RYOBI

RYOBI 3304H

OFFSET PRESS

OPERATION MANUAL

WARNING

This operation manual is written to assure that this machine is used safely and effectively. Read this manual and understand its contents fully before doing the machine operation and maintenance. The operator and supervisor must not allow a person who does not understand this machine to operate it.

This manual also includes the explanation of the optional accessories so as to explain the total capabilities of the machine.

WARNING

Concerning the machine operation

- When operating the machine carelessly, a serious injury or serious accident may occur.
- The operator and person doing the maintenance should read this manual carefully before operating or doing the maintenance on this machine.
- Never operate or do the maintenance on this machine until you understand this manual completely.
- Never replace any parts other than the consumables shown in this manual by yourself. Please call the dealer who you purchased the machine from.
- Never install, move, or scrap this machine by yourself. Please call the dealer who you purchased the machine from.
- Use the after sales parts and consumables which are supplied from the manufacturer, or recommended by the manufacturer. These parts and consumables are listed in the parts list which is supplied with the machine.

Concerning the handling of this manual

- Keep this manual in a place where the operator and person doing the maintenance can refer to it at any time when required.
- If this manual is lost or damaged, please order a new one from the dealer who you purchased the machine from.

When transferring this machine

- Please prepare this machine to be the same condition as when you purchased it.
- Please attach this manual with the machine.

OFFSET PRESS

RYOBI 3304H

OPERATON MANUAL

Safety Operation Edition

Introduction Edition

Operation Editon

Maintenace Edition

Optional Accessories Edition

OFFSET PRESS

RYOBI 3304H

OPERATION MANUAL

PREFACE

Thank you for purchasing our Ryobi product.
This operation manual is written to assure that this machine is used safely and effectively. Read this manual fully before operating this machine. Completely understand the content of the safety operation, name and function, operation, and maintenance and inspection sections before operating the machine. Failure to follow the operation instructions in this manual may result in a serious accident. There are certain photos in this manual in which the cover or safety cover has been removed to allow better understanding. However when operating the machine, mount all the covers and safety covers properly.
The purpose of this operation manual is to provide necessary safety hints about the correct range of applications for which the machine is intended. This operation manual is designed according to the European standard EN 292, part 1.

The following marks indicate items that careful attention should be paid in this manual to assure the safe operation. So please operate the machine only after understanding this manual completely.

Meaning of the marks



DANGER

This mark is used in the safety precautions and on the warning labels at places to indicate an imminent dangerous condition in which a death or serious injury may occur if the danger is not avoided.
In these safety precautions, the safety steps that have to be followed to avoid the danger are explained.



WARNING

This mark is used in the safety precautions and on the warning labels at places to indicate a potential dangerous condition in which a death or serious injury may occur if the danger is not avoided.
In these safety precautions, the safety steps that have to be followed to avoid the danger are explained.



CAUTION

This mark is used in the safety precautions and on the warning labels at places to indicate a potential dangerous condition in which an injury or preventable accident may occur if the danger is not avoided.
In these safety precautions, the safety steps that have to be followed to avoid the danger are explained.

CONTENTS

Safety Operation Edition

Chapter 1 Warning Labels

Warning labels 13
Place to apply the warning labels 15

Chapter 2 Precautions in the Operation Environment

Use and storage of organic solvent 17
Machine noise 17

Chapter 3 Precautions when Installing and Moving the Machine

Machine dimensions, weight, and power 18
Machine installing and moving 19

Chapter 4 Precautions when Operating

Preparation and procedures if an emergency happens! 20
Cautions for clothes! 20
Mount the covers and safety devices properly! Never alter the safety devices! 20
Never "crawl" and "work" at the same time! 21
Mount the cylinder gap safety covers properly! 21
Be sure of what the other people are doing! 21
Never touch the rotating parts! 21
Stop the machine before setting around the rotating parts!
(in the delivery section) 22
Never insert your hand inside when pulling out a sheet! 22
Never touch the electrical parts with wet hands! 23
Keep the area around the machine clean! 23
Never use broken tools! 23
Never put your hand on the feeder pile while it is rising! 23
Stop the machine before doing the setting around the rotating parts!
(in the feeder section) 24

Chapter 5 Precautions when Doing Maintenance

Turn off the power before doing the lubrication and maintenance! 25
Mount the covers and safety devices properly! Never alter the safety devices! 25
Stop the rotation before cleaning the cylinders and rollers! 25
Wear safety goggles before supplying or replacing the chemicals! 25
Wear safety goggles before using the air gun! 26
Adjustment and maintenance that should be done by the operator! 27
Turn off the power before cleaning the static eliminator! 27
Never replace any parts other than the consumables! 27

Chapter 6 Safety Device

Safety device operation indication 28
Safety device function explanation 30

Introduction Edition

Chapter 1 Machine Outline

1-1 Specifications 35
1-2 Mechanical Layout 37
1-3 Roller Arrangement 38
1-4 Cylinder Packing and Plate and Blanket Size 39

Chapter 2 Name and Function of Each Part

2-1 Feeder Section Operation Panel 40
2-2 Delivery Section Operation Panel 42
2-3 Ink and Water Operation Panel 47
2-4 Crawl Operation Panel 48
2-5 Unit Panel 50
2-6 Delivery Section Auxiliary Switch Panel 51
2-7 Paper Feed Section 52
2-8 Printing Section 56
2-9 Delivery Section 63
2-10 RYOBI RP520-220F 66
2-11 RYOBI PCS-F 67

Operation Edition

Chapter 1 Operation Procedures

1. Plate Making 85
2. Water Section Preparation 89
3. Mounting the Plate 91
4. Setting the Paper Feed Section 92
5. Setting the Registration Section 98
6. Setting the Delivery Section 103
7. Test Feeding 105
8. Setting the Ink Section 106
9. Setting the Blanket Cleaning Section 108
10. Setting the Impression Pressure Adjustment Dial 109
11. Setting the Delivery Section Auxiliary Switch Panel 109
12. Test Printing 111
13. Adjustment of the Image Position 112
14. Printing 115

Chapter 2 Printing Practice

2-1 Minimum Size Paper Printing 119
2-2 Thin Paper Feeding [Paper with a thickness less than 0.08 mm (0.0031")] 122
2-3 Paper Feed and Delivery of Curled Paper [Point] 125

Maintenance Edition

Chapter 1 Maintenance after the Printing

1. Cleaning the Ink Section 129
2. Cleaning the Water Section 132
3. Cleaning the Cylinder Section 134
4. Cleaning the Blanket Cleaning Device 136
5. Plate Preservation 138

Chapter 2 Periodic Inspection

1. Checking the Roller Pressure 139
2. Checking the Plate Pressure and Impression Pressure 150

Chapter 3 Periodic Maintenance

1. Maintenance Item List 152
2. Maintenance Point 153

Chapter 4 Replacing the Supplies

1. Replacing the Blanket 162
2. Replacing the Sheet Separator 164
3. Replacing the Water Form Roller and Metering Roller 165
4. Replacing the Water Control Wiper 166

Chapter 5 Troubles and Countermeasures

5-1 Error Message 167
5-2 Other Troubles 169

Optional Accessories Edition

Chapter 1 Dampening Solution Cooling/Circulation Device

1-1 Outline 177
1-2 Name and Function of Each Part 177
1-3 Operation Procedures 179
1-4 Maintenance 180

Chapter 2 Decurling Device

2-1 Outline 182
2-2 Operation Procedures 182

ILLUSTRATED CONTENTS

OPS

Operation Side

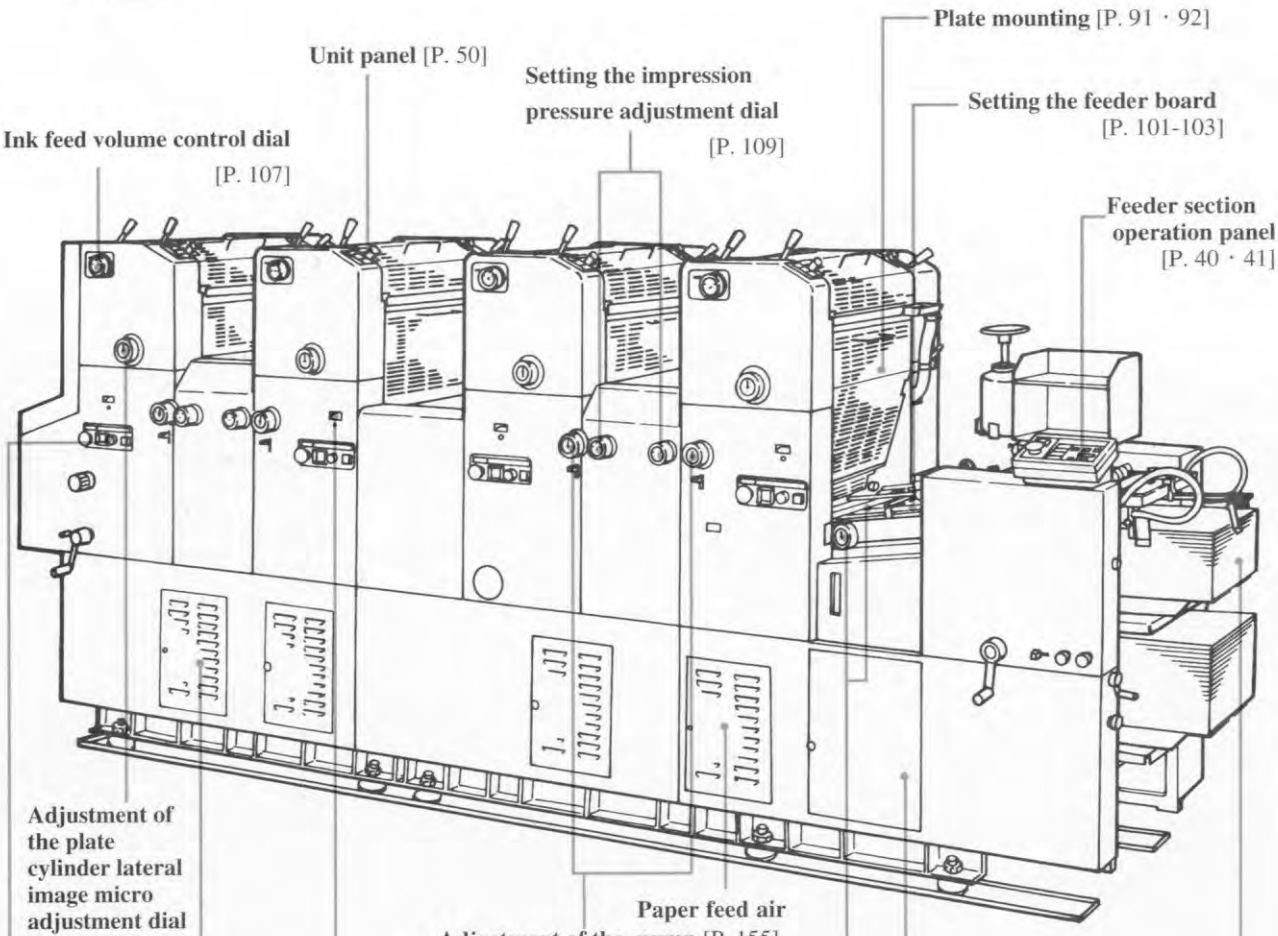


Plate mounting [P. 91 · 92]

Unit panel [P. 50]

Setting the impression pressure adjustment dial [P. 109]

Setting the feeder board [P. 101-103]

Ink feed volume control dial [P. 107]

Feeder section operation panel [P. 40 · 41]

Adjustment of the plate cylinder lateral image micro adjustment dial [P. 113 · 114]

Paper feed air pump [P. 155]

Adjustment of the vertical image micro adjustment dial [P. 113]

Setting the push side guide [P. 98-101]

- Push side guide adjustment dial [P. 98 · 114]

Setting the feeder section [P. 92-98]

- Feeder section guide [P. 94]
- Mechanical type double sheet detector [P. 97]
- Pull-out rollers and guide rollers [P. 97 · 98]
- Prepile device [P. 118]

Crawl operation panel [P. 48 · 49]

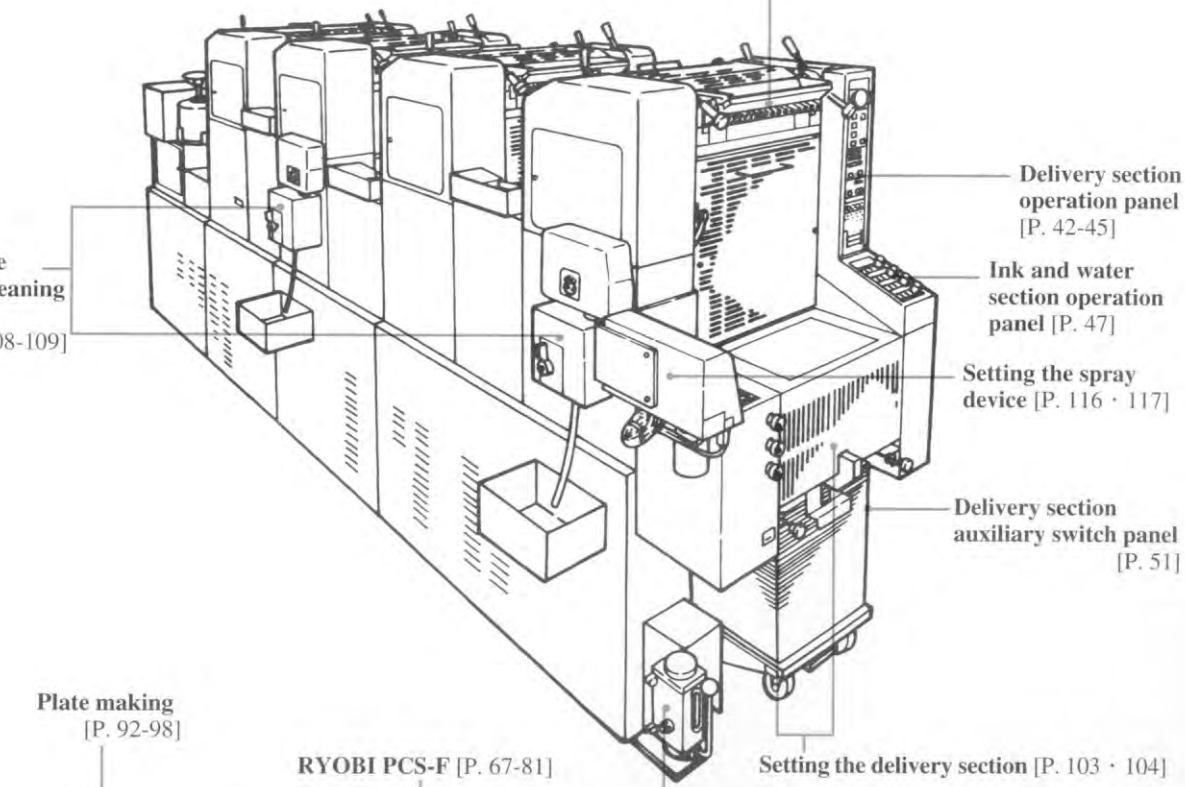
Plate pressure adjustment scale [P. 92]

Dampening solution circulation device [P. 61 · 89]

Delivery air pump [P. 155]

NOPS

Non Operation Side



[Important]
The machine maintenance and inspection are very important to keep the machine in top operation condition.
Please read, the maintenance edition P. 129 through P. 166 carefully.

Safety Operation Edition

This edition explains about what you should pay careful attention to assure the safety.
Only operate the machine after understanding this edition fully.



Read this edition fully to assure the safe operation.

Safety Operation Edition

This edition explains what you should pay careful attention to across the safety.

Only operate the machine after understanding this edition fully.

Read this edition fully to assure the safe operation.

Chapter 1

Warning Labels

On this machine, we have applied warning labels at places where you should pay careful attention to assure the safety. Follow the instructions of the warning labels and pay careful attention to the safety.

■ Warning labels

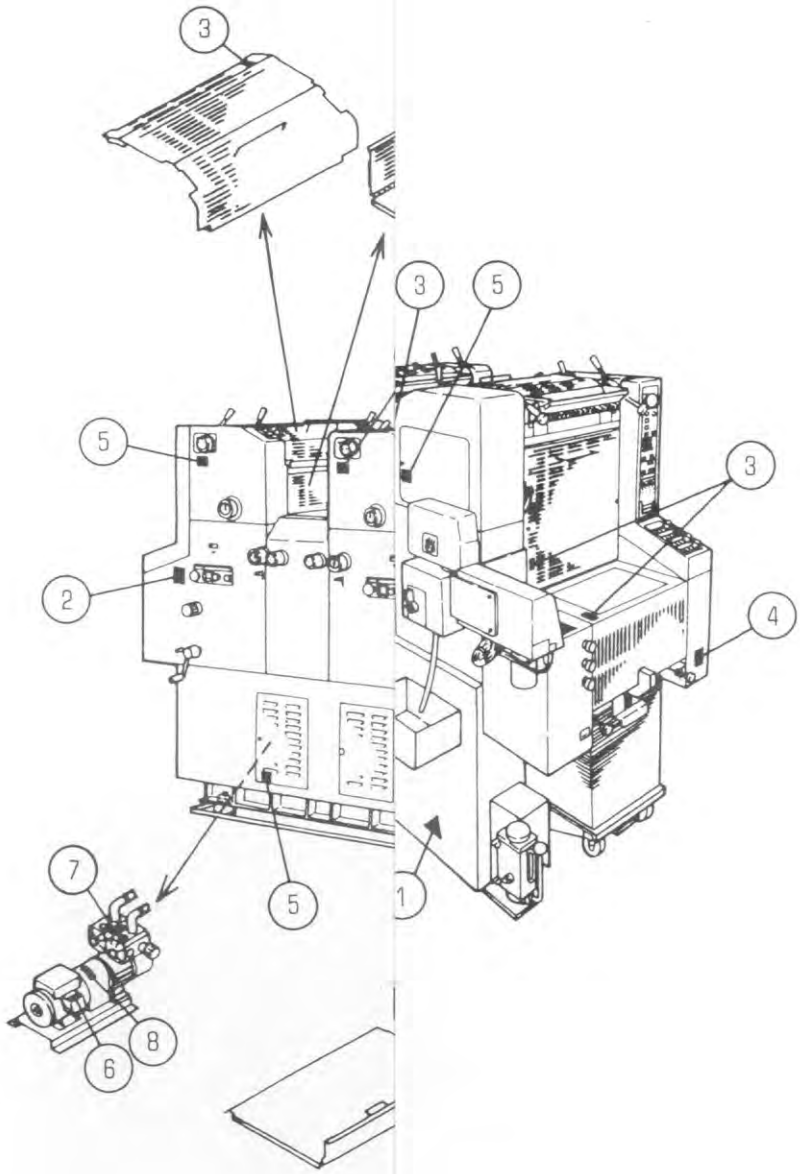
No.	Picture indication	Title and meaning
①	 Order number : 5290 61 135-1	Title : Danger of electric shock Meaning : When operating at the place that this label is applied, an electric shock causing death or grave injury may result if any part of your body touches it.
②	 Order number : 5290 74 087-2	Title : Warning of hands being caught in the machine Meaning : When operating at the place that this label is applied, failure to follow the instructions may result in a serious injury including your hands being caught in the machine.
③	 Order number : 5290 74 082-1	Title : Warning of hands being caught in the machine Meaning : When operating at the place that this label is applied, failure to follow the instructions may result in a serious injury including your hands being caught in the machine.
④	 Order number : 5290 74 083-2	Title : Caution of fingers being caught in the machine Meaning : When operating at the place that this label is applied, failure to follow the instructions may result in an injury including your fingers being caught in the machine.
⑤	 Order number : 5290 74 084	Title : Caution of fingers being caught in the machine Meaning : When operating at the place that this label is applied, failure to follow the instructions may result in an injury including your fingers being caught in the machine.

No.	Picture indication	Title and meaning
⑥		Title : Warning of electric shock Meaning : When operating at the place that this label is applied, an electric shock causing death or grave injury may result if any part of your body touches it.
⑦		Title : Caution of high temperature Meaning : When operating at the place that this label is applied, burns may result if any part of your body touches it.
⑧		Title : Caution of fingers being caught in the machine Meaning : When operating at the place that this label is applied, failure to follow the instructions may result in an injury including your fingers being caught in the machine.

(Note) For the warning labels that do not have order numbers, please consult the dealer who you purchased the machine from.

■ Place to apply the warning label

On this machine, the warning labels have been ap
and the ones shown on pages 13 and 14 are the s
When any of these labels are damaged or peeled o
are replaced should be the same ones and applied
you purchased the machine from.



(Note) The photographs used in this manual were

Chapter 2

Precautions in the Operation Environment

DANGER

Use and storage of organic solvent

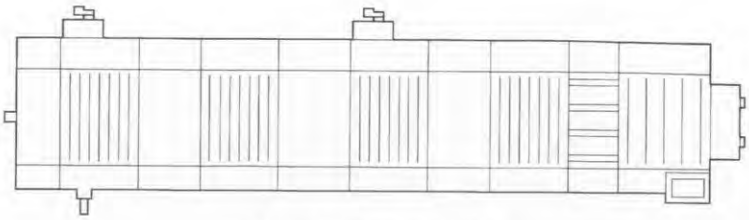
- On this machine, the isopropyl alcohol and organic solvents, for example cleaning solution, are used. Never run the machine in a place that is air tight. Failure to follow this instruction may result in poisoning.
- Never bring a flame close to the organic solvent or any other combustibles. Failure to follow this instruction may result in a fire or explosion. Please position a fire extinguisher at a place that is readily accessible and easy to use.
- Never use the organic solvent and other chemicals for printing (the blanket cleaning solution and roller cleaner etc.) which have a flash point lower than 55˚C (131˚F).
- Use and store the organic solvent in a place with good ventilation.
- The organic solvent and other chemicals for printing contain harmful elements. Use them only after fully understanding the elements and handling instructions. When having questions, consult the store selling the organic solvent and other chemicals for printing to get a complete explanation.





■ Machine noise

This machine produces the following noise levels. Please set the operation environment based on the local ordinances.



Delivery side 80 dB

Feeder side 80 dB

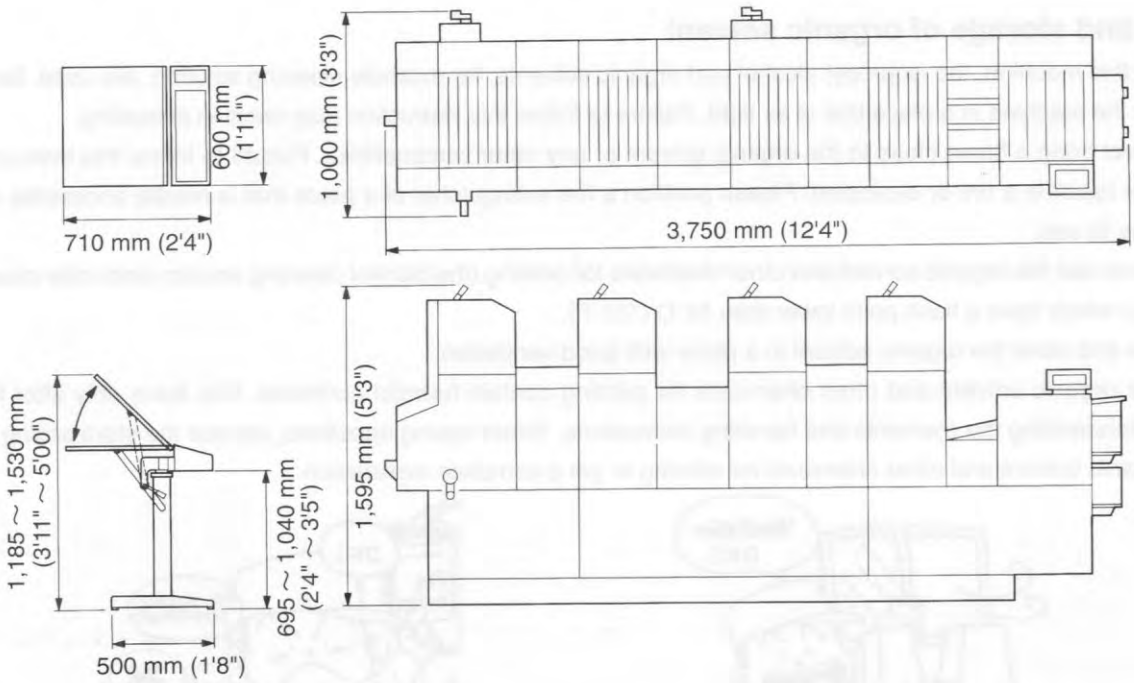
Operation side 80 dB

Measured by the DIN 45635 part 27.

Chapter 3 Precautions when Installing and Moving the Machine

■ Machine dimensions, weight, and power

<Installation>



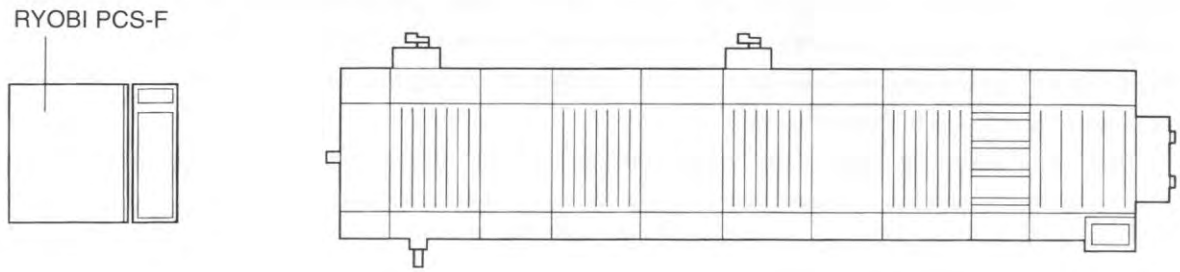
Weight	3,000 kg (6.614 lbs.)
Power	Single phase, 208 V, 60 Hz, 24 A
	Three phase, 200 V, 50/60 Hz, 14 A

(Note) For the three phase machine, confirm the rotating direction of the motors of the paper feed pump, delivery pump, decurling device (option), and dampening solution cooling/circulation device (option).

■ Machine installing and moving

Installing (wiring and piping) and moving of the machine requires special knowledge and trained personnel to assure the machine performance and safety. So consult the dealer who you purchased the machine from. (The detailed information about the machine installing and moving is given in the service manual. So the service technician should follow the information given in the service manual.)

<Machine installation>



To assure the safe operation, install each of the devices as shown in the illustration. Check the machine and devices position before the initial operation.

Chapter 4

Precautions when Operating

WARNING

Preparation and procedures if an emergency happens!

- If finding poor operation of any safety cover, switch, and the other safety devices while running the machine, immediately stop the machine and consult the dealer who you purchased the machine from.
- If noticing a noise or offensive smell (burnt motor smell) while running the machine, stop the machine as soon as possible and follow the steps below.
  1. Turn off the power and pull out the power cord plug from the outlet.
  2. If needing to rotate the machine, do it manually by using the crank handle.
  3. Consult the dealer who you purchased the machine from.
- Prepare a fire extinguisher to extinguish any possible fire in the machine. Keep it at a place that is readily accessible and easy to use.

Fire extinguisher type
When a fire occurs in the machine or around the machine area, use the all purpose type fire extinguisher. (This type should be able to handle wood, paper, and fiber fires; grease and flammable liquids fires; and electrical component fire.)



Cautions for clothes!

Never wear clothes or jewelry that may get easily caught in the machine when operating the machine. Set the long hair so that it does not get caught in the machine and wear a cap.



Failure to follow this instruction may result in a serious injury.

Mount the covers and safety devices properly!
Never alter the safety devices!

Mount the covers removed to do the maintenance, for example lubrication, in place and run the machine. Never remove or alter any safety device mounted on the machine.



Failure to follow this instruction may result in a serious injury.

WARNING

Never "crawl" and "work" at the same time!

When doing the work with the "crawl operation," for example cleaning the plate cylinder, blanket cylinder, impression cylinder, and water oscillating roller, never crawl and work at the same time.
Pushing the button and work should be done separately.



Failure to follow this instruction may result in a serious injury.

Mount the cylinder gap safety covers properly!

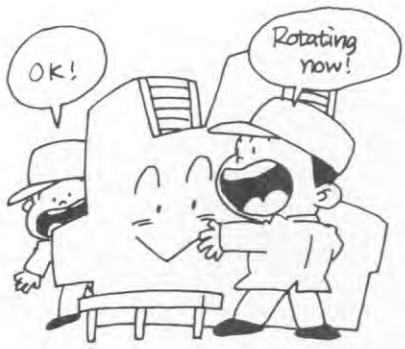
Mount the cylinder gap safety covers on the blanket cylinder and impression cylinder properly before running the machine.



Failure to follow this instruction may result in a serious injury.

Be sure of what the other people are doing!

Pay attention to what work the others are doing when working with 2 or more people.
When you start to run the machine, first give them a signal. Only after receiving their signal or response, should you start the work.



Failure to follow this instruction may result in a serious injury.

Never touch the rotating parts!

Never touch the rotating parts.
When foreign particles are on the plate cylinder and rollers, stop the machine before removing them.



Failure to follow this instruction may result in a serious injury.

WARNING

Stop the machine before doing the setting around the rotating parts! (in the delivery section)

Push the emergency stop button to stop the machine before doing the setting around the rotating parts, such as the air blower and rotary guide.



Failure to follow this instruction may result in a serious injury.

Never insert your hand inside when pulling out a sheet!

Never insert your hand inside the machine when pulling out sample sheets. Pick up the sheet edge using your fingers and pull it out quickly.



Failure to follow this instruction may result in a serious injury.

CAUTION

Never touch the electrical parts with wet hands!

Never do with wet hands, the plugging in or unplugging of the machine power cord plug or any connecting plug, turning the power switch ON or OFF, and handling any other electrical parts.



Failure to follow this instruction may result in an electric shock.

Keep the area around the machine clean!

Never leave any tools on the floor. Never allow oil and grease to collect on the floor.
Keep the area around the machine clean.



Failure to follow this instruction may result in an injury.

Never use broken tools!

Replace any worn out or broken tools with new ones.



Failure to follow this instruction may result in an injury.

Never put your hand on the feeder pile while it is rising!

Never put your hand on the top surface of the feeder pile, while it is rising.



Failure to follow this instruction may result in an injury.

CAUTION

Stop the machine before doing the setting around the rotating parts! (in the feeder section)

Stop the machine before doing the setting around the rotating parts, such as the suction feet and sheet separator bracket.



Failure to follow this instruction may result in an injury.

Stop the machine before doing the setting around the rotating parts! (in the feeder board section)

Stop the machine before doing the setting the feeder board, such as the mechanical type double sheet detector, pull-out roller, guide roller, retainer, board tape, and push side guide.



Failure to follow this instruction may result in an injury.

Chapter 5

Precautions when Doing Maintenance

WARNING

Turn off the power before doing the lubrication and maintenance!

Turn off the power before doing the lubrication by hand and maintenance.



Failure to follow this instruction may result in a serious injury.

Mount the covers and safety devices properly!
Never alter the safety devices!

Mount the covers removed to do the maintenance, for example lubrication, in place and run the machine. Never remove or alter any safety device mounted on the machine.



Failure to follow this instruction may result in a serious injury.

Stop the rotation before cleaning the cylinders and rollers!

Stop the crawl operation before doing the maintenance and cleaning of the plate cylinder, blanket cylinder, impression cylinder, transfer drum, and rollers.



Failure to follow this instruction may result in a serious injury.

Wear safety goggles before supplying or replacing the chemicals!

Wear safety goggles to protect your eyes before supplying or replacing the organic compound solvent or chemicals for printing.



Failure to follow this instruction may result in losing your eyesight.

WARNING

Wear safety goggles before using the air gun!

Wear safety goggles to protect your eyes before doing the maintenance and cleaning using the air gun.



Failure to follow this instruction may result in losing your eyesight.

CAUTION

Adjustment and maintenance that should be done by the operator!

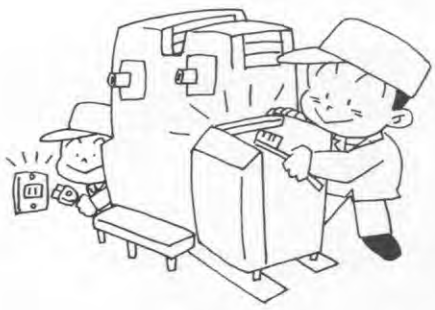
The adjustment of the ink and water roller pressure, adjustment of the feeder section, checking the air pump, and lubrication following the lubrication chart are the adjustments and maintenance listed in the operation manual that should be done by the operator.

All other adjustments and maintenance should be done by the service technician who has special knowledge and technical expertise through training, so consult the dealer who you purchased the machine from.



Turn off the power before cleaning the static eliminator!

Turn off the power before cleaning the static eliminator electrode.



Failure to follow this instruction may result in an electric shock.

Never replace any parts other than the consumables!

Never replace any parts other than the consumables shown in the maintenance edition "Chapter 4 Replacing the Supplies" in this manual.

The replacement should be done by a service technician who has special knowledge and technical expertise through training, so consult the dealer who you purchased the machine from.



Failure to follow this instruction may result in an injury.

Chapter 6

Safety Device

WARNING

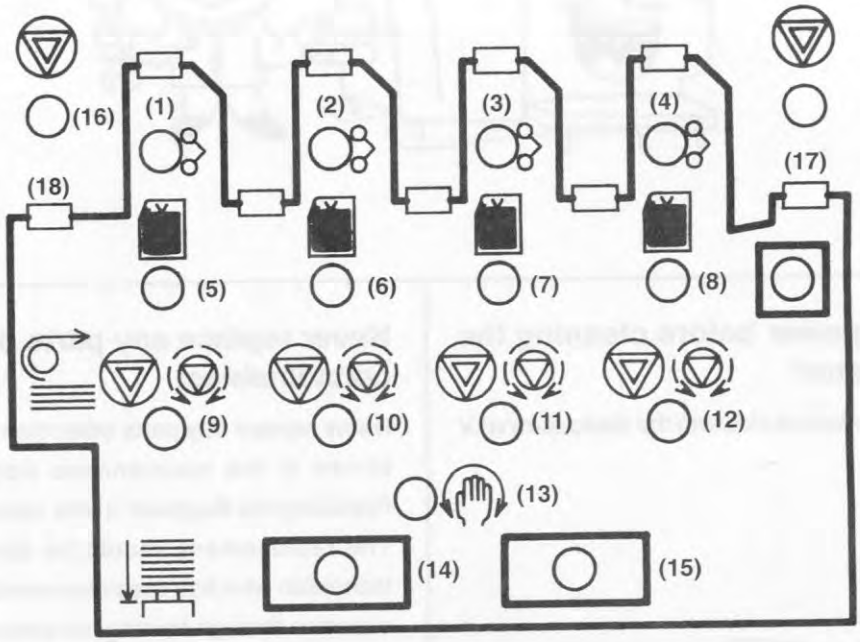
When a safety device is not functioning properly, consult the dealer who you purchased the machine from. Never remove or alter the safety devices.

■ Safety device operation indication

When a safety device actuates, the monitor indication lamp lights ON on the delivery section operation panel and it informs which safety device actuates.

To assure safety, when a safety device actuates, the machine cannot be run.

A. When the safety devices (1) through (18) in the illustration actuate, the machine cannot be run and crawled.

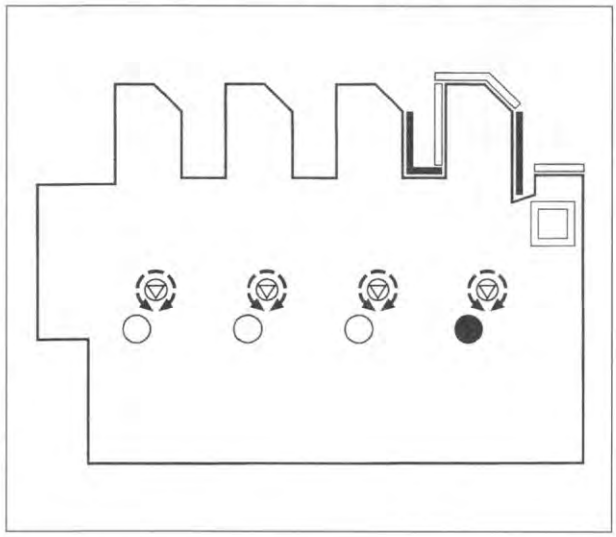


Sign	Name	Sign	Name
	Emergency stop button		Safety bar
	Crawl ON/OFF button		Handle mounting door
	Safety cover, Adjustment door, Door		Vertical image micro adjustment device

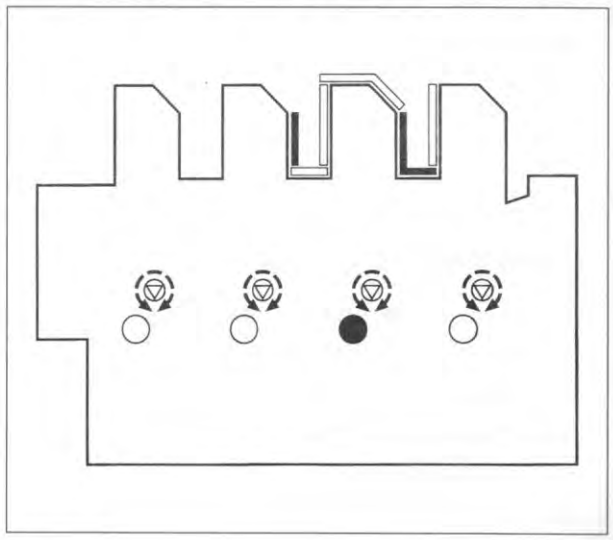
B. There are a limited number of covers that can be open and crawl operation (3m/min. and 1m/min.) can be done at the same time with the crawl ON/OFF button pushed. When opening any other cover, the crawl operation cannot be done.
When all of the covers are closed, the crawl operation speed is 3m/min..

● ... The crawl ON/OFF button that is pushed.
▬ ... Crawl operation (3m/min.) can be done even with the cover open.
▭ ... Crawl operation (1m/min.) can be done even with the cover open.

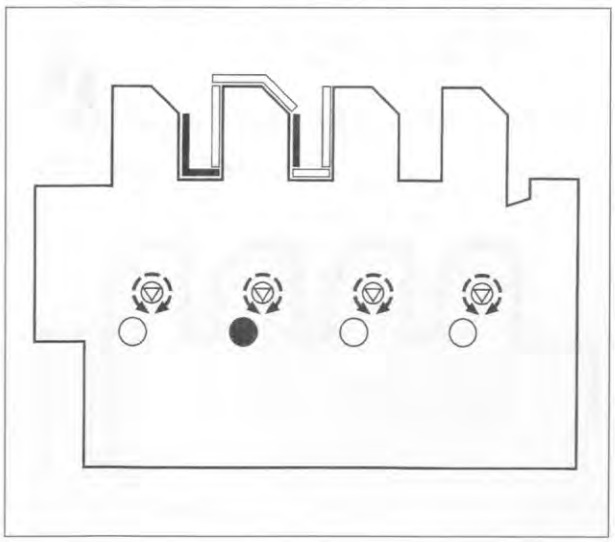
▼ When pushing the crawl ON/OFF button on the first unit crawl operation panel



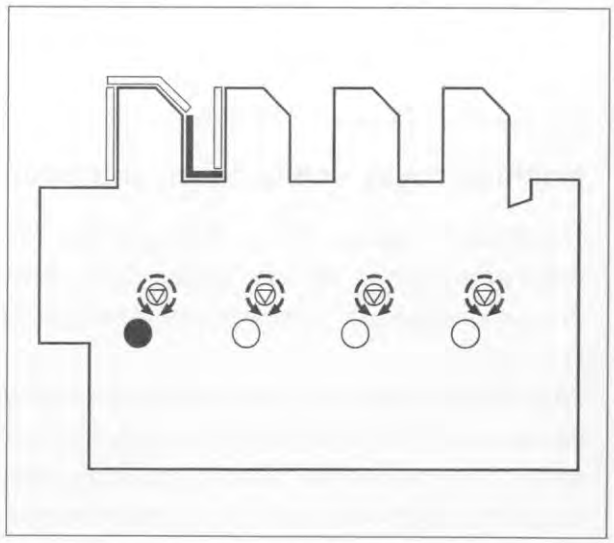
▼ When pushing the crawl ON/OFF button on the second unit crawl operation panel



▼ When pushing the crawl ON/OFF button on the third unit crawl operation panel



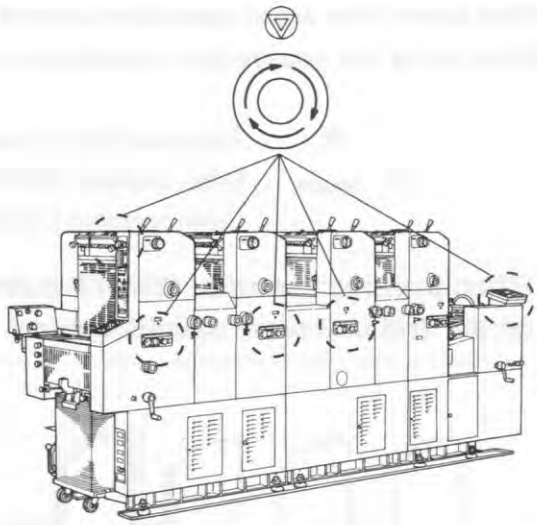
▼ When pushing the crawl ON/OFF button on the fourth unit crawl operation panel



■ Safety device function explanation

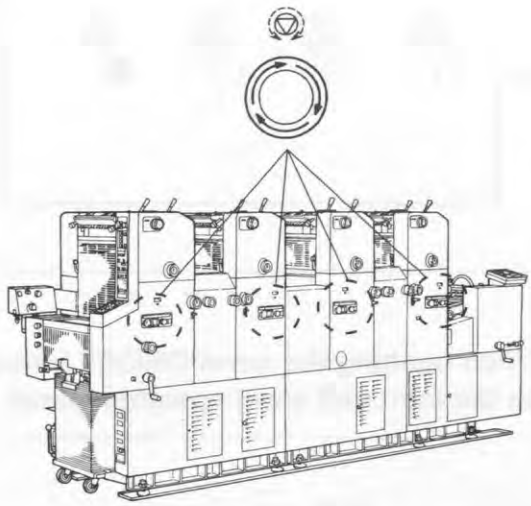
Emergency stop button

When pushing this button, the machine will stop and the button will lock. In this condition, the machine cannot be run and crawled. When turning the button in the direction of the arrow, the lock will be released and the machine can be run and crawled.
The emergency stop buttons are located on the feeder section operation panel, the crawl operation panel (first, second, third, and fourth units), and delivery section operation panel.



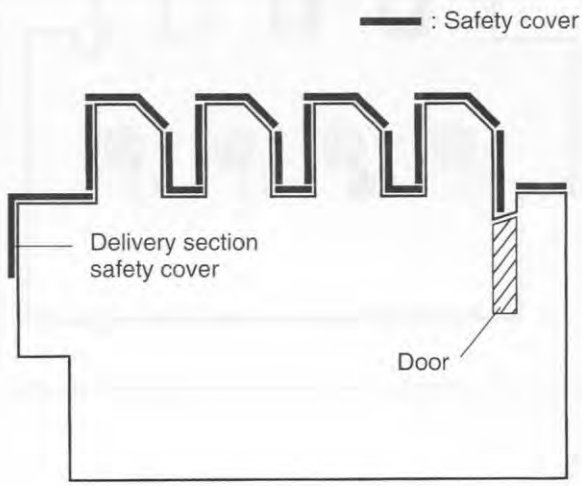
Crawl ON/OFF button

When pushing the button, the machine will stop and the button will lock. In this condition, the machine cannot be run but crawl operation can be done. When turning the button in the direction of the arrow, the lock will be released and the machine can be run.
The crawl ON/OFF button is located on the crawl operation panel (first, second, third, and fourth units).



Machine cover, safety cover, and door

The machine covers, safety covers, and door, cover the operating section and rotating parts of the machine to protect the operator from the danger of being caught in the machine.
When opening the safety cover or door, the machine cannot be run. Also when opening the delivery section safety cover, the machine cannot be run and crawled.
Mount the covers removed to do the maintenance in place after finishing the maintenance.

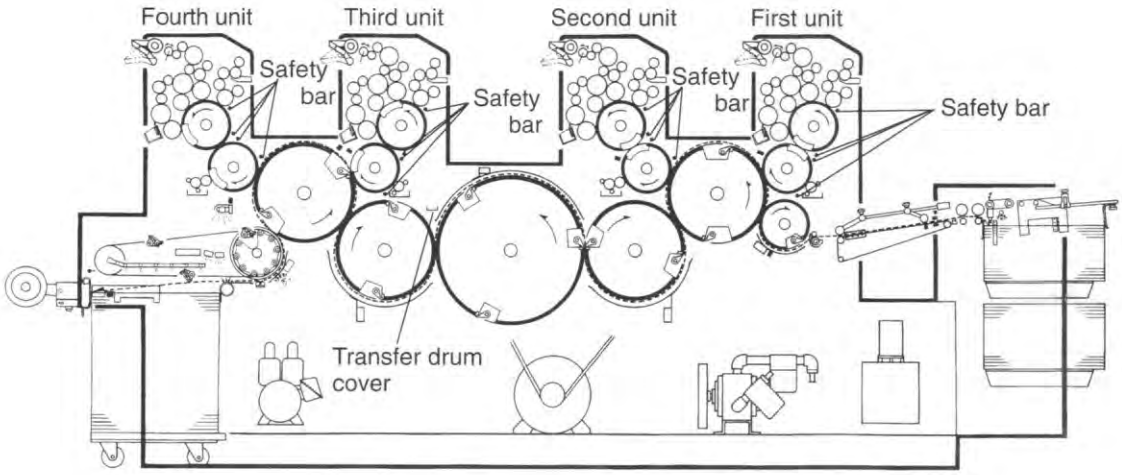


Safety bar

The safety bars are mounted to protect the fingers and rags from the danger of being caught in the machine, when operating the plate cylinder, blanket cylinder, impression cylinder, and around them.
When a safety bar actuates, the machine will stop immediately and the machine cannot be run and crawled.
When the safety bar is reset in the former position, the machine can be run and crawled.
The safety bars are located at the positions shown in the illustration.

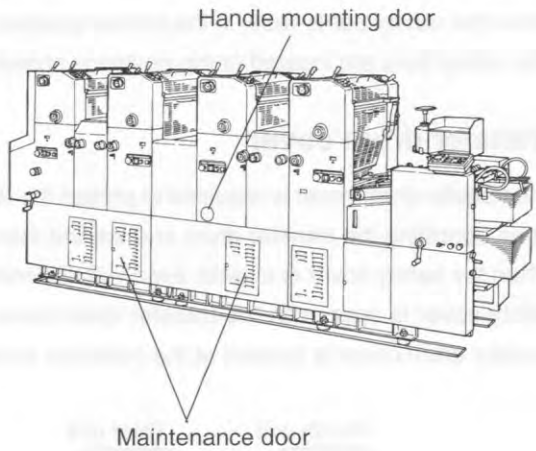
Transfer drum cover

The transfer drum cover is mounted to protect the fingers and rags from the danger of being caught in the machine, when operating the transfer drum and around them.
When the safety cover is closed, even with the transfer drum cover removed, the machine can be run. When the safety cover is open with the transfer drum cover removed, the crawl operation (1 m/min.) can be done. The transfer drum cover is located at the positions shown in the illustration.



Maintenance door

The safety device of the maintenance door is mounted to protect the hands, fingers, and tools from the danger of being caught in the machine, when removing the paper jammed on the transfer durm.
When opening the maintenance door, the safety device actuates and the machine cannot be run and crawled. When closing the maintenance door, the machine can be run and crawled.
The maintenance door is located at the position shown in the illustration on the right.



Handle mounting door

The safety device of the handle mounting door is mounted to assure the operator's safety when mounting the handle and rotating the cylinders manually.
When opening the handle mounting door, the safety device actuates and the machine cannot be run and crawled. When closing the handle mounting door, the machine can be run and crawled.
The handle mounting door is located at the position shown in the illustration on the right.

Introduction Edition

This edition is composed of Chapter 1 "Machine Outline" and Chapter 2 "Name and Function of Each Part."



