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**brother**®

**COPYBOARD  
SERVICE MANUAL**

**MODEL: CP1800/CP2000/CB200**

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## **PREFACE**

This publication is a Service Manual covering the specifications, construction, theory of operation, and maintenance of the Brother copyboard. It includes information required for field troubleshooting and repair--disassembly, reassembly, and lubrication--so that service personnel will be able to understand machine function, to rapidly repair the machine and order any necessary spare parts.

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 five chapters and appendix.

<b>CHAPTER I.</b>	<b>GENERAL DESCRIPTION</b>
<b>CHAPTER II.</b>	<b>THEORY OF OPERATION</b>
<b>CHAPTER III.</b>	<b>DISASSEMBLY/REASSEMBLY AND LUBRICATION</b>
<b>CHAPTER IV.</b>	<b>MAINTENANCE MODE</b>
<b>CHAPTER V.</b>	<b>ERROR INDICATION AND TROUBLESHOOTING</b>
<b>Appendix.</b>	<b>Circuit Diagrams</b>

This manual describes the models and their versions to be destined for major countries. The specifications and functions are subject to change depending upon each destination.

# **CHAPTER I.**

## **GENERAL DESCRIPTION**

# CHAPTER I. GENERAL DESCRIPTION

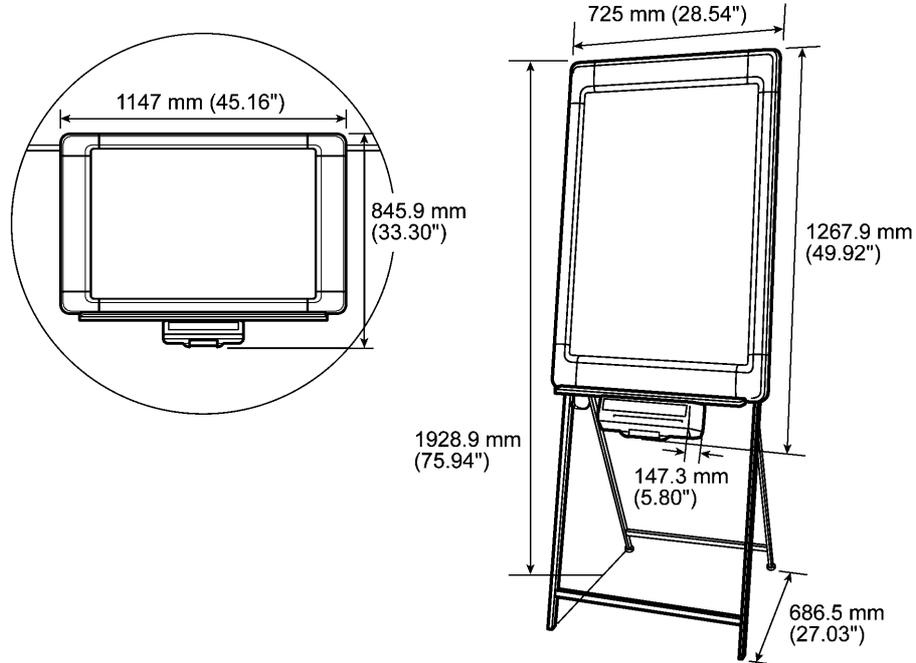
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# 1.1 MACHINE OUTLINE

## 1.1.1 External Appearance and Weight

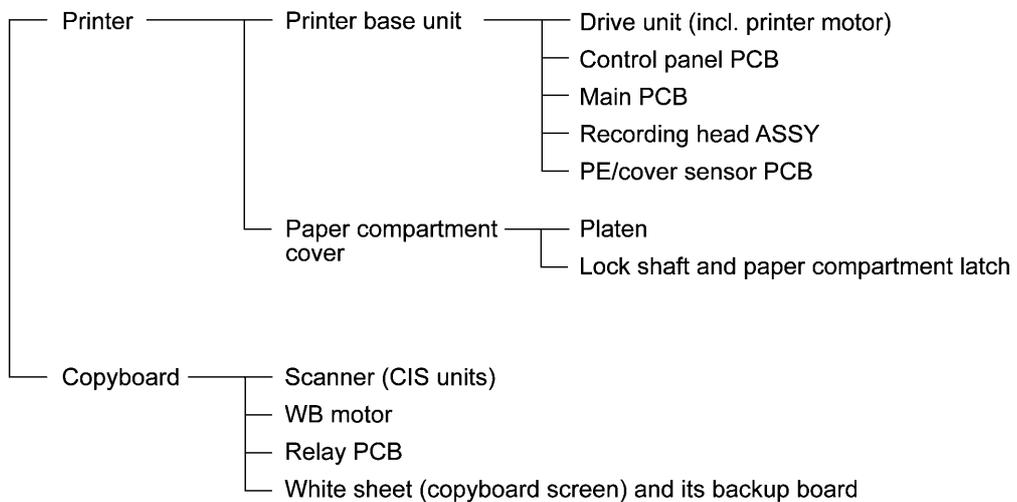
The figure below shows the machine appearance and approximate dimensions.



	CP2000/CB200	CP1800
Weight: Machine proper	14.5 kg (32.0 lbs.)	11.8 kg (26.0 lbs.)
In package	23.0 kg (50.7 lbs.)	19.5 kg (43.0 lbs.)

## 1.1.2 Components

The machine consists of the following major components:



## 1.2 SPECIFICATIONS

Model		CP2000	CB200	CP1800		
<b>MACHINE SPECIFICATIONS</b>						
INPUT	Screen Size (H) x (W)	35.43 x 23.62 inches 900 x 600 mm	Same as left.	Same as left.		
	Effective Scanning Area (H) x (W)	34.57 x 23.39 inches 878 x 594 mm				
	Ratio of Scanning Area	96.60%				
	Scanning Method	CIS				
	Number of Screens	2 (Endless)				
	Number of Screens for Copy	2				
	Writing	Dry-erase markers				
OUTPUT	Printing Method	Thermal	Same as left.	Same as left.		
	Copy Size	Letter			Letter/A4	Letter
	Copy Speed	Monochrome: 18 sec R&B: N/A				
	Continuous Copy	1 sheet				
	Paper	Therma PLUS, 30 m				
	Anti-Curl System (ACS)	Yes				
	Print Density	8 dots/mm				
USE	Easel Stand	Portrait	Same as left.	Same as left.		
	Wall Mount	Portrait/landscape				
	Partition Hanger	Portrait/landscape				
POWER	Power Source	AC adapter supplied, 100 to 240 VAC, 50/60 Hz	Same as left.	Same as left.		
	Power Consumption	Standby Operating			5W 30W	
SIZE	Size (H x W x D) In package	inch mm	Same as left.	49.9 x 38.3 x 10.0 1267 x 973 x 255		
	Use with easel stand	inch		75.9 x 28.5 x 27.0		
		mm		1929 x 725 x 687		
	Use without easel stand (Portrait)	inch		49.9 x 28.5 x 5.8		
		mm		1268 x 725 x 147		
Use without easel stand (Landscape)	inch	33.3 x 45.2 x 5.8				
	mm	846 x 1147 x 147				
Weight	Net	14.5 kg (32.0 lbs)	Same as left.	11.8 kg (26.0 lbs)		
	Gross	23 kg (50.7 lbs)		19.5 kg (43.0 lbs)		
PC I/F		Yes	Yes for Canada	Option		

