RN

SERIES

TECHNICAL MANUAL

VERSION 2.0
JULY 2003

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Chapter 1: MAINTENANCE

Contents

1. Work Precautions

When conducting maintenance work, be careful to avoid injury caused by springs or the sharp edges of sheet metal.

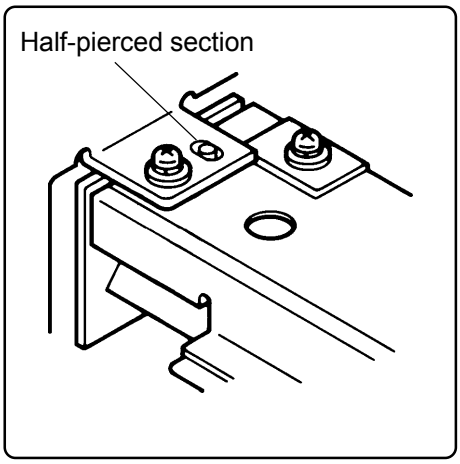
Inspection

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.



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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 pierced 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.

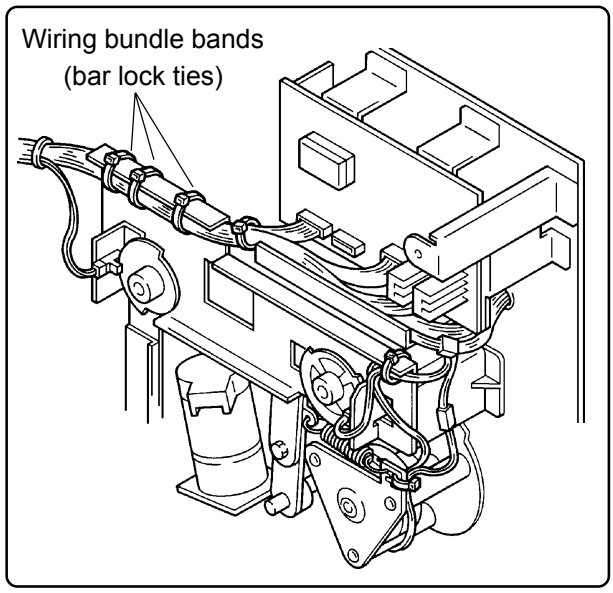
[Standard Tool list]

Type	Tip size	Shaft length, etc.
Phillips screw driver	No. 2 No. 2 No. 2 No. 1	(250 mm) (100 mm–150 mm) (stubby type) (75 mm–100 mm)
Standard screw driver	6 mm 3 mm 1.8 mm	(100 mm–150 mm) (100 mm–150 mm) (precision type)
Nut driver (box driver)	8 mm 7 mm	(100 mm–150 mm) (100 mm–150 mm)
High frequency driver	2.5 mm	
Spanners	5 mm 5.5 mm 7 mm 8 mm 10 mm 13 mm Monkey	
Hex w renches	5.0 mm 4.0 mm 3.0 mm 2.5 mm 2.0 mm 1.5 mm (For 3.0mm, 2 pieces required)	

Type	Remarks
Steel scale	150 mm
Feeler gauge	
Radial cutting pliers	
Pliers	
Nipper	
Small flashlight	
Multimeter	
Soldering iron	20 W–30 W
File	Flat, round

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.



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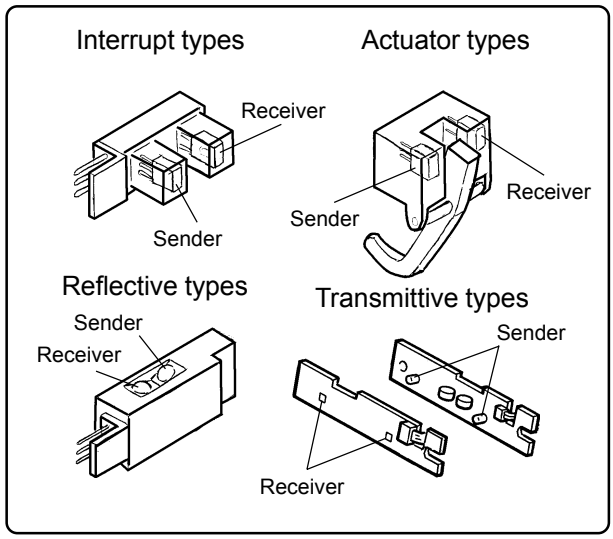
Sensor types

- Photo-electric sensors may be broadly divided into the following four types: interrupt types (U-shaped), actuator types, reflective types, and transmittive 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.



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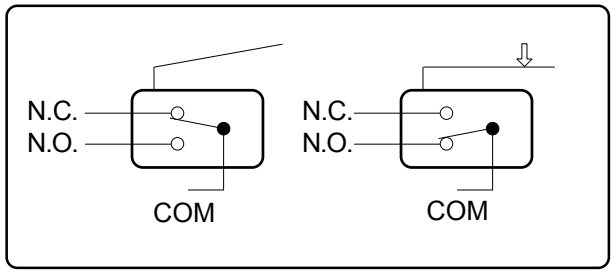
Switch types

- Microswitches may be divided between normally open (N.O.) types and normally closed (N.C.) types.
  With an N.O. connection, an internal contact is connected when the switch actuator is pressed.
  With an N.C. connection, an internal contact is disconnected when the switch actuator is pressed.



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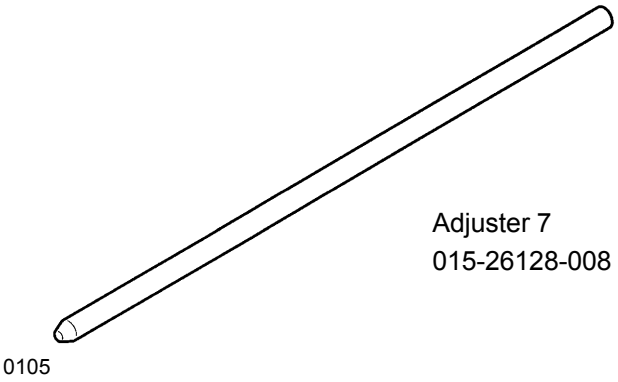
Note

The RN25 Series and RN20/21 Series are comprised of many gears. When inspecting or replacing parts, apply grease to the gears. If they are not properly greased, the gears may make abnormal sounds, and malfunctions or mechanical problems may occur.

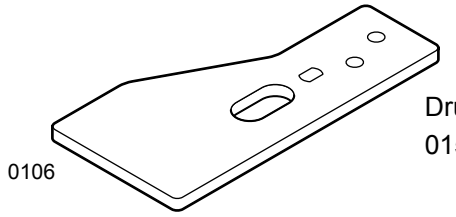
2. Jigs

[General jigs]



Adjuster 7
015-26128-008

0105

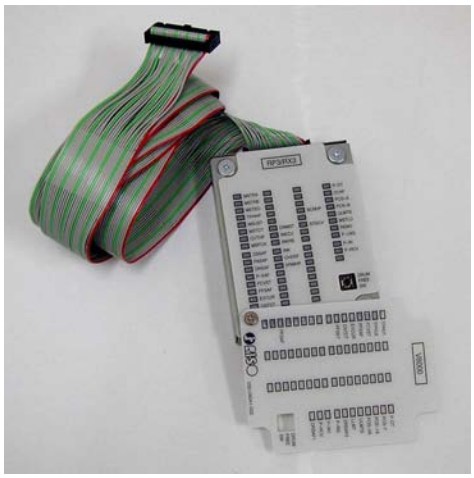


Drum stand
015-26836-002

0106

* The parts numbers are subject to change without prior notice.

[Jigs for RN25 Series]



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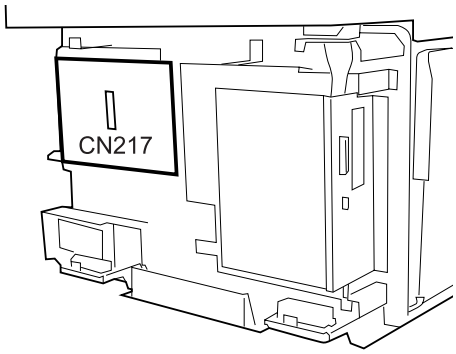
LED unit
030-90010-050

RP25x/RX25x



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Using the LED unit

(1) Remove the rear cover.
(2) Connect the cable of the LED unit to the connector (CN20) on the System PCB.
(3) Place the RN25 Series indication sheet over the LED unit.
(4) Check the printer condition by observing the LED indications on the LED unit.

* For the meanings of LED indications, see the table below.

RP25/RX25/RN25

			CPRS: Compression HP sensor
MSTED: Master end sensor			REMV: Master jam sensor
TPHHP: Master pressure sensor			FULL: Master-full sensor
MSUST: Pressure-plate set sensor		SCNHP: Flatbed HP sensor	MSTLD: Master sensor
MSTDT: Master detection sensor			CLMPA: Clamp sensor A
		STGCV: Stage cover sensor	CLMPB: Clamp sensor B
CUT: Cutter HP switch			ULMTA: Paper-feed upper-limit sensor A
MSPOS: Master standby sensor		ORGDT: Original detection sensor	ULMTB: Paper-feed upper-limit sensor B
DSSAF: Master disposable-box safety switch			POSA: Position-A sensor
FBSAF: Flatbed set switch			P-IN: Paper sensor
DRSAF: Print-drum safety switch	DRMST: Print-drum set sensor		P-RCV: Paper ejection sensor
FCVST: Front-cover set switch	DRMST: Print-drum set sensor		
P-SEL: Paper-feed pressure lever			
PFSAF: Paper-feed-tray safety-switch signal (lower limit)	DRMRV: Print drum free (DRV)		DRUM FREE SW
EVCUR: Elevator overcurrent detection signal	DSCUR: Master removal M overcurrent		
CNTDT: Electromagnetic-counter set signal	DRMHP: Print-drum withdrawal switch		

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3. Important Precautions

Precautions regarding installation

Installation location and operating environment

- Hold discussions with the customer at the time of product delivery to determine the installation location.
- The rental contract requires a fixed position for equipment installation. For details, please refer to the equipment rental contract.
- 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, cover the window with a curtain or other material.)
  (2) Those where the temperature changes drastically
  (3) Those that are too hot, cold, humid, or dry
  RECOMMENDED:
  Temperature range: 15°C–30°C
  Humidity range: 40%–70% (No condensation allowed)
  (4) Those near sources of fire or heat, or exposed to heat and any locations in the direct path of air from air conditioners or heaters
  (5) Where air circulation or ventilation is limited
  (6) Any tilted location
  (Installation height difference: 10 mm max. front - rear, 10 mm max. left - right)

Electrical connection

- Insert 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.
- Never connect the ground wire to any of the following:
  Gas pipe
  Ground wire for telephones
  Lightning rod
  Water-supply pipe or faucet (which has plastic pipes in the middle sections)

Precautions regarding use

Operation

- Do not switch off the power or unplug the power cord while the printer is in operation.
- Do not open any cover or move the printer while the printer is in operation.
- Open and close the covers gently.
- Do not place heavy items on the printer or apply impact to it.

Storage of consumables

Store consumables such as paper, masters, ink, and spare print drums properly. Do not store them in any of the following locations:

- Where they will be exposed to direct sunlight or in a bright location, such as by a window (If items must be stored in such a location, cover the window with a curtain or other material.).
- Where drastic temperature changes may occur.
- Where the temperature or humidity are particularly high or low.

Precautions regarding originals

Margins on originals

When producing an original, provide sufficient margins on the edges. Generally, on an original, printing is not allowed within 5 mm from the top, 2 mm from the bottom, and 3 mm from the right and left edges. If the margin at the top is insufficient, paper may not be properly fed.

Setting originals in the automatic original feed unit

Do not mix originals of different sizes.

The automatic original feed unit cannot be used with the following types of originals. These originals must be placed on the scanner table.

- Two or more sheets of paper placed on top of each other or held together by a paper clip or staple
- Excessively wrinkled, curled, or folded paper
- Glued or perforated paper
- Torn paper or paper with a jagged leading edge
- Paper with a carbon coating on back
- Transparent sheets such as OHP films and tracing paper
- Paper with an extremely smooth surface, such as art paper or coated paper

Cautions regarding printing paper

Types of copy paper

The best results can be achieved with paper designed for digital duplicators.

When using drafting paper or other thick paper, move the paper-feed pressure adjustment lever to the “CARD” position, and also adjust the stripper unit and paper-ejection wings on the paper-receiving tray.

Confirm that no sheets are stuck together before placing them in the tray.

Paper not suitable for use in the Risograph

Do not use any of the following paper types, as they may cause a paper jam:

- Chemically treated paper such as heat-sensitive paper and paper with a carbon coating on the face
- Excessively wrinkled, curled, folded, or damaged (torn) paper
- Coated paper
- Torn paper or paper with a jagged leading edge
- Art paper

Storage of paper

Store paper in a dry location. Damp paper may cause jamming or poor printing results.

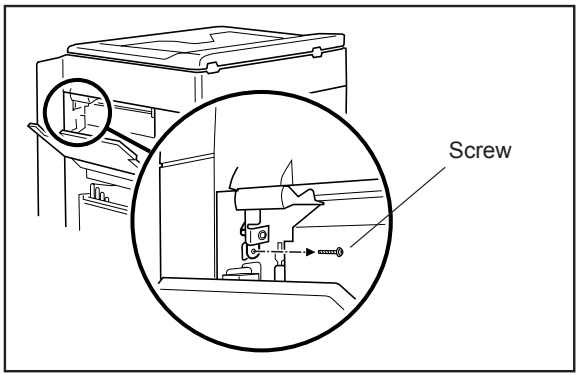
NOTE

4-1. Unpacking (RN25 series)

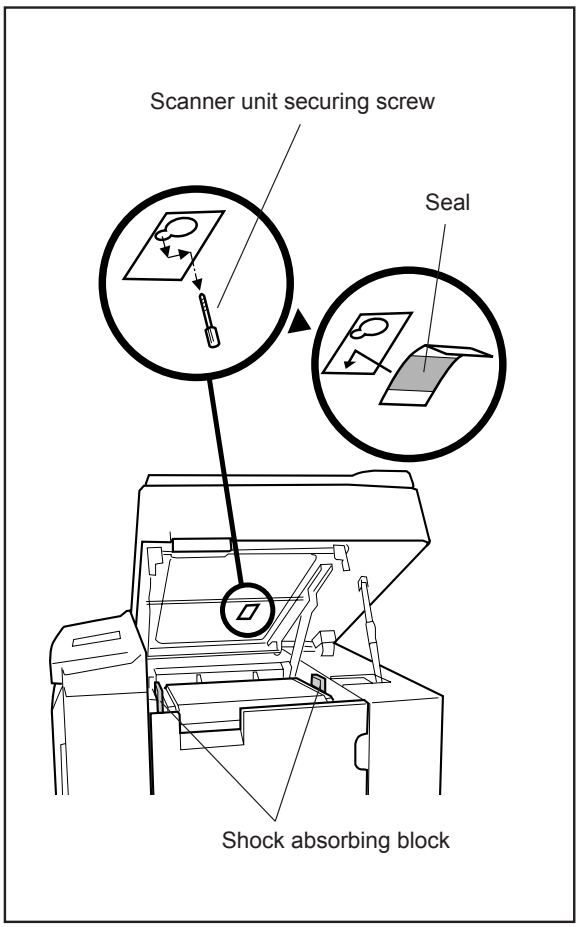
Installation Procedure

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.



1. Open the master roll cover and remove the screw which locks the scanner table.



2. Open the scanner table and unscrew the scanner unit securing screw. Then remove the screw from the unit sliding it sliding it to the right-hand.
3. Cover the hole, from which the scanner unit securing screw was removed, with the seal. (To affix the seal easily, it is recommended to make a tab beforehand by folding its edge.)
4. Remove the shock absorbing blocks on both sides of the Master loading unit.

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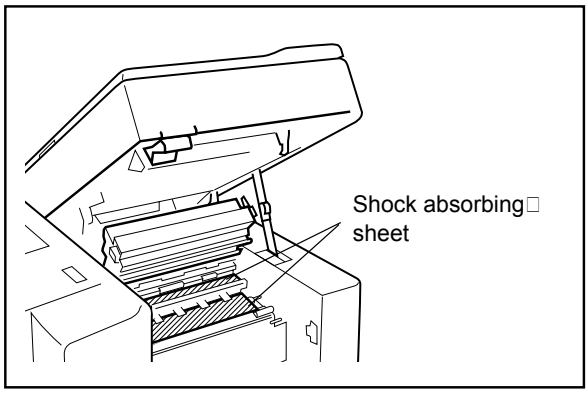
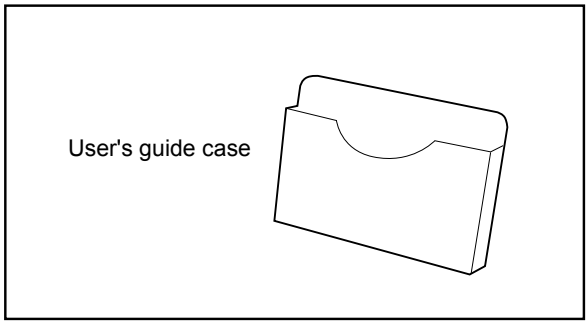


5. Open the Master loading unit and remove the shock absorbing sheets.

6. Start up the test mode of the printer and activate the "Scanner release action" (No. 155).



7. Remove the adhesive cover sheet from the User's guide case and affix the case on the printer. Be sure to consult your customer for the attachment position.

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4-2. Unpacking (RN20/21 series)

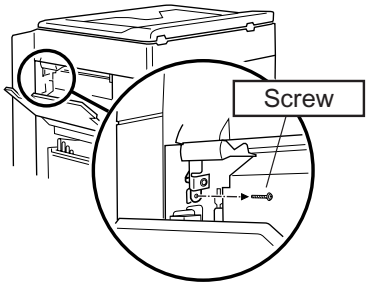
Installation Procedure

The following procedures are required before turning on the printer.

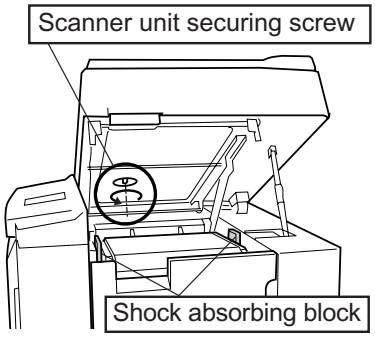
Caution

Be sure not to turn the power ON without releasing the scanner unit securing screw. Otherwise, it may cause damage to the printer.

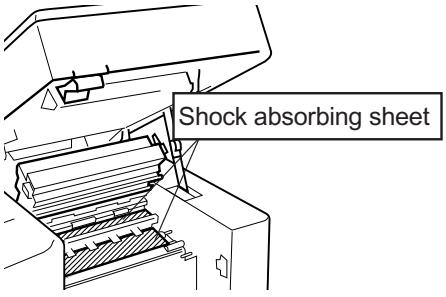
1. Open the master roll cover and remove the screw which locks the scanner table.



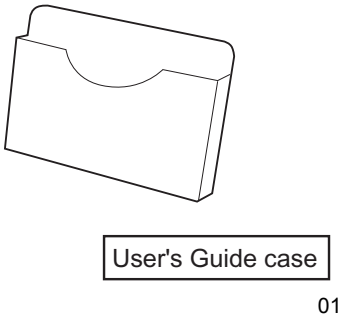
2. Open the sanner table and release the scanner unit securing screw.
3. Remove the shock absorbing blocks on both sides of the Master loading unit.



4. Open the Master loading unit and remove the shock absorbing sheets.
5. Start up the test mode of the printer and activate the "Scanner release action" (No. 155).



6. Attach the User's guide case to the printer. Remove the adhesive cover sheet on the backside and affix the case on the printer. Be sure to consult your customer for the attachment position.



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5. Installation Procedure for the RN-B4 Inkless Print Cylinder (Drum)

Important

- The inkless drum is only for color ink. (Black ink cannot be used.)
- Be sure that the print cylinder (drum) temperature is above 59°F (10°C).

1. Print Cylinder (Drum) Preparation
   (1) Insert an ink cartridge into the Ink cartridge holder.
   (2) Put the print cylinder (drum) in the printer and start the test mode.
   (Do not turn off the main power switch until the initial inking operation is completed.)
   (3) Press the C key or the Stop key to clear the displayed error message “D02-532.”
   (4) Input the test item code “No. 588” and press the Start key to open the print cylinder (drum) code entry window.
   Enter “4” using the ten-key pad, and press the Start key. The display shows “Executing.” Upon completion of the process, the print-drum-code entry window disappears. (Execution time: Approx. 9 sec)
   (5) Enter Test Mode No. 575 (Inking Operation), and press the Start key. The display shows “Executing.” (Execution time: Approx. 80 sec)
   When the display shows “Finished,” press the Stop key to turn off the indication. (If the operation is interrupted before “Finished” appears due to an error, execute Test Mode No. 575 again. The print-drum code normally becomes effective after the inking operation is completed.)
   * Execute the following test mode only for printer models RP215/250/255, RX215/250/255, and RE23P.
   Enter Test Mode No. 875 (Ink Color), and press the Start key.
   From the table below, select a color to be used, enter its code No. using the ten-key pad, and then press the Start key.

Code	Color	Code	Color	Code	Color	Code	Color
33	Black	41	Red 4	49	Purple	57	Gold
34	Blue	42	Green	50	Purple 2	58	Gold 2
35	Blue 2	43	Green 2	51	Gray	59	Silver
36	Blue 3	44	Green 3	52	Gray 2	60	Silver 2
37	Blue 4	45	Yellow	53	Light gray	61	Pink
38	Red	46	Yellow 2	54	Light gray	62	Pink 2
39	Red 2	47	Brown	55	Orange	63	Custom
40	Red 3	48	Brown 2	56	Orange 2	64	Color

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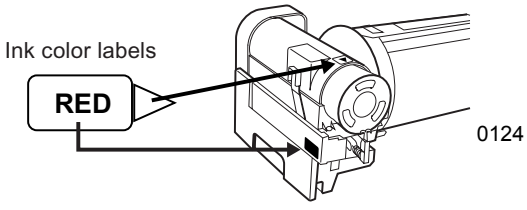
   (6) Hold down the Reset key for more than 2 seconds or restart the printer to quit the test mode.
2. Image Check
   (1) Using Test Chart No. 8, create a master, and print approximately 200 copies.
   (2) Check the printed images.

3. Labeling
   Put the corresponding ink color indication labels on the print cylinder (Drum).



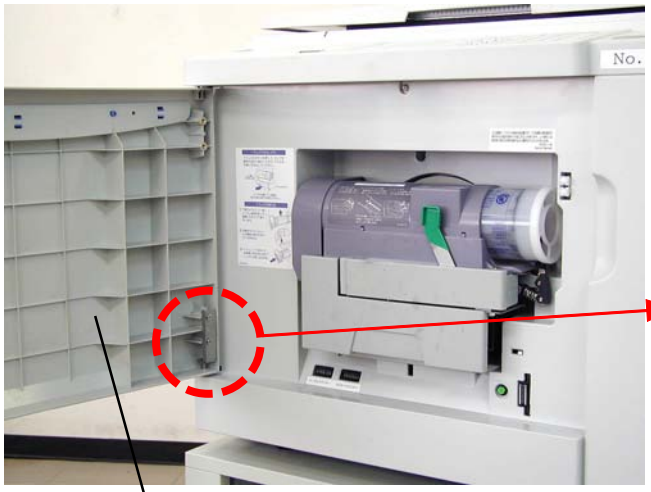
MEMO

6. Exterior Cover Removal

Bring the print drum to position A, unplug the power cord, and remove the outer covers.

FRONT COVER

- Remove the mounting screws (bind, M4 x 8: 2 pcs), remove the lower hinge, and dismount the front cover.



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Front cover

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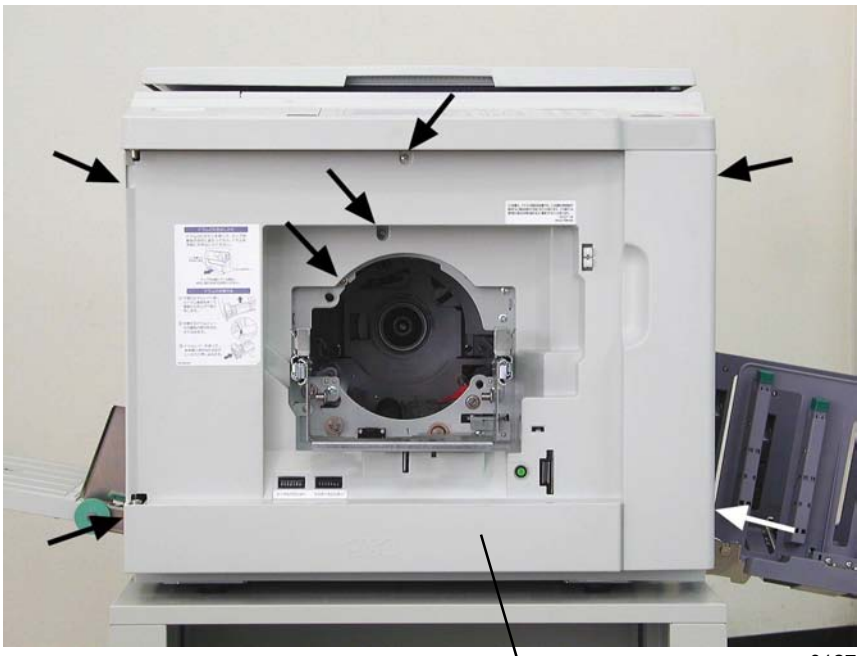
Hinge

FRONT FRAME COVER

- Pull out the print drum, remove the mounting screws (bind, M4 x 8: 7 pcs), and remove the front frame cover.



0127

Front cover

REAR COVER

- Remove the mounting screws (bind, M3 x 5: 1 pc each) from the two controller connector locks, and dismount the two connector locks.
- Remove screws (bind, M4 x 8: 4 pcs) and remove the rear cover.

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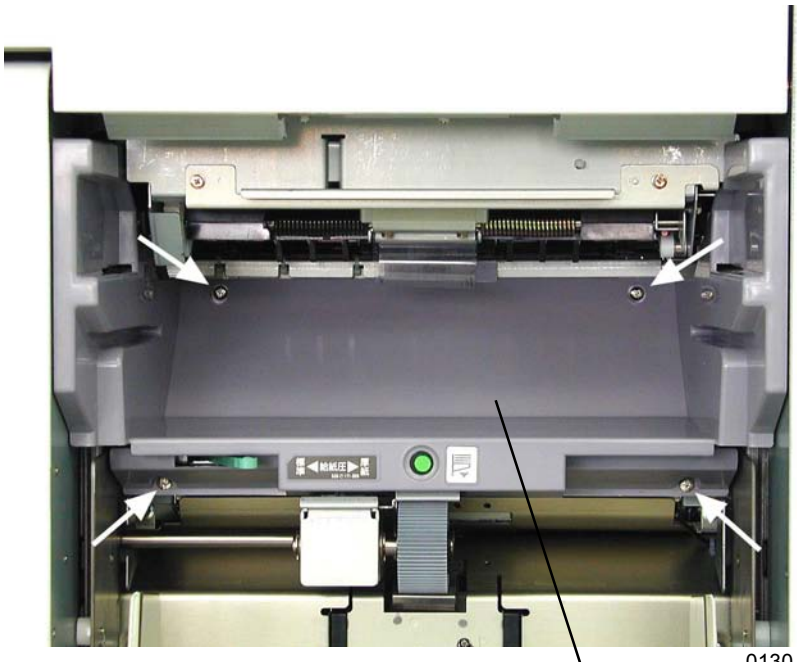
Rear cover

0129

Connector lock

MASTER REMOVAL LOWER COVER

- Remove the master disposal box.
- Remove screws (bind, M4 x 8: 4 pcs) and remove the master removal lower cover.



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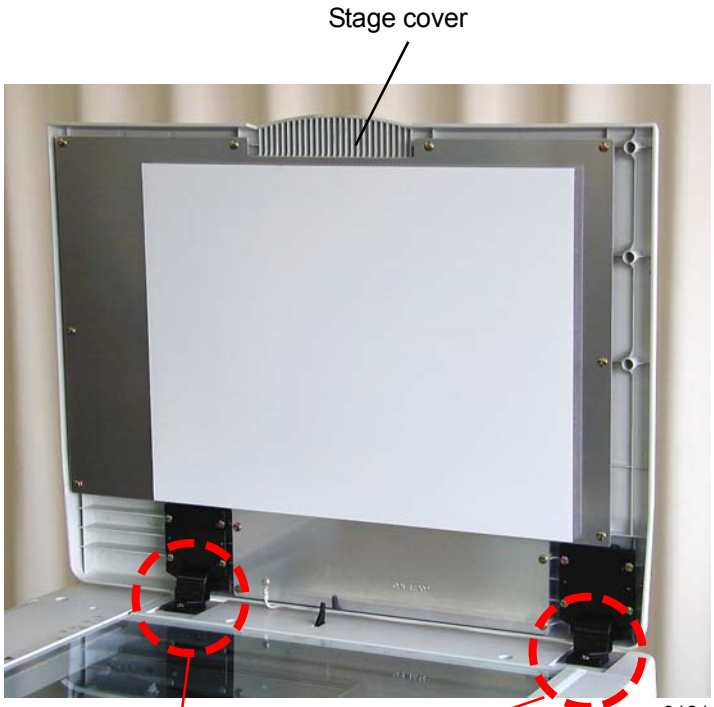
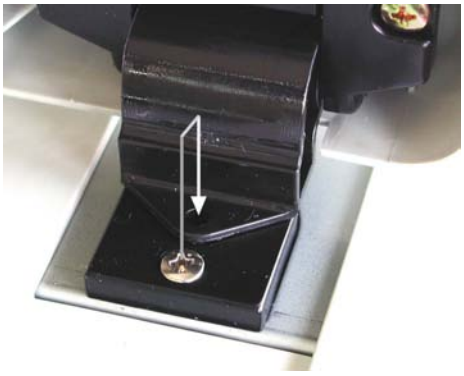
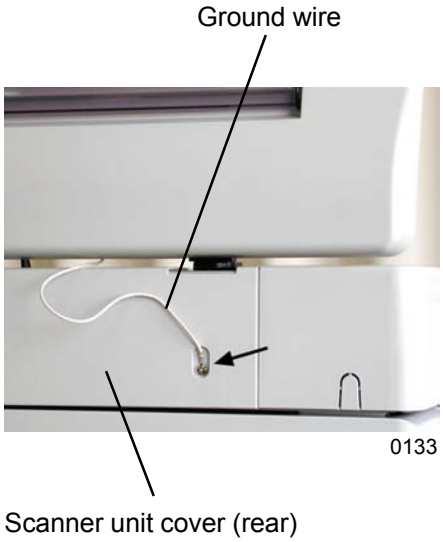
Master removal lower cover

STAGE COVER

- Remove mounting screw (bind,M4 x 10: 1 pc) from each of the two hinges (right and left) of the stage cover, and then as shown on the photograph, attach those screws in the screw holes behind.
- Remove screw (bind, M4 x 8: 1 pc) on the scanner unit cover (rear) to detach the ground wire from the machine, and then lift the stage cover off the machine.







SCANNER UNIT COVER (LEFT)

- Remove mounting screw (bind, M4 x 8: 4 pcs) and remove the scanner unit cover (left).

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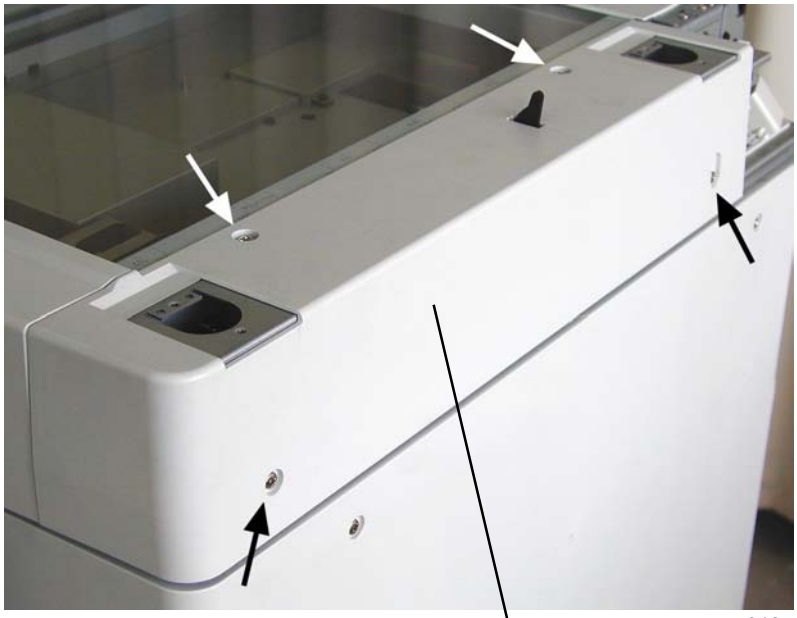
Scanner unit cover (left)

SCANNER UNIT COVER (REAR)

- Remove the stage cover.
- Remove mounting screw (bind, M4 x 8: 4 pcs) and remove the scanner unit cover (rear).



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Scanner unit cover (rear)

SCANNER UNIT COVER (FRONT)

- Open the scanner table. Remove the mounting screws (bind, M4 x 8: 3 pcs) and dismount the scanner table.

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SCANNER UNIT COVER (RIGHT)

- Remove scanner unit cover (front) and scanner unit cover (rear).
- Remove mounting screw (bind, M4 x 8: 2 pcs) and remove the scanner unit cover (right).

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7. Opening the PCBs (RN25 series)

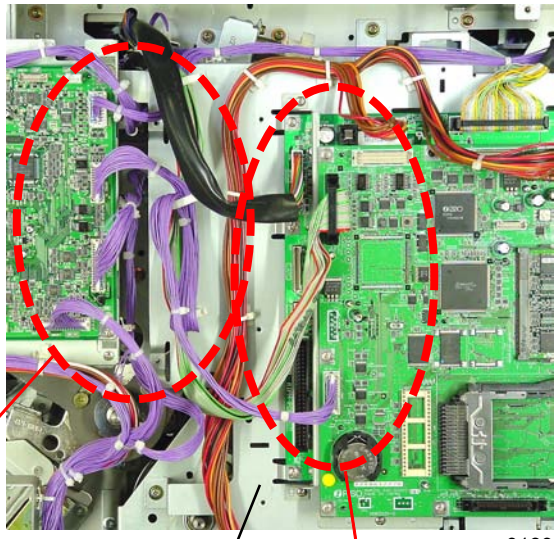
Opening the Main PCB bracket

- Remove the rear cover.
- Remove the four PCB cover-mounting screws (bind, M3 x 5), and remove the PCB cover.
- Disconnect the four connectors. (Disconnection of the CN4 connector disallows master-making operations.)
- Remove the wire harness from the three wire saddles on the main PCB bracket.
- Remove the five mounting screws (double-washer, M4 x 8) from the main PCB bracket, and open the main PCB bracket.

[Precautions on Reassembly]

- Take care not to trap the wire harness when opening or closing the main PCB bracket.

0138



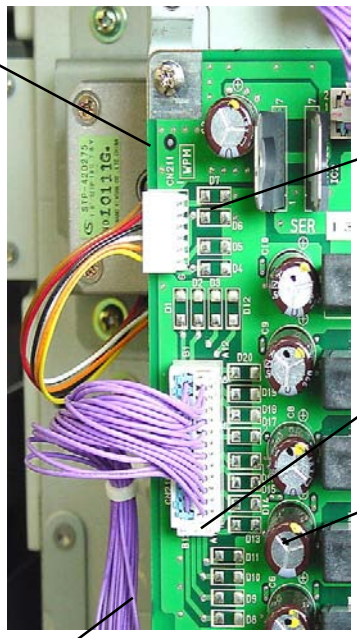
0139

Main PCB bracket

Connector

0140

Connector

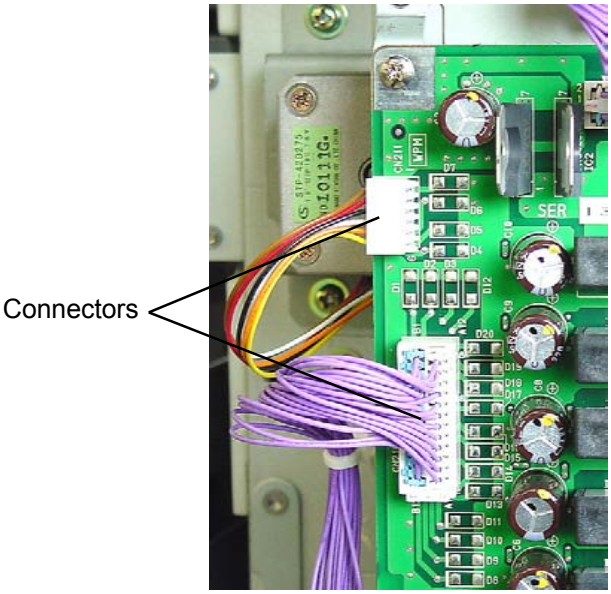


0141

RIPM-PCB

Opening the System PCB bracket

- Remove the rear cover.
- Disconnect two connectors from the System PCB.
- Remove the four mounting screws (bind, M3 x 5), and open the System PCB bracket.



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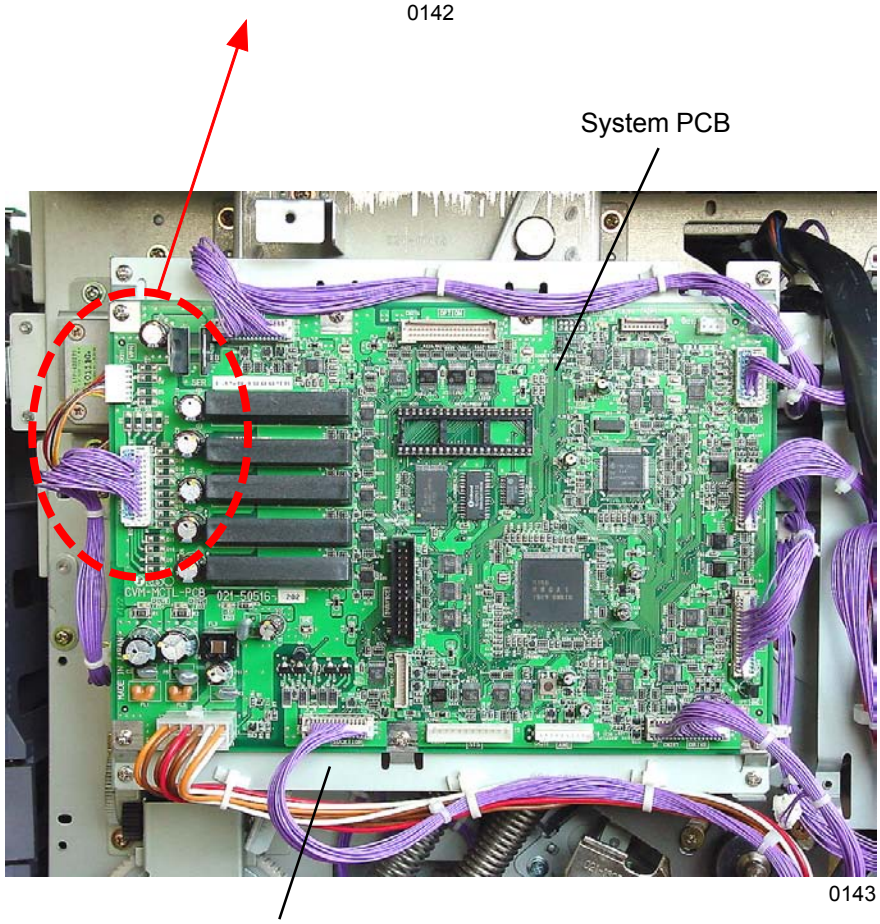
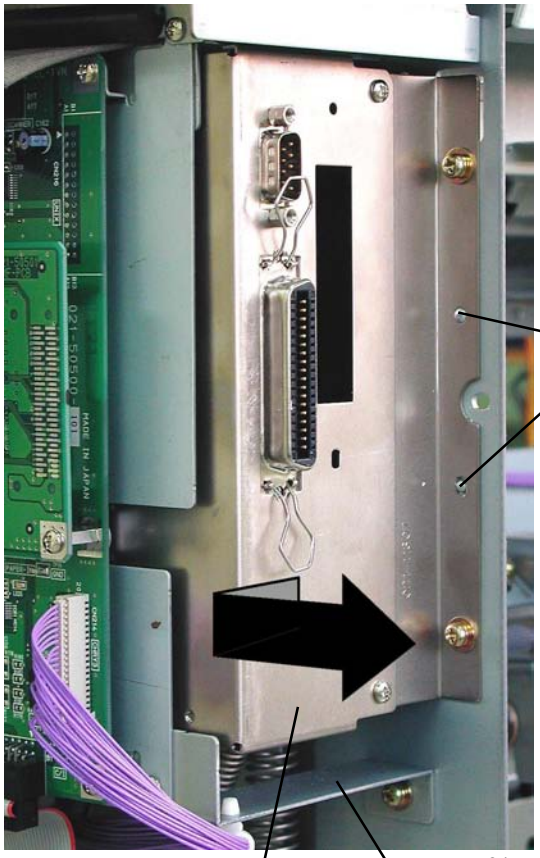


0143

8. Removal of the Controller and Main PCBs (RN20/21 series)

CONTROLLER

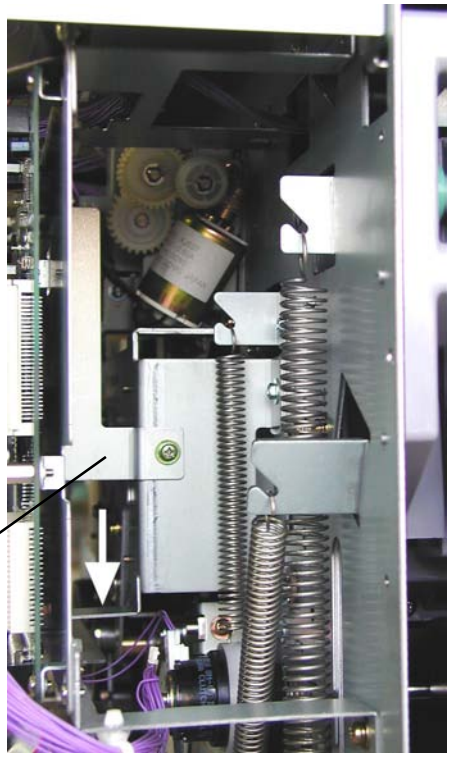
- Remove the rear cover.
- Disconnect three connectors from the controller (1 on the top and 2 on the bottom of the controller).
- Remove screws (double-washer, M3 x 6: 2 pcs), and pull the controller a little bit to the front, just enough to clear the half-pierced sections, and slide the controller out of the machine.



Half-pierced sections

0144

Controller



System PCB support bracket A

0145

[Precautions on Reassembly]

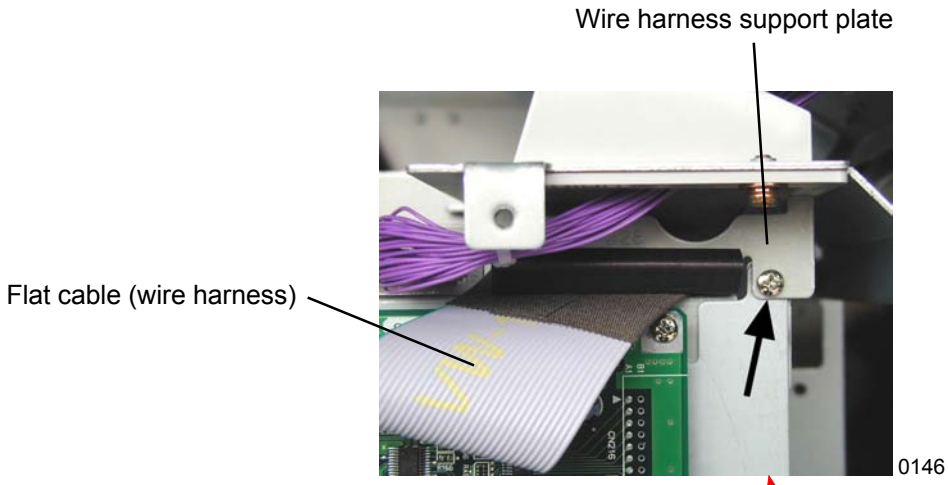
- Place the controller at the location of the Main PCB support bracket A indicated by the arrow, and push it into the unit.

MAIN PCB

- Remove the rear cover.
- Remove screws (bind, M3 x 5: 1 pc), and remove the wire harness support plate.
- Disconnect all the connectors from the main PCB, remove screws (bind, M3 x 5: 6 pcs), and then remove the main PCB together with the main PCB support bracket B.

[Precautions on Reassembly]

- Attach the wire harness support plate while pushing it down against the wire harness (flat cable) to hold the wire harness firmly in position.



