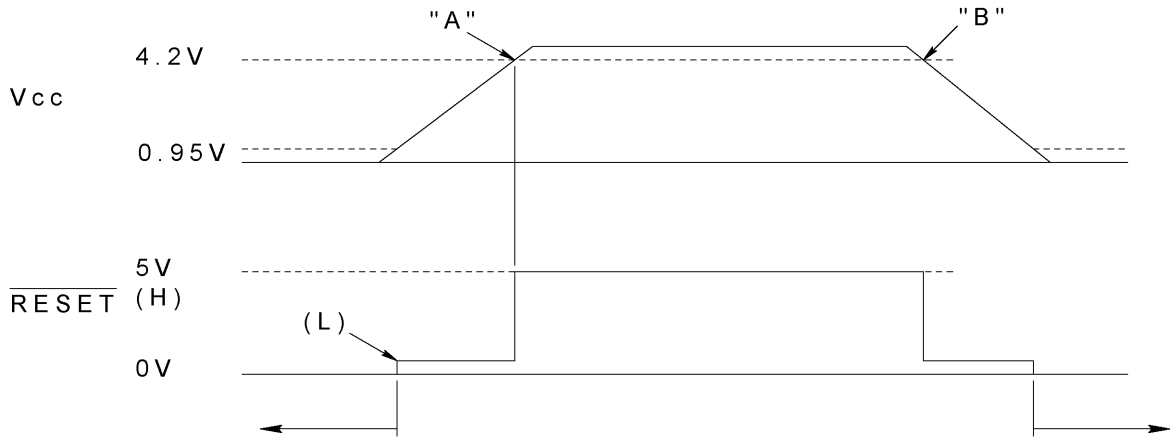


Fig. 3.2-15 Reset Timing

3.3 POWER SUPPLY PCB

3.3.1 +12V Power Supply Circuit

Fig. 3.3-1 shows the +12V power supply circuit. Acting as a DC stepping-up converter, this circuit steps up the AC adapter output to +12 VDC power supplies, VH and VM. The VH is fed to the thermal head and the VM is fed to the tape feed motor and cutter motor.

A closed loop comprising Q1, Q2, R2, R4, and C4 forms a self-running oscillator. Zener diode ZD1 and Q4 regulate the output voltage "A" around +12V.

The CPU turns the HPOW signal High to apply power to this circuit only when driving the mechanisms, thereby saving power. When no power is required for those mechanisms, the CPU cuts off Q5 (FET) by keeping the HPOW Low to protect them from unexpected powering.

Resistor R13 limits the current flowing into the motors.

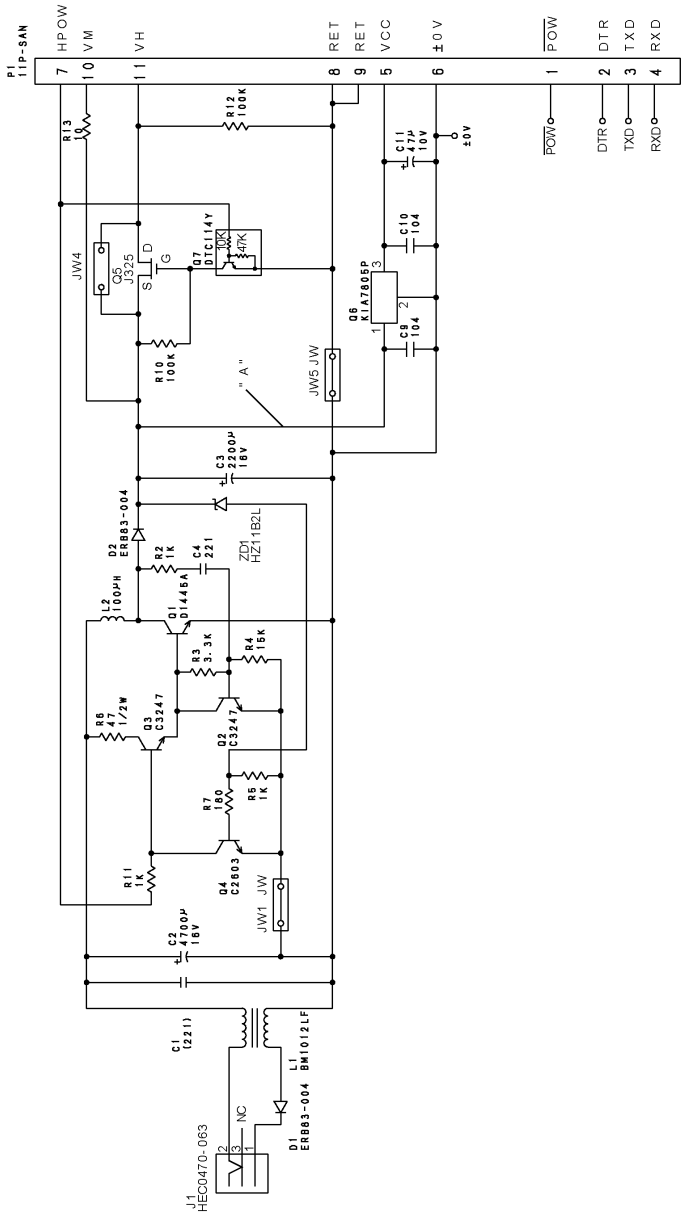


Fig. 3.3-1 +12V Power Supply Circuit

3.3.2 +5V Power Supply Circuit

Fig. 3.3-2 shows the +5V power supply circuit. A 3-terminal regulator (KIA7805P, Q6) stabilizes the Vcc (approx. 5V). During non-printing, the regulator is supplied with the VAD fed through the AC line adapter output. During printing, it is supplied with "A" (+12V) fed from the +12V source; this is to supply the stabilized power to the logic circuitry even when the AC line adapter output drops abnormally.