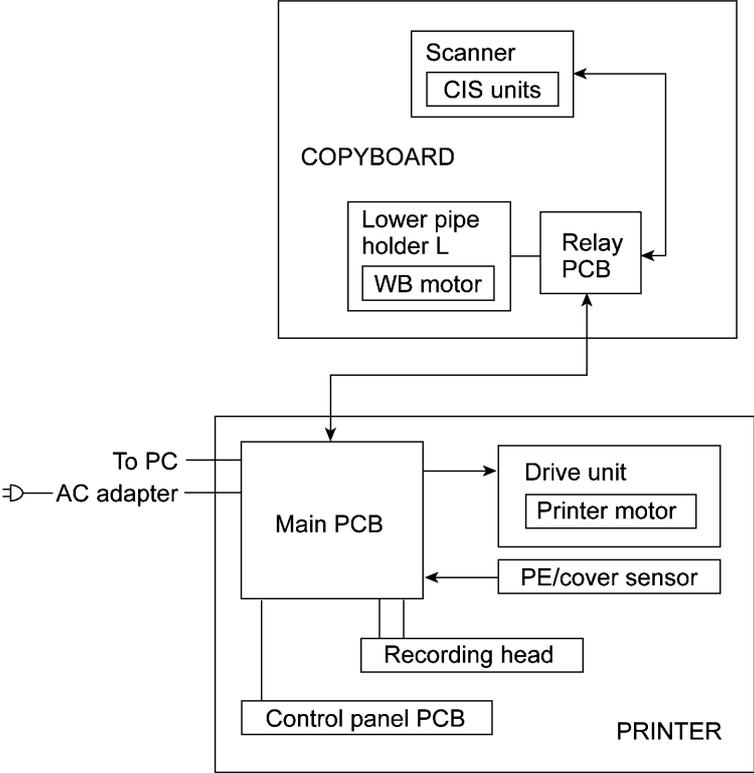
**CHAPTER II.**  
**THEORY OF OPERATION**

## CHAPTER II. THEORY OF OPERATION

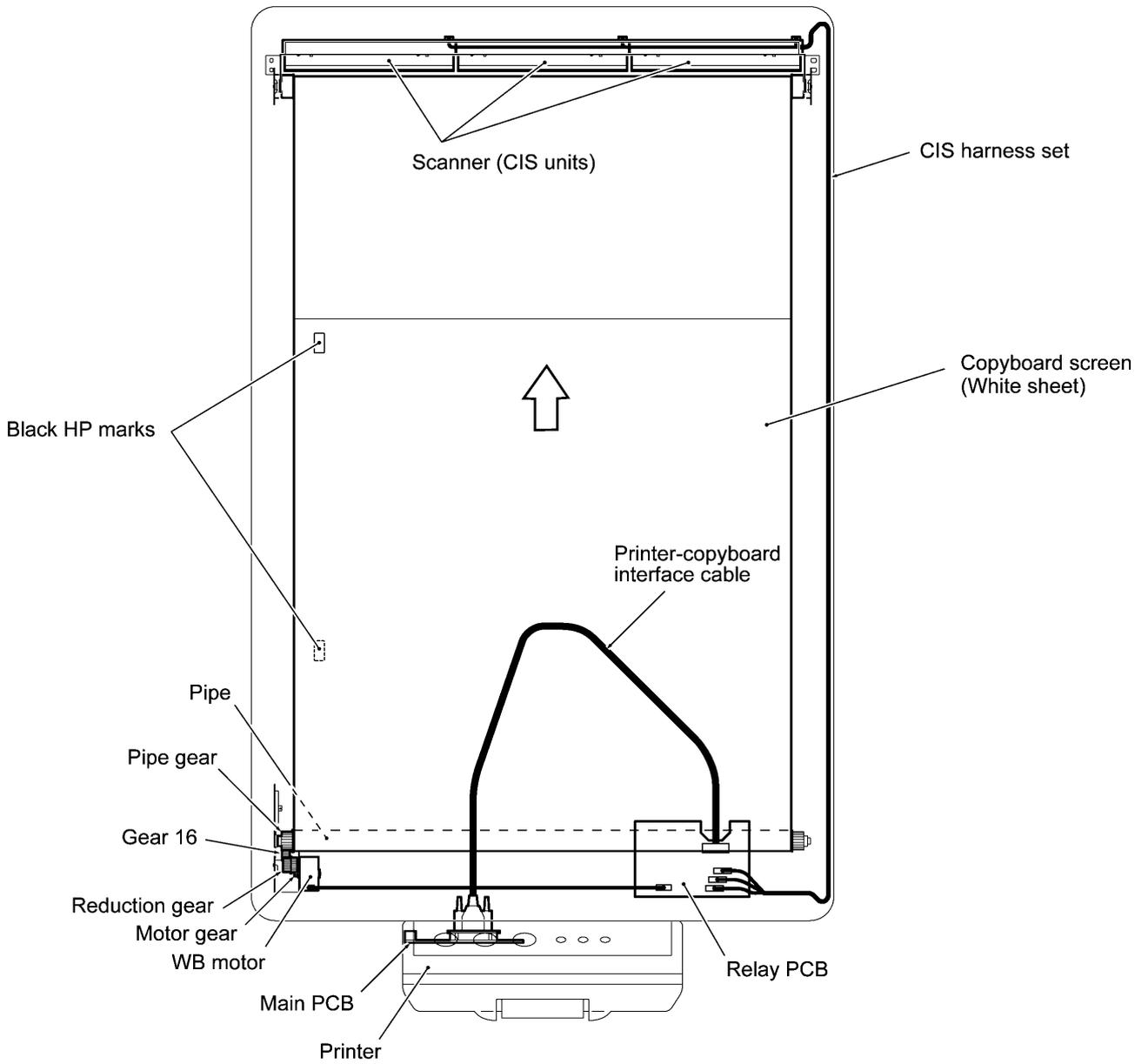
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# 2.1 OVERVIEW