Chapter 1

Machine Outline

1-1 Specifications

1) Base machine

Printing Unit	4
Max. Paper Size (W × L)	340 × 450 mm (13.39 × 17.72")
Min. Paper size (W × L)	90 × 100 mm (3.54 × 3.94")
Paper Thickness	0.04 ~ 0.3 mm (0.016 ~ 0.012")
Max. Printing Area (W × L)	330 × 438 mm (13 × 17.24")
Printing Speed	3,000 ~ 10,000 sheets per hour
Plate Size	335 × 485 mm (13.19 × 19.09")
Plate Clamp Type	Straight edge plate clamp with positioning pins
Blanket Type	Blanket with aluminum bar
Blanket Size	344 × 488 × 1.9 mm (13.54 × 19.21 × 0.075")
Under Blanket Size	330 × 447 × 0.6 mm (12.99 × 17.60 × 0.024")
Feeding System	Universal feeder
Feeder Pile Capacity	Height : 440 mm (17.32"), Weight : 90 kg (198 lbs.)
Feeder Pile System	Pre-pile
Delivery System	Chain delivery
Delivery Pile Capacity	Height : 440 mm (17.32"), Weight : 90 kg (198 lbs.)
Registration System	Push side guide
Infeed System	Upper feed roller and paper feed drum
Number of Rollers	Ink rollers : 16 (form rollers : 3) Water rollers : 6 (form roller : 1)
Dampening System	Continuous dampening system (RYOBI Super Dampener)
Gripper Margin	8 mm (0.31")
Vertical Image Micro Adjustment Range	± 20 mm (± 0.79")
Lateral Image Micro Adjustment Range	± 2 mm (± 0.079")
Oiling System	Automatic centralized oiling system
Power	Single phase, 208 V, 60 Hz, 24 A Three phase, 200 V, 50/60 Hz, 14 A
Wattage	4 kW
Motor Wattage	Main motor : 5.5 kW Paper feed pump motor (single phase) : 550 W Paper feed pump motor (three phase) : 750 W Delivery pump motor : 400 W
Dimensions (L × W × H)	3,750 × 1,000 × 1,595 mm (12'4" × 3'3" × 5'3")
Net Weight	3,000 kg (6.614 lbs.)

※ *Design and specifications are subject to change without notice.*
※ *Specifications may differ depending on the country.*
※ *Model without RYOBI PCS-F is also avalable.*

2) RYOBI PCS-F

Pitch for the ink fountain key and operation stand adjustment button	43 mm (1.69") (both ends : 36 mm (1.42"))
Indication	Liquid crystal display (L.C.D.)
Number of ink fountain keys	8
Memory capacity	3.5 inch floppy disk (2DD : 112 data files, 2HD : 124 data files)
Height adjustment	Gas spring pedal type (808 ~ 1,153 mm) (31.81" ~ 45.39")
Angle adjustment	Lever type (0 ~ 45°)
Dimensions (L × W × H)	710 × 600 × 808 ~ 1,153 mm (2'4" × 1'11" × 2'8" ~ 3'9") (When the inspection table is flat.)
Net weight	39.5 kg (87 lbs.)

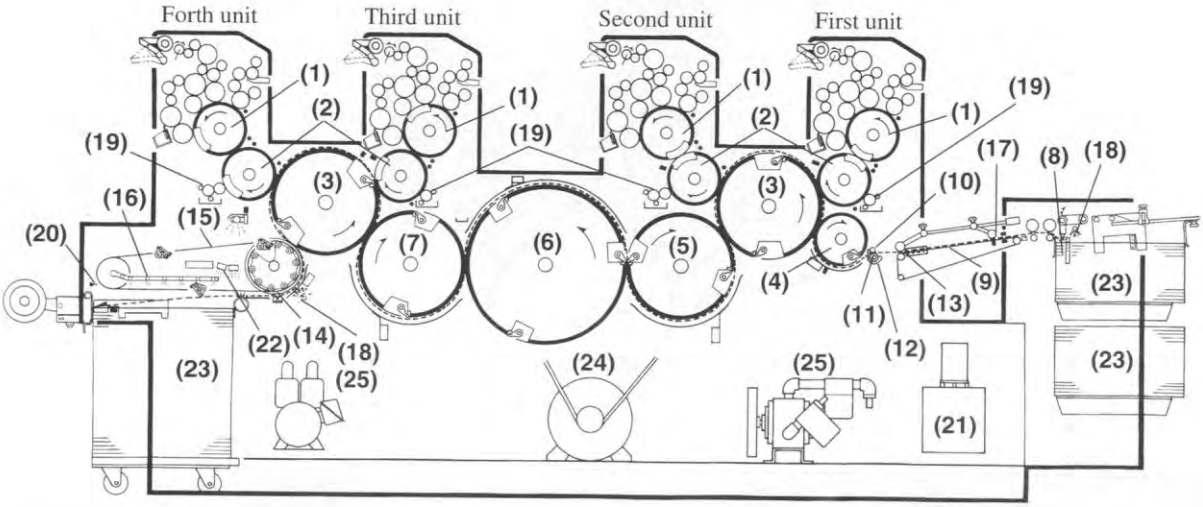
※ *Design and specifications are subject to change without notice.*

3) Optional accessories

The following items are optional accessories.
The operation of the optional accessories with the * mark are explained in this manual. For the explanation of the other optional accessories, please see each instruction manual.

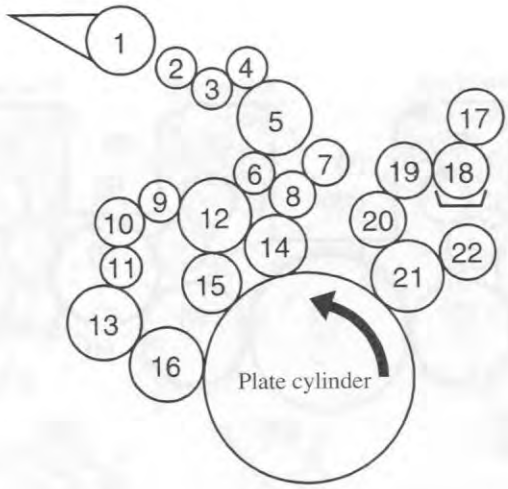
- Dampening solution cooling/circulation device*
- Tape inserter
- Decurling device*
- Multi-size paper pile board*
- Print counter* (total number of printed sheets, 8 digit, non-resettable)
- Card guide

1-2 Mechanical Layout



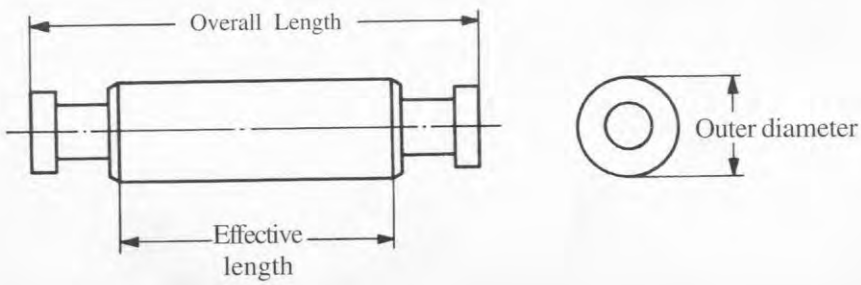
No.	Name	No.	Name
1	Plate cylinder	14	Rotary guide
2	Blanket cylinder	15	Chain delivery
3	Double diameter impression cylinder	16	Air blower
4	Paper feed drum	17	Double sheet detector
5	First transfer drum	18	Static eliminator electrode
6	Second transfer drum	19	Blanket cleaning device
7	Third transfer drum	20	Delivery jam detector
8	Suction foot	21	Dampening solution circulation device
9	Feeder board	22	Powder spray device
10	Upper feed roller	23	Printing sheet
11	Lower feed roller	24	Main motor
12	Stop finger	25	Pump
13	Push side guide		

1-3 Roller Arrangement



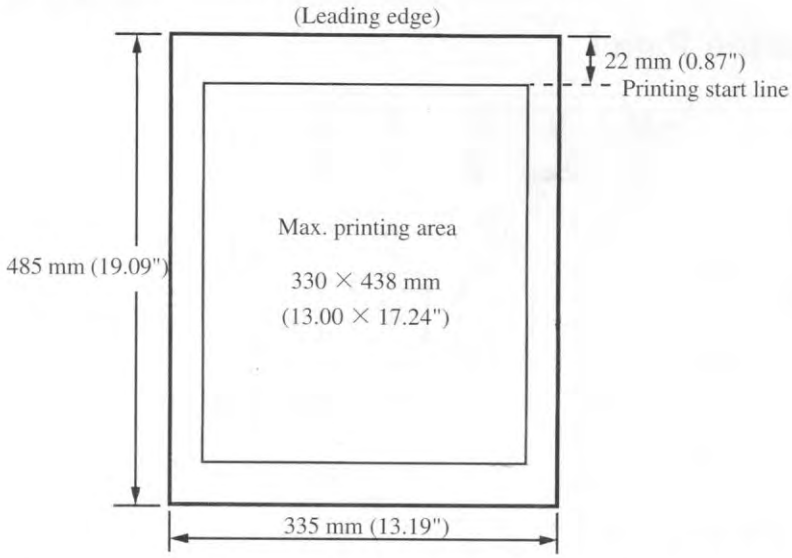
No.	Roller name	Outer diameter mm (inch)	Effective length mm (inch)	Material (JIS rubber hardness)	Part number
1	Ink fountain roller	50 (1.969")	345 (13.58")	Stainless	5344 66 311 (without PCS-F 5340 51 831-1)
2	Ink ductor roller	31 (1.220")	333 (13.11")	Rubber (25°)	5340 51 140
3	Ink first roller	28.5 (1.122")	333 (13.11")	Rilsan	5322 51 310-1
4	Ink distributor roller	34 (1.339")	335 (13.19")	Rubber (35°)	5340 51 570
5	Ink rider oscillating roller	63 (2.480")	346 (13.62")	Rilsan	5322 51 610-2
6	Ink distributor roller	34 (1.339")	335 (13.19")	Rubber (35°)	5340 51 550
7	Ink distributor roller (Bridge roller)	34 (1.339")	327 (12.87")	Rubber (35°)	5340 51 560-1
8	Ink distributor roller	40 (1.575")	333 (13.11")	Rilsan	5340 51 510-1
9	Ink distributor roller	34 (1.339")	335 (13.19")	Rubber (35°)	5340 51 550
10	Ink rider oscillating roller	40 (1.575")	333 (13.11")	Rilsan	5341 53 610-1
11	Ink distributor roller	34 (1.339")	335 (13.19")	Rubber (35°)	5340 51 550
12	Ink oscillating roller	69.64 (2.742")	340 (13.39")	Rilsan	5341 51 410-1
13	Ink oscillating roller	69.64 (2.742")	340 (13.39")	Rilsan	5341 51 410-1
14	Ink first form roller	61.5 (2.421")	335 (13.19")	Rubber (30°)	5340 51 700
15	Ink second form roller	56 (2.205")	335 (13.19")	Rubber (30°)	5322 51 700
16	Ink third form roller	65 (2.559")	335 (13.19")	Rubber (30°)	5322 51 810
17	Squeeze roller	46 (1.811")	396 (15.59")	Rubber (30°)	5344 53 220
18	Water fountain roller	48 (1.890")	396 (15.59")	Chrome plated	5344 53 111-1
19	Metering roller	46 (1.811")	396 (15.59")	Rubber (20°)	5344 53 330
20	Water oscillating roller	42 (1.654")	351 (13.82")	Chrome plated	5344 53 611
21	Water form roller	65.4 (2.575")	340 (13.39")	Rubber (20°)	5344 53 530
22	Water rider oscillating roller	45 (1.772")	346 (13.62")	Rilsan	5344 53 440

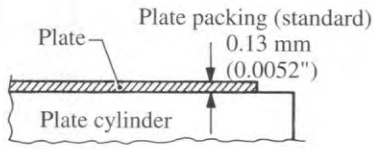
※ Please be sure to consult the parts list when ordering rollers.



1-4 Cylinder Packing and Plate and Blanket Size

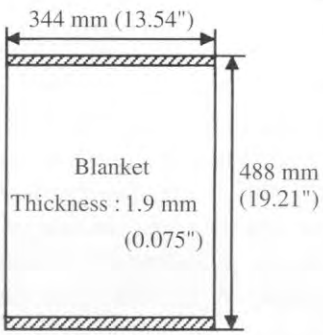
1) Plate Packing and Plate Size

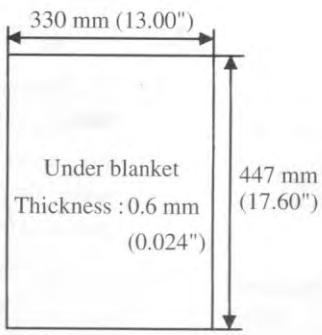


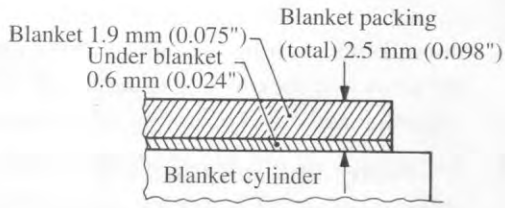


(Reference) The 0.13 mm (0.0051") packing thickness is the standard. However, because the pressure between the plate cylinder and blanket cylinder is adjusted by the plate pressure adjustment scale. A plate with a thickness from 0.1 mm (0.004") to 0.3 mm (0.012") can be used.

2) Blanket Packing and Blanket/Under Blanket Size





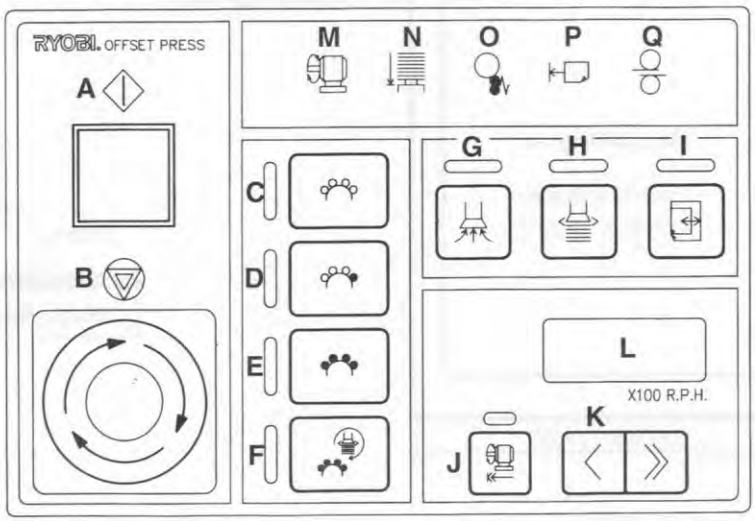


Chapter 2

Name and Function of Each Part

For the explanation about the symbols for the operation switches, please read this chapter carefully. They are designed following the DIN 30600 (symbols).

2-1 Feeder Section Operation Panel



Push button switch

A. Drive button
When pushing this button, the starting buzzer sounds. After the buzzer sounds, push the button again to run the machine.

B. Emergency stop button
When pushing this button, the machine will stop and the button will lock. In this condition, the machine cannot be run and also crawl operation cannot be done. When turning the button in the direction of the arrow, the lock will be released and the machine operation and crawl operation can be done.

C. Water and ink form roller OFF button
When pushing this button, the lamp will light. Both the water form roller and ink form roller will separate from the plate surface to stop the supply of the dampening solution and ink.

D. Water form roller ON button
When pushing this button, the lamp will light. Each roller in the water section will contact. Finally the water form roller will contact the plate surface to supply the dampening solution.

E. Water and ink form roller ON button
When pushing this button, the lamp will light. First each roller in the water section will contact and then water form roller will contact the plate surface to supply the dampening solution. After that, the ink form roller will contact the plate surface to supply the ink.

F. Printing start button
When pushing this button, the lamp will light. The water form roller and ink form roller in this order will contact the plate surface to supply the dampening solution and ink. After that, the pump operates and the paper feed and printing starts automatically.

G. Pump button
When pushing this button, the lamp will light and the pump will operate. When pushing this button again, the lamp will go off and the pump will stop.
(Note) Until the last sheet of paper fed reaches the delivery pile, the pump cannot be stopped to prevent a delivery jam from occurring.

H. Paper feed button
When pushing this button, the lamp will light and the feeder will start. When pushing this button again, the lamp will go off and the feeder will stop.

I. Paper size change button
When pushing this button, the lamp will light and feed only one sheet of paper. When the sheet fed reaches the stop finger, the lamp will go off automatically and the machine will stop. And when pushing this button again, the lamp will light and feed the sheet up to the delivery section. When the sheet fed reaches the delivery section, the lamp will go off automatically and the machine will stop.
(Note) This function is only available while the machine is running.

J. Set speed drive button

When pushing this button while the machine is running, the lamp will light and the machine accelerates to the speed set on the speed indication panel.

When pushing this button again, the lamp will go off and the machine returns to 3,000 R.P.H..

Use this button when adjusting the feeder section or cleaning the rollers.

K. Speed set button

When pushing the [<] button, the printing speed will be reduced and when pushing the [>>] button, the printing speed will be increased.

L. Speed indication

This indicates the printing speed of the machine.

Monitor indication

M. Drive lamp

When this lamp lights, the machine can be run. If any safety cover is open or any safety device is actuated, the lamp will go off and the machine cannot be run.

When a paper feed jam is detected, the lamp will go off. But when pushing the drive button while the lamp is off, the machine can be run.

N. Delivery table dolly lower limit detector lamp

When the delivery pile is full, the feeder will stop and the lamp will light.

O. Paper feed jam detector lamp

- **Feeder board jam detector function**
  When paper feed trouble occurs on the feeder board or paper feed drum, the machine will stop. At this time, a buzzer will sound and the lamp will light to inform the operator.
- **Cylinder ON sensor jam detector function**
  During 1 rotation of the cylinder after the paper passes over the cylinder ON sensor, if the paper is still on the sensor, the machine stops due to the gripper transfer trouble. At this time, a buzzer will sound and the lamp will light to inform the operator.
- **Sheet travel jam detector function**
  When sheet travel trouble from the paper feed drum to the second transfer drum occurs, the machine will stop. At this time, a buzzer will sound and the lamp will flicker to inform the operator.

After removing the paper on the feeder board or on each drum and when pushing the paper feed button again, the lamp will go off.

P. Paper feed break detector lamp

When a break in the paper feed occurs due to poor suction, the paper feed will stop. At this time, a buzzer will sound and the lamp will light to inform the operator.

After removing the paper on the feeder board and when pushing the paper feed button again, the lamp will go off.

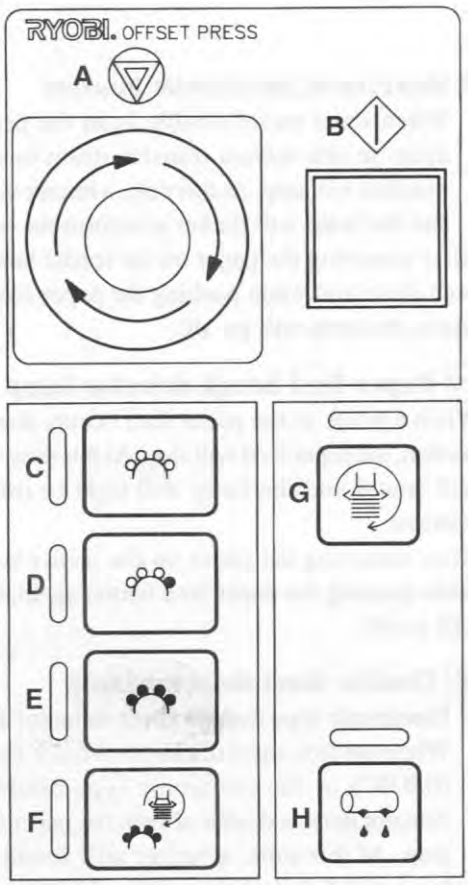
Q. Double sheet detector lamp

- **Electronic type double sheet detector function**
  When the first sheet thickness is more than 1 mm (0.039") or the electronic type double sheet detector detects double sheets, the paper feed will stop. At this time, a buzzer will sound and the lamp will light to inform the operator.
- **Mechanical type double sheet detector function**
  When the mechanical type double sheet detector detects double sheets, the paper feed will stop. At this time, a buzzer will sound and the lamp will flicker to inform the operator.

Remove the double sheets on the feeder board. Push the paper feed button again, and the detector will memorize the second or third sheet thickness automatically and then the lamp will go off.

2-2 Delivery Section Operation Panel

Push button



A. Emergency stop button
When pushing this button, the machine will stop and the button will lock. In this condition, the machine cannot be run and also crawl operation cannot be done. When turning the button in the direction of the arrow, the lock will be released and the machine operation and crawl operation can be done.

B. Drive button
When pushing this button, the starting buzzer sounds. After the buzzer sounds, push the button again to run the machine.

C. Water and ink form roller OFF button
When pushing this button, the lamp will light. Both the water form roller and ink form roller will separate from the plate surface to stop the supply of the dampening solution and ink.

D. Water form roller ON button
When pushing this button, the lamp will light. Each roller in the water section will contact. Finally the water form roller will contact the plate surface to supply the dampening solution.

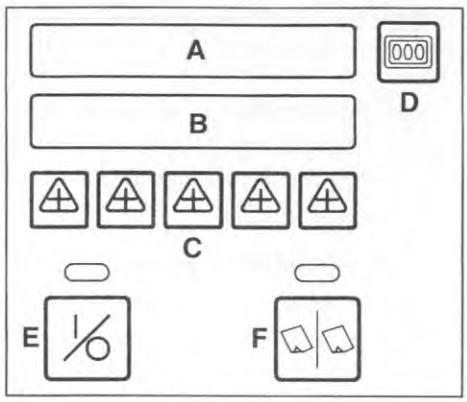
E. Water and ink form roller ON button
When pushing this button, the lamp will light. First each roller in the water section will contact and then water form roller will contact the plate surface to supply the dampening solution. After that, the ink form roller will contact the plate surface to supply the ink.

F. Printing start button
When pushing this button, the lamp will light. The water form roller and ink form roller in this order will contact the plate surface to supply the dampening solution and ink. After that, the pump operates and the paper feed and printing starts automatically.

G. Production button
When pushing this button, the lamp will light and the vacuum pump for the suction foot, will operate and then feed the paper. When pushing this button again, the lamp will go off and the paper feed will stop. And when the last sheet of paper fed reaches the delivery pile, the pump will stop.
When pushing this button during the printing, the paper feed and pump will stop. At the same time, the water form roller and ink form roller will separate from the plate surface.

H. Blanket cleaning button
When pushing this button while the machine is running, the lamp will light. The blanket on the unit selected by using the unit selection button will be cleaned.
After the number of rotations set by the cycle setting is completed, the lamp will go off.
(During the printing, it cannot be operated.)

Counter panel



A. Sheet counter

Indicates the number of sheets printed.
(Additional type)

B. Set counter

In the **preset repeat counter mode**, it indicates the set number of sheets to be printed.
In the **batch separation mode**, it indicates the number of sheets per batch and during the printing, the indicated number will be subtracted.

C. Counter setting button

When pushing any one of the buttons, the indication number of the set counter will change. Push each button to set the number of printed sheets or the batch number of sheets required.
When pushing the both side buttons at the same time, the number indicated on the set counter will return to "0".

D. Clear button

When pushing this button, the number indicated on the sheet counter will return to "0".

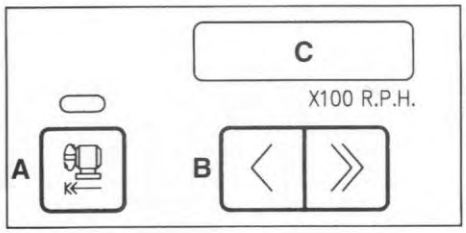
E. Count ON/OFF button

When pushing this button, the indication lamp lights and the count starts.
When pushing this again, the lamp goes off and the count stops.

F. Mode selection button

To select the **preset repeat counter mode** (the lamp is off) or **batch separation mode** (the lamp lights), push this button.
In the **preset repeat counter mode**, when the number indicated on the sheet counter display matches the number on the set counter display, the buzzer sounds and the paper feed will stop.
In the **batch separation mode**, when the number on the set counter display indicates "20" and "0", the buzzer sounds.

Speed set / indication panel



A. Set speed drive button

When pushing this button while the machine is running, the lamp will light and the machine accelerates to the speed set on the speed indication panel.
When pushing this button again, the lamp will go off and the machine returns to 3,000 R.P.H..
Use this button when adjusting the feeder section or cleaning the rollers.

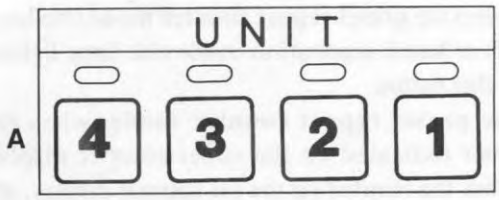
B. Speed set button

When pushing the [<] button, the printing speed will be reduced and when pushing the [>>] button, the printing speed will be increased.

C. Speed indication

This indicates the printing speed of the machine.

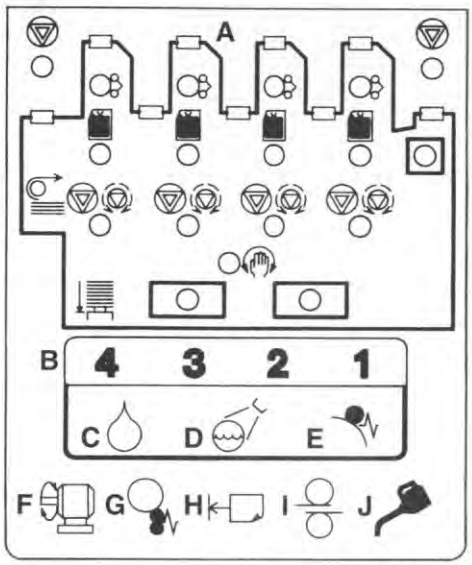
Unit selection panel



A. Unit selection button

When pushing the button with the unit number which printing will be done, the lamp will light indicating that it is possible to print on that unit.

Monitor indication



A. Safety device indication
(P. 28)

B. Unit indication lamp
When the dampening solution in the water fountain is not at the proper level, the water roller cleaning lever is at the position, or the blanket jam occurs, the lamp for that unit will light.

C. Water warning lamp
When the dampening solution level in the water fountain on any unit from the first to the fourth unit is not proper, this lamp will light.
When this lamp lights, the metering roller will not rotate. Also the paper feed button cannot go on.
When supplying the dampening solution, the lamp goes off.

D. Water roller cleaning lever ON detector lamp
When the water roller cleaning lever is at the position on any unit from the first to the fourth unit, this lamp will light.
When this lamp lights, printing cannot be done. When setting the water roller cleaning lever at the position, the lamp will go off.

E. Blanket jam detector lamp
When a sheet of paper is jammed on the blanket on any unit from the first to the fourth unit, the machine will stop. At this time, a buzzer will sound and the lamp will light to inform the operator. After removing the jammed paper, the lamp will go off.

H. Paper feed break detector lam
When a break in the paper feed occurs due to poor suction, the paper feed will stop. At this time, a buzzer will sound and the lamp will light to inform the operator.
After removing the paper on the feeder board and when pushing the paper feed button again, the lamp will go off.

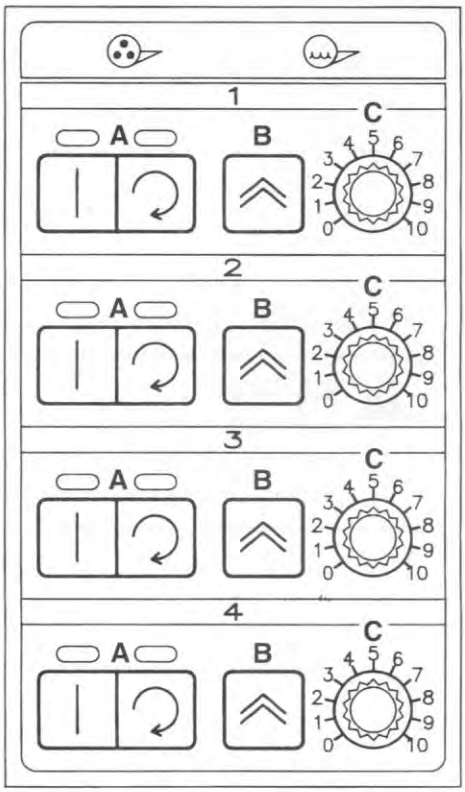
I. Double sheet detector lamp
- **Electronic type double sheet detector function**
  When the first sheet thickness is more than 1mm (0.039") or the electronic type double sheet detector detects double sheets, the paper feed will stop. At this time, a buzzer will sound and the lamp will light to inform the operator.
- **Mechanical type double sheet detector function**
  When the mechanical type double sheet detector detects double sheets, the paper feed will stop.
  At this time, a buzzer will sound and the lamp will flicker to inform the operator.

Remove the double sheets on the feeder board. Push the paper feed button again, and the detector will memorize the second or third sheet thickness automatically and then the lamp will go off.

J. Oil warning lamp
The lamp will light once every 500,000 rotations. Lubricate each section following the lubrication chart.
When push the oil warning reset button on the delivery section auxiliary switch panel, the lamp will go off.

A
B
1
2
3
4
C
D
E
F
G
H
I
J
K
L

2-3 Ink and Water Operation Panel



A. Ink ductor button

(Automatic) ... When pushing this button, the lamp will light. The ink ductor only operates during the printing and supplies the ink.
When pushing this button again, the lamp will go off. The ink ductor stops and no ink is supplied.

(Operation) ... When pushing this button, the lamp will lights. When running the machine, the ink ductor always operates and the ink is supplied.
When pushing this button again, the lamp will go off. The ink ductor stops and no ink is supplied.
When starting the printing, the lamp will go off automatically and the lamp will light automatically.

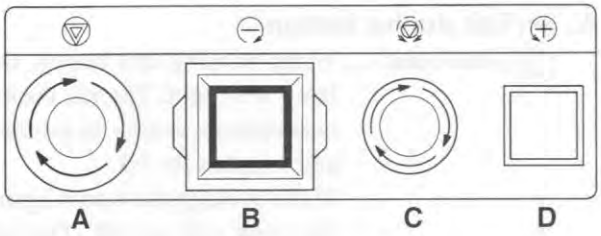
B. Dampening speed up button

While pushing this button, the dampening solution supply volume is increased. When releasing this button, the supply volume returns to that set by the dial. During the printing, scumming caused by a lack of dampening solution on the plate surface can be removed quickly.

C. Water volume control dial

When turning it toward a larger number on the dial scale, the dampening solution supply volume is increased.

2-4 Crawl Operation Panel



A. Emergency stop button

When pushing this button, the machine will stop and the button will lock. In this condition, the machine cannot be rotated and also crawl operation cannot be done. When turning the button in the direction of the arrow, the lock will be released and the machine operation and crawl operation can be done.

B. Reverse crawl button

WARNING

Never touch the rotating parts when doing the crawl operation. Failure to follow this instruction may result in a serious injury.

When pushing this button with the crawl ON/OFF button on this panel locked, the starting buzzer sounds. After the buzzer sounds, when pushing this button, the machine will crawl in the reverse direction.

When pushing this button within 10 seconds after the crawl operation, the starting buzzer will not sound, and the machine will crawl in the reverse direction.

There are 2 different kinds of crawl operation speed (3 m/min. and 1 m/min.). (P.29)

C. Crawl ON/OFF button

When pushing this button, the machine will stop and the button will lock. When turning the button in the direction of the arrow, the lock will be released and the machine can be run.

D. Forward crawl button

WARNING

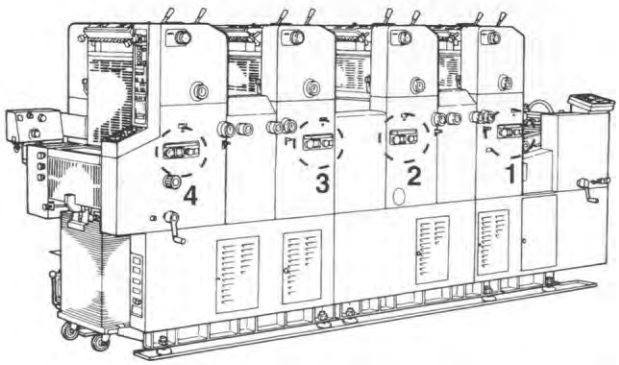
Never touch the rotating parts when doing the crawl operation. Failure to follow this instruction may result in a serious injury.

When pushing this button with the crawl ON/OFF button on this panel locked, the starting buzzer sounds. After the buzzer sounds, when pushing this button, the machine will crawl in the forward direction.

When pushing this button within 10 seconds after the crawl operation, the starting buzzer will not sound, and the machine will crawl in the forward direction.

There are 2 different kinds of crawl operation speed (3 m/min. and 1 m/min.). (P.29)

Crawl ON/OFF button and crawl button



WARNING

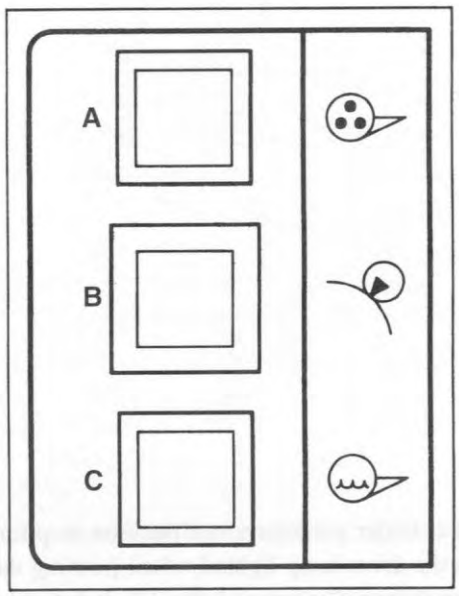
Never touch the rotating parts when doing the crawl operation. Failure to follow this instruction may result in a serious injury.

- The crawl ON/OFF button and crawl button are located at the 4 places marked 1 through 4. (P. 29) The crawl operation is possible when the crawl ON/OFF button on each panel is pushed. When pushing the crawl ON/OFF button, the lamp will light.
  a. While lighted ... It is possible to do the crawl operation.
  b. While flickering ... When the 2 or more crawl ON/OFF buttons are pushed or a safety device actuates, the crawl operation cannot be done.

- Plate cylinder predetermined position stop function
  With the drive lamp lighted, when pushing the crawl button (forward/reverse) 1 through 4 shown in the illustration, the machine crawls and stops automatically at the position where it is easy to mount/remove the plate.

Crawl button		Plate cylinder stop position
1	⊕	Position where it is easy to mount a plate on the first unit.
	⊖	Position where it is easy to remove a plate on the first unit.
2	⊕	Position where it is easy to mount a plate on the second unit.
	⊖	Position where it is easy to remove a plate on the second unit.
3	⊕	Position where it is easy to mount a plate on the third unit.
	⊖	Position where it is easy to remove a plate on the third unit.
4	⊕	Position where it is easy to mount a plate on the fourth unit.
	⊖	Position where it is easy to remove a plate on the fourth unit.

2-5 Unit Panel



A. Ink ductor manual ON button

While pushing this button, the ink ductor roller will rotate. When releasing it, the ink ductor roller will stop rotating. Use it when supplying ink to the rollers before starting printing.

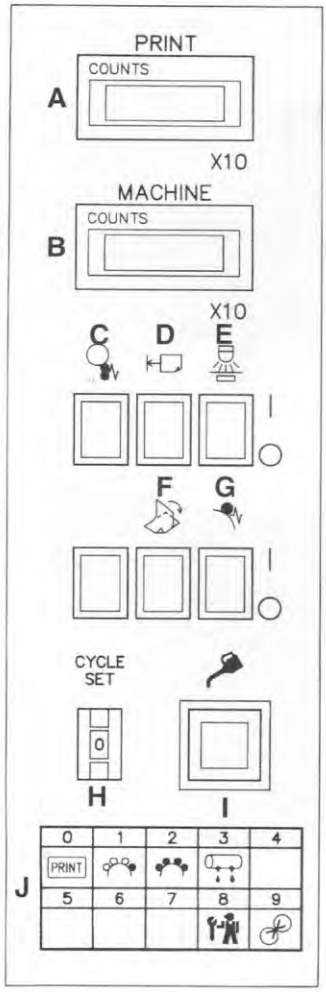
B. Plate hold-down button

When pushing this button, only the water form roller contacts the plate surface. (The water form roller will not contact the water oscillating roller.) When pushing it again, the water form roller will release from the plate surface. Use this button when mounting the plate on the plate cylinder.

C. Water roller crawl button

While pushing this button, the crawl operation of the metering roller, water fountain roller, and squeeze roller can be done. Use this button when doing the maintenance of each roller.

2-6 Delivery Section Auxiliary Switch Panel



A. Print counter

This shows the total number of sheets printed from the initial operation. This counter counts each sheet of paper fed through the machine whether it is printed or not.

B. Machine counter

This shows the total number of the cylinders rotations.

C. Sheet travel jam detector switch

This is the ON/OFF switch of the sheet travel jam detector which stops the machine when sheet travel trouble on the feeder board or from the paper feed drum to the second transfer drum occurs.

| (Operation) ... The device will operate.
○ (Stop) ... The device will not operate.

D. Paper feed break detector switch

This is the ON/OFF switch of the paper feed break detector which stops the paper feed when a paper feed break occurs.

| (Operation) ... The device will operate.
○ (Stop) ... The device will not operate.

E. Electronic type double sheet detector switch

When printing on the porous paper, turn the switch OFF (○ position) and only use the mechanical type double sheet detector.

F. Decurling device switch (→ P.182)

G. Blanket jam detector switch

This is the ON/OFF switch of the blanket jam detector that stops the machine when a sheet of paper jams on any blanket cylinder from the first to the fourth unit.

| (Operation) ... The device will operate.
○ (Stop) ... The device will not operate.

H. Cycle set button

Use this when setting each process cycle during the printing or when doing the maintenance and inspection. (P. 108)

I. Oil warning reset button

When the oil warning lamp lights on the delivery section operation panel, lubricate the required places on the machine, then push this button. The lamp will go off.

J. Cycle set indication panel

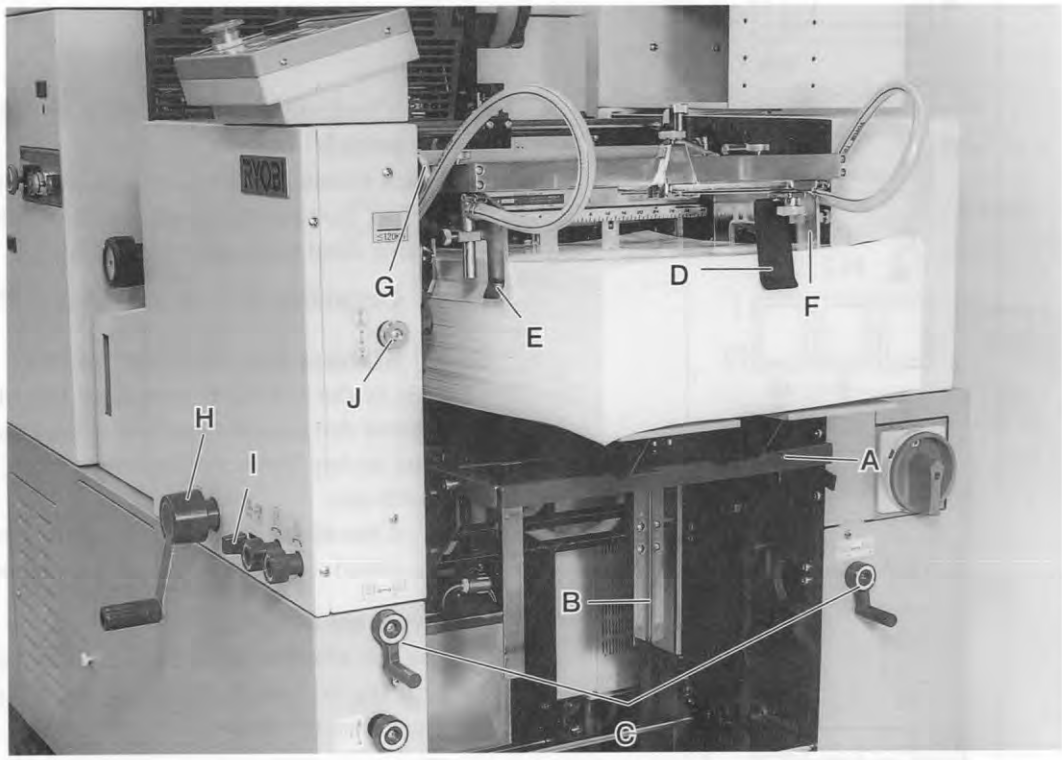
The cycle number of each process and contents set by the cycle set button (H) are indicated by the symbols.

Cycle number and symbol		Cycle process
0	PRINT	Set at this position when printing.
1		Wet cycle of the water form roller
2		Inking cycle
3		Blanket cleaning cycle
8		Only service technicians use this.
9		Set it at this position when doing the roller and cylinder pressure adjustment.

※ There are no functions for the cycle numbers from 4 to 7.

2-7 Paper Feed Section

1) Feeder Pile



A. Paper feed table
Pile the paper on this table.

B. Vertical guide
When piling the paper, pile it straight following this guide.

C. Vertical guide handle
This handle is used to set the vertical guides at both sides of the pile.
- direction ... Moves the vertical guide toward the pile.
- direction ... Moves the vertical guide away from the pile.

D. Back guide
This guide is used to guides the back of the paper pile.

E. F. Side guide
This guide is used to guide the side of the paper pile.

G. Side guide micro adjustment knob
This is used to make micro adjustments of the lateral position of the paper pile.
When turning the knob in the direction, the side guide moves toward the operation side. The maximum movement is 5 mm (0.2") and when turning the knob one complete turn, the side guide will move 1.3 mm (0.05").

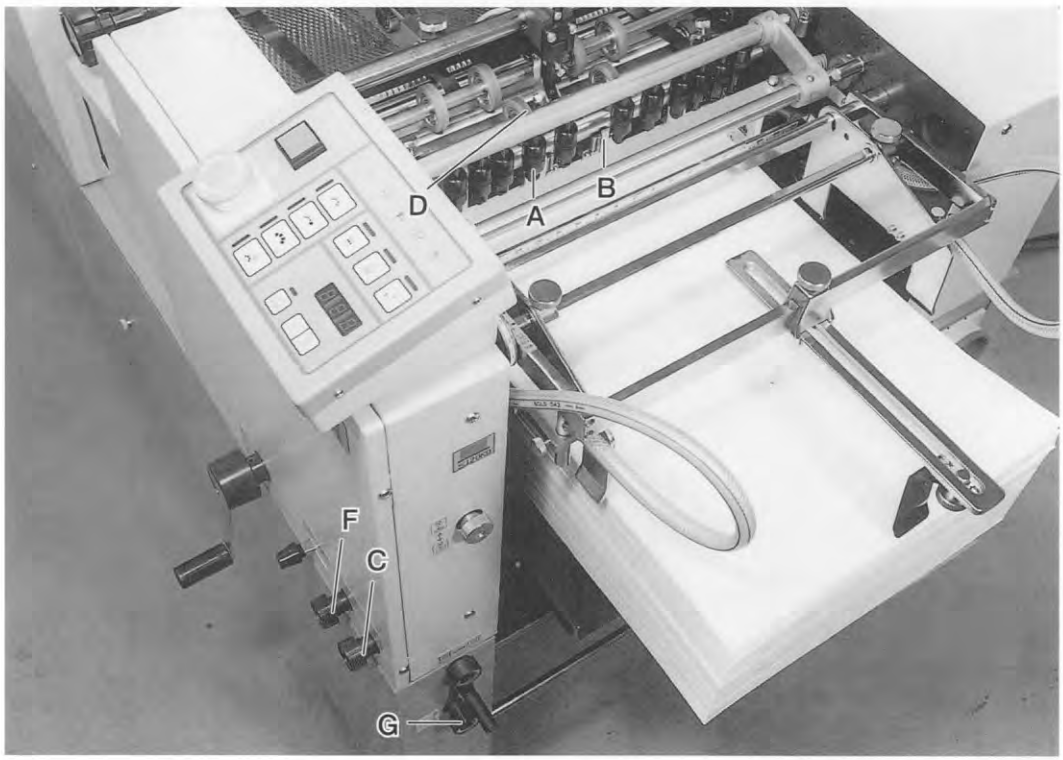
H. Crank handle
This handle is used to raise or lower the paper feed table.
- direction ... The paper feed table will be raised.
- direction ... The paper feed table will be lowered.

I. Release lever
- position... While the machine is running, the paper feed table will be raised automatically.
- position... Stops the paper feed table automatic elevation. To manually lower the paper feed table, set the release lever at this position and turn the crank handle.

J. Height control knob
This is used to set the height of the paper pile during the printing.
- direction ... The paper pile height will be raised.
- direction ... The paper pile height will be lowered.

2) Feeder

(Note) For the explanation, the cover is removed in the photograph.



A. Suction feet
They pick up the sheet of paper and feed it to the pull-out roller.

B. Sheet separator
This prevents double sheet feeding.

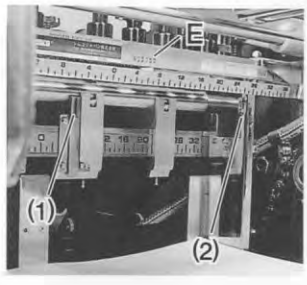
C. Vacuum control knob
This knob is for controlling the vacuum of the suction feet.

D. Pull-out roller
This roller feeds the paper sent out by the suction feet onto the feeder board.

E. Static eliminator
This is used to prevent poor paper feed caused by electrostatic that is generated on the paper during the printing. The static eliminator will automatically go ON and OFF when the pump switch is turned ON or OFF.

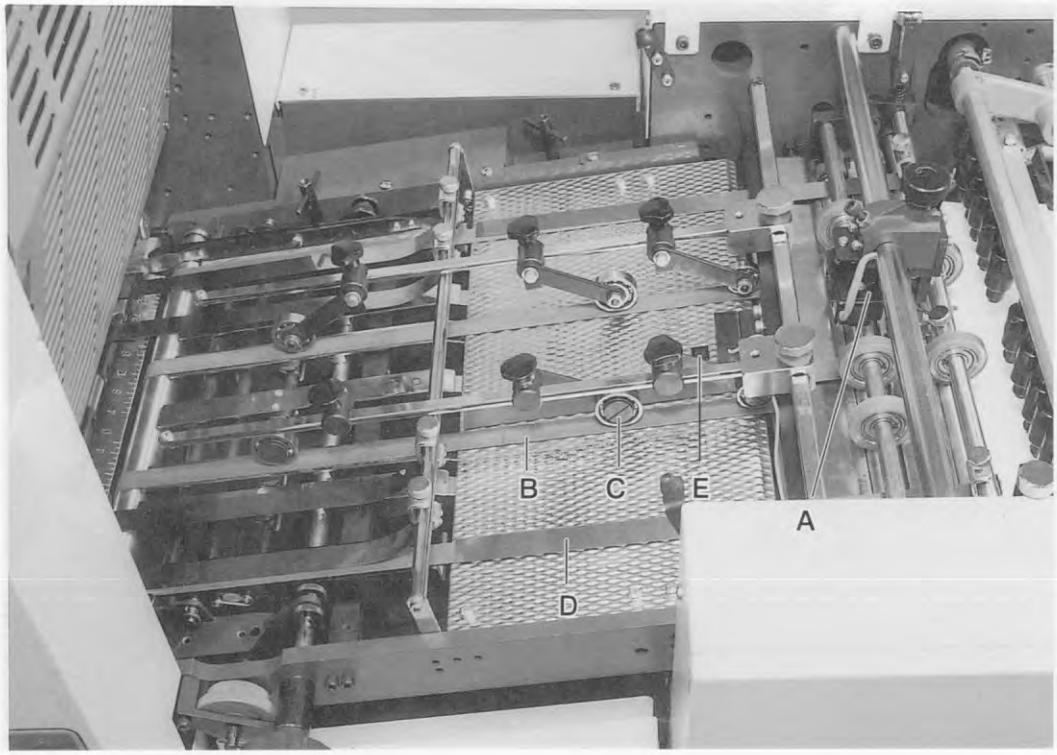
F. Blower control knob
This knob is for controlling the blower volume from the blower nozzle (1).

G. Auxiliary side blower control knob
This knob is for controlling the blower volume from the blower nozzle (2).



3) Double Sheet Detector, Feeder Board

(Note) For the explanation, the cover is removed in the photograph.



A. Mechanical type double sheet detector
When a double sheet is fed, the stop finger will rise and stop the paper on the feeder board.

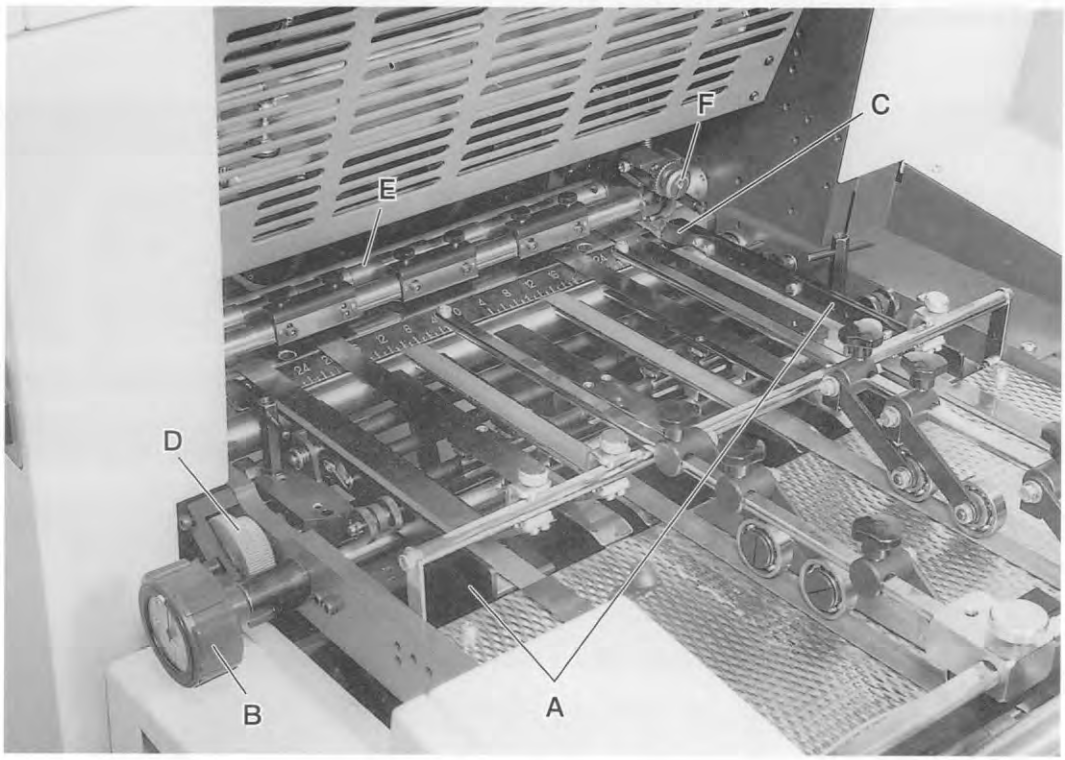
B. Board tape
These carry the paper sent out by the pull-out roller to the stop finger.