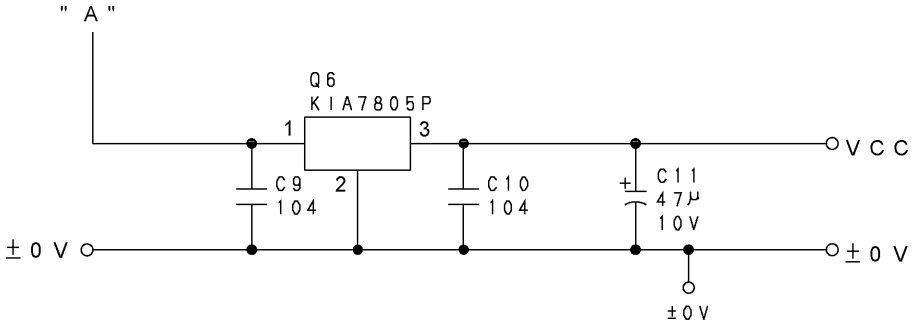


Fig. 3.3-2 +5V Power Supply Circuit

3.3.3 DC Jack-related Circuit

Fig. 3.3-3 shows the circuit around the DC jack. Diode D1 protects the machine when a wrong-polarity AC line adapter is connected. For the right polarity of the AC line adapter plug, refer to Fig. 3.3-4.

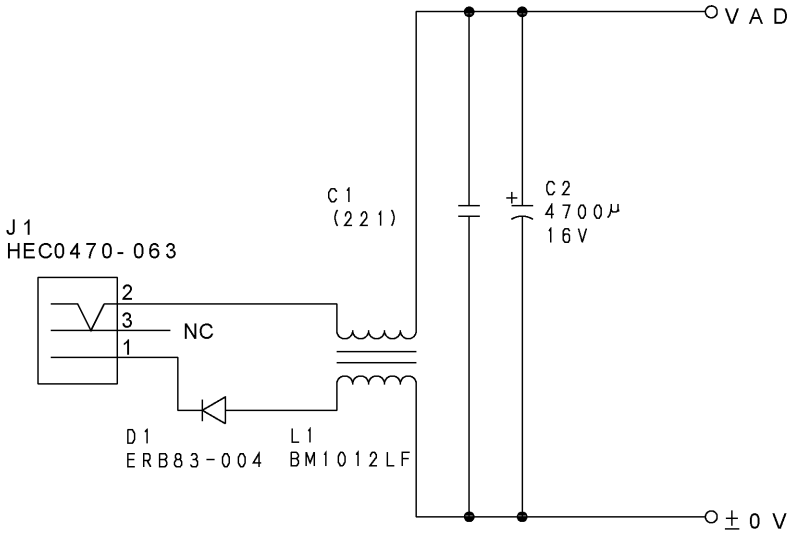


Fig. 3.3-3 DC Jack-related Circuit

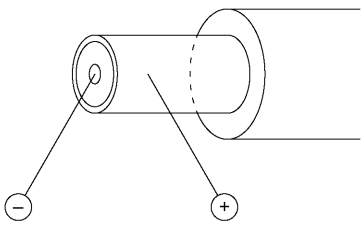


Fig. 3.3-4 Polarity of AC Line Adapter Plug

3.3.4 Interface Circuit

Fig. 3.3-5 shows the interface circuit. This 8-pin interface port serially receives print data from the connected PC.

Driver IC (ADM202, #1) converts the TTL logic level signals to the RS-232C compliant signals (+12V and -12V), and vice versa.

RXD is an input signal line to receive print data from the connected PC, which enables high transmission rate up to 115.2 Kbps. TXD and DTR are control signals to be outputted to the PC.

When the machine is powered on, the $\overline{\text{POW}}$ signal line goes Low, turning transistor Q8 on and feeding Vcc power to the driver IC (#1).