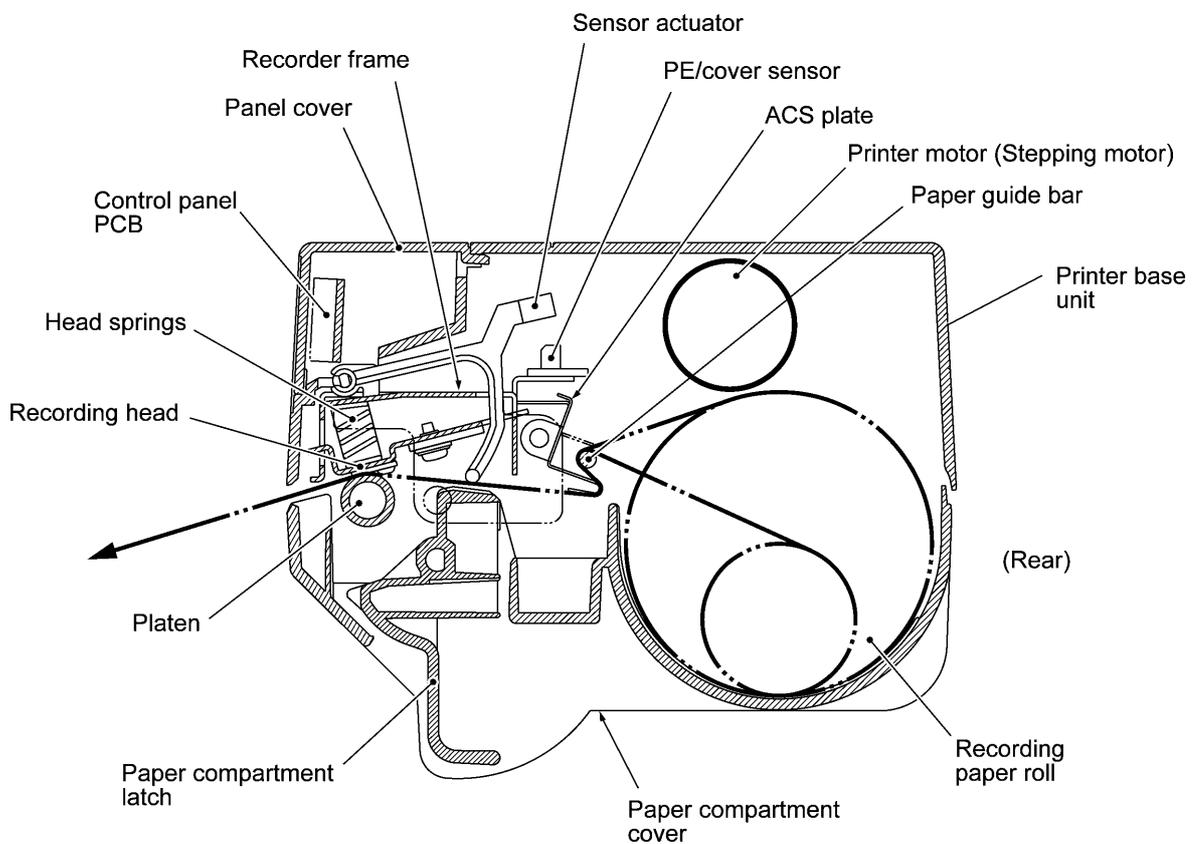
### 2.2.2 Thermal printing mechanism

The thermal printing mechanism in the printer consists of the thermal recording head, platen, anti-curl system (ACS) plate, and paper compartment cover.

The heat-sensitive recording paper is routed between the paper guide bar and ACS plate to the recording head which prints onto the paper pressed by the platen according to image signals issued from the main PCB.

The ACS eliminates curl peculiar to rolled paper by curving the paper towards the opposite side of the curl with the ACS plate.

If the printer motor (stepping motor) is driven, its rotational force is transmitted via the gear train in the drive unit to the platen gear. The platen rotates to feed paper.



### 2.2.3 Sensors

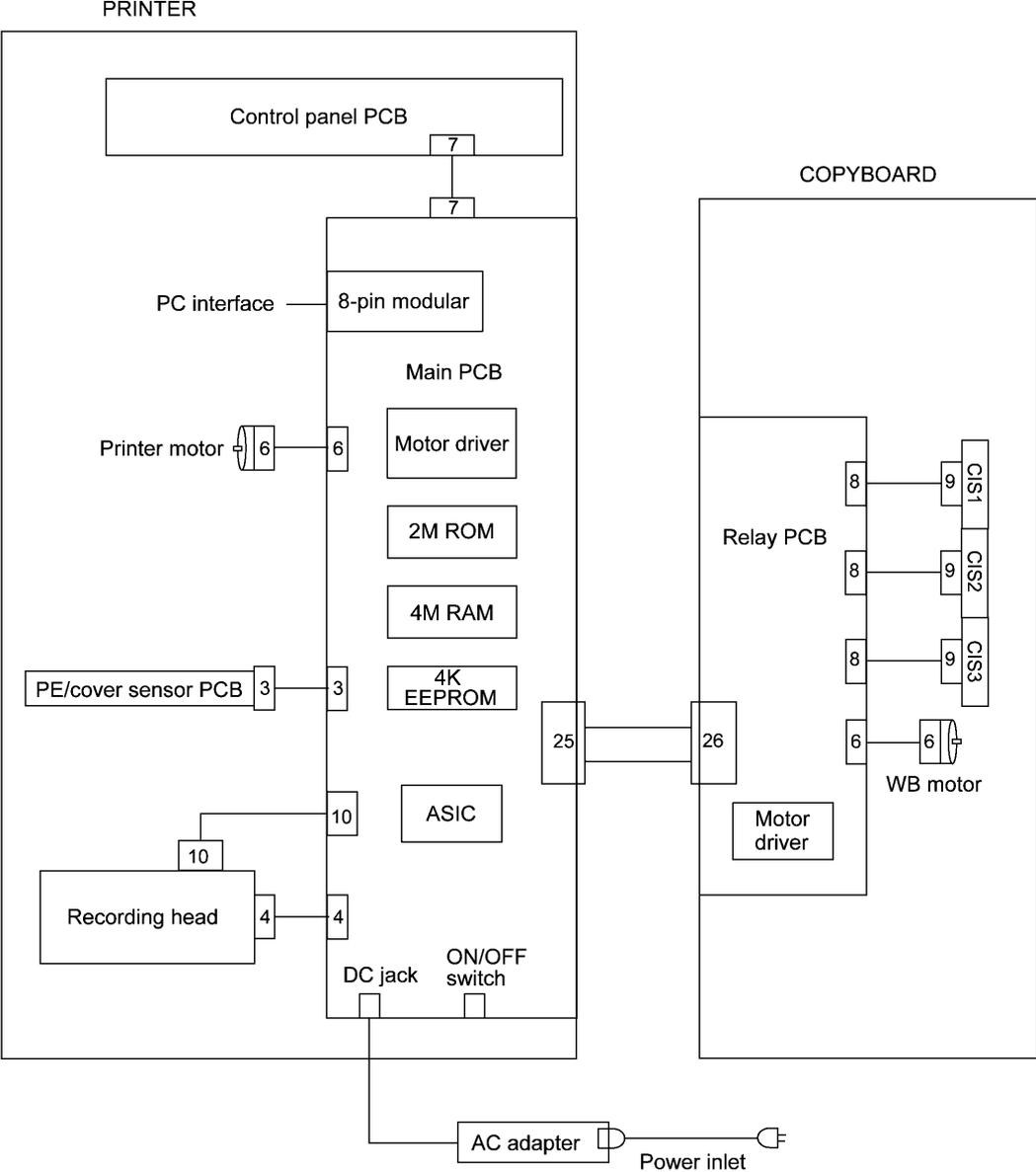
This machine has three sensors--PE/cover sensor (photosensor), thermistor in the thermal recording head, and left-hand CIS unit acting as a home position detector of the copyboard screen.

The PE/cover sensor is located on the PE/cover sensor PCB secured to the recorder frame. It detects whether the recording paper is present or the paper compartment cover is closed.

The thermistor in the recording head allows the controller to monitor the temperature of the head. According to the change of the thermistor's internal resistance monitored, the controller manages the duty cycle of the head drive current.

The left-hand CIS works as a home position detector of the copyboard screen also. If it detects either of the two black HP marks pasted on the copyboard screen, it recognizes that the screen is in the home position.

