

# V8000

## SERIES

# TECHNICAL MANUAL

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**VERSION**  
**FEBRUARY 2002**

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A01 A02 A03 A04 A05 A06 A07 A08 A09 A10 A16 A18	
A19 A20 A21 A23 A24 A25 A29 A30 A31 A32 A33	
B01 B21 B22 B23 B24	
C01 C02 C03 C04 C05 C06	

D01 D02 D03 D04 D05 D07 D09 D10 D11 D13 D16 D17	
D18 D19 D20 D22 D23 D24 D25 D26 D27 D28 D29 D30	
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# CHAPTER 1: MAINTENANCE

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### 1. Preface

This manual provides Technical Service Information for model **V8000** series.

This manual also provides procedures for removing and installing major components. Following these procedures will minimize machine malfunctions. The information will also increase technical representatives' awareness and experience regarding repairs necessary to insure end-user satisfaction.

## CAUTION

### [Handling of Lithium Battery]

- **Never fail to follow the following instructions when you discard the used lithium battery.**

**1. Never let the battery short-circuited.**

If the (+) and (-) terminals contact each other or metal materials, the battery will be short-circuited. If the batteries are collected and stored in disorderly or one upon another, the above-mentioned case will occur.

**- DANGER -**

If the battery is short-circuited, it will heat up and may in some cases explode into fire.

**2. Never heat up the battery.**

**- DANGER -**

If you heat the battery up to more than 100°C or put it into the fire, it may burn dangerously or explode.

**3. Never disassemble the battery or press it into deformation.**

**- DANGER -**

If you disassemble the battery, the gas pouring out of the inside may hurt your throat or the negative lithium may heat up into fire.

If the battery is pressed into deformation, the liquid inside may leak out of the sealed part or the battery may be short-circuited inside an explode.

**4. Never fail to keep the battery out of reach of children.**

If you put the battery within reach of children, they may swallow it down. Should they swallow the battery, immediately consult the doctor.

### [Replacement of the Lithium Battery]

- 1. The lithium battery must be replaced by a trained and authorized service technician.**
- 2. The battery must be replaced only with the same or equivalent type recom- mended by the manufacturer.**
- 3. Discard used batteries according to the manufacturer's instructions.**

## !! WARNING !!

### Important Safety Precautions

**1. Always disconnect electrical supply before placing hands in the machine.**

**I. To avoid injuries:**

Be sure to disconnect the electrical power before disassembling, assembling, or when making adjustments on the machine.

**II. Protection of the machine:**

Make sure to turn OFF the power to the machine before plugging or unplugging the electrical connectors, or when connecting a Meter.

**2. WARNING:**

The back light tube of LCD of the Control Panel on this Model, contains mercury which must be recycled or disposed of as hazardous waste.

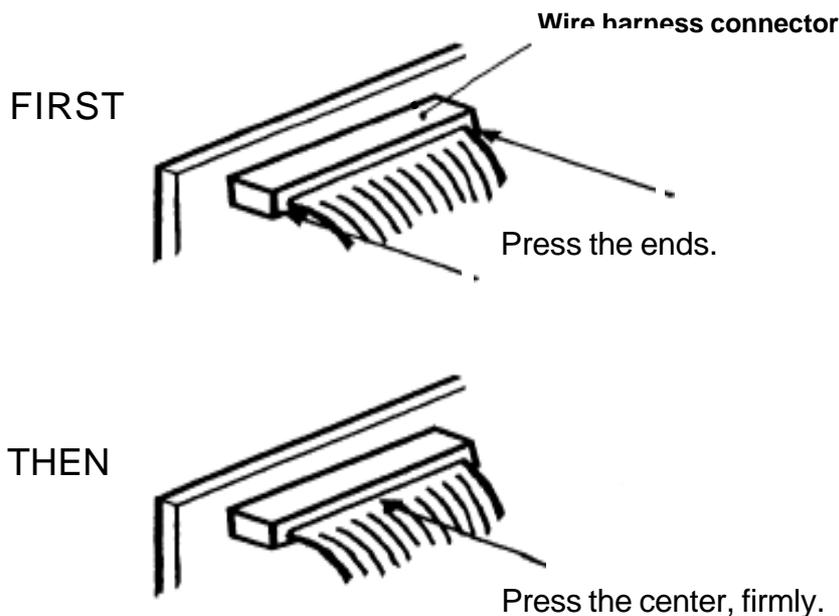
**3. Always connect electrical connectors firmly.**

**I. To avoid electrical failure:**

The connectors must be connected firmly together and onto the PCBs. Press on the ends of the connectors and then on the middle to ensure a firm fit.

**II. Protection of the electrical components:**

The electrical components may be damaged due to short circuits caused by a loose connector.



## 2. Work Precautions

### Inspection

If you discover any defects or problems during an inspection, fix the problems or if necessary take steps such as replacing a part.

### Removal

Check the problem area. At the same time, examine the cause of the problem and determine whether the part needs to be removed or disassembled. Next proceed according to the procedures presented in the Technical Manual. In cases where, for example, it is necessary to disassemble areas with large numbers of parts, parts which are similar to each other, or parts which are the same on the left and right, sort the parts so that you do not mix them up during reassembly.

- (1) Carefully sort the removed parts.
- (2) Distinguish between parts which are being replaced and those which will be reused.
- (3) When replacing screws, etc., be sure to use the specified sizes.

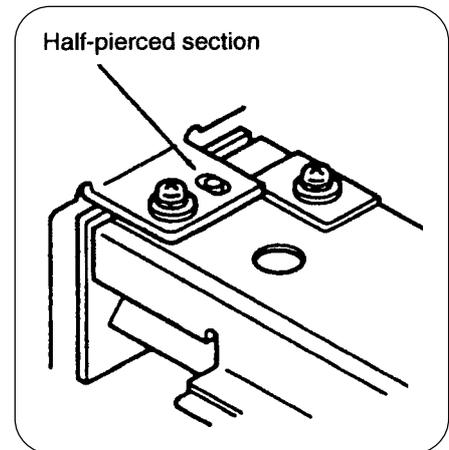
### Assembly and Installation

Unless specified otherwise, perform the removal procedures in reverse during assembly and installation. In cases where protrusions or holes are provided to assist in positioning parts, use them for accurate positioning and securing.

**(Protrusions and holes for positioning parts ⇒ Half pierce section)**

### Tools

Using tools other than those specified can lead to injury or damage screws and parts. Have all the tools necessary for the work available.



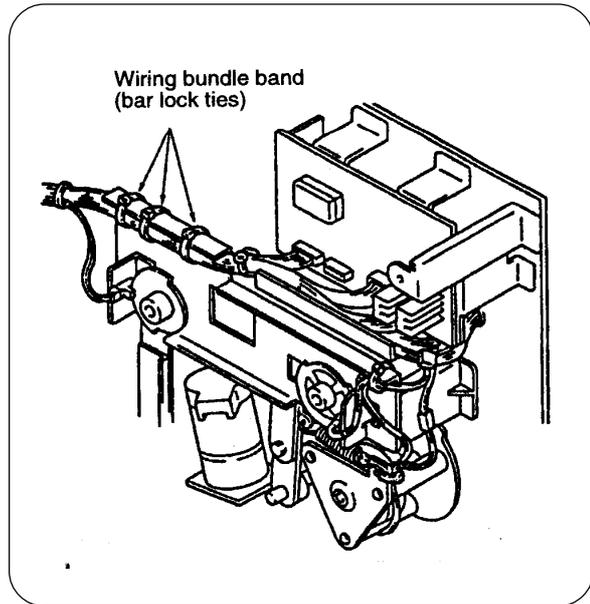
#### <Standard Tool list>

Type	Tip size	Shaft length, etc.	
Phillips screwdriver	No. 2	(250 mm)	
	No. 2	(100 mm-150 mm)	
	No. 2	(stubby type)	
	No. 1	(75 mm-100 mm)	
Standard screwdriver	6 mm	(100 mm-150 mm)	
	3 mm	(100 mm-150 mm)	
	1.8 mm	(precision type)	
Nut driver (box driver)	8 mm	(100 mm-150 mm)	
	7 mm	(100 mm-150 mm)	
High frequency driver	2.5 mm		
Spanners (may be double-ended)	5 mm	5.5 mm	7 mm
	8 mm	10 mm	13 mm
	Monkey		
Hex wrenches	5.0 mm		
	4.0 mm		
	3.0 mm		
	2.5 mm		
	2.0 mm		
	1.5 mm		

Type	Remarks
Steel scale	150 mm
Feeler gauge	
Long Nose pliers	
Pliers	
Nipper	
Small flashlight	
Multimeter	
Soldering iron	20 W-30 W
File	Flat, round
Ring pliers	for C-rings

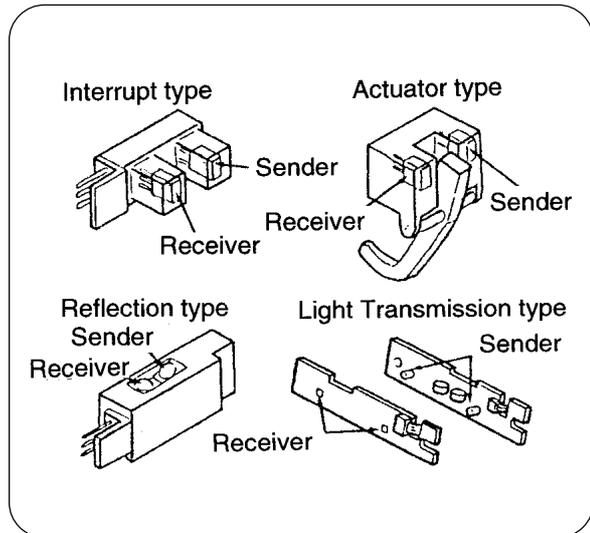
**Electrical system work**

- After removing wire bundles, fasten them with wire bundle bands (bar lock ties) so that they will not sag.
- When installing parts, be careful to avoid pinching or damaging the wire bundles.
- If a fuse blows, always replace it with one with the specified capacity. Using a fuse with a larger capacity can not only damage parts, but may cause fires.
- Be careful not to drop image scanners, thermal print heads, and other sensors as they can be easily damaged.



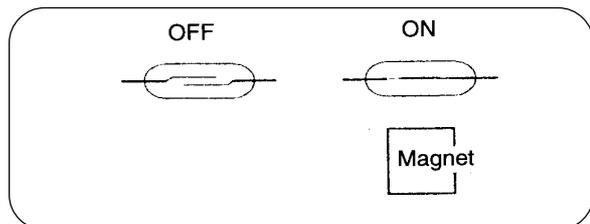
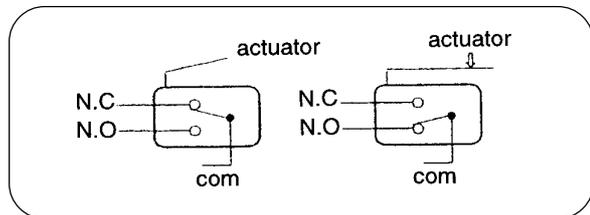
**Sensor types**

- Photo-electric sensors may be broadly divided into the following four types: interrupt types (U-shaped), actuator types, reflective types, and transmissive types.
- Magnetic sensors use Hall ICs, which react to the magnetic force in magnets.
- Always turn off the power before plugging or unplugging sensor connectors.



**Switch types**

- Microswitches may be divided between normally open (NO) types and normally closed (NC) types. With an NO connection, an internal contact is connected when the switch actuator is pressed. With an NC connection, an internal contact is disconnected when the switch actuator is pressed.
- Magnetic lead switches are switches in which an internal contact is connected in reaction to the magnetic force of a magnet.



### **Installation location**

- Do not install the machine in any of the following locations.
  - (1) Those subject to direct sunlight or any bright location such as by a window (If you must install in such a location, put a curtain or the like over the window.)
  - (2) Those where the temperature changes drastically
  - (3) Those that are too hot, cold, humid, or dry  
RECOMMENDED:  
Temperature range: 15° centigrade - 30° centigrade  
Humidity range: 40% - 70% No condensation allowed
  - (4) Those with radiant heat sources and any locations in the direct path of air from air conditioners, heaters
  - (5) Any poorly ventilated location
  - (6) Dusty atmosphere
  - (7) Any tilted location  
(Levelness of the floor: Within 2 degrees incline, and within 3mm difference in floor height.)

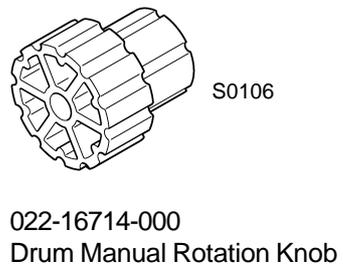
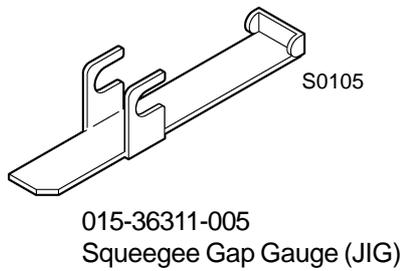
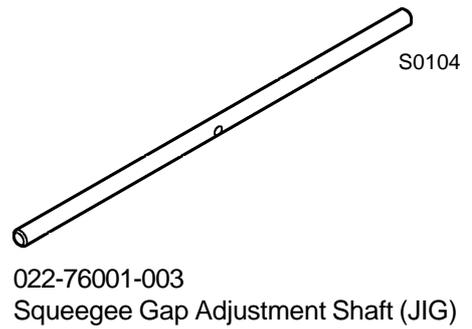
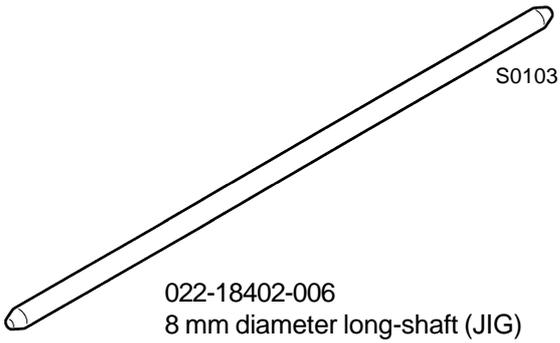
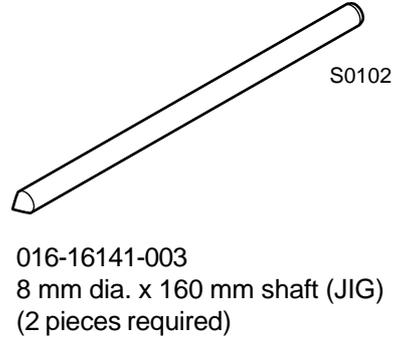
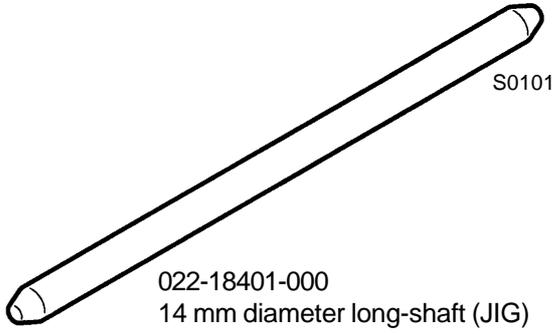
### **Electrical connection**

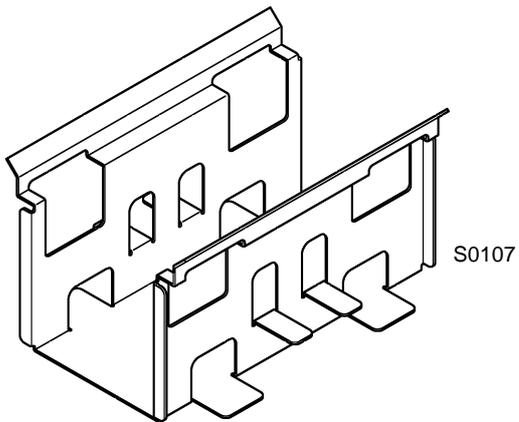
- Plug the plug securely into the socket so that there is no problem with the contact in the power supply plug section.
- Do not use any triplets or extension cords.
- Do not allow any other machine to stand on or crush the power cord.

### **Ground connection**

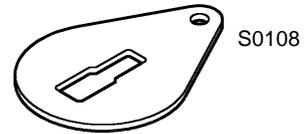
- Always ground this machine to prevent electrical shock in the unlikely event of electrical leakage.

### 3. JIGs





022-76003-006  
Drum Stand (JIG)



022-76002-000  
Drum Joint Alignment Lock (JIG)

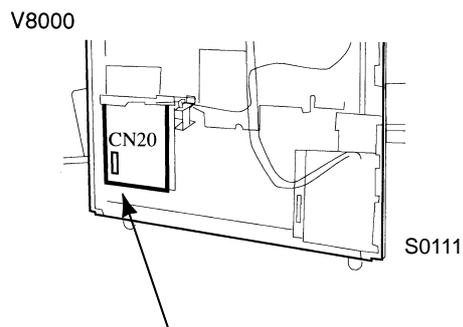


018-16255-208  
Blance Weight; FB

Three pieces of the part is formed into one unit, with one of the weight facing the other way

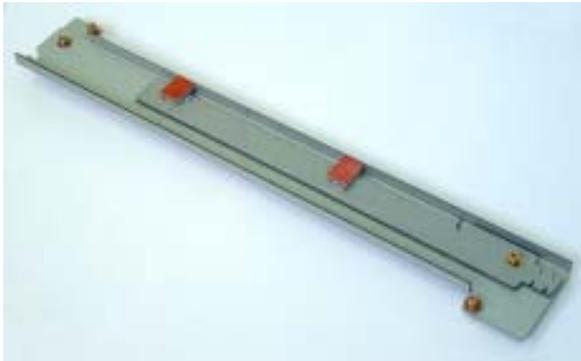


030-90010-050  
LED Unit



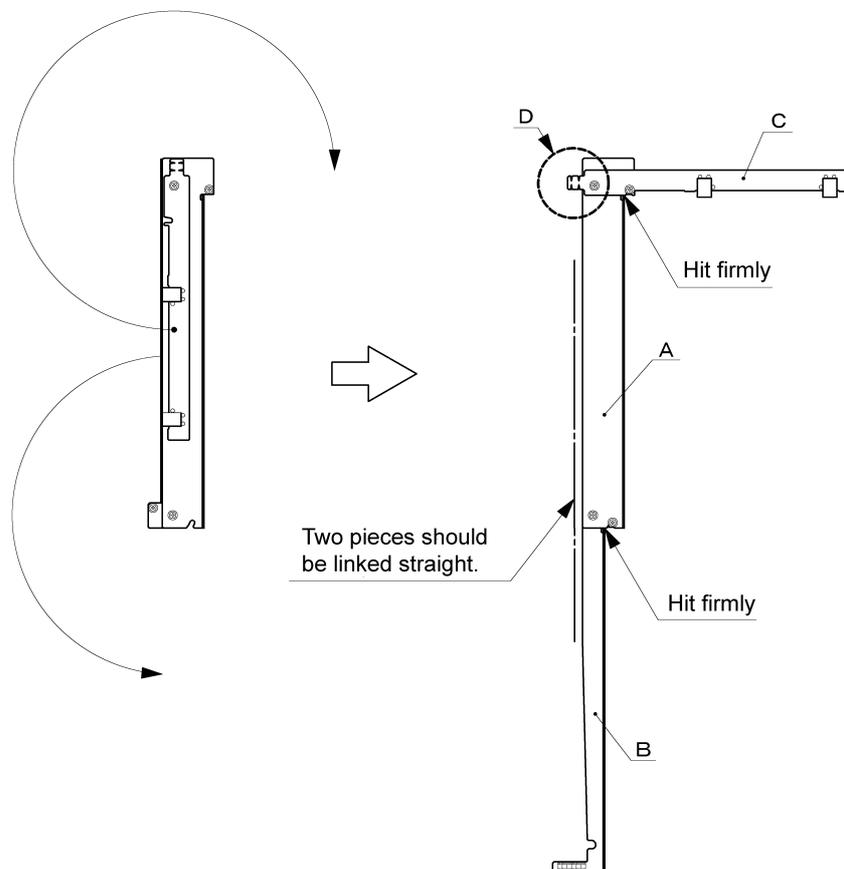
**Instructions for using the “LED Unit”**

1. Remove the Rear Cover.
2. Plug the connector of the LED Unit into connector “CN20” of the MCTL PCB.
3. Choose the display sheet for V8000 on the LED Unit.
4. Look at the LED display of the LED Unit to check the condition of the machine.



022-75000-054  
Leveling jig

P0128



**Instructions for assembling the Leveling Jig**

1. Swing open the plate indicated as B on above sketch until the pivot portion of the plate hits firmly against the plate indicated as A. Plates A and B should make one straight line. Tighten the two screws.
2. Swing open the plate indicated as C on above sketch until the pivot portion of the plate hits firmly against the plate indicated as A. Tighten the two screws.
3. Tie string on the groove pointed out as D on above sketch, at the tail of plate C, and tie a piece of weight on the other end of the string. (Refer to page 1-15)

**Note: The string (diameter of about 0.6 mm) and a weight are to be readied by each individual.**

# V8000 Installation Procedure

The following procedures are required before turning on the printer.

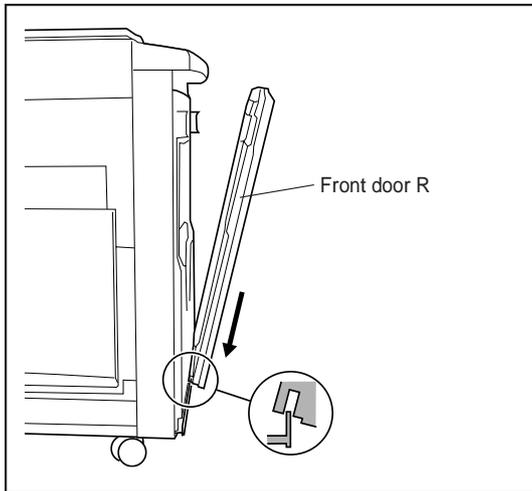
**Caution** Be sure not to turn the power ON without removing the Scanner unit securing screw. Otherwise, it may cause damage to the printer.

Nobody but Riso-authorized service representatives is allowed to install this unit.

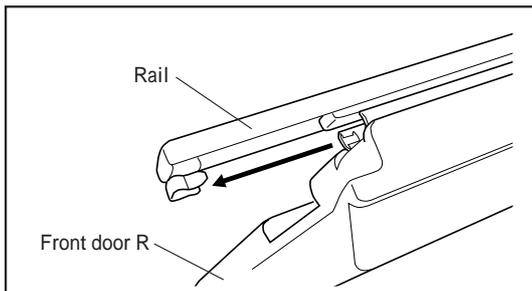
## Item to be Used

Use the following item in this package.

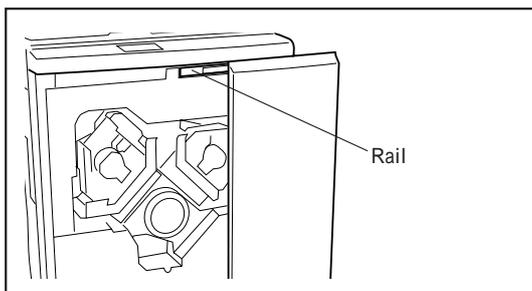
1. Side cover ..... 1 pc.
2. Unit cover F ..... 1 pc.
3. Unit cover R ..... 1 pc.
4. Front door L ..... 1 pc.
5. Front door R ..... 1 pc.
6. Adjustment foot ..... 2 pcs.
7. Instruction label ..... 1 pc.
8. Blind seal ..... 1 pc.
9. Screws ..... 1 set



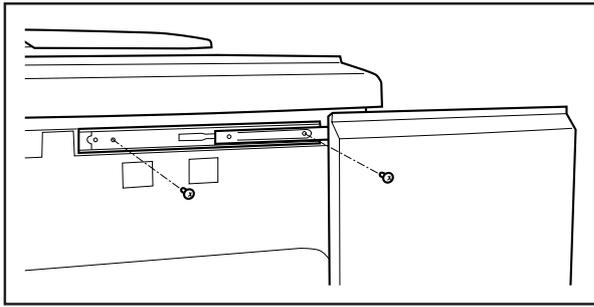
1. Insert the Front door R into the rail on the lower right part of the printer from upward.



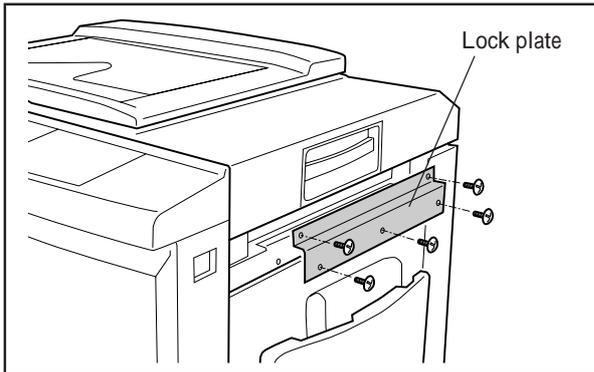
2. Unlock the rail on the upper part of the Front door R and extend it halfway.



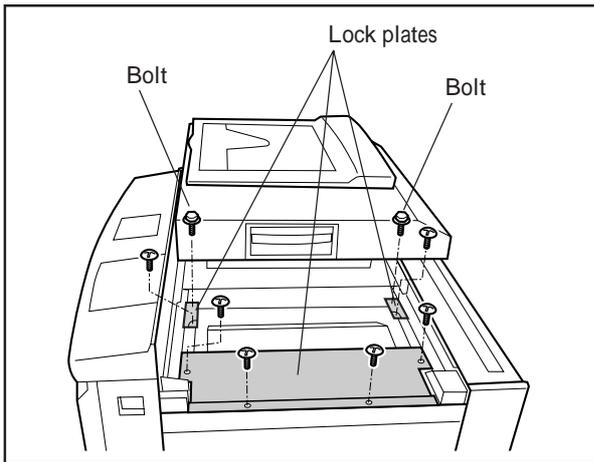
3. Fit the rail of the Front door R to the printer by pressing it against the printer.



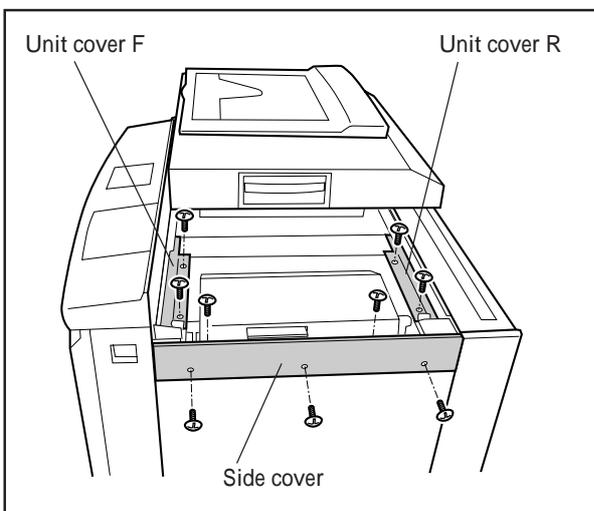
4. Secure the rail with binding screws which are coated with blue gum (M4x6, 2pcs.).
5. Secure the Front door L same as the Front door R (steps 1 through 4).



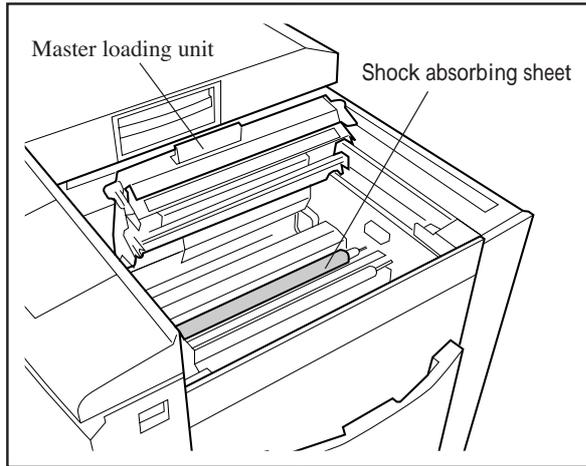
6. Remove the plate which locks the Scanner table.



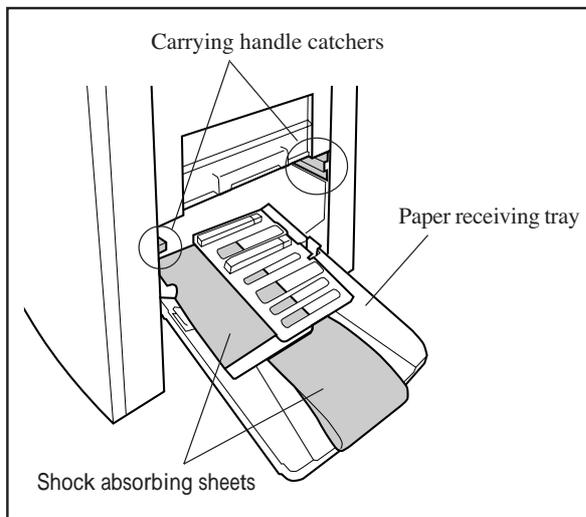
7. Open the Scanner table and remove three lock plates which secure the Master roll cover.
8. Replace the bolts removed in the previous step.



9. Attach the Unit cover F and R to the printer. (Binding screws M3x6)
10. Attach the Side cover to the printer. (Binding screws M4x8)

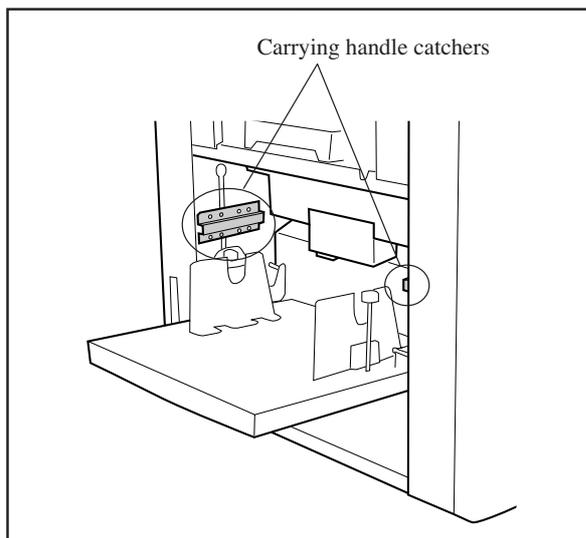


11. Open the Master loading unit and remove the Shock absorbing sheet.

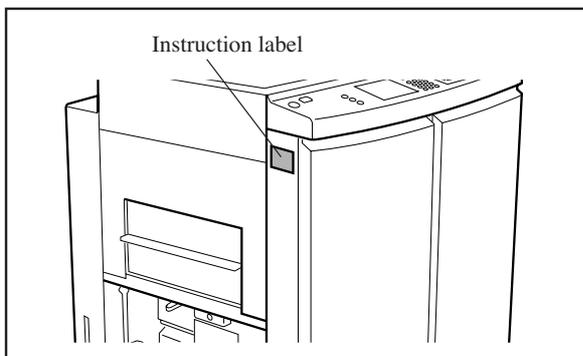
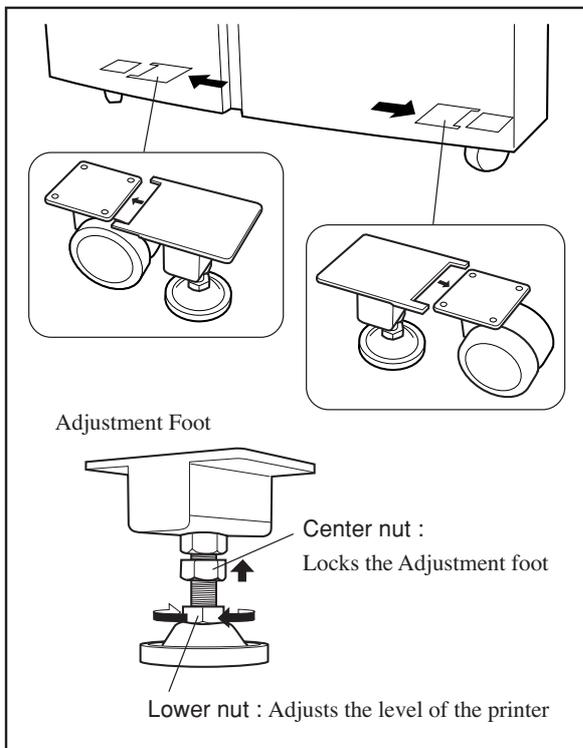
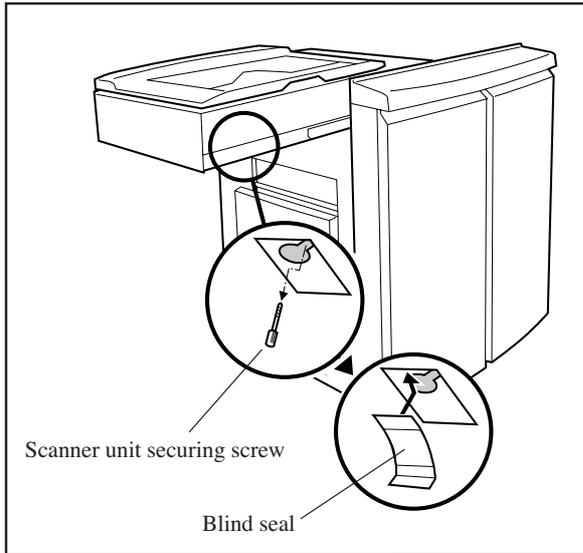


12. Open the Paper receiving tray and remove the Shock absorbing sheets.

13. Remove the carrying handle catchers in the Paper receiving area.



14. Remove the carrying handle catchers in the Paper feed area.



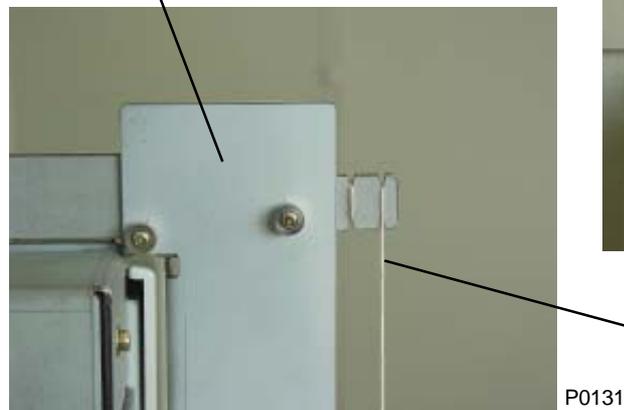
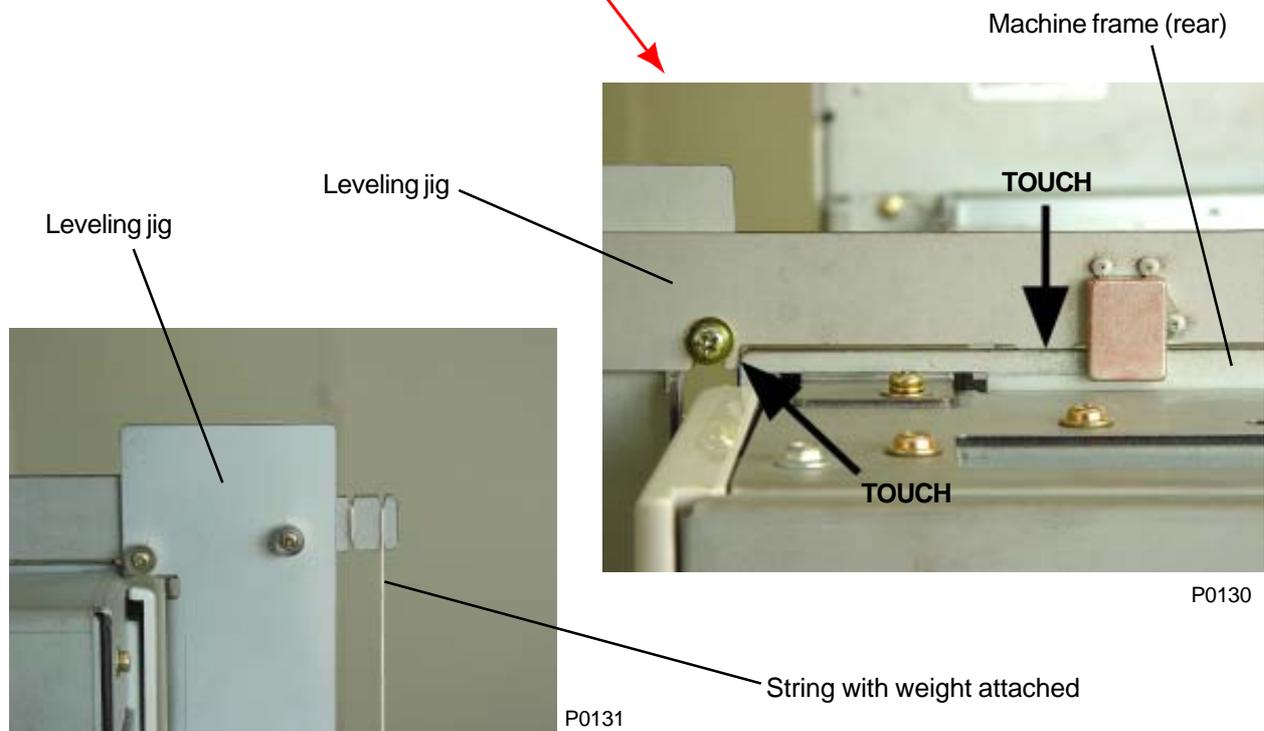
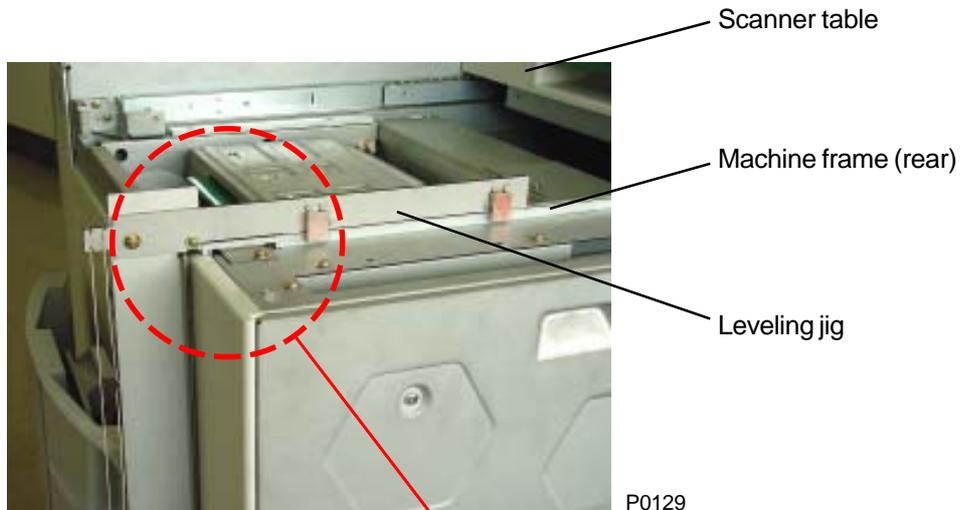
15. Unscrew the Scanner unit securing screw located under the Scanner table. Then remove the screw from the unit sliding it to the right-hand.
16. Cover the hole, from which the Scanner unit securing screw was removed, with the Blind seal. (To affix the seal easily, it is recommended to make a tab beforehand by folding its edge.)
17. Start up the test mode of the printer and activate the "Scanner release action" (Test mode code #155).
18. Lock the casters.
19. Measure the difference of levels between the front and rear frame of the printer using the specified jig. For the description about the jig and the operation procedure, refer to the technical manual.
20. Insert the Adjustment feet under the front door to fit the caster bases as illustrated.
21. Turn the lower nuts on the Adjustment feet clockwise until the feet reach the floor.
22. Using the jig, adjust the levels of the Adjustment feet by turning the lower nuts until both ends of the printer are leveled.
23. Lock the Adjustment feet by tightening the center nuts.
24. Stick the Instruction label on the illustrated part of the paper feeding area.

## 5. Leveling the Machine on the Floor

- (1) Assemble the Leveling jig.

< Rear side of the machine >

- (2) Slide open the Master making unit and mount the Leveling jig on the top thin surface of the machine frame, as shown on the photograph below. The surface on the Jig where it should meet against the machine frame is pointed out by thick arrow marks on one of the photographs below.
- (3) Let a string with a weight tied on one end hang on the Leveling jig as shown on the photographs below. The string should not touch the metal scale at the bottom of the Leveling jig to allow free hanging of the string.

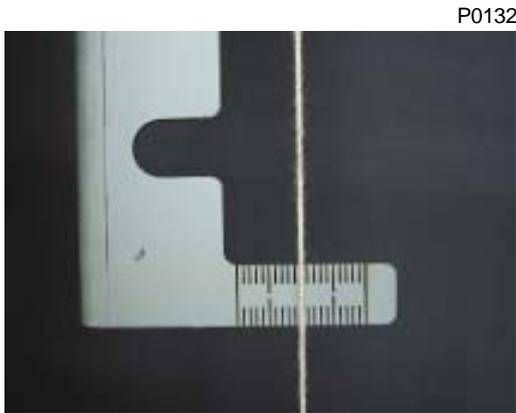


< View from the front of the machine >

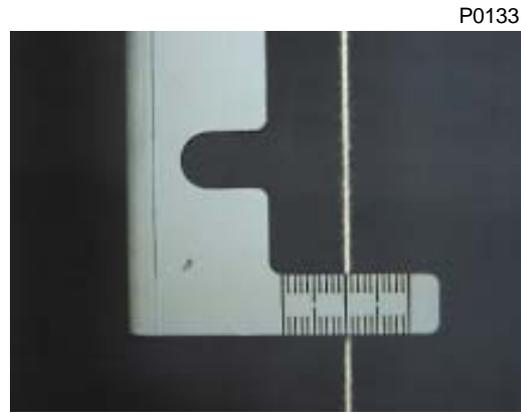
## CHAPTER 1. MAINTENANCE

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- (4) Look at the scale straight at right angle and read the line on the scale to which the string points to.  
Note: Incorrect reading of the scale will be made if the scale is viewed at an angle. The view must be made at 90 degrees against the scale.



< String in front of the scale >



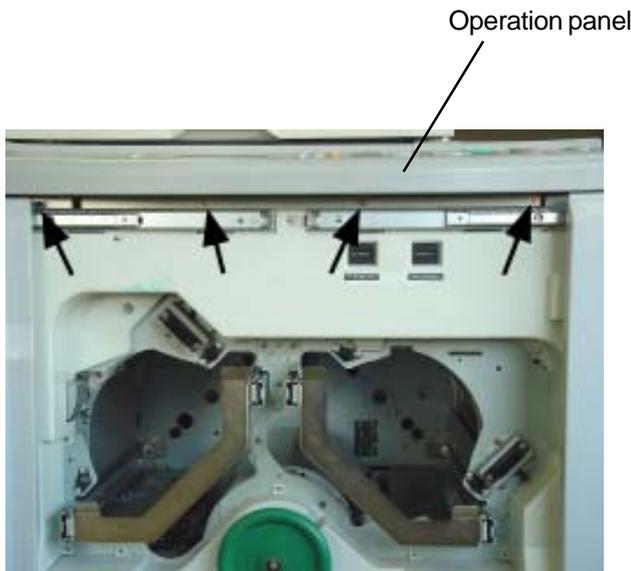
< String at back of the scale >

**< The string should hang free from the plate and scale, either in front or back of the scale >**

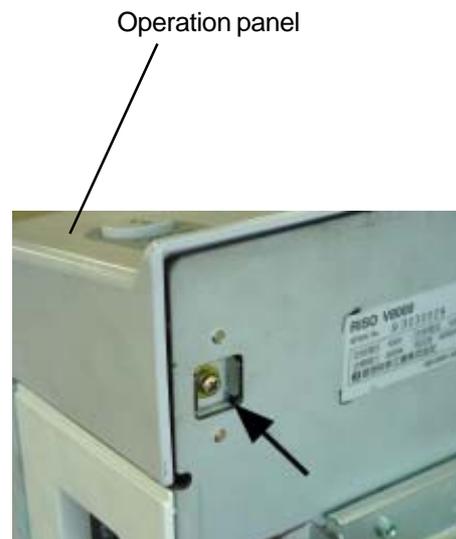
< Front side of the machine >

- (5) On the front of the machine, remove four screws holding the Operation Panel (refer to arrow marks on the photograph below).

Then remove one screw at the back of the Operation Panel on the paper receiving side.

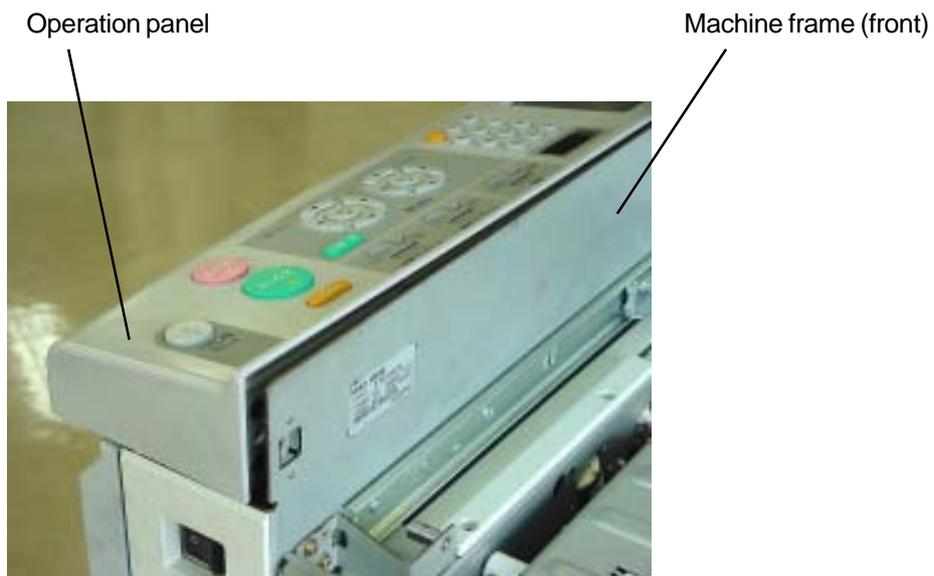


P0134

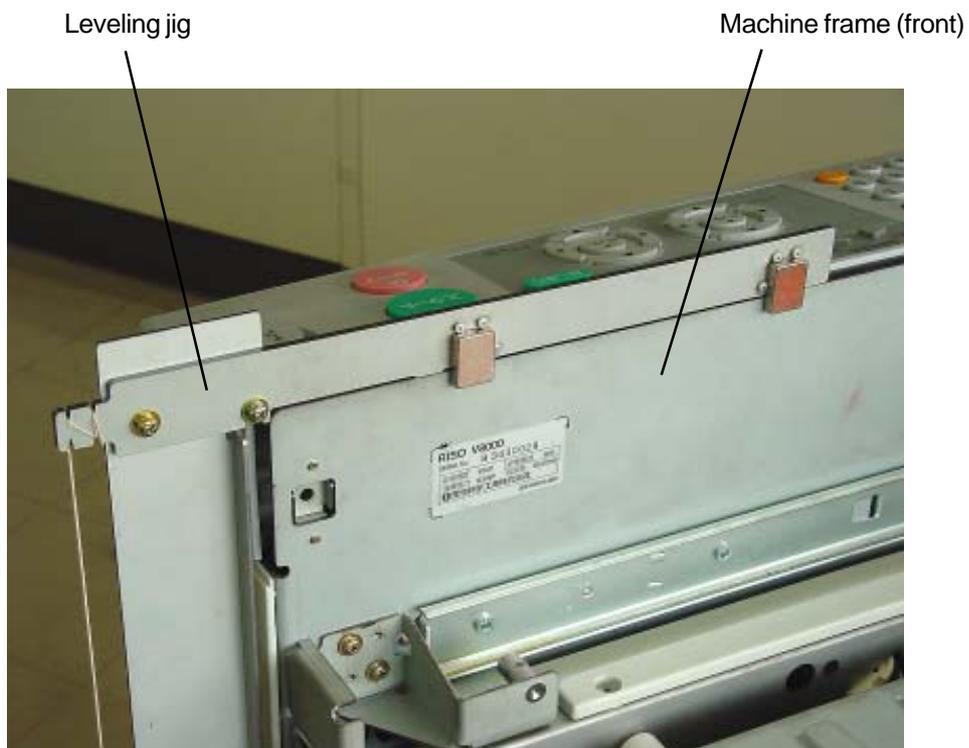


P0135

- (6) Lift the Operation Panel gently upwards a little and slide it towards the front to allow the top thin surface of the machine frame to appear.
- (7) Remove the Leveling jig from the rear machine frame and mount it on the front machine frame in the same manner as done on the rear machine frame.
- (8) Read the scale at the bottom of the jig in the same way as done for the rear of the machine.
- (9) The difference in the scale reading between the rear and front should be within 0.5 mm.



P0136

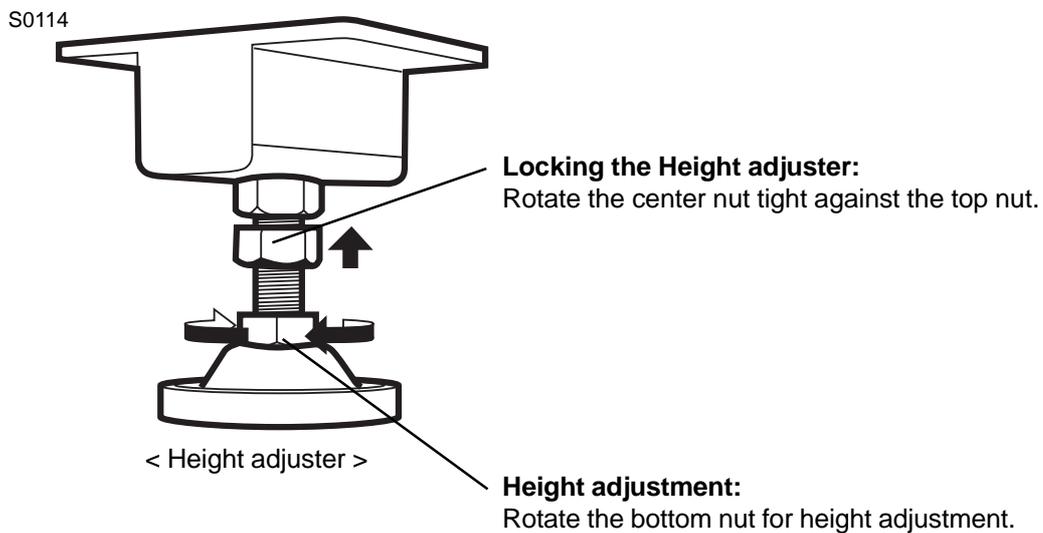
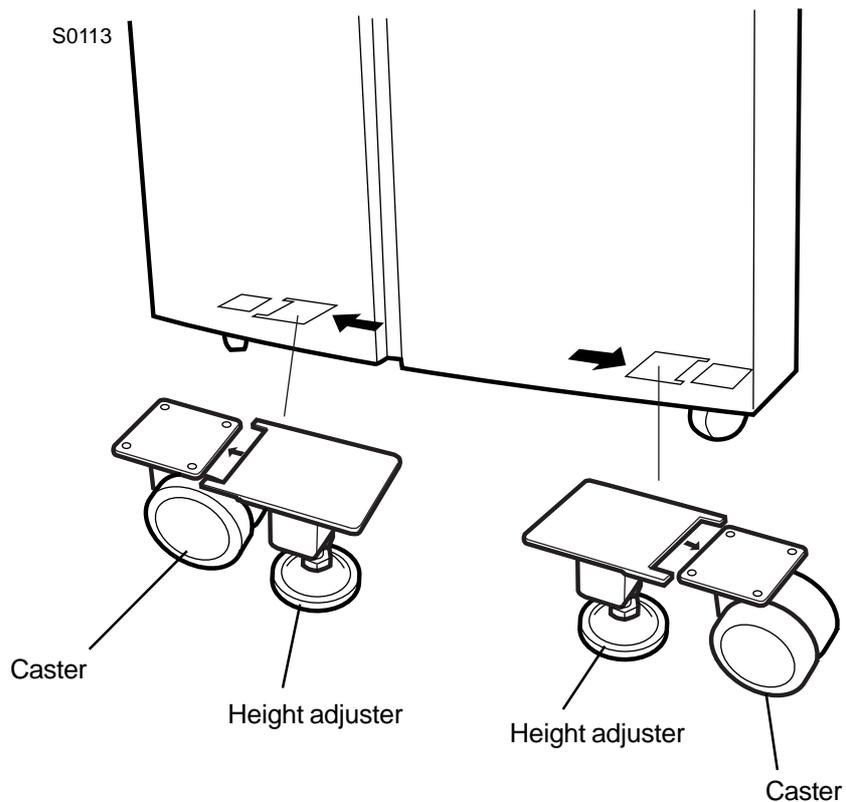


P0137

## CHAPTER 1. MAINTENANCE

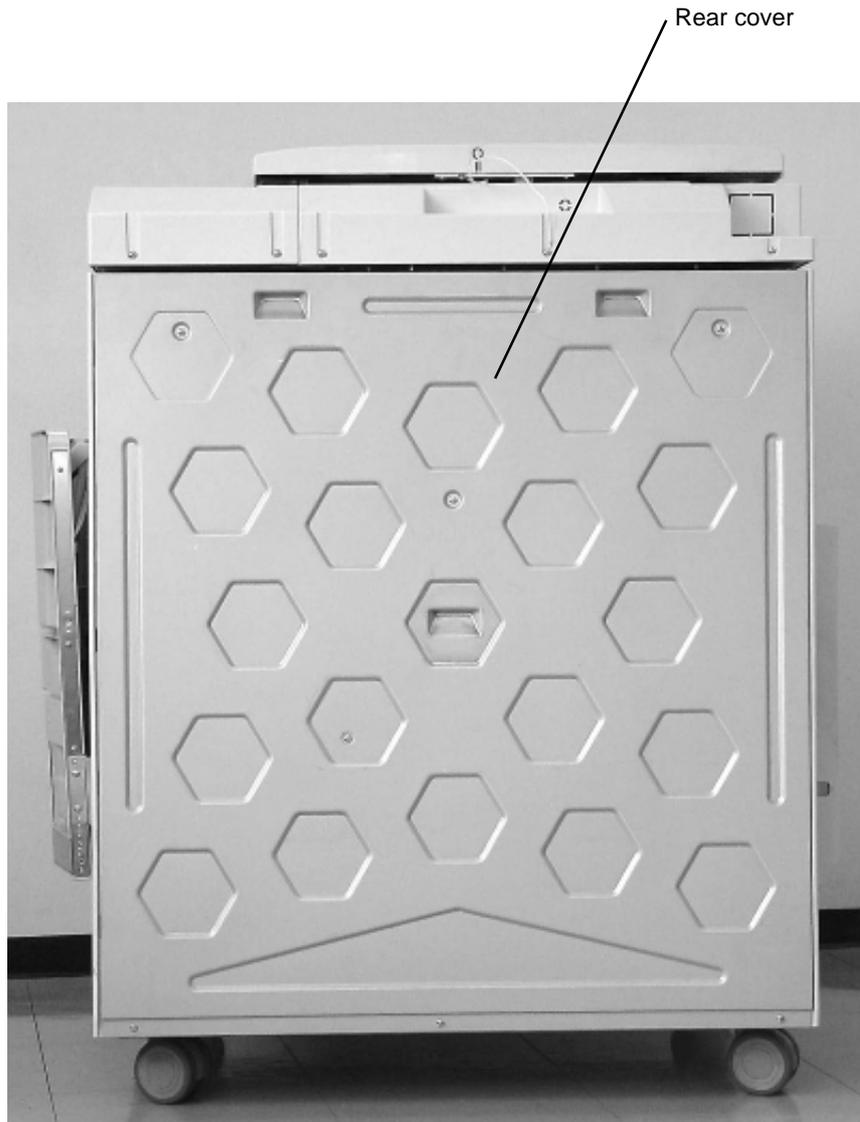
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- (10) If the difference is more than 0.5 mm between the front and rear, attach two Height adjusters under the front of the machine, firmly against the bracket of the two casters on the machine. The Height adjusters need not be placed on the rear of the machine.
- (11) Rotate either one of both of the Height adjusters to raise the machine until the rear and front of the machine is leveled (the difference in the scale reading is within 0.5 mm between the front and rear).  
The Height adjuster is raised or lowered by turning the bottom nut.
- (12) After adjusting the levelness, lock the position by turning and bringing the center nut tightly against the top nut.



## 4. Removing Exterior Covers

Rear cover



P0112

Front doors, L/R



P0113



P0114

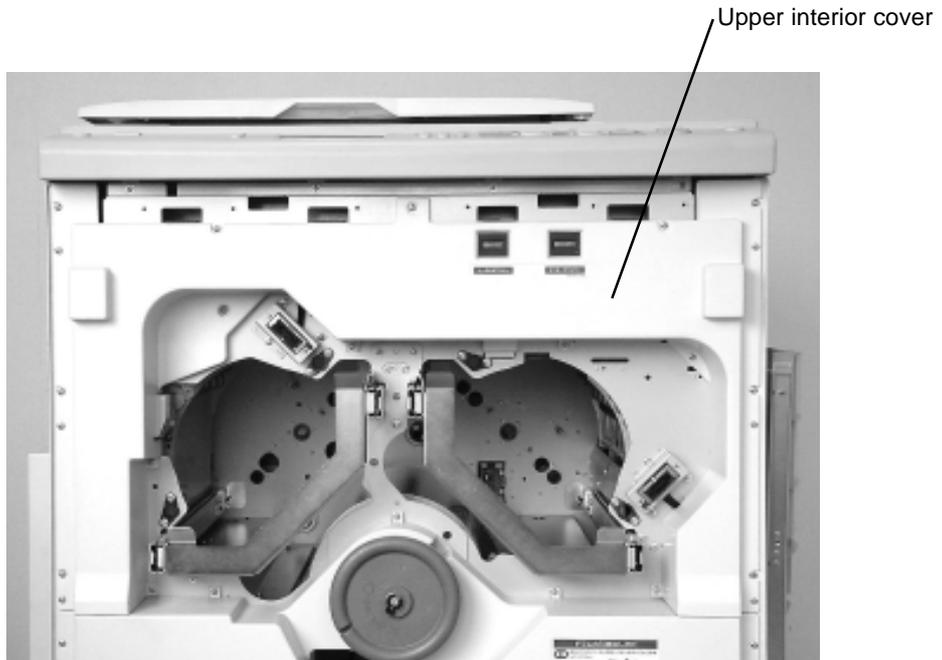


P0115



P0116

Upper interior cover



P0117

Lower interior cover



P0118

Lower interior cover

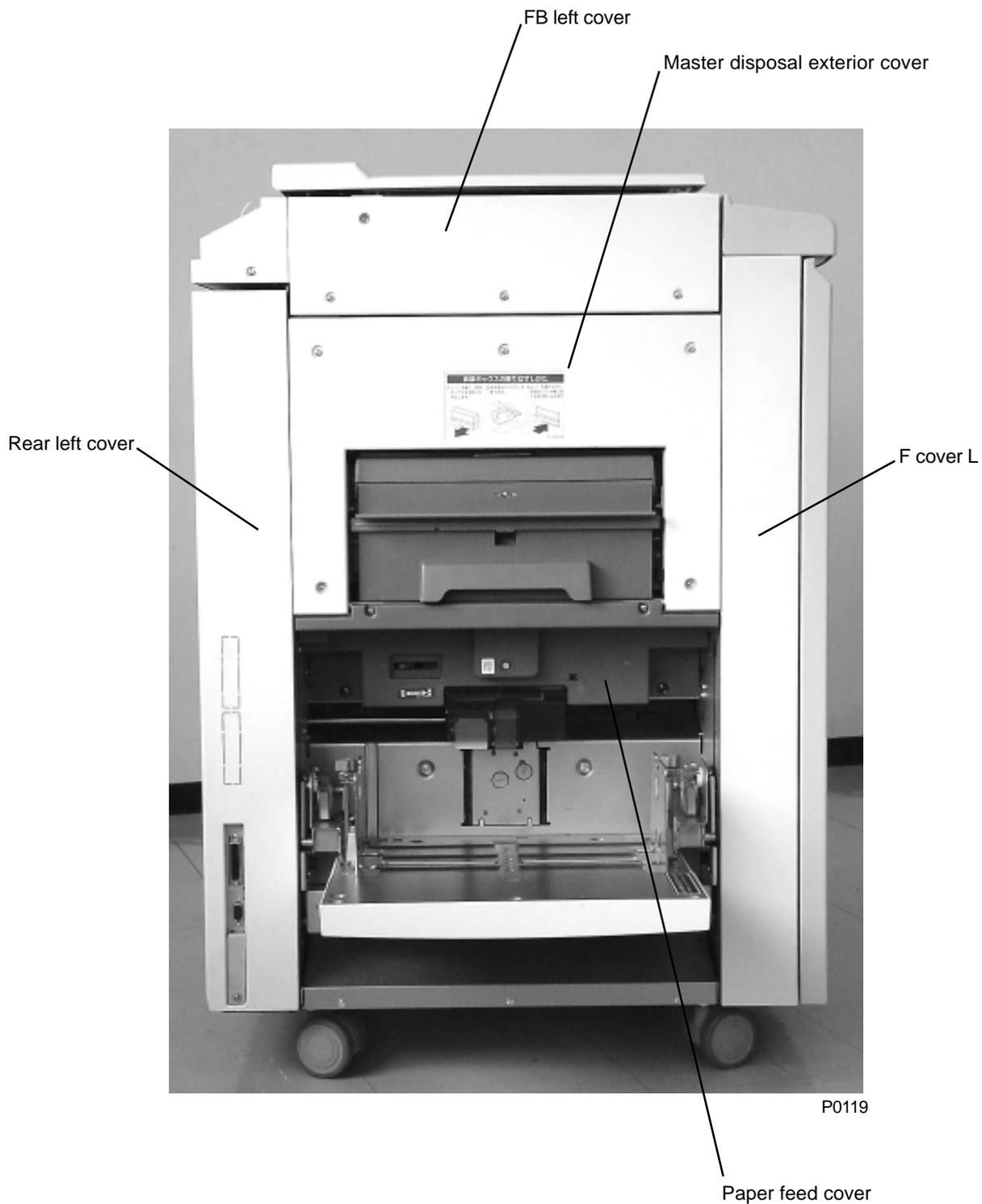
Master disposal exterior cover

F cover L

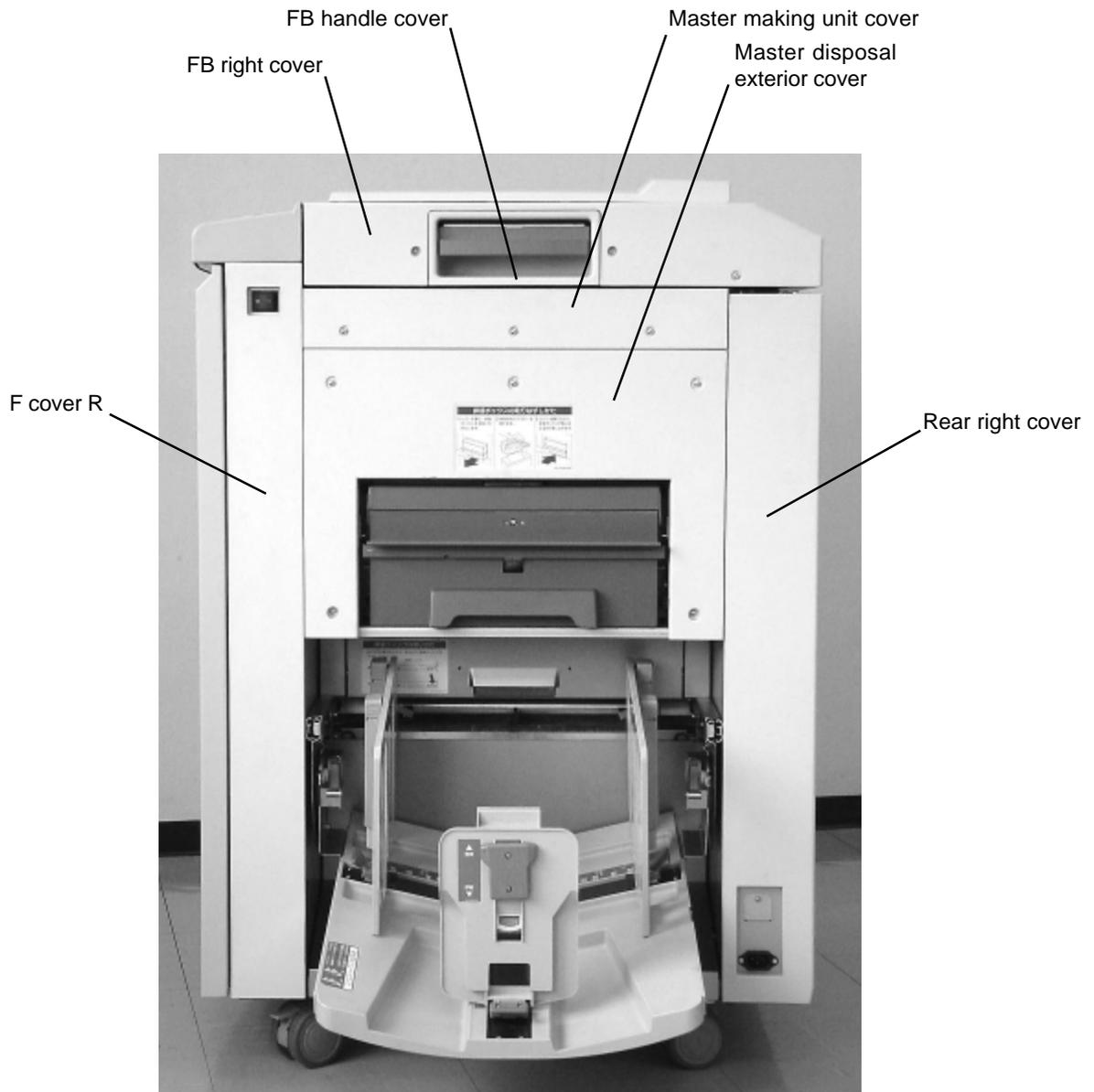
Rear left cover

FB left cover

Paper feed cover



- Master making unit cover
- Master disposal exterior cover
- F cover R
- Rear right cover
- FB right cover
- FB handle cover



P0120

## CHAPTER 1. MAINTENANCE

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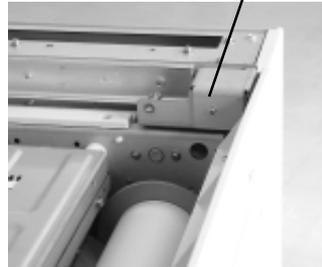
To remove the FB right cover, remove the FB lock plate front and FB safety SW Assy, slide the scanner table in the reverse direction, and remove the hidden screws.

FB lock plate front



P0121

FB safety SW Assy

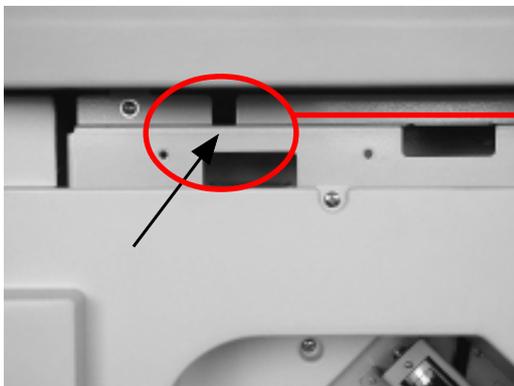


P0122



P0123

To remove the FB right and FB front covers, slide the scanner table, insert a screwdriver through the hole marked by the arrow in the picture, and remove the screws.



P0124

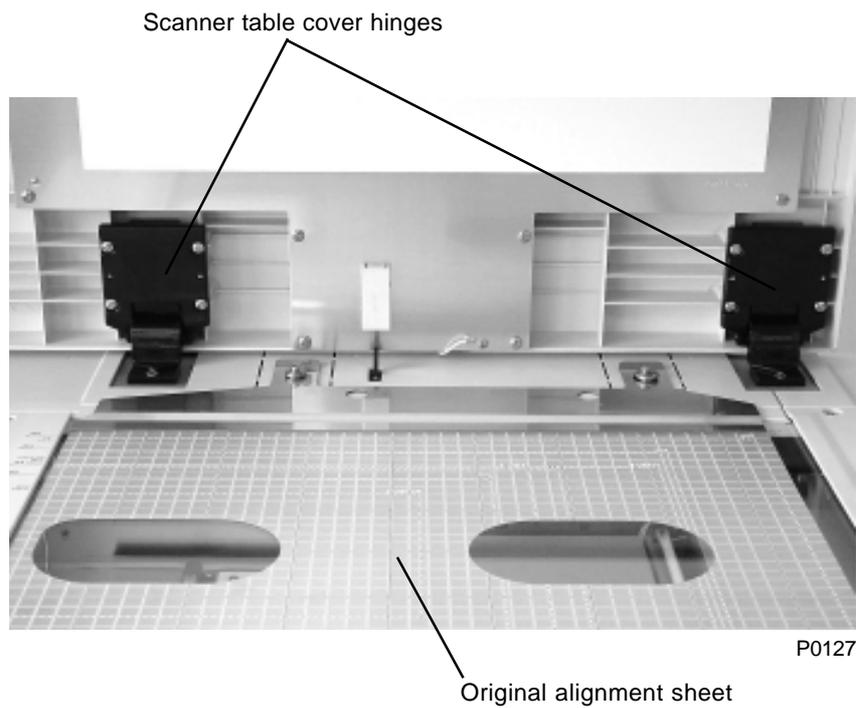
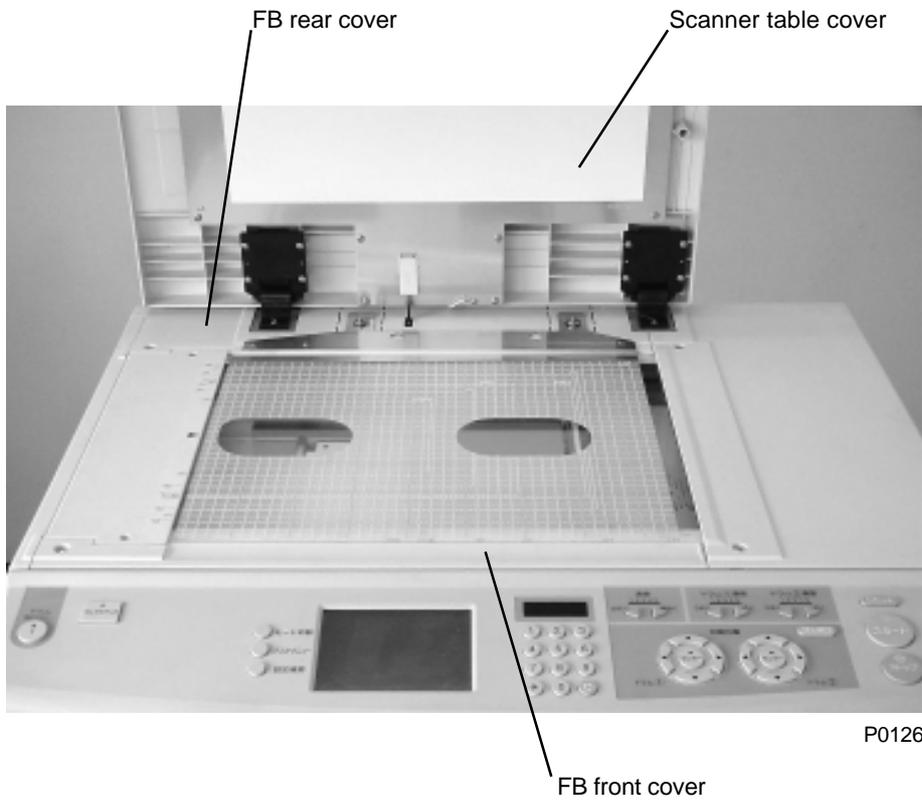


P0125

Scanner table cover

FB front cover

FB rear cover



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# CHAPTER 2: MACHINE OVERVIEW

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## Contents

1. Features .....	2-2
2. Specifications .....	2-3
3. Product Configuration .....	2-4
4. Schematic Cross-Sectional View .....	2-5

### 1. Features

#### ◆ Simultaneously prints two colors at speeds up to 120 sheets per minute.

The RISO V8000 uses its screen printing system to achieve both speed and economy in printing. The two print drums print simultaneously for easy two-color printing at speeds of 120 sheets per minute. Per page printing costs are even lower with greater print quantities. The cost of printing 1,000 copies is 173 yen, or approximately 0.17 yen per print.

#### ◆ High print quality with 600 dpi high resolution and V-Press

The machine incorporates a "V-Press" configuration, with two print drums arranged in a V-shape relative to the paper drum, for outstanding print quality and precise print positioning. Pressure is applied from each print drum to the paper drum, which retains precise, positive control of paper position to the ejection stage by gripping the ends of the paper, ensuring the precise print positioning required for two-color printing. The machine incorporates Riso Kagaku's extensive experience with high-quality image output, with variable pressure print drums capable of fine control of ink density and 600 dpi resolution.

#### ◆ Combined two-color printing capability

A dedicated printer driver enables colorful printing with two-color printers. One of the machine's major features is the ability to print color photo documents with combined two-color printing for dramatically improved image quality compared to previous single-color tones.

#### ◆ Network compatible, with a monitoring function to track operations on-screen

The RISO V8000 can be networked for high-speed, high-quality output of document data created on PCs. The monitoring function allows monitoring of RISO V8000 status (e.g., standby, in use), paper status, paper size, consumables status (e.g., ink, masters), print quantity, memory capacity used, and data display volume, all viewable from a PC monitor.

#### ◆ Compatible with paper originals, with a full complement of handy features for high-quality image reproduction

The RISO V8000 includes a scanner function, facilitating two-color printing of paper originals. The backlight beneath the stage glass and alignment sheet allows checking of document alignment at a glance, and print drums can be individually adjusted both horizontally and vertically for fine print positioning adjustment. A function eliminates moiré (interference) patterns that are generated when scanning shaded areas of documents or half-tone photographs. This is a new function that ensures even better reproduction quality.

#### ◆ Complete with energy-saving mode

The RISO V8000 can be used immediately after being powered on. No energy-wasting warm-up period is required. And unlike photocopiers, the RISO V8000 does not incorporate a heater, and thus generates no waste heat. It also features an auto-shutoff function and sleep mode to automatically switch off power if left unused for a preset length of time.

# Specifications

Processing	Automatic digital scanning/thermal screening, high-speed twin-cylinder (drum) dual-color printing system
Initial Imaging Time	Letter or A4 original : approx. 90 sec.
Print Speed	5 selectable levels (60 to 120 copies/min.)
Scanning Resolution	600 x 600 dpi
Original Input Type	Bound document or sheets
Original Size	- For the Stage Glass 2" x 3 <sup>1</sup> / <sub>2</sub> " (50 x 90 mm) to 11 <sup>5</sup> / <sub>8</sub> " x 17" (Ledger, A3, or 297 x 432 mm) - In the optional AF Unit 4" x 5 <sup>7</sup> / <sub>8</sub> " (A6 or 100 x 148 mm) to 11 <sup>5</sup> / <sub>8</sub> " x 17" (Ledger, A3, or 297 x 432 mm)
Output Paper Size	3 <sup>1</sup> / <sub>2</sub> " x 5 <sup>1</sup> / <sub>2</sub> " (90 x 140 mm) to 13 <sup>3</sup> / <sub>8</sub> " x 17 <sup>3</sup> / <sub>8</sub> " (340 x 440 mm)
Original Weight	- For the Stage Glass 22 lbs.(10kg) or less - In the optional AF Unit 14-lb bond (50 g/m <sup>2</sup> ) to 28-lb bond (110 g/m <sup>2</sup> )
Output Paper Weight	13-lb bond (46 g/m <sup>2</sup> ) to 110-lb index stock (210 g/m <sup>2</sup> )
Image Area	11 <sup>7</sup> / <sub>8</sub> " x 16 <sup>7</sup> / <sub>8</sub> " (301 x 429 mm)
Paper Capacity	1000 sheets in feed and receiving tray (16-lb bond or 64 g/m <sup>2</sup> paper)
Enlargement Parameters	USA model : 200%, 154%, 129%, 121% Metric model : 163%, 141%, 122%, 116%
Reduction Parameters	USA model : 50%, 61%, 65%, 78% Metric model : 61%, 71%, 82%, 87%
Zooming Parameters	50% to 200% (Direction-independent adjustment available)
Features	<ul style="list-style-type: none"> <li>- Direct-touch control panel</li> <li>- Print speed/density control</li> <li>- Photo contrast enhancement</li> <li>- Tone curve adjustment</li> <li>- Mirror image print</li> <li>- Multi-up printing (including ticket)</li> <li>- Print job memory mode (24 entries)</li> <li>- Side margin change</li> <li>- Auto process (full/semi)</li> <li>- Idling action (automatic/manual)</li> <li>- Master renewal (automatic/manual)</li> <li>- Current job reservation</li> <li>- Double feed check status control</li> <li>- Integral computer interface</li> <li>- Remote data reception</li> <li>- Dot screening (4 patterns)</li> <li>- Scanning contrast control (auto/manual)</li> <li>- Duo processing</li> <li>- Bound document processing</li> <li>- Background/watermark printing</li> <li>- Programmed printing (2 types)</li> <li>- Registration mark skip</li> <li>- Confidential mode</li> <li>- Energy saving mode (2 types)</li> <li>- Automatic ink warming</li> <li>- Custom display panel design</li> <li>- Supply status detection</li> <li>- Paper ejection guide roller control</li> <li>- Network capability (optional)</li> <li>- Document data memory (PC/scanning)</li> </ul>
Print Colors	A wide range of colors including : Black, Blue, Red, Green, Brown, Yellow, etc.
Optional Accessories	Color Cylinder (Drum), AF Unit VI, Digitizer V, Job Separator IV, Key/Card Counter IV and Network Interface Card
Power Source (Requirements)	V8000U : 120V AC, 60Hz <10A> V8000E : 220-240V AC, 50/60Hz <5A>
	<b>⚠ WARNING</b> Always check the rating plate on the machine before connecting the power.
Weight	Approx. 529 lbs. (240Kg)
Dimensions (WxDxH)	In use : 55" x 30 <sup>1</sup> / <sub>4</sub> " x 43 <sup>1</sup> / <sub>2</sub> " (1,400 x 770 x 1,104 mm) In storage : 39 <sup>3</sup> / <sub>8</sub> " x 30 <sup>1</sup> / <sub>4</sub> " x 43 <sup>1</sup> / <sub>2</sub> " (1,000 x 770 x 1,104 mm)

### 3. Product Configuration

**1. Main unit**

RISO V8000

**2. Accessories**

- Operating instruction manual x1
- Printer driver CD-ROM x1
- Power cable x1

**3. Optional items**

- AF unit VI
- Digitizer V
- Digitizer V; AF
- Inkless print drum (with case)
- Card counter IV
- Job separator IV
- RISORINC-NET-B

**4. Consumable items**

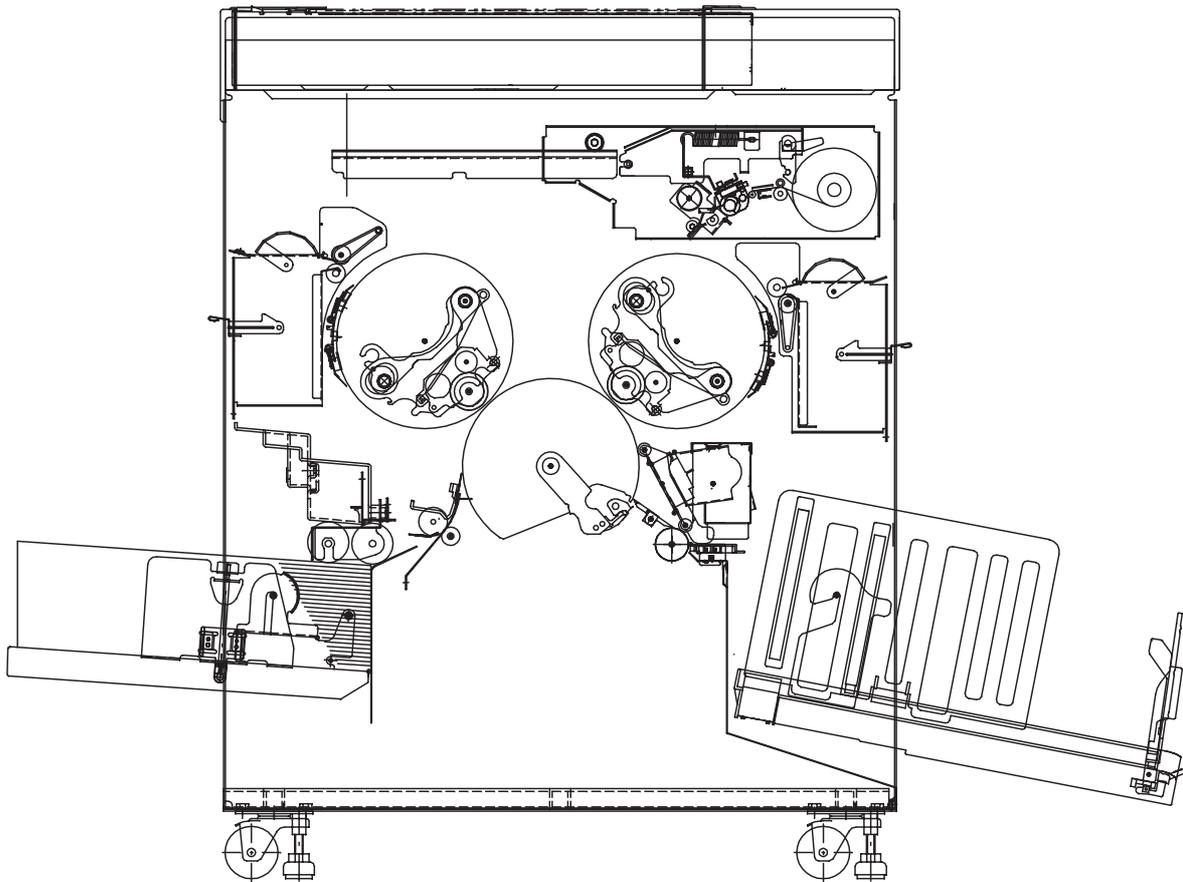
- RISO master V type (1 roll, approx. 200 masters)
- RISO ink V type (black)
- RISO ink V type (color)

#### 4. Schematic Cross-Sectional View

View of the Paper Drum and Print Drums in the "Idle" position after the printing.

The Paper Drum is at 150 degrees from the T-Position.

(Test mode No. 567 will also bring the machine to this position).



S0201

# MEMO

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# CHAPTER 3: MAIN DRIVE SECTION

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## Mechanism

### 1. Main Drive Section Rotating Mechanism

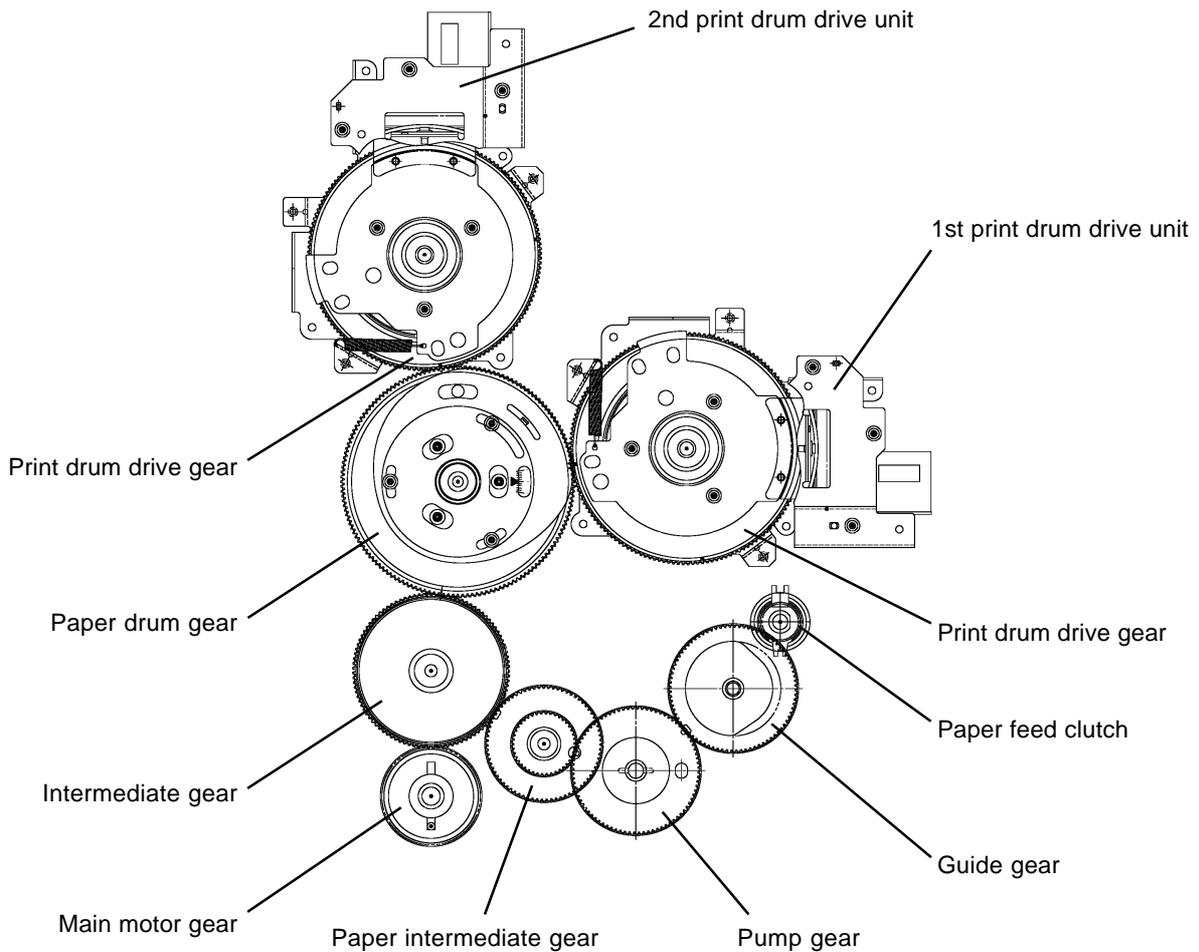
The print drum and paper drum are rotated for normal use by the main motor. The main motor limit sensor (encoder sensor) detects the main motor speed and the amount of rotation and verifies stable motor operations.

The free rotation of the main motor can be controlled using the switch on the mechanical control PCB.

The main pulse motor is used when ultra-low-speed rotation of the print drum or paper drum is required, for applications such as corrections for master loading or the print drum stop position, in which case the main clutch is applied. When the main motor is used to drive the print drum or paper drum, the main clutch is released to remove the load from the main pulse motor.

The following parts are driven by the main motor via gears and cams.

- Paper drum: Paper drum rotation and opening/closing of sheet gripper
- Print drum: Print drum rotation, and vertical movement and rotation of inner pressure roller
- First paper feed section: Rotation of pickup roller and scraper, and air pump operation
- Second paper feed section: Rotation of timing roller, vertical movement of guide roller, and vertical movement of paper feed variable guide.

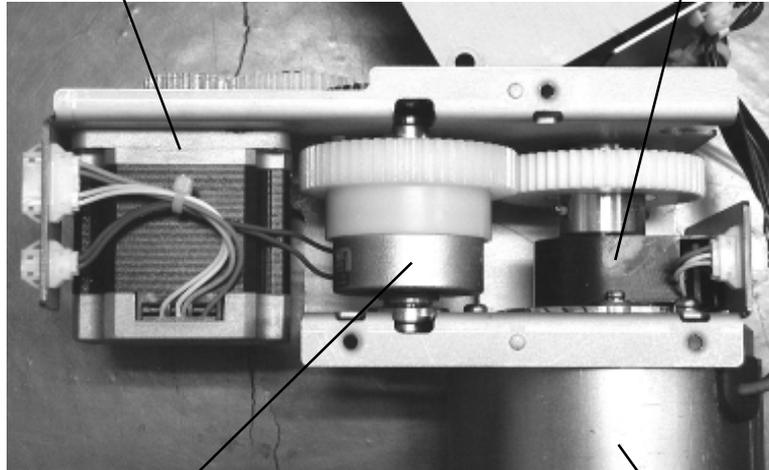


S0301

**The position in which the markings on gears are all aligned**  
(Paper drum at 180 degrees from the T-position)

Main pulse motor

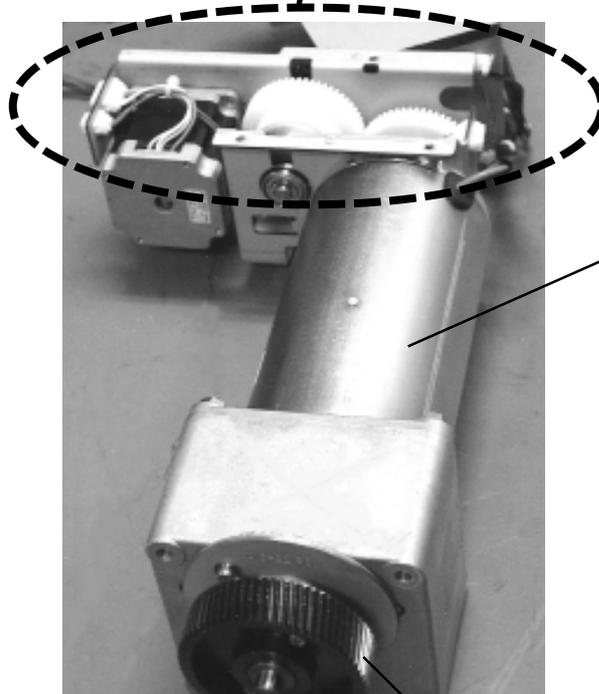
Main motor limit (encoder) sensor



P0302

Main clutch

Main motor



Main motor

P0303

Main motor gear

## **2. Main Motor Safety Mechanism**

To ensure operator safety, six safety switches listed below prevent main motor operation if any one of the switches are not activated.

1. Master disposal box 1 safety switch
2. Master disposal box 2 safety switch
3. Scanner table safety switch
4. Paper ejection unit safety switch
5. Front door safety switch (Right)
6. Front door safety switch (Left)

**The following will stop when any one of above safety switch activates.**

- Clamp slide motors 1 & 2
- Clamp opening and closing motors 1 & 2
- Master tail clamp fan
- Print positioning pulse motor
- Master compression motor
- Disposal plate motor
- Paper ejection motor
- Pinch pulse motor
- Master making unit slide motor
- Main motor
- Pinch roller release motor (This motor stops only with the activation of Paper ejection unit safety switch).



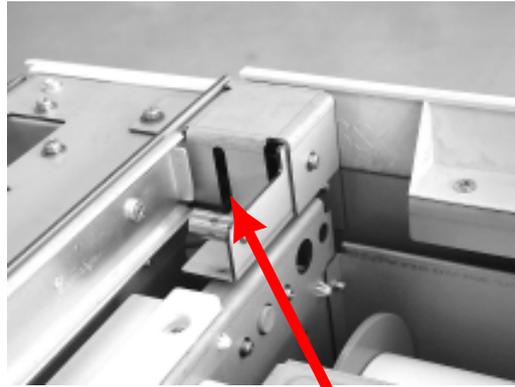
P0304

Master disposal box 1 safety switch



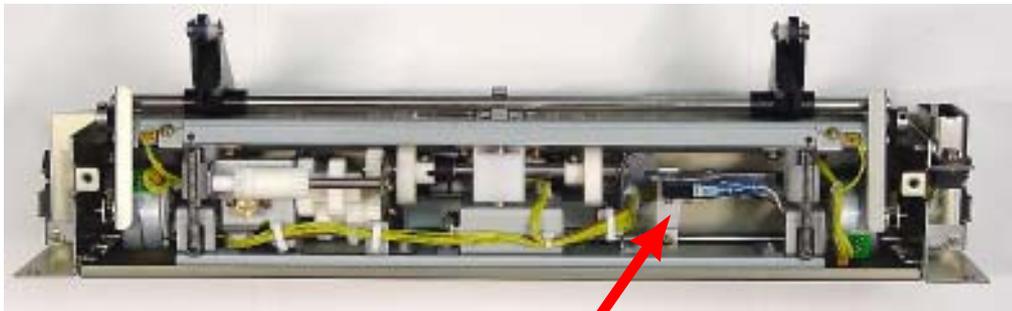
P0305

Master disposal box 2 safety switch



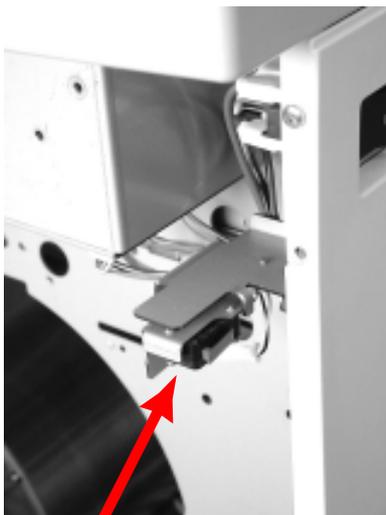
P0306

Scanner table safety switch



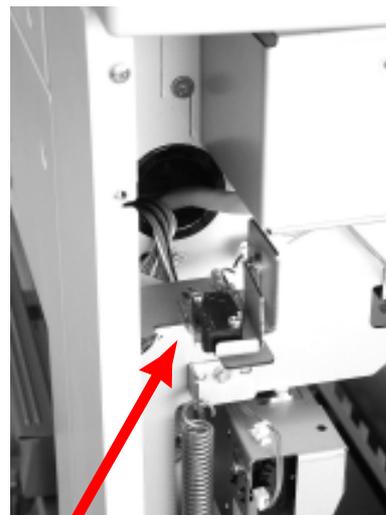
P0324

Paper ejection unit safety switch



P0307

Front door safety switch (Right)



P0308

Front door safety switch (Left)

### 3. Paper Drum Rotation Position

The paper drum rotation position is checked by the Position T sensor.

The precise rotational position of the paper drum is checked by the main motor limit sensor (encoder sensor) from the T-position.

The Paper Drum stops at 150 degrees from its T-position after the printing job is finished and waits for next job. ([Refer to page 2-5](#) for the sketch of the Paper drum 150 degrees position from the T-position).

### 4. Low Temperature Printing Speed Limit

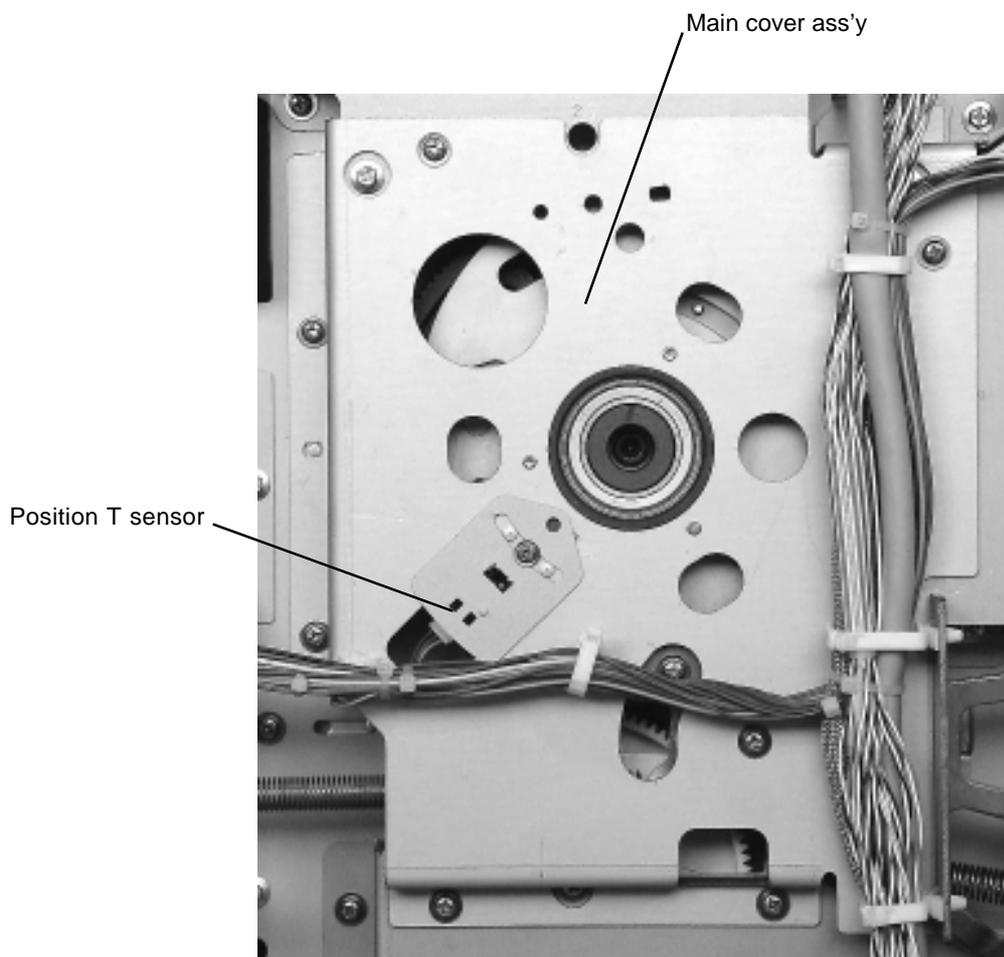
When either one of the temperature sensors, one on the Mechanical control PCB and the other on the Ink sensor PCB, detects temperature of 10 degrees Celsius or lower, the maximum Print drum rotation speed will be limited to 100 r.p.m. The operation panel will indicate the message, "Limited Print Speed".

While the printing is in progress, even though the temperature exceeds 10 degrees Celsius, the speed limitation remains until the Stop button is once pressed and the printing is restarted.

## Disassembly

### 1. Removing the Main Cover Ass'y

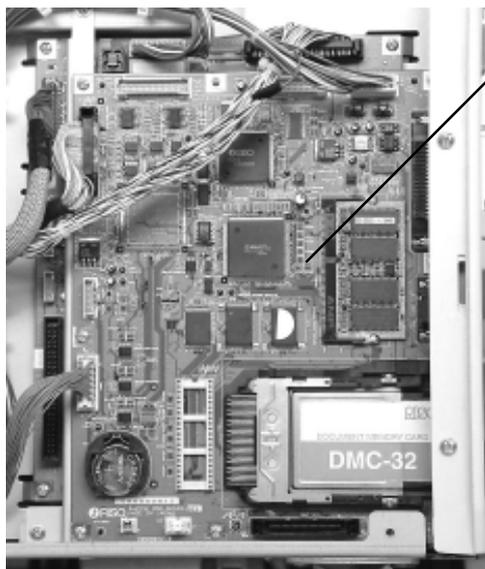
- (1) Remove the reuse band on the position T sensor wire harness and disconnect the position T sensor connector.
- (2) Detach the wire harness from the wire saddle.
- (3) Remove the eight mounting screws (M4 x 8), then remove the main cover ass'y.



P0309

## 2. Removing the Paper Feed Intermediate Gear, Pump Gear, and Guide Gear

- (1) Remove the blind plate. (M4 x 6 screw)
- (2) Remove the SH-PCB+graphic board together with the mounting bracket. (Two M4 x 8 screws, four M3 x 6 screws)
- (3) Remove the main cover ass'y.
- (4) Remove the sector gear spring, detach the E-ring, then remove the sector gear.
- (5) Disconnect the connector, detach the E-ring, then remove the paper feed clutch.
- (6) Remove the reinforcing plate. (Eight M4 x 8 screws)
- (7) Remove the guide lever spring.
- (8) Detach the two E-rings, then remove the paper pass guide link arm.
- (9) Rotate the paper drum by hand to bring the guide lever assembly to the bottom of the guide gear cam section. Remove the mounting screw (M4 x 6), then remove the guide lever assembly.
- (10) Remove the paper intermediate gear, pump gear, and guide gear.

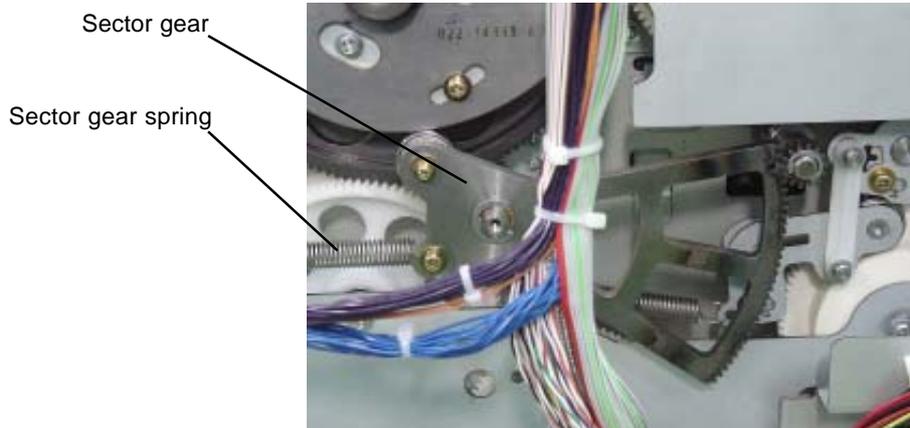


P0310

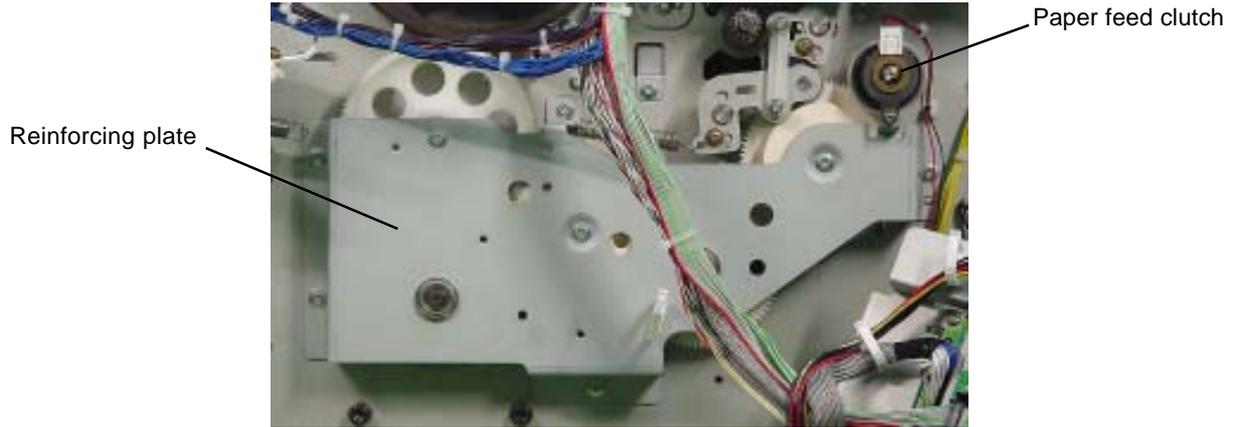


P0311

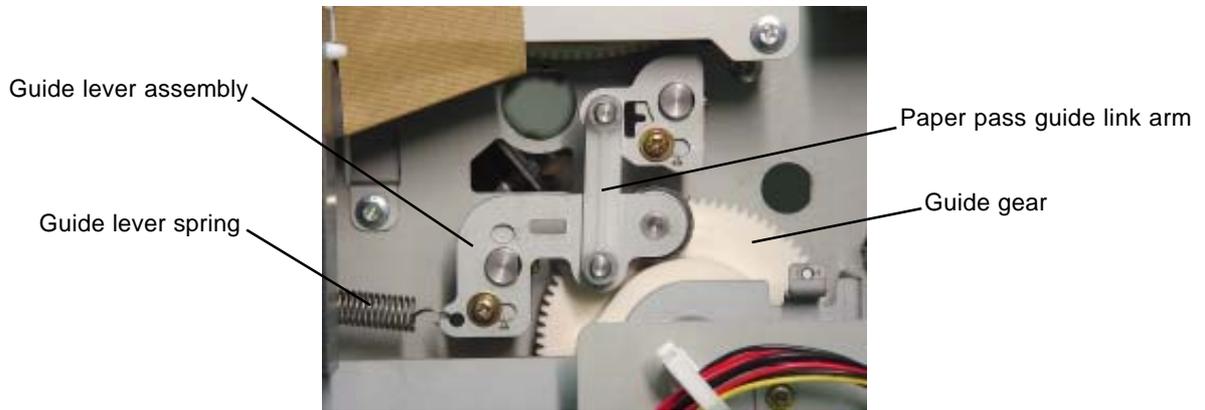
Blind plate



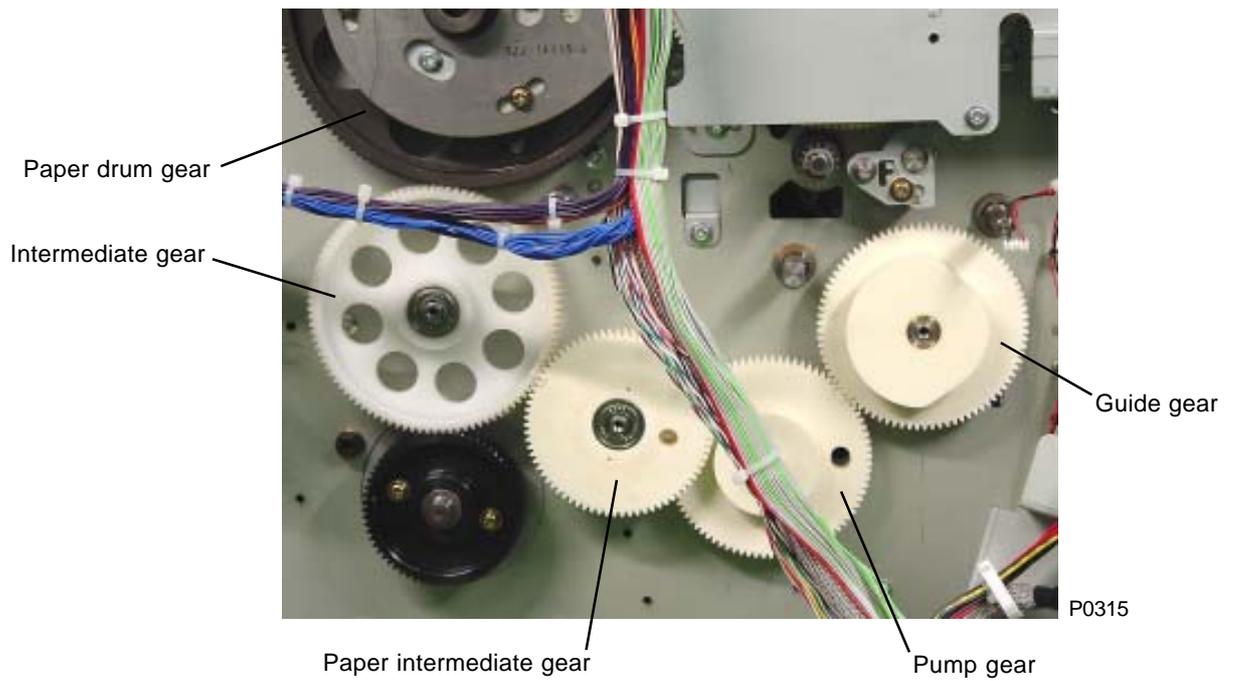
P0312



P0313



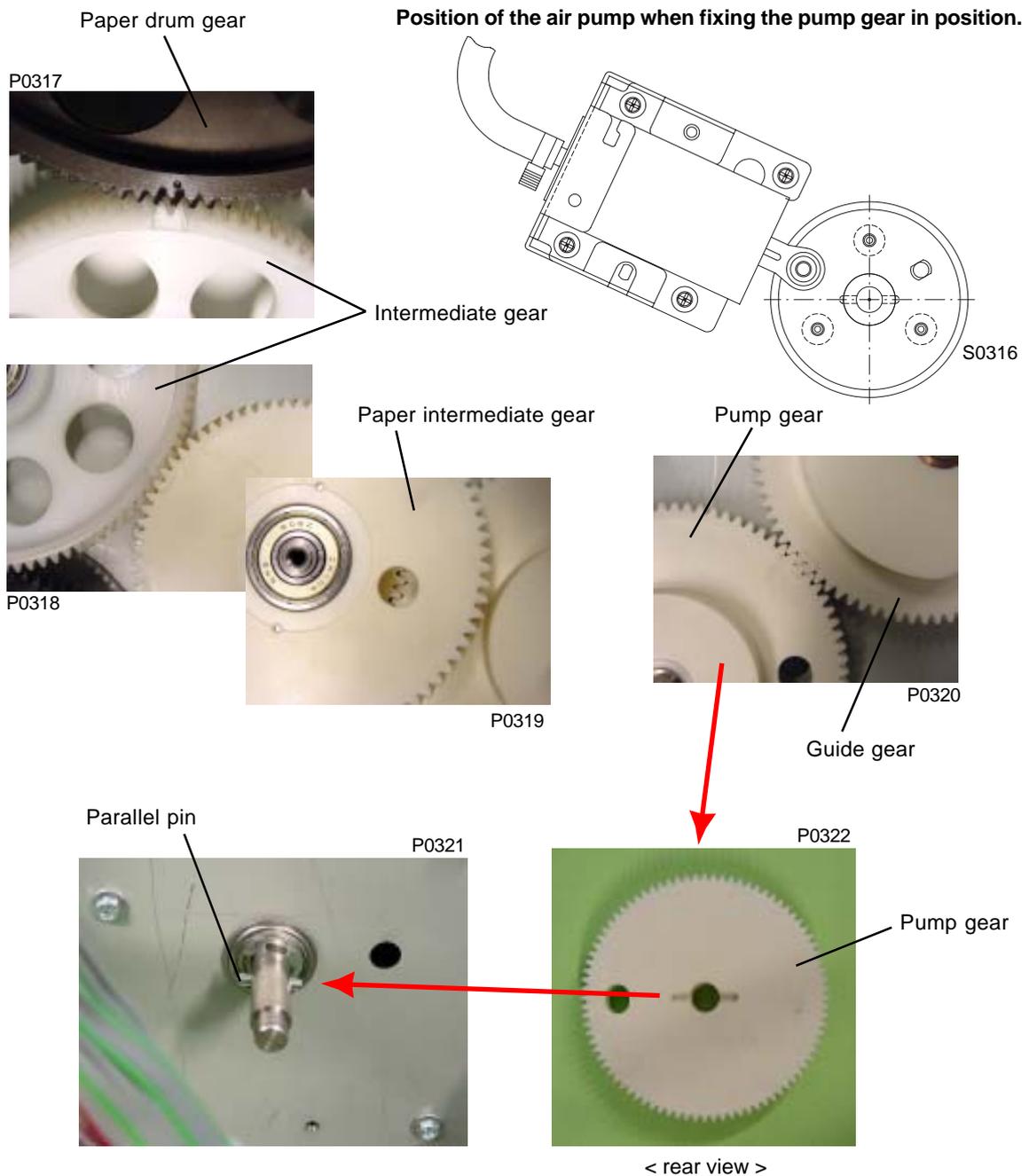
P0314



P0315

**[Precautions for Reassembly]**

- Align the gear phases when reassembling.
  - 1) Insert the dia. 8 JIG in the alignment hole in the paper drum gear.
  - 2) Align the marking on the intermediate gear with the marking on the paper drum gear before mounting.
  - 3) Mount the pump gear, confirming that the pump is at the position shown by below sketch.
  - 4) Align the marking on the paper feed intermediate gear with the markings on both the intermediate gear and pump gear before mounting.
  - 5) Align the marking on the guide gear with the marking on the pump gear before mounting.
- A parallel pin is inserted in the pump gear spindle. This must be aligned with the slots on the pump gear. Since the parallel pin is easily detached, care should be taken to keep it horizontal during mounting.