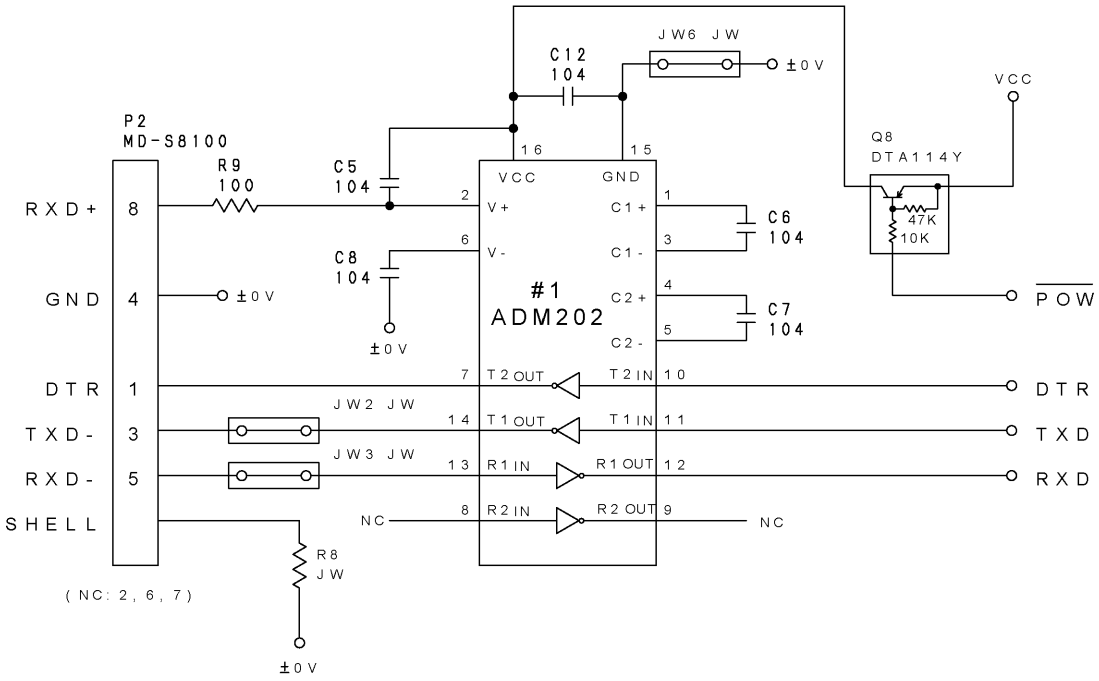


Fig. 3.3-5 Interface Circuit

CHAPTER IV

TROUBLESHOOTING

CONTENTS

CHAPTER IV TROUBLESHOOTING

4.1 PRECAUTIONS ON TROUBLESHOOTING

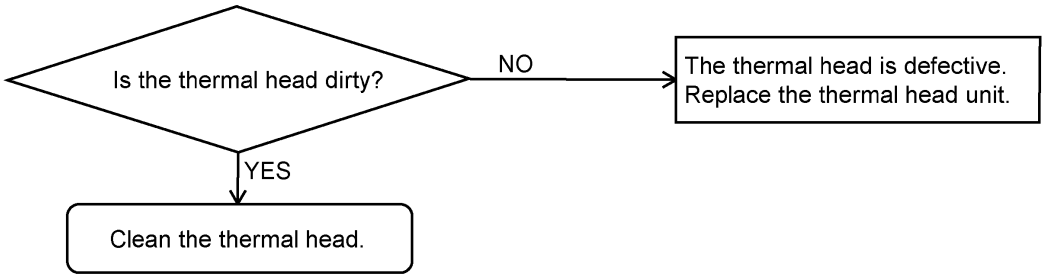
(1) Before testing electric conductivity with a circuit tester, unplug the AC line adapter and check that power is not supplied to the machine.

(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.

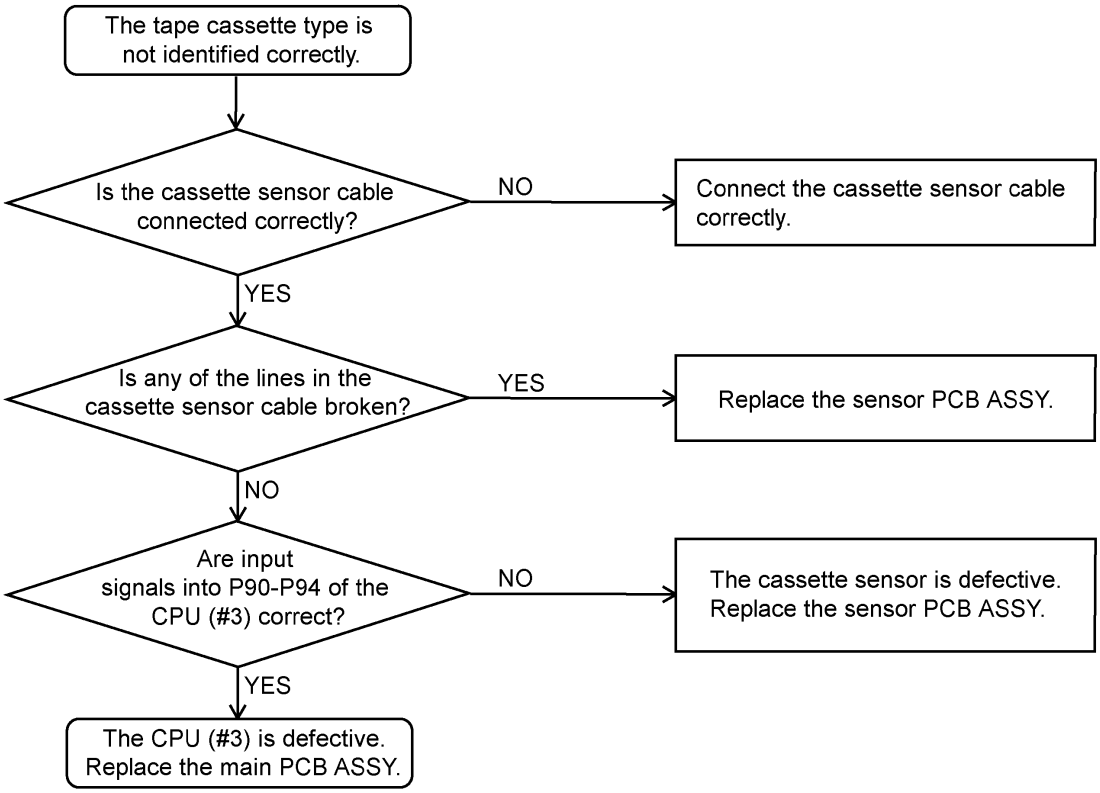
(3) To supply power to the machine, use the dedicated AC line adapter. If you need to use a regulated DC power supply, its specifications should be 11 to 13 VDC variable with minimum 5A supply.