# 2.3 CONTROL ELECTRONICS



**CHAPTER III.**  
**DISASSEMBLY/REASSEMBLY AND**  
**LUBRICATION**

# CHAPTER III. DISASSEMBLY/REASSEMBLY AND LUBRICATION

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## 3.1 DISASSEMBLY/REASSEMBLY

### n Safety Precautions

To prevent the creation of secondary problems by mishandling, observe the following precautions during maintenance work.

- (1) Turn the power off and unplug the AC cord from the power outlet before accessing parts or units inside the machine. When disassembling the printer, unplug the AC adapter from the left side of the printer.
- (2) Be careful not to lose screws, washers, or other parts removed for parts replacement.
- (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) Before handling the PCBs, touch a metal portion of the machine to discharge static electricity; otherwise, the electronic parts may be damaged due to the electricity charged in your body.
- (5) When transporting PCBs, be sure to wrap them in conductive sheets such as aluminum foil.
- (6) Be sure to reinsert self-tapping screws correctly, if removed.

When removing self-tapping screws from aluminum frames, aluminum material may stick to the threads of those screws, requiring higher torque for retightening. If it happens, do not tighten them forcedly, but use new screws and observe the specified torque values.

- (7) Tighten screws to the torque values listed on the next page.
- (8) When connecting or disconnecting cable connectors, hold the connector bodies not the cables. If the connector has a lock, always slide the connector lock to unlock it.
- (9) Before reassembly, apply the specified lubricant to the specified points. (Refer to Section 3.2.)
- (10) After repairs, check not only the repaired portion but also that the connectors and other related portions function properly before operation checks.
- (11) After completion of repairs, always press the **FEED** key to scroll the copyboard screen (white sheet) to the home position. This prevents the screen from leaving traces of being curled along the upper and lower pipes within the scanning area.

Make sure that the copyboard screen is in the home position before storing or packing it.

## n Tightening Torque List

Location	Screw type	Q'ty	Tightening torque (N•m)
<b>PRINTER</b>			
Platen stopper	Taptite, pan B M4x20	1	0.69 ±0.1
Platen frames R and L	Taptite, bind B M4x12	4	0.98 ±0.2
Printer support	Taptite, cup S M3x6	2	0.69 ±0.1
	Taptite, bind B M4x12	2	0.98 ±0.2
Sub cover	Taptite, bind B M4x12	1	0.98 ±0.2
Panel cover	Taptite, bind B M4x12	2	0.98 ±0.2
Control panel PCB	Taptite, cup B M3x8	2	0.69 ±0.1
Main PCB	Taptite, cup S M3x6	2	0.69 ±0.1
Drive unit	Taptite, bind B M4x12	2	0.98 ±0.2
Printer motor cover	Taptite, cup S M3x6	1	0.69 ±0.1
Printer motor	Screw, pan (s/p washer) M3x6DB	1	0.69 ±0.1
Hinge plate L	Taptite, bind B M4x12	2	0.98 ±0.2
Recorder frame	Taptite, bind B M4x12	2	0.98 ±0.2
PE/cover sensor PCB	Taptite, cup S M3x6	1	0.69 ±0.1
<b>COPYBOARD</b>			
Upper cover	Shoulder screw	3	0.78 ±0.1
Corner covers (upper)	Screw, flat S M3x10	4	0.78 ±0.1
CIS protector (upper)	Taptite, cup S M3x10	2	0.78 ±0.1
Upper support frame	Taptite, cup S M3x10	2	0.78 ±0.1
CIS frame	Taptite, cup S M3x10	4	0.78 ±0.1
CIS units	Taptite, bind B M3x8	6	0.39 ±0.1
Lower cover	Shoulder screw	3	0.78 ±0.1
Corner covers (lower)	Screw, flat S M3x10	4	0.78 ±0.1
CIS protector (lower)	Taptite, cup S M3x10	2	0.78 ±0.1
Lower support frame	Taptite, cup S M3x10	2	0.78 ±0.1
PCB support	Taptite, cup S M3x10	2	0.78 ±0.1
Relay PCB	Taptite, cup S M3x6	2	0.78 ±0.1
Printer-copyboard interface cable	Taptite, cup S M3x10	2	0.78 ±0.1
Lower corner plates R and L	Taptite, cup S M3x10	4	0.78 ±0.1
Lower frame	Taptite, washer S M3x10	1	0.78 ±0.1
	Taptite, bind B 3x8	2	0.69 ±0.1
Pipe holder stoppers	Taptite, cup S M3x8	2	0.78 ±0.1
WB motor	Screw, pan (s/p washer) M3x6DB	2	0.78 ±0.1
Side covers R and L	Taptite, cup S M3x10	6	0.78 ±0.1

## n Preparation

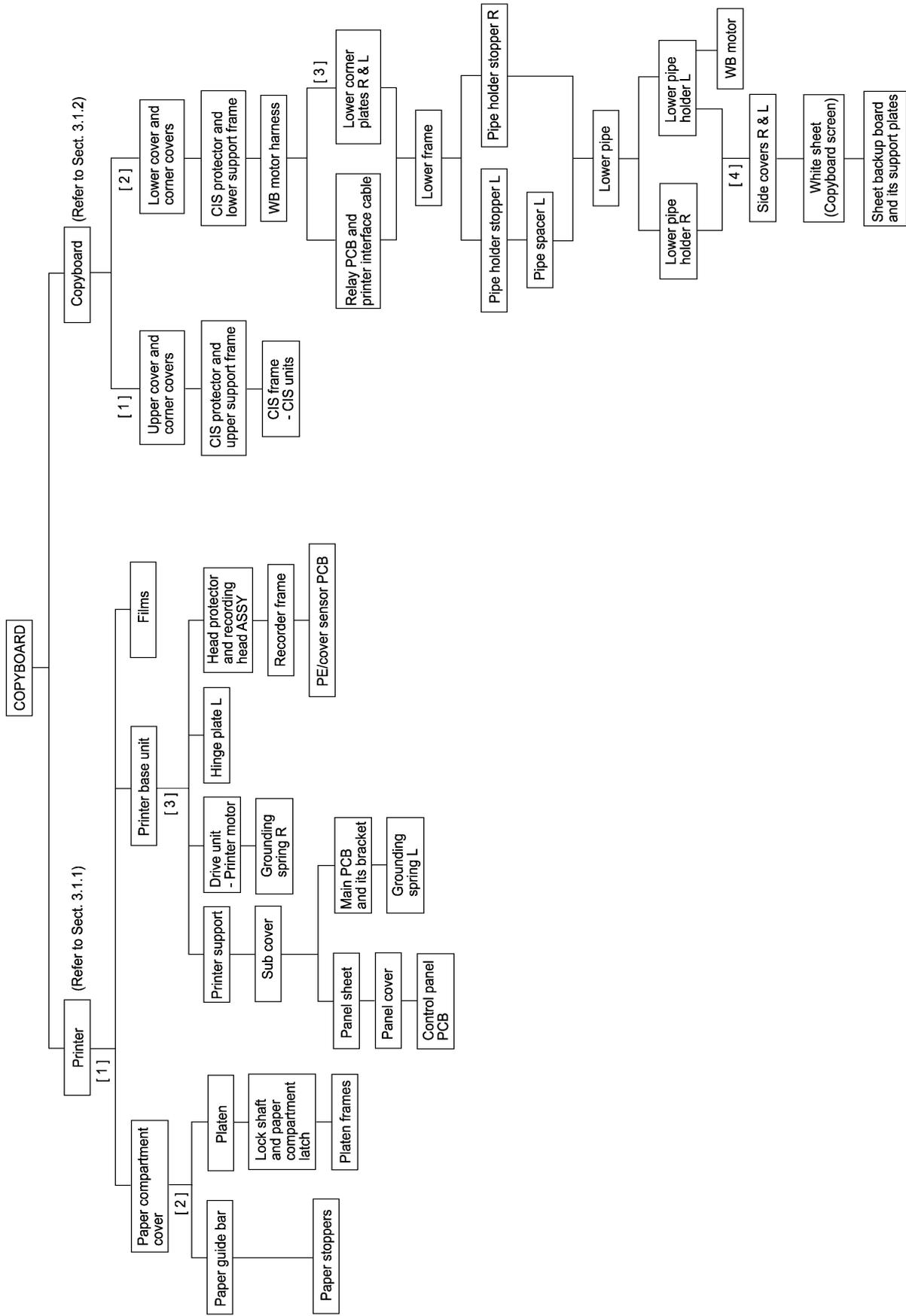
Prior to proceeding to the disassembly procedure,