### 3. Removing the Main Motor Unit

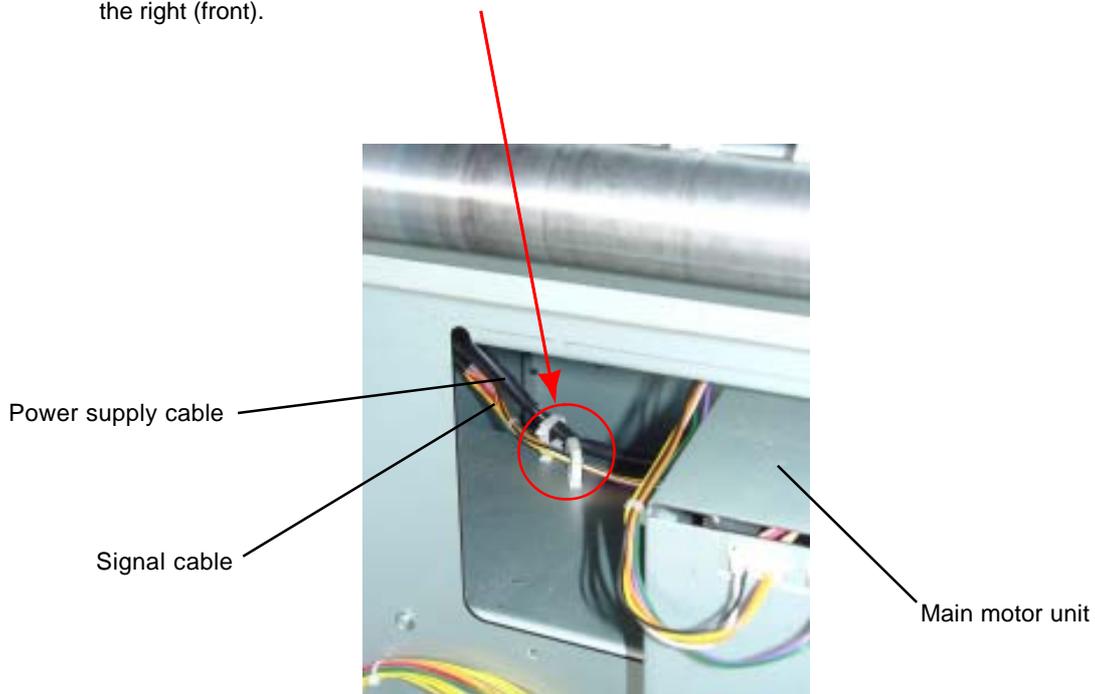
- (1) Remove the blind plate. (M4 x 6 screw)
- (2) Remove the SH-PCB+graphic board together with the bracket.  
(Two M4 x 8 screws, four M3 x 6 screws)
- (3) Disconnect the connector, detach the E-ring, and remove the paper feed clutch.
- (4) Remove the guide lever spring.
- (5) Remove the eight mounting screws (M4 x 8), then remove the reinforcing plate.
- (6) Remove the paper intermediate gear.
- (7) Pull out the paper ejection unit, remove the five mounting screws (M4 x 8), and remove the paper ejection cover ass'y.
- (8) Remove the four mounting screws (M6 x 10) on the main motor unit, disconnect the two connectors from the power supply PCB, and push inside the side panel. Detach the wire harness from the wire saddle and remove the main motor unit from the paper ejection side.

#### [Work Precautions]

- The connector on the motor power supply cable is fitted with a lock. This should be released before disconnecting.
- The main motor is extremely heavy. Work carefully to prevent injuries.

#### [Precautions for Reassembly]

- Two wire saddles are fitted to secure the wire harness. The power supply cable should be inserted in the wire saddle on the left (back), and the signal cable should be inserted in the wire saddle on the right (front).



P0323

# MEMO

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# CHAPTER 4: FIRST PAPER FEED SECTION

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## Mechanism

### 1. Paper Feed Tray Mechanism

Dampers are fitted to both sides of the paper feed tray to ensure that it opens gently. The paper feed tray set sensor checks that the paper feed tray is in place.

The horizontal print position is adjusted using the print drum so the paper feed tray does not move sideways.

The paper detection sensor (reflective type) checks that paper is loaded in the paper feed tray.

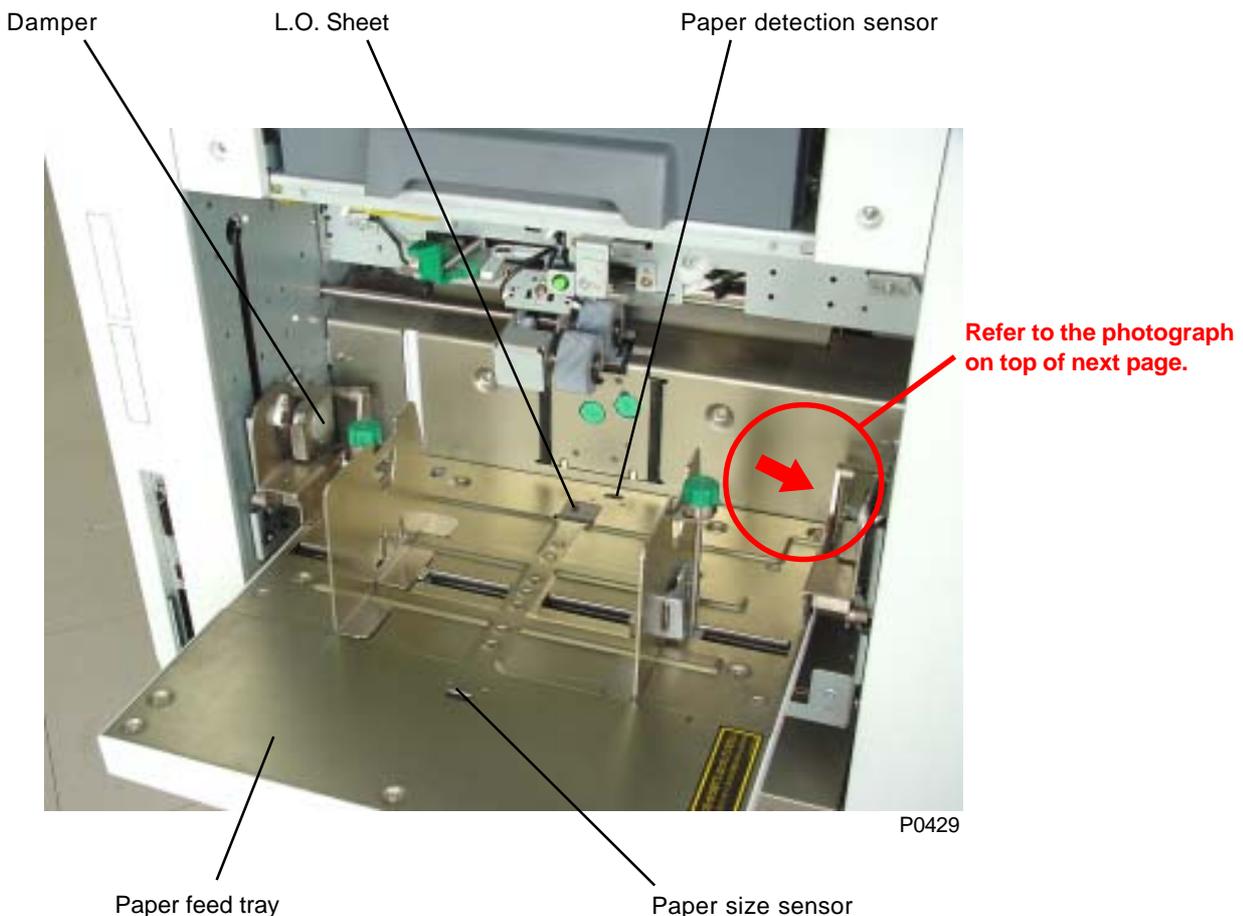
The final sheet in the paper feed tray is susceptible to multiple paper feeding. The L.O. sheet is used to prevent such occurrences.

The size of the paper loaded in the paper feed tray is detected by the paper width potentiometer and paper size sensor.

The paper width potentiometer senses the paper width, while the paper size sensor determines the paper orientation (portrait or landscape).

The gap between the front and rear pinch rollers on the pinch unit is adjusted automatically to suit the paper width detected.

The correspondence between the measured size and determined size is shown in the table on next page.



< Damper on the operator side of the paper feed tray >

VIEW FROM THE ARROW MARK ON THE PREVIOUS PAGE



P0430

Paper feed tray set sensor

< Measured size & Determined size chart >

Measured size (mm)	Determined size
292 - 302	A3
252 - 262	B4
205 - 215	A4
292 - 302	A4R
177 - 187	B5
252 - 262	B5R
95 - 105	Postcard

### 2. Paper Feed Tray Elevation Mechanism

The paper feed tray is raised automatically at the start of printing and is lowered when there is no more paper in the paper tray and the paper detection sensor does not detect reflected light.

The paper feed tray is also lowered if the feed tray button is pressed during print standby.

The paper feed tray is raised and lowered by the elevator motor. The upper stop position is detected by the elevator upper limit sensor, and the lower stop position is detected by the elevator lower limit sensor.

The scraper pressure is varied by switching the pressure adjust lever between “Standard” and “Card.” (Spring pressure adjustment)

The paper feed pressure sensor detects the lever setting.

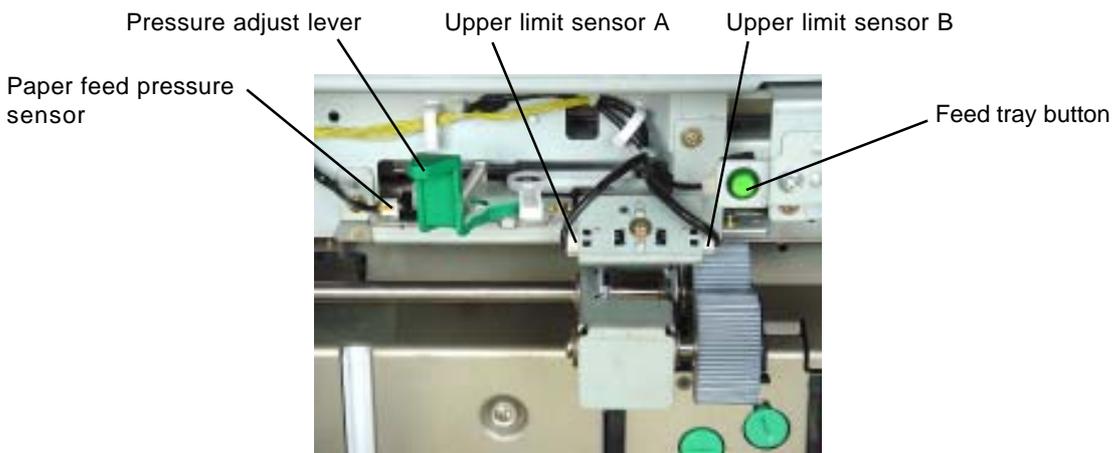
Either of the two elevator upper limit sensors (A and B) are used, as determined by the paper feed pressure sensor.

Positioned on the same bracket as the elevator lower limit sensors, paper volume det. sensors A and B determine the amount of paper remaining based on the paper feed tray position.

Paper volume percentages are checked in 100%, 75%, 50%, and 25% by above sensors, but when displaying the percentages on the panel, they are converted to 100%, 59%, 30%, and 10%.

If a foreign object is trapped in the paper feed section during raising or lowering of the paper feed tray, the elevator is immediately halted by the paper feed tray safety switch.

An air pump mechanism is incorporated to prevent poor printing due to paper dust .



P0432

### 3. First Paper Feed Mechanism

The paper feed through the first and second paper feed sections is checked by the first paper sensor, second paper sensor, and multiple paper feed sensor. The first paper sensor is located before the second paper feed roller, while the second paper sensor and multiple paper feed sensor are located after the second paper feed roller.

Paper is fed through the first paper feed section by the rotation of the scraper and pickup roller. The drive side of the paper feed clutch rotates continuously while the main motor rotates, but the actual rotation of the scraper and pickup roller is controlled by switching the paper feed clutch on and off.

The paper feed clutch is switched on at an angle of 150° from the paper drum position T.

The paper feed clutch is switched off when the paper drum has rotated 18° after paper has been detected by the first paper sensor.

The leading edge of the paper strikes the second paper feed roller here, and stops with the paper flexed.

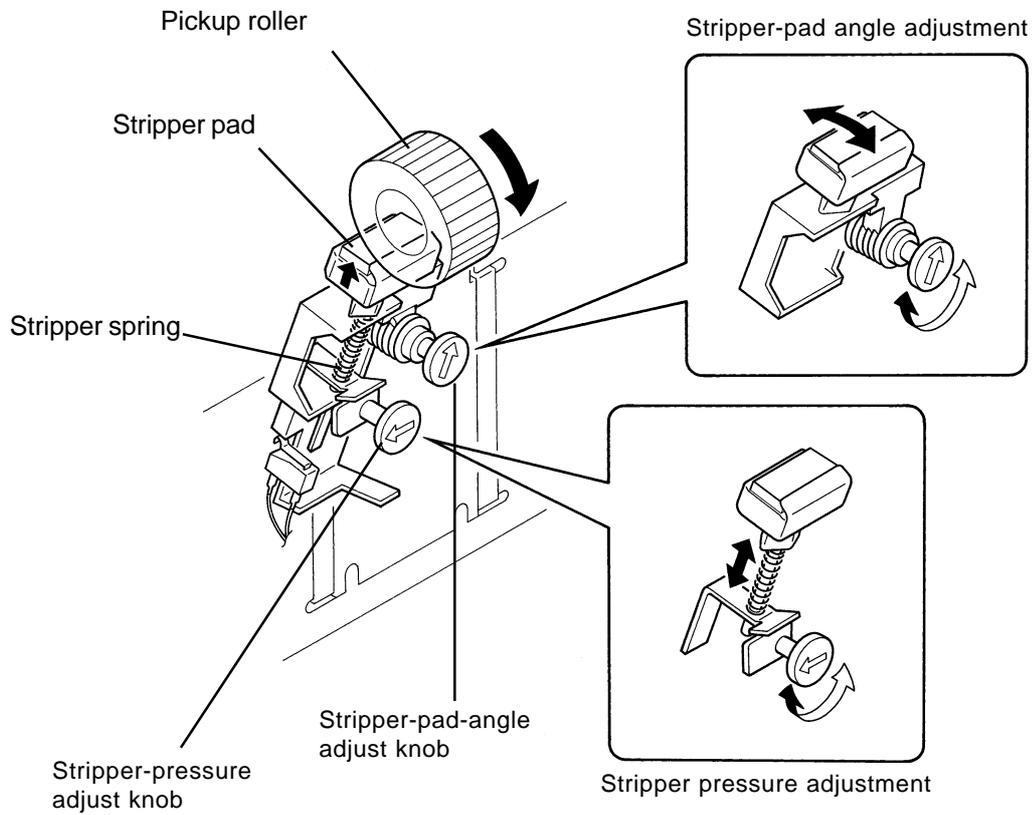
A one-way core is fitted to the scraper and pickup roller so that they spin, keeping the first paper feed section from acting as a brake once the paper has been transferred beyond the second paper feed section.

## 4. Paper Strip Mechanism

The paper loaded into the paper feed tray is fed in between the pickup roller and the stripper pad by the rotation of the scraper. The paper is stripped by the pickup roller and stripper pad to ensure that only the top single sheet is fed into the machine.

The stripper pad is pressed against the pickup roller by stripper spring pressure, stripping paper by applying resistance when the paper is fed.

Users can adjust the stripper pad angle and stripper pressure with the stripper pad angle adjust knob and stripper pressure adjust knob.

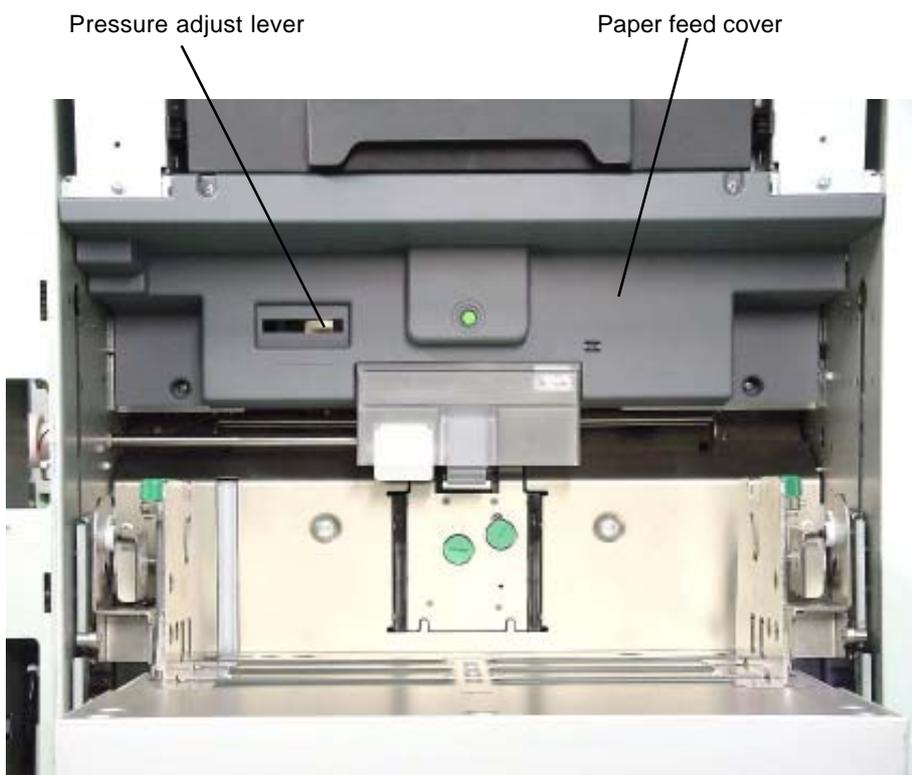


S0401

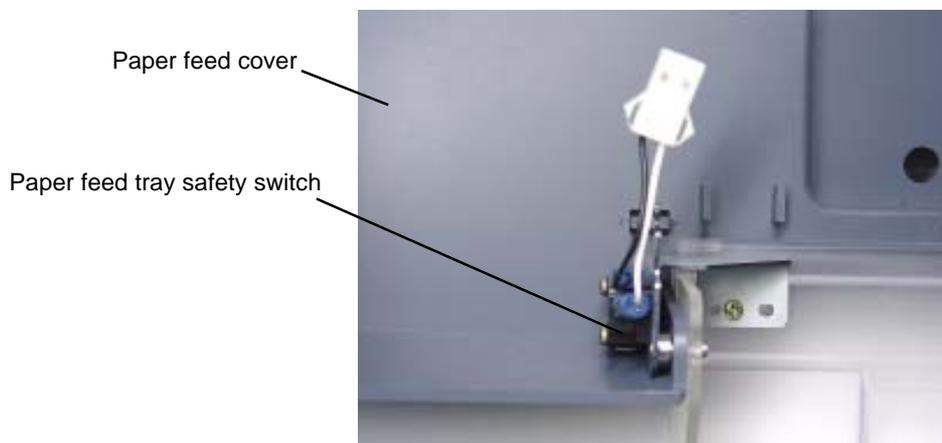
## Disassembly

### 1. Removing the Paper Feed Cover

- (1) Completely lower the paper feed tray.
  - (2) Remove the four mounting screws (M4 x 8), disconnect the connector on the paper feed tray safety switch wire harness, and remove the paper feed cover.
- \* Note the position of the pressure adjust lever. Avoid applying excessive force.



P0402



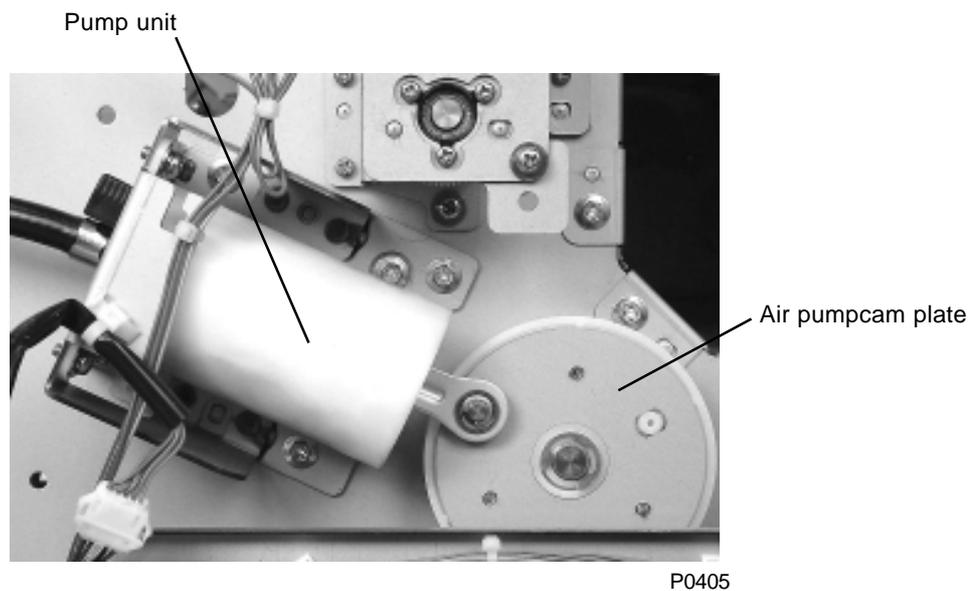
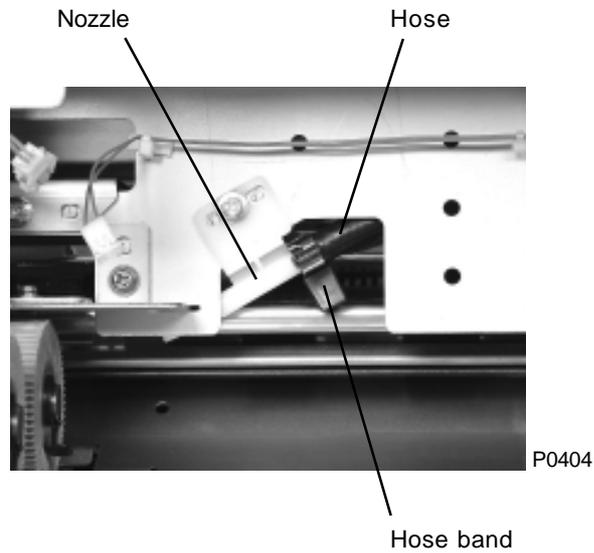
P0403

## 2. Removing the Air Pump Unit

- (1) Remove the paper feed cover.
- (2) Remove the nozzle. (M4 x 8 screw)
- (3) Loosen the hose band, detach the hose from the nozzle, then pull outside the side panel (front).
- (4) Detach the E-ring on the air pump cam plate, remove the four mounting screws (M4 x 8) on the pump unit, and remove the pump unit.

### [Precautions for Reassembly]

- Correctly position the Air pump cam during the assembly (refer to chapter 3, page 3-10).



### 3. Removing the Pickup Roller and Scraper

#### Removing the scraper

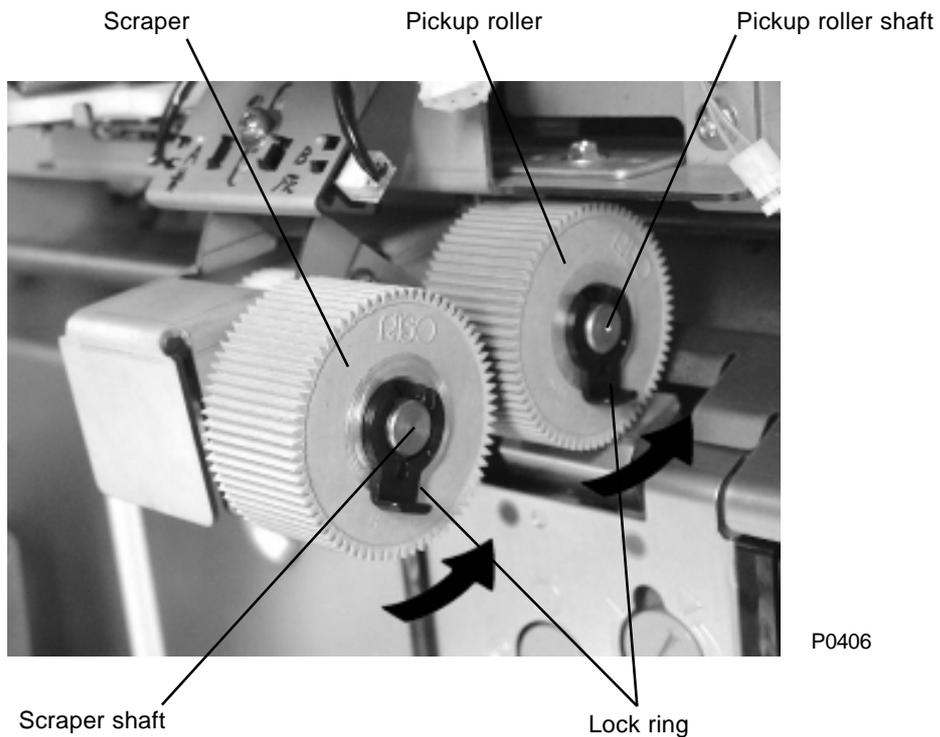
- (1) Completely lower the paper feed tray and switch off power.
- (2) Remove the lock ring on the end of the scraper shaft.
- (3) Remove the scraper from the scraper shaft.

#### Removing the pickup roller

- (1) Completely lower the paper feed tray and switch off power.
- (2) Remove the lock ring on the end of the pickup roller shaft.
- (3) Remove the pickup roller from the pickup roller shaft.

#### [Precautions for Reassembly]

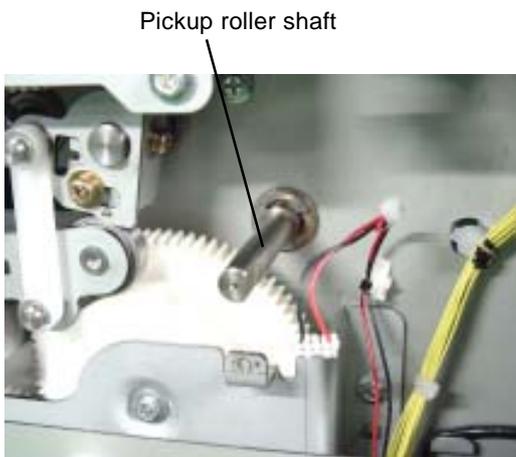
- The scraper and pickup roller contain a one-way core. If mounted incorrectly, the rollers will not rotate, even when the pickup roller shaft rotates. Mount the rollers on the shaft and rotate by hand in the direction indicated by the arrow in the diagram. They are mounted correctly if they rotate freely.



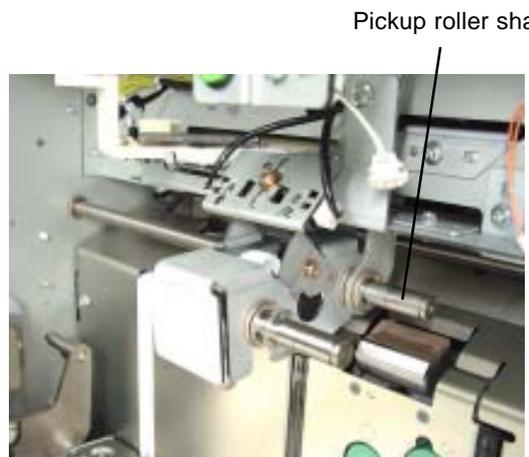
P0406

#### 4. Removing the Pickup Roller Shaft Ass'y and Paper Feed Pressure Adjustment Unit

- (1) Remove the paper feed cover.
- (2) Detach the E-ring, disconnect the connector, then remove the paper feed clutch.
- (3) Remove the E-rings and bearing bushes on both sides of the pickup roller shaft. Remove the pickup roller shaft ass'y.
- (4) Remove the three mounting screws (M4 x 8), then remove the paper feed pressure adjustment unit.



P0407



P0408

Paper feed pressure adjustment unit

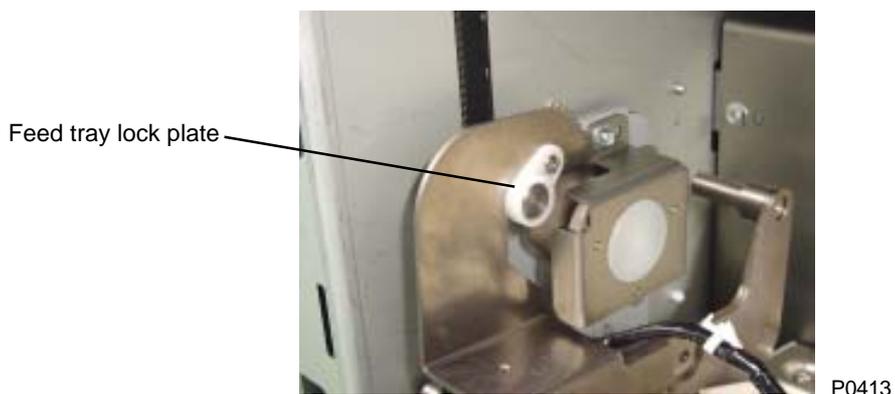
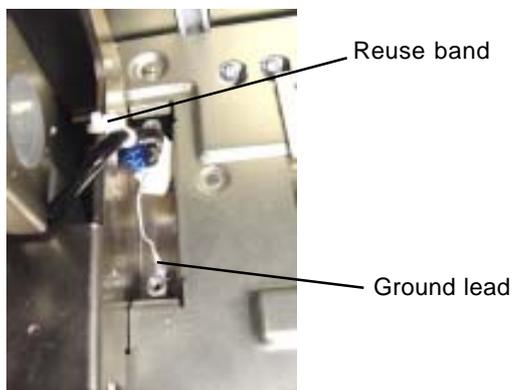
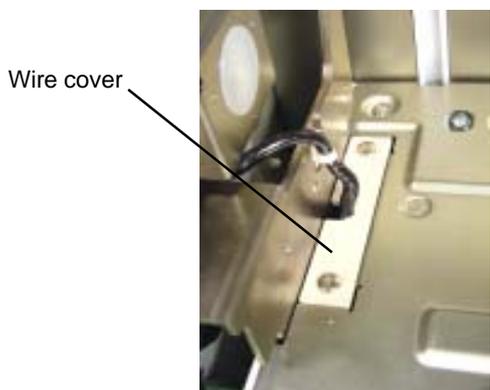
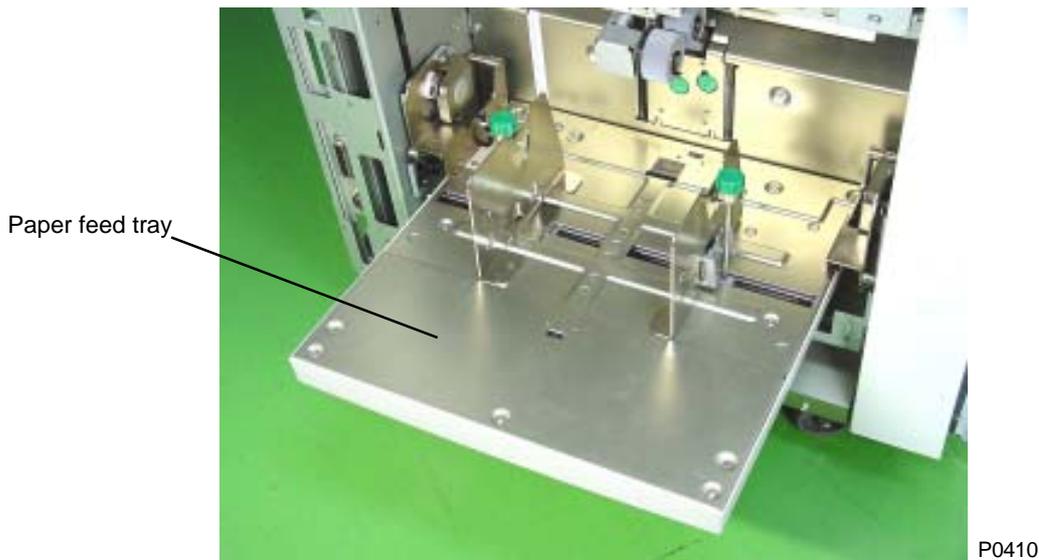


P0409

Pickup roller shaft ass'y

## **5. Removing the Paper Feed Tray Unit**

- (1) Completely lower the paper feed tray.
- (2) Remove the wire harness cover (white plastic plate). (Two M4 x 8 screws)
- (3) Detach the reuse band on the paper feed tray wire harness, disconnect the connector, and remove the ground wire retaining screw (M4 x 8).
- (4) Remove the feed tray lock plate on both sides. (One M3 x 6 screw on each side)
- (5) Remove the paper feed tray unit.



## 6. Removing the Paper Guide Fence

- (1) Loosen the set screw, rotate the fence lock knob, and remove the fence lock shaft.
- (2) Remove the two mounting screws (M3 x 6) on each side and remove the left and right paper guide fences.



P0414

## **7. Removing the Paper Detection Sensor, Paper Size Detection Sensor, and Paper Width Potentiometer**

- (1) Remove the seven mounting screws (M3 x 6) from the paper feed tray unit. Remove the paper feed tray cover.

### **Paper Detection Sensor**

- (2) Disconnect the connector, remove the mounting screw (M3 x 14), and remove the paper detection sensor.

### **Paper Size Detection Sensor**

- (2) Disconnect the connector, remove the mounting screw (M3 x 14), and remove the paper size detection sensor.

### **Paper Width Potentiometer**

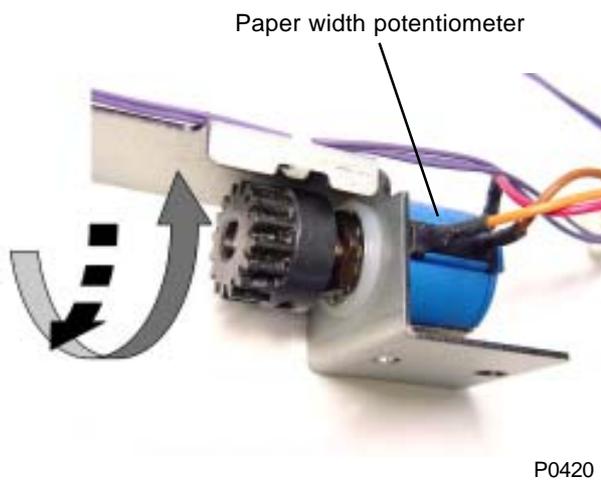
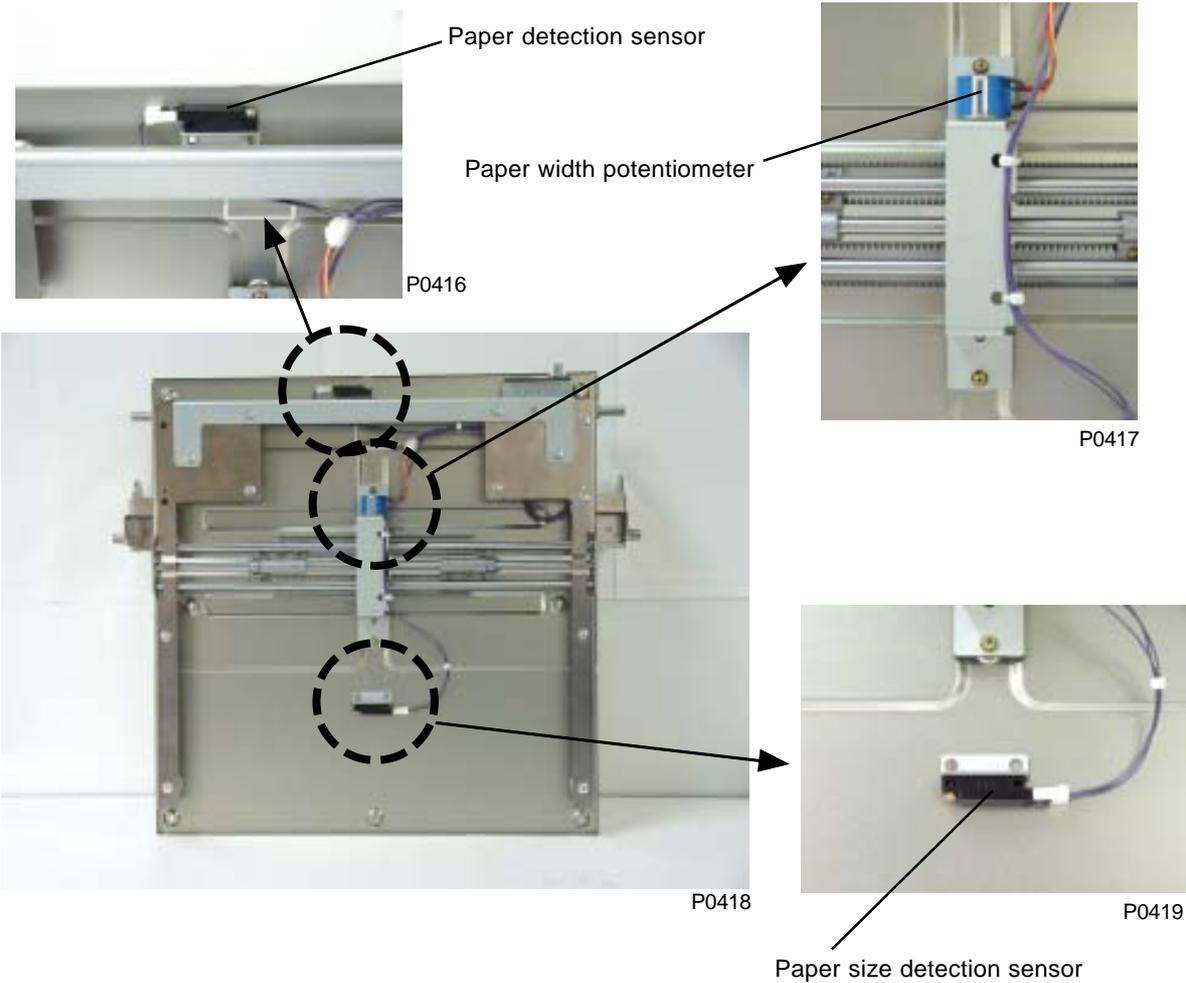
- (2) Disconnect the connector, remove the two mounting screws (M3 x 6), and remove the paper width potentiometer together with the bracket.

### **[Precautions for Reassembly]**

- When reattaching the paper width potentiometer, close the paper guides fully, rotate the potentiometer gear in the direction indicated on the photograph until it locks, and then rotate back by two teeth. The paper width potentiometer must be adjusted afterwards.



P0415

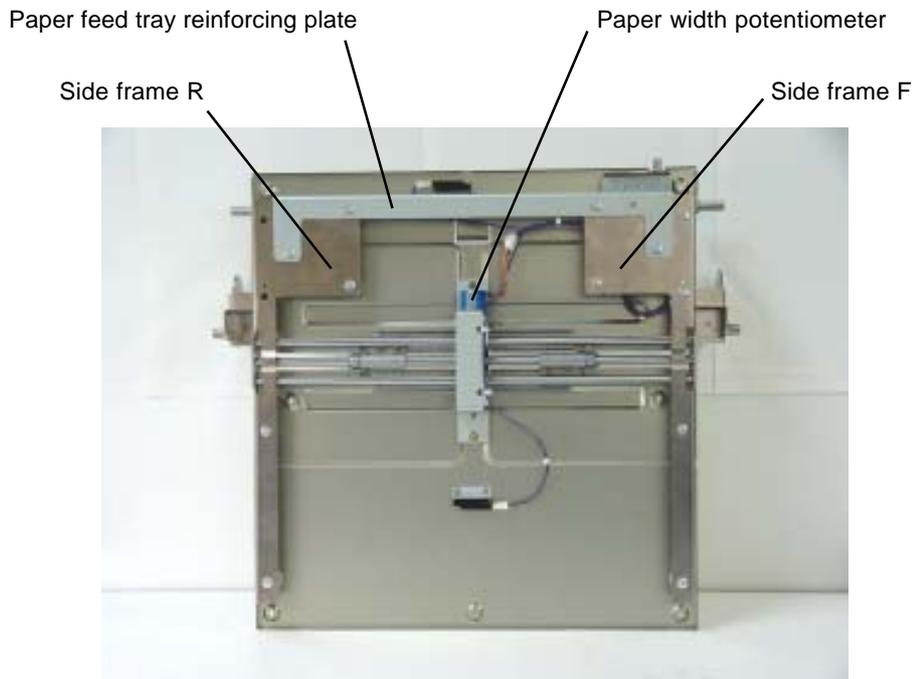


### 8. Removing the Center Gear

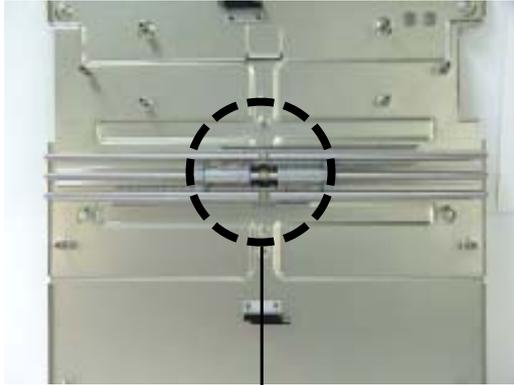
- (1) Remove the paper feed tray.
- (2) Remove the paper guide fences.
- (3) Remove the paper feed tray cover.
- (4) Remove the paper width potentiometer.
- (5) Remove the paper feed tray reinforcing plate. (Four M4 x 8 screws)
- (6) Remove side frames F and R. (Three M4 x 8 screws)
- (7) Remove the mounting screw (M3 x 10), then remove the front and rear shafts.
- (8) Remove the two fixed shaft studs, then remove the mounting screw (M3 x 10) on the center shaft.
- (9) Pull out the center shaft from the two fence blocks and their adjoining components, then remove the shaft.
- (10) Rotate the left and right fence blocks together with the racks to remove.
- (11) Detach the E-ring and remove the center gear.

#### [Precautions for Reassembly]

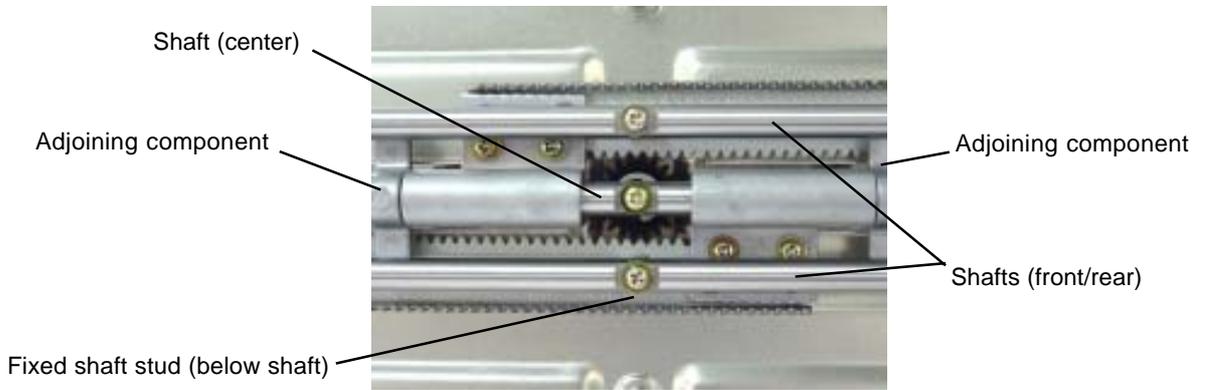
- Move the fence racks toward the center when reassembling.
- Gently turn, but do not secure, the mounting screws on the three shafts until the side frames are attached. Once the side frames are attached, thoroughly tighten the screws and check that the fence racks move smoothly.



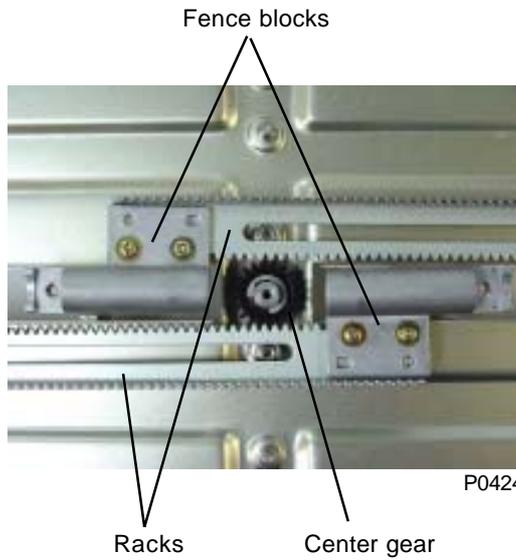
P0421



P0422



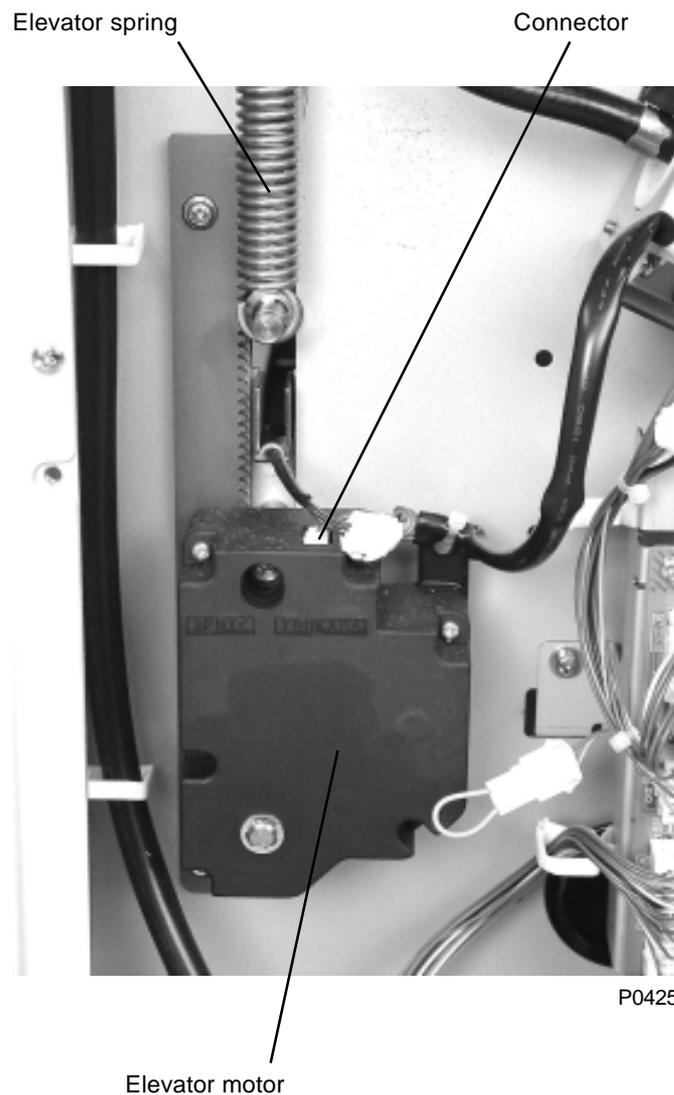
P0423



P0424

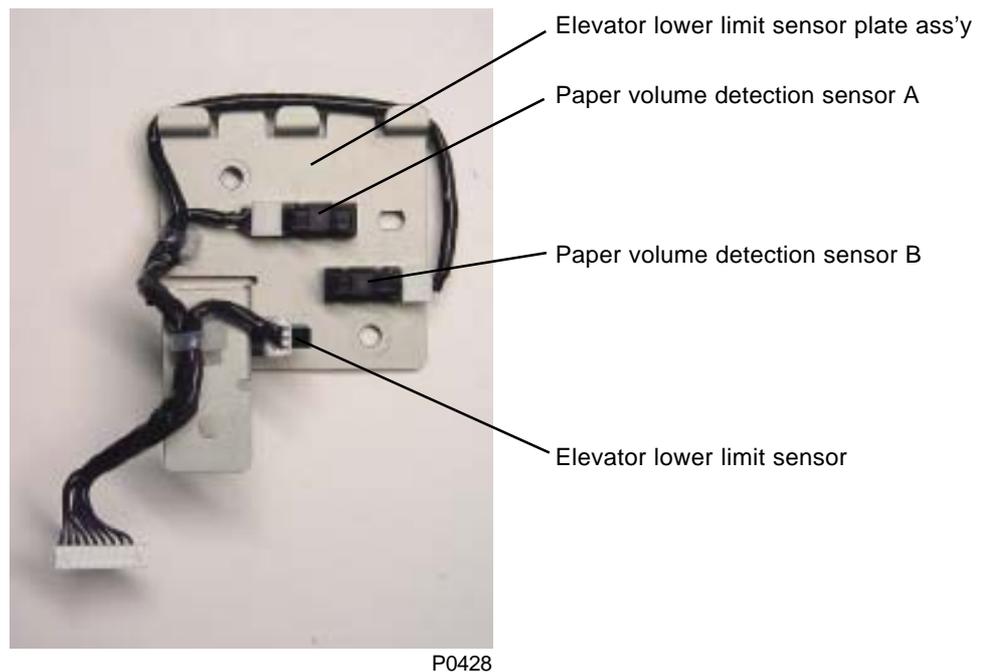
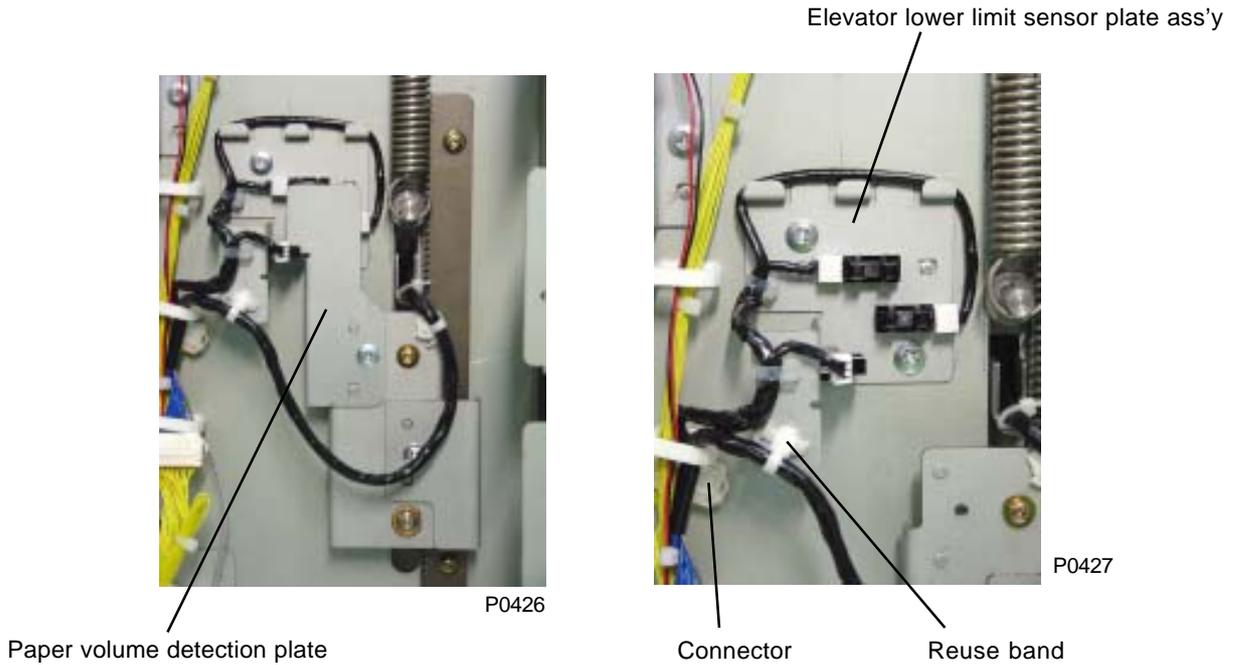
## 9. Removing the Elevator Motor

- (1) Detach the elevator spring from the E support plate F and E support plate R.
- (2) Disconnect the connector, remove the mounting screw (M4 x 8), then remove the elevator motor.



## 10. Removing the Elevator Lower Limit Sensor; Paper Volume Detection Sensors A and B

- (1) Remove the control PCB.
- (2) Remove the paper volume detection plate. (M4 x 8 screw)
- (3) Disconnect the connector, detach the reuse band, and remove the elevator lower limit sensor plate ass'y. (Two M4 x 8 screws)
- (4) Disconnect the connector and remove the sensors.

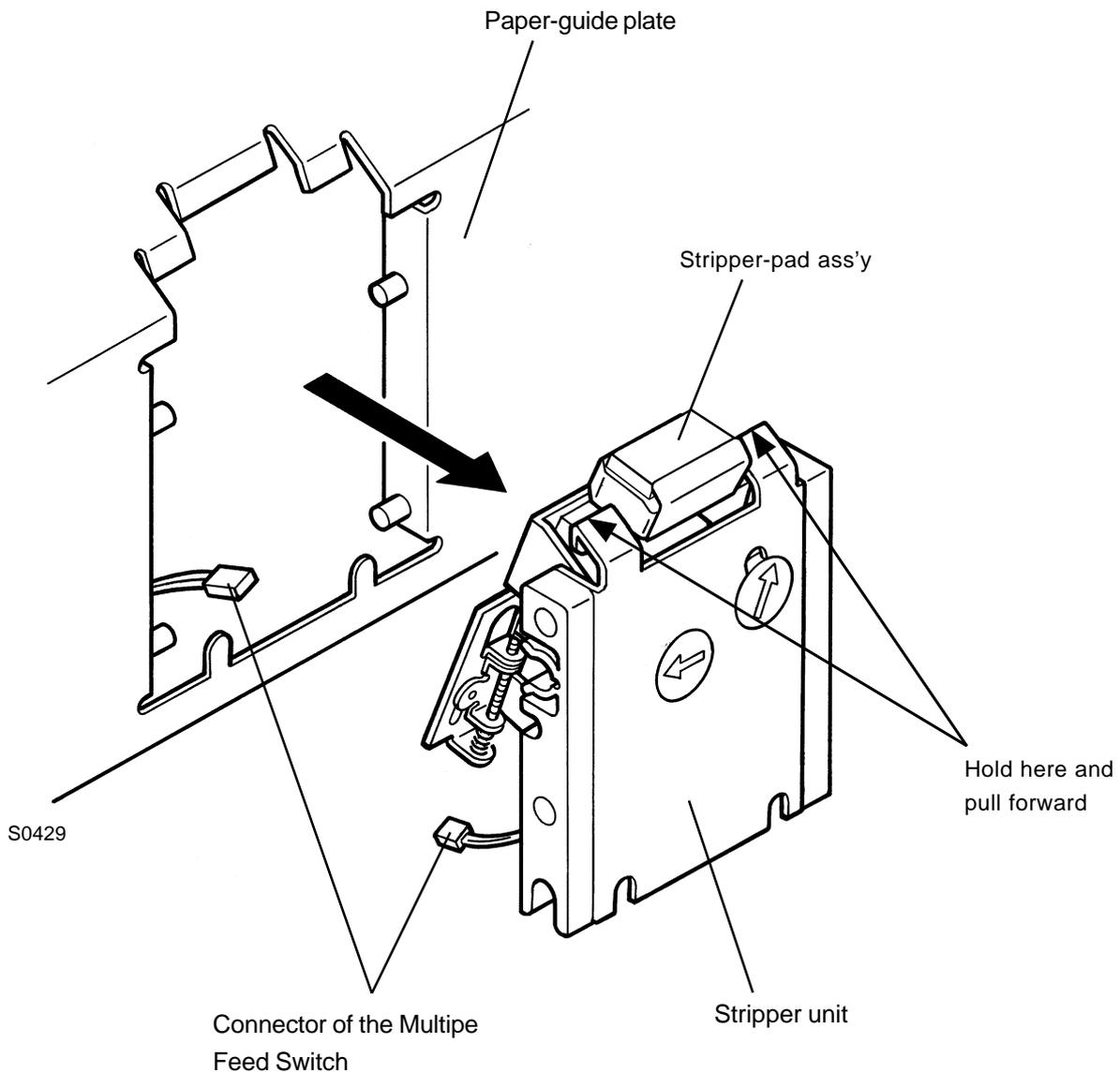


## 11. Removing the Stripper Unit

- (1) Lower the paper-feed tray to the lower-limit position, and turn OFF the machine power.
- (2) Place your finger on the top of the stripper unit and pull forward to unhook the unit.
- (3) Unplug the connector of the multiple feed switch, and remove the stripper unit.

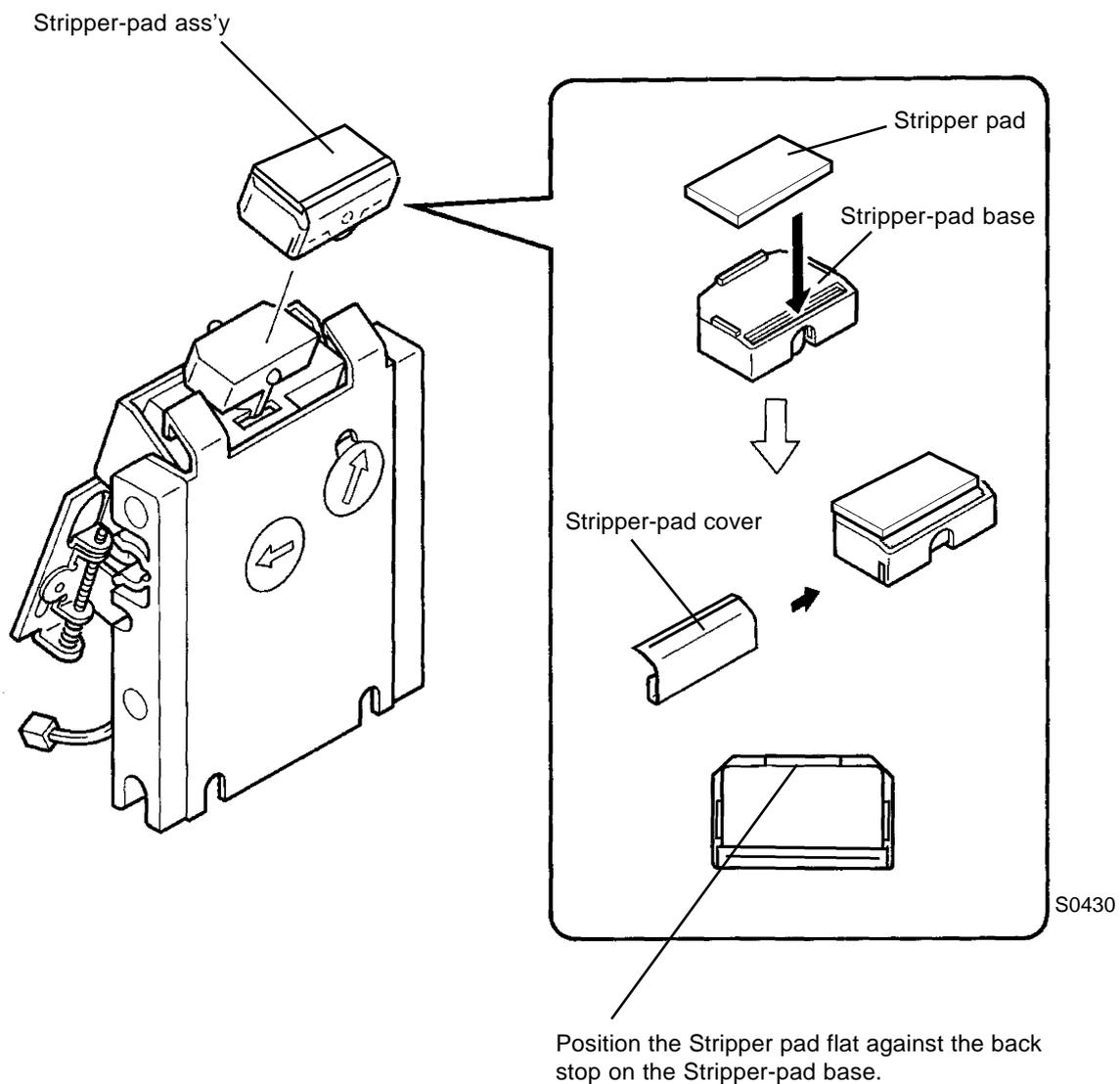
### [Precautions on Reassembly]

- Insert the stripper unit onto the paper-guide plate while pressing the stripper pad ass'y down.
- Adjust the stripper angle and pressure if necessary.
- Adjust the Multiple Feed Switch position if necessary.



## 12. Removing the Stripper-Pad Ass'y

- (1) Lower the paper-feed tray to the lower-limit position, and remove the stripper unit.
- (2) Lift the stripper-pad ass'y by hand and remove it.



# Adjustment

## 1. Paper Width Potentiometer Adjustment

### Check and adjustment procedure

- (1) Position the paper guide fences at 100 mm and run test mode No. 450 (Paper size VR adjust 100 mm).
- (2) Position the paper guide fences at 300 mm and run test mode No. 451 (Paper size VR adjust 300 mm).
- (3) With the paper guide fences still at 300 mm, run test mode No. 471 (Paper width metric data), confirming that the figure displayed is  $3000 \pm 10$ .

### Symptoms

Incorrect adjustment will not allow the size of the paper in the paper feed tray to be correctly identified, causing the machine not to function properly.

## 2. Elevator Upper Limit Sensor A Position Adjustment

### Check and adjustment procedure

- (1) Remove any paper in the paper feed tray, then remove the paper feed tray cover.
- (2) Start test mode No. 453 (Elevator motor servo action), raise the paper feed tray, and bring it to a complete stop.
- (3) Once the paper feed tray is halted, check that the gap between the pickup roller and the paper feed tray is  $2 \text{ mm} \pm 0.25 \text{ mm}$ .
- (4) If the gap is not within these specifications, adjust by loosening the screw on the elevator upper limit sensor bracket and moving the elevator upper limit sensor up or down together with the bracket.

### Symptoms

Positioning the elevator upper limit sensor too high increases paper feed pressure, increasing the potential for multiple paper feeds.

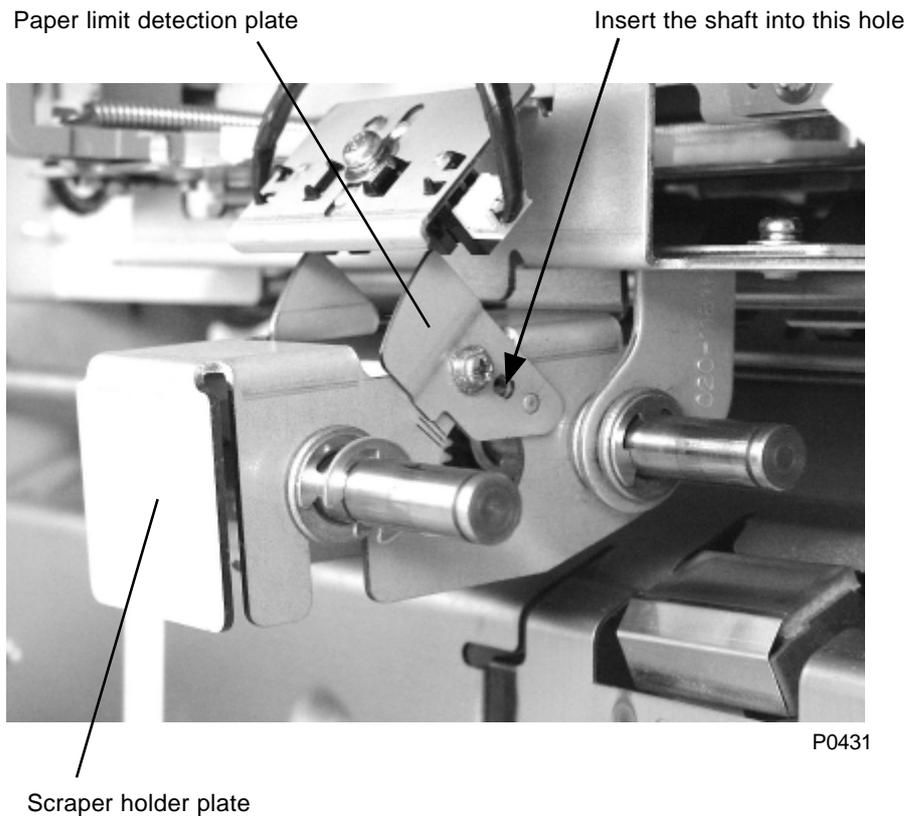
Positioning the upper limit sensor too low will result in reduced paper feed pressure, increasing the potential for paper misfeeds.

### 3. Paper Limit Detection Plate Attachment

- Attach with a diameter 3 mm round shaft (or 2.5 mm Allen wrench) inserted into the paper limit detection plate slot and scraper holder plate hole, as shown in the photograph. This will position the edge of the Paper limit detection plate against the center of the three lines engraved on the Scraper holder plate.

Paper limit detection plate, when attached following the above procedure will bring the Paper feed tray 1 mm higher when the Pressure adjust lever is switched from "Normal" to "Card" position.

For reference, changing the position of the Paper limit detection plate one engraved line will change the position of the Paper feed tray 2 mm from the above default position when the Pressure adjust lever is set to the "Card" position.



## 4. Stripper Adjustment

[Standard machines]

### Procedure

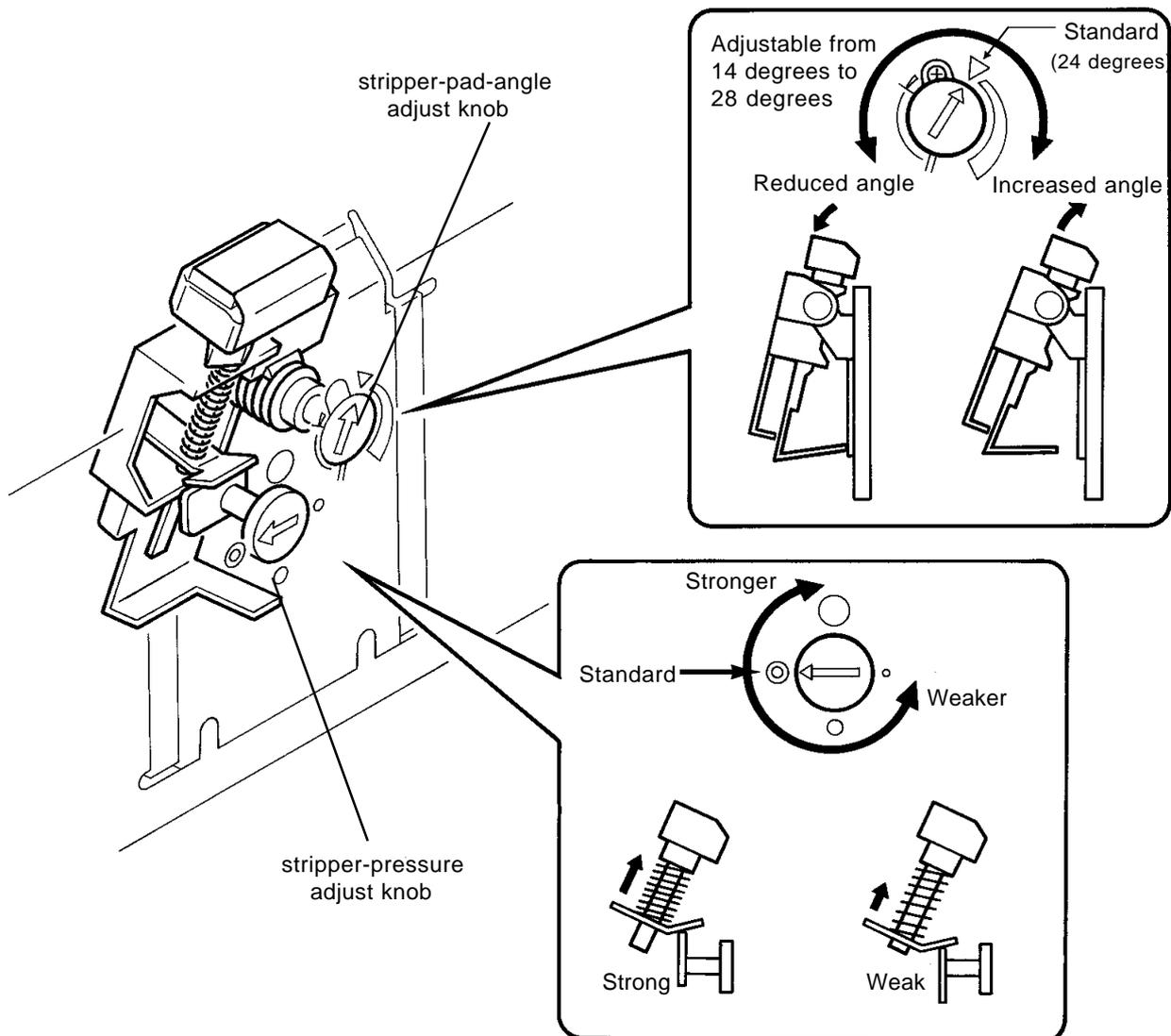
- (1) Use the pressure-adjust lever to set the most suitable paper type prior to printing.
- (2) If multiple feeding or misfeeding occurs, adjust the stripper-pad angle and stripper pressure.

#### 1) Multiple feeding

- Turn the stripper-pad-angle adjust knob clockwise to increase the stripper-pad angle (raise the pad to vertical).
- Turn the stripper-pressure adjust knob clockwise to increase the stripper pressure.

#### 2) Misfeeding

- Turn the stripper-pad-angle adjust knob [A] counterclockwise to reduce the stripper-pad angle (lower the pad to horizontal).
- Turn the stripper-pressure adjust knob [B] counterclockwise to reduce the stripper pressure.



S0432

## 5. Position of Multiple Paper Feed Switch

1. Activate test mode No. 416, with the stripper unit attached to the main body, push down the Stripper pad slowly with a finger. After pushing them down about 0.8mm to 1.2mm, make sure that the Multiple Paper Feed switch is pressed and clicks(Fig. a)
2. If other than the specified value, remove the stripper unit.
3. Turn the adjusting screw to make adjustment.
  - Viewing the adjusting screw from below, turning it counterclockwise causes the Stack Paper Feed switch to approach the actuator plate, and turning it clockwise causes it to go away.
  - One turn of the adjusting screw makes a change of about 0.5 mm.
4. Finally, apply a screw locking agent to the adjusting screw(Fig. c) and attach to the main body.

Fig. a

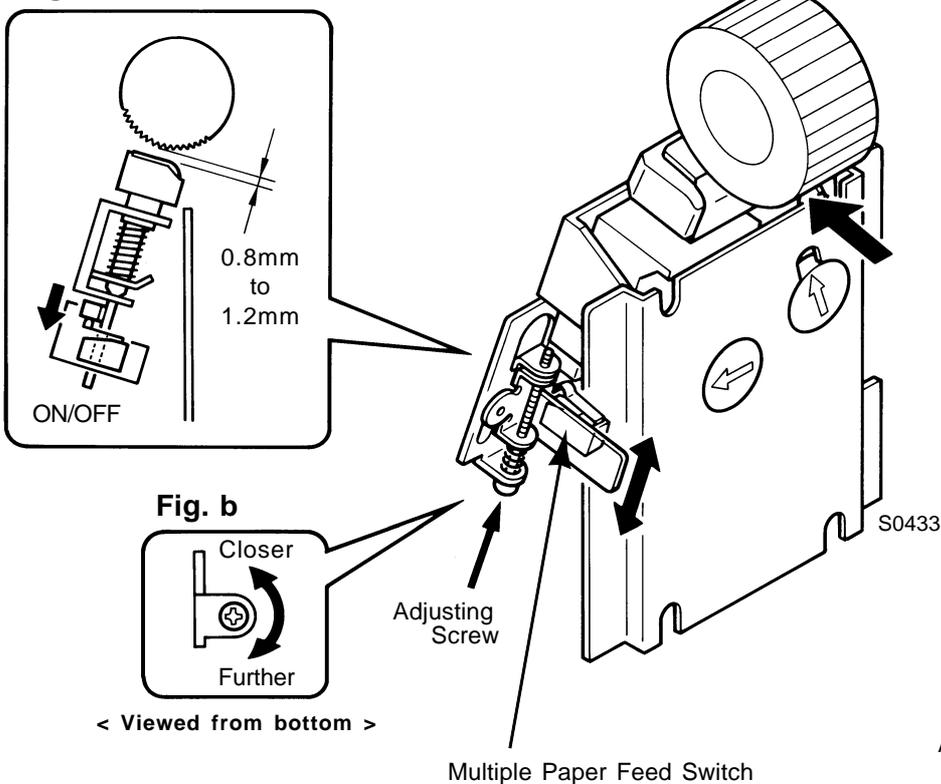
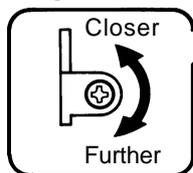
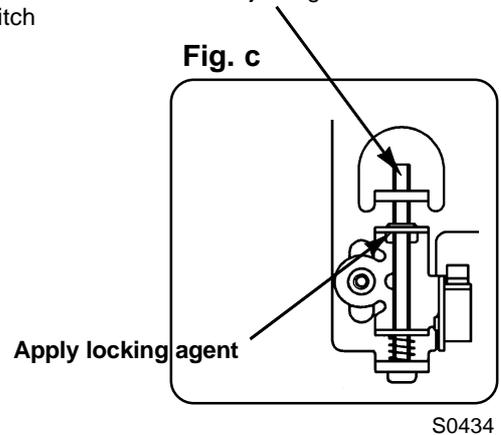


Fig. b



< Viewed from bottom >

Fig. c



# MEMO

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# CHAPTER 5: SECOND PAPER FEED SECTION

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# Mechanism

## 1. Second Paper Feed Mechanism

The second paper feed mechanism is operated by the rotating timing roller (the guide roller rotates due to drag torque). Rotary drive is provided by the sector gear, which in turn is driven by the timing cam.

The timing roller incorporates a one-way core that permits it to rotate when the timing gear rotates clockwise, but not when the timing gear rotates counterclockwise. A load is applied on the timing roller by the timing clutch and timing brake to ensure that it stops immediately when not being driven.

The timing clutch is activated at 195° from position T on the paper drum, and is deactivated at 358°.

The guide roller gear cam brings the guide roller into contact with the timing roller during the first paper feed operation, then moves the guide roller away at the same time that the timing roller stops rotating.

Paper feed status within the second paper feed section is monitored by the 2nd paper sensor and the multiple paper feed detection sensor.

The multiple paper feed detection sensor checks whether multiple paper feeding has occurred by measuring the light transmissivity of the paper. Printing stops if a multiple paper feed occurs.

Light transmissivity is measured 200 times within the 35 mm to 157 mm range at the leading edge of the paper, and a multiple paper feed is determined to have occurred if the measured value falls outside a range equal to 75% to 150% of the mean value set by Test mode No.457.

Multiple paper feed detection is also enabled for printing with the "Test print" key.

## 2. Paper Pass Guide Mechanism

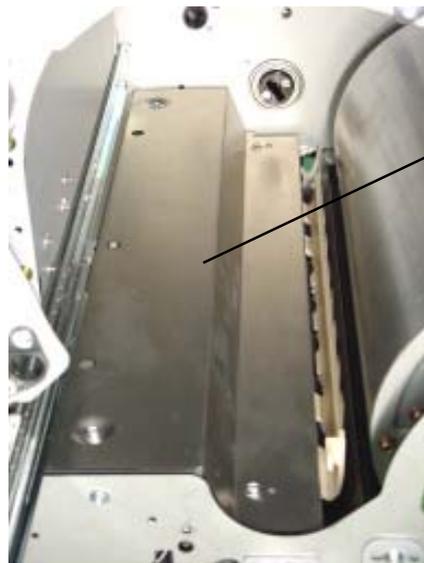
The paper pass guide is used to transfer the paper from the second paper feed section to the paper drum. The paper pass guide is brought toward the paper drum as the leading edge of the paper is gripped by the paper drum.

The paper pass guide is moved up and down by the cam on the guide roller gear.

## Disassembly

### 1. Removing the Paper Pass Guide

- (1) Open the front door and pull out the 1st print drum.
- (2) Remove the second paper feed upper cover. (Four M4 x 8 screws)
- (3) Remove the 2nd paper feed sensor bracket. (M4 x 8 screw)
- (4) Remove the two mounting screws (M4 x 6) and remove the paper pass guide.



Second paper feed upper cover

P0501

2nd paper feed sensor bracket



Paper pass guide

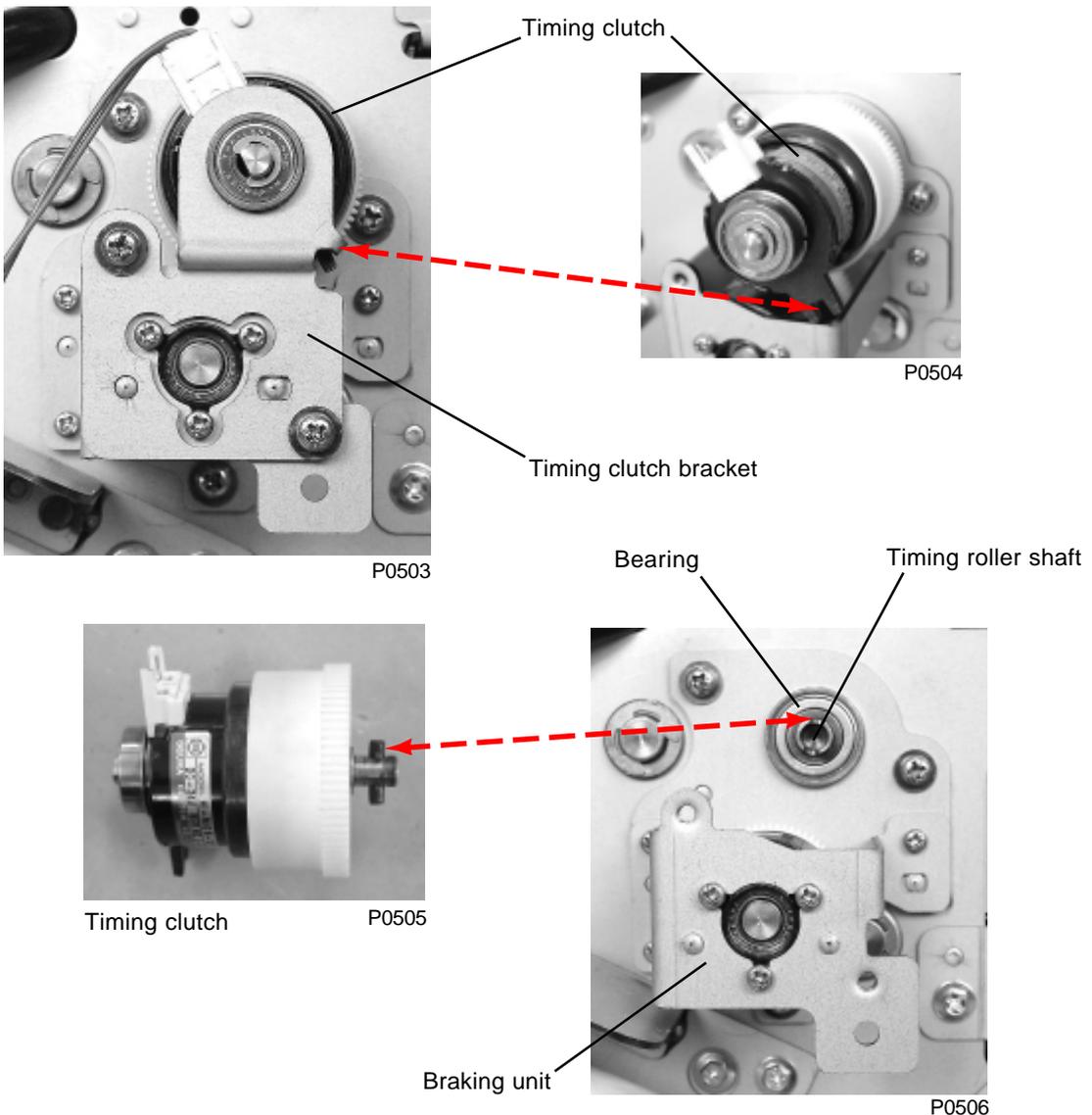
P0502

## 2. Removing the Timing Roller Ass'y

- (1) Open the front door and pull out the 1st print drum.
  - (2) Remove the covers.
  - (3) Remove the second paper feed upper cover.
  - (4) Remove the 2nd paper feed sensor bracket.
  - (5) Remove the two mounting screws (M4 x 8), then remove the timing clutch bracket.
  - (6) Disconnect the connector and remove the timing clutch.
  - (7) Detach the bearing, remove the three mounting screws (M4 x 8) on the braking unit, and remove the braking unit.
  - (8) Lift up the paper pass guide and pull out the timing roller through the opening in the front frame plate.
- \* Make sure that the guide roller is not in contact with the timing roller.
- \* Work carefully to avoid damaging the sensors.

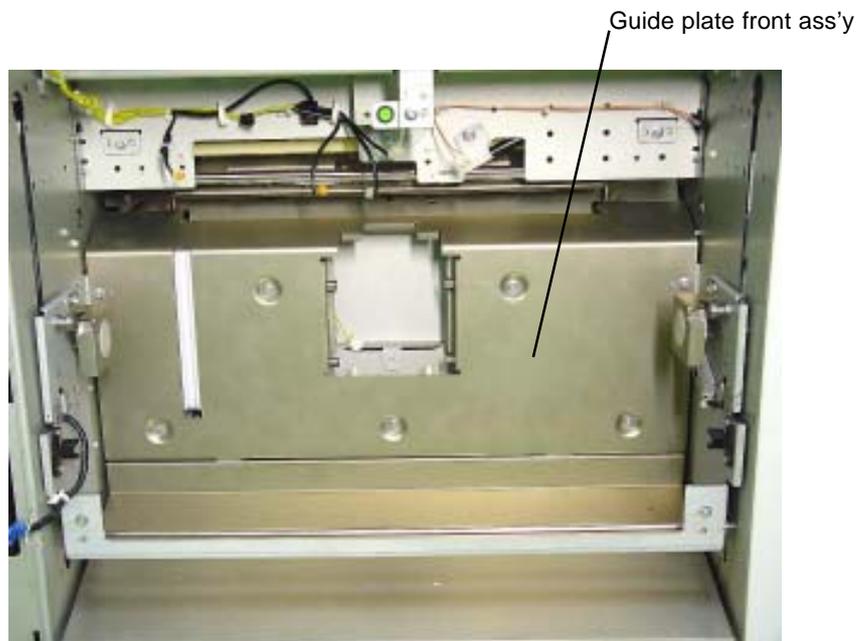
### [Precautions for Reassembly]

- Engage the pin on the timing clutch shaft with the slot in the timing roller shaft.
- Engage the slot in the timing clutch rotation lock with the lug on the timing clutch lock plate.

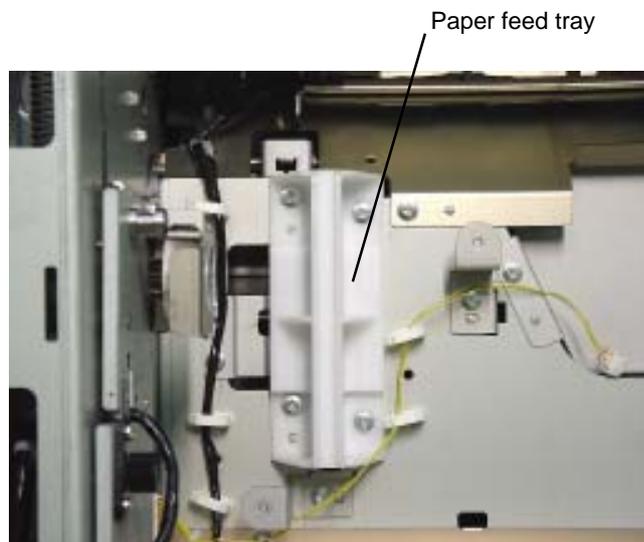


### 3. Removing the Guide Roller Ass'y

- (1) Lower the paper feed tray fully and remove the covers.
- (2) Remove the following components.
  - Pickup roller and scraper
  - Stripper unit
  - Paper feed tray unit
  - Paper feed clutch
  - Pickup roller shaft ass'y and paper feed pressure adjustment unit
- (3) Remove the timing roller ass'y.
- (4) Remove the guide plate front ass'y. (Seven M4 x 8 screws)
- (5) Remove the paper feed guide. (Four M4 x 8 screws)



P0507

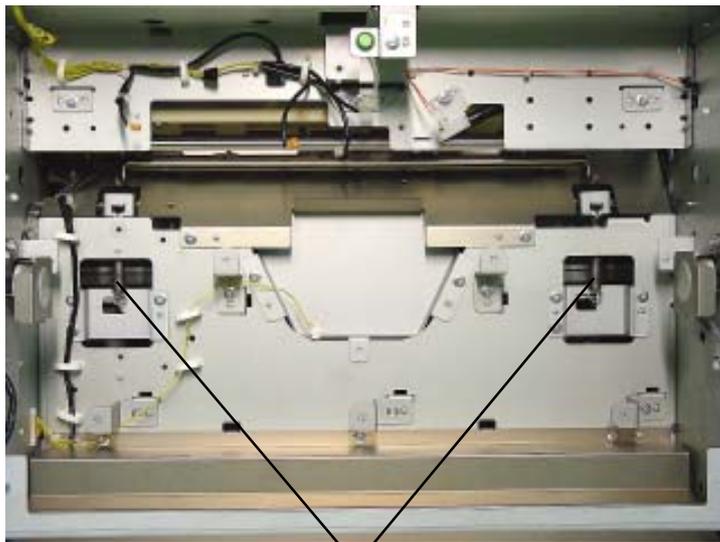


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## CHAPTER 5. SECOND PAPER FEED SECTION

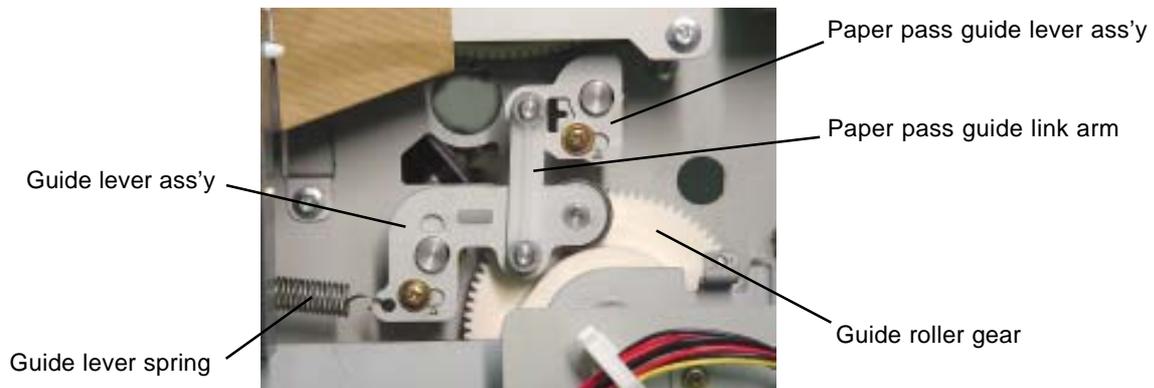
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- (6) Detach the two springs on the guide roller ass'y.
- (7) Remove the guide lever spring.
- (8) Detach the E-ring and remove the paper pass guide link arm.
- (9) Remove the paper pass guide lever ass'y. (M4 x 8 screw)
- (10) Rotate the paper drum by hand to position the guide lever ass'y at the bottom of the cam on the guide roller gear. Remove the mounting screw (M4 x 6) and the guide lever ass'y.
- (11) Detach the E-ring and metal and remove the paper pass guide ass'y.
- (12) Remove the two guide plate front brackets. (One M4 x 8 screw each)

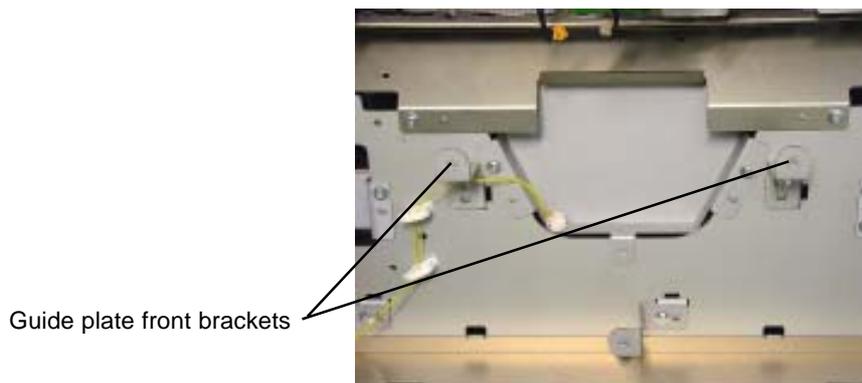


Guide roller ass'y springs

P0509

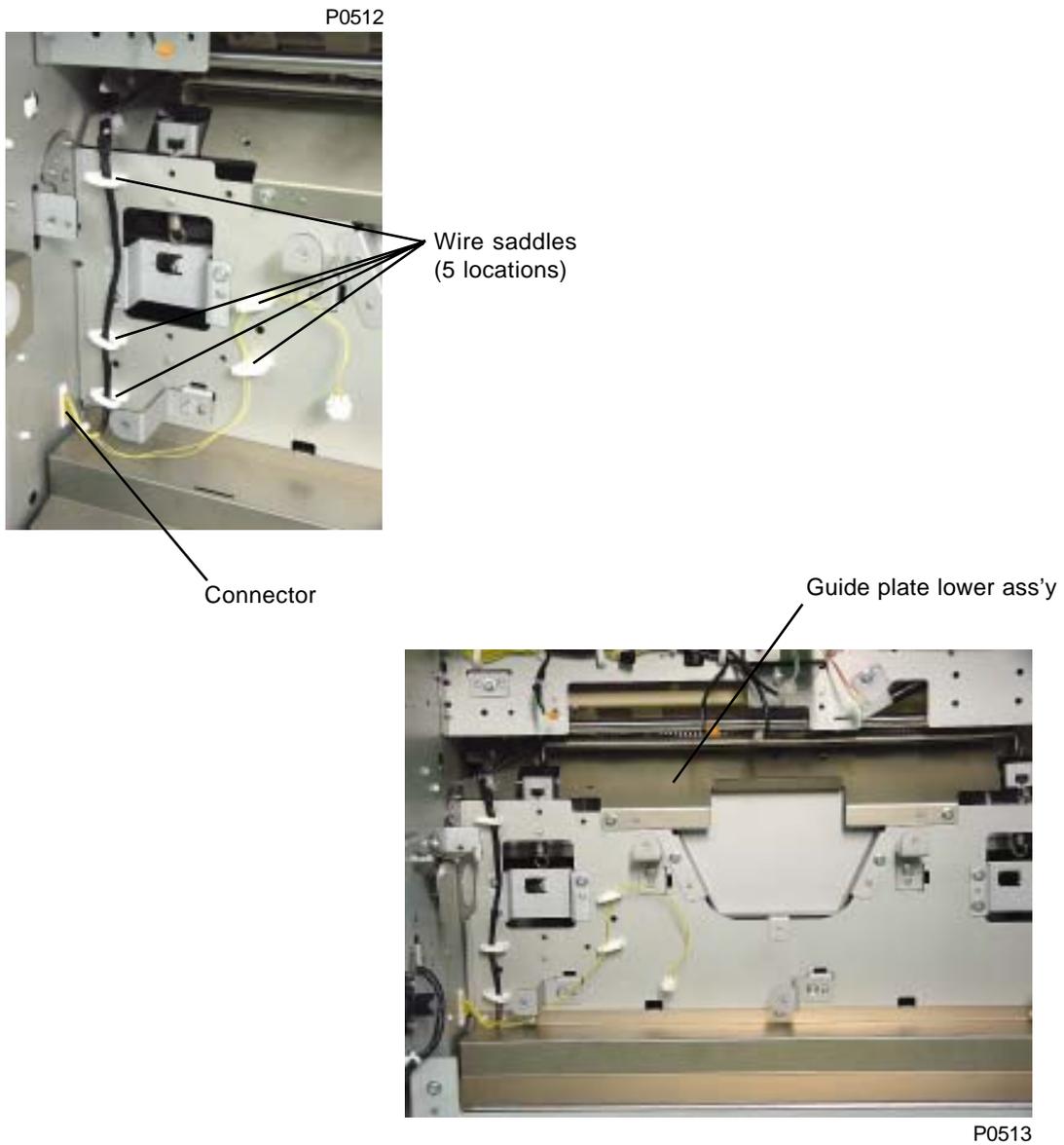


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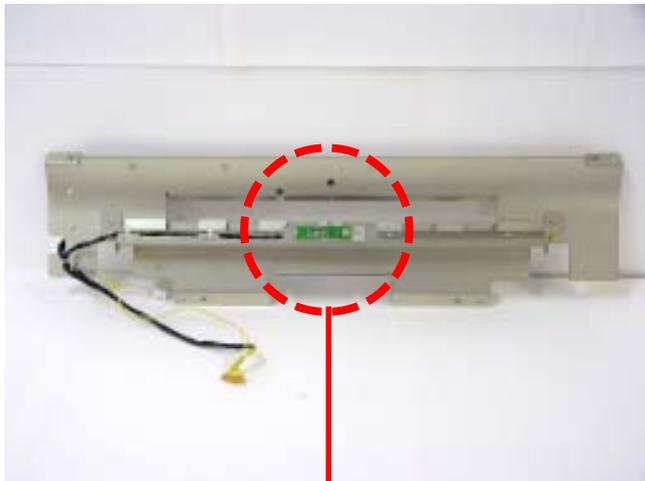
P0511

- (13) Disconnect the wire harness connector, detach from the wire saddles, and remove the guide plate lower ass'y. (Four M4 x 8 screws)
- (14) Detach the E-rings and metals on both sides and remove the guide roller ass'y with the two springs still attached.

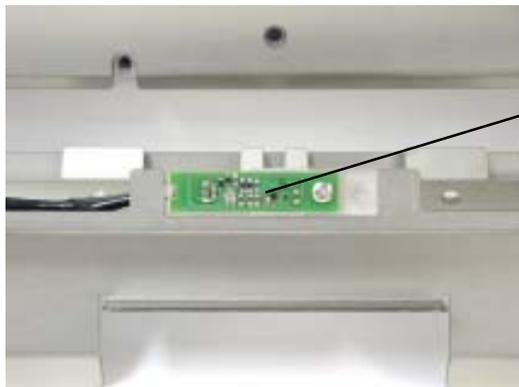


4. Removing the 1st Paper Feed Sensor, 2nd Paper Feed Sensor, and Multiple Paper Feed Detection Sensor

P0515



Guide plate lower ass'y (upper surface)



1st paper feed sensor (receive)

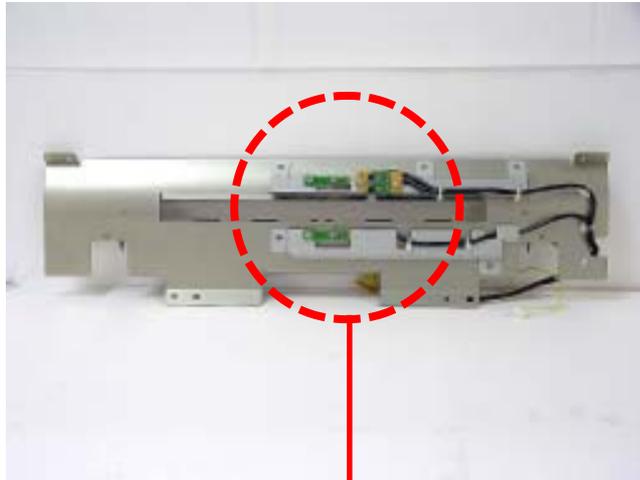
P0516

P0517



2nd paper feed sensor bracket

P0518



Guide plate lower ass'y (bottom view)

2nd paper feed sensor (send)



Multiple paper feed detection sensor (receive)

P0519

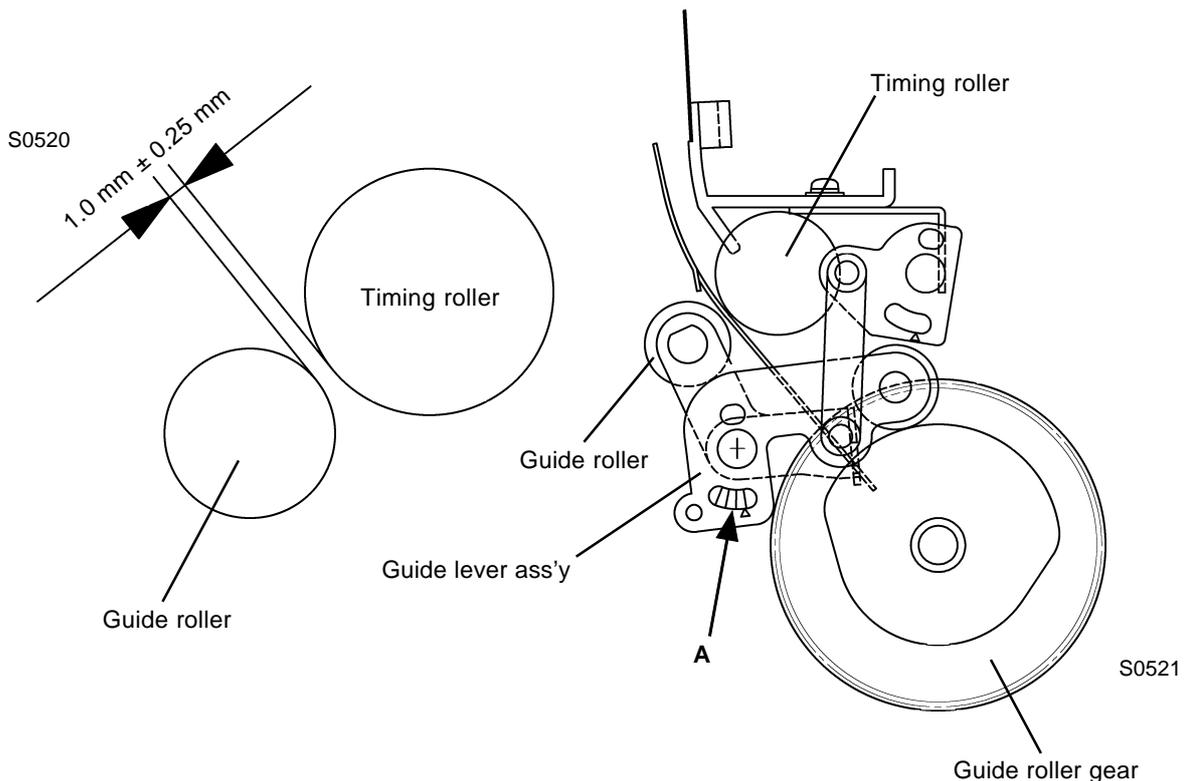
1st paper feed sensor (send)

## Adjustment

### 1. Gap Between Timing Roller and Guide Roller

#### Check and adjustment procedure

- (1) Rotate the paper drum until the cam on the guide roller gear is positioned as shown in the diagram.
  - (2) Check that the gap between the guide roller and the timing roller is  $1.0 \text{ mm} \pm 0.25 \text{ mm}$ .
  - (3) If the gap size falls outside these specified values, loosen the guide lever ass'y lock screw and adjust.  
(One graduation on the section marked "A" on the sketch below corresponds to a gap variation of 1 mm.)
- \* If the gap is too largely off from above value, it is recommended that the graduation scale, pointed out as "A" on sketch below, is adjusted to the center line. This will bring the gap close to 1 mm.
- \* Make sure to readjust the "Gap between paper pass guide and lower paper guide" (given on next page) after adjusting the gap between the timing roller and guide roller.

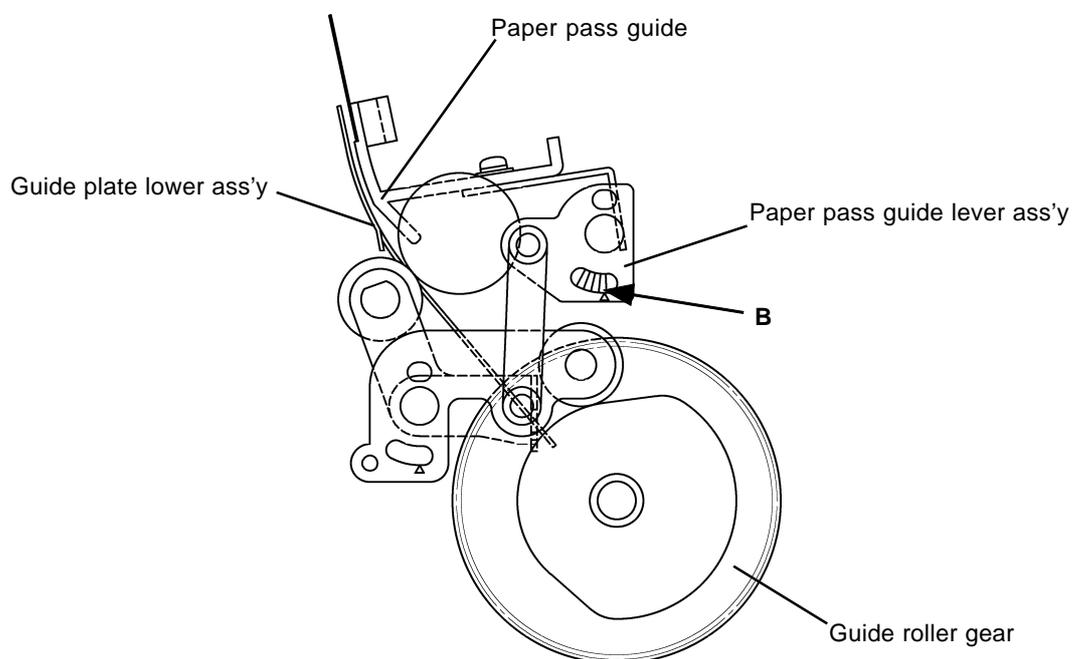


## 2. Gap Between Paper Pass Guide and Lower Paper Guide

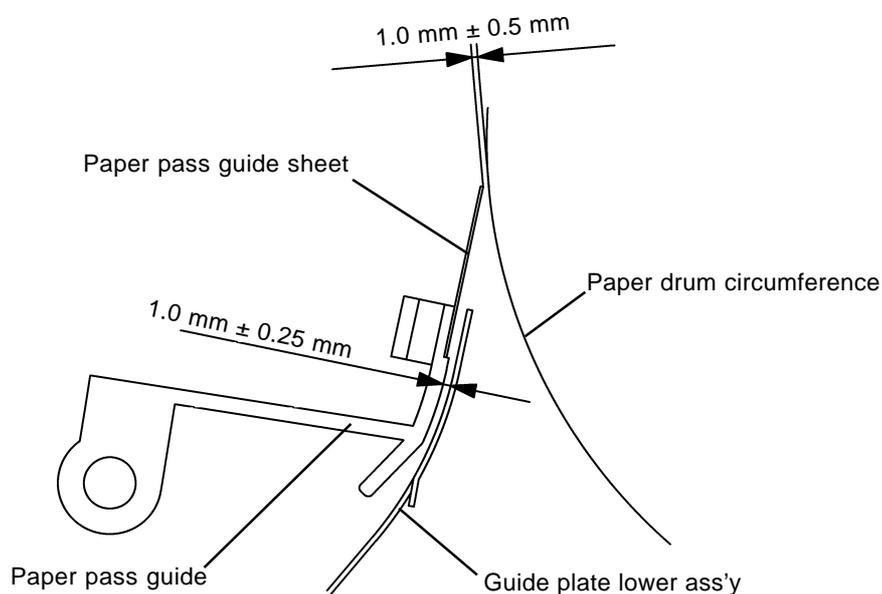
### Check and adjustment procedure

- (1) Rotate the paper drum until the cam on the guide roller gear is positioned as shown in the diagram.
- (2) Check that the gap between the paper pass guide ass'y and the lower guide plate is  $1.0\text{ mm} \pm 0.25\text{ mm}$ , and that the gap between the leading edge of the paper pass guide sheet and the circumference of the paper drum is  $1.0\text{ mm} \pm 0.5\text{ mm}$ .
- (3) If the gap sizes fall outside these specified values, loosen the paper pass guide lever ass'y lock screw and adjust.  
(One graduation on the section marked "B" varies the gap between the paper pass guide ass'y and lower guide plate by approximately 1.5 mm.)

\* The paper pass guide sheet may flex, so make adjustments until the gap between the leading edge of the paper pass guide sheet and the circumference of the paper drum is  $1.0\text{ mm} \pm 0.5\text{ mm}$ .



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S0523

### 3. 2nd Paper Feeding Adjustment

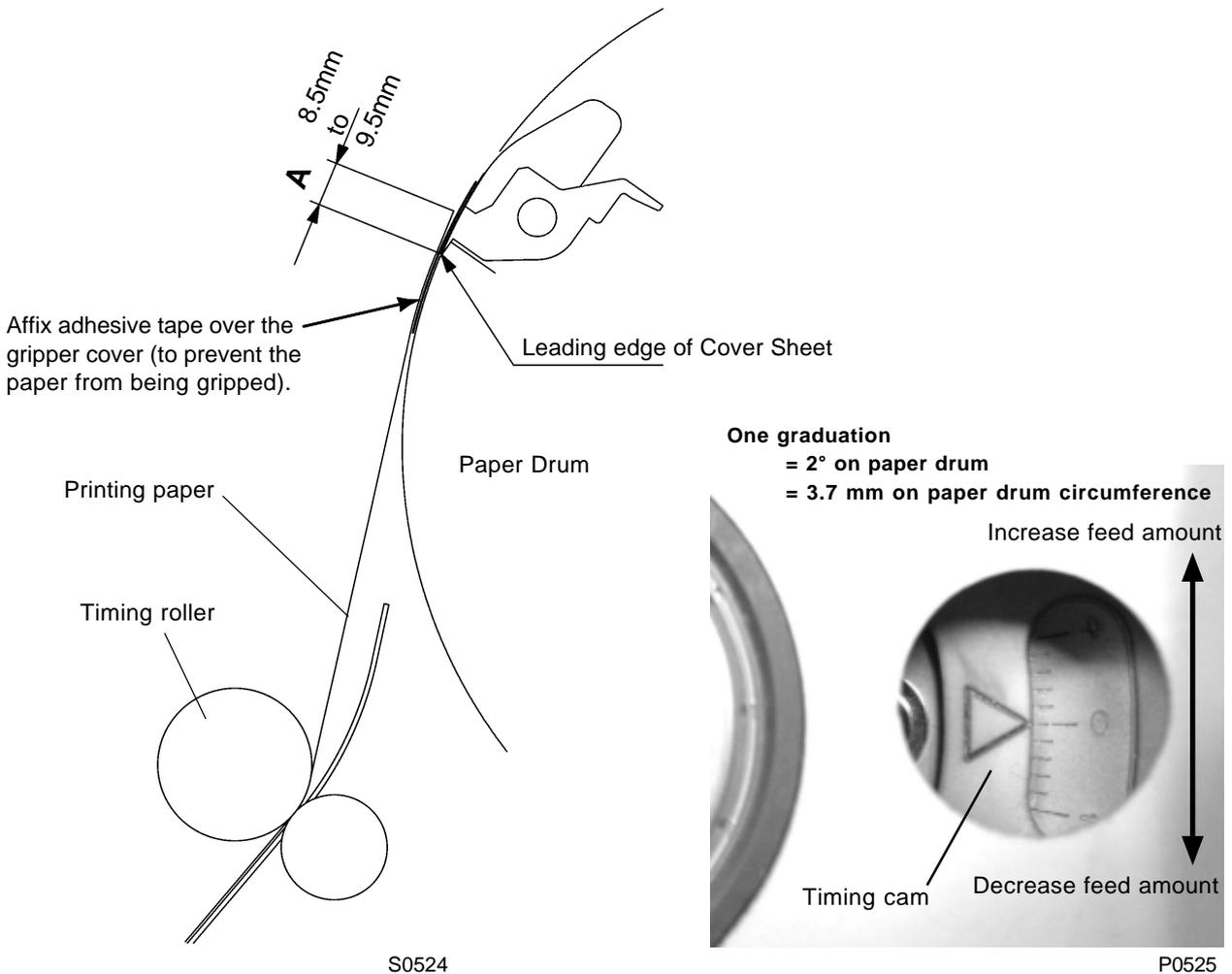
**Check and adjustment procedure**

- (1) Affix adhesive tape over the gripper cover (to prevent the paper from being gripped).
- (2) Load standard paper (A3) in the paper feed tray.
- (3) Feed paper using Test mode No. 464 (2nd paper feeding adjustment).
- (4) Measure the distance between the leading edge of the paper and the leading edge of the Cover Sheet on the paper drum (Dimension **A**) at the paper position by above step (3), confirming that it is between 9 mm ± 0.5 mm. Measure this distance with the paper tensioned towards the ejection side.
- (5) If the measured value falls outside these specified values, rotate the Paper Drum 180 degrees from Position-T (30 degrees turn from the waiting position), and then loosen the three timing cam lock screws and adjust by moving the timing cam.
  - \* One graduation on the timing cam corresponds to a 2° angle on the paper drum and a variation of 3.7 mm on the circumference of the paper drum.
- (6) Feed a sheet of paper through the machine and check feeding and variations in vertical print registration.
 

Make fine adjustments to the timing cam if any of the following symptoms are observed:

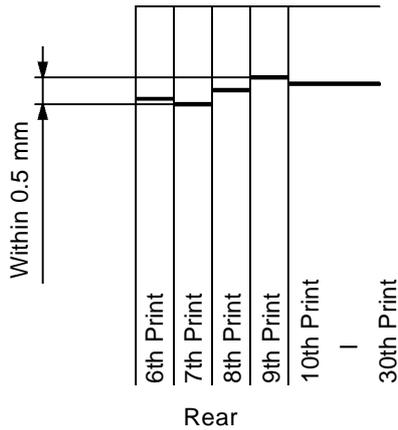
**Symptoms**

Vertical print registration problem (increase the feed amount for correction), paper escapes from the grip section (increase the feed amount for correction), and folding of paper leading edge (increase or decrease the feed amount depending on state of folding).

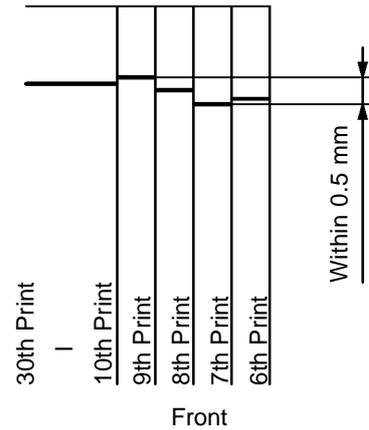


#### 4. Vertical Print Position Variation Check (Print Registration)

- (1) Run Test mode No. 051 (TPH test print with thin cross lines) for 1st and 2nd print drums.
- (2) Shift the horizontal printing position maximum to the machine drive side (left) on the 1st print drum.
- (3) Shift the horizontal printing position maximum to the machine operation side (right) on the 2nd print drum.
- (4) Print 30 copies at the maximum printing speed (120 rpm).
- (5) Remove first 5 prints and sample the 6th to 30th prints and measure the variation in vertical printing position as shown in the diagram. Check that these are within 0.5 mm.



S0526



S0527

#### 5. Automatic Multiple Paper Feed Adjustment

- (1) Load 50 gram A3 white paper on the paper feed tray.  
(Or white blank paper which is used the most on the machine.)
- (2) Run Test mode No. 457 (Auto Multi-Paper Feed Det. Adj.).
- (3) Paper feed starts automatically, halting when the paper has been fed through 20° paper drum turn (counted by the main motor limit sensor) from the activation of the 2nd paper feed sensor. The multi-feed det. sensor sensitivity is automatically adjusted. Once the multi-feed det. sensor sensitivity is adjusted, paper feed resumes, and the paper is ejected out.

# MEMO

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# CHAPTER 6: PAPER DRUM SECTION

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## Mechanism

### 1. Paper Drum Mechanism

For normal rotation, the paper drum is driven by the main motor; for master loading and super low speed rotation, it is driven by the main pulse motor.

The position of the paper drum is determined by the position T sensor. The precise position of the paper drum is confirmed by the main motor limit sensor using the position from position T sensor as a datum position.

In standby mode after printing is complete, the stop position for the paper drum is 150° from position T.

### 2. Gripper Open/Close Mechanism

The gripper is normally open, closing only when paper is fed from the second paper feed section. It opens when transferring paper to the ejection section.

The gripper open/close mechanism consists of the following three actions:

- (1) The leading edge of the paper is gripped by the opening and closing action of the grippers.
- (2) The gripper cover opens and closes to prevent the grippers from protruding and damaging the master on the print drum.
- (3) The paper lifter moves up and down when transferring the paper to the paper ejection section to ensure positive separation of the paper from the paper drum and to prevent paper jams.

All of these actions are performed by cam followers.

The grippers are opened and closed by gripper cam (paper drum side) at the rear of the machine.