C. Skid roller
This is set on the board tape, and prevents bounce back when a sheet of paper contacts the stop finger.

D. Retainer
This guides the paper on the feeder board up to the paper stop finger without allowing the sheet to curl or float up from the feeder board.

E. Paper feed sensor
This detects the paper feed timing to prevent a paper feed jam from occurring and it also controls the plate cylinder and impression cylinder ON/OFF.

4) Push Guide, Upper Feed Roller



A. Push side guide
This aligns the lateral position of the paper.

B. Push side guide adjustment dial
When turning this dial, the push side guide will move laterally. Use this when adjusting the lateral position of the image on the paper.

C. Flat spring
This is used to keep the lateral registration stable by using the spring pressure to push the paper against the push side guide.

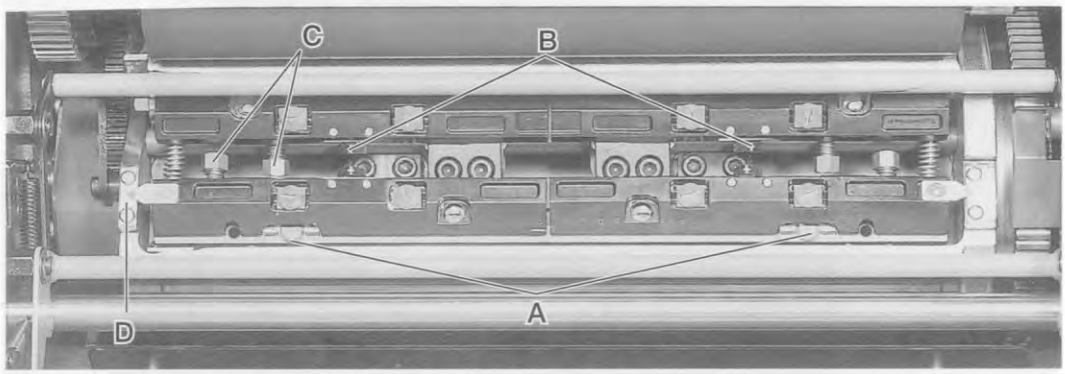
D. Flat spring micro adjustment knob
This is used to micro adjust the lateral position of the flat spring.

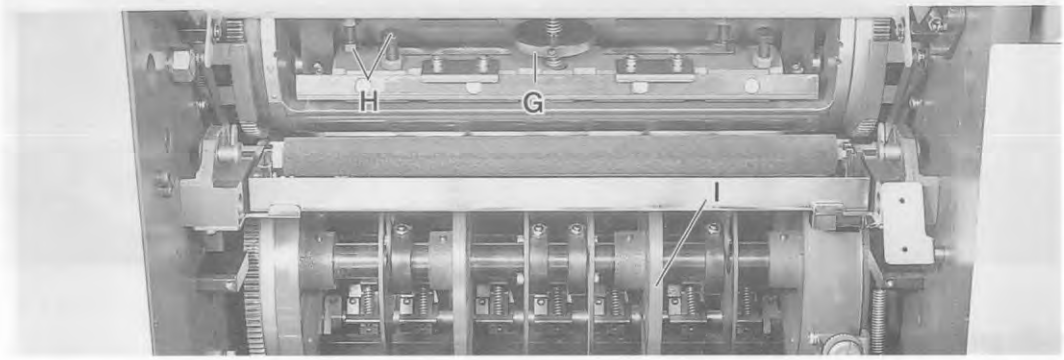
E. Upper feed roller
This feeds a sheet of the paper into the paper feed drum grippers.

F. Upper feed roller rotation control knob
This is used to control the upper feed roller rotation volume that feeds a sheet of paper to the paper feed drum.
The standard rotation volume is 1 1/4-1 1/2 rotations with the lower feed roller in contact.

2-8 Printing Section

1) Plate Cylinder, Blanket Cylinder, Paper Feed Drum





A. Plate positioning pin
The pins allow the plate to be set at the correct position.

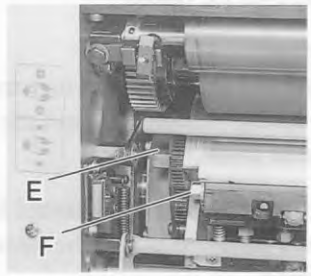
B. Plate clamp bolt
The clamp opens and closes by turning this bolt. The yellow mark on the bolt indicates that the clamp is open and the red mark indicates that the clamp is closed.

C. Plate tensioning bolt
This bolt is used to tension the plate.

D. Plate clamp positioning scale
These scales are used when setting the clamp parallel to the cylinder, or when doing the diagonal adjustment of the plate.

E. Quick tension bolt
This bolt is used to tension the plate.

F. Diagonal position adjustment bolt
This bolt is used to center the clamp, or to do the diagonal adjustment of the plate.

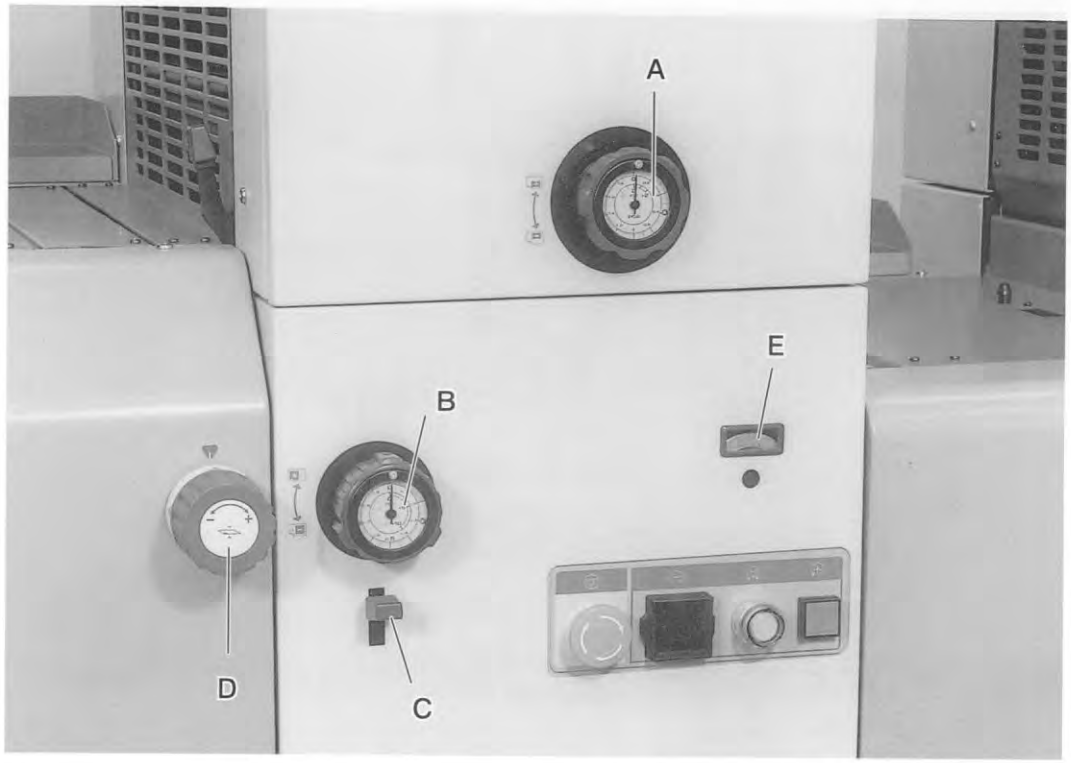


G. Tension knob
This knob is used to tension the blanket.

H. Blanket tension bolt
The blanket tension on both edges is equal by using the two bolts on the leading edge and tail edge.

I. Paper feed drum
This drum is the transfer drum that feeds the paper to the impression cylinder.

2) Image Micro Adjustment Device, Impression Pressure and Plate Pressure Adjustment Device



A. Plate cylinder lateral image micro adjustment dial
This dial is used when adjusting the image in the lateral direction by moving each unit plate cylinder. When turning it in the clockwise direction, the image will move toward the operation side.

B. Vertical image micro adjustment dial
This dial is used when adjusting the image on each unit in the vertical direction.
When turning it in the clockwise direction, the image will move toward the leading edge.

C. Clutch lever
When using the vertical image micro adjustment dial on each unit, push this lever down to engage the clutch.

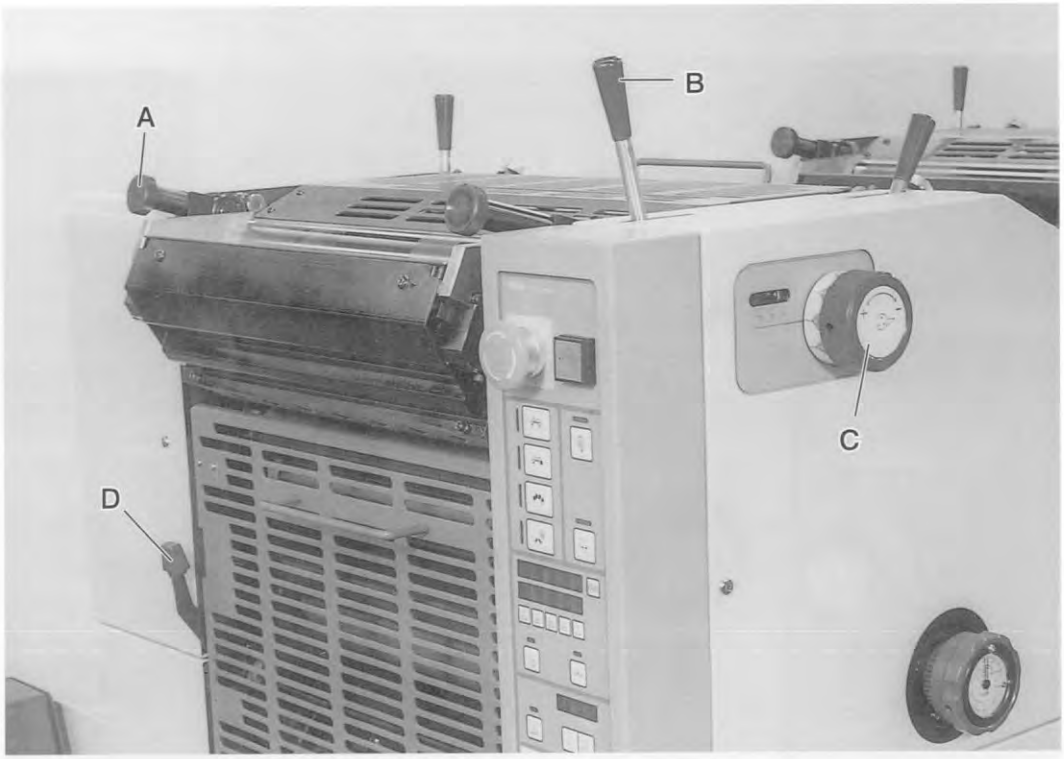
D. Impression pressure adjustment dial
Adjust the impression pressure by turning the dial on each unit. Align the dial graduation to the paper thickness printing on.

E. Plate pressure adjustment scale
This scale is used when adjusting each unit plate pressure. Turn the screw under the plate pressure adjustment scale and then align the scale graduation to the plate thickness to be used.

A. SIDEVEIS

B. FREM/BAK

3) Ink Section



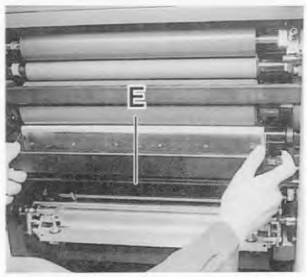
A. Ink fountain fixing knob
This is used to fix the ink fountain.

B. Ink fountain roller lever
This lever is used for manually rotating the ink fountain roller.

C. Ink feeding volume control dial
This dial is used to control the total ink feeding volume steplessly.

D. Ink roller cleaning lever
This lever is used when cleaning the ink rollers.

E. Ink roller cleanup attachment
The ink on the rollers is cleaned by using this ink roller cleanup attachment.

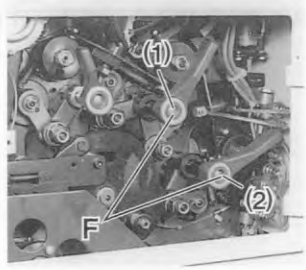


F. Ink form roller release lever

position ...The ink form roller is always separated (OFF) from the plate surface. Set the lever at this position when the machine will not be used for a long period.

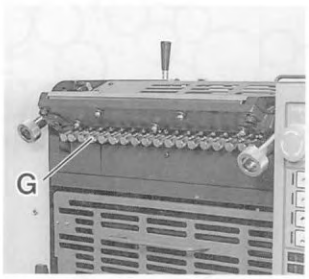
position ...The ON/OFF of the ink form roller on the plate surface is controlled by the water and ink form roller ON button and the water and ink form roller OFF button. When printing, set the lever at this position.

(1) ...Ink first form roller and second form roller
(2) ...Ink third form roller

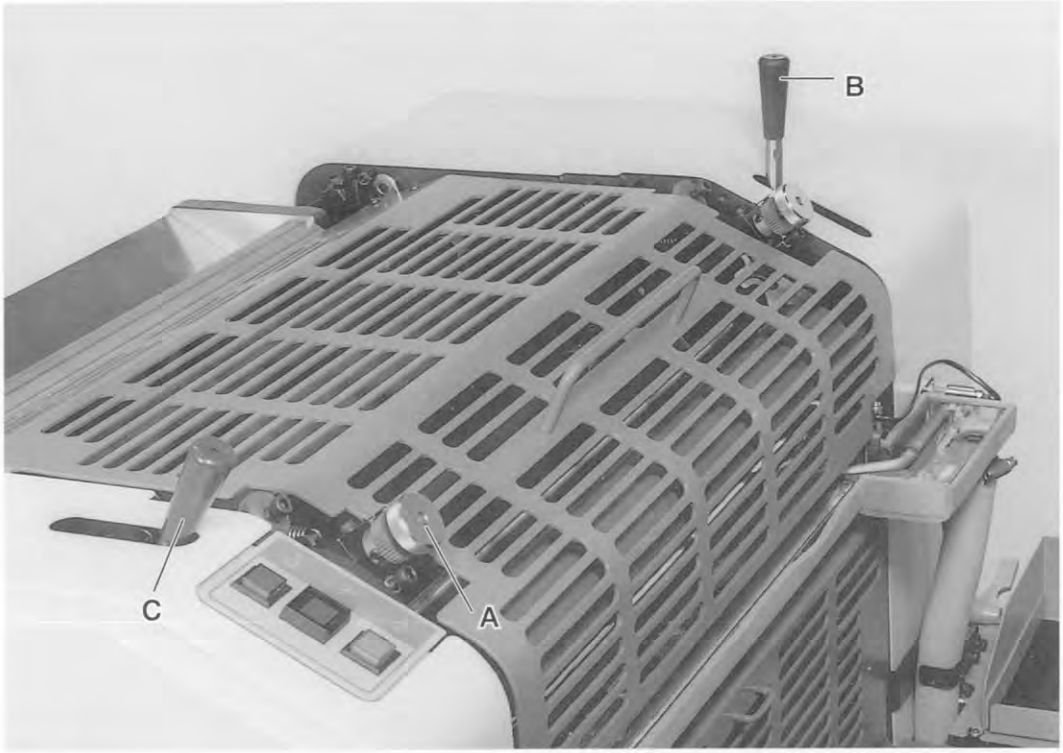


. Ink feeding volume control screw (without RYOBI PCS-F)

These are used to control the ink feeding volume partially based on the printed image.



4) Water Section



A. Metering roller pressure adjustment knob

This knob is used to adjust the pressure between the metering roller and water fountain roller.

B. Metering roller release lever

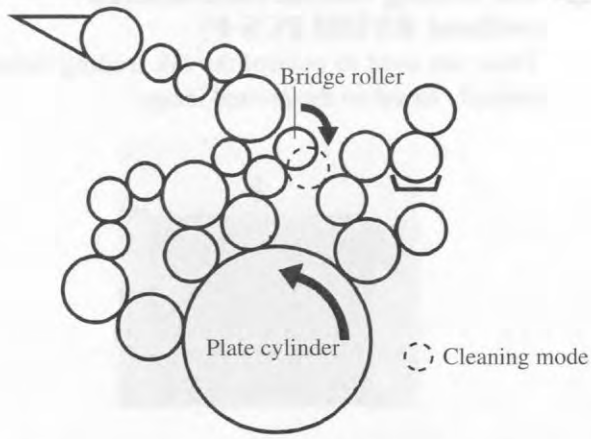
position ... The metering roller is always separated from the water fountain roller and water oscillating roller. The squeeze roller is separated from the water fountain roller.

position ... The metering roller contacts the water fountain roller and water oscillating roller. The squeeze roller contacts the water fountain roller. When printing, set the lever at this position.

C. Water roller cleaning lever

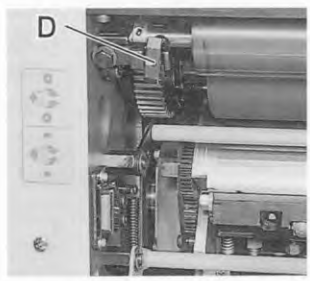
position ... The bridge roller contacts the water oscillating roller. Set the lever at this position to clean the water form roller and water rider oscillating roller. (When setting the lever at this position, the water roller cleaning lever ON button lights and the printing cannot to be done.)

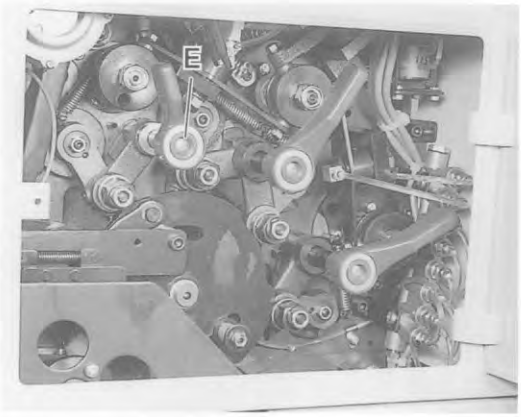
position ... The bridge roller is always separated from the water oscillating roller. When printing, set the lever at this position.

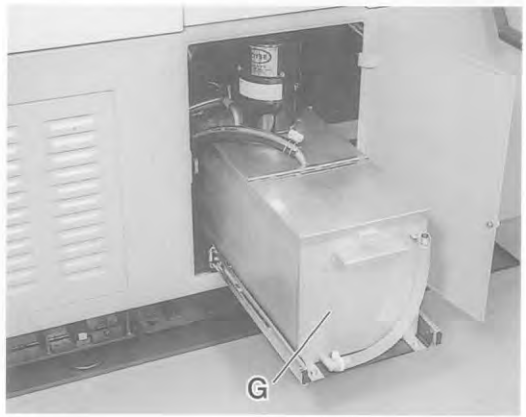


D. Water oscillating roller release knob

This knob is used to separate the water oscillating roller from the water form roller and to contact it with the water form roller. This knob is located on the operation side and non operaion side.







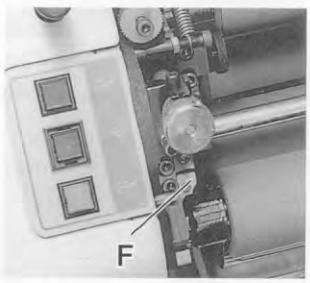
E. Water form roller release lever

position ... The water form roller is always separated (OFF) from the plate surface. Set the lever at this position, when the machine will not be used for a long period.

position ... The ON/OFF of the water form roller on the plate surface is controlled by the water and ink form roller ON button and the water and ink form roller OFF button. When printing, set the lever at this position.

F. Water control wiper

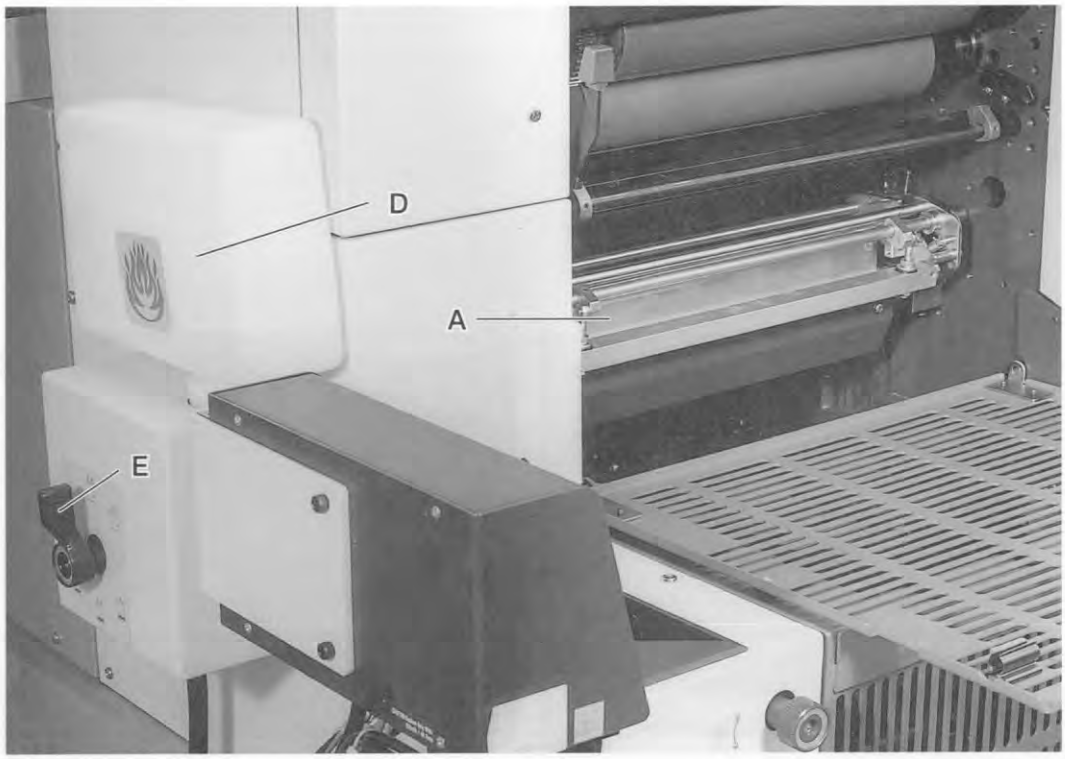
This wiper is used to return the excess dampening solution to the water fountain to assure a stable dampening solution supply from the metering roller to the water oscillating roller.



G. Dampening solution circulation device

By circulating and filtering the dampening solution, it keeps the condition of the dampening solution stable.

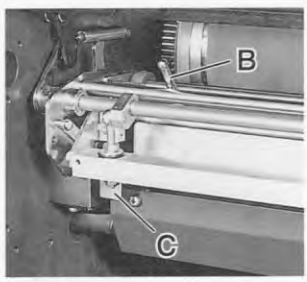
5) Blanket cleaning device



A. Blanket cleaning device
When pushing the blanket cleaning button, the device will clean the blanket automatically.

B. Roller release lever
When shifting this lever to the blanket cylinder side, the cleaning roller and squeeze roller will be released.

C. Sponge roller rotation lever
When pushing this lever, the sponge roller will be rotated and the clean part of the sponge roller can be positioned to contact the cleaning roller.

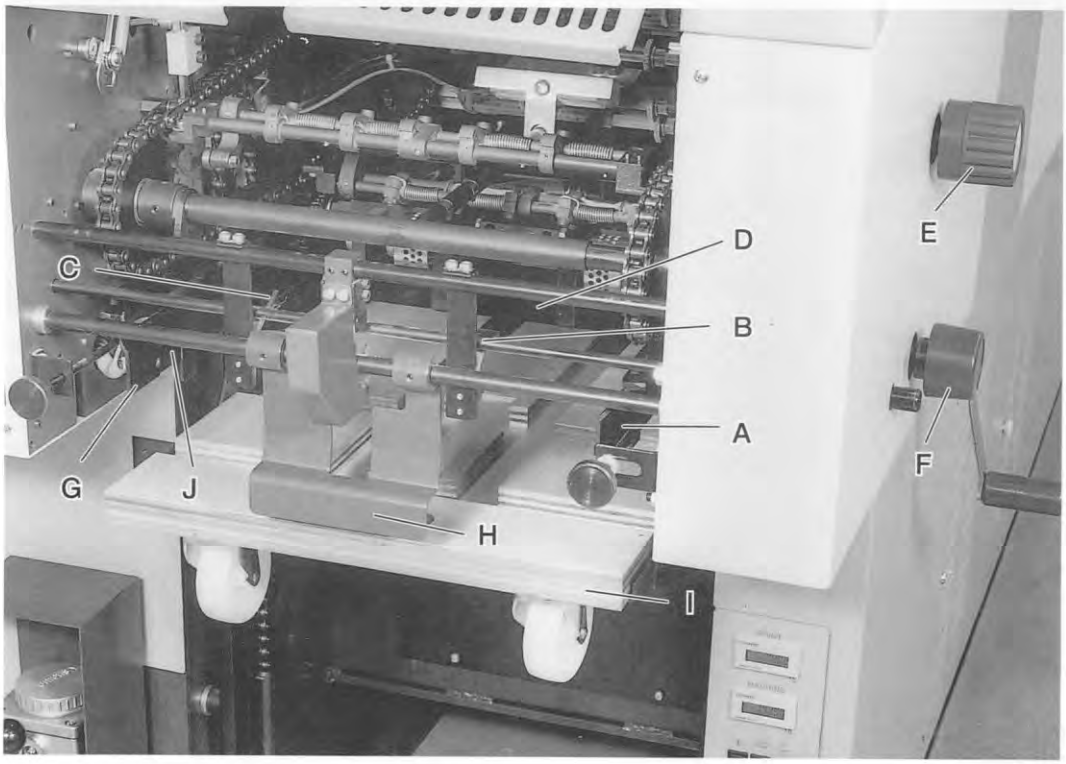


D. Blanket cleaning solution bottle
This bottle is the container that holds the blanket cleaning solution.

E. Blanket cleaning solution changeover lever
- 1 ...The blanket cleaning solution is supplied to the first blanket cleaning device.
- 2 ...The blanket cleaning solution is supplied to the second blanket cleaning device.
- 12 ...The blanket cleaning solution is supplied to both the first and second blanket cleaning devices.
- 1 ...The blanket cleaning solution is drained from the first blanket cleaning device.
- 2 ...The blanket cleaning solution is drained from the second blanket cleaning device.
- 12 ...The blanket cleaning solution is drained from both the first and second blanket cleaning devices.
- 3 ...The blanket cleaning solution is supplied to the third blanket cleaning device.
- 4 ...The blanket cleaning solution is supplied to the fourth blanket cleaning device.
- 34 ...The blanket cleaning solution is supplied to both the third and fourth blanket cleaning devices.
- 3 ...The blanket cleaning solution is drai from the third blanket cleaning device.
- 4 ...The blanket cleaning solution is drained from the fourth blanket cleaning device.
- 34 ...The blanket cleaning solution is drained from both the third and fourth blanket cleaning devices.

2-9 Delivery Section

1) Delivery Guides



A. Side jogger
This guide jogs to even up the sides of the printed sheets delivered onto the delivery table dolly.

B. Paper drop
This drops the printed sheet of paper onto the delivery pile after it is released by the delivery grippers.

C. Delivery jam detector
When a delivery jam occurs, it will stop the machine. After removing the paper, the machine can be run again.

D. Back guide
This is the fixed guide that is used to align the tail edge of the sheets delivered.

E. Back guide set knob
This knob is used to set the back guide position.

F. Crank handle
This handle is used to raise or lower the delivery table dolly.

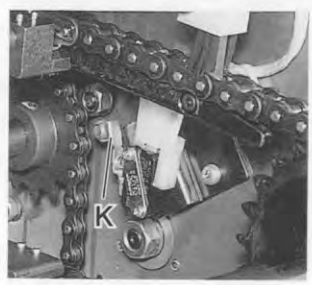
G. Side guide
This is the fixed guide that is used to set the lateral position of the sheets delivered.

H. Front guide
This is the jogger guide that is used to align the vertical position of the sheets delivered.

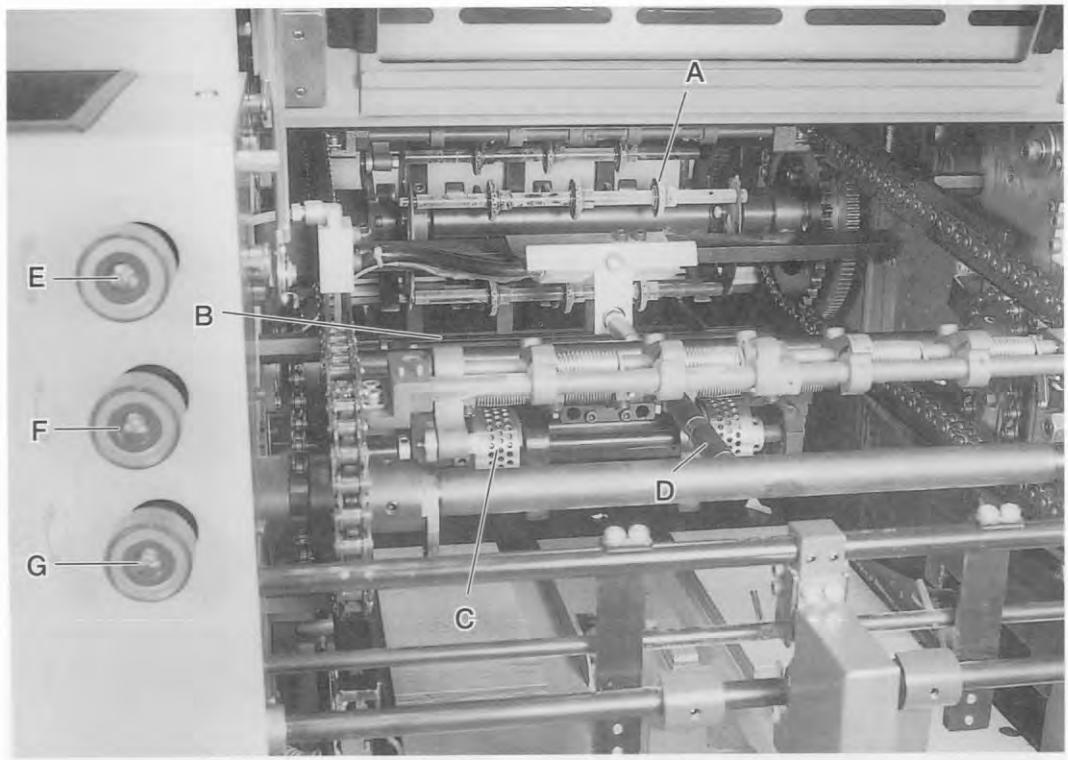
I. Delivery table dolly
The delivered sheets of paper are piled on this dolly.

J. Delivery pile lowering sensor
This sensor detects the height of the delivered sheets. When the pile reaches the specified height, the delivery table dolly is lowered automatically.

K. Delivery table dolly lower limit switch
When the delivery table dolly is fully lowered, the paper feed will stop automatically.



2) Rotary Guide, Suction Wheel, Delivery Air Blower



A. Rotary guide
This guide is used to deliver the printed sheet of paper to the chain delivery gripper from the impression cylinder gripper.

B. Decurling device (→ P.182)

C. Suction wheel
This device holds the tail edge of the delivered sheet, and assures the stable delivery.

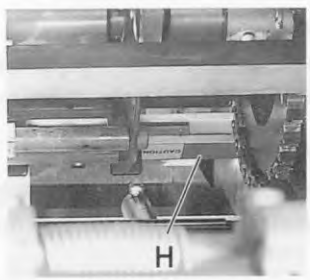
D. Delivery air blower
The force of the air from the air blower drops the sheet of paper that is released by the delivery grippers onto the pile.

E. Suction wheel control knob
This knob is used to control the suction wheel vacuum volume. When turning it in the clockwise direction, the vacuum will be increased.

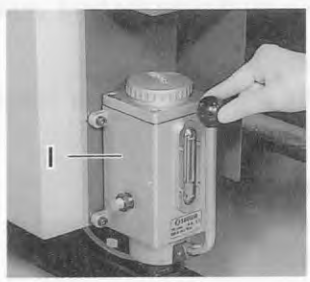
F. Delivery air blower control knob
This knob is used to control the delivery air blower volume. When turning it in the clockwise direction, the blower force will be increased.

G. Decurling device control knob (→ P.182)

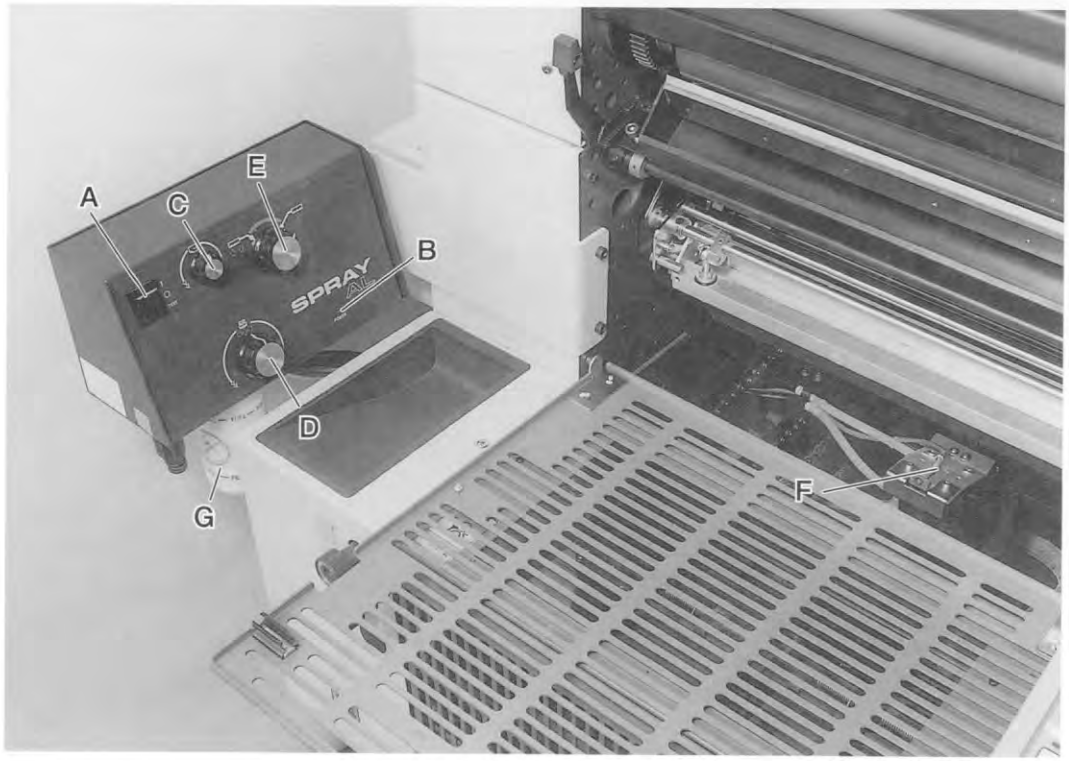
H. Static eliminator
This is used to prevent poor delivery caused by electrostatic that is generated on the paper during the printing. The static eliminator will automatically go ON and OFF when the pump button is ON or OFF.



I. Centralized oiling system
Pull the centralized oiling pump lever and release it after 2 to 3 seconds and the oil will be supplied. Pull the lever 2 to 3 times before running the machine.



3) Powder Spray Device



A. Spray switch

This is the spray powder device power switch.

| position ..... The device will operate during the paper feeding. When printing and using the device, generally set the switch at this position.

○ position ..... The device will not operate.

TEST position ... The device will operate continuously and spray the powder even when the paper does not pass.

B. Power lamp

This is the lamp that indicates the operation condition of the spray powder device.

C. Spray time adjustment knob

This is used to adjust the powder spray time during 1 rotation of the cylinders.

When turning it in the counterclockwise direction, the spray time will be increased and the spray area will be longer.

D. Spray volume control knob

This is used to control the powder spray volume.

When turning it in the counterclockwise direction, the spray volume will be increased. To prevent possible trouble, please control the spray volume to keep it at the minimum necessary.

E. Spray nozzle changeover knob

This is used to set the spray unit on either small size (position) or A3 size (position) depending on the paper size to be printed.

F. Spray unit

This is the unit that sprays the powder on the printed sheet of paper.

The lamp (1) lights while the powder is sprayed.

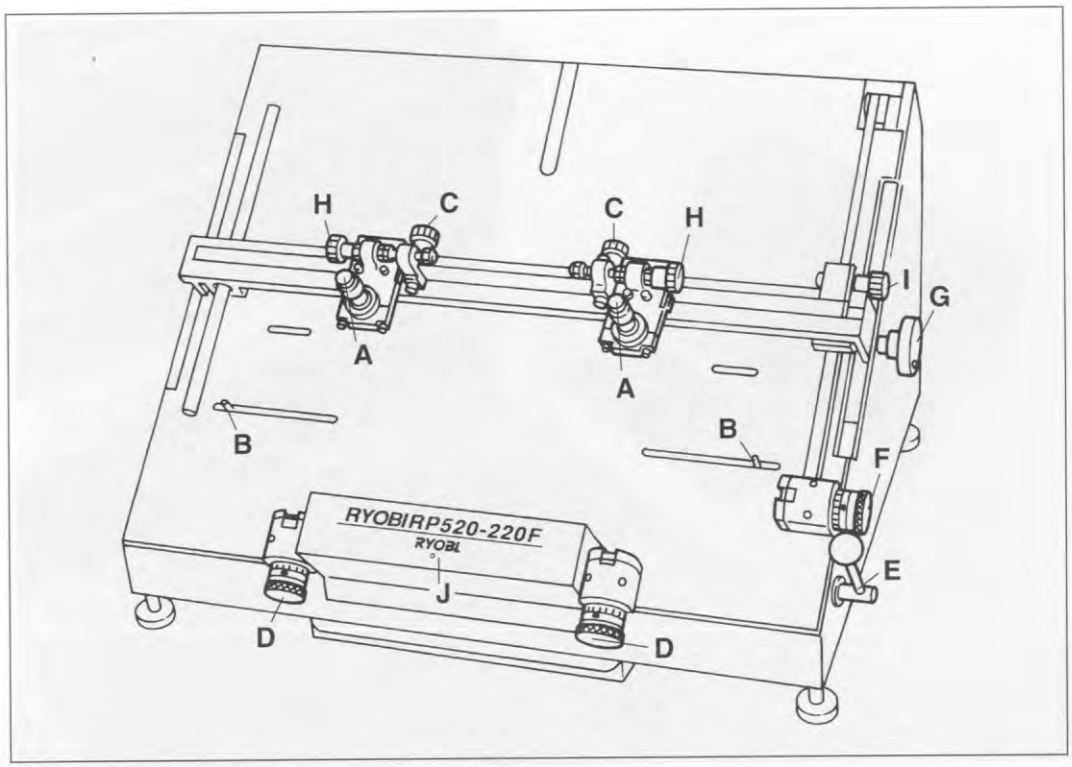


G. Powder bottle

Put the spray powder in this bottle.

Do not fill the powder over the FULL line. Supply the powder before the powder level falls below the FILL line.

2-10 RYOBI RP520-220F



A. Magnifying glass
There is a register mark in the magnifying glass. Align it with the plate register mark position.

B. Lateral positioning pin
Contact the pins on the plate edge lightly to set the lateral position of the plate.

C. Magnifying glass block fixing knob
This knob is used to fix the magnifying glass block.

D. Vertical image micro adjustment knob
This knob is used to do the micro adjustment of the plate in the vertical direction.

E. Punch lever
When shifting the lever, a punch hole is made in the plate.

F. Lateral image micro adjustment knob
This knob is used to do the micro adjustment of the plate in the lateral direction.

G. Slide bar vertical micro adjustment knob
This knob is used to do the micro adjustment of the slide bar in the vertical direction.

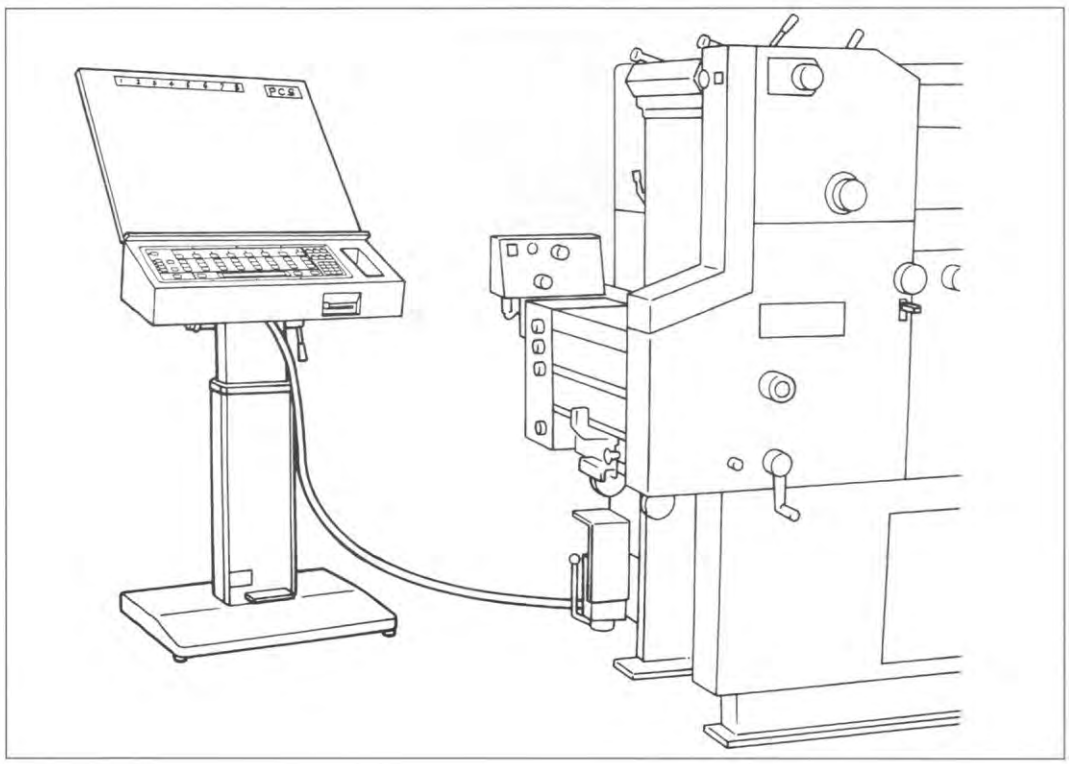
H. Magnifying glass lateral micro adjustment knob
This knob is used to do the micro adjustment of the magnifying glass in the lateral direction.

I. Slide bar fixing knob
This knob is used to fix the slide bar.

J. Lamp
This lamp lights when the metal plate is set correctly.

2-11 RYOBI PCS-F

1) Outline

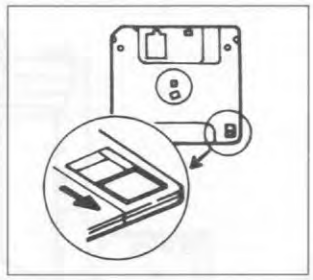


This device is made up of the remote control ink fountain and operation stand. With the input from the operation stand, the remote control opening and closing of each ink fountain key is done.
The ink fountain key opening and closing data can be written in the floppy disk. This data can be read again, and is used to preset the ink fountain key.

(Note) 1. Route the piping and electrical wiring properly between the press and operation stand so as not to obstruct the operators working around the machine. Please fix the cables with the cable cover.
2. For the place where the RYOBI PCS-F is installed, please prepare a light of over 1,500 lux.
3. The LCD "Liquid Crystal Display" is used for the message indication on the operation stand, therefore do not install the operation stand in a place with a high temperature (over 35°C (95°F)) and high humidity. If it is used under such conditions, the image brightness of the display may not be equal.

[Handling of the floppy disk]

1. While the lamp of the floppy disk drive is lights, do not take out the floppy disk. If taking it out, the data on the disk may be damaged.
2. When opening the notch of the floppy disk, the data can not be erased or written over.



3. The data before power is turned OFF is kept in the inside memory on the RYOBI PCS-F, but the data may be erased.
   At this time, the following message is indicated.

```
INTERNAL DATA IS BROKEN
PRESS ESC KEY
```

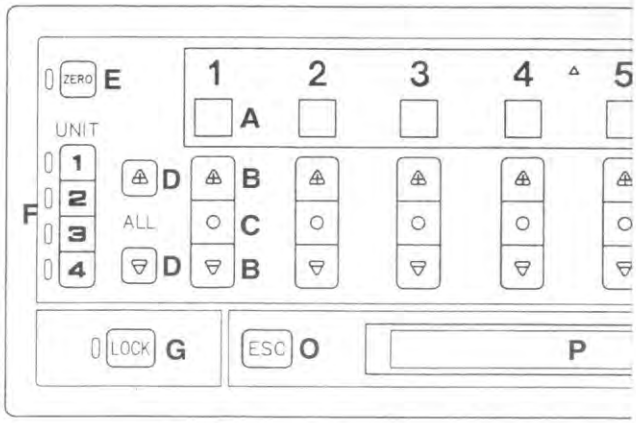
   Please copy the important data onto a floppy disk.
4. Be careful not to allow ink to adhere on the floppy disk. If a floppy disk with ink adhered is used, the floppy disk drive trouble will result.

[Handling of the liquid crystal display]

The liquid crystal display (LCD) is used for the message indication on the operation stand. Please be careful of the following points.

1. **⚠ CAUTION**
   If the liquid inside the LCD flows out caused by the display breakage, avoid contact with skin. Failure to follow this instruction may result in an injury.
2. Due to the properties of the LCD, there may be times when a point of the LCD always lights or goes off. (However, this is not trouble.)
3. If the same message is displayed for a long period, the reflection may be slightly left on the display. If this happens, turn the power OFF once and after a few minutes, turn the power ON again, and the display should return to the normal condition.
4. Never leave anything on the display surface or place strong shocks on it.

2) Ink Fountain Manual Operation Pa



A. Ink fountain key opening volume indication

Each ink fountain key opening volume is indicated by the digital display.

B. Ink fountain key opening and closing button

This is used when adjusting the opening and closing volume of each ink fountain key.

When pushing the △ button, each ink fountain key on the selected unit will open and increase the ink volume.

When pushing the ▽ button, the ink fountain key on the selected unit will close and reduce the ink volume.

C. Ink fountain key lock button

When pushing this button, the lamp will light. Even when pushing the ink fountain key opening and closing button (B) in the key alignment, the ink fountain key will not open or close. And when pushing the button again, the lamp will go off and the lock will be released.

D. Ink fountain key total opening and closing button

This button is used when adjusting the opening and closing volume of all the ink fountain keys at the same time.

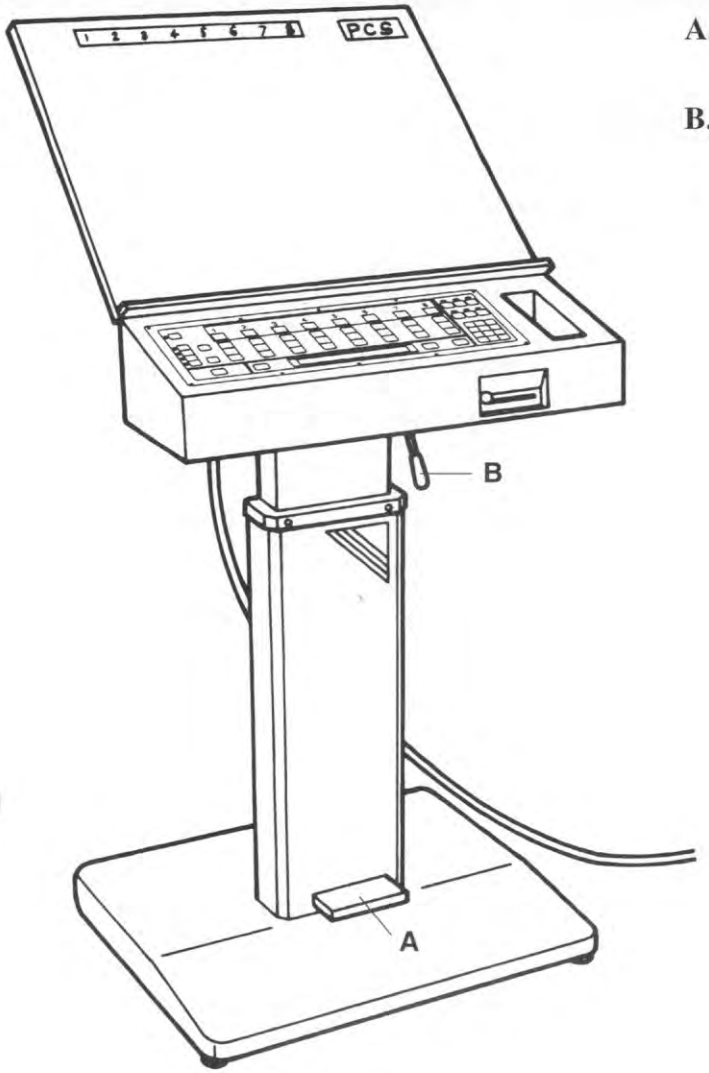
When pushing the △ button, all the ink fountain keys on the selected unit will open.