- (1) Unplug
  - the AC cord and AC adapter and
  - the optional PC interface cable if connected. (Not shown below.)
- (2) Remove the tray and recording paper.
- (3) CP2000/CB200: Take down the assembly of the copyboard and printer from the easel stand.
- (4) Disconnect the printer-copyboard interface cable from the printer and then remove the four decorative screws to separate the printer from the copyboard.

## n How to Access the Object Component

- On the next page is a disassembly order flow which helps you access the object components. To remove the main PCB, for example, first find it on the flow. You need to remove the printer, printer base unit, printer support, and sub cover so as to access the main PCB.
- Unless otherwise specified, the disassembled parts or components should be reassembled in the reverse order of removal.

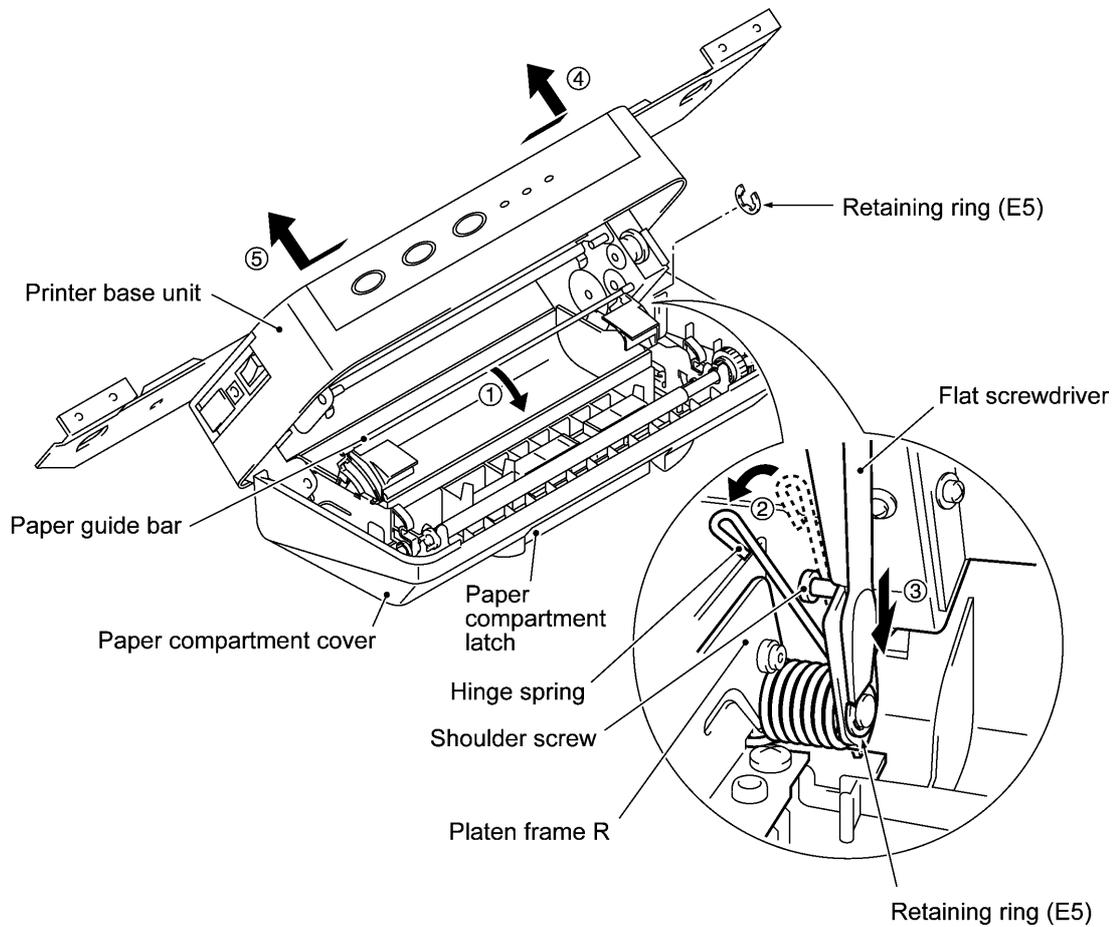
n Disassembly Order Flow



### 3.1.1 Disassembly of Printer

#### [ 1 ] Separating the paper compartment cover from the printer base unit

- (1) Open the paper compartment cover by pulling up its latch.
- (2) Pull the paper guide bar in the direction of arrow • and unhook the hinge spring from the shoulder screw (arrow , ).
- (3) Remove the retaining ring (E5) (arrow *f*) from the shaft of the platen frame R.
- (4) Shift the printer base unit in the direction of arrows „ and ... to release it from the shafts of the platen frame R and L, respectively.