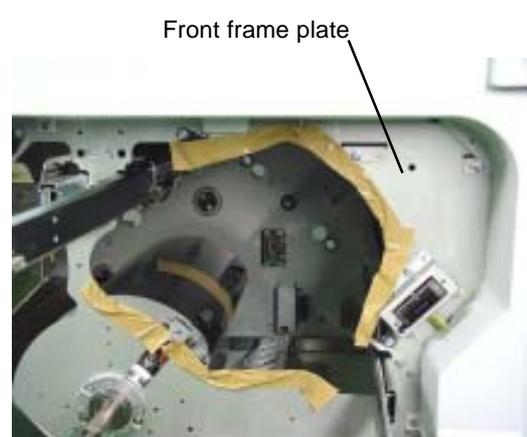
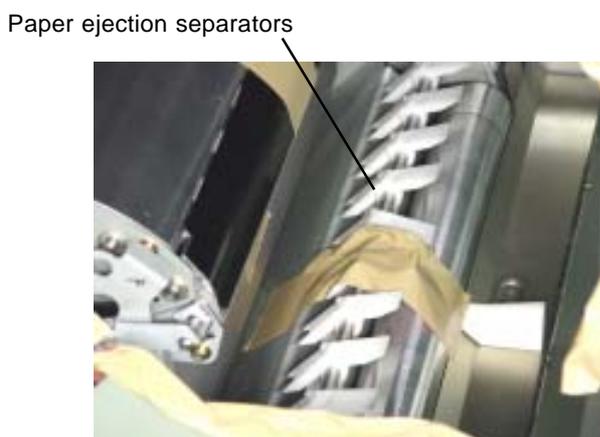
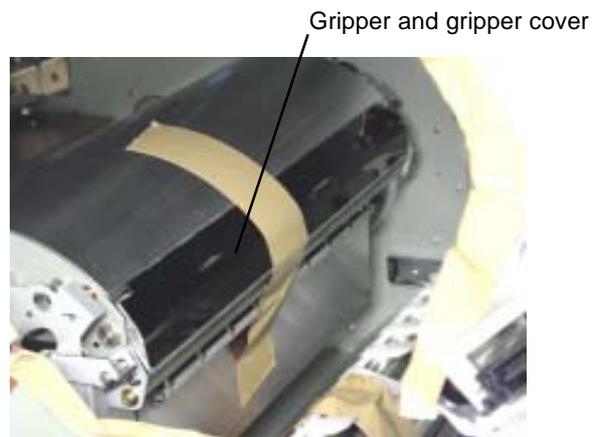
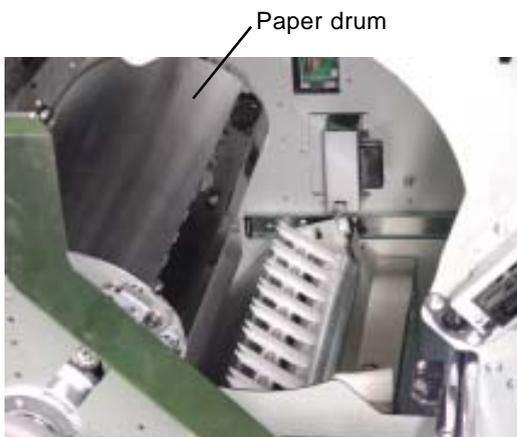
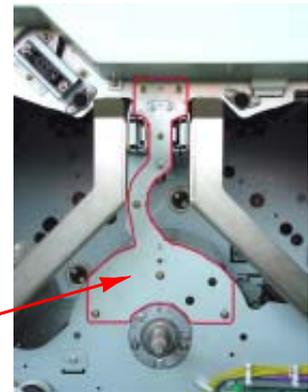
The gripper cover is opened and closed by the gripper cover cam at the front of the machine.

The paper lifter is moved up and down by the rear gripper cam at the rear of the machine.

## Disassembly

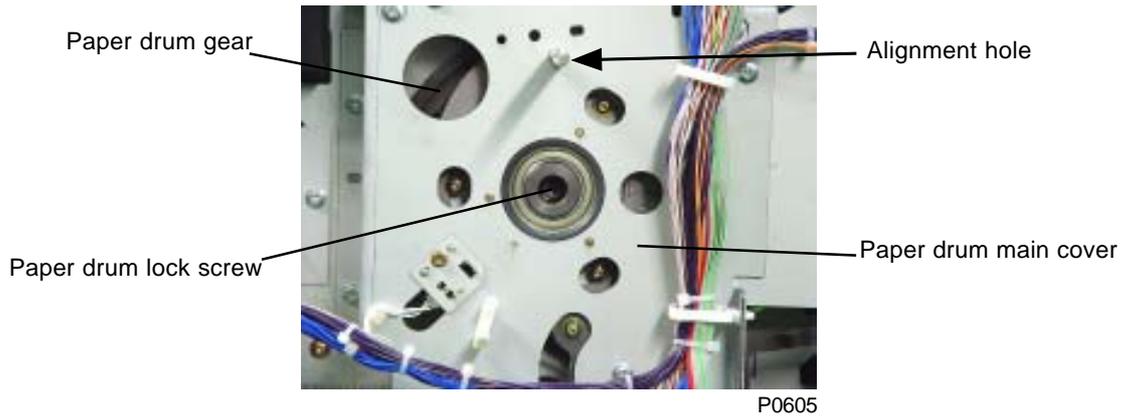
### 1. Removing the Paper Drum

- (1) Pull out 1st and 2nd print drums.
- (2) Detach the lock ring and remove the handle.
- (3) Remove the following covers.
  - Front doors (left/right)
  - Front cover (lower)
  - Rear cover
  - Reinforcing plate (seven M4 x 8 screws)
- (4) Remove the paper pass guide (see Chapter 5: Second Paper Feed Section).
- (5) Pull out the paper ejection unit.
- (6) Take the following steps to ensure safety and to prevent damage to components.
  - Rotate the paper drum by hand to the position shown in the photograph. (Photograph 1)
  - Secure the grippers and gripper cover with adhesive tape to keep them from opening. (Photograph 2)
  - Secure the paper ejection separators with adhesive tape in the lowered position. (Photograph 3)
  - Affix adhesive tape around the edges of the opening in the front frame plate (2nd print drum side). (Photograph 4)

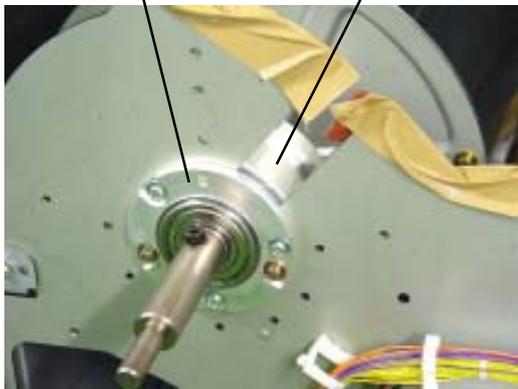


## CHAPTER 6. PAPER DRUM SECTION

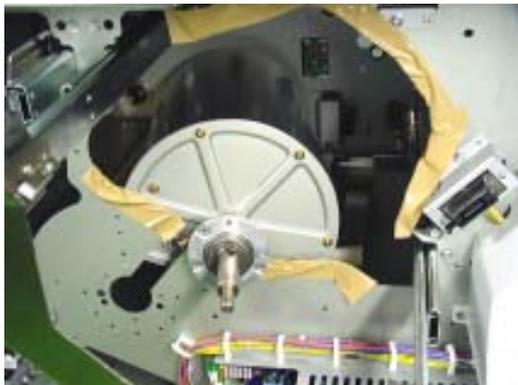
- (7) Rotate the paper drum to insert 8 mm diameter shaft (JIG) into the main cover alignment hole and rear paper drum gear, and lock the paper drum gear in position.
- (8) Remove the paper drum lock screw (M6 x 20) in the center of the paper drum gear.
- (9) Remove the gripper cover cam. (Two M4 x 14 screws)
- (10) Remove the three mounting screws (M4 x 8) on shaft bearing ass'y F.
- (11) Pull the paper drum forward, then disengage the paper drum shaft from the paper drum gear. Tilt the paper drum while providing support from below, and remove by pulling through the opening in the frame plate.



Shaft bearing ass'y F      Gripper cover cam



Insert a hand through this opening to support the paper drum.



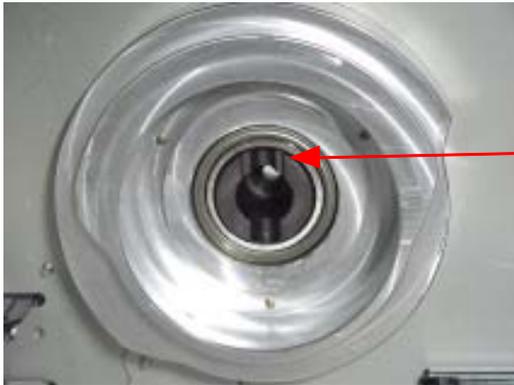
P0608



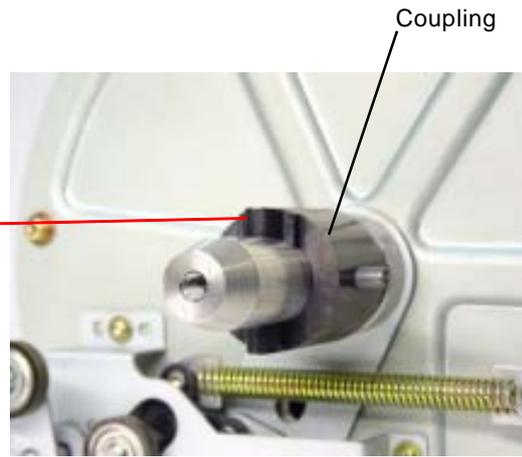
P0609

**[Precautions for Reassembly]**

- Align the paper drum coupling protrusions with the slots in the paper drum gear.
- When installing the paper drum, close the grippers and gripper cover and secure with adhesive tape in the same way as when removing.
- After reinstalling the paper drum, adjust the position T sensor position. (Refer to the "Position T Sensor Position Adjustment" within this chapter.)



P0610

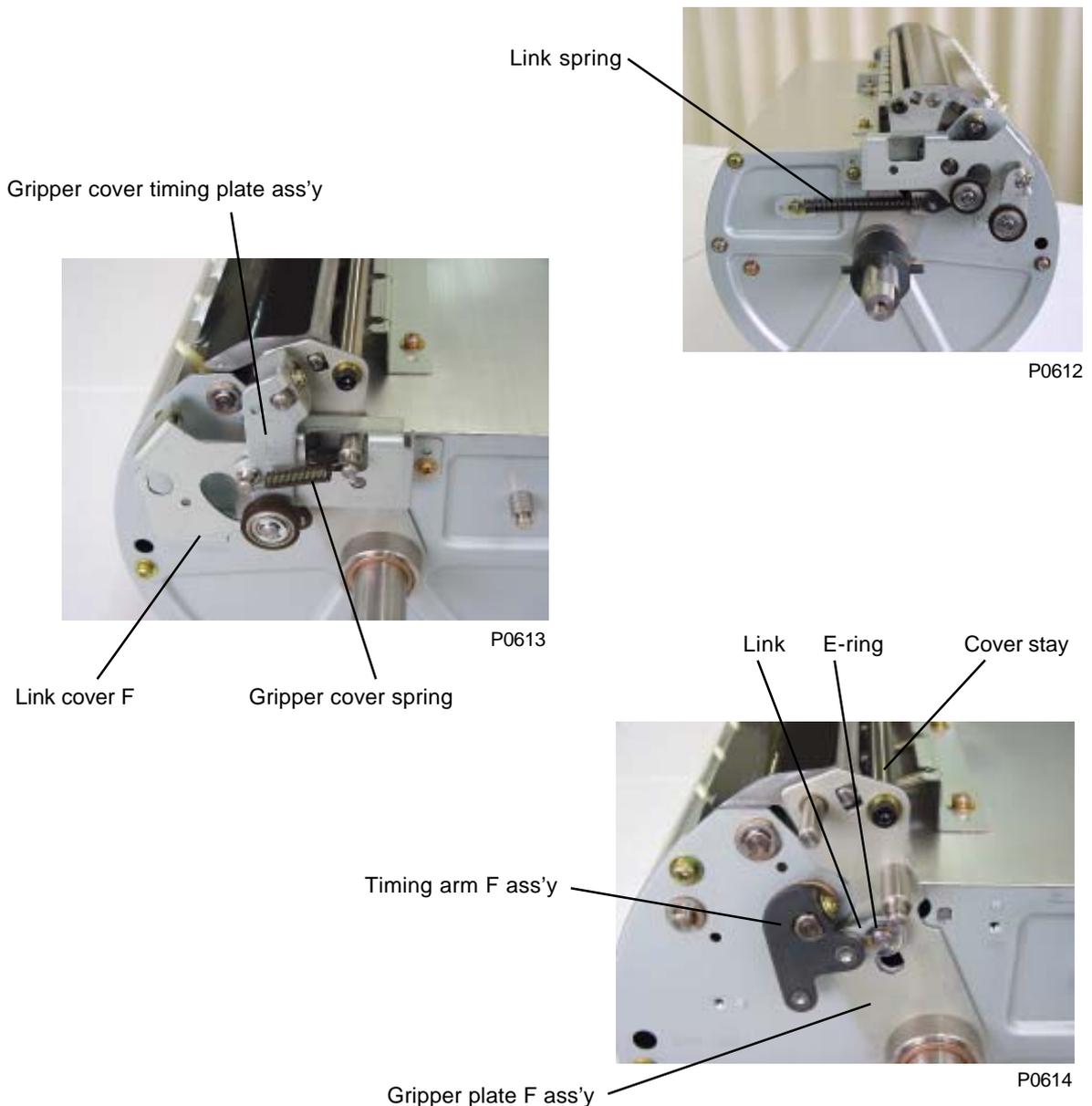


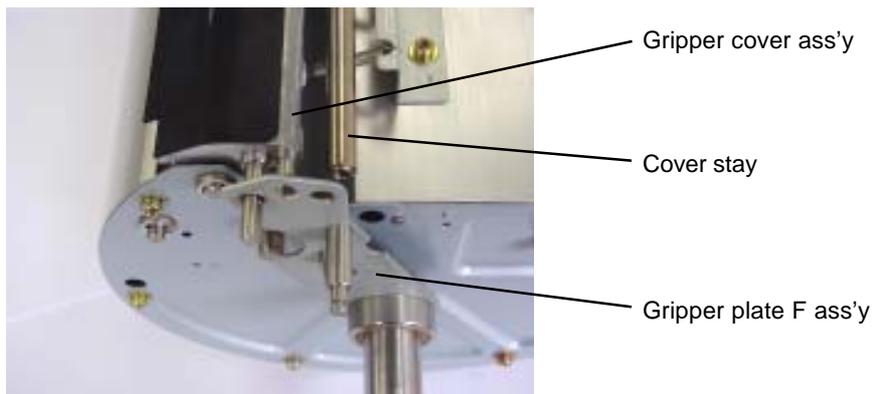
P0611

## 2. Removing the Gripper Cover Assembly

- (1) Remove the paper drum from the machine.
- (2) Remove the adhesive tape from the gripper cover ass'y and open the gripper cover.
- (3) Remove the link spring from the rear of the paper drum.  
<Instructions to follow are for the **front portion** of the paper drum.>
- (4) Remove the gripper cover spring.
- (5) Remove the gripper cover timing plate ass'y. (M3 x 6 screw)
- (6) Remove link cover F. (Two M3 x 6 screws)
- (7) Detach the E-ring on the link. Remove the mounting screw (M3 x 6) and the timing arm F ass'y.
- (8) Remove the screw on the cover stay (cap screw M4x8, spring washer, and plain washer).
- (9) Pull top portion of the gripper plate F ass'y to free the shaft of the gripper cover ass'y, and remove the gripper cover ass'y from the paper drum.

<Refer to page No. 6-8 for the assembly instructions>





P0615



Gripper cover ass'y

P0616



(Enlarged view)

P0617

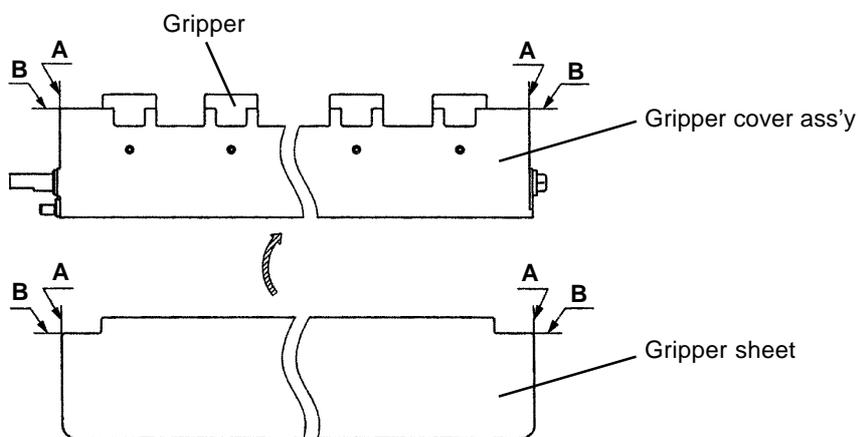
Gripper

**<Positioning the Cover sheet over the Gripper cover ass'y>**

Refer to the following sketch in positioning the cover sheet over the gripper cover ass'y.

The **A** and **B** marked lines on the sketch should align between the cover sheet and the gripper cover ass'y.

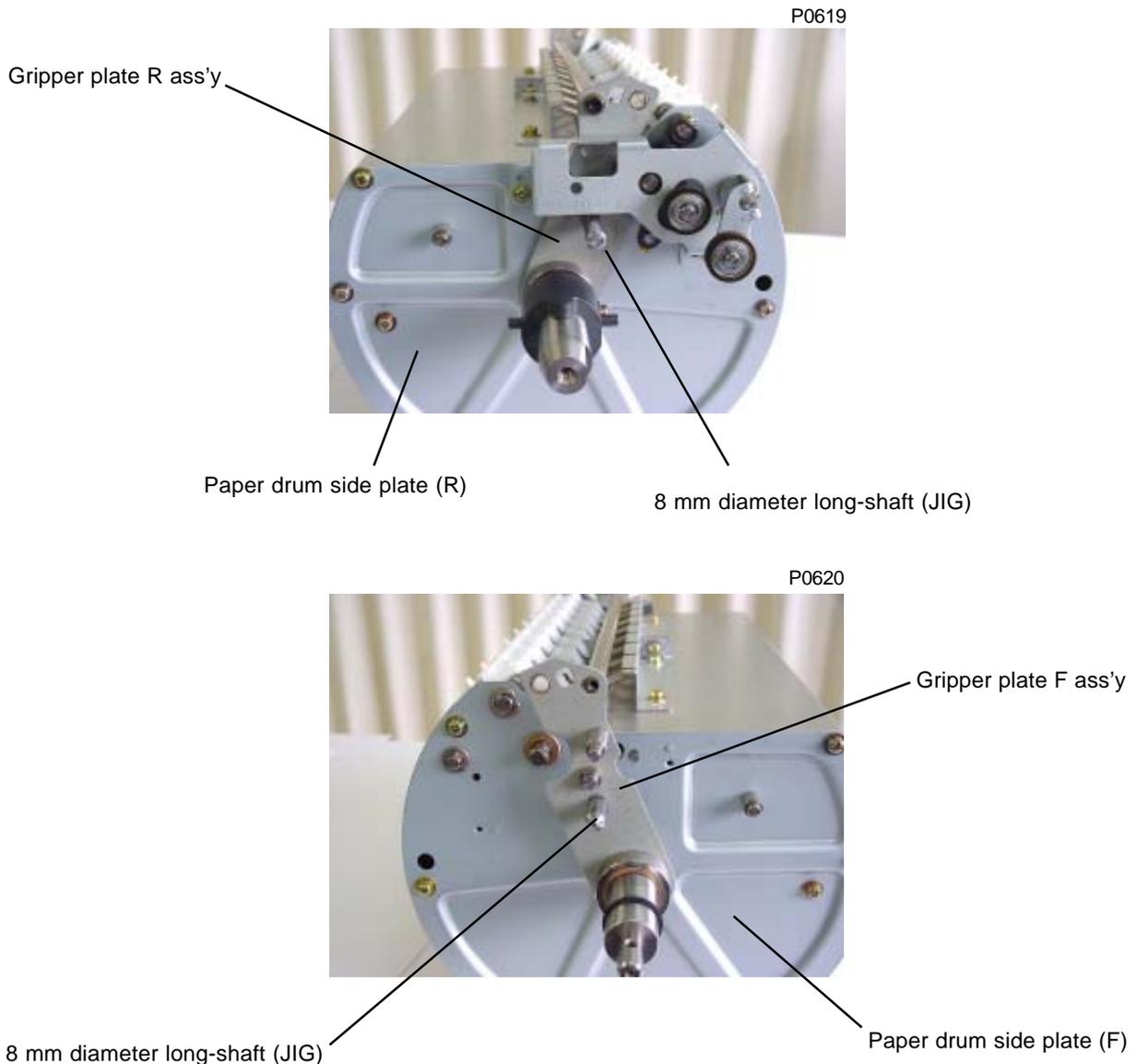
(The accuracy in positioning:  $\pm 0.5$  mm for **A** line,  $\pm 0.2$  mm for **B** line.)

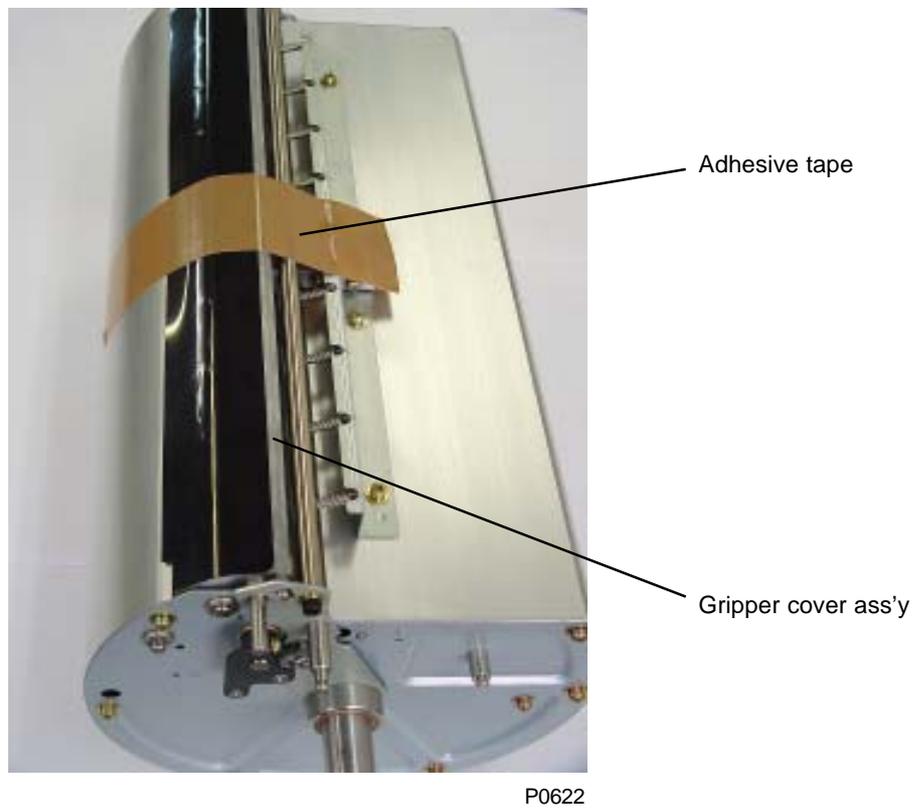
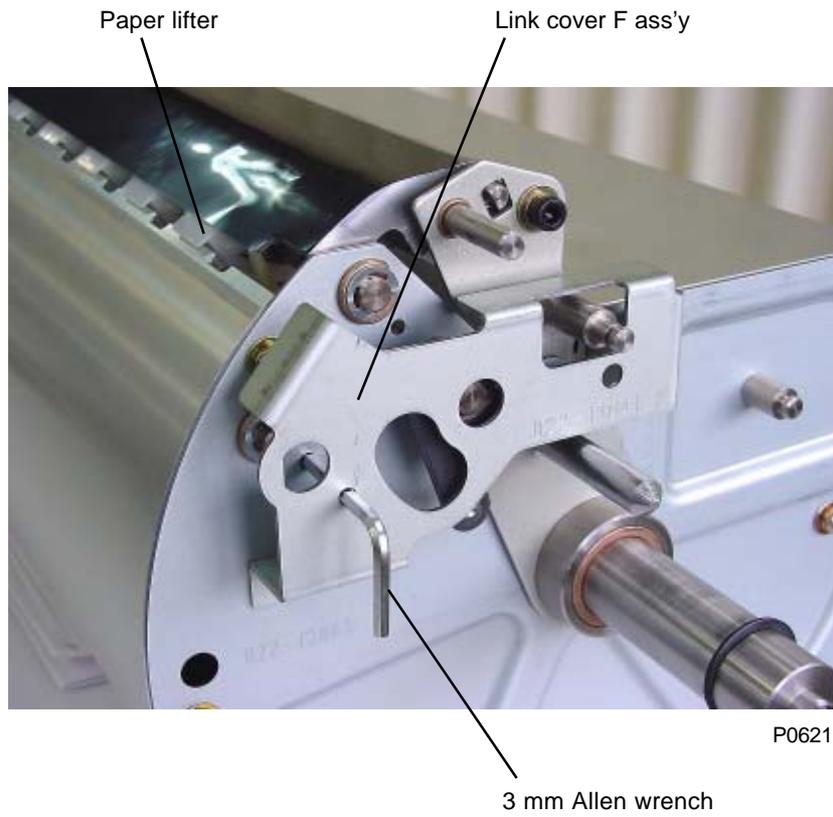


S0618

### Assembling back the gripper cover assembly

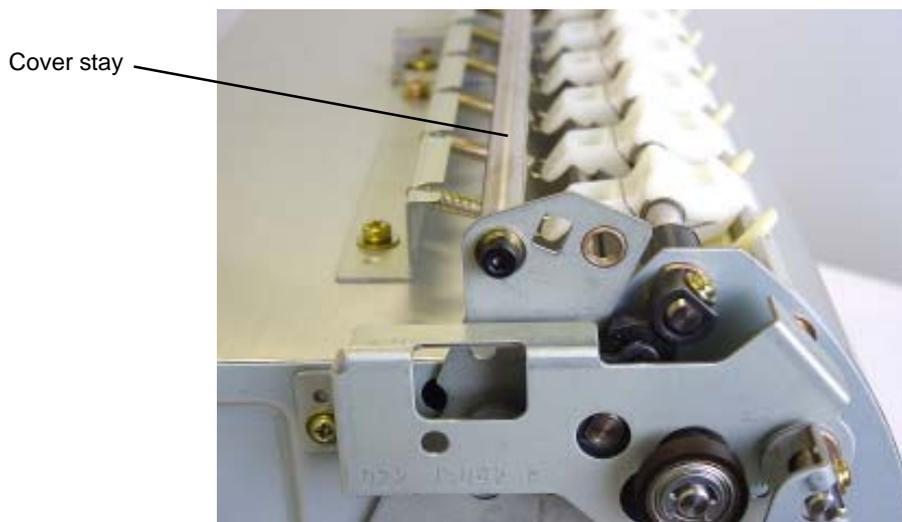
- (1) Fit the 8 mm diameter long-shaft (JIG) through the gripper plate R ass'y, paper drum side plate (R), paper drum side plate (F), and gripper plate F ass'y.
- (2) Insert the shaft of the gripper cover ass'y through the hole with the brass metal on the gripper plate ass'y F and R. Then insert the end of the cover stay into the hole on the gripper plate F ass'y, and fix by screw.
- (3) Install timing arm F ass'y on the paper drum.
- (4) Install link cover F on the paper drum.
- (5) Insert 3 mm Allen wrench through link cover F ass'y to keep the paper lifter down. (Refer to the photograph on next page.)
- (6) Remove the 8 mm diameter long-shaft (JIG) from the paper drum.
- (7) Close the gripper cover ass'y by hand and keep it closed using adhesive tape.  
**Make sure to remove the adhesive tape after installing the paper drum in the machine.**
- (8) Remove the 3 mm Allen wrench, which was inserted through the Link cover F ass'y by step (5).
- (9) Install the gripper cover timing plate ass'y.
- (10) Install the gripper cover spring and link spring.



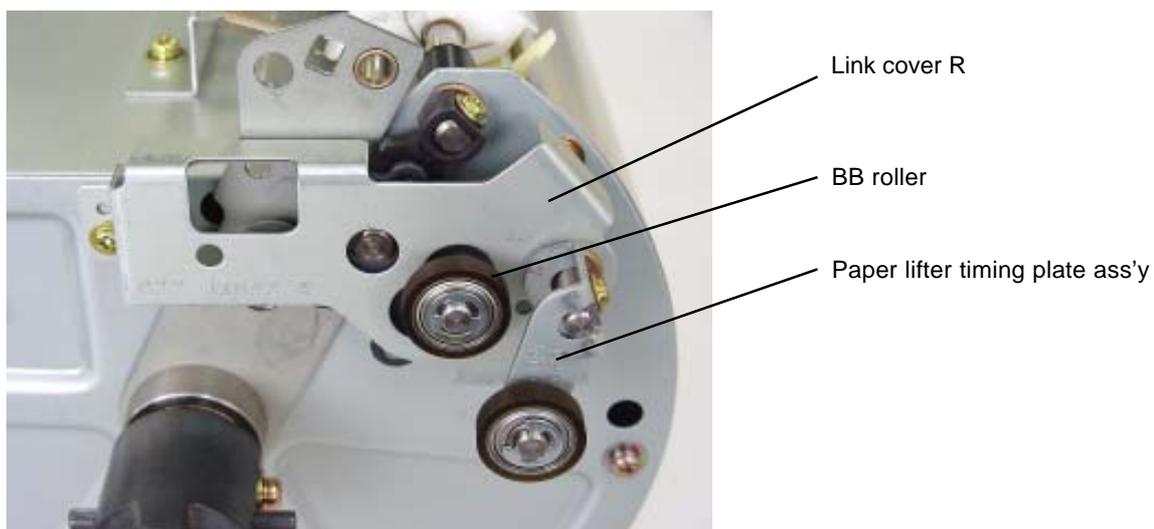


### **3. Removing the Gripper Shaft Unit**

- (1) Remove gripper cover ass'y. (Refer to page No. 6-6)
- (2) Remove cover stay (cap screw M4x8, spring washer, and plain washer).
- (3) Remove paper lifter timing plate ass'y (M3x6 screw) from the rear of the paper drum.
- (4) Remove BB roller (one E-ring) from the rear of the paper drum.
- (5) Remove link cover R (two M3x6 screws) from the rear of the paper drum.

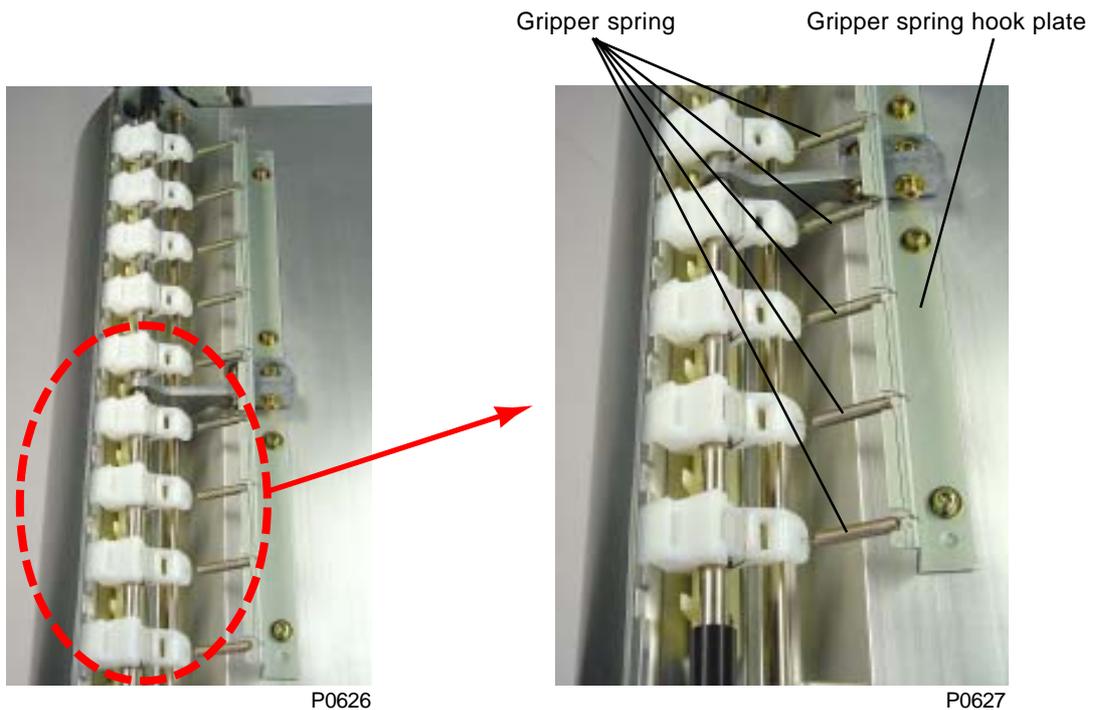
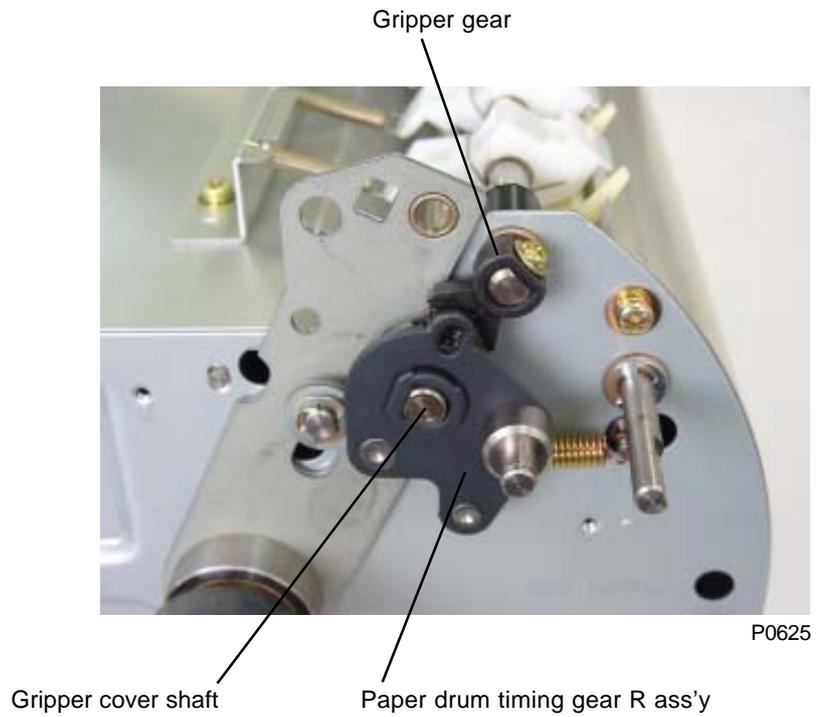


P0623



P0624

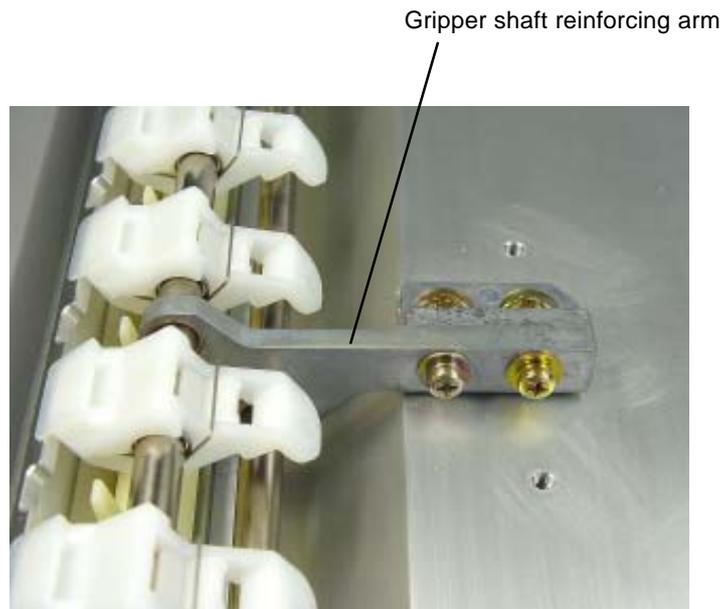
- (6) Remove E-ring and one screw (M3x6) to detach paper drum timing gear R ass'y from the rear of the paper drum.
- (7) Detach gripper cover shaft by removing metal shaft bearings from the front and rear of the paper drum.
- (8) Remove nine pieces of gripper springs.
- (9) Remove gripper spring hook plate (four M4x8 screws).



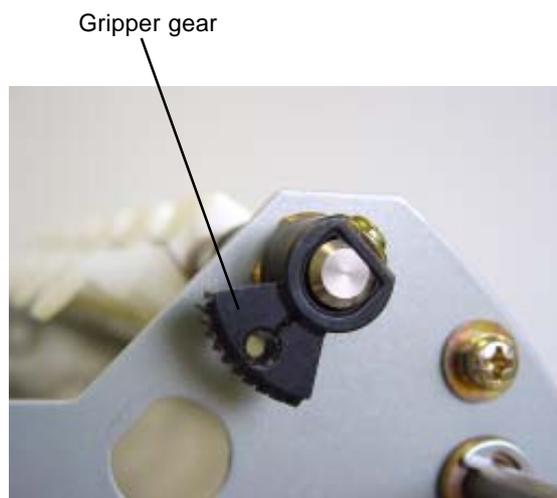
## CHAPTER 6. PAPER DRUM SECTION

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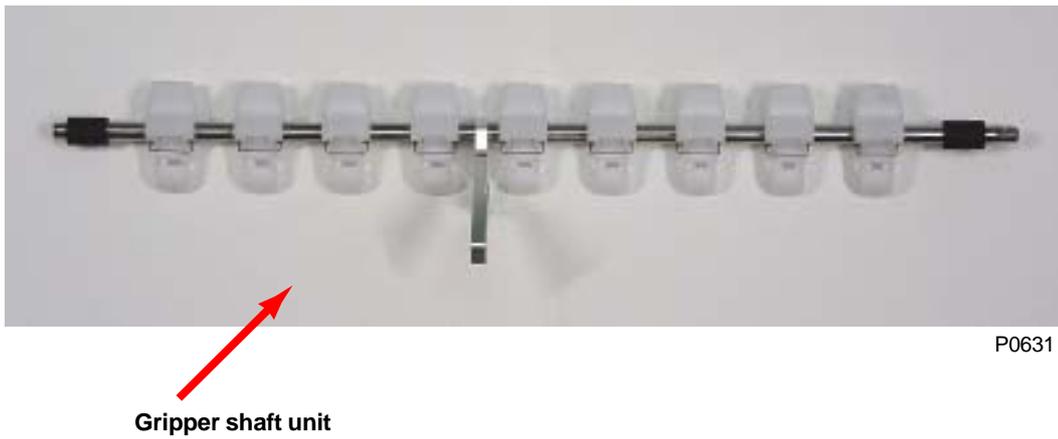
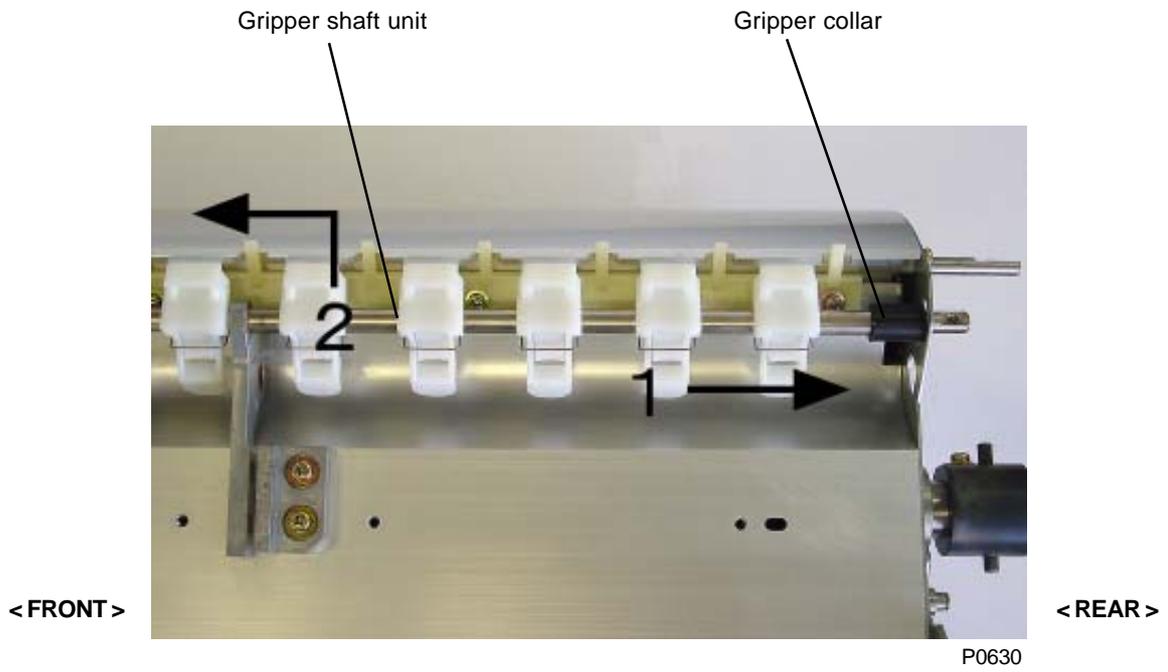
- (10) Remove the screws holding the gripper shaft reinforcing arm. (two M4x12 screws)
- (11) Remove gripper gear from the gripper shaft unit. (M3x6 screw)
- (12) Remove metal shaft bearing from the rear of the gripper shaft unit.
- (13) Remove E-ring and metal shaft bearing from the front of the gripper shaft unit.
- (14) Squeeze the gripper collar (rubber) on the rear side of the gripper shaft unit lightly, and detach the gripper shaft unit. (Refer to the photograph on top of next page.)



P0628



P0629



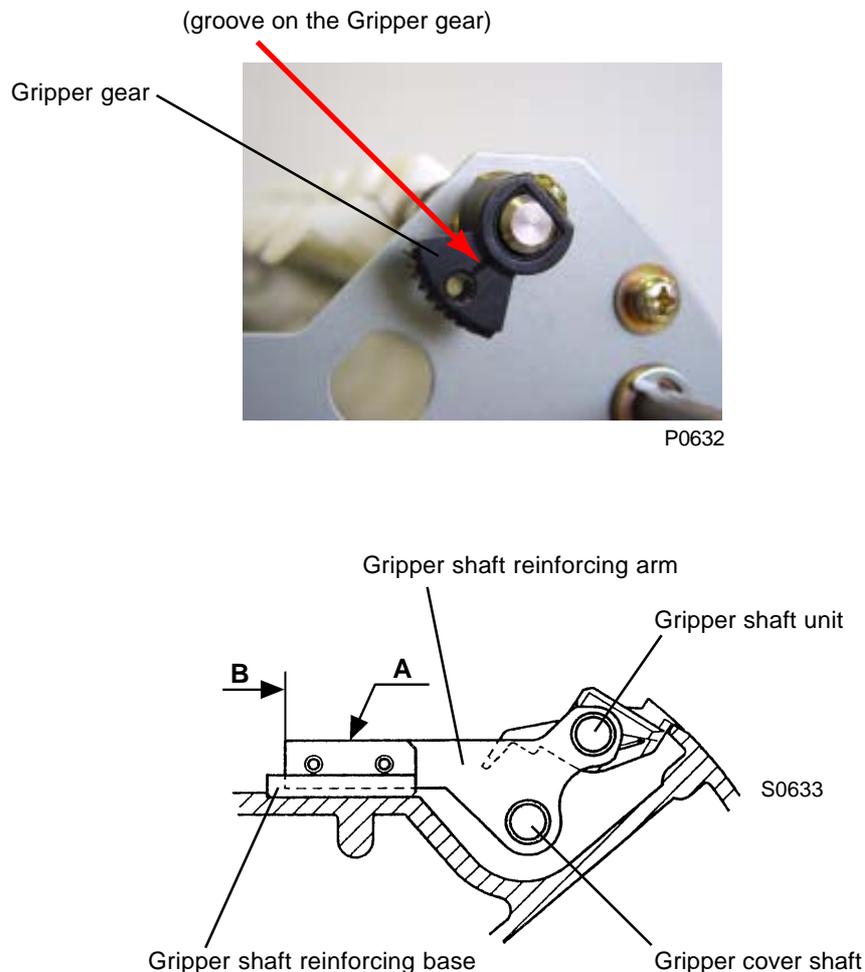
### Assembling back the gripper shaft unit

- (1) Fit the gripper shaft unit back on the paper drum.
- (2) Mount the gripper gear on the machine rear side of the gripper shaft unit.  
**The groove on the gripper gear should face outside.**
- (3) Mount the gripper cover shaft, together with the metal bearings on the front and rear.  
**The side with stepped down diameter should be for the rear side.**

- (4) Fix the gripper shaft reinforcing arm in position by two screws.

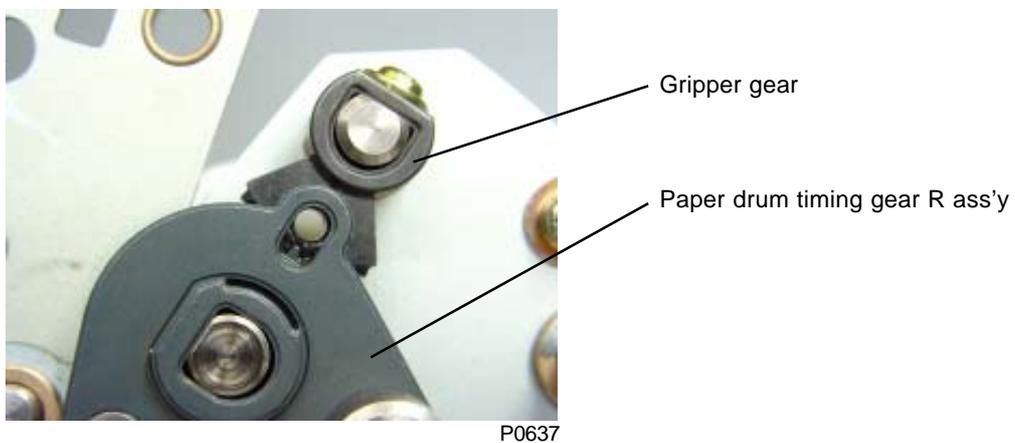
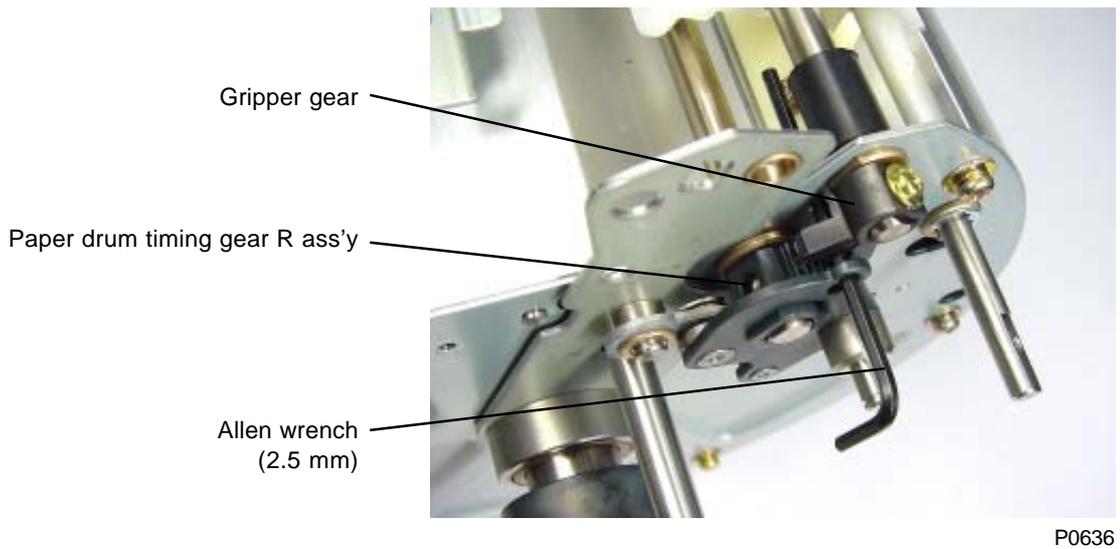
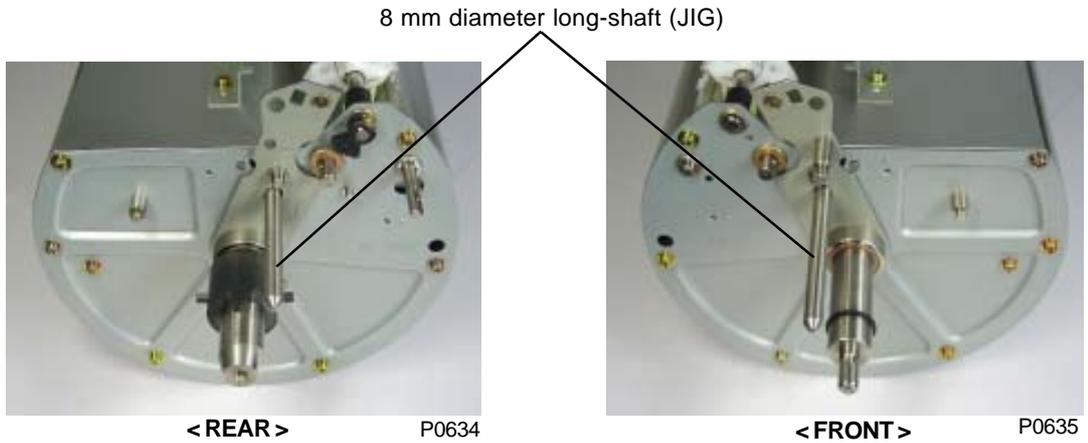
**The top surface of the reinforcing arm should be flat with the reinforcing base, as shown by "A" on the sketch below. The surface indicated by "B" on the sketch should also align with each other, though may need to slide the reinforcing arm a little bit to allow smooth movement of the gripper shaft unit and gripper cover shaft.**

- (5) The final position of the gripper shaft will be readjusted, if required, after running B4 size thin papers or recycled papers. If paper wrinkle appears, especially on the tail end of the paper, the gripper shaft reinforcing arm will need to be moved in the direction shown by the arrow mark indicated under the alphabet "B" on the sketch.



- (6) Fit the 8 mm diameter long-shaft (JIG) through the gripper plate R ass'y, paper drum side plate (R), paper drum side pate (F), and gripper plate F ass'y.
- (7) Attach paper drum timing gear R ass'y on the paper drum.

**Use an available 3 mm diameter rod or 2.5 mm Allen wrench to align the elongated hole on the paper drum timing gear R ass'y and round hole on the gripper gear to achieve correct positioning.**



## CHAPTER 6. PAPER DRUM SECTION

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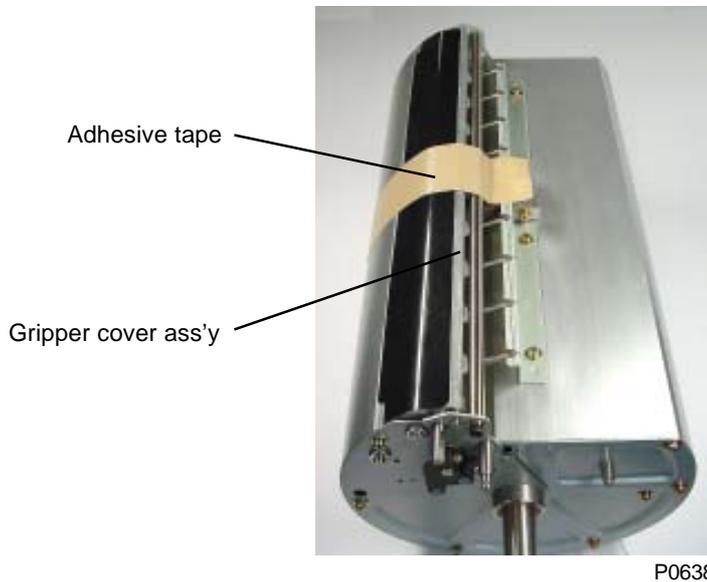
- (8) Mount the gripper spring hook plate, and hook the nine gripper springs.
- (9) Insert the shaft of the gripper ass'y and cover stay through the holes on the gripper plate ass'y F & R, and attach screws on both ends of the cover stay.

**The shaft on the cover stay with a flat cut should go on the rear of the paper drum.**

- (10) Mount timing arm F ass'y on the paper drum.
- (11) Remove the 8 mm diameter long-shaft (JIG) from the paper drum.
- (12) Close the gripper cover ass'y by hand and keep it closed using adhesive tape.

**Make sure to remove the adhesive tape after installing the paper drum in the machine.**

- (13) Hook the paper lifter spring and link spring on the paper drum.
- (14) Mount link cover R, BB roller (flat surface to face outside), and paper lifter timing plate ass'y on the paper drum.
- (15) Mount link cover F, gripper cover timing plate ass'y , and gripper cover spring on the paper drum.



P0638



P0639

## 4. Removing the Gripper

- (1) Remove gripper shaft unit.
- (2) Remove gripper collar.
- (3) Remove gripper base (M3x8 screw each).
- (4) Remove the grippers from gripper shaft.

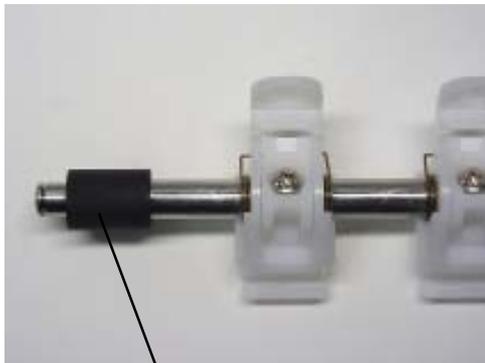
### [Precautions on Reassembly]

- Do not make mistake in the direction of the gripper shaft and gripper shaft spring during the assembly. Also, mount the grippers in correct direction on the gripper shaft, and mount the gripper shaft reinforcing arm in correct position.



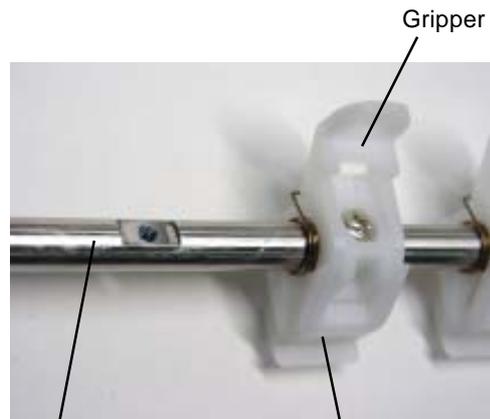
Gripper shaft unit

P0640



Gripper collar

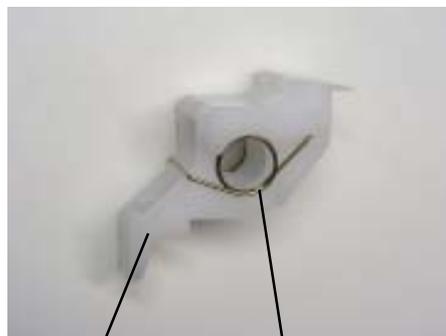
P0641



Gripper shaft

Gripper

P0642



Gripper

Gripper shaft spring

P0643

## **5. Removing the Paper Lifter**

- (1) Remove gripper shaft unit.
- (2) Remove paper lifter spring.
- (3) Since paper lifter ass'y cannot be detached, remove only the paper lifter by removing four screws.

Paper lifter spring



P0644

Paper lifter

Paper lifter ass'y

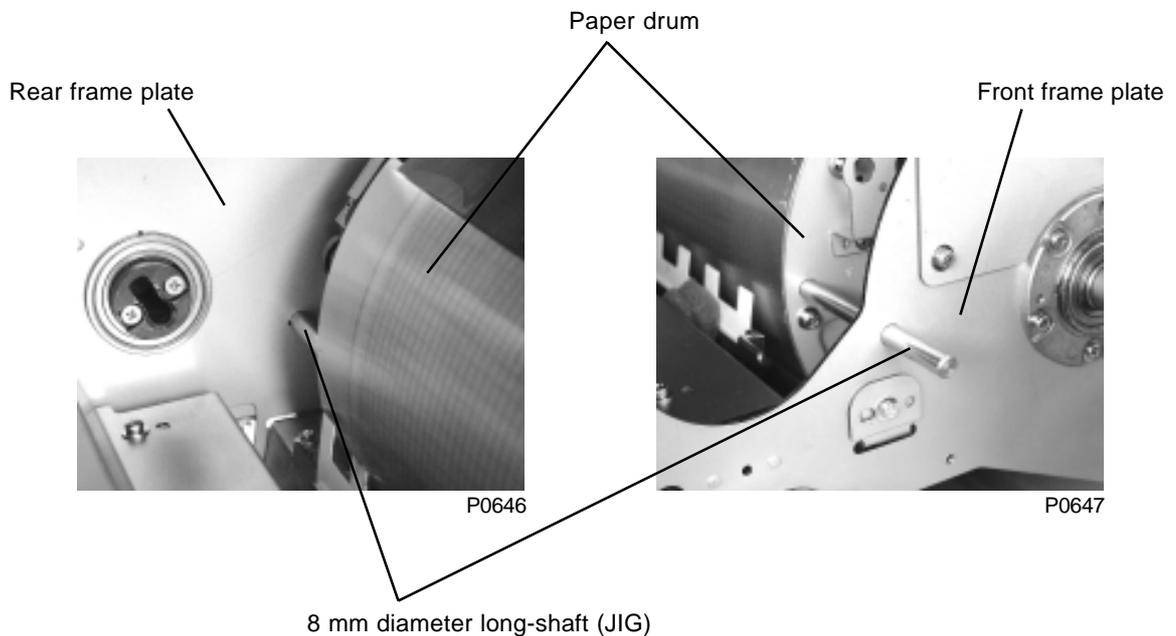


P0645

## Adjustment

### 1. Position T Sensor Adjustment

- (1) Start up Test mode.
- (2) Rotate the paper drum to position T and insert 8 mm diameter long-shaft (JIG) through the front frame plate, paper drum, and rear frame plate, in this sequence.
- (3) Run Test mode No. 503 (Position T sensor).
- (4) Loosen the lock screw (M3 x 6), move the position T sensor bracket position up (in direction of arrow in photograph), and secure at the point at which the buzzer sound changes from long beeps to short beeps.
- (5) Remove the 8 mm diameter long-shaft (JIG) and exit from the Test mode.



Position T sensor bracket



# MEMO

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# CHAPTER 7: PAPER EJECTION SECTION

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## Contents

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# Mechanism

## 1. Paper Ejection Mechanism

The paper transferred from the paper drum is ejected to the paper receiving tray, as described below.

- (1) The leading edge of the paper is released from the paper drum grippers while pinched between the paper drum and the first pinch roller.
- (2) The paper is guided to the paper ejection roller by the paper ejection separators.
- (3) The paper is gripped between the second pinch roller and the paper ejection roller, and is guided by the paper ejection wings before ejected onto the paper receiving tray.

The paper ejection unit safety SW confirms that the paper ejection unit is in place on the machine. The main motor is disabled if the paper ejection unit is not in place.

Power is supplied to the paper ejection unit via the drawer connector, and the contacts of this connector are used to determine whether the paper ejection unit is in place. (The paper ejection unit set signal is OFF when not in place.)

The paper ejection sensor checks that the printed paper is ejected properly.

The paper ejection roller is driven by the paper ejection motor, and the rotation of the paper ejection motor is monitored by the paper ejection limit sensor (encoder sensor).

The paper ejection wings can be manually adjusted up or down to suit the paper ejected. (Raise for normal paper, lower for thick paper or post card.)

## 2. Pinch Roller Mechanism

The paper is pinched at a position of  $3 \text{ mm} \pm 0.5 \text{ mm}$  from the edge.

With the first pair of the pinch rollers closer together and second pair of the pinch rollers further away, the ejecting papers are stretched out as they land on the paper receiving tray.

## 3. Pinch Roller Positioning Mechanism

The position of the pinch rollers change in accordance with the position of the paper guide fence on the paper feed tray. The two pinch roller assemblies, one on the machine drive side and the other on the machine operation side, are driven separately by different pinch pulse motors.

#### **4. Pinch Roller Ass'y Home Position and Movement**

The F/R pinch sensor detects the home position of the two pinch roller assemblies.

When power is switched on or pressing the All Reset Button moves the pinch roller ass'y s to the home position.

The pinch roller position during printing is determined by the paper width potentiometer on the paper feed tray, and the sliding of the pinch rollers to a new position is made when the START key is pressed for printing operation.

The pinch rollers stay in one set position throughout the printing. When the paper size is changed on the paper feed tray, the pinch rollers move to the new position when the START key is pressed to continue the printing operation.

The pinch slide ass'y is released or made in contact by the pinch roller release motor. The position of the pinch slide ass'y is checked by the pinch roller release sensor.

The pinch rollers are released during the sliding movement or when in standby, and are in contact position during the printing.

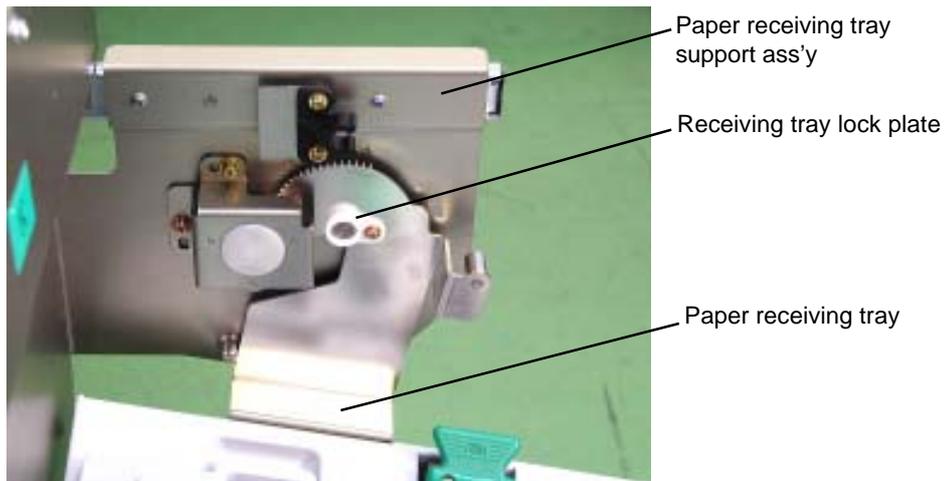
#### **5. Paper Receiving Tray Mechanism**

The ejected paper is sorted by a precision stacking mechanism and a V-shaped paper receiving tray. A stopper fence for postcards is also included.

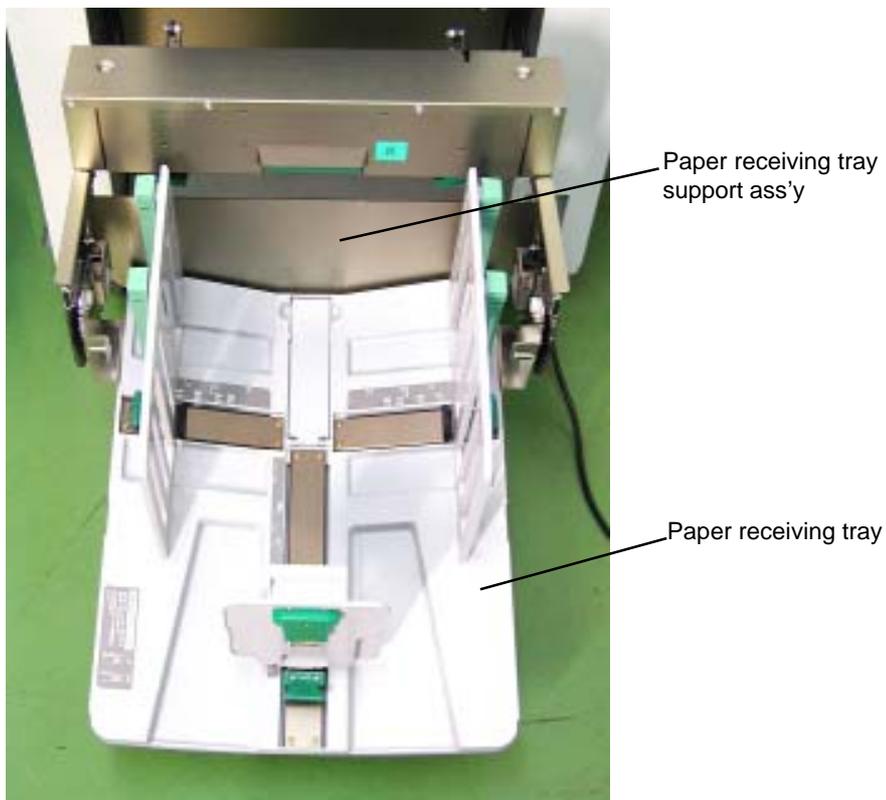
## Disassembly

### 1. Removing the Paper Receiving Tray

- (1) Remove the receiving tray lock plates on both sides. (M3 x 6 screw on each side)
- (2) Remove the paper receiving tray from the paper receiving tray support ass'y .



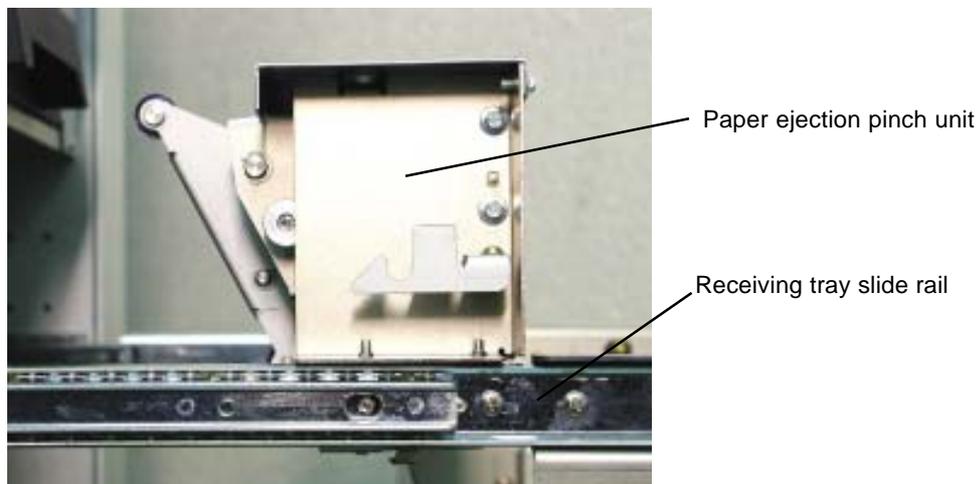
P0701



P0702

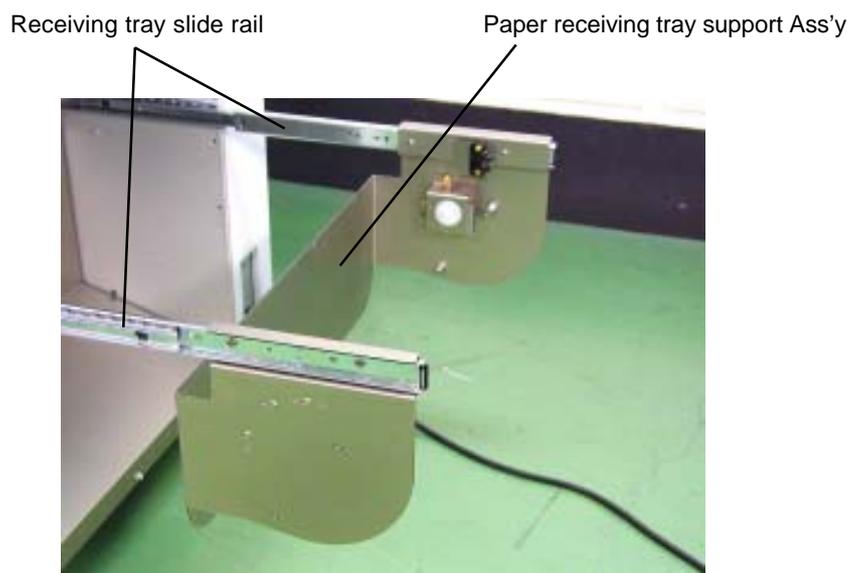
## 2. Removing the Paper Ejection Pinch Unit

- (1) Remove the four mounting screws (M4 x 6). Remove the paper ejection pinch unit from the receiving tray slide rail.



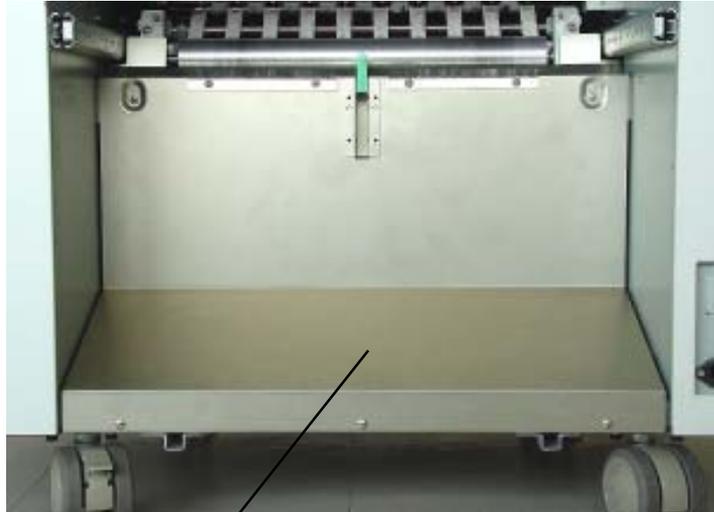
## 3. Removing the Paper Receiving Tray Support Ass'y

- (1) Remove the four mounting screws (M4 x 6) and remove the paper receiving tray support ass'y from the receiving tray slide rail.



#### 4. Removing the Paper Ejection Cover Ass'y

- (1) Remove the five mounting screws (M4 x 8), pull out the paper ejection cover ass'y toward the paper ejection side, and disconnect the paper ejection sensor (send) connector (at the rear) before removing the paper ejection cover Ass'y .



P0705

Paper ejection cover ass'y

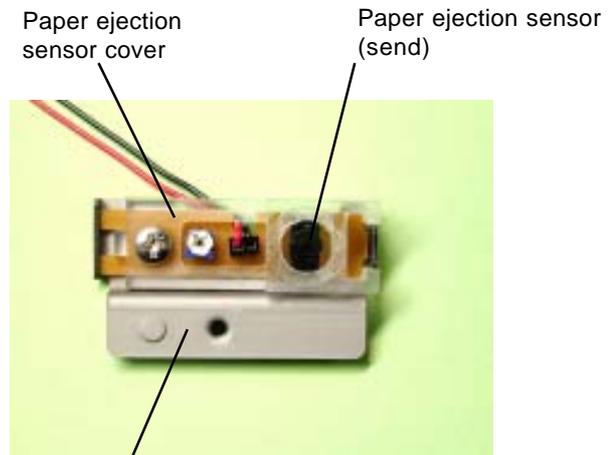
#### 5. Removing the Paper Ejection Sensor (Send)

- (1) Remove the paper ejection cover ass'y .
- (2) Remove the mounting screw (M3 x 6), then remove the paper ejection sensor (send) bracket together with the paper ejection sensor cover.
- (3) Remove the mounting screw (M3 x 6), remove the paper ejection sensor cover. Remove the paper ejection sensor (send).



P0706

Paper ejection sensor cover



P0707

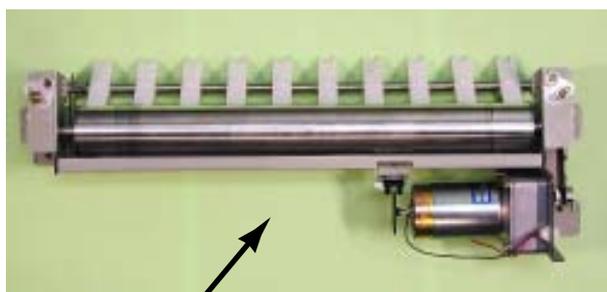
Paper ejection sensor (send) bracket

## 6. Removing the Paper Ejection Roller Unit

- (1) Remove the paper ejection cover ass'y .
- (2) Disconnect the two connectors, remove the four mounting screws (M4 x 8) and remove the paper ejection roller unit.



P0708



P0709

Paper ejection roller unit

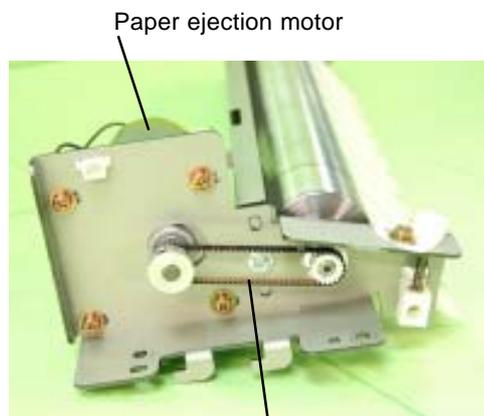
## 7. Removing the Paper Ejection Motor

- (1) Remove the paper ejection roller unit.
- (2) Remove the four mounting screws (M4 x 8), remove the pinch pulse motor timing belt. Remove the paper ejection motor.



P0710

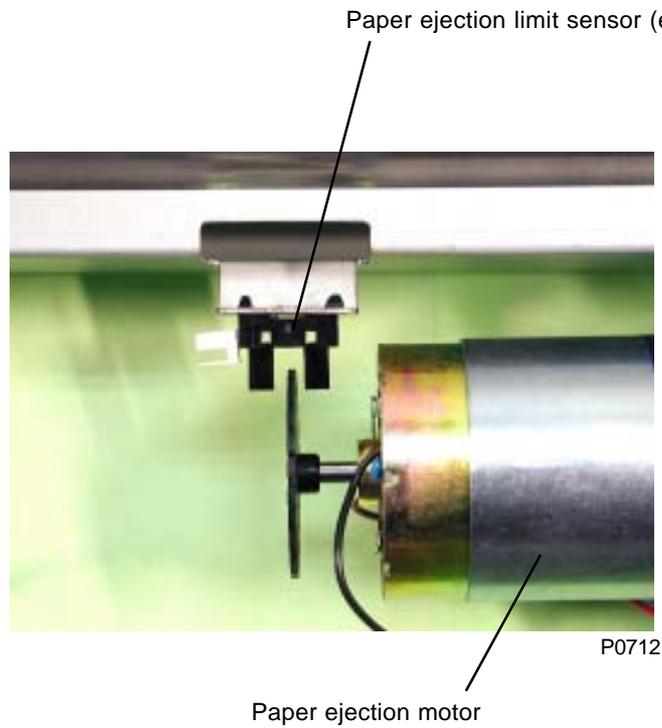
Paper ejection motor



P0711

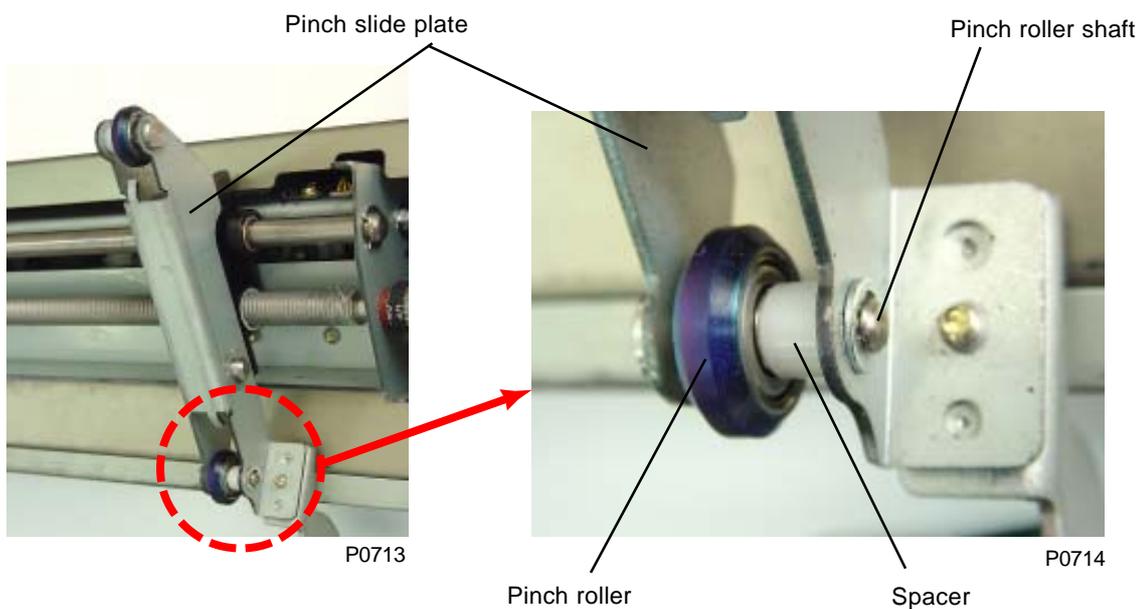
Pinch pulse motor timing belt

## 8. Removing the Paper Ejection Limit Sensor



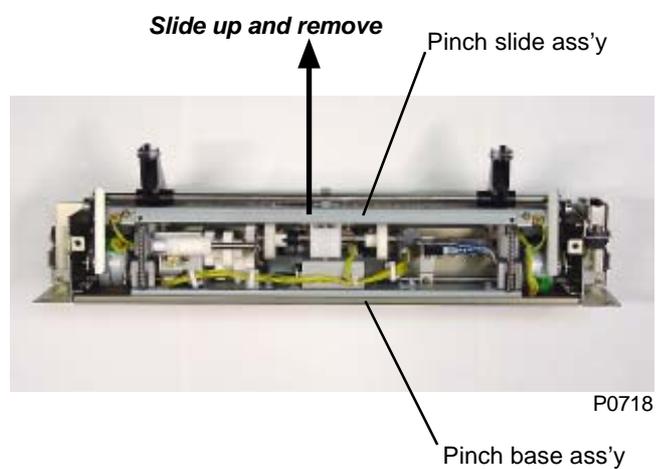
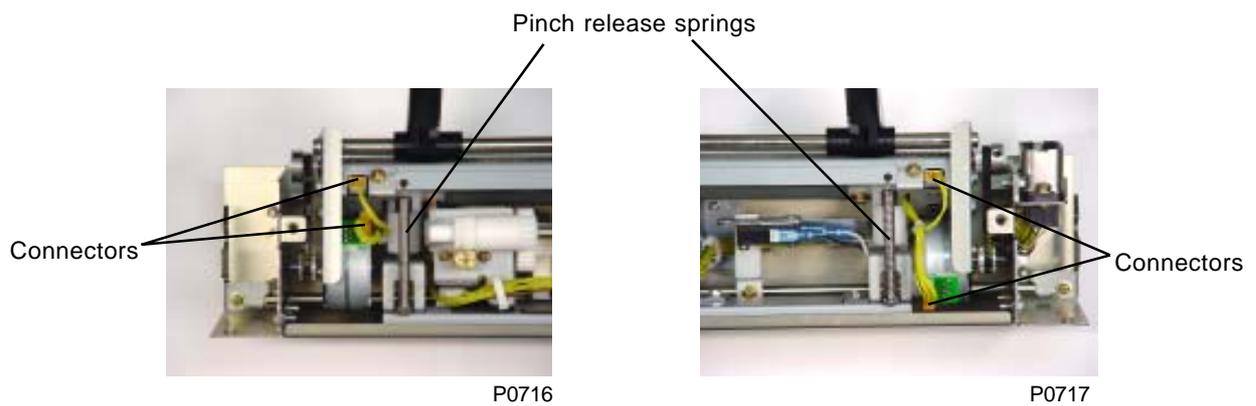
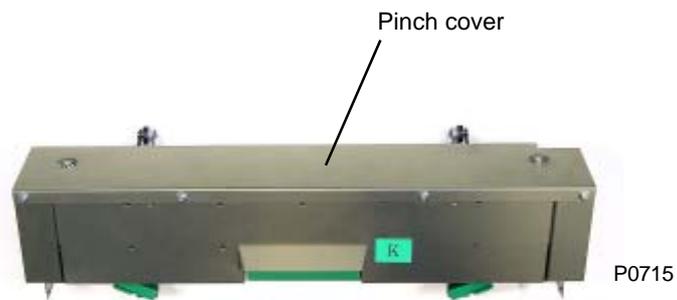
## 9. Removing the Pinch Rollers

- (1) Remove the paper ejection pinch unit.
- (2) Detach the E-ring, pull out the pinch roller shaft from the pinch slide plate and remove the spacer and pinch roller.



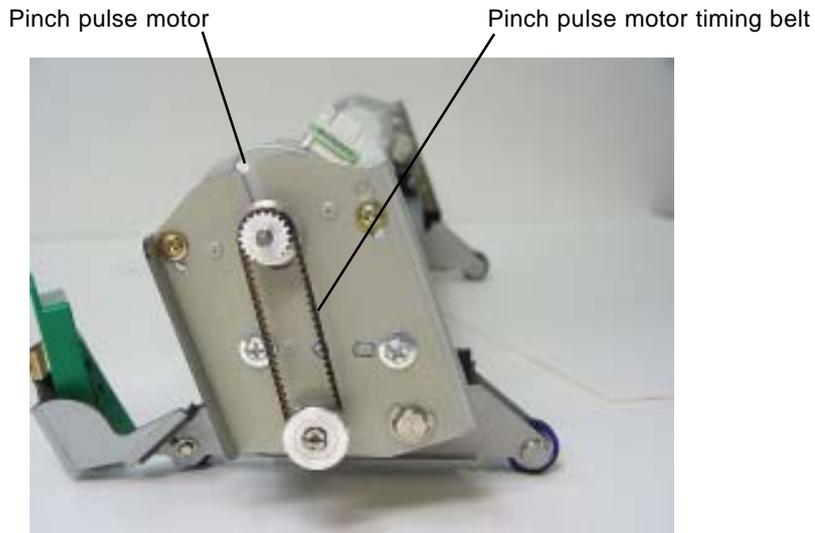
## 10. Removing the Pinch Slide Ass'y

- (1) Remove the paper ejection pinch unit.
- (2) Remove the pinch cover. (Six M4 x 8 screws)
- (3) Detach the pinch release springs (front and rear) and disconnect the connectors to the motor and sensor at the front and rear. Slide up the pinch slide ass'y and remove from the pinch base ass'y .



## **11. Removing the Pinch Pulse Motors F<sub>(FRONT)</sub> & R<sub>(REAR)</sub>**

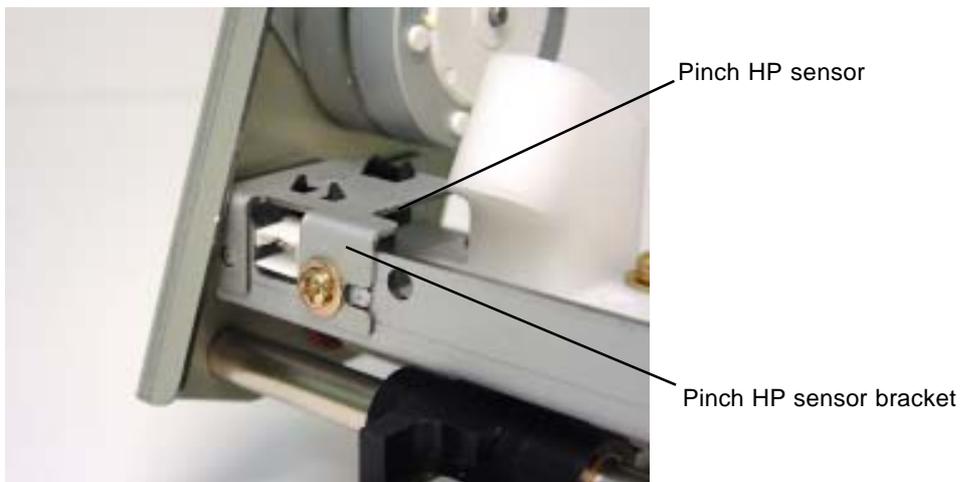
- (1) Remove the pinch slide ass'y .
- (2) From both ends of the pinch slide ass'y , remove the two mounting screws (M3 x 6), and detach the pinch pulse motor timing belt. Remove pinch pulse motors F and R.



P0719

## **12. Removing the Pinch HP Sensors F<sub>(FRONT)</sub> & R<sub>(REAR)</sub>**

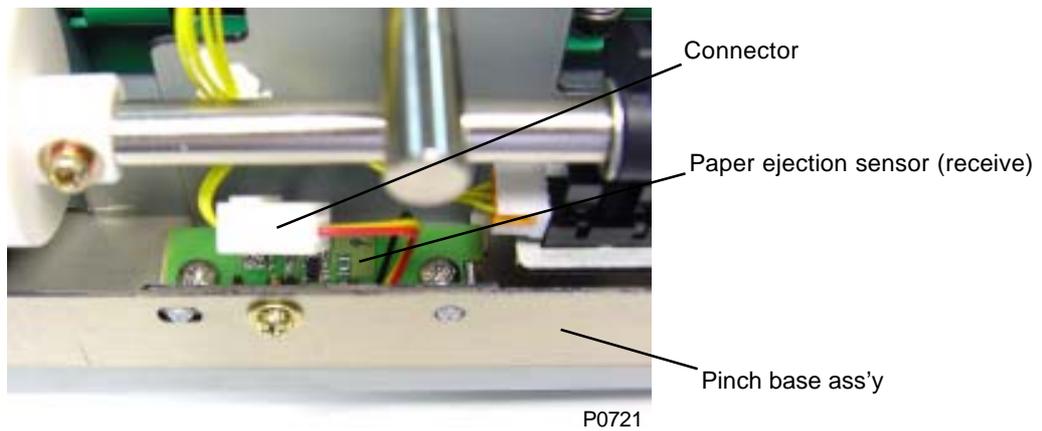
- (1) Remove the pinch slide ass'y .
- (2) From both ends of the pinch slide ass'y , remove the mounting screw (M3 x 6) and remove pinch HP sensors F and R together with their brackets.



P0720

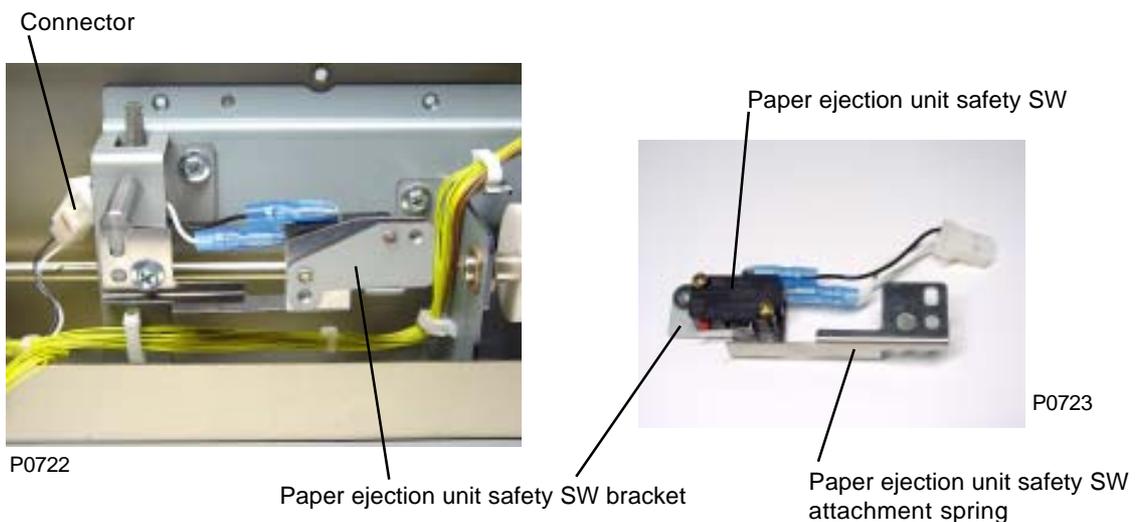
### 13. Removing the Paper Ejection Sensor (Receive)

- (1) Remove the paper ejection pinch unit.
- (2) Remove the pinch slide ass'y from the pinch base ass'y .
- (3) Disconnect the connector and remove the paper ejection sensor (receive) together with its bracket from the pinch base ass'y . (M3 x 6 screw)



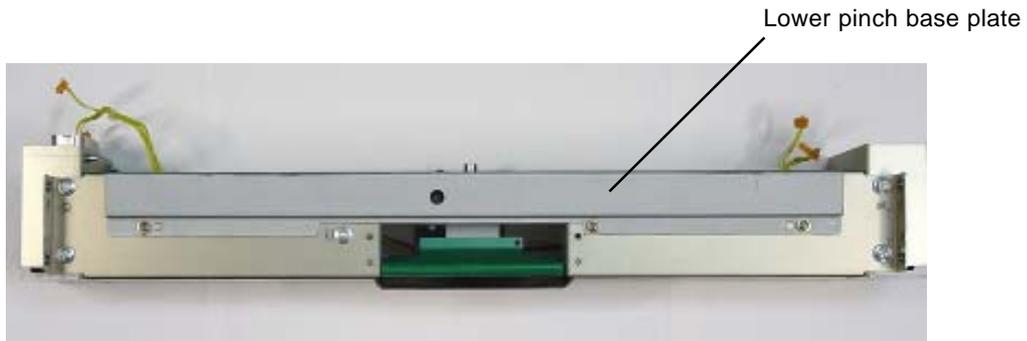
### 14. Removing the Paper Ejection Unit Safety SW

- (1) Remove the paper ejection pinch unit.
- (2) Remove the pinch slide ass'y from the pinch base ass'y .
- (3) Remove the mounting screw (M4 x 8) and disconnect the connector. Remove the paper ejection unit safety SW together with the paper ejection unit safety SW attachment spring and bracket.
- (4) Remove the two mounting screws (M3 x 14) and remove the paper ejection unit safety SW.

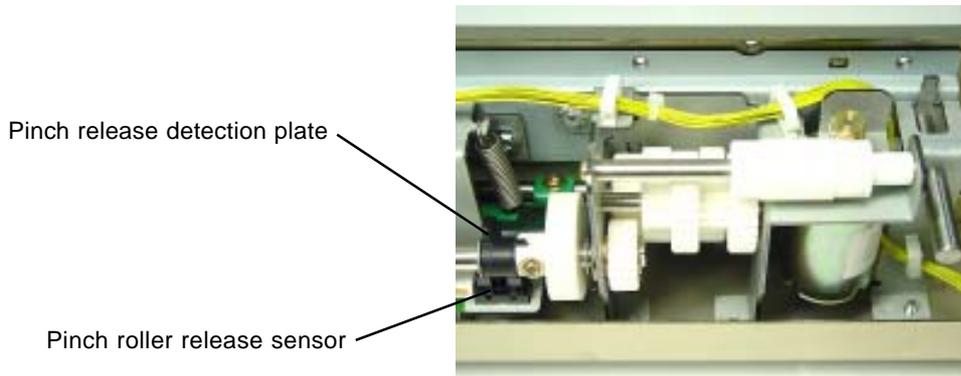


## 15. Removing the Pinch Roller Release Motor

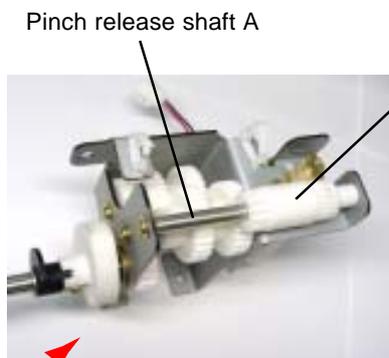
- (1) Remove the lower pinch base plate. (Three M3 x 6 screws)
- (2) Release the wire harness from the two wire saddles and disconnect the pinch roller release motor connector. Remove the three mounting screws (M4 x 8) and remove the pinch roller release ass'y and pinch roller release shaft ass'y .
  - \* Make sure that the pinch release detection plate does not strike the pinch roller release sensor.
- (3) Remove the mounting screw (M3 x 6), pull out pinch release shaft A, and remove the spur gear.
- (4) Remove the pinch roller release motor. (Two M3 x 6 screws)



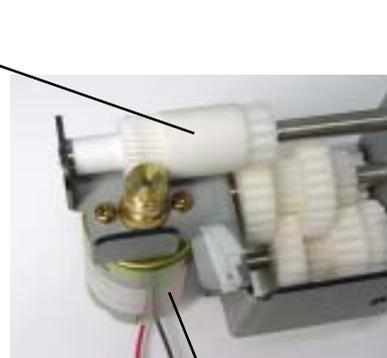
P0724



P0725



P0726



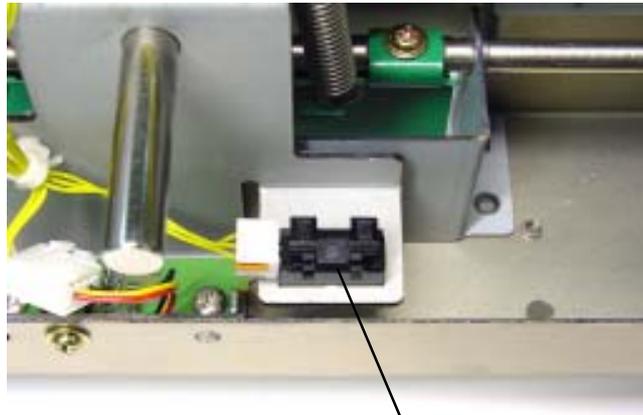
P0727

**Pinch roller release ass'y & pinch release shaft ass'y**

**Pinch roller release motor**

## 16. Removing the Pinch Roller Release Sensor

- (1) Remove the pinch roller release ass'y and pinch release shaft ass'y .
- (2) Disconnect the connector. Remove the pinch roller release sensor.



P0728

Pinch roller release sensor

## Adjustment

### 1. Pinch Roller Position Adjustment

- (1) Apply a marking agent to the pinch rollers and feed paper between them.
- (2) Measure the width of the marks for the front and rear rollers, confirming that this is  $3\text{ mm} \pm 0.5\text{ mm}$ .
- (3) If the pinch roller mark width falls outside the specifications, correct by running Test mode No. 489 (Front Pinch Roller Position Adjustment) for the front rollers and Test mode No. 490 (Rear Pinch Roller Position Adjustment) for the rear rollers.

Range: -100 to +100 (-10.0 mm to +10.0 mm)

Units: 5 (0.5 mm)

Default: 0 mm

Positive values move the rollers toward the center of the paper, while negative values move them toward the edge of the paper.

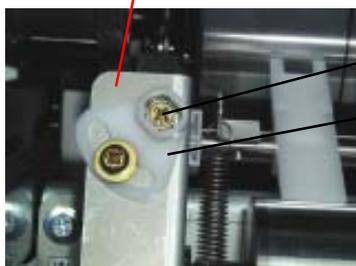
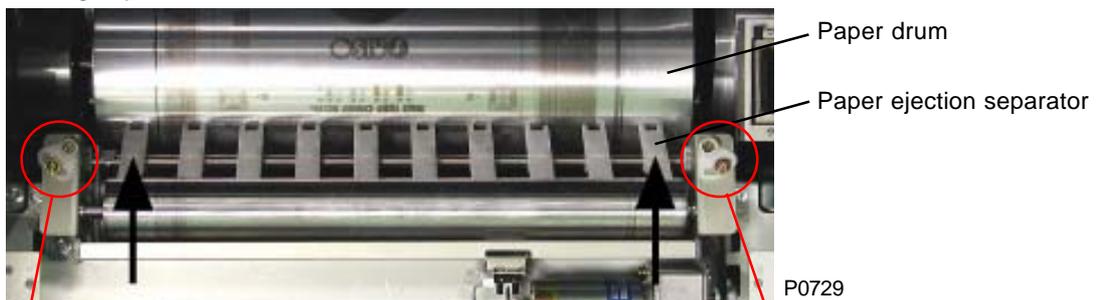
### 2. Paper Ejection Separator Gap Adjustment

#### Check and adjustment procedure

- (1) Pull out the paper ejection unit, confirming that the gap between the paper ejection separators and the paper drum is 1.4mm to 2.0mm at the two points indicated by arrows in the photograph.
- (2) If the gap falls outside the specifications, remove the adjuster plates on both sides. (M4 x 8 screws on each side)
- (3) Turn the adjuster screws to adjust the gap between the paper ejection separators and the paper drum.
- (4) Attach the adjuster plates so that the mounting screws are approximately in the center of the slots. Check that the adjuster screws slide back and forth smoothly.

#### Symptoms

- If the gap is too small, the paper ejection separators will touch the gripper cover on the paper drum. (The paper ejection separators may touch the gripper cover, but if the gap is in correct specification, there is no problem.)
- If the gap is too large, paper jamming may occur, or paper may not be ejected correctly to the paper receiving tray.



P0730



P0731

Adjuster screw

Adjuster plate

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# CHAPTER 8: PRINT DRUM SECTION

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# Mechanism

## 1. Print Drum Layout and Angle

The two interchangeable print drums have the identical construction. When mounted in the machine, the drum closest to the paper feed side is called the 1st print drum, while the one at the paper ejection side is called the 2nd print drum.

The two print drums are arranged in a V-shape at an angle of 45° on either side of the center of the paper drum. This enables simultaneous printing of two colors onto a single sheet of paper.

With the print drums mounted in the machine, the print drum position in which the clamp plate base is located at the top of the print drum is called position A, while the position for removing the print drum is called position B.

As described above, the two print drums are arranged in a V-shape at 45° to the paper drum to print two colors simultaneously onto a single sheet of paper. The two print drums are therefore mechanically out of phase by 90° during printing.

Position A sensors are positioned at the front and rear of the print drums. When the print drum is used as the 1st print drum, sensor No.1 (rear sensor) is used, and when the print drum is used as the 2nd print drum, sensor No.2 (front sensor) is used.

When the print drums are completely removed (and placed for example on the floor), the clamp plates for both the 1st and 2nd print drums move to their topmost positions. The position B lock confirmation sensor, located next to the rear position A sensor and blocked by the position A sensor detection plate, confirms that the print drum is at position B for print drum removal.

When the print drums are reinserted into the machine, it is the paper drum position which determines the position B on the machine drive unit, enabling the print drum to engage with the machine drive unit.

## 2. Print Drum Retaining Joint Mechanism

When the print drums are inserted into the machine, the drum positioning block on the front of the print drum engages with the pin holder on the machine to retain it. At the rear of the print drum, drum positioning pin R engages with the pin holder on the machine to retain it.

At the rear (drive end), the drum engagement pin engages with the paper drum drive joint on the main unit to transmit rotary drive from the main unit to the print drum.

The print drum is locked by the print drum locking mechanism.

Whether the print drums are inserted in the machine or not is detected by the print drum set sensor, print drum lock position sensor, and drum drawer connector.

## 3. Print Drum Horizontal Movement Mechanism

The printing position is adjusted horizontally by moving the drum unit horizontally using the drum horizontal pulse motor. The horizontal home position is detected by the horizontal centering HP sensor.

## 4. Print Drum Removal/Insertion Mechanism

The print drum is removed and inserted with the print drum at position B.

When removing the print drum from the machine, the B position is 13° print drum turn from the position in which the position B lock confirmation sensor on the print drum detects the position A detection plate.

In engaging the print drum with the machine after inserting the print drum, the position B is determined by the angle of the paper drum. Detected by the paper drum angle, position B is 113° for the 1st print drum and 203° for the 2nd print drum. The position B lock confirmation sensor located next to the rear position A sensor confirms that the print drum is at position B.

When removing the print drums, the current vertical and horizontal positions of the print drums are saved in the memory so that the print drums can be returned to their original positions when reinserted.

Then the print drum is moved all the way forward using the drum horizontal motor (position checked with drive release sensor) and disengage the print drum engagement pin from the drive joint on the machine to prevent the print drum from being rotated by the machine drive unit.

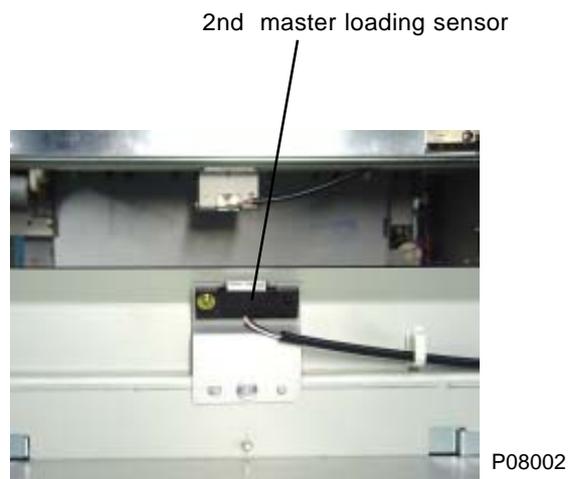
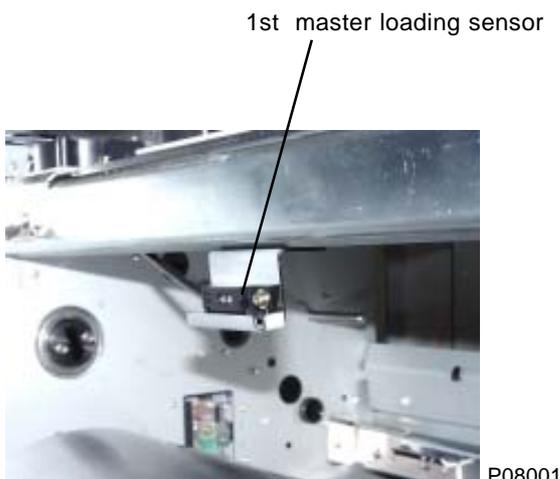
With the push of the START key to start printing after the reinsertion of the print drums, the drive unit on the machine is moved to the B position. Then the print drums are moved to the horizontal HP sensor position by the drum horizontal motor, and then the print drum is engaged with the drive unit on the machine. Once it is engaged with the machine and if the recall button is pressed, the print drums return to the vertical and horizontal positions saved in the memory.

## 5. Master on Drum (Before Printing) Check Mechanism

On starting printing, the master loading sensor confirms that there is a master on the print drum. The printing drum in the 1st print drum position is checked by the 1st master loading sensor and the 2nd print drum position print drum is checked by the 2nd master loading sensor.

The paper drum angle check positions for the master loading sensors are 328° for the 1st print drum and 298° for the 2nd print drum, both print drum angles measured from the print drum position A.

Master detection is memorized until the Drum is removed or power is turned OFF.



View with the 2nd master removal unit dismantled.

### 6. Ink Cartridge Set Mechanism

Black and color ink have different cartridge SW PCBs.

Black ink: 3 sensors. Color ink: 3 sensors.

The sensors check that the correct ink cartridges are inserted. Ink cartridge set switches 1 to 3 check whether the ink cartridges matching the print drum are in placed in the printing drums. If none of the ink cartridge set switches are pressed, "Install ink cartridge" is displayed; if incorrect cartridges are set, "Wrong type cartridge" is displayed.

### 7. Ink Supply System Mechanism

Inking is performed separately for each print drum.

#### No ink detection

Inking is performed if the ink sensor remains continuously OFF for a preset duration.

#### Ink overflow detection process

If the overflow sensor is continuously ON for a preset period of time, an overflow error message is given, and the printing operation is stopped.

### 8. Inner Pressure Mechanism

#### Inner pressure roller drive mechanism

The main motor rotates the inner pressure roller via the drive mechanism => drive joint => engagement pin => flange drive gear => flange gear => gear (Z38) => gear (Z31) => gear (Z40) => inner pressure drive gear.

#### Inner pressure roller vertical movement mechanism

The inner pressure roller is lifted up or pushed down during printing by switching the inner pressure clutch ON for 50 ms.

The inner pressure roller can be pushed down when the 2nd paper feed sensor is ON after the start of the printing.

The inner pressure clutch is switched ON at paper drum angle 250° from the position T for the 1st print drum and at 340° from position T for the 2nd print drum. When switching OFF the inner pressure clutch, the paper drum is at 310° from position T for the 1st print drum and at 400° from position T for the 2nd print drum.

The inner pressure detection sensor confirms that the inner pressure roller is at the lowered or raised position.

#### Inner pressure roller pressure regulation system

The printing pressure of the inner pressure roller on the paper drum is adjusted by the pressure control motor. The print pressure datum position is checked by the print pressure sensor. The print pressure limit sensor (encoder sensor) checks the rotation of the pressure control motor.

## 9. Print Drum Lock Mechanism

The print drums are locked by driving the print drum lock cam by the print drum lock motor.

The position of the drum lock cam is checked by the lock cam sensor.

The drum lock sensor confirms that the drum lock lever is in the lock position.

The drum lock motor rotates in one direction only.

Lock position: ..... Position at which the drum cam sensor changes from OFF to ON.

Release position: ..... Position at which the drum cam sensor changes from ON to OFF.

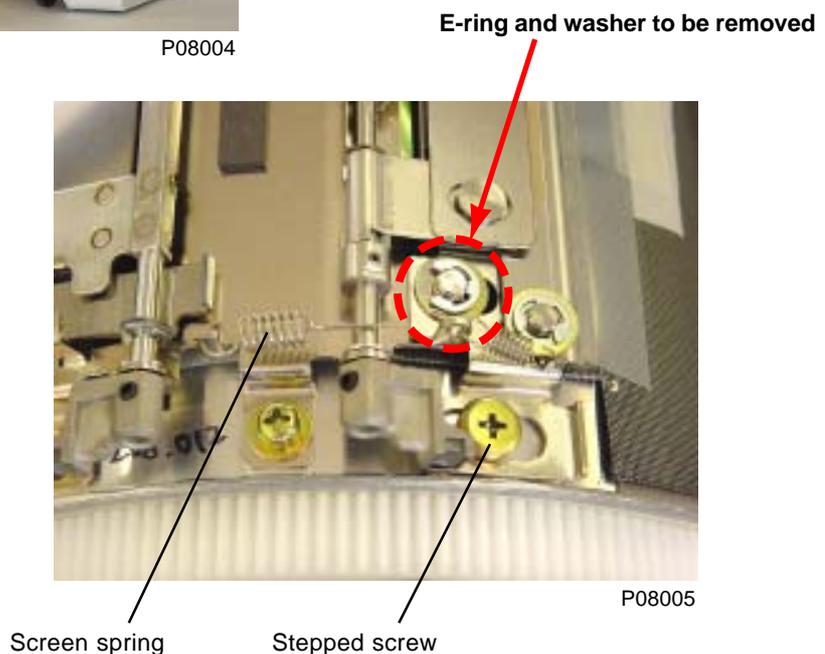
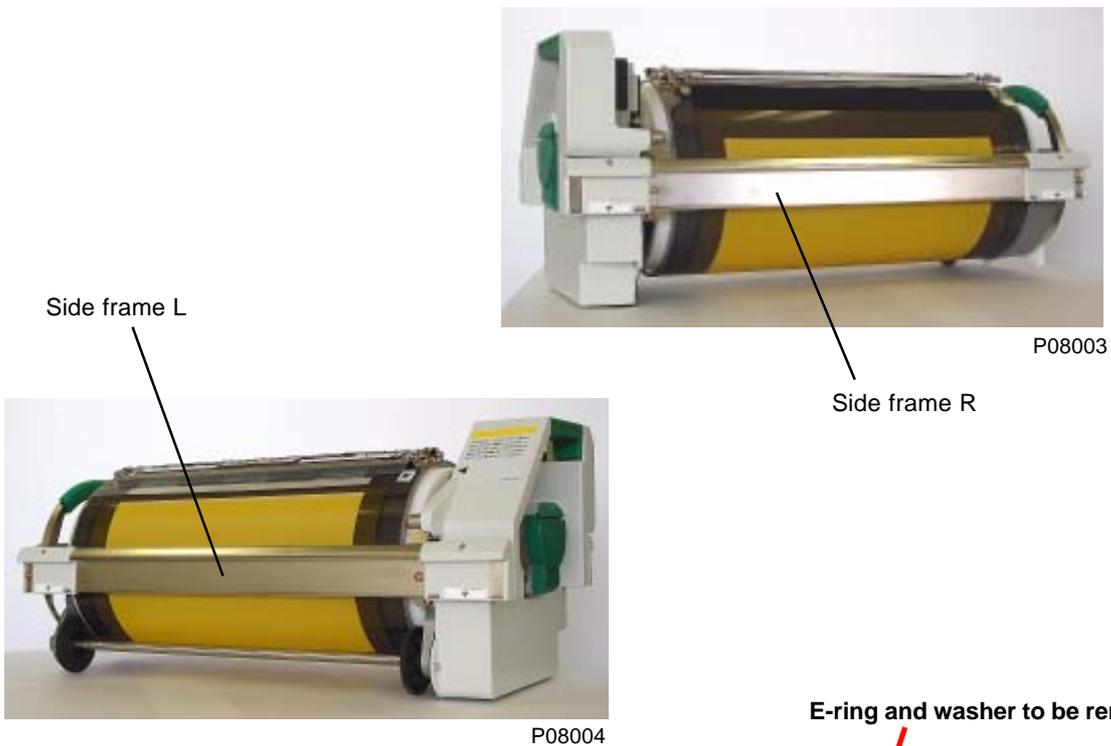
## 10. Master Clamp Mechanism

[Refer to "Chapter 10: CLAMP UNIT".](#)

## Disassembly

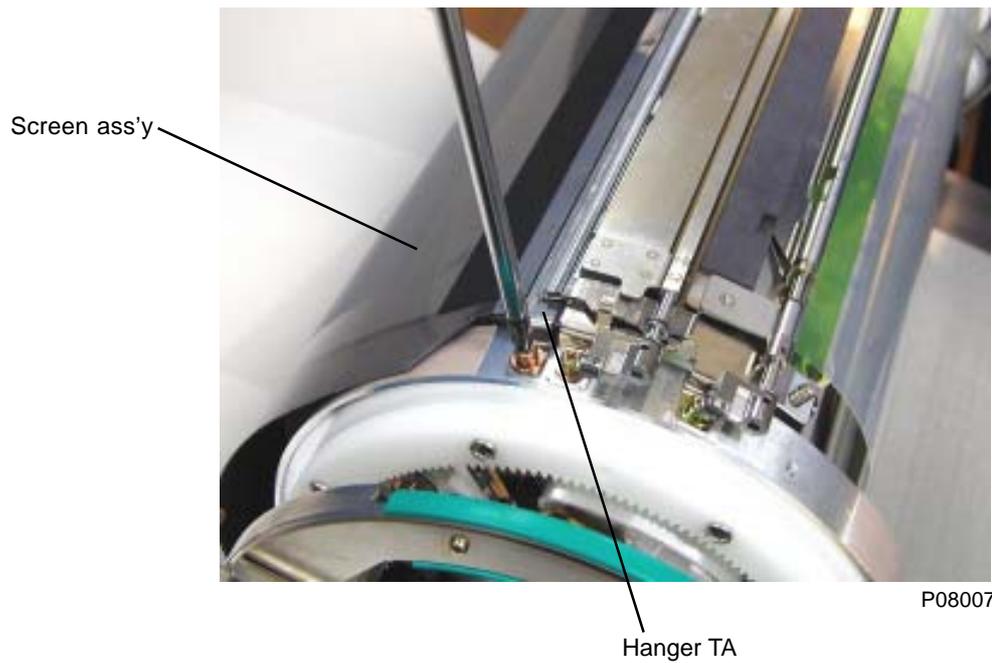
### 1. Removing the Screen Ass'y

- (1) Remove the side frame R and side frame L. (Five M4 x 8 screws on each)
- (2) Remove the two screen springs.
- (3) Remove the front and rear E-rings and washers. (Refer to the photograph below.)
- (4) Remove the front and rear stepped screws. Remove the clamp plate base ass'y from hanger E on the screen ass'y. (Refer to the photograph on the bottom and on the next page.)
- (5) Remove the two mounting screws on the hanger TA (M4 x 8), and remove the screen ass'y. (Refer to the photograph on next page.)