When pushing the ▽ button, all the ink fountain keys on the selected unit will close.

E. Ink fountain key 0 point reset button

When pushing this button, the lamp will light. In this condition, when pushing the unit selection button (F) and next pushing the YES button, all the ink fountain keys on the selected unit return the 0 point.

3) Stand Section



A. Height adjustment pedal
Height of the inspection table can be adjusted.

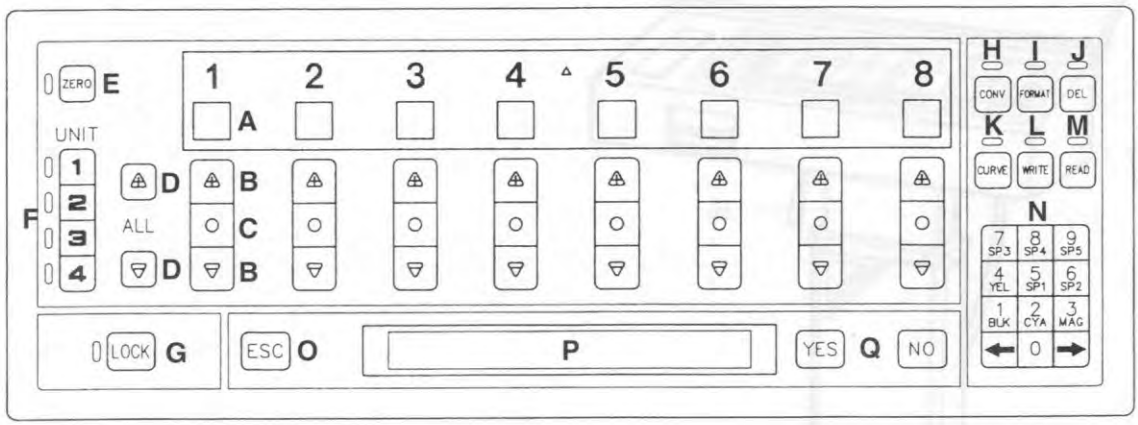
B. Angle adjustment lever
Angle of the inspection table can be adjusted and fixed.

4) Operation Procedures

(Reference) When the following operation process is indicated in the message indication, the contents are explained in the [ ]. Please refer to this.

1. Setting the ink fountain key. (Manual operation)

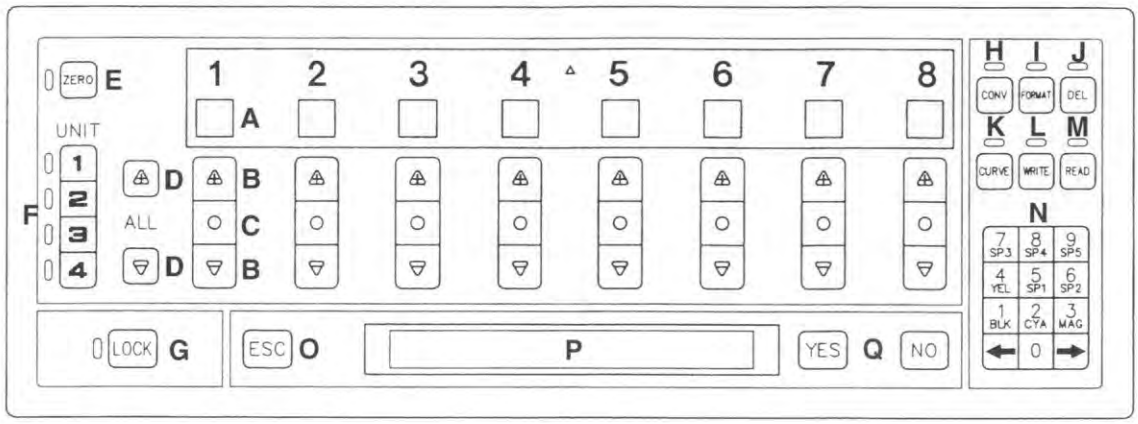
The ink fountain key opening volume setting data can be saved on a floppy disk.



1. Check that each button (H through M) on the ink fountain preset panel is OFF.
2. Check that the lock button (G) is OFF.
3. Select the unit by using the unit selection button (F).
4. Adjust the total ink fountain key opening volume while watching the ink fountain key opening volume indication (A) by using the ink fountain total opening/closing button (D).
5. Adjust each ink fountain key opening volume while watching the ink fountain key opening volume indication (A) by using each ink fountain key opening and closing button (B).

2. Formatting the floppy disk

When writing the RYOBI PCS-F data onto a floppy disk, format it by using the RYOBI PCS-F. Writing the data on an unformated floppy disk cannot be done.
Both a 2DD type and 2HD type flopy disk can be used.



1. Check that each button (H through M) on the ink fountain preset panel, ink fountain key 0 point reset button (E), and lock button (G) are OFF.
2. Push the format button (I).

   DISK IS FORMATTED. OK?
   YES OR NO

3. If the formatting is OK, push the [YES] button (Q).

   INSERT DISK AND PRESS YES KEY

4. Insert the floppy disk and push the [YES] button.

   SELECT DISK AND PRESS YES KEY
   1: 2DD(720KB) 2: 2HD(1.44MB)

5. Move the cursor by using the button ([←] or [→]) on the number input button (N). After selecting the floppy disk type used, push the [YES] button.

   ALL SAVED DATA ARE CLEARED. OK?
   YES OR NO

6. If the formatting is OK, push the [YES] button.

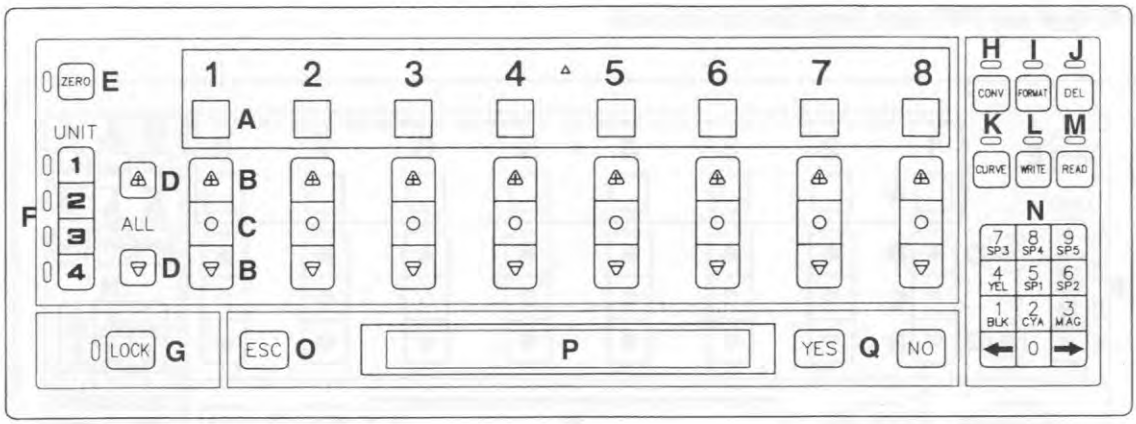
   FORMATTING. WAIT A MINUTE
   [ ]

7. When the formatting is completed, a buzzer will sound 3 times and the lamp on the format button (I) will go OFF automatically.
   The following message is indicated on the message indication for 2 seconds.

   FORMATTING COMPLETED

3. Saving the ink fountain key opening volume

This is the method to save the ink fountain key opening data on the selected total unit.



1. Check that each button (H through M) on the ink fountain preset panel, ink fountain key 0 point reset button (E), and lock button (G) are OFF.
2. Push the data writing button (L).

   INPUT JOB NO. AND PRESS YES KEY
   JOB NO. [ ]

3. Input the job No. by using the number input button (N). The job No. is the number that is used to save and call up the data and can be inputted by using the number from 1 figure to 8 figures. For example, input the "1". Push the [YES] button.

   JOB NO. [1]
   INSERT DISK AND PRESS YES KEY

4. Insert the formatted floppy disk and push the [YES] button.
5. When completing the floppy disk writing, a buzzer will sound 3 times, and the lamp on the data writing button (L) will go OFF automatically.
   The following message is indicated on the message indication for 2 seconds.

   WRITING COMPLETED

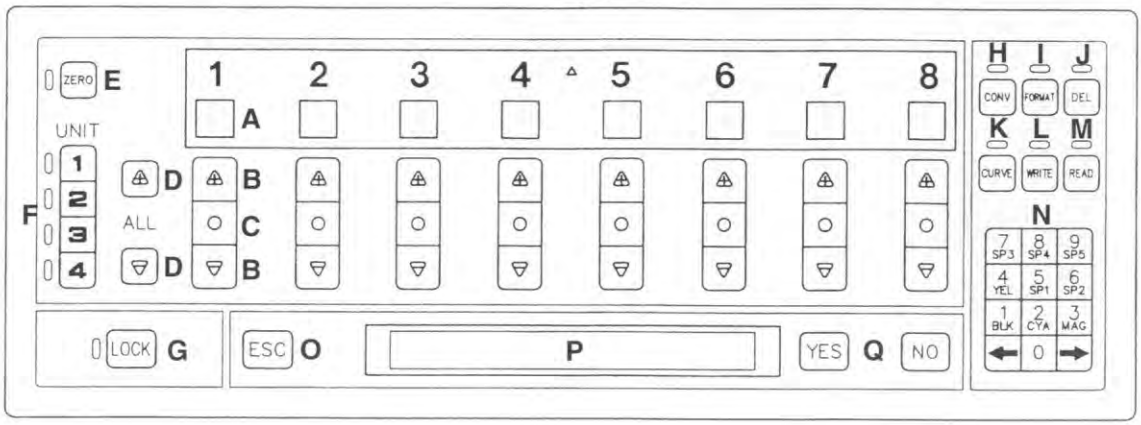
   (Note) If the same job No. is already used on the floppy disk, the following message is indicated on the message indication.

   SAME JOB NO. EXISTS. REWRITING. OK?
   YES OR NO

   - When pushing the [YES] button, the data is written over the old data. (The job No. 1 data on the floppy disk is delated and the new data is memorized for the job No. 1.)
   - When pushing the [NO] button, you can repeat the first process.

4. Read the ink fountain key opening data and preset it

Forward the data read from the floppy disk to each unit to move the ink fountain key.



1. Check that each button (H through M) on the ink fountain preset panel, ink fountain key 0 point reset button (E), and lock button (G) are OFF.
2. Insert the floppy disk with the memorized data and push the data reading button (M).

```
SELECT DATA AND PRESS YES KEY
      1   2   3   4
```

The memorized data job No. is indicated.
For example, the job No. from 1 to 4 is inputted.

3. Move the cursor by using the ← or → button on the number input button (N) and select the data to be read and push the YES button. (For example, select the job No. 2.)

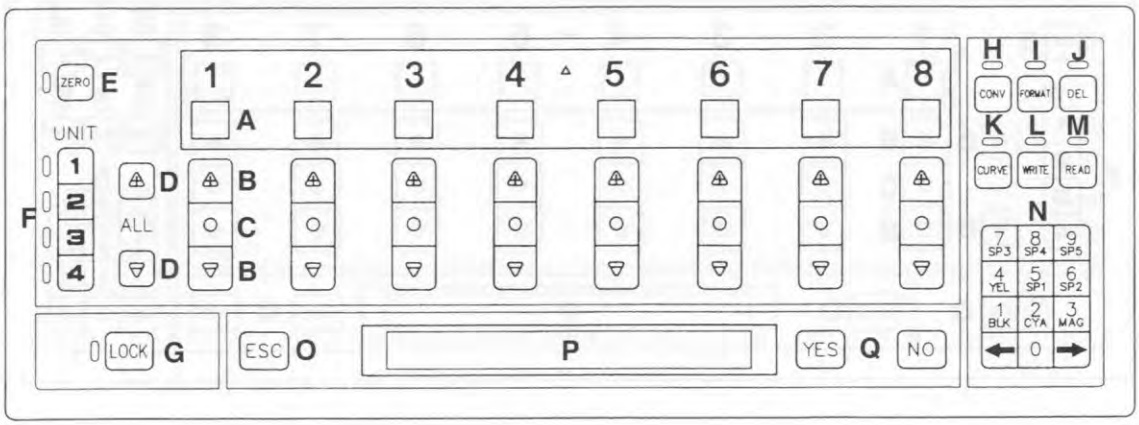
```
2  READING COMPLETE. START OK?
          YES OR NO
```

4. Push the YES button.
5. The lamp on the unit selection button (F) will light in the order and preset the ink fountain opening volume on each unit to the data read.
   During presetting, the following message is indicated on the message indication.

```
SETTING NO.* UNIT INK KEY
```

5. Returning to the ink fountain key 0 point

The ink fountain key opening volume on the unit selected by using the unit selection button can be returned to "0" by using the ink fountain key 0 point reset button.



1. Check that each button (H through M) on the ink fountain preset panel is OFF.
2. Push the ink fountain key 0 point reset button (E).

   ALL INK KEYS ARE CLOSED. SELECT UNIT

3. Select the units that you want to return the ink fountain key opening volume to 0 by using unit selection button. (At this time, you can select all units from the first to fourth unit.)

   ALL SELECTED INK KEYS ARE CLOSED
   YES OR NO

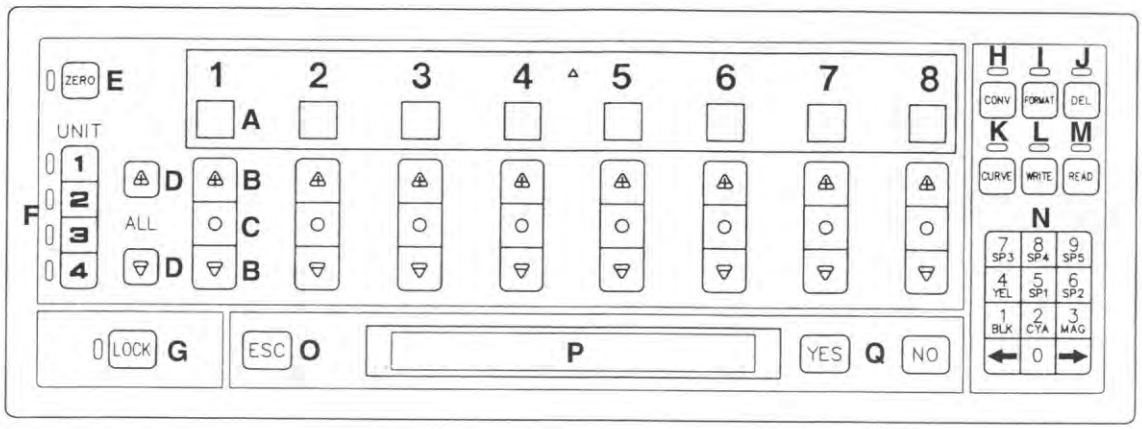
4. Push the YES button to return the ink fountain key on the selected unit to 0 in order automatically. At this time, the following message is indicated on the message indication.

   ALL NO.* UNIT INK KEYS ARE CLOSED
   WAIT A MINUTE

5. When completed, the lamp on the ink fountain key 0 point reset button (E) will go OFF automatically.

6. Copying of the multiple input of the same ink fountain key opening data

You can copy the ink fountain key opening data on the indicated unit to the other units.



1. Check that each button (H through M) on the ink fountain preset panel, ink fountain key 0 point reset button (E), and lock button (G) are OFF.
2. Push the convert button (H).

   DATA IS COPIED TO OTHER UNITS. OK?
   YES OR NO

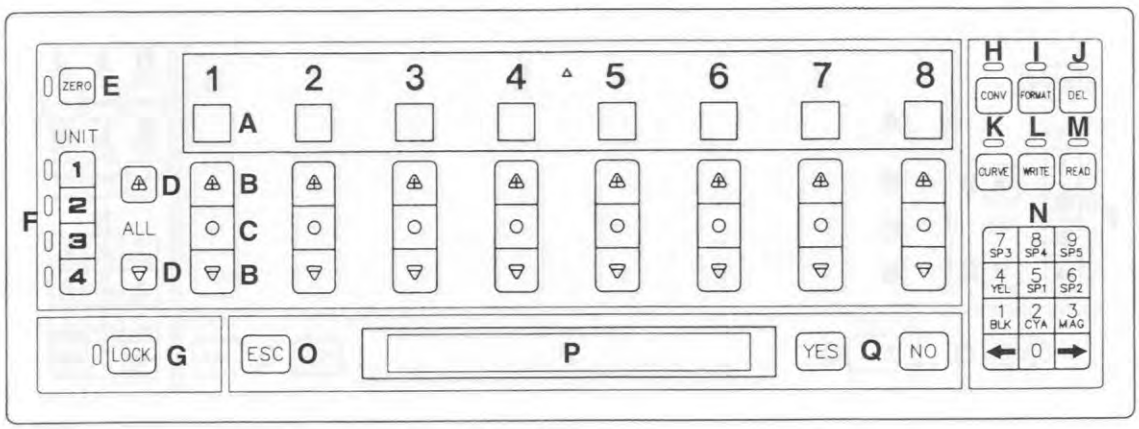
3. Push the YES button.
   The lamp on the setting unit selection button (F) will light in order and the following message is indicated on the message indication (P).

   SETTING NO.* UNIT INK KEY

4. When completing the copying, a buzzer will sound 3 times and the lamp on the convert button (H) will go OFF automatically.

7. Deleting the data from the floppy disk

You can delete any unnecessary data from the floppy disk.



1. Check that each button (H through M) on the ink fountain preset panel, ink fountain key 0 point reset button (E), and lock button (G) are OFF.
2. Insert the floppy disk including the data you want to delete and push the data clear button (J).

   SELECT DATA AND PRESS YES KEY
   1 2 3 4

   The job No. of the memorized data is indicated.
   For example, the job No. from 1 to 4 is inputted.

3. Move the cursor by using the ← or → button on the number input button (N) and select the data you want to delete and push the YES button. (For example, select the job No. 1.)

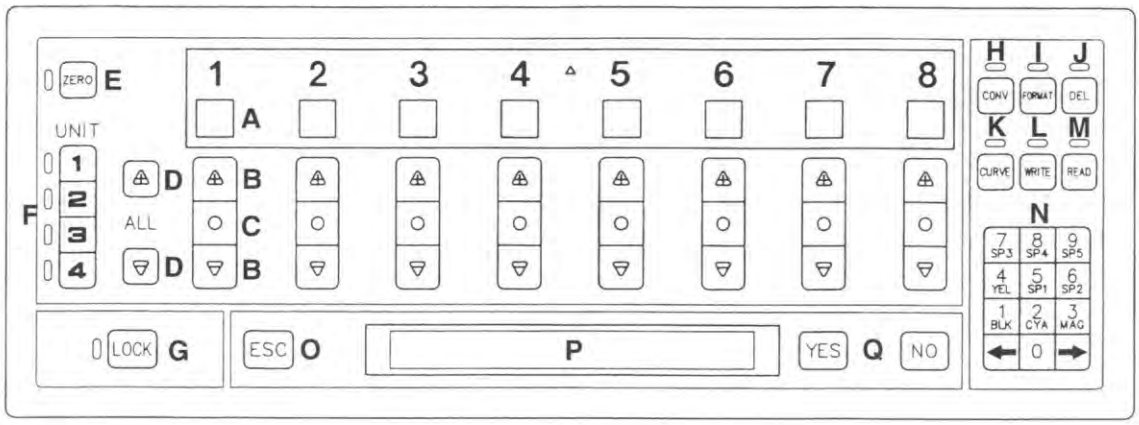
   1 IS ERASED. OK?
   YES OR NO

4. When pushing the YES button, the data deletion starts.
   When completed, the lamp on the data clear button (J) will go OFF automatically. The following message is indicated on the message indication (P) for 2 seconds.

   DATA ERASING COMPLETED

8. Setting the color and conversion curve number for each unit

The inside memory on the RYOBI PCS-F has 31 kinds of conversion curve that convert the image area percentage of the plate to the ink fountain key opening volume.
You can set the ink color used on each unit and the conversion curve number.
When inputting the data of the device for measuring image area of plate (DEMIA), the conversion curve number is used.



1. Check that each button (H through M) on the ink fountain preset panel, ink fountain key 0 point reset button (E), and lock button (G) are OFF.
2. Push the color/conversion curve number set button (K).

NO.1 UNIT	NO.2 UNIT	NO.3 UNIT	NO.4 UNIT
[CYA. 3]	[MAG. 1]	[BLK. 1]	[YEL. 6]

3. Set the color on each unit by using the number input button (N). Set each color input by using the following button. Move the cursor by using the ← or → button.

   1 ... Black (BLK)
   2 ... Cyan (CYA)
   3 ... Magenta (MAG)
   4 ... Yellow (YEL)
   5 through 9 ... Special color

4. Set the conversion curve number on each unit.
   For the relationship between the image area percentage of the plate of setting conversion curve number to the ink fountain key opening volume, please refer to the table in the next page.

5. When completing the setting, push the YES button.
   The following message is indicated on the message indication (P) and the lamp on the color/conversion curve number set button (K) will go OFF.

   SETTING COMPLETE

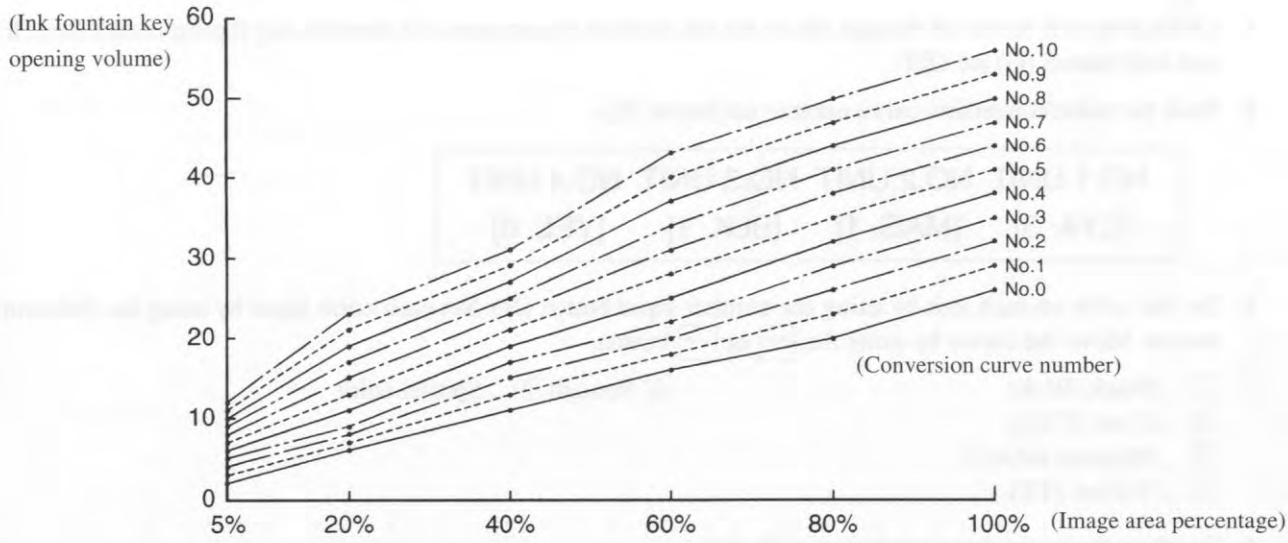
(Note) When setting the color, you cannot set the same color on any other units. If doing this, the following message is indicated on the message indication.

WRONG COLOR SETTING. PRESS ESC KEY

[The relationship between image area percentage of the plate of setting conversion curve number to the ink fountain key opening volume]

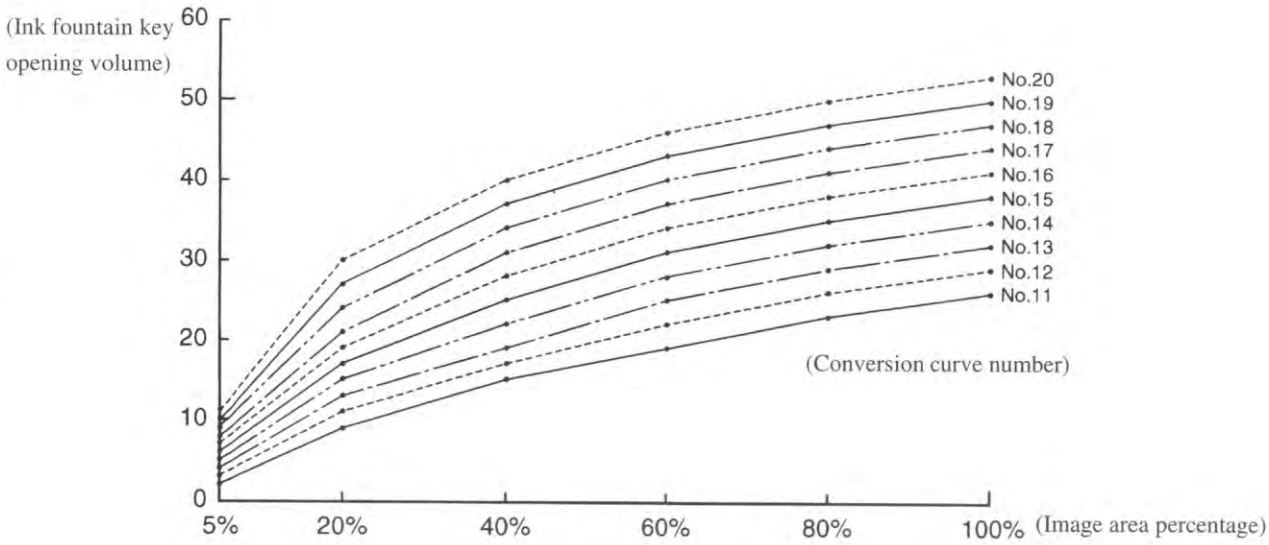
1) Normal image

Conversion curve number \ Image area percentage	5%	20%	40%	60%	80%	100%
0	2	6	11	16	20	26
1	3	7	13	18	23	29
2	4	8	15	20	26	32
3	5	9	17	22	29	35
4	6	11	19	25	32	38
5	7	13	21	28	35	41
6	8	15	23	31	38	44
7	9	17	25	34	41	47
8	10	19	27	37	44	50
9	11	21	29	40	47	53
10	12	23	31	43	50	56



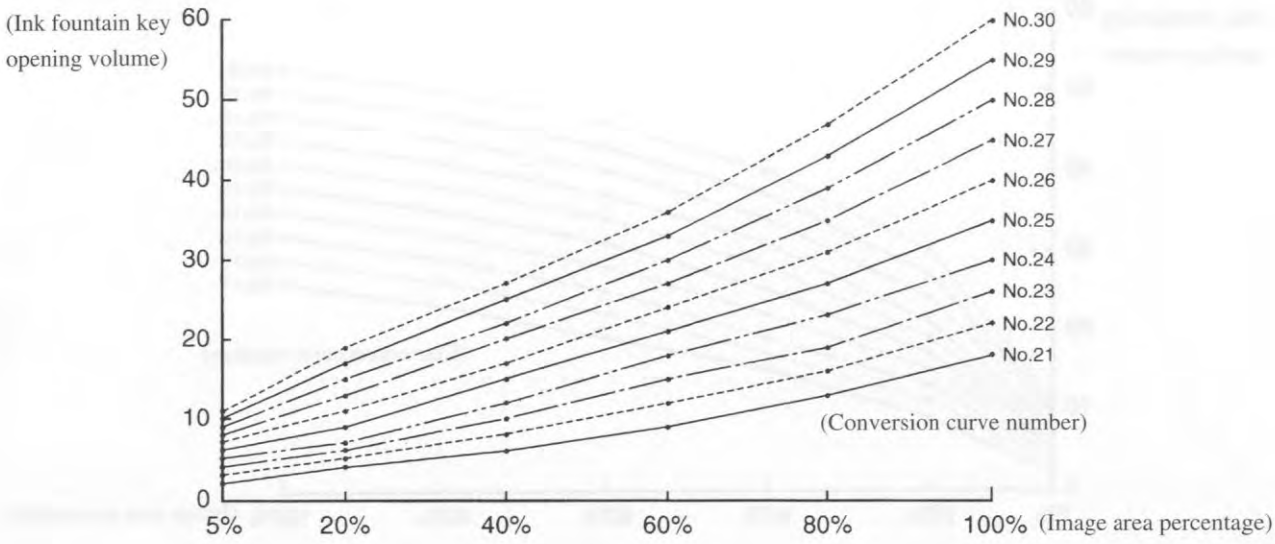
2) When wanting to make the contrast of the highlight section (below 40% of the image area percentage) stronger.

Conversion curve number \ Image area percentage	5%	20%	40%	60%	80%	100%
11	2	9	15	19	23	26
12	3	11	17	22	26	29
13	4	13	19	25	29	32
14	5	15	22	28	32	35
15	6	17	25	31	35	38
16	7	19	28	34	38	41
17	8	21	31	37	41	44
18	9	24	34	40	44	47
19	10	27	37	43	47	50
20	11	30	40	46	50	53



3) When wanting to make the contrast of the shadow section (above 60% of the image area percentage) stronger.

Image area percentage / Conversion curve number	5%	20%	40%	60%	80%	100%
21	2	4	6	9	13	18
22	3	5	8	12	16	22
23	4	6	10	15	19	26
24	5	7	12	18	23	30
25	6	9	15	21	27	35
26	7	11	17	24	31	40
27	8	13	20	27	35	45
28	9	15	22	30	39	50
29	10	17	25	33	43	55
30	11	19	27	36	47	60



Operation Edition

This edition is composed of Chapter 1 "Operation Procedures" and Chapter 2 "Printing Practice" and explains the basic printing procedures and points.



Chapter 1

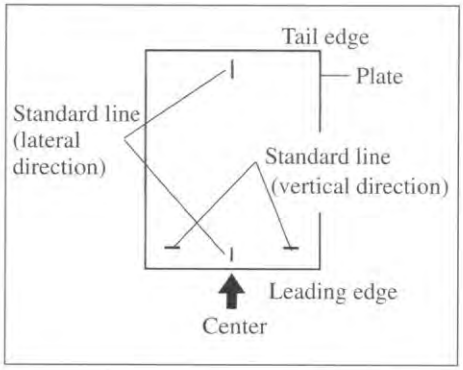
Operation Procedures

The basic printing procedures when printing on paper with a size of 310 × 440 mm (12.20" × 17.32") and a thickness of 0.1 mm (0.004") will be explained. The plate is punched by using the high-precision register punch (RYOBI RP520-220F).

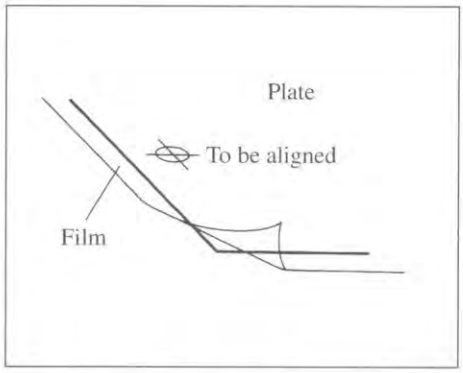
1. Plate Making

If the image position is incorrect, more time and work will be required for the vertical and diagonal image adjustment before printing. Use the RYOBI RP520-220F to assure efficient registration operation, and to reproduce the image accurately.

1) Do the plate making.

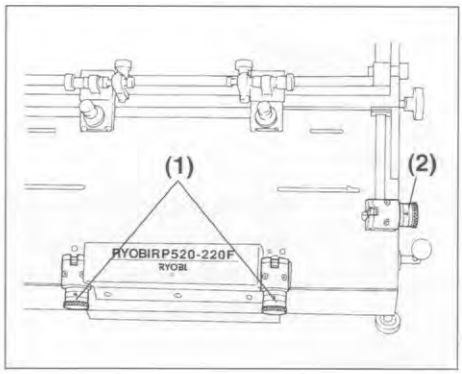


Mark the vertical and lateral standard lines on the plate. The standard line in the lateral direction should be marked in the center of the plate.
(Reference) The printing start line will be 22 mm (0.87") down from the plate leading edge.

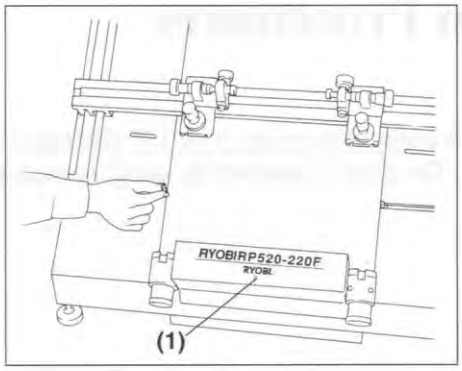


Align the register mark position (vertical and lateral) of the film with the standard line on the plate and then expose the image on the plate.

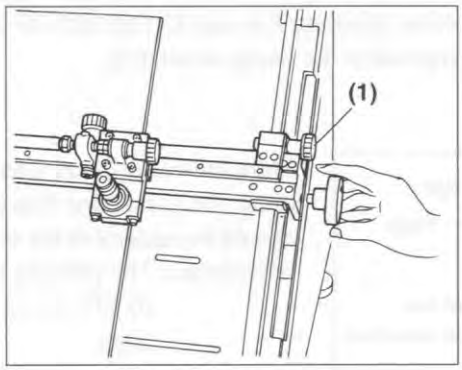
2) Punch the first plate.



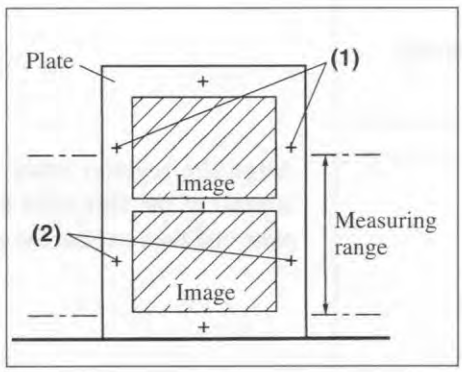
Align the lines of the vertical image micro adjustment knob (1) and the lateral image micro adjustment knob (2) with the standard position. (Initial setting position)
(The position where the line of the adjustment knob is aligned with the lines of the adjustment knob bracket.)



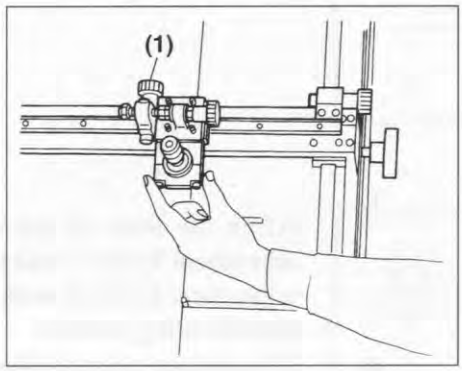
Set the plate on the punch table. At this time, contact the back of the plate with the table completely so it does not to rise off the table. Contact the latera. positioning pin on the plate edge lightly.
When using the metal plate, the lamp (1) lights when the plate is set at the correct position.



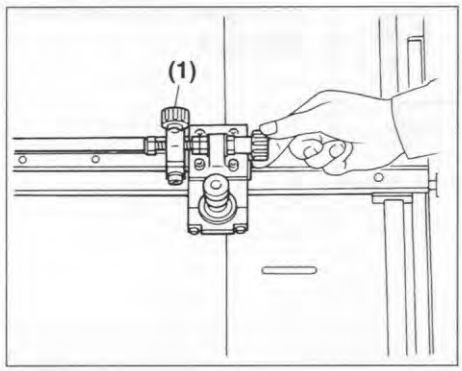
Loosen the slide bar fixing knob (1) to move the slide bar by using the slide bar vertical image micro adjustment knob. Move the slide bar to the position where the vertical position of the right side register mark on the plate is aligned with the magnifying glass register mark.



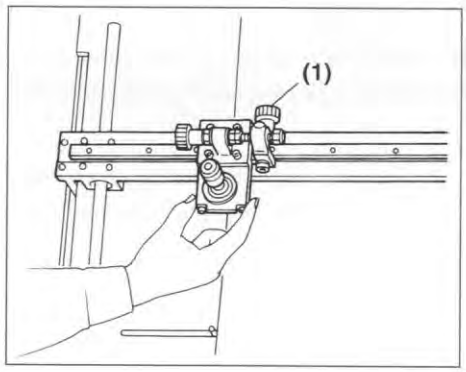
(Note) For the RYOBI 520-220F, the vertical direction measuring range of the magnifying glass is 59-347 mm (2.32"-13.66"). Therefore, when 2 images are positioned i. the vertical direction on one plate as shown in the illustration, the register marks (1) of the tail edge may not be measured.
When this occurs, please measure the register marks (2) of the leading edge.



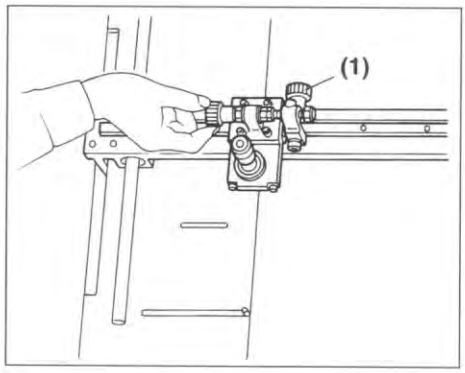
Loosen the magnifying glass block fixing knob (1) to move the block. Move the block to the position where the lateral position of the right side register mark on the plate is aligned with the magnifying glass register mark.



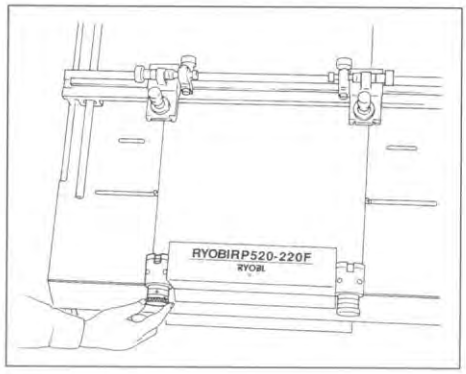
Tighten the magnifying glass block fixing knob (1), and turn the magnifying glass lateral image micro adjustment knob to do the micro adjustment in the lateral direction.



Next align the left side register mark on the plate with the left side register mark on the magnifying glass.
Loosen the magnifying glass block fixing knob (1) and align the lateral position by moving the block in the lateral direction.



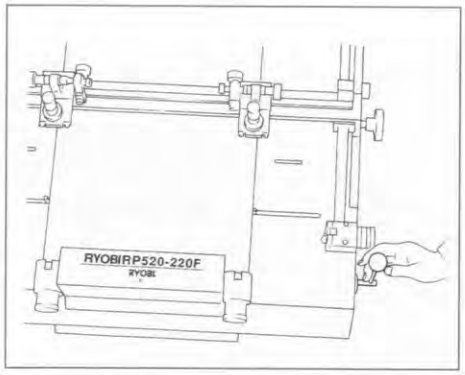
Tighten the magnifying glass block fixing knob (1), and turn the magnifying glass lateral image micro adjustment knob to do the micro adjustment in the lateral direction.



For the vertical adjustment, the left side register mark on the plate is aligned with the magnifying grass register mark by turning the vertical image micro adjustment knob on the left side to move the plate slightly.

(Note) 1. When turning the vertical image micro adjustment knob on the left side, the register mark on the right side may move. Check the register mark position on the right side again.

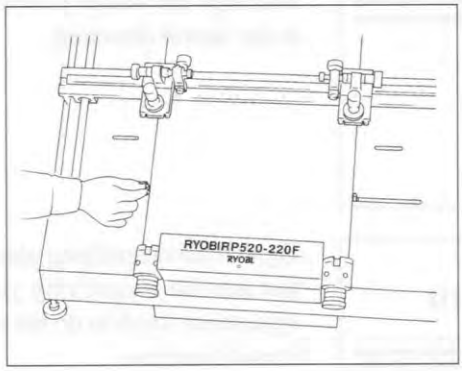
2. The vertical direction should be adjusted within ± 1 mm (0.04") range.
If the vertical image position cannot be adjusted within ± 1 mm (0.04"), the plate cannot be mounted on the machine correctly.



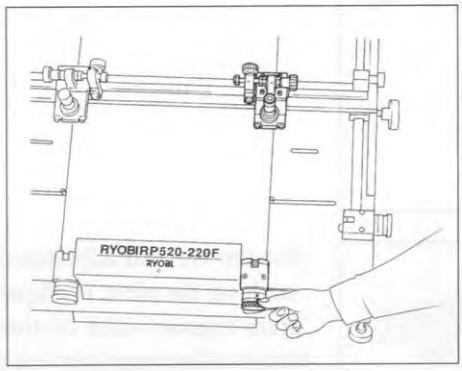
Shift the punch lever and make the punch holes in the plate.

3) Punch the second plate and after.

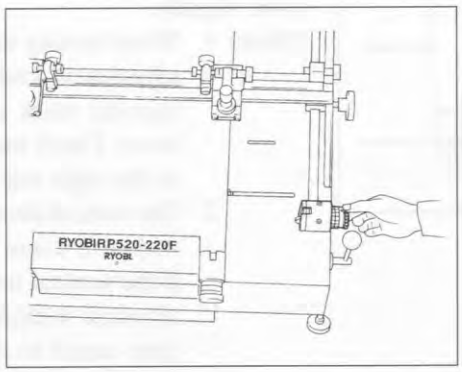
For the second plate and after, punch them following the same steps. Adjust the plate position by moving the plate slightly based on the magnifying glass position of the first plate setting and punch the plate.



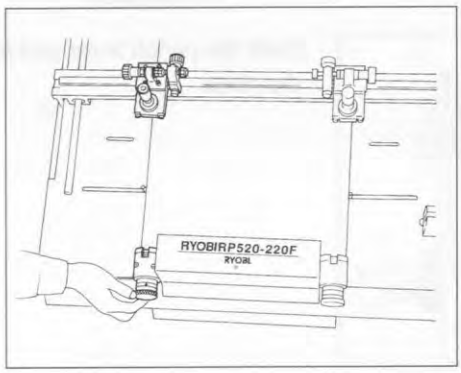
Set the next plate on the punch table and contact the lateral positioning pins on the plate edge lightly.



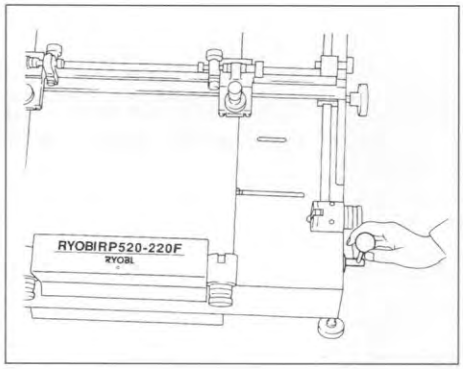
Align the magnifying glass register mark with the right side register mark on the plate.
The vertical direction is adjusted by turning the vertical image micro adjustment knob on the right side.



The lateral direction is adjusted by turning the lateral image micro adjustment knob.



Turn the vertical image micro adjustment knob on the left side to align the magnifying glass register mark with the left side register mark on the plate.
(Note) Look into the magnifying glass on the right side again and check that the magnifying glass register mark is aligned with the plate register mark.



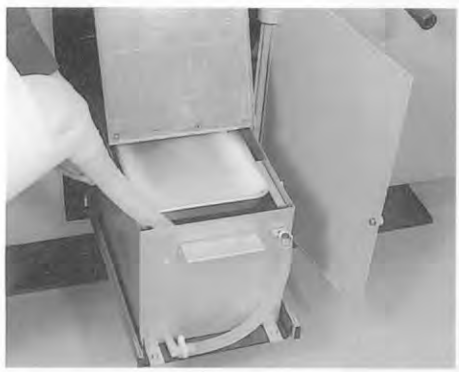
Shift the punch lever and make the punch holes in the plate.

2. Water Section Preparation

1) Prepare the dampening solution circulation device.



Open the door and pull the dampening solution circulation device out toward you.

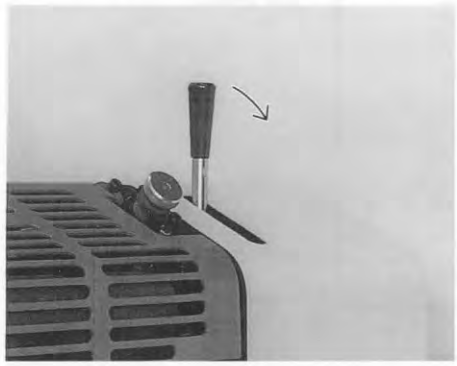


Make the dampening solution in which the alcohol substitute with the proper density is added in advance. Then pour it upto the line in the tank.
For the proper density of the alcohol substitute refer to the explanation of the alcohol substitute used.
(Reference) The tank capacity is 13.5 liters of dampening solution.
When the dampening solution in the tank falls below the minimum level, the buzzer will sound to inform the operator.

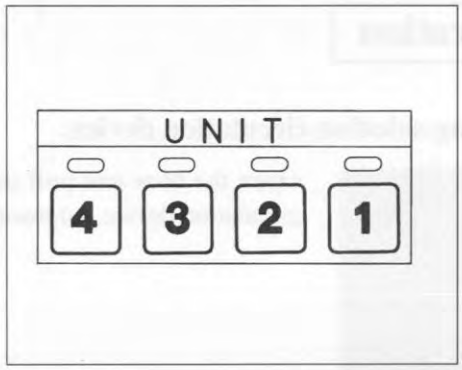


Check that the water fountain has enough dampening solution to soak the water fountain roller in the dampening solution. If not having enough dampening solution, adjust by using the water volume control valve. When turning it in the counterclockwise direction, the volume will be increased.

2) Set the metering roller.

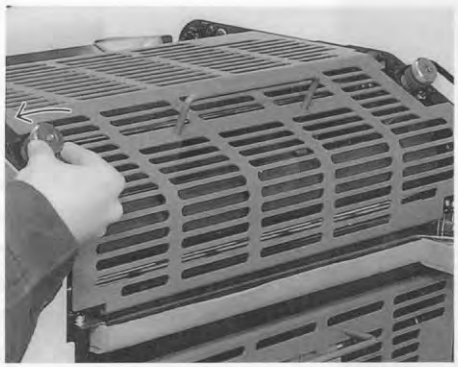


Shift the metering roller release lever in the direction of the arrow (position) and contact the metering roller with the water fountain roller.



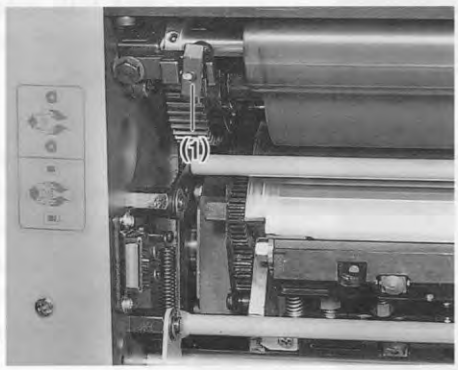
Push the unit selection button for the units to be used to rotate the water fountain roller.

(Note) If there is no dampening solution in the water fountain, the water sensor in the water fountain will prevent the metering roller from rotating. The paper feed also cannot be done.



Turn the metering roller pressure adjustment knob and adjust the aqua film on the metering roller.
Turn the metering roller pressure adjustment knob in the + direction (in counterclockwise direction) 10 pitches more from the position that the aqua film is just cut on the metering roller.

3) Set the water rider oscillating roller.



Turn the water rider oscillating roller release knob (1) to set at the 12 o'clock position. When there is a unit which is not used, be sure to turn the knob (1) to set at the 3 o'clock position so that the water rider oscillating roller releases from the water form roller.

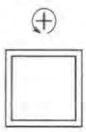
3. Mounting the plate

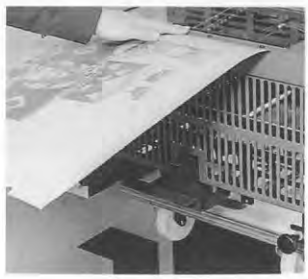
1) Mount the plate.