4.2 TROUBLESHOOTING FLOWS

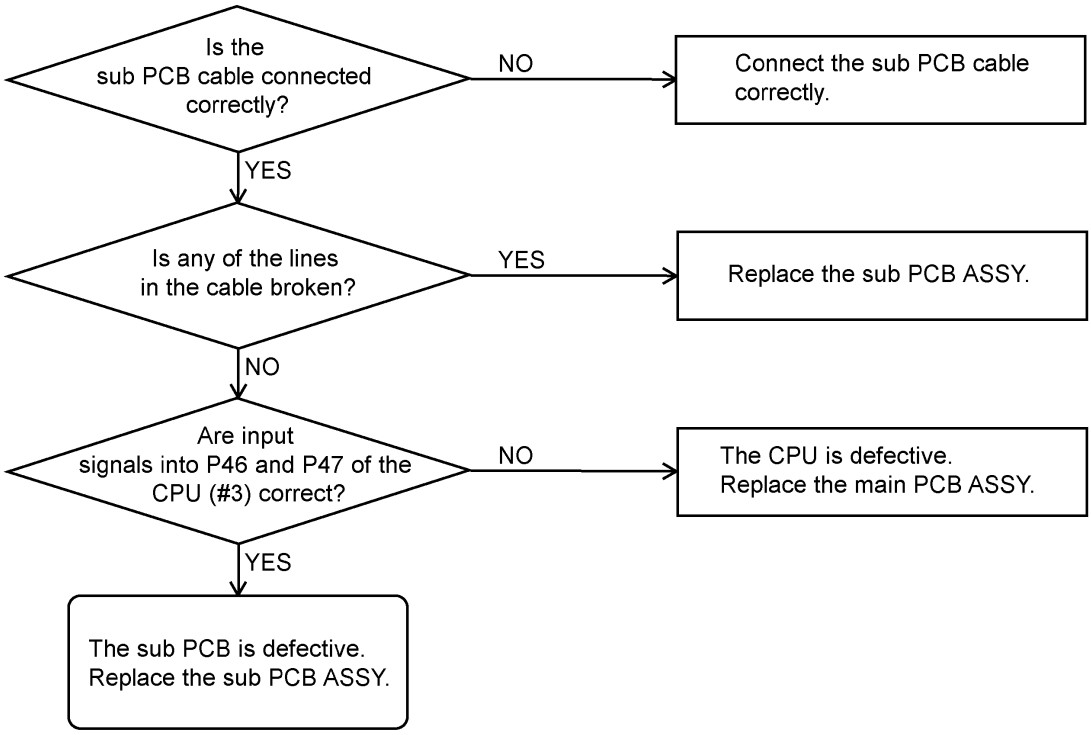
[1] Printing failure with particular dots missing