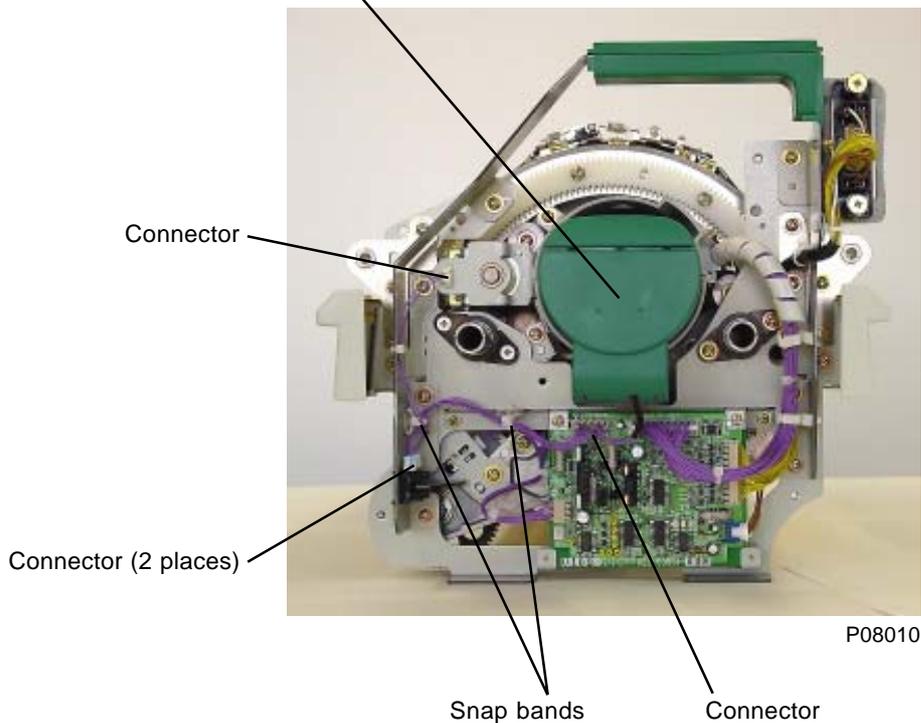
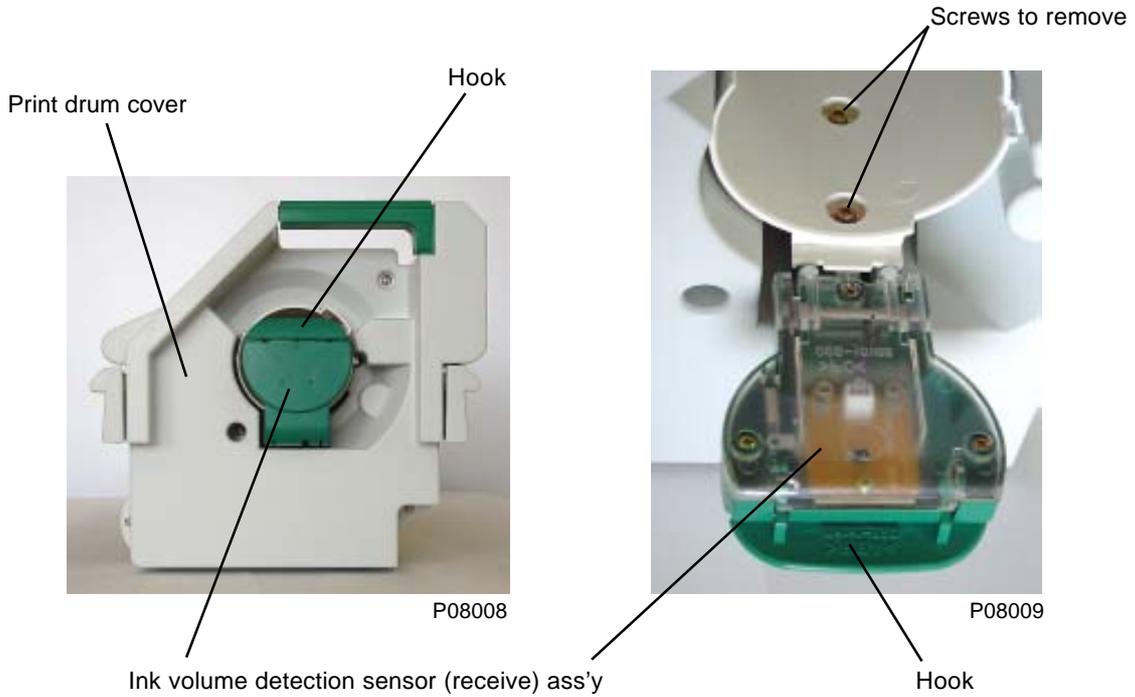
P08006



P08007

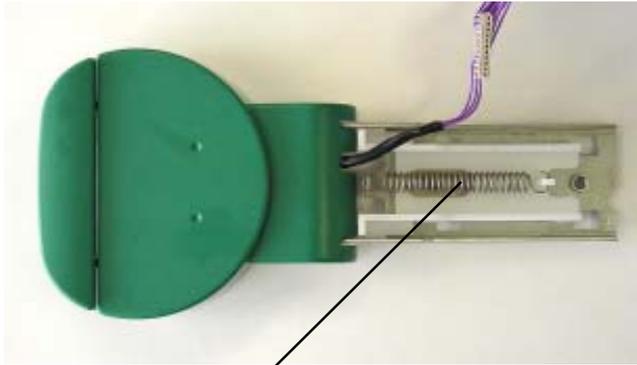
## 2. Removing the Ink Volume Detection Sensor (Receive) Ass'y

- (1) Remove the print drum cover. (Four M4 x 8 screws)
  - (2) Disconnect the four connectors and two snap bands, remove the two mounting screws (M4 x 8), and remove the ink volume detection sensor (receive) ass'y.
- \* When the ink volume detection sensor (receive) ass'y is closed, do not apply excessive force in opening it. Open it by releasing the hook.



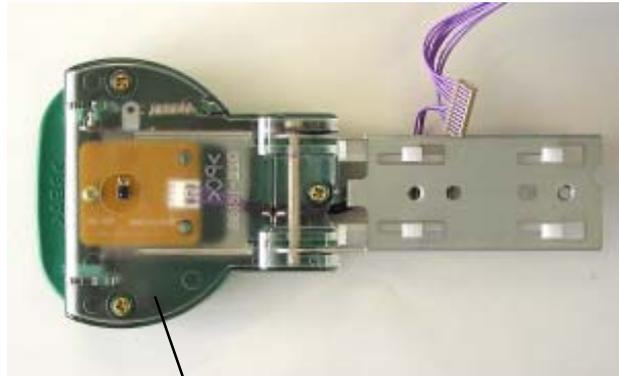
### 3. Removing the Ink Volume Detection Sensor (Receive)

- (1) Remove the print drum cover and detach the ink volume detection sensor (receive) ass'y.
- (2) Open the ink volume detection sensor (receive) ass'y flat on a table, and remove the bottle end cover spring.
- (3) Remove the three mounting screws (3 x 8), and remove bottle end cover B.
- (4) Disconnect the connector, remove the mounting screw (3 x 8), and remove the ink volume detection sensor (receive) PCB with the ink volume detection sensor (receive) attached.



P08011

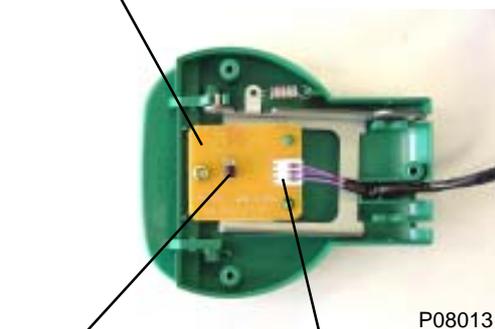
Bottle end cover spring



P08012

Bottle end cover B

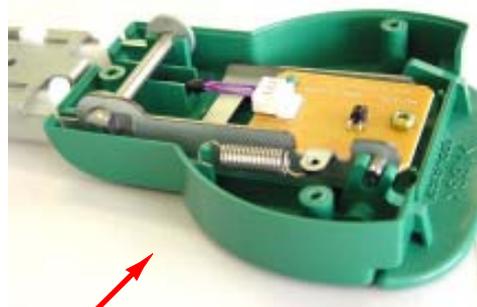
Ink volume detection sensor (receive) PCB



P08013

Ink volume detection sensor (receive)

Connector



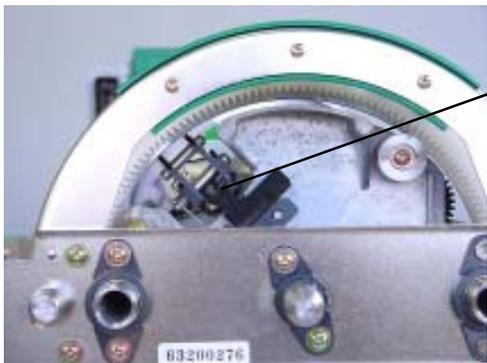
P08014

Layout of components inside the ink volume detection sensor (receive) ass'y

#### 4. Removing the Ink Volume Detection Sensor (Send) Ass'y

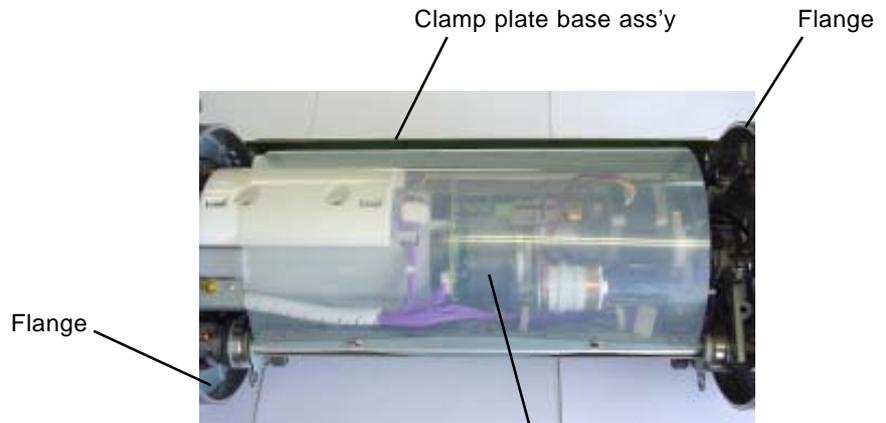
- (1) Remove the screen ass'y.
- (2) Release the position-B lock plate, and rotate the flange to bring the clamp plate base ass'y to the side.
- (3) Loosen the four mounting screws (M4 x 6). Remove the dome sheet.
- (4) Disconnect the connector, remove the two mounting screws (M4 x 8) and remove the ink volume detection sensor (send) ass'y.

\* Do not disassemble the ink volume detection sensor (send) ass'y.



Position-B lock plate

P08015



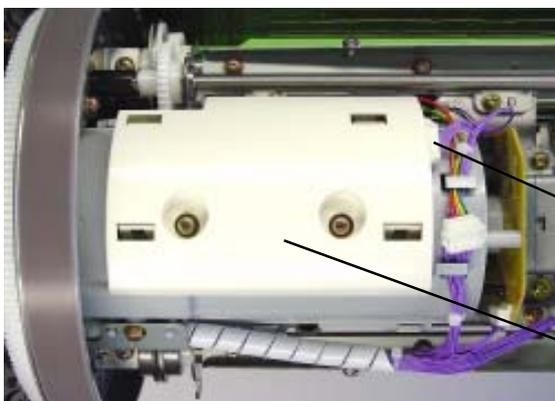
Clamp plate base ass'y

Flange

Flange

P08016

Dome sheet



Connector

Ink volume detection sensor (send) ass'y

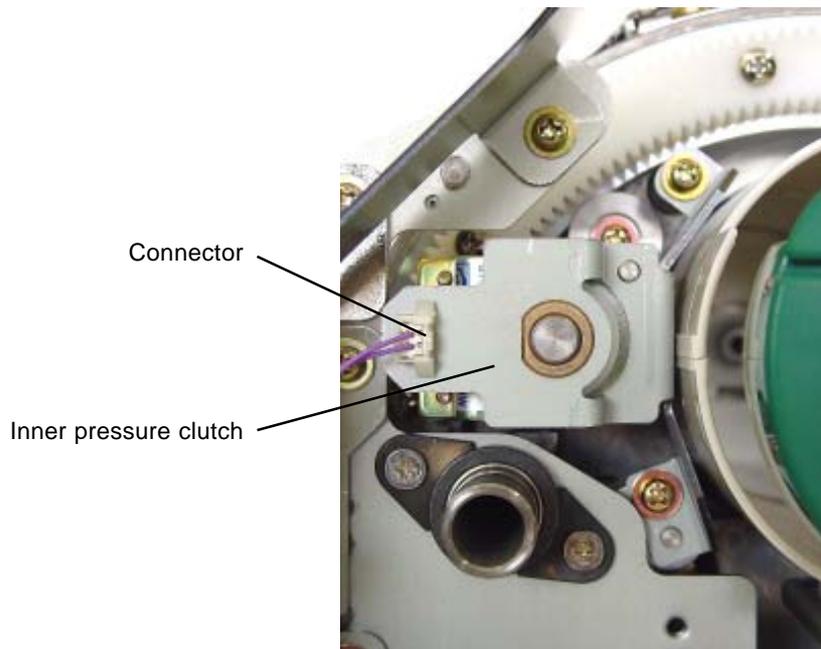
P08017

## 5. Removing the Inner Pressure Clutch

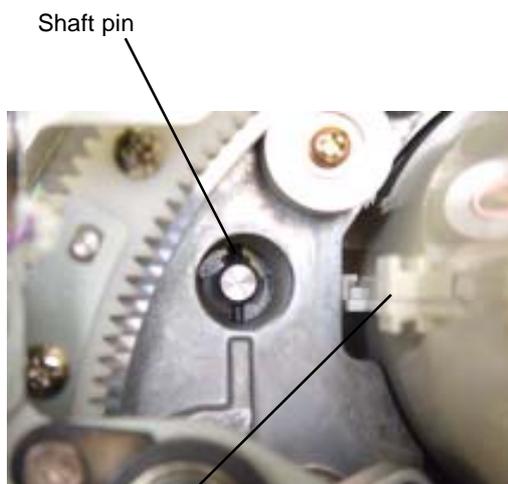
- (1) Remove the print drum cover. (Four M4 x 8 screws)
- (2) Disconnect the connector, remove the two mounting screws (M4 x 8), and remove the inner pressure clutch.

### [Precautions on Reassembly]

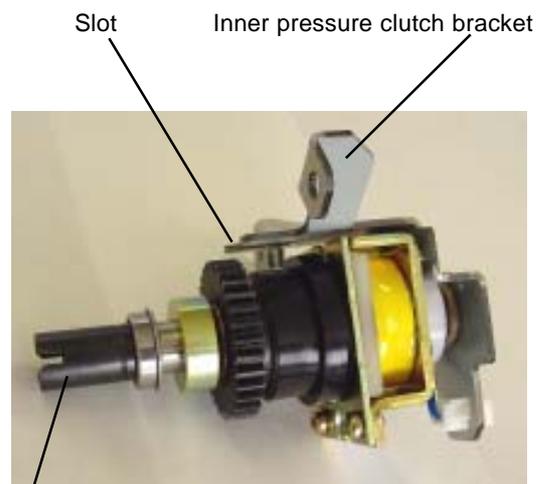
- Align the shaft pin with the slot in the clutch shaft.
- Engage the slot in the inner pressure clutch bracket with the protrusion on the bottle guide.



P08018



P08019



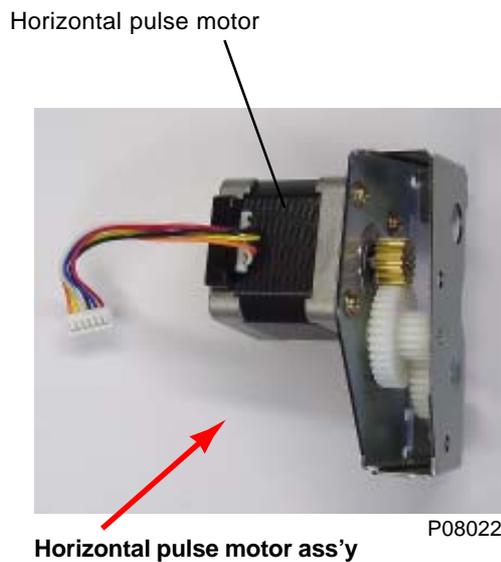
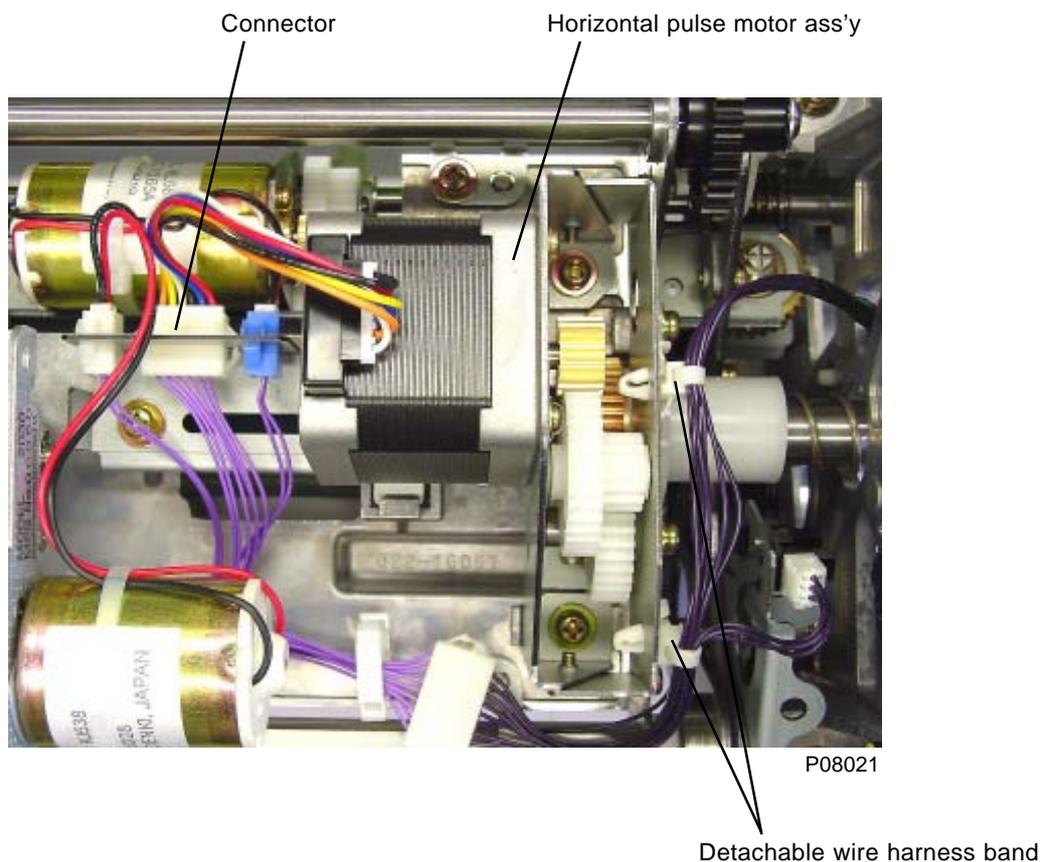
P08020

Protrusion on the bottle guide

Slot in the clutch shaft

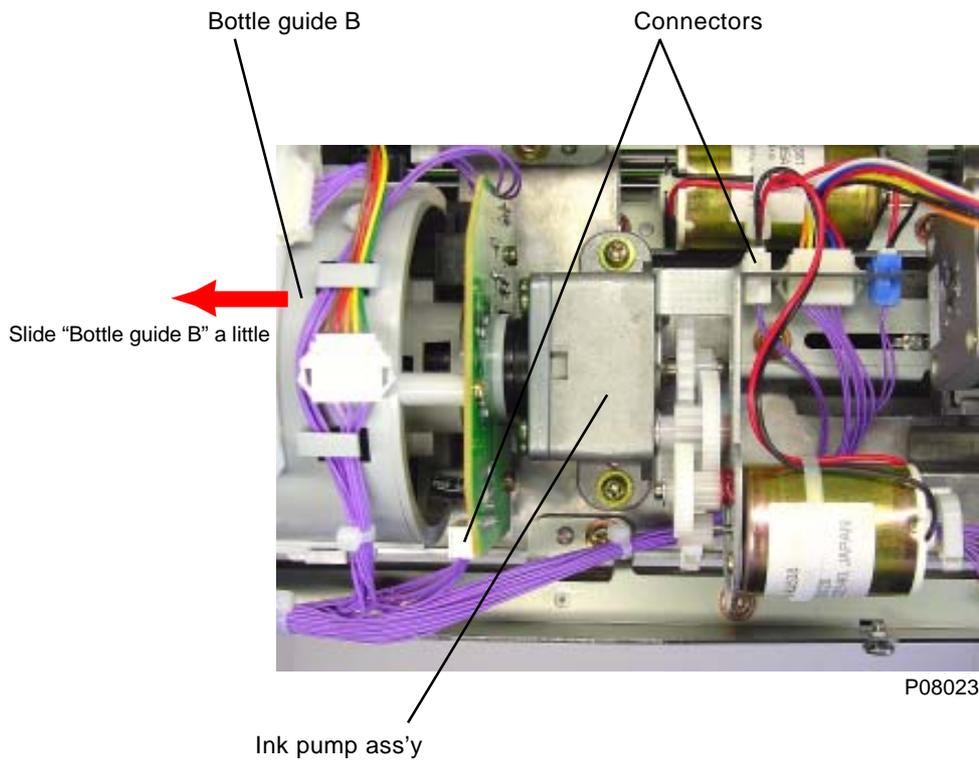
## **6. Removing the Horizontal Pulse Motor Ass'y**

- (1) Remove the screen ass'y.
- (2) Loosen the four mounting screws (M4 x 6) and remove the dome sheet.
- (3) Disconnect the connector, unplug two detachable wire harness bands, and remove the horizontal pulse motor ass'y by removing two mounting screws (M4 x 8).



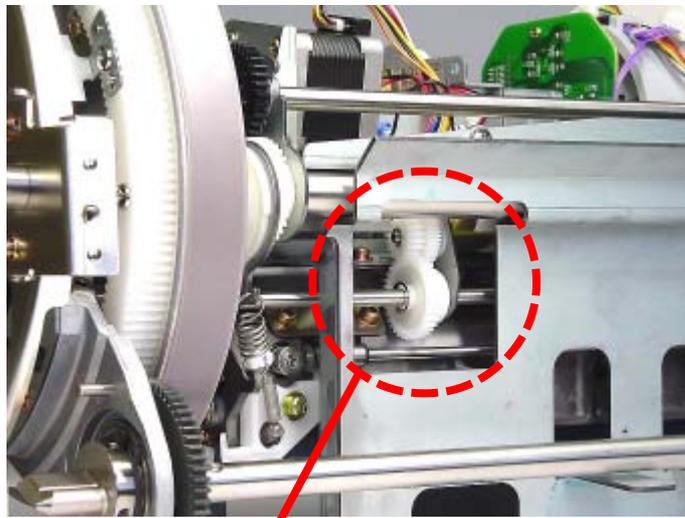
## 7. Removing the Ink Pump Ass'y

- (1) Remove the print drum cover.
- (2) Remove the screen ass'y.
- (3) Loosen the four mounting screws (M4 x 6) and remove the dome sheet.
- (4) Remove the inner pressure clutch ass'y.
- (5) Slide bottle guide B to one side and disconnect two connectors. Remove two mounting screws (M4 x 8) to detach the ink pump ass'y.

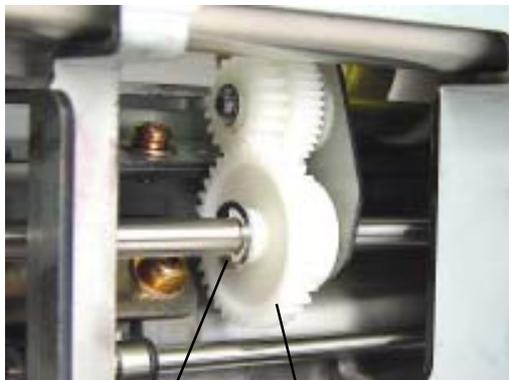


## 8. Removing the Pressure Control Motor

- (1) Remove the print drum cover.
- (2) Remove side frames L and R.
- (3) Remove the screen ass'y.
- (4) Loosen the four mounting screws (M4 x 6) and remove the dome sheet.
- (5) Lower the inner pressure roller.
- (6) Remove E-ring and slide the spur gear aside.
- (7) Pull out parallel pin and remove the metal bearing from the shaft.
- (8) Pull out the connector and remove screw (M4x8) to detach the pressure control motor assembly, together with the motor mounting bracket.

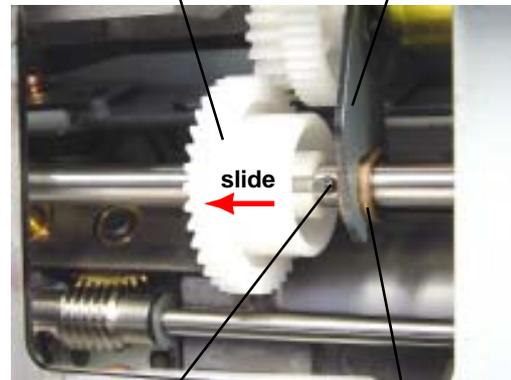


P08025



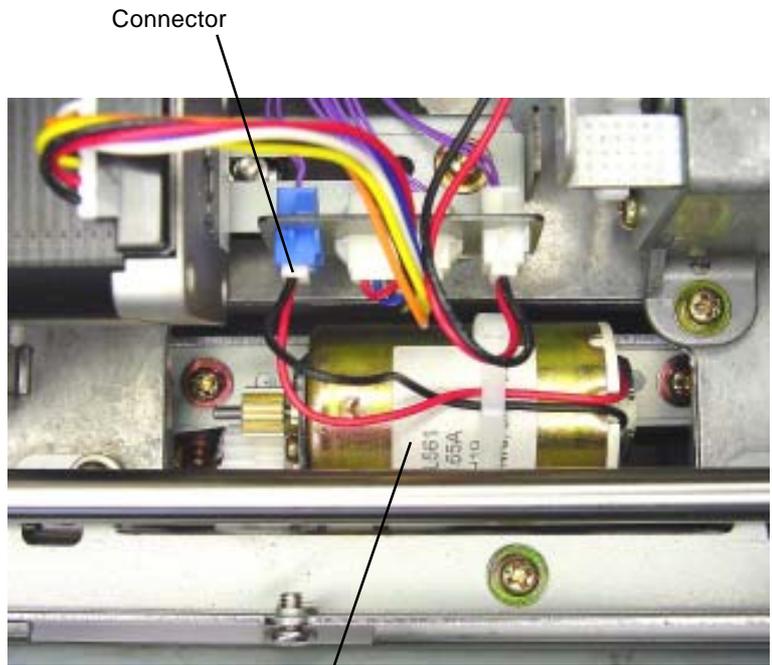
P08026

E-ring      Spur gear



P08027

Parallel pin      Metal bearing



P08028

Pressure control motor ass'y



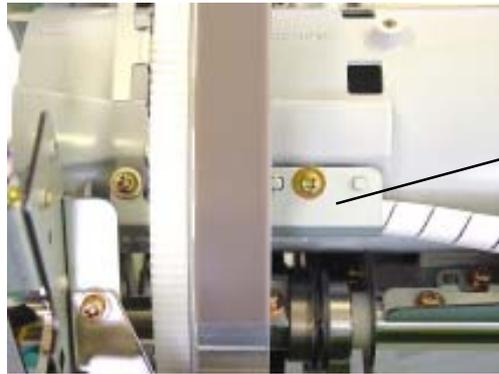
P08029

Pressure control motor ass'y

## 9. Removing the Ink Sensor PCB

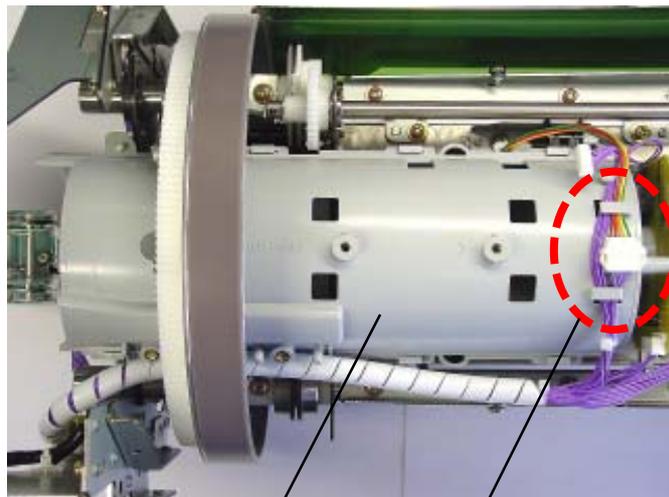
- (1) Remove the print drum cover.
- (2) Remove the screen ass'y.
- (3) Loosen the four mounting screws (M4 x 6) and remove the dome sheet.
- (4) Remove the inner pressure clutch ass'y.
- (5) Disconnect the connector and remove the ink volume detection sensor (send) ass'y.
- (6) Remove the three mounting screws (3 x 8), and remove bottle end cover B.
- (7) Remove the two mounting screws (M4 x 8), and remove the wire harness holding plate.
- (8) Unhook wire harness from the wire harness hook on the bottle guide B and remove bottle guide B.
- (9) Remove bottle guide A. (Two M4 x 8 screws)
- (7) Disconnect the connector, remove the mounting screw (M4 x 8), and remove the ink sensor PCB ass'y.

\* **Release lock on the connector of the ink sensor PCB before disconnecting the connector.**



Wire holding plate

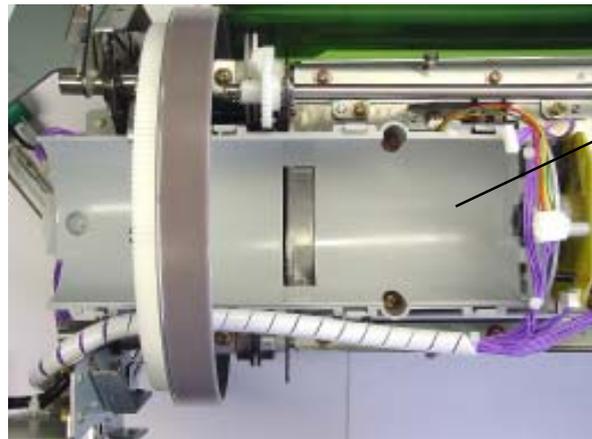
P08030



Bottle guide B

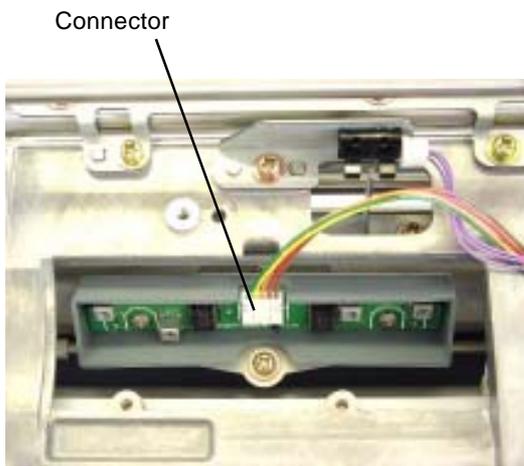
Wire harness hook on the Bottle guide B

P08031



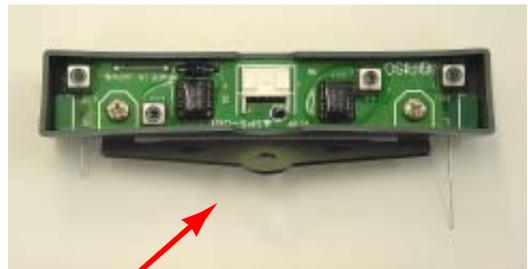
Bottle guide A

P08032



Connector

P08033



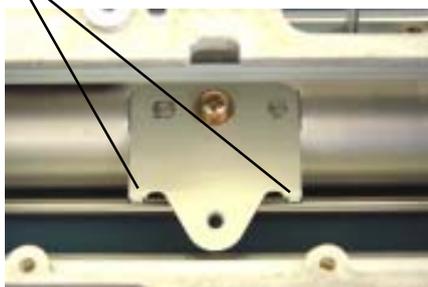
Ink sensor PCB ass'y

P08034

**[Precautions on Reassembly]**

Engage the protrusions on ink sensor PCB bracket A with the slots in ink sensor PCB bracket B.

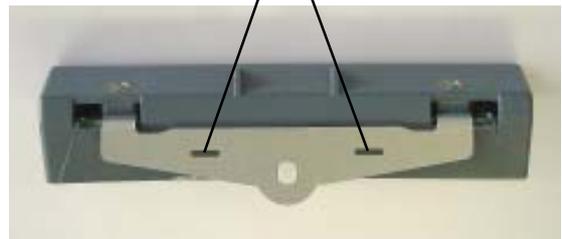
Protrusions on ink sensor PCB bracket A



Ink sensor PCB bracket A

P08035

Slots in ink sensor PCB bracket B

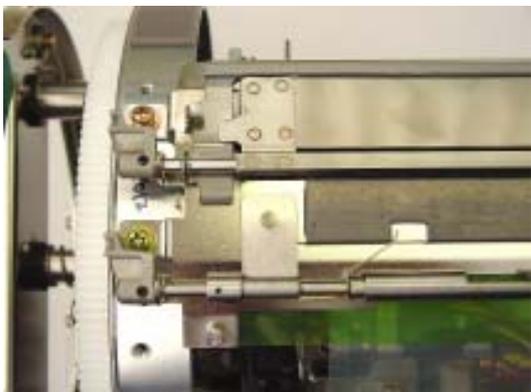


Ink sensor PCB bracket B

P08036

## 10. Removing the Clamp Plate Base Ass'y

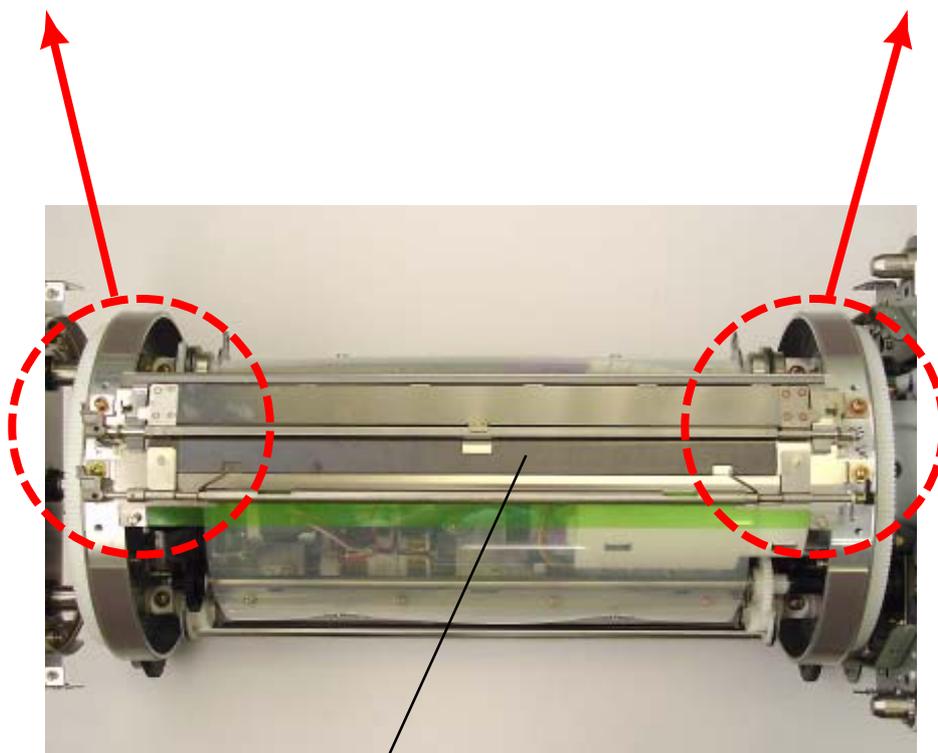
- (1) Remove the screen ass'y.
- (2) Remove the four mounting screws (M4 x 8). Remove the clamp plate base ass'y.



P08037



P08038



P08039

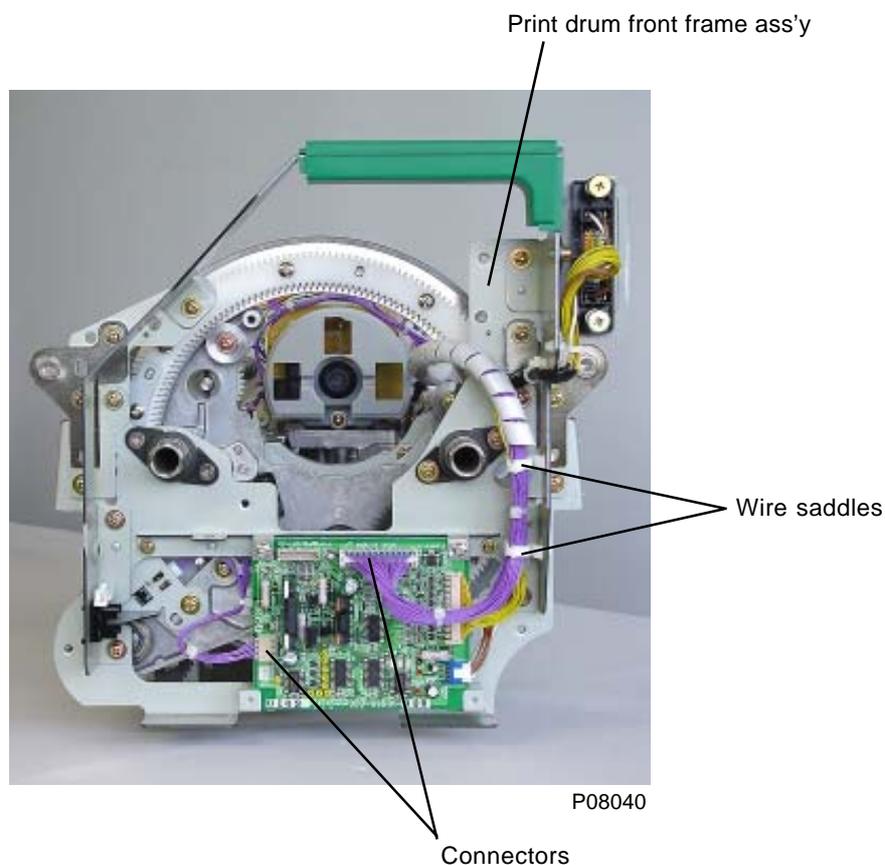
Clamp plate base ass'y

## 11. Removing the Inner Pressure Roller Unit

- (1) Activate test mode No.558 to print and remove the ink from the Print Drum.
- (2) Remove the print drum from the machine. Remove the following components:
  - Print drum cover
  - Side frames L and R
  - Screen ass'y
  - Clamp plate base ass'y
  - Dome sheet
  - Ink volume detection sensor (receive) ass'y
  - Ink volume detection sensor (send) ass'y
  - Wire holding plate (Refer to page 8-16)
  - Inner pressure clutch
  - Bottle guide B
  - Bottle guide A
  - Ink sensor PCB ass'y

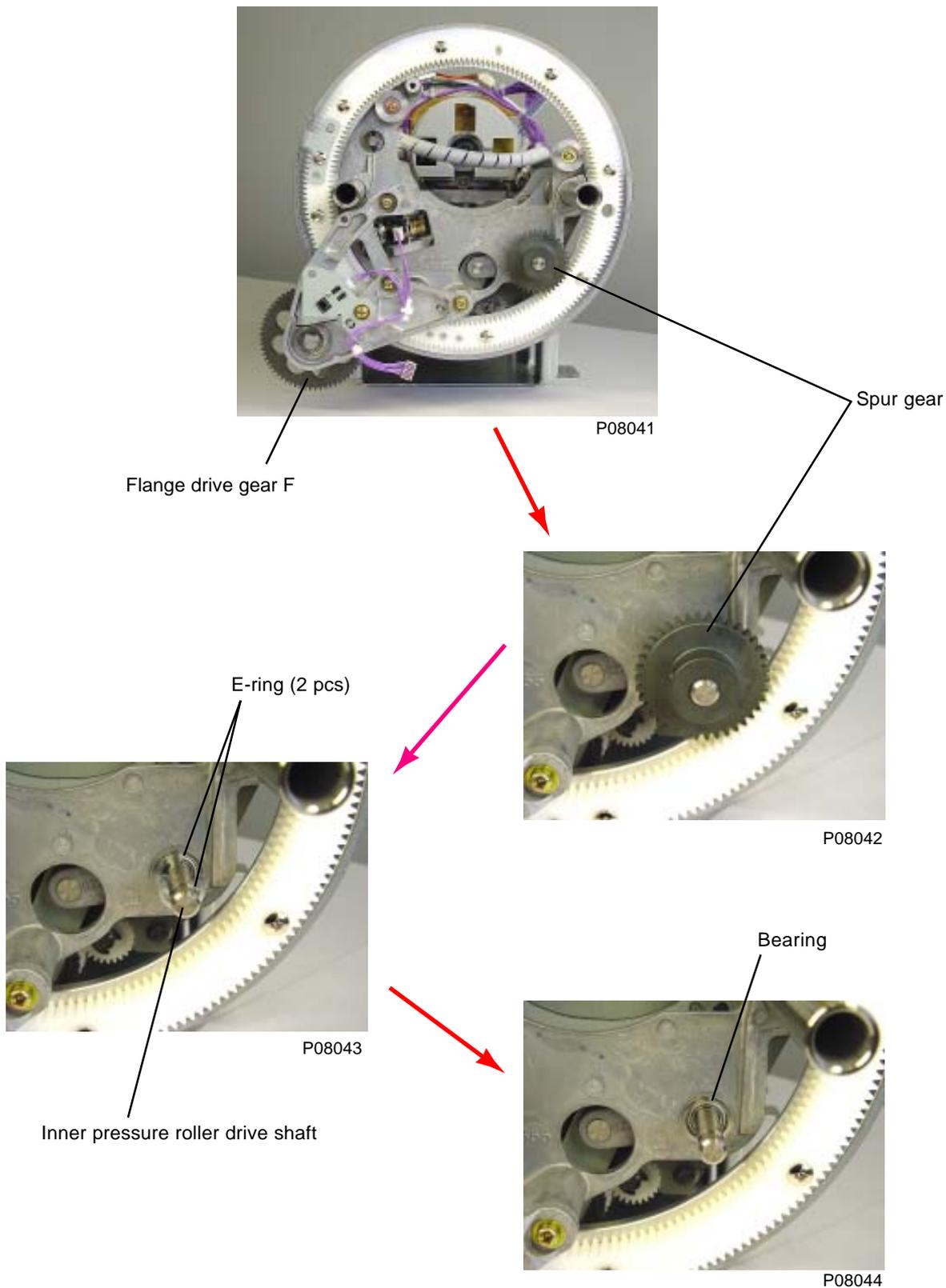
**From steps (3) to (7), which continues, are all on the front (operating) side of the machine.**

- (3) Disconnect the two connectors, detach the wire harness from the two wire saddles, and remove the print drum front frame ass'y.

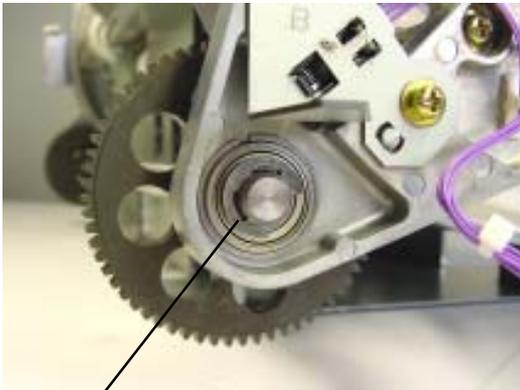


## CHAPTER 8. PRINT DRUM SECTION

- (4) Loosen two set screws and remove the spur gear from the inner pressure roller drive shaft.
- (5) Remove two E-rings and detach the bearing.



- (6) Detach the E-ring on the flange drive gear shaft and loosen the two set screws on flange drive gear F. Disconnect the connector on the inner pressure limit sensor (encoder sensor), confirming that the inner pressure detection plate is positioned in between the sensor. Then remove the two mounting screws (M4 x 8) on the print drum flange F ass'y and slide the print drum flange F ass'y and flange drive gear F to remove.



E-ring on the Flange drive gear



Flange drive gear F

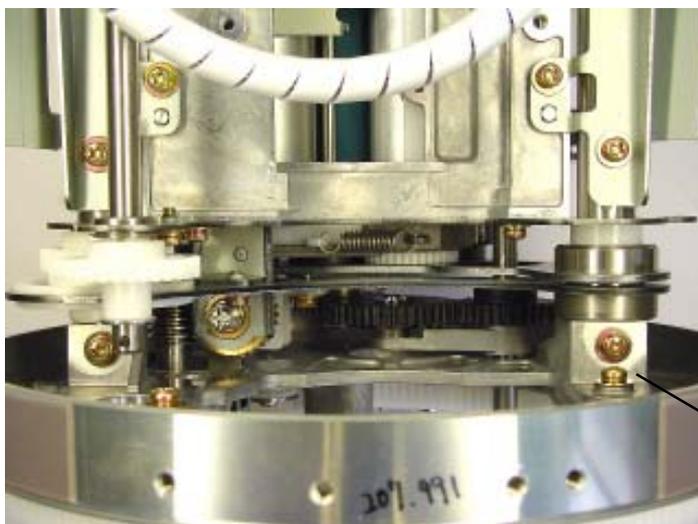


Inner pressure detection plate

Inner pressure limit sensor (encoder sensor)

Connector

P08047

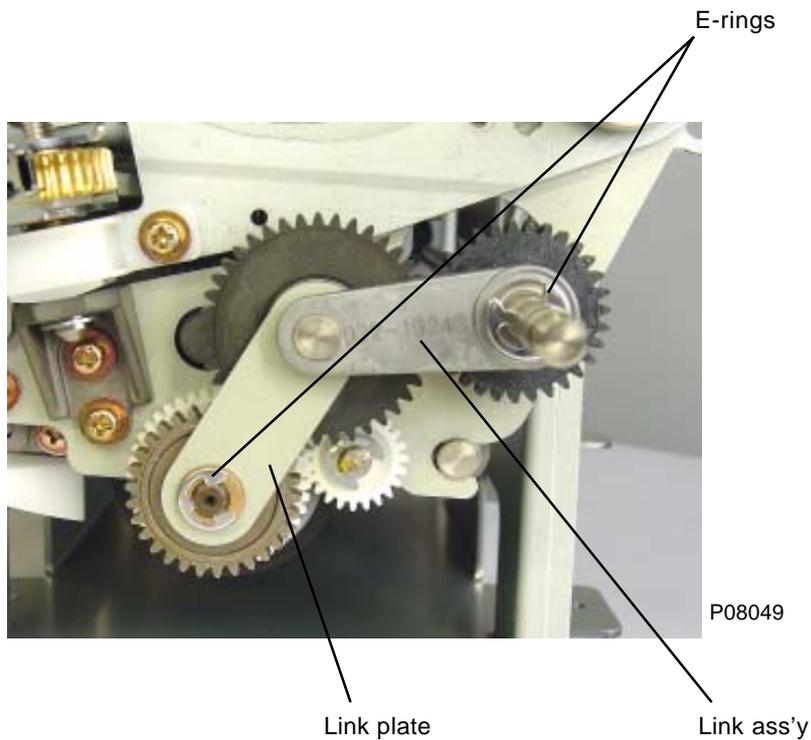


Print drum flange F ass'y

P08048

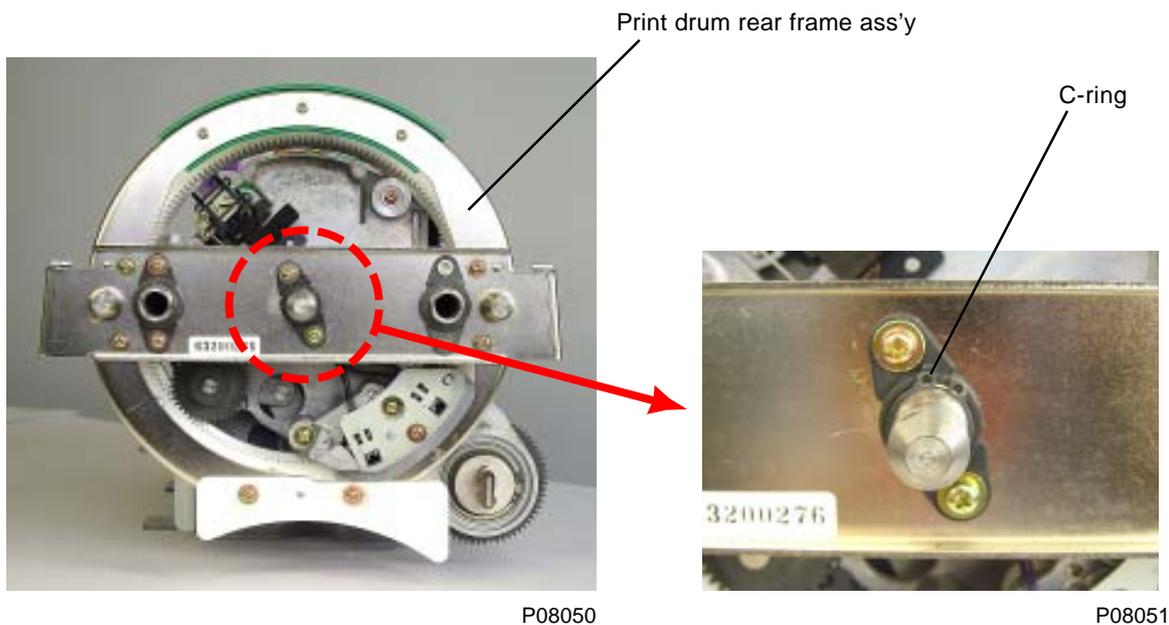
## CHAPTER 8. PRINT DRUM SECTION

(7) Detach the E-rings and remove the link plate and link ass'y.

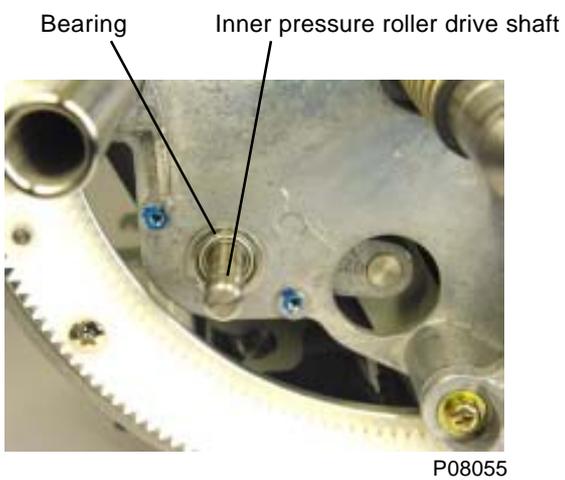
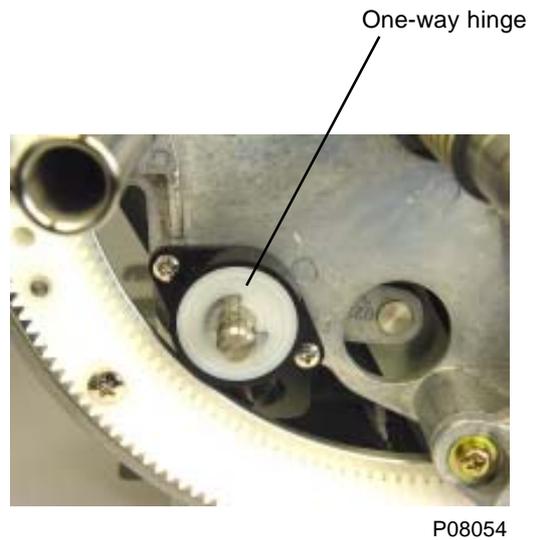
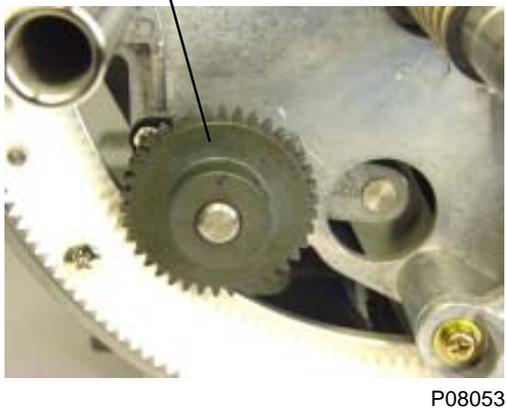
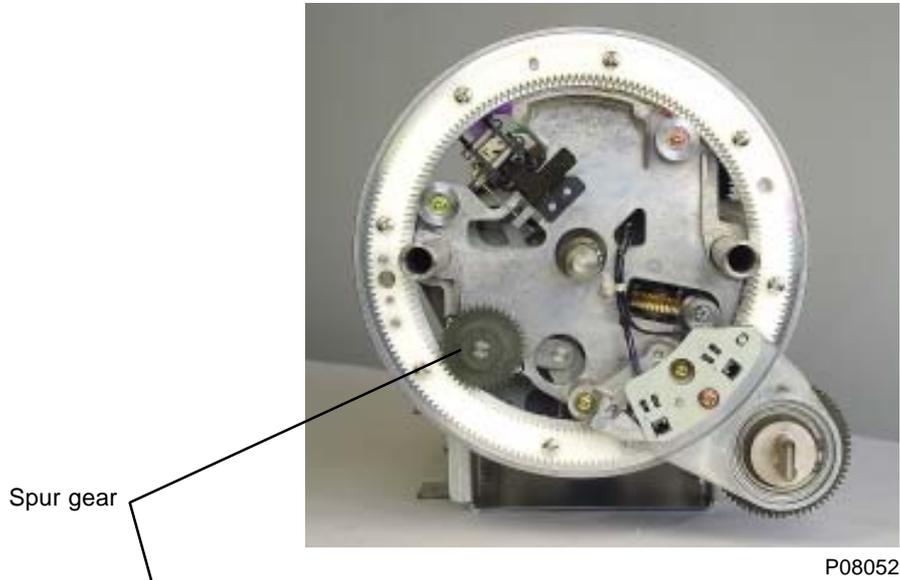


From steps (8) to (15), which continues, are all on the rear (drive) side of the machine.

(8) Remove C-ring and detach print drum rear frame ass'y.



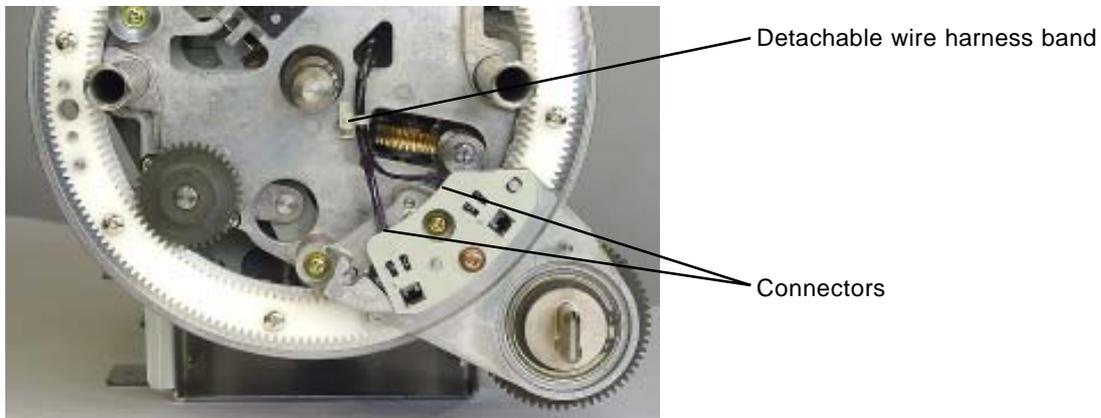
- (9) Loosen two set screws and remove the spur gear.
- (10) Remove E-ring, two screws (M3x8), and detach one-way hinge.
- (11) Remove the bearing.



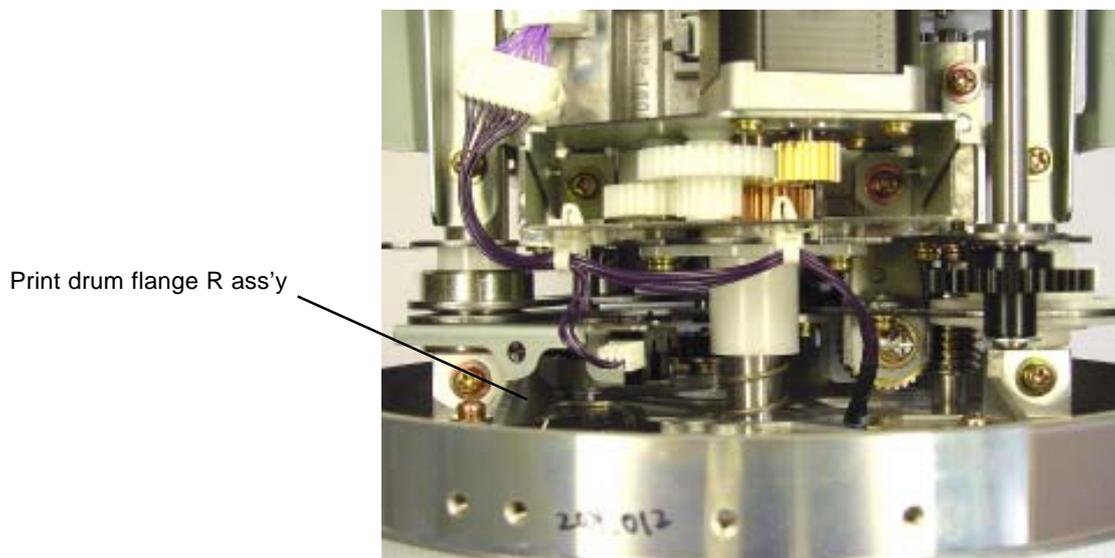
## CHAPTER 8. PRINT DRUM SECTION

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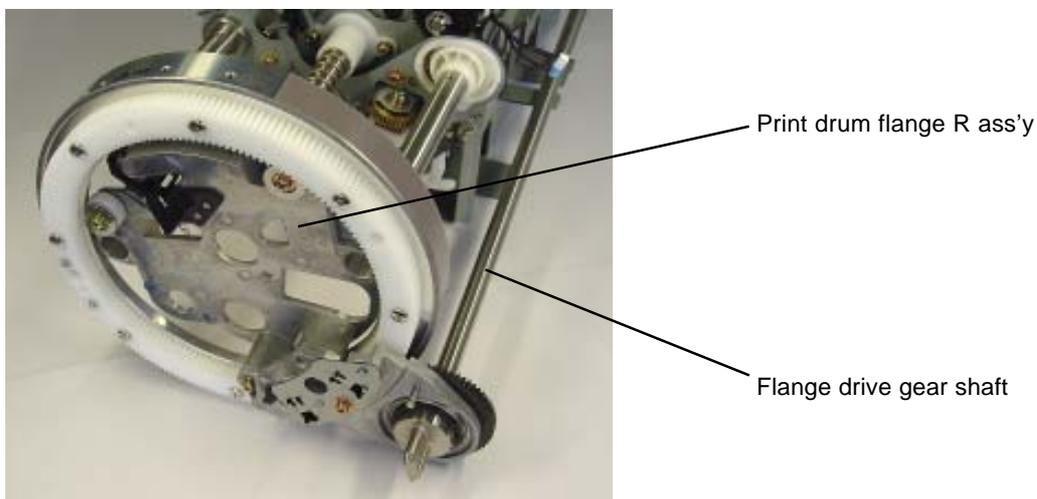
- (12) Unplug two sensor connectors and remove one detachable wire harness band.
- (13) Remove two mounting screws (M4 x 8) on the print drum flange R ass'y and slide the print drum flange R ass'y together with flange drive gear shaft attached to remove.



P08056

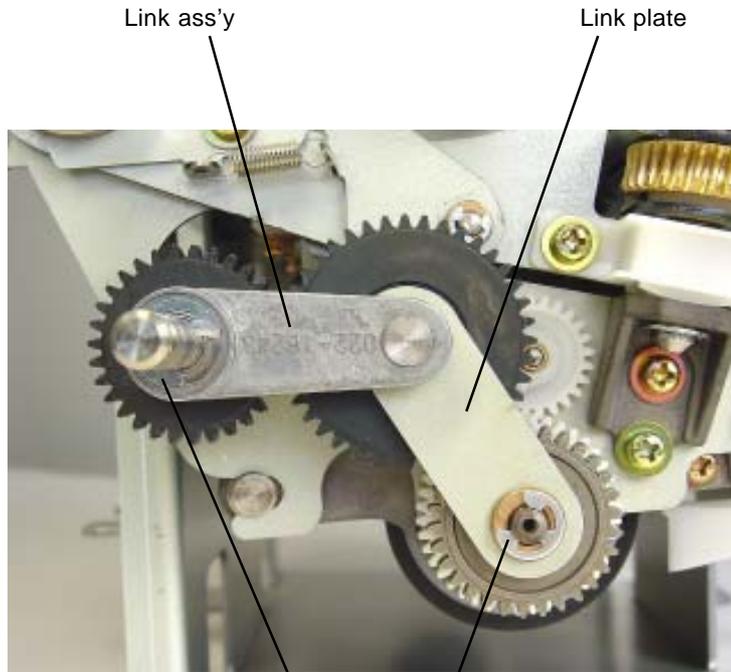


P08057



P08058

(14) Detach the E-rings and remove the link plate and link ass'y.



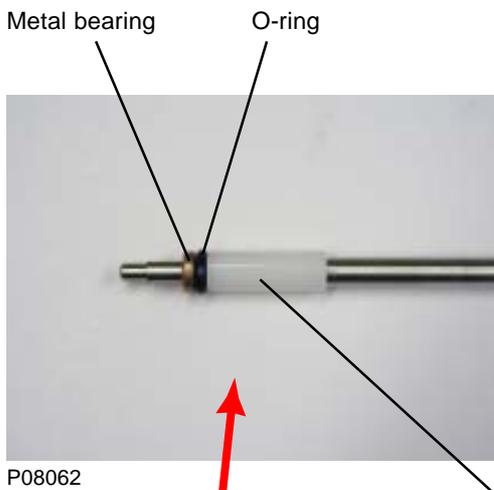
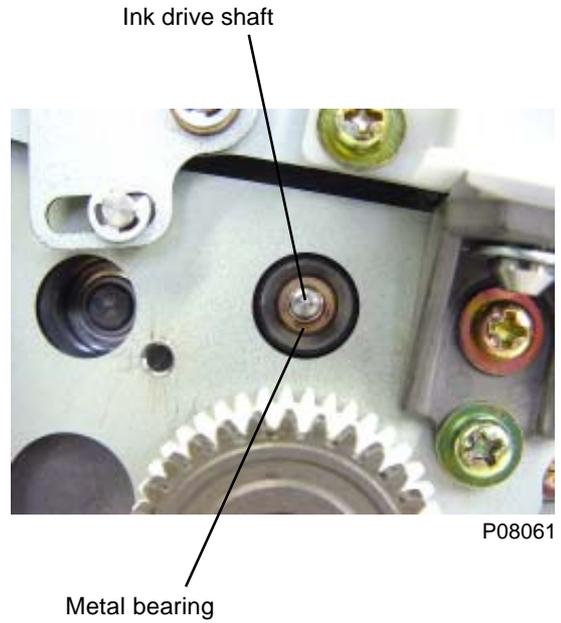
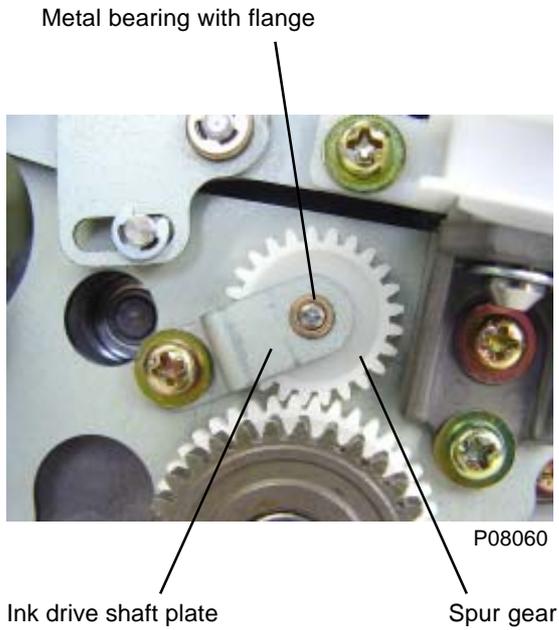
P08059

E-rings

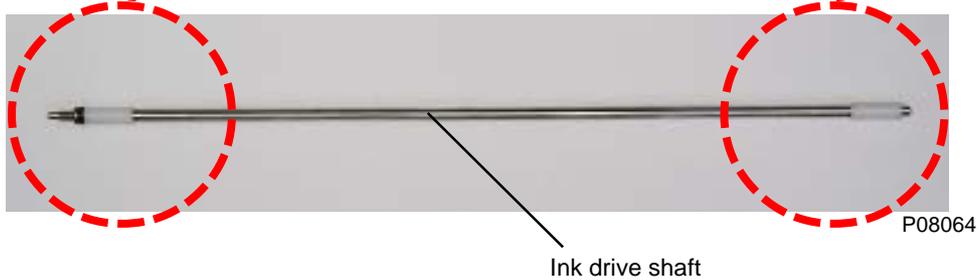
## CHAPTER 8. PRINT DRUM SECTION

(15) Detach ink shaft drive plate by removing screw (M4x8), and remove metal bearing with flange, spur gear, and then pull out the ink drive shaft.

\* Do not misplace the metal bearing between the spur gear and the O-ring.

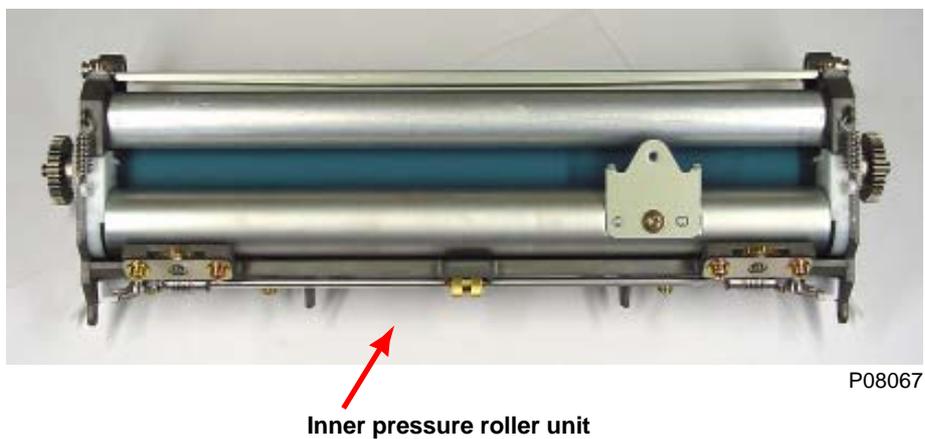
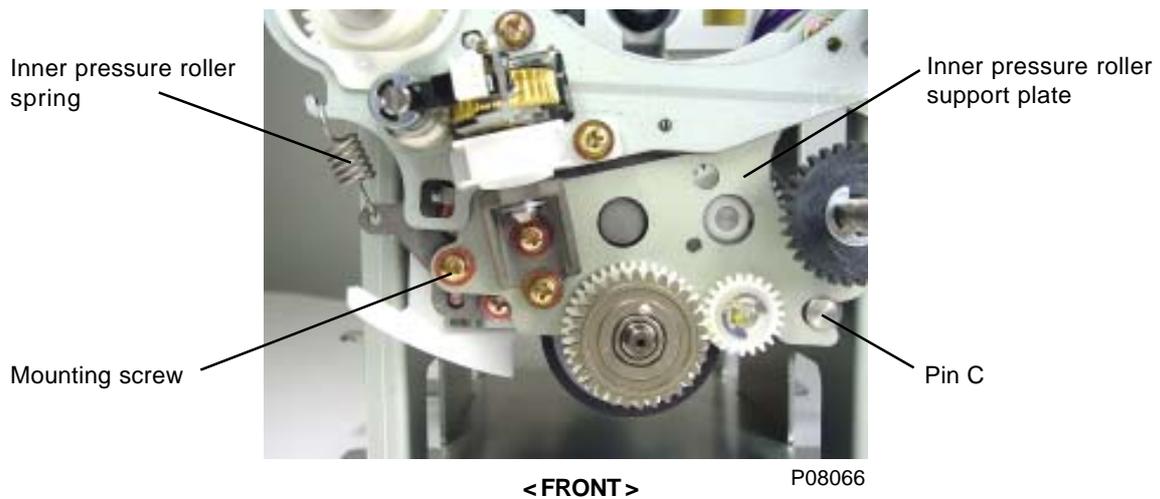
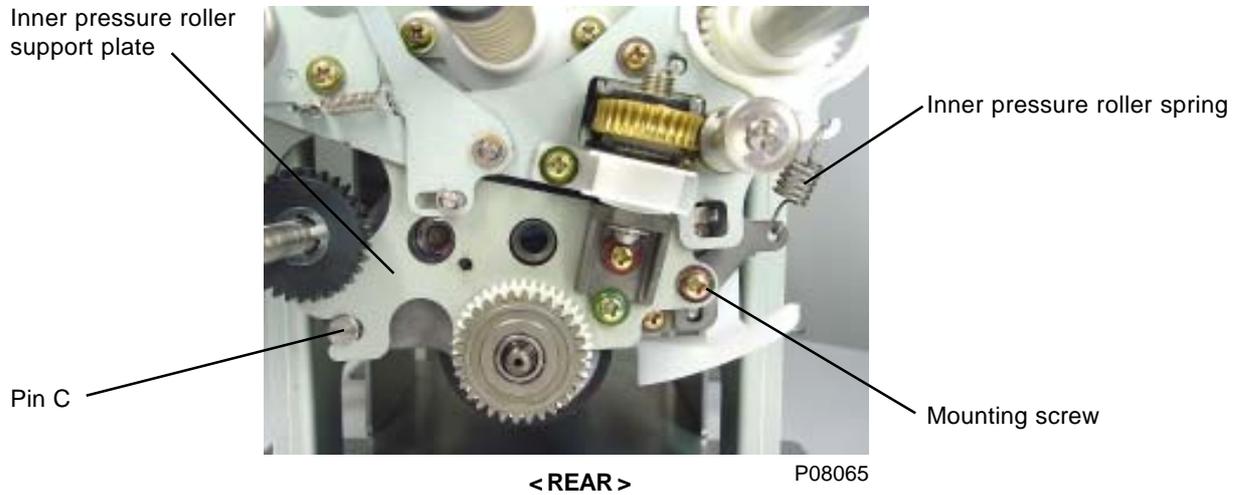


Ink drive collar



(16) Detach inner pressure roller springs (one each on FRONT and REAR) and remove mounting screw (M4x8) on each side. Detach pin C on the inner pressure roller unit from the slot in the inner pressure roller support plate and remove the inner pressure roller unit.

<Refer to page No. 8-28 for the assembly instructions>



**Assembling back the inner pressure roller unit**

- (1) Mount the inner pressure roller unit.

**Fix the inner pressure roller unit on the print drum by two mounting screws after attaching pin C in the slot in the inner pressure roller support plate and after attaching the inner pressure roller springs.**



Slot in the Inner pressure roller support plate.

P08068



P08069

Pin C



Inner pressure roller spring

P08070

- (2) Insert ink drive shaft, and mount spur gear and ink drive shaft plate.

**Firmly push the metal bearing and O-ring on the ink drive shaft with the spur gear for firm insertion of the O-ring.**

- (3) Mount link plate and link ass'y on both end of the print drum.

**Refer to the photographs on pages 8-22 and 8-25 for correct gear positions.**

- (4) Mount print drum flange R ass'y.

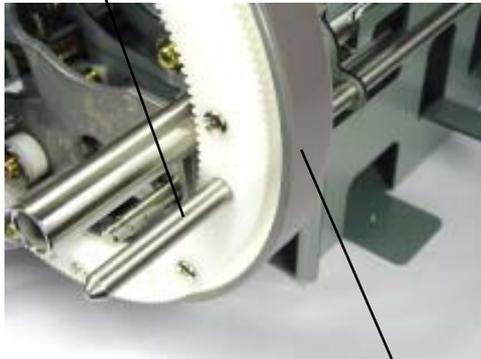
- (5) Mount detachable wire harness band and plug two connectors.

- (6) Mount print drum flange F ass'y while placing flange drive gear F on flange drive gear shaft.

**The two set screws on the flange drive gear F should face in the easy to access direction after the 8 mm diameter shaft (JIG) is inserted in next step (7). Tighten set screws by step (8).**

- (7) Align the position of print drum flanges R and F by inserting 8 mm diameter long-shaft (JIG) through the holes on the two flanges.

8 mm diameter long-shaft (JIG)



P08071

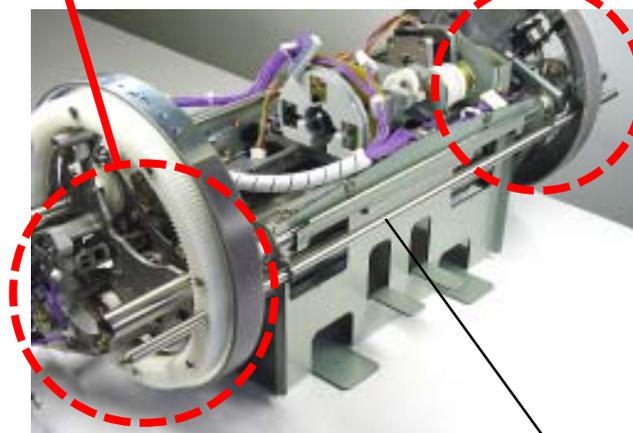
8 mm diameter long-shaft (JIG)



P08072

Print drum flange F ass'y

Print drum flange R ass'y



P08073

8 mm diameter long-shaft (JIG)

## CHAPTER 8. PRINT DRUM SECTION

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- (8) Attach E-ring on the flange drive gear shaft, and then pull the flange drive gear F against the bearing and tighten the two set screws on the gear.
- (9) Install bearing, one-way hinge, E-ring, and spur gear on the rear side of the inner pressure roller drive shaft.

**Push the spur gear against the E-ring when tightening the set screws.**

- (10) Install bearing, E-ring (2 pcs), and spur gear on the front side of the inner pressure roller.

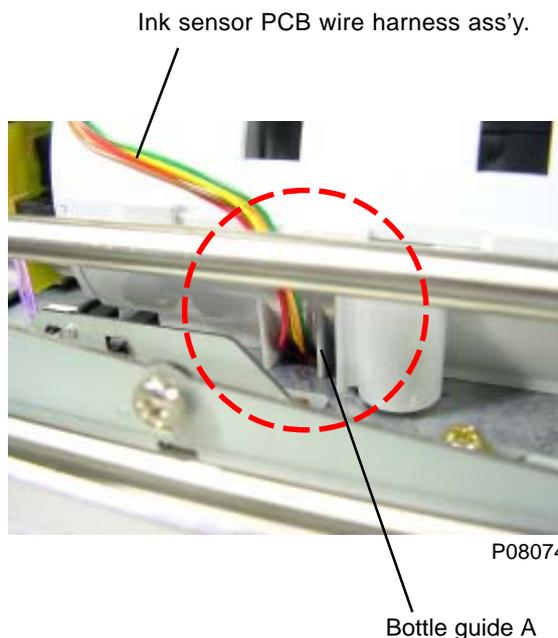
**Push the spur gear against the E-ring when tightening the set screws.**

- (11) Remove the 8 mm diameter long-shaft (JIG).
- (12) Mount print drum rear frame ass'y and attach C-ring.
- (13) Attach connector to the inner pressure limit sensor (encoder sensor).
- (14) Mount print drum front frame ass'y , run wire harness though two wire harness saddles, and connect two connectors on the print drum PCB.
- (15) Install following remaining parts on the print drum to complete the assembly.

- Ink sensor PCB ass'y
- Bottle guide A

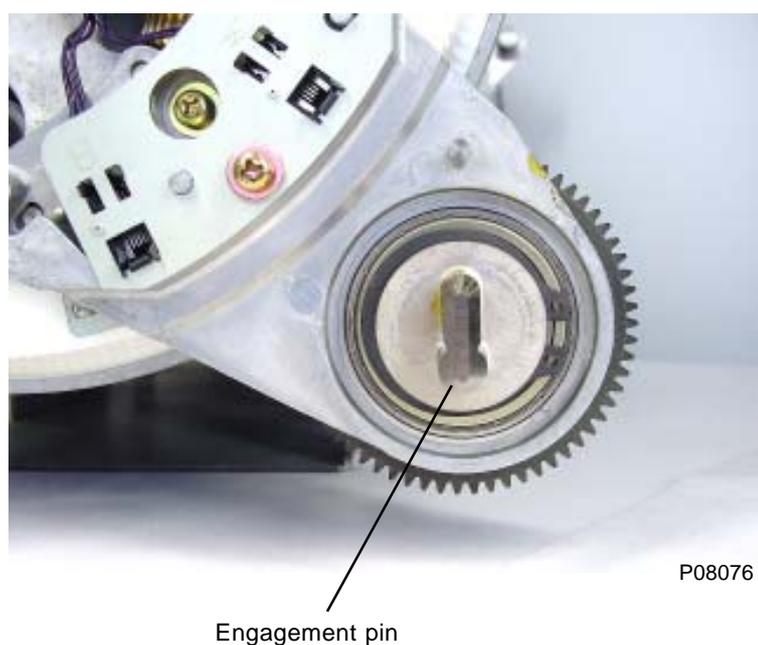
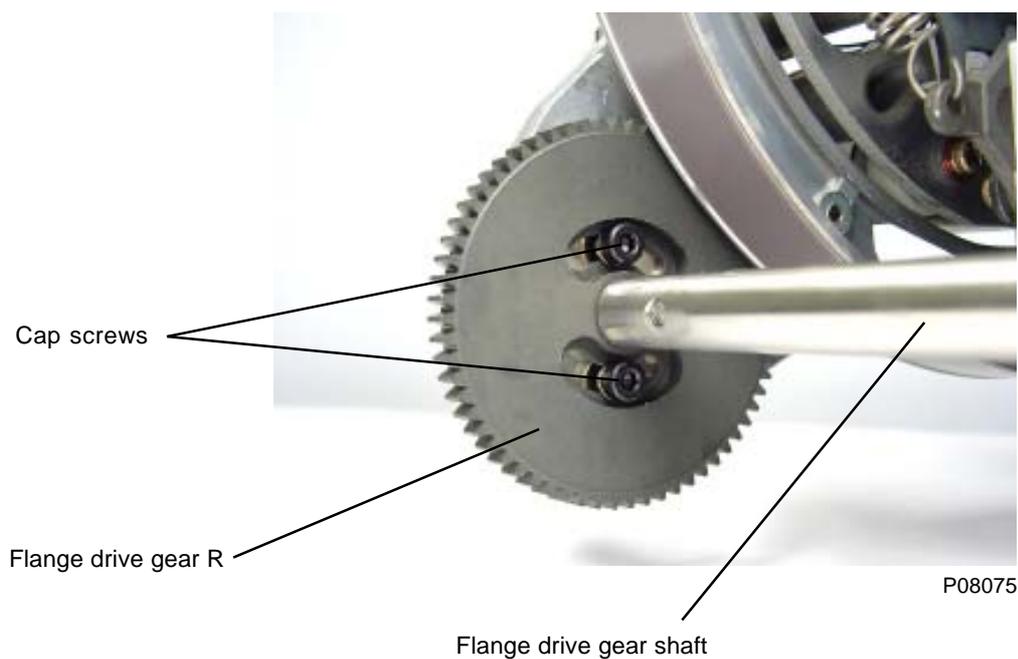
**Make sure not to pinch the ink sensor PCB wire harness ass'y. (Refer to photograph below)**

- Bottle guide B
- Inner pressure clutch
- Wire holding plate
- Ink volume detection sensor (send) ass'y
- Ink volume detection sensor (receive) ass'y
- Dome sheet
- Clamp plate base ass'y
- Screen ass'y
- Side frames L and R
- Print drum cover



## 12. Removing the Engagement Pin

- (1) Remove following parts from the print drum.
  - Print drum cover
  - Screen ass'y
  - Print drum rear frame ass'y
- (2) Remove two mounting screws of the flange drive gear R. (Cap screw M4x8 + 4 mm spring washer)
- (3) Remove the engagement pin by loosening two set screws.



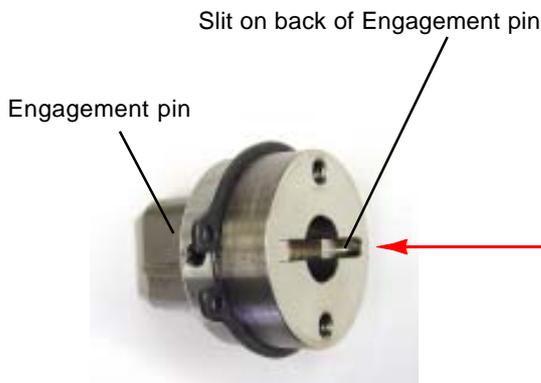
### Assembling back the engagement pin

- (1) Slide 8 mm diameter long-shaft (JIG) through the holes of print drum flanges F and R to align the two flanges.
- (2) Align the groove on the rear of the engagement pin against parallel pin on the flange drive gear shaft, and attach onto the shaft.
- (3) Set drum joint alignment lock (JIG) over the engagement pin to align the angle of the engagement pin, then tighten the two set screws on the engagement pin while pushing it against the flange drive gear shaft.
- (4) Mount flange drive gear R using two cap screws.
- (5) Remove 8 mm diameter long-shaft (JIG) and drum joint alignment lock (JIG).
- (6) Mount following parts to complete the assembly.
  - Print drum rear frame ass'y
  - Screen ass'y
  - Print drum cover

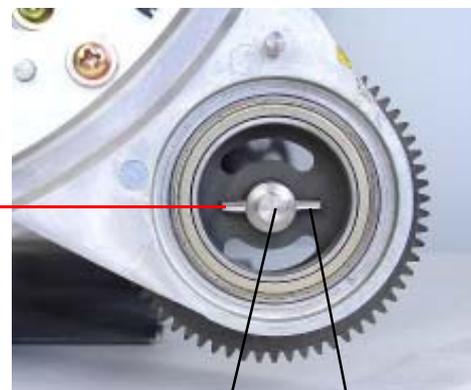
8 mm diameter long-shaft (JIG)



P08077



P08078



P08079

Flange drive gear shaft

Parallel pin



Drum joint alignment lock (JIG)

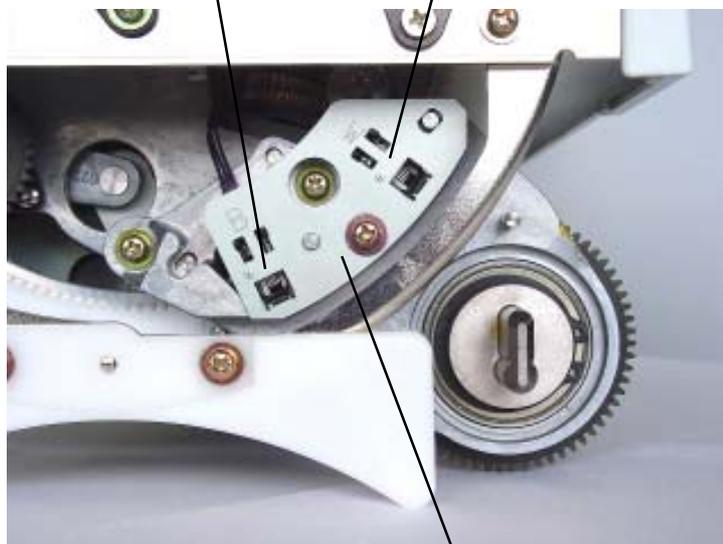
P08080

### 13. Removing the Position A Sensor (No.1) and Position B Lock Confirmation Sensor

- (1) Remove mounting screw (M4x8) from position A sensor mounting bracket R. Unplug connectors from both the position A sensor (No.1) and position B lock confirmation sensor to free both sensors from the mounting bracket attached.

Position B lock confirmation sensor

Position A sensor (No.1)

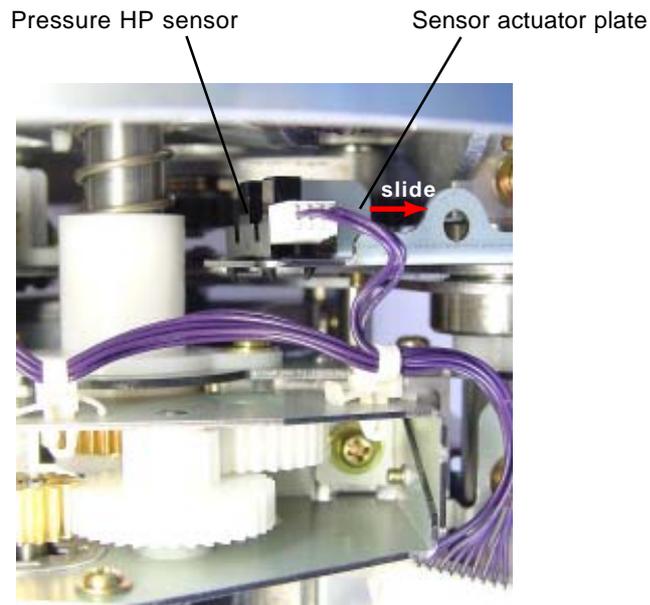


P08081

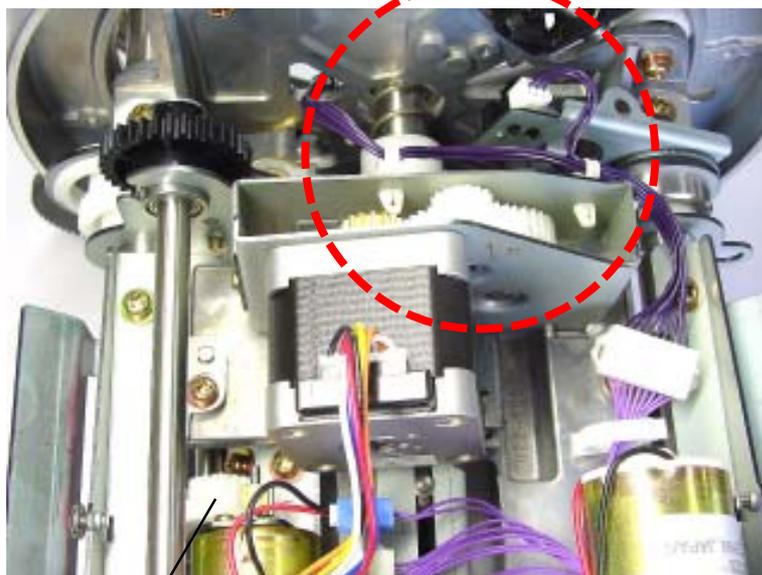
Position A sensor mounting bracket R

## 14. Removing the Pressure HP Sensor

- (1) Remove following parts from the print drum.
  - Side frames L and R
  - Screen ass'y
  - Dome sheet
- (2) Rotate the gear on the pressure motor ass'y by hand until the sensor actuator plate slides out of the sensor in the direction shown on the photograph below.
- (3) Unplug the connector and remove the pressure HP sensor.



P08082

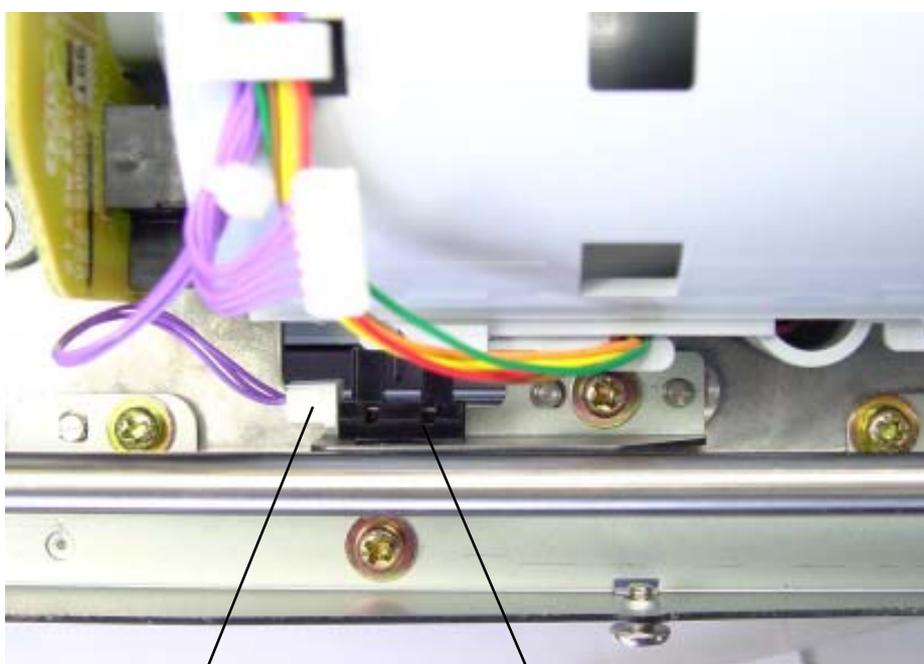


P08083

Gear on the pressure control motor ass'y

## 15. Removing the Inner Pressure Detection Sensor

- (1) Remove following parts from the print drum.
  - Side frames L and R
  - Screen ass'y
  - Dome sheet
  - Ink volume detection sensor (send) ass'y
- (2) Unplug connector, remove mounting screw (M4x8), and remove the inner pressure detection sensor with mounting bracket.



P08084

Connector

Inner pressure detection sensor

## 16. Removing the Drive Transmit Release Sensor, Horizontal Centering HP Sensor, and Position A Sensor (No.2)

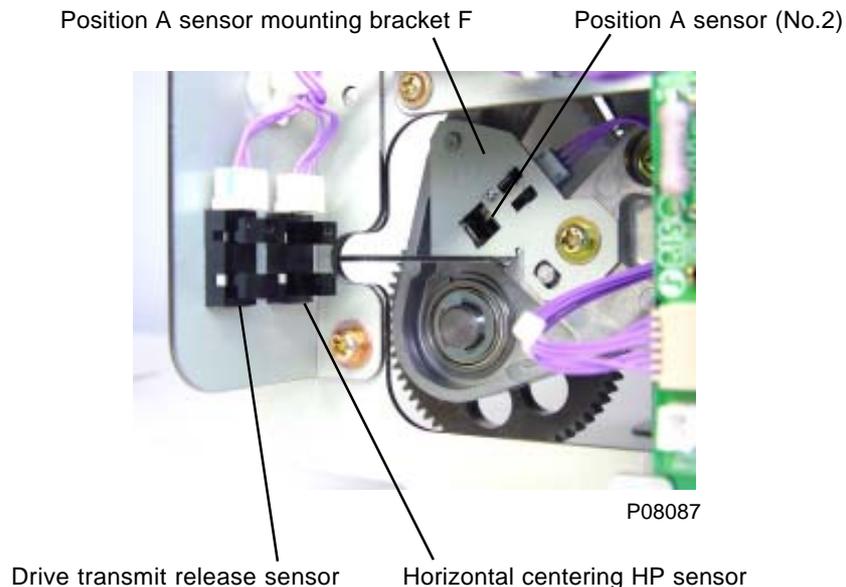
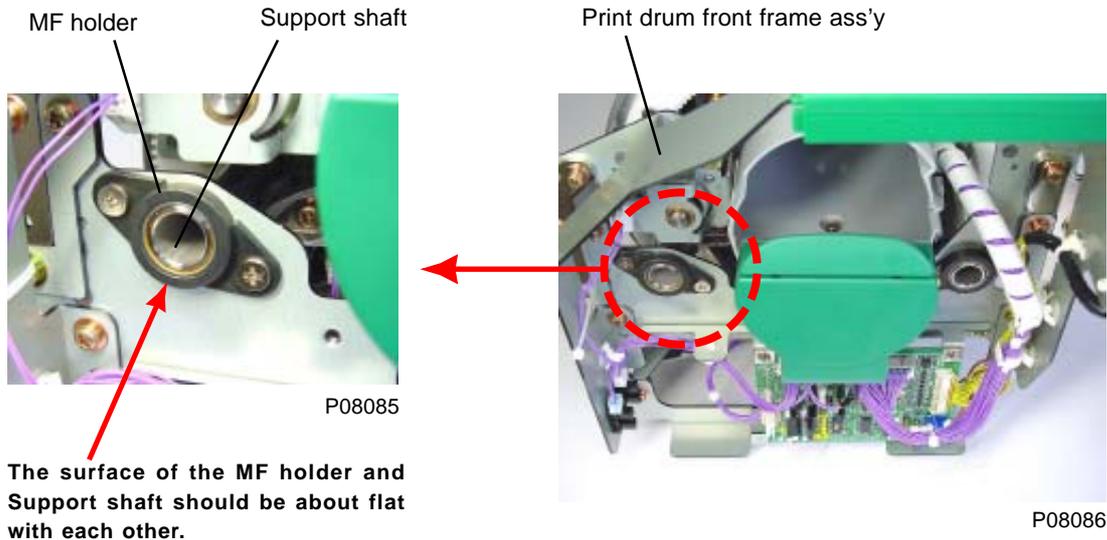
- (1) Remove following parts from the print drum.
  - Print drum cover
  - Side frames L and R
- (2) Slide print drum front frame ass'y towards the front until the surface of the MF holder and support shaft becomes flat with each other.

### Removing the Drive transmit release sensor and Horizontal centering HP sensor

- (3) Unplug the connectors and remove the two sensors.

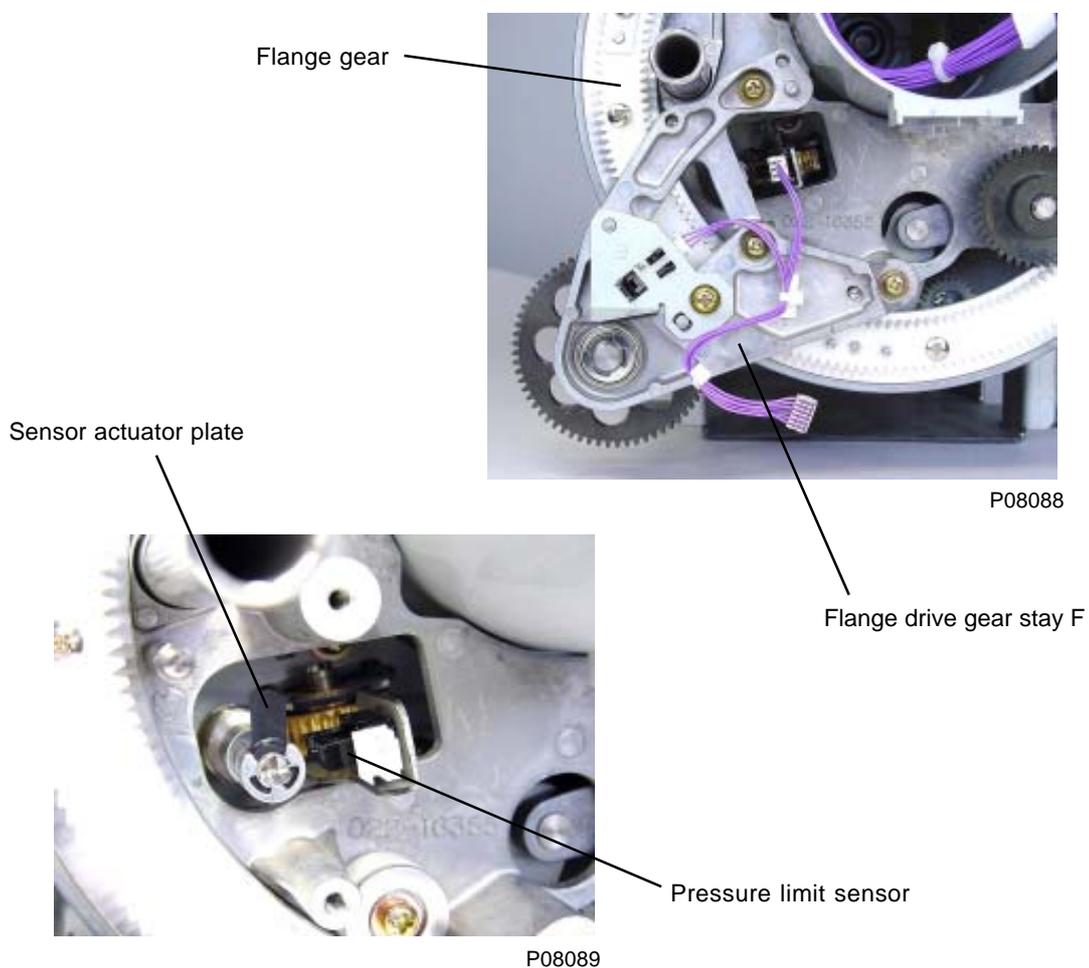
### Removing the Position A sensor (No.2)

- (3) Remove the mounting screw (M4x8) and unplug connector. Remove the sensor attached on the mounting plate.



## 17. Removing the Pressure Limit Sensor (encoder sensor)

- (1) Remove following parts from the print drum.
  - Print drum cover
  - Side frames L and R
  - Screen ass'y
  - Ink volume detection sensor (receive) ass'y
  - Print drum front frame ass'y
  - Inner pressure clutch ass'y
- (2) Remove the connector from pressure limit sensor, and remove E-ring from flange drive gear ass'y.
- (3) Remove three mounting screws (M4x12) and remove flange drive gear stay F.
- (4) Remove E-ring and detach sensor actuator plate.
- (5) Remove the pressure limit sensor.



### [Precautions for Reassembly]

- Insert 8 mm diameter long-shaft (JIG) through the holes in the print drum flange ass'y F and R to align the two flanges.
- Mount the flange drive gear stay F with the flange drive gear F engaged on the flange gear.

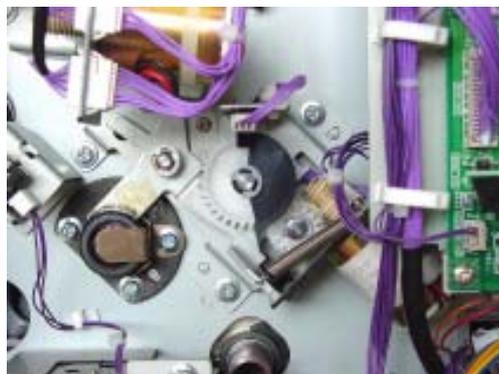
## 18. Removing the Print Drum Locking Unit

- (1) Disconnect the two connectors, remove the three mounting screws (M4 x 8), and remove the print drum locking unit.



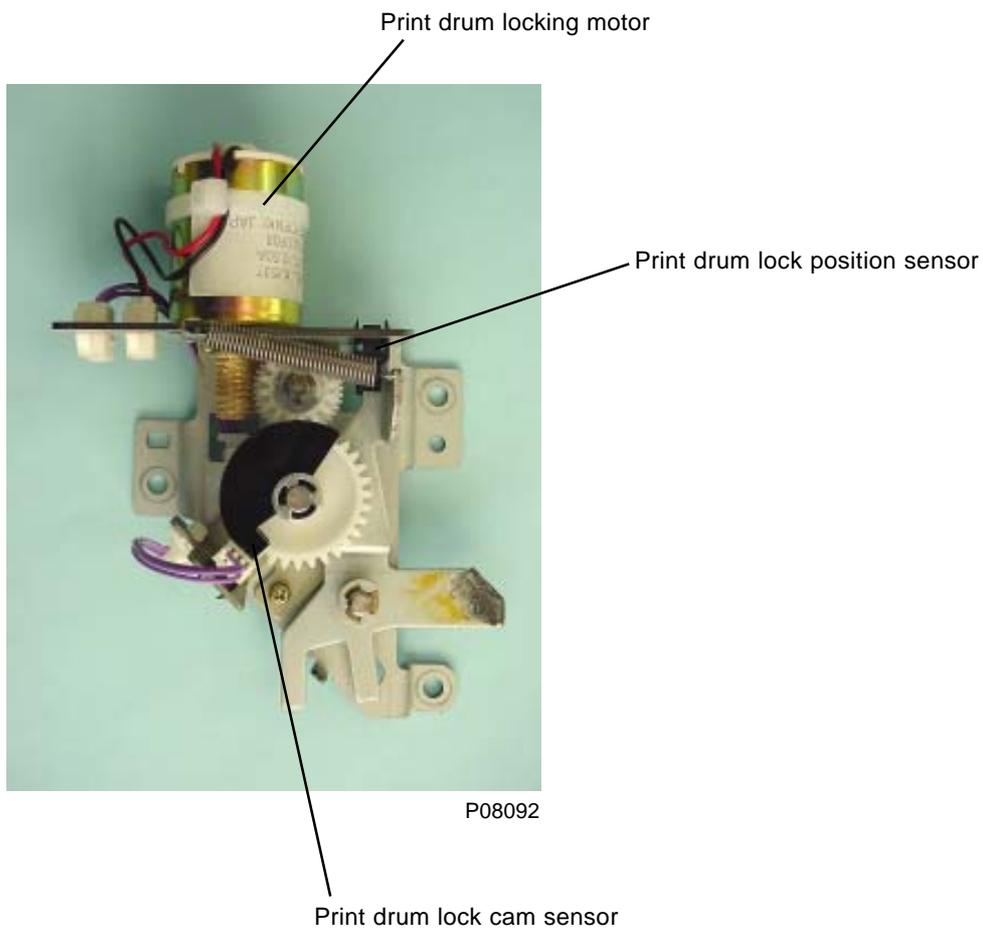
P08090

Print drum No.2



P08091

Print drum No.1



P08092

Print drum lock cam sensor

## 19. Removing the Print Drum Set Sensor

- (1) For both 1st print drum set sensor and 2nd print set sensor, remove mounting screw (M4x8) to detach the sensor with the mounting bracket attached.



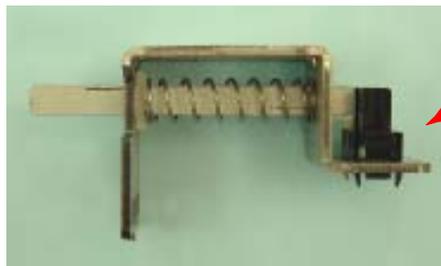
1st print drum set sensor

P08093



2nd print drum set sensor

P08094



Print drum set sensor with mounting bracket attached.

P08095

## Adjustment

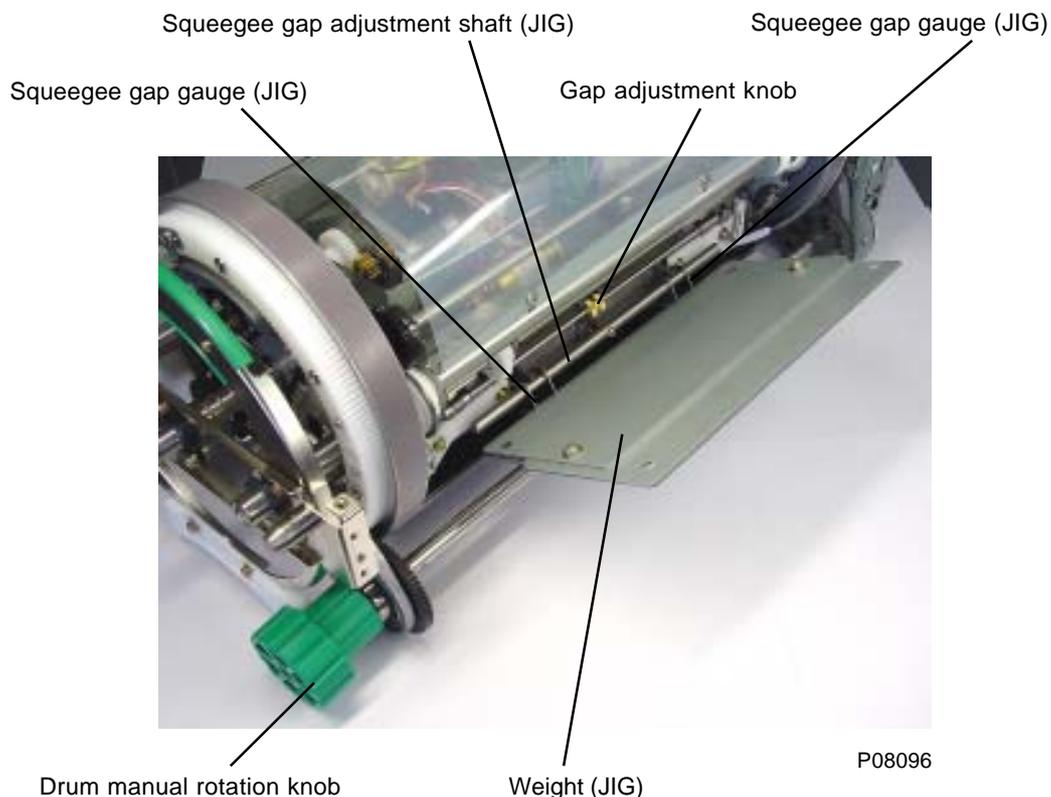
### 1. Inner Pressure Roller Gap Adjustment

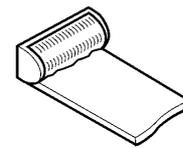
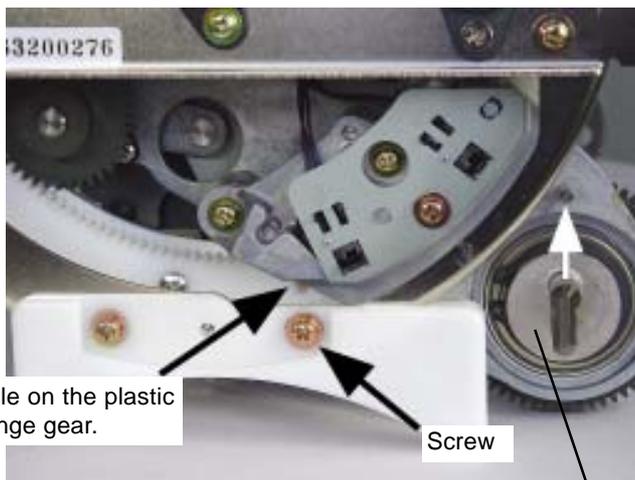
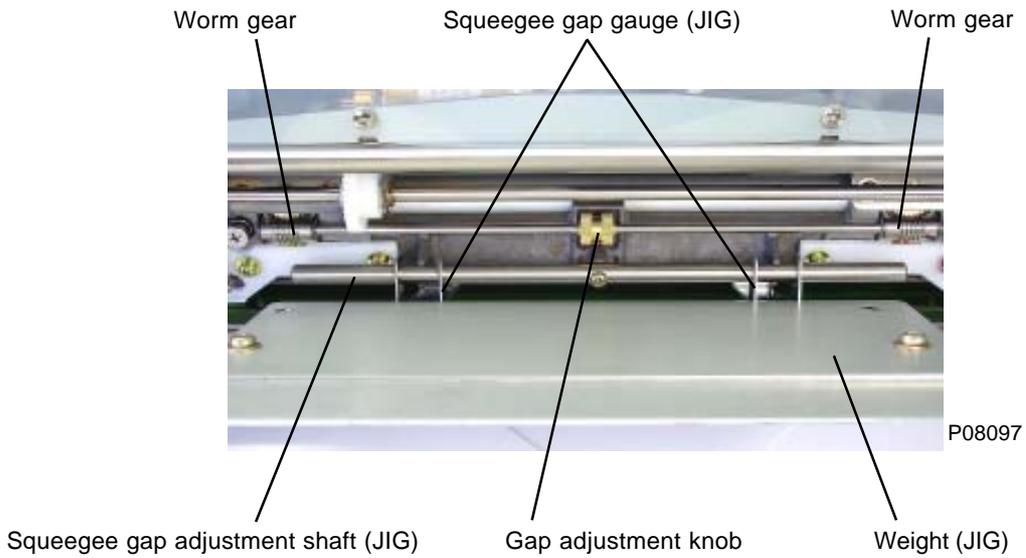
#### Check and Adjustment Procedure

- (1) Remove side frame L and screen ass'y.
- (2) Release the position B lock and rotate to move the clamp plate base ass'y to bottom.
- (3) Attach squeegee gap adjustment shaft (JIG) and drum manual rotation knob.
- (4) Hook two squeegee gap gauges (JIG) on the squeegee gap adjustment shaft (JIG), and hook the weight (JIG) on the squeegee gap gauges.
- (5) Rotate the print drum through a half revolution using the drum manual rotation knob.
- (6) Check the ink scooped on the squeegee gap gauges, referring to the sketch on next page. If the amount is incorrect and requires adjustment, loosen the two lock screws (refer to photograph on next page) and turn the gap adjustment knob to adjust. (Rotating upward reduces the gap, while rotating downward increases the gap.)
- (7) After adjusting, firmly retighten the two lock screws.
- (8) Run an actual print test (Test chart No. 11, print speed: 3, print density: 1, A3 size standard printing paper) to check the density balance.

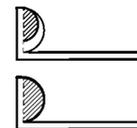
#### Precautions on Adjustment

- One revolution of the gap adjustment shaft alters the gap by approximately 0.025 mm.
- Adjust the gap by first increasing, then decreasing the gap to compensate for the play.
- Adjust at room temperature of between 20°C to 28°C
- After the adjustment, do not touch the gap adjustment knob or the worm gears.





S08099



Too little



Correct



Too much

**< Inner pressure roller gap adjustment start position >**

The hole on the flange gear and the screw is at same position and the engagement pin is in vertical position.

Engagement pin



Lock screw

Lock screw

**< Print drum as seen looked up at angle from the bottom >**

### 2. Print Density Adjustment

#### Adjustment Procedure

- (1) Run [Test mode No. 684 \(Print pressure home position adjustment\)](#).
- (2) If print density is too low, increment the value already input in the test mode.  
If the print density is too high, decrement the value already input.

**When the value is changed, value changed in amount of 3 is almost equivalent to one step change on the print density adjustment key on the operation panel.**

- (3) After adjusting, check the print density by the check procedure given below.

#### Checking Procedure

Test chart No. 11, print speed: 3, print density: 1, and standard A3 size white printing paper.

### 3. Master Elongation Adjustment

**Note:** Level the machine on the floor before making the adjustment ([Ref: Chapter 1, page 1-15](#))

#### Check and Adjustment Procedure

- (1) Make master using Test Mode No.51.
- (2) Feed 1,000 sheets of standard A3 size white printing paper at print speed No.5, print density at No.3 and print position at center, and check that the master on the print drum elongation is 0 to 0.5 mm for both the 1st and 2nd print drums.
- (3) If the elongation is not within the specifications, adjust the Teflon tape thickness around the print drum Flanges as shown below, depending on the master elongation.

The Teflon tape thickness around the print drum Flanges should be made identical between the two Flanges, (F) & (R), on each print drum.

**Reduce the Teflon tape thickness if the master elongates downwards on the print drum.**

**Increase the Teflon tape thickness if the master elongates upwards on the print drum.**

If master elongation is 1.0 mm, change the tape thickness by 0.08 mm.

If master elongation is 1.5 mm, change the tape thickness by 0.13 mm.

If master elongation is 2.0 mm, change the tape thickness by 0.18 mm.

## 4. Master Shift Adjustment

**Note:** Level the machine on the floor before making the adjustment (Ref: Chapter 1, page 1-15)

Make master using Test Mode No.51.

Feed 1,000 sheets of standard A3 white printing paper at print speed No.5, print density at No.3 and print position at center, and check the master horizontal shift on both the 1st and 2nd print drums, observing the tail portion of the drum.

**Measure the amount of master shifting at the end of the ink opening on the drum screen.**

If the master has shifted, adjust by moving the drum positioning block R horizontally.

If the master has shifted to the front, move drum positioning block R to the right.

If it has shifted to the rear, move drum positioning block R to the left.

The adjustment amounts for drum positioning block R are shown below, depending on the amount of master shift.

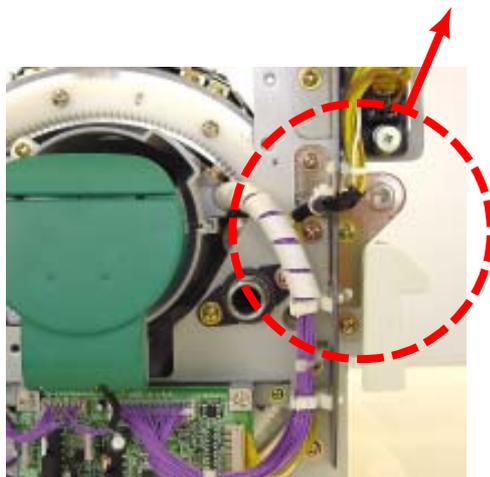
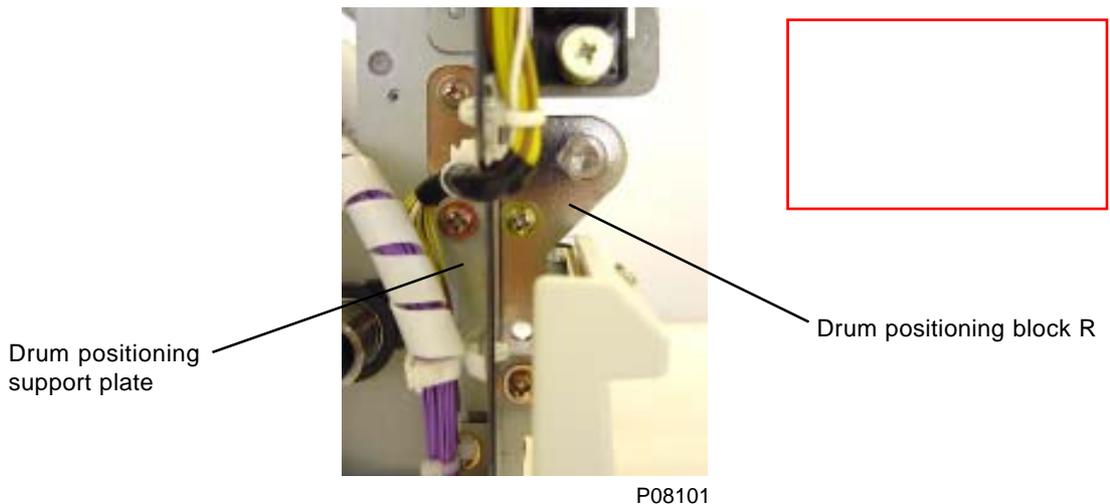
If the master has shifted 0.5 mm, move the drum positioning block R horizontally 0.1 mm.