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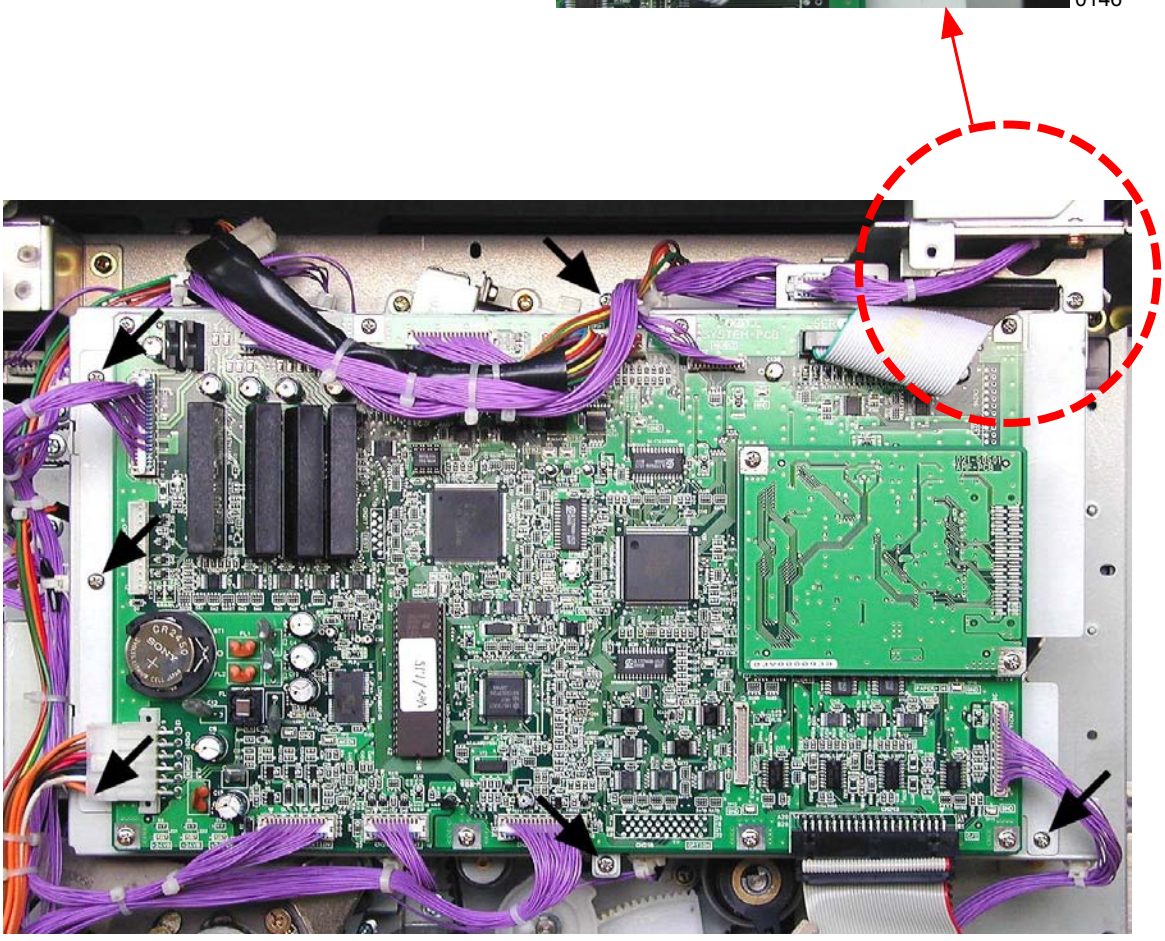
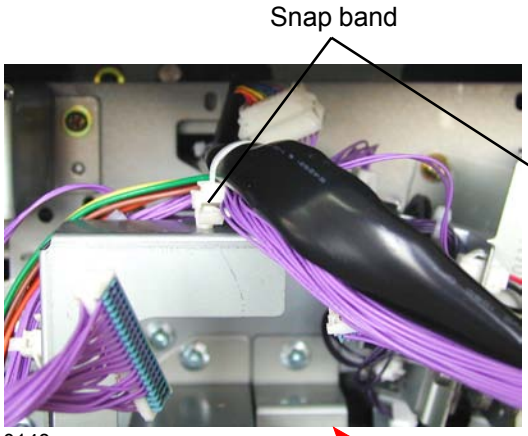


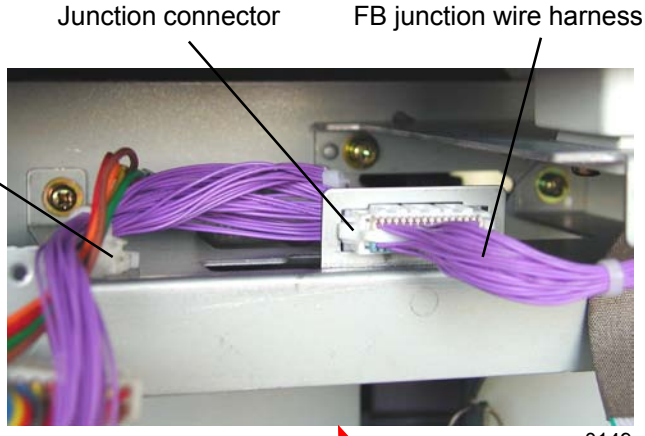
0147

MAIN PCB SUPPORT BRACKET A

- Unplug the connector of the FB junction wire harness from the junction connector, and then detach the junction connector from the main PCB support bracket A.
- Remove seven snap bands from the main PCB support bracket A.
- Remove screws (double-washer, M4 x 6: 5 pcs) and detach the main PCB support bracket from the machine.



0148



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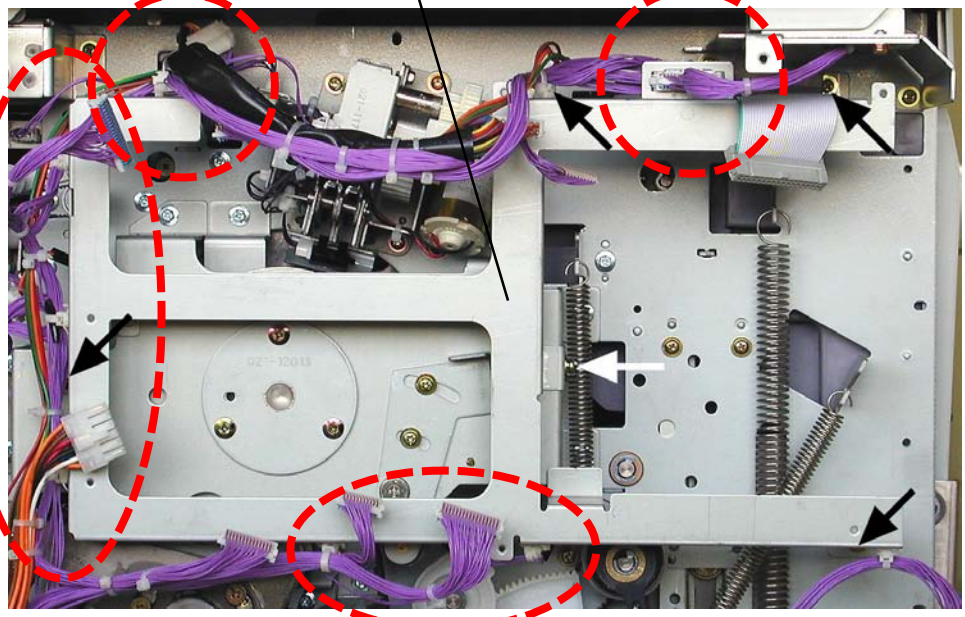

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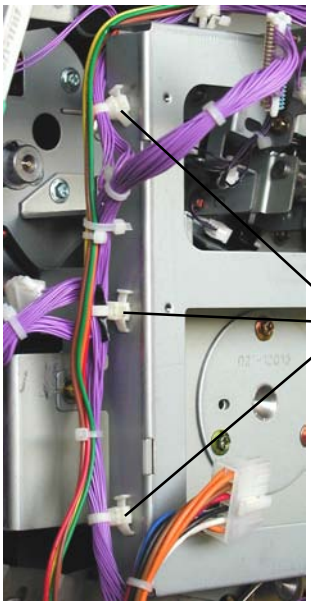

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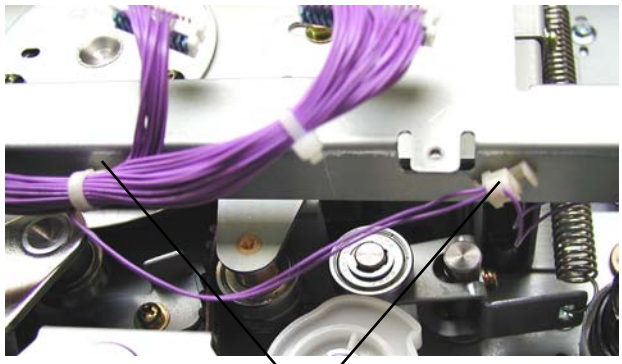


0152

Snap band

CHAPTER 2: MACHINE SUMMARY

Contents

1-1. Specifications (RN25 Series)

Given on this and next page are general specification of the RN series machines.
Refer to Users Guide (operations manual) on each model for more detailed specification of the machines.

Specifications	RN25Series
Original Size	A3 (297x420mm) or Ledger (11"x17") Min. Business Card (50x90mm) or 2"x3.5"
Scanning Resolution	400x400dpi
Paper Size	Max. 290x395mm (11.5"x15.5") Min. 90x140mm (3.5"x5.5")
Paper Weight	46-210g/m2 (13-lb bond to 110-lb index)
Image Area	RN2550: 251x357mm RN2530: 8.3"x14.0" RN2500: 210x290mm
Paper Capacity	Feed Tray: 1,000 sheets (64g/m2 or 16-lb bond) Receiving Tray: 1,000 sheets (64g/m2 or 16-lb bond)
Print Speed	5 selectable print speeds (60 to 130 copies per minute)
Dimensions In use (WxDxH)	1,300x695x635mm (51.2"x27.4"x 25.0")
In storage (WxDxH) Weight	735x695x635mm (28.9"x27.4"x25.0") 106kg (233lbs.)

0214

Specifications are subject to change without notice.

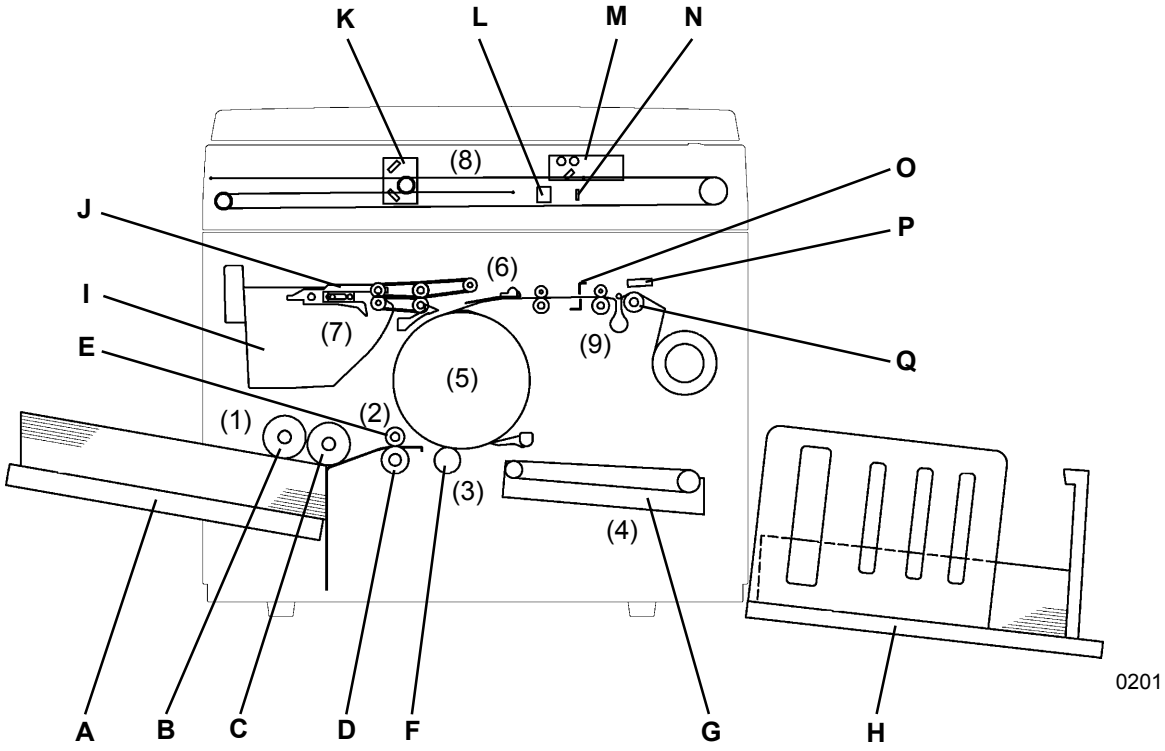
1-2. Specifications (RN20/21 Series)

Specifications	RN21 Series (Computer interface standard)	RN20 Series
Original Size	Max. A3 (297x420mm) or Ledger (11"x17") Min. Business Card (50x90mm) or 2"x3.5"	
Scanning Resolution	300x400dpi	
Paper Size	Max. 290x395mm (11.5"x15.5") Min. 90x140mm (3.5"x5.5")	
Paper Weight	46-210g/m2 (13-lb bond to 110-lb index)	
Image Area	RN2150: 251x357mm RN2130: 8.3"x14.0" RN2100: 204x290mm (A4 Drum)	RN2050: 251x357mm RN2030: 8.3"x14.0" RN2000: 204x290mm(A4 Drum) 8.3"x11.4"(Letter Cylinder)
Paper Feed	Feed Tray : 1,000 sheets (64g/m2or 16-lb bond) Receiving Tray : 1,000 sheets (64g/m2 or 16-lb bond)	
Paper Receiving Tray Capacity	1,000 sheets (64g/m2 or 16-lb bond)	
Print Speed	5 selectable print speeds (60 to 130 copies per minute)	
Dimensions In use (WxDxH)	1,300x645x600mm (51.2"x25.4"x23.6")	
In storage (WxDxH)	735x645x600mm (28.9"x25.4"x23.6")	
Weight	Approx. 97kg (213lbs.)	Approx. 95kg (209lbs.)

0215

Specifications are subject to change without notice.

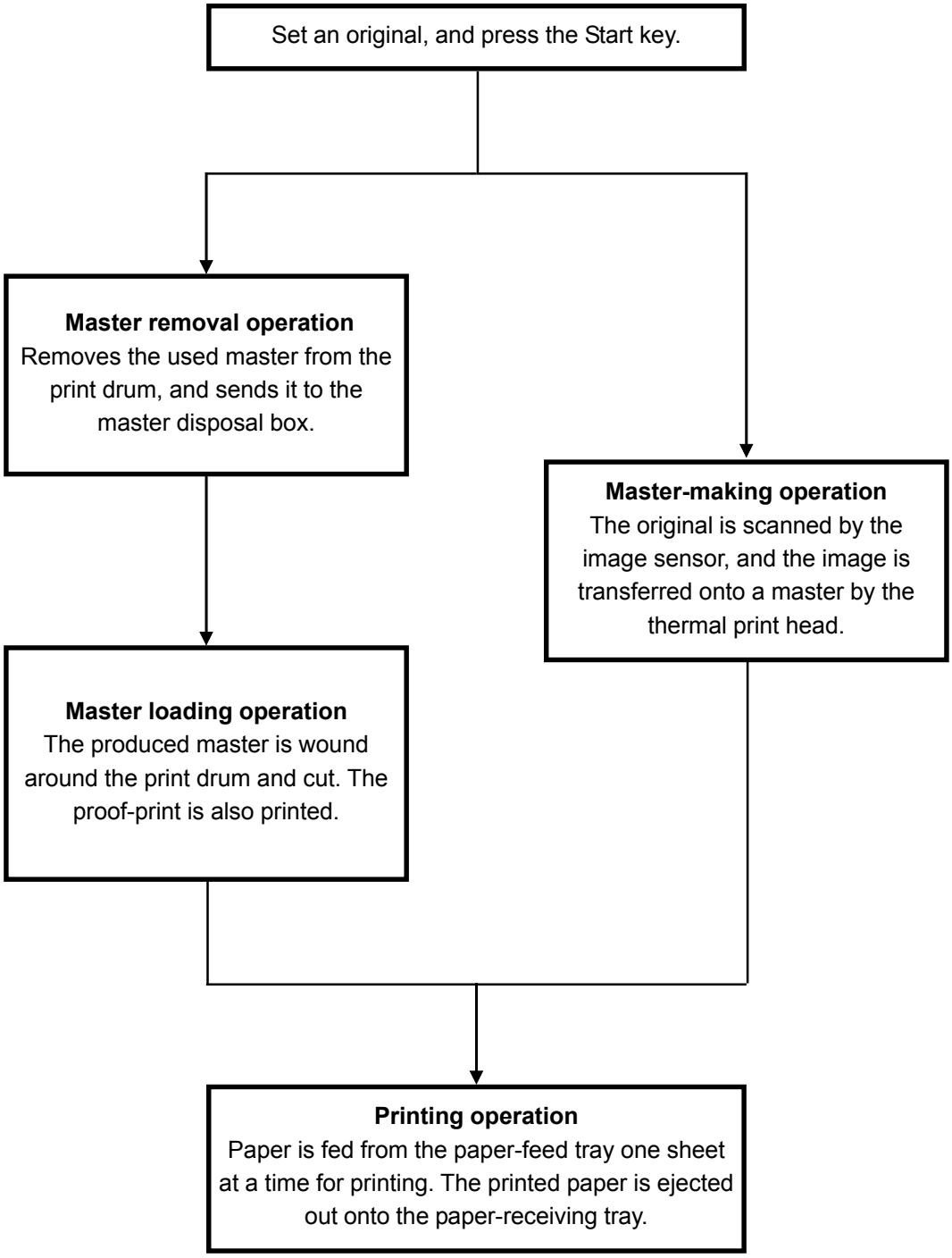
2. Cross-Sectional Diagram



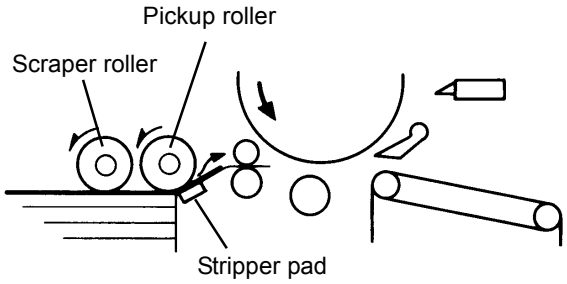
(1)	First paper-feed area	Sends paper from the paper-feed tray one sheet at a time.
(2)	Second paper-feed area	Stops the paper sent from the first paper-feed stage, and accurately feeds it to the print drum and pressure section.
(3)	Printing section	The pressure roller presses the paper firmly against the print drum for printing and feeding.
(4)	Paper-ejection section	Removes the printed paper from the print drum using the separator, and sends it to the paper-receiving tray.
(5)	Print cylinder (drum)	Supplies ink from the ink cartridge to the surface of the print drum for printing.
(6)	Clamp unit	Clamps the leading edge of a master.
(7)	Master-removal section	Peels the master from the print drum after use, and discharges it into the master disposal box.
(8)	Flatbed section	The lamp carriage and mirror carriage move, and the CCD unit scans the original on the scanner table.
(9)	Master-making section	Transports and creates a master using the thermal print head, then sends the produced master to the print drum, where it is cut.

A: Paper-feed tray
B: Scraper roller
C: Pickup roller
D: Timing roller
E: Guide roller
F: Pressure roller
G: Suction unit
H: Paper-receiving tray
I: Master disposal box
J: Compression plate
K: Mirror carriage
L: Lens
M: Lamp carriage
N: CCD
O: Cutter
P: Thermal print head
Q: Write roller

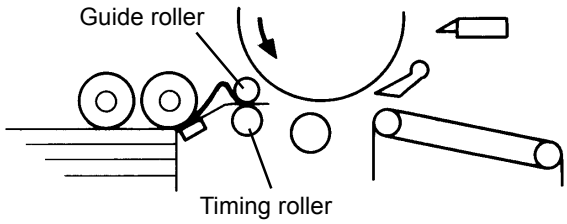
3. Operation Outline



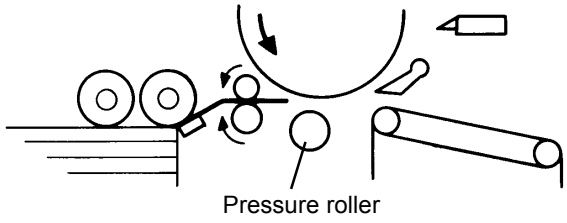
4. Outline of Paper-feeding, Printing, and Paper-ejection Operations



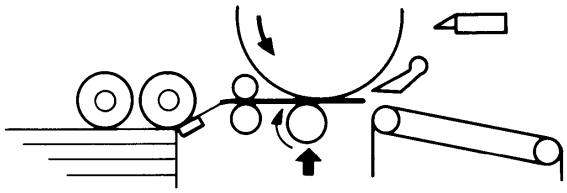
(1) When the print drum rotates, the scraper roller and pickup roller also turn to feed paper. The stripper pad allows only one sheet to pass through to the second paper-feed area.



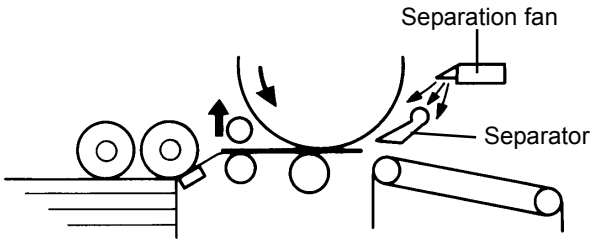
(2) The paper sent from the first paper-feed area contacts the timing roller and guide roller, and stops temporarily. This causes slight buckling of the paper.



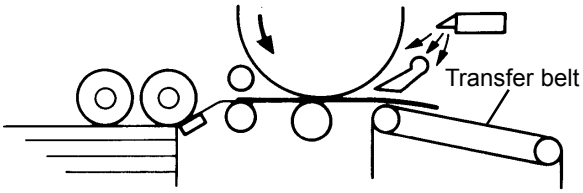
(3) The timing roller and guide roller start rotating, feeding paper to the pressure section. (This operation is referred to as the “second paper-feed drive.” To prevent tension from being placed on the end of the paper, the scraper roller and pickup roller are free to spin.)



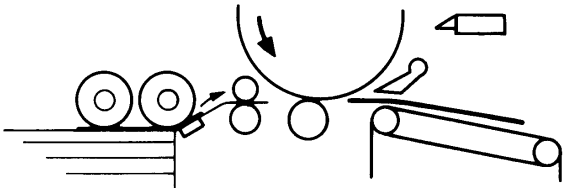
(4) When the paper is sent from the second paper-feed stage, the pressure roller rises to clamp the paper between the drum and pressure roller, and then the printing operation starts.



(5) The printed paper is removed from the print drum by the separator and separation fan. When the pressure roller rises, the guide roller also moves up to prevent tension from being placed on the end of the paper.

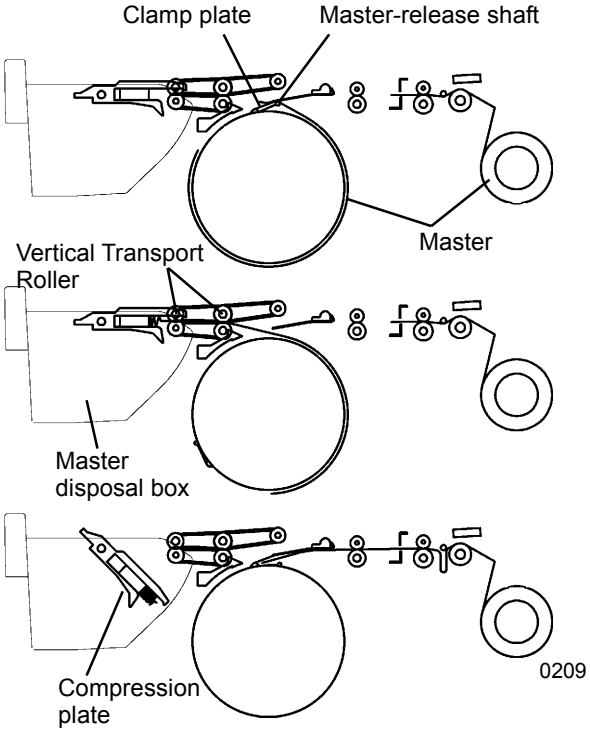


(6) Then, the suction fan blows air to keep the paper firmly on the transfer belts while the paper is carried to the paper-receiving tray.



(7) The next sheet of paper is sent to the first paper-feed stage, and the guide roller lowers.

5. Outline of Master-removal, Master-making, and Master-laoding Operations

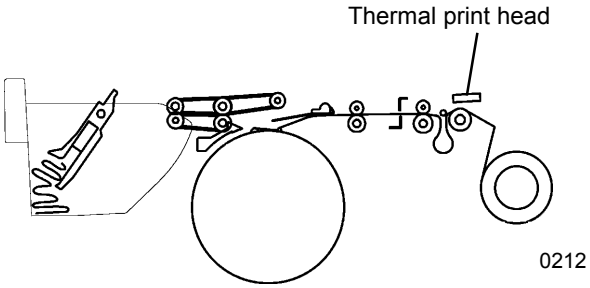


Master-removal operation

(1) The clamp plate holding the leading edge of the master opens, and the master-release shaft rises to lift off the master.

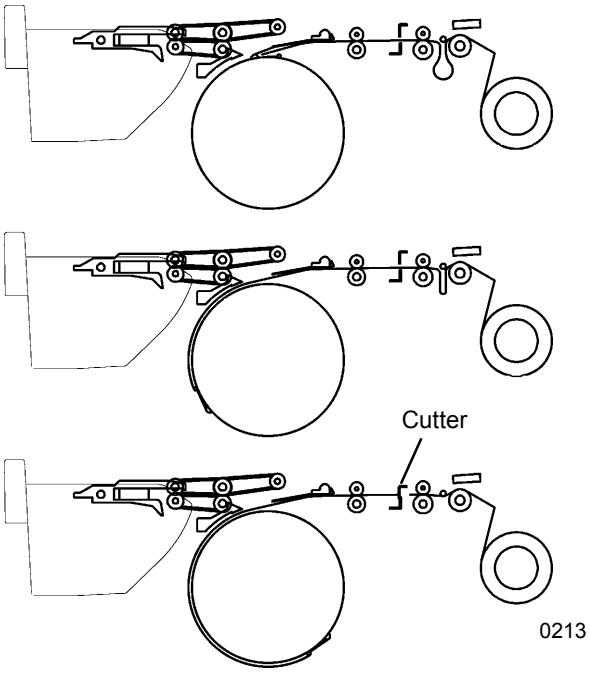
(2) The vertical transport roller and print drum rotate, thereby separating the master and sending it to the master disposal box.

(3) The motion of the compression plate starts, pressing the master into the master disposal box.



Master-making operation

(1) The image sensor scans the original, and the thermal print head transfers the image onto a master.



Master-loading operation

(1) The master is sent to a location above the print drum, and the leading edge is clamped by the clamp plate.

(2) The print drum rotates to wind the master around it.

(3) The cutter cuts the master.

[Memo]

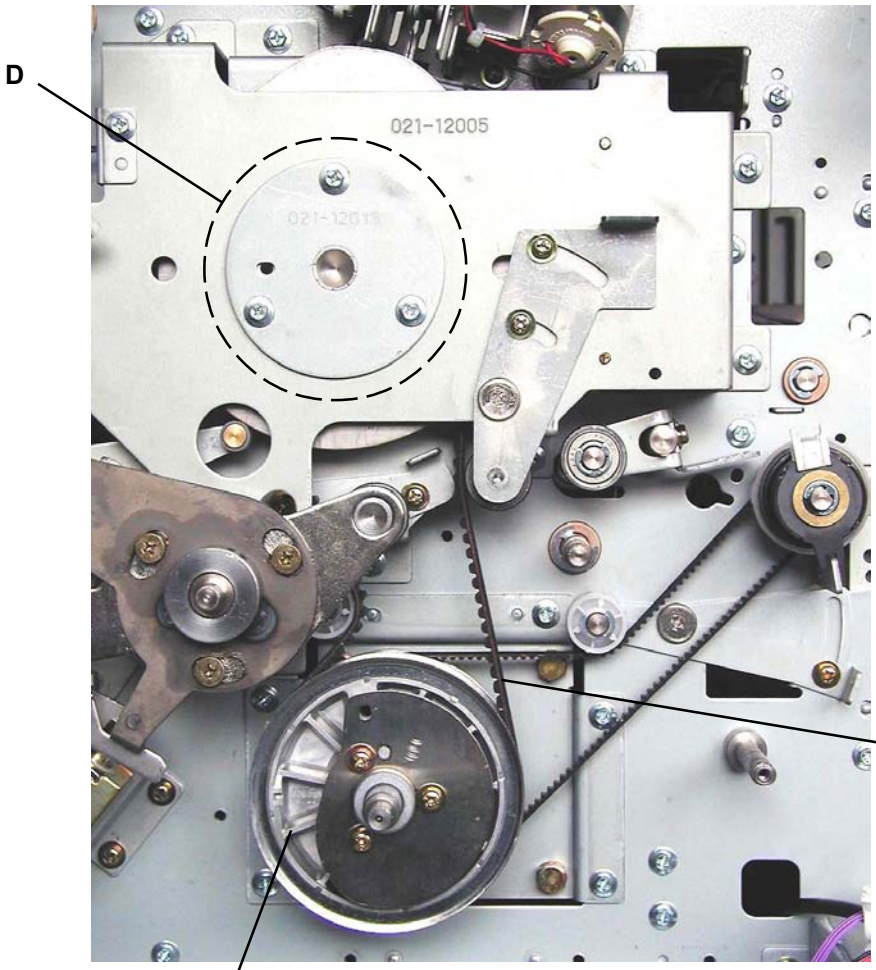
CHAPTER 3: MAIN DRIVE SECTION

Contents

Mechanism

1. Main Drive Section

When the main motor [A] is turned on, the main pulley [B] rotates and the rotation is transmitted to the print drum pulley [D] via the main belt [C].
The main motor encoder sensor [E] detects the speed and position of the main motor [A].



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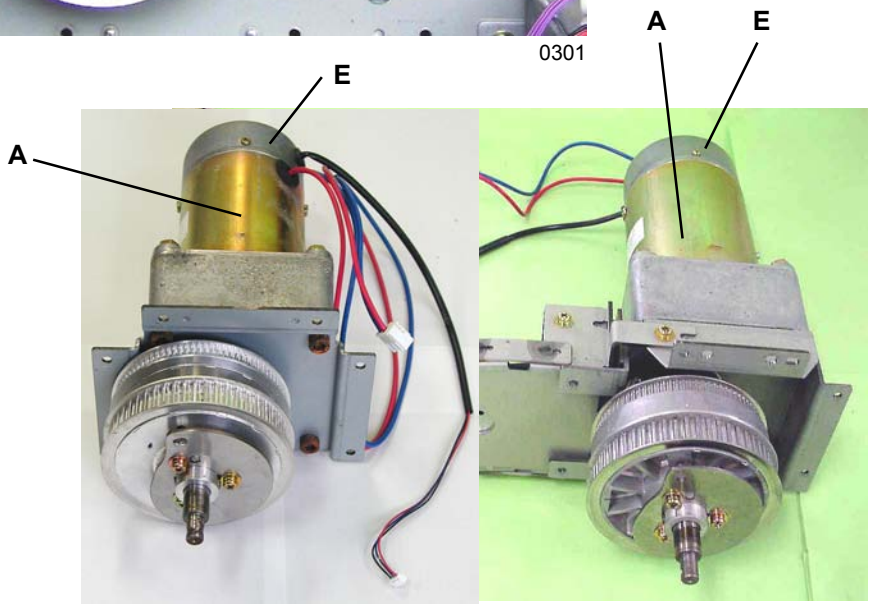


0302 **<RN20/21 Series>**

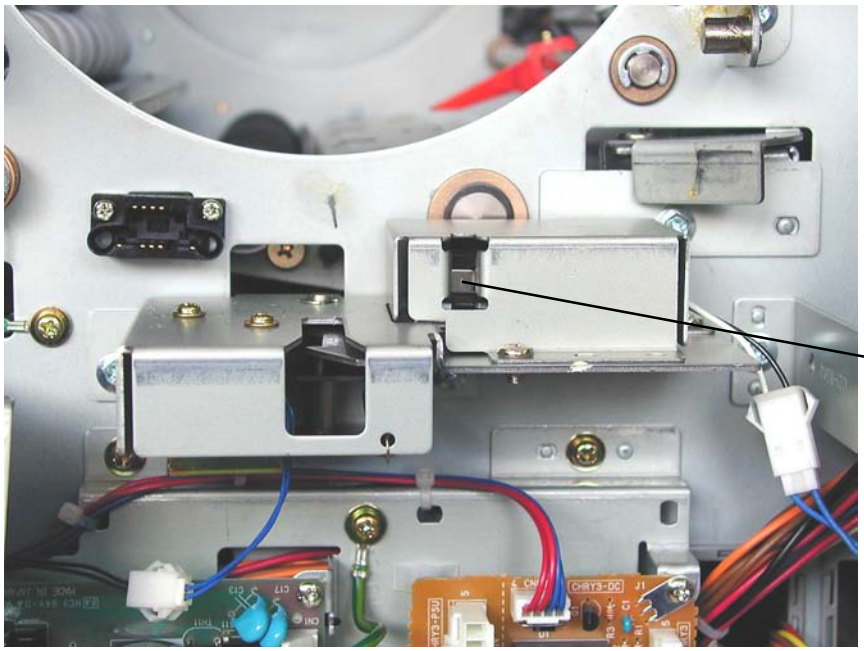
0303 **<RN25 Series>**

A: Main motor
B: Main pulley
C: Main belt
D: Print drum pulley
E: Main motor encoder sensor

2. Main Motor Safety Mechanism

Two safety switches (flatbed set switch [A] and print drum safety switch [B]) prevent the motor from being turned on if parts are not positioned.

0304

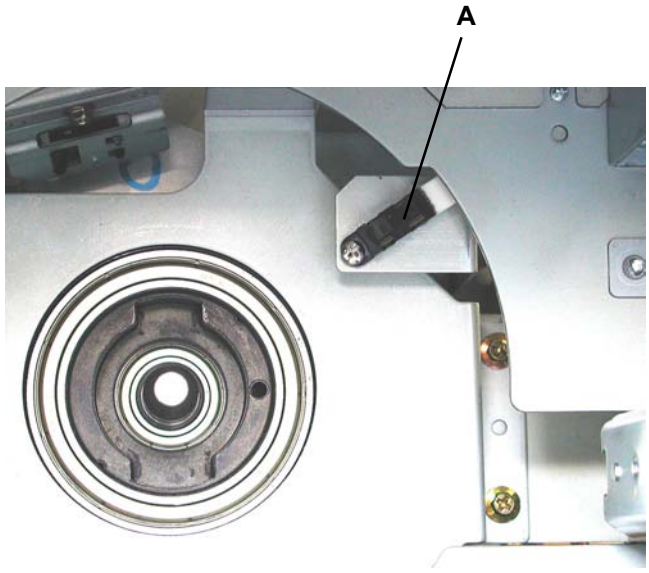


0305

A: Flatbed set switch
B: Print drum safety switch

3. Print Drum Position Check Mechanism

The print drum's rotation position is detected by the main motor encoder sensor referenced to the position A detected by the position A sensor [A] on the machine and position A detection plate [B] on the print drum.
Position A refers to the position where the print drum is located after the position-A detection plate blocks the optical axis of the position-A sensor and the printer drum rotates according to the specified pulses and compensation value.
The encoder counts 2933 pulses for each revolution of the print drum.



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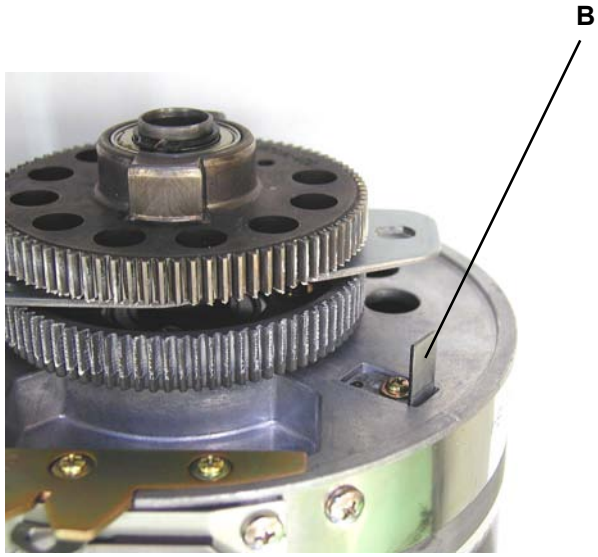


0307

A: Position-A sensor
B: Position-A detection plate

[Memo]

Disassembly

1. Removing the Main Motor Unit

(1) Bring the print drum to Position A, switch off the power, and remove the following covers and parts (in the case of the RN25 Series, open the main PCB bracket and System PCB bracket, and remove the connector bracket).

- Front cover
- Front frame cover
- Rear cover
- Controller (RN20/21)
- Main PCB (RN20/21)
- Print positioning unit
- Suction unit (RN25 Series)
- Separation-fan unit (RN25 Series)

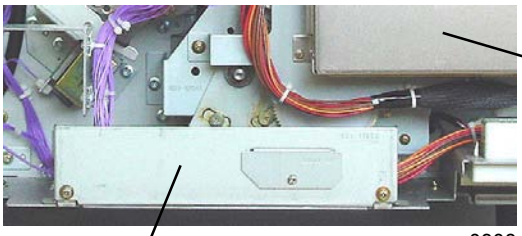
(2) Reduce the tension on the paper feed timing belt [A].
- Loosen the retaining screws on the idler A ass'y [B].

(3) Reduce the tension on the main belt [C].
- Loosen the retaining screws on the Idler B ass'y [D].
- Loosen the retaining screw [L] on the idler C ass'y [E], and then remove the mounting screw [M].

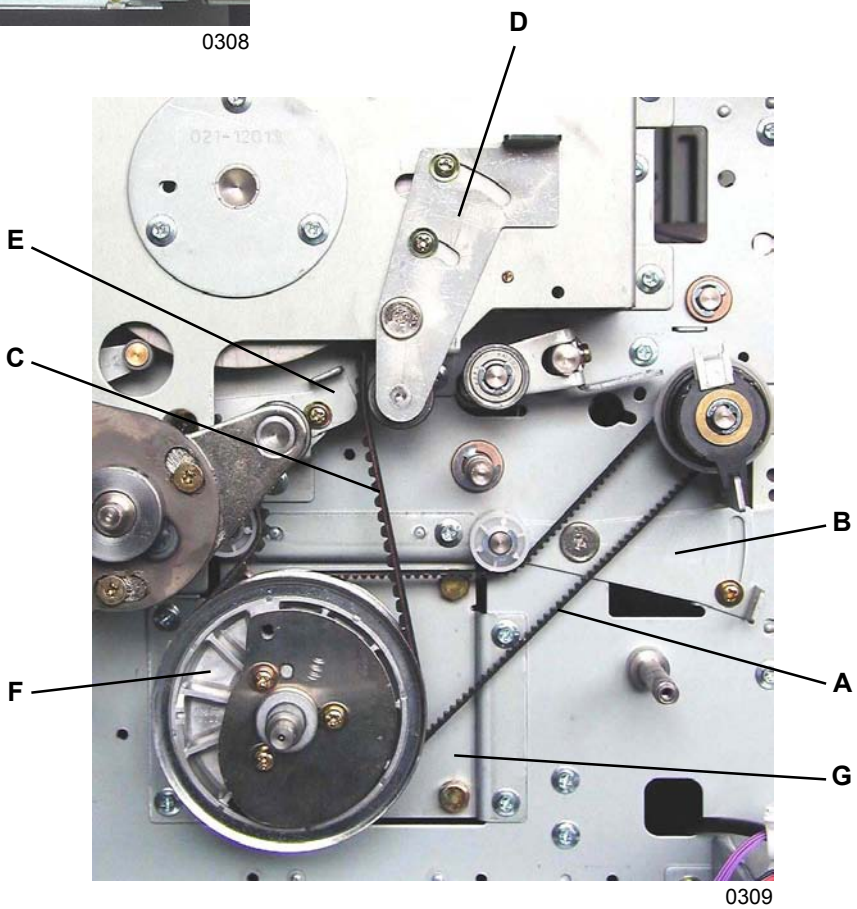
* Do not remove the retaining screw on the idler C ass'y.

(4) Remove the paper feed timing belt [A] and main belt [C] from the main pulley [F].

(5) Disconnect the drive PCB connector on the front side and the connector on the rear side, remove the mounting screws (RS tight, M4 x 8: 6 pcs), and dismount the main motor unit [G].



0308



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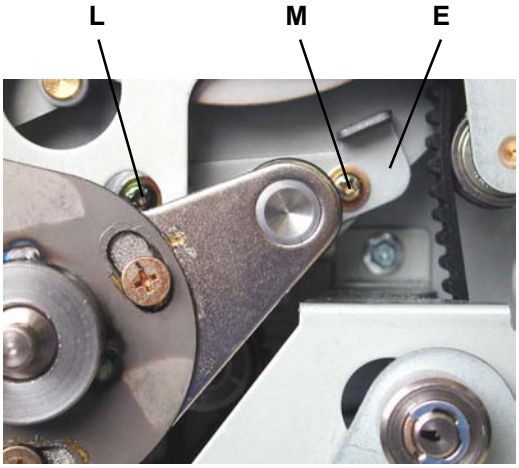
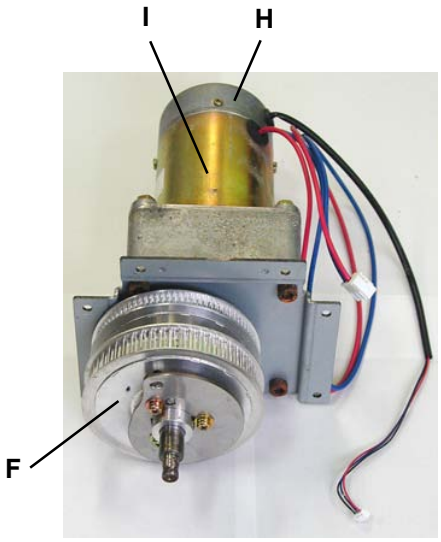
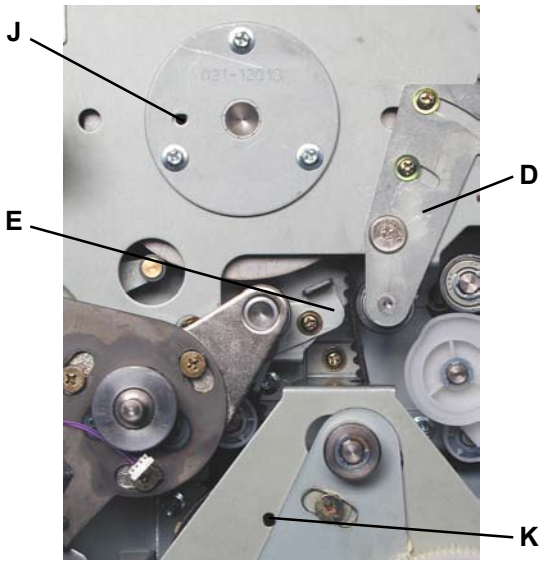


0310

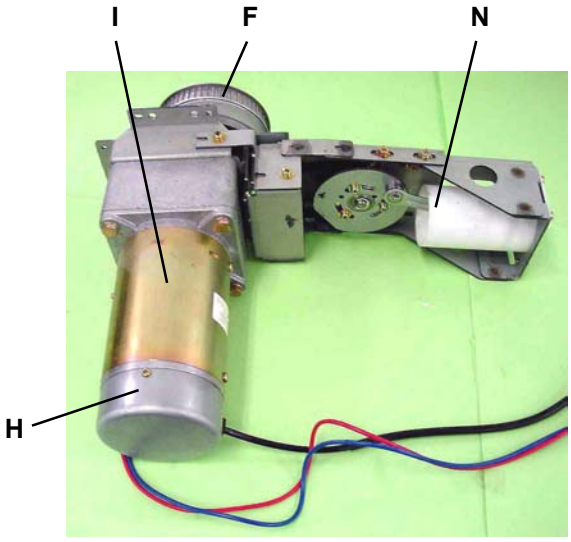


<RN20/21 Series> 0311

Main motor unit



0312



0313

<RN25 Series>
Main motor unit

[Precautions on Reassembly]

- Align the position-A alignment mark [J] on the drum pulley with the position-A alignment mark [K] on the main pulley, turn the idler C ass'y [E] counterclockwise to secure it in place, and make sure the main belt is taut. Then, turn the idler B ass'y [D] clockwise to apply tension to the main belt.

A: Paper feed timing belt
B: Idler A ass'y
C: Main belt
D: Idler B ass'y
E: Idler C ass'y
F: Main pulley
G: Main motor unit
H: Main motor encoder sensor
I: Main motor
J: Print drum pulley position-A alignment hole
K: Main-pulley position-A alignment hole
L: Idler C ass'y retaining screw
M: Idler C ass'y mounting screw
N: Air-pump-unit ass'y (RN25 Series only)

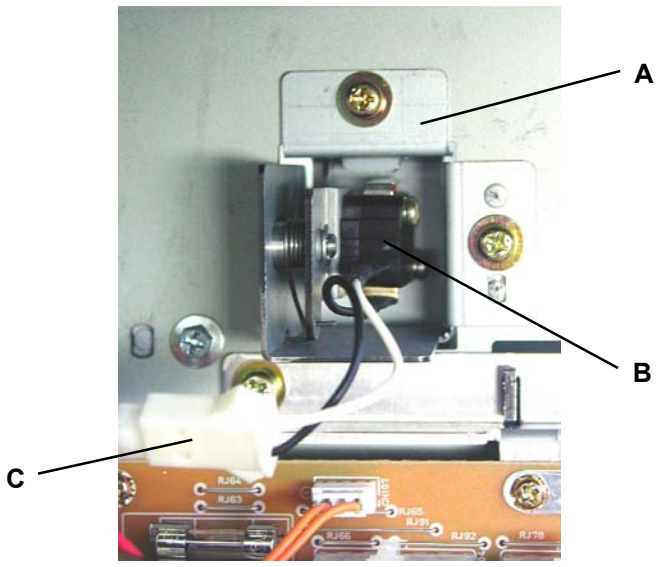
2. Removing the Flatbed Set Switch

(1) Pull out the print drum and remove the covers.
- Front door
- Front cover

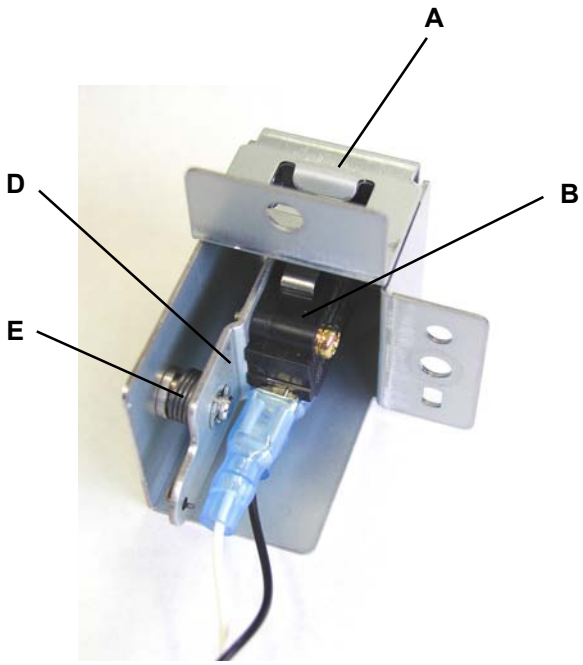
(2) Unplug the connector [C], remove the mounting screws (M4 x 6: 2 pcs), and then remove the entire flatbed set switch cover [A].

(3) Remove the E-ring, remove the torsion spring [E], and then remove the flatbed set switch [B] together with the sensor bracket [D].

(4) Remove the mounting screws (washer, M3 x 14: 2 pcs) and remove the flatbed set switch [B].



0314



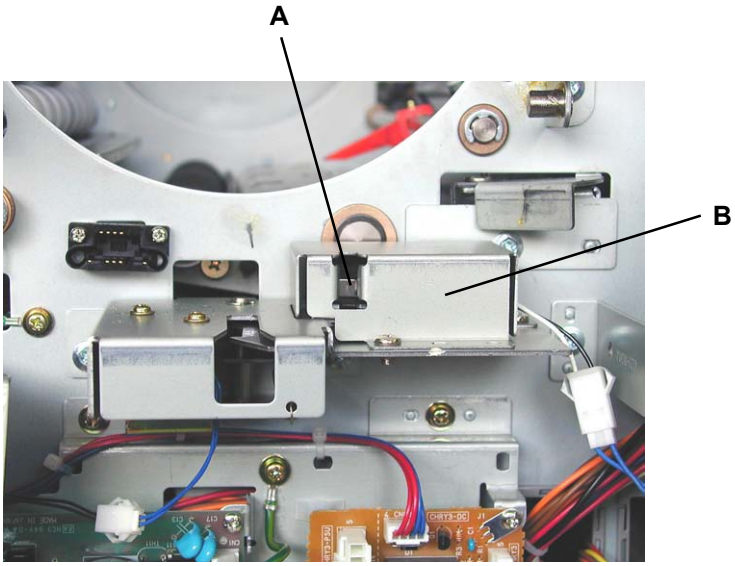
A: Flatbed set switch cover
B: Flatbed set switch
C: Connector
D: Sensor bracket
E: Torsion spring

0315

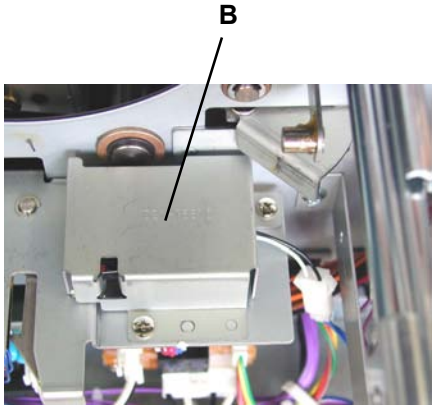
3. Removing the Print Drum Safety Switch

(1) Pull out the print drum.
(2) Remove the covers.
- Front door
- Front cover

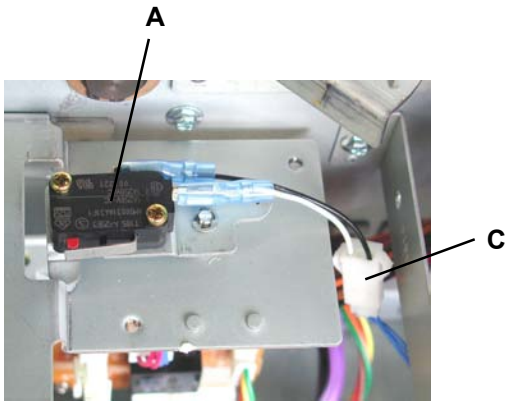
(3) Remove the print drum safety switch cover [B]. (bind, M4 x 6: 2 pcs)
(4) Unplug the connector [C], remove the mounting screws (washer, M3 x 14: 2 pcs), and then remove the print drum safety switch [A].