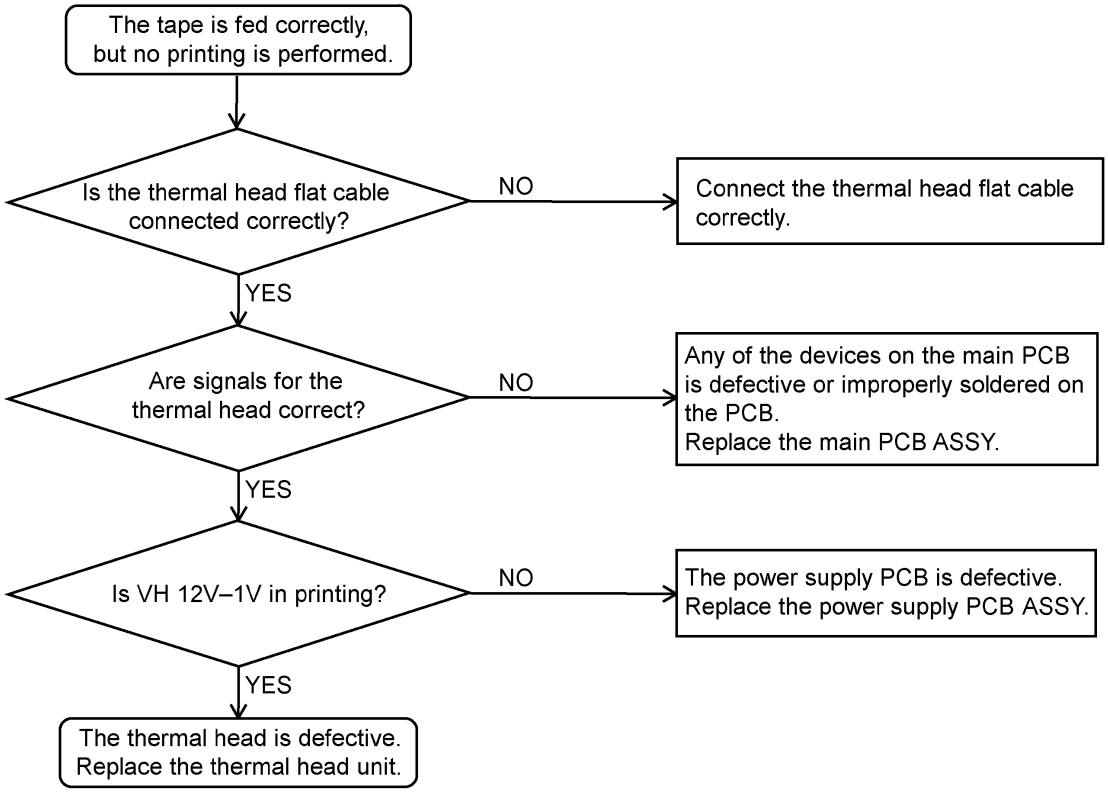
[2] Tape cassette type not identified



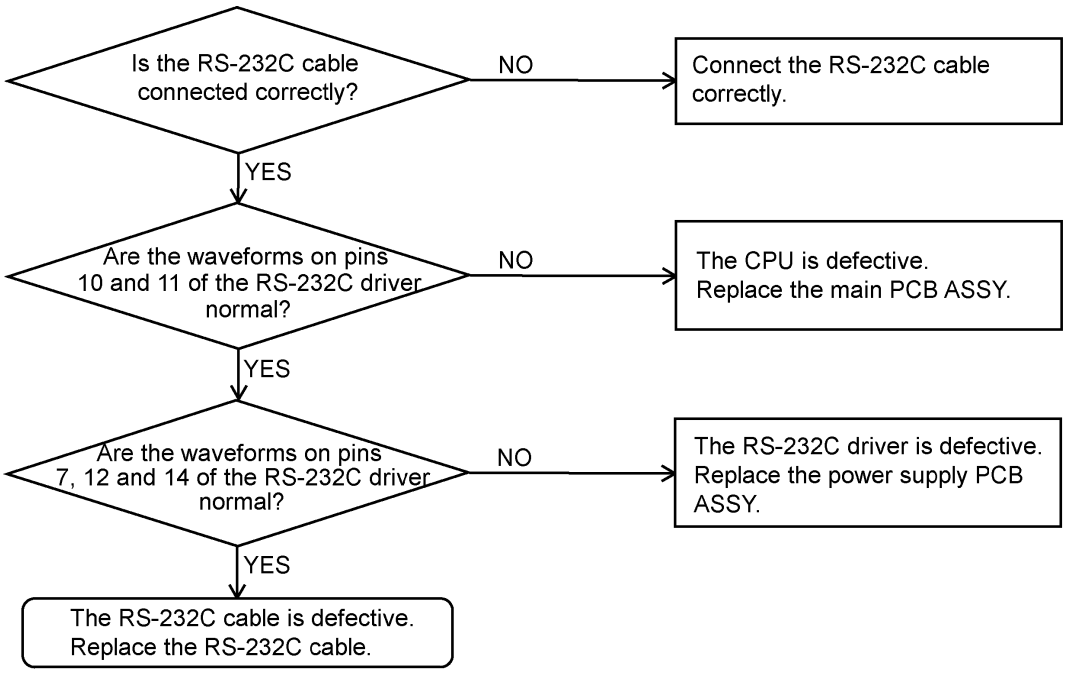
[3] The ON/OFF lamp (LEDs) will not come on



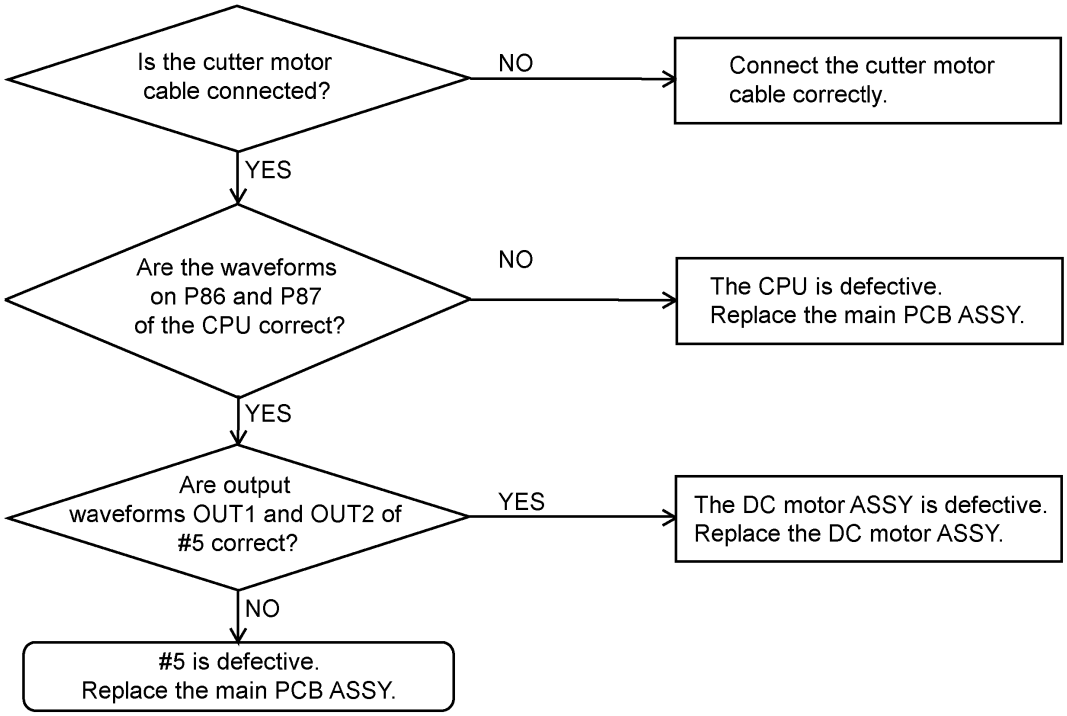
[4] No printing is performed.