If the master has shifted 1.0 mm, move the drum positioning block R horizontally 0.2 mm.

If the master has shifted 1.5 mm, move the drum positioning block R horizontally 0.3 mm.

If the master has shifted 2.0 mm, move the drum positioning block R horizontally 0.4 mm.

If creases are observed on the top of the screen, above the ink opening holes, move the drum positioning block R horizontally 0.07 mm.



P08102

# MEMO

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# CHAPTER 9: VERTICAL PRINT POSITION SECTION

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## Mechanism

### 1. Vertical Print Position Mechanism

Both the 1st and 2nd print drums are equipped with separate vertical print position mechanisms that are incorporated into the drum drive units.

The two print drum drive units are identical, but phase with respect to the paper drum differs when mounted in the machine.

The print drum drive unit incorporates a planetary gear mechanism. The vertical print position is controlled by the print positioning pulse motor, while the datum position is checked by the vertical centering sensor.

The initial vertical print position (home position) is the position in which the vertical centering sensor switches from ON to OFF as the print positioning pulse motor rotates in the direction to bring the image down.

If the vertical print position key is pressed while the machine is in idle, the panel display changes, but the motor still does not rotate. The actual print position does not change until the START button is pressed for the print operation.

If "0" is selected by test mode No. 091, the print position changes only at the start of the printing.

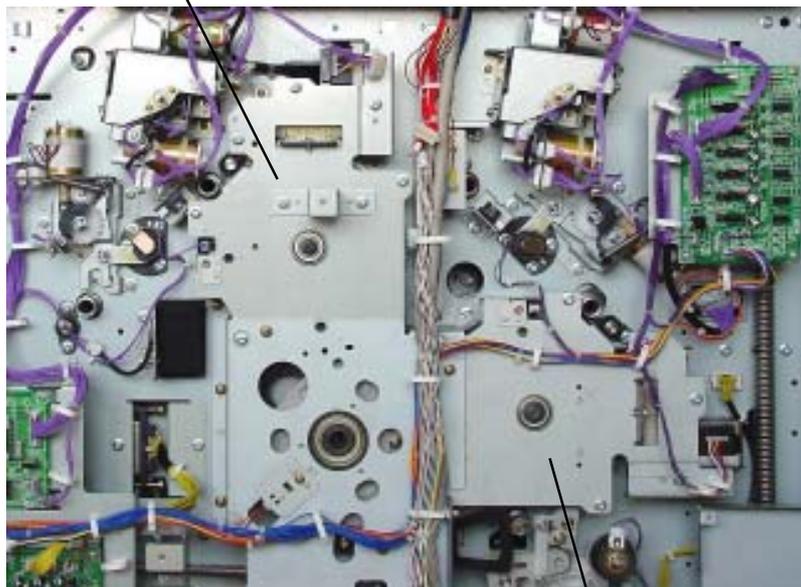
If "1" is selected by test mode No. 091, the print position changes simultaneously during the printing.

The print positions is altered in increments of  $\pm 0.1$  mm by a press of the print positioning key, and can be varied continuously by keeping the key depressed.

Vertical print positioning is performed under the following circumstances:

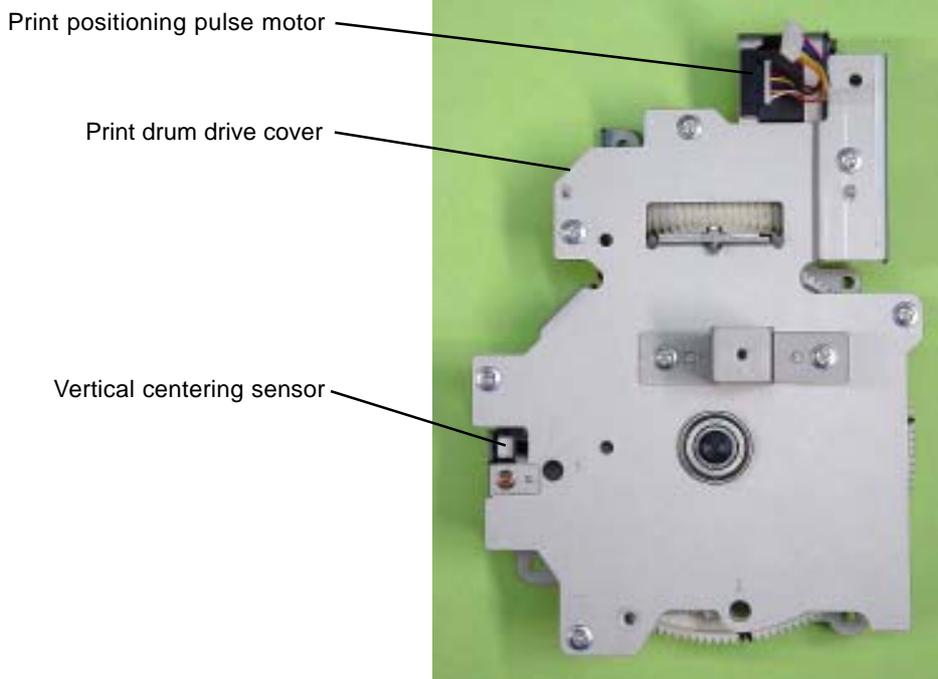
1. When the vertical print positioning key is pressed during printing.
2. During print preparation movement (moves to home position and then to the memorized position).
3. When the machine power is turned ON.

2nd print drum drive unit



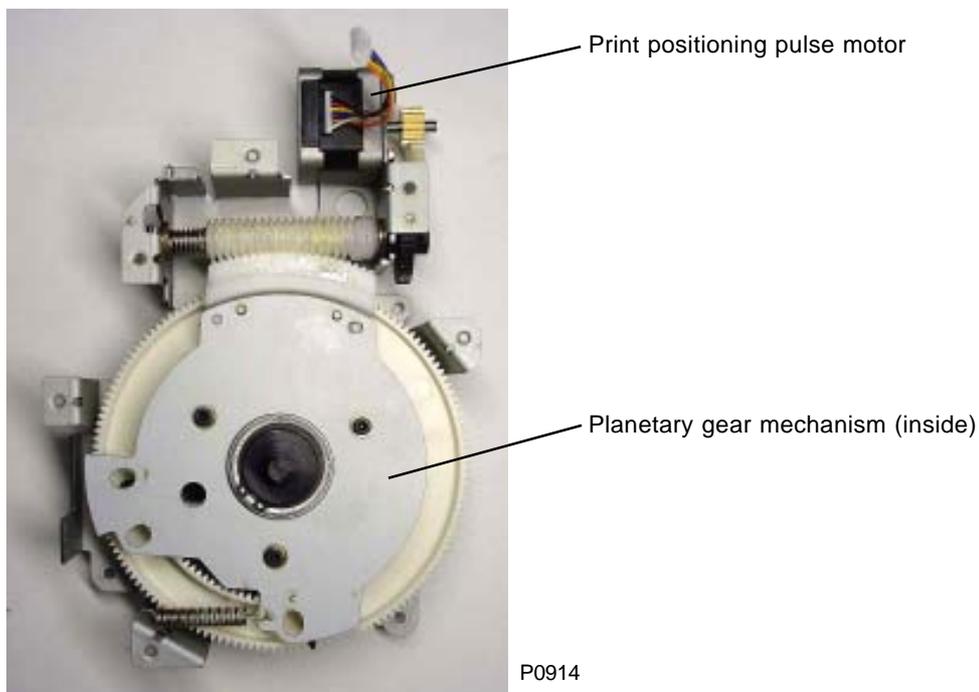
P0912

1st print drum drive unit



< Print drum drive unit >

< View with the Print drum drive cover removed >



< Print drum drive unit >

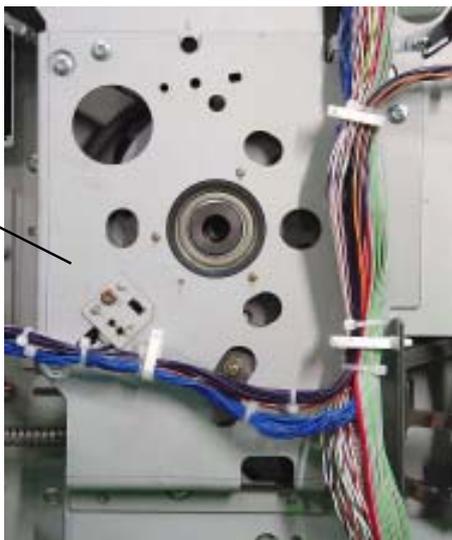
## Disassembly

### 1. Removing the Print Drum Drive Unit (same for 1st and 2nd print drum)

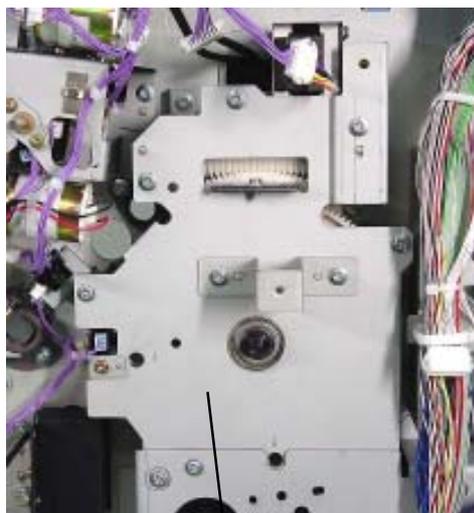
Refer to next page for PRECAUTIONS before disassembly.

- (1) Remove the main cover ass'y.
- (2) Disconnect the two connectors, remove the four mounting screws (M4 x 8), and remove the print drum drive unit.

Main cover ass'y

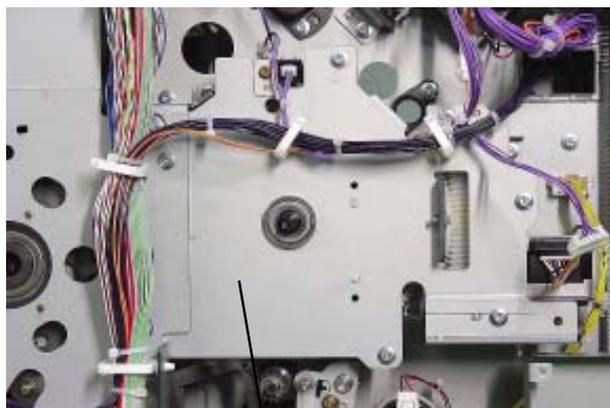


P0901



P0902

2nd print drum drive unit

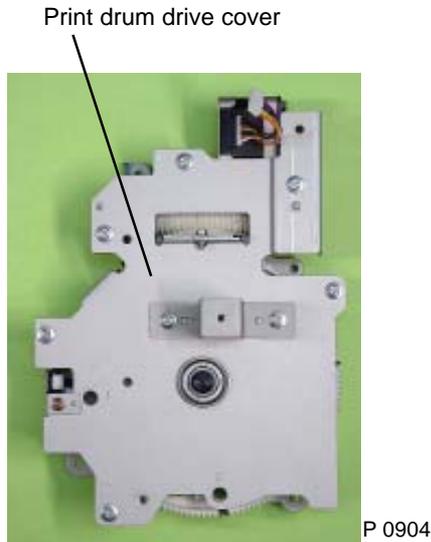


P0903

1st print drum drive unit

**[Work Precautions]**

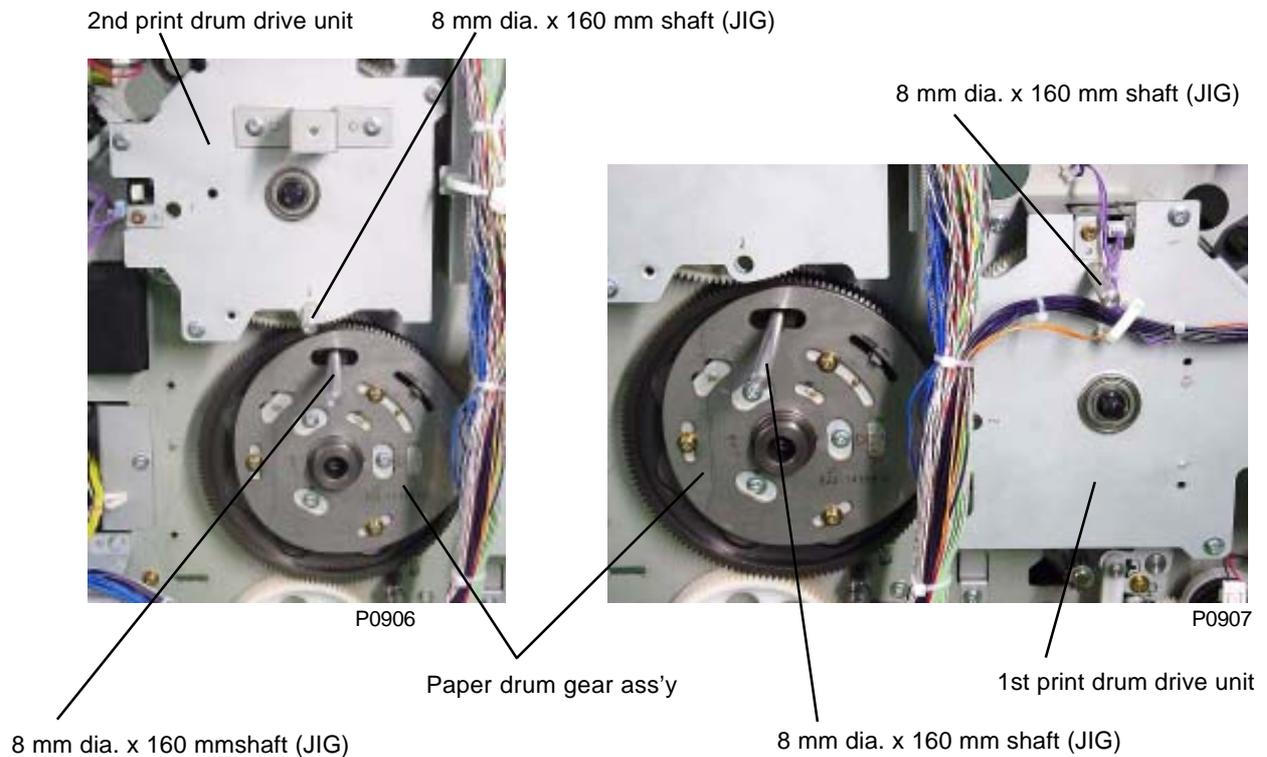
- Reassembling the print drum drive unit requires a jig to align the phase. Do not disassemble past the point shown in the photograph below.



**Do not disassemble beyond this point !**

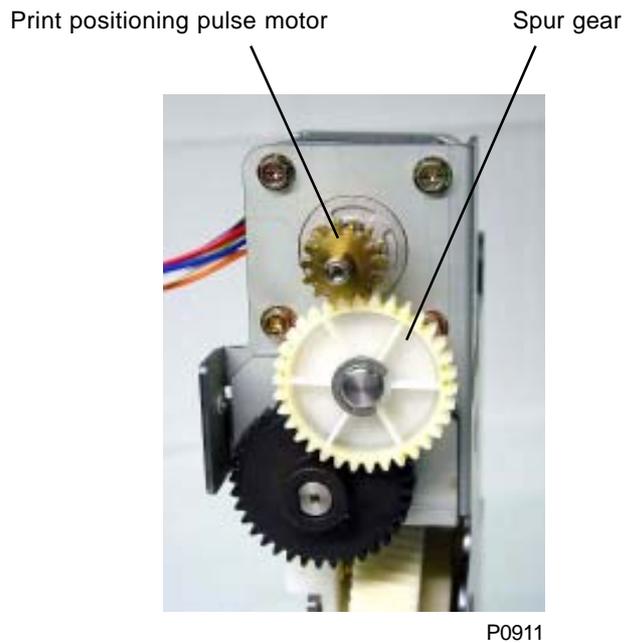
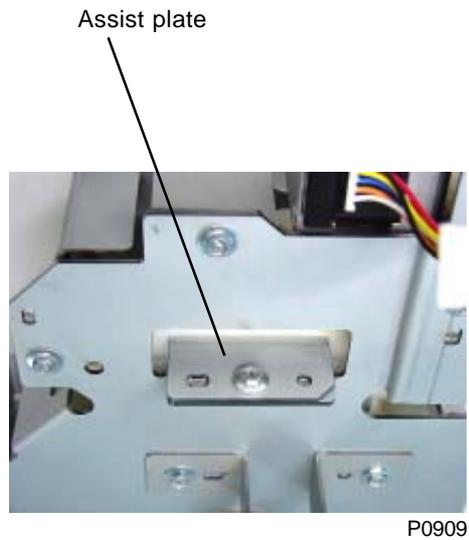
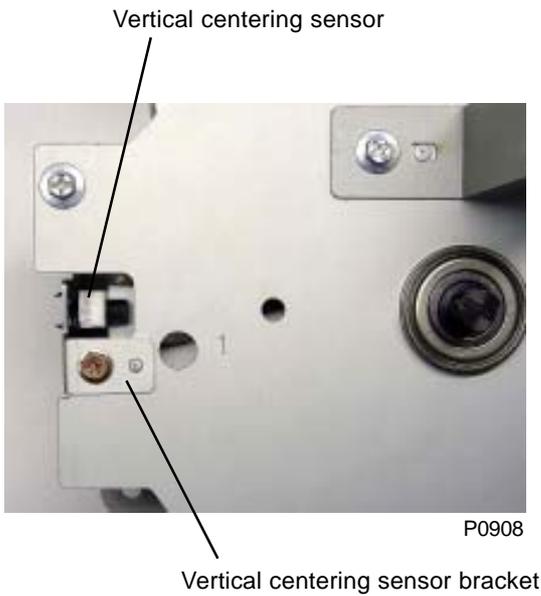
**[Precautions for Reassembly]**

- First insert 8 mm dia. x 160 mm shaft (JIG) into the phase alignment hole in the paper drum gear ass'y with the paper drum at 180 degrees (flat surface facing down). Then insert another piece of 8 mm dia. x 160 mm shaft (JIG) into the phase alignment hole on the 1st print drum drive unit, marked "1", for the 1st print drum drive unit. Attach the 1st print drum drive unit while matching the positioning marks on the gears. Then do the same for the 2nd print drum drive unit using the alignment hole marked "2".



## **2. Removing the Print Positioning Pulse Motor**

- (1) Remove the print drum drive unit.
- (2) Remove the vertical centering sensor together with the sensor bracket. (M3 x 6 screw)
- (3) Remove the assist plate. (M4 x 8 screw)
- (4) Remove the print drum drive cover. (Six M4 x 8 screws)
- (5) Detach the E-ring and remove the spur gear.
- (6) Remove the four mounting screws (M3 x 6), then remove the print positioning pulse motor.



## Adjustment

### 1. Adjusting the Datum Print Position (Phase Between Print Drum and Paper Drum)

This adjustment is to input the memory of the print position on each print drum for maximum of six print drum positions (print drum positions 1 and 2 location for each machine, for maximum of three machines).

#### Preparations before the adjustment

- (1) If there are more than one machine (maximum 3 machines) at an installation site, start up test mode No. 686 and register each machine with numbers starting with "0".

For maximum of three machines, the machines will be registered as "0", "1", and "3".

If there is only one machine, the default setting for that machine is "0" from the start, so there is no need to run test mode No.686.

- (2) If the vertical center position adjustment on the machine (test mode No.680) is changed from the default setting of "0" to another setting in the past, return the test mode No. 680 setting back to "0" on all the machines to which the datum print position adjustment on the print drum(s) is to be made.

#### Checking and Adjustment Procedure

- (3) Install the print drum(s) to be adjusted. Two print drums at one time or only one print drum at one time can be installed for the adjustment.
- (4) Make confidential master on the print drum(s).
- (5) Using a scale, preferably of a flexible material, make a mark on the master on the print drum(s) at a point 85 mm from the tip of the clamp plate.
- (6) Run prints (print speed: 3, print position: center) and check that the line(s) is printed 10 mm  $\pm$  1 mm from the leading edge of the print paper.
- (7) If the line(s) is not printed within the given distance from the leading edge of the paper, run test mode No.681 (vertical center position adjustment on the print drum) for the print drum(s) on which the line was not printed within the given distance.

**Increasing the value by test mode No.681 will bring the image up.**

- (8) Above adjustment should be made on all print drums for all the possible print drum positions the print drums will be inserted in all the machines at one installation site (maximum three machines).

#### Symptoms if incorrectly adjusted

The print position may vary on each print drum when the print drum position is changed for that print drum on the machine(s).

#### < Example of the adjustment >

##### Example 1: One machine, two print drums

- (1) Install the two print drums in the machine and follow the above instructions from (3) to (7).
- (2) Interchange the positions of the two print drums in the machine and follow above instructions (6) and (7).

##### Example 2: One machine, more than two print drums

- (1) Follow the steps given on "Example 1" for the first two print drums, and then repeat the same procedure for all other remaining print drums.

##### Example 3: Three machines, more than two print drums

- (1) First, number each machines by using test mode No. 686, starting with "0" on the first machine as stated on the top of the page. The second machine will be "1", and third machine will be "2".
- (2) Follow the steps given on "Example 2" for all the print drums which will be shared by the three machines.

# MEMO

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# CHAPTER 10: CLAMP UNIT

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## Mechanism

### 1. Mechanism Outline

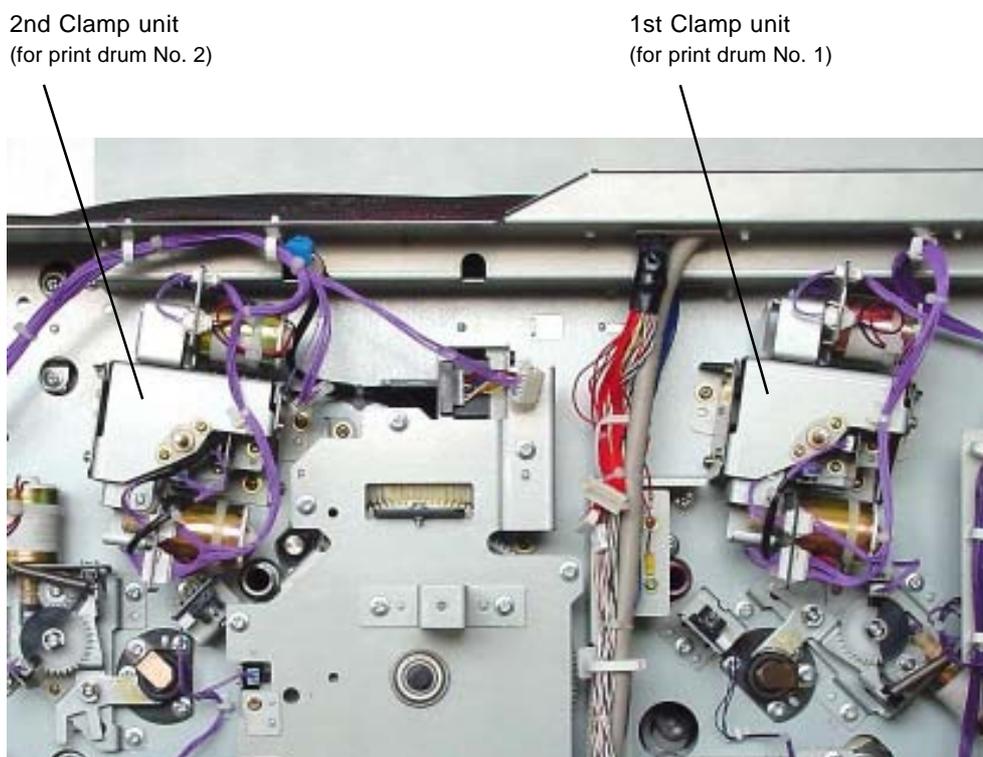
Identically constructed clamp units are provided on the 1st and 2nd print drums.

The clamp units are composed of the back and forth motion part and the opening and closing movement part.

The backward and forth motion is driven by the clamp slide motor.

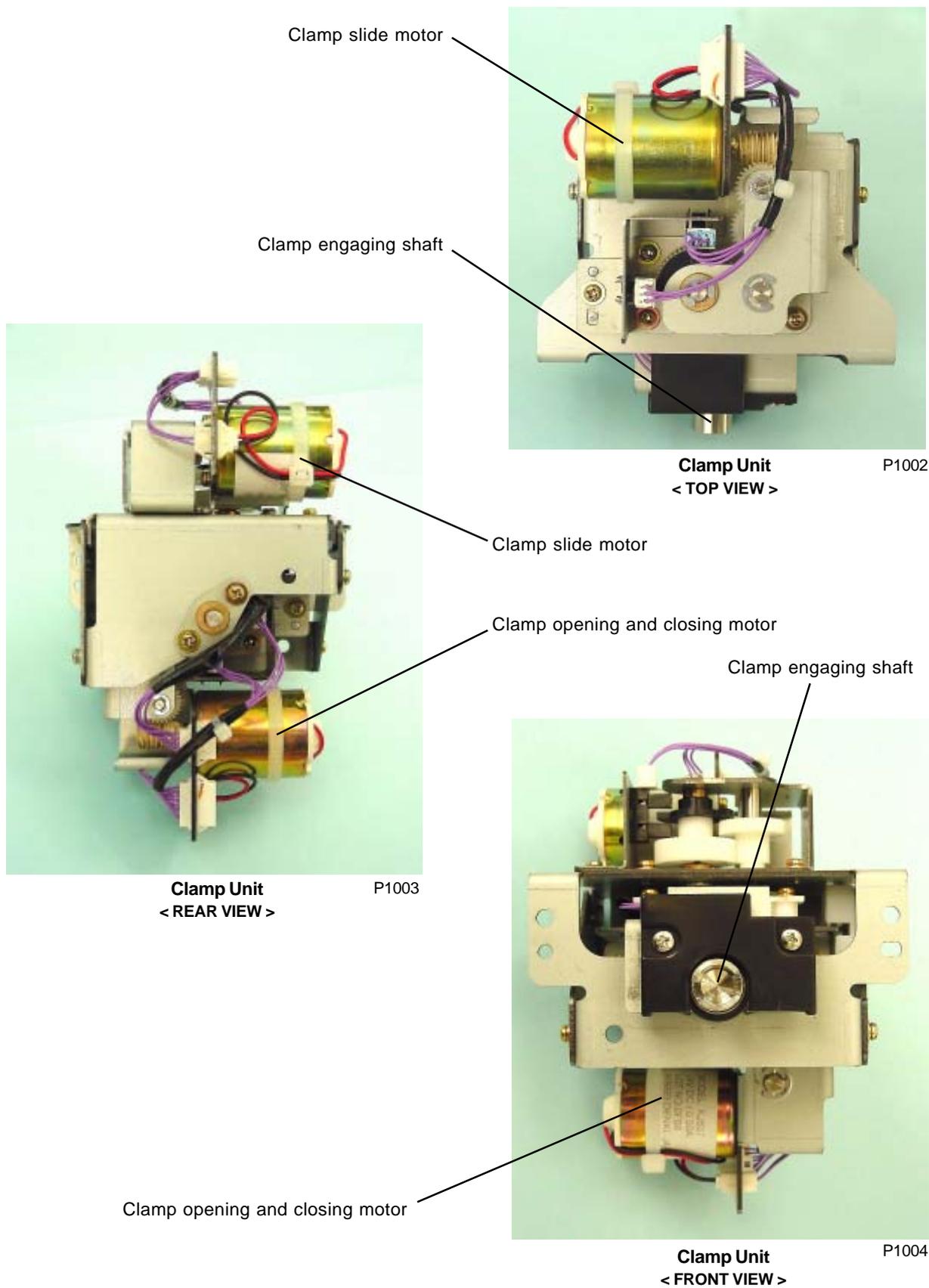
The position of the clamp is checked by the clamp slide HP sensor and clamp slide return sensor.

The opening and closing action is driven by the clamp opening and closing motor, and the position for the clamp opening and closing is checked by the clamp plate HP sensor, clamp plate loading position sensor, and angular sensor.



< Rear of the machine >

P1001



### 2. Print Drum Position-A Movement

The position A is determined by the position A detection plate blocking the position A sensor.

There are five position A for the print drums.

#### **Position A of the tail clamp plate for the master removal (same for print drums No. 1 & No. 2)**

- (1) With the main motor, the print drum rotates at 30 rpm and stops when position A sensor detection changes from OFF to ON.
- (2) Main clutch is engaged to rotate the print drum in the reverse direction by the main pulse motor.
- (3) The main pulse motor stops when position A sensor detection changes from ON to OFF.
- (4) 300 msec later, the main pulse motor rotates in the forward direction.
- (5) When position A sensor detection changes from OFF to ON, the main pulse motor stops and the main clutch is disengaged.

#### **Position A of the top clamp plate for the master removal (same for print drums No. 1 & No. 2)**

- (1) Main clutch engages and main pulse motor rotates in the forward direction.
- (2) The main pulse motor stops 800 msec after position A sensor detection changes from ON to OFF.
- (3) 300 msec later, the main pulse motor rotates the print drum in reverse direction.
- (4) Main pulse motor stops and main clutch disengages at 5 mm circumference rotation of the print drum from the time the position A sensor detection changes from OFF to ON.

#### **Position A of the top clamp plate for the master loading (same for print drums No. 1 & No. 2)**

- (1) With the main motor, the print drum rotates at 30 rpm and stops when position A sensor detection changes from OFF to ON.
- (2) Main clutch is engaged to rotate the print drum in the forward direction by the main pulse motor.
- (3) The main pulse motor stops 800 msec after position A sensor detection changes from ON to OFF.
- (4) 300 msec later, the main pulse motor rotates the print drum in reverse direction.
- (5) Main pulse motor stops and main clutch disengages at 5 mm circumference rotation of the print drum from the time the position A sensor detection changes from OFF to ON.

#### **Position A of the tail clamp plate after the master loading (for print drum No. 1 only)**

- (1) With the main motor, the print drum rotates at 30 rpm and decelerates to 10 rpm from paper drum at T position.
- (2) The main motor stops when the paper drum comes to 45 degrees from the T position.
- (3) 100 msec later, the main clutch engages and the main pulse motor rotates the print drum in forward direction.
- (4) Main pulse motor stops and main clutch disengages when the position A sensor detection changes from OFF to ON.

#### **Position A of the tail clamp plate after the master loading (for print drum No. 2 only)**

- (1) With the main motor, the print drum rotates at 30 rpm and decelerates to 10 rpm after the paper drum rotates 180 degrees from the T position.
- (2) The main motor stops when the paper drum comes to 225 degrees from the T position.
- (3) 100 msec later, the main clutch engages and the main pulse motor rotates the print drum in forward direction.
- (4) Main pulse motor stops and main clutch disengages when the position A sensor detection changes from OFF to ON.

### 3. Clamp Unit Engaged and Disengaged Position

#### Clamp unit disengaged position

This is where the clamp unit is disengaged from the clamp plate at which the clamp slide sensor is ON and clamp slide HP sensor changes from OFF to ON when the clamp slide motor rotates in the reverse direction.

#### Clamp unit engaged position

This is where the clamp unit is engaged with the clamp plate at which the clamp slide sensor is OFF and clamp slide HP sensor changes from OFF to ON when the clamp slide motor rotates in the forward direction.

### 4. Clamp Unit Initial Position

#### Clamp unit initial positioning movement

- (1) First the clamp unit is moved to the disengaged position.
- (2) Then the clamp engaging shaft is rotated to the home position.

#### Clamp engaging shaft home positioning

- 1) Clamp opening and closing motor rotates the clamp engaging shaft in the counterclockwise direction (looking from the rear).
- (2) Clamp opening and closing motor stops when clamp plate HP sensor detection changes from OFF to ON.
- (3) 300 msec later the clamp opening and closing motor rotates in the opposite direction until the clamp plate HP sensor detection changes from ON to OFF.

### 5. Angular Sensors

The clamp plate position on the print drum is checked during the clamp opening and closing movement by three sensors, 0 angular sensor, 180 angular sensor, and angular safety sensor.

#### (1) 0 angular sensor

Detects top clamp plate closed position.

Detects tail clamp plate opened position.

#### (2) 180 angular sensor

Detects top clamp plate opened position.

Detects tail clamp plate closed position.

#### (3) Angular safety sensor

Checks whether the top clamp plate is in opened position when the tail clamp plate is going to open. The tail clamp plate will not open if the top clamp plate is detected opened.

## 6. Clamp Plate Movements

### Tail clamp plate opening movement

- (1) Clamp unit makes initial positioning movement.
- (2) Clamp slide motor activates to engage clamp engaging shaft on the tail clamp plate shaft.
- (3) The angular safety sensor checks whether the top clamp plate is correctly closed.
- (4) Clamp opening and closing motor opens the tail clamp plate, and when the 0 angular sensor detects the tail clamp opened, the clamp opening and closing motor stops after the duration of time preset by test mode No. 597.
- (5) The clamp unit goes through initial positioning movement.

### Top clamp plate opening movement

- (1) Clamp unit makes initial positioning movement.
- (2) Clamp slide motor activates to engage clamp engaging shaft on the top clamp plate shaft.
- (3) Clamp opening and closing motor opens the top clamp plate, and when the 180 angular sensor detects the top clamp opened, the clamp opening and closing motor stops after the duration of time preset by test mode No. 595.
- (4) Clamp opening and closing motor activates again, this time in the direction to close the top clamp plate, and stops when the clamp plate loading position sensor detection changes from OFF to ON (This is the top clamp plate half-opened position for master removal.)
- (5) 300 msec later the clamp opening and closing motor rotates in the direction to open the top clamp plate, and when the 180 angular sensor detects the top clamp opened, the clamp opening and closing motor stops after the duration of time set by test mode No. 595.

**Above (4) and (5) will be skipped if "0" is selected by test mode No. 391 [master top release repetition]. If "1" through "5" is selected by test mode No. 391, above (4) and (5) will be repeated for the set repetition by test mode No. 391, and goes to next step (6).**

- (6) The clamp unit goes through initial positioning movement.

### Top clamp plate closing movement

- (1) Clamp unit makes initial positioning movement.
- (2) Clamp slide motor activates to engage clamp engaging shaft on the top clamp plate shaft.
- (3) Clamp opening and closing motor closes the top clamp plate, and stops when the clamp plate loading position sensor detection changes from ON to OFF (This is the top clamp plate half-opened position for master clamping.)
- (4) Leading edge of the master material is transferred under the top clamp plate.
- (5) Clamp opening and closing motor reactivates to continue closing the clamp plate and when the 0 angular sensor detects the top clamp closed, the clamp opening and closing motor stops after the duration of time preset by test mode No. 596.
- (6) The clamp unit goes through initial positioning movement.

### Tail clamp plate closing movement

- (1) Clamp unit makes initial positioning movement.
- (2) Clamp slide motor activates to engage clamp engaging shaft on the tail clamp plate shaft.
- (3) Clamp opening and closing motor closes the tail clamp plate, and stops when the clamp plate HP sensor detection changes from OFF to ON.
- (4) After 800 msec later the clamp opening and closing motor activates to close the tail clamp plate further, and after 180 angular sensor detects the tail clamp plate closed, the clamp opening and closing motor stops after the duration of time preset by test mode No. 598. (This movement slides the tail clamp plate and tensions the master on the print drum.)
- (5) The clamp unit goes through initial positioning movement.

## Disassembly

### 1. Removing the Clamp Unit (Same for 1st and 2nd)

- (1) Remove the rear cover.
- (2) Unplug three connectors and dismount detachable wire harness band.
- (3) Remove three mounting screws (M4 x 8), and remove the clamp unit.



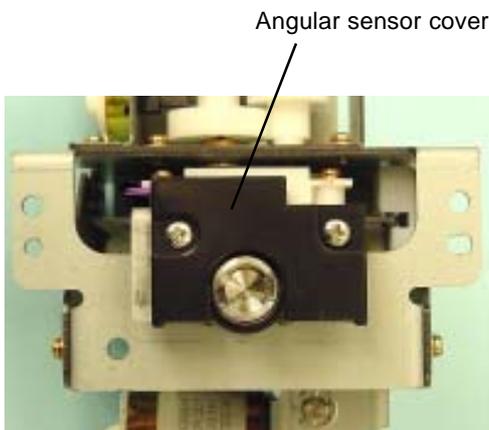
**1st Clamp unit** P1005  
(for print drum No. 1)



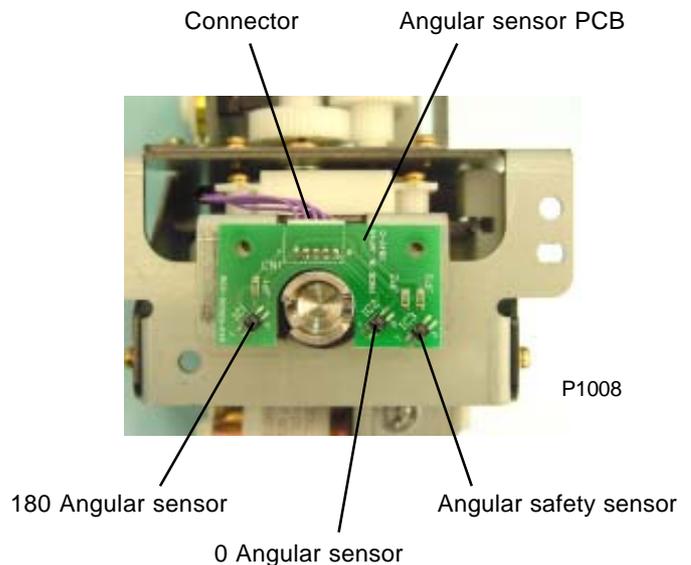
**2nd Clamp unit** P1006  
(for print drum No. 2)

### 2. Removing the Angular Sensor PCB

- (1) Remove the two mounting screws (M3 x 5), and remove the angular sensor cover.
- (2) Unplug connector and remove the angular sensor PCB.



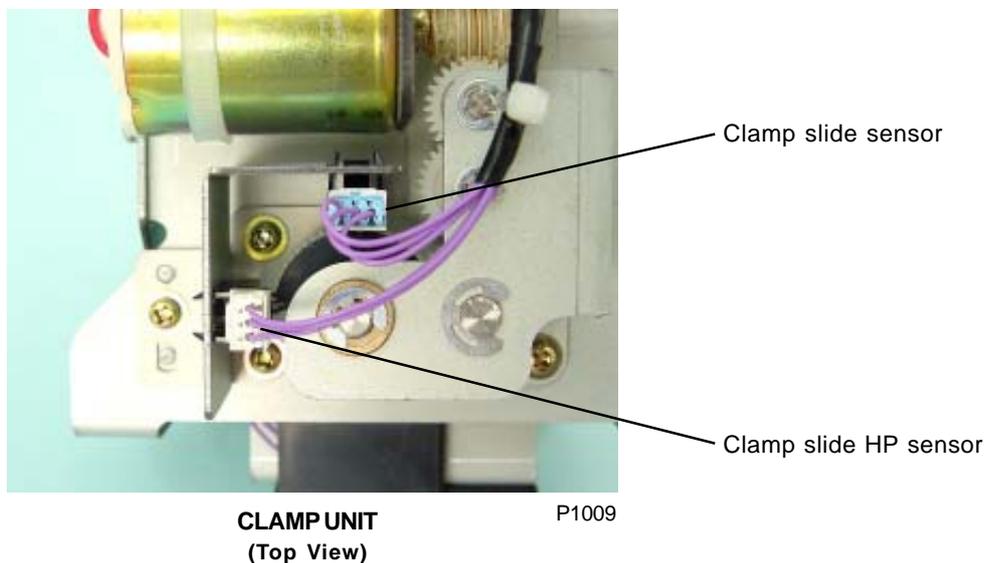
P1007



P1008

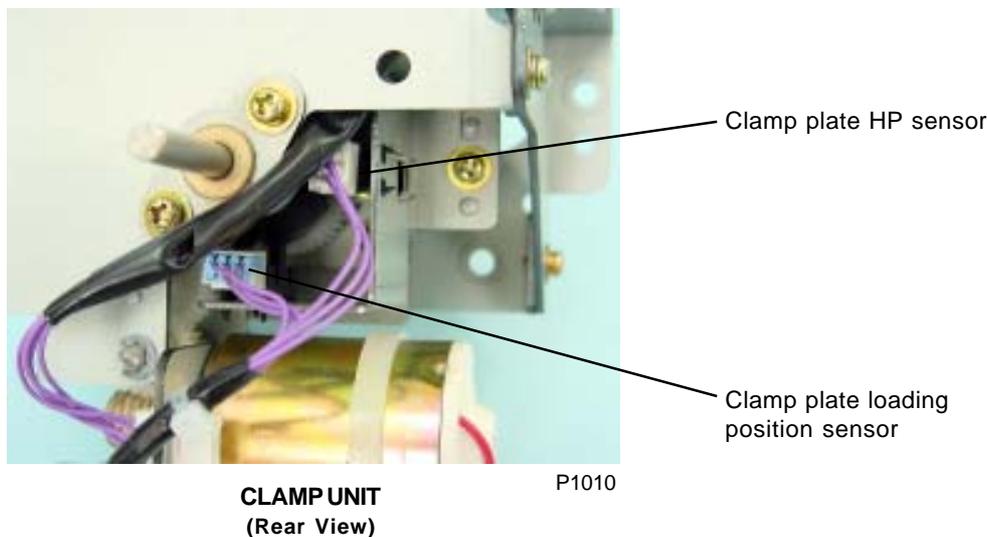
### 3. Removing the Clamp Slide HP Sensor and Clamp Slide Sensor

- (1) Remove the mounting screw (M3 x 6), then remove both the clamp slide HP sensor and clamp slide sensor together with mounting bracket.



### 4. Removing the Clamp Plate HP Sensor and Clamp Plate Loading Position Sensor

- (1) Remove the mounting screw (M3 x 6), then remove both the clamp plate HP sensor and clamp plate loading position sensor together with mounting bracket.



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# CHAPTER 11: MASTER DISPOSAL SECTION

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# Mechanism

## 1. Master Disposal Mechanism

The master disposal unit consists of the master disposal vertical transport section, which passes the master from the print drum to the master disposal unit, and the compression section, which compresses the disposed master inside the master disposal box.

The 1st and 2nd master disposal units are used for the 1st and 2nd print drums and differ in the construction of their vertical transport sections.

The 1st master disposal unit has four master tail clamp fans which operate to assist the master end clamping action on the 1st print drum.

A master disposal fan is also situated inside the master making unit, and the master making unit moves to each print drum during master disposal (master making) to assist in the master disposal operation.

## 2. Disposal Box Full Detection

The number of disposed masters contained inside the master disposal box for each master disposal unit is stored in memory. A disposal box full indication is given when the master disposal count reaches 50, or if an overcurrent is detected during compression plate compression operation.

The disposal box safety SW checks that the master disposal box is in position.

The disposal box empty detection sensor checks that any masters remain inside the master disposal box after masters have been discarded.

To reset the 'disposal box full' indication, detach the master disposal box from the main unit, then reattach (The disposal box safety SW goes ON → OFF → ON again after at least 5 seconds). The disposal box empty detection sensor checks for any masters remaining within the master disposal box.

The master disposal counters and displays for the disposal box full detection operate separately for the 1st and 2nd units.

## 3. Master on Drum (Before Master Removal) Check Mechanism

The master loading sensor checks the master with the print drums at an angular position of 328° (1st print drum) and 298° (2nd print drum) from the position the tailing edge of the position A detecting plate escapes from position A sensor.

If no master is present, the master disposal operation is performed, but jam detection is not performed.

The master disposal jam sensor checks that master disposal is performed correctly.

## 4. Master Disposal Vertical Transport Mechanism

### 1st print drum operation

- (1) The print drum master tail clamp plate opens at the master tail clamp position A.
- (2) The print drum is rotated in the forward direction, and the drum master top clamp plate opens at the master top clamp position A.
- (3) The master disposal belt is rotated by the master disposal motor to move the disposed master to the master disposal unit as the print drum rotates in the forward direction.
- (4) The print drum and master disposal motor stop when the print drum has rotated to the next master tail clamp position A.

### 2nd print drum operation

- (1) The drum master tail clamp plate opens at master tail clamp position A.
- (2) The print drum is rotated in the forward direction, and the drum master top clamp plate opens at the master top clamp position A.
- (3) The print drum is rotated back 70° from the position in step (2). The master disposal belt is then rotated by the master disposal motor to feed the disposed master to the master disposal unit, while the print drum rotates in the forward direction from this point. The master disposal motor stops when the 400° position is reached.
- (4) The print drum stops when the print drum has rotated to the next master tail clamp position A.

The master disposal jam sensor checks that the master has been correctly disposed of when the master disposal motor has stopped. The master disposal motor limit sensor (encoder sensor) monitors the speed of the master disposal motor.

## 5. Disposal Compress Action

The disposal compress action is performed by the rotating action of the master compression plate and the opening and closing action of the disposal plate.

The master compression plate is rotated by the master compression motor. The initial position is checked by the master compression HP sensor, while the compression position is checked by the master compression limit sensor.

The disposal plate is opened and closed by the disposal plate motor. The initial (open) position is checked by the disposal plate HP sensor, and the closed position is checked by the disposal plate limit sensor.

The following operations are performed after the master disposal vertical transport operation ends.

- (1) The compression operation is performed twice with the disposal plate open.
- (2) The disposal plate closes and the compression operation is performed once.
- (3) The disposal plate opens once again and then closes, and the compression operation is performed one more time.
- (4) The disposal plate opens, and the compression operation ends.

## Disassembly

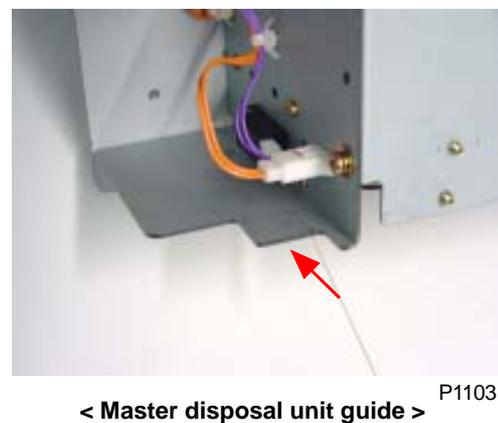
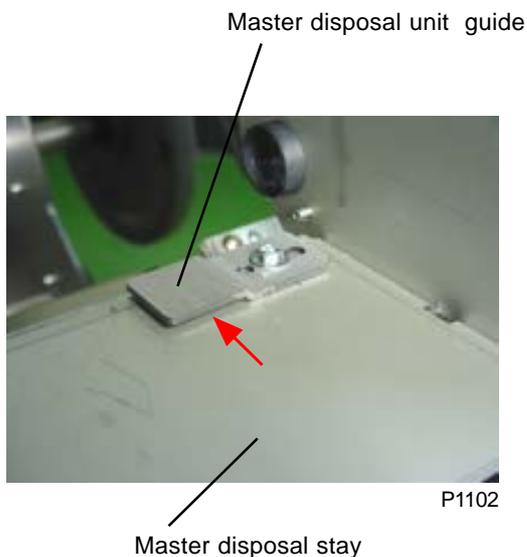
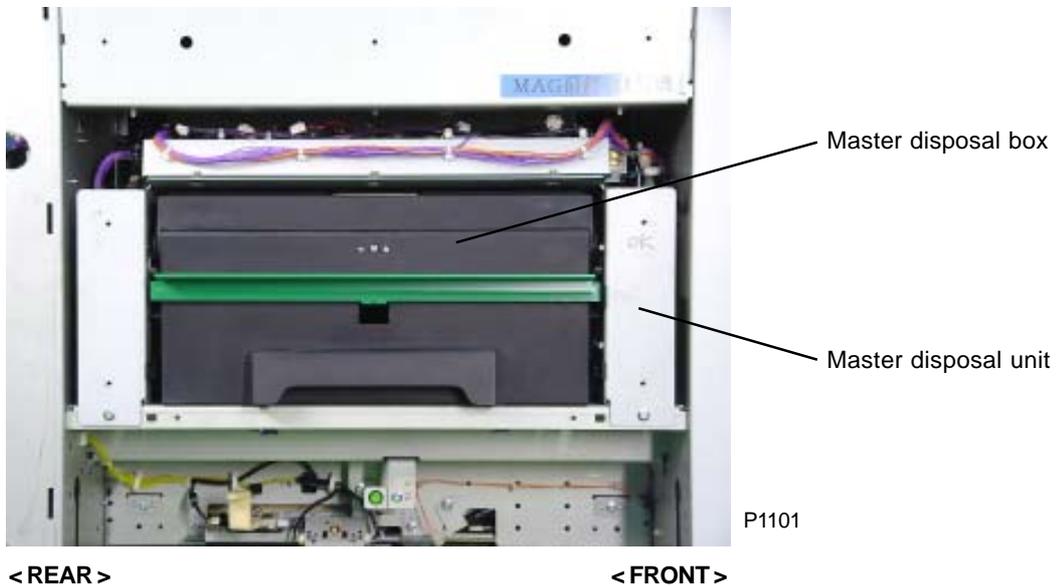
### 1. Removing the 1st Master Disposal Unit

Refer to page 11-18 for removing 2nd Master Disposal Unit.

- (1) Remove the master disposal box.
- (2) Remove the master disposal cover. (Five M4 x 6 screws)
- (3) Disconnect the three connectors and remove the two mounting screws (M4 x 8). Since the master disposal unit protrudes from the front, pull out and remove from the rear first.
  - \* Detach the wire harness from the wire harness clamp with the rear end of the unit pulled out slightly.

#### [Precautions for Reassembly]

Insert the flat section of the master disposal unit frame plate into the gap between the master disposal stay and the master disposal unit guide.



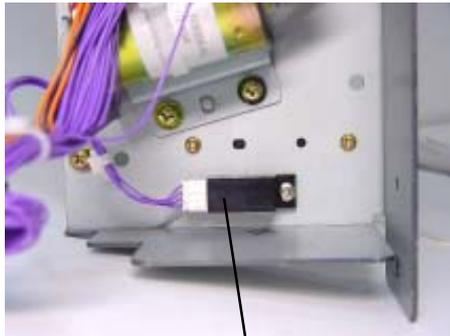
< Master disposal unit guide >

## 2. Removing the Disposal Box Empty Detection Sensor (Receive) and (Send)

(1) Disconnect the connector, remove the mounting screw (M3 x 6), then remove either the disposal box empty detection sensor (send) or disposal box empty detection sensor (receive).

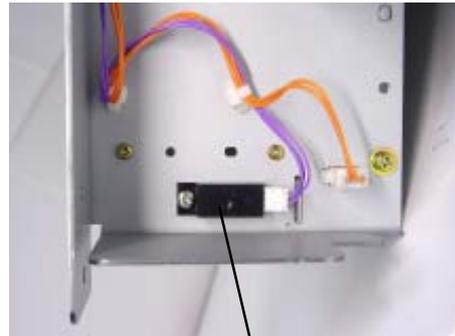
\* 1st master disposal unit: Front sensor (3 pins) = send. Rear sensor (4 pins) = receive.

\* 2nd master disposal unit: Front sensor (4 pins) = receive. Rear sensor (3 pins) = send.



P1104

Disposal box empty detection sensor (receive)

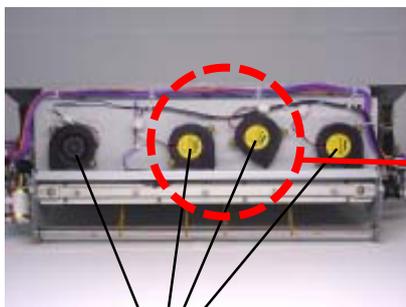


P1105

Disposal box empty detection sensor (send)

## 3. Removing the Master Tail Clamp Fan (1st Master Disposal Unit Only)

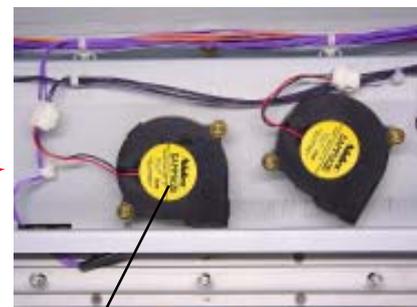
(1) Disconnect the connector, remove the two mounting screws (M3 x 20) on each fan, and remove the fan.



P1106

< Total of 4 Master tail clamp fans >

Enlarged View



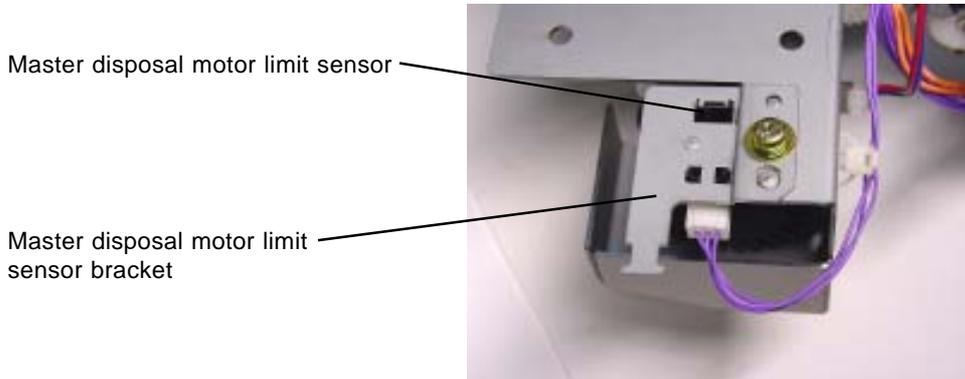
P1107

One of the four fans

#### 4. Removing the Master Disposal Motor Limit Sensor (Encoder Sensor)

[ The procedure is common for both the 1st and 2nd master removal unit ]

- (1) Disconnect the connector, remove the mounting screw (M4 x 5), and remove the master disposal motor limit sensor together with its bracket.

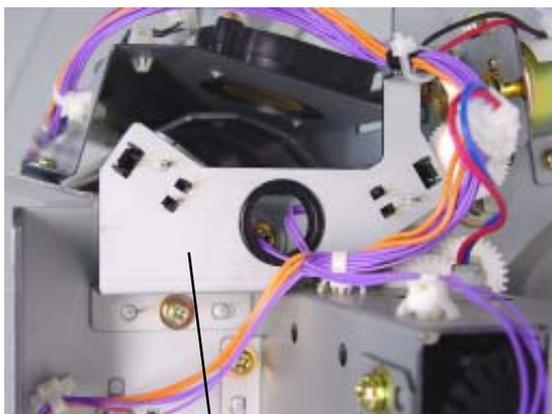


P1108

#### 5. Removing the Master Compression Limit Sensor (Encoder Sensor) and Master Compression HP Sensor

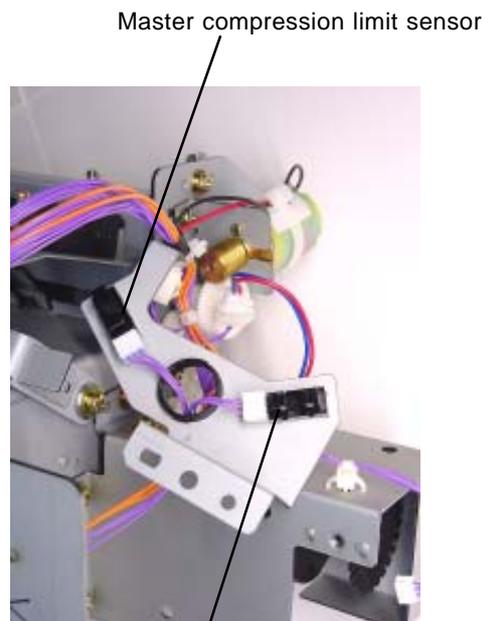
[ The procedure is common for both the 1st and 2nd master removal unit ]

- (1) Remove the mounting screw (M4 x 6), lift up the master compression sensor ass'y, disconnect the connector, and remove the master compression limit sensor and master compression HP sensor.



P1109

Master compression sensor ass'y



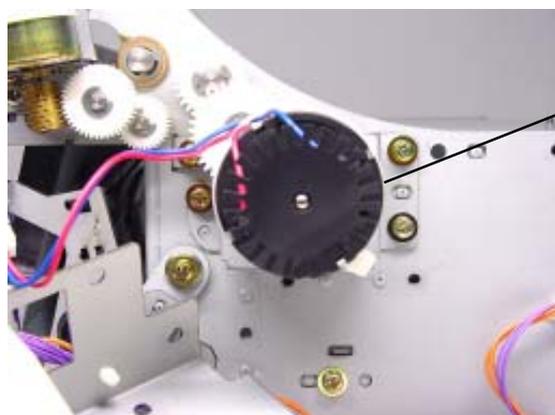
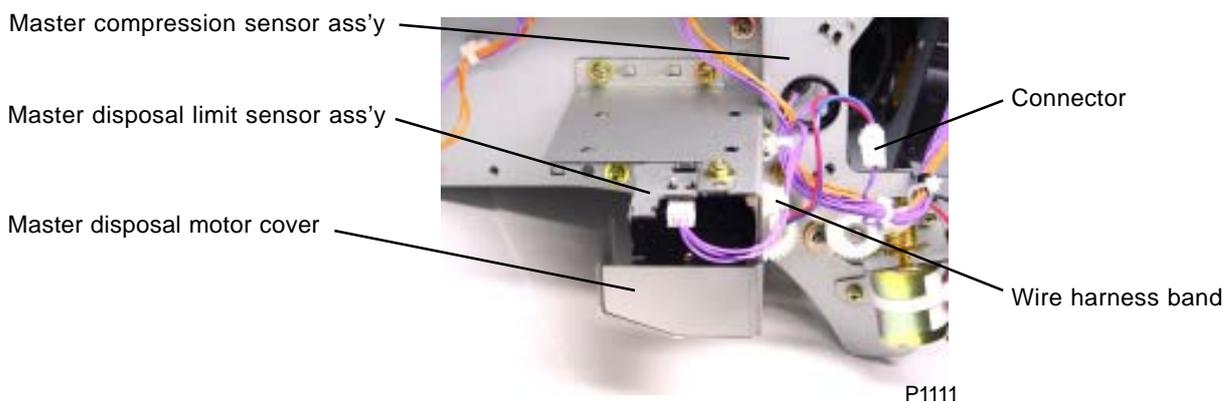
P1110

Master compression HP sensor

## 6. Removing the Master Disposal Motor

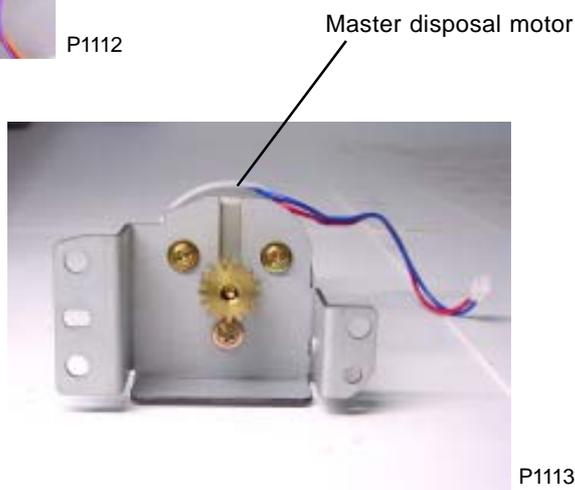
[ The procedure is common for both the 1st and 2nd master removal unit ]

- (1) Remove the mounting screw on the master disposal limit sensor ass'y.
- (2) Remove the mounting screw on the master compression sensor ass'y.
- (3) Disconnect the connector on the master disposal motor, cut the wire harness band, remove the three mounting screws (M4 x 6), and remove the master disposal motor cover.
- (4) Remove the master disposal motor ass'y. (Three M4 x 6 screws)
- (5) Remove the three mounting screws (M3 x 5), then remove the master disposal motor.



Master disposal motor ass'y

P1112



Master disposal motor

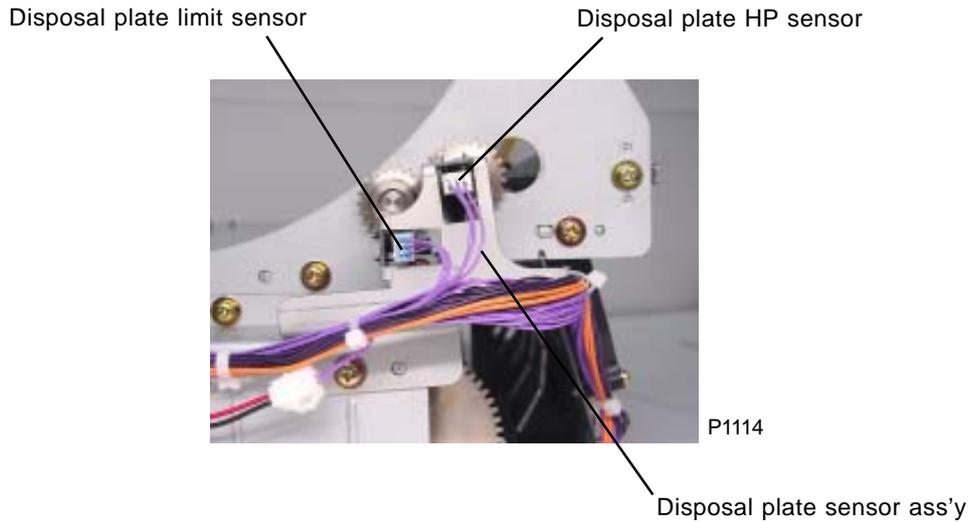
P1113

< Master disposal motor ass'y >

## 7. Removing the Disposal Plate Limit Sensor and Disposal Plate HP Sensor

[ The procedure is common for both the 1st and 2nd master removal unit ]

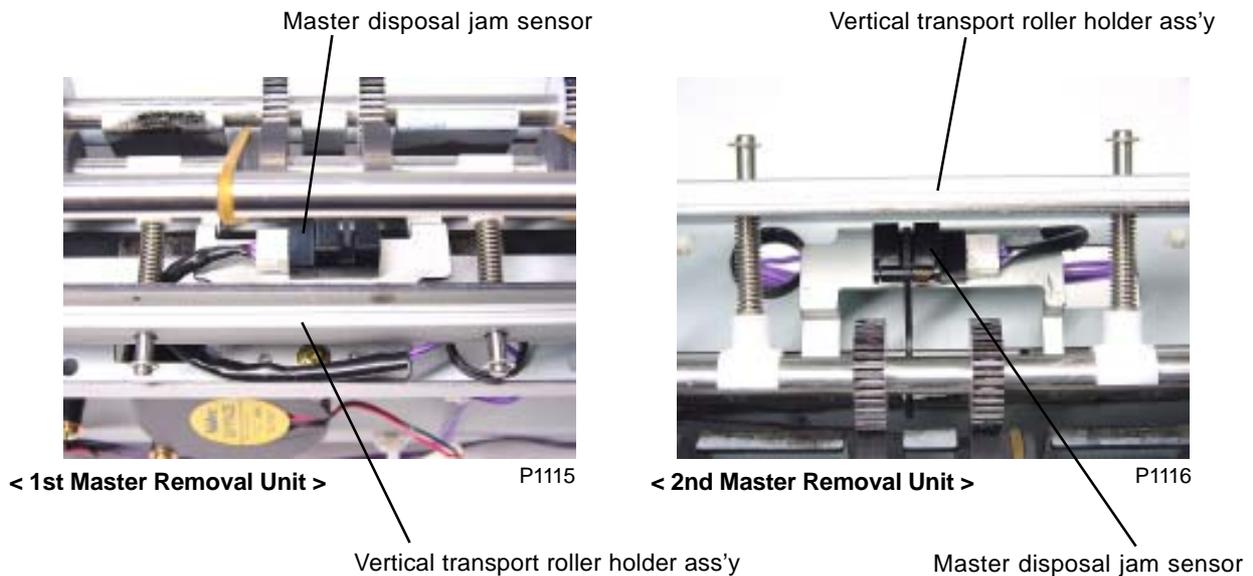
- (1) Remove the disposal plate sensor ass'y. (M4 x 6 screw)
- (2) Disconnect the connector and remove the disposal plate limit sensor and disposal plate HP sensor.



## 8. Removing the Master Disposal Jam Sensor

[ The procedure is common for both the 1st and 2nd master removal unit ]

- (1) Remove the vertical transport roller holder ass'y. (Two M4 x 6 screws)
- (2) Disconnect the connector, remove the mounting screw (M3 x 6), and remove the master disposal jam sensor together with the bracket.

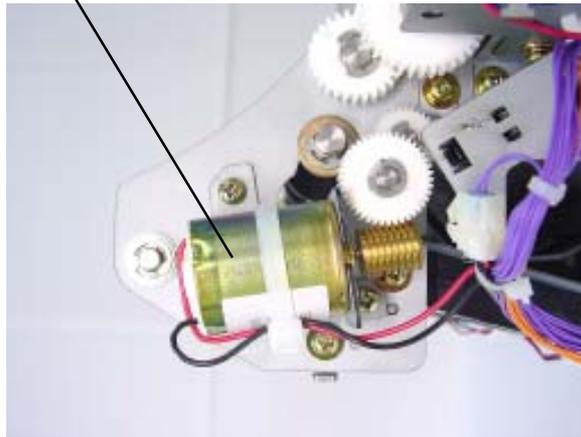


## 9. Removing the Disposal Plate Motor

[ The procedure is common for both the 1st and 2nd master removal unit ]

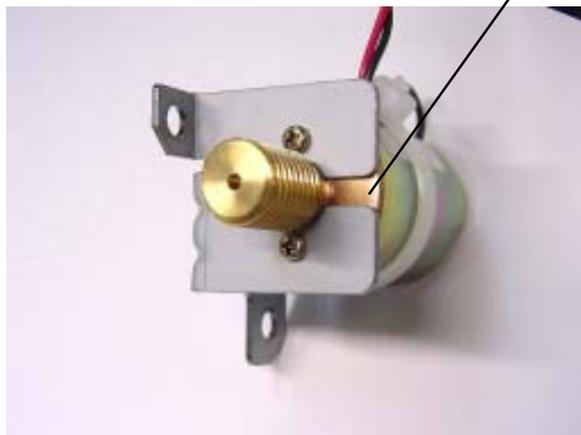
- (1) Cut the wire harness band, disconnect the connector, remove the two mounting screws (M4 x 6), and remove the disposal plate motor ass'y.
- (2) Remove the disposal plate motor. (Two M2.6 x 5 screws)

Disposal plate motor ass'y



P1117

Disposal plate motor



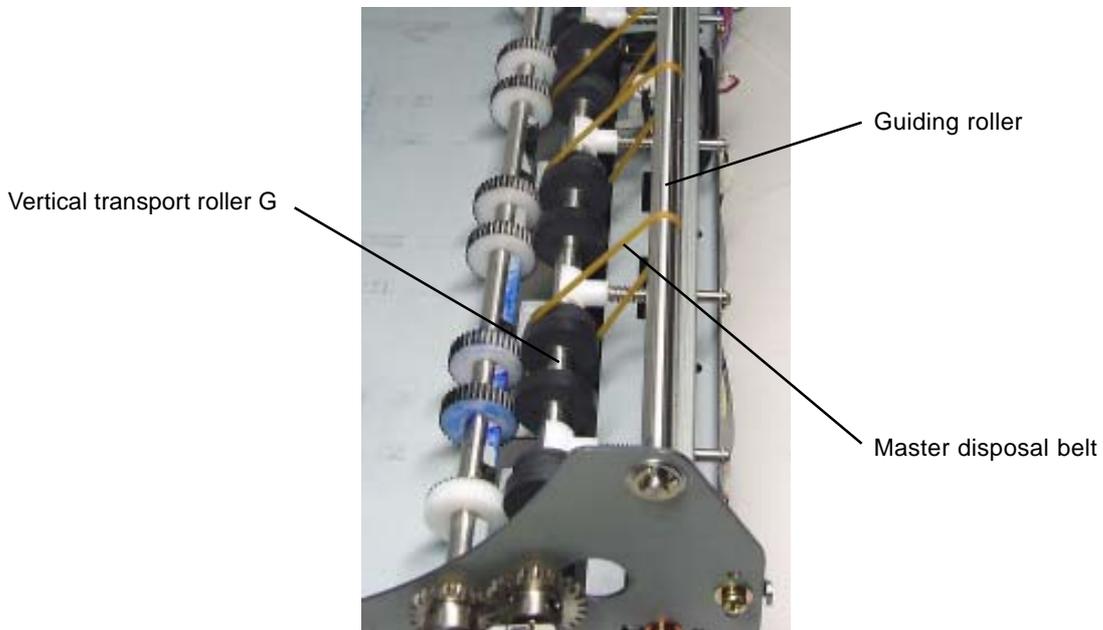
< Disposal plate motor ass'y >

P1118

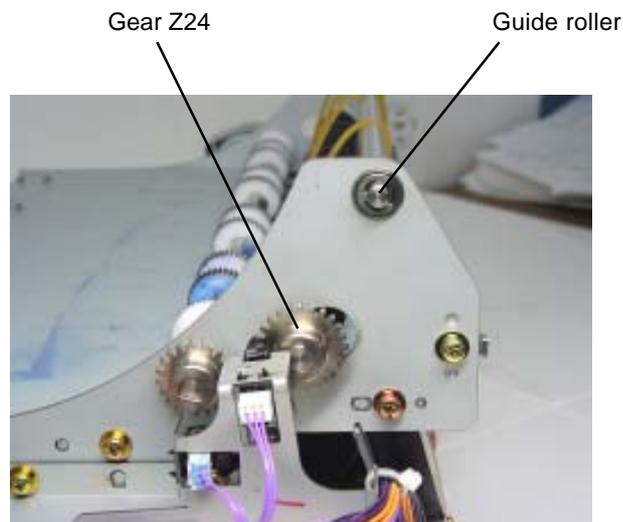
## 10. Removing the Vertical Transport Roller G and Master Disposal Belt (1st Master Disposal Unit)

Refer to page 11-19 for removing these parts from the 2nd Master Disposal Unit.

- (1) Remove the vertical transport roller holder.
- (2) Remove the master disposal jam sensor ass'y.
- (3) Remove the disposal plate motor.
- (4) Detach the E-ring and bearing on one side of the guiding roller, slide out the roller, and remove.
- (5) Loosen the set screw on gear Z24 and remove from vertical transport roller G.
  - \* The gear on the "Gear Z24" should face inside and the boss with the set screw faces outside.
- (6) Pull out and remove vertical transport roller G from the keyhole shaped hole in the frame plate.
- (7) Remove the master disposal belt from vertical transport roller G.



P1119

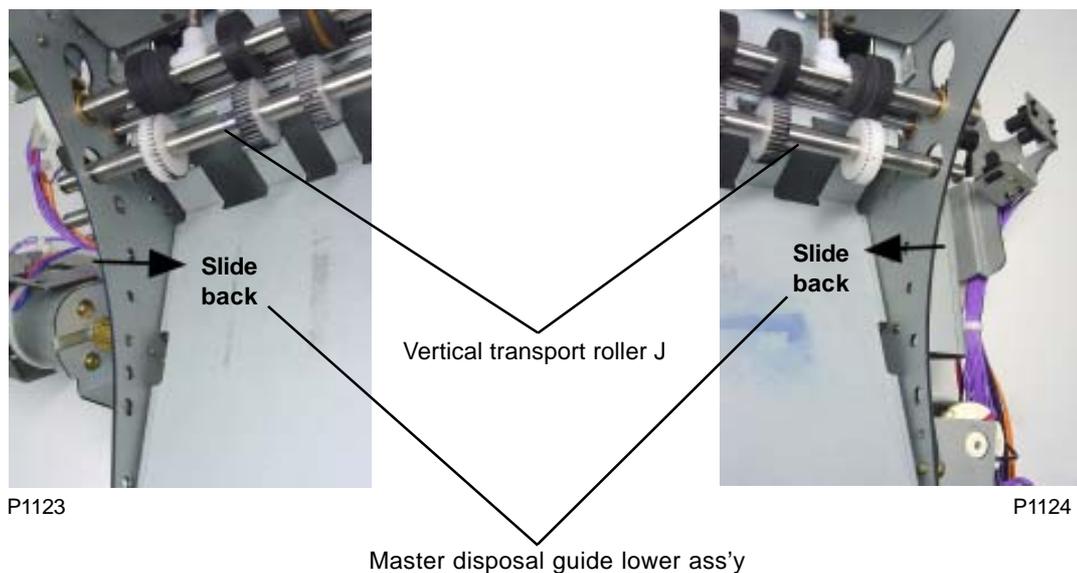
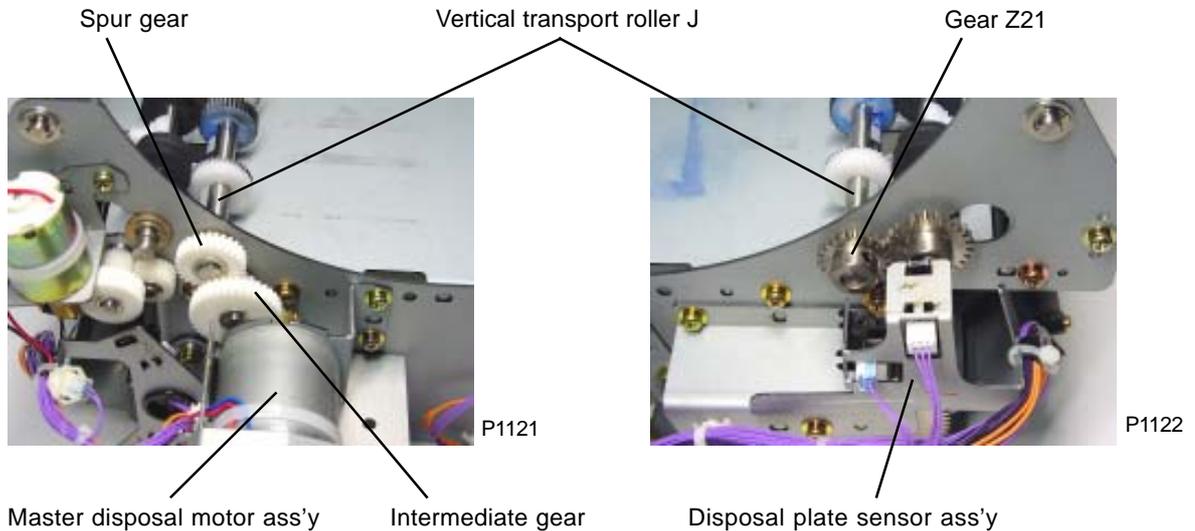


P1120

## 11. Removing Vertical Transport Roller J (1st Master Disposal Unit)

Refer to page 11-19 for removing these parts from the 2nd Master Disposal Unit.

- (1) Remove the master disposal motor ass'y together with the master disposal motor cover. (Five M4 x 6 screws)
- (2) Detach the E-ring and remove the intermediate gear. (Front)
- (3) Detach the E-ring and remove the spur gear (sharrow boss faces inwards). (Front)
- (4) Remove the disposal plate sensor ass'y. (M4 x 6 screw)
- (5) Loosen the set screw on the rear gear Z21 and remove from vertical transport roller J.
- (6) Remove the four mounting screws (M4 x 6) on the master disposal guide lower ass'y and slide the ass'y back a little.
- (7) Detach the E-rings and metals on both sides and remove vertical transport roller J.



## 12. Removing the Disposal Plate

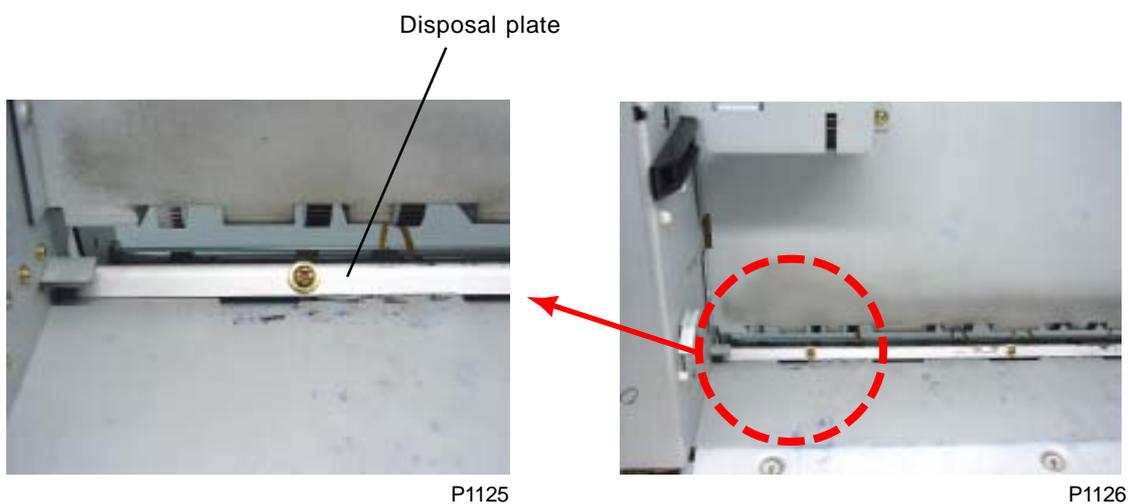
[ The procedure is common for both the 1st and 2nd master removal unit ]

- (1) Remove the vertical roller holder ass'y.
- (2) Remove the master disposal jam sensor ass'y.
- (3) Remove the disposal plate motor ass'y.
- (4) Move the disposal plate to an accessible position, remove the three mounting screws (M3 x 6), and remove the disposal plate.

### [Precautions for Reassembly]

Align the direction of the disposal plate with the disposal plate detection plate.

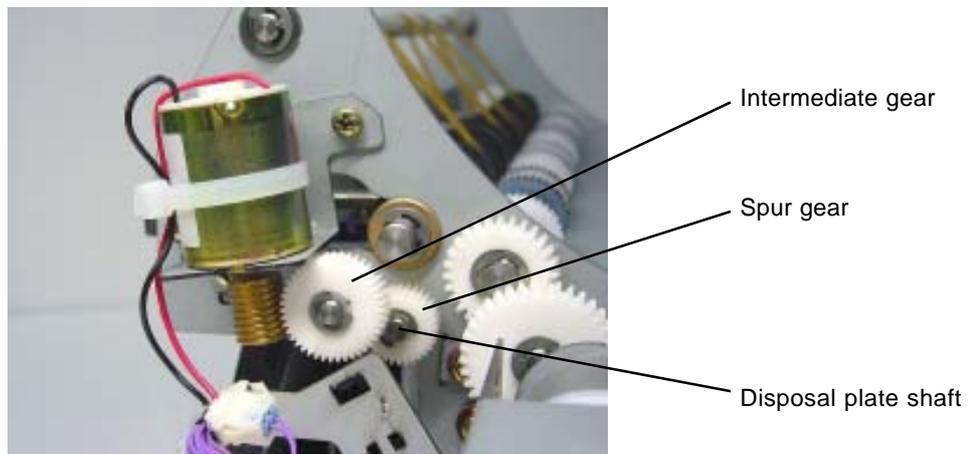
Avoid bending the disposal plate shaft.



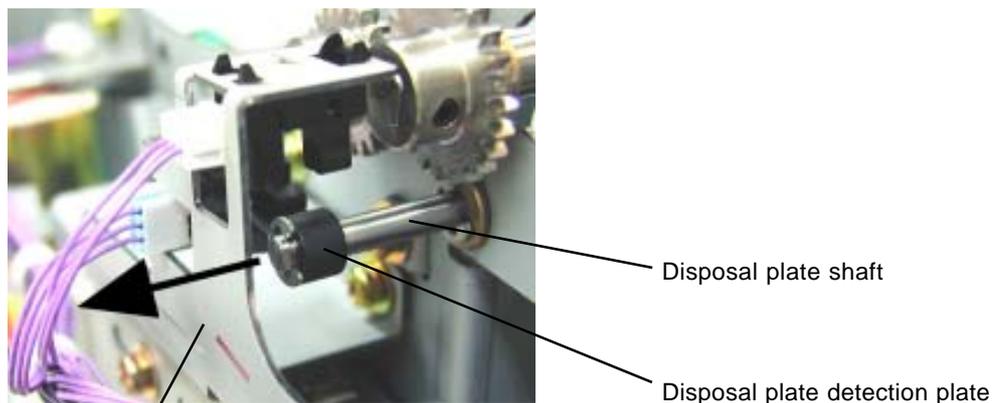
### 13. Removing the Disposal Plate Shaft

[ The procedure is common for both the 1st and 2nd master removal unit ]

- (1) Remove the disposal plate.
- (2) Remove the disposal plate sensor ass'y.
- (3) Detach the E-ring and remove the intermediate gear.
- (4) Detach the E-ring and remove the spur gear.
- (5) Detach the E-ring and metal. Then slide and remove the disposal plate shaft in the direction in which the disposal plate detection plate is attached, and remove.



P1127



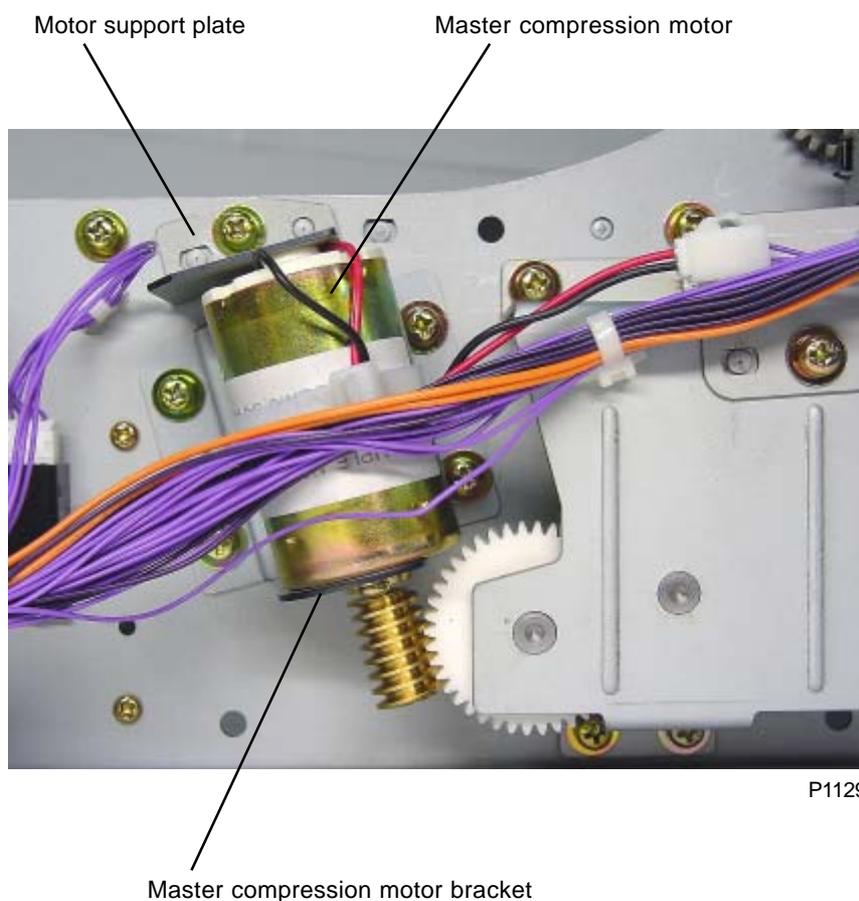
P1128

Disposal plate sensor ass'y

## 14. Removing the Master Compression Motor

[ The procedure is common for both the 1st and 2nd master removal unit ]

- (1) Remove the motor support plate. (M4 x 6 screw)
- (2) Disconnect the connector, remove the four mounting screws (M4 x 6), and remove the master compression motor together with the master compression motor bracket.
- (3) Remove the two mounting screws (M3 x 6), then remove the master compression motor from the master compression motor bracket.



## 15. Removing the Master Compression Plate

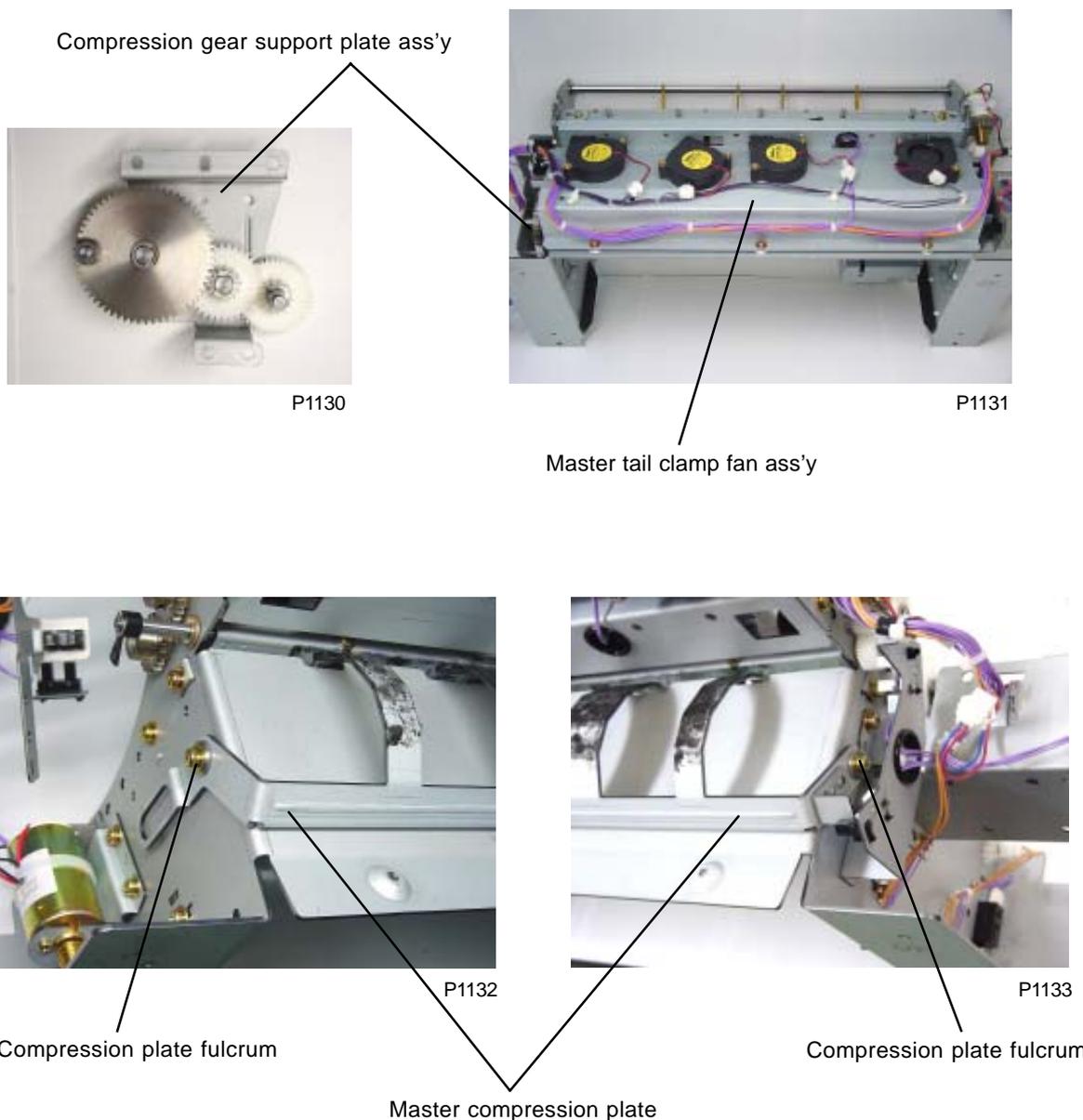
[ The procedure is common for both the 1st and 2nd master removal unit ]

\* Omit step (1) for the 2nd master disposal unit.

- (1) Remove the master tail clamp fan ass'y. (Three M4 x 6 screws)
- (2) Remove the disposal plate sensor ass'y.
- (3) Remove the compression gear support plate ass'y. (Four M4 x 6 screws)
- (4) Remove the mounting screws (one M4 x 10 screw on each side) and compression plate fulcrum from both sides, then remove the master compression plate.

[Precautions for Reassembly]

(Refer to next page)

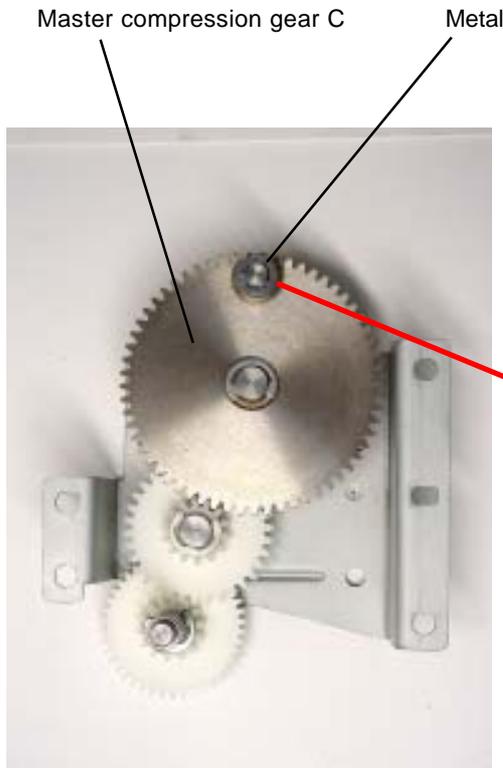


## CHAPTER 11. MASTER DISPOSAL SECTION

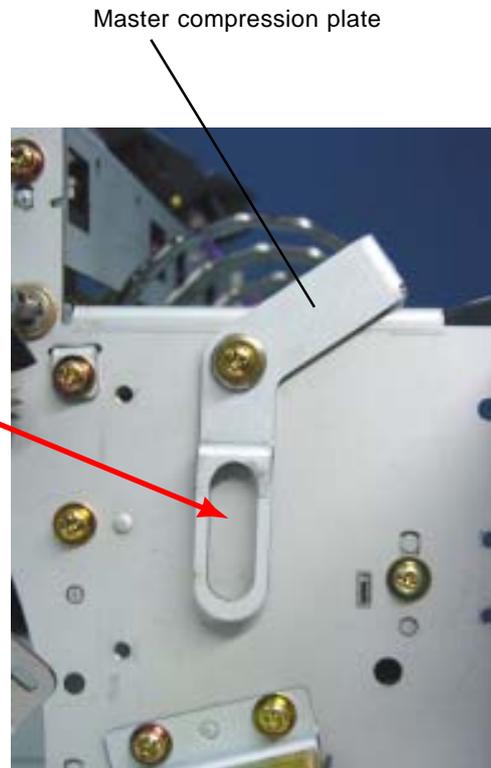
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### [Precautions for Reassembly]

Insert the "Metal" on the "Master compression gear C" in the elongated hole of the "Master compression Plate".



P1134



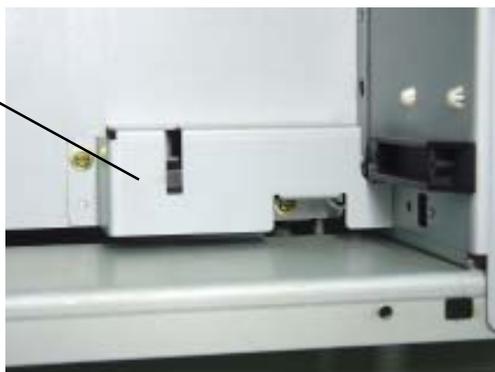
P1135

## 16. Removing the Disposal Box Safety SW

[ The procedure is common for both the 1st and 2nd master removal unit ]

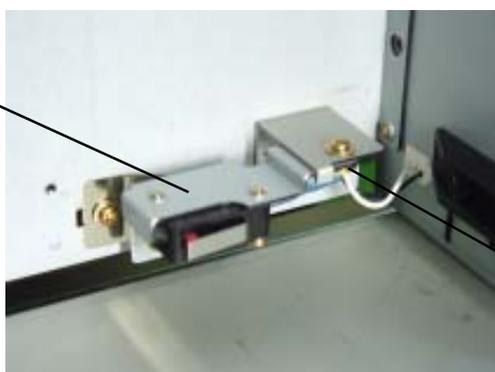
- (1) Remove the safety SW cover. (Two M3 x 6 screws)
- (2) Remove the mounting screw (M3 x 6) and safety SW fulcrum shaft, then remove the safety SW ass'y.
- (3) Disconnect the connectors, remove the two mounting screws (M3 x 14), and remove the disposal box safety SW from the safety SW bracket.

Safety SW cover



P1136

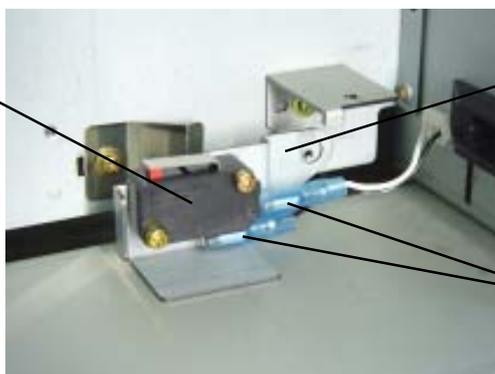
Safety SW ass'y



Safety SW fulcrum shaft

P1137

Disposal box safety SW



Safety SW bracket

Connectors

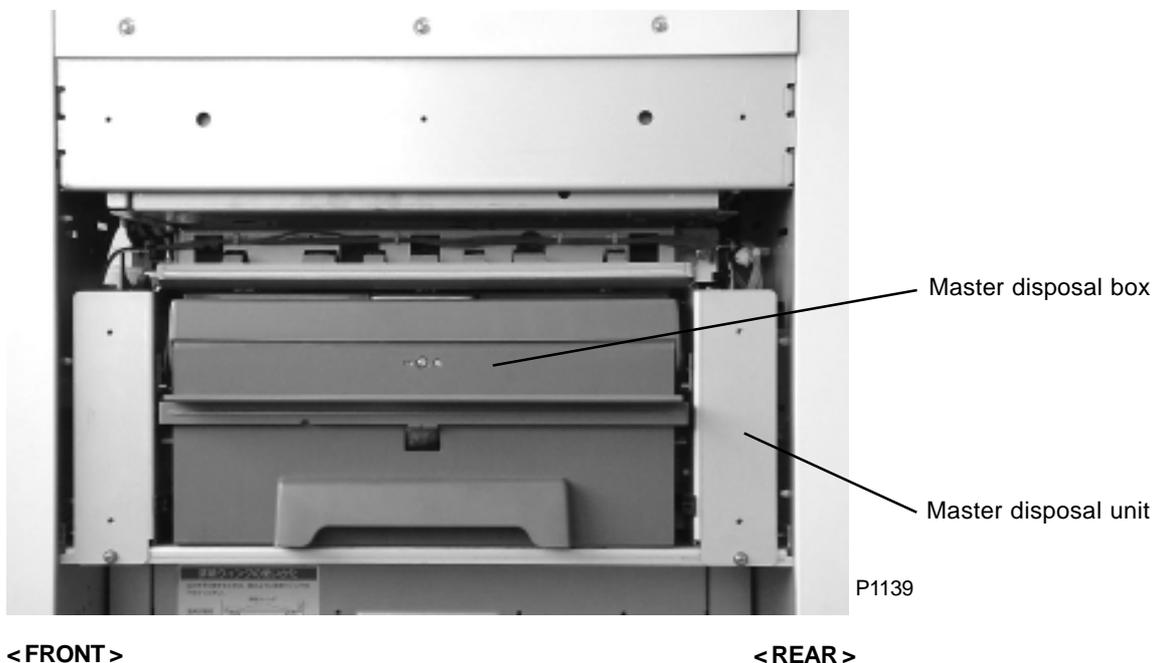
P1138

## 17. Removing the 2nd Master Disposal Unit

- (1) Remove the master disposal box.
- (2) Remove the master disposal cover. (Five M4 x 6 screws)
- (3) Disconnect the two connectors and remove the two mounting screws (M4 x 8). Since the master disposal unit protrudes from the rear, pull out and remove from the front first.

### [Precautions for Reassembly]

Insert the flat section of the master disposal unit frame plate into the gap between the master disposal stay and the master disposal unit guide.

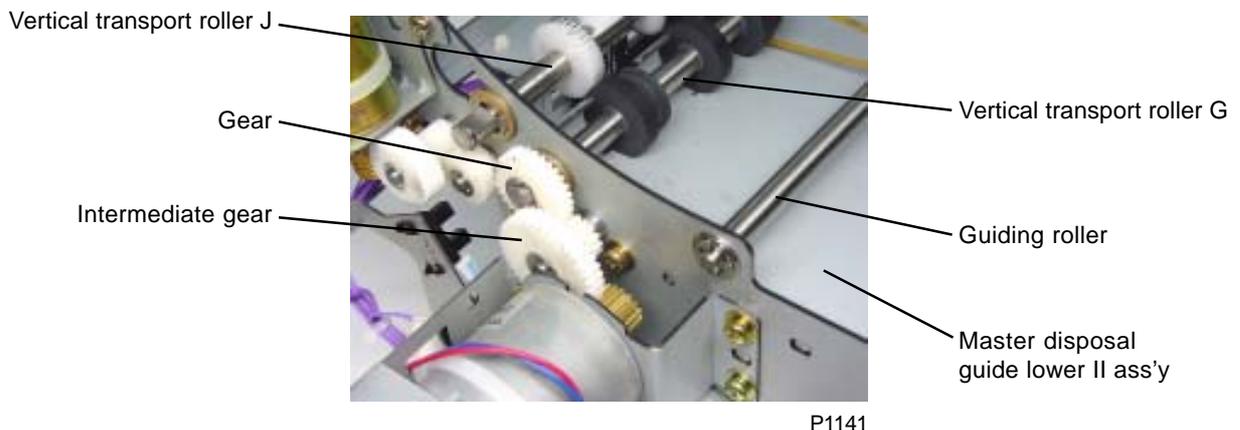
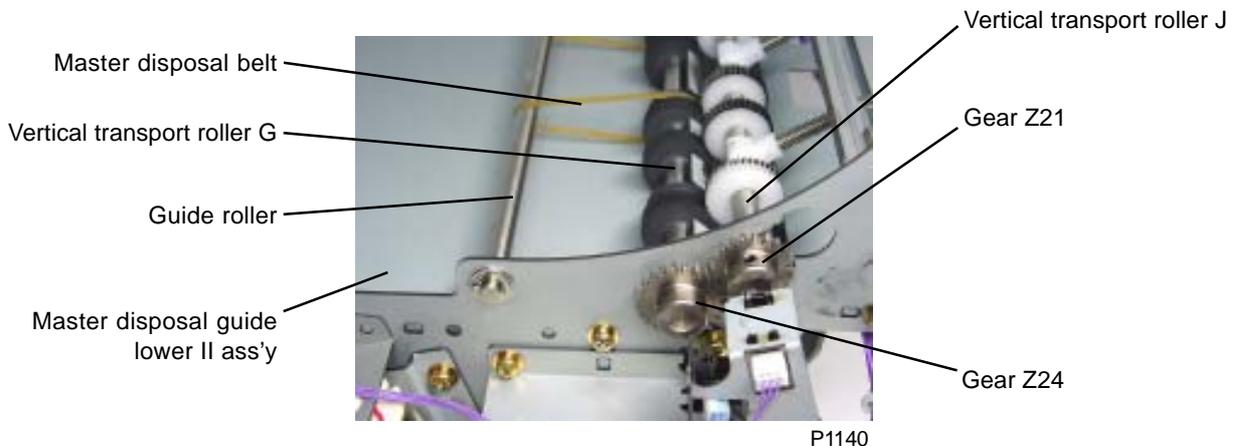


## 18. Removing Vertical Transport Roller G and Master Disposal Belt (2nd Master Disposal Unit)

- (1) Remove the vertical roller holder.
- (2) Remove the master disposal jam sensor ass'y.
- (3) Remove the motor ass'y together with the master disposal motor cover. (Five M4 x 6 screws)
- (4) Detach the E-ring and remove the intermediate gear. (Rear)
- (5) Detach the E-ring and remove the spur gear (sharrow boss faces inwards). (Rear)
- (6) Remove the disposal plate sensor ass'y. (M4 x 6 screw)
- (7) Loosen the set screw on the front gear Z24 and remove from vertical transport roller G.
- (8) Remove the four mounting screws (M4 x 6) on the master disposal guide lower II ass'y and move to one side.
- (9) Remove the E-rings and metals on both sides and remove vertical transport roller G.
- (10) Remove the E-ring and bearing on one side of the guiding roller, slide the roller, and remove the master disposal belt.

## 19. Removing Vertical Transport Roller J (2nd Master Disposal Unit)

- (1) Remove the vertical roller holder.
- (2) Remove the master disposal jam sensor ass'y.
- (3) Loosen the set screw on gear Z21 and remove from vertical transport roller J.
- (4) Pull out vertical transport roller J from the keyhole-shaped hole in the side plate and remove.



# MEMO

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# CHAPTER 12: FB ORIGINAL SCANNING SECTION

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## Contents

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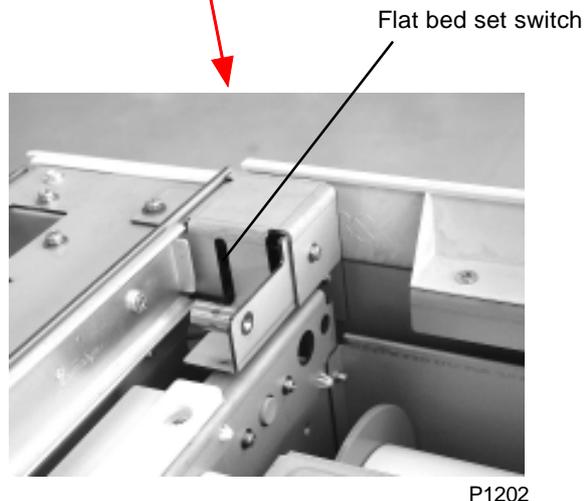
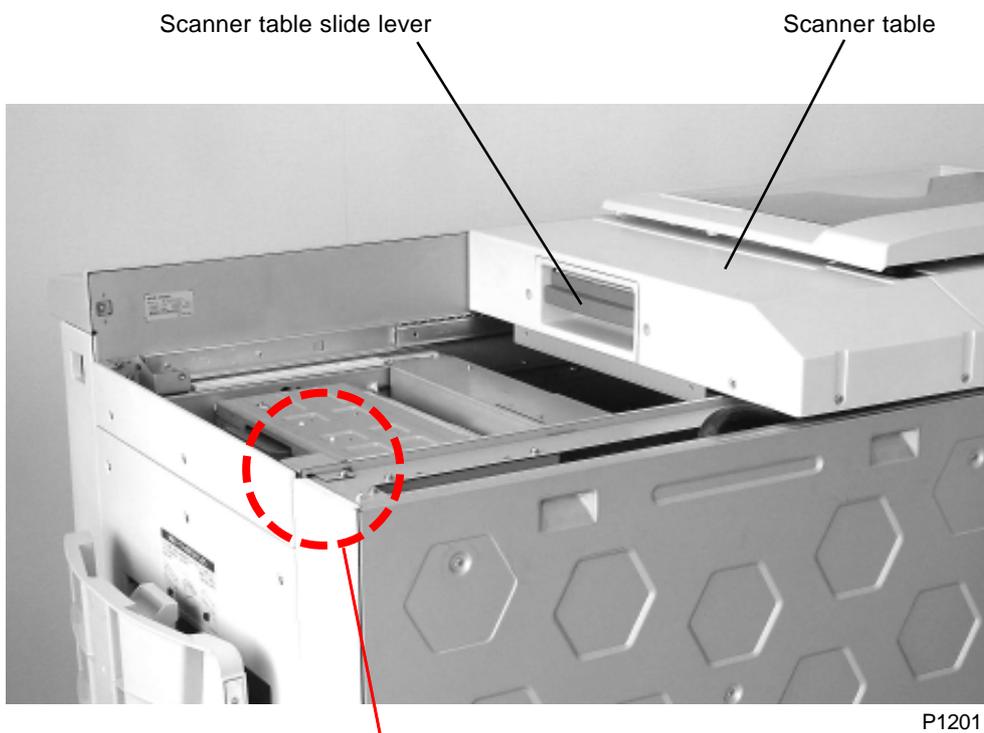
## Mechanism

### 1. Scanner Table Opening and Closing Mechanism

The scanner table can be opened by gripping the scanner table slide lever.

The flat bed set SW confirms that the scanner table is in position.

The flat bed set switch also acts as an interlock SW. When the scanner table is opened, the switch cuts power to the main motor, clamp motor, master loading fan, print positioning pulse motor, master compression motor, disposal plate motor, paper ejection motor, pinch pulse motor, master making unit shifting motor, and TPH power supply.



# MEMO

## 2. Scanning Mechanism

The FB read pulse motor drives the front and rear wire-spool pulleys via the two-stage reduction pulleys linked by the timing belt.

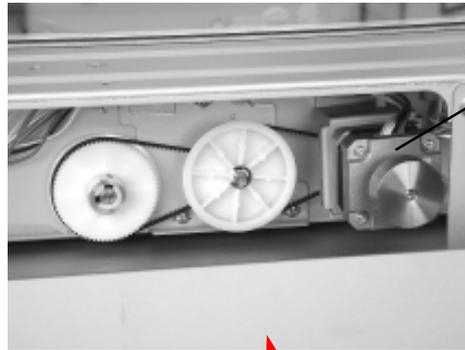
The front and rear wire-spool pulleys are configured symmetrically.

One end of the wire is secured to the frame via the spring, and is attached to the lamp carriage via sliding pulley 2 mounted on the mirror carriage. It is wound approximately 7 times around the wire-spool pulley from the opposite side via fixed pulley 2 secured to the frame. It is then attached to the frame via fixed pulley 1 mounted on the frame, and sliding pulley 1 mounted on the mirror carriage].

The mirror carriage and lamp carriage are able to move horizontally along the rails attached to the respective sliders.

The mirror carriage carries two mirrors (mirror 2 and mirror 3), and the lamp carriage carries the original illumination lamp (and lamp inverter) and mirror 1.

The mechanism uses a "full/half-rate mirror scanning" system, in which the mirror carriage moves  $1/2 L$  mm as the lamp carriage moves  $L$  mm in the same direction. This means that when the FB read pulse motor is activated, the original can be scanned while a constant distance is maintained between the original and the center of the lens mounted on the frame. The image of the original on the scanner table illuminated by the lamp is reflected via mirrors 1, 2, and 3, and is then focused onto the CCD by the lens in the lens ass'y.

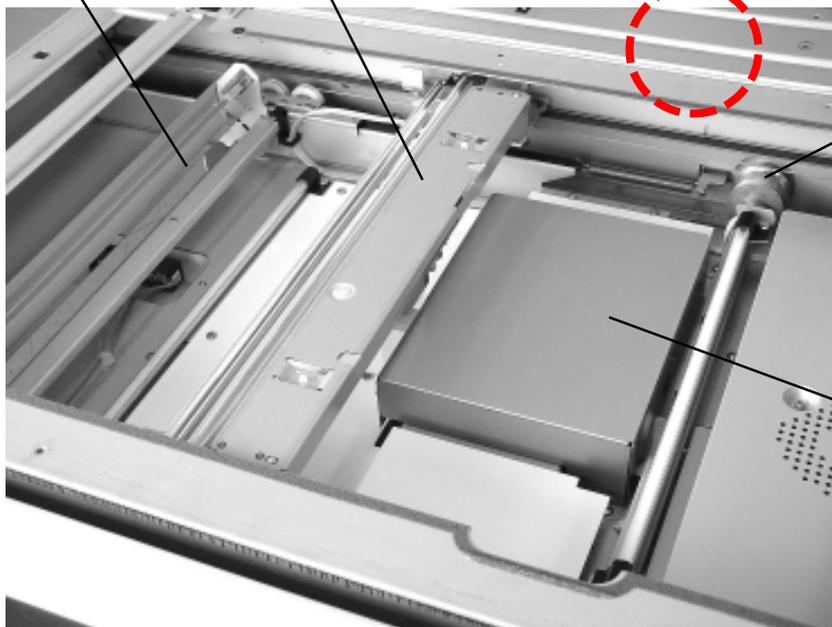


FB read pulse motor

P1203

Mirror carriage

Lamp carriage

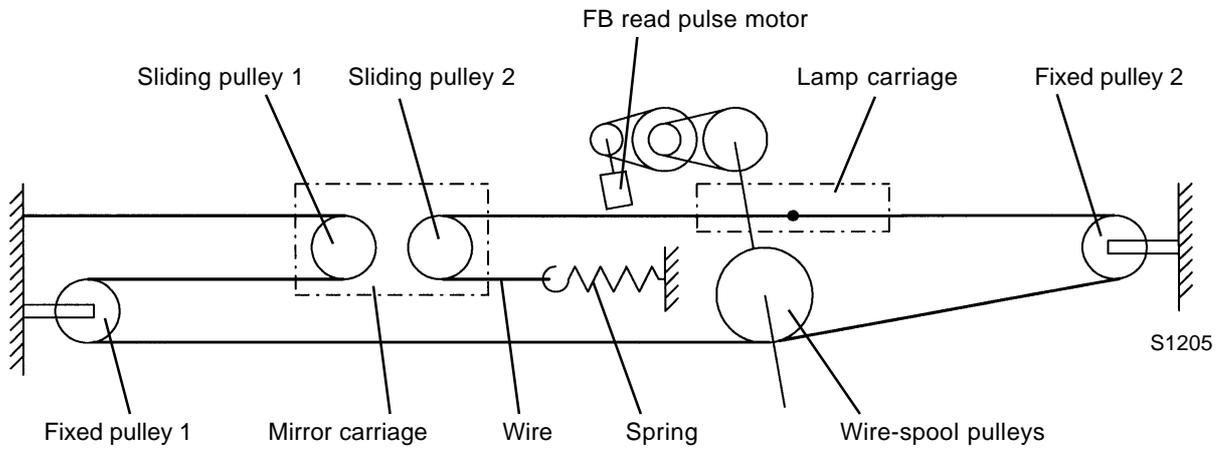


Wire-spool pulley

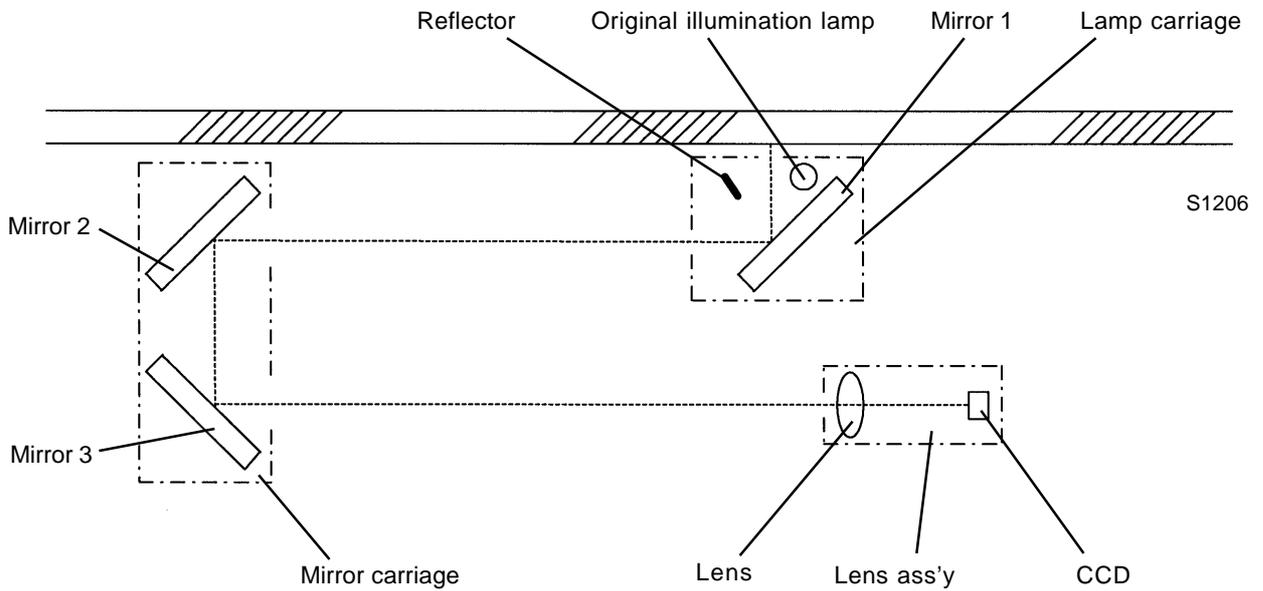
Lens ass'y

P1204

Drive-system diagram



Optical-system diagram



### 3. Flatbed Initialization

Initialization is performed in the following situations to place the flatbed in standby mode:

- When the power is switched on
- When "All reset" is performed

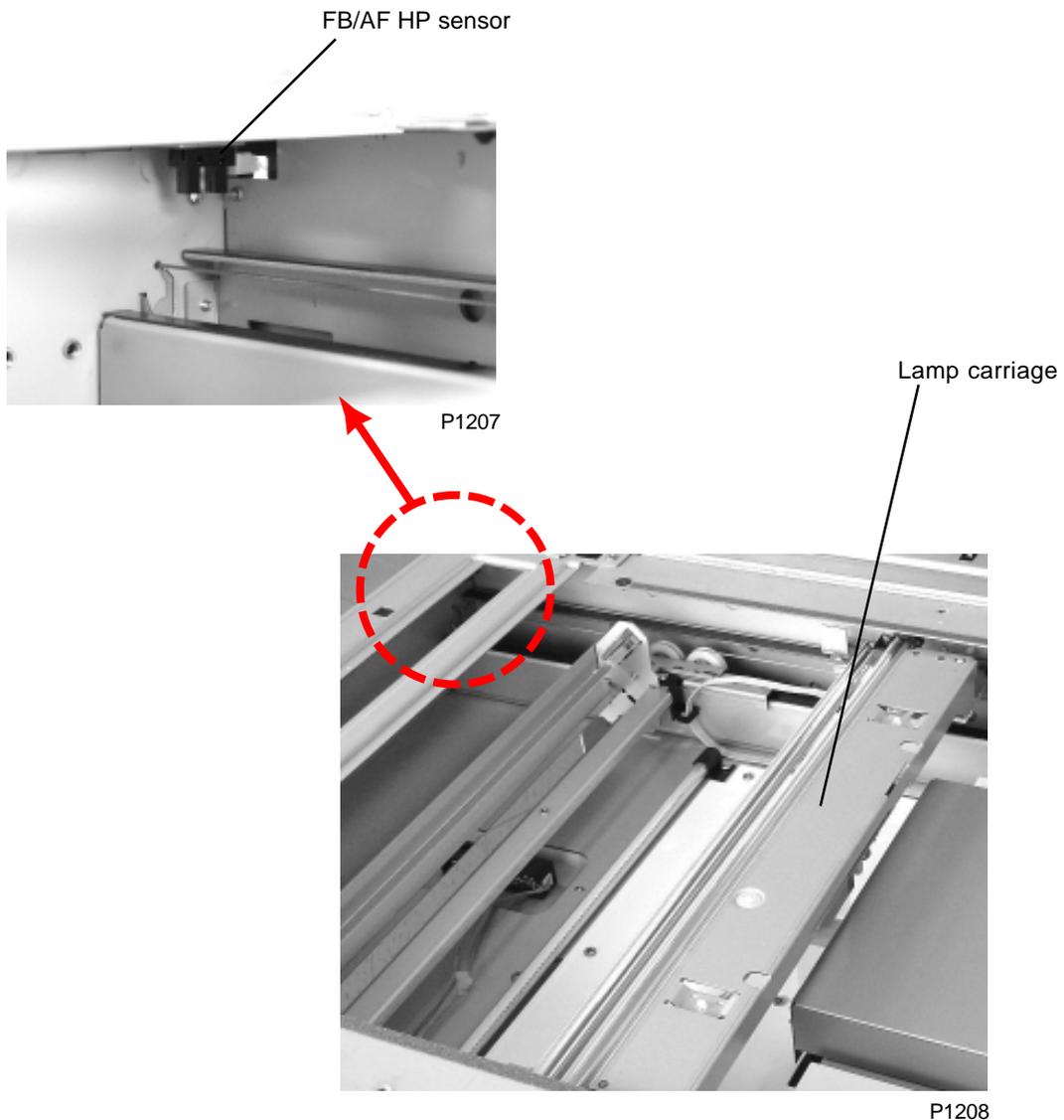
Initialization operation

The FB/AF HP sensor is checked, and if it is OFF (open), the FB read pulse motor is activated in the return direction until the light path is blocked, to move the lamp carriage to the left in the photograph. Once the FB/AF HP sensor turns ON (blocked), it is moved a further set distance before the operation ends (this is the "standby position").