0316



0317



0318

A: Print drum safety switch
B: Print drum safety switch cover
C: Connector

4. Removing the Main Belt

(1) Execute a confidential master, remove the print drum, and detach the rear cover.

<RN25 Series>

(2) Open the main PCB bracket and System PCB bracket, and then remove the System PCB bracket and connector bracket.

<RN20/21 Series>

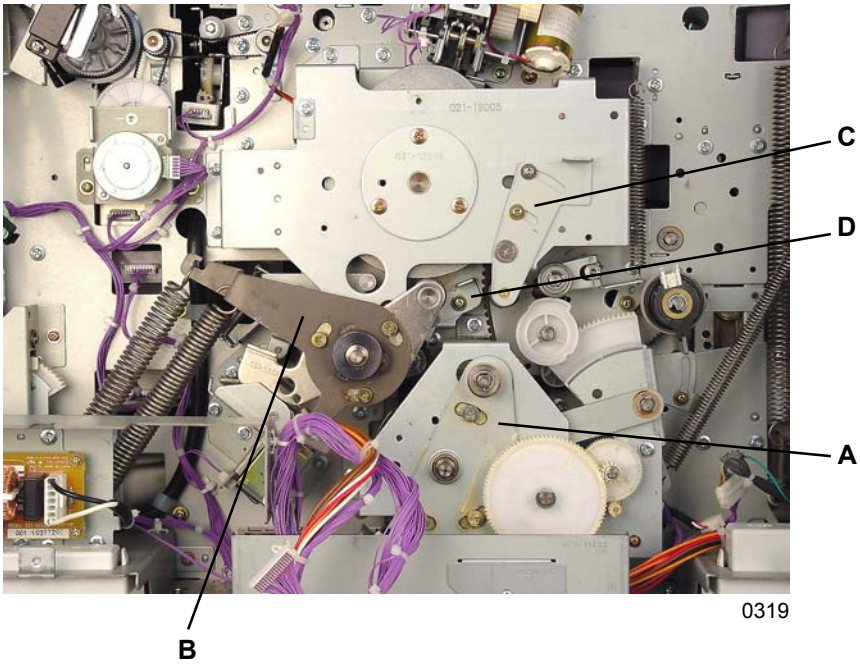
(2) Remove the controller and main PCB.

(3) Remove the following parts:
- Print positioning unit [A]
- Pressure-lever ass'y [B]

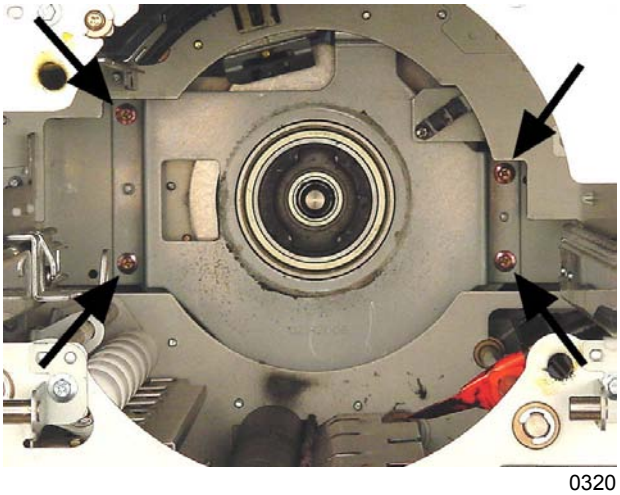
(4) Loosen the screws on the idler B ass'y [C] and idler C ass'y [D], and decrease the main-belt tension.

(5) Remove the mounting screws (RS tight, M4 x 6: 4 pcs) on the front side indicated by the arrows in the photograph.

(6) Remove the position-A plate-mounting screw (RS tight, M4 x 6: 1), and then remove the position-A plate [E].



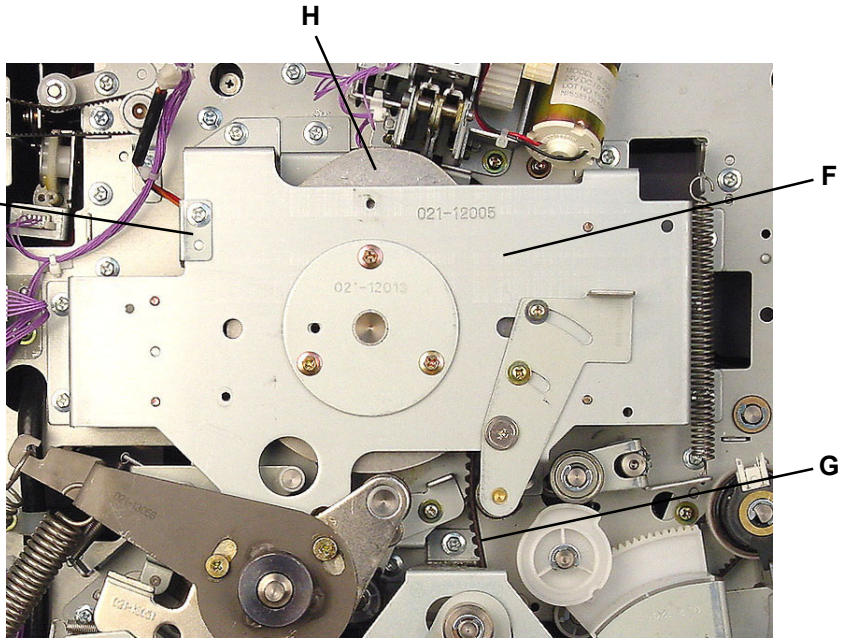
0319



0320

A: Print positioning unit
B: Pressure-lever assembly
C: Idler B assembly
D: Idler D assembly

(7) Detach the C-ring from the pressure shaft, remove the eight stay ass'y mounting screws (RS tight, M4 x 8: 8pcs), and then remove the R stay ass'y [F], main belt [G], and pressure cam [H].

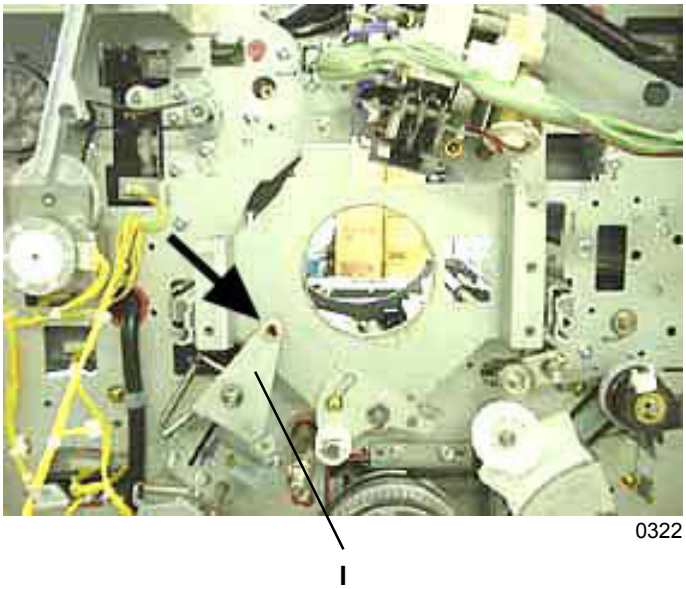


0321

E: Position-A plate
F: Stay ass'y
G: Main belt
H: Pressure cam

[Precautions on Reassembly]

- When fitting the R stay ass'y, main belt and pressure cam, press down on the separator arm [I] to prevent contact with the pressure cam.
- After installing the print-positioning unit, adjust the timing-cam mounting position.
- Align the position-A alignment hole on the drum pulley with the position-A alignment hole on the main pulley, and then tension the main belt.
- After installing the pressure-lever ass'y, adjust the mounting position.



0322

I: Separator arm

Adjustment

1. Print-Drum Position-A Adjustment

Checks and adjustment

(1) Pull out the print drum and return it back after removing the master attached to it.
(2) Start the Test Mode, and run Test Mode No. 551 (Print Drum on Position A).
(3) Open the scanner table.
(4) Open the master disposal gate housing, press down the clamp open arm plate by hand, and check that it slots smoothly into the groove in the position A.
(5) If it does not slot smoothly into the position-A compensator plate or if the print drum moves, run Test Mode No. 581 (Print Drum Position-A Adjustment) to adjust position A for the print drum. (On the setting procedure, refer to Chapter 18: Test Mode.)
(6) Repeat from step (2) until correct print drum position A is achieved.

CHAPTER 4: FIRST PAPER FEED SECTION

Contents

Mechanism

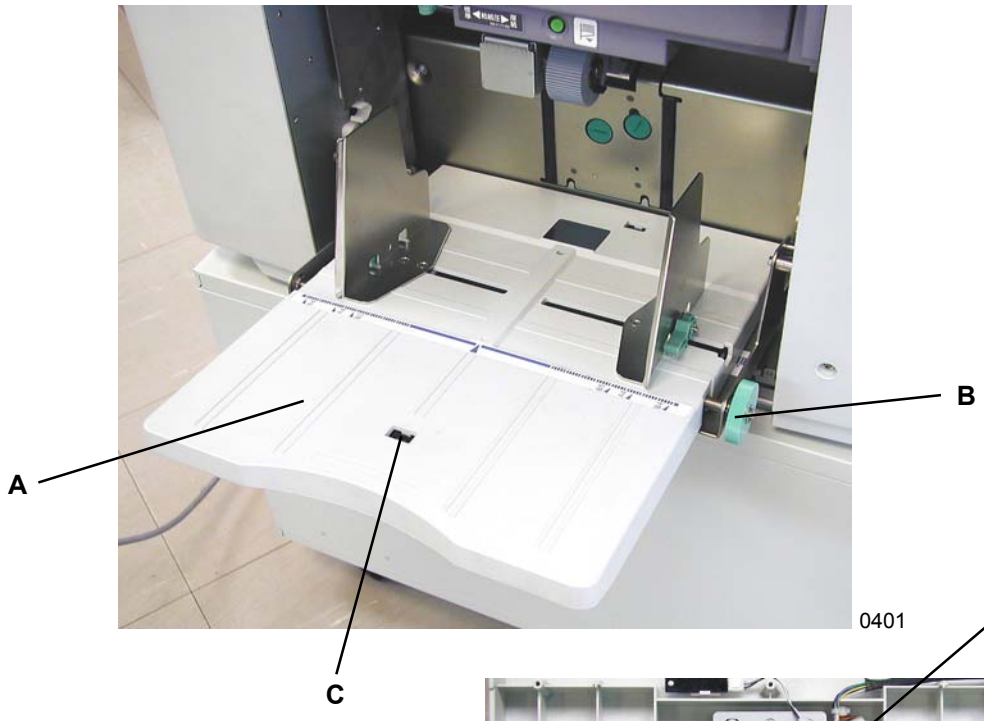
1. Paper Feed Tray Mechanism

1) Horizontal positioning (horizontal print positioning) of the paper feed tray

With RN25 Series, by turning the adjustment dial [B] by hand, the paper-feed tray [A] can be moved ±10 mm to the right or left when the paper width is 274 mm or less, ±5 mm to the right or left when the paper width is between 275 mm and 291 mm, or ±3 mm to the right or left when the paper width is between 292 mm and 297 mm.
With RN20/21 Series, the paper-feed tray can be moved ±10 mm to the right or left when the paper width is 274 mm or less, or ±5 mm to the right or left when the paper width is between 275 mm and 290 mm.

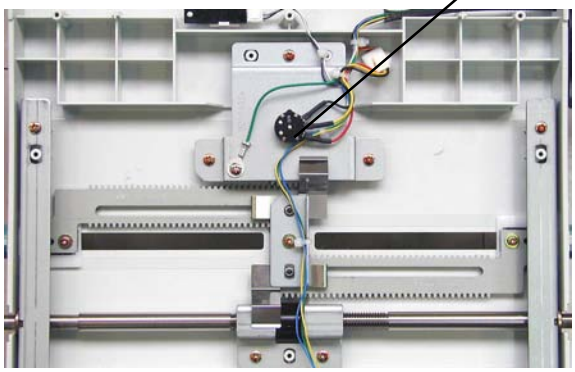
2) Print paper size detection

The paper feed tray [A] uses the paper width potentiometer [D] and paper size detection sensor [C] to determine the size of the paper loaded in the paper feed tray [A].
The paper width potentiometer [D] checks the paper width, and the paper size detection sensor [C] determines the paper length (portrait or landscape orientation).



0401

A: Paper feed tray
B: Adjustment dial
C: Paper size detection sensor
D: Paper width potentiometer

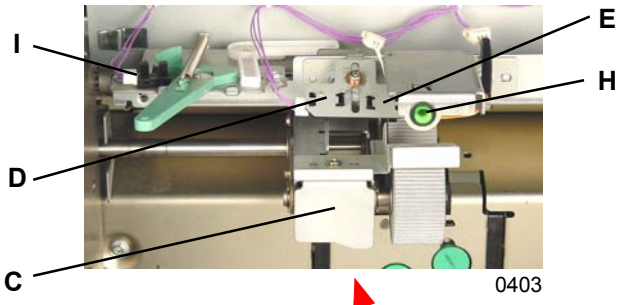


0402

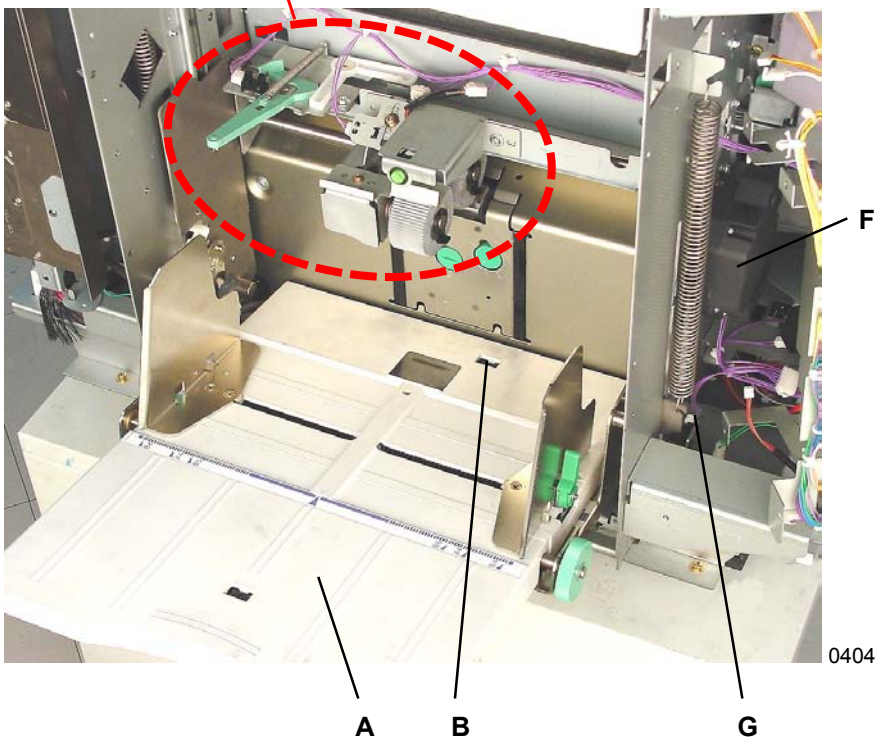
View of underside of the paper feed tray with the cover off

2-1. Paper Feed Tray Elevation Mechanism (RN25 Series)

The presence of paper in the paper-feed tray [A] is detected by the paper-detection sensor [B].
When light is received by the paper-detection sensor [B], pressing the Start key activates the elevator motor [F] and raises the paper-feed tray [A] until the scraper ass'y [C] blocks the light beam to upper-limit sensor A [D] or upper-limit sensor B [E].
During printing, the elevator motor [F] remains on until the light to upper-limit sensor A [D] or upper-limit sensor B [E] is blocked. Which upper-limit sensor is activated depends on the position of the pressure-adjust lever (NORMAL/CARD). When the lever is placed in the "CARD" position, upper-limit sensor B is used and the paper-feed-tray upper-limit position is higher than that for the "NORMAL" setting. The position of the pressure-adjust lever is confirmed here by the pressure-detection sensor [I].
The upper-limit position change described above is performed when "Auto" is selected in Test Mode No. 480. If "NORMAL" or "CARD" is selected in the test mode, the paper-feed-tray upper-limit position will be fixed irrespective of the pressure-adjust-lever position.
When no paper remains in the paper-feed tray [A] and light is not received by the paper-detection sensor [B], the elevator motor [F] activates and lowers the paper-feed tray [A] until the light beam to the lower-limit sensor [G] is blocked.
If the feed-tray button [H] is pressed in print standby mode, the elevator motor [F] activates and lowers the paper-feed tray [A] until either the light beam to the lower-limit sensor [G] is blocked or the feed-tray button [H] is pressed again.
When the drum is removed, the elevator motor [F] does not operate even if the feed-tray button [H] is pressed.



0403

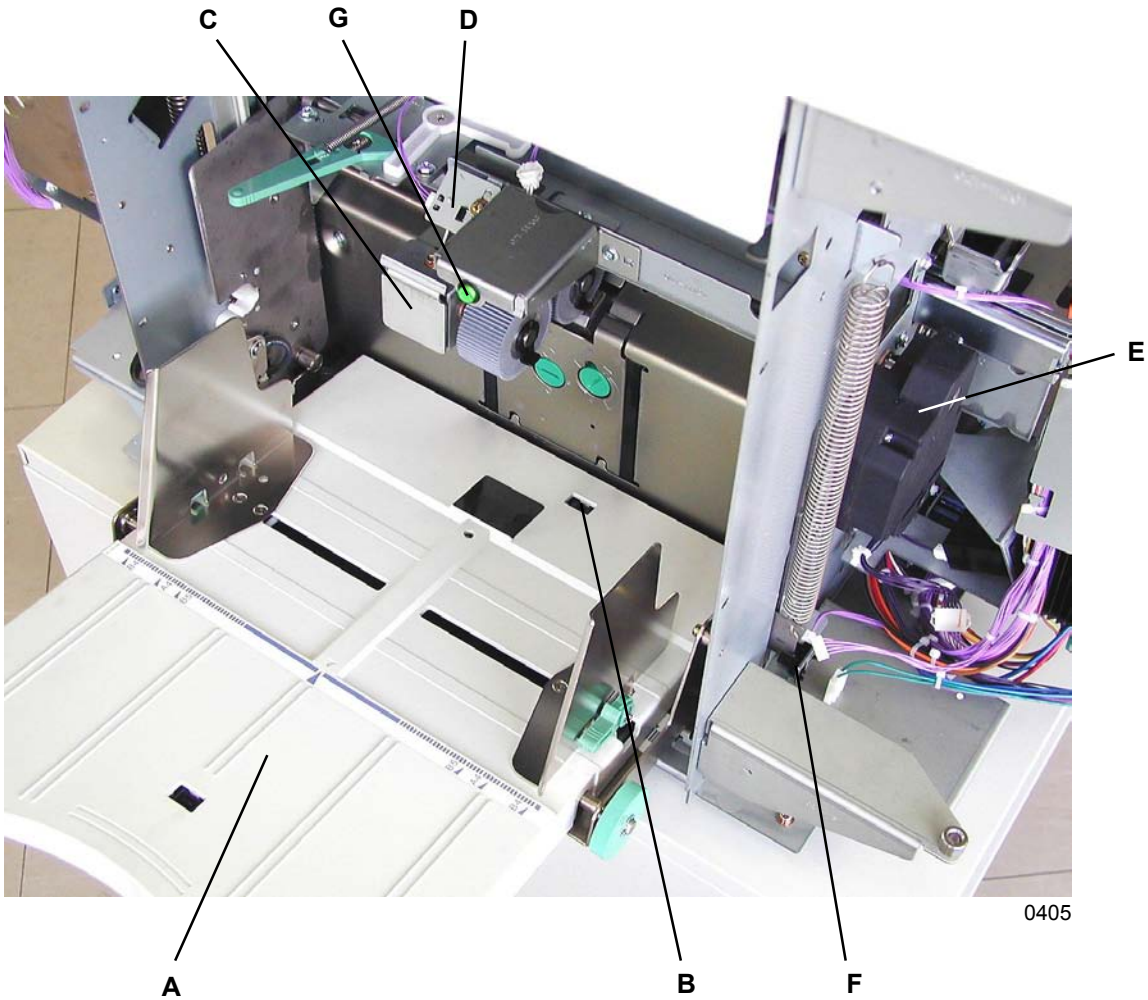


0404

A: Paper feed tray
B: Paper detection sensor
C: Scraper assembly
D: Upper-limit sensor A
E: Upper-limit sensor B
F: Elevator motor
G: Lower limit sensor
H: Feed tray descent button
I: Paper feed pressure sensor

2-2. Paper Feed Tray Elevation Mechanism (RN20/21 Series)

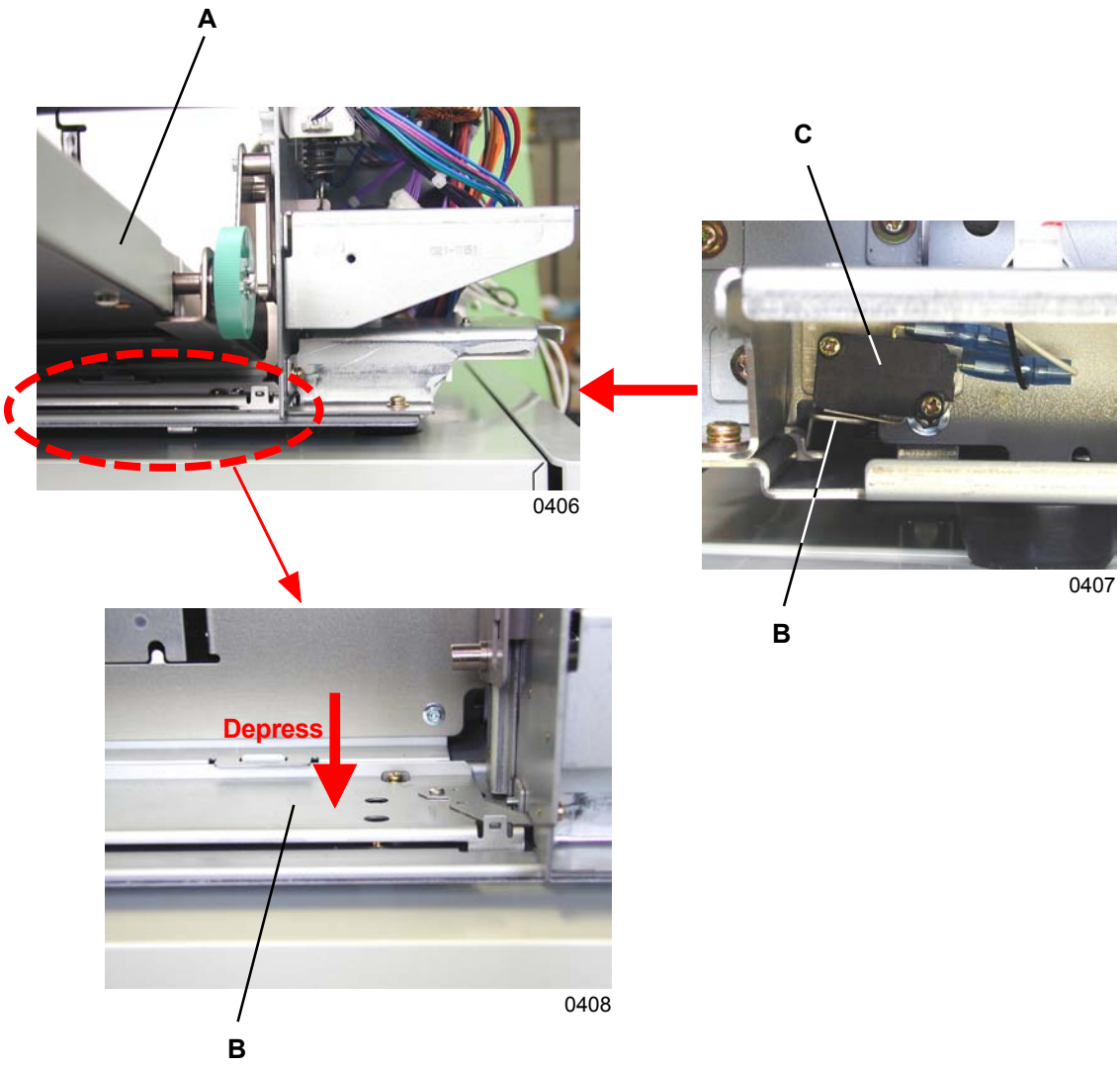
The presence of paper loaded in the paper feed tray [A] is detected by the paper detection sensor [B]. When light is received at the paper detection sensor [B] (paper present), pressing the Start key activates the elevator motor [E] and raises the paper feed tray [A] until the scraper assembly [C] blocks the light beam of the upper limit sensor [D].
During printing, the elevator motor [E] is activated until the light to the upper limit sensor [D] is blocked. When no paper remains in the paper-feed tray [A] and the light is not received by the paper-detection sensor [B], the elevator motor [E] activates and lowers the paper-feed tray [A] until the light beam to the lower-limit sensor [F] is blocked.
If the feed tray descent button [G] is pressed while in print standby mode, the elevator motor [E] activates and lowers the paper feed tray [A] until either the light beam of the lower limit sensor [F] is blocked or the feed tray descent button [G] is pressed once again.
The elevator motor [E] does not operate even if the feed tray descent button [G] is pressed while the print drum is removed.



A: Paper feed tray
B: Paper detection sensor
C: Scraper assembly
D: Upper limit sensor
E: Elevator motor
F: Lower limit sensor
G: Feed tray descent button

3. Paper Feed Tray Safety Mechanism

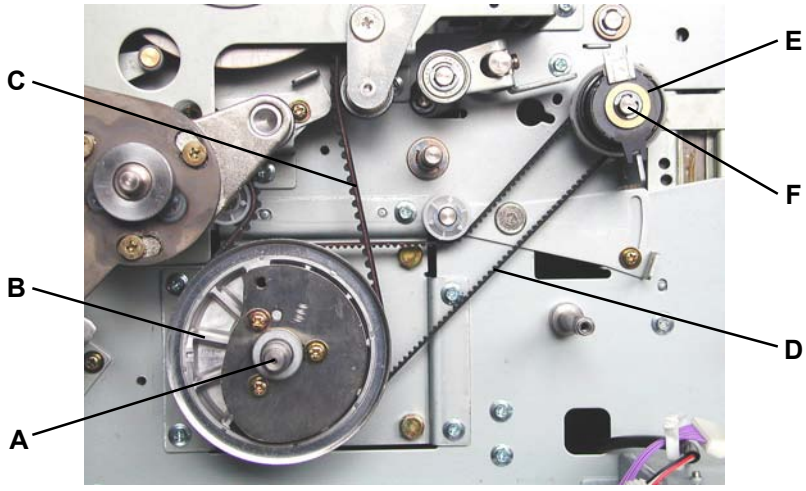
The paper feed tray lower safety switch [C] ensures safety while the paper feed tray is being raised or lowered or is stationary.
If the safety switch actuator plate [B] is depressed, the paper feed tray lower safety switch [C] trips. An error in the paper feed tray is then assumed, and the machine stops.



A: Paper feed tray
B: Safety switch actuator plate
C: Paper feed tray lower safety switch

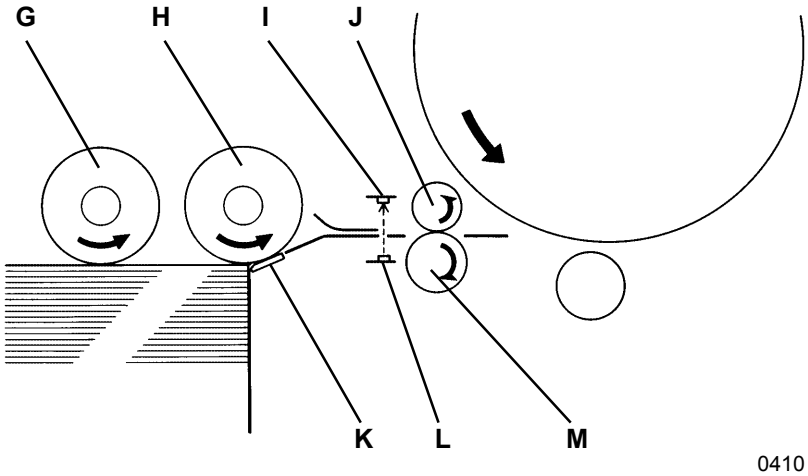
4. First Paper Feed Drive Mechanism

When the printing operation commences, the main motor [A] activates to rotate the print drum via the main belt [C]. When the main motor [A] is running, the paper feed timing belt [D] continuously drives the pulley on the paper feed clutch [E].
When the print drum rotates to a preset angle (angle set with the paper-feed clutch ON angle adjustment in Test Mode Nos. 495 through 498; or angle set with the paper-feed clutch ON angle adjustment (A3) in Test Mode No. 494 when feeding A3-size paper in a model capable of doing so) from position A, the paper-feed clutch [E] is activated. Then, the scraper roller [G] and pickup roller [H] rotate to send paper from the paper-feed tray into the printer.
The paper fed inside the machine blocks the light beam between paper sensors [I] and [L]. The print drum then rotates through a preset angle (the angle set for paper feed clutch deactivation angle adjustment by test mode Nos. 482 to 485), and the paper feed clutch [E] is deactivated, completing the first stage paper feed.
The leading edge of the paper rests against the guide roller [J] and timing roller [M] and stops with the paper bulging.
Following activation of the paper-feed clutch [E], if the print drum rotates to the first paper-feed jam-detection angle, the conditions of the first paper sensors [I] and [L] are checked for non-feeding paper.
After the paper is fed to the second paper-feed stage, the one-way clutches built into the scraper roller [G] and pickup roller [H] allow free spinning to prevent the first paper-feed stage from applying the brake to the paper transport.



0409

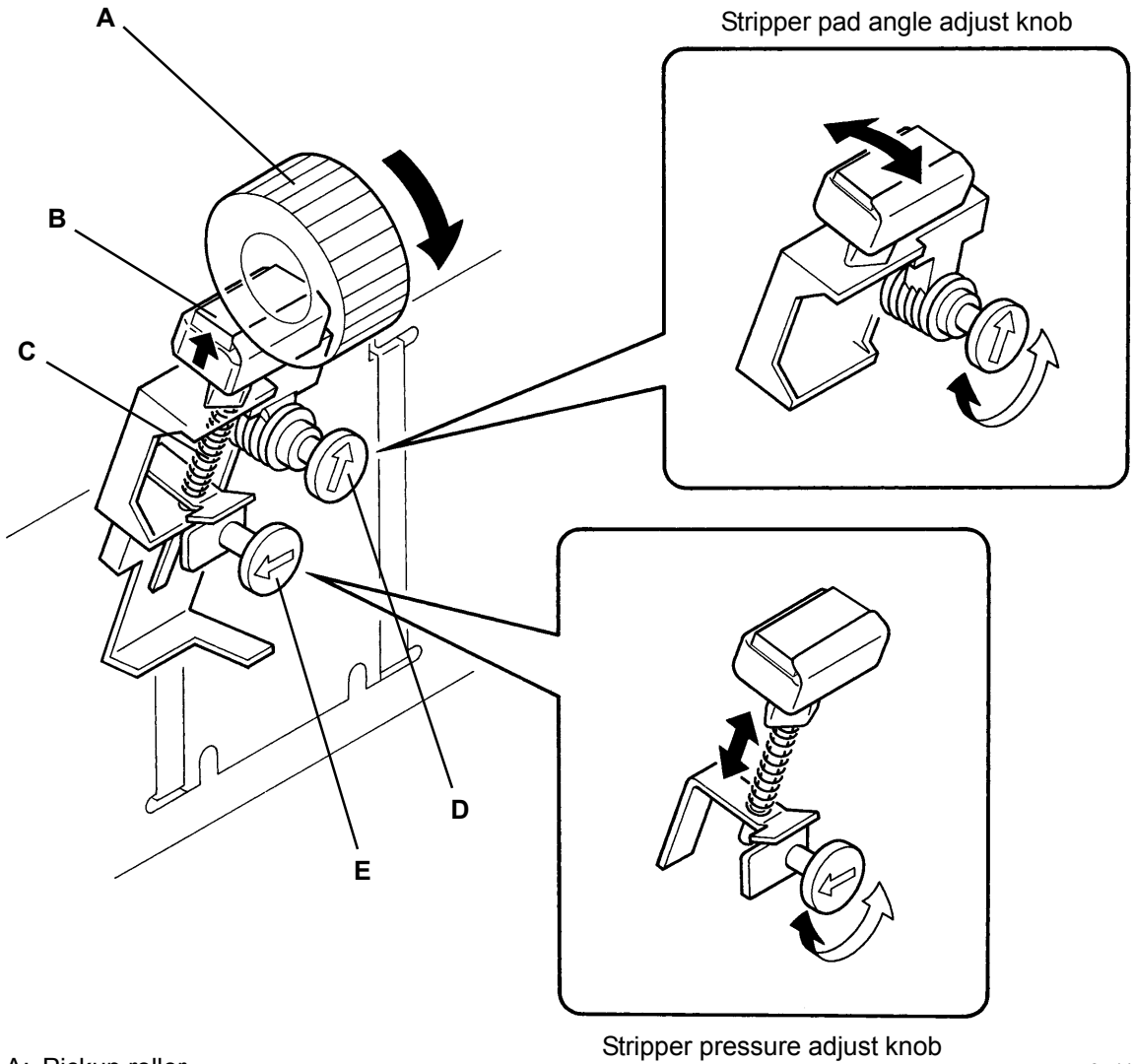
A: Main motor
B: Main pulley
C: Main belt
D: Paper feed timing belt
E: Paper feed clutch
F: Pickup roller shaft
G: Scraper roller
H: Pickup roller
I: Paper sensor (receive)
J: Guide roller
K: Stripper pad
L: Paper sensor (send)
M: Timing roller



0410

5. Paper Strip Mechanism

The paper loaded in the paper feed tray is fed in between the pickup roller [A] and stripper pad [B] by the rotating scraper roller. The paper is then separated by the pickup roller [A] and stripper pad [B] to ensure that only the uppermost sheet is sent into the machine.
The stripper pad [B] is pressed against the pickup roller [A] by the force of the stripper spring [C], and the resistance applied to the paper fed in separates the sheet.
The stripper-pad angle and stripping pressure can be adjusted by the user using the stripper pad angle adjust knob [D] and stripper pressure adjust knob [E].

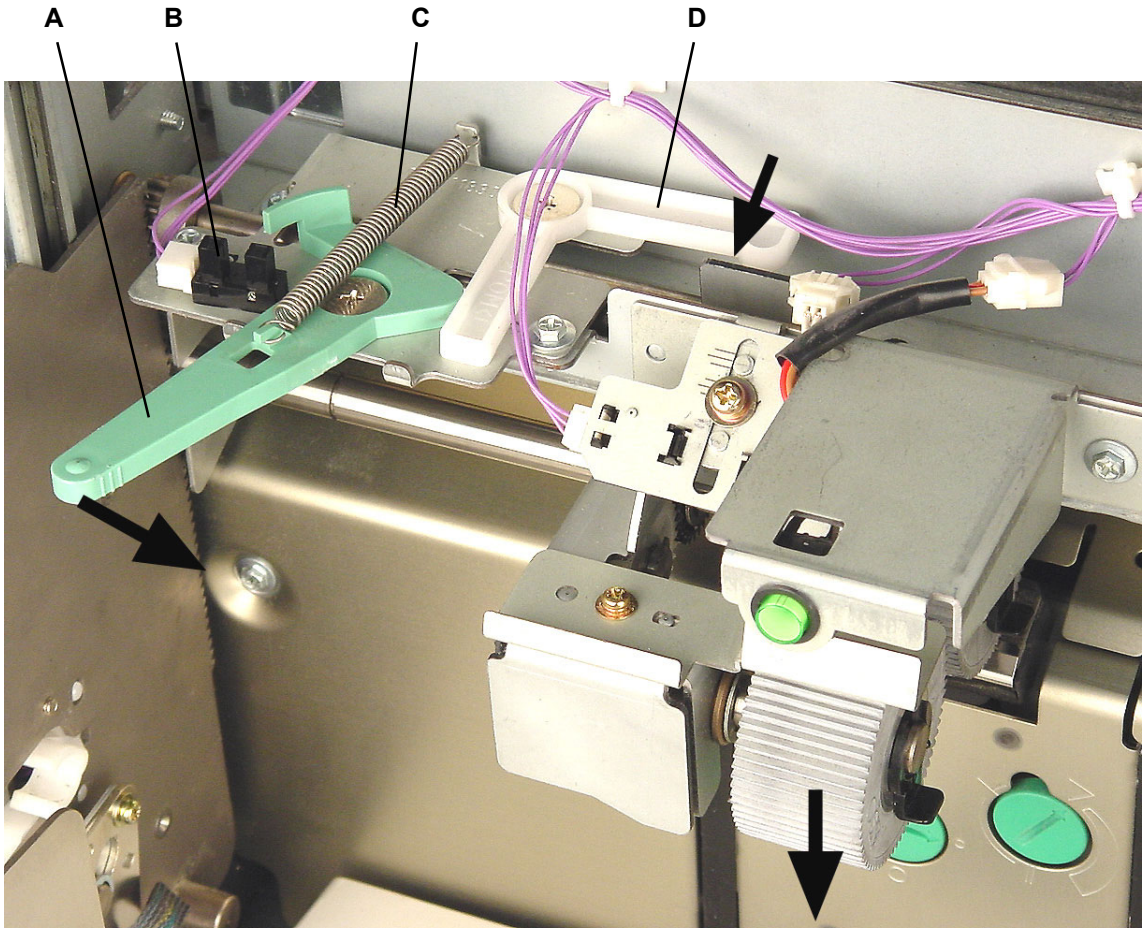


0411

A: Pickup roller
B: Stripper pad
C: Stripper spring
D: Stripper pad angle adjust knob
E: Stripper pressure adjust knob

6. Paper Feed Pressure Adjust Lever

The paper feed pressure adjust lever [A] is located on the left-hand side of the scraper unit, and moving this to the left or right switches the scraper-roller paper-feed pressure (scraper pressure) from NORMAL (weak) and CARD (strong).
Moving the pressure adjust lever to the right increases the paper-feed pressure (scraper pressure).
The RN25 Series are provided with a paper-feed pressure sensor [B]. This sensor turns ON or OFF according to the paper-feed pressure-adjustment lever position, and switches between the upper-limit sensors A and B to vary the paper-feed-tray stopping position.



0412

A: Pressure adjust lever
B: Paper-feed pressure sensor
C: Pressure arm spring
D: Pressure arm

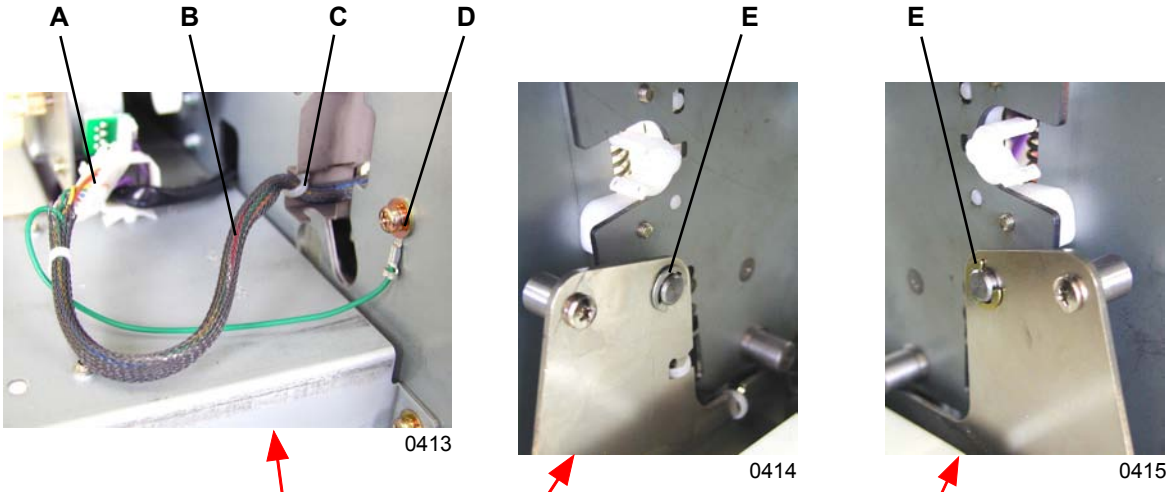
Disassembly

1. Removing the Paper Feed Tray Unit

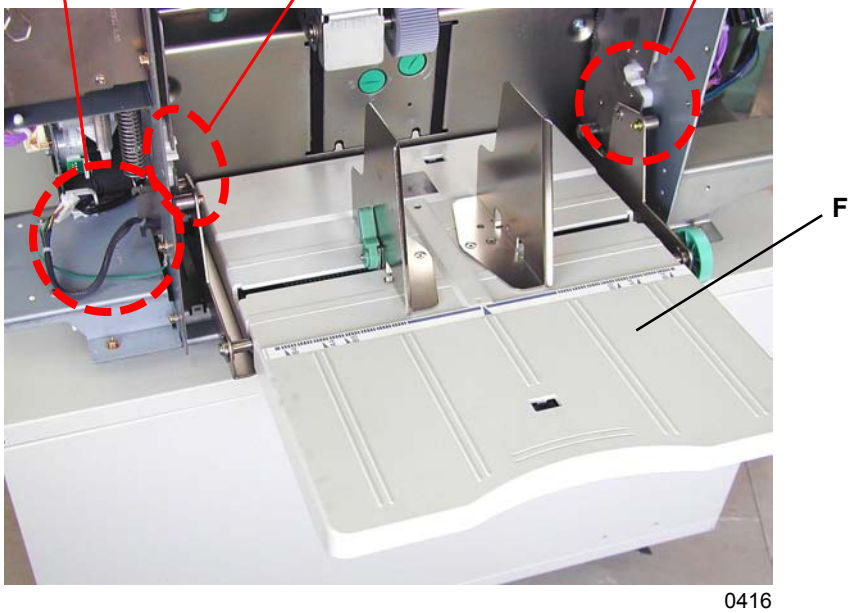
(1) Lower the paper feed tray [F] fully.
(2) Remove the rear cover.
(3) Unplug the connector [A] on the wire harness [B] from the paper feed tray [F]. Remove the mounting screw (double-washer, M4 x 6: 1 pc) and remove the ground screw [D]. Cut the wire harness band [C], and then pull the wire harness [B] towards the paper feed tray.
(4) Remove the E-rings [E] from the mountings on both sides of the paper feed tray, and remove the paper feed tray [F].

[Precautions on Reassembly]

- The wire harness on the paper feed tray must be secured with the harness band as before.
- Do not forget to attach the ground wire.



0413 0414 0415

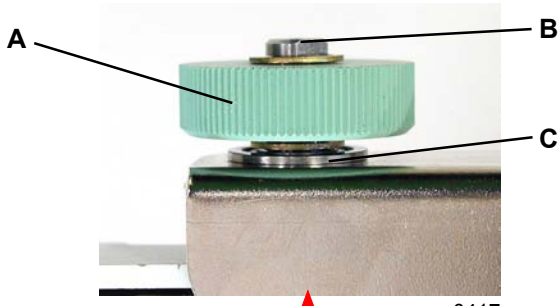


0416

A: Connector
B: Wire harness
C: Wire harness band
D: Ground screw
E: E-ring
F: Paper feed tray

2. Removing the Paper Width Potentiometer, Paper Detection Sensor, and Paper Size Detection Sensor

(1) Remove the paper feed tray unit.
(2) Remove the E-ring and remove the adjustment dial [A].
(3) Remove the E-rings [C] and bearings from both sides of the slide shaft [B].
(4) Remove the shoulder screws (2 pcs) [D] and remove the paper-feed mounting plate [E].
(5) Remove the paper-feed-tray bottom front cover [F] (bind, M4 x 6: 4 pcs) and paper-feed-tray bottom rear cover [G] (P tight, M3 x 8: 3 pcs).
(6) Unplug the connector and remove the paper detection sensor [H] while expanding the mounting clips.
(7) Unplug the connector and remove the paper size detection sensor [I] while expanding the mounting clips.
(8) Pemove the mounting screws (P tight, M3 x 8: 3 pcs), unplug the connector, and then remove the paper width potentiometer [K] together with the potentiometer base [J].