Mounting procedures

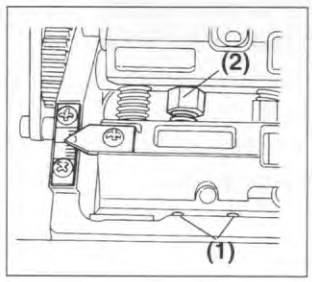
■ Plate cylinder predetermined position stop function

When pushing the forward crawl button on each crawl operation panel with the drive lamp lighted, the cylinders will rotate and stop automatically at the position where it is easy to mount the plate. (P. 49)

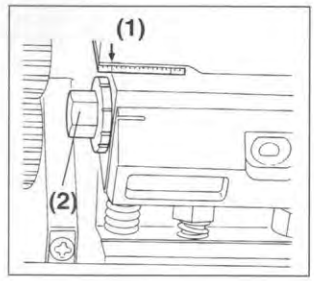




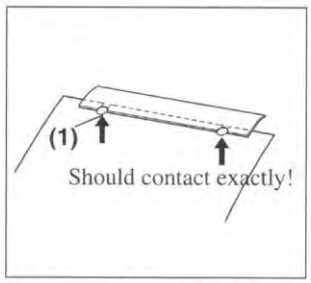
1. Bend the plate tail edge.



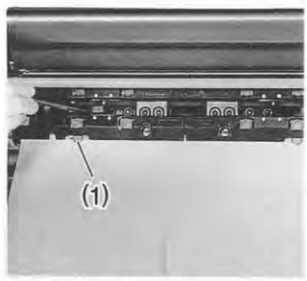
2. Return the leading edge of the plate clamp to the standard position (vertical direction). Loosen the plate tension bolt (2) until the stopper (1) contacts the plate cylinder. (Operation and Non operation sides)



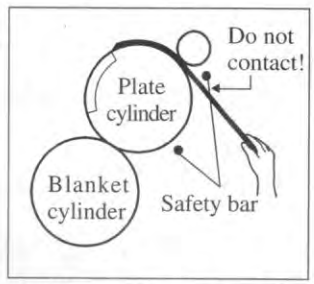
3. Return the tail edge of the plate clamp to the standard position (lateral position). Turn the bolt (2) so that the edge of the plate clamp is aligned with the third long line (1) from the left edge of the scale on the plate cylinder.



4. Contact and insert the plate into the positioning pins (1) of the plate clamp on the leading edge.



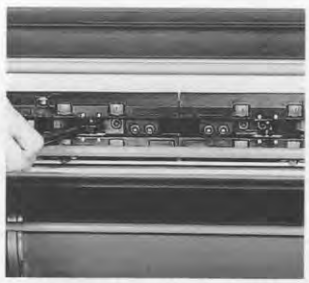
5. Turn the clamp bolt until the red mark faces you to fix the plate leading edge. Check that the plate contacts the positioning pins (1) exactly.



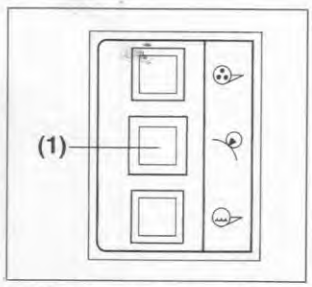
6. Mount the plate on the plate cylinder. When mounting the plate on the plate cylinder, be careful not to contact the plate on the safety bar. If the plate contacts the safety bar, the plate may be scratched.



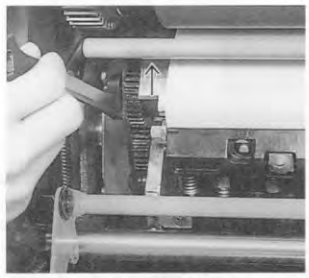
7. Before fixing the tail edge of the plate, push the plate hold-down button and contact the water form roller on the plate surface.



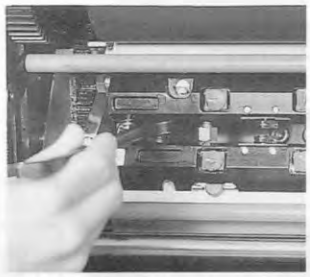
8. Insert the tail edge of the plate into the clamp and turn the clamp bolt until the red mark faces you to fix it.



9. Push the plate hold-down button (1) to release the water form roller from the plate surface.



10. Turn the quick tension bolt in the direction of the arrow mark to tension the plate.



11. When having the insufficient plate tension, tension the plate by using the plate tensioning bolt. The plate tensioning bolt on both the operation side and non operation side should be turned 2 to 3 times alternately.

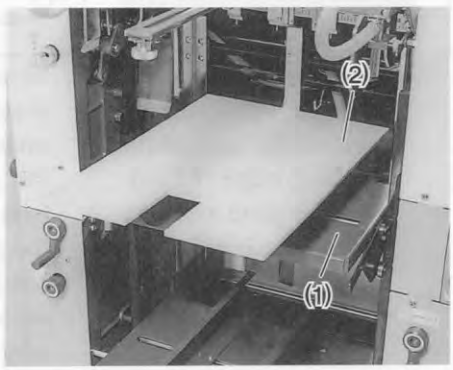


(Reference)
Align the thickness of the plate being used with the scale graduation on the plate pressure adjustment scale.

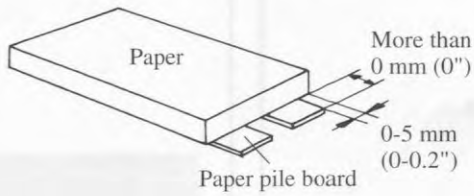
4. Setting the Paper Feed Section

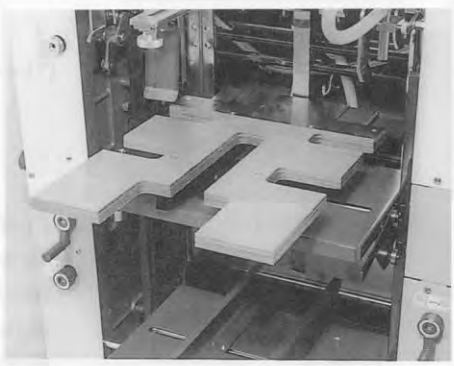
1) Pile the paper on the paper feed table.

CAUTION
Stop the machine before piling. Failure to follow this instruction may result in an injury.

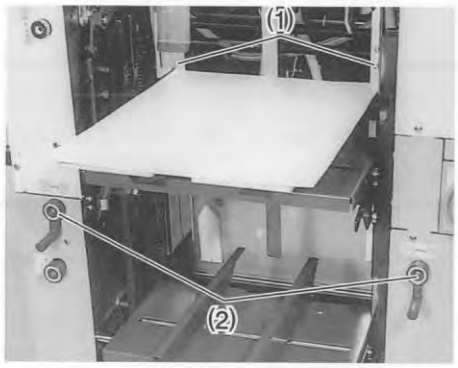


Put the paper pile board (2) on the paper pile board support (1).
(Reference) There are 4 different size paper pile boards included with the machine. Use the board that corresponds to the sheets of paper to be printed.





A multi-size paper pile board that can hold paper from 170 × 210 mm (6.69 × 8.27") to 340 × 450 mm (13.39 × 17.72") in size is available as an optional accessary.

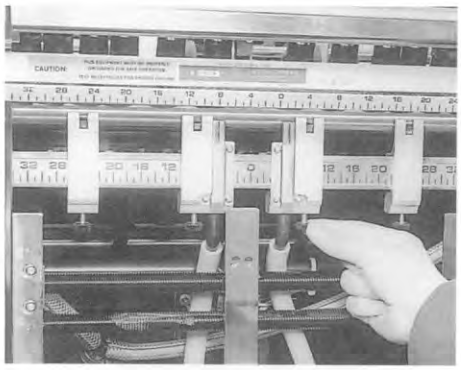


Pile a few sheets of paper on the paper pile board, then set the vertical guides (1) on both edges of the paper. The vertical guide is moved by turning the handle (2). Position the vertical guide using the scale stay. Adjust the paper lateral position so that the operation side and non operation side will be on the same graduation on the scale.
Pile the paper.

2) Set the sheet separator position.

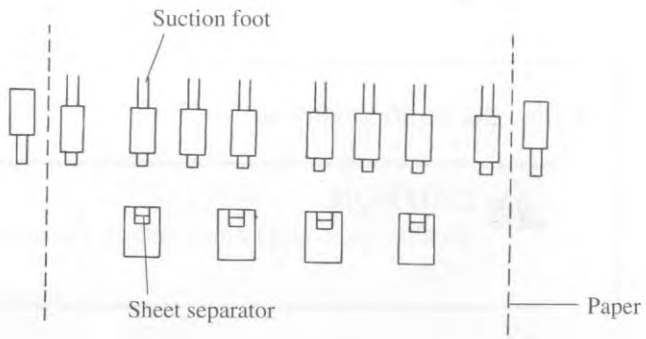
CAUTION

Stop the machine before setting. Failure to follow this instruction may result in an injury.



Loosen the screw and set the position by moving the sheet separator.

(Note) Use 4 sheet separators usually. The sheet separators on both edges should be located a little inward from the both ends suction feet to be used.



3) Adjust the paper pile height.

CAUTION

Do not put your hand on the feeder pile while it is rising. Failure to follow this instruction may result in an injury.

Setting procedures



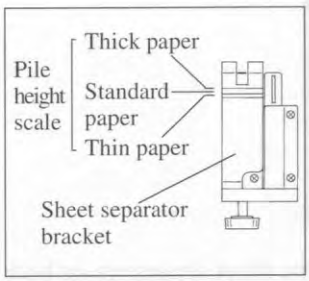
1. Turn the height control knob 3 to 4 turns in the clockwise direction.



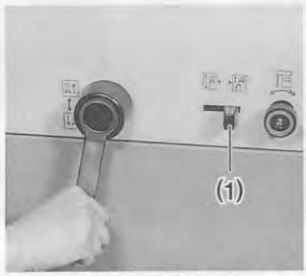
2. Run the machine and set the release lever at the position to raise the paper feed table automatically.



3. Adjust the paper pile height by turning the height control knob slowly in the counter-clockwise direction.



4. The top sheet of paper is aligned with the pile height scale.

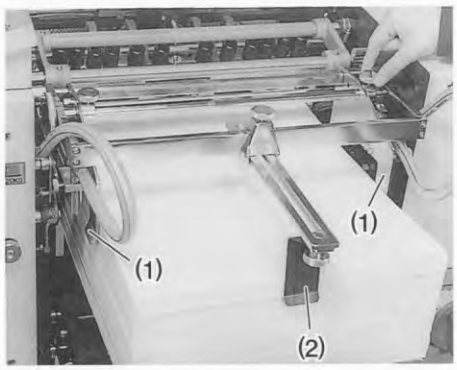


(Note) When the paper pile position is too high, set the release lever (1) at the position and turn the crank handle to lower the paper feed table, then repeat the steps 1 to 3.

4) Set the guide position.

CAUTION

Stop the machine before setting. Failure to follow this instruction may result in an injury.



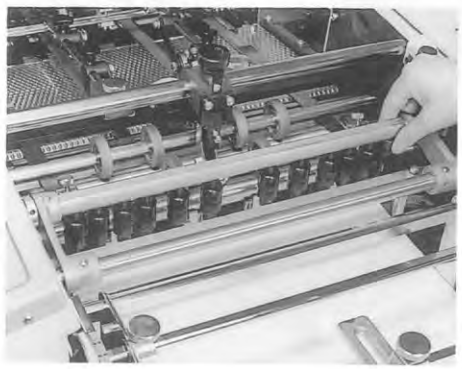
Set the side guides (1) (on both the operation and non operation sides) and back guide (2) to contact the paper edges.
And, set the back guide (2) so that it is located in the notched section of the paper pile board.

5) Set the suction feet.

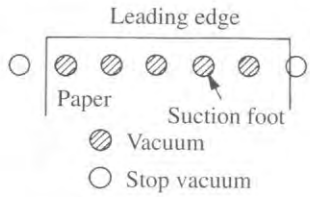
CAUTION

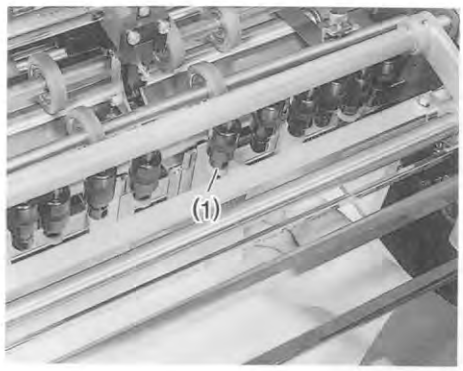
Stop the machine before setting. Failure to follow this instruction may result in an injury.

(Note) For the explanation, the cover is removed in the photograph.



Stop the vacuum to the suction feet which are only partially on or completely off the paper.
When raising it fully, the vacuum will stop.



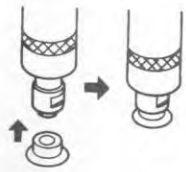


<Setting the thick paper>

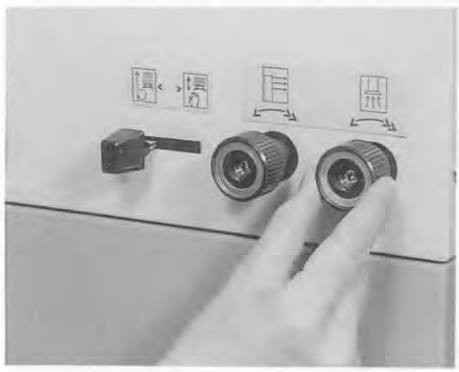
When printing on thick paper, mount the rubber suckers (1) on every other suction foot.
At this time, the vacuum of the suction feet that the rubber suckers are not mounted should be stopped.

(Note) 1. When using the rubber suckers, turn the vacuum control knob to 1/2-1 turn back in the counterclockwise direction from the maximum position.

2. When the rubber sucker wears out, the suction foot vacuum force will decrease causing paper feed problems. If this occurs, replace the rubber sucker with a new one.



6) Control the vacuum and blower volume.



Control the vacuum volume. When printing on paper with a thickness of over 0.1 mm (0.004"), set the vacuum control knob to the maximum (fully turned clockwise) position. For the paper with a thickness less than 0.1 mm (0.004"), turn the knob to 1/2-1 turn back in the counterclockwise direction from the maximum position.

■ When controlling the blower volume

Pump button ON

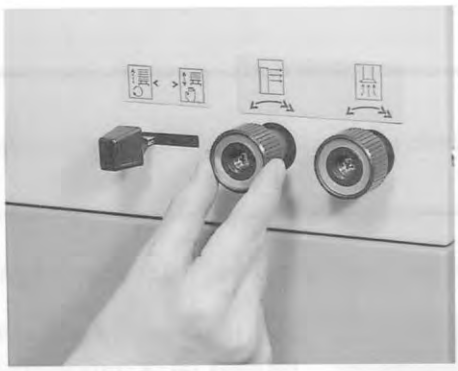


Drive button ON

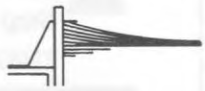


Set speed drive button ON





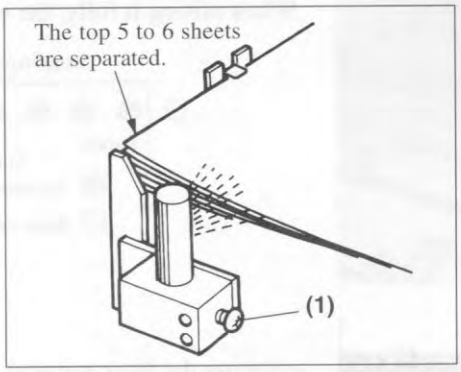
Control the blower volume of the center blower and side blower. Set them so that the top sheet of paper contacts the sheet separator lightly.



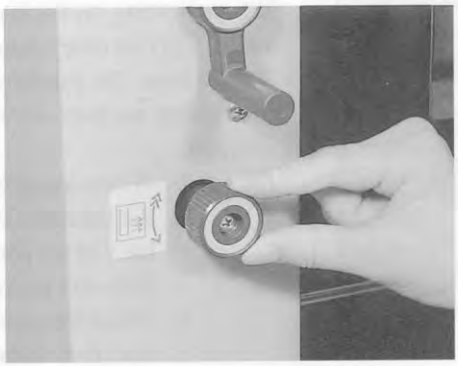
Correct



Incorrect



Loosen the screw (1) and adjust the height of the side blowers so that the top 5 to 6 sheets of paper are separated.



Control the auxiliary side blower volume.

(Reference) When printing with coated paper, if the paper separation is poor, use the auxiliary side blower to completely separate the sheets of paper. When turning the auxiliary side blower control knob in the clockwise direction, the blower volume is increased.

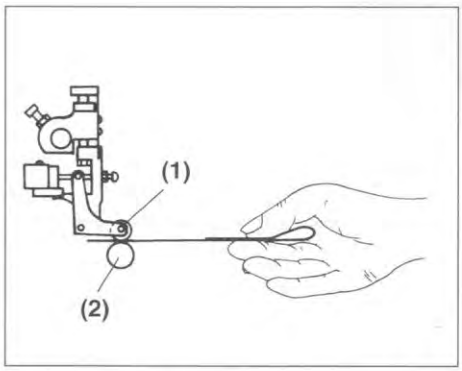


Loosen the screw and adjust the height of the blower nozzle so that it separates the top 10 to 15 sheets of paper.

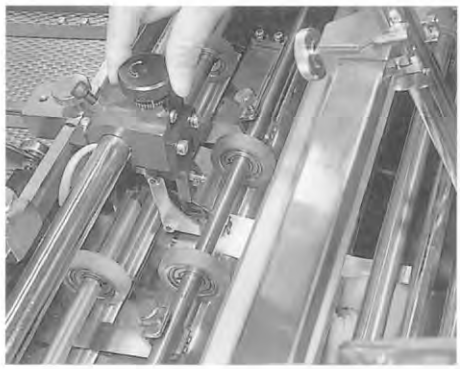
7) Set the mechanical type double sheet detector.

CAUTION

Stop the machine before setting. Failure to follow this instruction may result in an injury.



Cut a strip of paper from a sheet of paper to be used for printing, and fold it in half as shown in the illustration. Insert it between the detector roller (1) of the double sheet detector and feed roller (2).



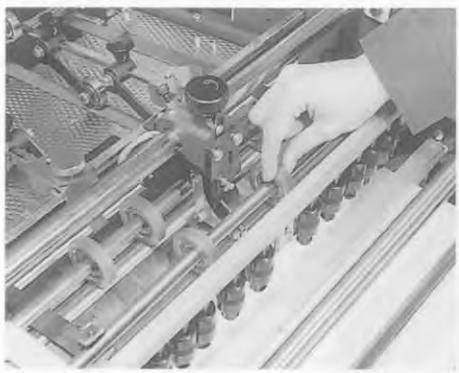
When the double sheet detector actuates, the buzzer will sound.
Turn the adjustment knob to adjust the double sheet detector so that the detector actuates when a double sheet of paper is fed, but does not actuate when only one sheet of paper is fed. When turning the adjustment knob in the direction of the arrow, the clearance between the detector roller and feed roller will be reduced for thin paper.
(Note) For the explanation, the cover is removed in the photograph.

8) Set the pull-out rollers position.

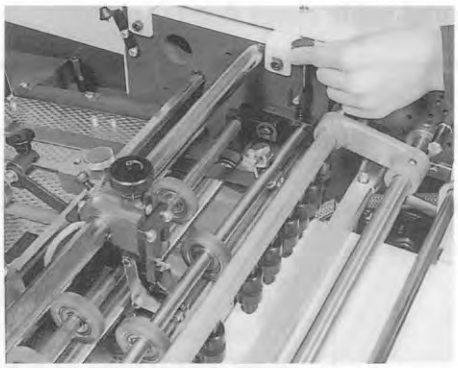
CAUTION

Stop the machine before setting. Failure to follow this instruction may result in an injury.

(Note) For the explanation, the cover is removed in the photograph.



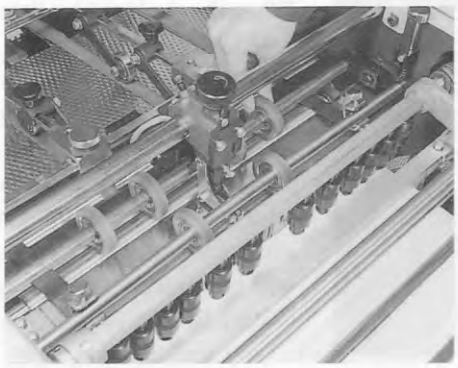
Adjust the position of the pull-out rollers.
The pull-out rollers are set so as not to contact the suction foot and be symmetrical to the center of the paper.



Adjust the pull-out roller pressure.
While rotating the pull-out roller with your finger lightly, adjust the pressure by turning the adjustment knob so it is the same on both the operation and non operation sides.
When turning the adjustment knob in the counterclockwise direction, the pressure is increased.

9) Set the guide rollers position.

CAUTION
Stop the machine before setting. Failure to follow this instruction may result in an injury.



Normally set 4 guide rollers at the position where they do not contact the retainers.

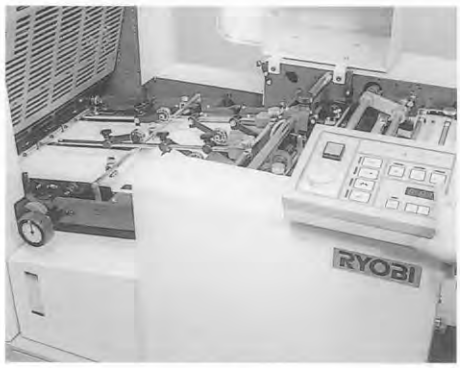
5. Setting the Registration Section

1) Set the push side guide.

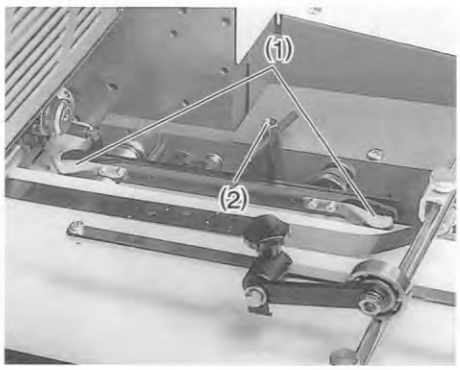
CAUTION
Stop the machine before setting. Failure to follow this instruction may result in an injury.



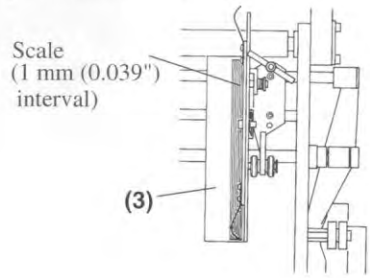
Set the indicator on the push side guide adjustment dial in the center (2 on the scale).

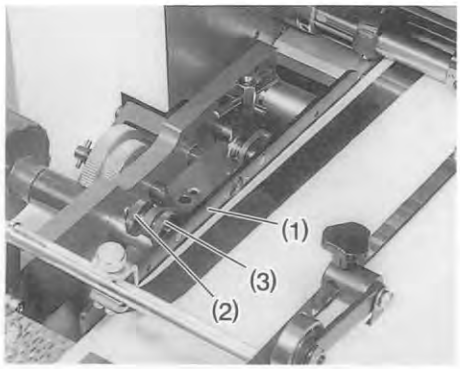


Run the machine and push the paper size change button to feed the paper to the stop finger.
(Reference) After the paper arrives at the stop finger, the machine stops automatically.

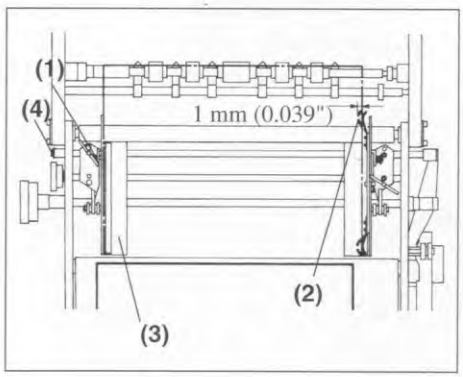


Loosen the fixing screw (2) of the flat spring (1), and position the flat spring so that it is about 1 mm (0.039") from the edge of the paper and fix it.
(Reference) On the flat spring plate (3), there is a scale with 1 mm (0.039") interval markings. Use this to set the standard position of the flat spring.





Push the forward crawl button and stop the jogger guide (1) at its fully pushed position.
If the jogger guide does not contact the paper edge in parallel, loosen the lock nut (2) and adjust the jogger guide by using the adjustment screw (3).



Loosen the fixing screw (1) and adjust the jogger guide (3) position so that the flat spring (2) is bent about 1 mm (0.039").
Adjust the flat spring bending volume by using the micro adjustment knob (4).

《NOTICE》

If the fixing screw is tightened by using the wrench or other tool, the bracket may be damaged. Only tighten the fixing screw by hand.



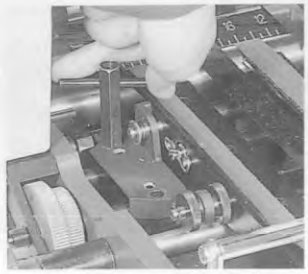
(Reference) There are 2 types of flat spring, one for thin paper and the other for thick paper.
The thin flat spring is used for paper with a thickness of less than 0.1 mm (0.004").

(Reference) Switch over the push side guide from the operation side to the non operation side.

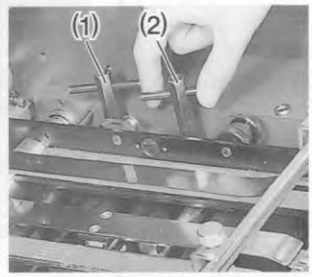
Switching over procedures



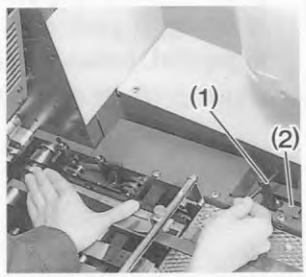
1. Loosen the fixing screw and remove the non operation side flat spring and mount it on the operation side.



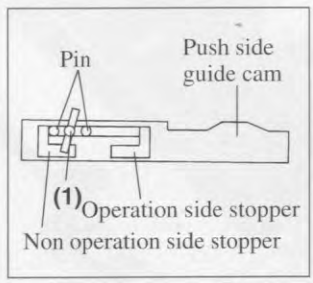
2. Remove the push side guide fixing screw on the operation side.



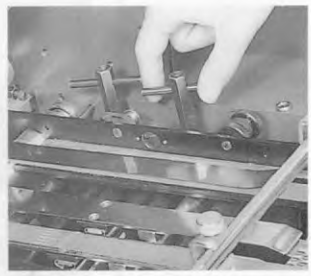
3. Mount the screw (1) in the push side guide on the non operation side and fix it and then loosen the screw (2).



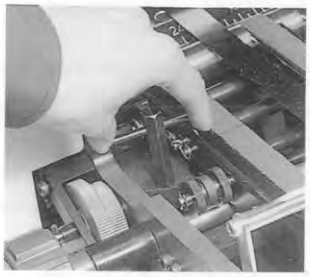
4. Loosen the screw (1) and move the push side guide cam (2) in the condition where the non operation side push side guide device is pushed toward the frame side.



At this time, connect the pin on the non operation side stopper exactly.
Finally fix the fixing screw (1).



5. Remove the fixing screw.



6. Mount the fixing screw on the operation side push side guide.

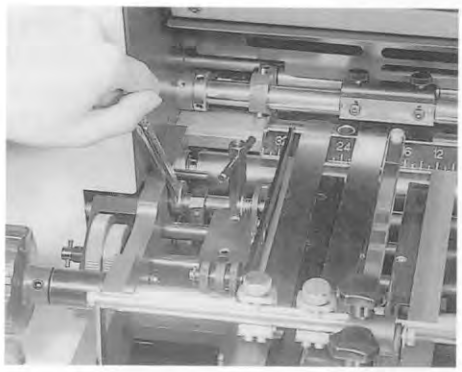
《NOTICE》

If the fixing screw is tightened by using the wrench or other tool, the bracket may be damaged. Only tighten the fixing screw by hand.

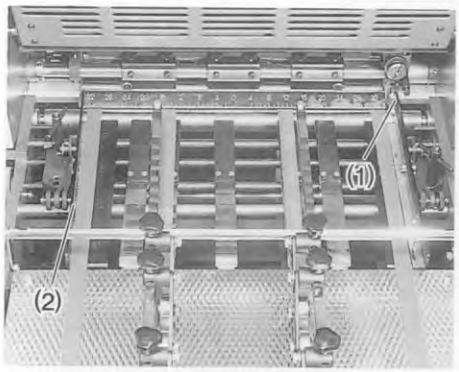
2) Position the board tapes.

⚠ CAUTION

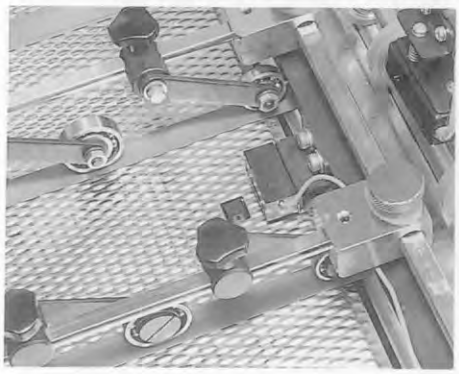
Stop the machine before setting. Failure to follow this instruction may result in an injury.



The board tape can be moved by turning the board tape tensioner shaft, then move it.



Set the jogger guide at the position where it is fully pushed.
Set both edge board tapes where they are 1 mm (0.039") away from the flat spring (1) and the jogger guide (2).
The other board tapes should be positioned to have even space between them.



(Note) Please be careful not to cover the paper feed sensor with the board tape.

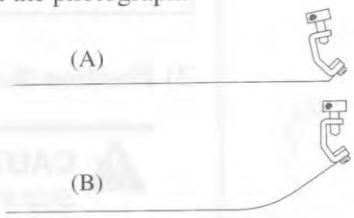
3) Set the retainers.

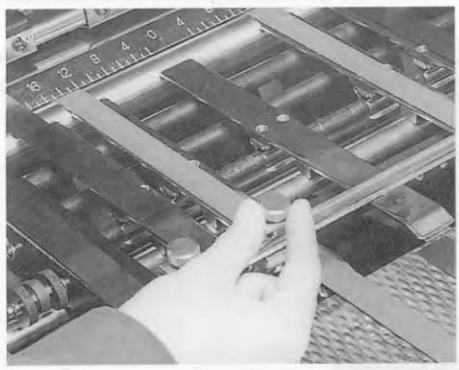
CAUTION

Stop the machine before setting. Failure to follow this instruction may result in an injury.

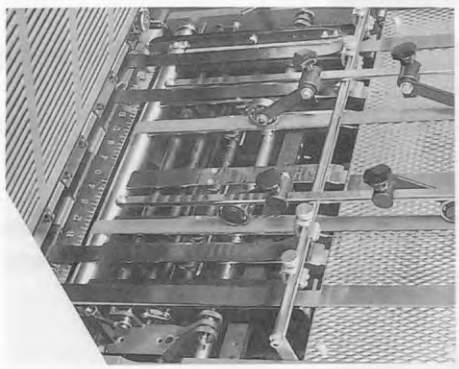


There are 2 different retainers. The retainer (A) has a square edge. The retainer (B) has a rounded edge. Mount the retainer (A) on the pull-out roller shaft.
(Note) For the explanation, the cover is removed in the photograph.

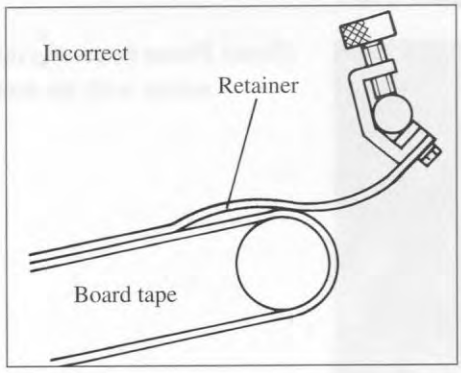




Mount the retainer (B) on the shaft over the feeder board. There are 2 types of retainers, one for thin paper and the other for thick paper. When using paper less than 0.1 mm (0.004") thick, use the thin retainer.

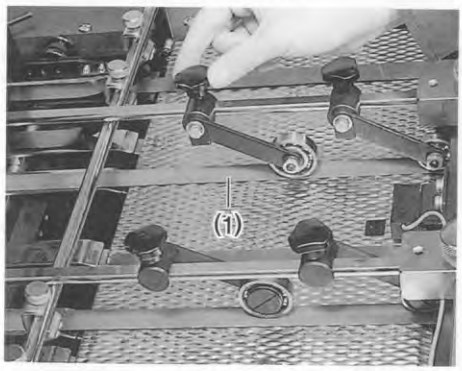


The retainers should always be set on both outer tapes.

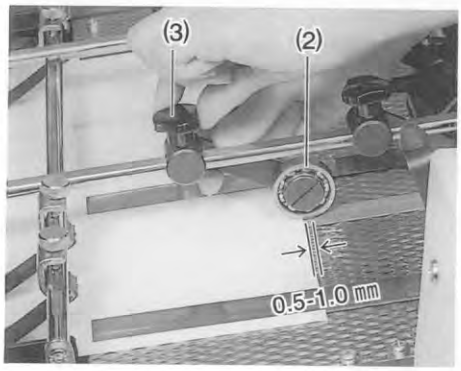


(Note) Do not push the retainer down strongly.

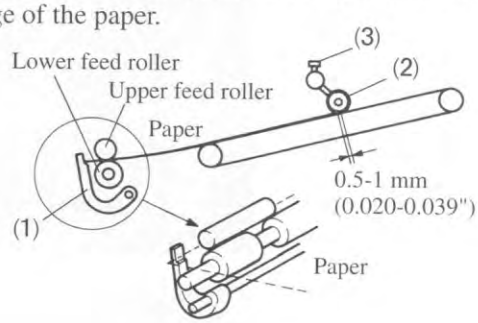
4) Set the skid rollers.



Set the skid rollers on the board tapes (1) that do not have retainers mounted.



Adjust the position of the skid rollers.
With the paper contacted with the stop finger (1), loosen the screw (3) and adjust the skid roller position so that the center of the skid roller (2) is located 0.5-1 mm (0.020-0.039") behind the tail edge of the paper.

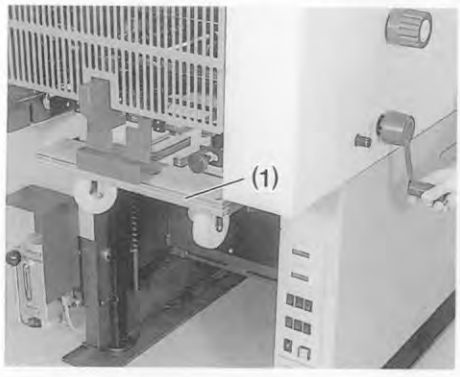


6. Setting the Delivery Section

⚠ WARNING

Stop the machine before setting. Failure to follow this instruction may result in a serious injury.

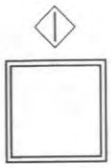
1) Set the delivery table dolly.



Elevate the delivery table dolly (1) by turning the crank handle.

■ When feeding the paper on the feeder board to the delivery section.

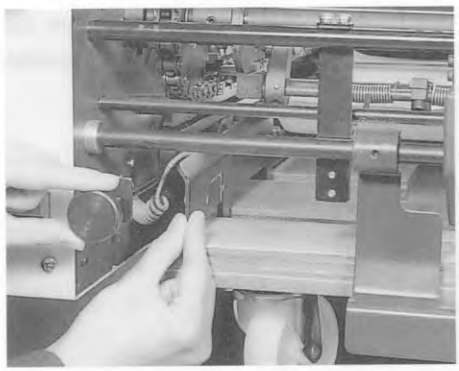
Drive button ON



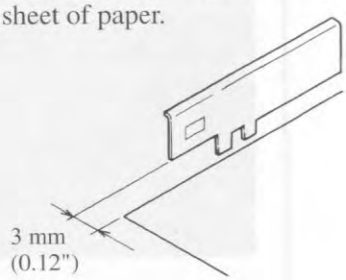
Paper size change button ON



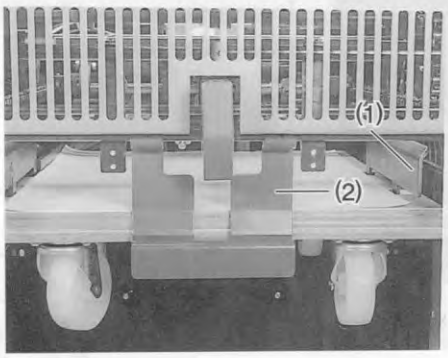
2) Set the side guide position.



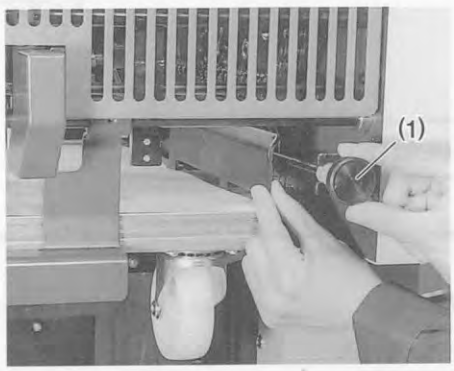
Feed a sheet of paper up to the delivery section. Then loosen the knob and set the delivery side guide at the position 3 mm (0.12") away from the side of the sheet of paper.



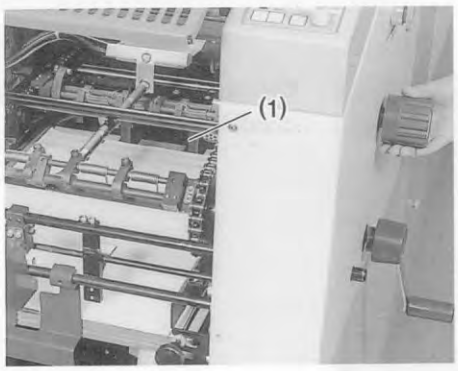
3) Set the side jogger and back guide position.



Push the forward crawl button and drop a sheet of paper on the delivery table dolly. Stop where the side jogger (1) and the front guide (2) are the closest to the paper.



Loosen the knob (1) and contact the side jogger on the paper lightly.

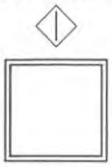


Turn the back guide set knob and contact the back guide (1) and front guide on the paper lightly.

7. Test Feeding

■ Test feeding procedures

Drive button ON



Pump button ON



Paper feed button ON



Paper feed button OFF



Pump button OFF

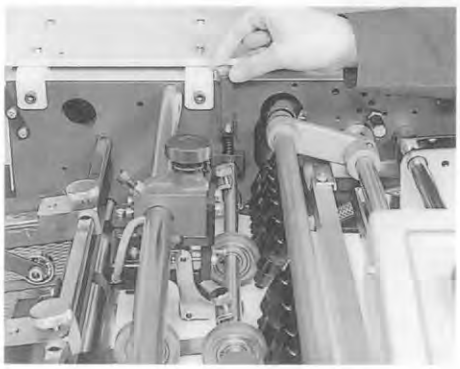


Crawl ON/OFF button ON



Feeding the sheets of paper, check and adjust each section.

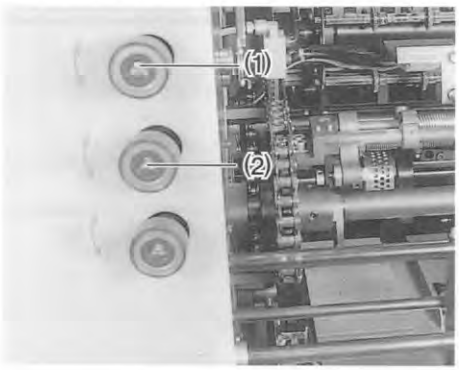
1) Correct the slewed paper fed from the paper feed section.



When the paper fed is slewed on the feeder board, adjust the pull-out roller pressure by using the adjustment knob.

(Note) For the explanation, the cover is removed in the photograph.

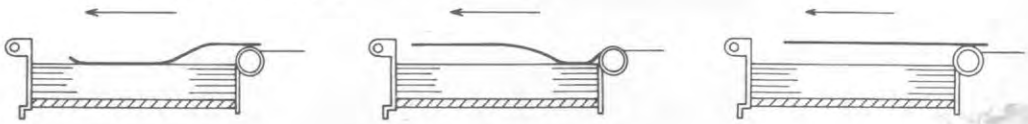
2) Control the suction wheel vacuum volume and delivery air blower volume.



Control the suction wheel vacuum volume and delivery air blower volume by using the suction wheel control knob (1) and delivery air blower control knob (2).

a. Suction wheel

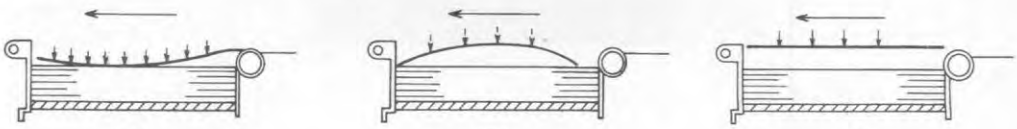
When the tail edge of the paper remains on the back guide [1] or when the tail edge of the paper drops earlier than the leading edge [2], control the suction wheel vacuum volume to deliver the paper properly [3].



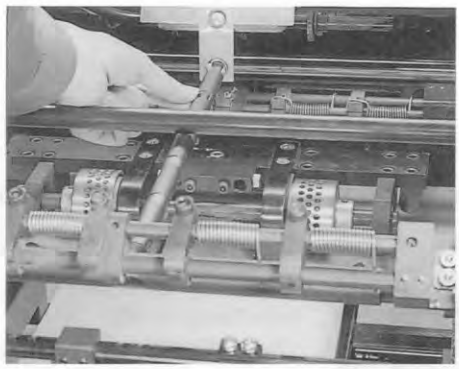
[1] [2] [3]

b. Delivery air blower

When the paper drops strongly [1] or weakly [2], control the delivery air blower volume to drop the whole sheet evenly [3].



[1] [2] [3]



WARNING

Push the emergency stop button to stop the machine before setting. Failure to follow this instruction may result in a serious injury.

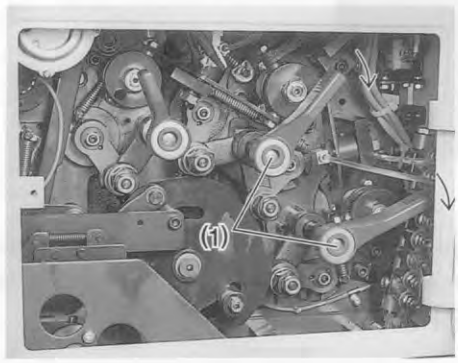
The delivery air blower nozzle can be opened or closed by using the sleeve.
When printing on smaller size paper, close the unnecessary delivery air blower nozzle. Adjust the opening and closing of the nozzle depending on the delivery condition of the printed paper.

8. Setting the Ink Section

1) Set the ink fountain.

CAUTION

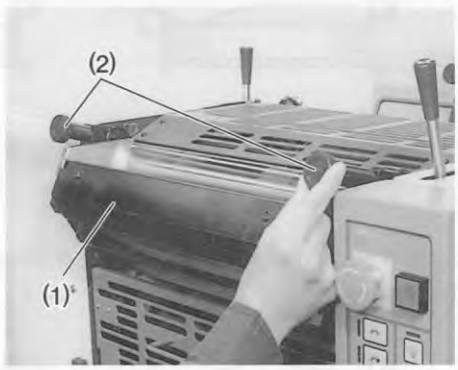
Stop the machine before setting. Failure to follow this instruction may result in an injury.



WARNING

Close the cover opened after setting. Failure to follow this instruction may result in a serious injury.

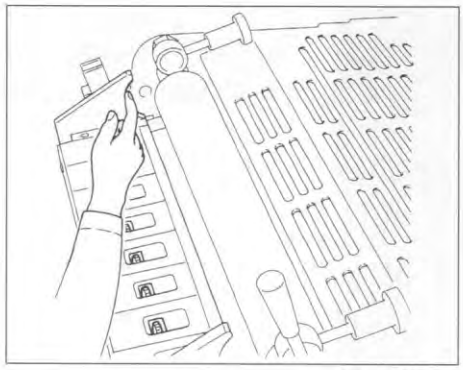
Open the non operation side cover and shift the ink form roller release lever (1) in the direction of the arrow. (, position)
After setting the lever, close the cover opened.



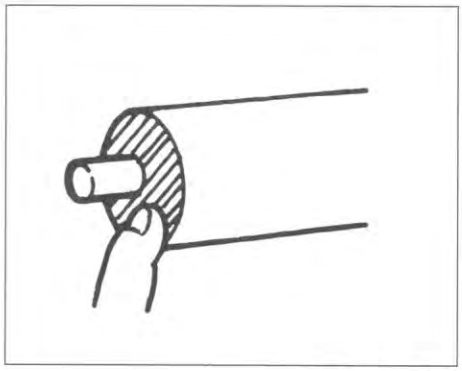
Push the ink fountain (1) against the ink fountain roller, and put the fixing knobs (2) into the brackets. Then tighten the knobs to fix the fountain.

《NOTICE》

When turning the ink fountain roller with no ink in the ink fountain, the ink fountain roller may be damaged, therefore please be careful.



With PCS-F



Without PCS-F

《NOTICE》

Before setting the ink fountain, wipe off any foreign particles in the ink fountain and on the ink fountain roller. Apply oil on the side edges of the ink fountain for the machine with the RYOBI PCS-F and on the side edges of the ink fountain roller for the machine without the RYOBI PCS-F. This oiling assures smooth fountain roller rotation.

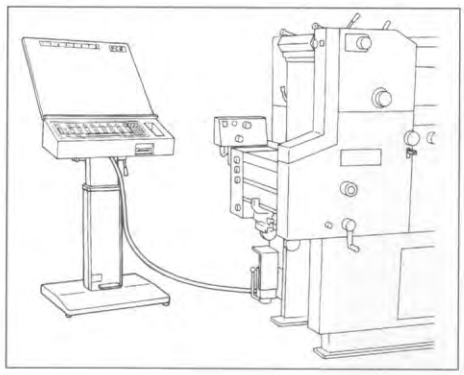
2) Control the ink feeding volume.

■ When feeding the ink to the ink rollers.

Drive button ON



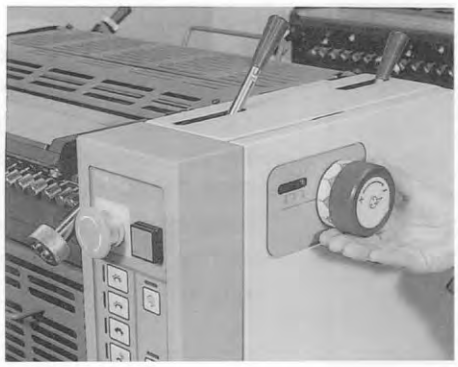
Ink ductor button ON



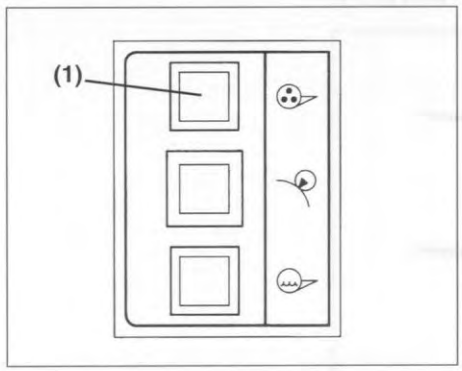
Put the ink in the ink fountain.
Control the ink fountain key by using the PCS-F.
Please refer the details "Introduction Edition 2-11 RYOBI PCS-F."



For the machine without PCS-F, control the ink feeding volume by using the screws to match the image.
When turning the screw in the clockwise direction, the ink feed volume will be reduced.



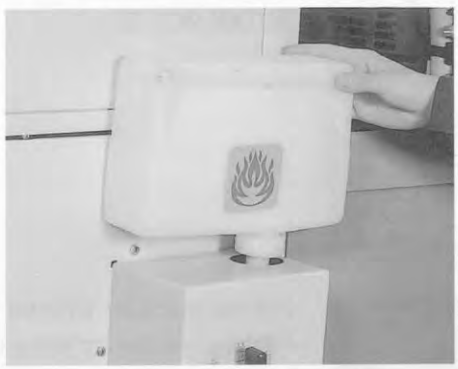
Run the machine and feed the ink to the rollers.
The total ink feeding volume is controlled by using the ink volume control dial.



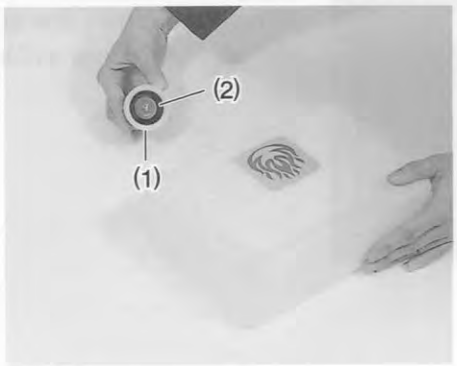
(Reference) While pushing the ink ductor manual ON button (1) on each unit, the ink can be fed onto the rollers by operating the ink ductor roller.

9. Setting the Blanket Cleaning Section

1) Set the blanket cleaning device.



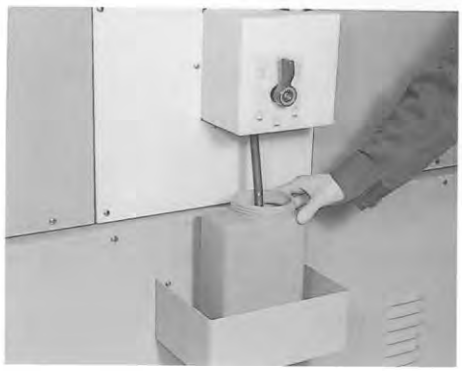
Put the cleaning solution into the bottle and mount it on the bracket.
Never use a blanket cleaning solution which has a flash point lower than 55°C (131°F).