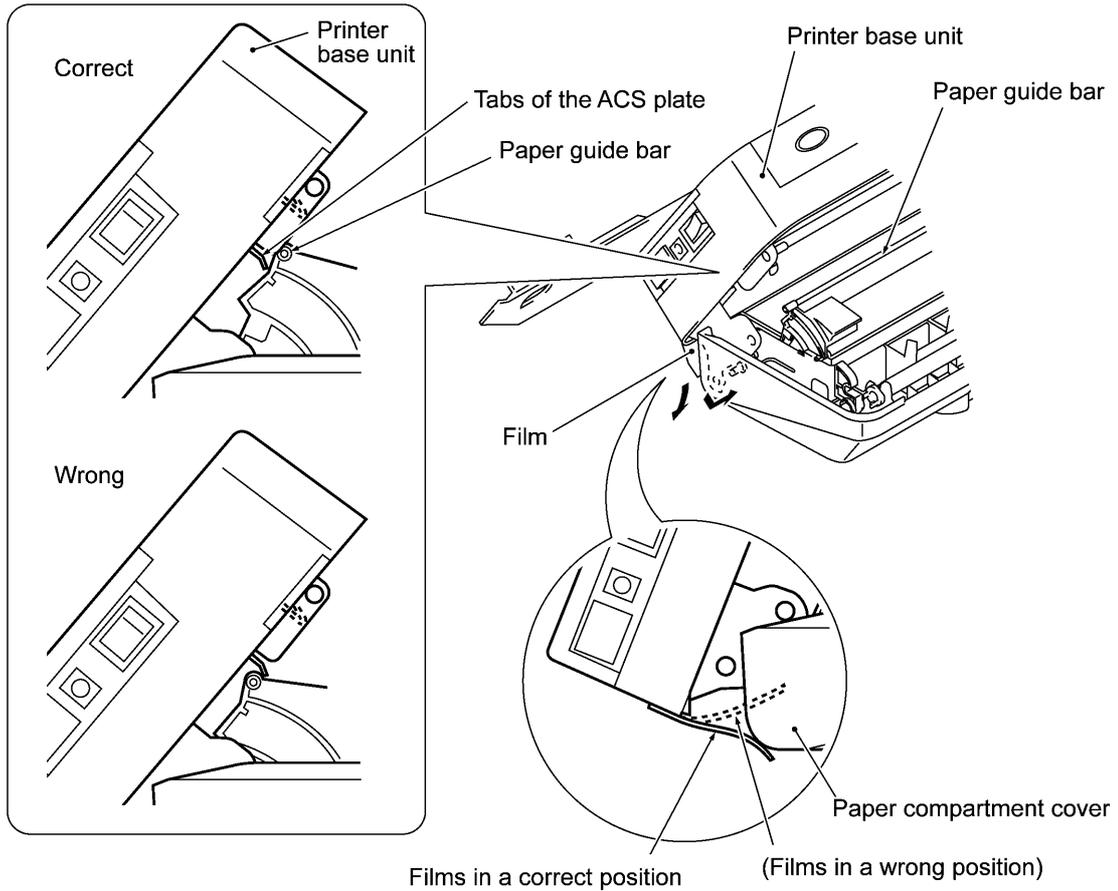


## n Reassembling notes

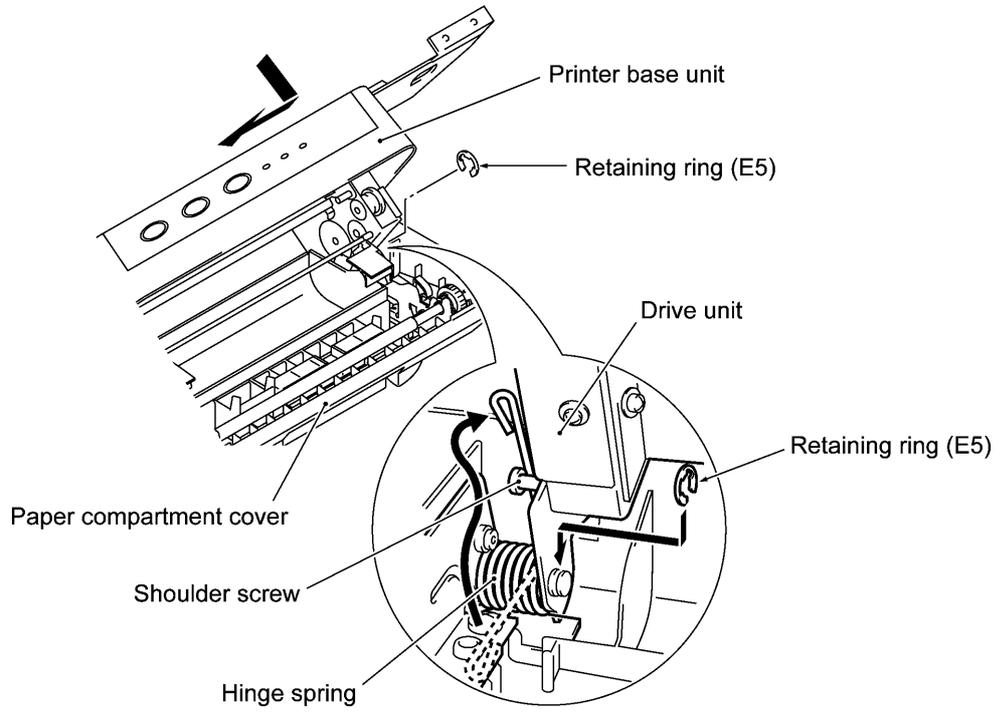
When reinstalling the printer base unit to the paper compartment cover:

- 1) Hold the printer base unit at a right angle from the paper compartment cover and fit it over the shafts of the platen frames L and R.

When doing this, take care not to bring the paper guide bar inside the tabs of the ACS plate or not to bring the films inside the paper compartment cover.



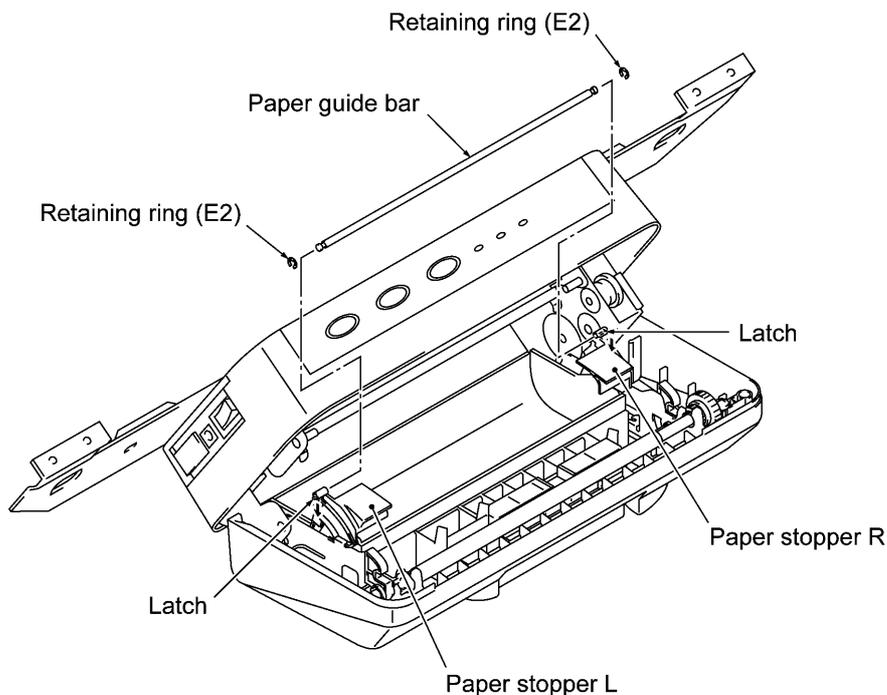
- 2) Set the retaining ring (E5) onto the shaft of the platen frame R.
- 3) Hook the hinge spring onto the shoulder screw.