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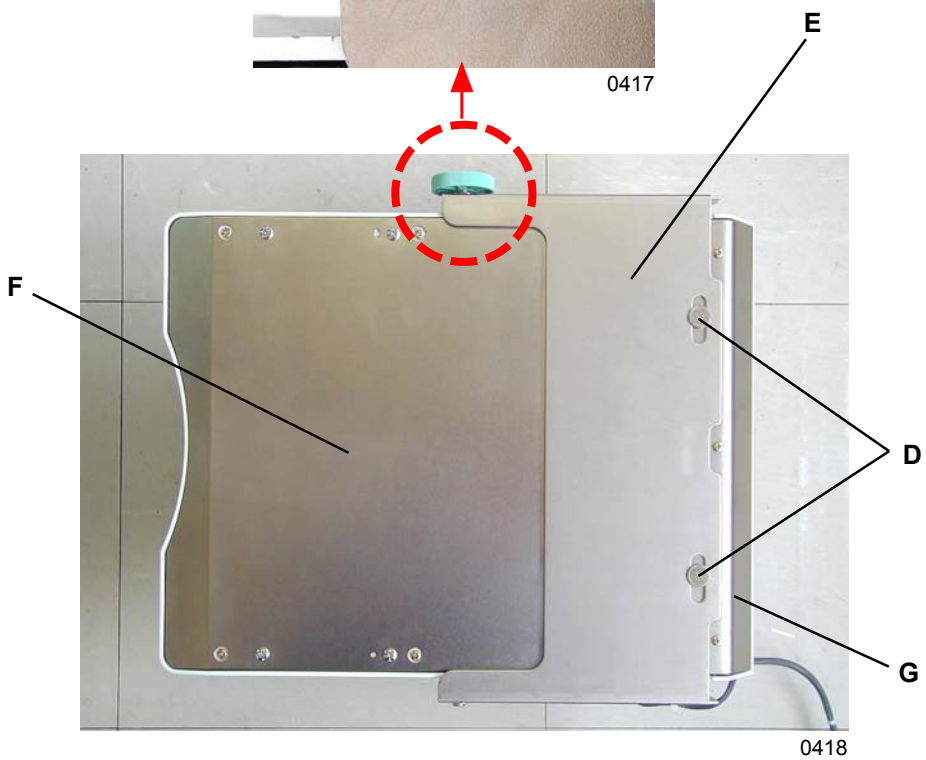
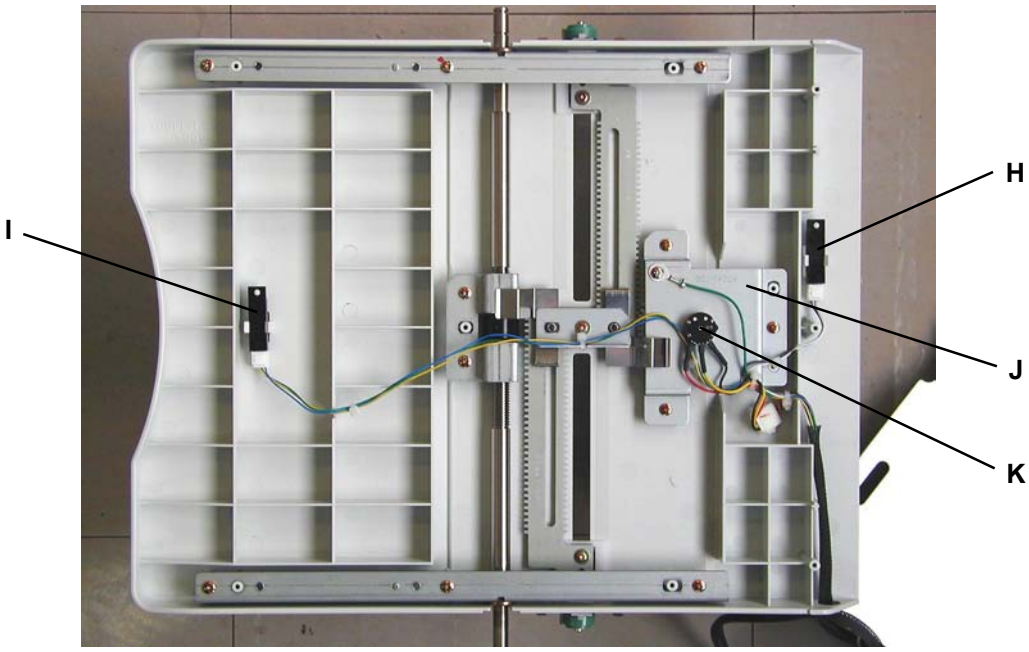


0418

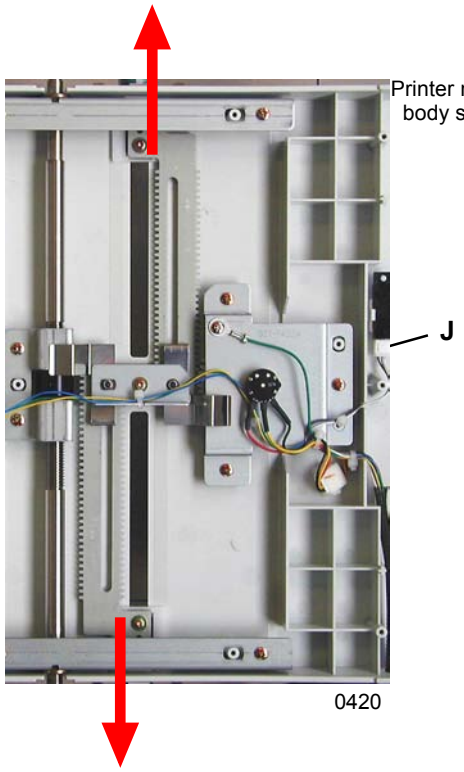
A: Adjustment dial
B: Slide shaft
C: Bearing
D: Shoulder screw
E: Paper-feed mounting plate
F: Paper-feed-tray bottom front cover
G: Paper-feed-tray bottom rear cover
H: Paper detection sensor
I: Paper size detection sensor
J: Potentiometer base
K: Paper width potentiometer
L: Spur gear
M: Potentiometer shaft



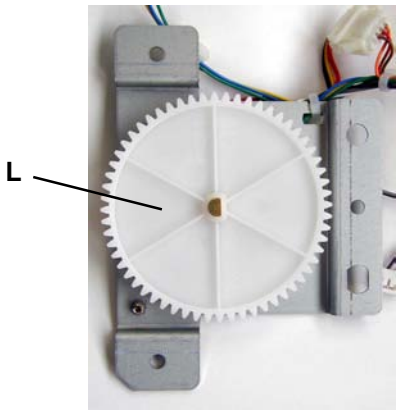
0419

[Precautions on Reassembly]

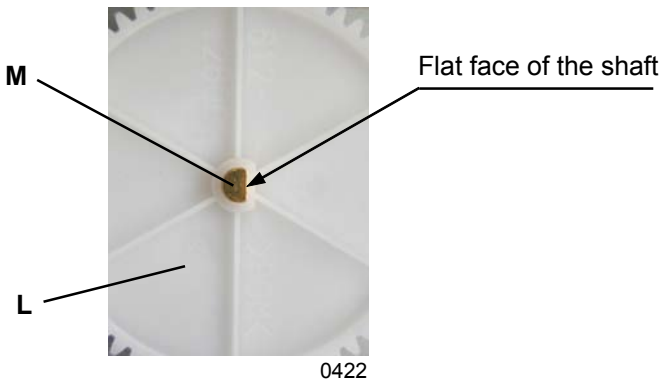
- With the fence opened fully, mount the spur gear [L] and the flat face of the potentiometer shaft [M] facing the printer body. (See photograph below.)
- Be sure to adjust the paper-width potentiometer (refer to 4-25).



0420



0421



0422

3. Removing the Pickup and Scraper Rollers

Removing the scraper roller

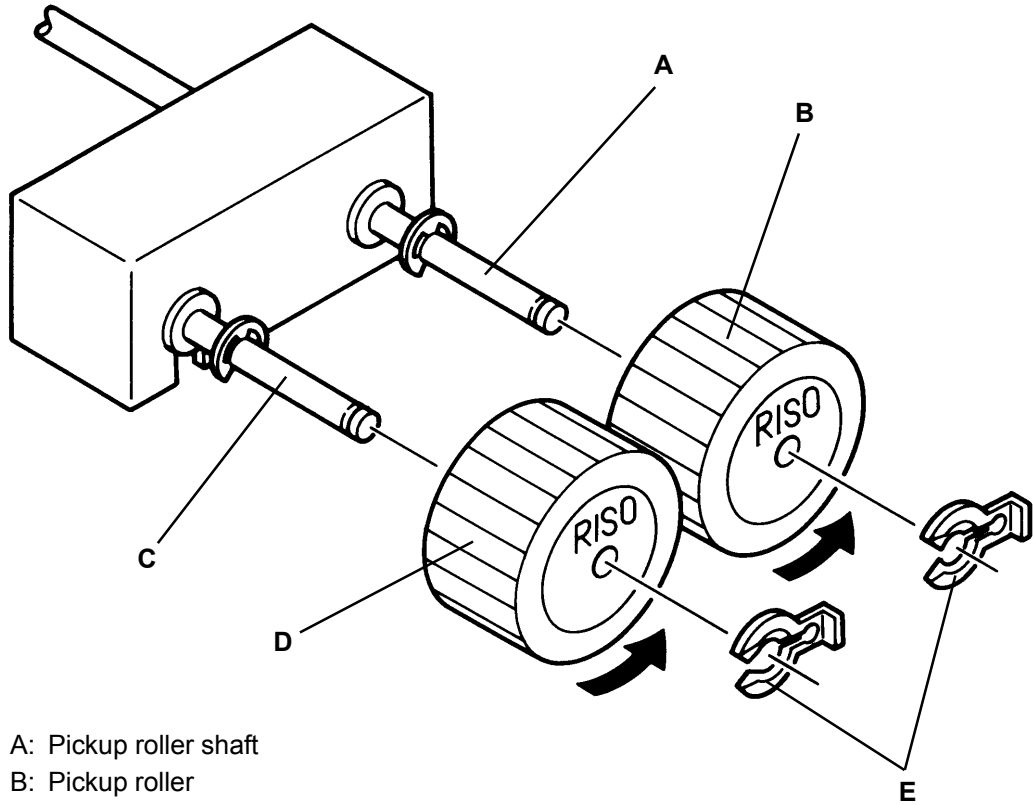
(1) Lower the paper feed tray fully and switch off the power.
(2) Remove the lock ring [E] on the scraper roller shaft [C].
(3) Slide the scraper roller [D] off the scraper roller shaft [C].

Removing the Pickup roller

(1) Lower the paper feed tray fully and switch off the power.
(2) Remove the lock ring [E] from the end of the pickup-roller shaft [A].
(3) Slide the pickup roller [B] off the pickup roller shaft [A].

[Precautions on Reassembly]

- The scraper and pickup roller contain a one-way clutch. If mounted in the opposite direction, the rollers will not rotate even when the pickup roller shaft rotates. When mounted on the shafts correctly, the rollers spin freely in the direction shown on the diagram below when rotated manually.



0423

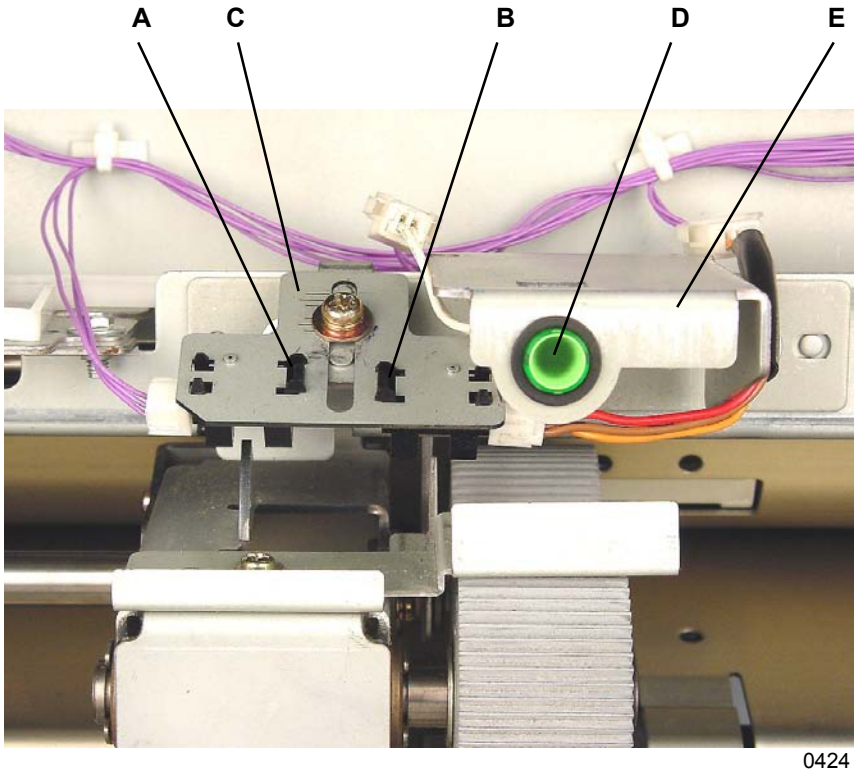
A: Pickup roller shaft
B: Pickup roller
C: Scraper roller shaft
D: Scraper roller
E: Lock ring

4-1. Removing the Feed Tray Descent Button and Upper Limit Sensor (RN25 Series)

(1) Remove the master-removal lower cover. (bind, M4 x 8: 4 pcs)
(2) Disconnect the two connectors, remove the mounting screw (double-washer, M4 x 8, 1 pc), and dismount the paper-feed upper-limit sensor A [A] and paper-feed upper-limit sensor B [B] together with the W-upper-limit-sensor detection plate A [C].
(3) Remove the mounting screws (RS tight, M4 x 8: 2 pcs), disconnect the connector, and remove the feed-tray descent button [D] together with the mounting bracket [E].

[Precautions on Reassembly]

- Adjust the position of the upper limit sensor.
- The paper-feed tray UP/DOWN Test Mode No. 452 does not operate unless the safety switch is turned ON.



0424

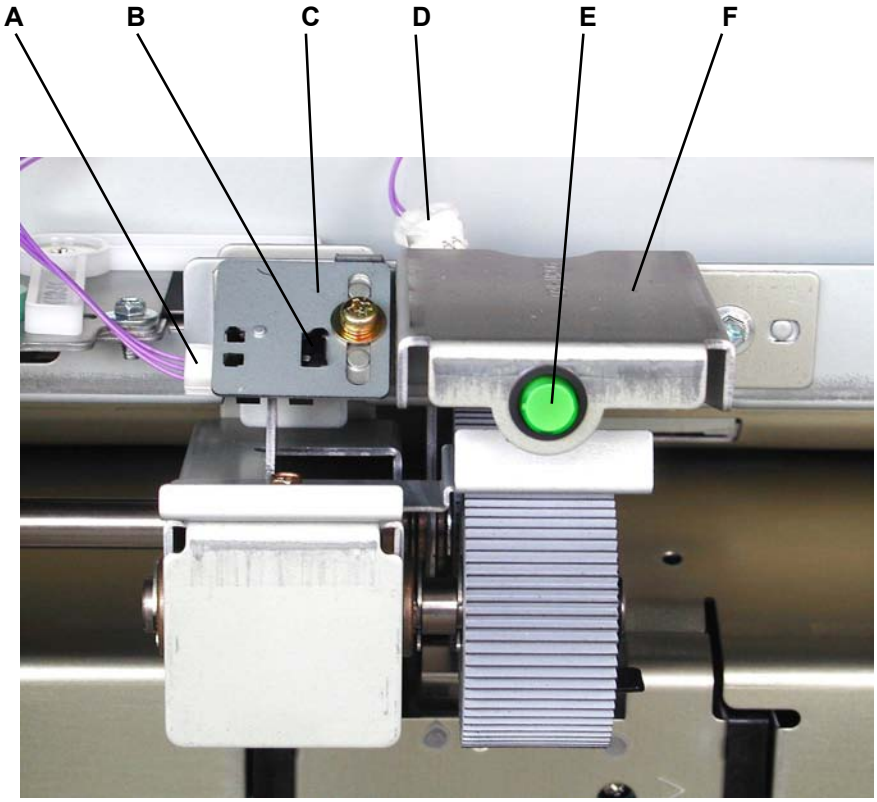
A: Upper-limit sensor A
B: Upper-limit sensor B
C: W-upper-limit-sensor detection plate A
D: Feed-tray descent button
E: Mounting bracket

4-2. Removing the Feed Tray Descent Button and Upper Limit Sensor (RN20/21 Series)

(1) Remove the master-removal lower cover. (bind, M4 x 8: 4 pcs)
(2) Unplug connector [A], remove the mounting screw (double-washer, M4 x 8: 1 pc), and then remove the upper limit sensor [B] together with the upper limit sensor bracket [C].
(3) Remove the mounting screws (RS tight, M4 x 8: 2 pcs), unplug the connector [D], and then remove the feed tray descent button [E] together with its mounting bracket [F].

[Precautions on Reassembly]

- Adjust the position of the upper limit sensor.



0425

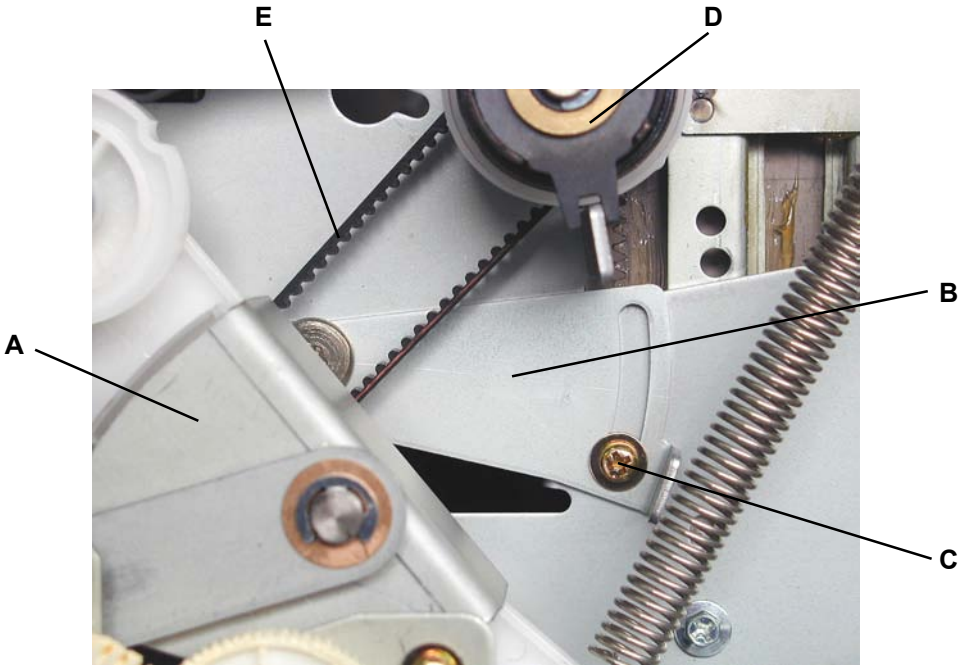
A: Upper limit sensor connector
B: Upper limit sensor
C: Upper limit sensor bracket
D: Feed tray descent button connector
E: Feed tray descent button
F: Mounting bracket

5. Removing the Paper Feed Clutch

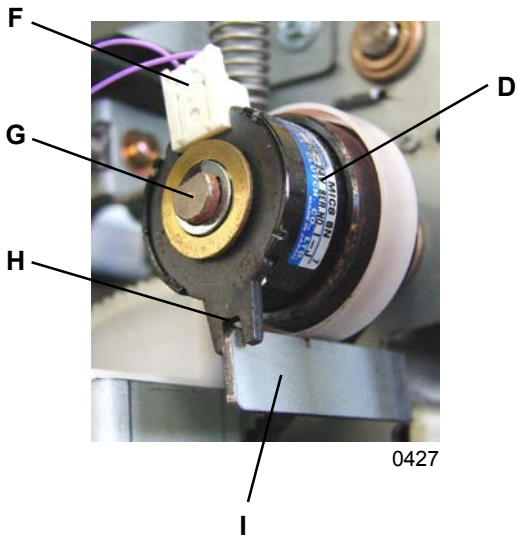
(1) Remove the rear cover.
(2) Loosen the retaining screw [C] on the idler A ass'y [B], and reduce the tension on the paper feed timing belt [E].
(3) Unplug the connector [F], remove the E-ring, and remove the paper feed clutch [D].

[Precautions on Reassembly]

- Align the flat face of the pickup roller shaft [G] with that on the paper feed clutch [D].
- Engage the slot [H] on the clutch with the clutch lock plate [I] on the machine to prevent the paper feed clutch unit from rotating.



0426



0427

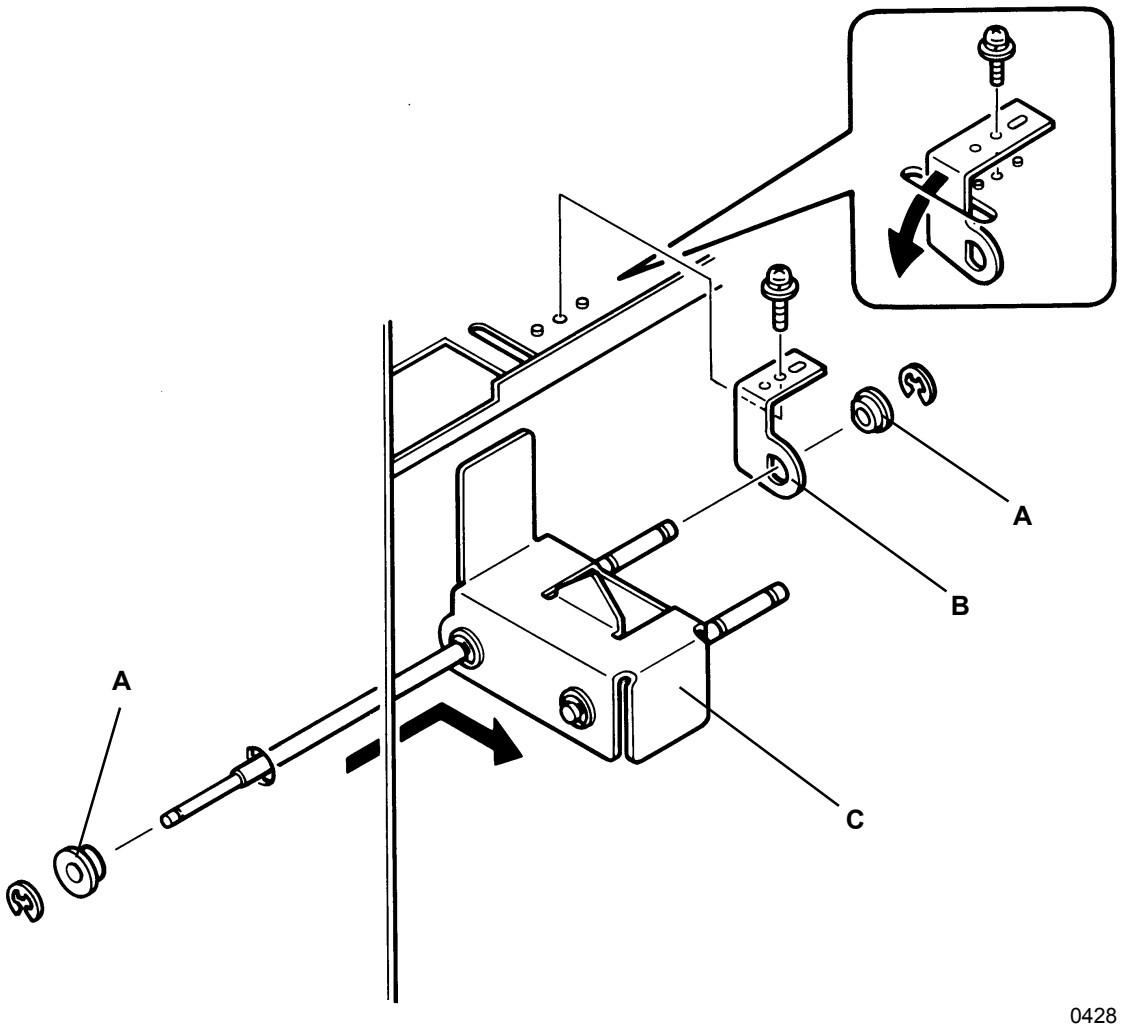
A: Timing gear
B: Idler A ass'y
C: Retaining screw
D: Paper feed clutch
E: Paper feed timing belt
F: Connector
G: Pickup roller shaft
H: Paper feed clutch slot
I: Clutch lock plate

6. Removing the Pickup Roller Shaft Ass'y

(1) Remove the covers.
  • Rear cover
  • Master-removal lower cover
(2) Remove the pickup and scraper rollers.
(3) Remove the upper limit sensor.
(4) Remove the paper feed clutch.
(5) Remove the E-rings and bearing bushes [A] on either end of the pickup roller shaft.
(6) Remove the mounting screw (RS tight, 4 x 8: 1 pc) on the shaft bracket [B], remove the bracket, and then remove the Pickup roller shaft ass'y [C] towards you.

[Precautions on Reassembly]

• Adjust the position of the upper limit sensor.



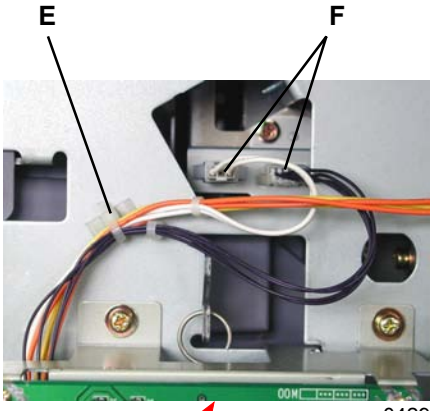
A: Bearing bush
B: Shaft bracket
C: Pickup roller shaft ass'y

7. Removing the Elevator Motor

(1) Lower the paper feed tray fully, switch off the power, and pull out the print drum.
(2) Remove the covers.
- Front door
- Front cover
- Master removal lower cover

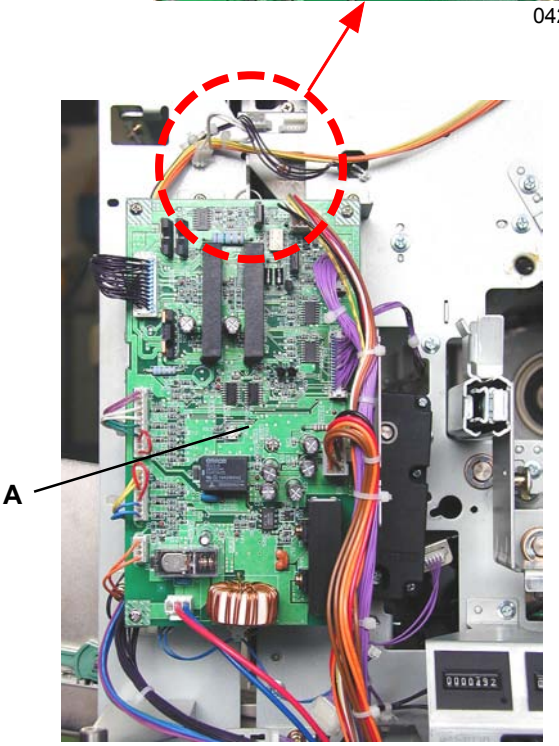
(3) Hold the wire harness band [E] from the inside, detach it from the side panel, and then disconnect the two master removal unit connectors [F].
(4) Remove the mounting screws (double-washer, M4 x 6: 4 pcs), and hang free the drive PCB [A] together with its mounting bracket.
(5) Remove the mounting screws (RS tight, M4 x 8: 2 pcs) [C], disconnect the connector [D], and remove the elevator motor [B].

* In this step, the paper-feed tray may pop up due to the action of the elevator spring. To prevent this, hold the paper-feed tray by hand while performing the procedure.



0429

A: Drive PCB
B: Elevator motor
C: Mounting screw
D: Connector
E: Wire harness band
F: Connector of master removal unit
G: Elevator spring



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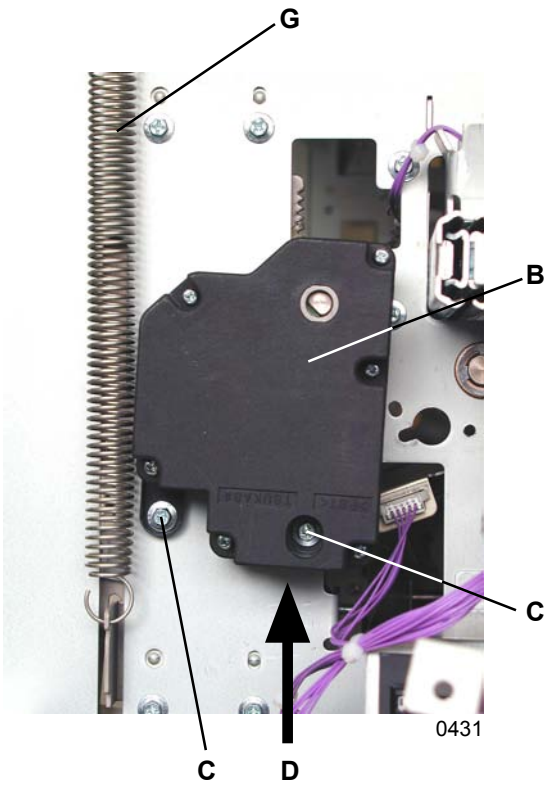

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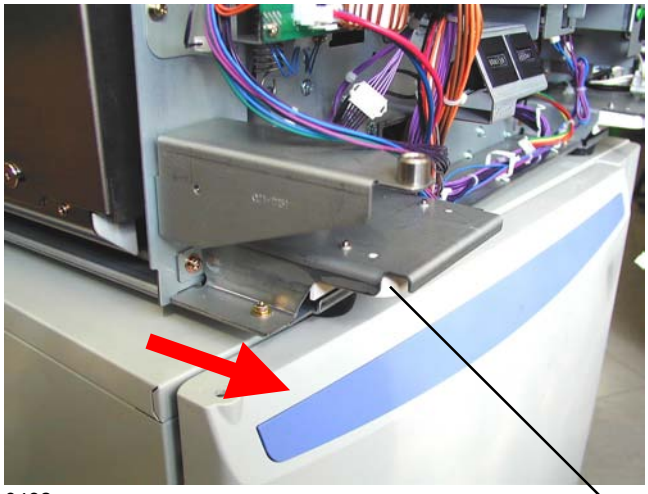
8. Removing the Paper Feed Tray Lower Safety Switch

(1) Remove the screws (shoulder screw, M4 x 30: 2 pcs), securing the printer to the Risograph stand.
(2) Remove the rear cover.
(3) Slide out the machine from the Risograph stand (in the direction shown by the arrow in the photograph) far enough to allow a screwdriver to be inserted in the mounting screws on the grip handle [A]. Make sure that the rubber feet do not slip off the Risograph stand.
(4) From underneath the machine, remove the mounting screws (bind, M4 x 8: 2 pcs), and remove the grip handle [A].
(5) Unplug the top connector [B].
(6) Unplug the switch connector [C] from the stay connector [D].
(7) Remove the mounting screws (washer, M3 x 14: 2 pcs), and remove the paper feed tray lower safety switch [E].



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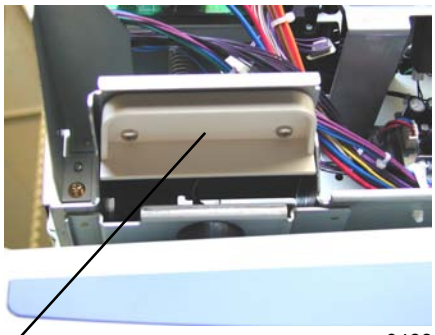

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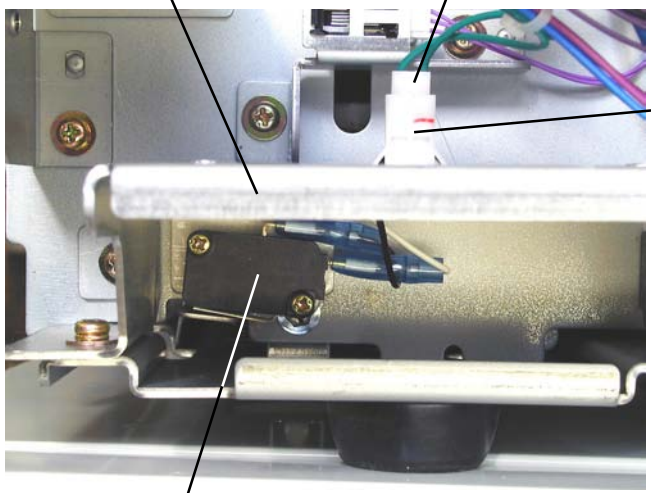


0434

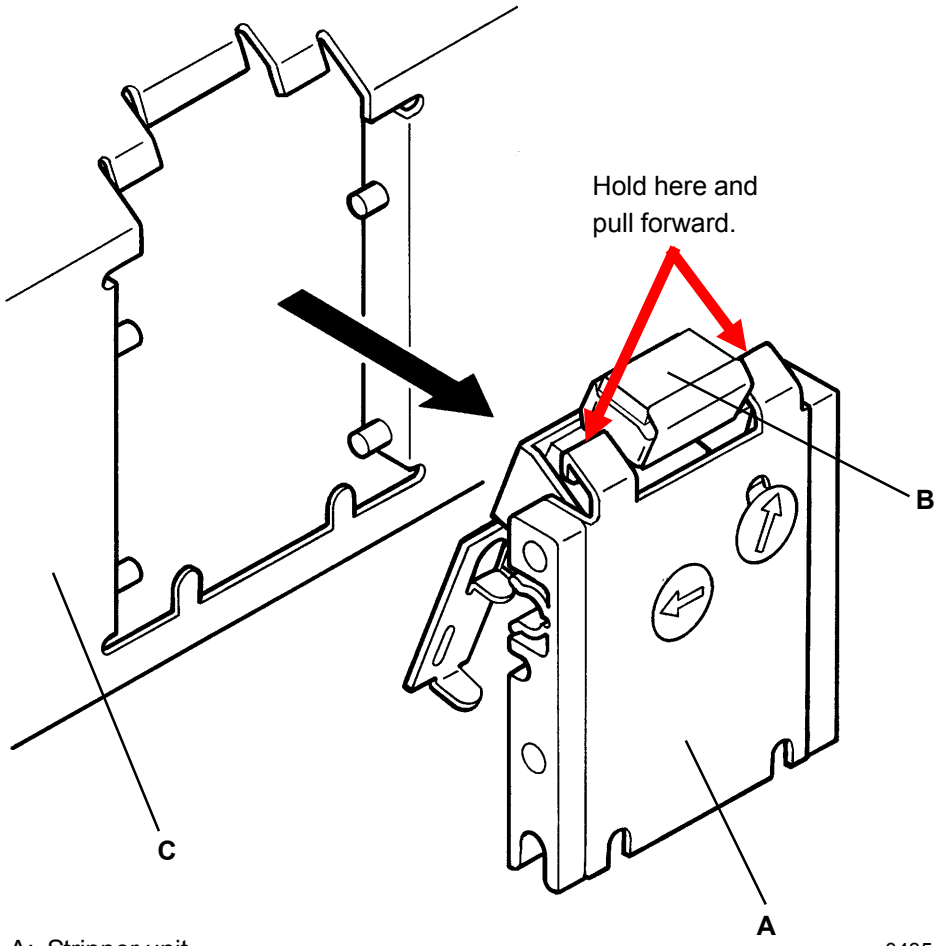
A: Grip handle
B: Top connector
C: Switch connector
D: Stay connector
E: Paper feed tray lower safety switch

9. Removing the Stripper Unit

(1) Lower the paper feed tray fully.
(2) Place a finger on the top of the stripper unit [A] and pull it forward to remove it.

[Precautions on Reassembly]

- Be sure to keep the stripper-pad ass'y [B] fully pushed back when installing the stripper unit [A] to the paper guide plate [C].
- Be sure to adjust the stripper unit.



A: Stripper unit
B: Stripper pad ass'y
C: Paper guide plate

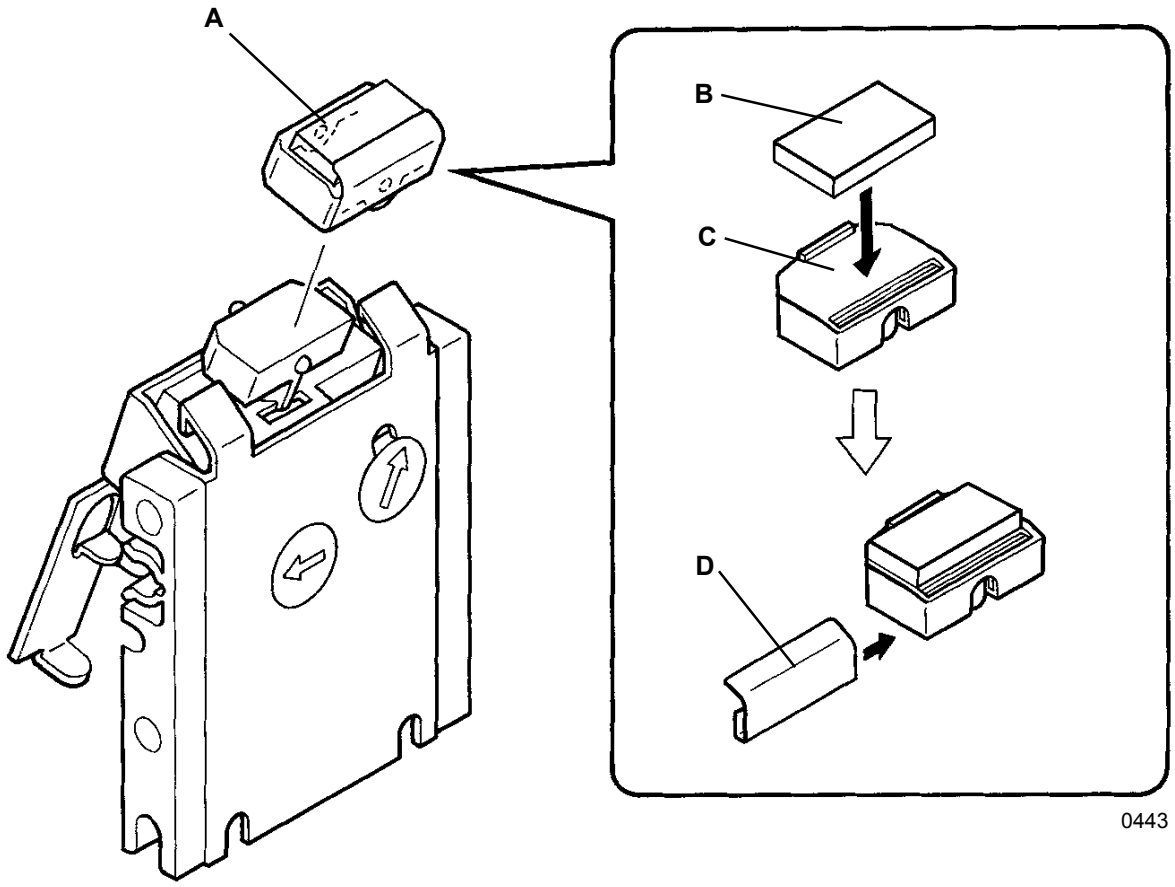
0435

10. Removing the Stripper Pad Ass'y

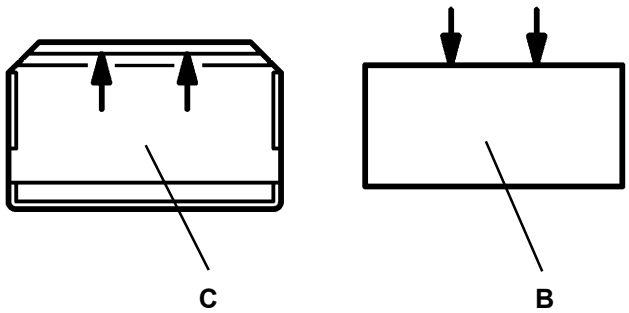
(1) Lower the paper feed tray fully, and remove the stripper unit.
(2) Lift up the stripper pad ass'y [A] by hand and remove it.

[Precautions on Reassembly]

- To attach the stripper pad [B], firmly press the bottom of the stripper pad [B] onto the face of the stripper-pad base [C] as indicated by the arrow and stick them together.



0443



A: Stripper pad ass'y
B: Stripper pad
C: Stripper pad base
D: Stripper pad cover

0436

Adjustment

1-1. Upper Limit Sensor Position Adjustment (RN25 Series)

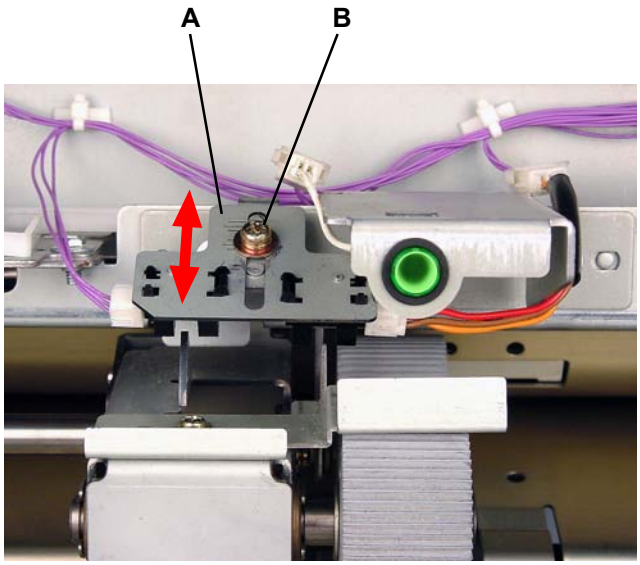
Adjustment

(1) Remove the paper from the paper-feed tray, and set the paper-feed pressure lever to “NORMAL.”
(2) Start Test Mode No. 453 (elevator servo) and raise the paper feed tray and bringing it to a complete stop.
(3) Once it is stopped, check that the gap between the pickup roller [C] and the paper feed tray [E] is 2.2 mm–2.7 mm.
(4) If the gap is not within the standard range, detach the master disposal box.
(5) Loosen the mounting screw [B] on the upper limit sensor bracket [A], and adjust by sliding the upper limit sensor up or down.

* Paper-feed-tray up/down Test Mode No. 452 does not operate if the safety switch is not pressed.

Symptoms

If the upper limit sensor is positioned too high, the paper-feed pressure is increased and multiple sheet feeding is more likely to arise.
Conversely, if it is positioned too low, the paper-feed pressure is reduced and non-feeding is more likely to arise.



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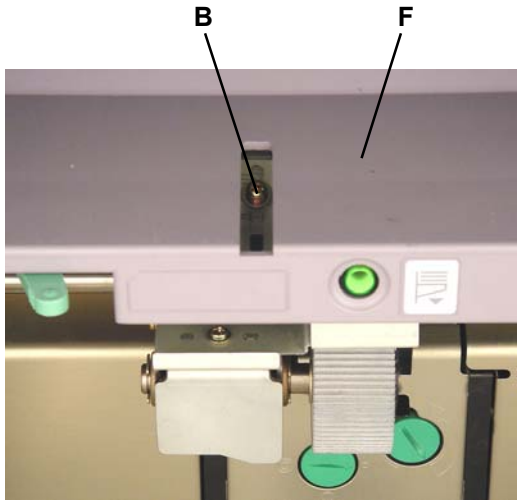

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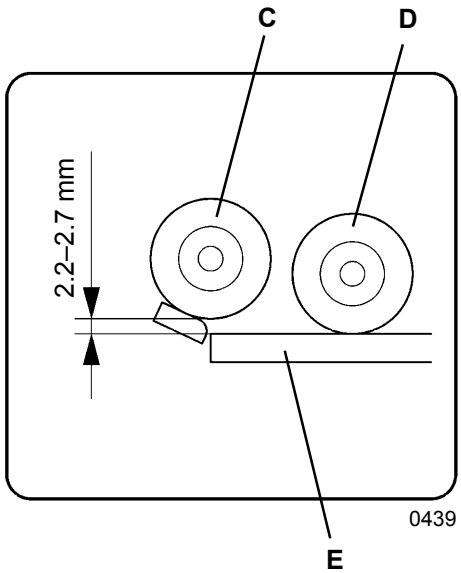


0439

A: Upper limit sensor bracket A
B: Upper limit sensor bracket A mounting screw
C: Pickup roller
D: Scraper roller
E: Paper feed tray
F: Master removal lower cover

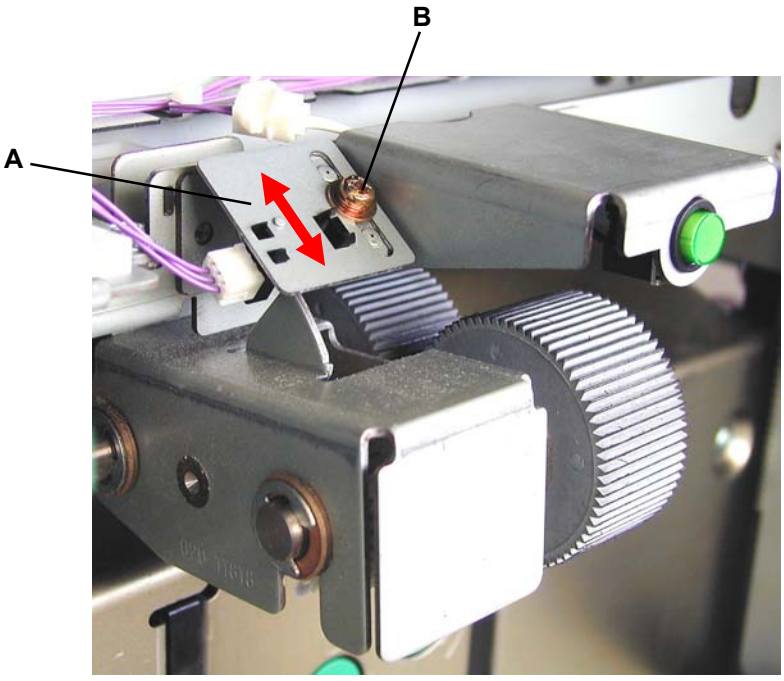
1-2. Upper Limit Sensor Position Adjustment (RN20/21 Series)

Adjustment

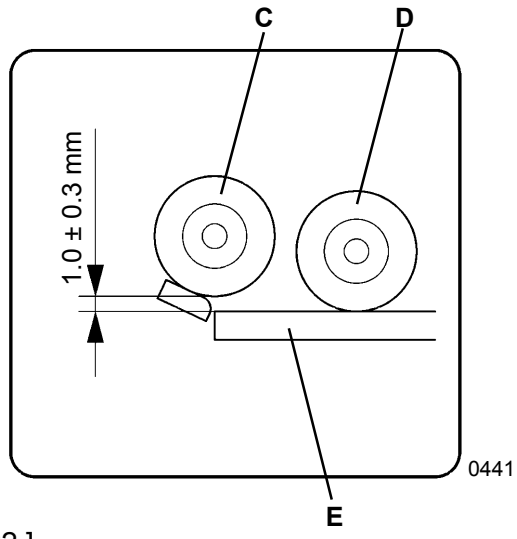
(1) Remove the paper on the paper feed tray.
(2) Start Test Mode No. 453 (Elevator-Motor Servo Action) and raise the paper feed tray and bringing it to a complete stop.
(3) Once it is stopped, check that the gap between the pickup roller [C] and the paper feed tray [E] is 1.0 mm ± 0.3 mm.
(4) If the gap is not within the specifications, detach the master removal box and remove the master removal lower cover.
(5) Loosen the mounting screw [B] on the upper limit sensor bracket [A], and adjust by sliding the upper limit sensor up or down.

Symptoms

If the upper limit sensor is positioned too high, the paper-feed pressure is increased and multiple sheet feeding is more likely to arise.
Conversely, if it is positioned too low, the paper-feed pressure is reduced and non-feeding is more likely to arise.



A: Upper limit sensor bracket
B: Upper limit sensor bracket mounting screw
C: Pickup roller
D: Scraper roller
E: Paper feed tray



2. Stripper Unit Adjustment

Adjustment

(1) Slide the paper feed pressure adjust lever to suit the paper type before printing.