The detection plate on the FB/AF HP sensor is attached to the lamp carriage.

No movement is made if the FB/AF HP sensor is ON from the start.

The flatbed is moved to the shading position after moving to the standby position. Then, the lamp illuminates, and peak detection is performed as part of the shading compensation operation. The lamp finally turns off, and the flatbed is returned to the standby position.



#### **4. FB Original Scanning Movement (Book Mode OFF)**

When the START key is pressed, the FB read pulse motor activates, and the lamp carriage starts to move in the scanning direction. After the top 4 mm of the original is skipped, the read/write signal is activated and scanning of the original starts.

Once scanning has been performed for the specified distance, the lamp turns off, and the scanning operation ends. The lamp carriage is then returned to the standby position.

#### **5. Book-Mode Pre-Scan Mechanism**

When an original is placed on the stage glass and the START key is pressed, the lamp turns off, the FB read pulse motor is activated, and the lamp carriage starts to move in the scanning direction. Once shading compensation has been performed and the lamp carriage has moved the specified distance, the FB read pulse motor stops and the lamp turns off.

The lamp carriage is then returned to the standby position to complete the pre-scan operation. Book-mode scanning is performed next.

#### **6. Book-Mode Scanning Mechanism**

Once the pre-scan operation is complete, the lamp illuminates, the FB read pulse motor is activated, and the lamp carriage starts to move in the scanning direction for the shading-compensation operation. The read/write signal is activated, and scanning of the original starts.

Once scanning has been performed for the specified distance, the lamp turns off and the FB read pulse motor stops briefly. The lamp carriage is then returned to the standby position, and the scanning operation ends.

## Disassembly

### 1. Removing the Scanner Unit

- (1) Move the carriage to the lock position using [Test mode No. 154 \(Scanner Lock Mode\)](#). Slide the scanner table, then secure the mirror carriage with the scanner unit securing screw.
- (2) Switch OFF power and remove the covers.
- (3) Remove the 6 screws (M4 x 8), disconnect the connector, and remove the operation panel unit.
- (4) Remove the screw (M4 x 6), disconnect the connector, and remove the stage cover sensor ass'y.
- (5) Remove the four screws (M4 x 6) securing the scanner unit to the hinge bracket.
- (6) Remove the four scanner unit screws (M4 x 6), disconnect the bottom connector, and raise and remove the scanner unit.

**(The scanner unit is heavy precision component. Handle with care.)**

#### [Precautions for Reassembly]

After reinstalling, slide the scanner table and **remove the scanner unit securing screw on the mirror carriage**. Reset the error status using [Test mode No. 155 \(Scanner Release Action\)](#).

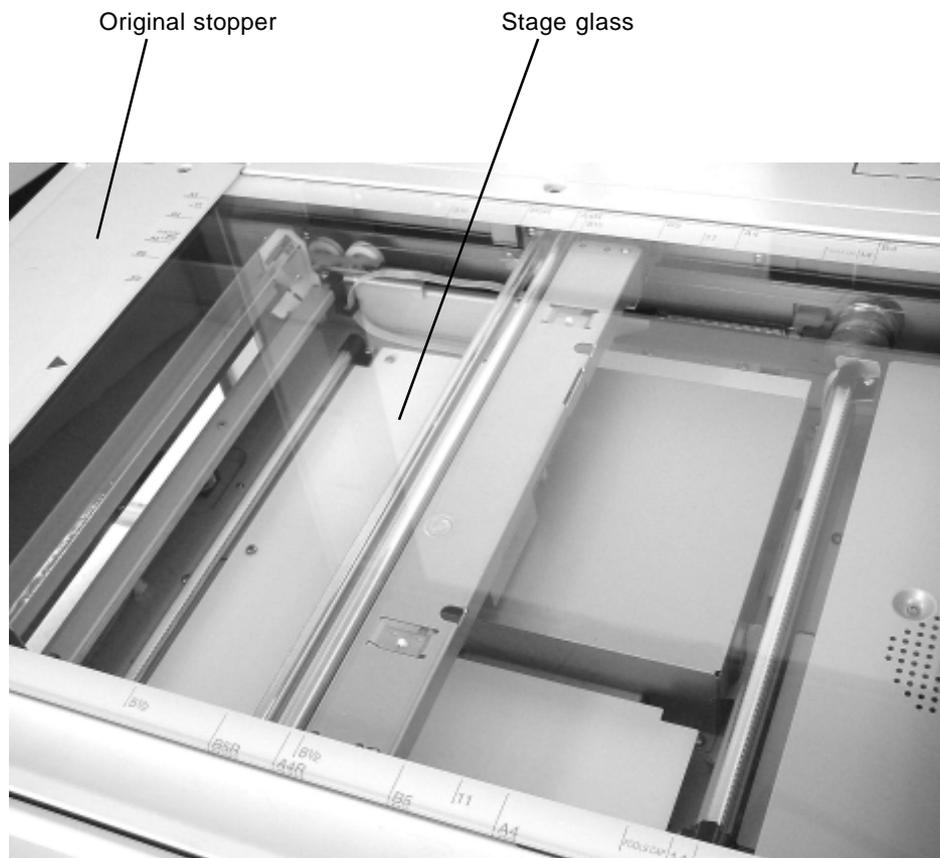
In replacing the scanner unit, memo down the three test mode setting numbers printed on a sticker attached on the top frame of the new scanner unit. After installing the new scanner unit on the machine, start up the factory test mode and input given number for each of the three factory test modes. (Apart from the fact that no menu screen appears, the procedure for the factory test mode is the same as for normal test modes.)

**Starting up factory test mode = 9874**

**Three test modes after accessing into factory test mode = 1203 , 1204, and 1205.**

## 2. Removing the Stage Glass

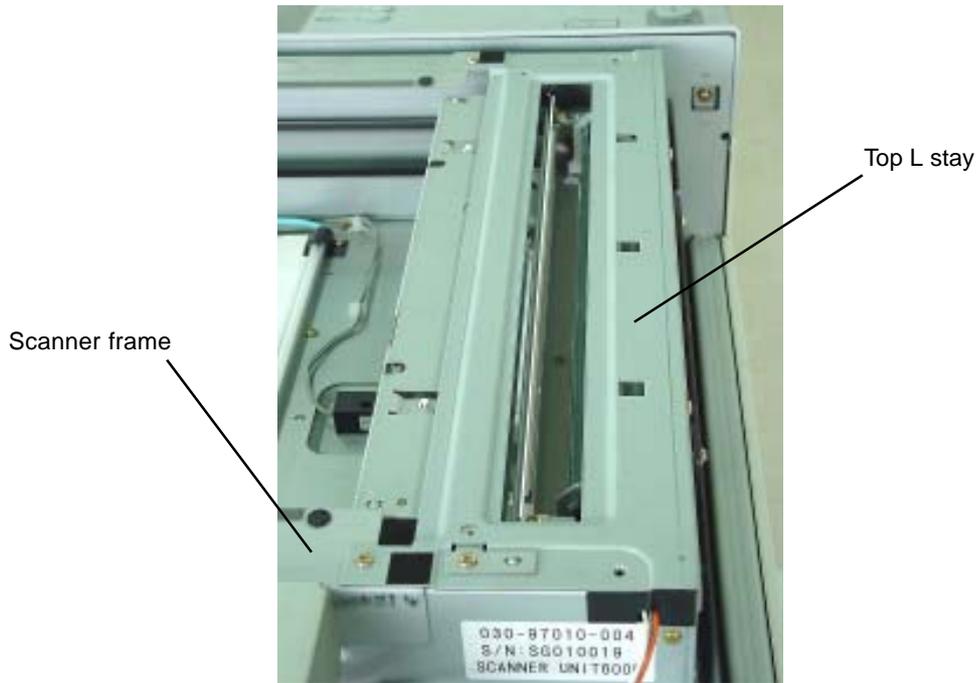
- (1) Remove following five covers from the scanner unit.
  - Scanner table cover
  - Scanner cover (right)
  - Scanner cover (rear)
  - Scanner cover (left)
  - Scanner cover (front).
- (2) Remove the two special stepped screws and remove the original stopper. (The original stopper is engaged from underneath. Move it toward the paper-feed side before removing it upward.)
- (3) Remove the stage glass.



P1209

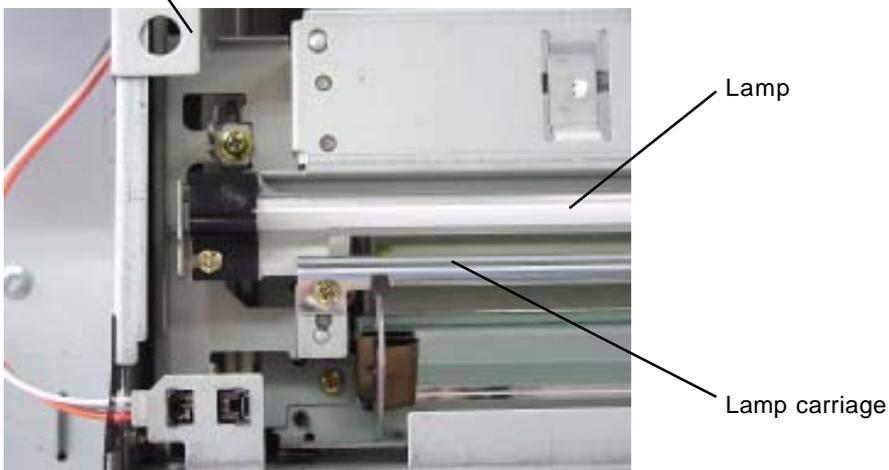
### **3. Removing the Lamp**

- (1) Switch off the power.
- (2) Remove the stage glass (refer to the previous page).
- (3) Remove the top L stay by removing four screws (M3 x 6).
- (4) Bring the lamp carriage to the large cutaway section on the scanner frame from which the top L stay was removed.
- (5) Remove the two screws (M3 x 6), detach the wire harness from the wire clamp and wire saddle, and then remove the lamp.



P1210

Scanner frame



P1211

## Adjustment

### 1. FB Read Pulse-Motor Speed Adjustment

#### Checks and procedure

- (1) Place A3-size papers on the paper-feed tray, place test chart No. 11 on the stage glass, and make one-to-one size image master and make prints.
- (2) Lay the print on top of the original to confirm that the image elongation and shrinkage is within  $\pm 1.0\%$  at the 350-mm line.
- (3) If the elongation and shrinkage is outside the specified parameters, adjust them using test mode No. 182 (FB scanning-speed adjustment).
  - \* **Prior to this adjustment, first adjust the image elongation and shrinkage in master making area (refer to page 14-23).**

### 2. FB Scan Start-Position Adjustment

#### Checks and procedure

- (1) Place A3-size papers on the paper-feed tray, place test chart No. 11 on the stage glass, and make one-to-one size image master and make prints.
- (2) Looking at the print, confirm that the scanning start position is at 5 mm  $\pm 2$  mm on the scale on the printed image.
- (3) If the position is outside the specified parameters, adjust it by using test mode No. 181 (FB scan start-position adjust).

**Test Mode No. 181 still does not exist.  
(January, 2002)**

### 3. FB Horizontal-Scan Position Adjustment

#### Checks and procedure

- (1) Place A3-size papers on the paper-feed tray, place test chart No. 14 on the stage glass, and make one-to-one size image master and make prints.
- (2) Inspect the master made on the print drum, and confirm that the pattern from the original is not missing on the left or right of the master on the print drum.
- (3) If the pattern is missing, adjust using [test mode No. 180 \(FB horizontal-scan position adjust\)](#).

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# CHAPTER 13: AF SCANNING SECTION

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# Mechanism

## 1. AF Original Set Mechanism

When the original is placed along the original guide fence and pushed against the original stopper, the AF original detection sensor is activated (light path open) and the display on the panel changes to "Ready to make master."

Following a preset interval, the AF read pulse motor reverses to lower the original pickup roller in the direction indicated by the arrow, and withdraw the original stopper upward. (The one-way clutch incorporated between the original registration roller gear and the original registration roller shaft prevents the original registration roller from rotating during this process.)

Once the original pickup roller has descended to push against the original, the original pickup roller and original stripper roller rotate in the original transport direction, and a single original is fed forward by the action of the original stripper roller and original stripper pad. This activates the AF original registration sensor (light path blocked), and the edge of the original is stopped by the stationary original registration roller.

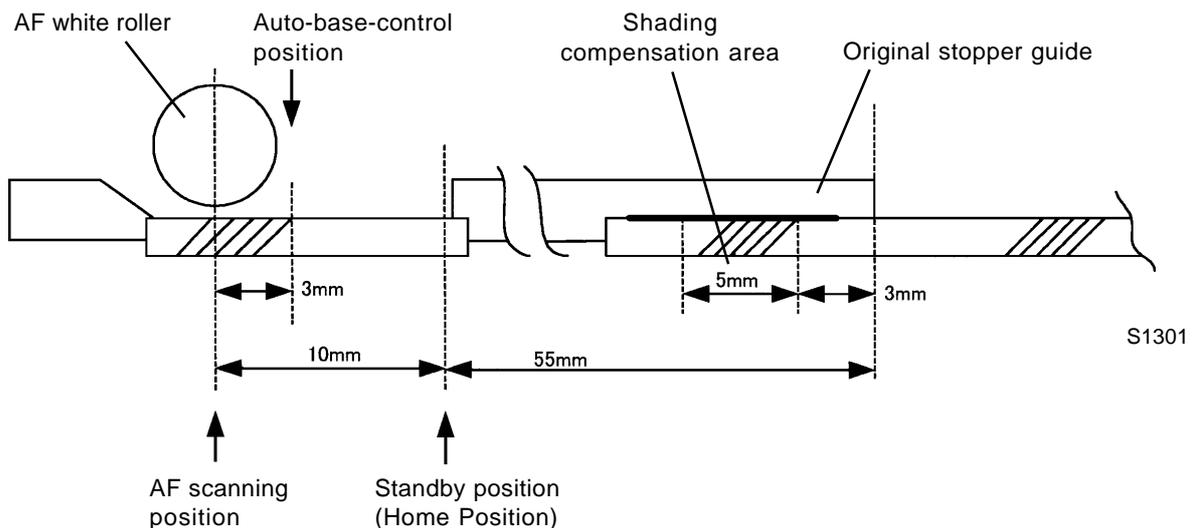
Once a preset interval has elapsed following activation of the AF original registration sensor, the AF read pulse motor operates in the forward direction.

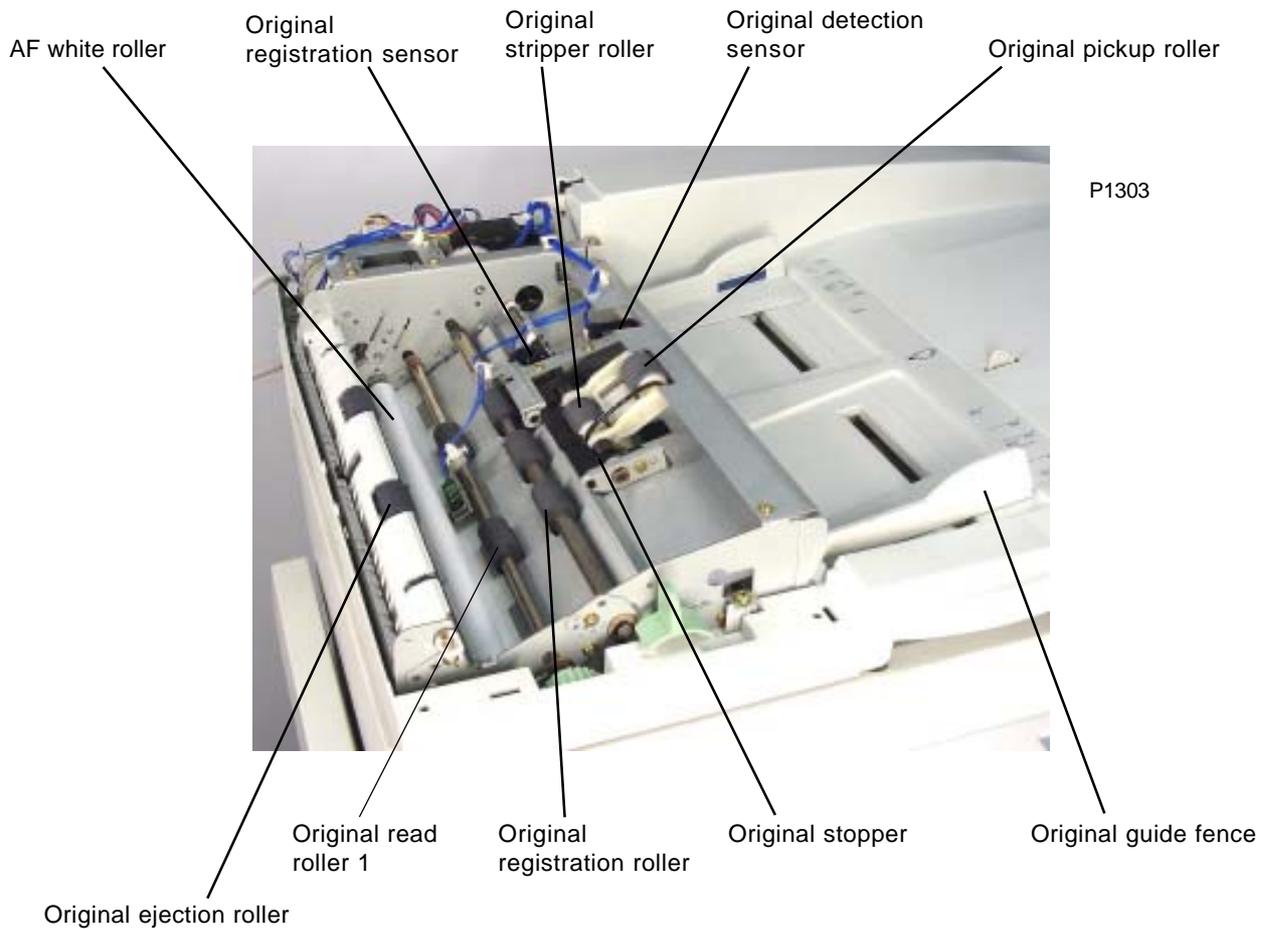
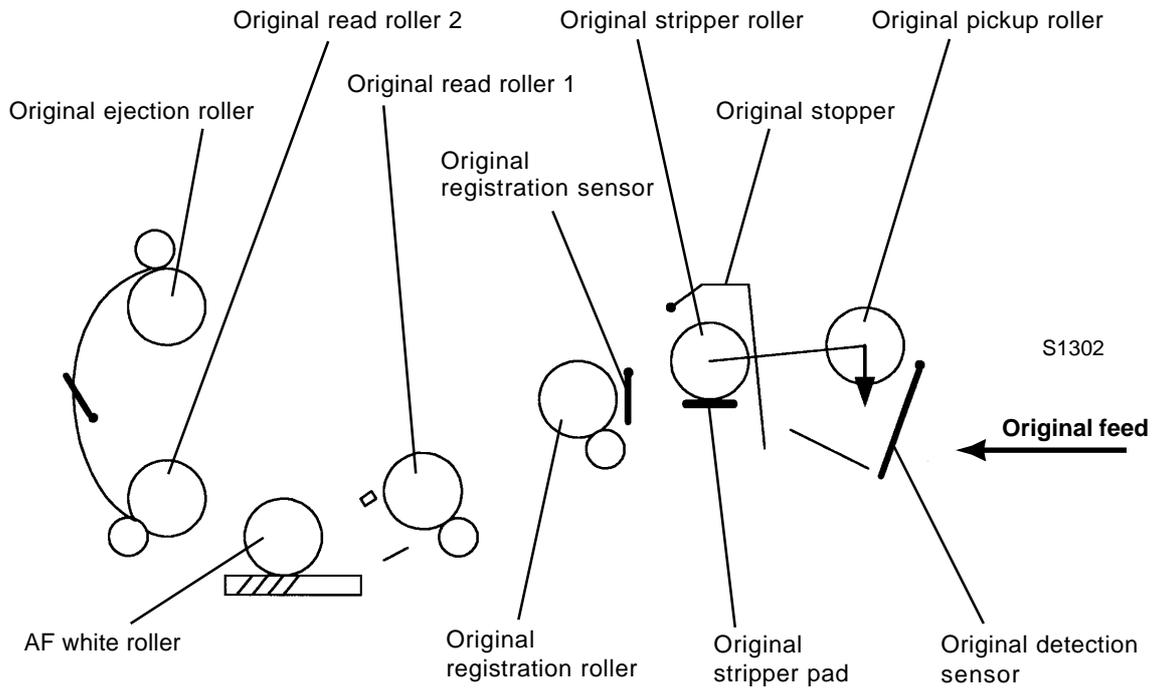
This raises the original pickup roller while rotating the original registration roller, the two original read rollers 1 & 2, and the original ejection roller, all of which are linked by the timing belt, in the feed direction. The original stops briefly after it has been moved 90 mm from the original set position.

The lamp illuminates when the AF original det. sensor is activated, and the lamp carriage in the scanner unit performs shading compensation and moves to the AF scanning position before waiting in standby.

If the START key is not pressed within 60 seconds, the lamp turns off and the lamp carriage returns to the standby position. If the START key is subsequently pressed, shading compensation is repeated (auto base control is also performed if the original scanning density is set to "Auto") and scanning starts.

If the START key is pressed within 60 seconds, scanning starts immediately, provided that the original scanning density is not set to "Auto." If the original scanning density is set to "Auto," the lamp carriage returns to the standby position, shading compensation is repeated, and auto base control is performed before scanning is begun.





## 2. AF Original Scanning Mechanism (with Auto Base Control)

(This operation occurs only when the original scanning density is set to "Auto.")

Upon completion of the AF original setting operation, pressing the START key moves the lamp carriage to the shading position. It then moves to the auto-base-control position after shading compensation has been performed. The AF read pulse motor meanwhile operates in the forward direction, rotating the original registration roller, two original read rollers, AF white roller, and original ejection roller in the feed direction. The original is fed forward 22.5 mm and stops after the original IN sensor activates (light path blocked), and the intensity of the original background color is scanned by the CCD in this position (auto-base-control position). The FB read pulse motor then moves the lamp carriage back 3 mm in the return direction (AF scanning position).

The AF read pulse motor immediately operates in the forward direction, and the read/write signal activates at the same time to start original scanning. When the original is moved away, the read/write signal is deactivated a preset length of time after the original IN sensor is deactivated (light path open). The AF read pulse motor then operates at high speed as soon as scanning is complete. Once the original is transported a preset distance after the original OUT sensor deactivates, the AF read pulse motor stops, the lamp carriage is returned to the standby position, and the AF original scanning operation is complete.

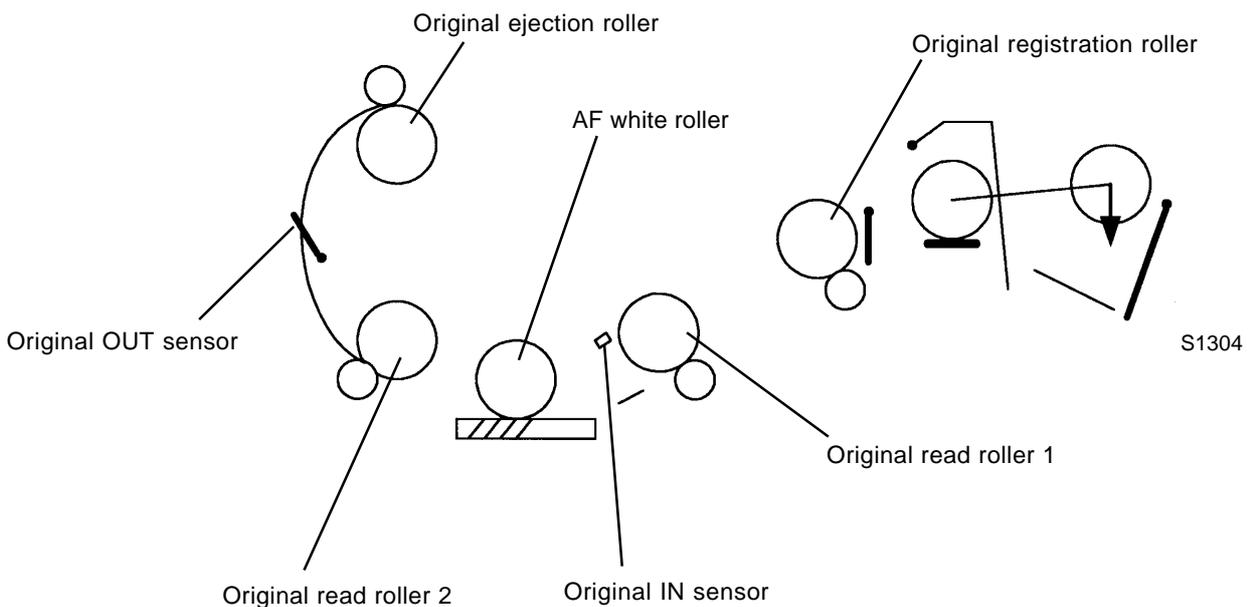
The auto-base-control function does not operate in the Photo, Duo, or Dot process modes.

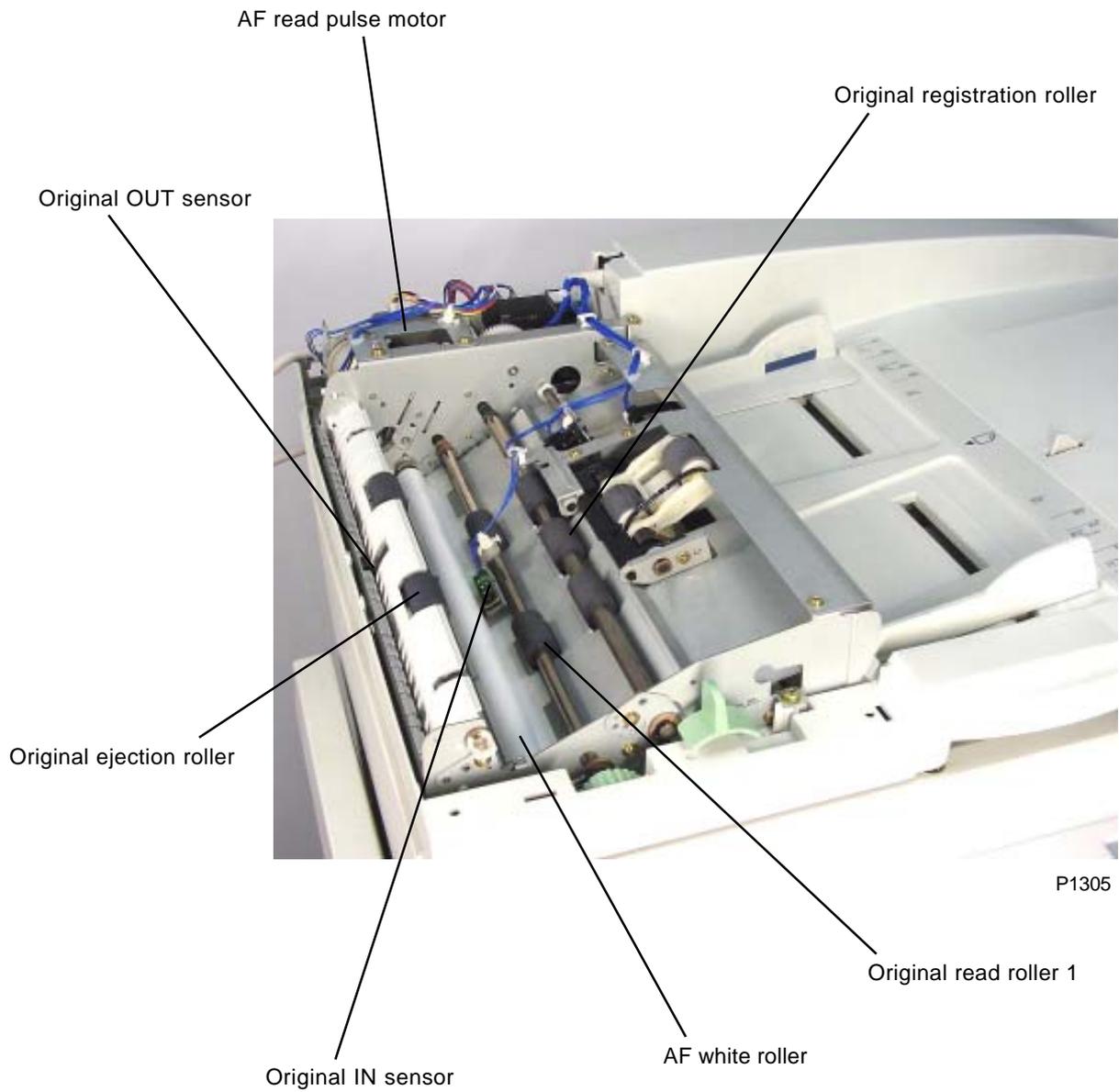
## 3. AF Original Scanning Mechanism

Upon completion of the AF original setting operation, pressing the START key operates the AF read pulse motor [A] in the forward direction to rotate the original registration roller, two original read rollers 1 & 2, AF white roller, and original ejection roller in the feed direction. The original is fed forward 25.5 mm after the original IN sensor activates (light path blocked), and scanning starts when the read/write signal activates (the original pickup roller returns to the standby position).

When the original is moved away, the read/write signal is deactivated a preset length of time after the original IN sensor is deactivated (light path open).

The AF read pulse motor [A] then operates at high speed as soon as scanning is complete. Once the original is transported a preset distance after the original OUT sensor [G] deactivates, the AF read pulse motor stops, the lamp carriage is returned to the standby position, and the AF original scanning

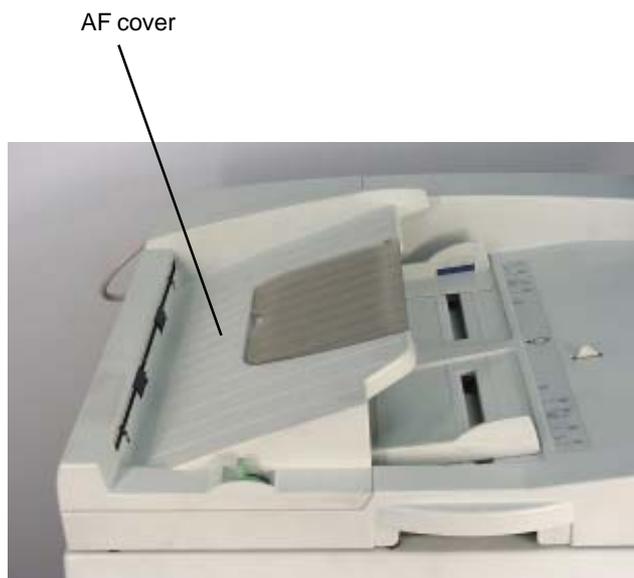




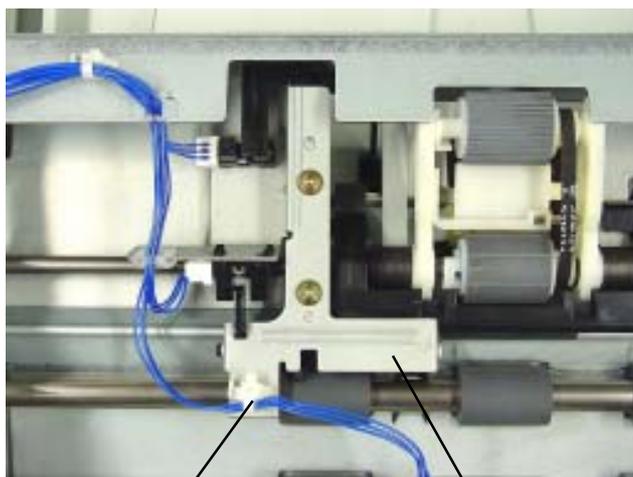
## Removal and Assembly

### 1. Removing the Original Pickup Roller Ass'y

- (1) Loosen the three screws (M4 x 6) at the front of the AF cover, remove the two screws (M4 x 10) from underneath, and then remove the AF cover.
- (2) Unplug the two sensor connectors, detach the detachable wire harness band, and then remove the sensor bracket ass'y by removing two screws (M3 x 4).



P1306

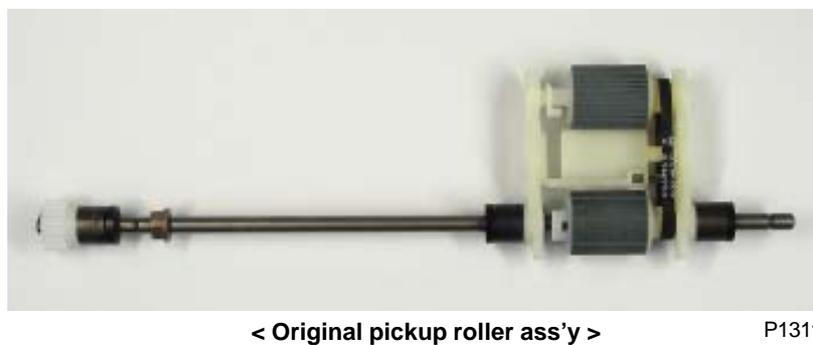
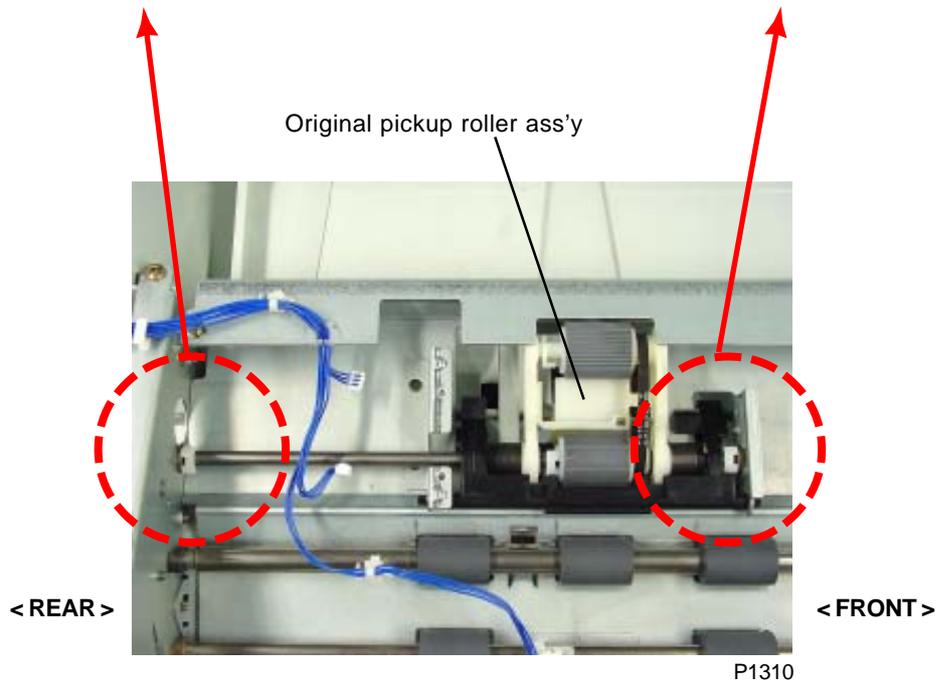
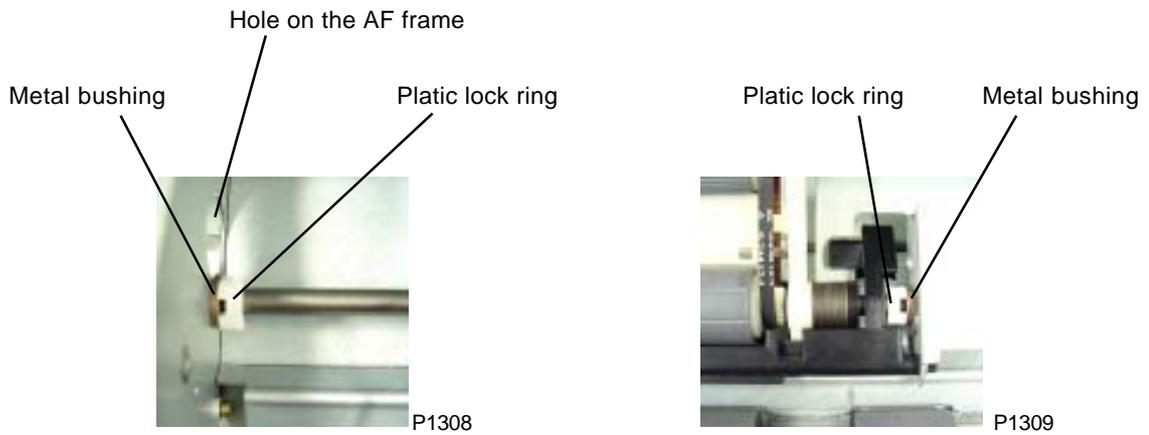


P1307

Detachable wire harness band

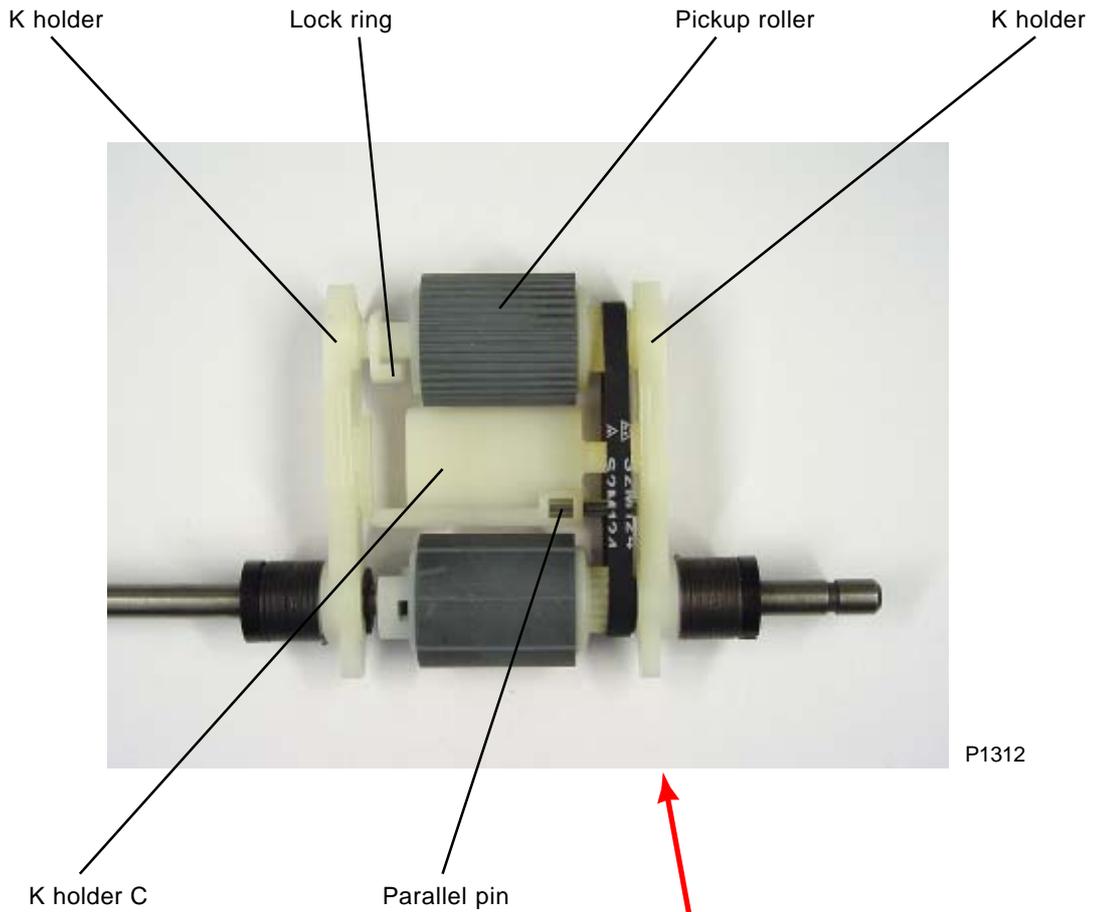
Sensor bracket ass'y

- (3) Detach plastic lock rings from both ends of the shaft, slide the metal bushings toward the center, and then remove the original pick up roller ass'y towards the front by sliding the rear drive gear of the original pickup roller out through from the hole on the AF frame plate.

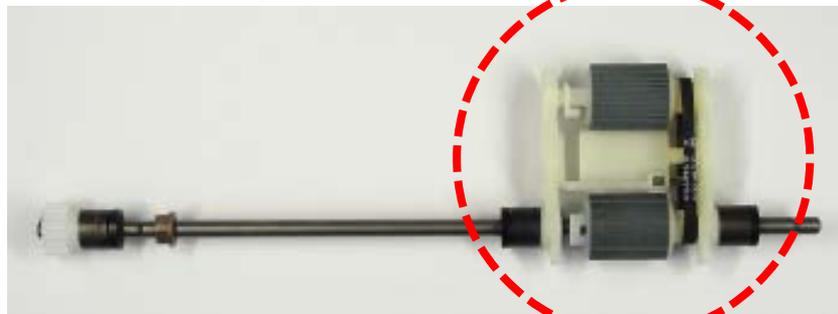


## 2. Removing the Original Pickup Roller

- (1) Remove the original pickup-roller ass'y. (Refer to previous two pages)
- (2) Detach the lock ring, open the end of the K holder, and then remove the pickup roller. (Take care not to lose the K holder C and Parallel pin, as they come apart.)



P1312



P1313

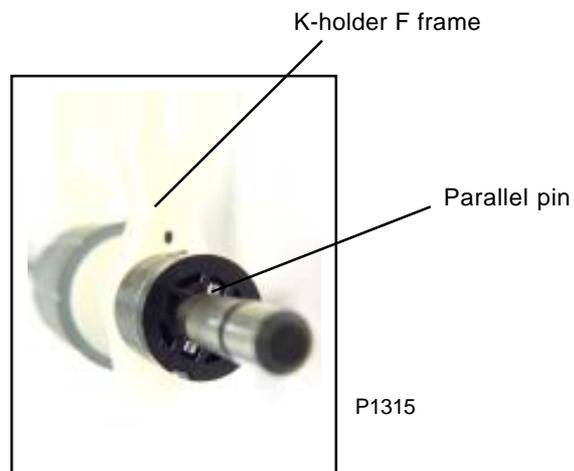
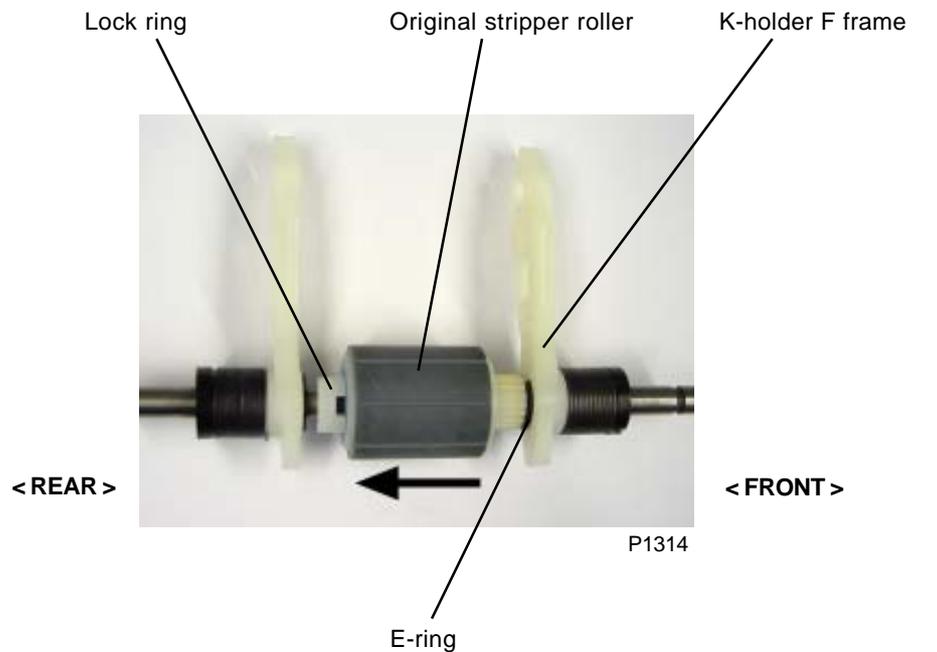
< Original pickup roller ass'y >

### 3. Removing the Original Stripper Roller

- (1) Remove the original pickup roller ass'y. (Refer to pages 6 and 7)
- (2) Remove K holder C, the parallel pin, and the original pickup roller. (Refer to previous page)
- (3) Detach the lock ring from the rear of the original stripper roller, and slide the original stripper roller in the direction of the arrow mark on the photograph below.
- (4) Remove the E-ring, and slide the K-holder F frame in the direction of the arrow mark. Then remove the parallel pin from the shaft and remove the K-holder F frame.
- (4) Remove the original stripper roller.

**[Precautions on Reassembly]**

- When engaging the parallel pin with the K-holder F frame, insert it into the shallower groove on the K-holder F frame.
- Note the direction of the original stripper roller. It must be inserted with the gear end at the front.



Joining area between "K-holder F" and "Parallel pin"

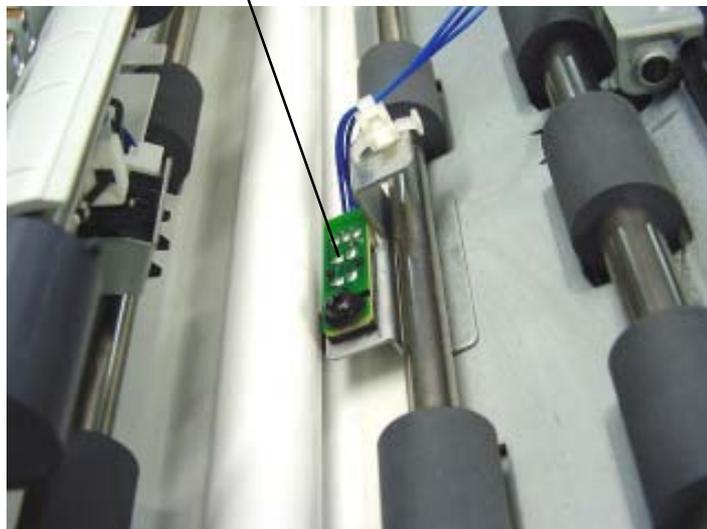
## **4. Removing the Original IN Sensor**

- (1) Loosen the three screws (M4 x 6) at the front of the AF cover, remove the two screws (M4 x 10) from underneath, and then remove the AF cover.
- (2) Remove one screw (M3 x 8), and disconnect the connector to remove the original IN sensor.

**[Precaution on Reassembly]**

After placing a new original IN sensor, adjust the sensor sensitivity by using test mode No. 752.

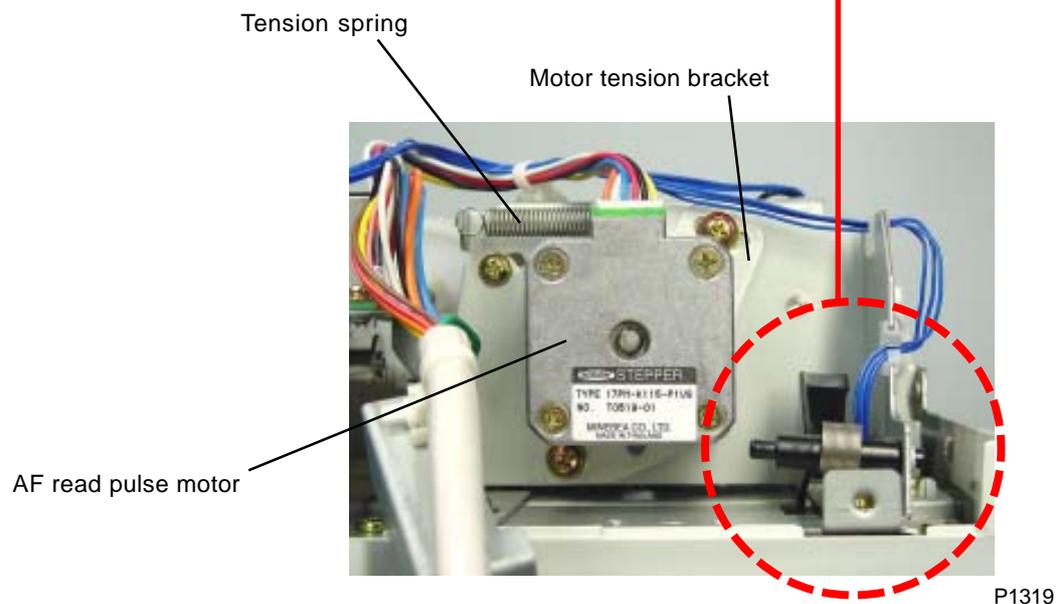
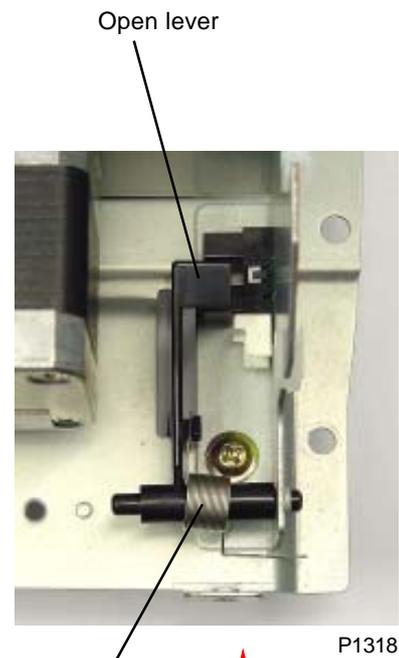
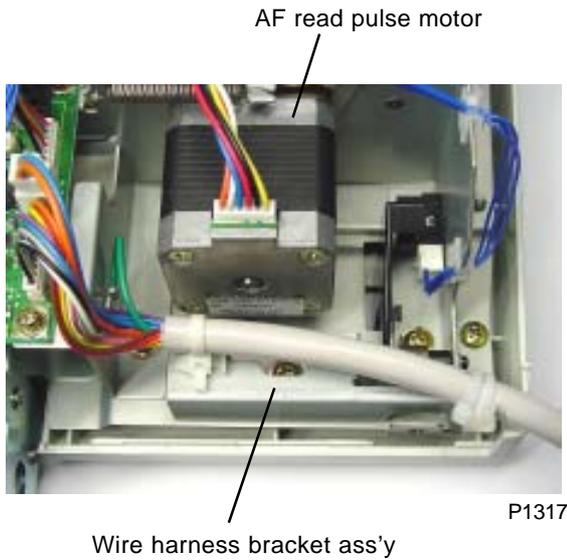
Original IN sensor



P1316

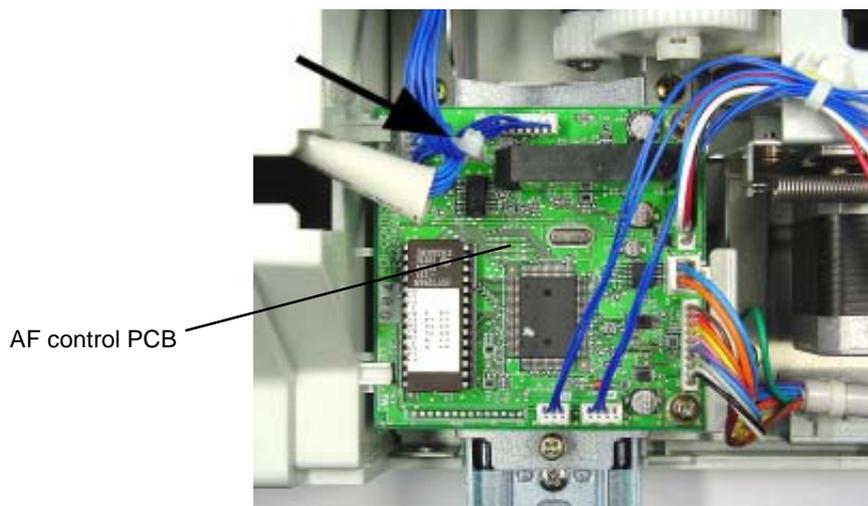
## 5. Removing the AF Read Pulse Motor

- (1) Loosen the three screws (M4 x 6) at the front of the AF cover, remove the two screws (M4 x 10) from underneath, and then remove the AF cover.
- (2) Remove one screw (M4 x 6) from the wire harness bracket ass'y and set the bracket ass'y aside.
- (3) Remove the open lever with the open lever spring attached.
- (4) Remove the tension spring, and by removing two screws (M3 x 6) detach AF read pulse motor from the AF unit, together with the motor tension bracket.

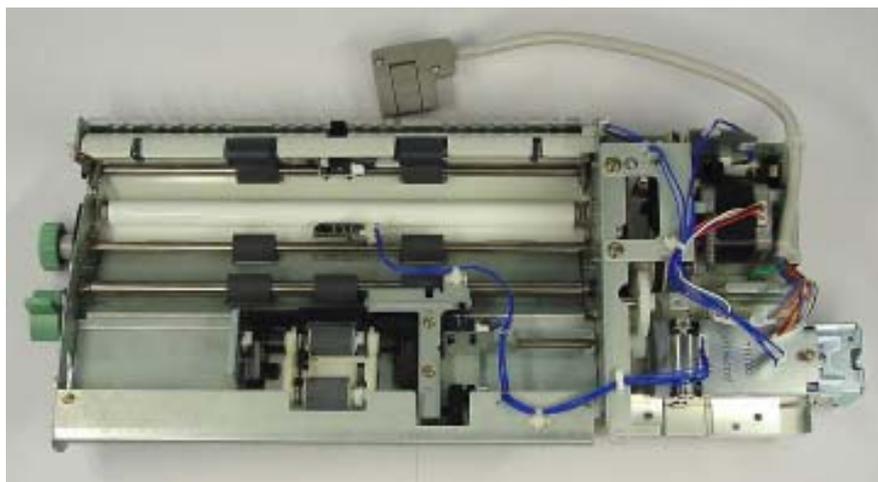


## 6. Removing Other Rollers

- (1) Remove the AF unit from the machine (see the AF Installation Procedure).
- (2) Loosen the three screws (M4 x 6) at the front of the AF cover, remove the two screws (M4 x 10) from underneath, and then remove the AF cover.
- (3) Unplug the connector, and remove two screws (M3 x 6) to detach AF control PCB.
- (4) Cut loose one wire harness band indicated by an arrow mark on the photograph, and remove seven screws (M4 x 10) and 2 screws (M4 x10 + washer) to detach the AF drive unit.



P1320



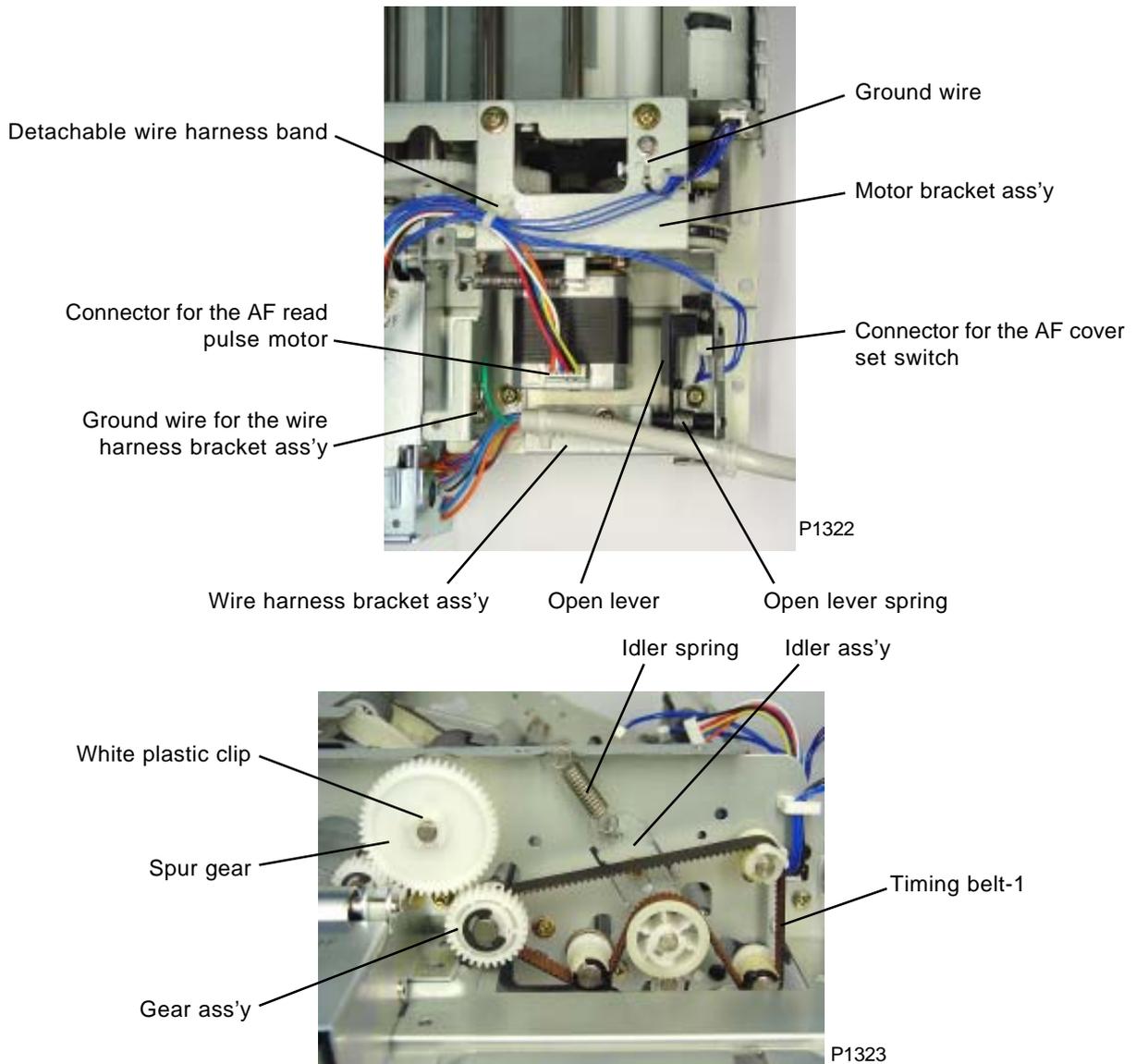
< AF Drive unit >

P1321

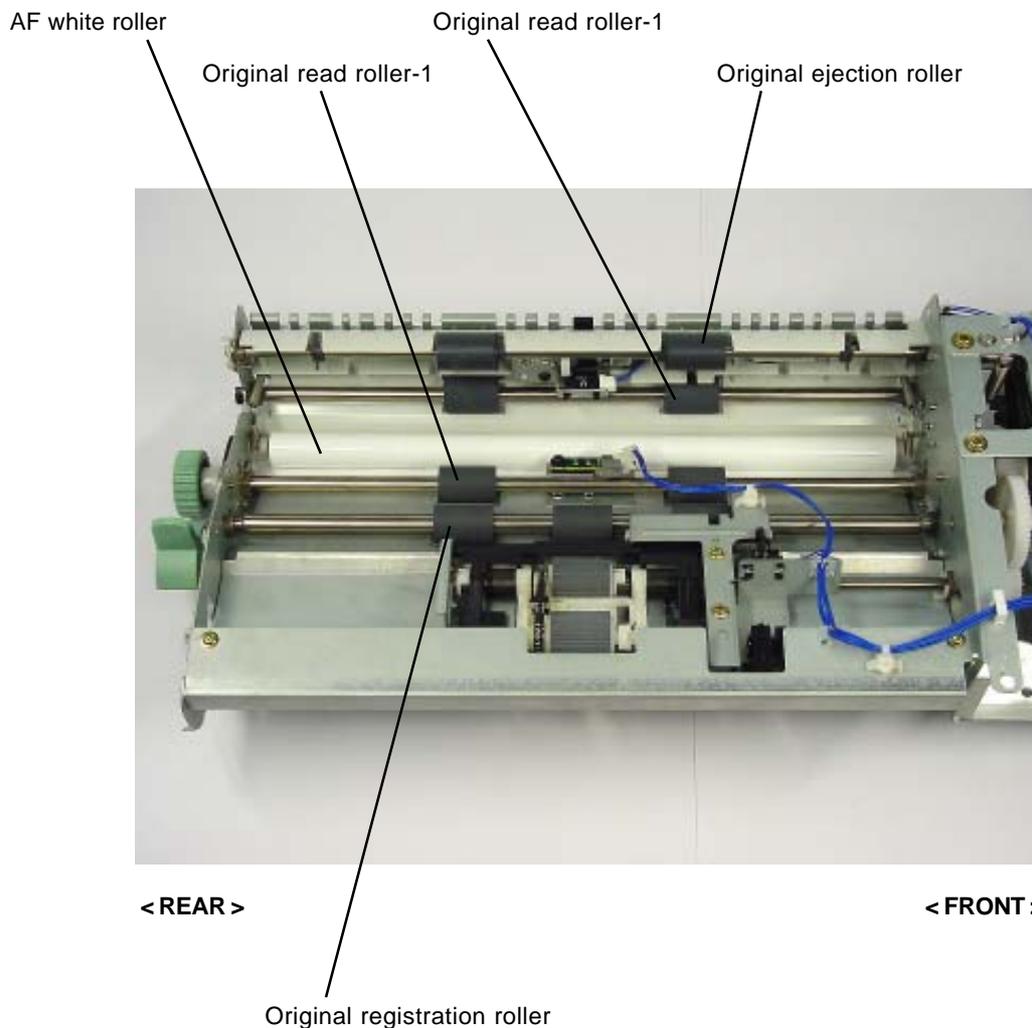
- (5) Unplug the connectors of the AF cover set switch and AF read pulse motor, and remove one screw (M3 x 6) to detach the ground wire..
- (6) Detach the detachable wire harness band (referred on the photograph) and free the wire harness from three plastic hooks, and let the wire harness free.
- (7) Remove one screw (M4 x 6) and detach the ground wire of the wire harness bracket ass'y.
- (8) Remove one screw (M4 x 6) and detach the wire harness bracket ass'y.
- (9) Remove the open lever with the open lever spring attached.
- (10) Remove four screws (M4 x 6) and remove the motor bracket ass'y.
- (11) Loosen the screw on the idler ass'y and remove the idler spring.
- (12) Remove white plastic clip and remove the spur gear, and then remove E-ring to detach the gear ass'y located under the spur gear. The timing belt-1 comes off.

**[Precaution on Reassembly]**

The gear ass'y contains one-way clutch. The surface with the boss should face outward.

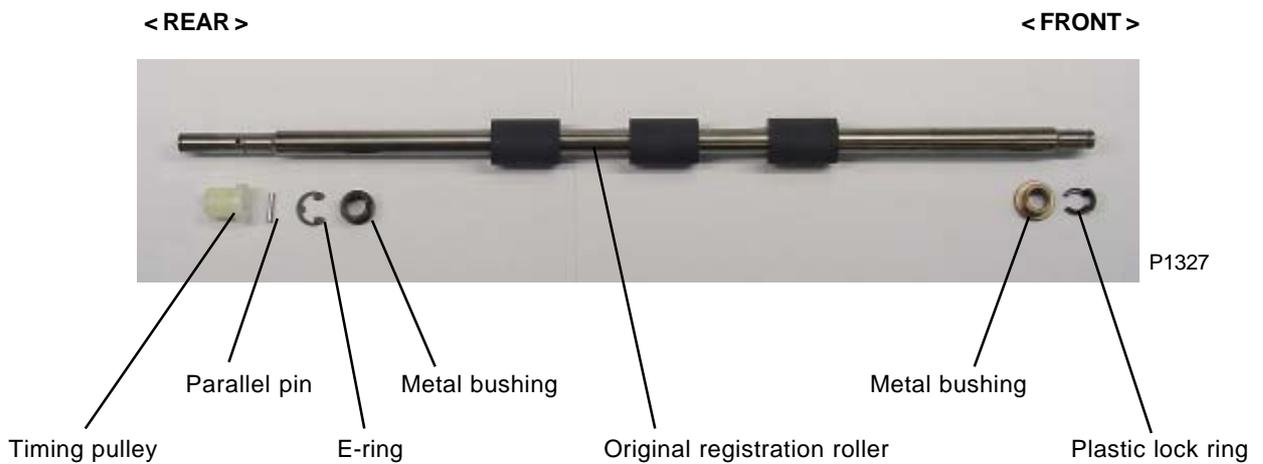
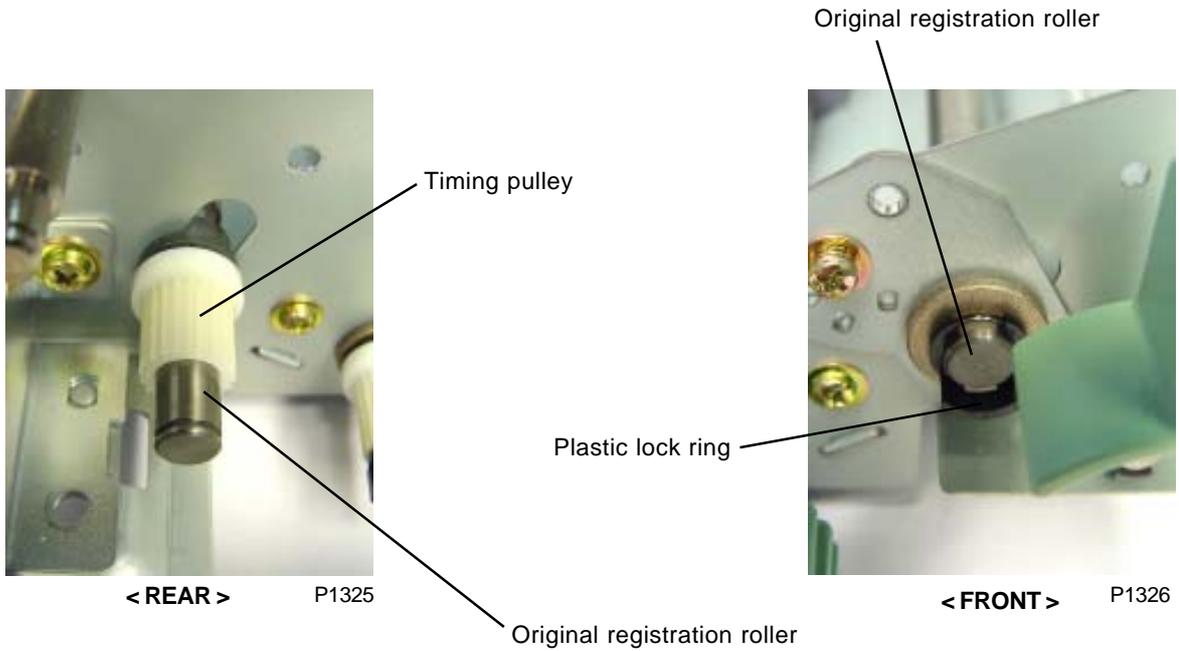


< Layout of the Rollers >



**Original registration roller**

- (13) Remove the timing pulley and parallel pin from the rear of the original registration roller shaft.
- (14) Detach E-ring and remove metal bushing.
- (15) Remove plastic lock ring from the front of the original registration roller shaft and remove metal bushing.
- (16) Detach the original registration roller.



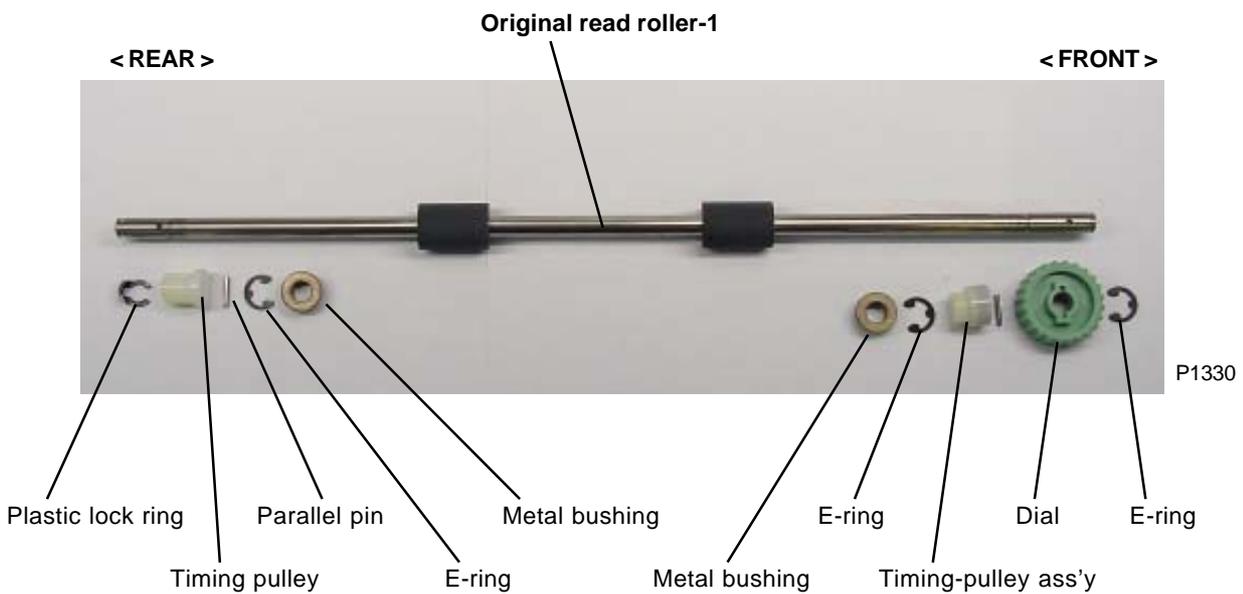
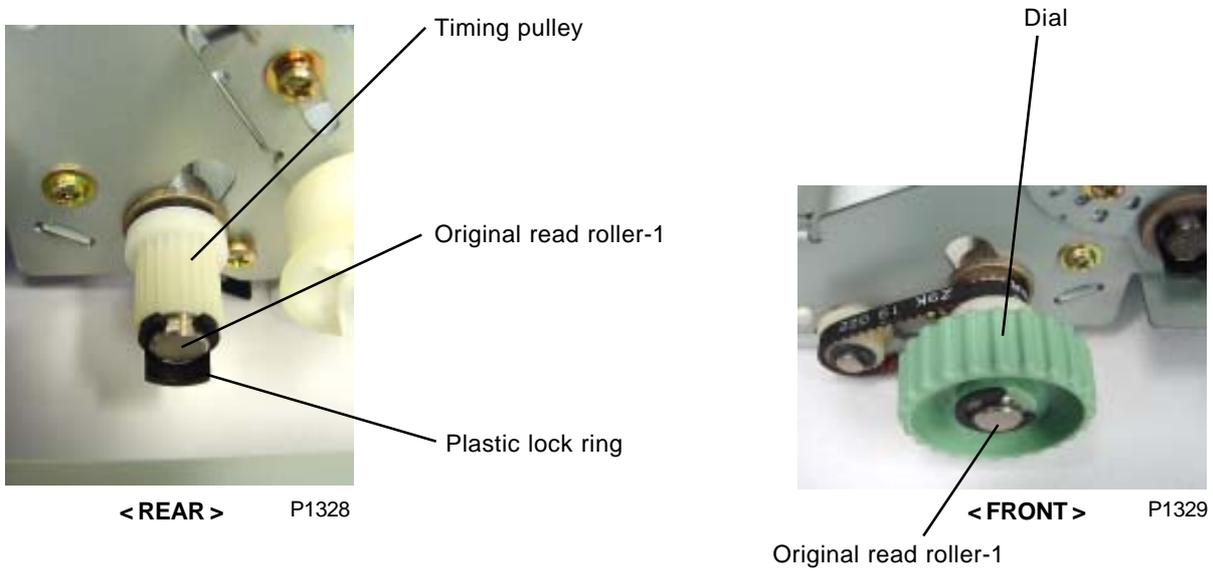
**Original read roller-1**

< Before detaching original read roller-1, original registration roller must be removed first. >

- (13) Remove the plastic lock ring from the rear of the original read roller-1 shaft and remove timing pulley together with parallel pin.
- (14) Remove E-ring and detach metal bushing.
- (15) Remove E-ring from the front of the original read roller-1 shaft and remove the dial together with parallel pin.
- (16) Remove timing-pulley ass'y and E-ring. Then remove metal bushing.
- (17) Detach the original read roller-1.

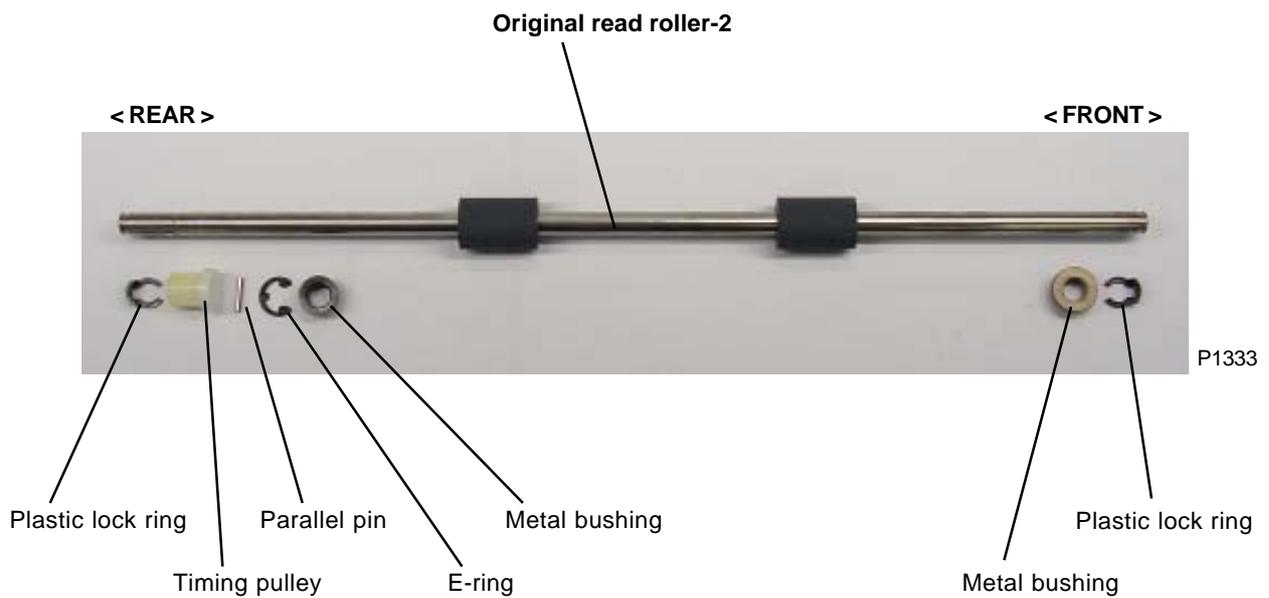
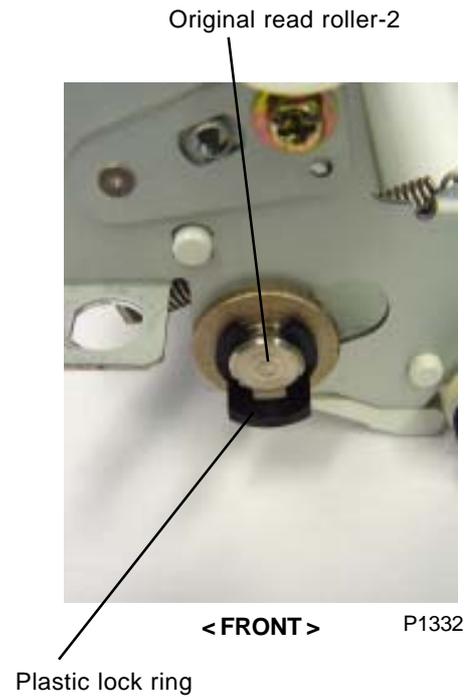
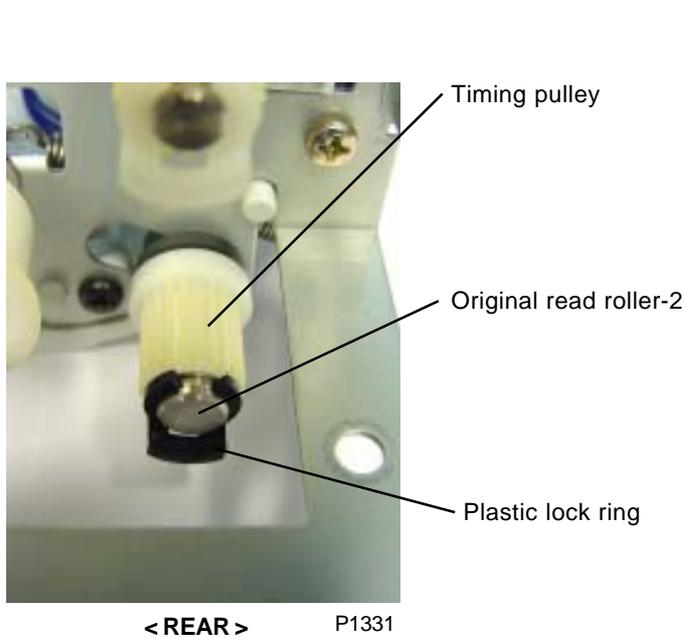
**[Precaution on Reassembly]**

The timing-pulley ass'y contains one-way clutch. Make sure to install it back in the correct direction.



**Original read roller 2**

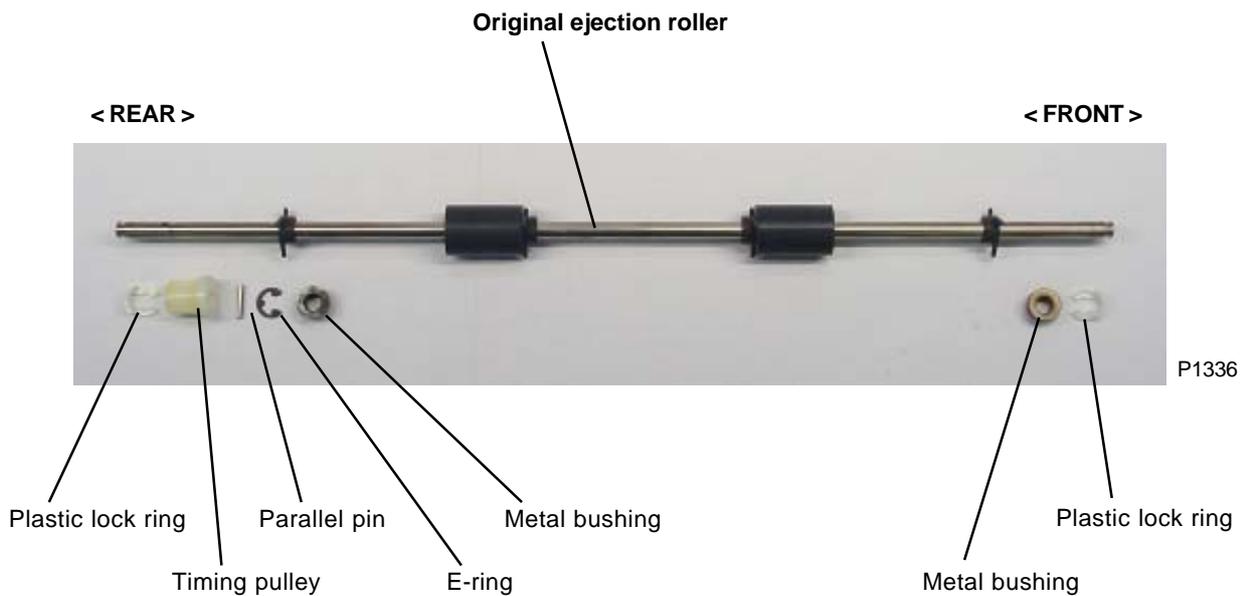
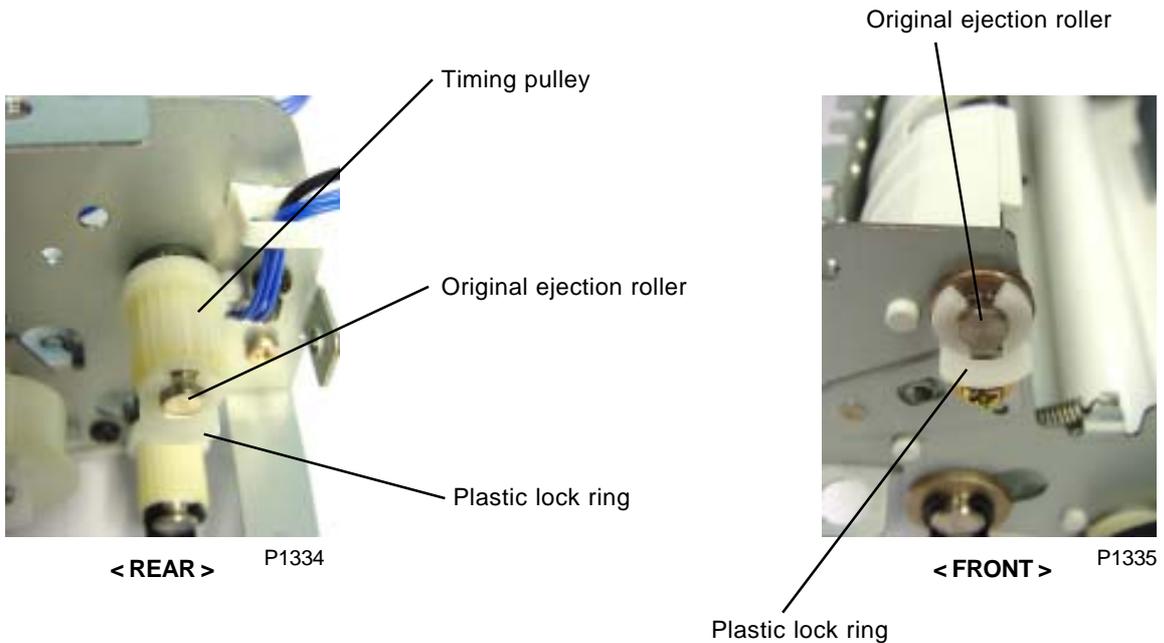
- (13) Remove plastic lock ring from rear of the original read roller-2 shaft, and then remove the timing pulley together with parallel pin.
- (14) Remove E-ring and detach the metal bushing.
- (15) Remove plastic lock ring from front of the original read roller-2 shaft and detach the metal bushing.
- (16) Detach the original read roller-2.



## CHAPTER 13. AF SCANNING SECTION

### Original ejection roller

- (13) Remove plastic lock ring from rear of the original ejection roller shaft, and then remove the timing pulley together with parallel pin.
- (14) Remove E-ring and detach the metal bushing.
- (15) Remove plastic lock ring from front of the original ejection roller shaft and detach the metal bushing.
- (16) Detach the original ejection roller shaft.

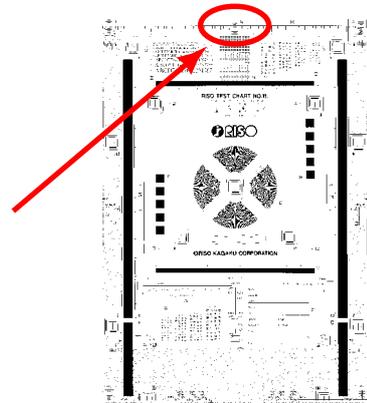


## Adjustment

### 1. AF Scanning-Start Position Adjustment

#### Checks and adjustment procedure

- (1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using test chart No.11 through the AF unit., and make prints.
- (2) Examine the prints to confirm that the scanning start position is at  $5\text{ mm} \pm 2\text{ mm}$  on the top vertical scale on the test chart No.11 printed image.
- (3) If the AF scanning start position does not fall within above specification, make an adjustment using [test mode No. 783 \(AF Scan Start Position Adjustment\)](#).

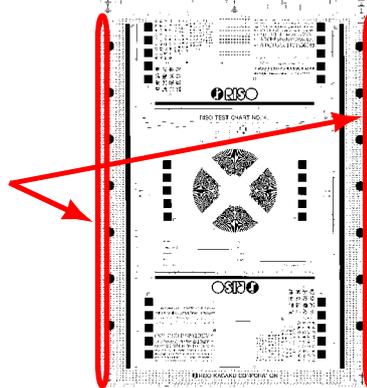


Test chart No.11

### 2. AF Horizontal-Scanning Position Adjustment

#### Checks and adjustment procedure

- (1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using test chart No.14 through the AF unit., and make prints.
- (2) Examine the master created on the print drum, and confirm that the “e” images on the left and right of the original is not missing.
- (3) If the “e” images are not made on the master, make adjustment using [test mode No. 782 \(AF Horizontal Scan Position Adjustment\)](#).

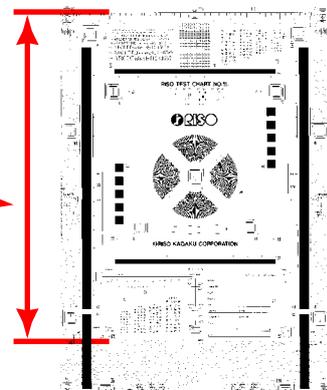


Test chart No.14

### 3. AF Read Pulse-Motor Speed Adjustment (Image Elongation and Shrinkage Adjustment)

#### Checks and adjustment procedure

- (1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using test chart No.11 through the AF unit., and make prints.
- (2) Lay the print on top of the original to confirm that the image elongation or shrinkage is within  $\pm 1.0\%$  at the 350-mm line of the test chart image.
- (3) If the elongation and shrinkage does not fall within this specification, make an adjustment using [test mode No. 784 \(AF Scanning speed Adjustment\)](#).



Test chart No.11

\* Prior to this adjustment, make sure to do the image elongation and shrinkage adjustment in master making, first. (Refer to [Chapter-14, page No.14-23](#))

## 4. AF Original IN Sensor Sensitivity Adjustment

### Adjustment procedure

- (1) With no original on the AF unit, activating test mode [No.752 \(original IN sensor sensitivity adjustment\)](#) will automatically adjust the sensitivity of the sensor.

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# CHAPTER 14: MASTER MAKING SECTION

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# Mechanism

## 1. Basic Construction of the Master Making Section

The flat bed set SW checks that the scanner table is in position, functioning as an interlock SW.

The master making unit sensor checks that the master making unit is in place. The master positioning operation is performed once the master making unit is in position.

The master volume detection sensor checks the amount remaining on the master roll.

The master end sensor detects when the master roll is finished.

The master detection sensor checks that a master is present in the master making unit.

The master positioning sensor checks that a master is present in the standby position.

Manual master cutting is performed with the master cut SW.

\* Master cut SW conditions: The scanner table must be open, the 2nd print drum must be removed, and the master detection sensor must be on.

## 2. Master Making Unit Shifting Mechanism

This moves the master making unit for master making on the 1st and 2nd print drums.

The position of the master making unit is checked by master making position sensors 1 and 2, and the master making unit is moved by the master making unit shifting motor.

The master making unit is initially positioned at the 2nd print drum position.

## 3. TPH Elevation Mechanism

The TPH is moved up and down by the thermal pressure motor, and the position is checked by the thermal pressure sensor.

The TPH is initially at the TPH pressure release position.

TPH pressure release position: The position at which the thermal pressure sensor goes off when the motor is rotated in the release direction.

TPH pressure applied position: The position at which the thermal pressure sensor goes off when the motor is rotated in the pressure direction.

## 4. Master Set Mechanism

The master positioning operation is performed once the master making unit is opened and closed and the master making unit switch is on.

With the TPH in the pressure applied position, the write pulse motor rotates in the feed direction, then stops after feeding the master 2 mm from the position at which the master positioning sensor goes on.

If the master positioning sensor was initially on, the master is returned until the master positioning sensor goes off. The master positioning operation is then performed.

Under normal conditions, the master positioning sensor should be in standby mode.

## 5. Master Loading

The master is fed by the write pulse motor and master loading motor in the master making section.

Master loading relies on a "simultaneous loading" system, which simultaneously makes the master and loads the master around the print drum.

For master loading, the print drum is rotated at super-low speed by the main pulse motor.

## 6. Master Cutting Mechanism

### Cutter Mechanism

The master is cut by the rotary cutter on the cutter unit, which is rotated by the cutter motor. The cutter motor rotates in one direction only.

The position of the rotary cutter is confirmed by the cutter home position switch. The home position for the cutter is the point at which the switch is raised.

### Master Cutting

The master cutting starts when the print drum is at the 298.8° position.

The print drum rotates during master cutting.

The switch is depressed after the cutter motor starts rotating, and the motor stops again when the switch is no longer depressed.

### Initialization Movement

The cutter is initialized when the power is switched on, during "All Reset", and when master making begins.

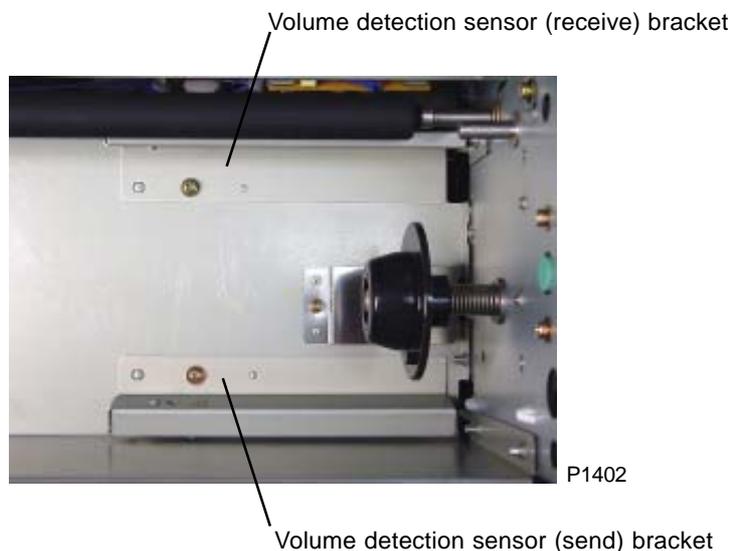
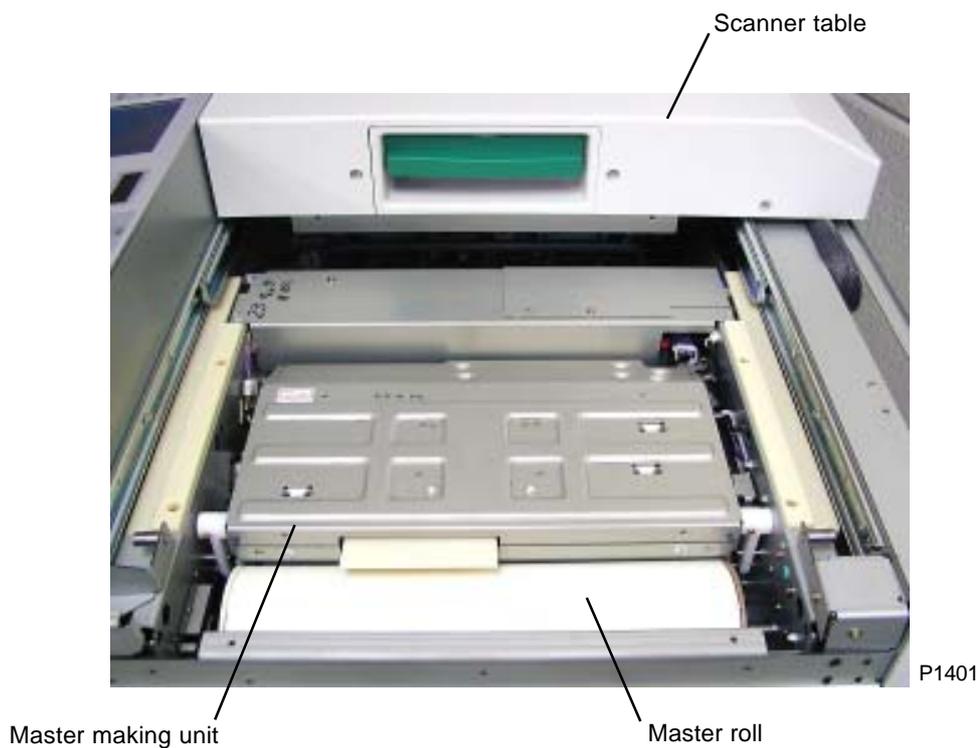
Initialization is not performed if the cutter is at the home position (cutter home position switch is not depressed) at the start of the operation.

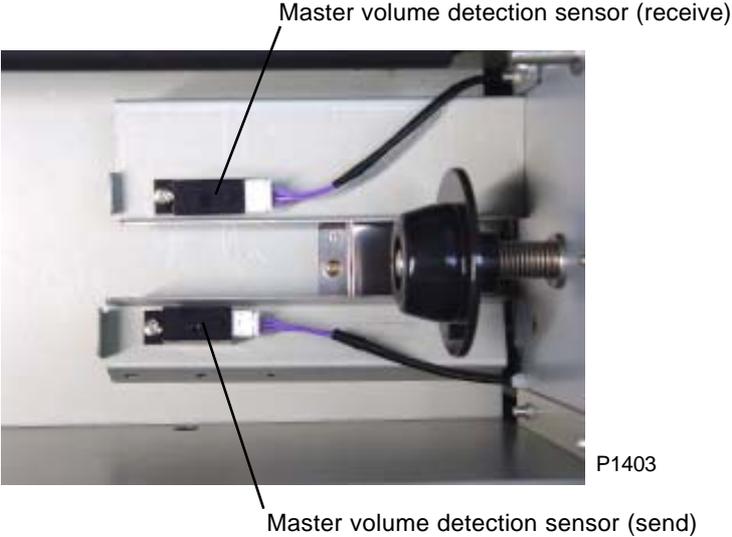
If the cutter home position switch is depressed, the cutter motor rotates until the switch is no longer depressed.

## Disassembly

### 1. Removing the Master Volume Detection Sensor (Receive/Send)

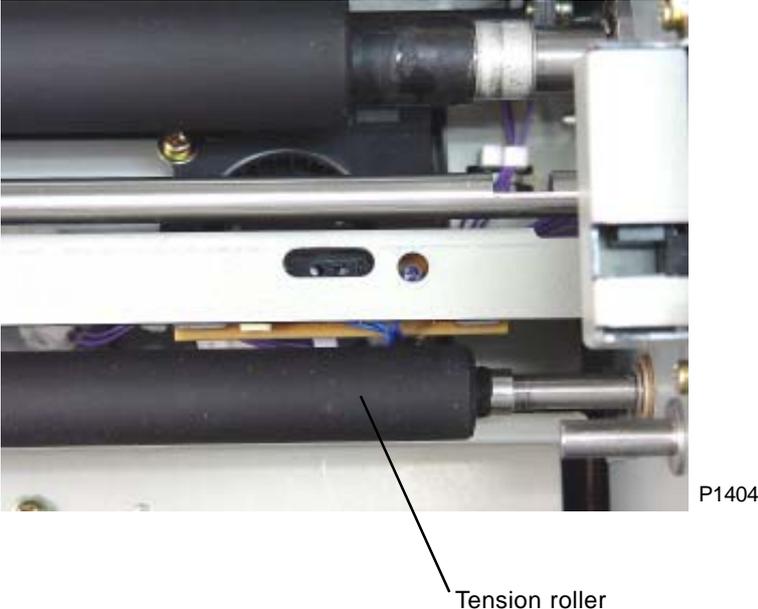
- (1) Open the scanner table.
- (2) Open the master making unit and remove the master roll.
- (3) Remove the volume detection sensor (receive) bracket and volume detection sensor (send) bracket. (One M3 x 6 screw each)
- (4) Remove the mounting screw (M3 x 6) on the master volume detection sensors (receive) and (send), disconnect the connectors, and remove the sensors.





**2. Removing the Tension Roller**

- (1) Open the master making unit and remove the master roll.
- (2) Detach the E-ring from one side and remove the tension roller.



### **3. Removing the Master Detection Sensor**

- (1) Remove the front and rear unit covers.
- (2) Remove the two mounting screws (M3 x 6) on the master guide ass'y to free the ass'y.
- (3) Remove the two mounting screws (M3 x 6) on the underside of the master guide ass'y, disconnect the connector, and remove the master detection sensor.

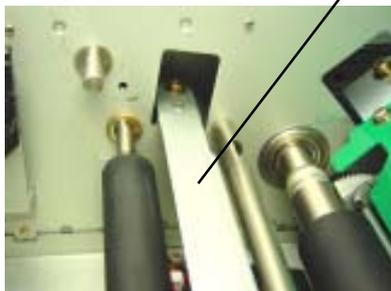
Front unit cover

Rear unit cover

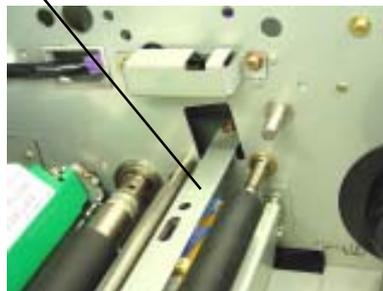


P1405

Master guide ass'y



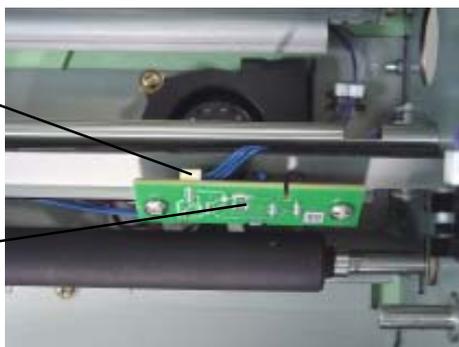
P1406



P1407

Connector

Master detection sensor



P1408

## 4. Removing the Master Making Unit Lower Cover

- (1) Open the master making unit.
- (2) Remove the two mounting screws (M4 x 8), disconnect the master end sensor connector, and remove the master making unit lower cover ass'y.

### [Precautions for Reassembly]

- Insert the bosses on both sides of the master making unit into the slots on the sides of the master making unit lower cover ass'y.



P1409



P1410

Boss on side of master making unit

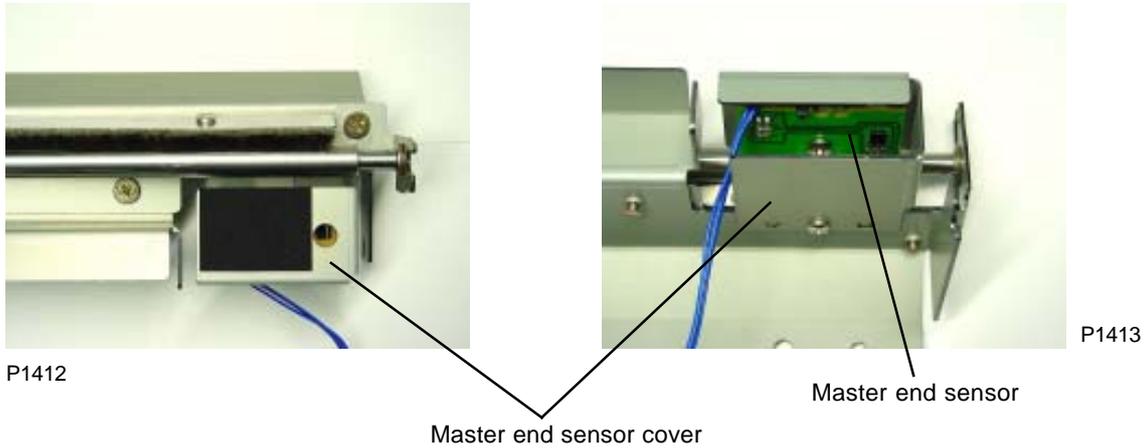


P1411

Slot on end of master making unit lower cover ass'y

## 5. Removing the Master End Sensor

- (1) Remove the master making unit lower cover ass'y.
- (2) Remove the master end sensor together with the master end sensor cover. (M3 x 6 screw)
- (3) Remove the mounting screw (M3 x 6), then remove the master end sensor.

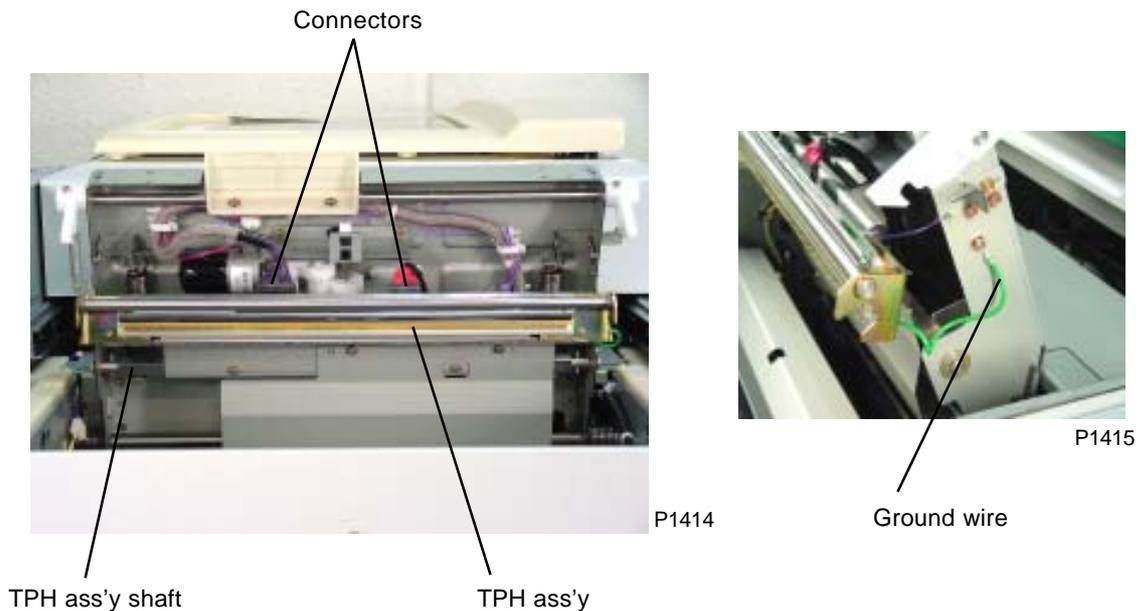


## 6. Removing the TPH Ass'y

- (1) Remove the master making unit lower cover ass'y.
- (2) Detach the ground wire. (M3 x 6 screw)
- (3) Remove the two mounting screws (M3 x 6), disconnect the two connectors, and remove the TPH ass'y.

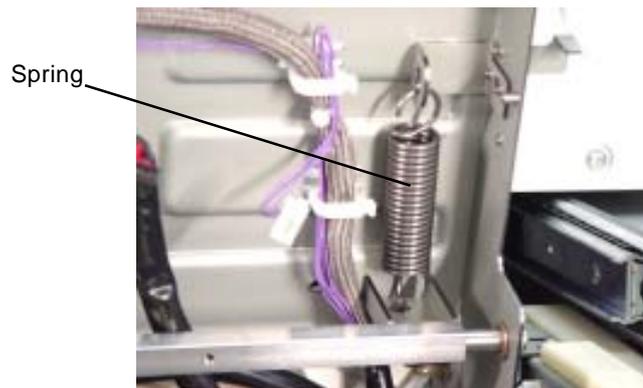
### [Precautions for Reassembly]

1. Align the half-pierced section with the hole in the TPH ass'y shaft.
2. If the TPH is replaced, enter the new TPH registance value using [Test Mode No.288](#).

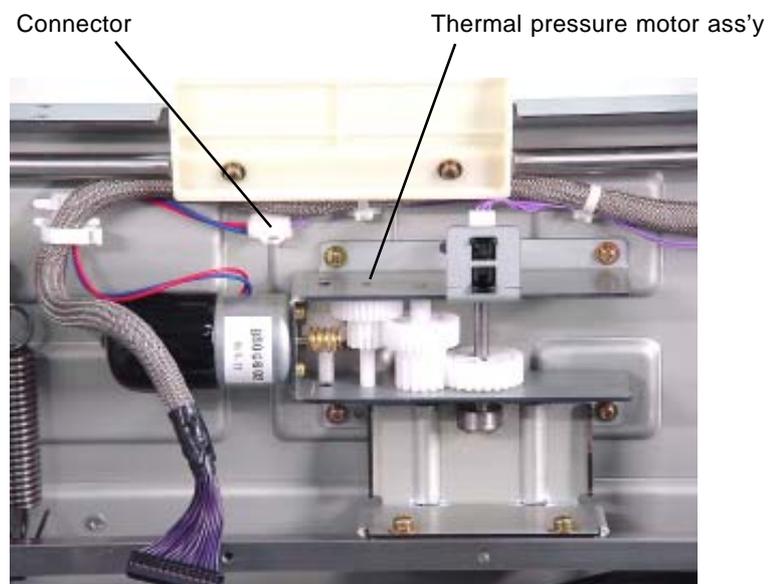


## 7. Removing the Thermal Pressure Motor Ass'y

- (1) Remove the master making unit lower cover ass'y.
- (2) Remove the TPH ass'y.
- (3) Remove the springs on both sides.
- (4) Disconnect the connector, remove the four mounting screws (M3 x 6), and remove the thermal pressure motor ass'y.



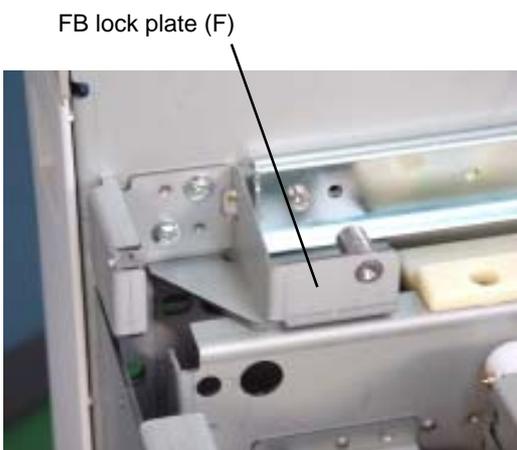
P1416



P1417

## 8. Removing the Master Making Unit

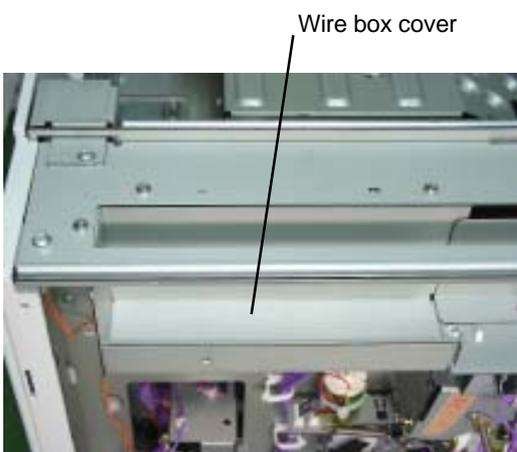
- (1) Remove the following covers:
  - Front door (left) & (right)
  - Inner cover (upper)
  - Rear cover
  - Master making unit cover
  - Unit cover F, Unit cover R
- (2) Open the scanner table
- (3) Remove the FB safety SW ass'y. (Three M4 x 8 screws)
- (4) Remove the FB lock plate (F). (Two M4 x 8 screws)
- (5) Remove the wire box cover. (Three M4 x 8 screws and one M4 x 8 screw)
- (6) Remove the wire blind plate. (Two M3 x 6 screws)



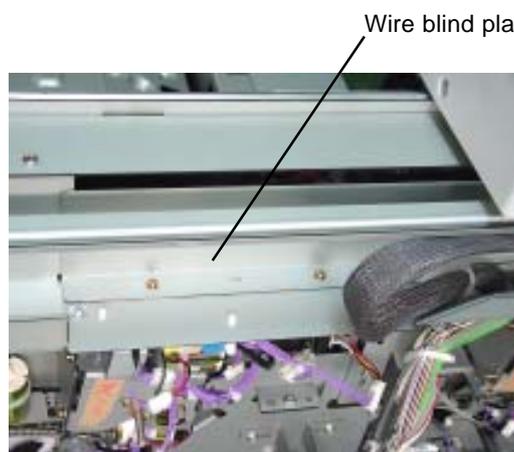
P1418



P1419

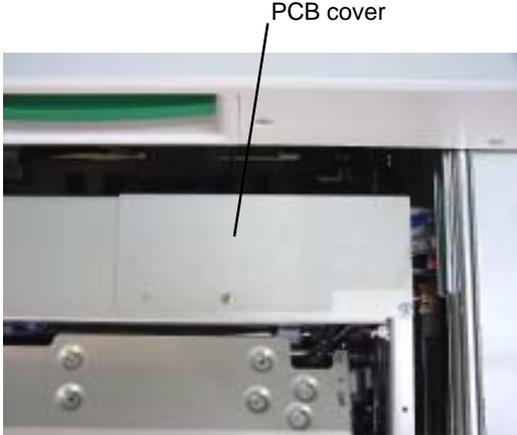


P1420

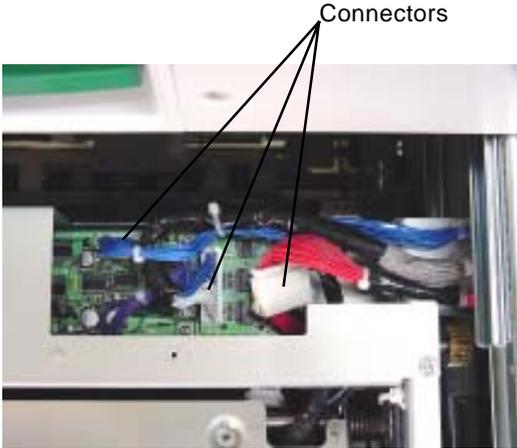


P1421

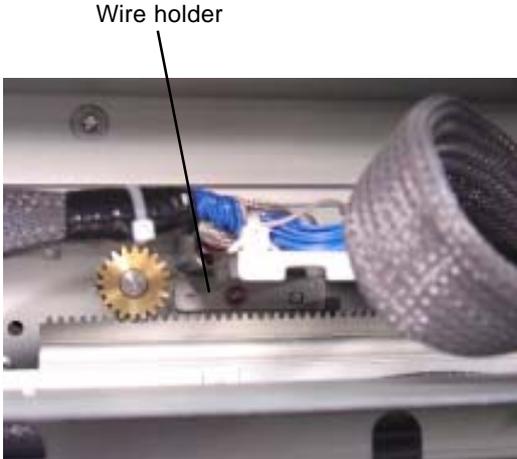
- (7) Remove the PCB cover. (M3 x 6 screw)
- (8) Disconnect the three connectors, remove the mounting screw (M3 x 6), and then pull the wire holder out of the frame plate together with the bracket.