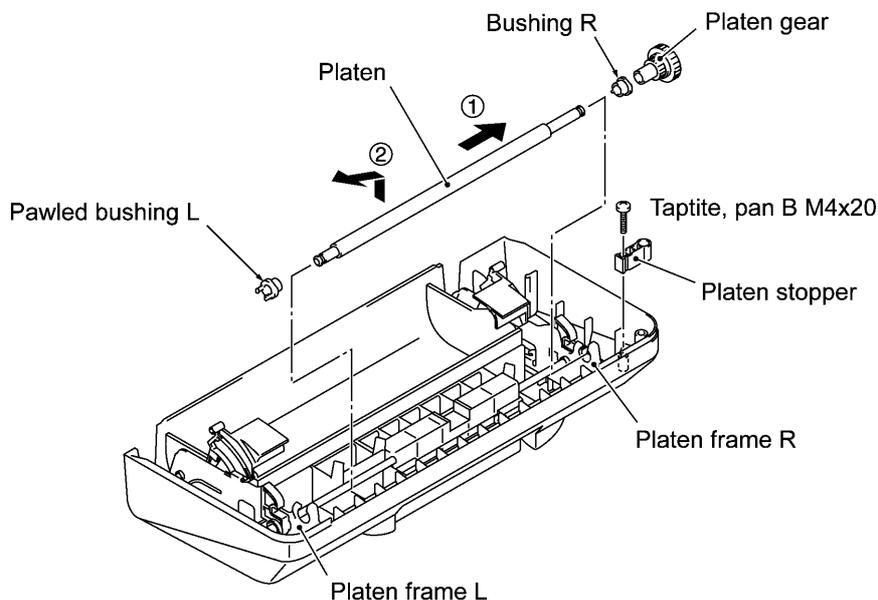
## [ 2 ] Removing the components from the paper compartment cover

### Removing the paper guide bar and platen

- (1) If the printer base unit has not been removed, open the paper compartment cover by pulling up its latch.
- (2) Remove the retaining ring (E2) from each end of the paper guide bar, then remove the paper guide bar from the paper stoppers R and L.

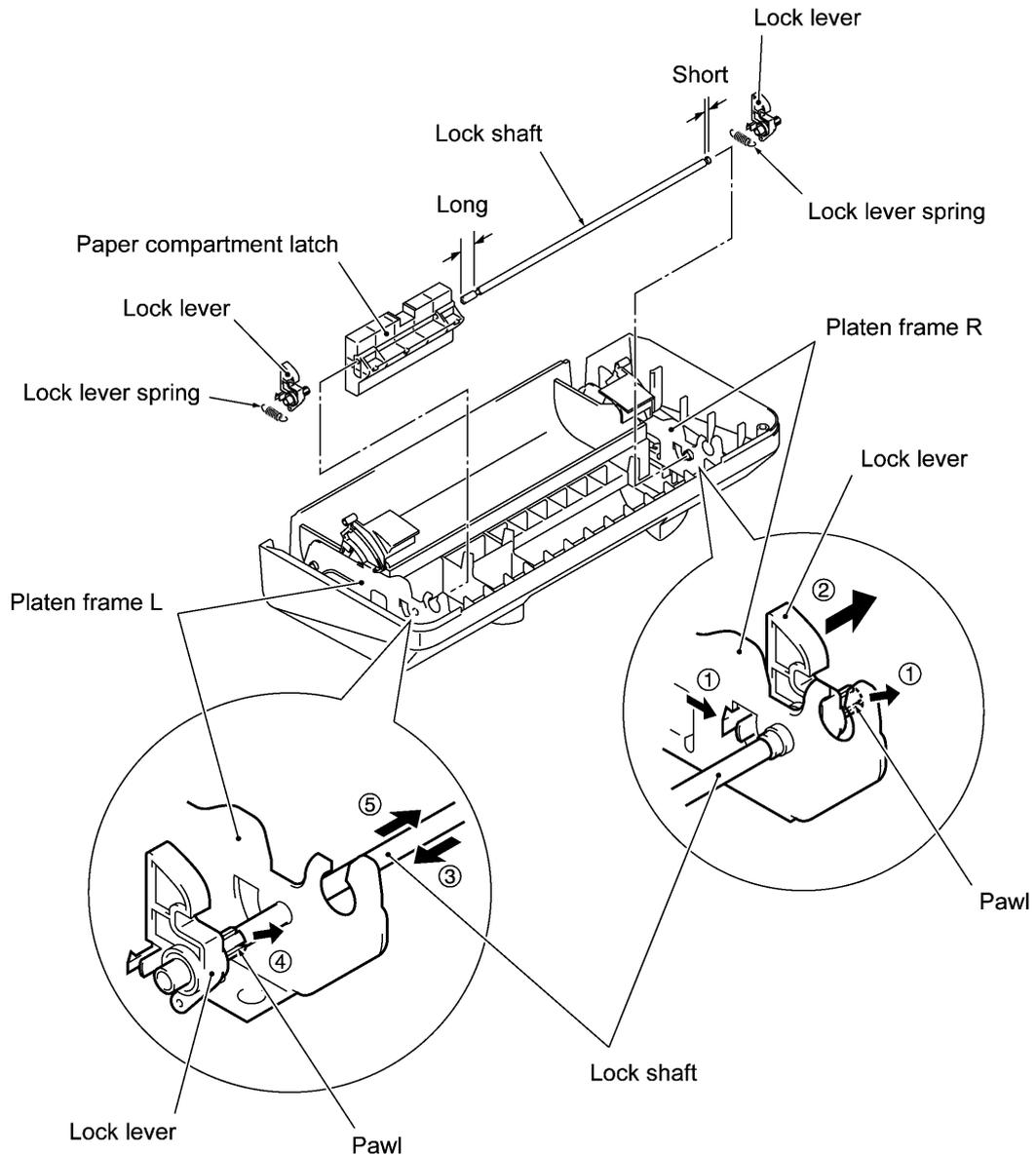


- (3) Remove the platen stopper (one pan B taptite screw, M4x20).
- (4) At the right end of the platen shaft, remove the platen gear by pulling its pawl outwards and then remove the bushing R. At the left end, remove the pawled bushing L by pulling its pawls outwards.
- (5) Move the platen to the right (arrow •) to take out the left end from the platen frame L and then take it out to the left (arrow ,).



### **Removing the lock shaft and paper compartment latch**

- (6) At the right end of the lock shaft, remove the lock lever by unlatching the pawls in the direction of arrows • and pulling the lock lever outwards (arrow , ) and then unhook the lock lever spring from the platen frame R.
- (7) Move the lock lever to the left (arrow *f*). At the left end of the lock shaft, remove the lock lever by unlatching the pawl (arrow „ ) and then unhook the lock lever spring from the platen frame L. Take out the lock shaft (arrow ...).