(Note) On the inside of the bottle cap (1), there is a rubber packing (2). If the bottle is mounted without the packing, the cleaning solution in the cleaning tray may overflow. So please be careful.

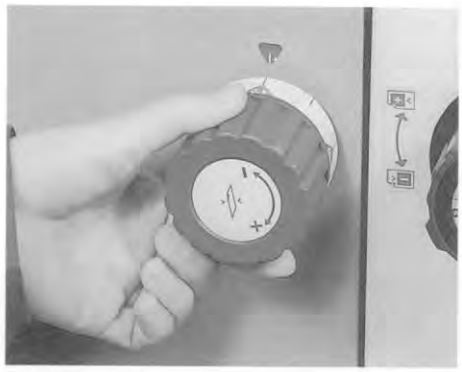


When shifting the blanket solution changeover lever in the unit to be used to the position, the cleaning solution is supplied in the tray. With the lever at this position, the proper volume of the cleaning solution is automatically supplied into the tray.



Set the drain bottle (a big bottle, can or other container).

10. Setting the Impression Pressure Adjustment Dial



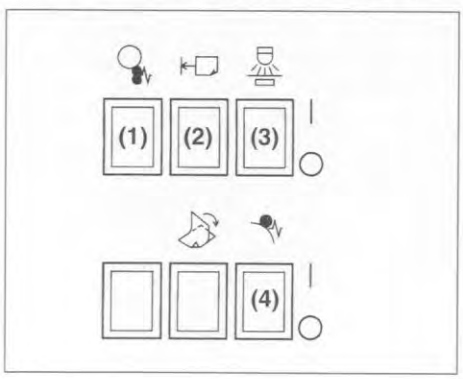
Set the impression pressure adjustment dial to match the paper thickness. The impression pressure may slightly differ depending on the surface of the paper and condition of the blanket, therefore adjust the impression pressure based on the printed material.

《NOTICE》

If printing with the dial scale set to a paper thickness less than the thickness of the paper being printed, the blanket and machine will be damaged.

11. Setting the Delivery Section Auxiliary Switch Panel

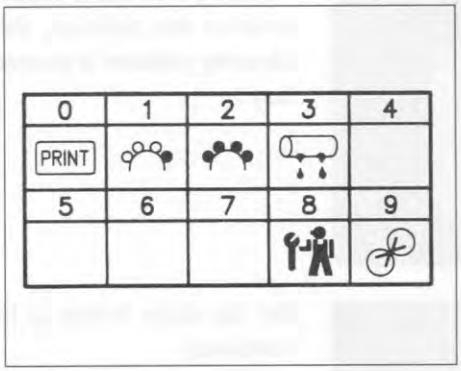
1) Set the each detector switch.



Set the paper feed jam detector switch (1), paper feed break detector switch (2), electronic type double sheet detector switch (3), and blanket jam detector switch (4) at the position.

2) Set the cycle set button.

[Cycle type]



There are the following cycles for the printing process.

(1) CY-0... Printing cycle
When printing, the cycle set button should be set on "0".

(2) CY-1... Wet cycle
This is the process that supplies dampening solution to the plate by contacting the water form rollers with the plate automatically before feeding paper only when pushing the printing start button.
If this process is not properly done, scumming will occur when starting printing or too much dampening solution will be supplied.

(3) CY-2... Inking cycle
This is the process that supplies ink to the plate by contacting the ink form rollers with the plate automatically before feeding paper only when pushing the printing start button.

(4) CY-3... Blanket cleaning cycle
This is the process that cleans the blanket by the blanket cleaning device cleaning roller. Set the cycle time to be able to properly clean the blanket.

(5) CY-8... Cycle for the service technician

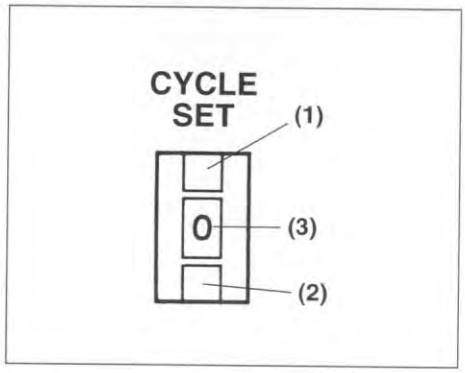
(6) CY-9... Cycle for the maintenance and inspection

(Note) 1. CY-4, 5, 6 and 7 ... There are no function.
2. CY-8 and 9 are not necessary to set when printing.

[Cycle Indication]

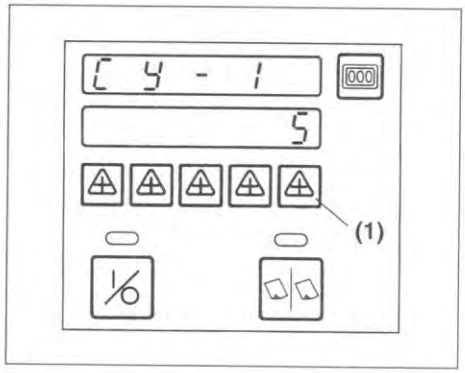
Indication	Cycle type	Setting possible range	Setting pitch
CY-1	Wet cycle	1 ~ 10 rotation	Every one rotation
CY-2	Inking cycle	1 ~ 10 rotation	Every one rotation
CY-3	Blanket cleaning cycle	20 ~ 70 rotation	Every five rotations

[Cycle setting procedures]



There are 2 cycle setting buttons (1) and (2). When pushing either button, the cycle indication (3) in the middle changes and at the same time, the cycle indication and setting value will be indicated on the counter panel on the delivery section operation panel.

(Note) When pushing the button (1), the cycle set number is increased and when pushing the button (2), the cycle set number is reduced. The numbers can be changed from 0 to 9.



The setting value is set by using the counter set button (1) on the delivery section operation panel. Set the cycle setting value from the CY-1 to the CY-3 by repeating the operation above.

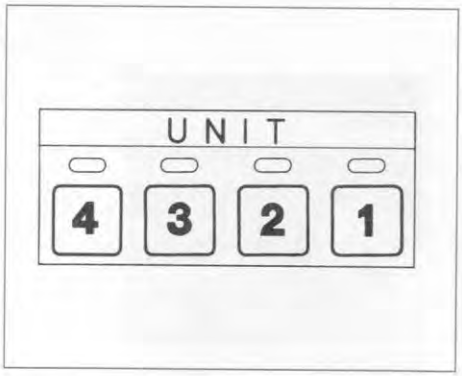
(Note) After completing the setting of the set value, return the cycle set button indication to "0".

12. Test Printing

1) Print and check the image position.



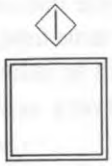
When using a metal plate, wipe off the gum solution on the plate surface using a sponge soaked with water.



Check that the unit selection button of the unit used for printing is ON.

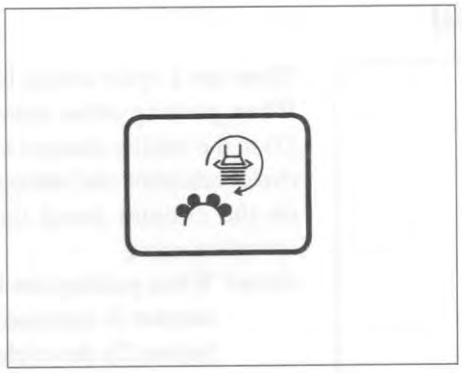
■ When doing the test printing ...

Drive button ON



Printing start button ON



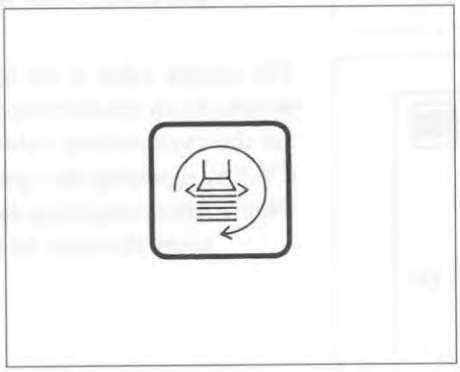


Run the machine and push the printing start button to start printing.

■ When completing the test printing ...

Production button OFF





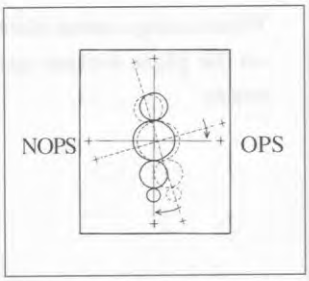
Push the production button on the delivery section operation panel and stop the paper feed and then stop the machine. Check the image position and color on the printed sheet.

(Reference) When pushing the production button to stop the paper feed, the water form roller and ink form roller will release automatically from the plate surface.

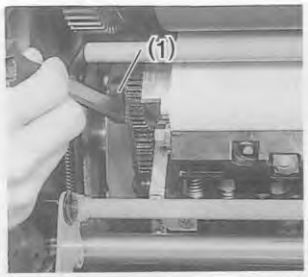
13. Adjustment of the Image Position

<Diagonal image adjustment>

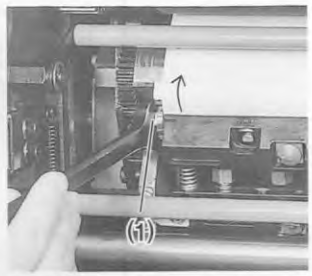
Adjustment example



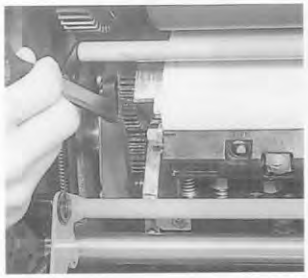
Here we will explain about moving the operation side image toward the leading edge.



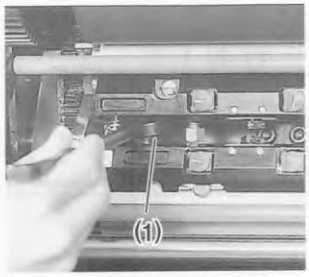
1. Loosen the quick tension bolt (1).



2. Move the clamp by turning the diagonal position adjustment bolt (1) in the direction of the arrow.



3. Tension the plate by turning the quick tension bolt.

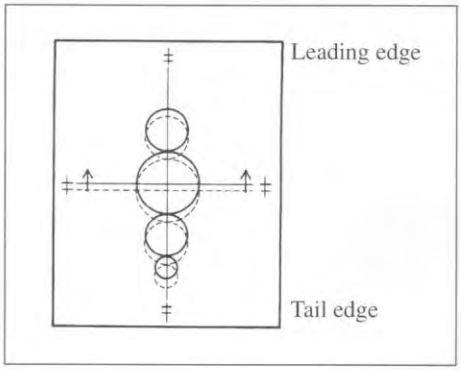


4. Tighten the leading edge plate tensioning bolt (1) on the operation side.

<Vertical image adjustment>

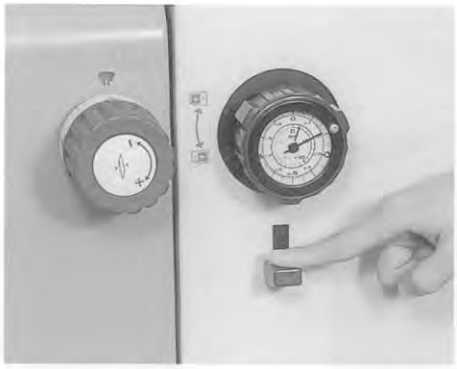


Stop the machine and push in the vertical image micro adjustment dial by pushing the clutch lever down. When releasing your hand from the clutch lever after pushing it down, the adjustment dial is engaged and the vertical image adjustment can be done.



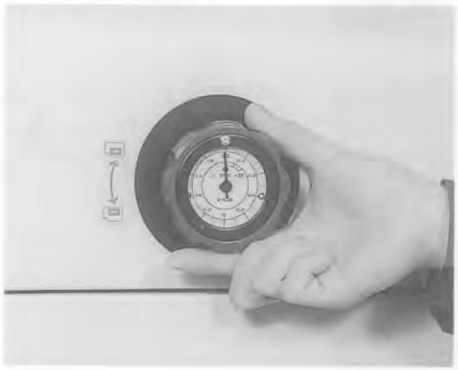
Turn the vertical image micro adjustment dial and do the vertical image position adjustment.
The maximum movement volume is ± 20 mm (0.787"). When turning the adjustment dial in the "+" direction, the image will move toward the leading edge.
(Reference)
Turning the adjustment dial by one scale moves the image 0.05 mm (0.002").



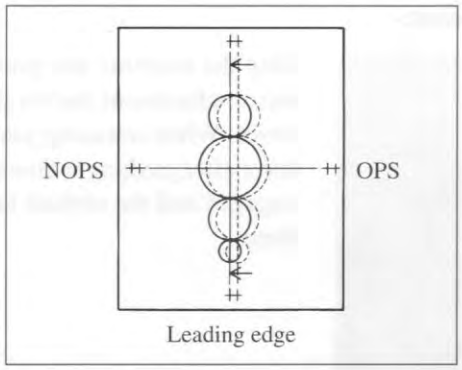


Push the clutch lever down again to release the vertical image micro adjustment dial lock.
(Note) When the adjustment dial is locked, a safety device actuates and the machine cannot be run.

<Lateral image adjustment>



Turn the plate cylinder lateral image micro adjustment dial and do the lateral image position adjustment.



Turning the plate cylinder lateral image micro adjustment dial in the clockwise direction, the image will move toward the operation side.

(Reference)

Turning the adjustment dial by one scale moves the image 0.1 mm (0.004").



(Note) 1. Do not adjust the lateral image position by using the plate cylinder lateral image micro adjustment dial during the printing.

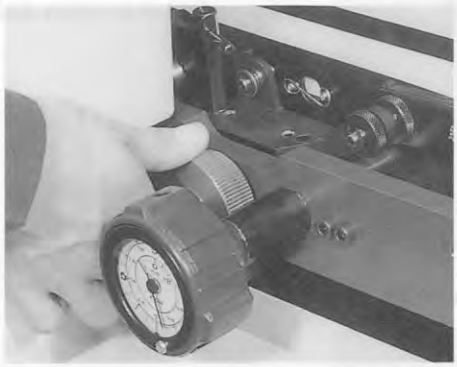
2. The maximum movement volume by using the plate cylinder lateral positioning adjustment dial is ± 2 mm (0.08"). If the image position cannot be adjusted within this range, change the plate exposing position.

<Lateral position adjustment of the paper>

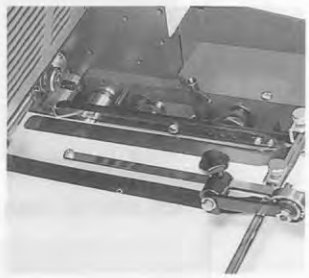


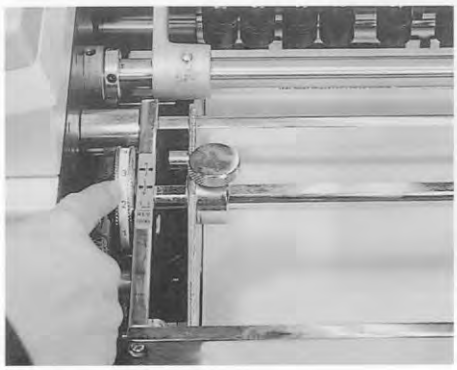
Turn the push side guide adjustment dial and do the paper lateral position adjustment.

The maximum adjustment volume is ± 2 mm (0.08").



Adjust the flat spring pushing volume of play by turning the flat spring micro adjustment knob.





Adjust the piled paper lateral position by turning the side guide micro adjustment knob.

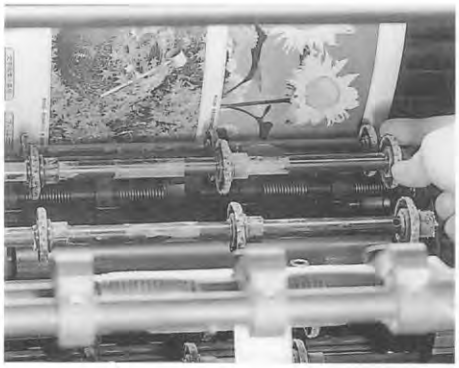
Check the paper lateral position again.

14. Printing

1) Position the rotary guides.

WARNING

Push the emergency stop button to stop the machine before setting the guides. Failure to follow this instruction may result in a serious injury.



The rotary guides have to be moved to non image area positions.

2) Set the counter.

■ Counter setting procedures (P. 43)

Set the function mode by using the mode selection button



⬇

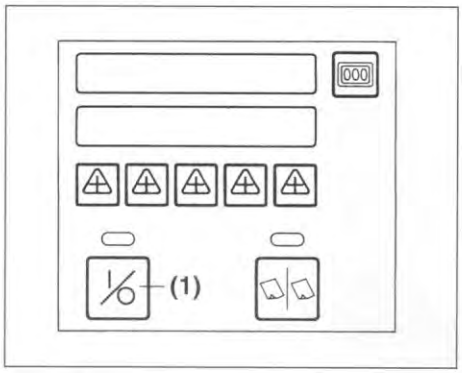
Set the number of printed sheets or number of printed sheets per batch by using the counter setting buttons.



⬇

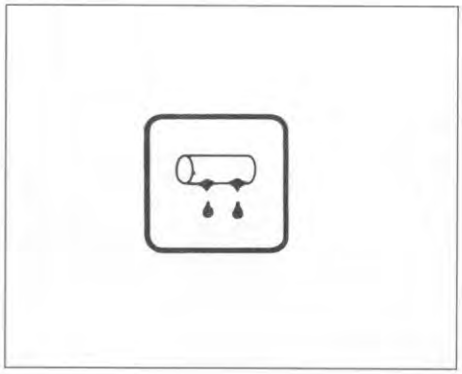
Count ON/OFF button ON



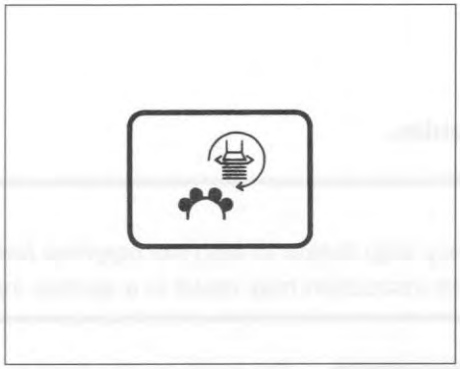


Input the required number of sheets and push the count ON/OFF button (1).

3) Print.



Run the machine and push the blanket cleaning button to clean the blanket.



Push the printing start button and start printing.

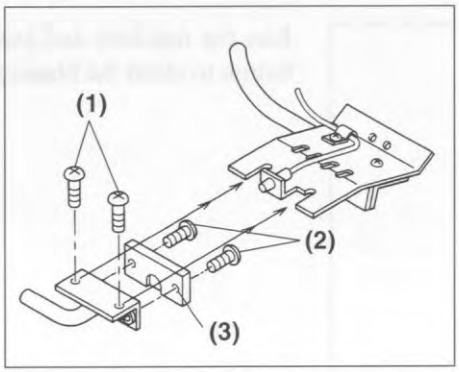
4) Set the powder spray device.



When setoff is likely to occur during printing, use the powder spray device. When setting the spray device switch at the | position, powder will be sprayed when a sheet passes under the spray nozzle.



Switch the spray nozzle to match the printing paper size.



(Reference) The nozzle for the small size paper can be changed from the minimum size paper up to A4 size paper.

1. Remove the nozzle fixing screws (1).
2. Remove the fixing screws (2) of the plate and turn over the plate (3) and then mount it.



Adjust the powder spraying time during 1 cylinder rotation by using the spray time adjustment knob.
When turning it in the counterclockwise direction, the spraying time will be increased and the spraying area will be longer.
The lamp on the spray unit lights during spraying. Adjust the spraying time while checking the lamp lighting time.



Control the powder spraying volume by using the spray volume control knob.
When turning it in the counterclockwise direction, the spray volume will be increased.
To prevent possible trouble, please control the spray volume to keep it at the minimum necessary.

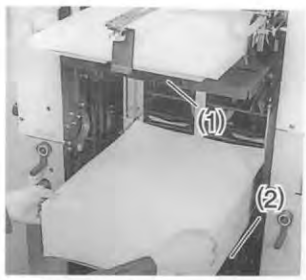
5) Control the decurling device. (→ P.180)

6) Pre-pile system.

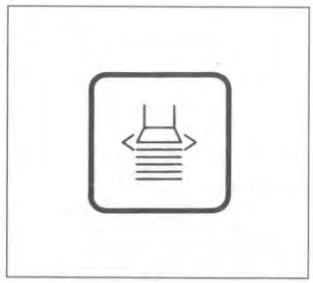
CAUTION

Stop the machine before setting. Failure to follow this instruction may result in an injury.

Exchanging the paper pile board



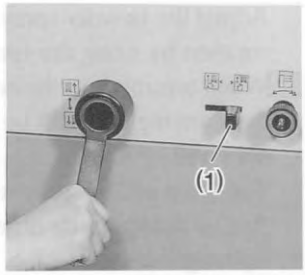
1. When the paper pile on the first paper pile board (1) becomes low, set the second paper pile board (2) on the second step and pile the paper.



2. After the first paper pile is all printed, push the paper feed button OFF.



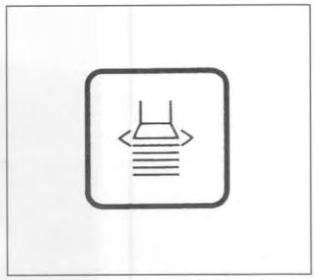
3. Lift the lever and remove the first paper pile board.



4. Set the release lever (1) at the position and turn the crank handle and then elevate the second paper pile board.



5. Set the release lever at the position.



6. Push the paper feed button ON and start printing again.

15. Printing Finished

Chapter 2

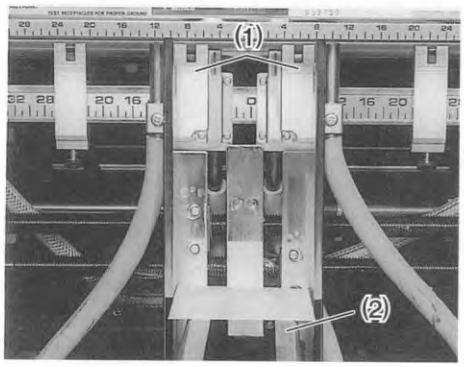
Printing Practice

2-1 Minimum Size Paper Printing (Point)

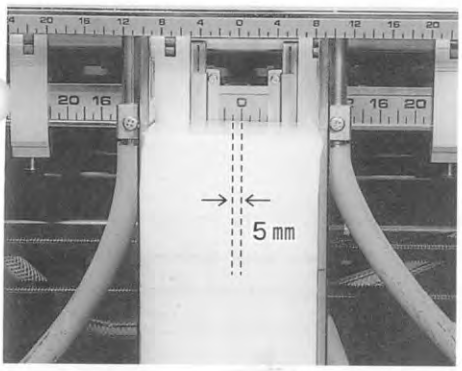
1) Setting the paper feed section

CAUTION

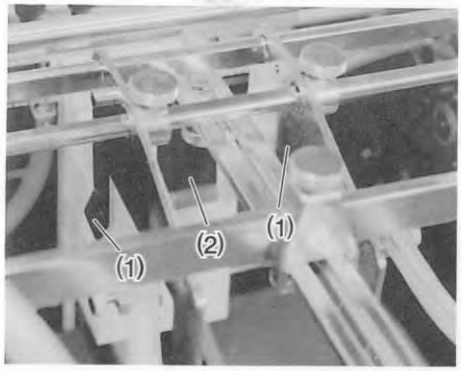
Stop the machine before setting. Failure to follow this instruction may result in an injury.



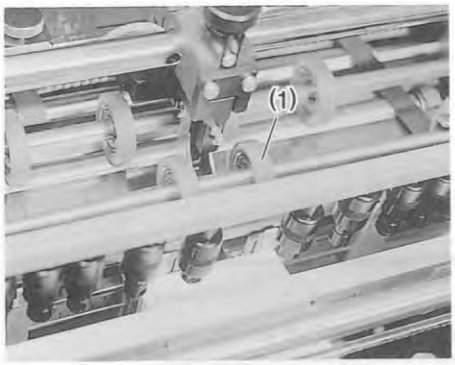
Use the 2 center sheet separators (1).
Center the paper pile board support (2) and set a sheet of paper.



Set the vertical guides so that the center of the sheets is positioned 5 mm (0.197") from the center toward the operation side and pile the paper.



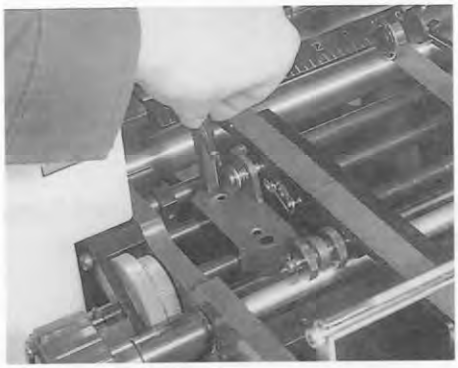
Set the side guides (1) and back guide (2).



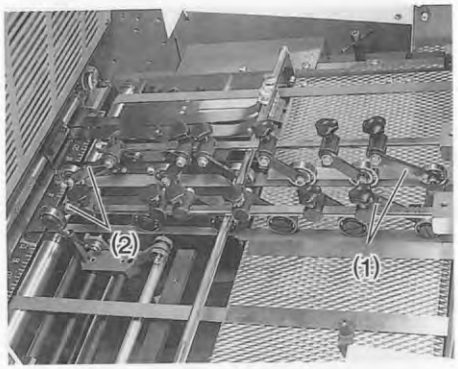
Set the pull-out rollers (1) on both sides of the double sheet detector (between the suction feet).
Use the 2 central suction feet.
Stop the vacuum of the suction feet not going to be used.
Set the 2 central guide rollers according to the paper size.
(Note) For the explanation, the cover is removed in the photograph.

2) Setting the feeder board

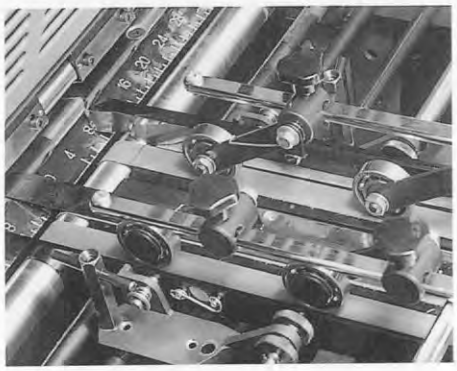
⚠ CAUTION
Stop the machine before setting. Failure to follow this instruction may result in an injury.



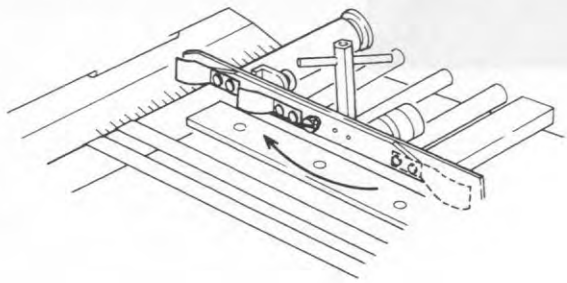
Loosen the board tape tension shaft and use the 2 inside board tapes.
Remove the push side guide fixing screws at the operation side and non operation side and move the 2 outer board tapes to the outside of the push side guide.
The 2 board tapes should be positioned on both edges of the minimum size paper.
(Note) Please be careful not to set the board tape over the paper feed sensor.

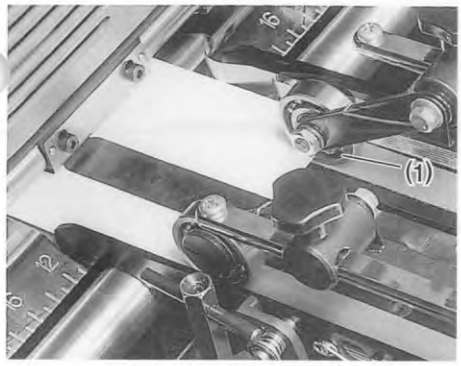


Set the skid rollers on the board tapes. 12 skid rollers are used.
Set the skid rollers (1) with the long arm on the guide roller side.
Set the skid rollers (2) with the spring on the paper feed drum side. (There are 2 types of the skid rollers for the operation side and non operation side.)
Set the remaining skid rollers as shown in the photograph.
(Note) One pair out of 6 pairs of skid rollers should contact always the paper.



Set the push side guide and flat spring.
Change the mounting position of the flat spring.



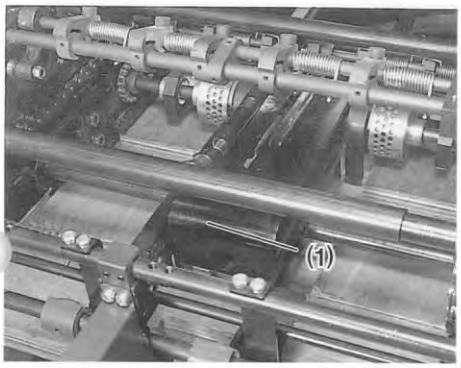


Set the skid rollers (1) at the tail edge of the sheet.

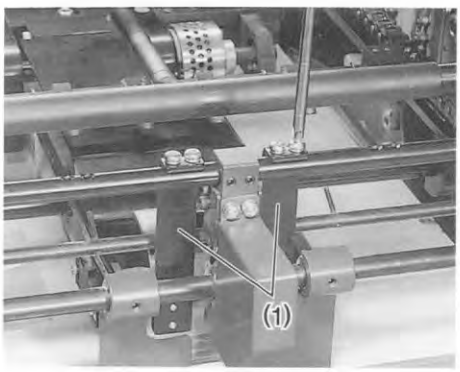
3) Setting the delivery section

WARNING

Push the emergency stop button to stop the machine before setting the guides. Failure to follow this instruction may result in a serious injury.



Pull the minimum size paper guide (1) out of the back guide.



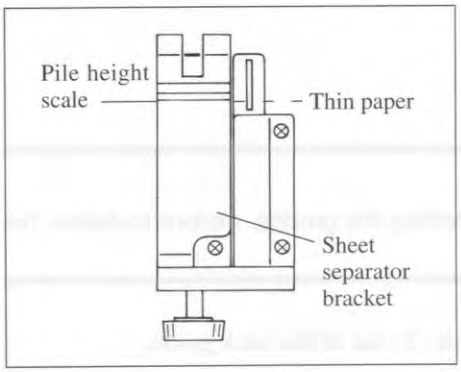
Change the paper drop (1) mounting position to the inside.

2-2 Thin Paper Feeding [Paper with a thickness less than 0.08 mm (0.0031")] (Point)

CAUTION

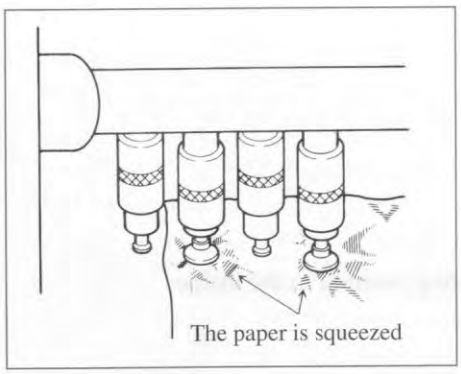
Stop the machine before setting. Failure to follow this instruction may result in an injury.

1) Adjust the paper feed pile height.



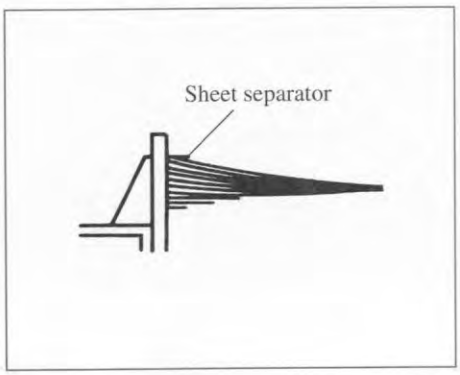
Adjust the paper pile height for the thin paper.

2) Set the suction feet and control the vacuum.



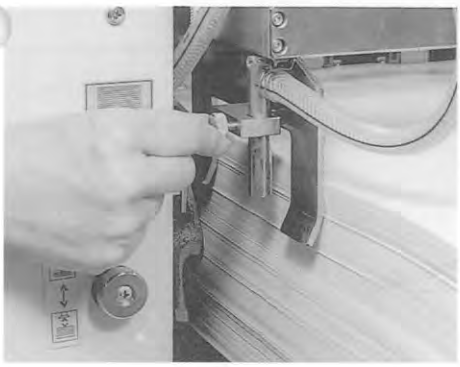
Please do not use the rubber suckers on the suction feet.
Control the vacuum to be as weak as possible.
(Note) If the rubber suckers or strong vacuum is used, the paper will be squeezed by the suction feet and will not be fed straight up to th pull-out rollers.

3) Control the center blower and side blower.



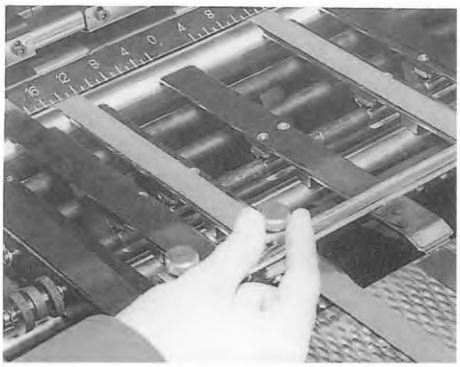
Control the center blower and side blower volume so that the top 5 to 6 sheets of paper are separated and so that the top sheet lightly contacts the sheet separator.

4) Control the auxiliary side blower.



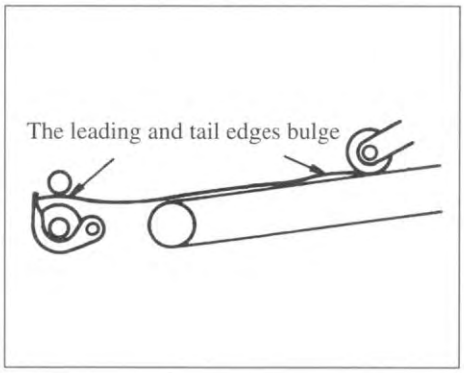
Control the auxiliary side blower volume to separate the top 5 to 6 sheets of paper.

5) Set the retainers.



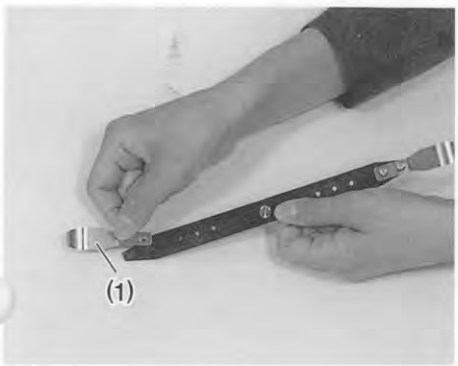
Use the retainers for thin paper.

6) Set the skid rollers.



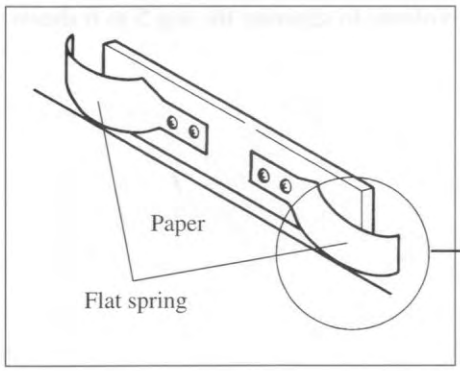
If the skid rollers are positioned too forward, the sheet of paper will bulge as shown in the illustration. Do not set the skid rollers like this.

7) Change the flat spring.



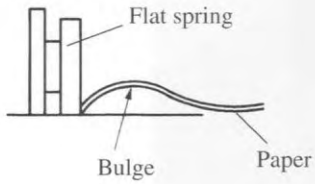
Change the flat spring (1) on the paper feed drum side with the one for thin paper.

8) Control pushing volume.



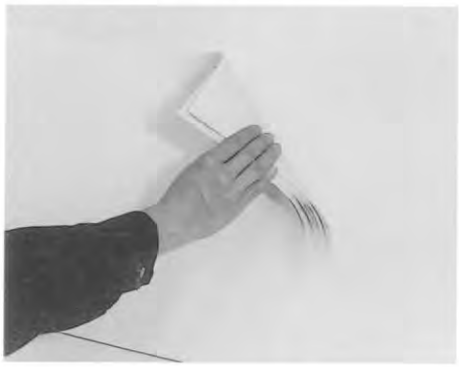
When the paper is pushed by the push side guide, the flat spring should bend about 0.5 mm (0.020").

(Note) If the pushing volume is too great, the paper will bulge as shown in the illustration below and stable lateral registration accuracy will not be possible.

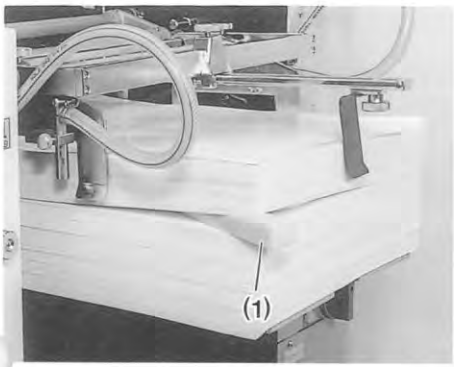


2-3 Paper Feed and Delivery of Curled Paper [Point]

1) Paper feed section

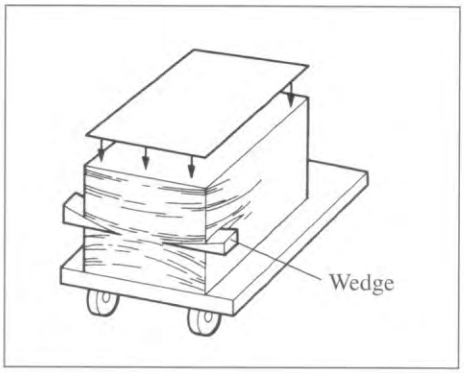


Control the curl of the paper and pile the paper.



Use a wedge (1) to make the top of the paper pile flat.

2) Delivery section



Use wedges so that the whole sheet drops at the same time.

2-3 Paper Feed and Delivery of Curled Paper [Point]

1) Paper feed section

Control the end of the paper and pile the paper.

Use a wedge (1) to make the top of the paper pile flat.

2) Delivery section

Use wedges to slant the whole sheet drops at the same time.

Maintenance Edition

This edition is composed of Chapter 1 "Maintenance after the Printing," Chapter 2 "Periodic Inspection," Chapter 3 "Periodic Maintenance," Chapter 4 "Replacing the Supplies," and Chapter 5 "Troubles and Countermeasures."

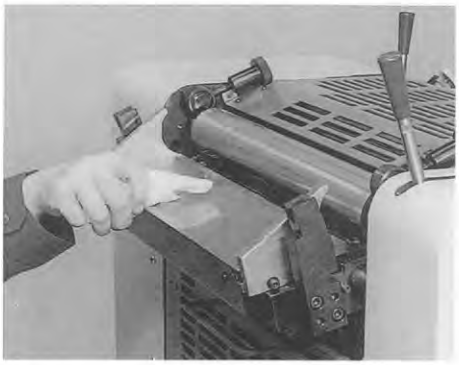
Chapter 1

Maintenance after the Printing

《NOTICE》

Be sure to do the maintenance after the printing to keep the machine in top operation condition.

1. Cleaning the Ink Section



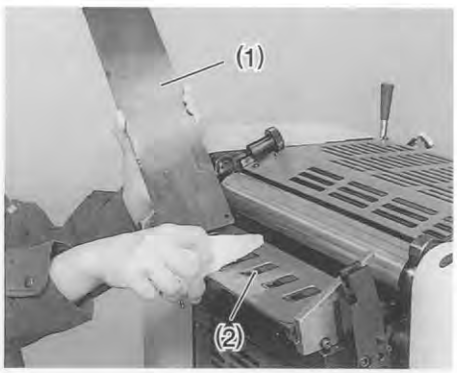
⚠ WARNING

Stop the machine before cleaning the ink fountain and ink fountain roller. Failure to follow this instruction may result in a serious injury.

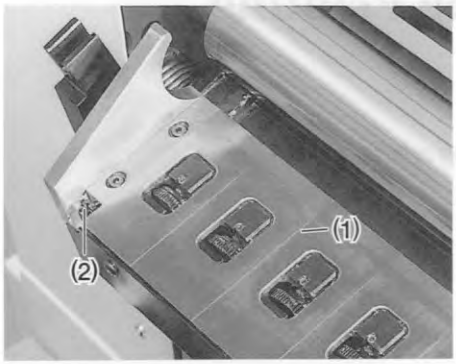
Remove the ink in the ink fountain.
Loosen the ink fountain fixing knobs and release the ink fountain downwards.
Clean the side edges of the ink fountain roller, both sides of the ink fountain, and edge of the ink fountain key well.

《NOTICE》

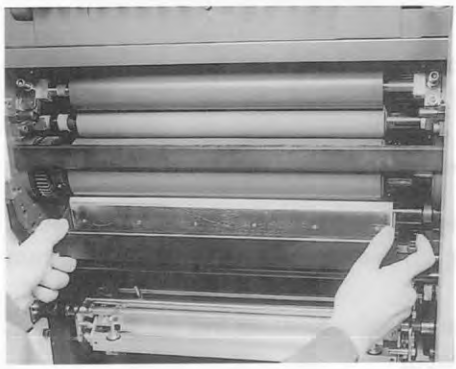
1. *Do not use any powerful corrosive acid or chlorine type cleaning solution on the metal. The metal may corrode when the acid or chlorine reacts with the water.*
   Example of powerful corrosive chemicals:
   Plate cleaner (powerful acid)
   Blanket cleaner (chlorine type)
2. *If the machine will not be operated for 3 days or more, apply the rust preventive oil on the ink fountain roller after cleaning it.*
   Also if the printing room environment is one with a high temperature and damp, the metal will easily corrode and rust. Therefore in this environment when not using the machine the following day, apply the rust preventive oil on the ink fountain roller after cleaning it.



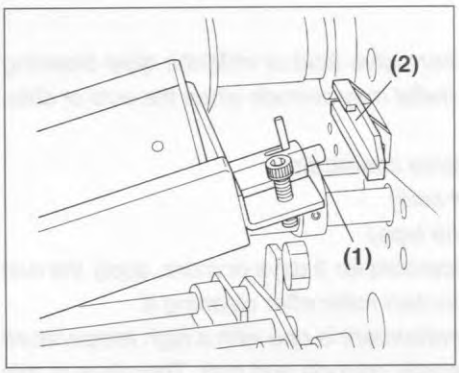
Remove the plate (1) and then clean each ink fountain key. Clean well so that the ink does not remain on the edge of the ink fountain key. Be careful so as not to allow the ink to enter the inside (2). If there is any ink on it, it should be removed completely.
When changing the color, remove the plate (1) and clean the inside the same as above.



After cleaning, apply the oil on each border (1) between the keys.
(Note) After cleaning it, the plate should be set onto the ink fountain correctly. Then check that the pins (2) are properly in the slots of the plate.

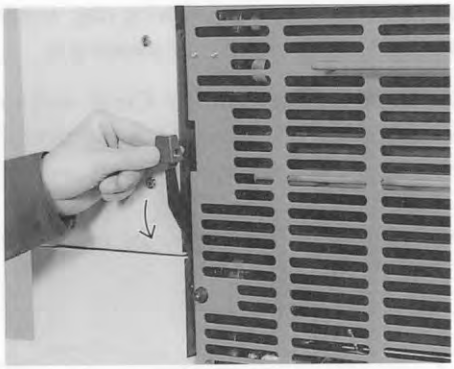


Mount the ink roller cleanup attachment on the bracket.



《NOTICE》

Insert the pins (1) of the ink roller cleanup attachment into the pin holes on the bracket (2) exactly. If it is not set properly, when running the machine the ink roller cleanup attachment will drop and this will cause an accident.



Run the machine and apply the roller cleaning solution on the rollers and shift the ink roller cleaning lever in the direction of the arrow.



Shift the metering roller release lever in the direction of the arrow (position) to release the metering roller from the water fountain roller and water oscillating roller.



Push the speed set buttons ([<] , [≫]) at the same time and the speed indication is automatically set to "70".



Push the set speed drive button and set the machine rotation speed to 7,000 R.P.H..



When the ink roller cleaning is almost completed, shift the water roller cleaning lever in the direction of the arrow'([ ] position) and contact the bridge roller with the water oscillating roller.



After cleaning the ink rollers and water form roller well, return the ink roller cleaning lever in the direction of the arrow and water roller cleaning lever ([ ] position) and stop the machine.
After stopping the machine, wipe off the paper dust and foreign particles on the rollers.



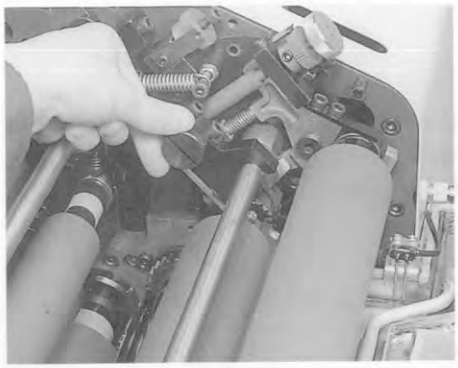
Remove the ink roller cleanup attachment and clean it well.

《NOTICE》

1. *After finishing the ink roller cleaning, remove the ink roller cleanup attachment immediately. If the ink roller cleanup attachment blade edge contacts the dry ink oscillating roller while the machine is running, it will damage the ink oscillating roller and ink roller cleanup attachment blade and cause the machine trouble.*
2. *If ink adheres on the ink roller cleanup attachment blade edge and it dries, it will wear out and damage the roller. Clean the blade edge well.*
3. *Never expose the ink roller cleanup attachment to ultraviolet rays (i.e. direct sunlight). This will cause the blade to harden.*

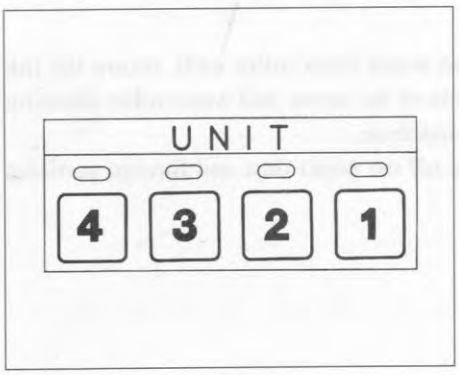
2. Cleaning the Water Section

1) Remove the water control wiper.

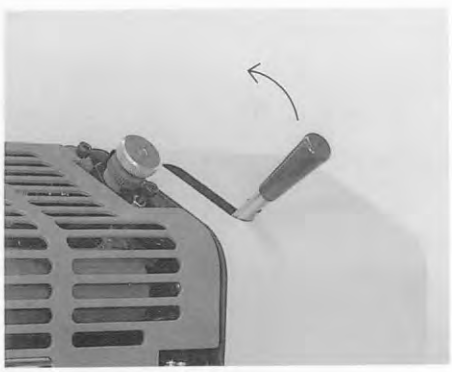


When cleaning the metering roller, be sure to remove the water control wiper.

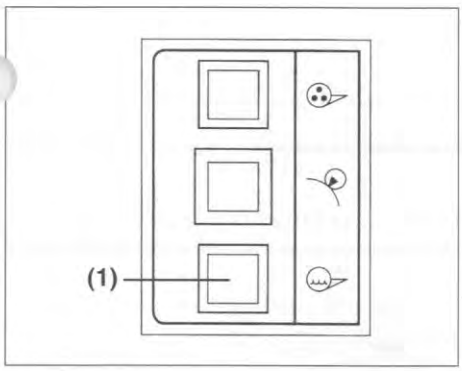
2) Clean the metering roller.



Turn all the unit selection buttons OFF to stop the metering roller rotation.



Shift the metering roller release lever in the direction of the arrow (position) to release the metering roller from the water fountain roller and water oscillating roller.



While pushing the water roller crawl button (1), the metering roller will rotate at crawl speed.

《NOTICE》

If pushing the water roller crawl button while the metering roller contacts the water fountain roller and water oscillating roller, the metering roller will be damaged.

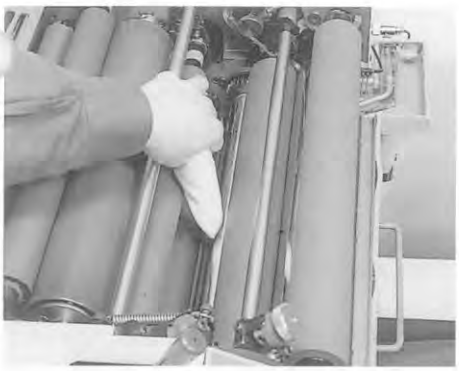


Wipe off all the ink that is adhered on the metering roller using the exclusive cleaner for the continuous dampening rubber rollers.

《NOTICE》

Release the metering roller by using the metering roller release lever after completing the daily operation to prevent deformation of the metering roller shape.

3) Clean the water fountain roller and water oscillating roller.