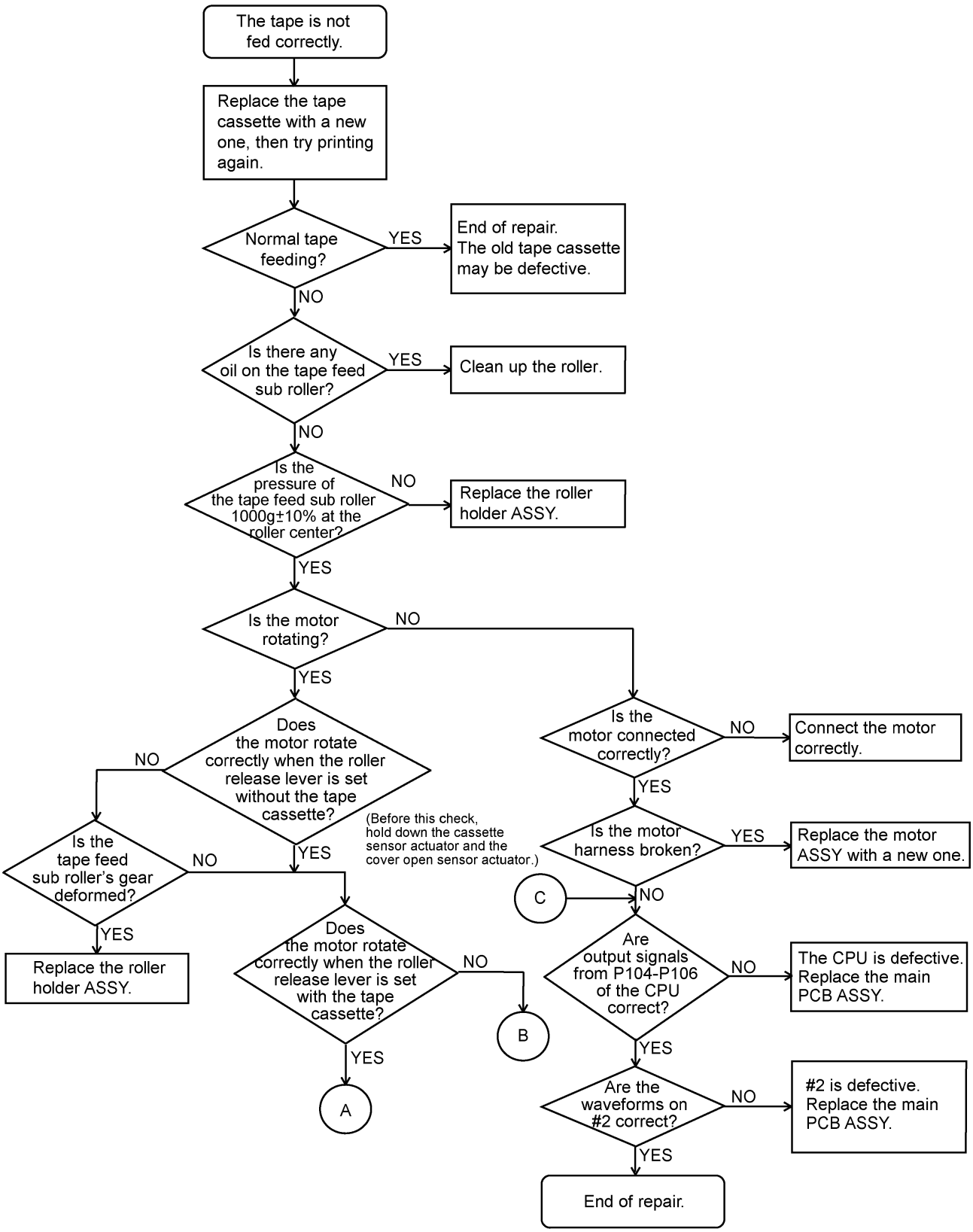
[5] Interface malfunctions

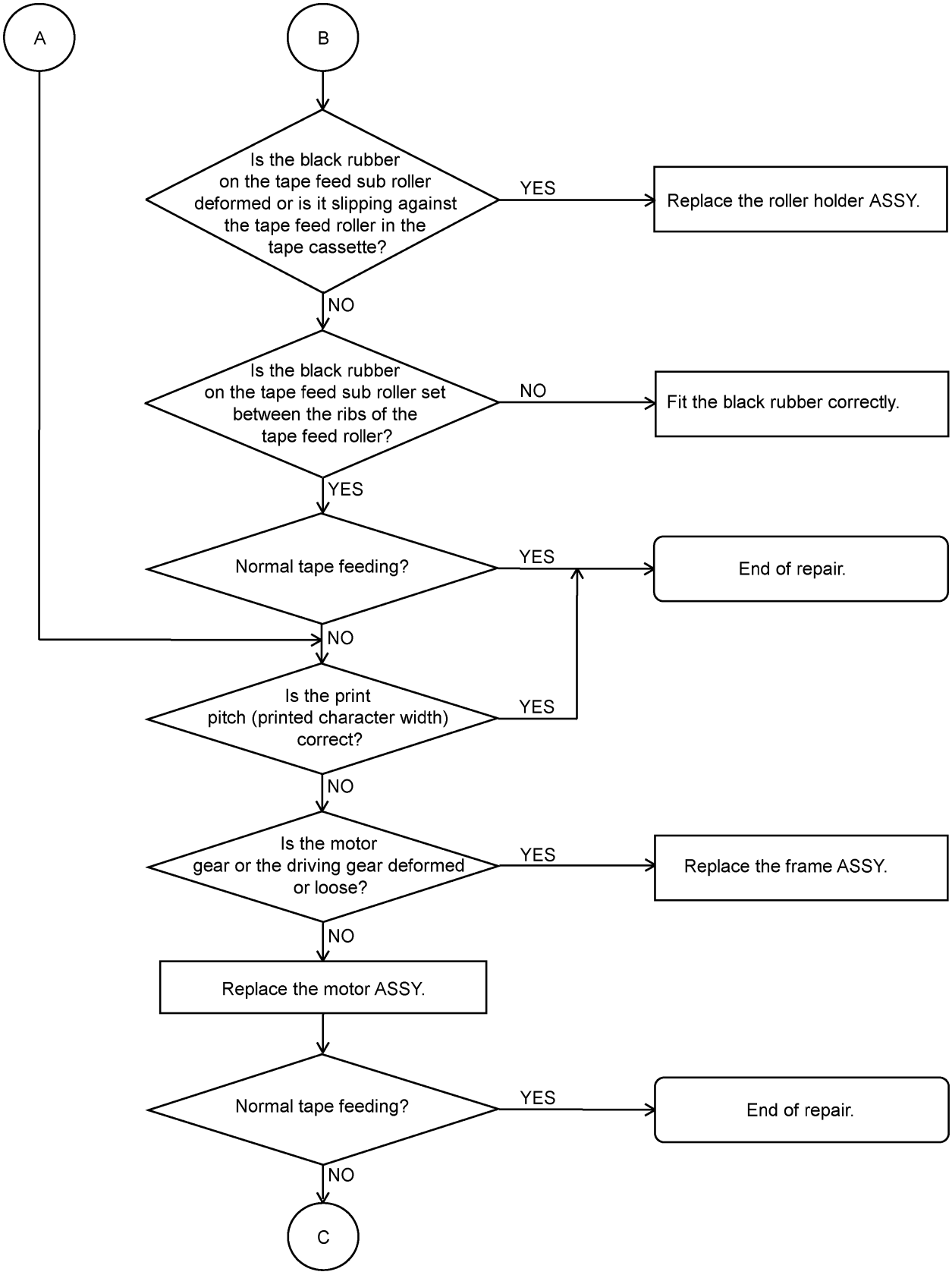


[6] No tape cutting



[7] Tape feeding error



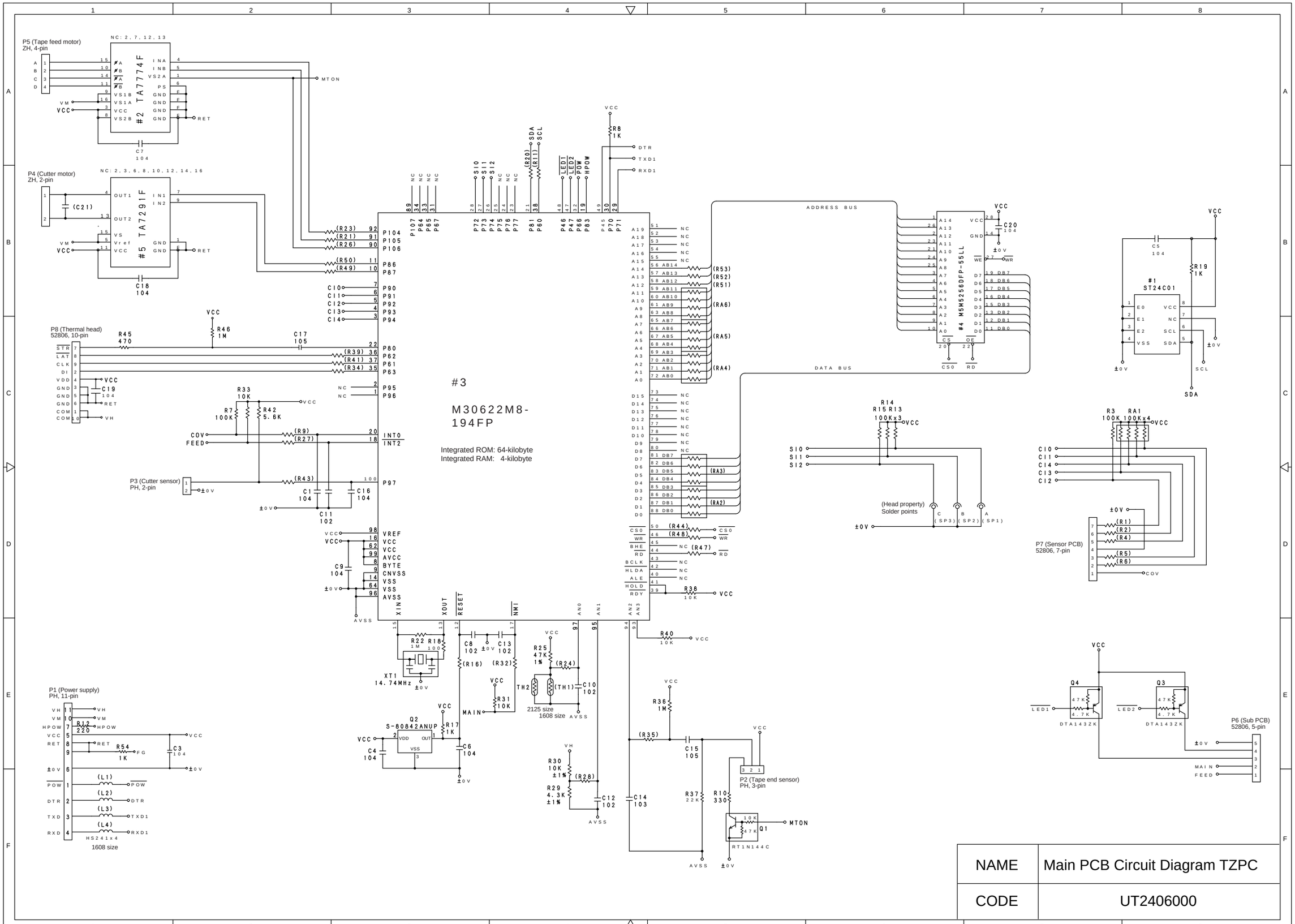

A
B
Is the black rubber on the tape feed sub roller deformed or is it slipping against the tape feed roller in the tape cassette?
YES
Replace the roller holder ASSY.
NO
Is the black rubber on the tape feed sub roller set between the ribs of the tape feed roller?
NO
Fit the black rubber correctly.
YES
Normal tape feeding?
YES
End of repair.
NO
Is the print pitch (printed character width) correct?
YES
NO
Is the motor gear or the driving gear deformed or loose?
YES
Replace the frame ASSY.
NO
Replace the motor ASSY.
Normal tape feeding?
YES
End of repair.
NO
C