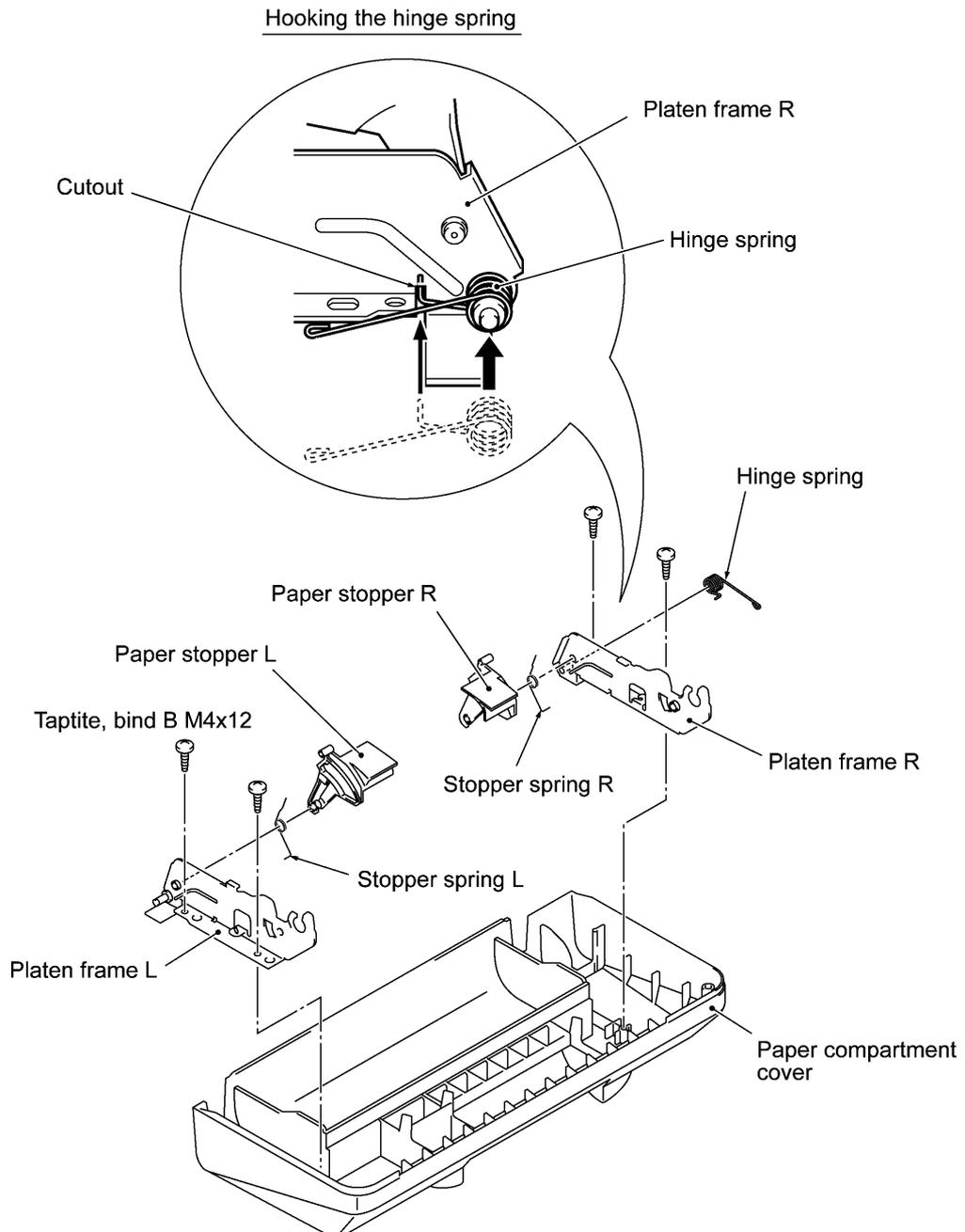


#### **n Reassembling notes**

- When inserting the lock shaft through the paper compartment latch, face its short end to the right as shown above.

**Removing the paper stoppers and platen frames**

- (8) Remove two screws from the platen frame R and take out the platen frame R together with the hinge spring, paper stopper R and its spring.
- (9) Remove two screws from the platen frame L and take out the platen frame L together with the paper stopper L and its spring.

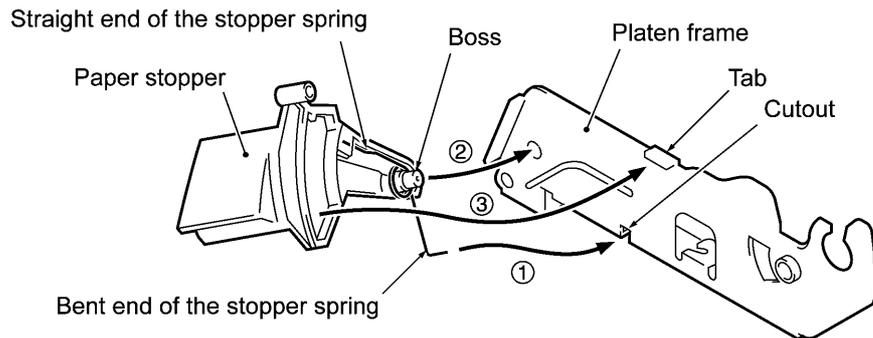


#### n Reassembling notes

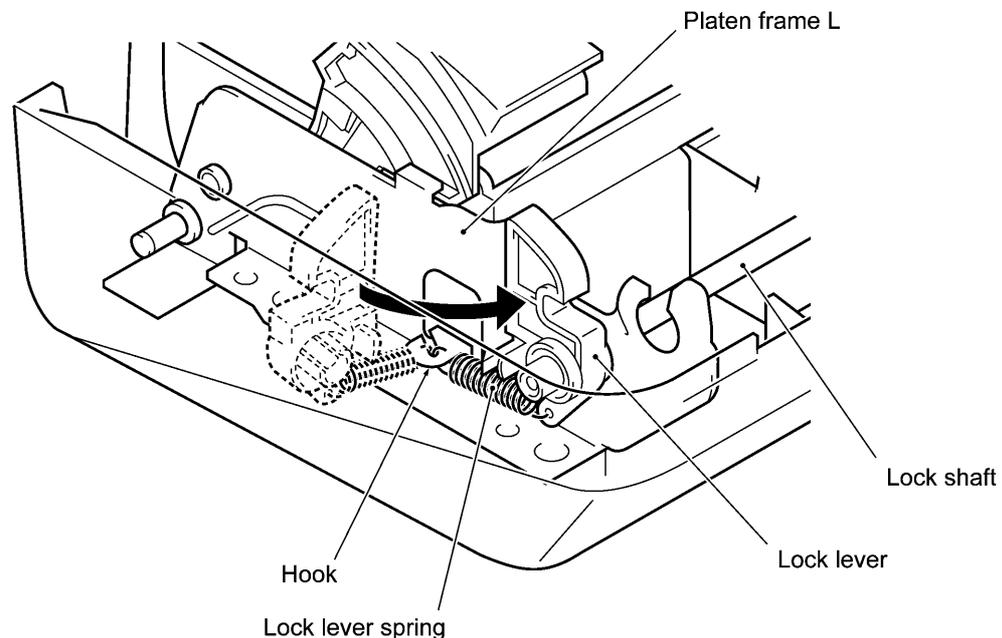
- Before reinstalling the platen frames to the paper compartment cover, assemble the platen frame R (or L), paper stopper, and stopper spring together as follows:

As illustrated below, first fit the stopper spring over the boss of the paper stopper. Insert the bent end of the stopper spring into the cutout of the platen frame (arrow *a*), fit the boss of the paper stopper into the hole of the platen frame (arrow *b*), and then fit the paper stopper to the tab of the platen frame (arrow *c*).

For the platen frame R, set the hinge spring on it as shown on the previous page.



- When reinstalling the lock levers, first work at the platen frame L. As shown below with dotted lines, hold the lock lever and then hook the lock lever spring onto the platen frame L. Next, work the same way at the platen frame R and then snap the lock lever into the platen frame R.



- When fitting the pawled bushing L and bushing R onto the platen shaft, align each guide boss with the cutout provided in each of the bushings.

### [ 3 ] Removing the components from the printer base unit

#### Removing the printer support

- (1) Take off the printer support from the printer base unit by removing the four screws.

**NOTE:** After removing the printer support, take care not to bend the grounding spring R.