P1422



P1423

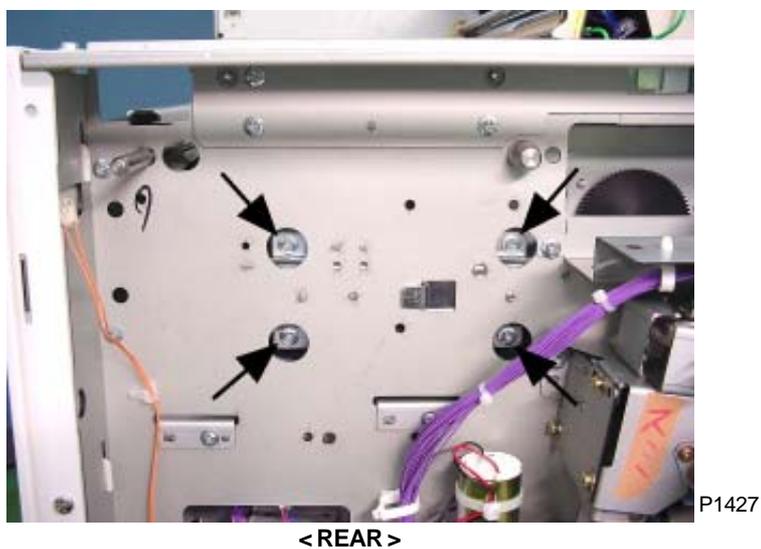
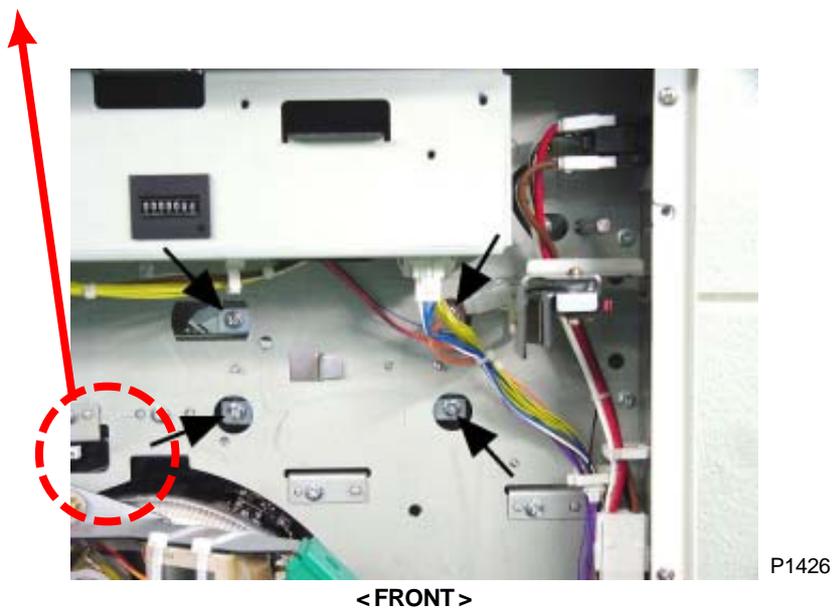
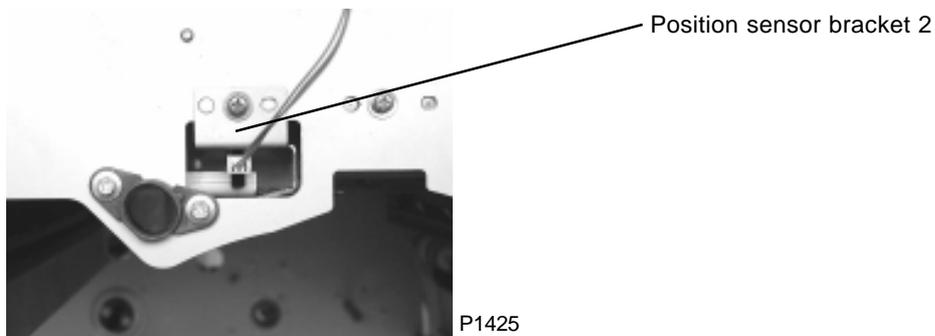


P1424

## CHAPTER 14. MASTER MAKING SECTION

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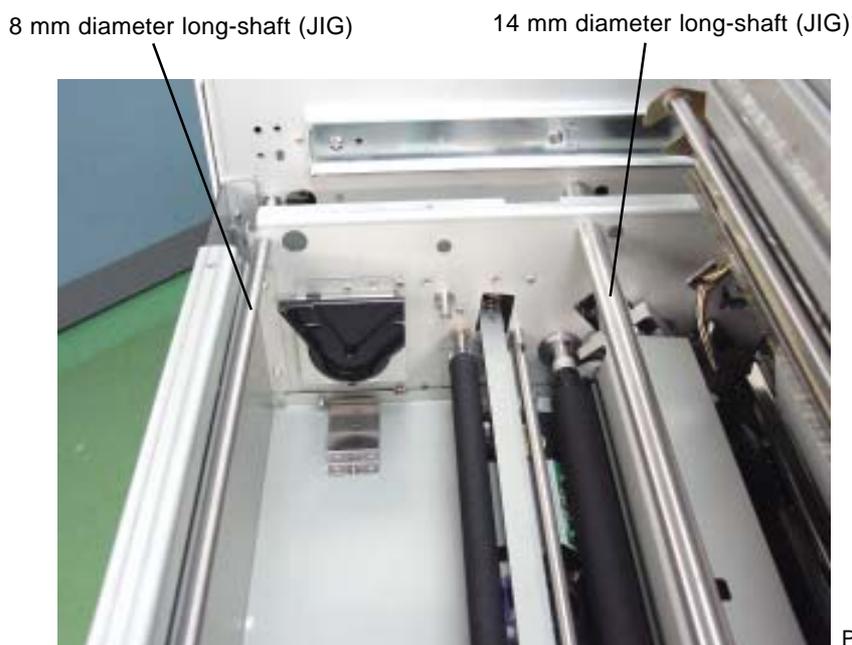
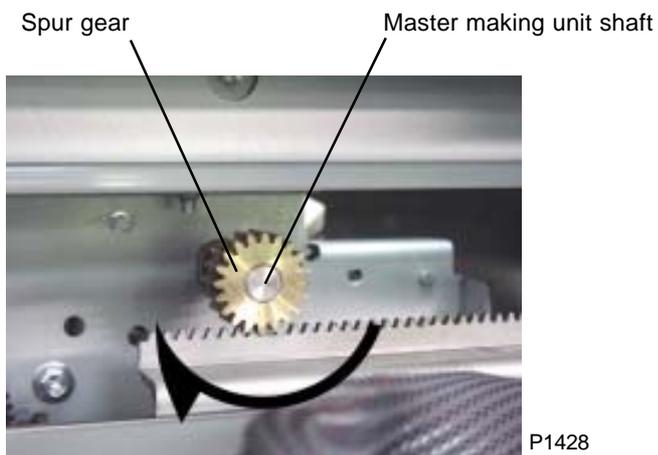
- (9) Remove the screws (four M4 x 8 screws each) retaining the master making unit to the master making rails on the front and rear.
- (10) Move the master making unit and remove position sensor bracket 2. (M4 x 8 screw)
- (11) Move the master making unit toward the master holder until a hand can be inserted. Lift up the master holder side slightly and move toward the paper ejection side to allow removal of the spur gear on the master making unit shaft. Now remove the master making unit.



### [Precautions for Reassembly]

The master making unit should be reinstalled as follows:

- (1) Loosen the set screws on the master making unit shaft spur gears and move them toward the center.
- (2) Install the master making unit so that the jig holes line up roughly with those on the front, rear, frame plates and master making rail.
- (3) Open the master making unit, insert the jigs (14 mm diameter long-shaft and 8 mm diameter long-shaft positioning shaft).
- (4) With the jigs still in place, align the master making unit shaft spur gear with the end face of the master making unit shaft and side of the spur gear on both sides, and then secure with the two set screws on each.
  - \* Secure the master making unit shaft spur gears after aligning the front and rear to have matching amounts and directions of backlash.
- (5) Remove the jigs.
- (6) Run [Test mode No. 254 \(Master Making Unit Shifting Position 1\)](#). Check that the wire harness does not catch before attaching position sensor bracket 2.



## 9. Removing the Write Roller

- (1) Remove the master making unit.
- (2) Open the master making unit, detach the master making unit sensor cover, and remove the cutter guide.
- (3) Loosen the tensioner on the rear timing belt (one screw) and remove the belt. (Photo on next page)
- (4) Remove the mounting screw (M4 x 8) to remove the pulley from the write roller shaft. (Photo next page)

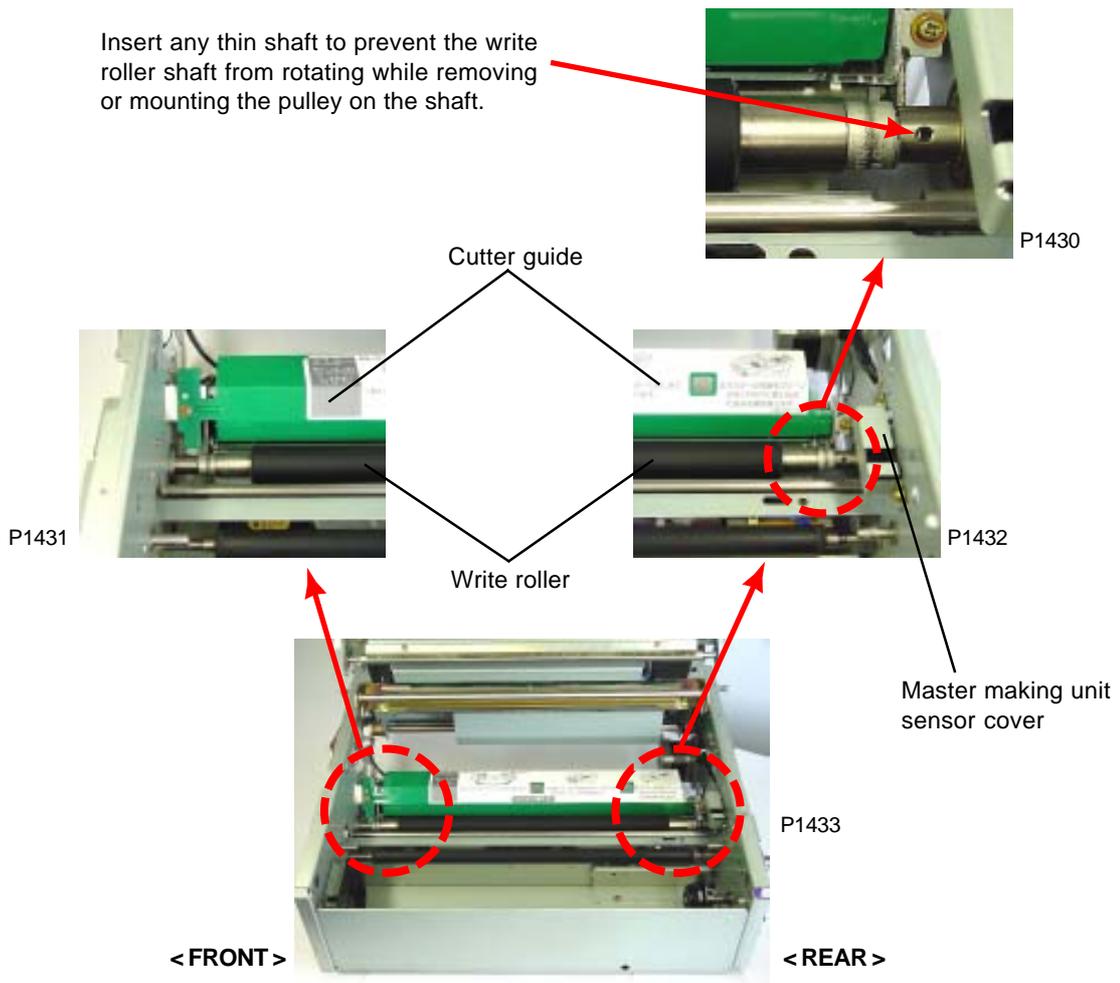
**Insert thin shaft through the hole on the write roller shaft to prevent the shaft from rotating while removing or mounting the mounting screw of the pulley. (Photograph below)**

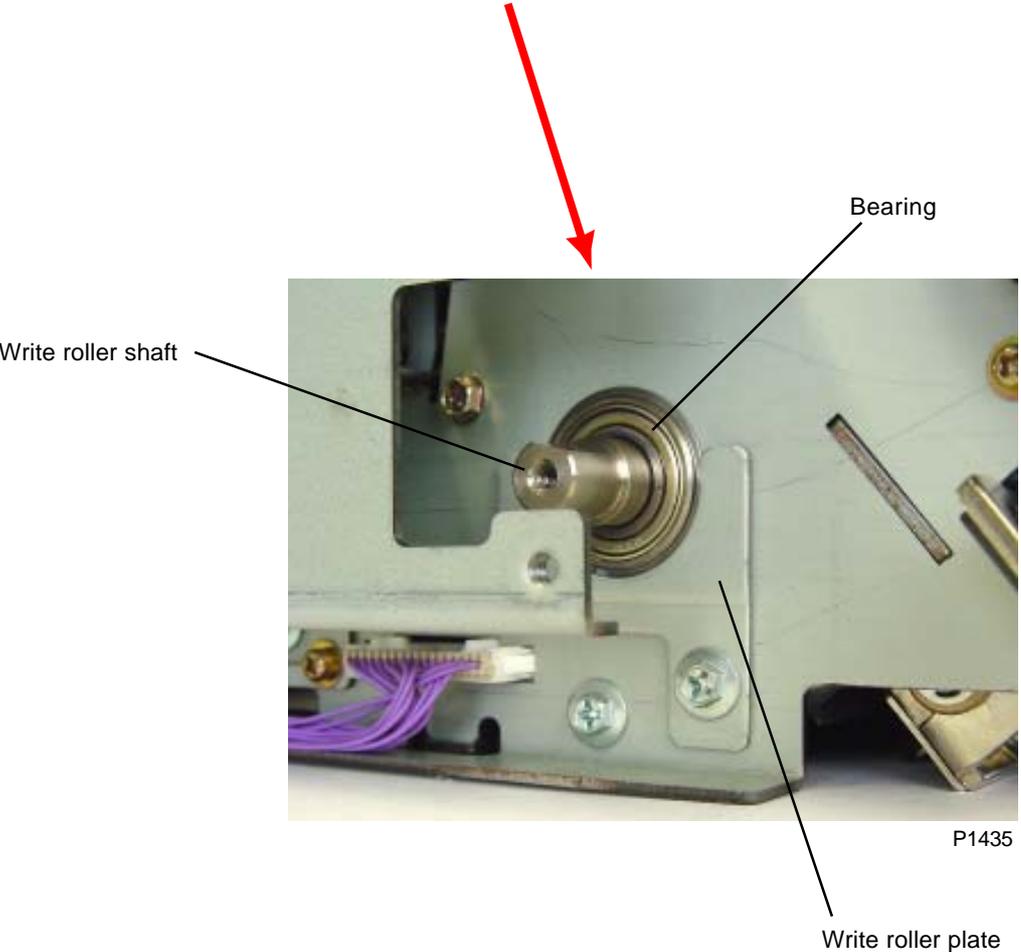
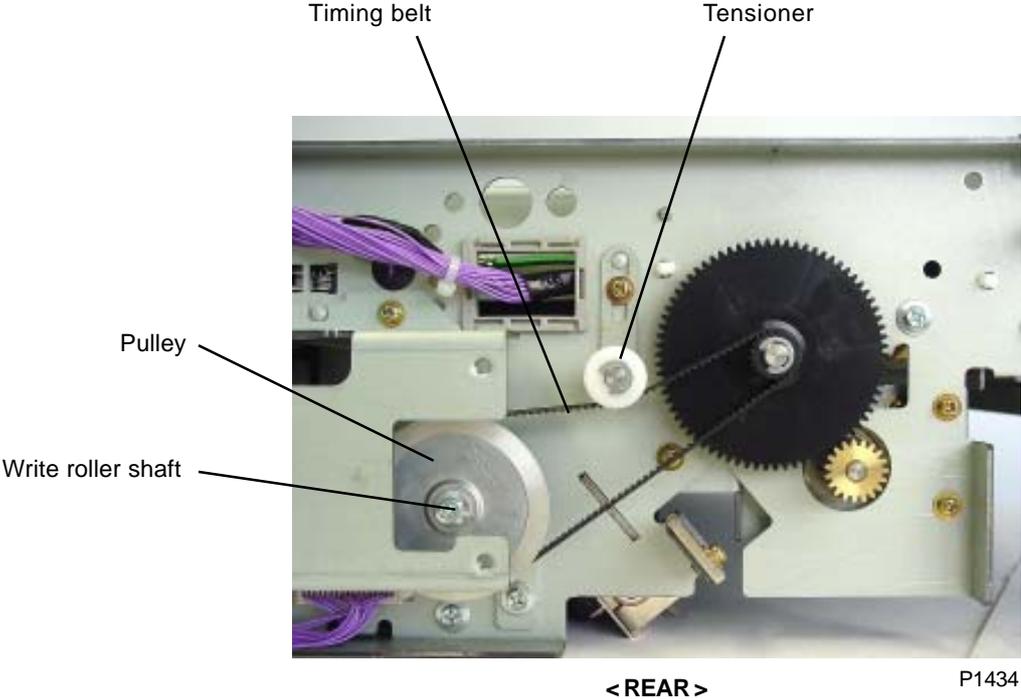
- (5) Remove the write roller plate. (M4 x 8 screw)
- (6) Detach the bearing and remove the write roller.

### [Precautions for Reassembly]

Align the flat cut face on the write roller shaft against the flat cut face on the pulley hole.

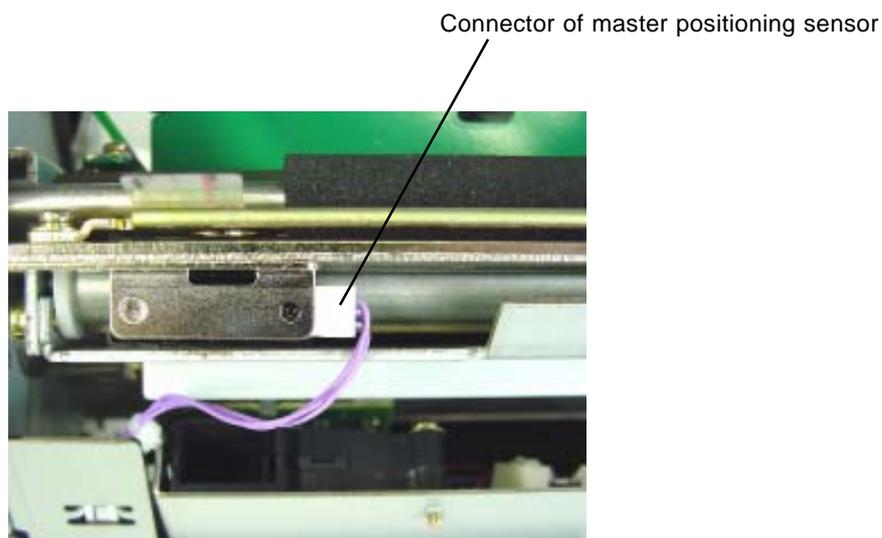
In replacing the write roller, [input the diameter data of the new write roller \(data comes with each new write roller\) with test mode No. 289](#), and then do the checking and adjustment of the image elongation and shrinkage given on [page No. 14-23](#).





## 10. Removing the Master Loading Roller Ass'y

- (1) Remove the master making unit.
- (2) Detach the E-ring and remove intermediate gear.
- (3) Disconnect the master positioning sensor connector, remove the two mounting screws (M3 x 6) on either side, and remove the master loading roller ass'y.

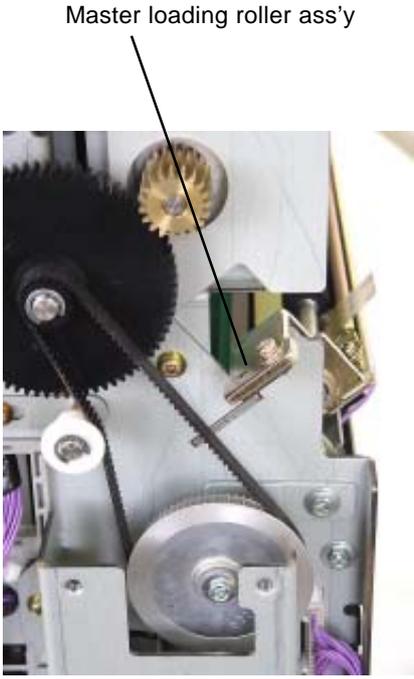


P1436

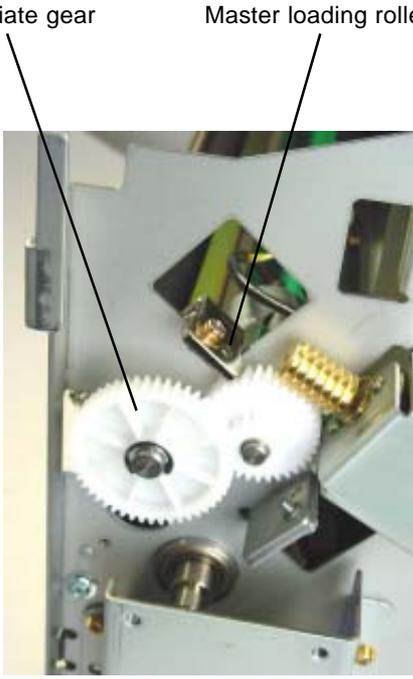


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Master Making Unit  
< REAR VIEW >



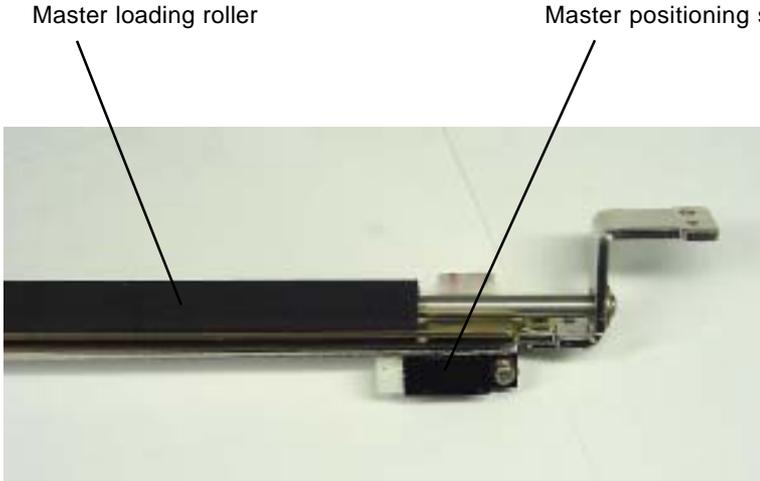
Master Making Unit  
< REAR VIEW >



Master Making Unit  
< FRONT VIEW >

**11. Removing the Master Positioning Sensor**

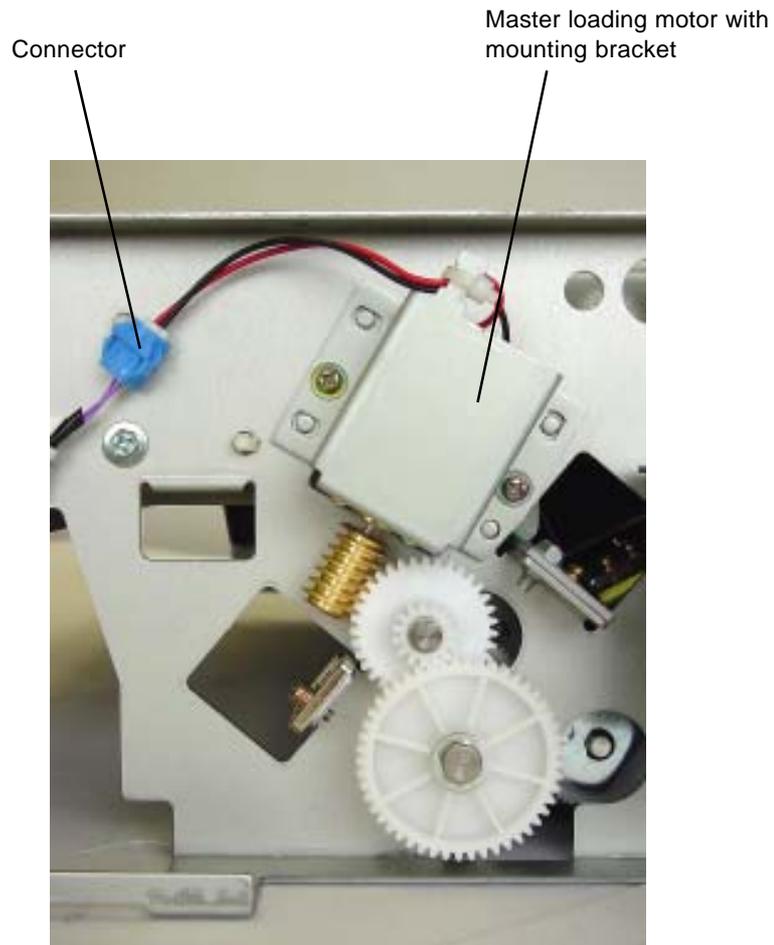
- (1) Remove the master making unit.
- (2) Remove the master loading roller ass'y.
- (3) Remove mounting screw (M3 x 6) and dismount the master positioning sensor.



Master Loading Roller Ass'y

## 12. Removing the Master Loading Motor

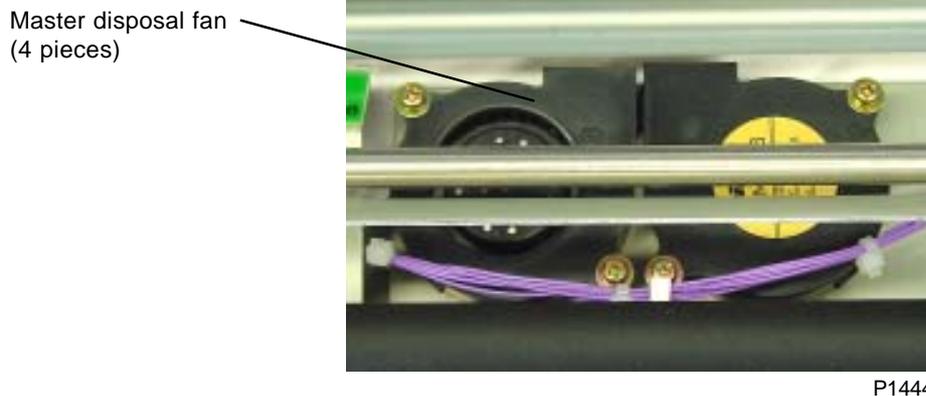
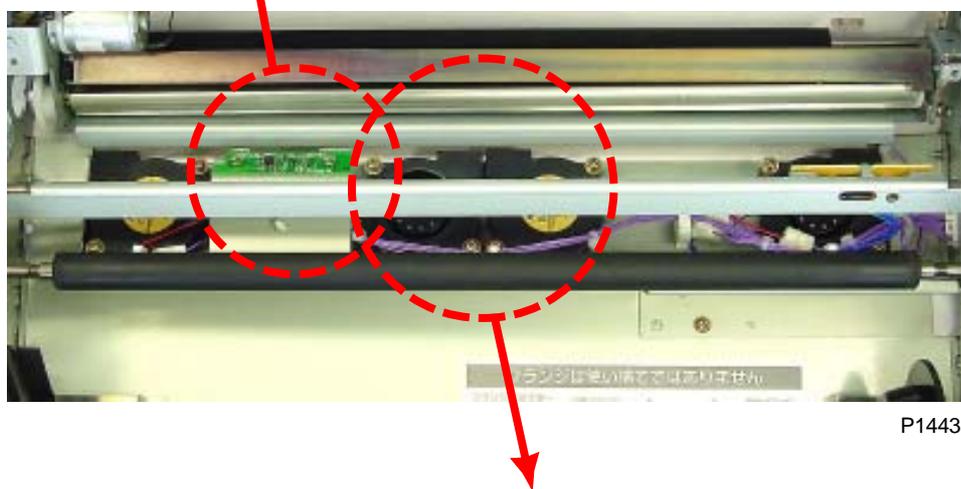
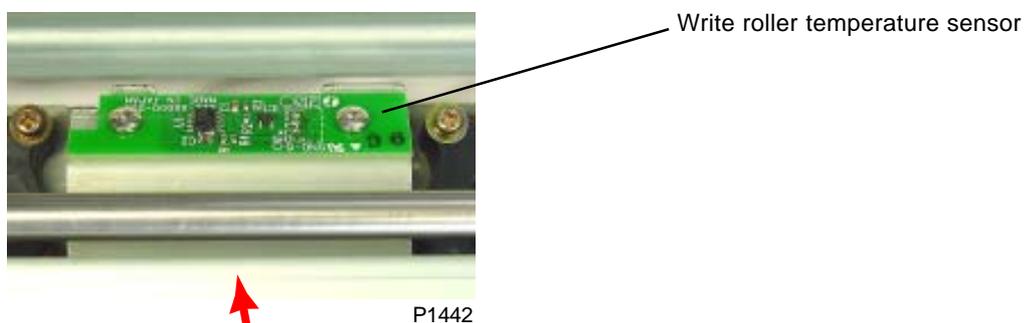
- (1) Remove the master making unit.
- (2) Disconnect the connector and remove the master loading motor with the motor bracket attached.  
(Two M3 x 6 screws)



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### 13. Removing the Master Disposal Fan and Write Roller Temperature Sensor

- (1) Remove the master making unit.
- (2) Remove the write roller.
- (3) Disconnect the master detection sensor connector and remove the master guide ass'y. (Two M3 x 6 screws)
- (4) Disconnect total of four master disposal fan connectors, remove the two mounting screws (M3 x 20), and remove the master disposal fan.
- (5) Disconnect the connector, remove the two mounting screws (M3 x 6), and remove the temperature sensor.

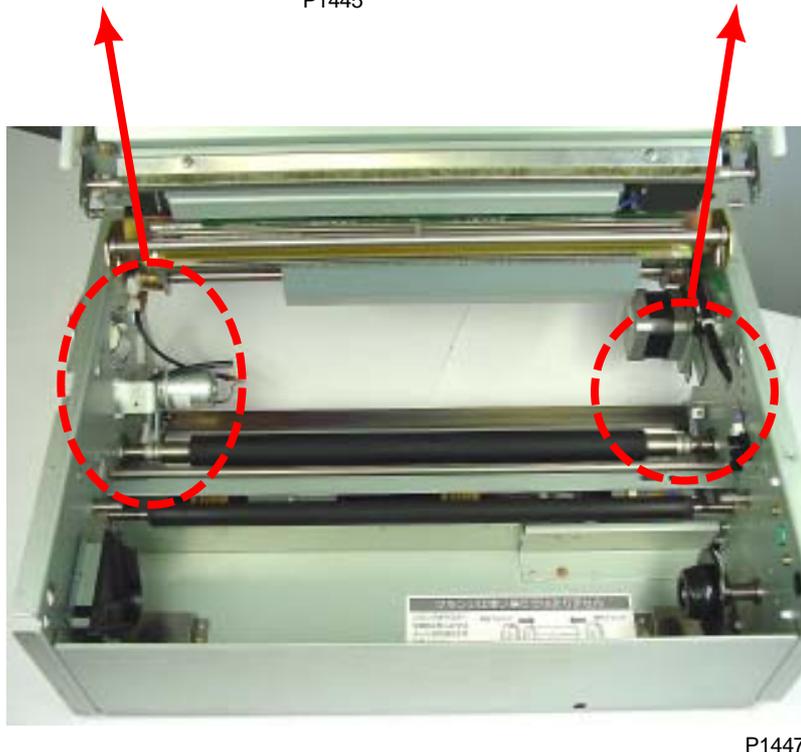
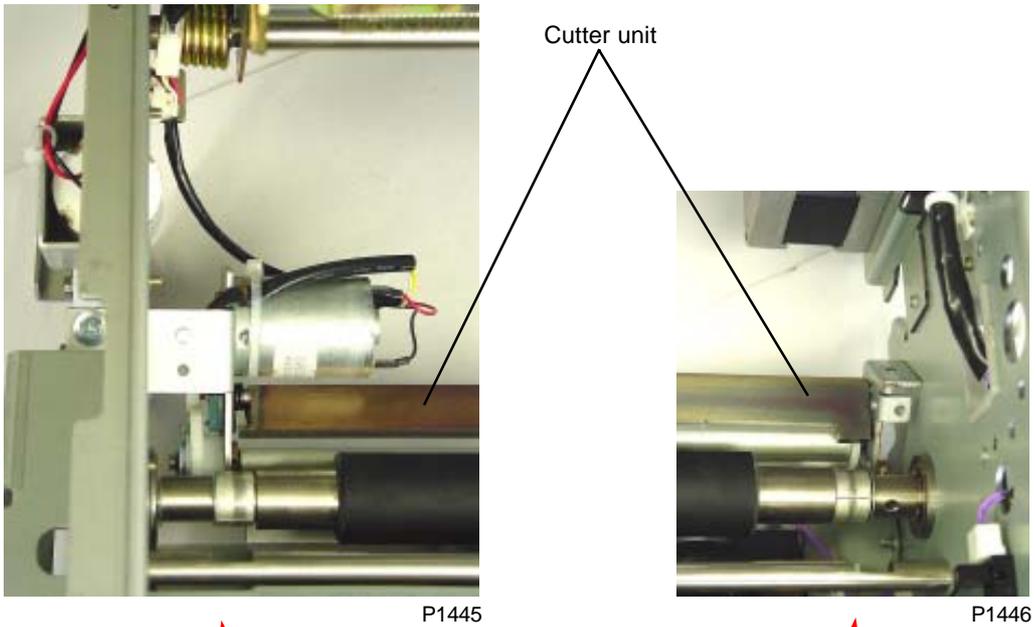


## 14. Removing the Cutter Unit

- (1) Remove the master making unit.
- (2) Remove the master loading roller ass'y.
- (3) Remove the master making unit sensor cover.
- (4) Remove the cutter guide.
- (5) Disconnect the cutter unit connector, remove the mounting screw (M4 x 8), and remove the cutter unit.

### [Precautions for Reassembly]

After installation, activate [Test Mode No. 250 \(cutter motor cycle action\)](#) to confirm the cutter movement.



## Adjustment

### 1. Master Leading Clamp Range Adjustment

#### Checking and Adjustment Procedure

- (1) Make marking on the clamped master at the tip end of the closed top clamp plate.
- (2) Measure the distance from the mark to the top of the master, confirming that this is 17 mm  $\pm$  2 mm.
- (3) If the measured value falls outside the specifications, run [Test mode No. 283 \(Master Clamp Range Adjustment\)](#) and make the necessary adjustments.

**Increasing the value by the test mode increases the master top clamping area.**

#### Symptoms

If incorrectly adjusted, the master may start slipping out of the clamp plate or master skewing on the print drum may occur during the printing. Master removal error may also occur.

### 2. Master Tail Clamp Range Adjustment

#### Checking and Adjustment Procedure

- (1) Make marking on the clamped master at the tip end of the closed tail clamp plate.
- (2) Measure the distance from the mark to the top of the master, confirming that this is 17 mm  $\pm$  3 mm.
- (3) If the measured value falls outside the specifications, run [Test mode No. 284 \(Master cut position adjustment\)](#) and make the necessary adjustments.

**Increasing the value by the test mode increases the master tail clamping area.**

#### Symptoms

If incorrectly adjusted, the master may skew on the print drum during the printing.

### 3. Write Start Position Adjustment

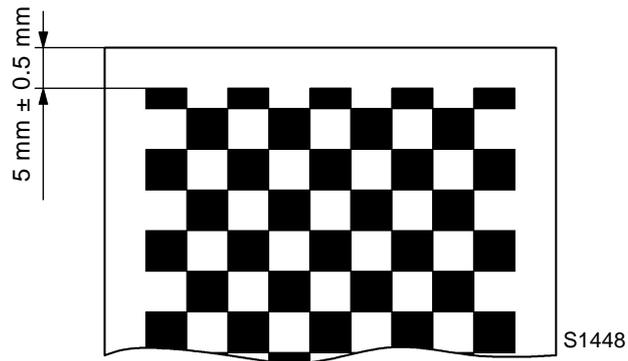
#### Checking and Adjustment Procedure for 1st Print Drum

Make a master using test mode No.50 on the 1st print drum and make few prints using one color. (Print speed: 3, print density: 3, print position adjustment: center)

Measure the position of the printed image and confirm that the top edge of the image is  $5\text{ mm} \pm 0.5\text{ mm}$  from top of the print.

If the measured value falls outside the range of specifications, run [Test mode No. 281 \(Write Start Position Adjustment\)](#) and adjust the write start position for the 1st print drum.

Increasing the setting on the test mode moves the write start position down, while decreasing the setting moves the image up.



#### Checking and Adjustment Procedure for 2nd Print Drum Write Start Position relative to the 1st Print Drum Position

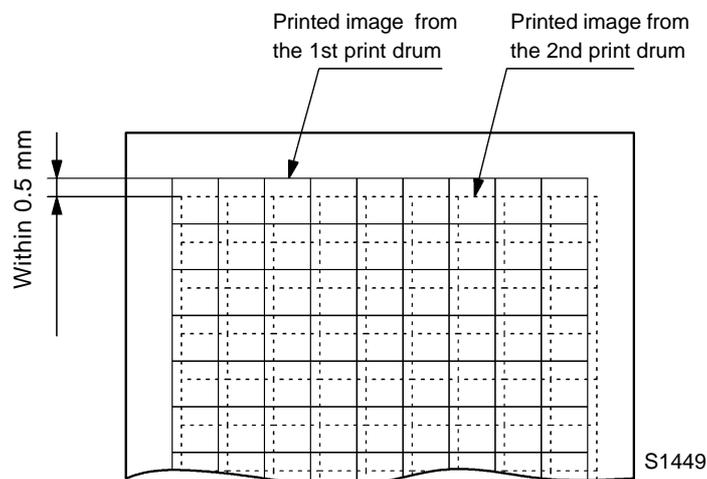
Once the 1st print drum has been adjusted, make master on both the 1st and 2nd print drums using test mode No. 51. Make few prints using two colors. (Print speed: 3, print density: 3, print position adjustment: center)

Check that the difference between the first printed line at the top of the print on the 1st print drum and 2nd print drum is within 0.5 mm.

If the difference falls outside the range of specifications, run [Test mode No. 281 \(Write Start Position Adjustment\)](#) and adjust the difference between 1st and 2nd print drums by adjusting only the write start position for the 2nd print drum.

#### Symptoms

Incorrect adjustment leads to print positioning offset between the two print drums.



## 4-1. Checking and Adjusting Image Elongation and Shrinkage (New Master Making Unit)

### Checking and Adjustment Procedure for 1st Print Drum

Make a master on the 1st print drum using test mode No. 51 and make few prints using one color. (Print speed: 3, print density: 3, print position adjustment: center)

Fold the printed paper at a 45 degrees line so that the printed lines will be 90 degrees against each other. The elongation or shrinkage should be within 0.3 %. (Example: For the length of 300mm, the elongation or shrinkage should be within 0.9 mm.)

If the measured value falls outside the above range, run [Test mode No. 287 \(master-making speed adjustment\)](#) and adjust image elongation on the 1st print drum.

Increasing the test mode setting shrinks the image, while the opposite will elongate the image.

### Checking and Adjustment Procedure for 2nd Print Drum Image Elongation and Shrinkage relative to the 1st Print Drum Setting

Once the 1st print drum has been adjusted, make a master on the 2nd print drum using test mode No. 51 and make few prints using two colors. (Print speed: 3, print density: 3, print position adjustment: center)

Align the 1st print drum image and the 2nd print drum image at the top (if offset, adjust using the vertical print position keys). Confirm that the difference between the 1st and 2nd print drums is within 0.5 mm at the 5th or 6th horizontal line from the bottom.

If the measured value falls outside the above range, run [Test mode No. 287 \(master-making speed adjustment\)](#) on the 2nd print drum and adjust the difference between the 1st and 2nd print drums.

## 4-2. Checking and Adjusting Image Elongation and Shrinkage (Old Master Making Unit)

### Checking and Adjustment Procedure for 1st Print Drum

Make a master on the 1st print drum using test mode No. 51 and make few prints using one color. (Print speed: 3, print density: 3, print position adjustment: center)

Fold the printed paper at a 45 degrees line so that the printed lines will be 90 degrees against each other. The elongation or shrinkage should be within 0.3 %. (Example: For the length of 300mm, the elongation or shrinkage should be within 0.9 mm.)

If the measured value falls outside the above range, run [Test mode No. 292 \(main pulse motor speed for master making\)](#) and adjust image elongation on the 1st print drum.

Increasing the test mode setting elongates the image, while the opposite will shrink the image.

### Checking and Adjustment Procedure for 2nd Print Drum Image Elongation and Shrinkage relative to the 1st Print Drum Setting

Once the 1st print drum has been adjusted, make a master on the 2nd print drum using test mode No. 51 and make few prints using two colors. (Print speed: 3, print density: 3, print position adjustment: center)

Align the 1st print drum image and the 2nd print drum image at the top (if offset, adjust using the vertical print position keys). Confirm that the difference between the 1st and 2nd print drums is within 0.5 mm at the 5th or 6th horizontal line from the top.

If the measured value falls outside the above range, run [Test mode No. 292 \(main pulse motor speed for master making\)](#) on the 2nd print drum and adjust the difference between the 1st and 2nd print drums.

## 5. Checking and Adjusting the Horizontal Printing Position

### Checking and Adjustment Procedure

Make master using test mode No. 50 on both print drums and make prints.

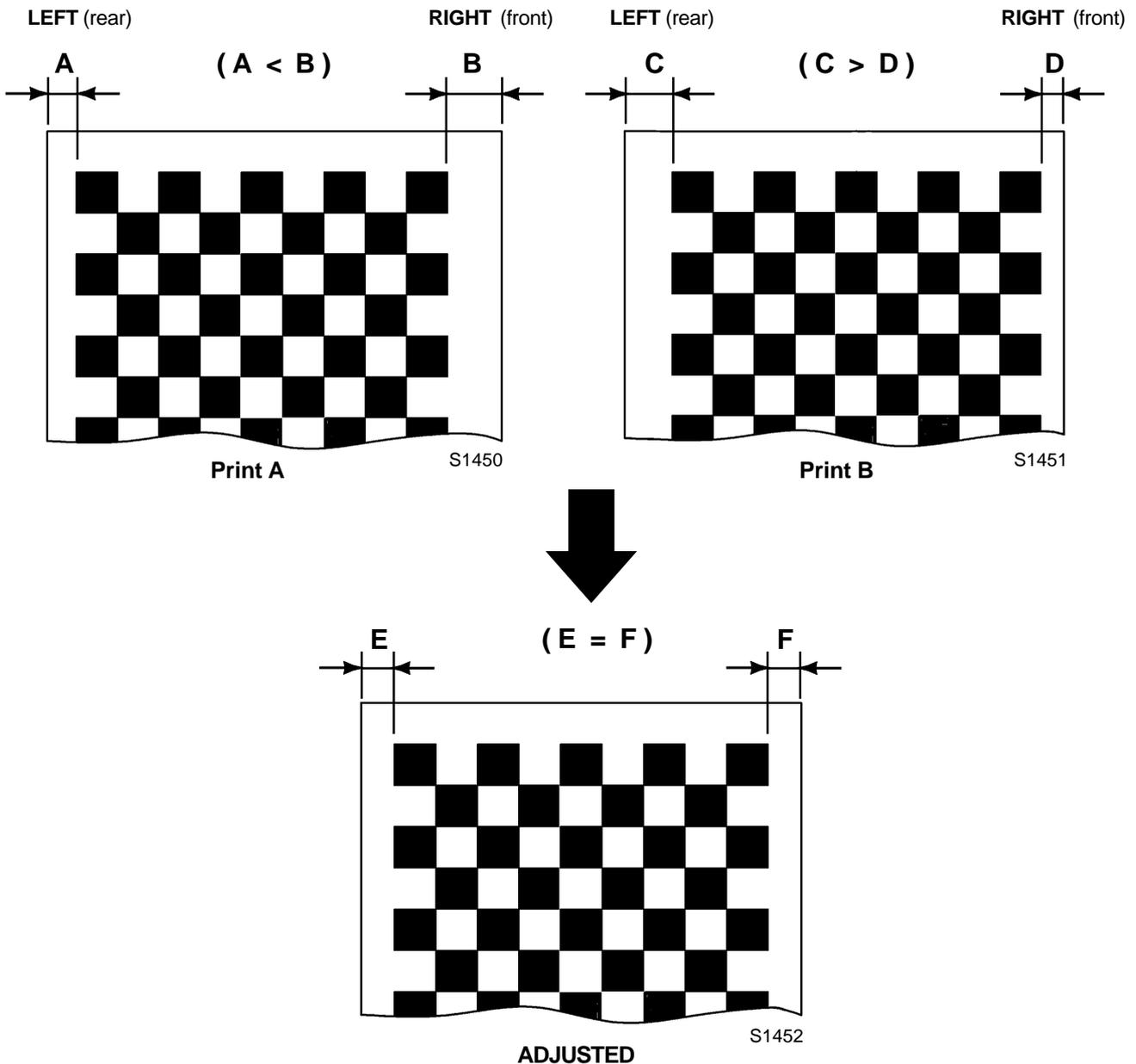
Measure the white margin on the paper, on the left and right. The width of both margins should equal in centering the image.

If the margins do not equal, start up [test mode No. 294 \(TPH horizontal write position adjust\)](#) and make the necessary adjustments separately for the 1st and 2nd print drums. Input number on this [test mode No.294](#) for print drum No.1 and print drum No.2 to center the image.

Positive settings move the image making position toward the left, while negative settings move the position toward the right. If following sketches are referred, Print **A** needs to have a negative number ( - ) input on the test mode, while Print **B** requires a positive number ( + ) input to center the image.

Make master and prints using test mode No.50 again to confirm that the image has centered.

The print position of print drum No.2 should be adjusted to within 0.5 mm horizontally against that of print drum No.1.



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## **CHAPTER 15: TIMING CHARTS**

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### **Contents**

**( This chapter is not completed )**

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# CHAPTER 16: PANEL MESSAGES

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B01 B21 B22 B23 B24	
C01 C02 C03 C04 C05 C06	
D01 D02 D03 D04 D05 D07 D09 D10 D11 D13 D16 D17	
D18 D19 D20 D22 D23 D24 D25 D26 D27 D28 D29 D30	
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F01 F02 F03 F04 F05 F06 F10 F14 F23 F25 F27 F28	
F30 F32 F35 F36 F43	
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## 2. List of Error Types

Error type	Details
T01	Main motor lock
T02	Elevator motor lock
T03	1st clamp slide motor lock
T04	1st ink overflow
T05	1st print positioning pulse motor lock
T06	1st horizontal pulse motor lock
T07	Digitizer error
T08	Computer interface error
T11	1st pressure control motor lock
T12	1st master disposal compression motor lock
T13	Cutter motor lock
T14	Flat bed error
T15	AF error
T16	1st inner pressure error
T17	Solenoid counter not connected
T18	Main pulse motor lock
T19	Thermal pressure motor lock
T20	Paper ejection motor lock
T21	F pinch pulse motor lock
T22	1st print drum lock error
T23	Scanner lock not released
T24	1st inking motor lock
T25	No ROSE battery
T27	Master making shifting motor lock
T28	2nd clamp slide motor lock
T29	2nd ink overflow
T30	2nd print positioning pulse motor lock
T31	2nd horizontal pulse motor lock
T32	2nd pressure control motor lock
T33	2nd master disposal compression motor lock
T34	2nd inner pressure error
T35	2nd print drum lock error
T36	2nd inking motor lock
T37	MCTL PCB no battery
T38	1st clamp opening and closing motor lock
T39	1st disposal plate motor lock

Error type	Details
T40	2nd disposal plate motor lock
T41	1st master disposal motor lock
T42	2nd master disposal motor lock
T43	R pinch pulse motor lock
T44	Pinch roller release motor lock
T45	2nd clamp opening and closing motor lock
T46	Loading motor lock
T47	Fuse was cut
T48	1st inner pressure error (when the print drive is released)
T49	2nd inner pressure error (when the print drive is released)
T97	Machine type code error
T98	Hardware error

Error type	Details
A01	Master feed error
A02	1st master loading error
A03	1st print drum cutting error
A04	1st master disposal error
A05	1st master present in master disposal section
A06	Check paper feed tray
A16	Awaiting master removal
A18	1st print drum unlocked
A19	2nd master loading error
A20	2nd master disposal error
A21	2nd master present in master disposal section
A23	2nd print drum unlocked
A24	AF original reset
A29	1st print drum clamp plate status error
A30	2nd print drum clamp plate status error
A31	1st print drum reset
A32	2nd print drum reset
A33	2nd print drum cutting error

These errors listed below are not displayed independently.

They are displayed as "G" error.

Error type	Details
A07	Paper feed error
A08	Paper jam on print drum
A09	Paper ejection error
A10	AF original feed error
A25	Paper feed OUT error

## CHAPTER 16. PANEL MESSAGES

### LIST OF ERROR TYPES

Error type	Details
B01	Keycard counter
B21	Data storage: Read/write error
B22	Job separator: Power off
B23	Job separator: No tape
B24	Job separator: Tape jam
Error type	Details
C01	Replace 1st ink cartridge
C02	Replace master roll
C03	1st master disposal box full
C04	No paper during FP
C05	Replace 2nd ink cartridge
C06	2nd master disposal box full
Error type	Details
D01	1st print drum not set
D02	Incorrect 1st print drum
D03	1st ink cartridge not set
D04	Incorrect 1st ink cartridge
D05	Master not set
D07	1st master disposal box not set
D09	Master making unit not set
D10	Scanner table not set
D11	Front door not set
D13	Paper ejection unit not set
D16	2nd print drum not set
D17	Incorrect 2nd print drum
D18	2nd ink cartridge not set
D19	Incorrect 2nd ink cartridge
D20	2nd master disposal box not set
D22	D to P 1st print drum removal indication
D23	D to P 2nd print drum removal indication
D24	1st print drum status error
D25	2nd print drum status error
D26	P to P 1st print drum not set
D27	P to P 2nd print drum not set
D28	D to P 1st print drum not set
D29	D to P 2nd print drum not set
D30	Paper feed tray not set

Error type	Details
E01	Replace ROSE battery
E02	Maintenance call
E03	Replace MCTL PCB battery
Error type	Details
F01	No master on 1st print drum
F02	Master image larger than paper size
F03	Multi up: paper size error
F04	Original not set
F05	Print quantity under "minimum print quantity"
F06	P to P 1st print drum removal request
F10	Master image larger than paper size: 2
F14	No paper
F23	Communication error: D to P
F25	Incorrect image resolution
F27	No master on 2nd print drum
F28	P to P 2nd print drum removal request
F30	Multiple paper feed
F32	Data storage area full
F35	D to P 1st print drum removal request
F36	D to P 2nd print drum removal request
F37	D to P Master image larger than paper size

### 3. Detailed List of Panel Messages

#### Service call errors

Error type	T01 [Main motor lock]
Panel display	T01-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
501	Main encoder pulse count does not change within the preset interval while the main motor is running.
502	The main encoder pulse count exceeds the preset count between T positions while the main motor is running.
503	The main encoder pulse count exceeds the preset count to first position A sensor while the main motor is running.
504	The 1st clamp (back/forth) unit is not at the home position while the main motor is running.
505	The main encoder pulse count exceeds the preset count to second position A sensor while the main motor is running.
506	The 2nd clamp (back/forth) unit is not at the home position while the main motor is running.
507	The print drum set sensor and print drum connection signal switched OFF while the print drum was running.
592	Overload current detection
593	Position B lock is assumed to be released (position B lock confirmation sensor 1 is OFF) when print drum 1 drive engagement is in released state (drive transmit release sensor is ON). (This detection is continued until the B-positioning of the print drum drive engagement.)
594	Position B lock is assumed to be released (position B lock confirmation sensor 2 is OFF) when print drum 2 drive engagement is in released state (drive transmit release sensor is ON). (This detection is continued until the B-positioning of the print drum drive engagement.)
595	The 1st print drum set sensor switched ON, the 1st print drum connection signal switched ON, and the 1st print drum lock position sensor switched OFF when the main motor started or was running.
596	The 2nd print drum set sensor switched ON, the 2nd print drum connection signal switched ON, and the 2nd print drum lock position sensor switched OFF when the main motor started or was running.
597	The main motor encoder count exceeded 168 pulses within 20 ms.
598	In trying to release the position-B lock of print drum 1 when print drum 1 drive engagement is in released state (drive transmit release sensor is ON), the position-B lock is found released (position B lock confirmation sensor 1 is OFF)
599	In trying to release the position-B lock of print drum 2 when print drum 2 drive engagement is in released state (drive transmit release sensor is ON), the position-B lock is found released (position B lock confirmation sensor 2 is OFF)

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T02 [Elevator motor lock]
Panel display	T02-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
401	Lower limit sensor does not switch OFF within 2 s when rising.
402	Upper limit sensor does not go ON within 12 s when rising.
403	Upper limit sensor does not switch OFF within 2 s when lowering.
404	Lower limit sensor does not go ON within 12 s when lowering.
405	Upper limit sensor is continuously ON for at least 2 s during the elevator servo operation.
406	Both upper and lower limit sensors were ON.
407	Overload current detection
Error type	T03 [1st clamp slide motor lock]
Panel display	T03-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
508	Clamp slide HP sensor does not switch from OFF → ON and the slide return sensor does not switch OFF within 2 s when positioning the clamp at the home position.
509	Clamp slide HP sensor does not switch from ON → OFF within 1 s when positioning the clamp at the home position.
510	Clamp slide HP sensor does not switch from OFF → ON and the slide return sensor does not go ON within 2 s when resetting the clamp.
511	Clamp slide HP sensor does not switch from ON → OFF within 1 s when resetting the clamp.
512	Overload current detection (It is not monitored between 100ms after motor ON)
513	The master-making unit is in the incorrect position when starting positioning the clamp unit at the forth position.
562	The machine type communication error is occurred when positioning the clamp unit at the forth position.
563	The machine type communication error is occurred when positioning the clamp unit at the back position.
Error type	T04 [1st ink overflow]
Panel display	T04-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, and switch off the overflow sensor.
Error point	Error conditions
516	Overflow conditions were reached.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T05 [1st print positioning pulse motor lock]
Panel display	T05-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
601	The vertical centering sensor does not go ON within 3 s during fine adjustment of the vertical home position from the top.
602	The vertical centering sensor does not switch OFF within 12 s during rough adjustment of the vertical home position from the top.
603	The vertical centering sensor does not go ON within 12 s when positioning at the home position from the bottom.
605	Position T and position A correction does not finish.
Error type	T06 [1st horizontal pulse motor lock]
Panel display	T06-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
611	Horizontal centering sensor does not go ON within 3.5s during horizontal centering.
612	Horizontal centering sensor does not switch OFF within 2s when releasing the drive.
613	Drive transmit release sensor does not go ON within 3.5s when releasing the drive.
614	Drive release sensor does not switch OFF within 5s when connecting the drive.
623	Horizontal centering sensor is ON during horizontal movement, even when more than 2 mm from the sensor.
Error type	T07 [Digitizer error]
Panel display	T07-*** !!System Error!! Turn Main Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch on power once again.
Error point	Error conditions
701	Communication error with digitizer.
Error type	T08 [Computer interface error]
Panel display	T08-*** !!System Error!! Turn Main Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch on power once again.
Error point	Error conditions
001	Communication error with computer interface.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T11 [1st pressure control motor lock]
Panel display	T11-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
621	Print pressure HP sensor does not go ON within the preset interval during print pressure initialization. (To identify a defect in the sensor itself)
622	Pressure HP sensor does not switch OFF within the preset interval when the motor rotates from HP sensor ON.
624	Print pressure limit sensor does not change within the preset interval after the motor starts (initial status) during the print pressure limit count. (for motor lock detection)
625	Print pressure limit sensor does not change within the preset interval during the print pressure limit count (after leaving initial status). (for motor lock detection)
Error type	T12 [1st master disposal compression motor lock]
Panel display	T12-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → recovery operation (HP resetting), or switch on power once again.
Error point	Error conditions
301	Master compression HP sensor does not go ON within 7 s when the master compression plate returns.
304	Master disposal upper limit sensor does not go ON within 7 s when the master compression plate performs compression.
305	Overload current detected when the master compression plate returns.(It is not monitored between 300msec after motor ON.)
306	Both the master compression limit sensor and master compression HP sensor are ON at the start of the operation.
Error type	T13 [Cutter motor lock]
Panel display	T13-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → recovery operation (HP resetting), or switch on power once again.
Error point	Error conditions
201	Cutter HP sensor does not go ON within 0.5 s when the cutter motor operates.
202	Cutter HP sensor does not switch OFF within 0.5 s when the cutter motor operates.
203	A03 occurs even when cutting is repeated.
204	Cutter HP switch is OFF when the cutter motor tries to operate.

**CHAPTER 16. PANEL MESSAGES**  
**DETAILED LIST OF PANEL MESSAGES**

Error type	T14 [Flat bed error]
Panel display	T14-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Switch on power once again.
Error point	Error conditions
101	HP sensor does not go ON.
102	HP sensor does not switch OFF.
103	Communication error
104	Incorrect setting data
105	Communication error (Time out)
127	Communication error (Sequence error)
128	Scanner communication time out 1
129	Scanner communication time out 2
160	Scanner communication time out 3
161	Scanner communication time out 4
162	Scanner communication time out 5
163	Scanner communication time out 6
164	Scanner communication time out 7
165	Scanner communication time out 8
166	Scanner communication time out 9
167	Scanner communication time out 10
168	Scanner communication time out 11
Error type	T15 [AF error]
Panel display	T15-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Jam reset
Error point	Error conditions
706	AF read pulse motor lock
707	EEPROM error
708	Original IN Sensor Sensitivity Adj. error
709	Communication error with shading IC
710	AF-VR error
711	ROM-Ver of AF is not informed.
712	Signal of "AF_SIG_TIMING" from AF is not detected.
Error type	T16 [1st inner pressure error]
Panel display	T16-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → recovery operation (inner pressure roller HP resetting).
Error point	Error conditions
519	Inner pressure detection sensor does not switch OFF during inner pressure roller raise operation, even when retried.
520	Inner pressure detection sensor does not go ON during the inner pressure roller lower operation, even when retried.
521	Inner pressure detection sensor does not go ON during the idling (when power is switched on).

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T17 [Solenoid counter not connected]
Panel display	T17-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Connect the solenoid counter (Connection signal ON).
Error point	Error conditions
004	Solenoid counter connection signal was OFF.
Error type	T18 [Main pulse motor lock]
Panel display	T18-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
522	On print drum No.1, the position-B lock confirmation sensor is OFF again at the finish of B-positioning retry after the first B positioning movement which ended up with the position-B lock confirmation sensor OFF after the completion of the movement.
523	On print drum No.2, the position-B lock confirmation sensor is OFF again at the finish of B-positioning retry after the first B positioning movement which ended up with the position-B lock confirmation sensor OFF after the completion of the movement.
525	Time out
526	Main pulse motor is monitored every 500 ms while operating, and main motor encoder count is less than 10 pulses between checks (under 0.35 rpm at design setting).
527	Main encoder pulse count to position A sensor exceeds the range of specifications when the main pulse motor is operating.
528	1st clamp (slide) unit is not at the reset position.
589	2nd clamp (slide) unit is not at the reset position.
590	1st print drum set sensor is ON, 1st print drum connection signal is ON, and 1st print drum lock position sensor is OFF when the main pulse motor starts or is operating.
591	2nd print drum set sensor is ON, 2nd print drum connection signal is ON, and 2nd print drum lock position sensor is OFF when the main pulse motor starts or is operating.
Error type	T19 [Thermal pressure motor lock]
Panel display	T19-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → recovery operation (HP resetting), or switch on power once again.
Error point	Error conditions
211	TPH pressure release sensor does not switch from ON → OFF within 4 s during the TPH pressure release operation after the TPH pressure release sensor goes ON.
212	TPH pressure release sensor does not switch from OFF → ON within 4 s during the TPH pressure release operation after the TPH pressure release sensor switches OFF.
213	TPH pressure release sensor does not switch from OFF → ON within 4 s during the TPH pressurizing operation after the TPH pressure release sensor goes ON.
214	TPH pressure release sensor does not switch from ON → OFF within 4 s during the TPH pressurizing operation after the TPH pressure release sensor switches OFF.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T20 [Paper ejection motor lock]
Panel display	T20-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
411	(This message is still not used.)
412	(This message is still no used.)
Error type	T21 [F pinch pulse motor lock]
Panel display	T21-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
416	F pinch HP sensor does not go ON within 10 s during F pinch pulse motor HP resetting.
417	F pinch HP sensor does not switch OFF within 10 s during F pinch pulse motor positioning adjustment.
Error type	T22 [1st print drum lock error]
Panel display	T22-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → Recovery operation (lock release), or switch on power once again.
Error point	Error conditions
531	Print drum lock cam sensor does not go ON within the preset interval during the print drum locking operation.
532	Print drum lock position sensor does not go ON within the preset interval during the print drum locking operation.
533	Print drum lock position sensor does not switch OFF within the preset interval during the print drum releasing operation.
534	Print drum cam sensor does not switch OFF within the preset interval during the print drum releasing operation.
Error type	T23 [Scanner lock not released]
Panel display	T23-*** Image Scanner is Locked!! Call Service
Reset method	Reset the scanner lock flag in test mode.
Error point	Error conditions
106	Scanner lock flag is set.
Error type	T24 [1st inking motor lock]
Panel display	T24-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
539	Overload current detected .(It is not monitored between 300msec after motor ON.)

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T25 [No ROSE battery]
Panel display	T25-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Replace battery.
Error point	Error conditions
007	No ROSE backup battery.(The voltage of battery is under 2.3V)
Error type	T27 [Master making shifting motor lock]
Panel display	T27-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
221	Master making unit position sensor 1 does not go ON within 7 s while the unit is moving toward the 1st print drum.
222	Master making unit position sensor 1 does not go OFF within 2 s while the unit is moving toward the 2nd print drum.
223	Master making unit position sensor 2 does not go ON within 7 s while the unit is moving toward the 1st print drum.
224	Master making unit position sensor 2 does not go OFF within 2 s while the unit is moving toward the 2nd print drum.
225	Master making unit position sensors 1 and 2 are both ON at start of operation.
226	The clamp slide unit is not resetting position at start of master making shifting motor rotation.(Both clamp slide HP sensor and slide return sensor are OFF)
Error type	T28 [2nd clamp slide motor lock]
Panel display	T28-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
508	Clamp slide HP sensor does not switch from OFF → ON and the slide return sensor does not switch OFF within 2 s during the clamp slide HP resetting (forward) operation.
509	Clamp slide HP sensor does not switch from ON → OFF within 1 s during the clamp slide HP resetting (forward) operation.
510	Clamp slide HP sensor does not switch from OFF → ON and the slide return sensor does not go ON within 2 s during the clamp slide resetting operation.
511	Clamp slide HP sensor does not switch from ON → OFF within 1 s during the clamp slide resetting operation.
512	Overload current detection (It is not monitored between 100ms after motor ON)
513	The master-making unit is in the incorrect position when starting positioning the clamp unit at the forth position.
562	The machine type communication error is occurred when positioning the clamp unit at the forth position.
563	The machine type communication error is occurred when positioning the clamp unit at the back position.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T29 [2nd ink overflow]
Panel display	T29-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button and switch off the overflow sensor.
Error point	Error conditions
516	Overflow conditions were reached.
Error type	T30 [2nd print positioning pulse motor lock]
Panel display	T30-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
601	The vertical centering sensor does not go ON within 3 s during fine adjustment of the vertical home position from the top.
602	The vertical centering sensor does not switch OFF within 12 s during rough adjustment of the vertical home position from the top.
603	The vertical centering sensor does not go ON within 12 s when positioning at the home position from the bottom.
605	Position T and position A correction does not finish.
Error type	T31 [2nd horizontal pulse motor lock]
Panel display	T31-*** !!System Error!! Call Service
Reset method	To be reset by Risograph Technician only
Error point	Error conditions
611	Horizontal centering sensor does not go ON within 3.5s during horizontal centering.
612	Horizontal centering sensor does not switch OFF within 2s when releasing the drive.
613	Drive release sensor does not go ON within 3.5s when releasing the drive.
614	Drive release sensor does not switch OFF within 5s when connecting the drive.
623	Horizontal centering sensor is ON during horizontal movement, even when more than 2 mm from the sensor.
Error type	T32 [2nd pressure control motor lock]
Panel display	!!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
621	Pressure HP sensor does not go ON during pressure initialization within the preset interval. (to identify a defect in the sensor itself)
622	Pressure HP sensor does not switch OFF within the preset interval when the motor rotates with the HP sensor ON.
624	Print pressure limit sensor does not change when the motor starts (initial status) during the print pressure limit count within the preset interval. (for motor lock detection)
625	Print pressure limit sensor does not change during the print pressure limit count (after leaving initial status) within the preset interval. (for motor lock detection)

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T33 [2nd master disposal compression motor lock]
Panel display	T33-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → recovery operation (HP resetting), or switch on power once again.
Error point	Error conditions
301	Master disposal HP sensor does not go ON within 7 s when the master compression plate returns.
304	Master disposal upper limit sensor does not go ON within 7 s when the master compression plate performs compression.
305	Overload current detected when the master compression plate returns. (It is not monitored between 300msec after motor ON)
306	Both the master compression limit sensor and master compression HP sensor are ON at the start of the operation.
Error type	T34 [2nd inner pressure error]
Panel display	T34-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → recovery operation (inner pressure roller HP resetting).
Error point	Error conditions
519	Inner pressure detection sensor does not switch OFF during the inner pressure roller raise operation, even when retried.
520	Inner pressure detection sensor does not go ON during inner pressure roller lower operation, even when retried.
521	Inner pressure detection sensor does not go ON during idling (when power is switched on).
Error type	T35 [2nd print drum lock error]
Panel display	T35-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → Recovery operation (lock release), or switch on power once again.
Error point	Error conditions
531	Print drum lock cam sensor does not go ON within the preset interval during the print drum locking operation.
532	Print drum lock position sensor does not go ON within the preset interval during the print drum locking operation.
533	Print drum lock position sensor does not switch OFF within the preset interval during the print drum releasing operation.
534	Print drum cam sensor does not switch OFF within the preset interval during the print drum releasing operation.
Error type	T36 [2nd inking motor lock]
Panel display	T36-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
539	Overload current detection. (It is not monitored between 300msec after motor ON)

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T37 [MCTL PCB no battery]
Panel display	T37-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Replace battery.
Error point	Error conditions
010	No MCTL PCB backup battery. (The voltage of battery is under 2.3V)
Error type	T38 [1st clamp opening and closing motor lock]
Panel display	T38-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
542	0 angular sensor does not go ON within 3s when opening the end clamp.
544	180 angular sensor does not go ON within 3s when opening the top clamp.
546	Clamp plate loading position sensor does not go ON within 1.5s when half-closing the top clamp.
548	0 angular sensor does not go ON within 1.5s when closing the top clamp.
550	Clamp plate home position sensor does not go ON within 1.5s when half-closing the end clamp.
552	180 angular sensor does not go ON within 1.5s when closing the end clamp.
554	Overload current detection
555	Clamp plate home position sensor is ON at the start of the open and close returning operation and clamp plate home position sensor dose not go OFF within 3s during the rotation of the motor toward 180 angular.
556	Clamp plate home position sensor dose not switch from OFF to ON within 3s during the rotation of the motor toward 0 angular when the open and close returning.
557	Clamp plate home position sensor dose not switch from ON to OFF within 3s during the rotation of the motor toward 180 angular after the clamp plate home position sensor switching from ON to OFF when the open and close returning.
Error type	T39 [1st disposal plate motor lock]
Panel display	T39-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → Recovery operation (HP resetting).
Error point	Error conditions
311	Disposal plate home sensor does not go ON within 3 s when the disposal plate returns.
313	Disposal plate home sensor does not switch from ON to OFF within 0.5 s after the disposal plate blaking goes ON.
314	Disposal plate limit sensor does not go ON within 3 s when the disposal plate performs compression.
315	Overload current was detected when the disposal plate motor operates. (It is not monitored between 300msec after motor ON)
316	Both the disposal plate limit sensor and disposal plate home sensor were ON at the start of the operation.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	T40 [2nd disposal plate motor lock]
Panel display	T40-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → Recovery operation (HP resetting).
Error point	Error conditions
311	Disposal plate home sensor does not go ON within 3 s when the disposal plate returns.
313	Disposal plate home sensor does not switch from ON to OFF within 0.5 s after the disposal plate blaking goes ON.
314	Disposal plate limit sensor does not go ON within 3 s when the disposal plate performs compression.
315	Overload current was detected while the disposal plate motor was running. (It is not monitored between 300msec after the motor ON)
316	Both the disposal plate limit sensor and disposal plate home sensor were ON at the start of the operation.
Error type	T41 [1st master disposal motor lock]
Panel display	T41-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
321	Overload current was detected during 500msec while the motor was runing.
Error type	T42 [2nd master disposal motor lock]
Panel display	T42-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
321	Overload current was detected during 500msec while the motor was runing.
Error type	T43 [R pinch pulse motor lock]
Panel display	T43-*** !!System Error!! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button, or switch on power once again.
Error point	Error conditions
416	R pinch HP sensor does not go ON within 10 s when resetting the R pinch pulse motor HP.
417	R pinch HP sensor does not switch OFF within 10 s when adjusting the R pinch pulse motor position.

**CHAPTER 16. PANEL MESSAGES**  
**DETAILED LIST OF PANEL MESSAGES**

Error type	T44 [Pinch roller release motor lock]
Panel display	T44-*** !!System Error! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button → Recovery operation (Pinch release), or switch on power once again.
Error point	Error conditions
421	Pinch roller release sensor does not switch from ON → OFF within 1.3 s during the pinch release action after the pinch roller release sensor goes ON.
422	Pinch roller release sensor does not switch from OFF → ON within 1.3 s during the pinch release action after the pinch roller release sensor switches OFF.
423	Pinch roller release sensor does not switch from OFF → ON within 1.3 s during the pinch pressurizing action after the pinch roller release sensor goes ON.
424	Pinch roller release sensor does not switch from ON → OFF within 1.3 s during the pinch pressurizing action after the pinch roller release sensor switches OFF.
Error type	T45 [2nd clamp opening and closing motor lock]
Panel display	T45-*** !!System Error! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
542	0 angular sensor does not go ON within 3s when opening the end clamp.
544	180 angular sensor does not go ON within 3s when opening the top clamp.
546	Clamp plate loading position sensor does not go ON within 1.5s when half-closing the top clamp.
548	0 angular sensor does not go ON within 1.5s when closing the top clamp.
550	Clamp plate home position sensor does not go ON within 1.5s when half-closing the end clamp.
552	180 angular sensor does not go ON within 1.5s when closing the end clamp.
554	Overload current detection
555	Clamp plate home position sensor is ON at the start of the open and close returning operation and clamp plate home position sensor dose not go OFF within 3s during the rotation of the motor toward 180 angular.
556	Clamp plate home position sensor dose not switch from OFF to ON within 3s during the rotation of the motor toward 0 angular when the open and close returning.
557	Clamp plate home position sensor dose not switch from ON to OFF within 3s during the rotation of the motor toward 180 angular after the clamp plate home position sensor switching from ON to OFF when the open and close returning.
Error type	T46 [Loading motor lock]
Panel display	T46-*** !!System Error! Press Reset Key. If Recovery has Failed, Call Service
Reset method	Press the [OK] key or the Reset button , or switch on power once again.
Error point	Error conditions
290	Overload current is detected when the loading motor rotates master feeding direction.
291	Overload current is detected when the loading motor rotates master reverse direction.

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Error type	T47 [Fuse was cut]
Panel display	T47-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
090	F12 (24V-A-Fuse) was cut.
091	F13 (24V-B-Fuse) was cut.
092	F14 (24V-C-Fuse) was cut.
093	F15 (24V-D-Fuse) was cut.
Error type	T48 [1st inner pressure error (when the print drive is engaged) ]
Panel display	T48-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
558	The print drum was installed in the condition of the inner pressure roller was at the pressure position. (Inner pressure detection sensor was ON)
Error type	T49 [2nd inner pressure error (when the print drive is engaged) ]
Panel display	T49-*** !!System Error!! Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
558	The print drum was installed in the condition of the inner pressure roller was at the pressure position. (Inner pressure detection sensor was ON)
Error type	T97 [Machine type code error]
Panel display	T97-*** !!System Error!! Turn Main Power SW OFF Then ON Call Service
Reset method	To be reset by Technician only
Error point	Error conditions
016	

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Error type	T98 [Hardware error]
Panel display	T98-*** !!System Error!! Turn Main Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch on power once again.
Error point	Error conditions
005	Machine code error
019	1st print drum memory check sum error
020	1st print drum memory write error
021	2nd print drum memory check sum error
022	2nd print drum memory write error
036	Communication error between MCTL PCB and SH PCB.
051	Touch panel communication error
053	Memory setting data read error
054	Memory setting data write error
063	Test mode error
085	User setting data read error
086	User setting data write error
087	No memory setting save data is set.
088	No user setting save data is set.
089	ROSE: EEPROM Ver incorrect
100	ROSE: undefined command
101	ROSE: Receive break interruption
102	ROSE: Irregular ACK/NAK command received.
103	ROSE: Received error signal 3 times.
104	ROSE: No response within a preset interval after sending
105	ROSE: CTS does not switch to HIGH within 1 second.
219	TPH size code does not match the machine type code data.
220	TPH resolution code does not match the machine type code data.

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### DETAILED LIST OF PANEL MESSAGES

#### Jam errors (A--)

Error type	A01 [Master feed error]
Panel display	A01-*** Master Mis-Feed Rewind Master Roll and Reset Master in Place
Reset method	Open the master making unit and remove the master. (Master detection sensor: OFF)
Error point	Error conditions
227	Master positioning sensor does not switch OFF even when the master is reversed for 1 s when the positioning sensor is ON at the start of master positioning.
228	Master positioning sensor does not go ON even when the master is fed for 2 s when the positioning sensor is OFF at the start of master positioning.
229	Master positioning sensor was OFF during standby.
285	Displayed following A02 1st master loading error].
286	Displayed following A03 1st print drum cutting error].
287	Displayed following A19 2nd master loading error].
288	Displayed following A33 2nd print drum cutting error].
Error type	A02 [1st master loading error]
Panel display	A02-*** Master Jam Pull Out Print Drum 1 and Remove Master
Reset method	Pull out 1st print drum. (The 1st print drum set sensor switches OFF, and the 1st print drum connection signal switches OFF.)
Error point	Error conditions
231	Master loading sensor does not go ON during master loading.
Error type	A03 [1st print drum cutting error]
Panel display	A03-*** Master was Not Loaded on Print Drum 1 Correctly Pull Out Print Drum 1 and Remove Master
Reset method	Pull out 1st print drum. (1st print drum set sensor switches OFF and 1st print drum connection signal switches OFF.)
Error point	Error conditions
236	Master positioning sensor does not switch OFF even when the print drum rotates 20° after cutting.
Error type	A04 [1st master disposal error]
Panel display	A04-*** Master Disposal Error Pull Out Print Drum 1 and Remove Master
Reset method	Pull out 1st print drum. (1st print drum set sensor switches OFF and 1st print drum connection signal switches OFF.)
Error point	Error conditions
331	Master disposal jam sensor does not go ON when disposal is complete (after the master disposal motor stops).
332	Master disposal jam sensor does not switch OFF when master compression ends (after the fourth compression).

**CHAPTER 16. PANEL MESSAGES**  
**DETAILED LIST OF PANEL MESSAGES**

Error type	A05 [1st master present in master disposal section]
Panel display	A05-*** Master Jammed in Disposal Unit Pull Out Print Drum 1 and Remove Master
Reset method	Pull out 1st print drum (The 1st print drum set sensor switches OFF and the 1st print drum connection signal switches OFF) and 1st master disposal jam sensor is OFF.
Error point	Error conditions
336	Master disposal jam sensor was ON at the start of master making.
Error type	A06 [Check paper feed tray]
Panel display	A06-*** Check Standard Feed Tray
Reset method	Switch OFF the paper feed tray safety SW.
Error point	Error conditions
431	Paper feed tray safety SW was ON.
Error type	A16 [Awaiting master removal]
Panel display	A16-*** Master Remains on Print Drum 2 Pull Out Print Drum 2 and Remove Master
Reset method	Remove the master. (Master positioning sensor: OFF)
Error point	Error conditions
256	Master positioning sensor does not switch OFF after the user master cutting operation. (Cut master is not removed.)
Error type	A18 [1st print drum unlocked]
Panel display	A18-*** Print Drum 1 has been Unlocked To Lock it Again, Pull it Out and Set it Back in Place
Reset method	Pull out the 1st print drum. (1st print drum set sensor switches OFF and 1st print drum connection signal switches OFF.)
Error point	Error conditions
561	Print drum lock was released for drum removal.
Error type	A19 [2nd master loading error]
Panel display	A19-*** Master Jam Pull Out Print Drum 2 and Remove Master
Reset method	Pull out 2nd print drum. (2nd print drum set sensor switches OFF and 2nd print drum connection signal switches OFF.)
Error point	Error conditions
231	Master loading sensor does not go ON during master loading.
Error type	A20 [2nd master disposal error]
Panel display	A20-*** Master Disposal Error Pull Out Print Drum 2 and Remove Master
Reset method	Pull out 2nd print drum. (2nd print drum set sensor switches OFF and 2nd print drum connection signal switches OFF.)
Error point	Error conditions
331	Master disposal jam sensor does not go ON when disposal is complete (after the master disposal motor stops).
332	Master disposal jam sensor does not switch OFF when master compression ends (after the fourth compression).

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Error type	A21 [2nd master present in master disposal section]
Panel display	A21-*** Master Jammed in Disposal Unit Pull Out Print Drum 2 and Remove Master
Reset method	Pull out 2nd print drum. (2nd print drum set sensor switches OFF and 2nd print drum connection signal switches OFF.)
Error point	Error conditions
336	Master disposal jam sensor was ON at the start of master making.
Error type	A23 [2nd print drum unlocked]
Panel display	A23-*** Print Drum 2 has been Unlocked To Lock it Again, Pull it Out and Set it Back in Place
Reset method	Pull out the 2nd print drum. (2nd print drum set sensor switches OFF and 2nd print drum connection signal switches OFF.)
Error point	Error conditions
561	Print drum lock was released for drum removal.
Error type	A24 [AF original reset]
Panel display	A24-*** Place Originals in AF Again
Reset method	Reset the original in the AF.
Error point	Error conditions
116	
Error type	A29 [1st print drum clamp plate status error]
Panel display	A29-*** Pull Out Print Drum 1 and Check Clamp Plate Position
Reset method	Pull out 1st Print Drum. (1st Print Drum set sensor switches OFF and 1st Print Drum connection signal switches OFF)
Error point	Error conditions
564	Angular safety sensor was ON when the end clamp was opened.
Error type	A30 [2nd print drum clamp plate status error]
Panel display	A30-*** Pull Out Print Drum 2 and Check Clamp Plate Position
Reset method	Pull out print 2nd print drum. (2nd print drum set sensor switches OFF and print 2nd print drum connection signal switches OFF)
Error point	Error conditions
564	Angular safety sensor was ON when the end clamp was opened.
Error type	A31 [1st print drum reset]
Panel display	A31-*** Set Print Drum 1 in Place Again
Reset method	The 1st print drum set sensor detects the 1st print drum. (The 1st print drum set sensor, the 1st print drum connection signal, and the 1st print drum lock position sensor all go ON.)
Error point	Error conditions
567	The 1st print drum lock position sensor dose not go ON within 2 s after the 1st print drum connection signal and the 1st print drum set sensor goes ON

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### DETAILED LIST OF PANEL MESSAGES

Error type	A32 [2nd print drum reset]
Panel display	A32-*** Set Print Drum 2 in Place Again
Reset method	The 2nd print drum set sensor detects the 2nd print drum. (2nd print drum set sensor, 2nd print drum connection signal, and 2nd print drum lock position sensor all go ON.)
Error point	Error conditions
567	The 2nd print drum lock position sensor dose not go ON within 2 s after the 2nd print drum connection signal and the 2nd print drum set sensor goes ON
Error type	A33 [2nd print drum cutting error]
Panel display	A33-*** Master was Not Loaded on Print Drum 2 Correctly Pull Out Print Drum 2 and Remove Master
Reset method	Pull out 2nd print drum. (2nd print drum set sensor switches OFF and 2nd print drum connection signal switches OFF)
Error point	Error conditions
236	Master positioning sensor does not go OFF even when the print drum rotates 20° after cutting.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

#### Jam errors (A--:Displayed as list of G error)

Error type	A07 [Paper feed error]
Error point	Error conditions
436	First paper paper buckle jam.
437	First paper no ejection jam, but following paper jammed before second feed area. Paper before the last no ejection jam, but last paper jammed before second feed area.
438	1st paper sensor was ON before start of printing.
439	Stripper multiple feed SW became ON.
Error type	A08 [Paper jam on print drum]
Error point	Error conditions
466	Paper jam below the paper drum
467	First paper ejection jam, and following paper jammed before second feed area. Paper before the last ejection jam, and last paper jammed before second feed area.
468	First paper ejection jam, and following paper jammed at first feed area. Paper before the last ejection jam, and last paper jammed at first feed area..
469	1st paper sensor and paper ejection sensor were ON before start of printing.
470	First paper jammed under paper drum, but following paper ejected correctly. Paper before the last jammed under paper drum, but last paper ejected correctly.
471	First paper ejection jam, and following paper jammed under paper drum. Paper before the last ejection jam, but last paper ejected correctly.
Error type	A09 [Paper ejection error]
Error point	Error conditions
457	Paper ejection jam in last print.
458	First paper ejection jam, but following paper no jamming before second feed area. Paper before the last ejection jam, but last paper no jamming before second feed area.
459	First paper ejection jam, but following paper no jamming at first paper feed. Paper before the last ejection jam, but last paper no jamming at first paper feed.
460	Paper ejection sensor was ON before start of printing.
Error type	A10 [AF original feed error]
Error point	Error conditions
111	One of the following paper jams has occurred: paper remaining at resist sensor, paper remaining at read sensor, paper not reaching resist sensor, paper not reaching read sensor, or paper not reaching AF paper ejection sensor.
Error type	A25 [Paper feed OUT error]
Error point	Error conditions
446	First paper jammed in first paper feed area.
447	First paper ejection jam, and following paper jammed at first paper feed. Paper before the last ejection jam, and last paper jammed at first paper feed.
448	2nd paper sensor was ON before paper feed began.
<b>Refer to below for the meaning of the four phrases as used on this page.</b>	
slack jam:	1st paper sensor does not switch ON during paper drum angle 180-236 degrees.
paper feed jam:	2nd paper sensor does not switch ON during paper drum angle 270-310 degrees.
Paper jam below the paper drum:	paper ejection sensor does not switch ON during paper drum angle 530-580 degrees.
Paper ejection jam:	paper ejection sensor was ON at drum angle 840 degrees.

**Option errors**

Error type	B01 [Keycard counter]
Panel display	B01-*** Insert Card in Key/Card Counter
Reset method	Insert card
Error point	Error conditions
027	No card
Error type	B21 [Data storage: Read/write error]
Panel display	B21-*** !!System Error!! Turn Main Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch on power once again.
Error point	Error conditions
030	Read/write error (Data storage card was not connected completely or structure of files was broken.)
Error type	B22 [Job separator: Power off]
Panel display	B22-*** !! Job Separator Has No Power !! Turn On Power Switch of it
Reset method	[OK] button ON
Error point	Error conditions
721	Power was OFF when the Start key was ON with function setting "Tape separation" set to ON.
727	Busy signal did not go [H] within 7s after cluster A signal switched ON. (Job separator was switched OFF in driving.)
Error type	B23 [Job separator: No tape]
Panel display	B23-*** No Paper Tape in Job Separator Replace Tape Roll
Reset method	[OK] button ON
Error point	Error conditions
722	Tape detection signal was "H (no tape)" when the Start key was switched ON with the BUSY signal at "H (Power ON)" and the function setting "Tape separation" set to ON.
723	Tape detection signal was "H (no tape)" after the BUSY signal changed from "L" to "H" and the function setting "Tape separation" was set to ON following the ST tape output.
Error type	B24 [Job separator: Tape jam]
Panel display	B24-*** Paper Tape Jam in Job Separator Remove Paper Tape
Reset method	[OK] button ON
Error point	Error conditions
724	Tape jam detection signal was "L (tape remaining)" when the Start key was switched ON, with the BUSY signal at "H (Power ON)" and the function setting "Tape separation" set to ON.
725	Tape jam detection signal was "H" within 1.2 s after the cluster A signal switched to ON. (Tape feed error)
726	Tape jam detection signal was "L" when the BUSY signal changed from "L" to "H" (or remained at "L" after 7 s) after the cluster A signal switched to ON. (Tape ejection sensor)

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### DETAILED LIST OF PANEL MESSAGES

#### Errors involving consumables

Error type	C01 [Replace 1st ink cartridge]
Panel display	C01-*** No Ink in Print Drum 1 Replace Ink Cartridge in Drum 1
Reset method	Switch OFF 1st ink cartridge set SW for 3 s.
Error point	Error conditions
570	Ink sensor fails to go ON even when inking is performed for the preset interval.
Error type	C02 [Replace master roll]
Panel display	C02-*** No Master Replace Master Roll
Reset method	Master making set sensor: OFF → Master detection sensor: OFF
Error point	Error conditions
271	Supply of masters ran out during master feeding. (Master detection sensor OFF)
Error type	C03 [1st master disposal box full]
Panel display	C03-*** Empty Master Disposal Box 1
Reset method	1st master disposal box set sensor: OFF for 5 s → 1st master disposal box set sensor: ON → 1st disposal box empty detection sensor: ON.
Error point	Error conditions
341	Master disposal count has reached the preset limit.
342	Disposal box empty detection sensor was ON during the resetting of the master disposal box after C03.
343	Overload current detection during the master compression action.
Error type	C04 [No paper during FP]
Panel display	C04-*** Add Paper
Reset method	Set paper → Recovery operation (master making continues).
Error point	Error conditions
490	Paper detection sensor was OFF (before paper feeding).
Error type	C05 [Replace 2nd ink cartridge]
Panel display	C05-*** No Ink in Print Drum 2 Replace Ink Cartridge in Drum 2
Reset method	Switch OFF 2nd ink cartridge set SW for 3 s.
Error point	Error conditions
570	Ink sensor fails to go ON even when inking is performed for the preset interval.
Error type	C06 [2nd master disposal box full]
Panel display	C06-*** Empty Master Disposal Box 2
Reset method	2nd master disposal box set sensor: OFF for 5 s → 2nd master disposal box set sensor: ON → 2nd disposal box empty detection sensor: ON.
Error point	Error conditions
341	Master disposal count has reached the preset limit.
342	Disposal box empty detection sensor was ON during the resetting of the master disposal box after C03.
343	Overload current detection during the master compression action.

**Set check errors**

Error type	D01 [1st print drum not set]
Panel display	D01-*** Set Print Drum 1 in Place
Reset method	1st print drum set sensor detects the 1st print drum. (1st print drum set sensor, 1st print drum connection signal, and 1st print drum lock position sensor all ON)
Error point	Error conditions
573	The print drum specified by the print menu is not set.
Error type	D02 [Incorrect 1st print drum]
Panel display	D02-*** Wrong-Type Print Drum Installed for Drum 1
Reset method	Pull out 1st print drum. (1st print drum set sensor OFF; 1st print drum connection signal OFF)
Error point	Error conditions
576	Print drum clour erro out of range
577	Print drum code error (error of ink cartridge PCB ID)
578	Print drum code error (error of size ID)
Error type	D03 [1st ink cartridge not set]
Panel display	D03-*** Install Ink Cartridge in Print Drum 1
Reset method	Install the ink cartridge. (1st ink cartridge set SW: ON)
Error point	Error conditions
579	1st ink cartridge set SW OFF (This is displayed only when the test-mode No.599="0")
Error type	D04 [Incorrect 1st ink cartridge]
Panel display	D04-*** Wrong-Type Ink Cartridge Installed in Print Drum 1
Reset method	Replace with correct ink cartridge.
Error point	Error conditions
582	Ink cartridge value detected by the sensor does not match the set value. (This is displayed only when the test-mode No.599="0")
Error type	D05 [Master not set]
Panel display	D05-*** Master Not Set in Place Insert Lead Edge of Master into Master Entrance and Close Master Making Unit
Reset method	Set the master. (Master detection sensor: ON)
Error point	Error conditions
276	Master is not set. (Master detection sensor is OFF.)
Error type	D07 [1st master disposal box not set]
Panel display	D07-*** Set Master Disposal Box 1 in Place
Reset method	Set 1st master disposal box. (1st master disposal box safety SW: ON)
Error point	Error conditions
346	Master disposal box safety SW was OFF in standby mode.
347	Master disposal box safety SW was OFF during operations.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	D09 [Master making unit not set]
Panel display	D09-*** Close Master Making Unit
Reset method	Master making set sensor: ON
Error point	Error conditions
281	Master making set sensor was OFF.
Error type	D10 [Scanner table not set]
Panel display	D10-*** Close Scanner Table
Reset method	Flat bed set SW: ON
Error point	Error conditions
121	Flat bed set SW was OFF in standby mode.
122	Flat bed set SW was OFF during operations.
Error type	D11 [Front door not set]
Panel display	D11-*** Close Front Cover
Reset method	Front door safety SW: ON
Error point	Error conditions
036	Front door safety SW was OFF in standby mode.
037	Front door safety SW was OFF during operations.
Error type	D13 [Paper ejection unit not set]
Panel display	D13-*** Close Paper Receiving Tray
Reset method	Paper ejection unit safety SW: ON
Error point	Error conditions
486	Paper ejection unit safety SW was OFF in standby mode.
487	Paper ejection unit safety SW was OFF during operations.
Error type	D16 [2nd print drum not set]
Panel display	D16-*** Set Print Drum 2 in Place
Reset method	2nd print drum set sensor detects 2nd print drum. (2nd print drum set sensor, the 2nd print drum connection signal, and the 2nd print drum lock position sensor all ON)
Error point	Error conditions
573	The print drum specified by the print menu is not set.
Error type	D17 [Incorrect 2nd print drum]
Panel display	D17-*** Wrong-Type Print Drum Installed for Drum 2
Reset method	Pull out 2nd print drum. (2nd print drum set sensor OFF; 2nd print drum connection signal OFF)
Error point	Error conditions
576	Print drum code error
577	Print drum code error (error of ink cartridge PCB ID)
578	Print drum code error (error of size ID)

**CHAPTER 16. PANEL MESSAGES**  
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Error type	D18 [2nd ink cartridge not set]
Panel display	D18-*** Install Ink Cartridge in Print Drum 2
Reset method	Install the ink cartridge. (2nd ink cartridge set SW: ON)
Error point	Error conditions
579	2nd ink cartridge set SW OFF.(This is displayed only when the test-mode No.599="0")
Error type	D19 [Incorrect 2nd ink cartridge]
Panel display	D19-*** Wrong-Type Ink Cartridge Installed in Print Drum 2
Reset method	Replace with the correct ink cartridge.
Error point	Error conditions
582	Ink cartridge value detected by the sensor dose not match the set value. (This is displayed only when the test-mode No.599="0")
Error type	D20 [2nd Master disposal box not set]
Panel display	D20-*** Set Master Disposal Box 2 in Place
Reset method	Set 2nd master disposal box. (2nd master disposal box safety SW: ON)
Error point	Error conditions
346	Master disposal box safety SW was OFF in standby mode.
347	Master disposal box safety SW was OFF during operations.
Error type	D22 [D to P 1st print drum removal indication]
Panel display	D22-*** Pull Out Print Drum 1
Reset method	Pull out 1st print drum. (1st print drum set sensor OFF, 1st print drum connection signal OFF)
Error point	Error conditions
585	The user must remove 1st print drum.
Error type	D23 [D to P 2nd print drum removal indication]
Panel display	D23-*** Pull Out Print Drum 2
Reset method	Pull out 2nd print drum. (2nd print drum set sensor OFF; 2nd print drum connection signal OFF)
Error point	Error conditions
585	The user must remove 2nd print drum.
Error type	D24 [1st print drum status error]
Panel display	D24-*** !! Print Drum 1 is Not in Correct Position !! Check the Position of Print Drum 1
Reset method	Pull out 1st print drum. (1st print drum set sensor OFF; 1st print drum connection signal OFF)
Error point	Error conditions
586	The inserted print drum was unlocked during idling.
587	Print drum inserted with position B lock released.(Drum lock position sensor was OFF)
615	Horizontal centering sensor dose not go ON within 10s when connecting the drive.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	D25 [2nd print drum status error]
Panel display	D25-*** !! Print Drum 2 is Not in Correct Position !! Check the Position of Print Drum 2
Reset method	Pull out 2nd print drum. (2nd print drum set sensor OFF; 2nd print drum connection signal OFF)
Error point	Error conditions
586	The inserted print drum was unlocked during idling.
587	Print drum inserted with position B lock released.(Drum lock position sensor was OFF)
615	Horizontal centering sensor dose not go ON within 10s when connecting the drive.
Error type	D26 [1st print drum not set]
Panel display	D26-*** Set Print Drum 1 in Place
Reset method	1st print drum detection. (1st print drum set sensor, 1st print drum connection signal, and 1st print drum lock position sensor all ON)
Error point	Error conditions
573	The print drum specified by the print menu is not set.
Error type	D27 [2nd print drum not set]
Panel display	D27-*** Set Print Drum 2 in Place
Reset method	2nd print drum set sensor detects 2nd print drum. (2nd print drum set sensor, 2nd print drum connection signal, and 1st print drum lock position sensor all ON)
Error point	Error conditions
573	The print drum specified by the print menu is not set.
Error type	D28 [D to P 1st print drum not set]
Panel display	D28-*** Set Print Drum 1 in Place
Reset method	After the 1st print drum is detected, press the "Cancel" button to switch to the Job delete screen.
Error point	Error conditions
573	The print drum specified by the D to P is not set.
Error type	D29 [D to P 2nd print drum not set]
Panel display	D29-*** Set Print Drum 2 in Place
Reset method	After the 2nd print drum is detected, press the "Cancel" button to switch to the Job delete screen.
Error point	Error conditions
573	The print drum specified by the D to P is not set.
Error type	D30 [Paper feed tray not set]
Panel display	D30-*** Set Standard Feed Tray in Place
Reset method	Switch the paper feed tray set sensor ON. (Set)
Error point	Error conditions
489	Paper feed tray set sensor was OFF.

**Warnings (requiring service calls)**

Error type	E01 [Replace ROSE battery]
Panel display	!!Battery Replacement!! Call Service
Reset method	Press the "Close" button, the "Stop" key, or the "Reset" key.
Error point	Error conditions
039	Battery detection signal was OFF after power was switched on, reset, or after operation. (The voltage of battery goes down under 2.5V)
Error type	E02 [Maintenance call]
Panel display	!!Maintenance!! Call Service
Reset method	Press the "Close" button, the "Stop" key, or the "Reset" key.
Error point	Error conditions
042	Displays when machine power ON or All-Reset is pressed after master making quantity reached set quantity by test mode.
043	Displays when machine power ON or All-Reset is pressed after printing quantity reached set quantity by test mode.
044	Displays when machine power ON or All-Reset is pressed after print drum No.1 maintenance counter reaches set number by test mode.
045	Displays when machine power ON or All-Reset is pressed after print drum No.2 maintenance counter reaches set number by test mode.
Error type	E03 [Replace MCTL PCB battery]
Panel display	!!Battery Replacement!! Call Service
Reset method	Press the "Close" button, the "Stop" key, or the "Reset" key.
Error point	Error conditions
047	Battery detection signal was OFF after power was switched on. (The voltage of battery goes down under 2.5V)

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

#### Warnings (Miscellaneous)

Error type	F01 [No master on 1st print drum]
Panel display	No Master on Print Drum Make a New Master
Reset method	Switch to master making mode to clear.
Error point	Error conditions
050	No master on the print drum at the start of printing
Error type	F02 [Master image larger than paper size]
Panel display	Page Format is Larger than Paper Size !! Possible Ink Smudges on Prints !! (Continue->START Key)
Reset method	Press the Start key to start. (Print mode).
Error point	Error conditions
053	The paper size did not match the size of the master on the print drum at the start of printing.
Error type	F03 [Multi up: paper size error]
Panel display	Multi-Up on Irregular-Size Paper? !! Possible Image Cutting !! Continue->START Key / Cancel->STOP Key
Reset method	Continue printing with standard paper.
Error point	Error conditions
056	Tried to use multi up mode on non-standard paper.
Error type	F04 [Original not set]
Panel display	Place Another Original and Press Start Key To Cancel, Press Stop Key
Reset method	Press the Start key to clear.
Error point	Error conditions
059	
Error type	F05 [Print quantity under "minimum print quantity"]
Panel display	Enter Print Quantity Over [nn], Programmed Minimum Value
Reset method	Set the print quantity over the minimum print quantity setting.
Error point	Error conditions
062	Print quantity was not set above the minimum print quantity setting in master making mode.
Error type	F06 [P to P 1st print drum removal request]
Panel display	Press Print Drum 1 Release Key and Pull Out Print Drum 1
Reset method	Pull out 1st print drum using the 1st print drum removal key. Press the Cancel button to switch to the print menu.
Error point	Error conditions
585	The user must remove 1st print drum.
Error type	F10 [Master image larger than paper size: 2]
Panel display	Page Format is Larger than Paper Size !! Possible Ink Smudges on Prints !! (Continue->TEST Key)
Reset method	Press the stop, reset, or test keys.
Error point	Error conditions
068	Paper size did not match the size of the master on the print drum at the start of test printing.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	F14 [No paper]
Panel display	Add Paper
Reset method	Set paper in the paper feed tray.
Error point	Error conditions
491	Paper detection sensor was OFF (in idle mode).
Error type	F23 [Communication error: D to P]
Panel display	Communication Error Check Communication Devices and Cables
Reset method	Jam reset
Error point	Error conditions
013	Communication error in remote-mode.(D to P mode)
Error type	F25 [Incorrect image resolution]
Panel display	!! The Image Resolution of the Current Data has Just been Converted !! (Continue->START Key)
Reset method	Press the Start key to start.
Error point	Error conditions
077	Resolution data transmitted via CI was not 600 dpi.
Error type	F27 [No master on 2nd print drum]
Panel display	No Master on Print Drum Make a New Master
Reset method	Switch to master making mode to clear.
Error point	Error conditions
050	No master on the print drum at the start of printing.
Error type	F28 [P to P 2nd print drum removal request]
Panel display	Press Print Drum 2 Release Key and Pull Out Print Drum 2
Reset method	Pull out 2nd print drum using the 2nd print drum removal key. Press the Cancel button to switch to the print menu.
Error point	Error conditions
588	The user must remove 2nd drum.

## CHAPTER 16. PANEL MESSAGES

### DETAILED LIST OF PANEL MESSAGES

Error type	F30 [Multiple paper feed]
Panel display	!! Possible Multiple Paper Feed !! Check Printed Copies
Reset method	Jam reset. (Check prints.)
Error point	Error conditions
493	Insufficient light when no paper is present
494	Excessive light when no paper is present
495	Insufficient light when paper is present
496	Excessive light when paper is present
497	Multiple paper feed detection
498	Incorrect length
499	Cannot detect
Error type	F32 [Data storage area full]
Panel display	!! The Data Storage Area has Become Full !! Clear Old Storage Data to Store Current Data
Reset method	Clear the data to reset.
Error point	Error conditions
033	No space available
Error type	F35 [D to P 1st print drum removal request]
Panel display	Press Print Drum 1 Release Key and Pull Out Print Drum 1
Reset method	Pull out 1st print drum using the 1st print drum removal key. Press the Cancel button to switch to the print menu.
Error point	Error conditions
585	In D to P mode, with two print drums in the machine, master-making or printing job was made only for the 2nd print drum.
Error type	F36 [D to P 2nd print drum removal request]
Panel display	Press Print Drum 2 Release Key and Pull Out Print Drum 2
Reset method	Pull out 2nd print drum using the 2nd print drum removal key. Press the Cancel button to switch to the print menu.
Error point	Error conditions
585	In D to P mode, with two print drums in the machine, master-making or printing job was made only for the 1st print drum.
Error type	F43 [D to P Master image larger than paper size]
Panel display	The image size and paper size does not match. Check the paper size. Press START key to continue.
Reset method	Press START key for image cut to the paper size (If paper is changed to image size, full image is made). Press Cancel key or All Reset key to cancel master making or printing.
Error point	Error conditions
017	In D to P mode, image larger than the paper size was selected.

**Paper jam errors (G codes)**

Paper jams (including AF original feed errors) are assigned [A\*\*] internal errors, but these are displayed on the panel in the form [G\*\*\*] because [A\*\*] errors are included in [G\*\*\*]. The five jam errors involved are listed below.

Press the “\*” key to display detailed error codes.

Error type	G001
Panel display	G001 Master Mis-Feed Rewind Master Roll and Reset Master in Place
Error type	G002
Panel display	G002 Paper Jam Check Indicated Areas and Press [OK] button.
Error type	G004
Panel display	G004 Paper Jam Pull Out Print Drum X, Remove Paper in Indicated Areas and Press [OK] (DrumX is Drum1 or Drum2 or Drum1&2)
Error type	G008
Panel display	G008 Paper Jam Pull Out Print DrumX, Remove Paper in Indicated Areas and Press [OK] (DrumX is Drum1 or Drum2 or Drum1&2)
Error type	G016
Panel display	G016 Paper Jam Pull Out Print DrumX, Remove Paper in Indicated Areas and Press [OK] (DrumX is Drum1 or Drum2 or Drum1&2)

## CHAPTER 16. PANEL MESSAGES

### ERRORS REQUIRING SPECIAL ACTION

#### 4. Errors Requiring Special Action

The errors listed below are not cleared even when the power is switched off.

These error codes are displayed again when the power is switched on.

Error type	Error details
T01	Main motor lock
T03	Clamp motor lock
T05	1st print positioning pulse motor lock
T06	1st horizontal pulse motor lock
T18	Main pulse motor lock
T27	Master making shifting motor lock
T28	2nd clamp slide motor lock
T30	2nd print positioning pulse motor lock
T31	2nd horizontal pulse motor lock
T38	1st clamp opening and closing motor lock
T45	2nd clamp opening and closing motor lock
T48	1st inner pressure error (when the print drive is engaged)
T49	2nd inner pressure error (when the print drive is engaged)
A01	Master feed error
A02	1st master loading error
A03	1st print drum cutting error
A04	1st master disposal error
A07	Paper feed error
A08	Paper jam on print drum
A09	Paper ejection error
A10	AF original feed error
A16	Awaiting master removal
A18	1st print drum unlocked
A19	2nd master loading error
A20	2nd master disposal error
A23	2nd print drum unlocked
A25	Paper feed OUT error
A29	1st print drum clamp plate status error
A30	2nd print drum clamp plate status error
A31	1st print drum reset
A32	2nd print drum reset
A33	2nd print drum cutting error
B01	Keycard counter
C01	Replace 1st ink cartridge
C02	Replace master roll
C03	1st master disposal box full
C04	No paper during FP
C05	Replace 2nd ink cartridge
C06	2nd master disposal box full

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# CHAPTER 17: TEST MODE

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## 1. Procedures

### 1) Start-up Procedure

Switch on power while simultaneously pressing the “←” and “→” print positioning keys on the panel. This initiates test mode in standby mode.

### 2) Operating Procedure

Test mode numbers can be entered (selected) via “Key entry” or “Menu selection.”

#### a) Key entry procedure

- (1) In standby mode, enter the number of the test mode to be run using the numeric keys. If you make a mistake during entry, you can perform entry once again by pressing the “C” key.
- (2) Press the “Start” key to initiate Test mode operations.
- (3) Press the “Stop” or “Start” key to end Test mode and return to standby or operation standby modes.

\* After setting data, press the “Start” key to confirm the modified data and return to standby mode. Press the “Stop” key to cancel settings before returning to standby mode.

#### b) Menu selection method

- (1) While in standby mode, select the unit containing the test item to be run from the Test mode menu.
  - Press the unit name on the LCD screen. (Unit name is highlighted.)
  - The Test mode sub-menu appears.
- (2) Select the test item to be run from the Test mode sub-menu.
  - Press the test item on the LCD screen. (Test item is highlighted.)
- (3) Press the “Start” key to initiate Test mode operations.
- (4) Press the “Stop” or “Start” key to end the Test mode operation and return to standby mode or operation standby mode.

\* After setting data, press the “Start” key to confirm the modified data and return to standby mode. Press the “Stop” key to cancel the settings before returning to standby mode.

### 3) Ending procedure

To exit the Test mode, press the “Reset” key for at least 1 second during test mode standby mode or test mode operation standby mode.

## **2. Individual Test Procedures**

### **1) Checking sensors and switches**

Indicates the sensor and switch status with audible beeps.

- Detected: Buzzer sounds at 0.1 second intervals (short beeps).
- Not detected: Buzzer sounds at 0.5 second intervals (long beeps).

### **2) Checking motors and solenoids**

Switch on by pressing the "Start" key, then press the "Start" or "Stop" key to switch off.

\* Error checking is not performed during the operation. Note that moving parts may lock if at their limit positions.

### **3) Checking unit operations**

- (1) Switch on by pressing the "Start" key, then initiate unit operation. Error checking is performed in basically the same way as for normal operation. Some operations will halt when the sequence is complete, while other operations will continue until you press a key ("Stop" or "Start").
- (2) A continuous audible tone is emitted to indicate an error. To cancel errors, press the "Reset" key.

### **4) Data check**

Press the "Start" key to display data.

\* Data check only displays the various settings. These settings cannot be changed here.

### **5) Data setting**

- (1) Press the "Start" key to display and change the data currently set.
- (2) Change data using the numeric keys. Use the "\*" key to change the "±" display.
- (3) Once settings have been changed, press the "Start" key to confirm the data and return to standby mode. Press the "Stop" key to cancel the settings and return to standby mode.

\* The settings will be set to their default values if values beyond the specified setting ranges are entered. The settings are also set to their default values if values are entered in units other than the units specified.

## CHAPTER 17. TEST MODE

### SYSTEM/CNTRL PANEL TEST MODE

#### 3. System/CNTRL Panel Test Mode

No.	Sensors, switches	Detection status
001	Wakeup Key	Key pressed
No.	Motors, solenoids	Remarks
030	Beep Sound Check 1	0.1 second intervals
031	Beep Sound Check 2	0.5 second intervals
032	Wakeup LED ON	Illuminates
No.	Unit check	1/2 Switch
050	Test Print A Creates a master for test pattern 1.	<input type="radio"/>
051	Test Print B (Check) Creates a master for test pattern 2 (check).	<input type="radio"/>
052	Test Print C (Dot1) Creates a master for test pattern 3 (dot 1).	<input type="radio"/>
053	Test Print D (Dot2) Creates a master for test pattern 4 (dot 2).	<input type="radio"/>
054	Test Print E (Dot1 + Check) Creates a master for test pattern 5 (dot 1 + check).	<input type="radio"/>
055	Test Print F (Dot2 + Check) Creates a master for test pattern 6 (dot 2 + check).	<input type="radio"/>
056	Paper Feed Test (Cycle) Prints continuously. * The "Speed" key is on. * At least one print drum must be inserted.	
057	Low-speed Printing Prints continuously at 15 rpm. * At least one print drum must be inserted.	
058	Stepped Printing Operation Prints at 15 rpm only while the "Test print" key is pressed. Printing stops as soon as the key is released, resuming if the key is pressed once again. When the "Stop" key is pressed, one more copy is printed before printing halts. * At least one print drum must be inserted.	
059	Auto Power-OFF Signal Output Outputs the power-off signal.	
060	Panel Key Test Displays the panel key numbers on the 7-segment LED.	
061	Panel LCD Test Switches the LCD on and off.	
062	Panel LED Test Flashes all the panel LEDs.	
063	Unit Initialization Resets the mechanical sections to their home positions. (TPH pressure release, pinch pressure release, print drum lock, clamp resetting, master disposal unit)	
064	System Configuration Data Output Creates a master for the CI system data on the print drum specified.	<input type="radio"/>
065	LCD Base Point Compensation Perform the following adjustments in the order given. 1) Touch two diagonally opposite + markings (top left & bottom right) on the panel. 2) Touch three diagonally positioned + markings (top left, center, and bottom right). 3) Confirm that square marks are all made right on the three diagonally positioned + markings.	