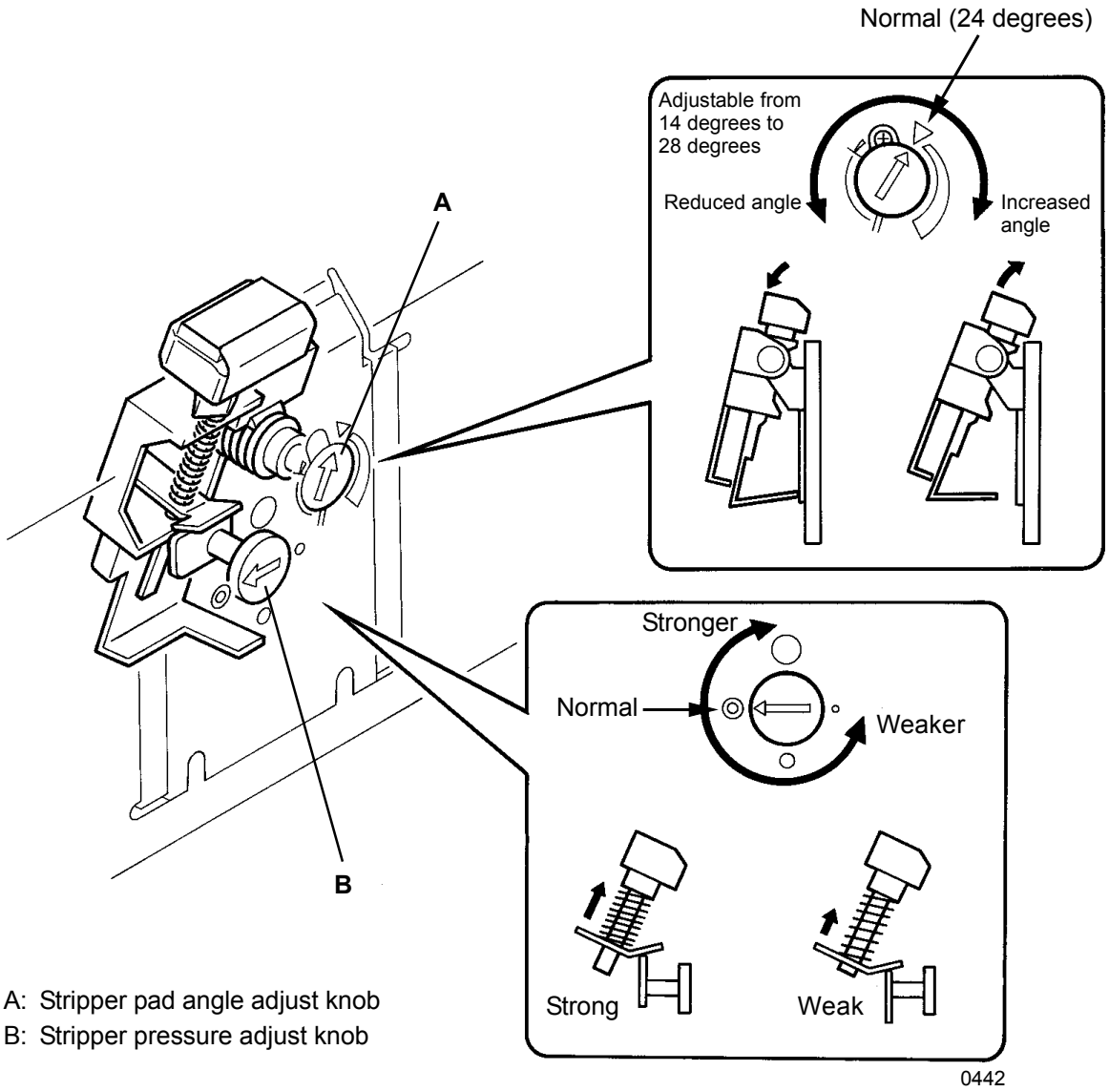
(2) If multiple feeding or non-feeding occurs, adjust the stripper-pad angle and pressure.

1) Multiple feeding

- Turn the stripper pad angle adjust knob [A] clockwise to increase the stripper-pad angle (raise the pad more vertically).
- Turn the stripper pressure adjust knob [B] clockwise to increase the stripper pressure.

2) Non-feeding

- Turn the stripper pad angle adjust knob [A] counter-clockwise to reduce the stripper-pad angle (lower the pad more horizontally).
- Turn the Stripper pressure adjust knob [B] counter-clockwise to reduce the stripper pressure.



A: Stripper pad angle adjust knob
B: Stripper pressure adjust knob

3. Paper-Feed Clutch ON Angle Adjustment

Checks and adjustment

(1) Test print to check that paper is fed smoothly.
(2) If the first-stage paper-feed timing is not synchronized, adjust using Test Modes Nos. 495 through 498 (paper-feed clutch ON angle adjustment) according to the paper-type setting in the User Mode. (For the setting procedure, refer to Chapter 18 “Test Mode.”)
(3) Repeat from step (1) until correct timing is achieved.

Symptoms

If the first stage paper feed timing is not synchronized, paper jamming or inconsistent print registration may occur.

4. Paper-Feed Clutch ON Angle Adjustment (A3 size)

For models capable of feeding A3-size paper, make the following adjustment.

Checks and adjustment

(1) Place A3-size paper in the paper-feed tray, and print to make sure paper is fed smoothly into the machine.
(2) If the first-stage paper-feed timing is not synchronized, adjust using Test Mode No. 494 (paper-feed clutch ON angle adjustment A3) in accordance with the paper-type setting in the User Mode (for the setting procedure, refer to Chapter 18 “Test Mode”).
(3) Repeat from step (1) until correct timing is achieved.

5. Paper-Feed Clutch OFF Angle Adjustment

Checks and adjustment

(1) Test print to check that printing is performed smoothly.
(2) If printing is not performed smoothly due to excessive or insufficient buckling of the paper, adjust using Test Modes Nos. 482 through 485 (paper-feed clutch OFF angle adjustment) according to the paper-type setting in the User Mode (for the setting procedure, refer to Chapter 18 “Test Mode”).
(3) Repeat from step (1) until correct timing is achieved.

Symptoms

If the paper is excessively or insufficiently buckled, paper may not be fed to the second stage and paper jamming may occur.

6. Paper-Width Potentiometer Compensation

Checks and adjustment

(1) Start Test Mode No. 491 (Paper Size VR Adjustment Selection), and set “1” (for 297-mm width compensation) in the case of a model capable of feeding A3-size paper, or “0” (for 210-mm width compensation) for other models (not compatible with A3-size paper).
(2) Set the fence position to 105 mm, and execute Test Mode No. 450 (Paper Size VR Adjustment: 105 mm).
(3) When “1” is set in step (1), set the fence position to 297 mm. When “0” is set, set the fence position to 210 mm. Then, start Test Mode No. 451 (Paper-Width Potentiometer Compensation: 210/297 mm).
(4) Set the fence position to 105 mm. Start Test Mode No. 471 (Paper Width: mm), and make sure the indication shows a value of between 1040 and 1060 (1050 ± 10).
(5) In Test Mode No. 471 (Paper Width: mm), set the fence position to 297 mm if “1” is set in step (1), and make sure the indication shows a value of between 2960 and 2980 (2970 ± 10). If “0” is set in step (1), set the fence position to 210 mm, and make sure the indication shows a value of between 2090 and 2110 (2100 ± 10).

Symptoms

In the event of incorrect adjustment, the size of paper in the paper-feed tray cannot be detected correctly, and a message may be displayed to warn that the paper size and print size do not match and that ink contamination of the rollers may result.

[Memo]

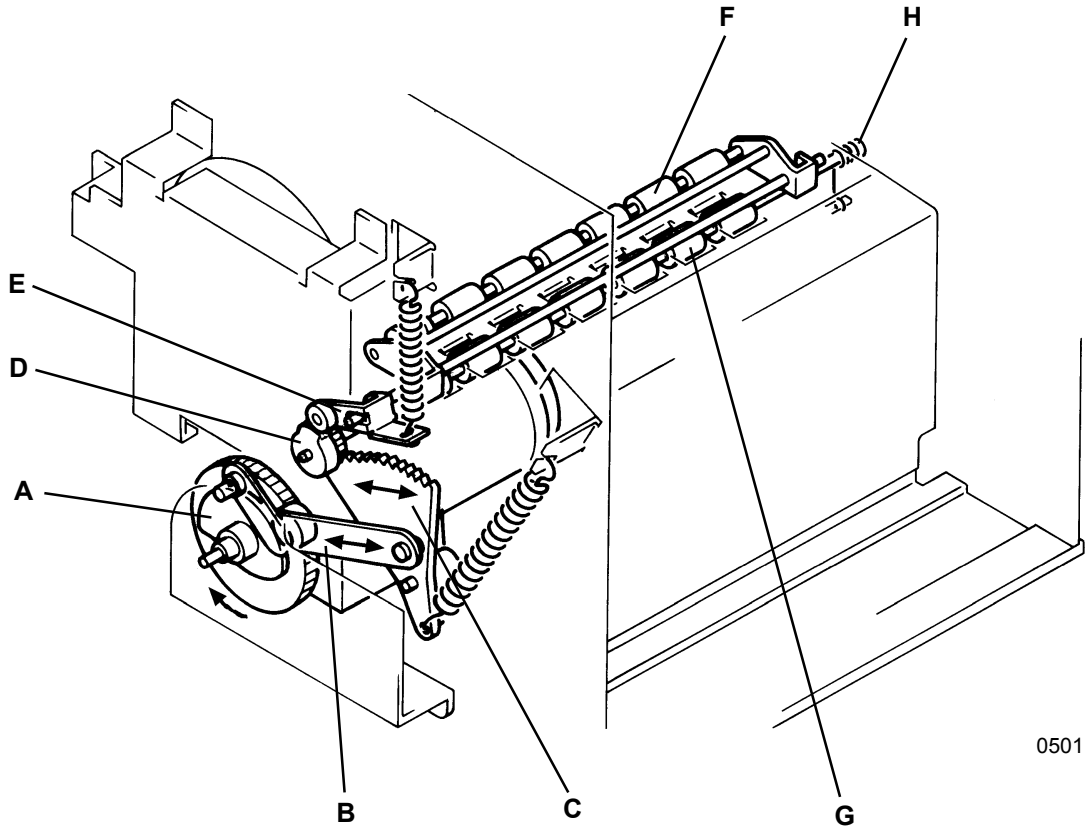
CHAPTER 5: SECOND PAPER FEED SECTION

Contents

Mechanism

1. Second Paper Feed Mechanism

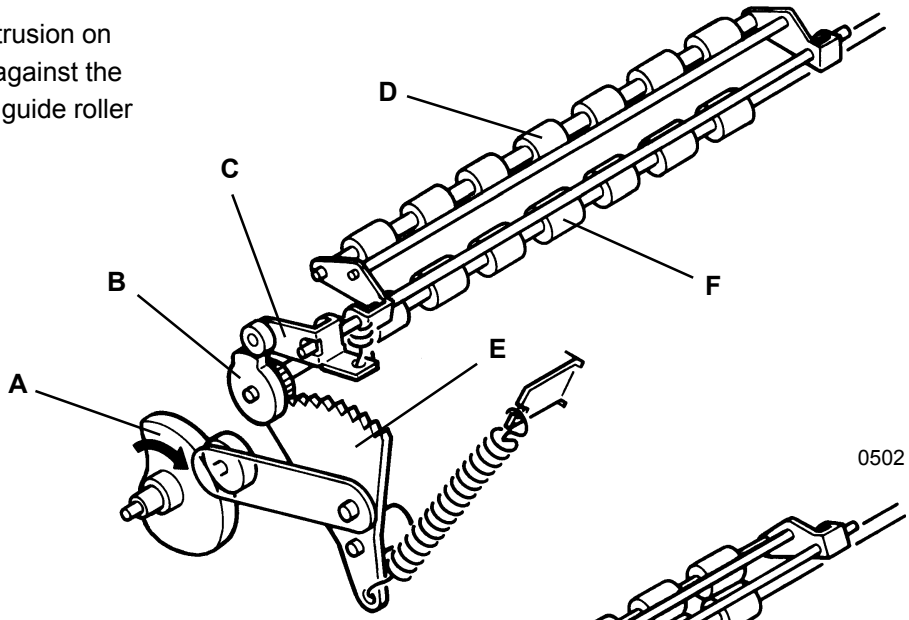
When the main motor operates during printing, the main cam [A] rotates clockwise.
The main cam [A] rotation moves the timing gear [C] via the cam follower arm [B], and this rotates the timing cam [D].
The timing cam [D] contains a one-way clutch so that when it rotates counter-clockwise, the rotation is transferred to the timing roller [G], but when it rotates clockwise, the rotation is not transferred.
The load spring [H] continuously applies a load to the timing roller [G] to ensure that the timing roller [G] stops immediately when it is not rotated.
The timing roller [G] rotation also rotates the guide roller [F] clockwise.
As the timing cam [D] rotates, the protrusion pushes against the timing lever [E] and raises the guide roller [F].
During printing, the guide roller [F] moves down and contacts the timing roller [G] during the first paper feed operation, and then rises once the timing roller [G] stops rotating.



A: Main cam
B: Cam follower arm
C: Timing gear
D: Timing cam
E: Timing lever
F: Guide roller
G: Timing roller
H: Load spring

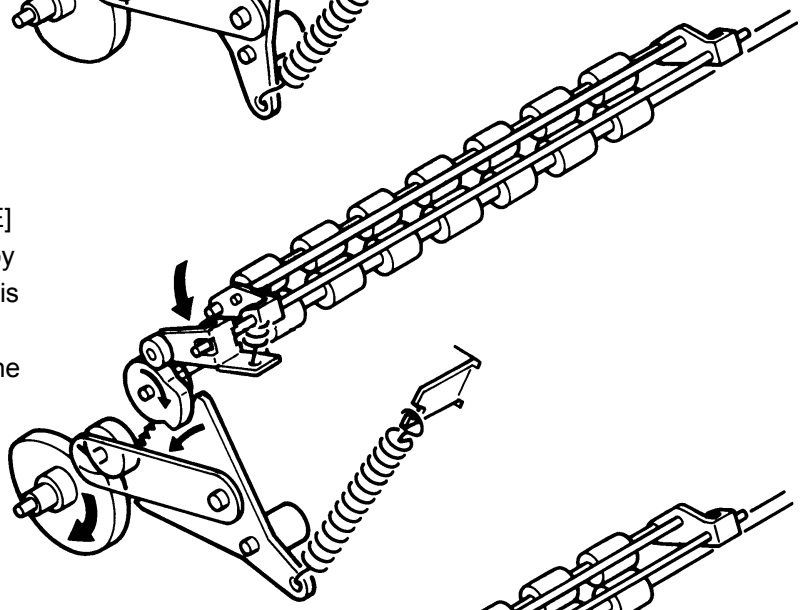
Drum position-A

At drum position-A, the protrusion on the timing cam [B] pushes against the timing lever [C] to raise the guide roller [D].



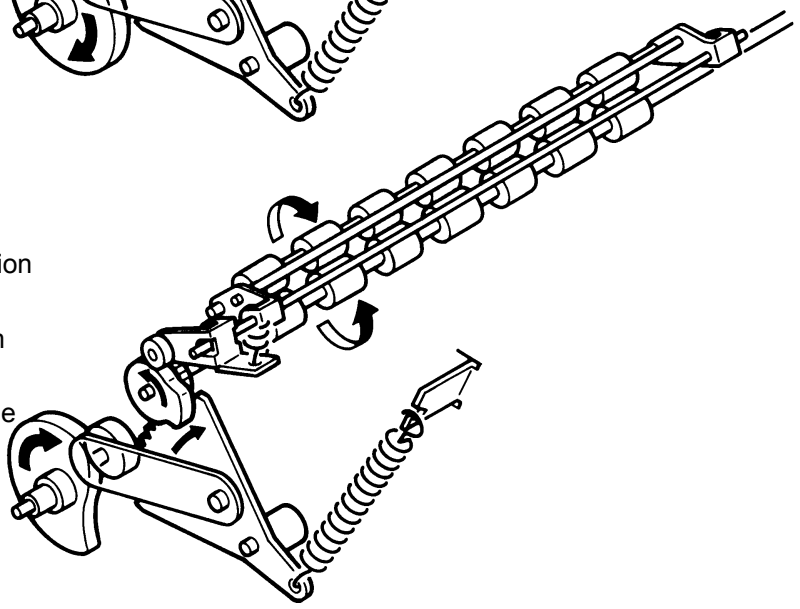
First paper feed start

When the first paper feed starts and the paper is fed in, the timing gear [E] is rotated in the direction, indicated by arrow mark, by the main cam [A]. This rotates the timing cam [B], which lowers the timing lever [C] to lower the guide roller [D].



Second paper feed start

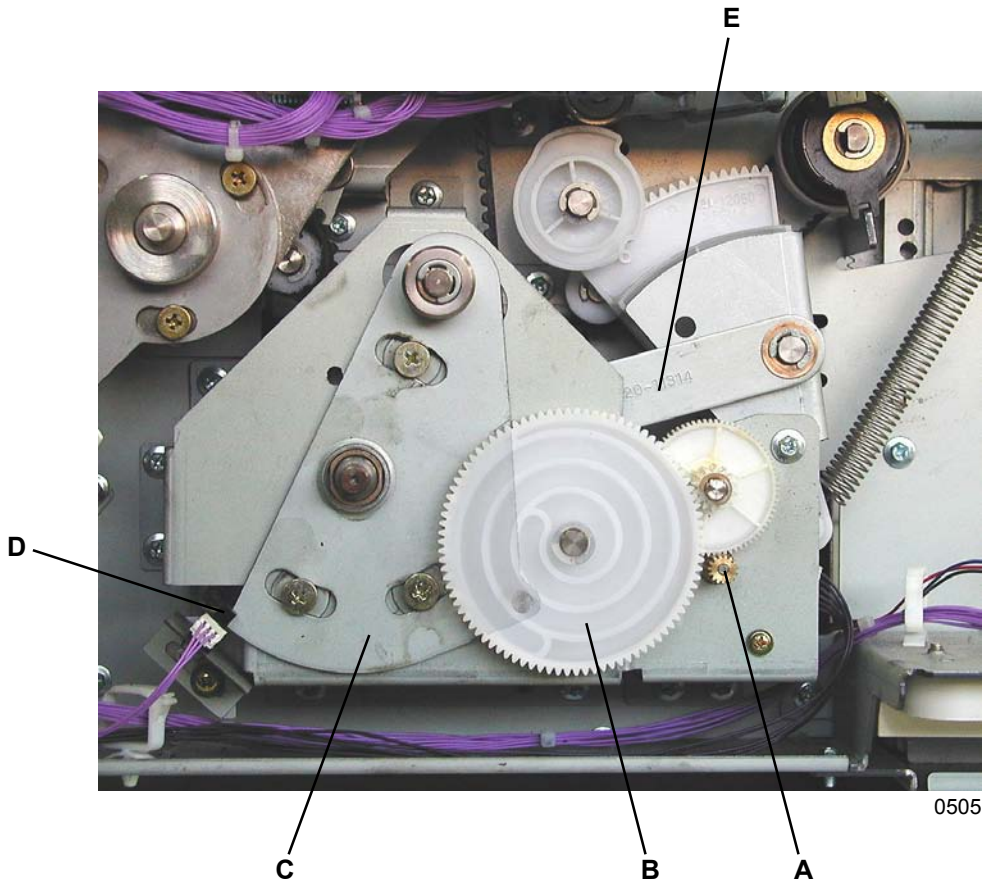
Upon completion of the first paper-feeding operation, the main cam [A] turns the timing gear [E] in the direction indicated by the arrow shown in the diagram. This causes the timing cam [B] to rotate, thus turning the timing roller [F] to feed the paper. (The guide roller [D] is a free-spinning roller.)



A: Main cam
B: Timing cam
C: Timing lever
D: Guide roller
E: Timing gear
F: Timing roller

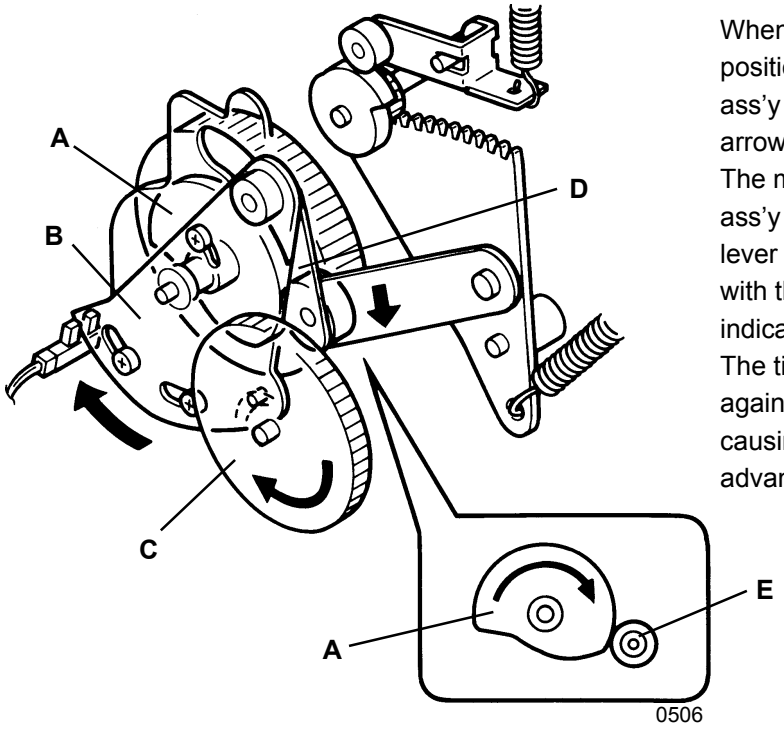
2. Vertical Print Positioning Mechanism

Pressing the ◀ or ▶ print position keys on the panel activates the print positioning pulse motor [A], which rotates the print positioning adjuster cam [B] to move the print positioning plate ass'y [C].
The print positioning plate ass'y [C] motion moves the print positioning lever ass'y [E], changing the timing with the main cam.
The second paper feed (timing roller rotation start) timing is thus changed, changing the vertical printing position.
The vertical centering sensor [D] checks the centering of the print positioning.



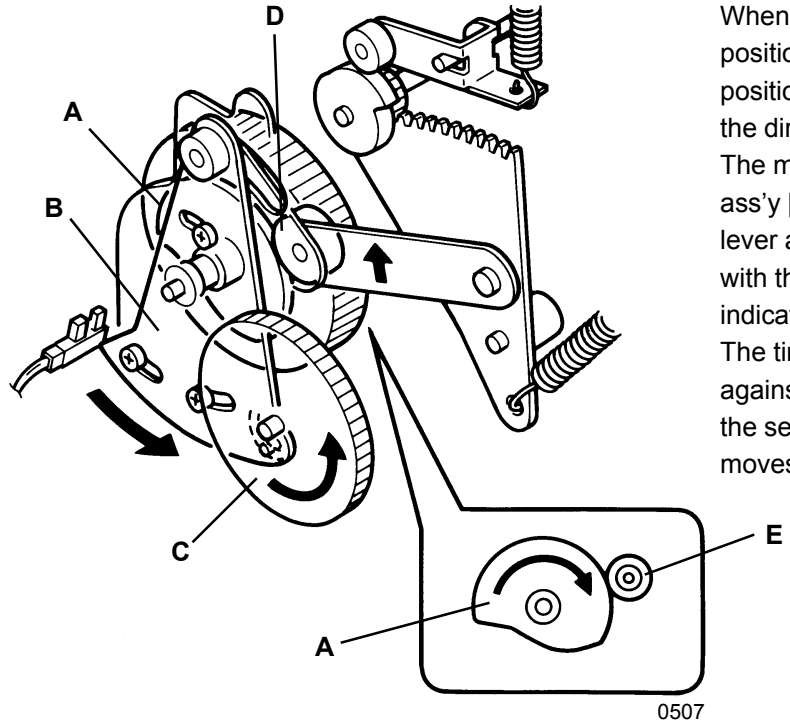
A: Print-positioning pulse motor
B: Print-positioning cam (with the spiral groove on its back side)
C: Print-positioning plate ass'y
D: Vertical centering sensor
E: Print-positioning lever ass'y

1) Pressing the ▶ (up) key on the panel



When the ▶ key is pressed, the print-positioning cam [C] and print-positioning plate ass'y [B] move in the directions indicated by arrows.
The movement of the print-positioning plate ass'y [B] also moves the print-positioning lever ass'y [D], and the bearing [E] in contact with the main cam [A] moves in the direction indicated by arrows.
The timing of the contact of the bearing [E] against the main cam [A] is advanced, causing the second paper feed timing to advance, and moves the print position up.

2) Pressing the ◀ (down) key on the panel



When the ◀ key is pressed, the print-positioning adjuster cam [C] and print-positioning adjuster plate ass'y [B] move in the directions indicated by arrows.
The movement of the print-positioning plate ass'y [B] also moves the print-positioning lever ass'y [D], and the bearing [E] in contact with the main cam [A] moves in the direction indicated by arrows.
The timing of the contact of the bearing [E] against the main cam [A] is delayed, causing the second paper feed timing to delay, and moves the print position down.

A: Main cam
B: Print-positioning plate ass'y
C: Print-positioning cam
D: Print-positioning lever ass'y
E: Bearing

Disassembly

1. Removing the Guide Roller Ass'y

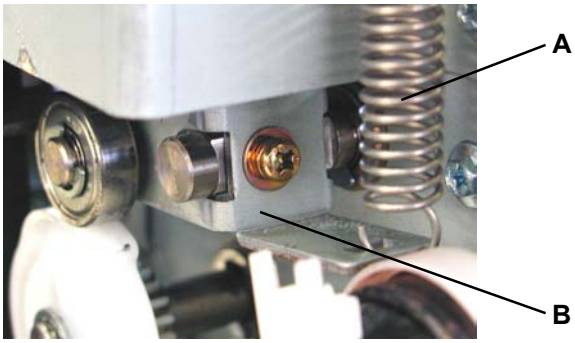
(1) Pull out the print drum and remove the following covers.
- Front door
- Front cover
- Rear cover

(2) **<RN 25 Series>** Remove the PCB cover, and open the main PCB bracket.
<Rn 20/21 Series> Remove the controller.

(3) Remove the guide roller spring [A].

(4) Remove the timing lever ass'y [B]. (double-washer, M4 x 8: 1 pc)

(5) Remove the E-rings [C] and bearing bushes [D] at both front and rear, and then remove the guide roller ass'y [E].



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A: Guide roller spring
B: Timing lever ass'y
C: E-ring
D: Bearing bush
E: Guide roller ass'y

2. Removing the Paper Guide Plate Ass'y

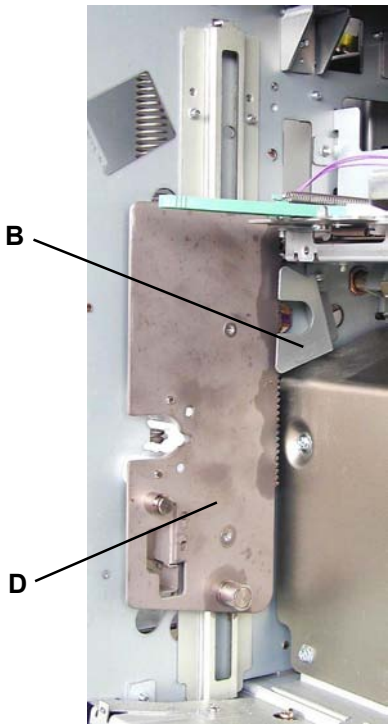
(1) Pull out the print drum and remove the following covers.
- Front door
- Front cover
- Rear cover
- Master-removal lower cover

(2) Remove the following components.
- Paper feed tray unit
- Stripper unit
- Paper feed clutch
- Pickup roller shaft ass'y
- Elevator motor
- Guide roller ass'y

(3) **<RN25 Series>** Remove the PCB cover, and open the main PCB bracket.
<RN20/21 Series> Remove the controller and the main PCB.

(4) Loosen the retaining screws, and remove guard plate F [A] and the guard plate R [B].

(5) Remove the elevator rack front [C] and the elevator rack rear [D]. (RS tight, M4 x 8: 4 pcs each)



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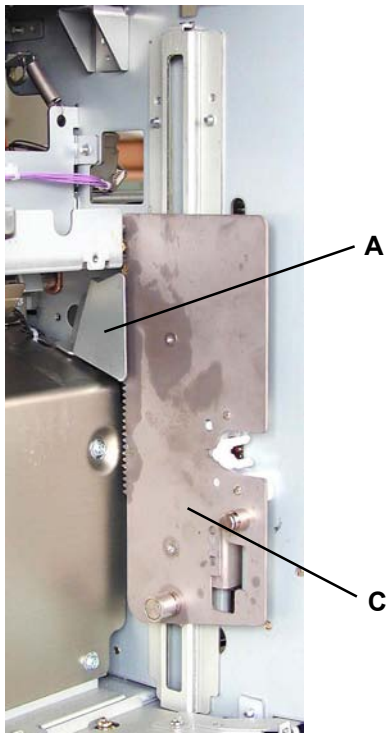
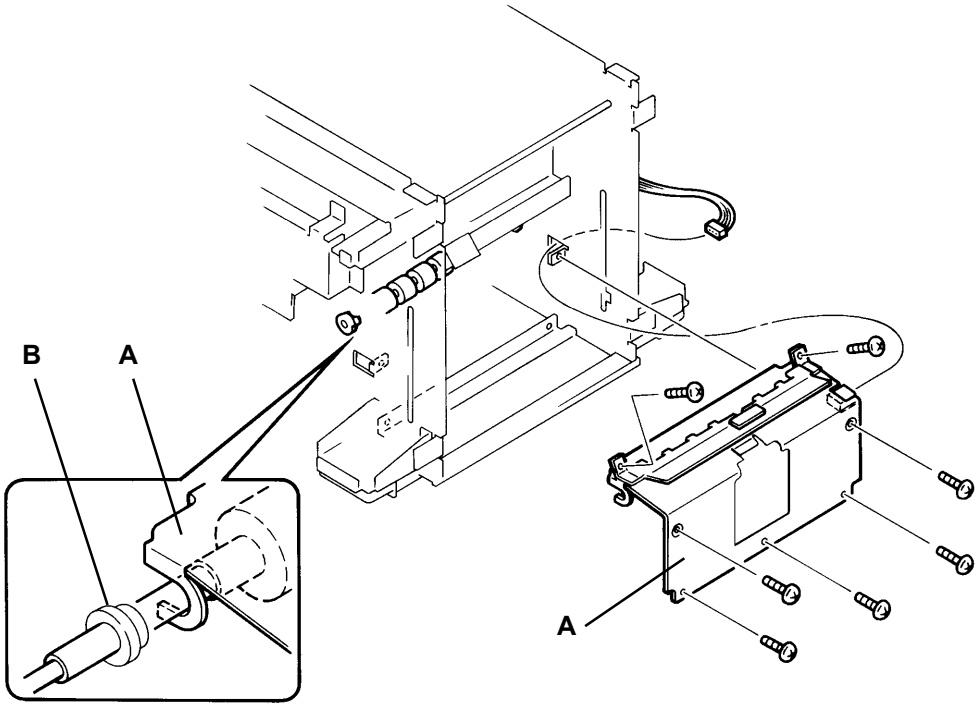


0511

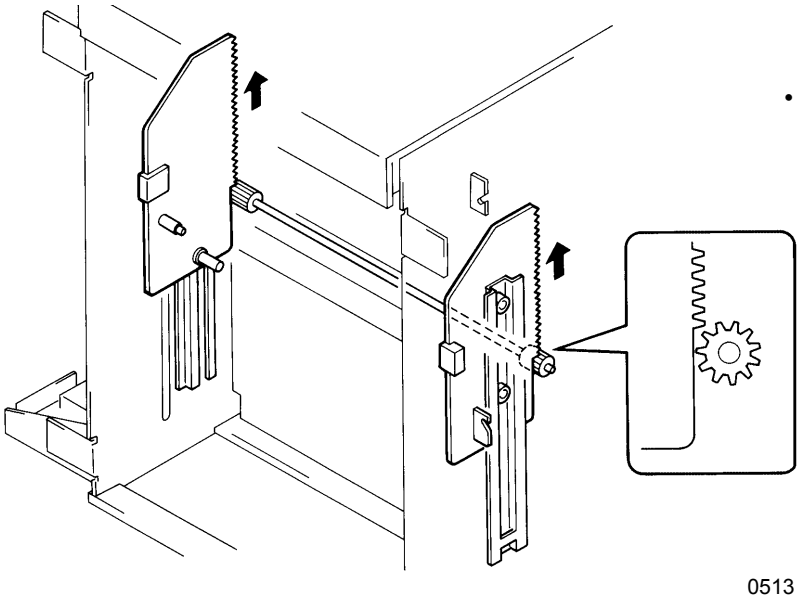
A: Guard plate F
B: Guard plate R
C: Elevator rack front
D: Elevator rack rear

(6) Unplug the connector from the paper guide plate [A], remove the mounting screws (RS tight, M4 x 8: 7 pcs), and then remove the paper guide plate [A].



[Precautions on Reassembly]

- Hook the paper guide plate [A] onto the timing roller bearing bushes [B]. (See enlarged view.)
- Align the half-pierced sections of the front and rear elevator racks.
- Align the gear height for the front and rear elevator racks.



- Raise the front and rear elevator racks fully to disengage the gears, and then lower them while aligning the height.

A: Paper guide plate
B: Bearing bush

3. Removing the Paper Sensor

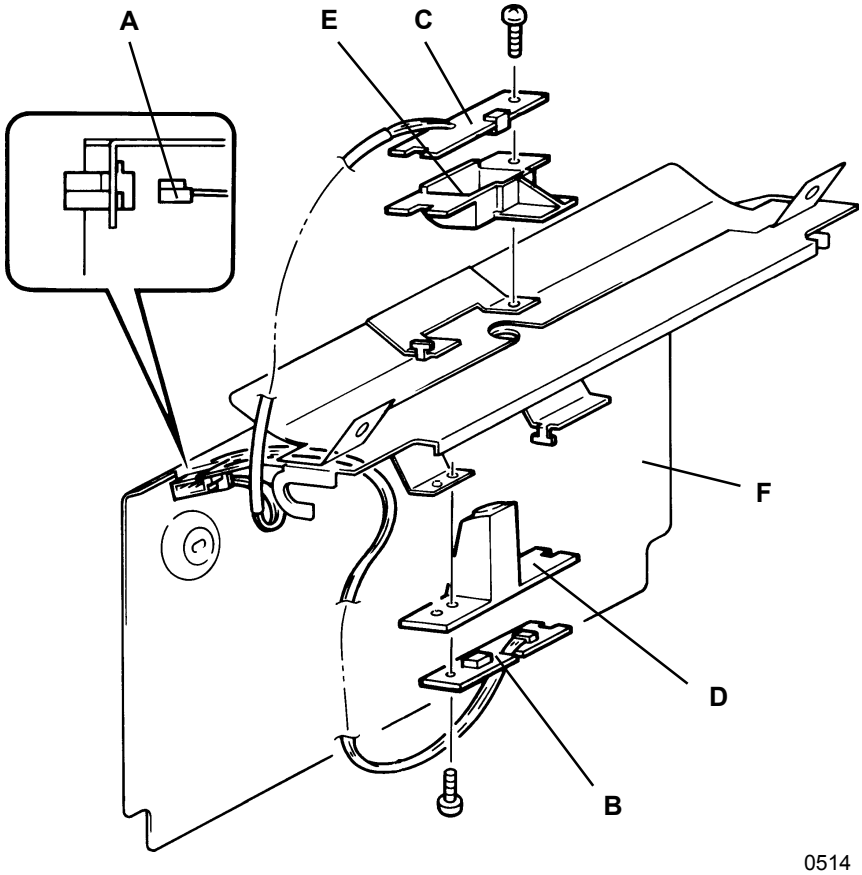
(1) Pull out the print drum and remove the following covers.
- Front door
- Front cover
- Rear cover
- Master removal lower cover

(2) Remove the following components.
- Paper feed tray unit
- Stripper unit
- Paper feed clutch
- Pickup roller shaft ass'y
- Elevator motor
- Guide roller ass'y
- Paper guide plate

(3) Unplug the paper sensor connector [A] from the paper guide plate [F].

(4) Remove the paper sensor (send) [B] mounting screw (bind, M3 x 8: 1 pc) and paper sensor (receive) [C] mounting screw (bind, M3 x 8: 1 pc), remove the paper-sensor covers [D] and [E], and then remove paper sensors [B] and [C] from the paper guide plate [F].

[Precautions on Reassembly]
- Hook the paper sensors onto the retaining brackets of the paper guide plate.



0514

A: Connector
B: Paper sensor (send)
C: Paper sensor (receive)
D: Paper-sensor cover (send)
E: Paper-sensor cover (receive)
F: Paper guide plate

4. Removing the Timing Roller

(1) Remove the following covers.
- Front door
- Front cover
- Rear cover
- Master removal lower cover

(2) Remove the following components.
- Paper feed tray unit
- Stripper unit
- Paper feed clutch
- Pickup roller shaft ass'y
- Elevator motor
- Guide roller ass'y
- Paper guide plate

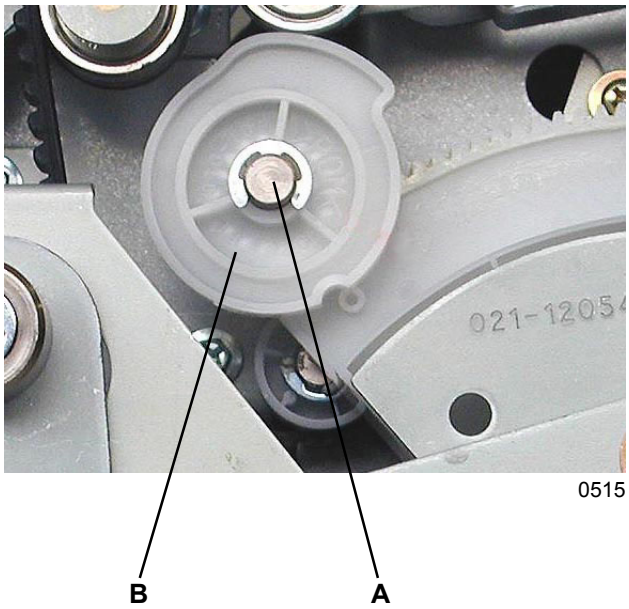
(3) Remove the E-ring from the rear of the timing roller [A], then remove the timing cam [B].

(4) Remove the E-ring and collar [C] from the front of the timing roller [A], then remove the load spring [D].

(5) Remove the E-rings and bearing bushes [E] from both ends of the timing roller [A], and then remove the timing roller [A].

[Precautions on Reassembly]
- Note the direction in which the load spring is mounted. (See diagram.)

[Adjustment after Reassembly]
- Adjust the timing cam mounting position.



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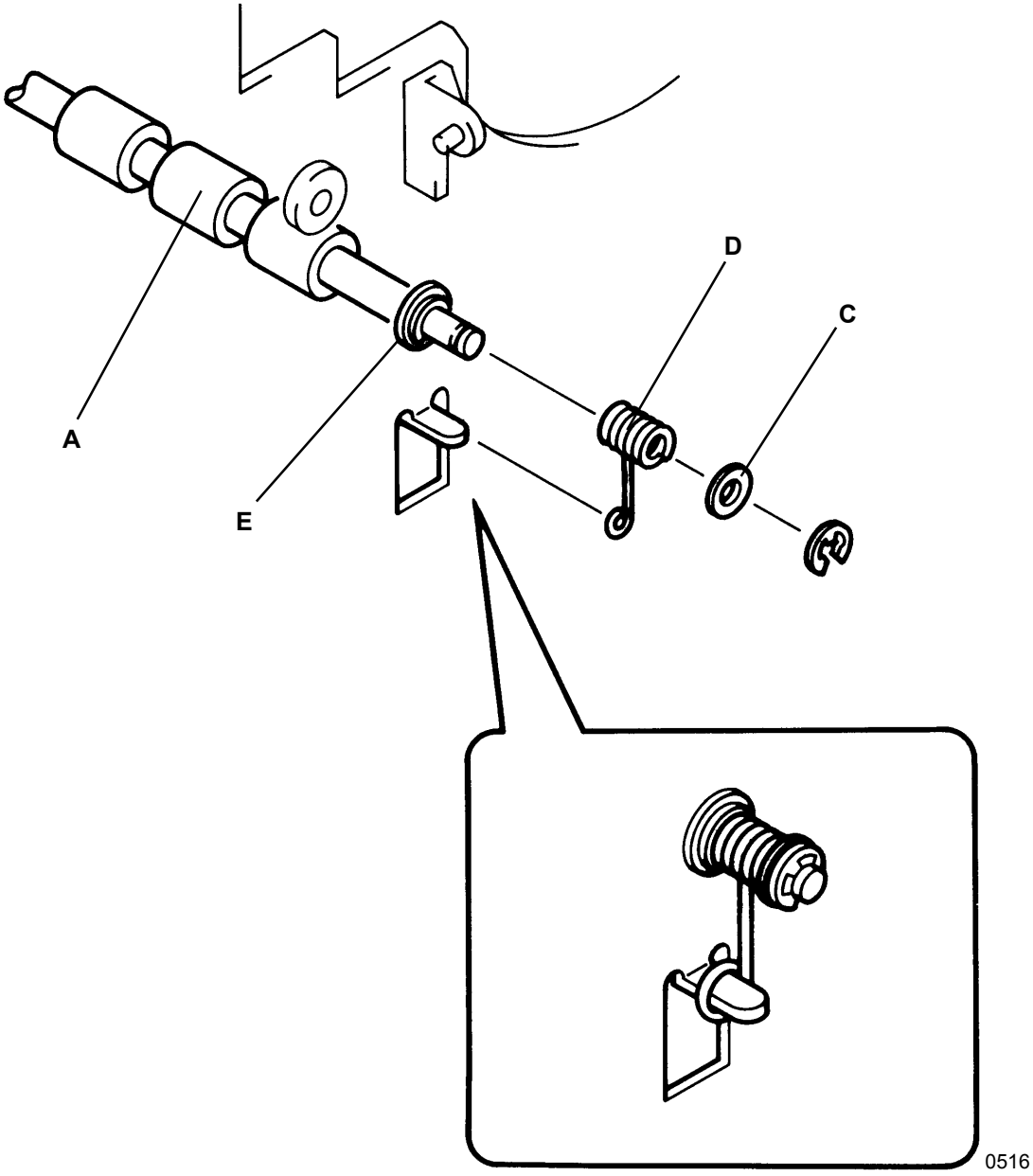


Load spring mounting direction

A: Timing roller
B: Timing cam
C: Collar
D: Load spring
E: Bearing bush

5. Removing the Print-Positioning Unit

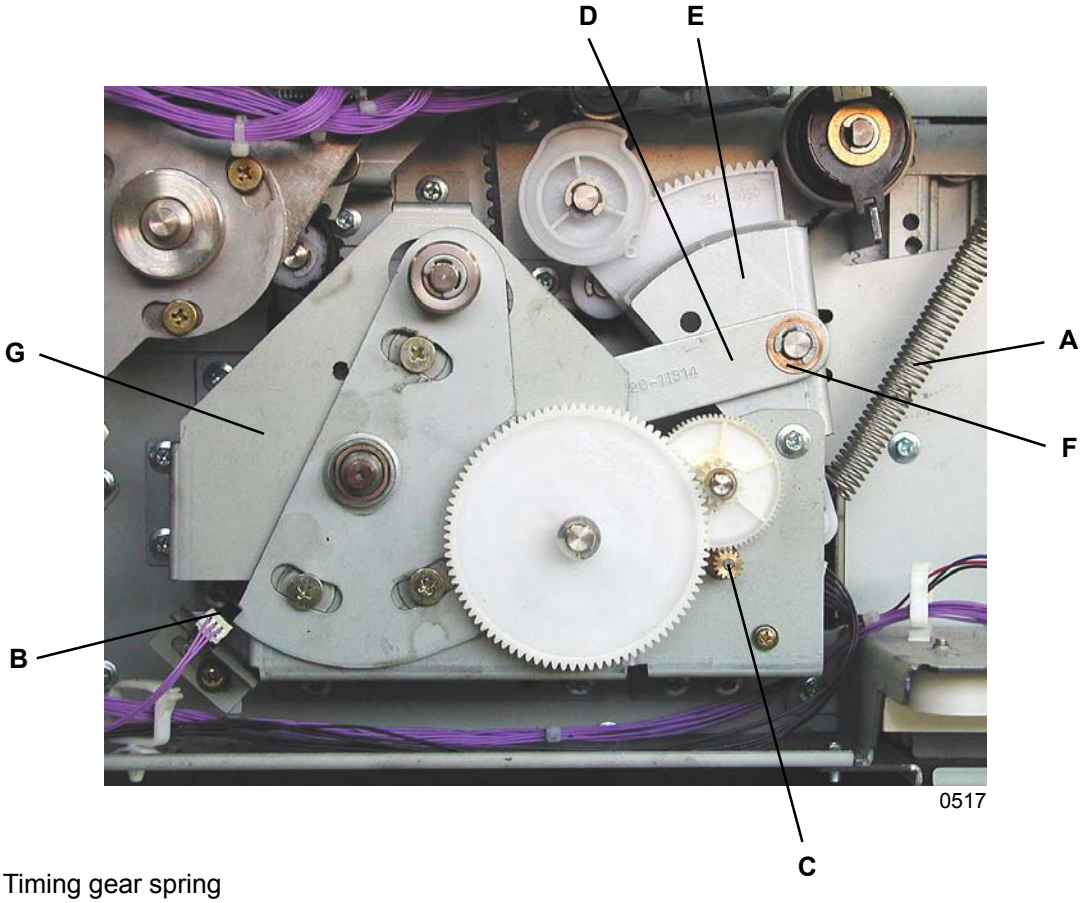
(1) Remove the rear cover.
(2) **<RN25 Series>** Remove the PCB cover, and open the main PCB bracket.
Remove the connector bracket.
<RN20/21 Series> Remove the controller.
(3) Remove the timing gear spring [A].
(4) Unplug the connectors on the vertical centering sensor [B] and print-positioning pulse motor [C].
(5) Remove the E-ring on the cam follower arm [D], and remove the cam follower arm [D] and washers [F] (one each on the front and rear of the cam follower arm [D]) from the timing gear [E].
(6) Remove the mounting screws (RS tight, M4 x 8: 6 pcs) on the print-positioning unit [G], and then remove the print-positioning unit [G].

[Precautions on Reassembly]

- When mounting the print-positioning unit [G], the timing gear [E] should be turned all the way in the clockwise direction.

[Adjustment after Reassembly]

- Adjust the timing cam mounting position.



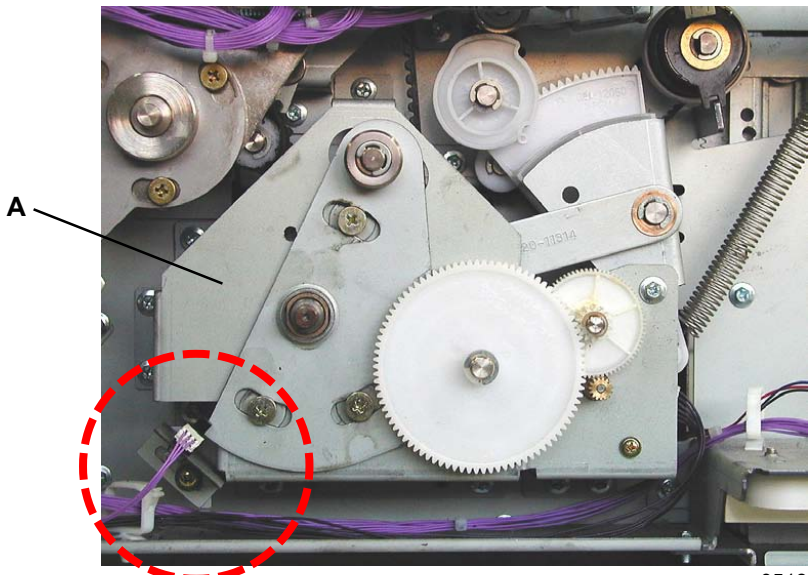
A: Timing gear spring
B: Vertical centering sensor
C: Print-positioning pulse motor
D: Cam follower arm
E: Timing gear
F: Washer
G: Print-positioning unit

6. Removing the Vertical Centering Sensor

(1) Remove the rear cover. (In the case of the RN25 Series, also remove the connector bracket.)
(2) Unplug the connector, remove the mounting screw (double-washer, 3 x 6: 1 pc), and then remove the vertical centering sensor [B] together with the vertical centering sensor bracket [C].

[Precautions on Reassembly]

- Align the two faces of the vertical centering sensor bracket [C] as shown in the photograph below.