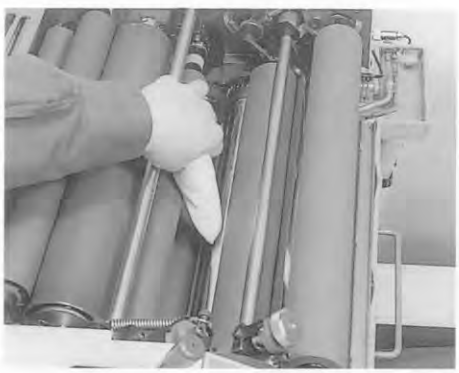


⚠ WARNING

Stop the crawl operation before cleaning. Failure to follow this instruction may result in a serious injury.

When completing the daily operation, clean the water fountain roller and water oscillating roller by using the exclusive cleaner for the continuous dampening metal rollers.

4) Do the roller maintenance to keep the hydrophilic properties of the roller surface.



⚠ WARNING

Stop the crawl operation before doing the maintenance. Failure to follow this instruction may result in a serious injury.

When completing the daily operation, do the roller maintenance to keep the hydrophilic properties of the roller surface by using the exclusive cleaners for the rubber rollers and metal rollers of the continuous dampening system.

《NOTICE》

Do not use polishing powder and glaze remover, because the roller surface will be damaged.

3. Cleaning the Cylinder Section

⚠ WARNING

Stop the crawl operation before cleaning. Failure to follow this instruction may result in a serious injury.

The materials that are used with the printing machine have a high degree of acidity and alkali which has a negative effect on the machine. The use of these strong chemicals may cause the metal parts to corrode or rust, so proper maintenance of the machine is very important after finishing the operation for the day. Because the cylinder section greatly influences the printing quality, proper maintenance should be done on it every day.

1) Clean the plate cylinder.



Take off the plate and under sheet from the plate cylinder after printing is finished. Wipe off any stains such as ink, etching solution, and plate cleaner on the plate cylinder surface with a cotton rag containing water and cleaning solution.

Also, when using the gauge film with the plate cylinder, take off the gauge film and clean the plate cylinder at least once a month.

《NOTICE》

1. *Do not use plate cleaner to clean the plate cylinder. When cleaning the plate, be careful that the plate cleaner does not adhere on the plate cylinder surface.*
   If the plate cleaner adheres on the plate cylinder surface, wipe it o with a cotton rag containing water and cleaning solution immediately.
2. *When using the gauge film with the plate cylinder, clean the cylinder surface well and dry it completely before mounting the gauge film. Also, mount the gauge film so that it contacts the entire surface of the cylinder. If there is any clearance between the film and cylinder, water, etching solution, and the other chemicals will enter into the clearance and rust will form.*
3. *When the hydrophilic properties of the plate surface cannot be kept, wipe off any ink and oil with a cotton rag containing chrome roller cleaner. Then wipe off the chrome roller cleaner completely with a cotton rag containing water.*

2) Clean the blanket cylinder.



Wipe off any ink and etching solution on the blanket surface and side with a cotton rag containing water and cleaning solution.



Take off the blanket from the blanket cylinder and wipe off any stains such as ink and etching solution on the blanket cylinder surface with a cotton rag containing water and cleaning solution at least once a month. Make sure that the cylinder is completely dry, and then apply rust preventive oil over the entire surface of the blanket cylinder.
Also, when using the gauge film with the blanket cylinder, take off the gauge film and clean the blanket cylinder at least once a month.

《NOTICE》

1. *Be careful that the blanket recovery solution and other chemicals do not adhere on the blanket cylinder surface. If they adhere on the blanket cylinder surface, wipe them off with a cotton rag containing water and cleaning solution immediately. Make sure that the cylinder is completely dry, and then apply rust preventive oil over the entire surface of the blanket cylinder.*
2. *When using the gauge film with the blanket cylinder, clean the cylinder surface well and dry it completely before mounting the gauge film. Also, mount the gauge film so that it contacts the entire surface of the cylinder. If there is any clearance between the film and cylinder, water, etching solution, and the other chemicals will enter into the clearance and rust will form.*

3) Clean the impression cylinder and transfer drum.



⚠ WARNING

Mount the cover removed in place after cleaning. Failure to follow this instruction may result in a serious injury.

Wipe off any stains such as ink and etching solution on the impression cylinder surface and transfer drum surface with a cotton rag containing water and cleaning solution after printing is finished.
After cleaning, mount the transfer drum cover removed in place.

[Recommended rust preventive oil list]

Maker	Trade name
E. F. Houghton & Co.	Rust Veto 371, 377
Daubert Chemical Co.	Nox-Rust 307
Valvoline Oil Co.	Tectyl 894

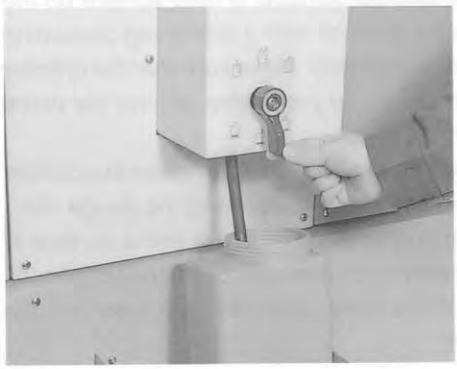
(Note) The recommended rust preventive oil is equivalent to the MIL (Military specifications and standards), P-3 type.
(Please use the rust preventive oil that displaces water.)

4. Cleaning the Blanket Cleaning Device

WARNING

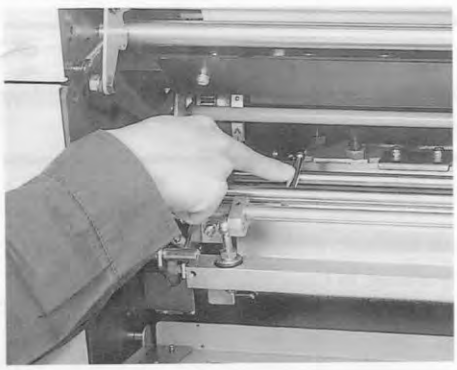
Push the emergency stop button to stop the machine before mounting and removing the blanket cleaning device. Failure to follow this instruction may result in a serious injury.

1) Drain the blanket cleaning solution.

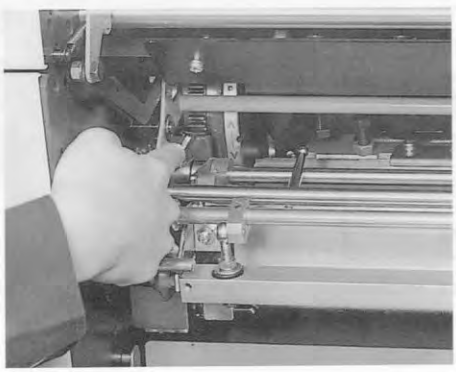


Set the blanket cleaning solution changeover lever at the used unit to the position to drain the cleaning solution.
Dispose the solution in the waste solution bottle every day.
Please entrust the waste disposal company with the waste solution.

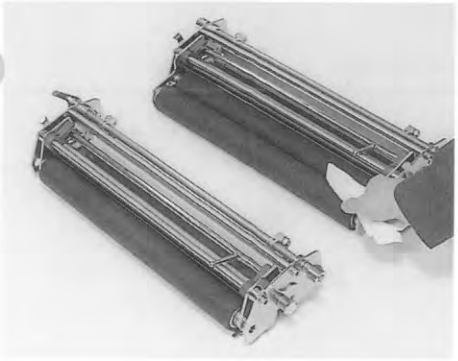
2) Remove the blanket cleaning device and clean it.



Shift the roller release lever to the blanket cylinder side and release the cleaning roller and squeeze roller.

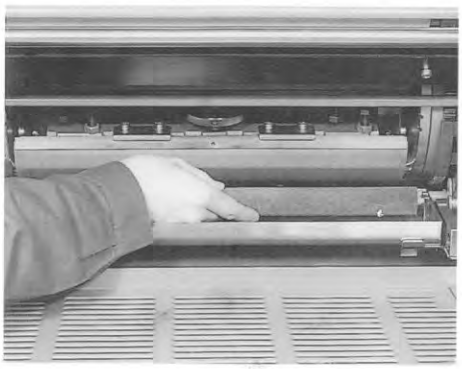


Shift the lock lever (operation side and non operation side) to the blanket cylinder side and remove the blanket cleaning device.

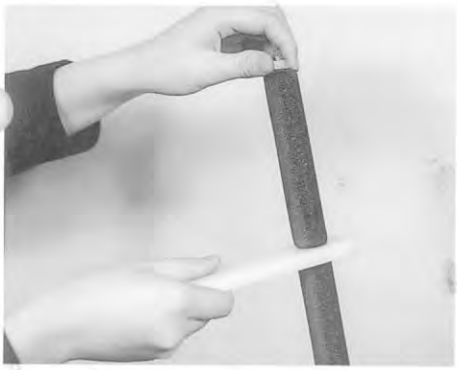


If etching solution or zinc oxide of the plate surface adheres on the cleaning roller, printing problems may be caused.
Wipe it off using a cotton rag containing water and cleaning solution every day.

- For the first and third units ..... 1 cleaning roller
- For the second and fourth units ... 2 cleaning rollers



Take out the sponge roller from the cleaning tray.

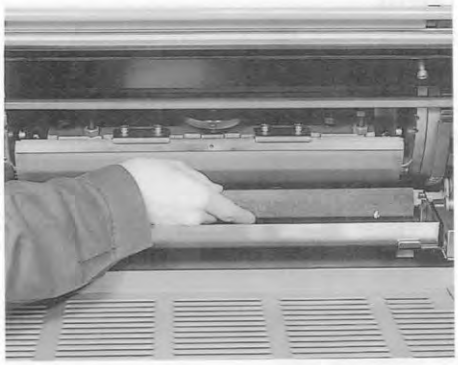


After dipping the sponge roller in the cleaning solution, clean the sponge roller using the sponge roller cleaner by squeezing it out. Repeat this process a couple of times. When using the sponge roller with ink and foreign particles adhered, the blanket cleaning effect will be reduced.

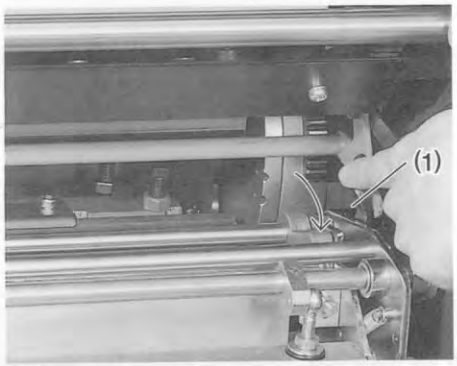


Clean the cleaning tray.
Remove the tray and remove any ink and foreign particles adhered in the tray.
Since the pipe of the tray is set in the hole, pull the tray straight up.

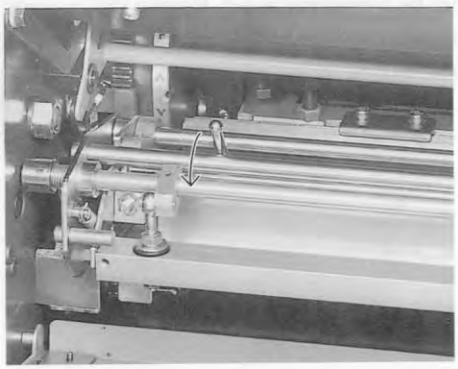
3) Mount the blanket cleaning device.



Mount the sponge roller in the cleaning tray.

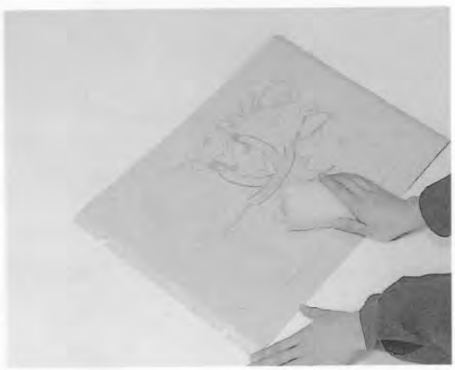


Align the gap section of the lock lever (1) (operation side and non operation side) with the stud and then mount the cleaning device base body. Shift the lock lever in the direction of the arrow and fix it.



Shift the roller release lever in the direction of the arrow.

5. Plate Preservation



To use the metal plate over again, correct plate preservation is necessary.

1. Using a sponge soaked with water, apply water onto the plate surface. Then using cleaning solution, wash off the ink on the plate surface and then rinse the plate surface with water.
2. Apply the metal plate protection ink on the plate after dampening the plate surface.
3. First rinse it with water, then dry it, then apply gum solution and finally dry it.

Chapter 2

Periodic Inspection

《NOTICE》

Check each section periodically to keep the machine in top operating condition.

1. Checking the Roller Pressure

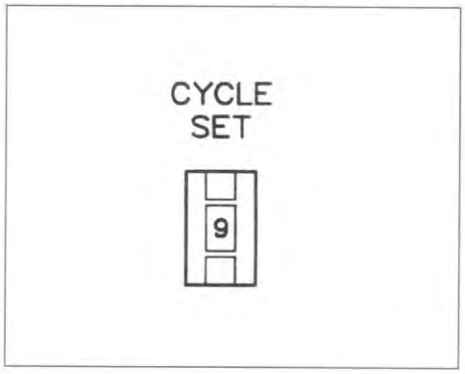
The roller pressures have a great influence on the printing results and ink roller cleaning. Check the pressure at the minimum of once every 3 months.

1) Checking and adjustment of the ink form roller pressure

WARNING

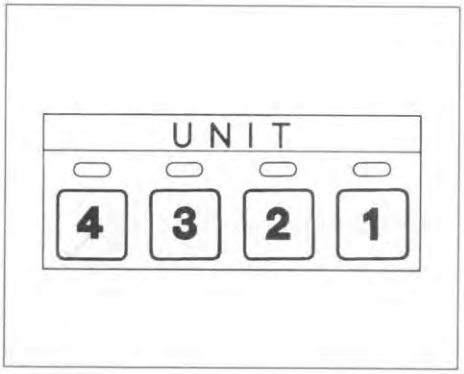
1. Never touch the rotating parts when doing the crawl operation.
2. Close the cover opened after finishing the inspection.
Failure to follow this instruction may result in a serious injury.

Checking the roller pressure



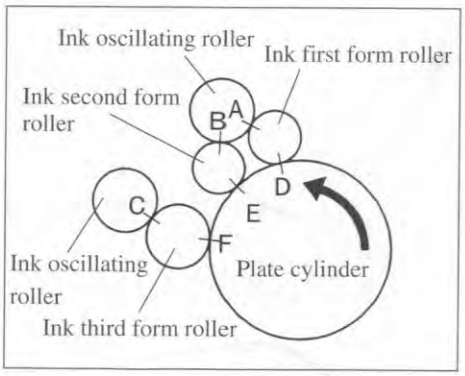
Push the cycle set button on the delivery section auxiliary switch panel and set it to the cycle "9".

(Note) When setting it to the cycle "9", the ink form roller and water form roller will be in contact with the plate surface when the machine is stopped. When checking and adjusting the form roller pressure, the cycle should be set on "9". After completing the adjustment, the cycle should be returned to "0".

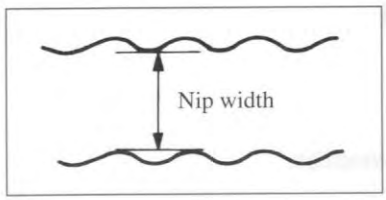


Push the unit selection button of the unit on which the roller pressure adjustment will be done.

(Note) The checking and adjustment should be done on every unit.



Sign	Nip width (mm) (inch)	Sign	Nip width (mm) (inch)
A	3.0 (0.118")	D	3.5 (0.138")
B	3.0 (0.118")	E	3.5 (0.138")
C	3.0 (0.118")	F	3.5 (0.138")

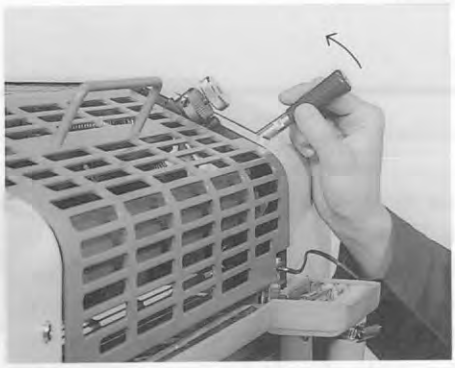


(Note) The nip width should be measured both on the operation and non operation sides after transferring it onto a sheet of paper. Adjust so that both sides nip widths are the same and equal the standard value.

(Note) When adjusting the pressure between the ink form roller and ink oscillating roller, the pressure with the plate will change. (However even when adjusting the pressure with the plate, the pressure with the ink oscillating roller will not change.) Therefore adjust the pressure with the ink oscillating roller first, and after that, adjust the pressure with the plate.

a. The pressure between the ink form roller and ink oscillating roller (A, B, C)

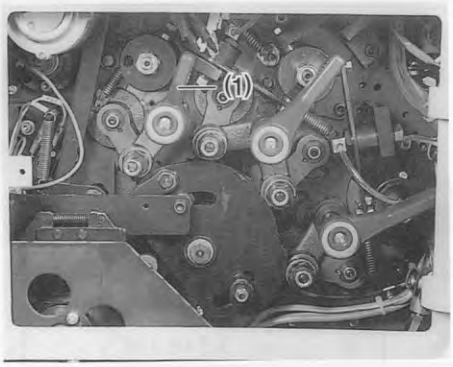
Checking procedures



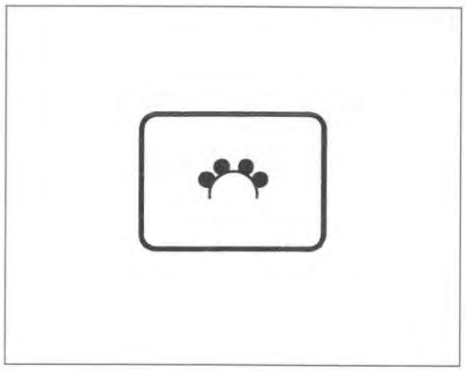
Shift the metering roller release lever in the direction of the arrow (position) and release the metering roller from the water oscillating roller.



Apply ink on the roller thinly and run the machine.



Set the water form roller release lever (1) at the position.

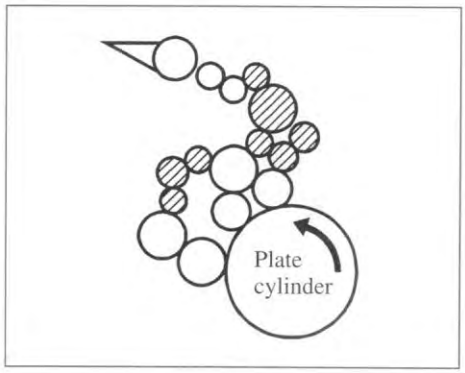


Push the water and ink form roller ON button to contact the ink form rollers with the plate surface.

(Note) If the water sensor does not detect the dampening solution in the water fountain, the water and ink form roller ON button cannot be ON.

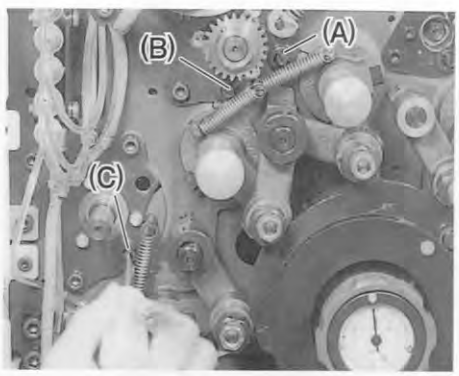


After running the machine for a few minutes, stop the machine. After a few seconds, push the crawl button and check the nip width on the ink oscillating roller.



(Reference) The nip width should be checked after removing the distributor rollers as shown in the illustration.

<Adjustment procedures>



Turn the adjustment screws (A), (B), (C) to adjust them. The adjustment screws are located at the 3 places each on the operation and non operation sides. When turning them in the + direction (in the counterclockwise direction), the pressure will be increased.

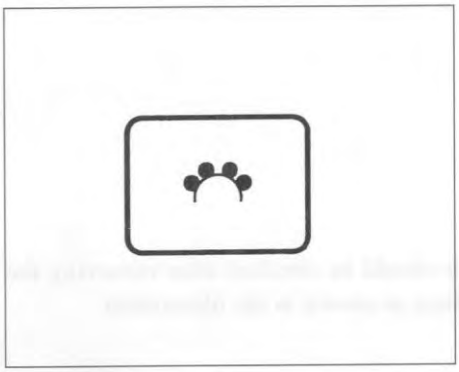
- Ink first form roller and ink oscillating roller ... (A)
- Ink second form roller and ink oscillating roller ... (B)
- Ink third form roller and ink oscillating roller ... (C)

b. The pressure between the ink form roller and plate (D, E, F)

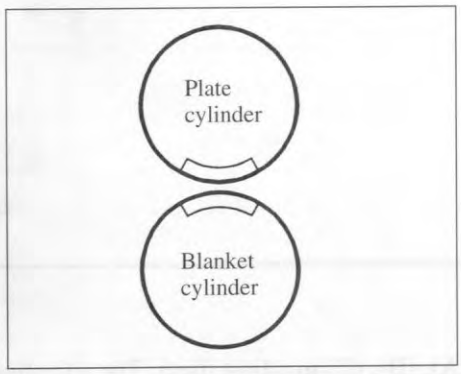
Checking procedures



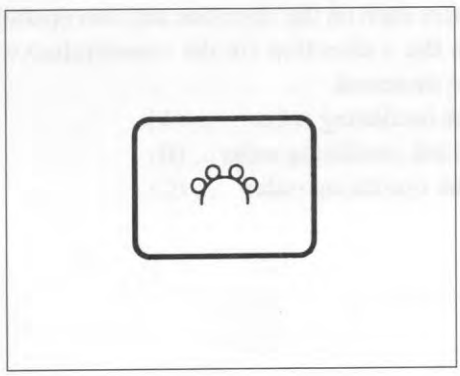
Set the water form roller release lever (1) at the position.



Run the machine and push the water and ink form roller ON button to contact the ink form roller with the plate surface.



After running the machine a few minutes, stop it. (Stop at the position where the plate cylinder gap faces the blanket cylinder gap.)

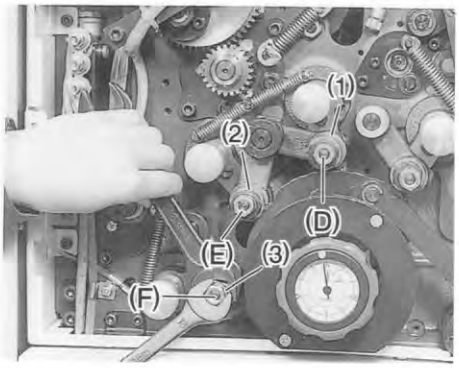


After a few seconds, push the water and ink form roller OFF button and release the ink form roller from the plate surface.



Push the crawl button and then check the nip width that appears on the plate surface.

<Adjustment procedures>



Loosen the lock nuts (1), (2), and (3) and turn the pressure adjustment nuts (D), (E), and (F).
The adjustment nuts are located at the 3 places each on the operation and non operation sides. When turning them in the direction of the arrow, the pressure will be increased.

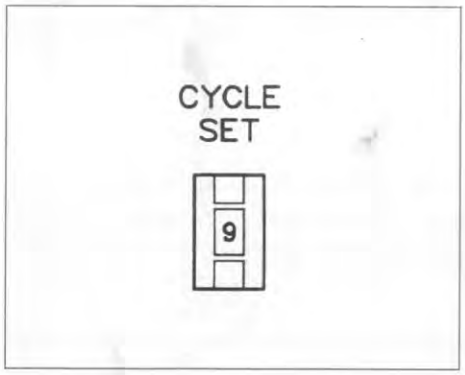
- Ink first form roller and plate ... (D)
- Ink second form roller and plate... (E)
- Ink third form roller and plate ... (F)

2) Checking and adjustment of the water roller pressure

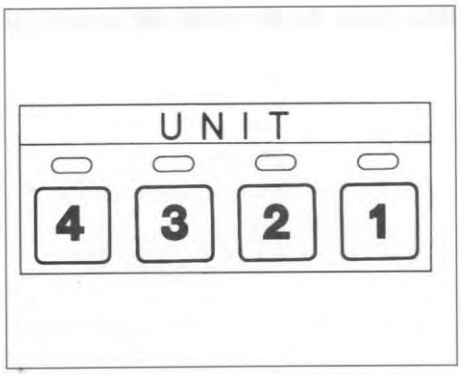
WARNING

1. Never touch the rotating parts when doing the crawl operation.
2. Close the cover opened after finishing the inspection.
Failure to follow this instruction may result in a serious injury.

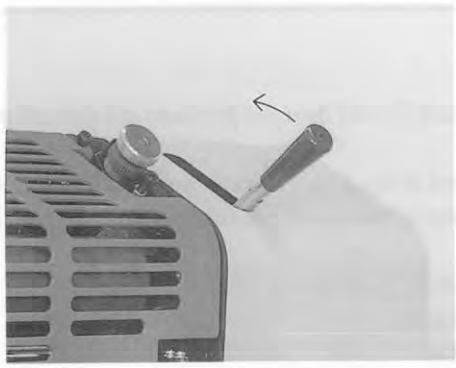
Checking the roller pressure



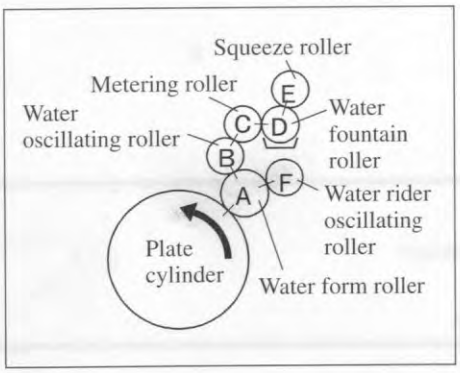
Push the cycle set button on the delivery section auxiliary switch panel and set it to the cycle "9".
(Note) When setting it to the cycle "9", the ink form roller and water form roller will be in contact with the plate surface when the machine is stopped. When checking and adjusting the form roller pressure, the cycle should be set on "9". After completing the adjustment, the cycle should be returned to "0".



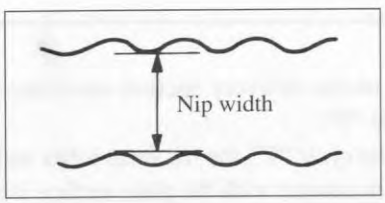
Push the unit selection button of the unit on which the roller pressure adjustment will be done.
(Note) The checking and adjustment should be done on every unit.



Shift the metering roller release lever in the direction of the arrow (position) and release the metering roller from the water oscillating roller.



Sign	Nip width (mm) (inch)	Sign	Nip width (mm) (inch)
A	4.0 (0.157")	D	—
B	2.0 (0.079")	E	Parallel pressure
C	2.5 (0.098")	F	Parallel pressure



(Note) The nip width should be measured both on the operation and non operation sides after transferring it onto a sheet of paper. Adjust so that both sides nip widths are the same and equal the standard value.

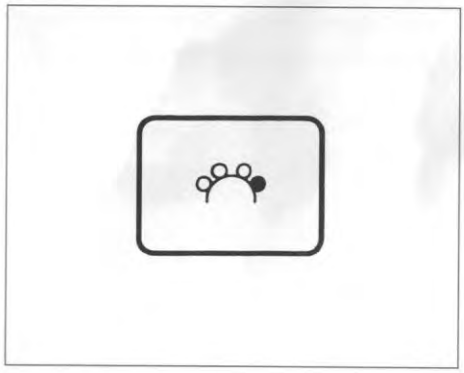
(Note) When adjusting the pressure between the water form roller and water oscillating roller, the pressure with the plate will change. (However even when adjusting the pressure with the plate, the pressure with the water oscillating roller will not change.) Therefore adjust the pressure with the water oscillating roller first, and after that, adjust the pressure with the plate.

a. The pressure between the water form roller and water oscillating roller (B)

Checking procedures



Apply ink on the roller thinly and run the machine.
(Reference) It is possible to feed the ink to water roller by shifting the water roller cleaning lever.

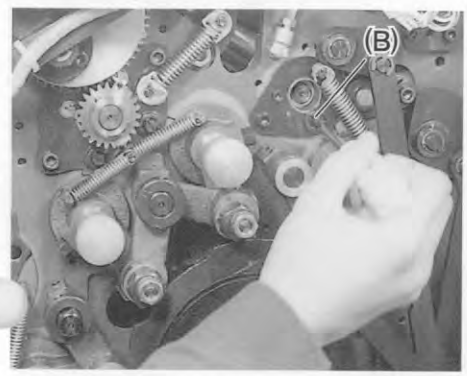


Push the water form roller ON button to contact the water form roller with the water oscillating roller.



After running the machine for a few minutes, stop the machine. After a few seconds, push the crawl button and check the nip width on the water oscillating roller.

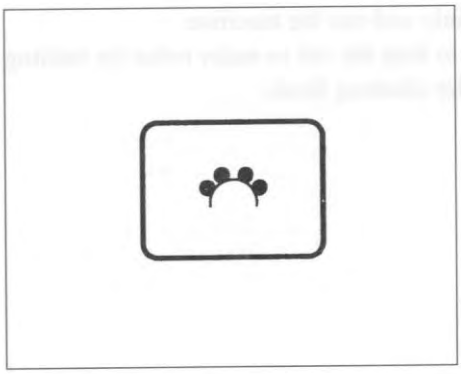
<Adjustment procedures>



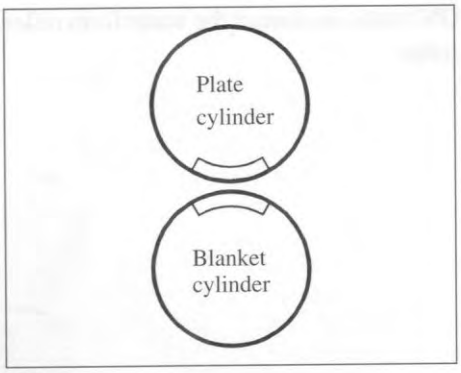
Turn the adjustment screw (B) to adjust it.
The screw is located on both the operation and non operation sides. When turning it in the counterclockwise direction, the pressure will be increased.

b. The pressure between the water form roller and plate (A)

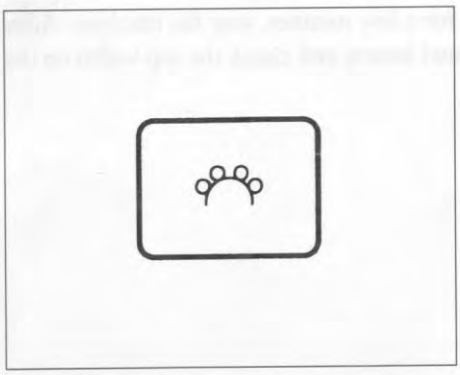
Checking procedures



Apply ink on the roller thinly and run the machine and push the water and ink form roller ON button to contact the water form roller with the plate surface.



After running the machine a few minutes, stop it. (Stop at the position where the plate cylinder gap faces the blanket cylinder gap.)

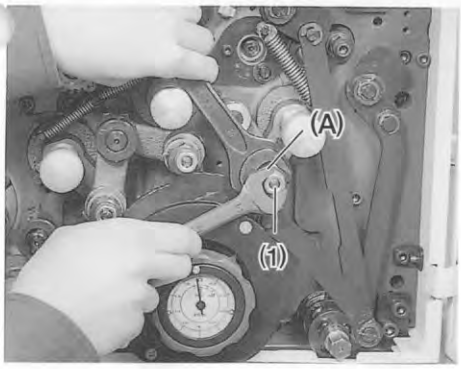


After a few seconds, push the water and ink form roller OFF button and release the water form roller from the plate surface.



Push the crawl button and then check the nip width that appears on the plate surface.

<Adjustment procedures>



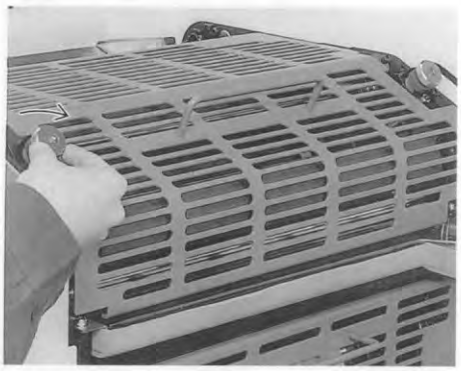
Loosen the lock nut (1) and turn the pressure adjustment nut (A).
When turning the adjustment nut (A) in the direction of the arrow, the pressure will be increased.

c. The pressure between the metering roller and water fountain roller (D)

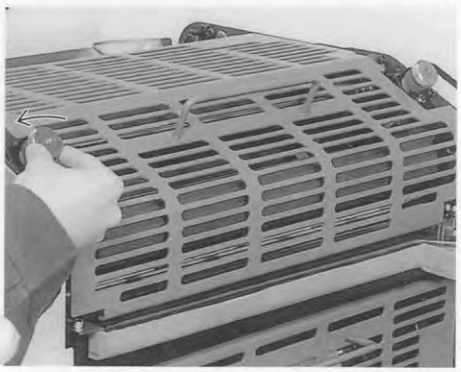
<Checking and adjustment procedures>



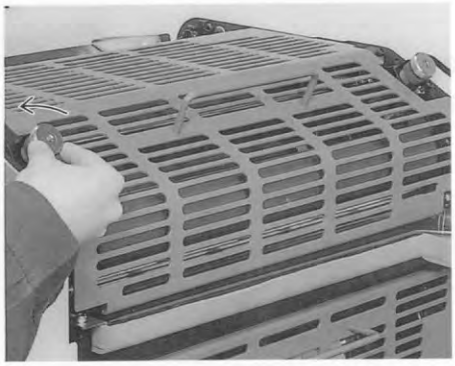
Check that the dampening solution is supplied into the water fountain until the dampening solution contacts the water fountain roller.
Shift the metering roller release lever in the direction of the arrow (position) and contact the metering roller with the water fountain roller.



Run the machine and turn the metering roller pressure adjustment knob in the - direction (in the clockwise direction) one turn complete and release the pressure.



Turn the metering roller pressure adjustment knob in the + direction (in the counterclockwise direction) slowly until the aqua film on the metering roller just cuts.



Turn the metering roller pressure adjustment knob in the + direction (in the counterclockwise direction) 10 clicks more from the position that the aqua film was cut.

d. The pressure between the metering roller and water oscillating roller (C)

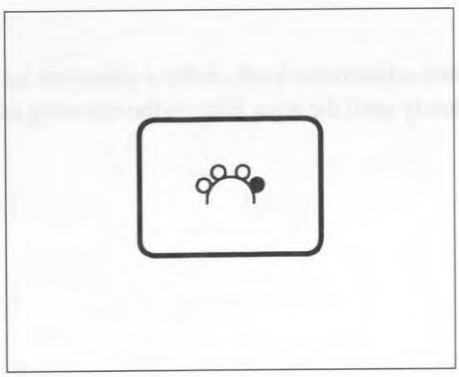
Checking procedures



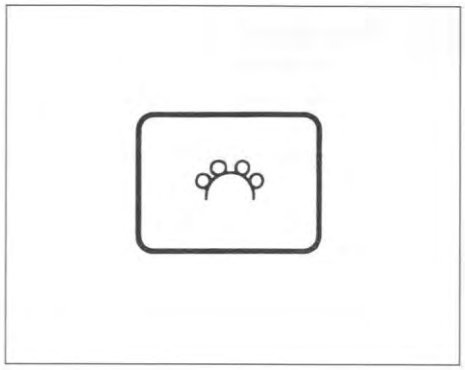
Shift the metering roller release lever in the direction of the arrow (position) and contact the metering roller with the water fountain roller.
At this time, set the water volume control dial to "0".



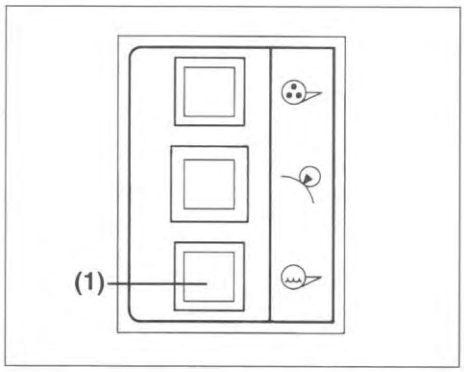
Run the machine.
Shift the water roller cleaning lever in the direction of the arrow (position) and contact the bridge roller with the water oscillating roller, to apply ink on the water oscillating roller.
After that, shift the water roller cleaning lever back. (position)



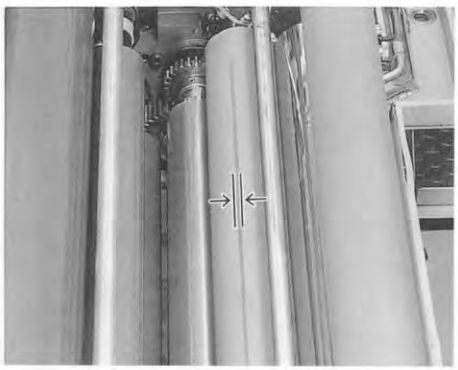
Stop the machine.
Push the water form roller ON button and contact the metering roller with the water oscillating roller.



After a few of seconds, push the water and ink form roller OFF button to release the metering roller from the water oscillating roller.

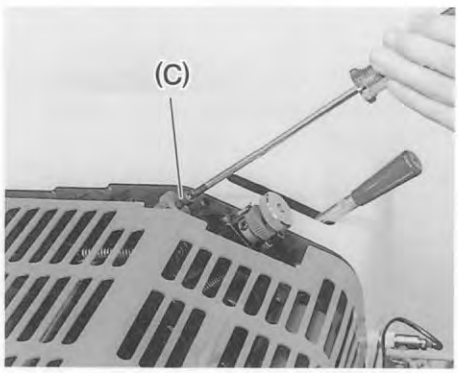


Push the water roller crawl button (1).



Crawl the metering roller and check the nip width on the metering roller.

<Adjustment procedures>



Turn the adjustment bolt (c) (operation side and non operation side) to adjust it.
When turning it in the + direction (in the counterclockwise direction), the pressure will be increased.

2. Checking the Plate Pressure and Impression Pressure

When the printing image becomes texture grained or white out occurs, the cause is poor printing pressure (plate pressure, impression pressure). Follow the procedures below.

	Standard nip width (mm) (inch)
Pressure between the blanket cylinder and plate cylinder (Plate pressure)	5.5 ~ 6.0 (0.22 ~ 0.24")
Pressure between the blanket cylinder and impression cylinder (Impression pressure)	6.5 ~ 7.0 (0.26 ~ 0.28")

(Note) The nip width given on the left is when using the Ryobi blanket and under blanket.

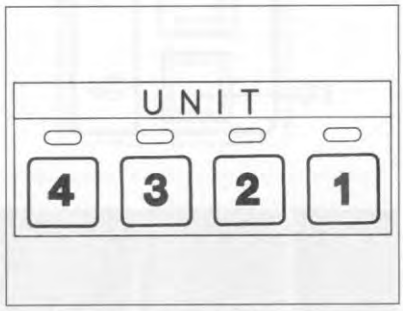
Checking procedures



1. Align the plate pressure adjustment scale to the thickness of the plate.



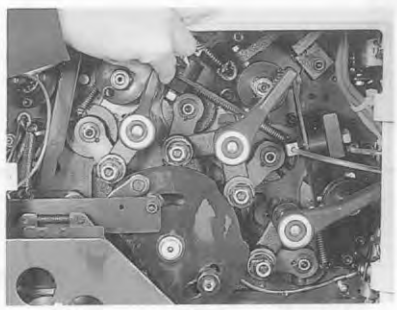
2. Align the impression pressure adjustment dial to the thickness of the paper.



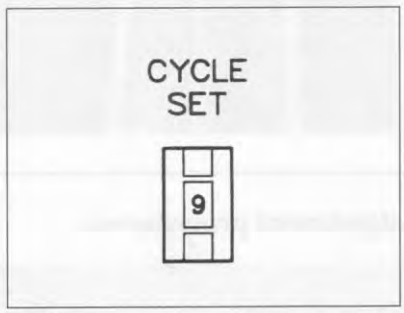
3. Push the unit selection button of the checking unit.



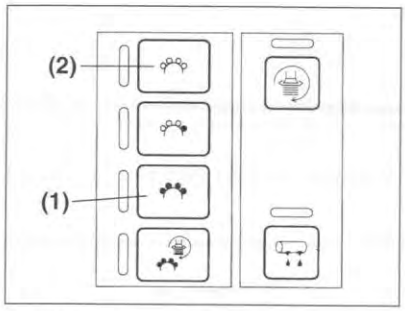
4. Shift the metering roller release lever in the direction of the arrow (position) to release the metering roller from the water fountain roller.



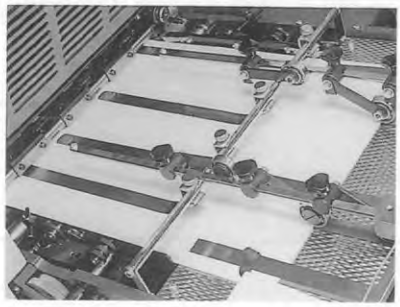
5. Set the water form roller release lever at the position.



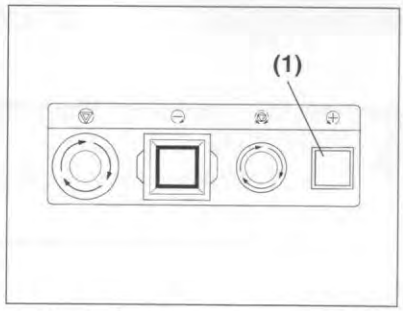
6. Set the cycle set button on the delivery section auxiliary switch panel to the cycle "9".
   (Note) After completing the checking, return it to the cycle "0".



7. Run the machine and push the water and ink form roller ON button (1). After feeding ink to the plate surface fully, push the water and ink form roller OFF button (2) to release the water form roller and ink form roller from the plate surface.



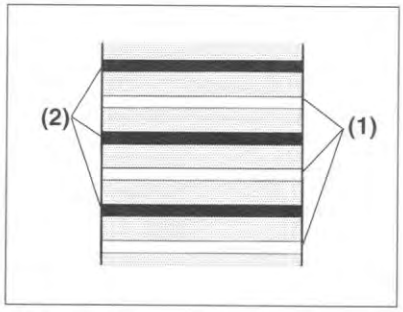
8. Feed a sheet of paper up to the delivery section and stop the machine before doing the cylinder ON on the checking unit.



9. Push the forward crawl button (1) and transfer the ink to the paper.



10. After transferring the ink to the paper, feed the paper to the delivery section.
Measure the nip width that appears on the paper.



(Reference)
The stripes on the printed sheet distinguish the impression pressure from the plate pressure as shown in the illustration.

Chapter 3

Periodic Maintenance

WARNING

Turn off the power before doing the periodic maintenance. Failure to follow this instruction may result in a serious injury.

《NOTICE》

1. *Do the periodic maintenance of each section to keep the machine in top operating condition and to assure the high printing accuracy.*
2. *When not using the machine for a long time, apply the rust preventive oil after cleaning each section of the machine with a cotton rag containing water and cleaning solution. If these instructions are not followed, rust and corrosion will form caused by the temperature, humidity, and chemicals.*

1. Maintenance Item List

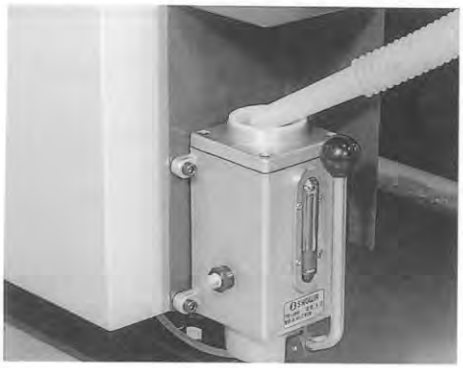
Do the maintenance of each section periodically by following the frequency given below as a guide. However, depending on the machine operation, the frequency may have to be increased.

No.	Item	Frequency
1	a. Supplying the oil to the centralized oiling system tank	When the oil level reaches the lower limit line.
	b. Supplying the oil to each section by using the centralized oiling system	Every day
	c. Manually oiling and greasing each section	Lubricate every day, every week, or every month by following the lubrication chart.
2	Cleaning the air pump filter	Every week
3	Cleaning the water fountain	
4	Cleaning each sensor surface	
5	Cleaning the skid rollers	
6	Cleaning the pull-out rollers and guide rollers	
7	Maintenance of the powder spray device	
8	Cleaning the dampening solution circulation device filter	
9	Oiling the air pump	Every month
10	Cleaning the grippers and gripper bases on the transfer drum and on the impression cylinder	
11	Cleaning the static eliminator electrode	
12	Cleaning the PV pump of the dampening solution circulation device	
13	Cleaning the inside of the tank of the dampening solution circulation device	

2. Maintenance Point

1) Lubrication

a. Supplying the oil to the centralized oiling system tank



Before the oil level reaches the lower limit line, supply the oil through the filter.

b. Supplying the oil to each section by using the centralized oiling system



Before starting the machine, supply the oil to each section by using the centralized oiling system.
Pull the centralized oiling pump lever and release it after 2 to 3 seconds to supply the oil. Repeat this 2 to 3 times.

[Recommended lubrication list for the centralized oiling system and pump]

《NOTICE》

1. *Use the recommended oil. Do not use the used oil or oil with special additives.*
2. *The specific gravity and viscosity of the oil for the centralized oiling system and pump is lower than that of the manual lubrication oil. When this oil is used for the manual lubrication, the effect will be reduced prematurely. Therefore, only use this oil for the centralized oiling system and pump.*

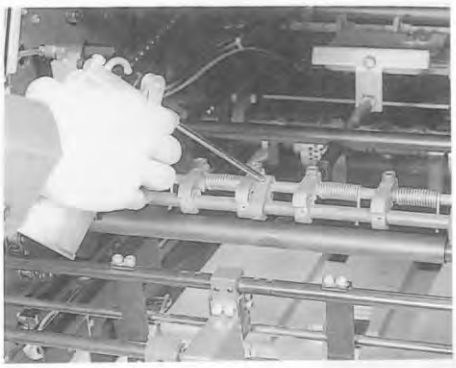
Maker	Oil
Shell	TETRA OIL 32 or 46
Mobil	Mobil DTE 24 or 25
ESSO	UNIPOWER MP 32 or 46

(Note) The recommended oil is equivalent to antiwear type ISO (International Organization for Standardization) VG 32 or 46.

c. Manually oiling and greasing each section

⚠ WARNING

1. Turn off the power before lubricating.
2. Mount the cover removed in place after lubrication.
Failure to follow these instructions may result in a serious injury.



All of the required lubrication points are marked with red paint. Use oil or grease depending on the function of the part.
Lubricate the machine following the lubrication chart that is included with the machine.

[Recommended lubrication list for the manual lubrication]

《NOTICE》

1. Use the recommended oil and grease. Do not use the used oil or oil with special additives.
2. The specific gravity and viscosity of the manual lubrication oil is higher than that of the oil for the pump and centralized oiling system. When this oil is used for the pump and centralized oiling system, the oil circulation may be poor and then this may cause the trouble with the pump and centralized oiling system.

Maker	Oil	Grease
Shell	GC OIL SE100	ALVANIA GREASE EP 1 ALVANIA GREASE 1
Mobil	Mobil DTE Oil Heavy	Mobilux EP 1
ESSO	SPARTAN EP 100 TERESSO 100	LITHTAN 1

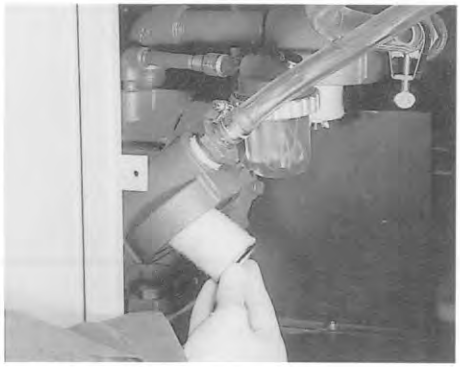
(Note) 1. The recommended oil is equivalent to antiwear type ISO (International Organization for Standardization) VG 100.
2. The recommended grease is equivalent to the multipurpose grease (Li) NLGI No. 1.
3. Supply oil and grease at all the lubricating points every week for 3 months after installation. After that, lubricate the machine following the lubrication chart.

2) Cleaning the air pump filter

⚠ WARNING

Close the cover opened after cleaning. Failure to follow this instruction may result in a serious injury.

a. Paper feed air pump



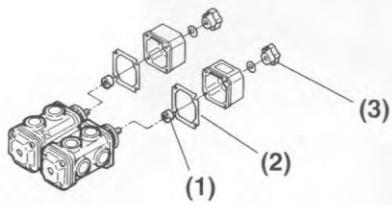
If the pump filter is dirty, the vacuum force of the pump will be lowered. Take out the filter and remove any dirt and foreign particles on the filter, and dip it in cleaning solution periodically.