No.	Data check	Display details
070	System Parameter Adjust Record	Lists Test mode No. and setting for non-default items during data setting.
071	SW Action Record	Displays error code (D**-***) for set switch that caused operation to stop. (Most recent 8 items)
072	Error Record	Lists error codes for errors occurring recently in normal mode. (Most recent 8 codes)
073	Maintenance Count	Displays all maintenance counter values. (Master, printing, drum 1, drum 2)
074	Current Battery Voltage	Displays current battery capacity for ROSE and MCTL as AD value and voltage. AD value: 0 to 255 (full at 255) Voltage: 0 to 3.3 V (displays x10 values)
078	Optional Configuration Check	Displays optional peripherals/devices currently connected. Displays the version number if the device contains ROM.
No.	Data settings	1/2 Switch
080	Clear Error Status Data	
	Description	Forcibly clears the jam. This test mode can also be used to clear error data for items for which T errors can otherwise be cleared only by Technicians. Consumable errors cannot be cleared. This is the same mode with power ON pressing reset key.
	Setting	None
081	Clear User Memory	
	Description	Resets test mode data settings and settings other than those for machine codes, drum codes, and ink codes (user settings, administrator settings) to default values. <b>* Always save data before resetting.</b>
	Setting	None
082	Clear Test Mode Data Setup	
	Description	Resets all settings set in normal test modes to default values. <b>* Cannot be selected from menu screen of the test mode.</b> <b>* Always save data before resetting.</b>
	Setting	None
083	Maintenance-Master Count Entry	
	Description	Sets the number of masters at which the maintenance call message is displayed.
	Setting	Range: 0 to 9999 (*100) Units: 1 (*100) Default: 0
084	Maintenance-Copy Count Entry	
	Description	Sets the number of main unit prints at which the maintenance call message is displayed.
	Setting	Range: 0 to 9999 (*1000) Units: 1 (*1000) Default: 0
085	Maintenance-Drum Meter Entry	
	Description	Sets the number of print-drum prints at which the maintenance call message is displayed for the drum currently installed. (Set for each print drum.)
	Setting	Range: 0 to 9999 (*1000) Units: 1 (*1000) Default: 0

## CHAPTER 17. TEST MODE

### SYSTEM/CNTRL PANEL TEST MODE

No.	Data settings		1/2 Switch
087	Maintenance-Master Count Clear		
	Description	Clears the maintenance master count to display the maintenance call message.	
	Setting	None	
088	Maintenance-Copy Count Clear		
	Description	Clears the maintenance print count to display the maintenance call message.	
	Setting	None	
089	Maintenance-Drum Meter Clear		O
	Description	Clears the maintenance print-drum print count to display the maintenance call message.	
	Setting	None	
090	Print Quantity Display Recovery		
	Description	Setting of print quantity display after previous printing finish, display [0] or [previous print quantity].	
	Setting	Range: 0 (Recovery) 1 (Not recovery) Default: 1 (Not recovery)	
091	Printing Position Adjust Control		
	Description	Enables/Disables the printing position adjustment when printing is running.	
	Setting	Range: 0 (Disabled) 1 (Enabled) Default: 1 (Enabled)	
094	Min. Print Quantity Control		
	Description	Enables/Disables the minimum print number option in the administrator settings.	
	Setting	Range: 0 (Disabled) 1 (Enabled) Default: 1 (Enabled)	
095	Counter Action Control		
	Description	Enables/Disables copy counters (solenoid counter, software counter). Setting returns to default value when power is switched off.	
	Setting	Range: 0 (Disabled) ⇨ Does not increment 1 (Enabled) ⇨ Increments Default: 1 (Enabled)	
097	Constant Print Position Recovery		
	Description	The printing position goes center before master making. In the case of renew pages only/all times of master making; the printing position goes back to the previous position after master making.	
	Setting	Range: 0 (renew pages only) 1 (all times) Default: 0 (renew pages only)	
098	Counter Action Control 2		
	Description	Enables/Disables counters (solenoid counter, software counter). This setting is stored even when power is switched off.	
	Setting	Range: 0 (Disabled) ⇨ Does not increment 1 (Enabled) ⇨ Increments Default: 1 (Enabled) <b>* Cannot be selected from menu screen of the test mode.</b> <b>* Can be set if No. 960 has been previously entered.</b> <b>* Enter the number and press the "Start" key to select 0/1.</b>	
099	Warning errors display		
	Description	Display or not display the following warning errors. (F02, F10, F43)	
	Setting	Range: 0 (not display) 1 (display) Default: 1 (display)	

## 4. Process/Scanning Test Mode

No.	Sensors, switches	Detection status
100	Image Scanner AF Shading Sensor	Carriage at home position
101	Flat Bed Original Det. Sensor	Open (original present)
110	Stage Cover Sensor	Original cover is open
No.	Motors, solenoids	Remarks
130	Image Scanner Lamps ON	Original scanning light source
131	FB Backlight	Original alignment light source
No.	Unit check	
150	Shading Operation Runs the shading operation.	
151	Scanner Home Action Returns the scanner to the home position.	
152	Scanner Cycle Action Performs one scanner operation cycle. (A3 scanning) * Adjusts the speed according to the reproduction size in Test mode No. 187.	
153	Scanner AF Action Moves the scanner to the AF scanning position.	
154	Scanner Lock Action Moves the scanner to the lock position for transporting. * Set the machine to display the error T23.	
155	Scanner Release Action Cancels the error status set in Test mode No. 154.	
No.	Data check	Display details
No.	Data settings	
180	FB Horizontal Scan Position Adjust	
	Description	Adjusts the original horizontal scan position on the flat bed.
	Setting	Range: -30 to +30 (-3.0 mm to +3.0 mm) relative to datum * (+ is to rear) Units: 5 (0.5 mm) Default: 0 mm
	181 FB Scan Start Position Adjust	
	Description	Adjusts the original scanning start position on the flat bed.
	Setting	Range: -60 to +60 (-6.0 mm to +6.0 mm) relative to datum * (+ is downward) Units: 1 (0.1 mm) Default: 0 mm
182 FB Scanning Speed Adjustment		
	Description	Adjusts the original scanning speed on the flat bed.
	Setting	Range: -100 to +100 (-10.0% to +10.0%) relative to datum * (+ shrinks) Units: 1 (0.1%) Default: 0%
183 Line-copy Slice Level Adjustment		
	Description	Sets the slice level for text mode. Larger values for lighter print.
	Setting	Range: -16 to +16 Units: 1 Default: 2

## CHAPTER 17. TEST MODE

### PROCESS/SCANNING TEST MODE

No.	Data settings	
184	Base Tone Slice Level Adjustment	
	Description	Sets the slice level for ABC (auto base control) text mode. Larger values for lighter print.
	Setting	Range: -16 to +16 Units: 1 Default: -1
185	Stray White Dot Erasure	
	Description	Image processing function compensates if stray white dots of specified size exist.
	Setting	Range: 0 (OFF) 1 (Erase 1*1 dots) 2 (Erase 2*2 dots) 3 (Erase 3*3 dots) Default: 3
186	Stray Black Dot Erasure	
	Description	Image processing function compensates if stray black dots of specified size exist.
	Setting	Range: 0 (OFF) 1 (Erase 1*1 dots) 2 (Erase 2*2 dots) 3 (Erase 3*3 dots) Default: 3
187	Cycle Test Scanning Speed Adjust	
	Description	Sets the scanning speed (reproduction size) for one scanner cycle in Test mode No. 152.
	Setting	Range: 50 to 200 (50% to 200%) Units: 1 (1%) Default: 100%
188	Line Edge Stress Level Adjust	
	Description	
	Setting	Range: 0 to 15 Units: 1 Default: 8

No.	Data settings		
189	Halftone Curve Selection (Photo)		
	Description	Selects the matrix forming the halftone curve base for photo mode.	
	Setting	Range: 0 to 8 Units: 1 Default: 4	
190	Halftone Curve Selection (Dot)		
	Description	Selects the matrix forming the halftone curve base for dot mode.	
	Setting	Range: 0 to 8 Units: 1 Default: 4	
191	Halftone Curve Selection (Duo)		
	Description	Selects the matrix forming the halftone curve base for Duo mode.	
	Setting	Range: 0 to 8 Units: 1 Default: 4	
192	Halftone Curve Selection (DtDuo)		
	Description	Selects the matrix forming the halftone curve base for DtDuo mode.	
	Setting	Range: 0 to 8 Units: 1 Default: 4	
193	Trimming Slice Level Adjustment		
	Description	Sets the slice level for trimming. Larger values for lighter print.	
	Setting	Range: -16 to +16 Units: 1 Default: -2	
199	Multi-Up Activation Default Selection		
	Description	Selects if the Multi-up stays active or become inactive after one Multi-up operation.	
	Setting	Range: 0 (change to inactive) Units: 1 (stays active) Default: 1 (stays active)	

## CHAPTER 17. TEST MODE

### MASTER MAKING TEST MODE

#### 5. Master Making Test Mode

No.	Sensors, switches	Detection status	
200	Master Positioning Sensor	Open (master present)	
201	Master End Sensor	Blocked (master end label detected)	
202	Master Detection Sensor	Open (master present)	
203	Cutter Home Position Switch	Switch OFF (cutter at HP)	
204	TPH Pressure Switch	Blocked (detection plate present)	
205	Master Making Unit Switch	Blocked (master-making unit/cover set)	
206	Flat Bed Set Switch	Switch ON (flat bed set) This test mode enables when the disposal box safety SW 1/2 are ON.	
207	Master Volume Det. Sensor	Blocked (master present)	
209	Master Making Unit Position Sensor 1	Blocked (detection plate present)	
210	Master Making Unit Position Sensor 2	Blocked (detection plate present)	
211	Master Cutter Switch	Switch on	
No.	Motors, solenoids	Remarks	1/2 Switch
230	Thermal Pressure Motor (CW)		
231	Thermal Pressure Motor (CCW)		
232	Write Pulse Motor CW (feed)		
233	Write Pulse Motor CCW (reverse)		
238	Thermal Power Control		
239	Loading Fan		O
240	Loading Motor CW (Feed)		
241	Loading Motor CCW (Reverse)		
No.	Unit check		
250	Cutter Motor Cycle Action Performs cutting (1 cycle).		
251	Thermal Press. Motor Action (+) Moves the TPH in the compress direction.		
252	Thermal Press. Motor Action (-) Moves the TPH in the release direction.		
254	Master Making Unit Action (Position 1) Moves the master-making unit to the master-making unit position 1 sensor.		
255	Master Making Unit Action (Position 2) Moves the master-making unit to the master-making unit position 2 sensor.		
No.	Data check	Display details	
270	TPH Thermistor A/D Data	Displays the AD values for the TPH thermistor.	
271	TPH Thermistor Temperature Data	Displays the TPH thermistor AD values as temperature values.	
272	Write Roller Temp. A/D Data	Displays the AD values for the write roller ambient temperature.	
273	Write Roller Temp. Scale Data	Displays the AD values as temperature values for the write roller ambient temperature.	
274	TPH Power Voltage	Displays the voltage applied to the TPH when the TPH is switched on. * Displayed as voltage x 100.	

No.	Data settings		1/2 Switch
281	Write Start Position Adjustment		O
	Description	Adjusts the master-making start position (distance from master positioning sensor ON to read/write signal ON).	
	Setting	Range: -300 to +500 (-3.0 mm to +5.0 mm) * (+ is downward) Units: 1 (0.01 mm) Default: 0 mm	
282	Master-Making Length Adjustment		O
	Description	Adjusts the master-making area (adjusts master making signal ON time).	
	Setting	Range: -100 to +100 (-10.0 mm to +10.0 mm) * (+ increases length) Units: 1 (0.1 mm) Default: 0 mm	
283	Master Clamp Range Adjustment		O
	Description	Adjusts the master clamp range when loading the master (distance from master positioning sensor).	
	Setting	Range: -1000 to +1000 (-10.0 mm to +10.0 mm) * (+ increases clamp range) Units: 1 (0.01 mm) Default: 0 mm	
284	Master Cut Position Adjustment		O
	Description	Adjusts the length of one master (rear clamp amount).	
	Setting	Range: -1000 to +500 (-10.00 mm to +5.00 mm) * (+ increases master length) Units: 1 (0.01 mm) Default: -800 (-8.00 mm)	
285	Master Image Front Margin Adjust		
	Description	Adjusts the master margin (mask amount in image processing) at the right (front) of the copy.	
	Setting	Range: -40 to +40 (-4.0 mm to +4.0 mm) * (+ increases margin) Units: 1 (0.1 mm) Default: 0 mm	
286	Master Image Rear Margin Adjust		
	Description	Adjusts the master margin (mask amount in image processing) at the left (rear) of the copy.	
	Setting	Range: -40 to +40 (-4.0 mm to +4.0 mm) * (+ increases margin) Units: 1 (0.1 mm) Default: 0 mm	
287	Master-Making Speed Adjustment ( <b>New Master Making Unit Only</b> )		O
	Description	Adjusts image elongation and shrinkage during master making by varying the speed of the write pulse motor.	
	Setting	Range: -100 to +100 * (+ shrinks) Units: 1 (0.125 mm) Default: 0 mm	
288	TPH Resistance Value Entry		
	Description	Sets the TPH resistance value.	
	Setting	Range: 1200 to 5300 (1200 $\Omega$ to 5300 $\Omega$ ) Units: 1 (1 $\Omega$ ) Default: 1200 $\Omega$	

## CHAPTER 17. TEST MODE

### MASTER MAKING TEST MODE

No.	Data settings		1/2 Switch
289	W-Roller Diameter Correction		
	Description	Corrects variations in write roller diameter.	
	Setting	Range: 2345 to 2355 (23.45 mm to 23.55 mm) Units: 1 (0.01 mm) Default: 2350 (23.50 mm)	
290	W-Roller Temp. Reference Control		
	Description	Enables/disables automatic image size adjustment for image elongation and shrinkage caused by expansion and contraction of the write roller due to temperature variations.	
	Setting	Range: 0 (Disabled) 1 (Enabled) Default: 1 (Enabled)	
291	Loading Motor Rotation Stop Delay For Master Loading		
	Description	Adjusts the time delay from the stop of the write pulse motor to the stop of the loading motor when the master is loaded to the top clamp of the print drum.	
	Setting	Range: 0 to 2000 (0 ms to 2000 ms) Units: 10 (10 ms) Default: 0 ms	
292	Main Pulse Motor Speed For Master Making <b>(Old Master Making Unit Only)</b>		O
	Description	Adjusts image elongation by varying the main pulse motor speed.	
	Setting	Range: 750 to 850 (750 pps to 850 pps) Units: 1 (1 pps) Default: 795 pps	
293	Loading Motor Overcurrent Detect		
	Description	Enables/Disables the loading motor over current detection.	
	Setting	Range: 0 (Disabled) Units: 1 (Enabled) Default: 1 (Enabled)	
294	TPH Horizontal Write Position Adjust		O
	Description	Adjusts the horizontal printing position of the TPH (main scanning direction).	
	Setting	Range: -30 to +30 (-3.0 mm to +3.0 mm) relative to datum * (+ moves to rear) Units: 1 (0.1 mm) Default: 0 mm	
295	Master Making Center Position Check		
	Description	Prevents printing of TPH second block. (Center of the main scanning direction can be checked.)	
	Setting	Range: 0 (prints all) Units: 1 (does not print 2nd block) Default: 0	

No.	Data settings		1/2 Switch
296	Loading Motor Start Point Adj		
	Description	Adjustment of the loading motor reverse rotation start timing in relation to the print drum angle. (Top clamp position-A standard angle).  If the adjustment is set to +30 degrees, and if test mode No.297 is set to 25 degrees, the print drum angle for the loading motor start and stop angles becomes equal. In that case, the loading motor will not rotate.	
	Setting	Range: -31 to +30 (-31 degree to +30 degree) Units: 1 (1 degree) Default: 0 (0 degree)	
297	Loading Motor Finish Point Adj		
	Description	Adjustment of the loading motor reverse rotation stop timing in relation to the print drum angle. (Top clamp position-A standard angle).	
	Setting	Range: -28 to +30 (-28 degree to +30 degree) Units: 1 (1 degree) Default: 0 (0 degree)	
298	Loading Motor Action Control		
	Description	Activating or deactivating the loading motor start and stop movement as set by test modes No.296 and 297.	
	Setting	Range: 0 (Inactive) Units: 1 (Active) Default: 1 (Active)	
299	Image Size Control Shift Switch (after software version 2.00)		
	Description	Selection of whether new master making unit or old master making unit.	
	Setting	Range: 0 (old master making unit) Units: 1 (new master making unit) Default: 1 (new master making unit)	

## CHAPTER 17. TEST MODE

### MASTER DISPOSAL TEST MODE

#### 6. Master Disposal Test Mode

No.	Sensors, switches	Detection status	1/2 Switch
300	Master Disposal Jam Sensor	Open (master present)	O
301	Master Compression Sensor	Blocked (detection plate present)	O
303	Disposal Box Safety Switch	Switch ON (master disposal box set) This test mode enables when another disposal box safety SW is ON.	O
307	Master Compression Upper Limit Sensor	Blocked (detection plate present)	O
308	Master Disposal Plate Upper Limit Sensor	Blocked (detection plate present)	O
309	Master Disposal Plate HP Sensor	Blocked (detection plate present)	O
310	Mstr Disposal Motor Limit Sensor	Blocked (master disposal unit closed)	O
311	Master Disposal Empty Detection Sensor	Open (no master)	O
No.	Motors, solenoids	Remarks	1/2 Switch
330	Master Disposal Motor		O
331	Master Disposal Fan		
No.	Unit check		1/2 Switch
350	Compression Plate Home Action	Returns the compression plate to the HP sensor position.	O
351	Master Compression Cycle Action	Performs one master compression cycle: Master compression HP sensor → Master compression upper limit sensor → Master compression HP sensor.	O
352	Master Compression Plate Compression Action	Moves master compression plate to master compression upper limit sensor.	O
353	Master Disposal Plate Home Action	Moves the master disposal plate to the master disposal plate HP sensor position.	O
354	Master Disposal Plate Cycle Action	Performs one master disposal cycle: Master disposal plate HP sensor → Master disposal plate upper limit sensor → Master disposal plate HP sensor.	O
355	Master Disposal Plate Compression Action	Moves the master disposal plate to the master disposal plate upper limit sensor position.	O
356	Master Disposal Unit Action	Performs normal master disposal compression action. (Combined operation of master compression plate and master disposal plate)	O
No.	Data check	Display details	1/2 Switch
371	Master Disposal Count Display	Displays the master disposal count stored.	O

No.	Data settings		1/2 Switch
388	Disposal Motor Speed Selection		
	Description	Selects the master disposal motor speed table.	
	Setting	Range: 0 to 2 Units: 1 Default: 0	
389	Clear Master Disposal Count		O
	Description	Clears the current count for removed masters.	
	Setting	None	
390	Disposal Motor Overcurrent Det.		O
	Description	Select whether to detect or not detect over current while the vertical transport motor is activating.	
	Setting	Range: 0 (No detection) 1 (Detection) Default: 1 (Detection)	
391	Master Top Release Repetition		O
	Description	Repeats the clamp open action to help easier master ejection off the print drum.	
	Setting	Range: 0 to 5 (0 to 5 times) Units: 1 (1 time) Default: 0 (No repetition)	
392	Disposal Plate Home Brake Action		O
	Description	To activate or deactivate the brake movement of the disposal plate to prevent over run.	
	Setting	Range: 0 (no Brake Action) 1 (Brake Action) Default: 0 (no Brake Action)	

## CHAPTER 17. TEST MODE

### PAPER FEED/EJECT TEST MODE

## 7. Paper Feed/Eject Test Mode

No.	Sensors, switches	Detection status
400	Paper Detection Sensor	Open (paper present)
401	Paper Size Detection Sensor	Open (paper present)
402	Elevator Upper Limit Sensor A	Blocked (detection plate present)
403	Elevator Upper Limit Sensor B	Blocked (detection plate present)
404	Elevator Lower Limit Sensor	Blocked (detection plate present)
405	Paper Feed Sensor	Blocked (paper feed tray ready for feeding)
406	Paper Ejection Sensor	Blocked (paper present)
407	Paper Feed Tray Upper Safety SW	Switch ON (pressed)
409	Feed Tray Button	Switch ON (pressed)
410	Paper Volume Det. Sensor A	Blocked (detection plate present)
411	Paper Volume Det. Sensor B	Blocked (detection plate present)
412	Paper Ejection Limit Sensor	Blocked (detection plate present)
414	Paper Feed Pressure Sensor-High	Blocked (detection plate present)
415	Paper Feed Pressure Sensor-Low	Open
416	Stripper Multiple Feed SW	Switch ON (pressed)
417	1st Paper Sensor	Blocked (paper present)
418	2nd Paper Sensor	Blocked (paper present)
419	F Pinch HP Sensor	Blocked (detection plate present)
420	R Pinch HP Sensor	Blocked (detection plate present)
421	Pinch Release Sensor	Blocked (detection plate present)
422	Paper Ejection Unit Safety SW	Switch ON (pressed) This test mode enables when the disposal box safety SW 1/2 and flat bed set SW are ON.
No.	Motors, solenoids	Remarks
430	Paper Ejection Motor	
433	Pinch Release Motor	
436	Paper Feed Clutch	
437	Timing Clutch	
No.	Unit check	
450	Paper Size VR Adjust (100 mm)	Sets VR value of 100 mm.
451	Paper Size VR Adjust (300 mm)	Sets VR value of 300 mm.
452	Elevator Motor Action	Raises and lowers the paper feed tray repeatedly. * Starts by raising, except when at the upper limit. * Stops when the "Stop" key is pressed. * Stops for 1 s at the upper and lower limits.
453	Elevator Motor Servo Action	Performs servo operation. * Upper limit stop position varies depending on the position of the pressure adjust lever.
457	Auto Multi-Paper Feed Det. Adj.	Start paper feed (low speed) → paper feed stops after feeding 20° at main FG after 2nd paper sensor activates → Sensor adjustment action → Paper feed is restarted, and paper is ejected. * Perform with A3 50 g paper loaded in the paper feed tray.
458	Pinch Home Action	Resets the pinch home position after releasing the pinch.
459	Pinch Position Movement	Moves to the specified width (including HP correction) after releasing the pinch.

No.		Unit check	
462	Pinch Roller Compression		
	Performs pinch roller compression.		
463	Pinch Roller Release		
	Performs pinch roller release.		
464	Second Paper Feeding Adjustment		
	Instead of feeding the paper manually into the grippers when adjusting the paper feed cam, this feeds the paper to the angle specified in Test mode No. 492, then pauses the paper feed. Press the Stop or Start key to restart the paper feed.		
No.		Data check	Display details
470	Paper Width A/D Data		Displays 10-bit data after A/D conversion.
471	Paper Width Metric Data		Displays paper width (mm) after adjustment.
472	Multi-Paper Feed Det. A/D Data		Multi-paper feed det. A/D values
No.		Data settings	
480	Elevator Upper Limit Selection		
	Description	Selects the paper feed tray stop position (paper feed position). If 0, stop position is linked to the pressure adjust lever. If 1 or 2, stop position is fixed.	
	Setting	Settings: 0: Linked to the pressure adjust lever; switches the upper limit position to upper limit sensor A or B. 1: Fixed at the upper limit sensor A position. 2: Fixed at the upper limit sensor B position. Default: 0	
481	Paper Feed Clutch ON Angle		
	Description	Adjusts the angle at which (i.e. timing) the paper feed clutch is activated.	
	Setting	Range: -150 to +150 (-15.0° to +15.0°) * (+ delays ON timing) Units: 1 (0.1°) Default: 0°	
482	Paper Feed Clutch OFF Angle/Std		
483	Paper Feed Clutch OFF Angle/Card		
	Description	Adjusts the angle at which (i.e. timing) the paper feed clutch is deactivated according to paper type setting.	
	Setting	Range: -150 to +150 (-15.0° to +15.0°) * (+ delays OFF timing) Units: 1 (0.1°) Default: 0°	
485	Ejection Motor Overcurrent Det.		
	Description	Detect or non-detect selection of the over current while the paper ejection motor activation.	
	Setting	Range: 0 (No detection) 1 (Detection) Default: 1 (Detection)	
486	Timing Clutch ON Angle Adjustment		
	Description	Adjusts the angle at which (i.e. timing) the timing clutch is activated.	
	Setting	Range: -150 to +150 (-15.0° to +15.0°) * (+ delays ON timing) Units: Units: 1 (0.1°) Default: Default: 0°	
487	Timing Clutch OFF Angle Adjustment		
	Description	Adjusts the angle at which (i.e. timing) the timing clutch is deactivated.	
	Setting	Range: -150 to +150 (-15.0° to +15.0°) * (+ delays OFF timing) Units: Units: 1 (0.1°) Default: Default: 0°	

## CHAPTER 17. TEST MODE

### PAPER FEED/EJECT TEST MODE

No.	Data settings	
489	Front Pinch Roller Position Adjustment	
	Description	Adjusts the front pinch roller position.
	Setting	Range: -100 to +100 (-10.0 mm to +10.0 mm) * (+ moves inside) Units: 5 (0.5 mm) Default: 0 mm
490	Rear Pinch Roller Position Adjustment	
	Description	Adjusts the rear pinch roller position.
	Setting	Range: -100 to +100 (-10.0 mm to +10.0 mm) * (+ moves inside) Units: 5 (0.5 mm) Default: 0 mm
491	Pinch Roller Movement Width Setting	
	Description	Sets the pinch roller movement width.
	Setting	Range: 0 to 340 (0 mm to 340 mm) Units: 1 (1 mm) Default: 0 mm * When 0 is entered, the pinch width is varied by the paper width potentiometer. * Values below 55 are treated as 0. (The pinch width is varied by the paper width potentiometer.)
492	Paper Feed Adjustment Angle	
	Description	Specifies the paper feed stop angle for Test mode No. 464 (second paper feed amount adjustment).
	Setting	Range: -200 to +200 (-20.0° to +20.0°) Units: 1 (0.1°) Default: 0°
493	Paper Ejection Roller Speed Adjustment 1	
	Description	Adjusts the paper ejection roller speed when the main motor speed is less than 35 rpm (inner pressure roller resetting and test mode low-speed printing).
	Setting	Range: 0 to 2000 Units: 1 Default: 1251
494	Paper Ejection Roller Speed Adjustment 2	
	Description	Adjusts the paper ejection roller speed when the main motor speed is 50 rpm (proof print).
	Setting	Range: 0 to 2000 Units: 1 Default: 1013
495	Paper Ejection Roller Speed Adjustment 3	
	Description	Adjusts the paper ejection roller speed when the main motor speed is 60 rpm (speed key 1 during printing).
	Setting	Range: 0 to 2000 Units: 1 Default: 1100
496	Paper Ejection Roller Speed Adjustment 4	
	Description	Adjusts the paper ejection roller speed when the main motor speed is 80 rpm (speed key 2 during printing).
	Setting	Range: 0 to 2000 Units: 1 Default: 977

No.	Data settings	
497	Paper Ejection Roller Speed Adjustment 5	
	Description	Adjusts the paper ejection roller speed when the main motor speed is 100 rpm (speed key 3 during printing).
	Setting	Range: 0 to 2000 Units: 1 Default: 915
498	Paper Ejection Roller Speed Adjustment 6	
	Description	Adjusts the paper ejection roller speed when the main motor speed is 110 rpm (speed key 4 during printing).
	Setting	Range: 0 to 2000 Units: 1 Default: 915
499	Paper Ejection Roller Speed Adjustment 7	
	Description	Adjusts the paper ejection roller speed when the main motor speed is 120 rpm (speed key 5 during printing).
	Setting	Range: 0 to 2000 Units: 1 Default: 915

## CHAPTER 17. TEST MODE

### PRINT DRUM TEST MODE

#### 8. Print Drum Test Mode

No.	Sensors, switches	Detection status	1/2 Switch
500	Position A Sensor	Blocked (detection plate present)	○
501	Position B lock Sensor	Blocked (detection plate present)	○
502	Main Motor Limit Sensor	Blocked (detection plate present)	
503	Position T Sensor	Blocked (detection plate present)	
504	Drive Release Sensor	Blocked (detection plate present)	○
505	Inner Pressure Detection Sensor	Open (inside press lowered)	○
506	Master Loading Sensor	Open (master present)	○
507	Print Drum Lock Position Sensor	Blocked (detection plate present)	○
508	Print Drum Lock Cam Sensor	Blocked (detection plate present)	○
509	Ink Sensor	In contact with ink	○
510	Overflow Sensor	In contact with ink	○
511	Ink Cartridge Set SW 1	Switch ON	○
512	Ink Cartridge Set SW 2	Switch ON	○
513	Ink Cartridge Set SW 3	Switch ON	○
514	Ink Cartridge Set SW 4	Switch ON	○
515	Ink Cartridge Set SW 5	Switch ON	○
516	Free Drum Rotation SW	Switch ON	
517	Front Door Safety Switch	Switch ON (front door closed) This test mode enables when the disposal box safety SW 1/2 and flat bed set SW and paper ejection unit safety SW are ON.	
518	Angular Safety Sensor	ON when magnet is detected	○
519	Print Drum Connection Signal	Drum connectors on drum and main unit are connected	○
520	Print Drum Set Sensor	Blocked (detection plate present)	○
521	Ink Volume Det. Sensor 1	ON when ink levels are below 10%	○
522	Ink Volume Det. Sensor 2	ON when ink levels are below 30%	○
523	Ink Volume Det. Sensor 3	ON when ink levels are below 50%	○
524	Clamp Plate Home Position Sensor	Blocked (detection plate present)	○
525	Clamp Plate Loading Position Sensor	Blocked (detection plate present)	○
526	Clamp Motor Home Position Sensor	Blocked (detection plate present)	○
527	Clamp Motor Return Position Sensor	Blocked (detection plate present)	○
528	0 Angular Sensor	ON when magnet is detected	○
529	180 Angular Sensor	ON when magnet is detected	○
No.	Motors, solenoids	Remarks	1/2 Switch
530	Main Motor Action (15 rpm)		
531	Main Motor Action (30 rpm)		
534	Print Drum Locking Motor		○
536	Main Pulse Motor (Forward)		
537	Main Pulse Motor (Reverse)		
538	Main Motor Clutch		

No.	Sensors, switches	1/2 Switch
550	Variable Main Motor Speed Use the speed keys to rotate the main motor.	
551	Print Drum On Position T == Spare (function not available) ==	
552	Print Drum On Position B Stops the print drum at position B.	O
553	Print Drum Drive Release Action Performs the drive release action using the left/right pulse motors.	O
554	Print Drum Drive Connection Action Performs the drive connection action using the left/right pulse motors.	O
555	Print Drum Locking Action Locks the print drum.	O
556	Print Drum Release Action Unlocks the print drum.	O
557	Inking Action Perform the following operations in sequence. Make confidential master beforehand. Rotate the main motor (30 rpm) and apply ink. Lower the inside press on the print drum after the ink sensor goes ON. Rotate the main motor at 60 rpm. The main motor stops after 100 rotations at position T * Both the ink sensor and overflow sensor are enabled. * The inking time is set during replacement.	O
558	Print Drum Ink Drainage Prints 250 sheets or until the STOP key is pressed at fixed printing speed of 5 and printing density of 3. No inking action and deactivation of ink sensor. Make sure to make master by test mode No.50 before activating test mode No.558	O
559	Master Top Clamp Positioning (Master top position A) Performs front position A positioning (With Master Top Position A Adjustment).	O
560	Master End Clamp Positioning (Master end position A) Performs rear position A positioning (With Master End Position A Adjustment).	O
561	Clamp Home Action Moves the clamp front/rear units to the home position.	O
562	Master Top Clamp Opening/Closing Action Moves clamp unit front → Opens clamp → Resets clamp HP → Moves clamp unit front → Closes clamp to master loading sensor → Closes clamp → Resets clamp HP	O
563	Master end Clamp Opening/Closing Action Moves clamp unit front → Opens clamp → Resets clamp HP → Moves clamp unit front → Closes clamp to open/close HP sensor → Closes clamp → Resets clamp HP	O
564	Inner Pressure Clutch ON/OFF Switches the inner pressure clutch ON for 1 second and then OFF again.	O
567	Standby Positioning Stops at the paper drum standby position (150° from position T)	

## CHAPTER 17. TEST MODE

### PRINT DRUM TEST MODE

No.	Data check	Display details	1/2 Switch
570	Main Motor Limit Count	Rotate the paper drum and detect the FG pulses between detections of T position sensor. Display the double count of that detected pulses. (6750 pulses / 1 rotation)	
571	Paper Drum Rotation Angle	== Spare (function not available) ==	
572	Print Drum Temperature A/D Data	Displays the ink thermistor A/D value.	O
573	Print Drum Temperature Scale	Displays the ink thermistor A/D value following conversion to °C value.	O
No.	Data settings		1/2 Switch
583	Inking Time (Regular)		O
	Description	Sets the period of no ink detection after which a no-ink alarm is displayed during normal operations. (This data is stored in the print drum EEPROM.)	
	Setting	Range: 1 to 60 (1 to 60 s) Units: 1 (1 s) Default: 20 s	
584	Inking Time (Replacement)		O
	Description	Sets the period of no ink detection after which a no-ink alarm is displayed after the ink cartridge is replaced. (This data is stored in the print drum EEPROM.)	
	Setting	Range: 1 to 60 (1 to 60 s) Units: 1 (1 s) Default: 40 s	

## CHAPTER 17. TEST MODE

### PRINT DRUM TEST MODE

No.	Data settings			1/2 Switch
587	Ink Color Code			O
	Description	Sets the ink color set in the inking drum. (This data is stored in the print drum EEPROM.)		
	Setting	33: Black 36: Blue 3 39: Red 2 42: Green 45: Yellow 48: Brown 2 51: Gray 54: Sepia 2 57: Gold 60: Silver 2 63: Custom Default: 33 (Black)	34: Blue 37: Blue 4 40: Red 3 43: Green 2 46: Yellow 2 49: Purple 52: Gray 2 55: Orange 58: Gold 2 61: Pink	35: Blue 2 38: Red 41: Red 4 44: Green 3 47: Brown 50: Purple 2 53: Sepia 56: Orange 2 59: Silver 62: Pink 2
588	Print Drum Code			O
	Description	Sets the print drum code. (size and color informations)		
	Setting	Range: 1 to 15 ( 3:black 4:color) Units: 1 Default: 3(black)		
589	Drum Release Angle Fine Adjust			O
	Description	Use this test mode if the print drum still does not engage after test mode No. 593 adjustment. This test mode is to be made for each print drum and the adjustment made is memorized in each print drum.		
	Setting	Range: -50 to 50 ( -5 to 5 degree) Units: 1(0.1 degree) Default: 0(0degree)		
593	Position B Adjustment (machine)			O
	Description	Position-B adjustment for print drum removal (adjustment of the paper drum stop angle from the position-T sensor detection) The standard print drum angle from the paper drum position-T is 113 degrees for drum No.1 and 203 degrees for drum No.2		
	Setting	Range: -65 to 55 ( -6.5 to 5.5 degree) Units: 1 (0.1 degree) Default: Drum No.1: 5 (0.5degree) Drum No.2: -15 (-1.5 degrees)		

## CHAPTER 17. TEST MODE

### PRINT DRUM TEST MODE

No.	Data settings		1/2 Switch
594	Position B Adjustment (Print drum)		O
	Description	Position-B adjustment for print drum removal (adjustment of the paper drum stop angle from the position-T sensor detection)  This adjustment should be made if the position B lock plate does not engage in print drum removal even though the print drum is at the removal position-B angle.	
	Setting	Range: -50 to 50 ( -5 to 5 degree) Units: 1(0.1 degree) Default: 0(0degree)	
595	Master Top Clamp Open Time Extension		O
	Description	Sets the motor rotation time adjustment timer for opening the master top clamp.  (To prevent master disposal errors, the rotation time is extended for the open/close motor opening the master top clamp during master disposal to increase the opening angle of the master projection plate.)	
	Setting	Range: 0 to 140 (0 ms to 140 ms) Units: 10 (10 ms) Default: 50 ms	
596	Master Top Clamp Close Time Extension		O
	Description	Sets the motor rotation time adjustment timer for closing the master top clamp.  (The rotation time is extended for the open/close motor closing the master top clamp during master loading to prevent lifting of the clamp plate.)	
	Setting	Range: 0 to 140 (0 ms to 140 ms) Units: 10 (10 ms) Default: 50 ms	
597	Master End Clamp Open Time Extension		O
	Description	Sets the motor rotation time adjustment timer for opening the rear clamp.  (The rotation time is extended for the open/close motor opening the master end clamp during master disposal to prevent damage to the master end and master top clamp plates.)	
	Setting	Range: 0 to 140 (0 ms to 140 ms) Units: 10 (10 ms) Default: 50 ms	
598	Master End Clamp Close Time Extension		O
	Description	Sets the motor rotation time adjustment timer for closing the master top clamp.  (The rotation time is extended for the open/close motor closing the master end clamp during master loading to prevent damage to the master end clamp plate.)	
	Setting	Range: 0 to 140 (0 ms to 140 ms) Units: 10 (10 ms) Default: 120 ms	
599	Ink Cartridge Changeover Setting		O
	Description	Makes settings appropriate for either old or new ink cartridges.	
	Setting	Range: 0 (New ink cartridge) 1 (Old ink cartridge) Units: 1 Default: 0  * This setting does not need to be made for print drums shipped after 1 December 2000 because they are compatible with new ink cartridges.	

## 9. Printing Test Mode

No.	Sensors, switches	Detection status	1/2 Switch
600	Print Pressure HP Sensor	Blocked (detection plate present)	O
601	Vertical Centering Sensor	Blocked (detection plate present)	O
602	Horizontal Centering Sensor	Blocked (detection plate present)	O
603	Print Pressure Limit Sensor	Blocked (detection plate present)	O
No.	Motors, solenoids	Remarks	1/2 Switch
Unit check			1/2 Switch
650	Vertical Centering Action	Resets the vertical center position to the home position.	O
652	Horizontal Centering Action	Performs the HP positioning action using the horizontal motor with the drive connected.	O
654	Print Pressure Home Action	Resets the print pressure to the home position.	O
No.	Data check	Display details	
670	Ambient Temperature Sensor A/D Data	Displays the A/D value for the temperature sensor on the MCTL PCB.	
671	Ambient Temperature Sensor Scale	Displays the A/D value for the temperature sensor on the MCTL PCB following conversion to °C value.	

## CHAPTER 17. TEST MODE

### PRINTING TEST MODE

No.	Data settings		1/2 Switch
680	Vertical Center Position Adjust		O
	Description	Sets the offset for the vertical print home position. (This data is stored in flash memory on the ROSE board.)	
	Setting	Range: -50 to +80 (-5.0 mm to +8.0 mm) * (+ is upwards) Units: 1 (0.1 mm) Default: 0 mm	
681	Drum Vertical Home Pos. Adj.		O
	Description	Sets the offset for the vertical print home position of the print drum. (This data is stored in EEPROM of the drum.)	
	Setting	Range: -50 to +80 (-5.0 mm to +8.0 mm) * (+ is upwards) Units: 1 (0.1 mm) Default: 0 mm	
682	Print Pressure HP Adjustment <b>(For Factory Use Only !)</b>		O
	Description	Shifts the print drum pressure position on the 5 step print pressure on the operation panel. (This data is stored in EEPROM on the print drum.)	
	Setting	Range: -10 to +10 pulses * (+)increases pressure, (-)decreases pressure Units: 1 pulse Default: 0 pulses	
683	Paper Drum to Print Drum Distance Data Input <b>(For Factory Use Only !)</b>		O
	Description	Sets the distance data from the paper drum to print drum. (This data is stored in flash memory on the ROSE board.)	
	Setting	Range: -10 to +10 pulses * (+)increases pressure, (-)decreases pressure Units: 1 pulse Default: 0 pulses	
684	Print Pressure Data Input <b>(For Field Serviceman Use)</b>		O
	Description	Sets the print pressure data. (This data is stored in EEPROM on the print drum.)	
	Setting	Range: -10 to +10 pulses * (+)increases pressure, (-)decreases pressure Units: 1 pulse Default: 0 pulses	
685	Print Drum Diameter Correction <b>(For Old Master Making Unit Only)</b>		O
	Description	Sets the tape thickness for print drum diameter correction. (This data is stored in EEPROM on the print drum.)	
	Setting	Range: 0 to 100 (0 mm to 1.00 mm) Units: 1 (0.01 mm) Default: 0 mm	
686	Drum Body ID Parameter Entry		
	Description	When the drum vertical home Pos. Adj. are performed using test-mode No.681, at the user where there are 2 or 3 V8000 machines, set ID Parameter for machines in advance.	
	Setting	Range: 0 to 2 Units: 1 Default: 0	
687	Warm-up Temperature		
	Description	Warm-up function temperature setting	
	Setting	Range: 10 to 15 (10 to 15 degrees Celsius) Units: 1 (1 degree Celsius) Default: 13 (13 degrees Celsius)	
688	Main Drive PCB: NEW - OLD selection		
	Description	Switching the main motor drive constant by selecting correct Main Drive PCB	
	Setting	Range: 0 (Main Drive PCB with part number before 022-52502-403) Units: 1 (Main Drive PCB with part number 022-52502-403 or after) Default: 1 (Main Drive PCB with part number 022-52502-403 or after)	

## 10. Accessories 1 Test Mode

No.	Sensors, switches	Detection status
700	Original Registration Sensor	Blocked (original present)
701	Original IN Sensor	Blocked (original present)
702	Original OUT Sensor	Blocked (original present)
703	AF Original Detection Sensor	Original present
707	AF Unit Cover SW	Stage cover (AF) is set
708	AF Unit Joint Signal Check	AF is connected
709	ST Tape Jam Sensor	Blocked (tape present)
710	ST Tape Detection Sensor	Blocked (tape present)
711	ST Power Switch	Power ON
No.	Motors, solenoids	Remarks
730	ADF Read Pulse Motor	
No.	Unit check	
750	AF Cycle Action	<p>Performs one AF scanning cycle.            Feed in original → Reset scanner to HP → Shading → Move scanner to scan position            → AF scanning and ejection → Reset scanner to HP            * Adjust speed to suit reproduction size in Test mode No. 785.</p>
751	AF Feed Action	<p>Performs AF feed operation.            * Adjust speed to suit reproduction size in Test mode No. 785.</p>
752	Orig. IN Sensor Sensitivity Adj.	<p>Adjusts sensitivity of origin IN sensor.</p>
755	AF Base Tone Adj. Cycle Action	<p>Start: Shading → Moves to AF-ABC position (lamp ON at AF-ABC position)            Stop: Lamp goes OFF, and returns to home position.</p>
756	Digitizer Initialization	<p>Resets the digitizer internal data to the default values.            * Test mode No. 787 also resets to defaults.</p>
757	Storage Memory Initialization	<p>Erases data and initializes storage memory.            * Only one storage memory card should be inserted into the slot for initialization.            * Two memory cards cannot be initialized simultaneously.</p>
758	Storage Memory Check	<p>Checks the data in the storage memory.            * Only one storage memory card to be checked should be inserted into the slot.            * Two memory cards cannot be checked simultaneously.</p>
759	ST Tape Output	<p>== Spare (function not available) ==</p>

## CHAPTER 17. TEST MODE

### ACCESSORIES 1 TEST MODE

No.	Data check	Display details
772	Storage Memory Card Data	<p>Displays details for the memory card inserted into the slot.</p> <p>* Download cards should be inserted after switching on power, since downloading begins when power is switched on.</p> <p>* Display details</p> <p>0: No card            1: ROSE download            2: MCTL PCB download            3: Function upgrade            4: Storage memory (ATA card)            255: Other card</p> <p>* Status can be selected for storage memory card slots 1/2.            * Select 1 or 2 using the Print drum 1/2 selector button. (The slot on the PCB side is slot 1)</p>
773	Storage Memory Properties	<p>== Spare (function not available) ==</p> <p>Displays the volume label, capacity, volume used, and available capacity for storage memory.</p> <p>* Only one storage memory card to be checked should be inserted into the slot.            * Two memory cards cannot be checked simultane</p>
No.	Data settings	
780	AF Scan Mirror Position Adjust	
	Description	Adjusts the stop position of the mirror (carriage) during AF scanning.
781	Setting	Range: -20 to +20 (-2.0 mm to +2.0 mm) *(+ is downward) Units: 1 (0.1 mm) Default: 0 (0 mm)
	Description	Adjusts the stop position of the mirror (carriage) during AF-ABC.
782	Setting	Range: 0 to 30 (0 mm to 3.0 mm) *(+ is upward) Units: 1 (0.1 mm) Default: 0 (0 mm)
	Description	Adjusts the horizontal position when scanning the original using the AF. Set separately from flat bed.
783	Setting	Range: -35 to +40 (-3.5 mm to +4.0 mm) *(+ is rear) Units: 5 (0.5 mm) Default: 0 (0 mm)
	Description	Adjusts the scan start position when scanning the original using the AF.
784	Setting	Range: -60 to +60 (-6.0 mm to +6.0 mm) *(+ is downward) Units: 1 (0.1 mm) Default: 0 (0 mm)
	Description	Adjusts the scanning speed when scanning the original using the AF. (Adjusts the AF read pulse motor speed.)
784	Setting	Range: -50 to +50 (-5.0% to +5.0%) *(+ shrinks) Units: 1 (0.1%) Default: 0 (0%)

No.	Data settings	
785	AF Cycle Action Speed Adjust	
	Description	Sets the scanning speed (reproduction size) for the AF feed action in No. 751 and AF cycle action in No. 750.
	Setting	Range: 50 to 200 (50% to 200%) Units: 1 (1%) Default: 100%
786	AF Scan End Signal Output Time	
	Description	Adjusts the scanning end position when scanning the original using the AF.
	Setting	Range: -63 to +63 (-6.3 mm to +6.3 mm) *(+ is downward) Units: 1 (0.1 mm) Default: 0 mm
787	Digitizer Data Skip Range Adjust	
	Description	Sets the distance for scanning after the digitizer receives digitizer VSYNC. (Ignores noise in initial section.)
	Setting	Range: 0 to 255 (0.0 mm to 25.5 mm) Units: 1 (0.1 mm) Default: 0 mm
799	Tele-Metering (This feature not supported in overseas)	
	Description	Activation or Deactivation of the Tele-Metering feature.
	Setting	Range: 0 (Deactivate) Units: 1 (Activate) Default: 0 (Deactivate)

## **11. Factory Mode Test Mode**

The factory mode test mode is used for the items set at the factory. It is not used in normal maintenance.

The factory mode test mode is required for entry of settings if the scanner unit has been replaced.

### **Factory mode test mode procedures**

- (1) Start up Test mode.
- (2) Enter 9874 using the numeric keys in standby mode, then press the “Start” key.
- (3) Enter the factory mode test mode number to be run, then press the “Start” key.

No.	Data settings	
1203	TTEC scanner setting 1	
1204	TTEC scanner setting 2	
1205	TTEC scanner setting 3	
	Description	Set the values indicated on the label affixed to the top of the scanner unit plate.
	Setting	Enter the values on the label for each item.

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# CHAPTER 18: FUNCTIONS

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# Function Settings (Sub-Screen)

Refer to V8000 Users Guide for the details on the contents of this Chapter.

Function settings are made on the panel sub-screen.

To switch to the sub-screen from the main screen, press the "Main/Sub" button on the right-hand side of the screen.

## 1. Configuration

The function setting sub-screen contains the following items:

- (1) Selections
- (2) Memory
- (3) Programs
- (4) Other settings (Functions list/Properties)

### 1) Selections [\(Jump to Users Guide\)](#)

Functions from the functions list in the "Other settings screen" that are frequently used can be assigned to function buttons.

- The functions available are listed in the functions list. Up to eight can be assigned to function buttons.
- Functions are assigned on the "Catalog (Properties)" screen and can be separately set for P to P and D to P modes.
- Functions set in "Selections" for optional devices are automatically deleted if the particular optional device is disconnected after assigning.
- The default functions assigned in "Selections" when first shipped will vary by machine type.
- The function buttons for "Continuous," "Multi-up," and "Repeat Master Making" can be displayed on the main screen apart from "Selections." (This information is displayed or not displayed, depending on settings made on the "Properties" screen.)

### 2) Memory (Mode Memory) [\(Jump to Users Guide\)](#)

This function stores the current master making and printing settings for the machine to be called up and used again later.

- Memory details are stored by pressing the "Confirm settings" key to open the Confirm settings screen.
- Up to 24 settings can be stored. These can be assigned alphanumeric names.
- Details are stored until they are deleted by the user, or until Test mode No. 081 "Clear User Memory" is run.
- Functions that do not exist when invoked are ignored, such as when optional devices have been disconnected.
- The functions that can be stored in memory are as listed in V8000 Users Guide. (The current status is stored when the "Confirm settings" key is pressed.) If a function is to be stored after the printing has started, the print quantity to be stored in the memory will be what is shown on the operation panel at that moment.

### 3) Programs (Program Printing Memory) [\(Jump to Users Guide\)](#)

This function stores program printing details for future use.

- The memory details are stored and called up via the sub-screen memory screen.
- Up to 12 single- or multi-original programs can be stored. These can be assigned alphanumeric program names.
- Programs are stored until they are deleted by the user, or when Test mode No. 081 "Clear User Memory" is run.
- If both the mode memory and program print memory are both invoked, the number of prints is defined by the program print memory settings, and not from the mode memory.

#### 4) Other Settings (Functions List)

This screen allows the user to choose functions from the available functions list for normal printing.

Refer to the “USERS GUIDE” for the Functions that can be viewed and set on the sub-screen, and also of the Items that can be saved in memory.



[\(Jump to Users Guide\)](#)



[\(Jump to Users Guide\)](#)

#### 5) Other Settings (Properties)

This mode is used to change the machine default settings to which the machine adjusts itself when the machine power is switched ON or All Reset button is pressed, and also to set special functions.

Refer to the “USERS GUIDE” for the details.  [\(Jump to Users Guide\)](#)

# MEMO

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# CHAPTER 19: OTHER PRECAUTIONS

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## **1. Software Download Instructions**

- (1) Switch off power.
- (2) Remove the blind plate on the rear left-hand cover. (M3 x 8 screw)
- (3) Remove the Document Storage Card DM-32 if inserted.

### **Download precautions**

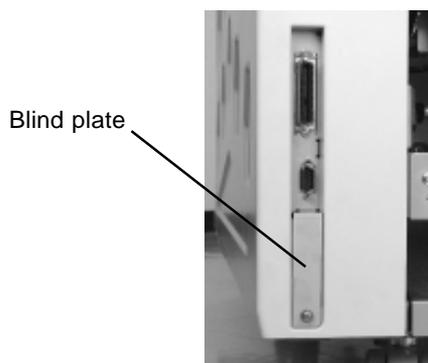
- Do not insert two PC cards, ROSE and MCTL software, into the card slot at the same time.
- Excluding certain occasions, it does not matter whether the ROSE software downloads first, or MCTL software downloads first, but these two software download must be done continuously. (In certain occasions, depending on the contents of the upgrading software to be issued in the future, the ROSE software needs to be downloaded first, so it would be best to make it a habit to download the ROSE software before the MCTL software.)

### **ROSE software download instructions**

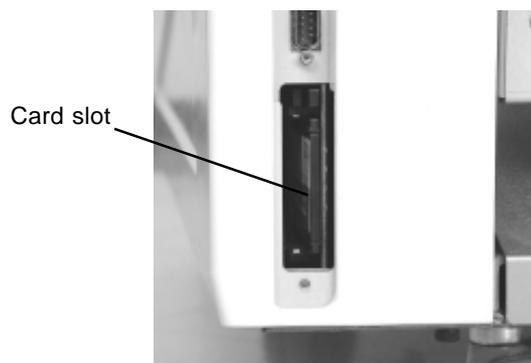
- (4) Insert a ROSE download card (SMG1/V\*.\*\*).
- (5) The green LED at the rear of the SH-PCB will blink when power is switched on. (Reading)  
Reading is complete once the green LED stays on.  
[If the red LED lights during the download, an error has occurred. Repeat the procedure from above (4)].
- (6) Switch off power and remove the card.

### **MCTL software download instructions**

- (4) Insert an MCTL download card (MG1M/V\*.\*\*).
- (5) The green LED at the rear of the SH-PCB will blink when power is switched on. (Reading)  
Reading is complete when the green LED stays on.  
[If the red LED lights during the download, an error has occurred. Repeat the procedure from above (4)].
- (6) Switch off power and remove the card.
- (7) Reinsert the Document Storage Card DM-32 if previously removed.
- (8) Reattach the blind plate.



P1901



P1902

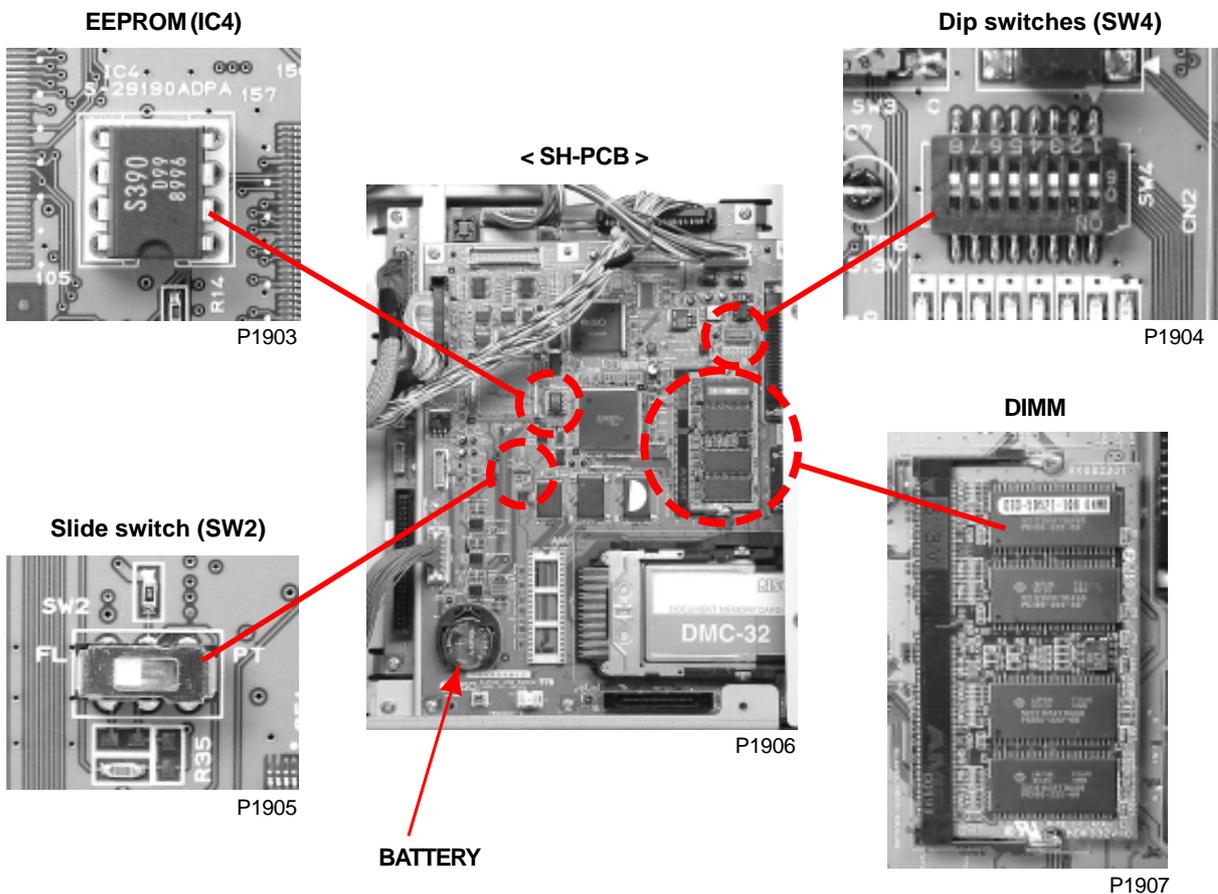
## **2. Battery Replacement**

Replace the battery on the SH-PCB or MCTL PCB with power switched on.

\* To prevent data loss, always replace with the power switched on.

### 3. SH-PCB (Main PCB) Replacement

- (1) After replacing the SH-PCB, the test mode details need to be reset as well. Record the settings for the items listed below before replacing.
  - \* Activate test mode No. 070 (data setting change confirmation) and memo down the existing setting.
  - \* Memo down the settings for sub-screen selections, memory, programs, and catalog (properties).
- (2) Switch off the power, remove the DIMM, EEPROM (IC4) and Battery, and remove the SH-PCB.
- (3) Set all DIP switches (SW4) on the new SH-PCB to OFF. Set the slide switch (SW2) to the side marked FL.
- (4) Reinstall the removed DIMM, EEPROM, and Battery onto the new SH-PCB. Install the new SH-PCB on the machine.
- (5) Download the ROSE software referring to the previous page. There is no need to download the MCTL software if same version ROSE software is to be downloaded.
- (6) Start up the test mode.
- (7) Run Test mode No. 080 (Clear Error Status Data), No. 081 (Clear User Memory) and No. 082 (Clear Test Mode Data Setup).
- (8) Re-input all the data memo downed in step (1).
- (9) Run Test mode No. 450 (Paper Width Potentiometer Adjustment 100 mm) and No. 451 (Paper Width Potentiometer Adjustment 300 mm).
- (10) Switch off power, then switch on again.
- (11) Check that start-up is normal.
- (12) Set present clock time in the "Properties" screen to complete the job.



### 4. MCTL PCB Replacement

- (1) Start up test mode and input number **973** and press START key. Then input number **1100** and press START key.
- (2) Remove print drum No.1 and No.2 and then turn OFF the machine power.
- (3) Remove existing MCTL PCB from the machine, and remove the battery from the removed PCB.
- (4) Installed removed battery on the new MCTL PCB, and install the new PCB on the machine.
- (5) Start up test mode and activate test mode No. 80, and keep the machine in test mode.
- (6) While in the test mode, input number **973** and press START key. Then input number **1101** and press START key.
- (7) Turn OFF the machine power once and turn the power back ON again.
- (8) Install the two removed print drums back in the machine.
- (9) Confirm that the machine operates normal.

### 5. Print Drum PCB Replacement

**Caution:** In replacing Print Drum PCB, select only the correct print drum (either No.1 or No.2) on the select key on top portion of the test mode display all through the replacement procedure.

- (1) Start up test mode and press drum selection number 1 or 2 to select the print drum on which the Print Drum PCB is to be replaced. Input number **973** and press START key. Then input **1110** and press START key.
- (2) Remove the print drum from the machine and replace the Print Drum PCB on that print drum.
- (3) Return the print drum back on the machine.
- (4) Start up test mode again and press drum selection number 1 or 2 to select the print drum on which the Print Drum PCB was replaced. Input number **973** and press START key. Then input **1112** and press START key.
- (5) Turn OFF the machine power once and turn the power back ON again.
- (6) Confirm that the machine operates normal.

### 6. Print Image Adjustment Procedure

The adjustment should be made in the order of steps given below. If adjusted in wrong order of steps, the result will not be good.

**The 1st and 2nd paper feeding adjustment must be completed before going into the print image adjustment.**

#### 1) Vertical Image Position Adjustment:

- (1) Datum Print Position Adjustment. ([Refer to Chapter 9](#))
- (2) Master Leading Clamp Range Adjustment. ([Refer to Chapter 14](#))
- (3) Master Tail Clamp Range Adjustment. ([Refer to Chapter 14](#))
- (4) Write Start Position Adjustment. ([Refer to Chapter 14](#))
- (5) Checking and Adjusting Image Elongation and Shrinkage. ([Refer to Chapter 14](#))

#### 2) Horizontal Image Position Adjustment::

- (1) Checking and Adjusting the Horizontal Printing Position. ([Refer to Chapter 14](#))

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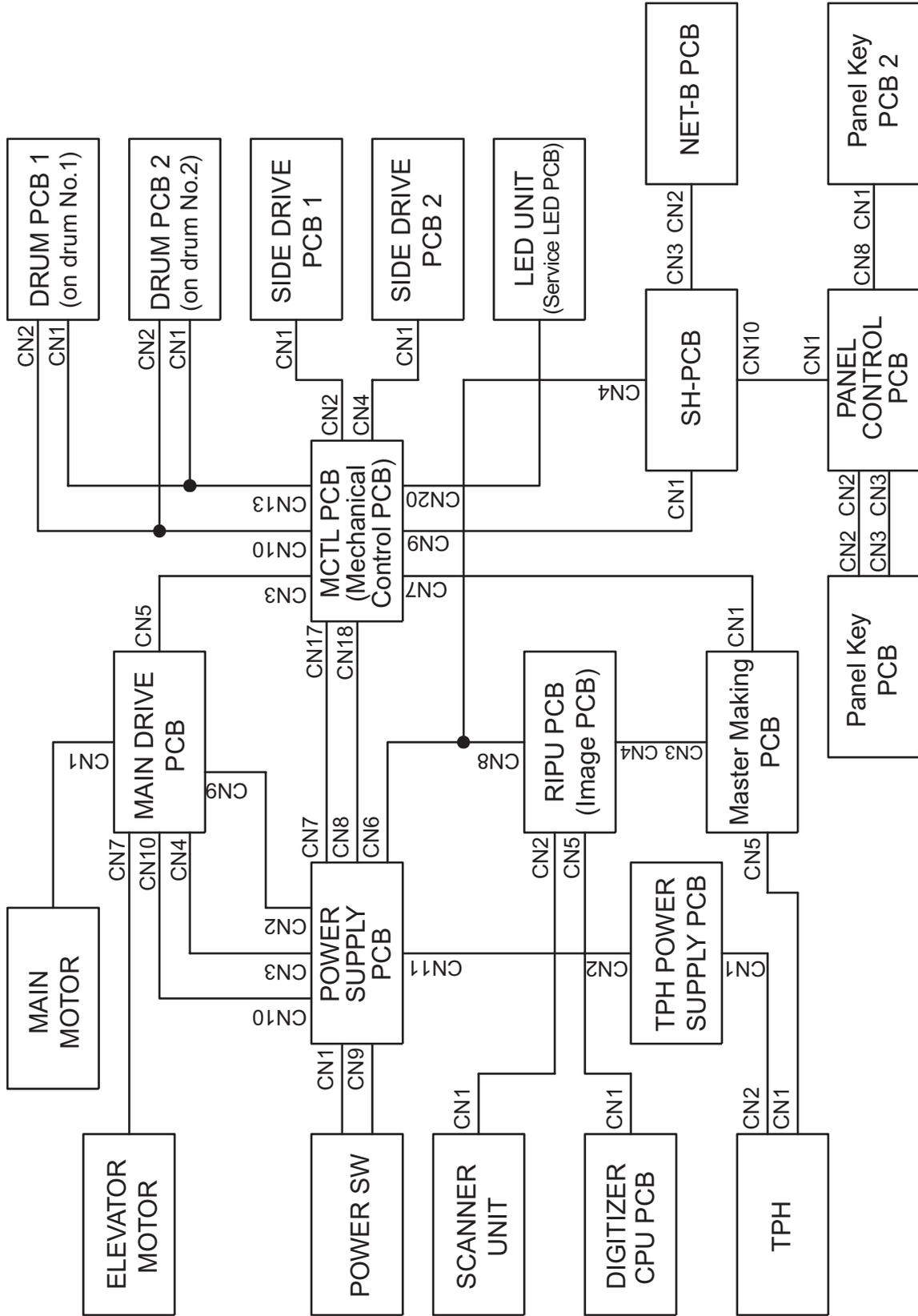
# CHAPTER 20: PRINTED CIRCUIT BOARDS

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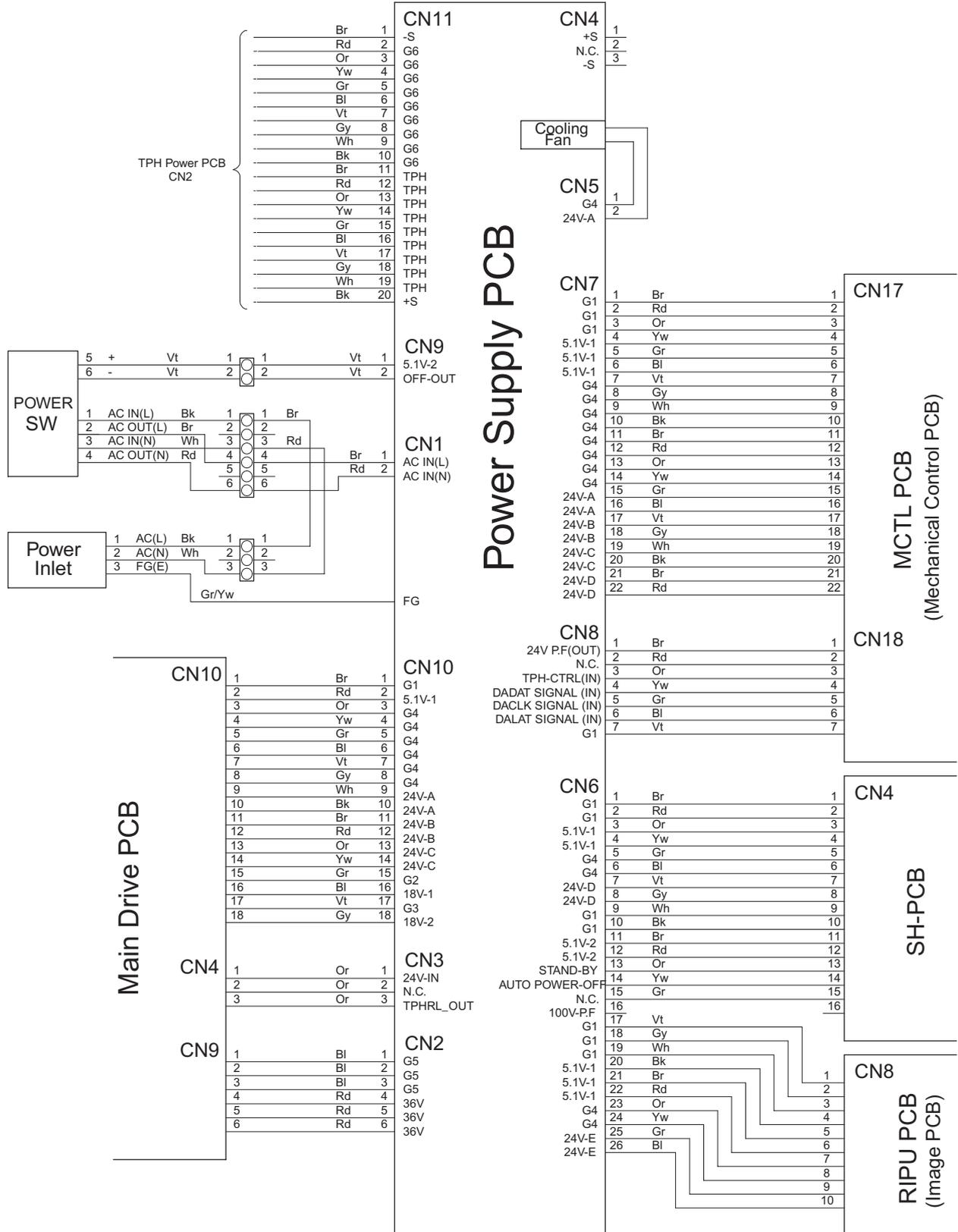
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1. Connection Diagram Between Boards



2. PCBs

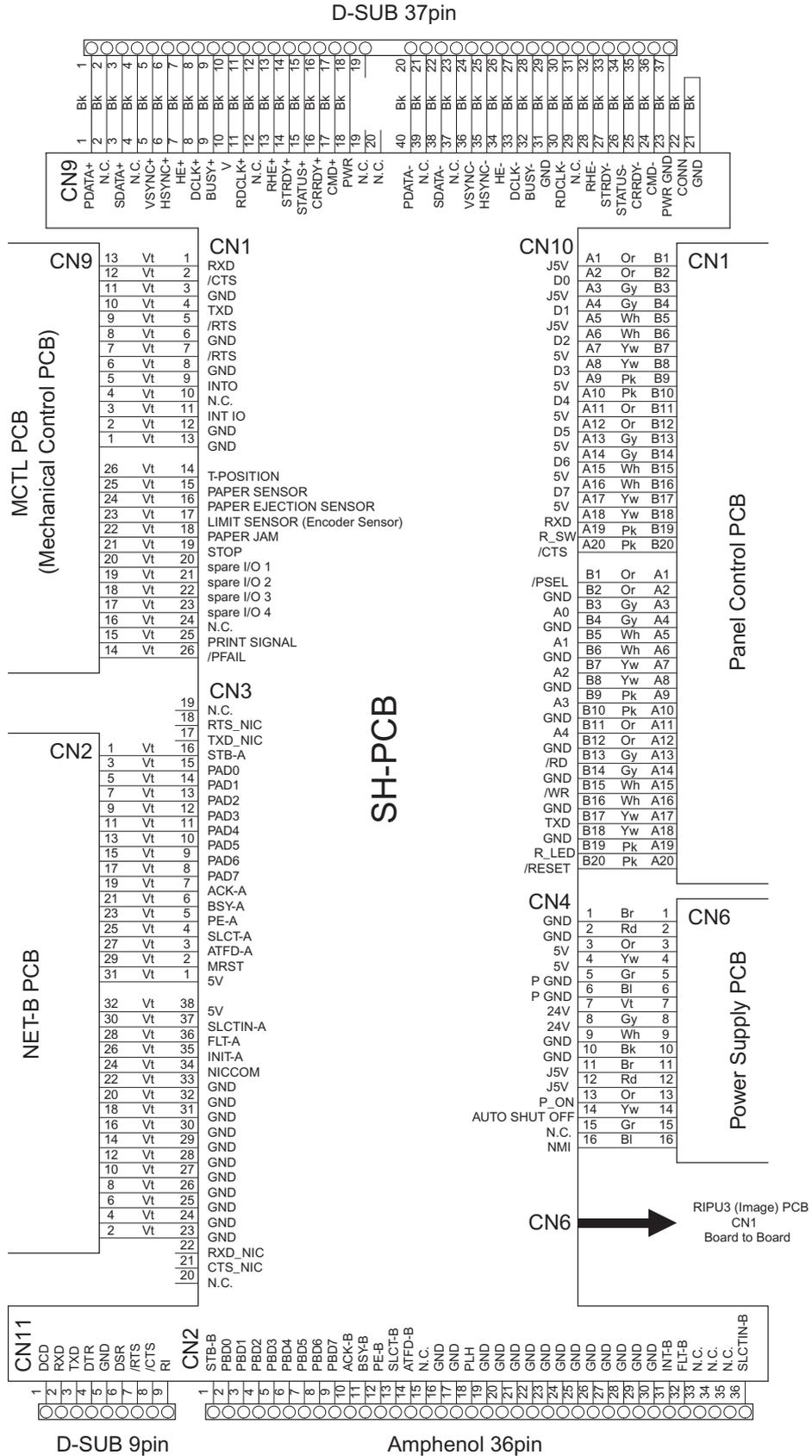
2-1-1. Power Supply PCB



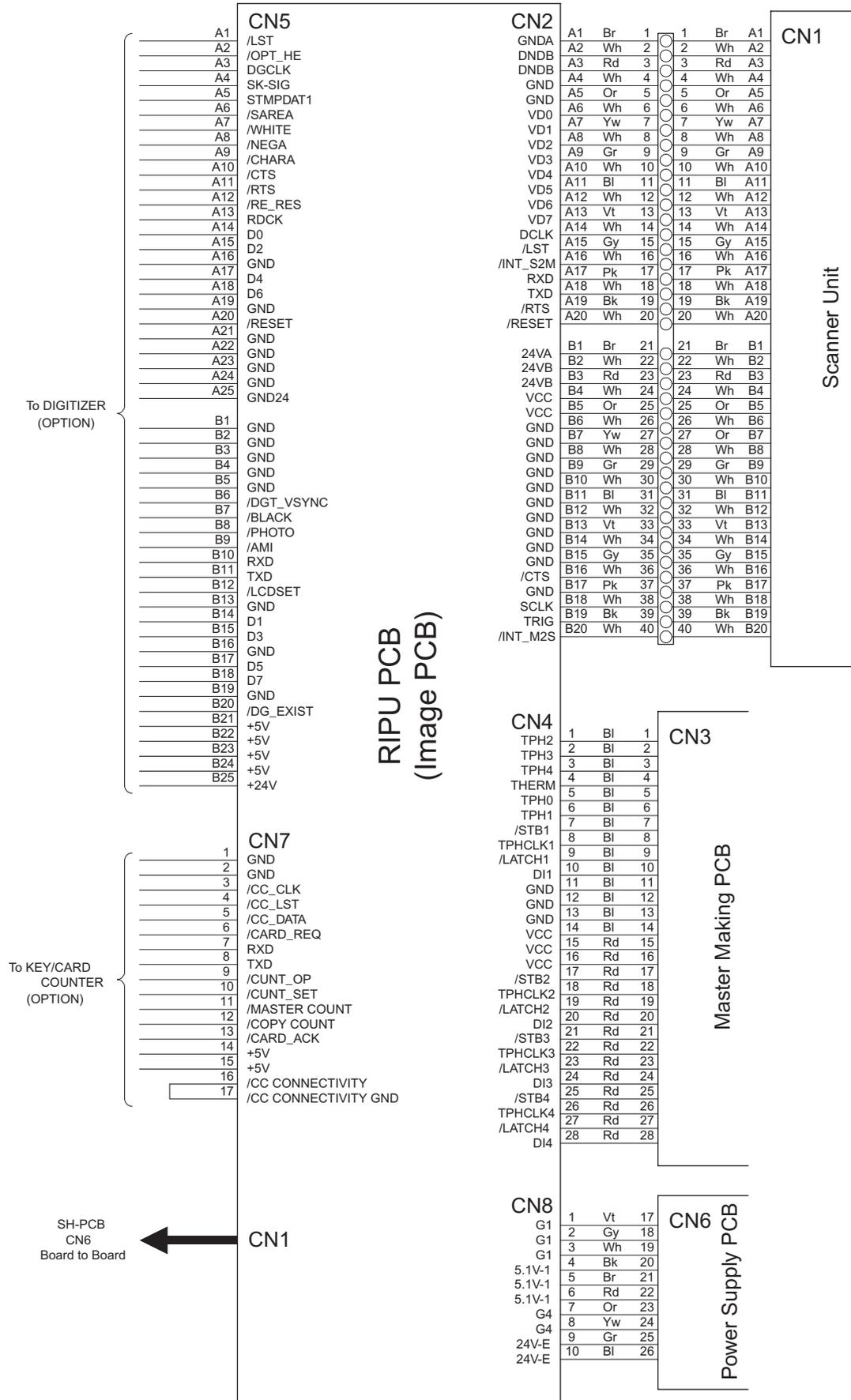
**2-1-2. Power Supply PCB and Fuse Compatibility Chart**

Fuse No.	Circuit	When power is switched on	Connected components
F1 250V 15A	Main primary	Power not provided	For power supply main unit
F300 250V 1.25A	Main	Power not provided	For power supply main unit
F190 125V 3.15A	5V-1	Power supply fan operates briefly, then stops. Panel does not illuminate.	All PCBs
F11 250V 20A	36V	T01-501 display Main motor lock	Main drive PCB Main motor
F12 125V 3.15A	24V-A	T28-509 display 2nd clamp slide motor lock	Paper feed clutch Timing clutch 2nd master disposal motor 2nd master compression motor 2nd disposal plate motor 2nd clamp opening and closing motor 2nd print positioning pulse motor 2nd clamp slide motor Pinch roller release motor
F13 125V 3.15A	24V-B	T06-611 display 1st horizontal pulse motor lock	Main pulse motor Main motor clutch Maintenance lamp 1st inking motor 1st inner pressure clutch 1st horizontal pulse motor 1st print pressure motor 1st print drum locking motor 2nd print drum locking motor
F14 125V 3.15A	24V-C	T17-004 display Solenoid counter not connected	Solenoid counter Main forward/reverse relay Interlock relay Elevator motor 1st master disposal motor 1st master compression motor 1st disposal plate motor 1st clamp opening and closing motor 1st print positioning pulse motor 1st clamp slide motor Paper ejection motor F pinch pulse motor R pinch pulse motor Master making unit shifting motor
F15 125V 3.15A	24V-D	T31-611 display 2nd horizontal pulse motor lock	2nd inking motor 2nd inner pressure clutch 2nd horizontal pulse motor 2nd print pressure motor Master loading fan Cutter motor Write pulse motor Master disposal fan Thermal pressure motor Job separator Option PCB
F16 125V 3.15A	24V-E	T14-101 display Flat bed error	Digitizer Scanner

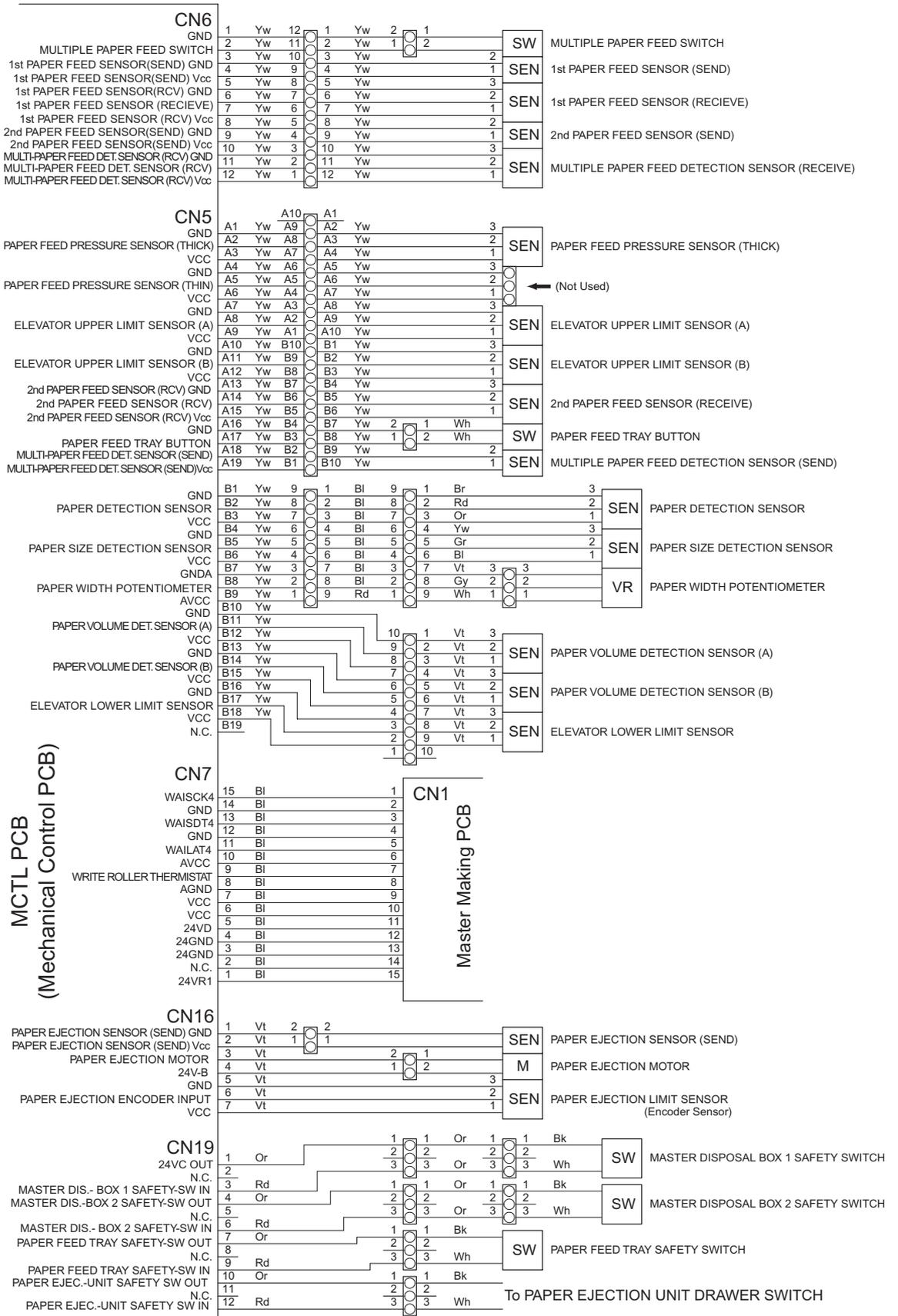
2-2-1. SH-PCB



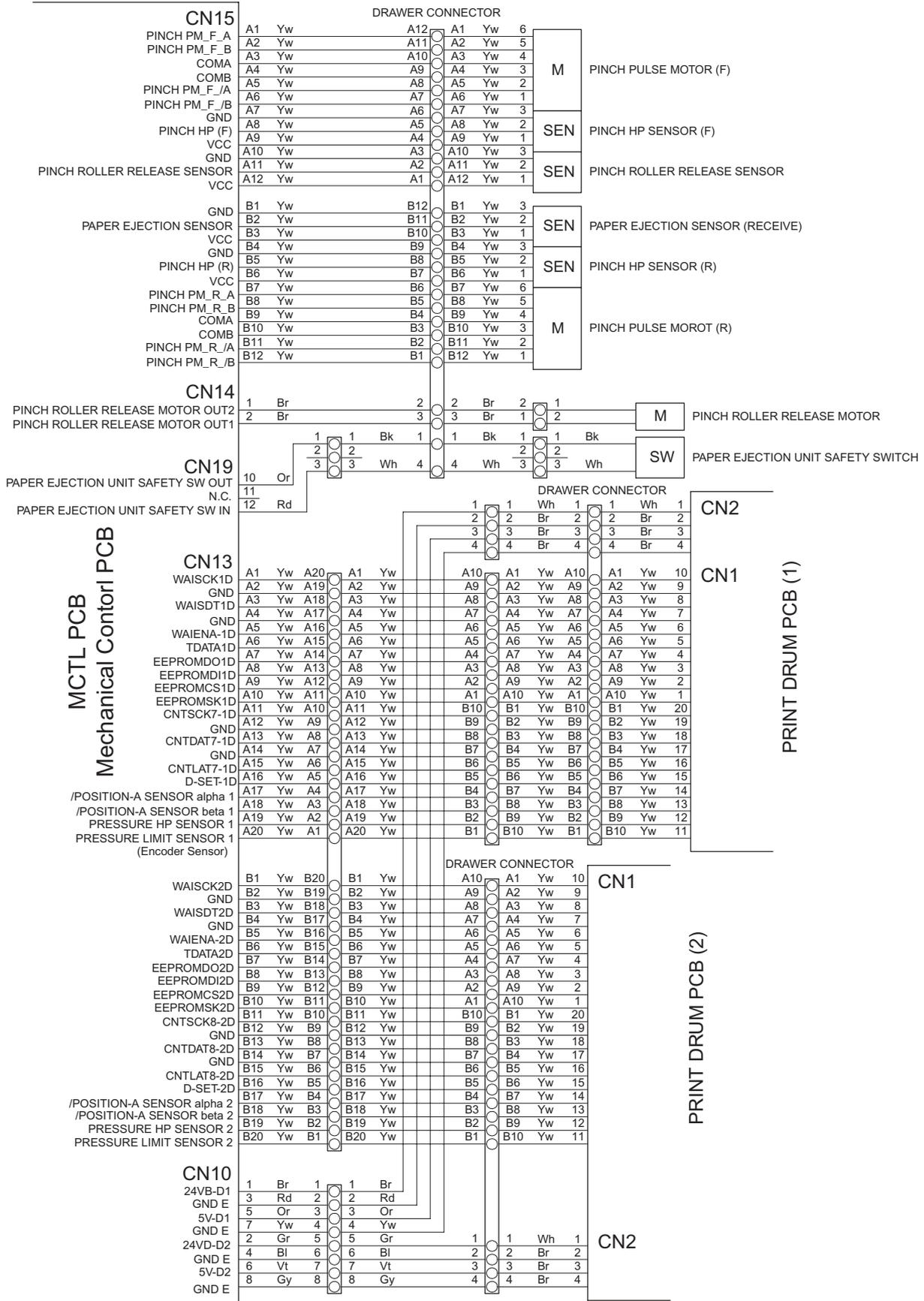
2-3-1. RIPU PCB (Image PCB)



2-4-1. MCTL PCB (Mechanical Control PCB) [1 of 3]

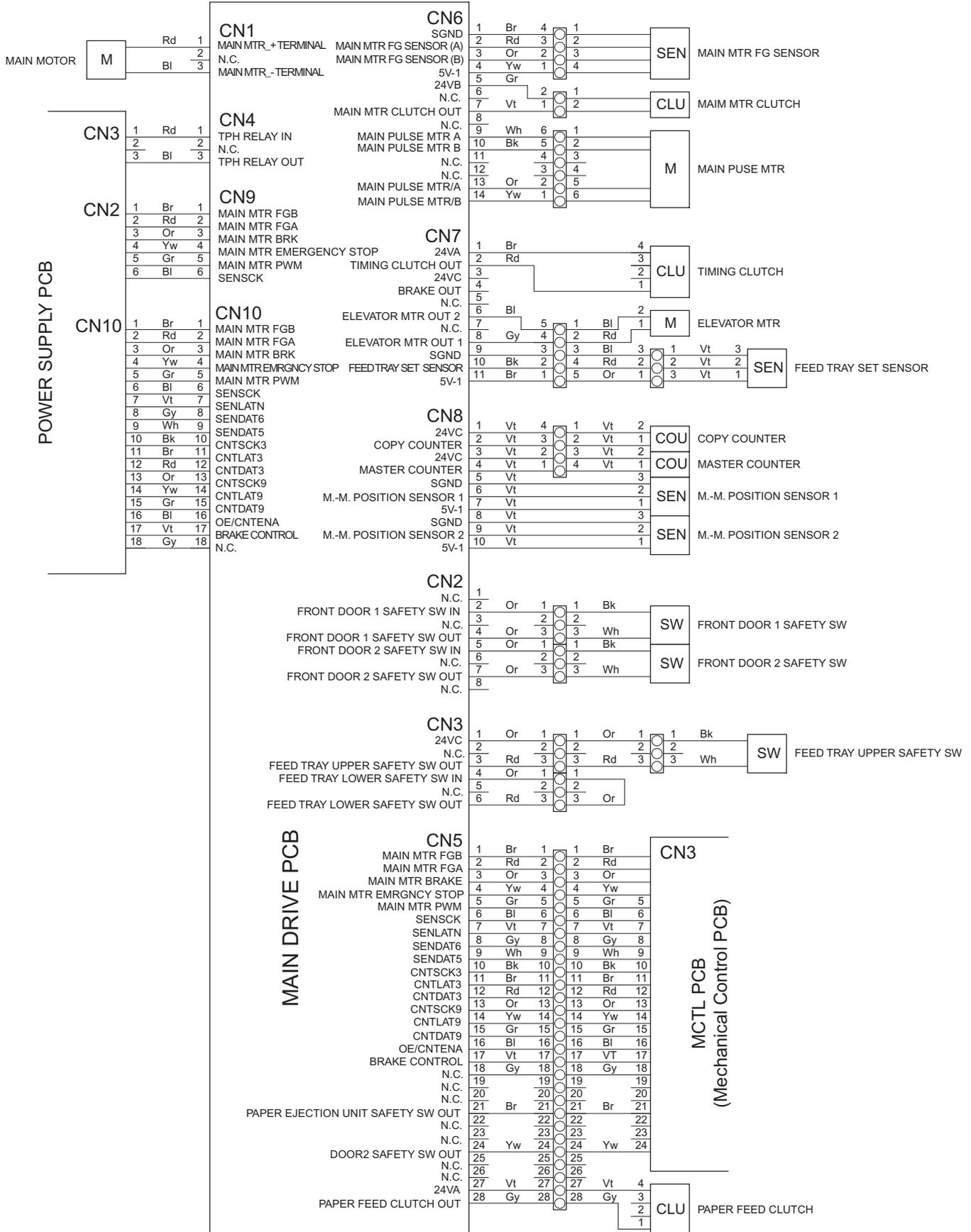


2-4-2. MCTL PCB (Mechanical Control PCB) [2 of 3]

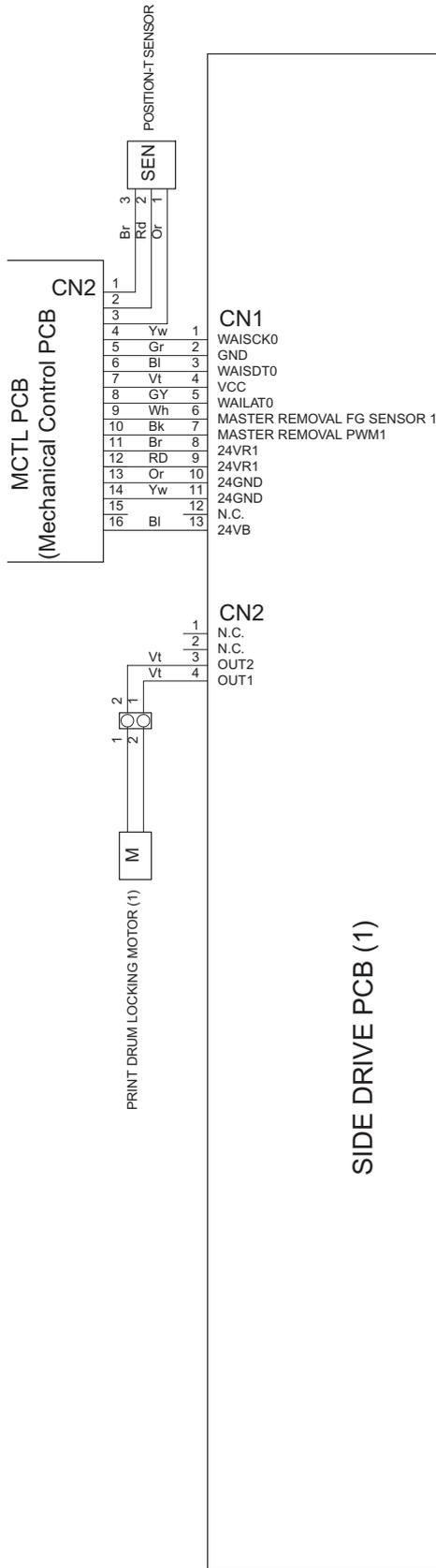




2-5-1. Main Drive PCB



2-6-1. Side Drive PCB 1



**CN5**

1	Vt	16	1	Vt	2	1	
2	Vt	15	2	Vt	1	2	M
3	Vt	14	3	Vt			
4	Vt	13	4	Vt			SEN
5	Vt	12	5	Vt			
6	Vt	11	6	Vt			SEN
7	Vt	10	7	Vt			
8	Vt	9	8	Vt			SEN
9	Vt	8	9	Vt			
10	Vt	7	10	Vt			SEN
11	Vt	6	11	Vt			
12	Vt	5	12	Vt			SEN
13	Vt	4	13	Vt			
14	Vt	3	14	Vt			SEN
15	Vt	2	15	Vt	2	1	
16	Vt	1	16	Vt	1	2	M
17	Vt	32	17	Vt	2	1	
18	Vt	31	18	Vt	1	2	M
19	Vt	30	19	Vt			
20	Vt	29	20	Vt			SEN
21	Vt	28	21	Vt			
22	Vt	27	22	Vt			SEN
23	Vt	26	23	Vt			
24	Vt	25	24	Vt			SEN
25	Vt	24	25	Vt			
26	Vt	23	26	Vt			SEN
27	Vt	22	27	Vt			
28	Vt	21	28	Vt			SEN
29	Vt	20	29	Vt			
30	Vt	19	30	Vt			SEN
31	Vt	18	31	Vt			
32	Vt	17	32	Vt			

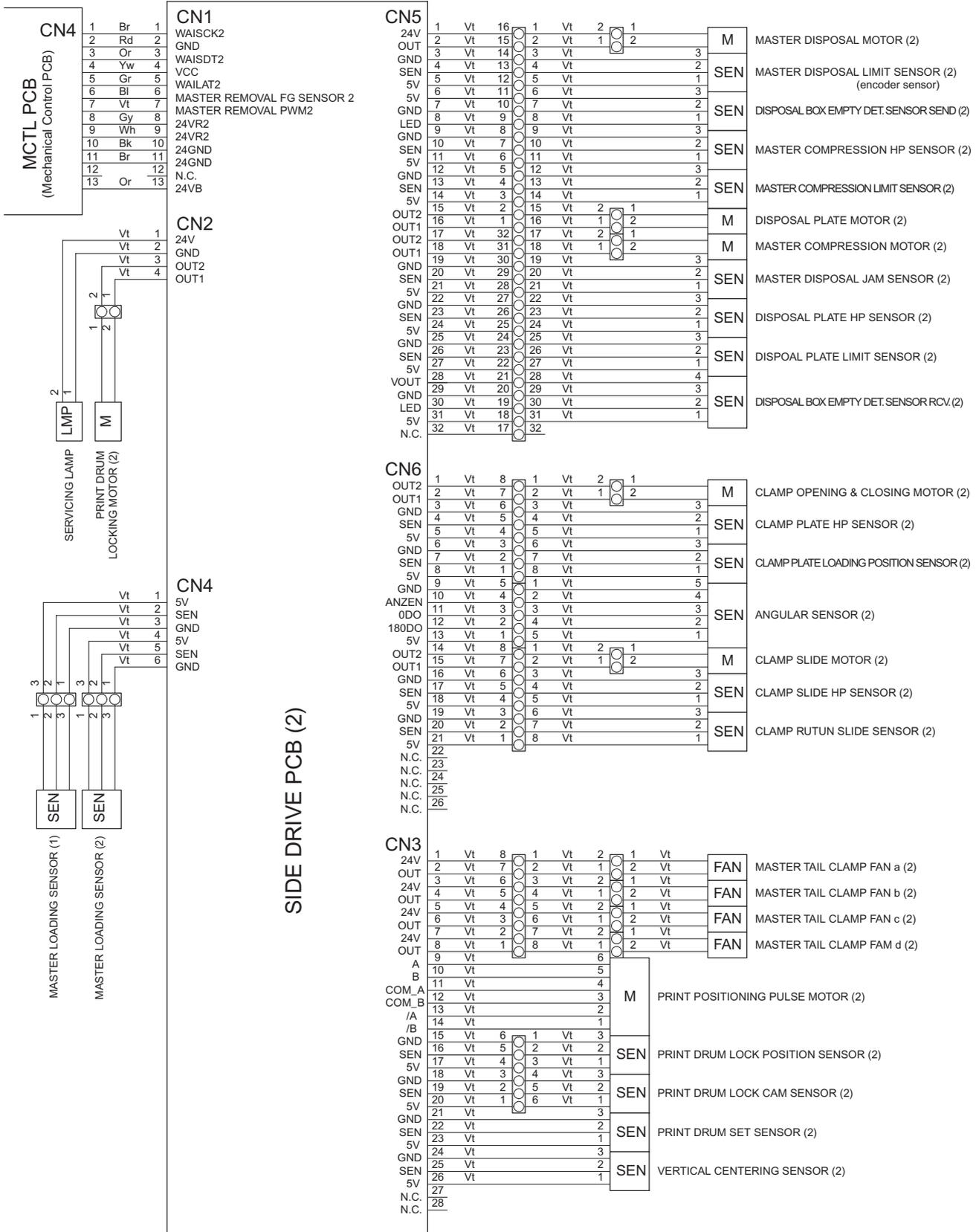
**CN6**

1	Vt	8	1	Vt	2	1	
2	Vt	7	2	Vt	1	2	M
3	Vt	6	3	Vt			
4	Vt	5	4	Vt			SEN
5	Vt	4	5	Vt			
6	Vt	3	6	Vt			SEN
7	Vt	2	7	Vt			
8	Vt	1	8	Vt			SEN
9	Vt	5	1	Vt			
10	Vt	4	2	Vt			SEN
11	Vt	3	3	Vt			
12	Vt	2	4	Vt			SEN
13	Vt	1	5	Vt			
14	Vt	8	1	Vt	2	1	
15	Vt	7	2	Vt	1	2	M
16	Vt	6	3	Vt			
17	Vt	5	4	Vt			SEN
18	Vt	4	5	Vt			
19	Vt	3	6	Vt			SEN
20	Vt	2	7	Vt			
21	Vt	1	8	Vt			SEN
22	N.C.						
23	N.C.						
24	N.C.						
25	N.C.						
26	N.C.						

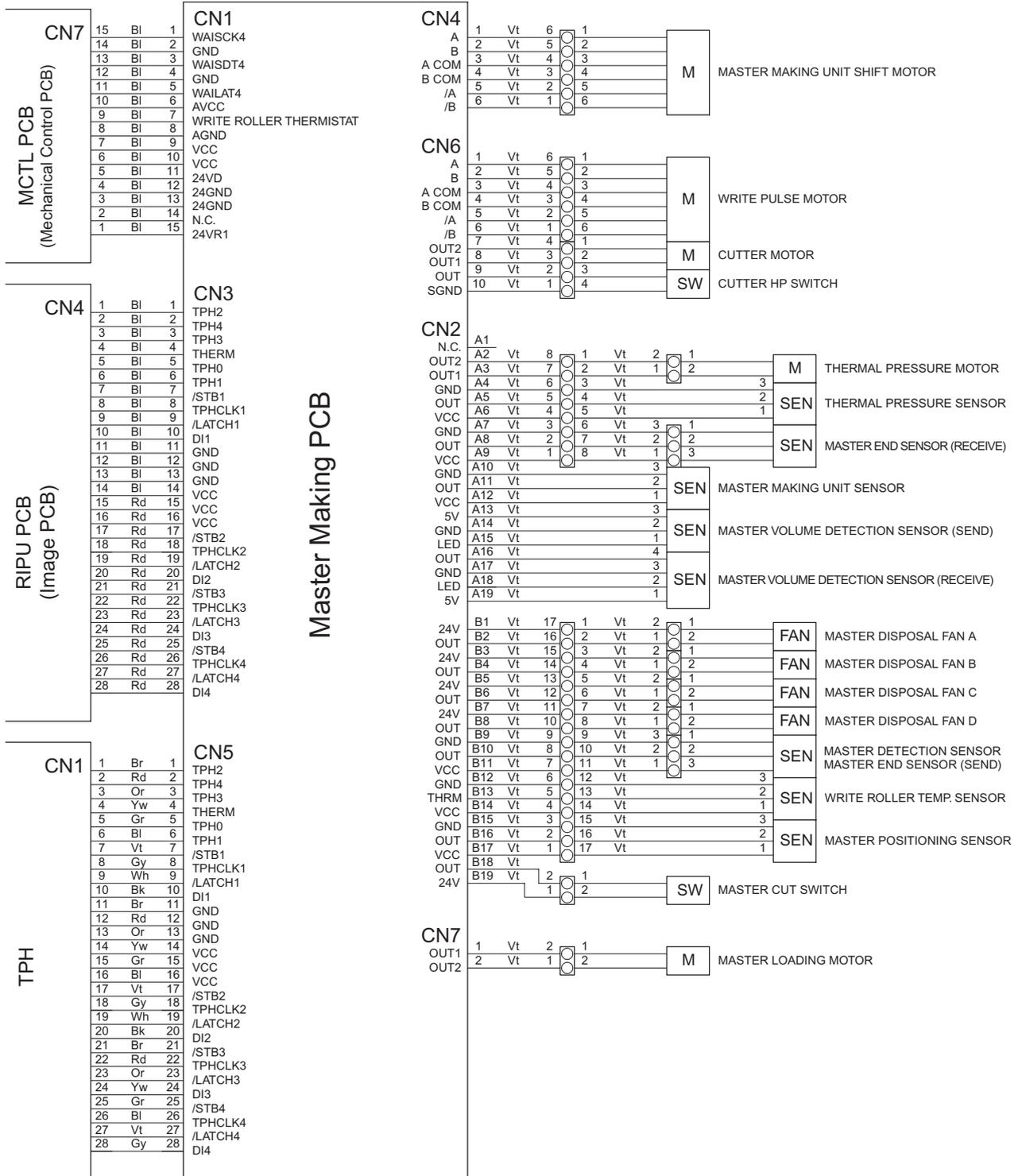
**CN3**

1	Vt	8	1	Vt	2	1	Vt	
2	Vt	7	2	Vt	1	2	Vt	FAN
3	Vt	6	3	Vt	2	1	Vt	FAN
4	Vt	5	4	Vt	1	2	Vt	FAN
5	Vt	4	5	Vt	2	1	Vt	FAN
6	Vt	3	6	Vt	1	2	Vt	FAN
7	Vt	2	7	Vt	2	1	Vt	FAN
8	Vt	1	8	Vt	1	2	Vt	FAN
9	Vt						6	
10	Vt						5	
11	Vt						4	
12	Vt						3	M
13	Vt						2	
14	Vt						1	
15	Vt	6	1	Vt	3			
16	Vt	5	2	Vt	2			SEN
17	Vt	4	3	Vt	1			
18	Vt	3	4	Vt	3			
19	Vt	2	5	Vt	2			SEN
20	Vt	1	6	Vt	1			SEN
21	Vt						3	
22	Vt						2	SEN
23	Vt						1	
24	Vt						3	
25	Vt						2	SEN
26	Vt						1	SEN
27	N.C.							
28	N.C.							

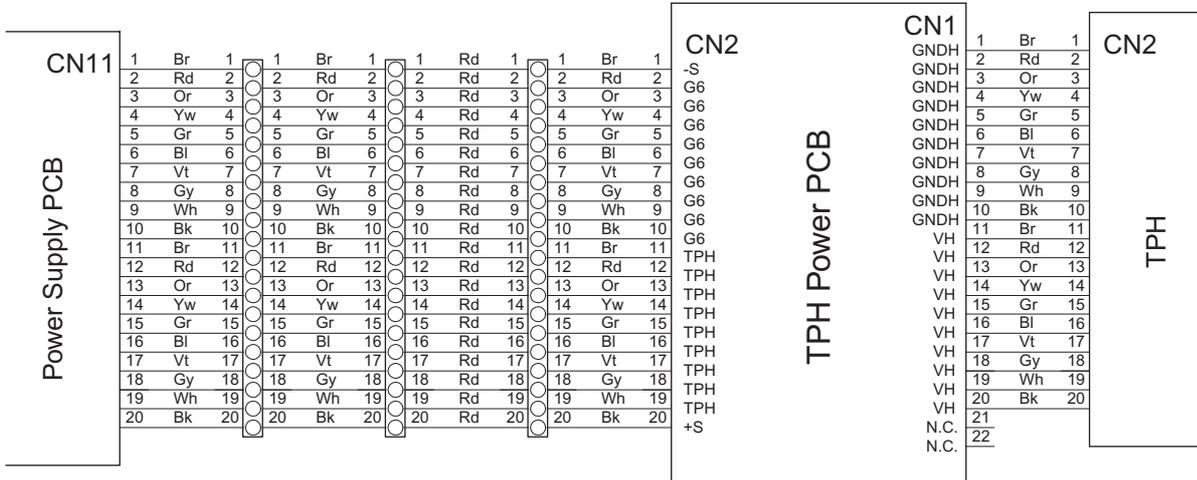
2-7-1. Side Drive PCB 2



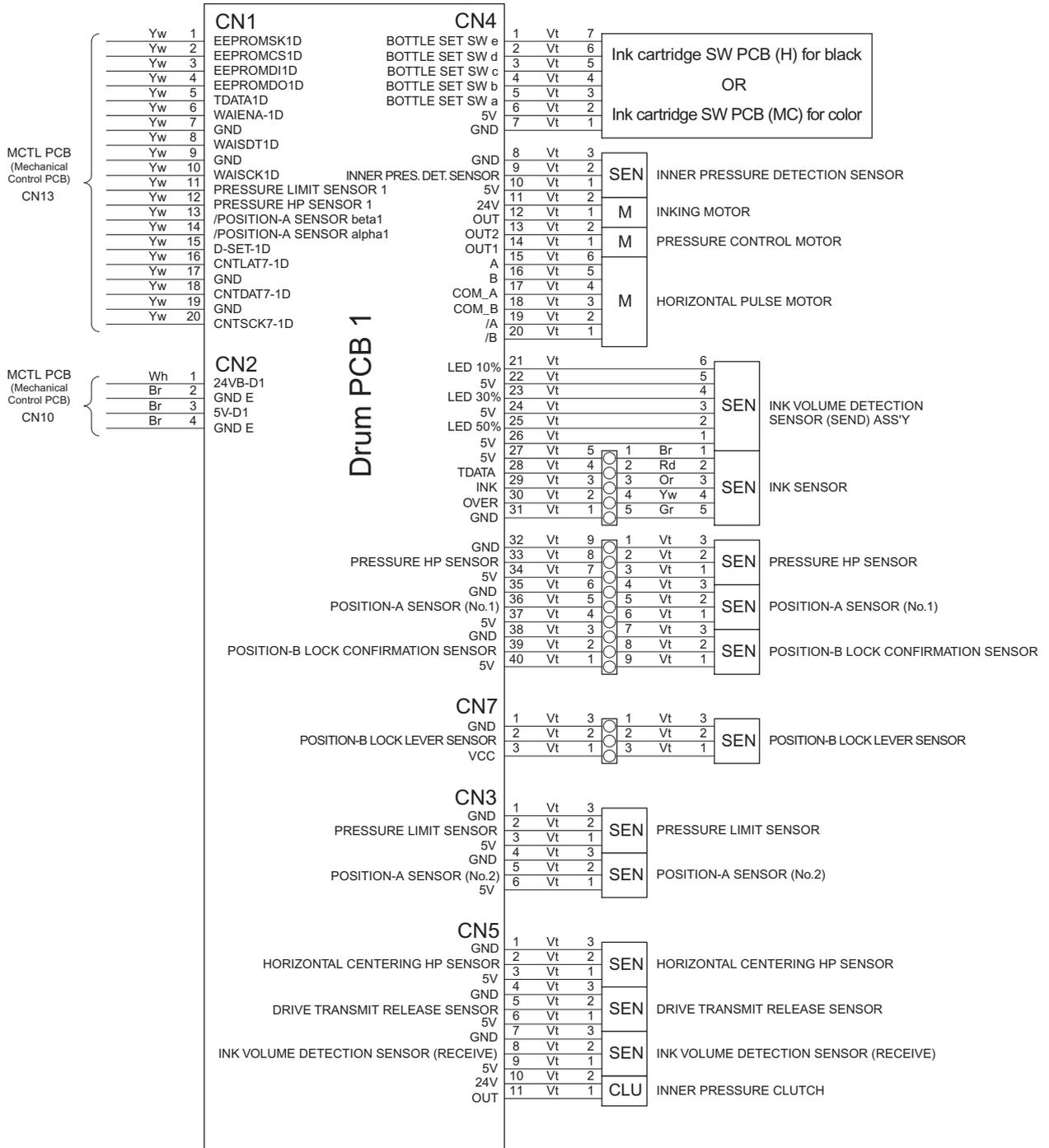
2-8-1. Master Making PCB



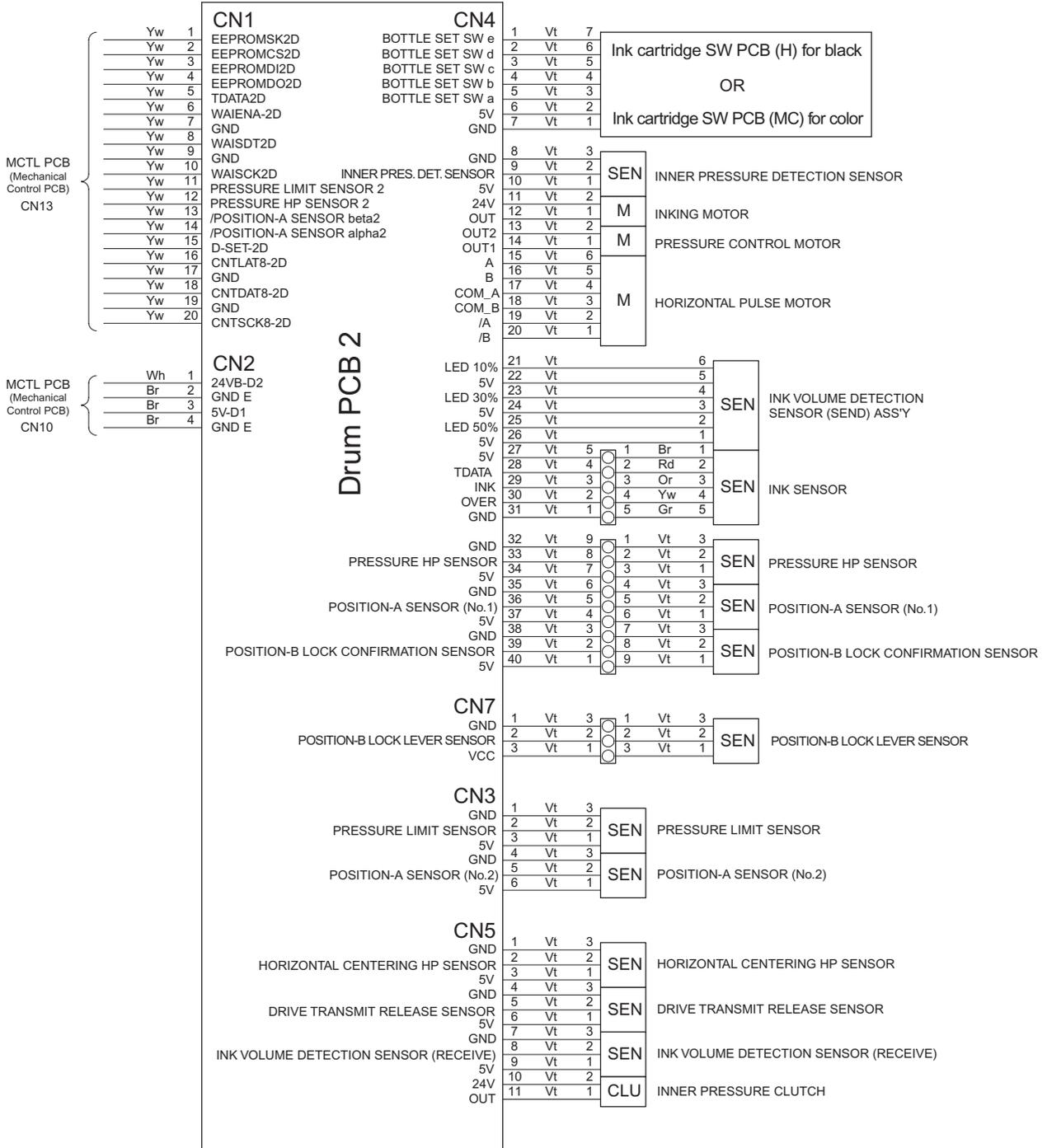
2-9-1. TPH Power PCB



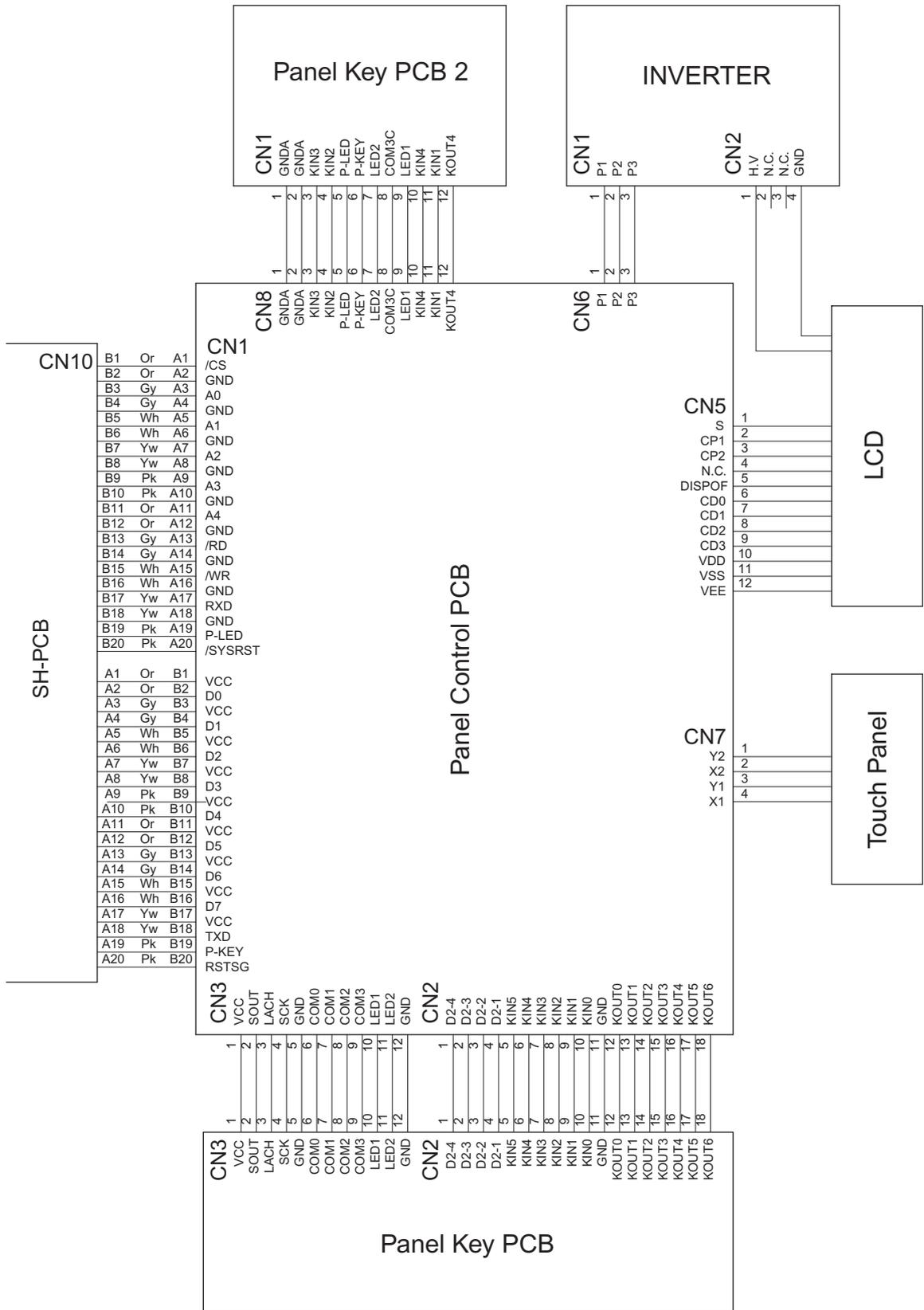
2-10-1. Drum PCB 1



2-11-1. Drum PCB 2



2-12-1. Panel Unit



# MEMO

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