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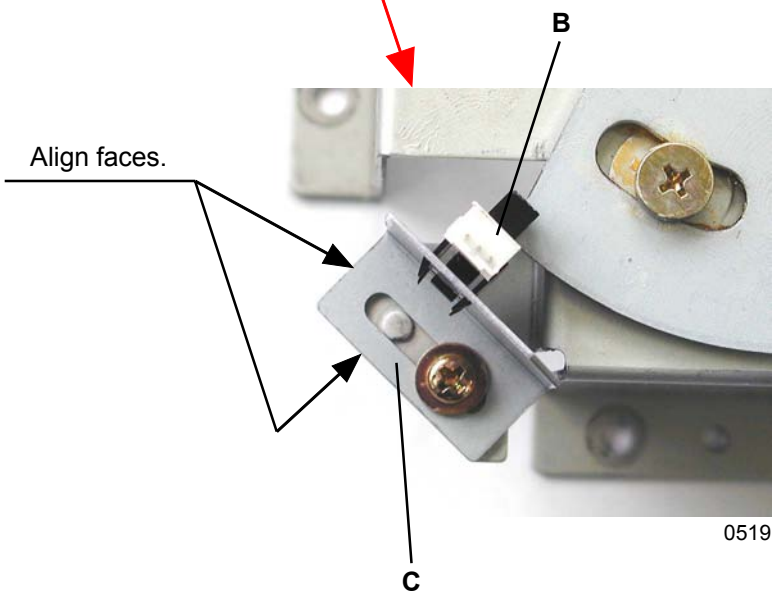


0519

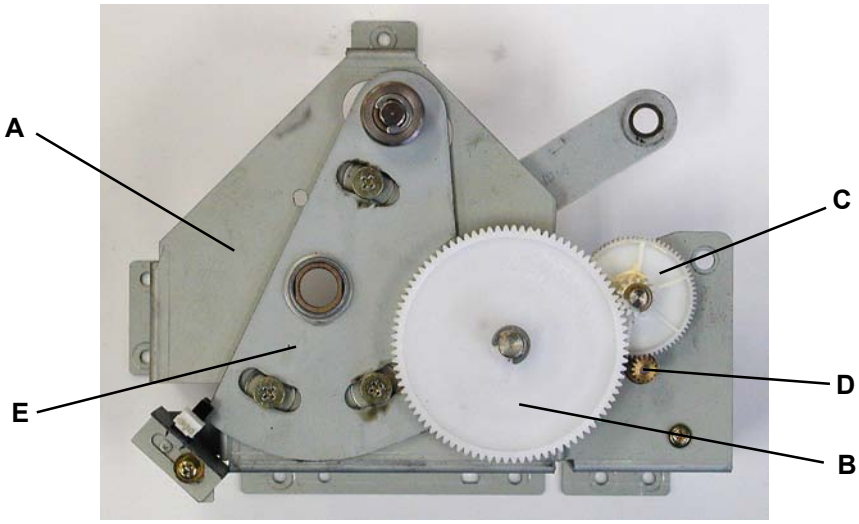
A: Print-positioning base unit
B: Vertical centering sensor
C: Vertical centering sensor bracket

7. Removing the Print-Positioning Pulse Motor

(1) Remove the rear cover.
(2) **<RN25 Series>** Remove the PCB cover, and open the main PCB bracket.
Remove the connector bracket.
<RN20/21 Series> Remove the controller.
(3) Remove the following components.
- Timing gear spring
- Print-positioning unit [A]

(4) Remove the E-ring and remove the print-positioning cam [B].
(5) Remove the E-ring and remove the print-positioning intermediate gear [C].
(6) Remove the mounting screws (double-washer, M3 x 6: 2 pcs) on the print-positioning pulse motor [D], and then remove the print-positioning pulse motor [D].

[Precautions on Reassembly]
- Insert the pin [F] of the print-positioning plate ass'y [E] into the spiral groove [G] on the print-positioning cam [B].



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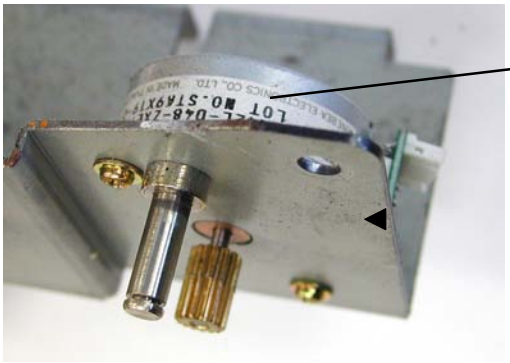

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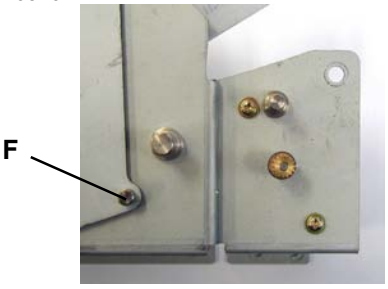

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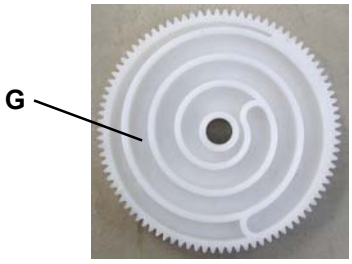


0523

A: Print-positioning unit
B: Print-positioning cam
C: Print-positioning intermediate gear
D: Print-positioning pulse motor
E: Print-positioning plate ass'y
F: Print-positioning plate ass'y pin
G: Spiral groove on the print-positioning cam

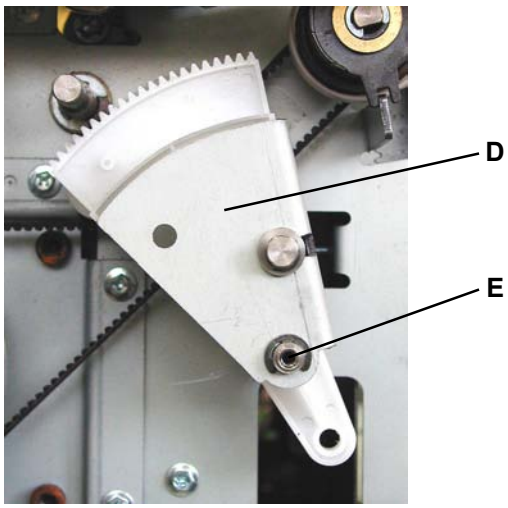
8. Removing the Timing Gear

(1) Remove the rear cover.
(2) **<RN25 Series>** Remove the PCB cover, and open the main PCB bracket.
Remove the connector bracket.
<RN20/21 Series> Remove the controller.
(3) Remove the following components.
- Guide roller spring
- Timing cam [A]
- Timing gear spring [B]
- Print-positioning unit [C]

(3) Remove the E-ring from the timing gear shaft [E] and remove the timing gear [D].

[Precautions on Reassembly]
- Adjust the mounting position of the timing cam.

0524



0525

A: Timing cam
B: Timing gear spring
C: Print-positioning unit
D: Timing gear
E: Timing gear shaft

Adjustment

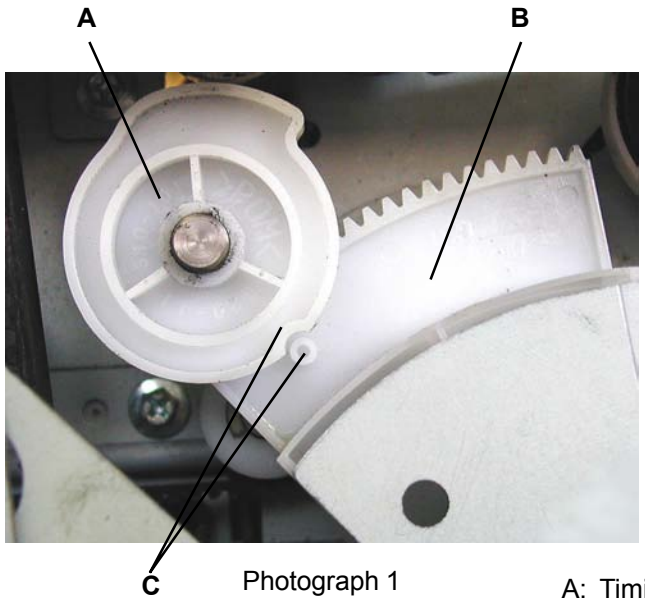
1. Timing Cam Mounting Position

Checks and adjustment

(1) Move the print drum to position A, centralize the printing position, switch off the power, and then remove the rear cover.
(2) With the position-A positioning mark on the main pulley properly aligned, confirm that the positioning marks [C] on the timing gear [B] and timing cam [A] are aligned (see photograph 1).
* The alignment may be offset in the direction indicated in photograph 2, but it must not be offset in the direction indicated in photograph 3.
(3) If not aligned, remove the E-ring from the timing roller shaft and remove the timing cam [A].
(4) Mount the timing cam [A] and timing gear [B] with the positioning marks [C] aligned.

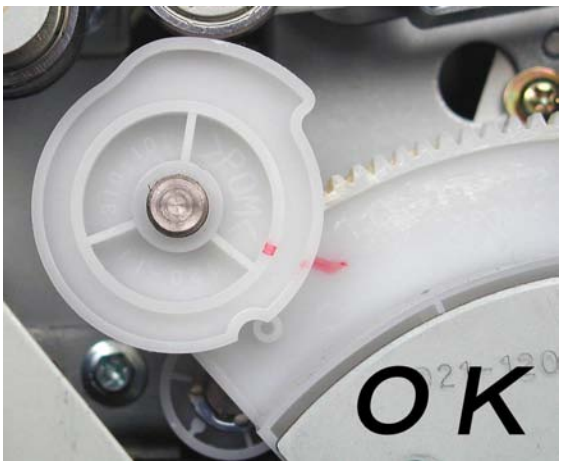
Symptoms

• If the timing cam is incorrectly positioned, the timing of the guide roller's vertical movement will be off, and paper jamming, print registration problems, or ghosting may occur.



Photograph 1

A: Timing cam
B: Timing gear
C: Positioning marks



Photograph 2

Photograph 3

CHAPTER 6: PRESS SECTION

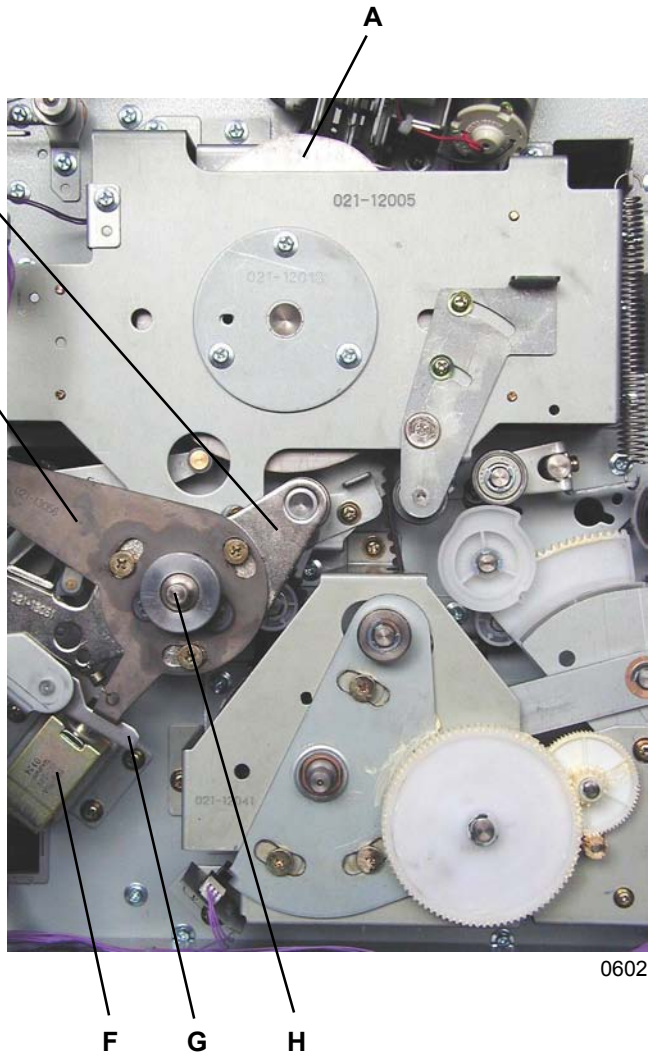
Contents

Mechanism

1. Press Mechanism

The main motor activates when printing begins, and the pressure solenoid [F] activates once the print drum rotates through 40°.
As the clamp plate base on the print drum approaches the pressure roller, the protrusion on the pressure cam [A] pushes against pressure lever A [B] to rotate it clockwise. This rotary motion causes pressure lever A [B] to push against pressure lever B [C], and the solenoid lever [G] separates from pressure lever B [C] and descends.
Once the protrusion on the pressure cam [A] has passed, pressure lever A [B] rotates counterclockwise. Likewise, pressure lever B [C] is pulled by the tension of the pressure spring [D] and second pressure spring [E], and rotates in unison with pressure lever A [B]. The pressure shaft [H] fixed to pressure lever B [C] therefore also rotates counterclockwise. The pressure roller therefore rises and is pressed against the print drum.
During printing, the pressure cam [A] pushes against pressure lever A [B] and lowers the pressure roller to prevent the pressure roller from touching the print drum clamp plate base. The pressure solenoid [F] remains activated.
After printing is complete, the pressure solenoid [F] is deactivated when the print drum reaches the 143° position.

0601



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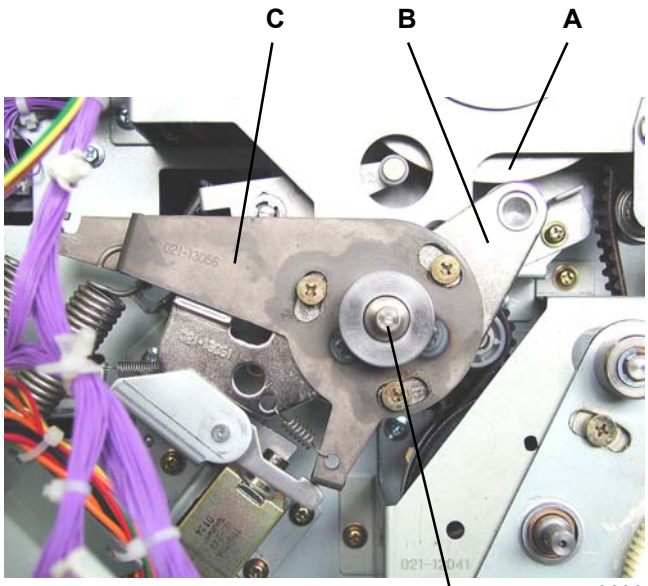
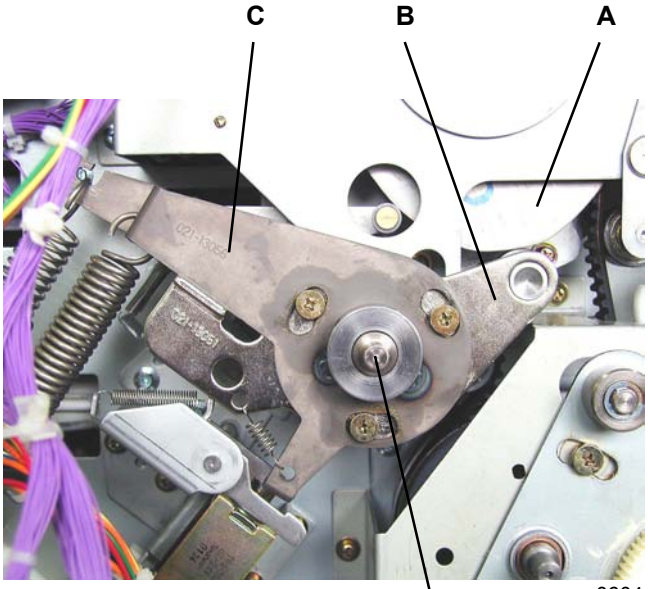


0603

Pressure roller is raised.



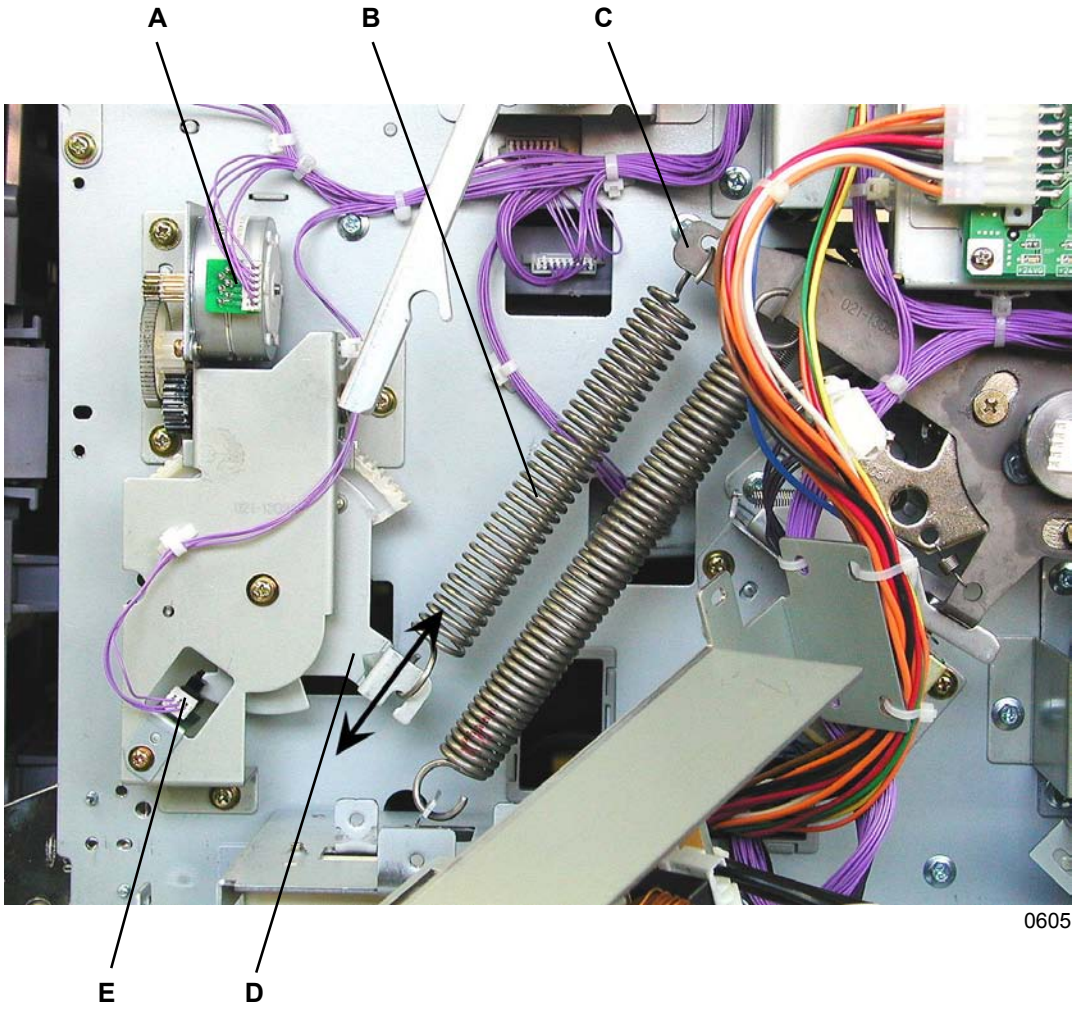
0604

Pressure roller is lowered.

A: Pressure cam
B: Pressure lever A
C: Pressure lever B
D: Pressure spring
E: Second pressure spring
F: Pressure solenoid
G: Solenoid lever
H: Pressure shaft

2. Pressure Control Mechanism

Pressing the ◀ or ▶ print density keys on the panel activates the pressure control motor [A] and moves the print pressure gear ass'y [D]. The movement of the print pressure gear ass'y [D] varies the tension of the second pressure spring [B].
This alters the pressure acting on pressure lever B [C], and varies the print density by varying the pressure of the pressure roller against the print drum. The pressure control motor is not actually activated until the Start key is pressed.
The printing pressure will vary depending on the printing speed and print density settings, the ink color, the length of time the print drum remains standing, and the print drum's internal temperature.
The print pressure control sensor [E] checks the standard printing pressure position.



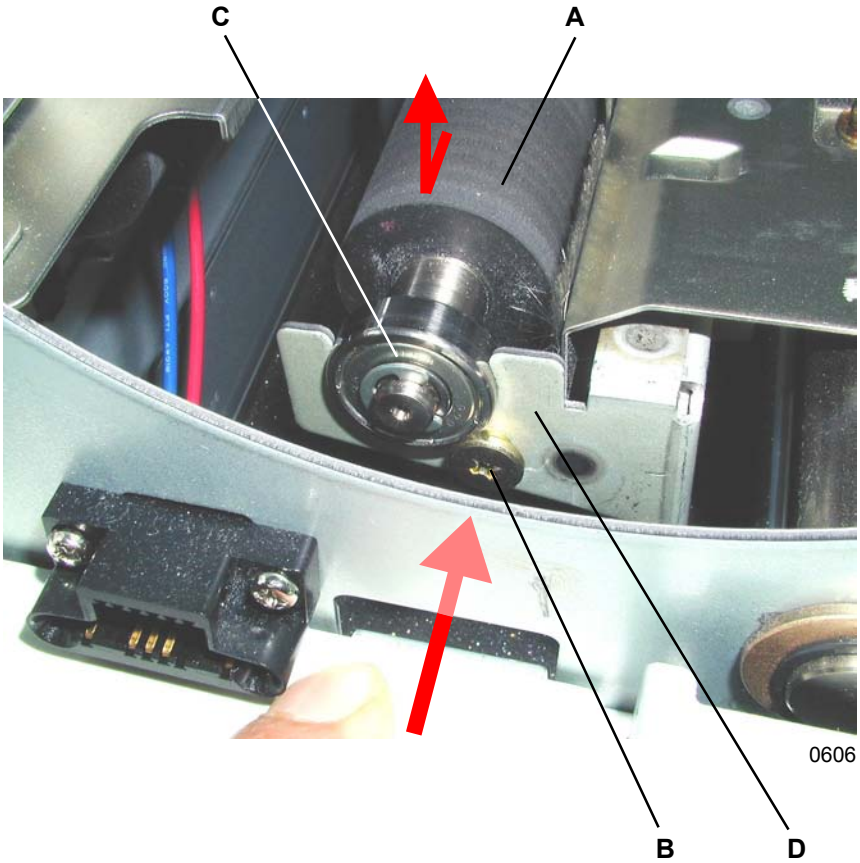
0605

A: Pressure control motor
B: Second pressure spring
C: Pressure lever B
D: Print pressure gear ass'y
E: Print pressure control sensor

Disassembly

1. Removing the Pressure Roller

(1) Pull out the print drum.
(2) Insert a screwdriver through the opening in the front frame of the machine, and remove the retaining screw [B].
(3) Slide the pressure roller [A] forward until the bearing [C] disengages from the pressure roller bracket [D], and then lift upward to remove it.



A: Pressure roller
B: Retaining screw
C: Bearing
D: Pressure roller bracket

2. Removing the Pressure Solenoid

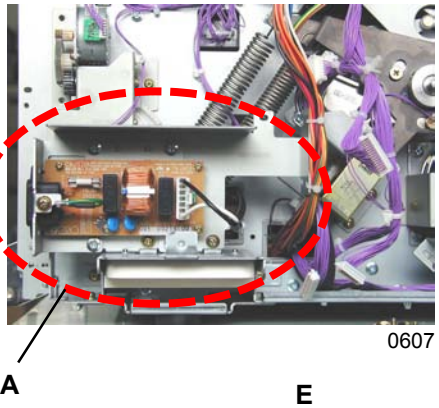
(1) Remove the rear cover. (In the case of the RN25 Series, also open the System PCB bracket.)
(2) Remove the mounting screws (RS tight, M4 x 8: 3 pcs), and pull the filter PCB unit [A] forward.
(3) Open the scanner table, and remove the second pressure spring [B] and pressure ring [C].
(4) Unplug the connector [D], remove the mounting screws (RS tight, M4 x 8: 4 pcs) on the solenoid base ass'y [E], and then remove the solenoid base ass'y [E].
(5) Unplug the pressure solenoid connector [G], remove the mounting screws (washer, M3 x 6: 2 pcs), and then remove the pressure solenoid [F].

[Work Precautions]

• The pressure spring and second pressure spring are extremely powerful. Take care to avoid injury when removing or reassembling.

[Precautions on Reassembly]

• Align the half-pierced sections.



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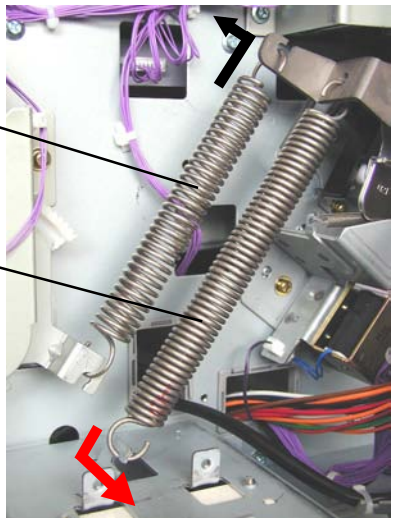

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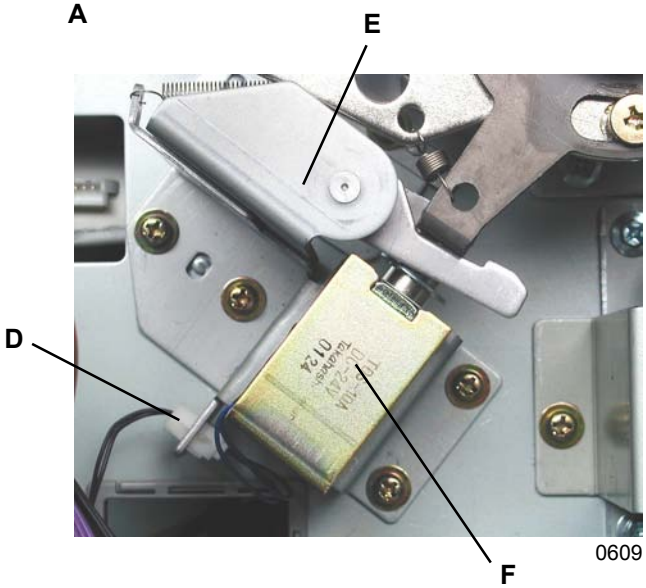

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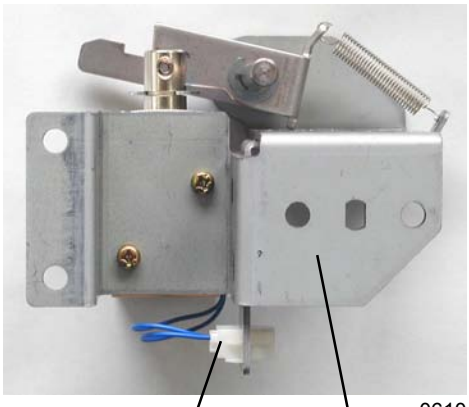


0610

A: Filter PCB unit
B: Second pressure spring
C: Pressure spring
D: Connector
E: Solenoid base ass'y
F: Pressure solenoid
G: Pressure solenoid connector

3. Removing the Pressure Lever Ass'y

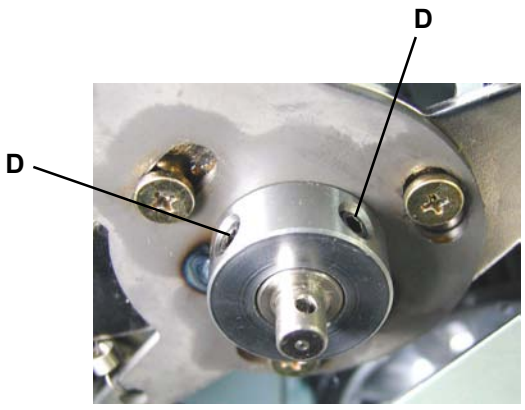
(1) Make a confidential master, and then bring the print drum to position A.
(2) Open the scanner table, and remove the rear cover. (In the case of the RN25 Series, also open the main PCB bracket and System PCB bracket.)
(3) Pull forward the filter PCB unit.
(4) Remove both the second pressure spring and pressure spring.
(5) Loosen the two set screws [D] on pressure lever B [A] using an allen wrench (3 mm), and remove the pressure lever ass'y (pressure lever A [B] + pressure lever B [A]) from the pressure shaft [C].

[Work Precautions]

- The pressure spring and second pressure spring are extremely powerful. Take care to avoid injury when removing or refitting.

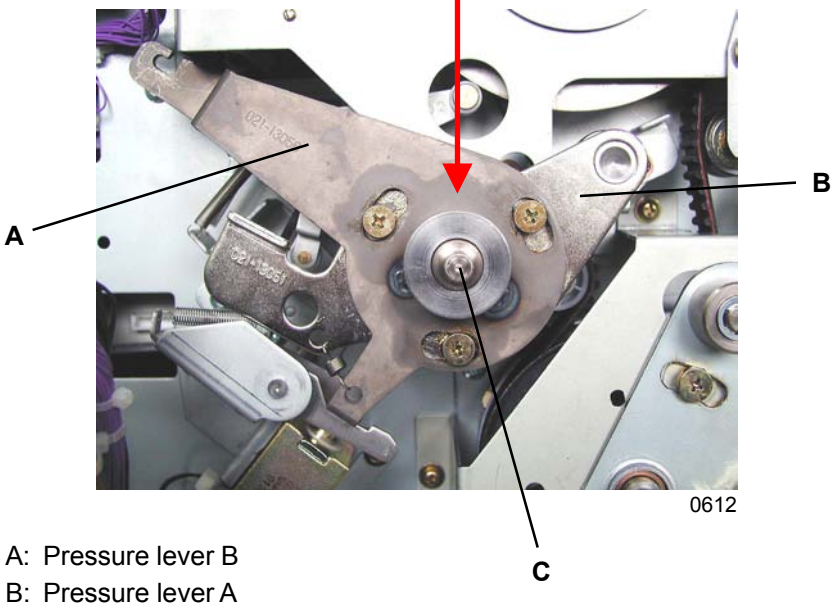
[Precautions on Reassembly]

- Adjust the mounting position of the pressure lever ass'y.



0611

Enlarged view



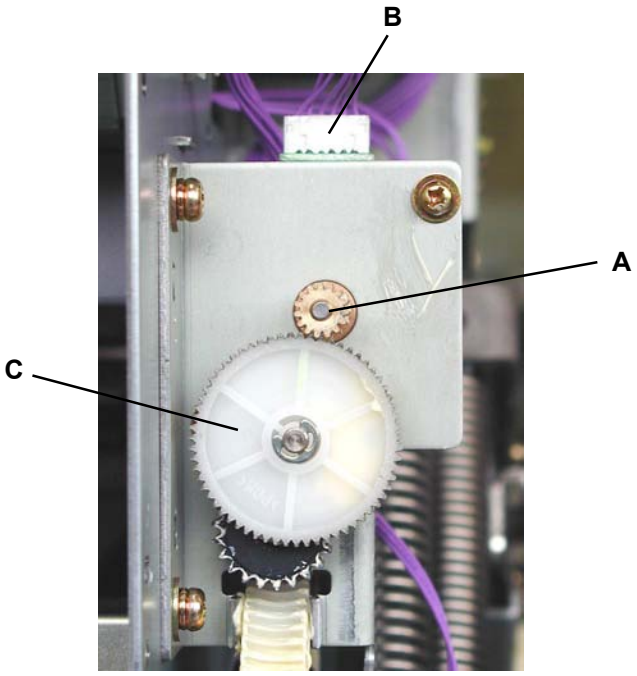
0612

A: Pressure lever B
B: Pressure lever A
C: Pressure shaft
D: Set screw

4. Removing the Pressure Control Motor and Print Pressure Control Sensor

Removing the Pressure Control Motor

(1) Remove the rear cover.
(2) Remove the E-ring and the drive transfer gear [C].
(3) Unplug the connector [B] on the pressure control motor [A], remove the mounting screws (double-washer, M3 x 6: 2 pcs), and then remove the pressure control motor [A].



0613

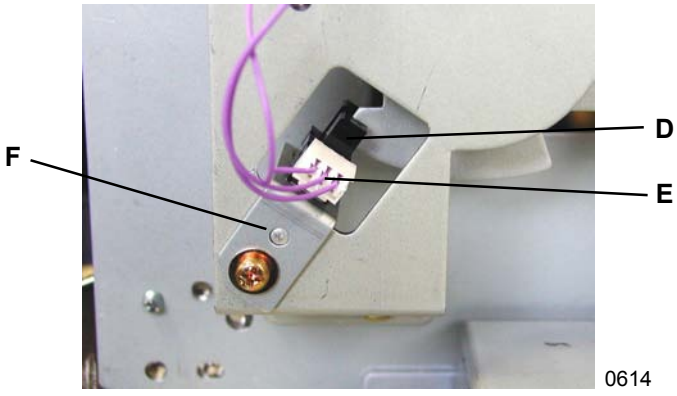
Removing the Print Pressure Control Sensor

(1) Remove the rear cover.
(2) Remove the mounting screws on the filter PCB unit, and then pull it forward.
(3) Unplug the connector [E] on the print pressure control sensor [D], remove the mounting screw (double-washer, M3 x 6: 1 pc), and then remove the print pressure control sensor [D] together with the print pressure control sensor bracket [F].

[Precautions on Reassembly]

- Align the half-pierced sections.

A: Pressure control motor
B: Pressure control motor connector
C: Drive transfer gear
D: Print pressure control sensor
E: Print pressure control sensor connector
F: Print pressure control sensor bracket



0614

[Memo]

Adjustment

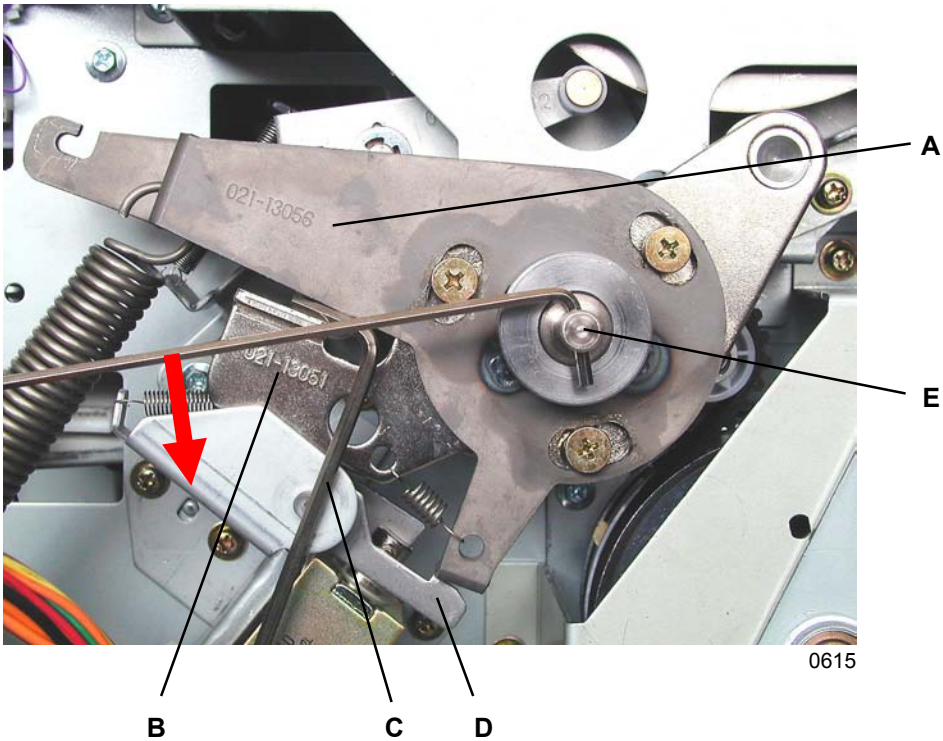
1. Mounting Position of the Pressure Lever Ass'y

Checks and adjustment

(1) Make a confidential master, and then bring the print drum to position A.
(2) Remove the rear cover. (In the case of the RN25 Series, also open the main PCB bracket and System PCB bracket.)
(3) Pull out the filter PCB unit in the forward direction.
(4) Remove the second pressure spring, push up the pressure lever B [A], and disengage it from the Solenoid lever [D].
(5) Attach the second pressure spring and check that the gap between pressure lever A [B] and pressure lever B [A] is between 1.5 mm and 2.0 mm. (See detailed figure 2.)
(6) If the gap in step (5) is outside the specifications, remove the second pressure spring and loosen the two set screws on pressure lever B [A]. Insert a 3 mm allen wrench [C] between pressure lever A [B] and pressure lever B [A] (see detailed figure 1), rotate the pressure shaft [E] fully counter-clockwise, and then tighten the set screws on pressure lever B [A] with the pressure roller pressing hard against the print drum. The pressure lever B [A] should be pushed all the way back against the machine, when tightening the set screws.
(7) Check as in step (5), and if the gap is still outside the specifications, repeat step (6). If the gap is within the specifications, push pressure lever B [A] upwards, lock with the solenoid lever [D], and attach the second pressure spring.

Symptoms

- If the gap is too small, the pressure will be too weak, and the printing density may become too light.
- If the gap is too large, there will not be sufficient space between the pressure roller and the clamp plate base on the print drum, and they may touch, damaging the clamp plate base.



0616

Detailed figure 1

0617

Detailed figure 2

A: Pressure lever B
B: Pressure lever A
C: Allen wrench (3 mm)
D: Solenoid lever
E: Pressure shaft

[Memo]

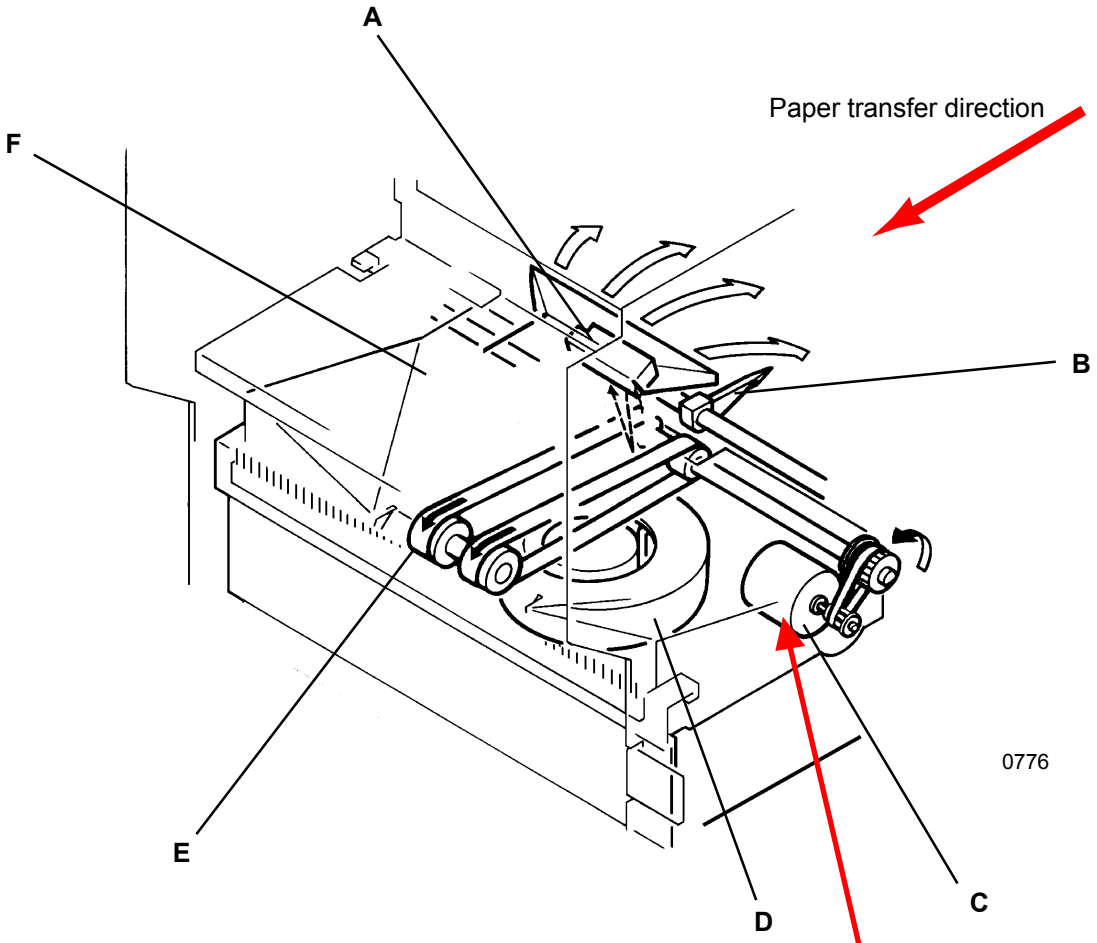
CHAPTER 7: PAPER EJECTION SECTION

Contents

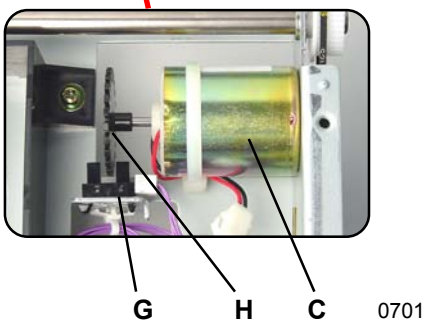
Mechanism

1. Paper Ejection Mechanism

Printed paper is first detached from the print drum by the separator [B], by air blown from the separator (except for 210), and by two separation fans [F]. It is then sent to the paper receiving tray by the transfer belts [E].
The transfer belts [E] are driven by the paper ejection motor [C].
Two suction fans [D] are located below the transfer belts [E], and these suck the paper onto the transfer belts [E].
The paper receiving sensor [A] checks whether the paper is ejected correctly.
To ensure the smooth ejection of paper from the print drum, the encoder sensor [G] and encoder sensor disc [H] check the rotation speed of the paper ejection motor and control the transfer-belt speed so that it is slightly greater than the speed of the print drum at its circumference.

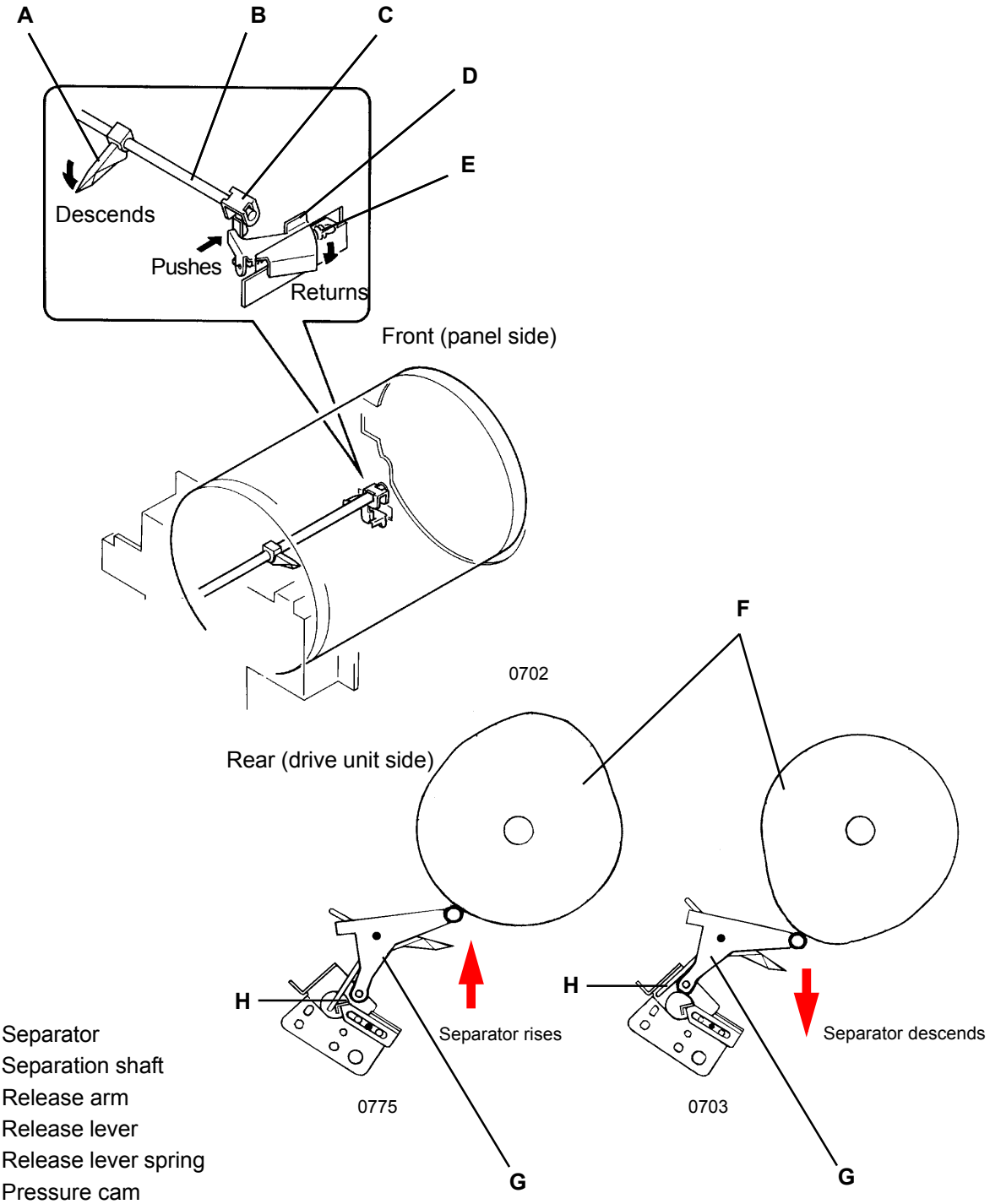


A: Paper receiving sensor
B: Separator
C: Paper ejection motor
D: Suction fan
E: Transfer belt
F: Separation fans (x2)
G: Encoder sensor
H: Encoder sensor disc



2. Paper Separator Mechanism

The separator [A] is close to the print drum when the paper is being detached from the print drum. As the print drum rotates and the clamp plate base approaches the separator [A], the separator arm ass'y [G] is pushed by the pressure cam [F] on the print drum pulley. This also pushes the separator lever [H], and the separation shaft [B] rotates, causing the separator [A] to move away from the print drum.
Likewise, when pulling out the print drum, the release lever [D] is returned by the release lever spring [E]. And when the release arm [C] is pressed, the separation shaft [B] rotates, causing the separator [A] to move away from the print drum.



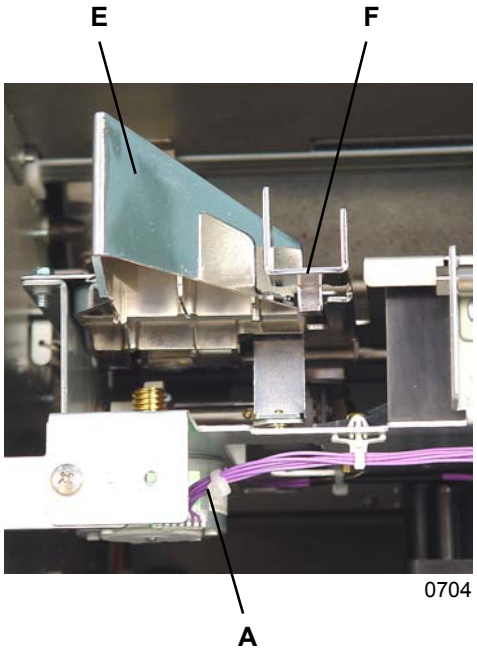
A: Separator
B: Separation shaft
C: Release arm
D: Release lever
E: Release lever spring
F: Pressure cam
G: Separator arm assembly
H: Separator lever

3. Paper-Ejection-Wing Mechanism

Set the positions of the right- and left-hand paper ejection wings on the paper receiving tray according to the type of paper used.