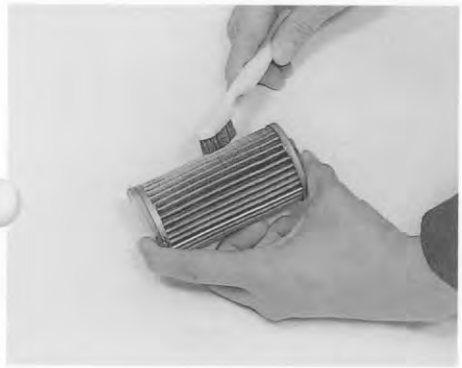


b. Delivery air pump



If the pump filter is dirty, the vacuum force of the pump will be lowered. Take out the filter and remove any dirt and foreign particles on the filter, periodically.
After cleaning, mount the acrylic resin packing seal (1) and rubber packing seal (2) properly and fix the knob (3) completely.
The improper setting or fixing may result in air leakage and noise.





3) Cleaning the water fountain

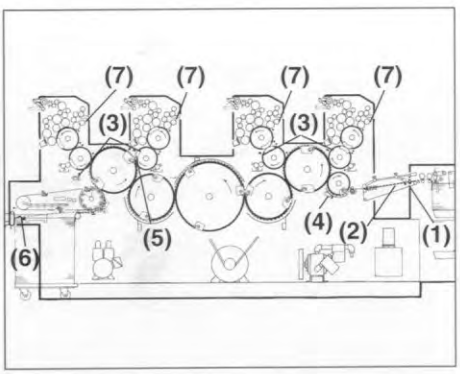


Foreign particles will accumulate in the water fountain. Remove any foreign particles in the water fountain.

4) Cleaning each sensor surface

⚠ WARNING

Push the emergency stop button to stop the machine before cleaning the sensor surface. Failure to follow this instruction may result in a serious injury.

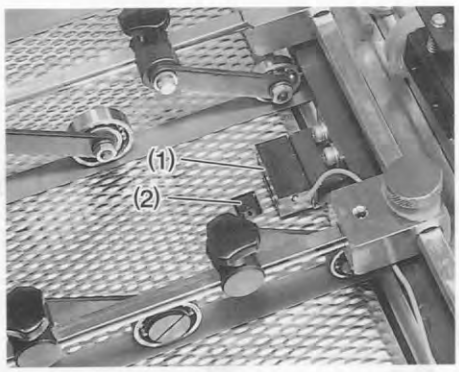


Each sensor is positioned as shown in the illustration.

(1) Double sheet detector sensor
(2) Paper feed sensor
(3) Blanket jam detector sensor
(4) Cylinder ON sensor
(5) Sheet travel jam detector sensor
(6) Delivery pile lowering sensor
(7) Water sensor

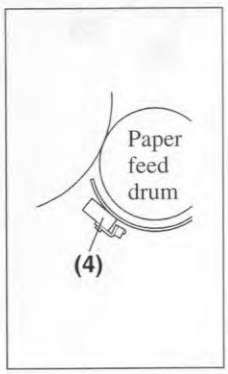
《NOTICE》

If using cleaning solution when cleaning the sensor surface, it will damage the sensor. Only use a dry soft rag when cleaning.

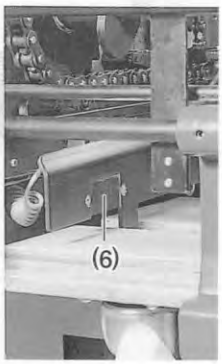


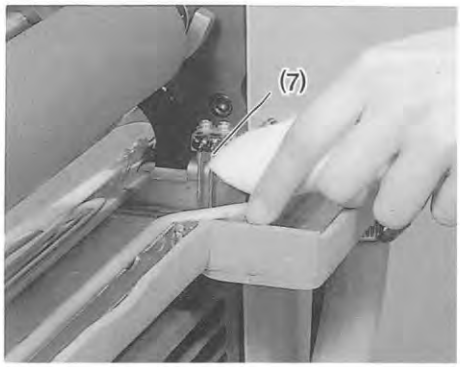
Foreign particles and spray powder that may adhere on the sensor surface (1) through (6) will cause the miss operation of the sensor. So, wipe off the sensor surface using a soft rag.











Foreign particles and ink adhering on the water sensor (7) electrode causes miss functioning. Wipe off the electrode with a dry soft rag and keep it clean.
When it becomes too dirty, clean it with a rag containing water and cleaning solution. At this time, be careful not to allow the cleaning solution to enter the sensor body.

5) Cleaning the skid rollers



When the skid rollers do not rotate smoothly because dust or foreign particles are adhered on the bearing, clean the bearing using cleaning solution. After cleaning it, lubricate it with a little oil.
(Note) Wipe off any excess oil that adheres on the bearing when supplying too much.

6) Cleaning the pull-out rollers and guide rollers



If ink adheres on the pull-out rollers and guide rollers, the roller surface will become hard. Once a week, clean them after checking the surfaces of the rollers.
(Note) For the explanation, the cover is removed in the photograph.

7) Maintenance of the powder spray device



After using the powder spray device, and then not using it for a long time the spray powder will harden in the spray hose. After using the powder spray device, remove the spray powder bottle and feed waste paper to use up any spray powder remaining in the hose.

(Note) 1. When the spray powder in the bottle gets dirty or foreign particles are mixed in, empty and dispose of the spray powder in the bottle. Clean the inside of the bottle with a clean dry soft rag.

2. Do not use spray powder which has hardened because it contains moisture.

8) Cleaning the dampening solution circulation device filter.



The foreign particles will accumulate in the dampening solution circulation device filter.

If the filter is blocked, the circulation function will be reduced.

Remove the filter and wash it with water.

9) Oiling the air pump

⚠ WARNING

Close the cover opened after oiling. Failure to follow this instruction may result in a serious injury.





The air pump is inside the door at the feeder section.
Check the oil level once a month and be sure that the oil level in the oil cup is never less than half full.

[Recommended lubrication list for the pump and centralized oiling system]

《NOTICE》

1. *Use the recommended oil. Do not use the used oil or oil with special additives.*
2. *The specific gravity and viscosity of the oil for the pump and centralized oiling system is lower than that of the manual lubrication oil. When this oil is used for the manual lubrication, the effect will be reduced. Therefore, only use this oil for the pump and centralized oiling system.*

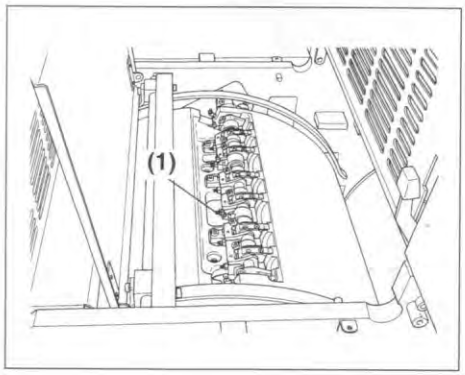
Maker	Oil
Shell	TETRA OIL 32 or 46
Mobil	Mobil DTE 24 or 25
ESSO	UNIPOWER MP 32 or 46

(Note) The recommended oil is equivalent to antiwear type ISO (International Organization for Standardization) VG 32 or 46.

10) Cleaning the grippers and gripper bases on the transfer drum and on the impression cylinder

⚠ WARNING

Mount the cylinder gap safety cover removed in place after cleaning. Failure to follow this instruction may result in a serious injury.

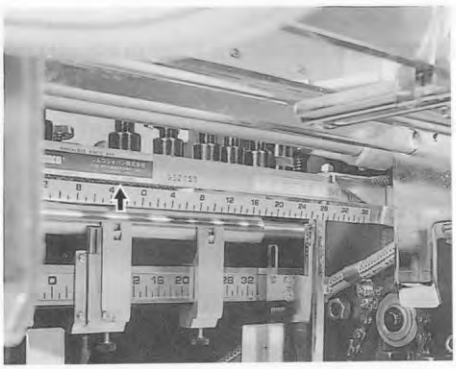


Open the safety cover on each impression cylinder and transfer drum and remove the cylinder gap safety cover. Open the gripper by pushing the screw (1) by hand and remove any paper dust and ink accumulated on the underside of the gripper by using the brush which is included with the machine.
Wipe off any paper dust and ink accumulated on the gripper base with a soft cotton rag.

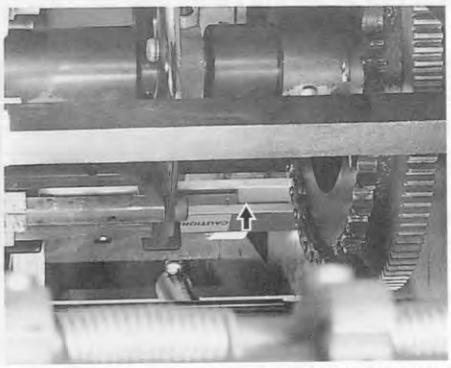
11) Cleaning the static eliminator electrode

CAUTION

Turn off the power before cleaning. Failure to follow this instruction may result in an electric shock.



Feeder side



Delivery side

When the static eliminator is used for a long time, carbon will build up and adhere on the electrode. This causes the eliminating force to become weak. Clean the electrode with the brush periodically.

12) Cleaning the PV pump of the dampening solution circulation device

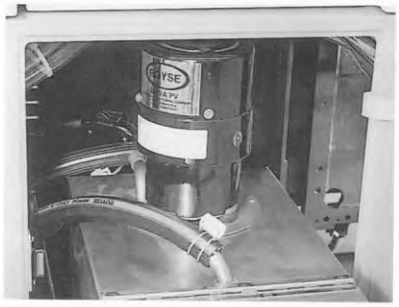


The returning dampening solution from the water fountain will be sucked into the dampening solution circulation device by the impeller in the PV pump bottom. When foreign particles adhere in the PV pump bottom, the suction force will be reduced. So please remove any foreign particles inside periodically.

Cleaning procedures



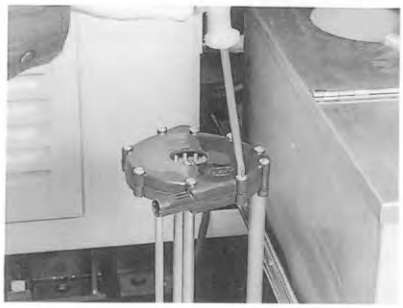
1. Loosen the 2 fixing screws which fix the tank.



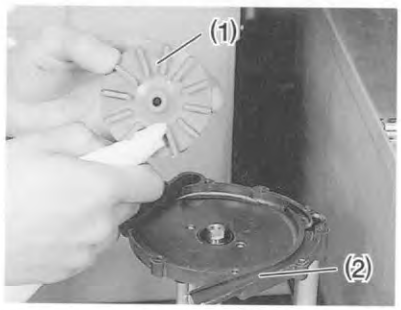
2. Remove the 2 hoses that are connected to the PV pump.



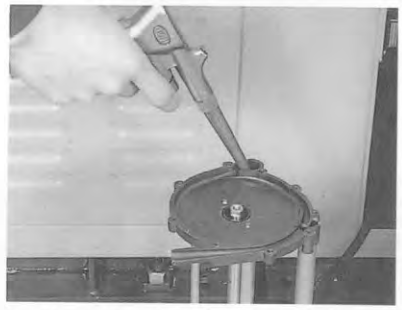
3. Take the PV pump out.



4. Loosen the screws and remove the cover.



5. Clean the impeller (1) and groove section (2).



6. Blow the air in to clean the inside of the pipe.

13) Cleaning the inside of the tank of the dampening solution circulation device

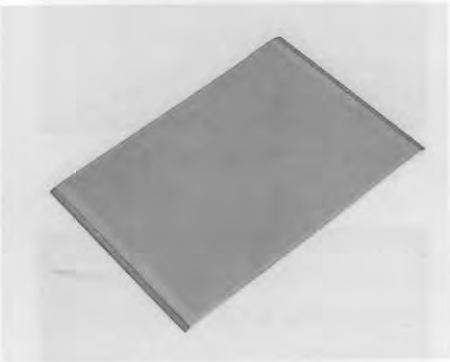


Foreign particles and spray powder will accumulate on the bottom of the tank. Drain the dampening solution in the tank from the water level control cup and clean the tank with a soft sponge.

Chapter 4

Replacing the Supplies

1. Replacing the Blanket



After the blanket is used for a long time, the rubber will age causing the adhesiveness to be increased and the surface of the blanket to become slick and shiny. As a result, paper may adhere on the blanket surface, causing such picking trouble as peeling and roughness on the paper to occur. If this problem becomes worse, paper may be jammed on the blanket cylinder or ink may not be transferred smoothly onto the blanket resulting in poor printing. When this happens, replace the blanket with a new one.

(Note) The blanket jam detector may actuate incorrectly depending on the blanket color. For more detailed information, ask the service technician.



《NOTICE》

1. *Before mounting the blanket, remove stains, etching solution, and water on the blanket cylinder surface.*
   Make sure that the cylinder is completely dry, and then apply rust preventive oil over the entire surface of the blanket cylinder to protect it.
2. *Be careful that the blanket recovery solution and other chemicals do not adhere on the blanket cylinder surface. If they adhere on th blanket cylinder surface, wipe them off with a cotton rag containing water and cleaning solution immediately and apply rust preventive oil over the entire surface of the blanket cylinder to protect it.*
   (Please refer to the recommended rust preventive oil list as shown on the page 135.)
3. *Mount the aluminum bars (both the leading and tail edges) in the clamp holders exactly. If it is not done properly, when running the machine, the aluminum bars may release from the holders and the blanket cylinder will be damaged.*

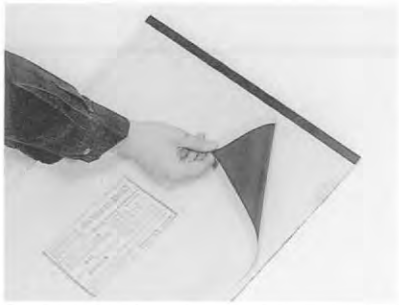


⚠ WARNING

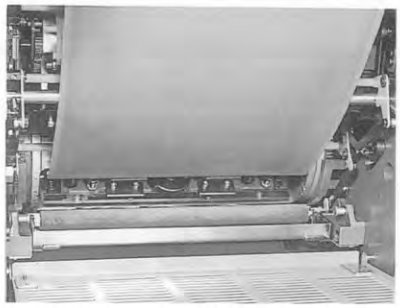
Mount the blanket cylinder gap safety cover, after mounting the blanket. Failure to follow this instruction may result in a serious injury.

When removing the blanket, reverse the mounting procedures.
Remove the blanket cleaning device on both the first and third units before mounting the blanket.
Removing the blanket cleaning device on both the second and fourth units is unnecessary.

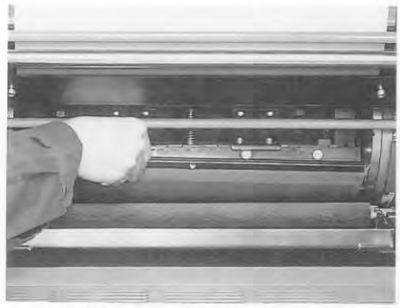
Mounting procedures



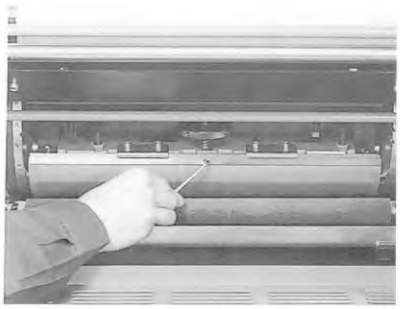
1. Attach the under blanket on the back of the blanket.
   As the mounting position is indicated the back of the blanket, fix the under blanket on that position using the double sided tape that comes with the under blanket.



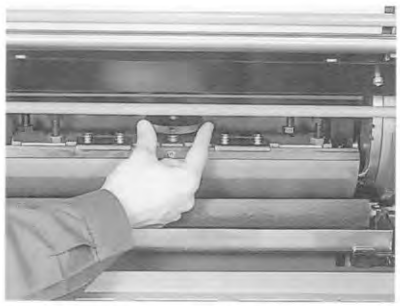
2. Loosen the tension knob and mount the blanket leading edge on the blanket cylinder.
   (Reference)
   The fixing side of the blanket and under blanket with tape is the leading edge.



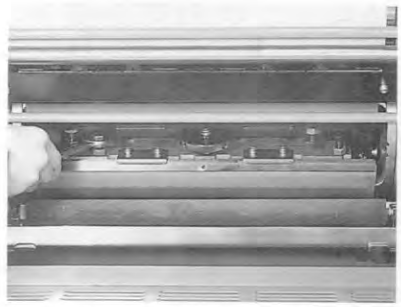
3. Continuously pushing the forward crawl button, while pulling the blanket and underblanket to fit on the blanket cylinder.



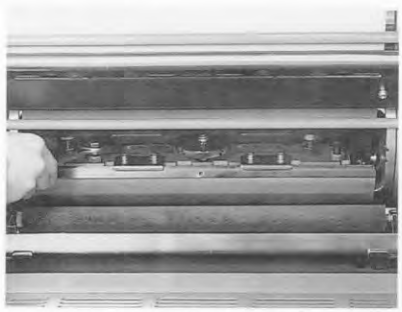
4. Mount the blanket tail edge in the clamp holder of the blanket cylinder by using the 4mm (0.16") Allen wrench.



5. Turn the tension knob to tension the blanket.



6. Tighten the blanket tension bolt (leading and tail edges).
   Feed about the 10 sheets of paper to fit the blanket to the cylinder and then tension the blanket again. Repeat this procedure 2 or 3 times.



7. Finally turn the blanket tension bolt the 1/4 to 1/2 turn further for the final tensioning.

2. Replacing the Sheet Separator

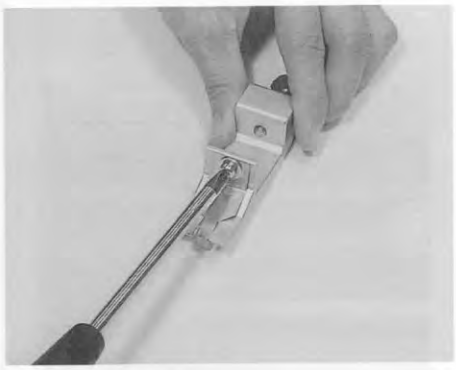
CAUTION

Stop the machine before replacing the sheet separator. Failure to follow this instruction may result in an injury.



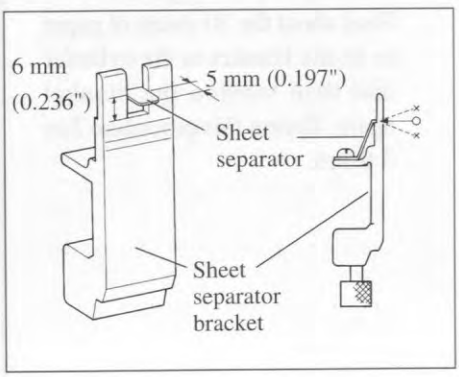
When the edge of the sheet separator is bent, replace it with a new one.

1) Removing



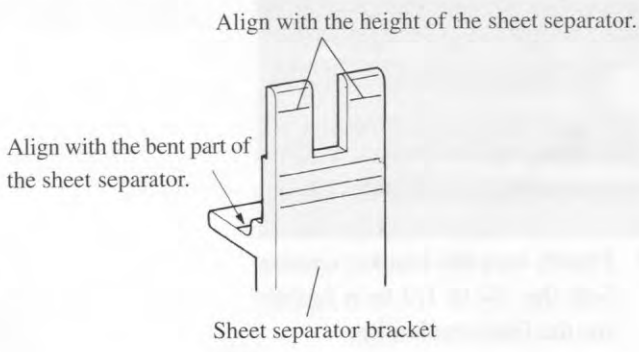
Loosen the screw and remove the sheet separator.

2) Mounting

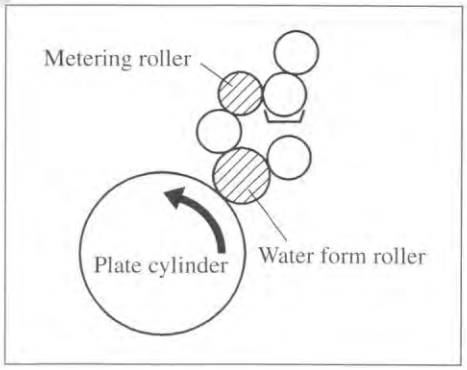


Mount the new sheet separator and set the separator so that it is positioned 5 mm (0.197") out from the front surface of the sheet separator bracket and is 6 mm (0.236") above the notch in the sheet separator bracket.

(Reference) The standard line for positioning the sheet separator is marked on the sheet separator bracket. So when mounting the sheet separator, aligning it with this line assures that it is mounted at the standard position.

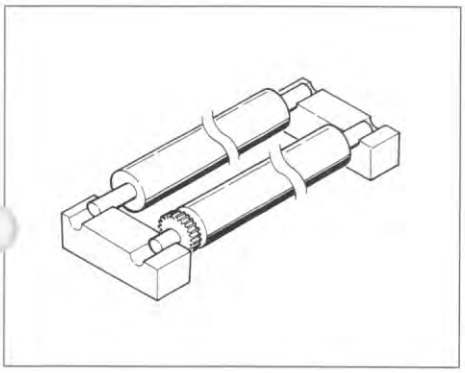


3. Replacing the Water Form Roller and Metering Roller



Generally the rubber roller shrinks over time and the diameter becomes smaller.
Especially, if using isopropyl alcohol, the shrinking will be intensified and the hardness will be increased 20 to 30 % a year. As the hardness increases, the characteristics of the roller are lost and the dampening solution supply balance will become unstable. This will result in stains being caused and excessive emulsification occurring.
The life of the rubber roller is usually from 6 months to one year after starting initial printing on the machine. After this period has passed, replace the roller. For more details, please ask your service technician.

(Note) 1. The replacement period of the roller will differ depending on the machine using condition.
2. When doing printing with large solids or when requiring high printing quality, the replacement period of the roller will be quicker.



(Reference) When keeping an extra roller for replacement, if the roller is not properly stored, the roller may be damaged. So please store it following the points below.
1. Do not put the roller surface directly on the floor. It should be held by the shaft section. (See illustration.)
2. Store the roller in a cool (below 20˚C (68˚F)) dark (no light) place.

1) Mounting the water form roller

(Note) Remove the water rider oscillating roller before mounting or removing the water form roller.

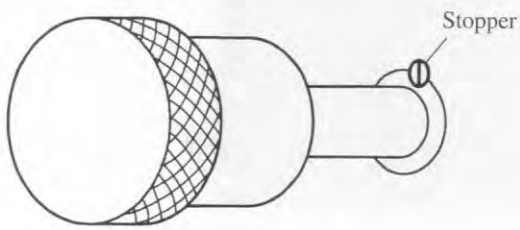


Mount the water form roller after setting the water form roller release lever at the position. After mounting it, set the lever at the position.

(Note) The side of the shaft with the gear is on the operation side. If reversing the water form roller mounting direction, the machine may be damaged.



Align the water form roller shaft notch with the stopper and push the roller in fully and then turn it slowly until there is a response.



4. Replacing the Water Control Wiper

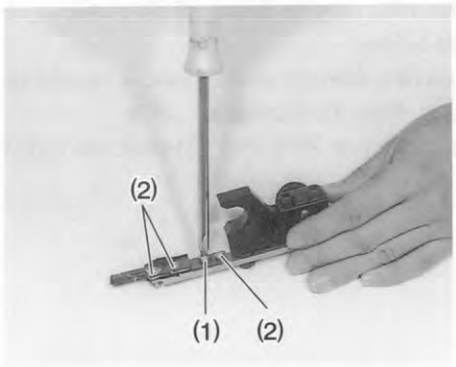
CAUTION

Stop the machine before setting. Failure to follow this instruction may result in an injury.



When the water control wiper wears out, the printing quality may not be stabile due to the over supply of dampening solution.
Replace it with a new one.

1) Mounting



Fix the water control wiper on the bracket by using the fixing screw (1).

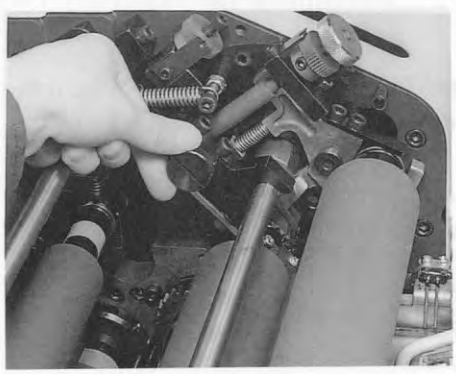
《NOTICE》

Never loosen the water control wiper fixing screws (2). If loosening them, the stable pressure cannot be assured.



《NOTICE》

Soak the water control wiper in water before mounting it on the machine. Mount the wet water control wiper on the machine and run the machine. By doing this, stable printing quality is assured immidiately after mounting it.



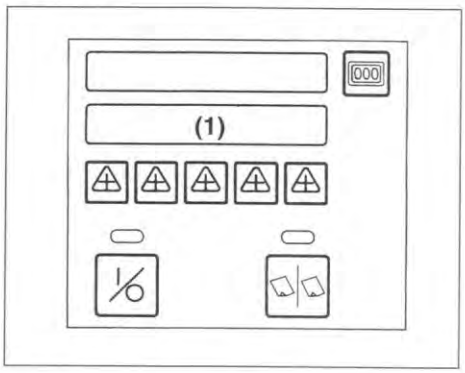
Mount the water control wiper on the machine.

Chapter 5

Troubles and Countermeasures

5-1 Error Message

1) Base machine



When having input trouble on the machine, a program in the machine will indicate an error message.
If any one of the error messages (E-1, E-2, E-3, and E-5) is indicated on the set counter indication (1) on the delivery section operation panel, please contact your service technician and tell him the error message.

2) RYOBI PCS-F

On the PCS-F, the following error messages will be indicated on the message indication when trouble occurs. Before calling for after sales service, please check the following.

Error message	Cause	Countermeasure
INTERNAL DATA IS BROKEN PRESS ESC KEY	There is trouble with the inside data caused by a dead battery (This message is indicated when turning the power ON.)	When pushing the ESC key, the memory will be reformatted.
MISTAKE IN UNIT COLOR SETTING PRESS ESC KEY	When the setting the conversion curve, the same color is set on the multiple units.	Set a different color on each unit.
MISTAKE IN CONVERSION CURVE SETTING PRESS ESC KEY	Over 30 conversion curve numbers has been set by the conversion curve.	Set the conversion curve number below 30.
WRONG COLOR SETTING. PRESS ESC KEY INPUT DATA [*** *** *** ***]	The color setting information which is read from the floppy disk has color information which can not be read by the PCS-F.	Change the color setting of the PCS-F or convert the data to use for the color setting of the PCS-F.
PROBLEM OF DATA PRESS ESC KEY	Reads out the machine data except for the RYOBI 3304H.	Read out the data of the RYOBI 3304H again.

Error message	Cause	Countermeasure
DISK IS NOT INSERTED PRESS ESC KEY	Pushing the READ, WRITE, FORMAT or DEL buttons without inserting the floppy disk.	Insert the floppy disk and do the operation again.*1
DISK IS PROTECTED FROM WRITING PRESS ESC KEY	The floppy disk write protect notch is open.	Close the write protect notch.*1
DISK IS NOT FORMATTED PRESS ESC KEY	The floppy disk is not formatted.	Do the formatting of either the 2HD or 2DD floppy disk.*1
DISK IS FULL AND UNABLE TO WRITE PRESS ESC KEY	The data cannot be written on the floppy disk. (The disk is full.)	Use a floppy disk with more space.*1
FAILED IN WRITING PRESS ESC KEY	There is trouble with the floppy disk or the floppy disk drive.	Replace the floppy disk with a new one.*1
NO DATA FILE PRESS ESC KEY	Pushing the READ or DEL button when the floppy disk does not have the data.	Use the floppy disk with the data on it.*1
ERROROO * * = 1 ~ 3	Trouble with the key board correspondence.	Please write down the message shown on the display, then contact your service technician.
ERROROO * * = 4, 5	Trouble with the motor control board correspondence.	Please write down the message shown on the display, then contact your service technician.
ERRORO1O ** ** 00 00 * = 0~9, A~F	Other trouble	Please write down the message shown on the display, then contact your service technician.

(Note) *1 When the same message is indicated over and over again, this may indicate trouble with the hardware. Please contact your service technician.

5-2 Other Troubles

When the troubles shown below occur during the printing, first follow the countermeasures given below and if the trouble is not corrected then call your service technician for after sales service.

1) The printing image becomes texture grained or white out.

Cause	Countermeasure
Improper plate pressure and impression pressure (Checking procedures : P. 150 · 151)	1. Check the packing thickness for the plate and blanket. (P. 39) 2. Check the plate pressure adjustment scale and impression pressure adjustment dial setting. (P. 92 · 109) 3. Replace the blanket. (P. 162 · 163) (When the blanket is partially smashed.)
Improper ink roller pressure	Adjust the ink roller pressure. (P. 139-143)
Poor ink transfer because of high ink tack	Add reducer into the ink to lower the tack.
Excess emulsification of the ink	1. Check the supply volume of the dampening solution. 2. Clean the ink rollers. (when there is excessive ink emulsification on the rollers, it is hard to control. Clean the rollers.)

2) Doubling of the image on the printed sheet

Cause	Countermeasure
Poor blanket tension	Correctly tension the blanket. (P. 163)
The blanket is smashed. (One part is concave.)	Replace the blanket with a new one. (P. 162 · 163)
The plate floats up from the plate cylinder.	Retension the plate. (P. 91 · 92)
The plate pressure and impression pressure are too strong.	1. Check the plate pressure adjustment scale and impression pressure adjustment dial setting. (P. 92 · 109) 2. Check the packing thickness for the plate and blanket. (P. 39)

The paper is not fed straight.	⇨	Check the setting of the feeder board. (P. 98-103)
The paper condition is poor and is partially wavy.	⇨	Correct the poor paper condition to be flat. Keep the paper in the printing area for several hours to season the paper. (P. 125)
The paper is not released from the blanket smoothly because the ink tack is too high and then the tail edge of the sheet moves too much.	⇨	Add reducer into the ink to lower the tack.
The paper slips off from the impression cylinder and transfer drum grippers.	⇨	Clean the grippers and gripper bases on the impression cylinder and on the transfer drum.

3) Successive color ink is not printed on the paper well. (Poor trapping)

Cause		Countermeasure
The successive color ink tack is too high.	⇨	Add reducer into the ink to lower the ink tack.

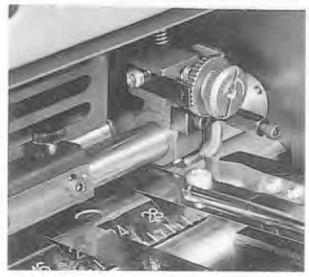
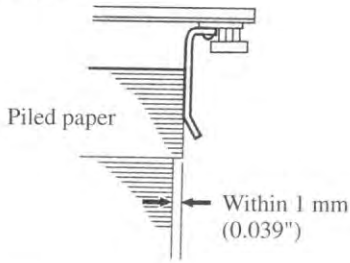
4) The color is muddy.

Cause		Countermeasure
The successive color ink tack is too high.	⇨	Add reducer into the ink to lower the ink tack.

5) The paper is not fed smoothly.

Cause		Countermeasure
A lack of vacuum or blower volume	⇨	1. Control the vacuum volume and blower volume. (P.95 · 96) 2. Clean the air pump filter. (P. 155)
Poor rotation of the skid rollers	⇨	Clean and lubricate the skid rollers. (P. 157)
Electrostatic is generated on the paper.	⇨	1. Clean the static eliminator electrode. (P. 160) 2. Adjust the humidity in the working area. (The normal humidity is around 60%.)

6) Poor registration (Poor front registration)

Cause		Countermeasure
Poor positioning of skid rollers	⇨	Reposition the skid rollers. (P. 103)
Poor paper feed volume	⇨	Adjust the rotation volume of the upper feed roller. (1 1/4 - 1 1/2 turns). 
The distance between the skid rollers and paper tail edge is not always the same due to poor paper cutting.	⇨	Cut the paper again so that difference of the paper size is within 1mm (0.039"). 
The leading edge does not contact the stop finger exactly due to poor paper cutting.	⇨	Cut the paper again. 

The paper is curled.	⇨	Correct the poor paper condition to be flat. Keep the paper in the printing area for several hours to season the paper. (P. 125)

(Poor lateral registration)

Cause		Countermeasure
The push side guide and spring is too strong.	⇨	Set the push side guide and spring.
The paper feed position is poor and the side edge of the paper contacts the stop finger.	⇨	Move the paper feed position laterally and set so that it does not contact the stop finger.
The side edge of the paper does not contact the push side guide exactly due to poor paper cutting.	⇨	Cut the paper again. 
The paper is curled.	⇨	Correct the poor paper condition to be flat. Keep the paper in the printing area for several hours to season the paper. (P. 125)

7) The paper is bent.

Cause		Countermeasure
Poor positioning of the sheet separators	⇨	Reposition the sheet separators. (P. 93)
The paper is not fed smoothly to the retainers from the pull-out rollers.	⇨	Reset the retainers. (P. 102)

8) The paper is wrinkled.

Cause		Countermeasure
The paper has waves.	⇨	Correct the poor paper condition to be flat. Keep the paper in the printing area for several hours to season the paper. (P. 125)
The impression pressure is too strong.	⇨	1. Check the impression pressure adjustment dial setting. (P. 109) 2. Check the blanket packing thickness. (P. 39)

9) Poor roller cleaning.

Cause		Countermeasure
The cleaning solution drys too fast.	⇨	Use a cleaning solution that is slow drying.
Poor blade pressure on the ink roller cleanup attachment	⇨	Ask your service technician how to adjust it.

10) The dampening solution feed is not stable.

Cause		Countermeasure
The density of the alcohol substitute and etching solution is not the standard value.	⇨	Make the dampening solution following the maker's recommended density.
Poor water roller maintenance	⇨	Do the water roller maintenance to assure the hydrophilic property. (P. 133)
The metering roller shape has deformed and worn out.	⇨	The roller has to be replaced depending on the condition of the water film between the metering roller and water fountain roller. Ask the service technician.
Wearing out of the water control wiper	⇨	Replace the water control wiper. (P. 166)
Improper water roller pressure	⇨	Adjust the water roller pressure. (P. 143-149)

Optional Accessories Edition

This edition explains Chapter 1 "Dampening Solution Cooling/ Circulation Device" and Chapter 2 "Decuring Device".

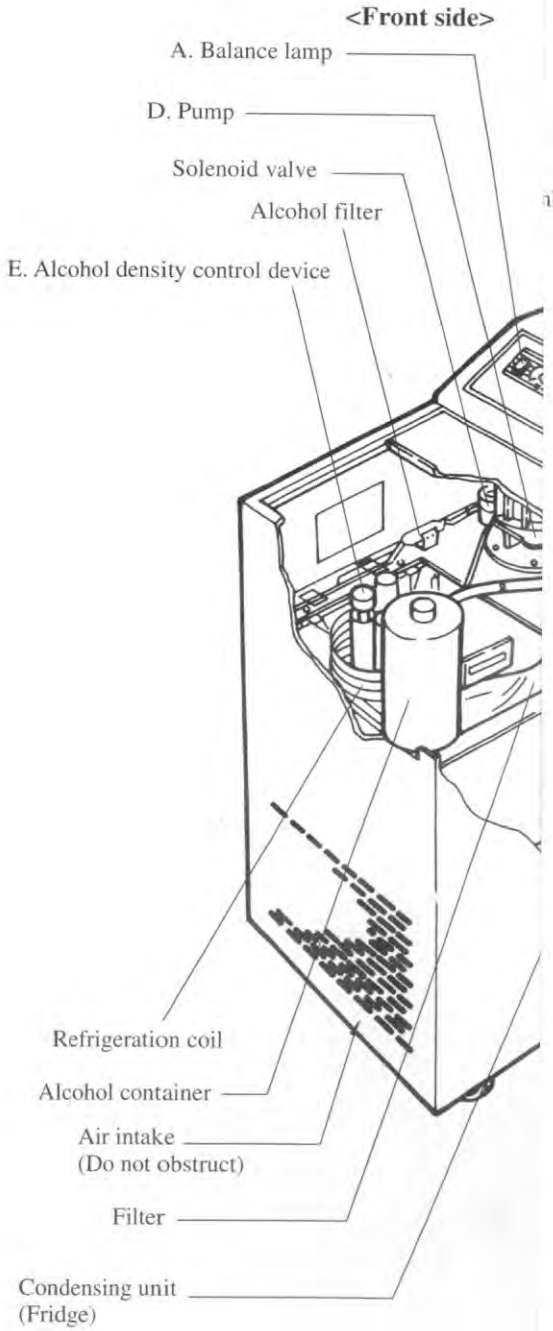
Chapter 1

Dampenin

1-1 Outline

For this device, the dampening solution on the firs
circulates to keep the printing quality stable.

1-2 Name and Function of Each



This device uses Isopropyl alcohol.

WARNING

EXTREMELY FLAMMABLE
VAPORS CAN EXPLODE
HARMFUL OR FATAL IF SWALLOWED
If swallowed, do not induce vomiting, call a physician immediately.
Keep out of reach of children.
Avoid prolonged breathing of vapors.
Do not siphon by mouth.
Do not store in vehicle or living space.
Store and use in well-ventilated area.
Vapors can be ignited by a spark or flame source many feet away.
Keep away from flame, pilot lights, stoves, heaters, electric motors, and other sources of ignition.
Keep container closed.

A. Balance lamp

When the alcohol density is stable at the value set using the alcohol density control dial, the lamp will light.
When the alcohol density decreases, the lamp will go off, and the alcohol will be supplied.

B. Alcohol density control dial

This is used to control the alcohol density.

C. Power switch

When the power switch is at the [|] position, the pump and cooling system will operate.

D. Pump

This is the pump that circulates the dampening solution from the device to the base machine and back.

E. Alcohol density control device

This is the alcohol density automatic control device used to change the surface tension of the dampening solution by changing the alcohol density.

F. Water fountain side circulation volume control valve

This is used to control the circulation volume.

G. Auxiliary tank

The dampening solution supplement is held in this.

H. Hydrometer column

When checking the alcohol density, put the alcohol hydrometer in this.

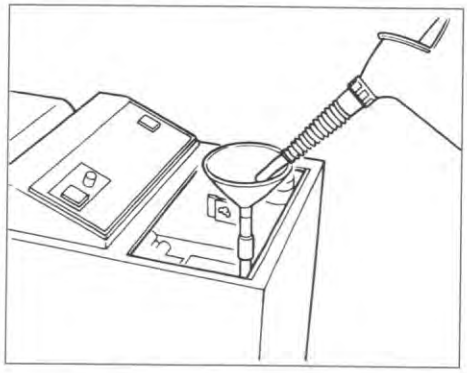
Chapter 1

1-1 Outline

1-2 Name and Function of Each Part

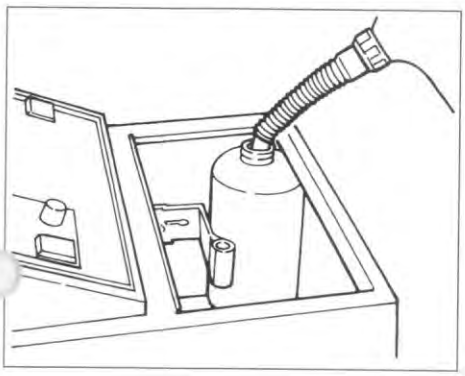
1-3 Operation Procedures

1) Prepare the dampening solution.

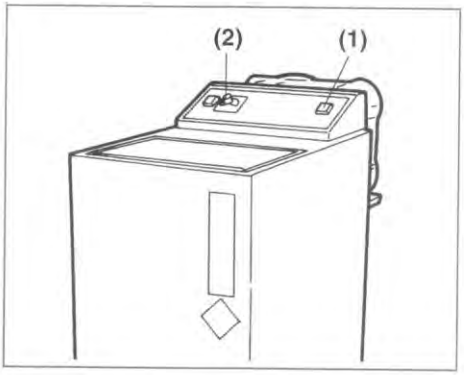


Mix the alcohol in the dampening solution in advance, and put it in the tank.
For the proper density of alcohol, please ask your service technician when installing the machine.
(Reference) To keep the proper dampening solution level, 15 liters of dampening solution should be prepared.

2) Set the alcohol density.

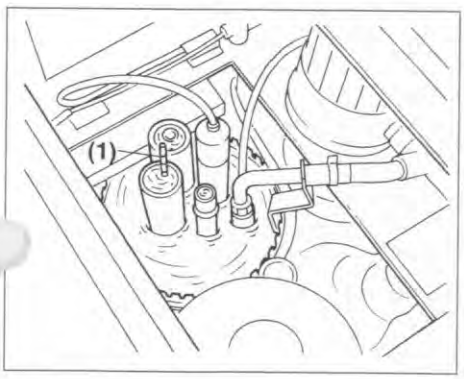


Remove the refill cap of the alcohol container and put the alcohol in it.
(Note) When the alcohol is used up, bubbles will appear in the tank easily. When the alcohol is used up, immediately set the alcohol density control dial to "0" and supply the alcohol in the alcohol container.



Set the power switch (1) at the ON position.
After running the device for from 15 minutes to 30 minutes and the dampening solution is properly mixed and cooled, set the alcohol density control dial (2).
For the proper density, please ask your service technician when installing the machine.

3) Check the alcohol density.

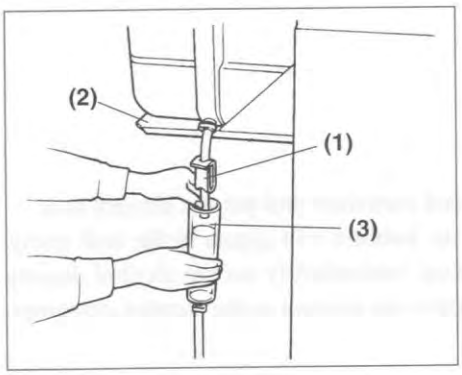


Put the hydrometer (1) in the hydrometer column, then check the alcohol density.

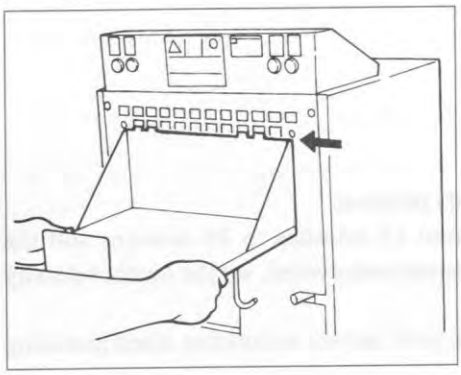
4) Set the auxiliary tank.



Put the dampening solution in the auxiliary tank and tighten the cock tightly.
There is no need to add alcohol in.
(Reference) The auxiliary tank has a capacity of 15 liters.



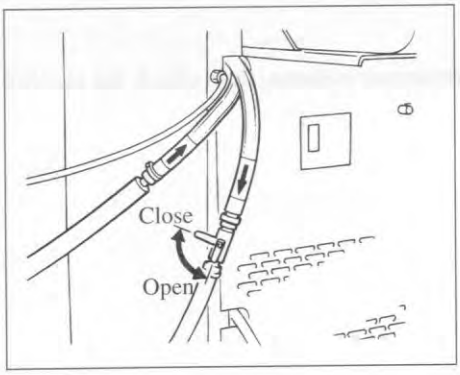
Fix the hose by using the clip (1) and put the auxiliary tank on the supporting table (2).
Check that the hose is properly positioned in the water level control cup (3) and after opening the ON/OFF valve of the drain pipe fully, open the clip (1).



(Reference) When setting the supporting table of the auxiliary tank, set it at the position shown by the arrow on the base device re side.

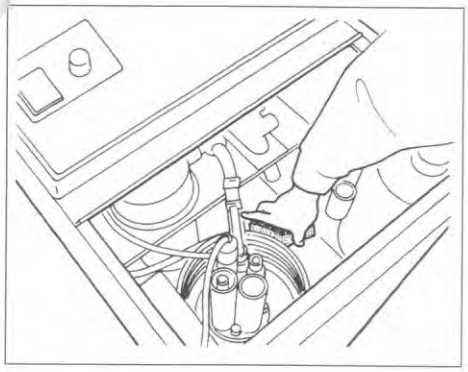
1-4 Maintenance

1) Cleaning the water fountain (Every week)



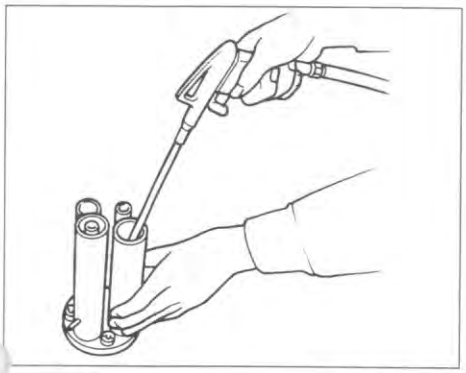
Close the ON/OFF valve on the dampening solution cooling/circulation device to drain the dampening solution in the water fountain.
After the cleaning, be sure to open the ON/OFF valve.

2) Cleaning the inside of the tank of the dampening solution cooling/circulation device (Every week)



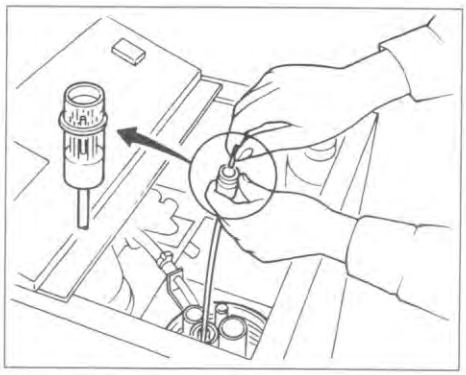
Foreign particles and spray powder will accumulate on the bottom of the tank. Drain the dampening solution in the tank from the water level control cup and clean the tank with a soft sponge.

3) Cleaning the tower of the dampening solution cooling/circulation device (Every week)



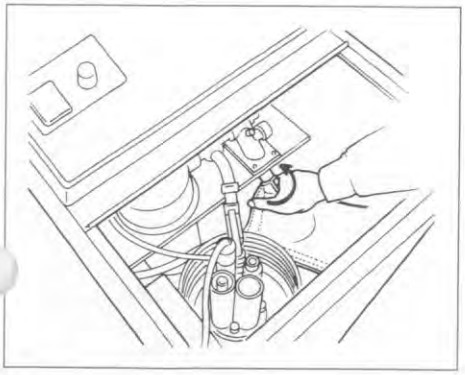
Foreign particles will accumulate inside of the tower. Blow the air in to clean the inside of the tower.

4) Cleaning the needle of the dampening solution cooling/circulation device (Every week)



Remove any stains that adhere on the needle surface by using an eraser. Press the eraser on the needle and twist it 2 to 3 times. Just doing this can clean the needle surface.
After the cleaning, mount it at the former position properly.

5) Replacing the filter of the dampening solution cooling/circulation device



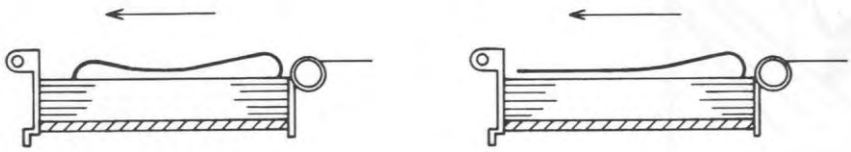
When the filter is blocked, the circulation function will be decreased.
When the filter starts to expand caused by the pressure of the dampening solution, replace the filter.

Chapter 2

Decurling Device

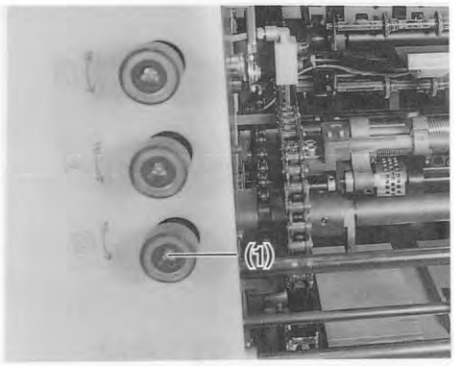
2-1 Outline

This is the device that prevents the paper from decurling by holding the delivered paper.
When the whole sheet [1] or tai edge of the paper [2] is curled, use the decurling device.

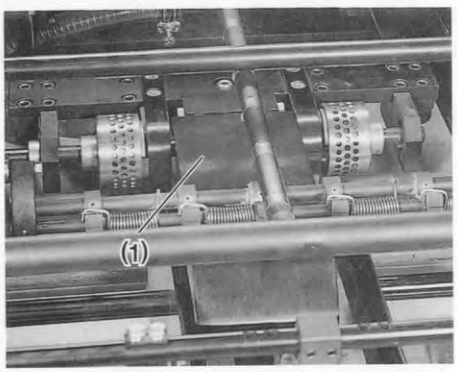


[1] [2]

2-2 Operation Procedures



Set the decurling device switch at the [I] position on the delivery section auxiliary switch panel and adjust by using the decurling device control knob (1).



When printing on the minimum size paper, set the minimum size paper guide (1) including the machine on the delivery back guide.

RYOBI LIMITED

TOKYO HEAD OFFICE;
3-15-1 SOTOKANDA, CHIYODA-KU
TOKYO, 101, JAPAN
TEL. (03) 3257-1502
FAX. (03) 3257-0223
TELEX J33672 RYOBI

1st/Sept.'96 SB1365609
Printed in Japan