APPENDICES

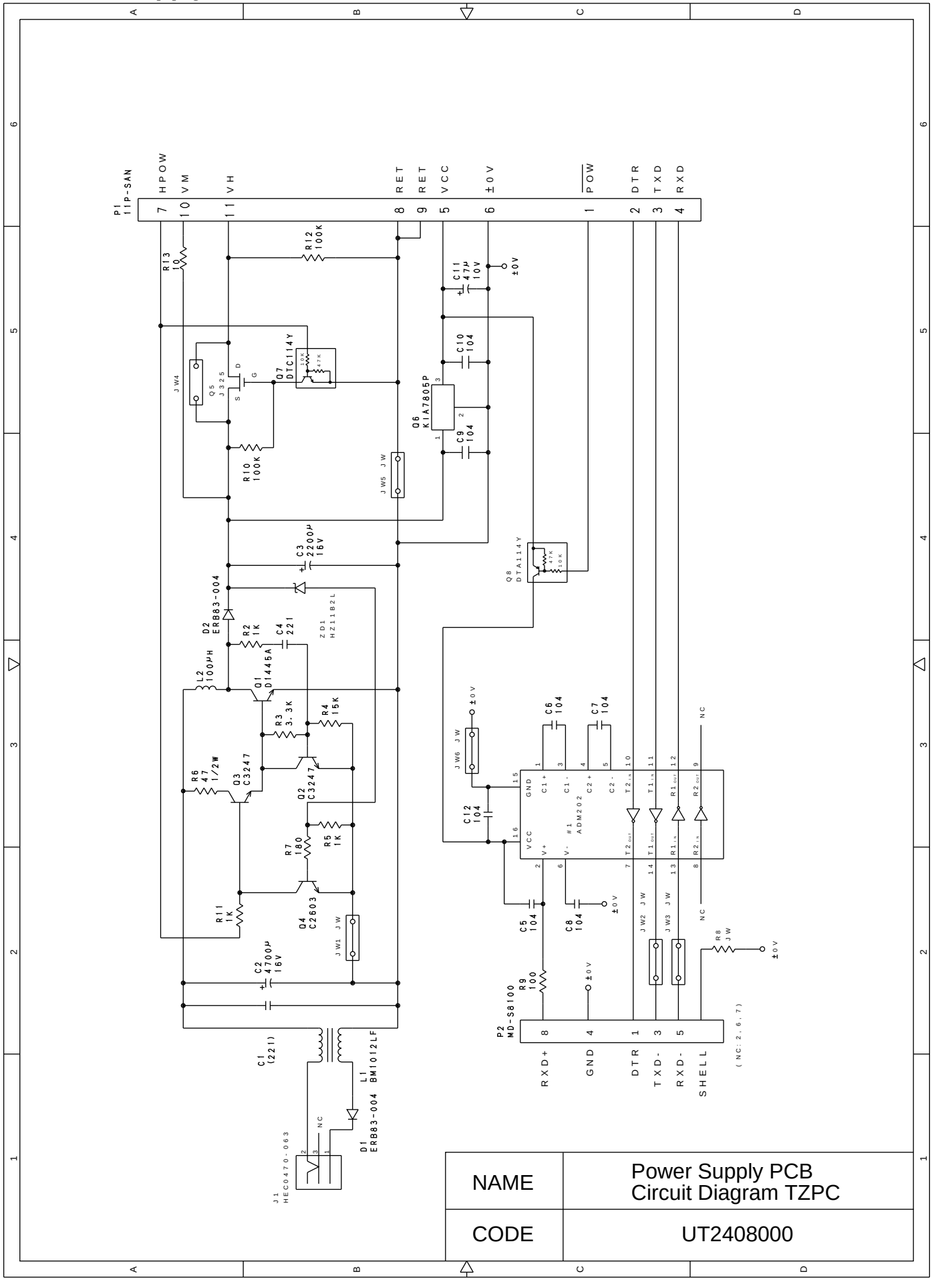
Circuit Diagrams

A: Main PCB
B: Power Supply PCB

A. Main PCB


P5 (Tape feed motor)
ZH, 4-pin
NC: 2, 7, 12, 13
#2 TA7774F
MTON
RET
C7 104
P4 (Cutter motor)
ZH, 2-pin
NC: 2, 3, 6, 8, 10, 12, 14, 16
#5 TA72091F
C18 104
P8 (Thermal head)
52806, 10-pin
R45 470
R46 1M
C17 105
C19 104
R33 10K
R7 100K
R42 5.6K
COV
FEED
P3 (Cutter sensor)
PH, 2-pin
C1 104
C16 104
C11 102
#3
M30622M8-194FP
Integrated ROM: 64-kilobyte
Integrated RAM: 4-kilobyte
R8 1K
DTR
TXD1
RXD1
SDA
SCL
LED1
LED2
POW
HPOW
ADDRESS BUS
DATA BUS
#4 M5M5256DFP-55LL
C20 104
#1 ST24C01
C5 104
R19 1K
R14 R15 R13 100Kx3
SI0
SI1
SI2
(Head property)
Solder points
R3 RA1 100K 100Kx4
CI0
CI1
CI4
CI3
CI2
P7 (Sensor PCB)
52806, 7-pin
R22 1M
R18 100
C8 102
C13 102
(R16)
(R32)
XT1 14.74MHz
R25 47K 1%
(R24)
TH2
(TH1)
C10 102
2125 size
1608 size
R31 10K
MAIN
Q2 S-80842ANUP
R17 1K
C4 104
C6 104
R30 10K ±1%
(R28)
R29 4.3K ±1%
C12 102
R36 1M
(R35)
C15 105
C14 103
R37 22K
R10 330
Q1 RT1N144C
P2 (Tape end sensor)
PH, 3-pin
Q4
Q3
DTA143ZK
LED1
LED2
P6 (Sub PCB)
52806, 5-pin
MAIN
FEED
P1 (Power supply)
PH, 11-pin
R12 220
R54 1K
C3 104
(L1)
(L2)
(L3)
(L4)
HS241x4
1608 size
NAME
Main PCB Circuit Diagram TZPC
CODE
UT2406000

B. Power Supply PCB



NAME	Power Supply PCB Circuit Diagram TZPC
CODE	UT2408000

Nov. ’98
5V2086BE0
Printed in Japan