<RN25 Series>

The paper ejection wings can be moved by rotating the wing cam [B] using the paper-ejection-wing motor [A]. The paper ejection wings are in the raised position when the low section of the wing cam is not in contact with the wing support plate [C]. The wing HP sensor [D] checks the wing cam position. The right- and left-hand paper-ejection wings on the paper receiving tray can be set to one of four positions, (1) to (4), depending on the paper size (width only) and paper-feed pressure-lever (NORMAL/ CARD) settings. Their positions are not determined by the paper-data settings (THIN, NORMAL, CARD, CUSTOM).



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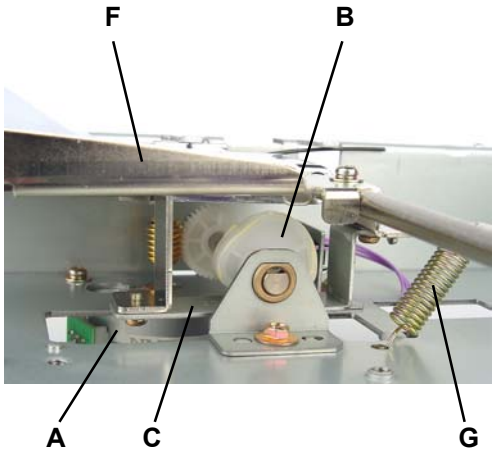

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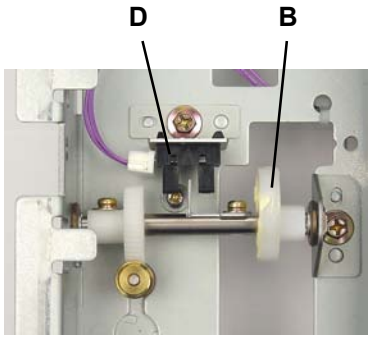

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<RN20/21 Series>

The paper-ejection-wing positions can be adjusted manually using the wing levers [H] on the right- and left-hand sides. They can be set to one of three positions, (1) to (3), depending on the type of paper used.

A: Paper-ejection-wing motor
B: Wing cam
C: Wing support plate
D: Wing HP sensor
E: M wing F
F: S wing F
G: Hook spring
H: Wing lever

0707

Setting the paper-ejection-wing positions

(1) Raised position

Both the M wing and S wing are raised. This setting is for normal paper of A4 size or smaller.

RN25 Series: Paper-feed pressure lever set to “NORMAL,” and paper-width potentiometer set to A4 or smaller.

RN20/21 Series: Both the right- and left-hand wing levers in the raised position

(2) Intermediate position

The M wing is raised, and the S wing is lowered. This setting is for normal paper greater than A4 in size.

RN25 Series: Paper-feed pressure lever set to “NORMAL,” and paper-width potentiometer set to a size greater than A4

RN20/21 Series: Left wing lever lowered, and right wing lever raised

(3) Lowered position

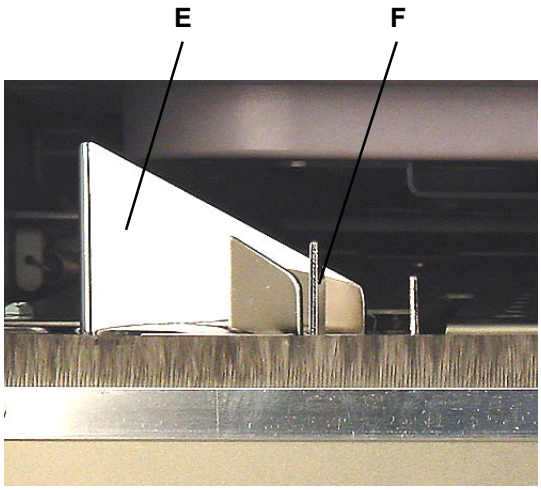
Both the M wing and S wing are lowered. This setting is for thick paper of all sizes.

RN25 Series: Paper-feed pressure lever is not determined by “CARD” and paper-width potentiometer.

RN20/21 Series: Both the right- and left-hand wing levers in the lowered position

(4) Custom position

This setting is made by a service engineer using Test Mode No. 490 (wing position setting) for non-standard paper. When the user uses this position, “CUSTOM” must be selected in the “Paper-ejection-wing setting” on the function-list screen displayed by the panel.



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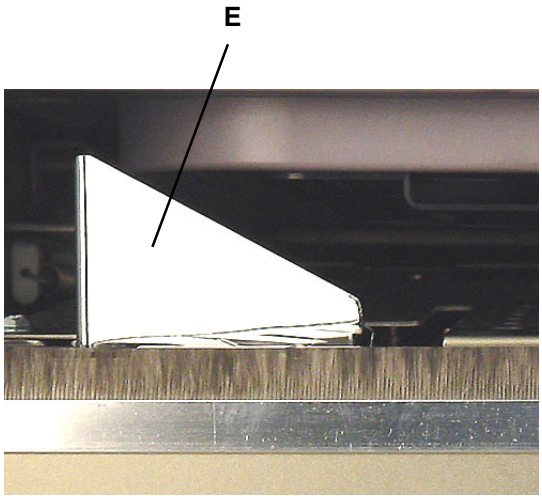
(1) Raised position



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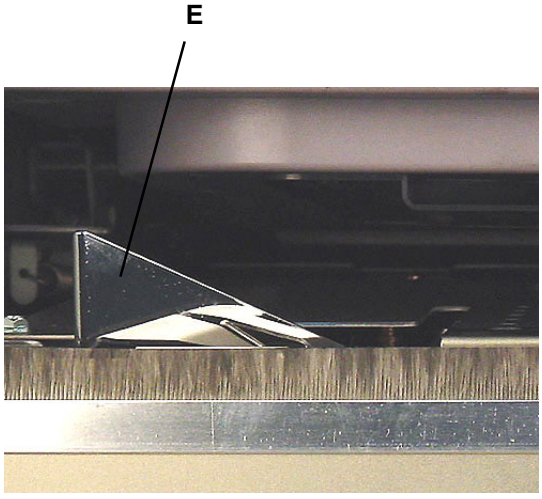
(2) Intermediate position



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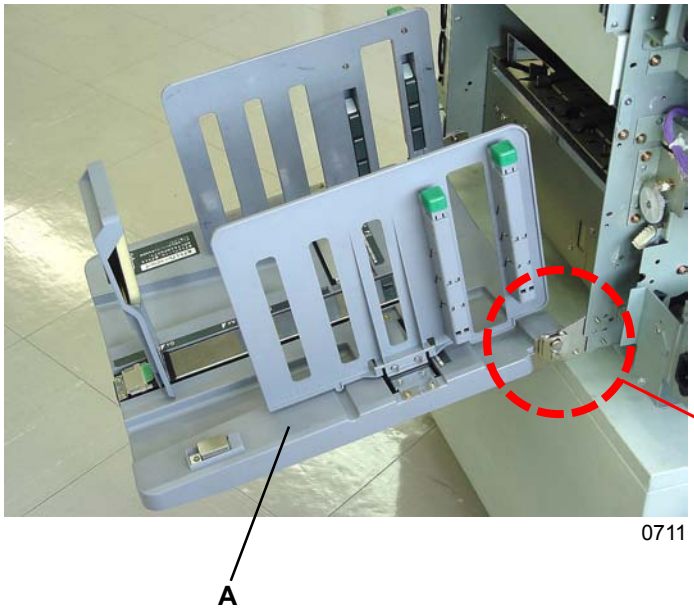
(3) Lowered position

Disassembly

1. Removing the Paper Receiving Tray

(1) Remove the retaining plates [B] from both sides of the paper receiving tray [A] (bind, M4 x 6: 1 pc each).

(2) Fold down the fences on the paper receiving tray, and close the paper receiving tray to an angle slightly greater than 45 degrees. Lifting the paper receiving tray [A] vertically upwards at this angle detaches it from the machine.



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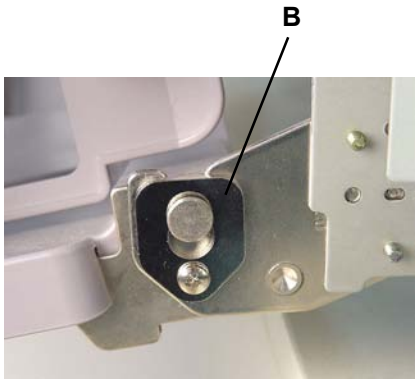

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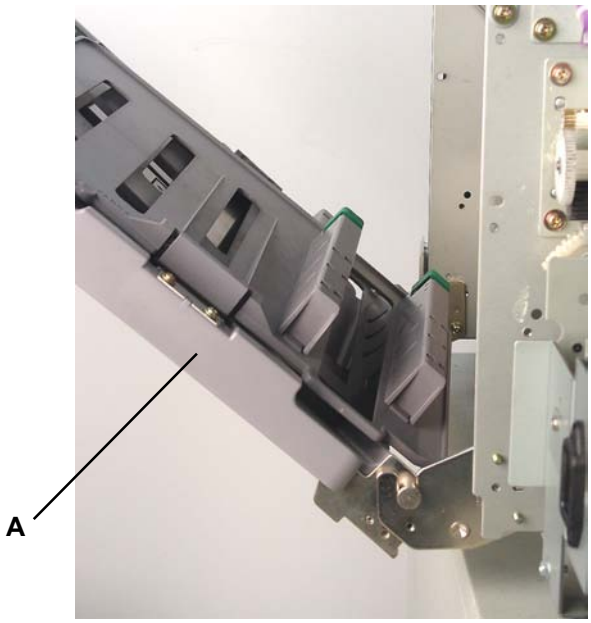

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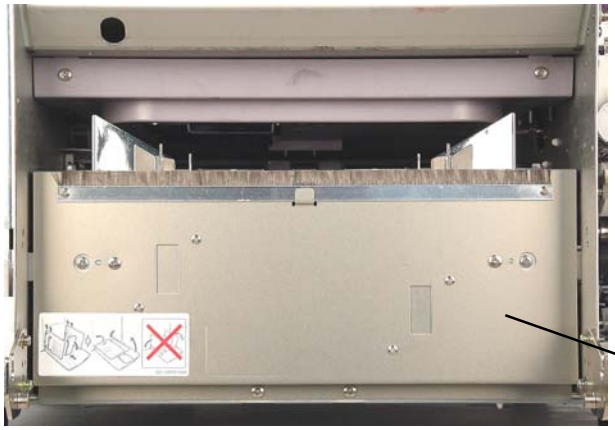
A: Paper receiving tray
B: Retaining plates

2. Removing the Suction Unit

<RN25 Series>

(1) Switch off the power, remove the rear cover, and detach the paper receiving tray.

(2) Remove the mounting screws (bind, M4 x 8: 4 pcs), and detach the suction unit cover [A].



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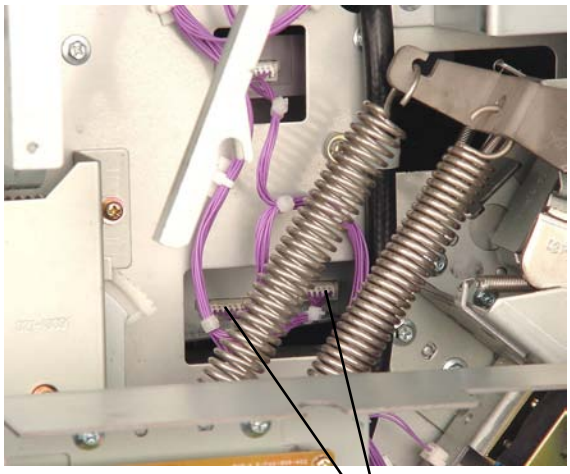
(3) Disconnect the two suction unit connectors [B].

(4) Remove the mounting screws (bind, M4 x 8: 2 pcs), and detach the suction unit [C].



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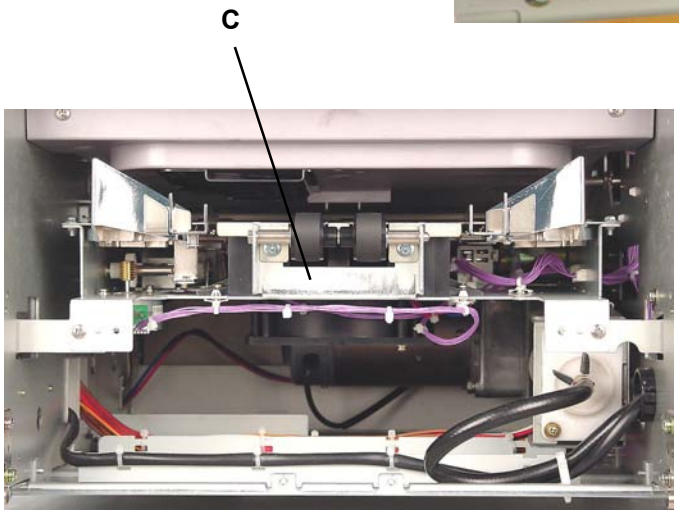


0716

A: Suction unit cover
B: Connectors
C: Suction unit

<RN20/21 Series>

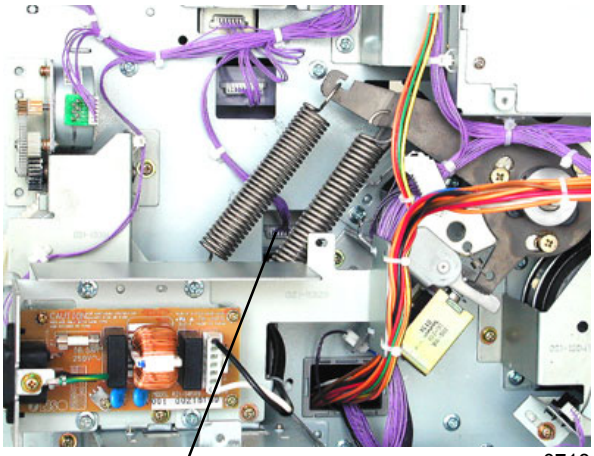
(1) Switch off the power, remove the rear cover, and detach the paper receiving tray.

(2) Remove the mounting screws (bind, M4 x 8, 4 pcs), and detach the suction unit cover [A].

0717

(3) Disconnect the suction unit connector [B].

(4) Remove the mounting screws (bind, M4 x 8: 2 pcs), and detach the suction unit [C].



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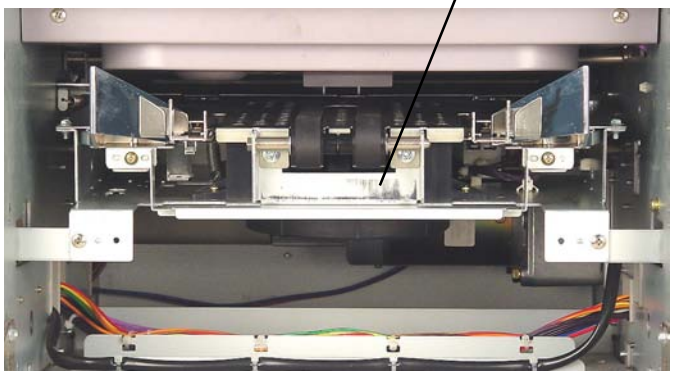
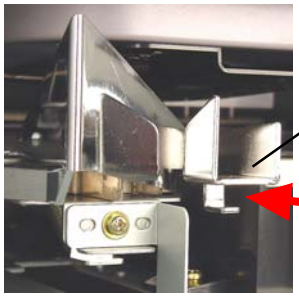


0719

A: Suction unit cover
B: Connector
C: Suction unit

[Precautions on Reassembly: RN20/21 Series]

- When installing the suction unit cover [A], confirm that the protrusions [D] on the rear of the wing levers are positioned at the locations of the suction unit indicated in the photographs below.



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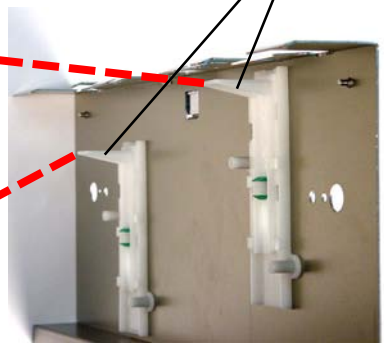

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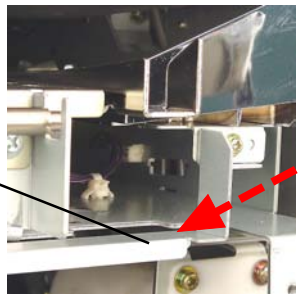

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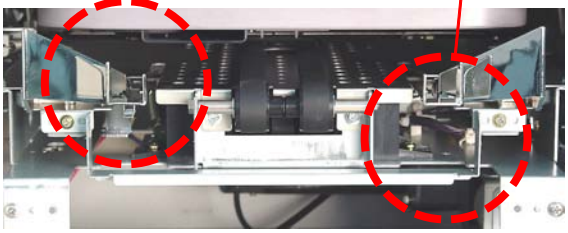

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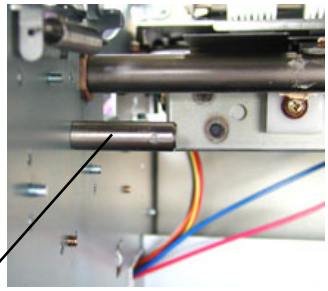
D: Protrusions on the rear of the wing lever
E: S wing F
F: Connection plate

[Precautions on Reassembly: All Models]

- Hook the indented sections [G] at the right- and left-hand edges of the suction unit onto the pins [H] on the side panels of the main unit.



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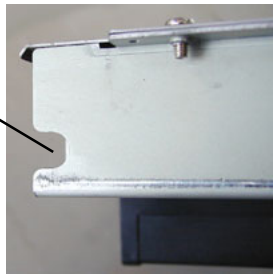

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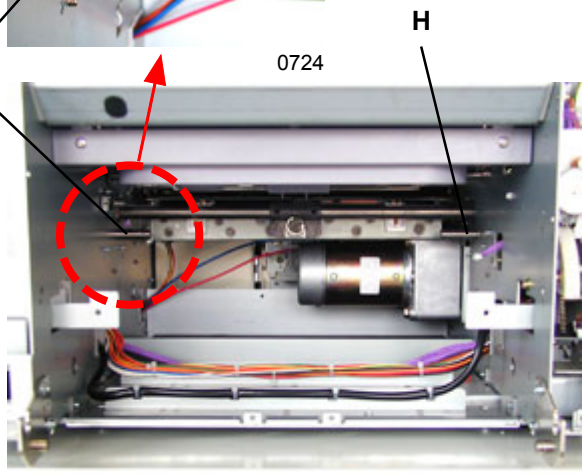

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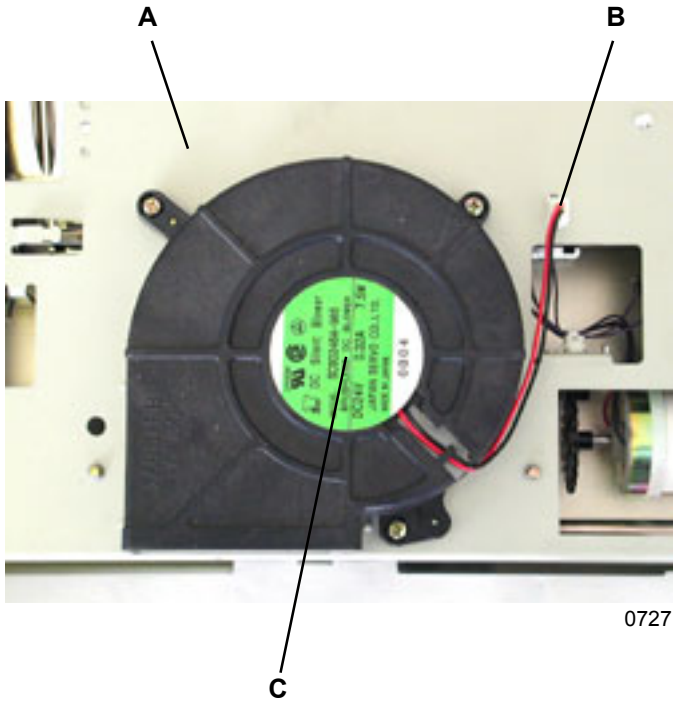
G: Indented section at the suction unit front edge
H: Pins on the main-unit side panels

3. Removing the Suction Fan

(1) Switch off the power, remove the rear cover, and remove the following components.
- Paper receiving tray
- Suction unit cover
- Suction unit

(2) Turn the suction unit [A] upside down, and unplug the suction fan connector [B].

(3) Remove the mounting screws (washer, M4 x 10: 3 pcs), and remove the suction fan [C].



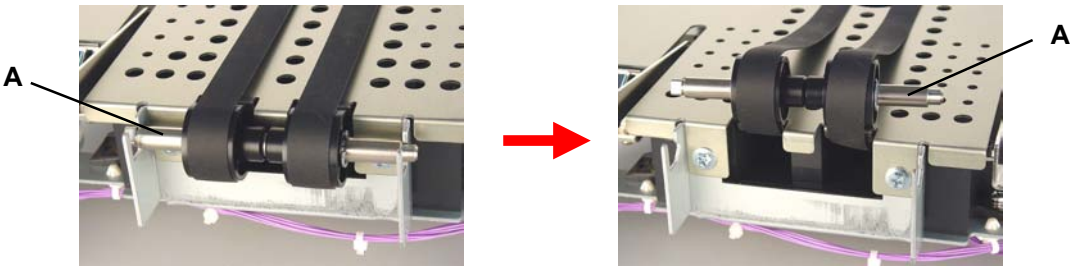
0727

A: Suction unit
B: Connector
C: Suction fan

4. Removing the Transfer Plate

(1) Switch off the power, remove the rear cover, and remove the following components.
- Paper receiving tray
- Suction unit cover
- Suction unit

(2) Lift the conveyor pulleys [A] by hand, disengage them from the notched sections on the suction unit, and remove them.



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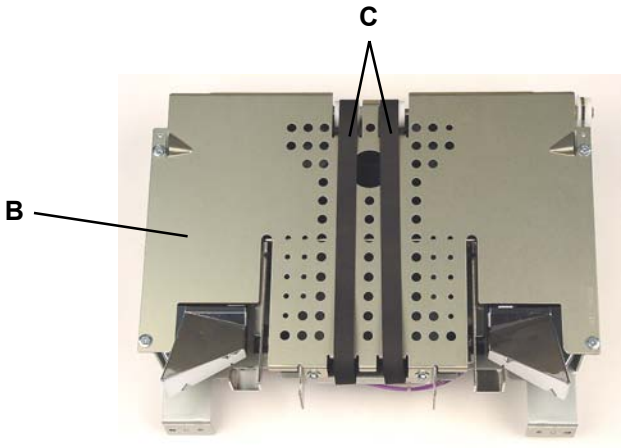
(3) Remove the mounting screws (RS tight, MS x 8: 6 pcs) that hold the suction unit transfer plate [B] in place.



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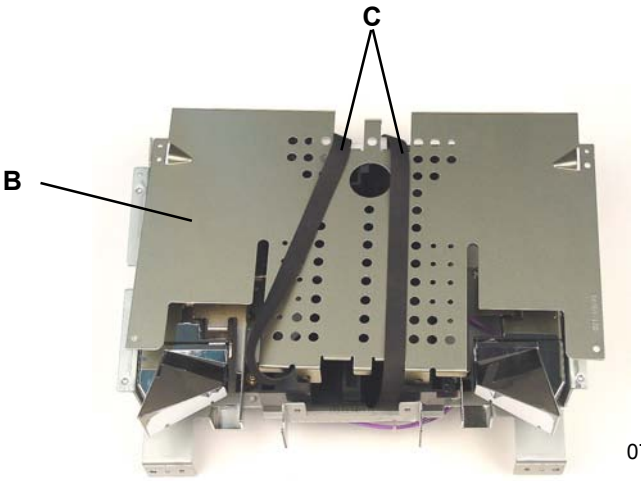
(4) Pass the transfer plate under the right- and left-hand transfer belts [C] to remove the transfer plate from the suction unit.



0731

A: Conveyor pulleys
B: Transfer plate
C: Transfer belts

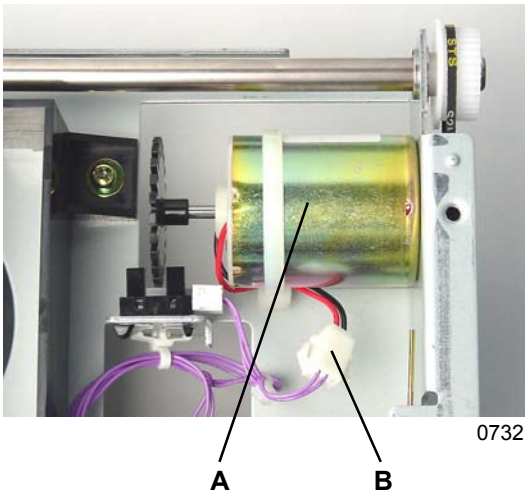
5. Removing the Paper Ejection Motor and Encoder Sensor

Removing the paper ejection motor

(1) Switch off the power, remove the rear cover, and remove the following components.
- Paper receiving tray
- Suction unit cover
- Suction unit
- Transfer plate

(2) Disconnect the connector [B] of the paper ejection motor [A].

(3) Remove the paper ejection motor timing belt [C], the paper ejection motor mounting screws (washer, M3 x 5: 3 pcs), and then remove the paper ejection motor.



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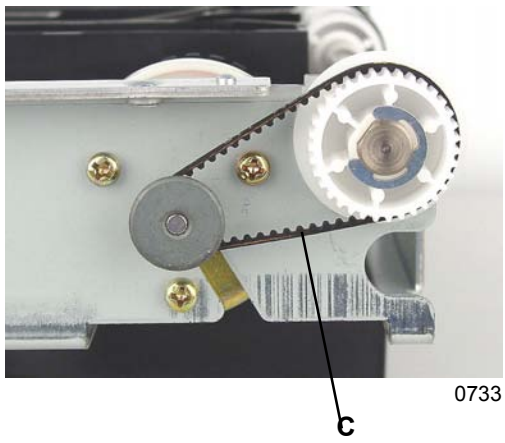

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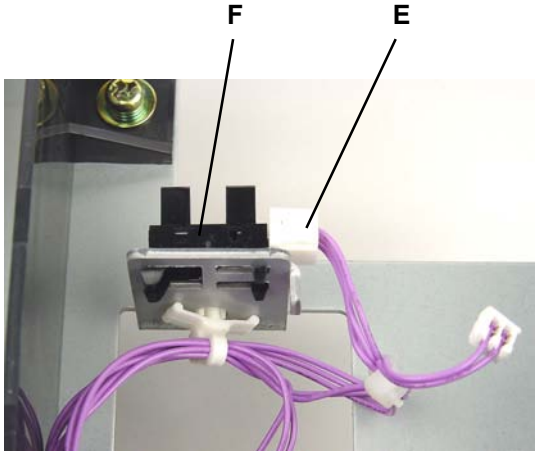
Removing the encoder sensor

(4) Unplug the encoder sensor connector [E], remove the sensor hooks from the mounting bracket, and then remove the encoder sensor [F].



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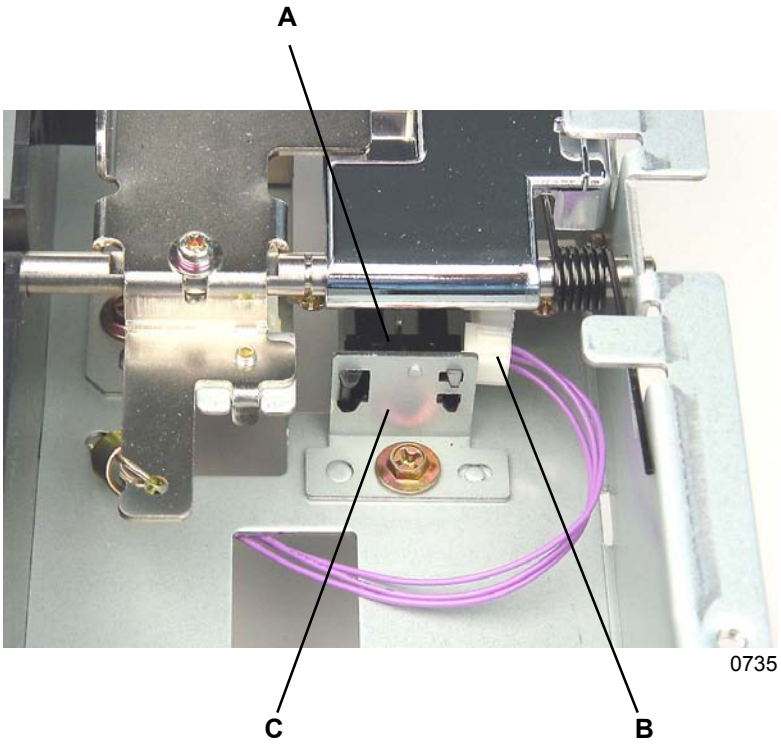
A: Paper ejection motor
B: Connector
C: Paper ejection motor belt
E: Connector
F: Encoder sensor

6. Removing the Wing HP Sensor

(1) Switch off the power, detach the rear cover, and remove the following parts:
- Paper receiving tray
- Suction unit cover
- Suction unit
- Transfer plate

(2) Disconnect the connector [B] of the wing HP sensor [A].

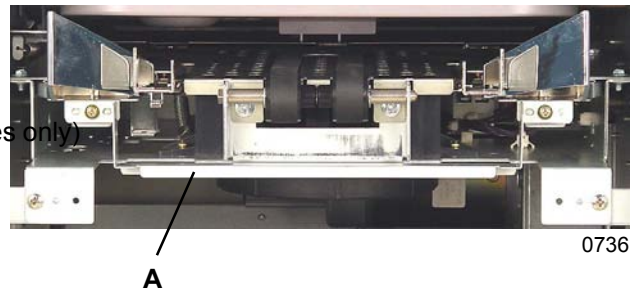
(3) Remove the mounting screw (RS tight, M3 x 6: 1 pc), and detach the wing HP sensor together with the mounting bracket [C].



A: Wing HP sensor
B: Connector
C: Mounting bracket

7. Removing the Paper-Ejection-Wing Shafts

(1) Switch off the power, detach the rear cover, and remove the following parts:
- Paper receiving tray
- Suction unit cover
- Suction unit
- Transfer plate
- Connection plate [A] (RN20/21 Series only)



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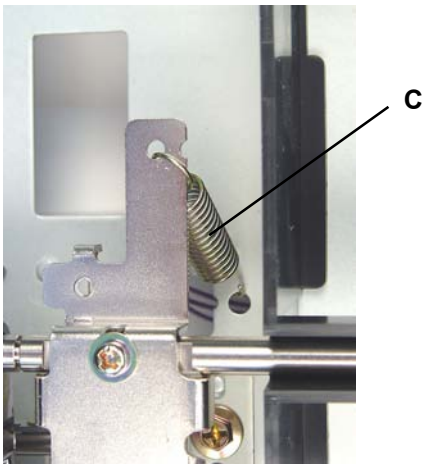
(2) From the rear of the suction unit, remove the wing support plate [B] mounted on the S wing F [H] (double-washer, M3 x 6: 2 pcs).

(3) Remove the hook spring (C) from the S wing F [H].



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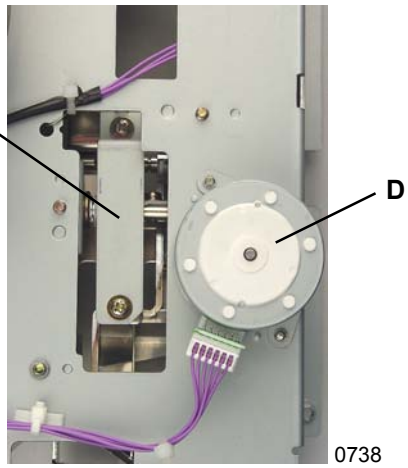

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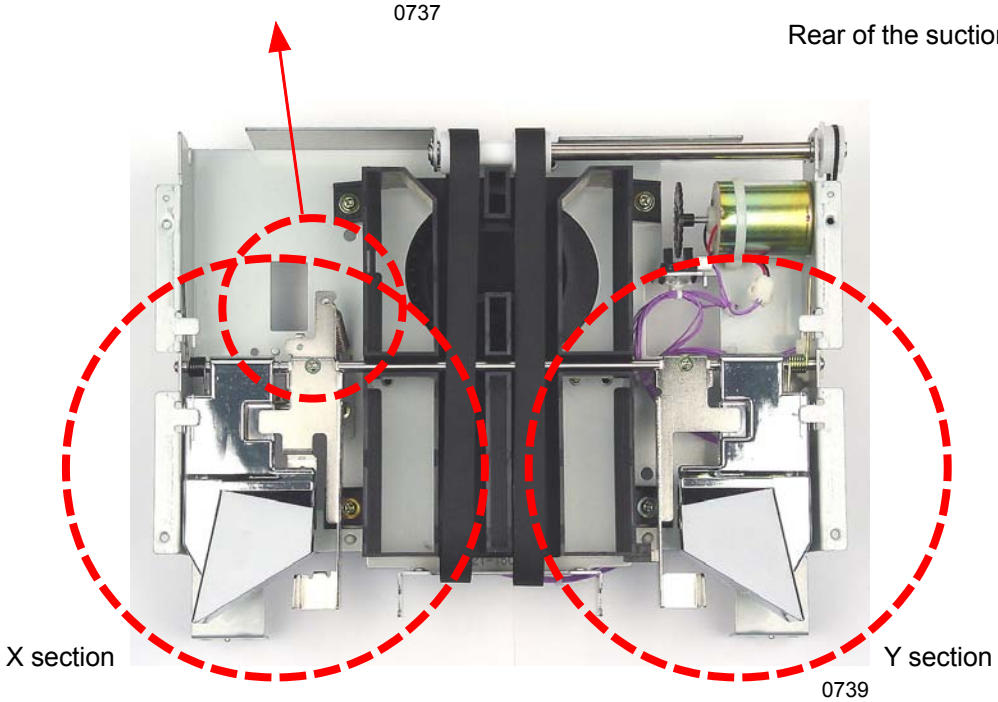
Rear of the suction unit



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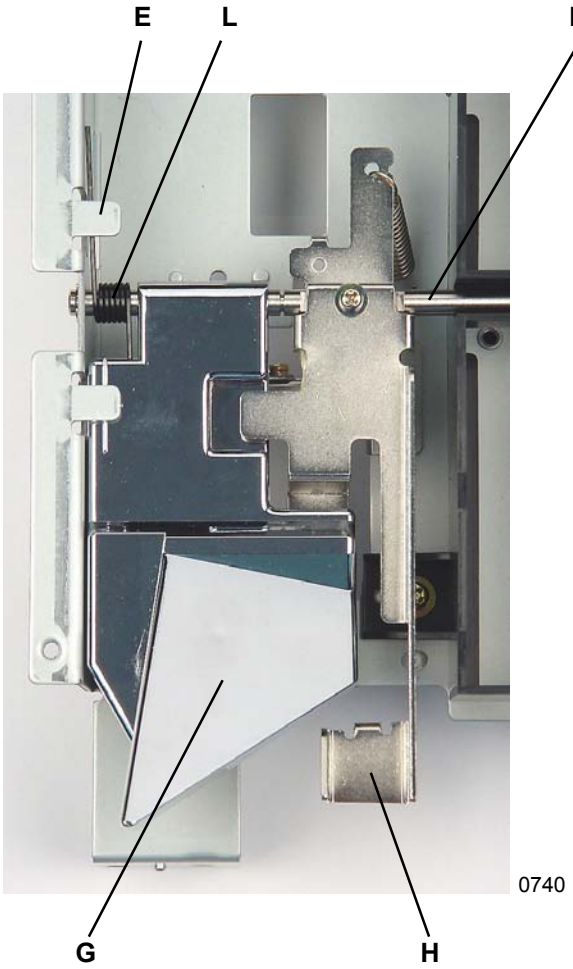
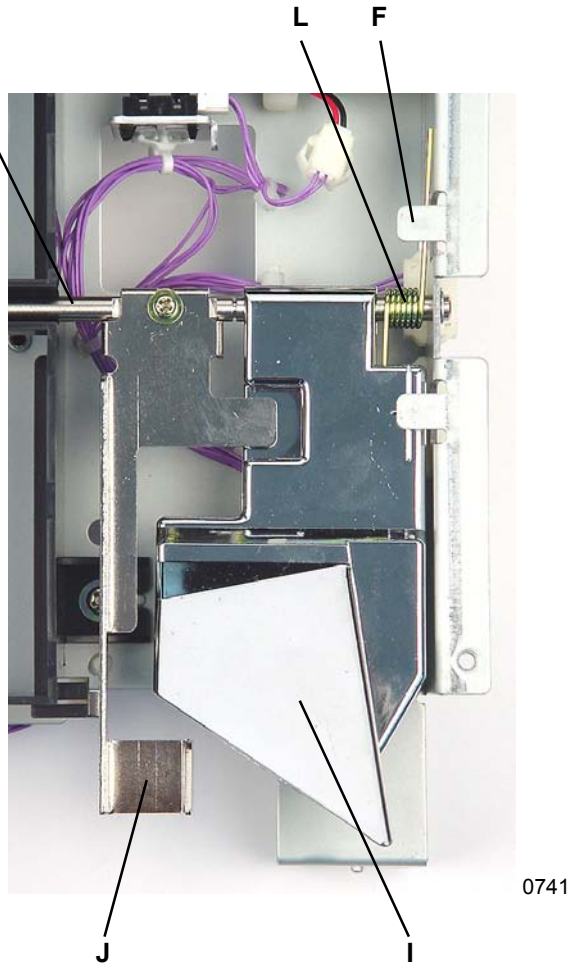
(4) Remove the S wing F [H] (double-washer, M3 x 8: 1 pc).
(5) Remove the S wing R [J] (double-washer, M3 x 8: 1 pc).
(6) Unhook the M-wing spring F [E] and M-wing spring R [F] from the protrusions [L] on the suction unit base.
(7) Remove the E-ring from one side of the wing shaft [K]. By sliding the wing shaft, remove the M wing F [G], M wing R [I], M-wing spring F [E], and M-wing spring R [F].



Close-up of X section



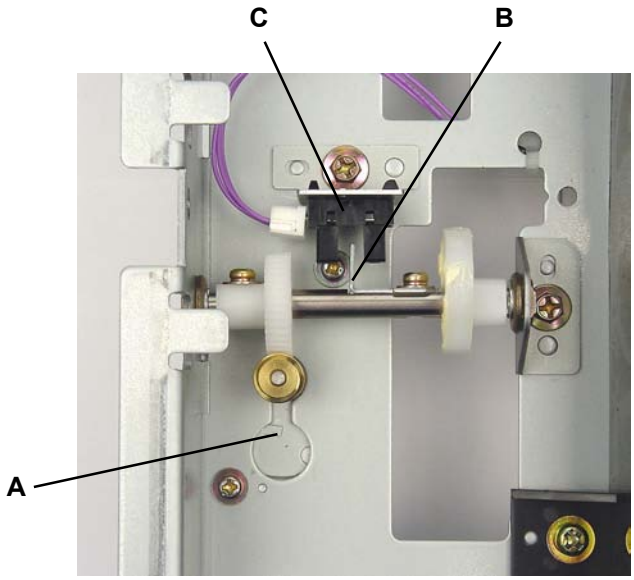
Close-up of Y section

A: Connection plate (RN20/21 Series)
B: Wing support plate
C: Hook spring
D: Paper-ejection-wing motor
E: M-wing spring F
F: M-wing spring R
G: M wing F
H: S wing F
I: M wing R
J: S wing R
K: Wing shaft
L: Protrusions on the suction unit base

8. Removing the Paper-Ejection-Wing Motor (RN25 Series)

(1) Switch off the power, detach the rear cover, and remove the following parts:
- Paper receiving tray
- Suction unit cover
- Suction unit
- Transfer plate
- Paper ejection wings, wing shafts

(2) Disconnect the connector, remove the mounting screws (double-washer, M3 x 6: 2 pcs), and detach the paper-ejection-wing motor [A].



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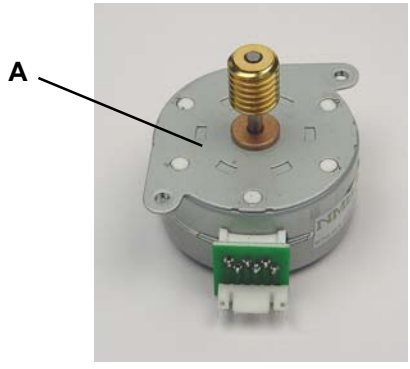


0743

[Precautions on Reassembly]

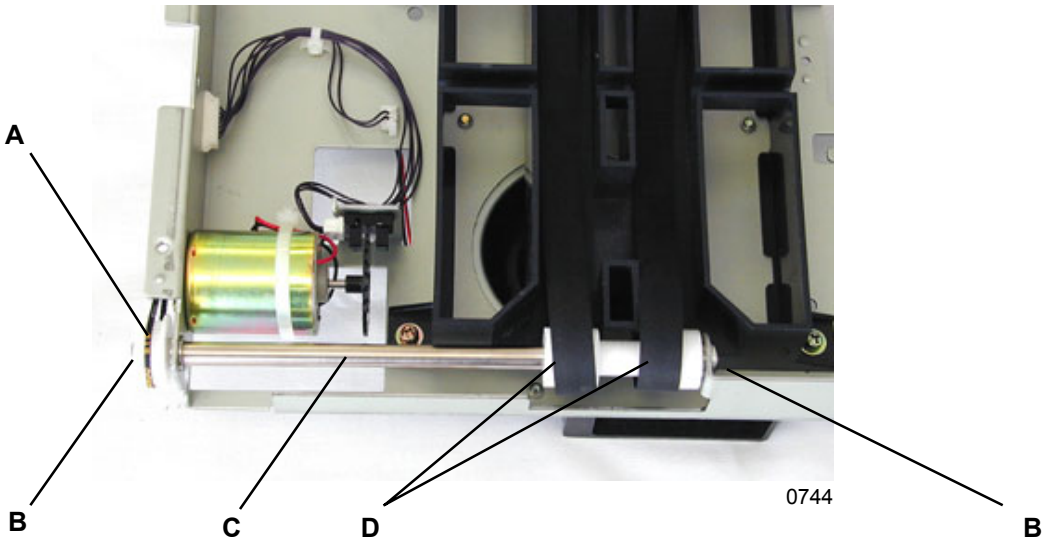
- When reinstalling the paper-ejection-wing motor, be sure to face the sensor-L shielding plate [B] in the direction (home position) of the wing HP sensor [C].

9. Removing the Transfer Belts

(1) Switch off the power, remove the rear cover, and remove the following components.
- Paper receiving tray
- Suction unit cover
- Suction unit
- Transfer plate
- Paper ejection wings, wing shafts

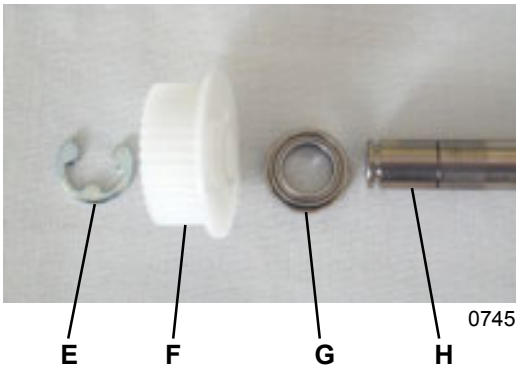
(2) Remove the paper ejection motor belt [A].

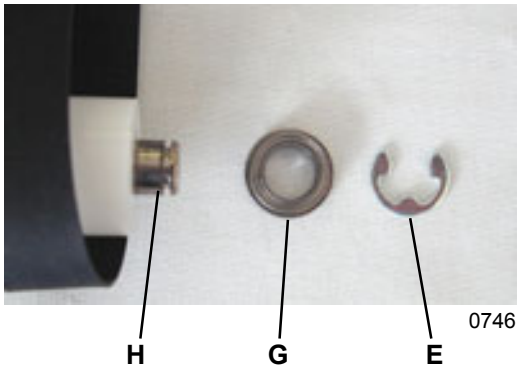
(3) Remove the E-rings [B] on the left and right of the belt pulley shaft [C], and remove the transfer belts [D] by sliding them off the belt pulley shaft [C].



A: Paper ejection motor belt
B: Left and right belt pulley shaft E-rings
C: Belt pulley shaft
D: Transfer belt

[Precautions on Reassembly]
- Fit the left and right bearings [G] and E-rings [E] on the belt pulley shaft from outside the mounting brackets.
- Mount the pulley [F] on the left-hand end of the belt pulley shaft [H] with the flange facing inwards.

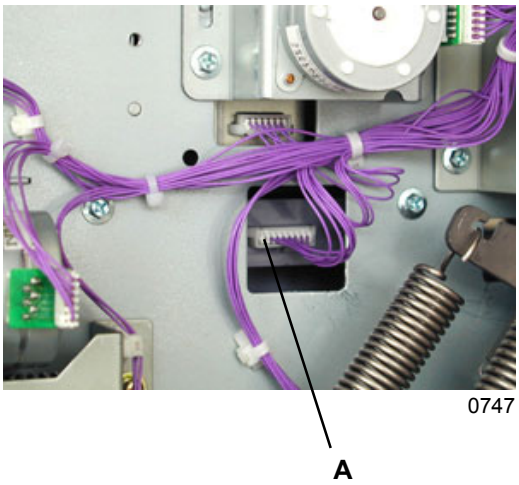




E: E-ring
F: Pulley
G: Bearing
H: Belt pulley shaft

10. Removing the Separation Fan Unit

(1) Switch off the power and remove the rear cover.
(2) Unplug the separation fan unit connector [A].
(3) Remove the mounting screws (bind, M4 x 8: 2 pcs) [B] on the separation fan unit [C], and remove the separation fan unit by sliding it in the same direction that paper is ejected.



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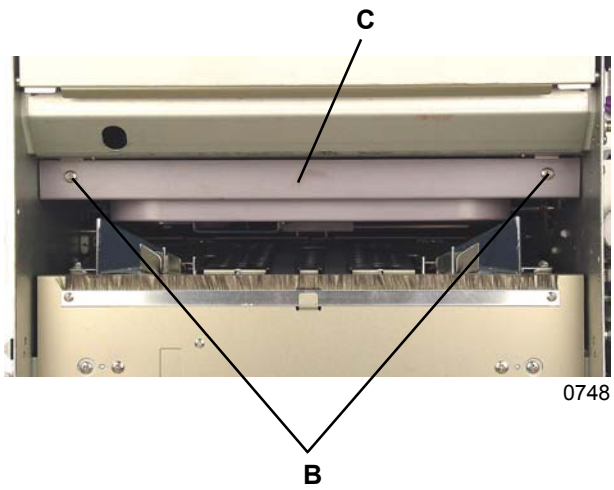
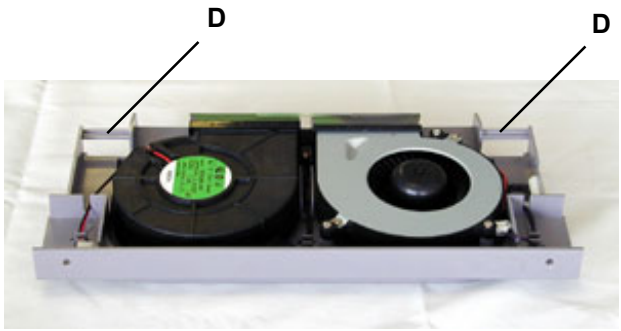


0748

A: Separation fan unit connector
B: Mounting screws (bind, M4 x 8: 2 pcs)
C: Separation fan unit

[Precautions on Reassembly]

- Engage the right and left hooks [D] on the separation fan unit with the main-unit mounting sections [E] for installation.



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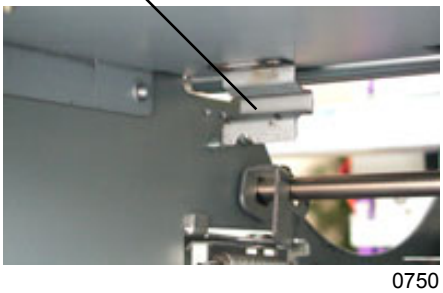


0750

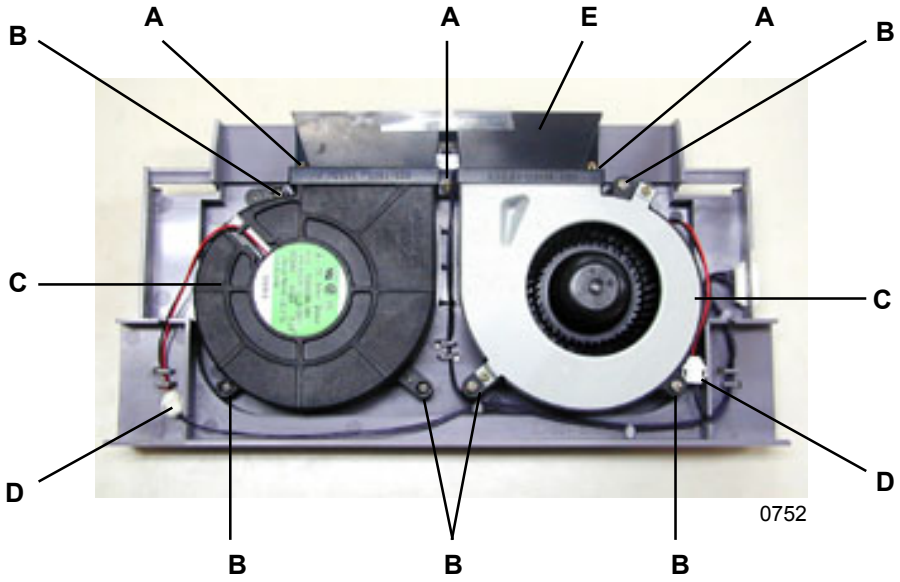
0751

D: Hooks on the separation fan unit
E: Slots inside the machine

11. Removing the Separator Fan and Paper Receiving Sensor

Removing the separator fan

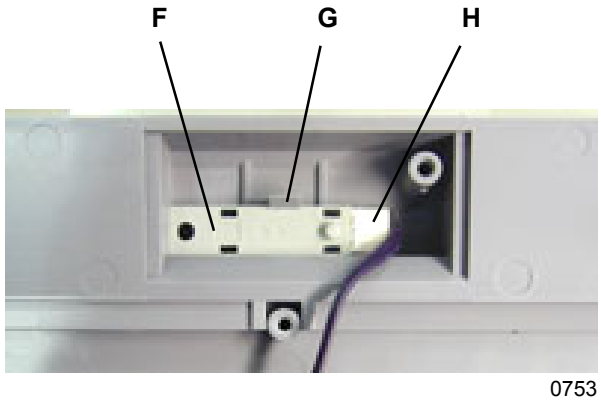
(1) Switch off the power, detach the rear cover, and remove the separation fan unit.
(2) Remove the nozzle mounting screw (P tight, M3 x 10: 3 pcs) [A], and remove the nozzle [E].
(3) Unplug the two separation fan connectors [D].
(4) Remove the mounting screws (bind, M3 x 12: 3 pcs each) [B] from the two separation fans [C], and remove both separation fans [C].



A: Nozzle mounting screw (P tight, M3 x 10: 3 pcs)
B: Separation fan mounting screws (bind, M3 x 12: 3 pcs each)
C: Separation fan
D: Separation fan connectors
E: Nozzle

Removing the paper receiving sensor

(5) Disengage the paper receiving sensor [F] from the hook [G] and remove the paper receiving sensor [F].
(6) Unplug the paper receiving sensor connector [H].

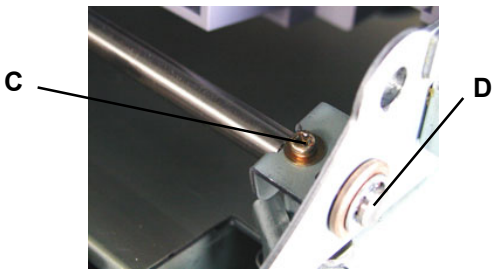


F: Paper ejection sensor
G: Hook
H: Connector

12-1. Removing the Separator (RN25 Series)

(1) Pull out the print drum, switch off the power, and remove the front cover. Remove the rear cover, then open the System PCB bracket and remove separator fan.
(2) Move the separator air-hose band [A] to the side, and detach the hose. (The air-hose band's knob points upwards.)
(3) Remove the separator mounting screw (double-washer, M3 x 8: 1 pc) [B]. Remove the release arm mounting screw (double-washer, M3 x 8: 1 pc) [C].
(4) Remove the E-ring [D] on the end of the separation shaft, and remove the bearing bush.

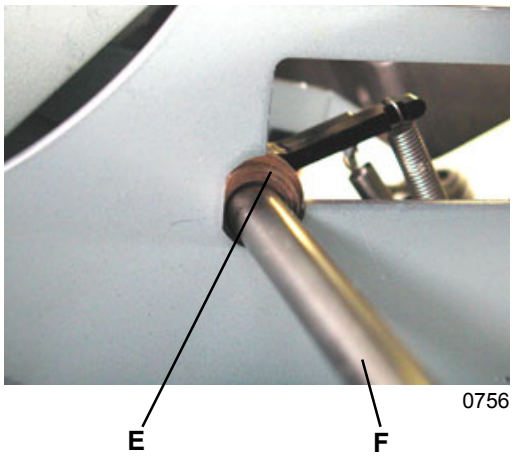
0754



0755

A: Separator air-hose band
B: Separator mounting screw (double-washer, M3 x 8)
C: Release arm mounting screw (double-washer, M3 x 8)
D: Separation-shaft-end E-ring

(5) Push the Separation shaft [F] back slightly, and remove the rear bearing bush [E] from the machine side frame. Do not push back the shaft more than necessary. To prevent the components mounted on the rear from detaching, stop pushing back the shaft once the bush in the rear has been removed.
(6) Slide the separator [G] and release arm [H] forward and remove both of these parts off the machine.



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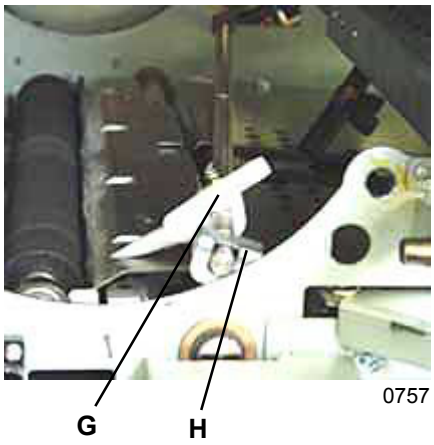

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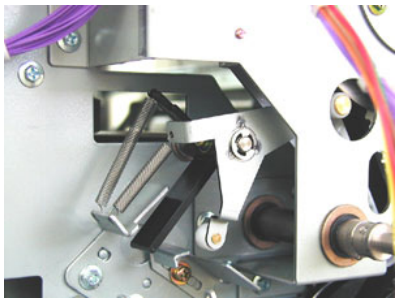
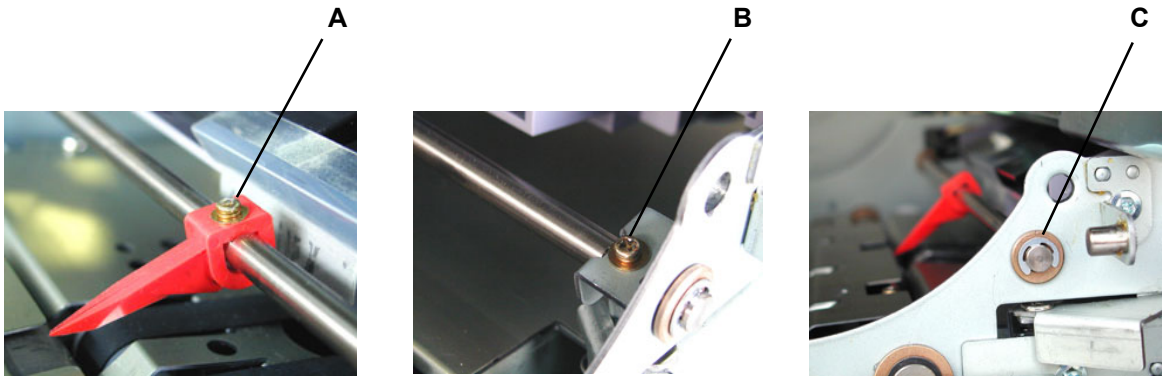
E: Separation shaft rear bearing bush
F: Separation shaft
G: Separator
H: Release arm

[Reference]
Photograph of separator assembly and rear mount (machine drive side)


0758

12-2. Removing the Separator (RN20/21 Series)

(1) Pull out the print drum, switch off the power, and remove the front cover.
(2) Remove the separator mounting screw (double-washer, M3 x 8: 1 pc) [A].
(3) Remove the release arm mounting screw (double-washer, M3 x 8: 1 pc) [B].
(4) Remove the E-ring [C] on the end of the separation shaft, and remove the bearing bush.



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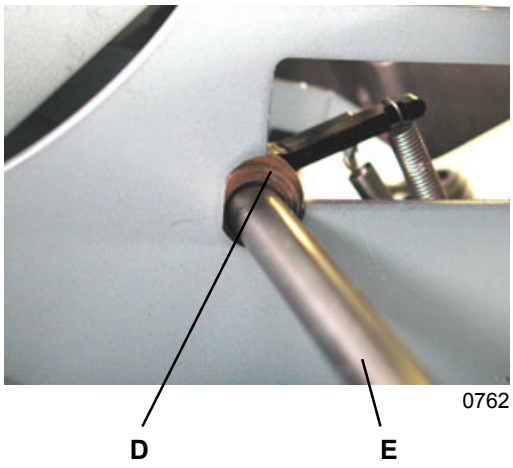
A: Separator mounting screw (double-washer, M3 x 8: 1 pc)
B: Release arm mounting screw (double-washer, M3 x 8: 1 pc)
C: Separation-shaft-end E-ring

(5) Push the separation shaft back slightly, and remove the rear bearing bush from the machine side frame. Do not push back the shaft more than necessary. To prevent the components mounted on the rear from detaching, stop pushing back the shaft once the bush in the rear has been removed.
(6) Slide the separator and release arm forward and remove both of these parts off the machine.



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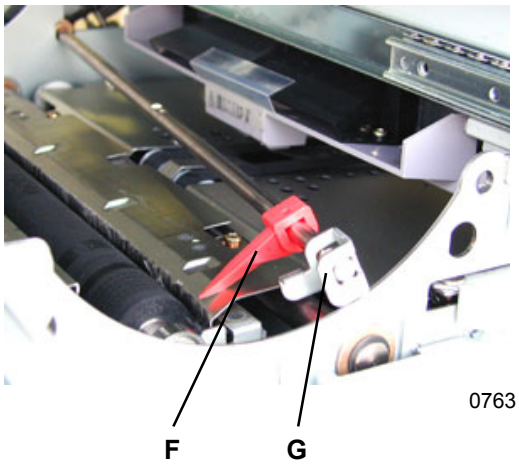
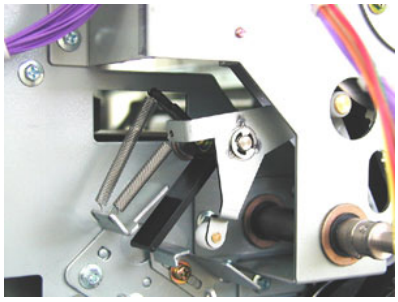


0763

D: Separation shaft rear bearing bush
E: Separation shaft
F: Separator
G: Release arm

[Reference]
Photograph of separator assembly and rear mount (machine drive side)


0764

13. Removing the Air-Pump Ass'y (RN25 Series)

(1) Switch off the power with the drum at position A.
(2) Detach the rear cover, open the System PCB bracket, and then remove the following components:
  • Suction unit
  • Separation-fan unit
(3) Move the air-pump hose band [A] to the side, and detach the hose.
(4) Remove the four air-pump-cylinder mounting screws (double-washer, M4 x 8: 4pcs) [B], and remove the air-pump cylinder.
(5) Loosen the four air-pump mounting screws (cross recessed hexagon head, double-washer, M4 x 10: 4pcs) [C], and reduce the tension in the air-pump belt [D].

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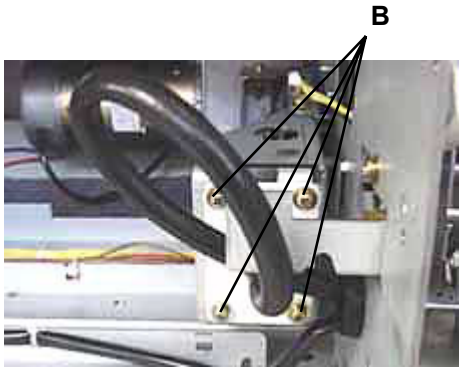

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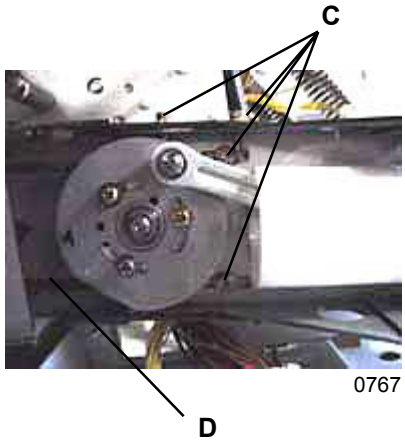
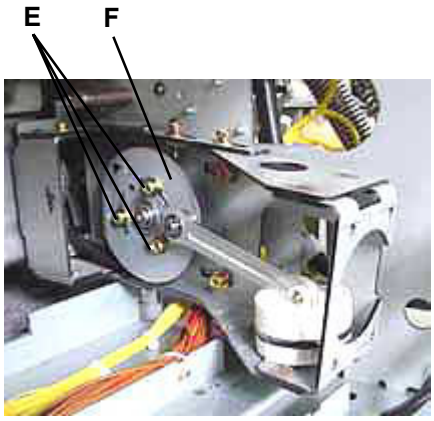


0767

A: Air-pump hose band
B: Air-pump-cylinder mounting screw (double-washer, M4 x 8: 4pcs) 4 locations
C: Air-pump mounting screw (cross recessed hexagon head, double-washer, M4 x 10: 4pcs) 4 locations
D: Air-pump belt

(6) Remove the three air-pump-cam mounting screws (double-washer, M4 x 8: 3pcs) [E], and detach the air-pump cam [F].

(7) Remove the four air-pump mounting screws (double-washer, M4 x 14: 4pcs) [C], and then remove the air-pump bracket [G].
Remove the main motor before removing the air-pump belt (refer to Chapter 3: Main Drive Section).



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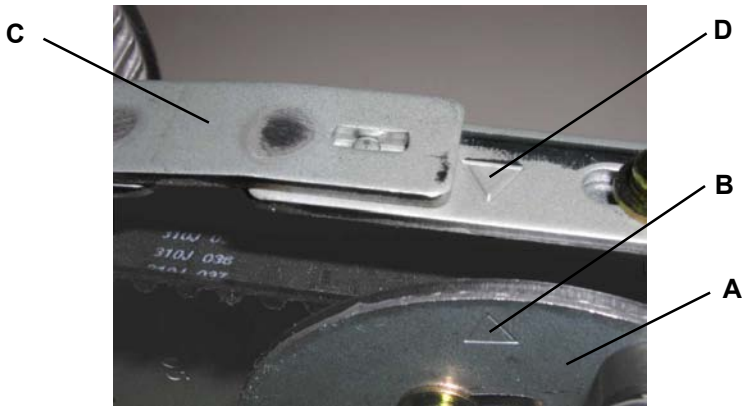
0769

E: Air-pump-cam mounting screw (double-washer, M4 x 8: 3pcs) 3 locations
F: Air-pump cam
G: Air-pump bracket

[Precautions on Reassembly]

- Install the air-pump cam by aligning the alignment mark [B] on the air-pump cam [A] with the alignment mark [D] on the air-pump bracket [C], inserting a 2.5 mm allen wrench into the holes in the air-pump cam and air-pump bracket, and aligning the air-pump-cam position with the air-pump cam bracket.



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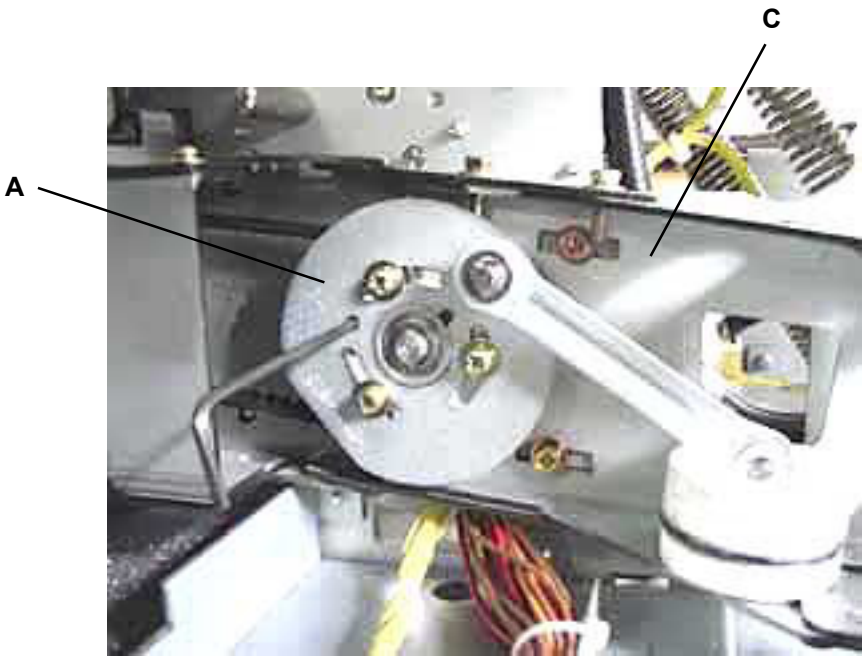


0771

A: Air-pump cam
B: Air-pump-cam alignment mark
C: Air-pump bracket
D: Air-pump-bracket alignment mark

Adjustment

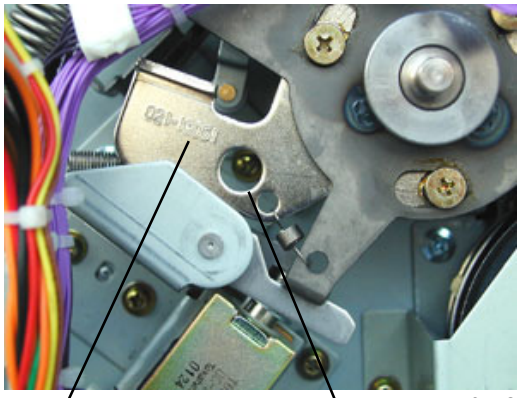
1. Separator Mounting Position

Checks and adjustment

(1) Using Test Chart No. 15, create a master and make prints. Confirm that no misfeeding of paper or black streaks are caused by the separator contacting the center of the print drum (acceptable if there is no misfeeding of paper when a 5-mm margin is provided at the top).
(2) If misfeeding of paper occurs or a black streak appears on the printed paper, bring the print drum to position A, switch off the power, detach the rear cover, open the System PCB bracket in the case of the RN25 Series, and remove the separation fan unit.
(3) Insert a screwdriver through the insertion point [B] at the bottom left of pressure lever A [A], and loosen the retaining screw [D] on the separator positioning plate.
(4) Insert a penlight deep into the suction unit, and position the separator [E] so that its tip is visible through the square hole on the side panel immediately above the pressure lever A [A].
(5) Move the separator positioning plate [C] and tighten the separator positioning plate retaining screw [D] so that the gap between the separator [E] tip and the print drum surface [F] is 1.0 mm to 1.5 mm.

Symptoms

- If the tip of the separator [E] touches the print drum surface [F], it will scratch the surface of the master, causing a black line on the printed sheets.
- Conversely, if the gap is too wide, paper will not be properly separated from the print cylinder (drum), and misfeeding of paper may occur.



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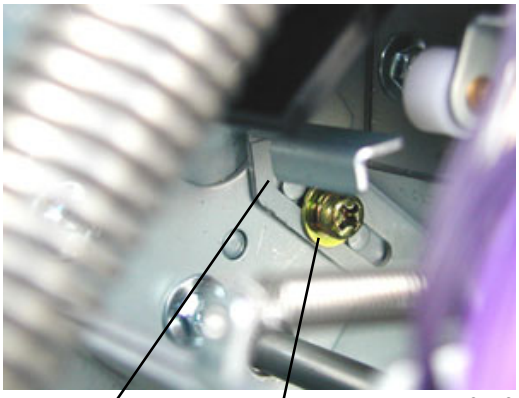
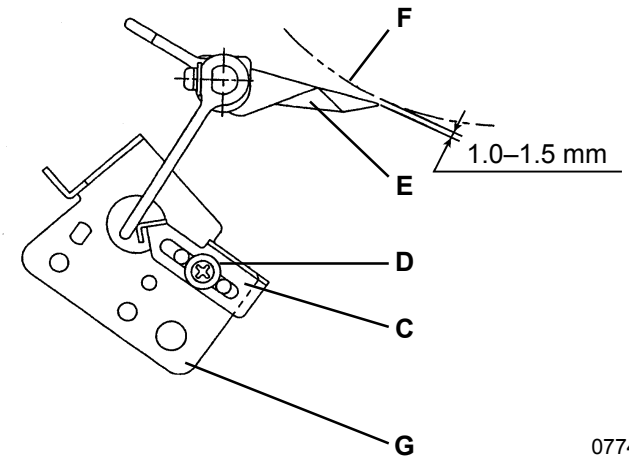


0773

A: Pressure lever A
B: Screwdriver insertion point
C: Separator positioning plate
D: Separator positioning plate retaining screw
E: Separator
F: Print drum surface
G: Separator positioning plate base



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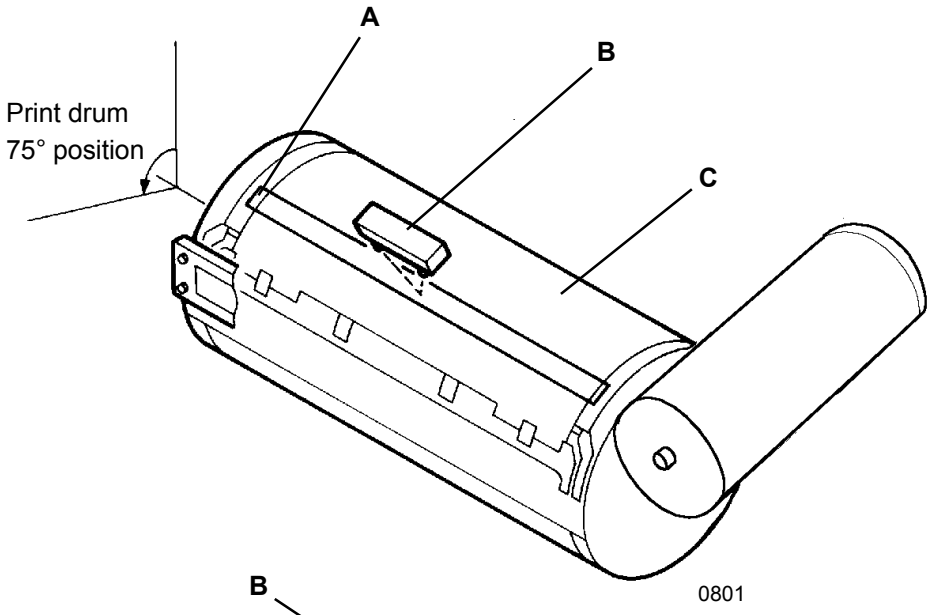
CHAPTER 8: PRINT DRUM SECTION

Contents

Mechanism

1. Master on Drum (Pre-printing) Check Mechanism

This mechanism checks whether there is a master on the print drum when printing begins.
The print drum begins to rotate when the Start key is pressed, and when the print drum reaches the 75° position, the master sensor [B] checks whether there is a master [C] on the print drum.
The information checked by the master sensor is stored until either the print drum is pulled out or the power is switched off. Subsequent printing therefore starts immediately after the Start key is pressed.
If light is not reflected back to the master sensor [B] (implying that the master is absent) when the print drum reaches the 75° position at the start of the printing, it is assumed that there is no master on the print drum.



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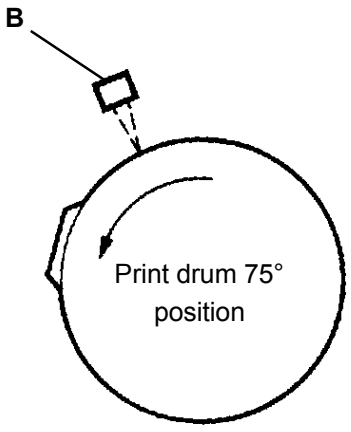
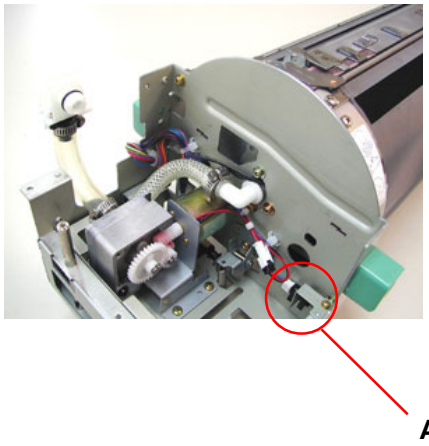


0802

A: Light absorber strip
B: Master sensor (reflective type)
C: Master

2. Print Drum Set Mechanism

The print drum set sensor [A] checks whether the print drum is correctly set in the machine.
A light beam from the print drum set sensor [A] is transmitted when the levers are gripped, and blocked when they are released.
The light beam of print drum set sensor [A] is therefore transmitted if the print drum is not correctly set in the machine.



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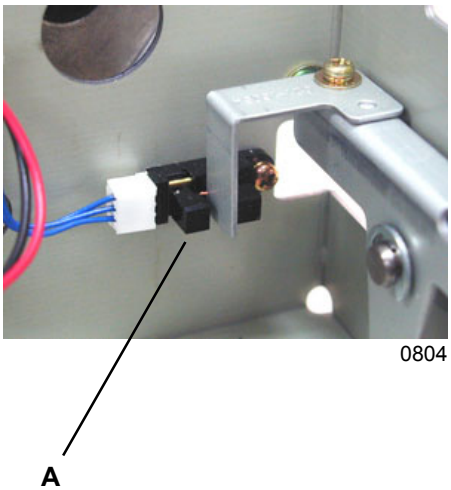
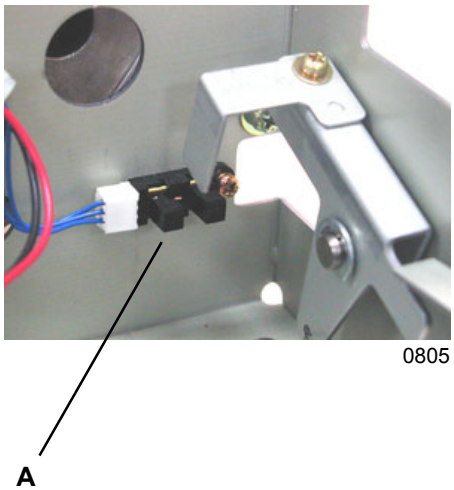


0804

Print drum set sensor light beam is blocked.
Print drum is assumed to be in place.



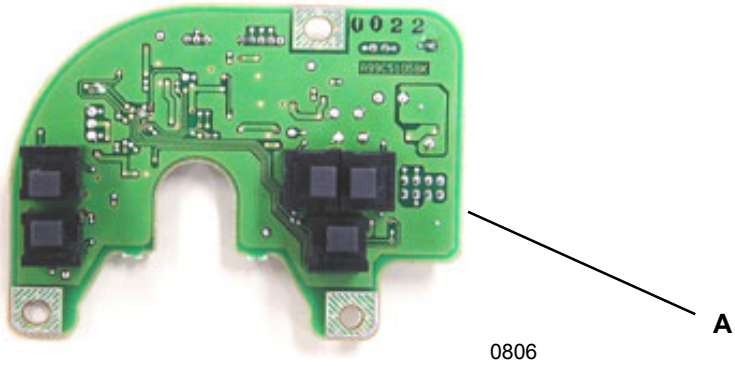
0805

Print drum set sensor light beam is transmitted.
Print drum is assumed not to be in place.

A: Print drum set sensor

3. Ink Cartridge Set Switch PCB

Different ink cartridge set switch PCBs are used for the black ink and color ink print drums.
The black ink cartridge set switch PCB [A] has five sensors, while the color ink cartridge set switch PCB [B] has three sensors.
The combination [C] of the cartridge set sensors pressed by the protrusions [D] at the tip of the ink cartridge is used to determine whether the correct ink cartridge is installed.



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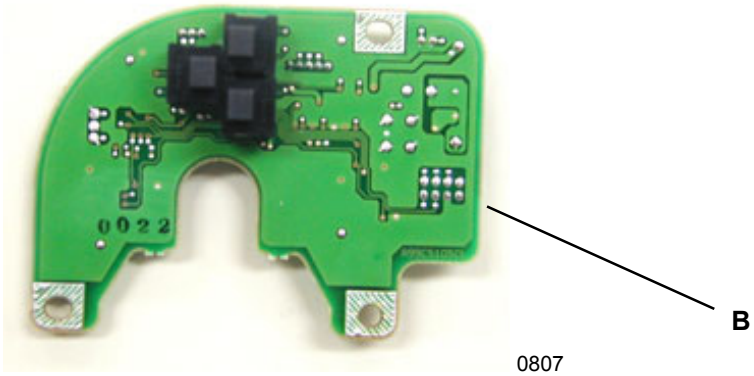

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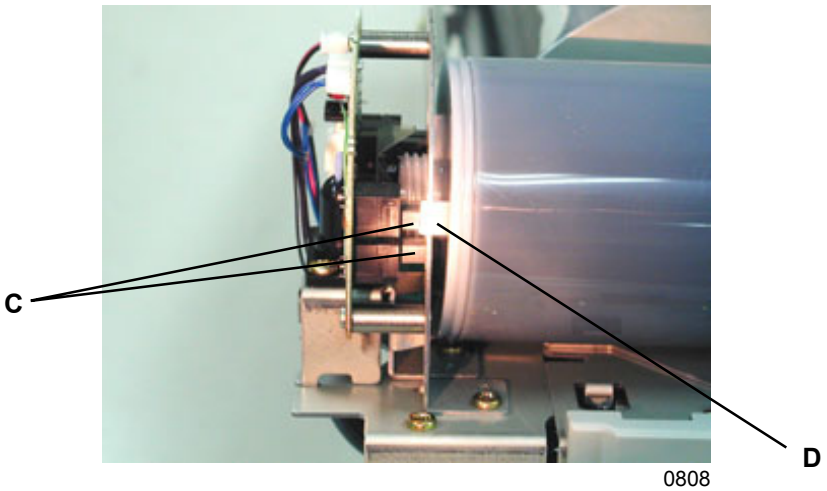
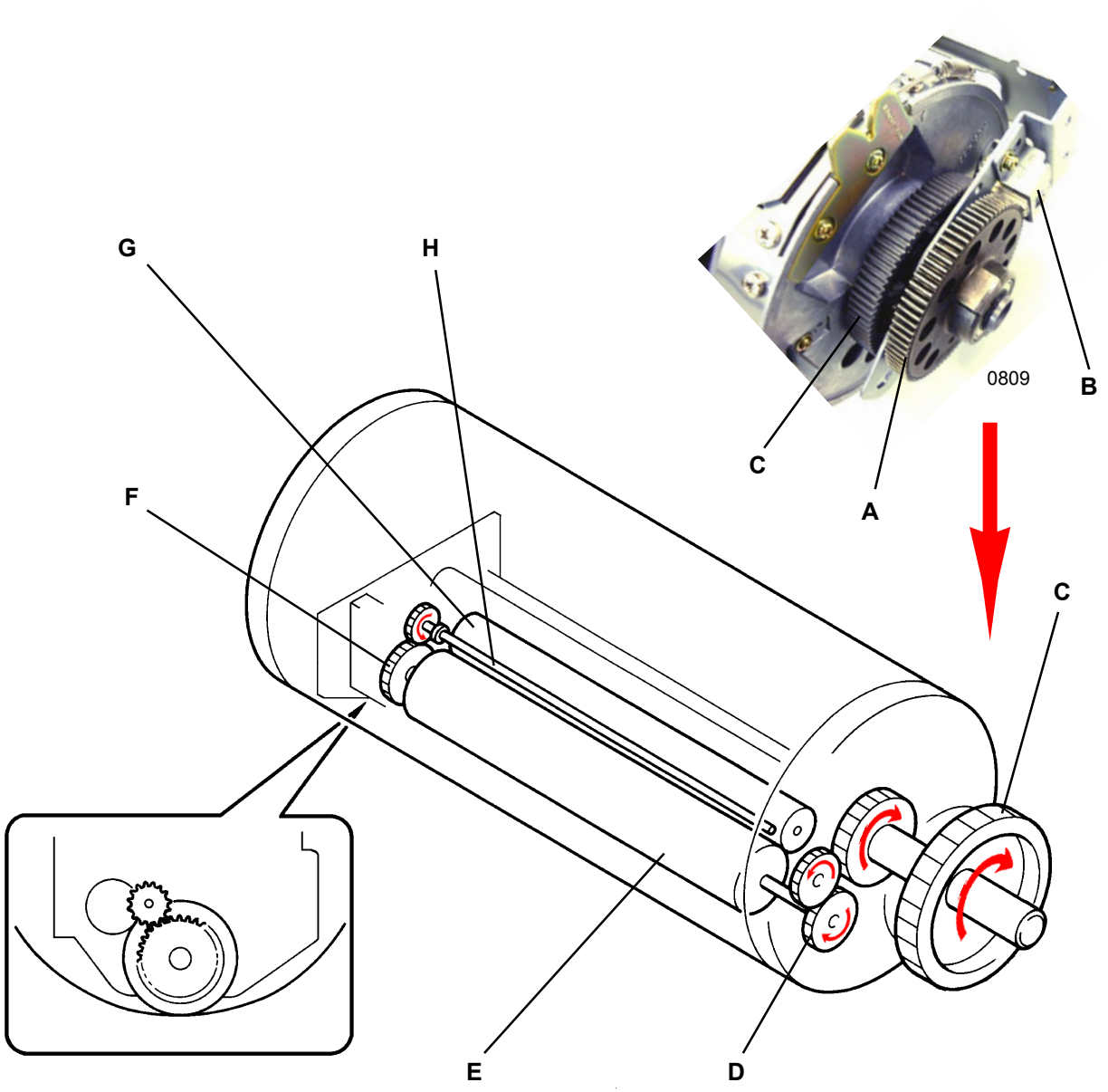


0808

A: Ink cartridge set switch PCB (for black ink)
B: Ink cartridge set switch PCB (for color ink)
C: Ink cartridge set switch PCB sensors
D: Protrusion on the front end of the ink cartridge presses sensor actuator on the print drum set switch PCB.

4. Print Drum Rotating Mechanism

When the main motor rotates, the drive power is transmitted to the joint gear [A] and also the print-drum main gear [C] via the junction gear ass'y [B].
The rotation also drives the squeegee roller gear (R) [D] via the gears to rotate the squeegee roller [E].
The squeegee roller [E] drives the driven shaft [H] via the squeegee roller gear (F) [F].
The squeegee roller gear (R) [D] contains a one-way clutch to prevent the squeegee roller [E] from rotating when the print drum is manually rotated in the reverse direction.



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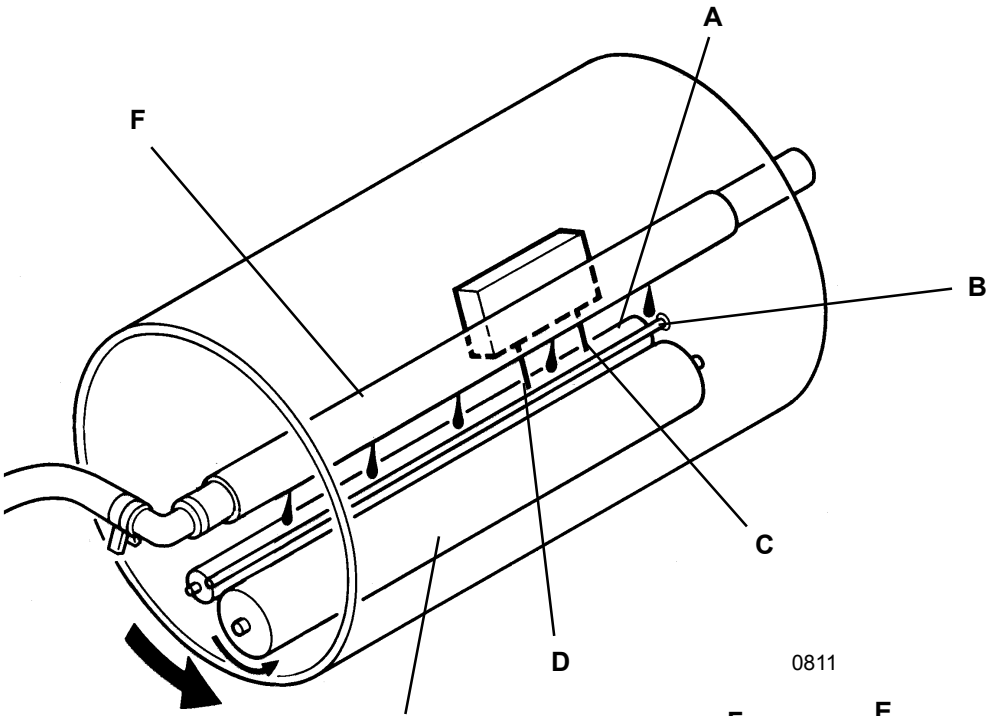
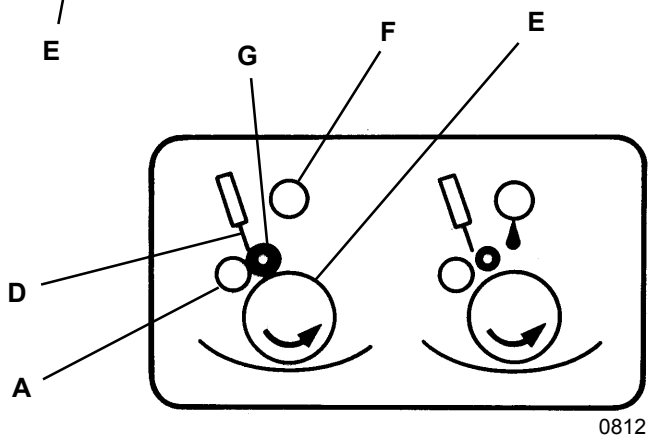
A: Joint gear
B: Junction gear ass'y
C: Print drum main gear
D: Squeegee roller gear (R)
E: Squeegee roller
F: Squeegee roller gear (F)
G: Doctor roller
H: Driven shaft

5. Inking Mechanism

When the main motor is operating and the print drum is rotating, if the ink bead moves away from the Ink sensor [D], the inking motor activates to pump in the ink from the ink cartridge.
The ink pumped is fed via the hose onto the squeegee roller [E]. The inking motor is switched off when the ink reaches the ink sensor [D].
The ink deposited on the squeegee roller [E] is made into ink bead between the squeegee roller [E] and doctor roller [A]. The driven shaft is rotated to build a smooth ink bead.
The ink is transferred onto the print drum from squeegee roller [E] via a small gap between the squeegee roller [E] and doctor roller [A].
The overflow sensor [C] checks to prevent ink from overflowing inside the print drum.

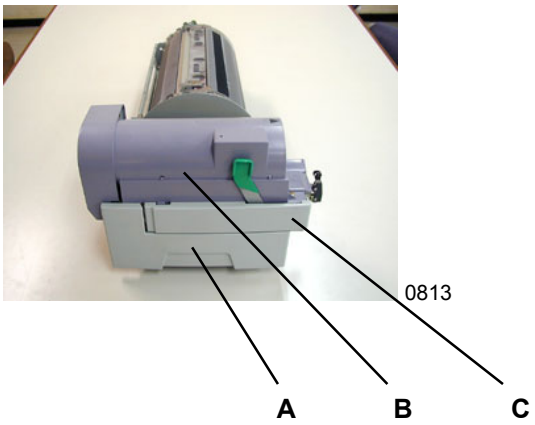




A: Doctor roller
B: Driven shaft
C: Overflow sensor
D: Ink sensor
E: Squeegee roller
F: Ink distributor
G: Ink bead

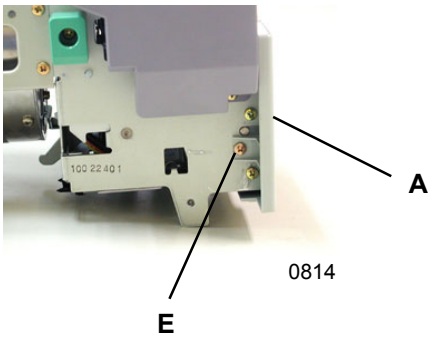
Disassembly

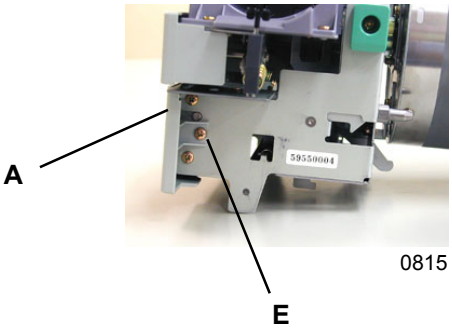
1. Removing the Print Drum Front Cover, Ink Cartridge Guide Ass'y, Drum Front Upper Cover



Removing the print drum front cover

(1) Remove the left- and right-hand mounting screws (IB lock, M4 x 6: 1 pc each) [E] on the print drum front cover [A], and then remove the cover itself.

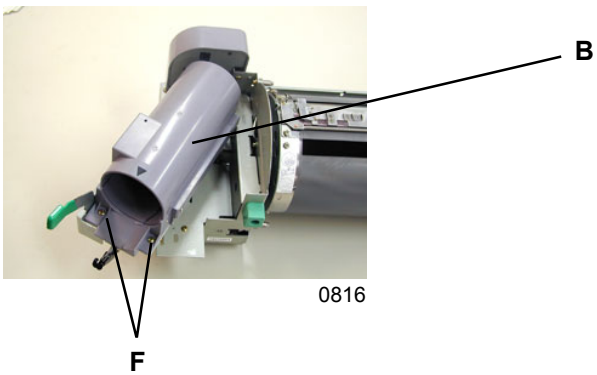




Removing the ink cartridge guide ass'y

(2) Pull the ink cartridge release lever [D] and open the swing base.

(3) Remove the mounting screws (IB lock, M4 x 6: 2 pcs) [E] on the ink cartridge guide ass'y [B], and then remove it.

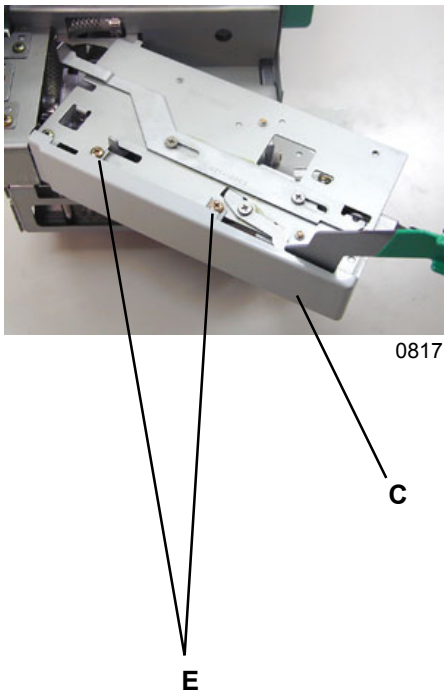


A: Print drum front cover
B: Ink cartridge guide ass'y
C: Drum front upper cover
D: Ink cartridge release lever
E: Mounting screws (IB lock, M4 x 6: 2 pcs)
F: Mounting screws (IB lock, M4 x 6: 2 pcs)

Removing the drum front upper cover

(4) Remove the ink cartridge guide ass'y.

(5) Remove the mounting screws (IB lock, M4 x 6: 2 pcs) [E] on the drum front upper cover [C], and then remove without damaging the two hooks [F] at the inside bottom of the cover.



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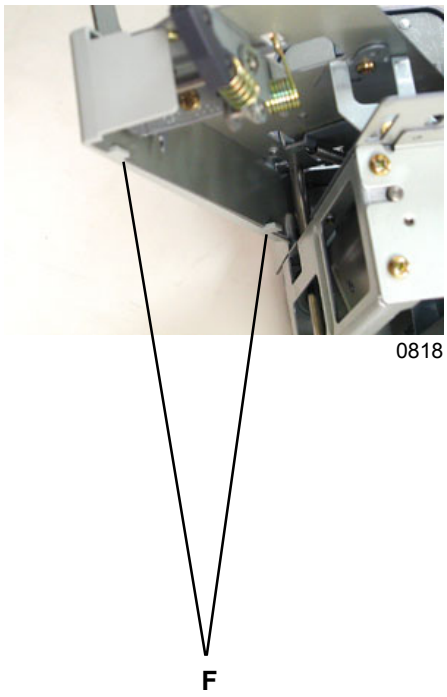

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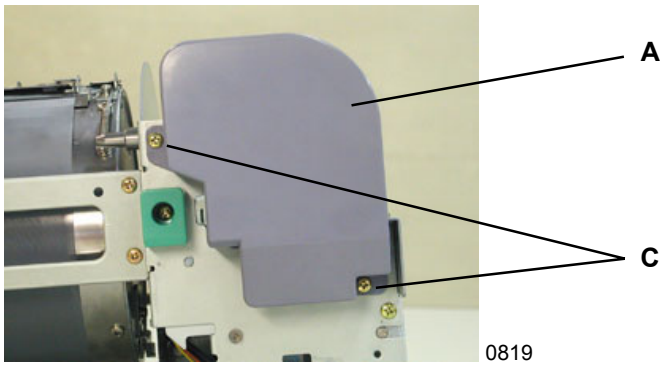
C: Drum front upper cover
E: Mounting screw (IB lock, M4 x 6: 1 pc)
F: Hooks (inside bottom of the cover)

2. Removing the Ink Cartridge Set Switch Cover and Ink Cartridge Set Switch PCB

Removing the ink cartridge set switch cover

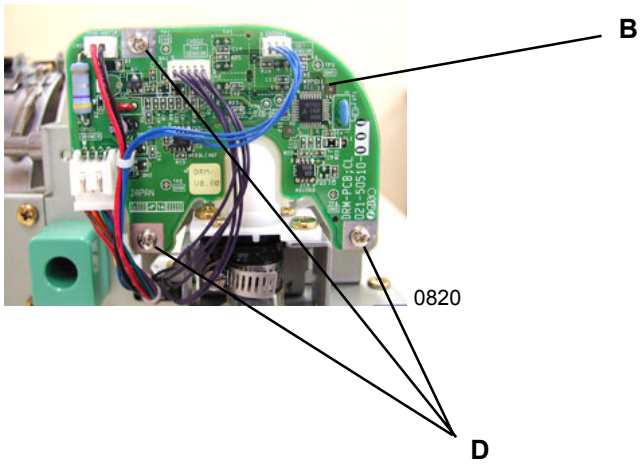
(1) Remove the mounting screws (IB lock, M4 x 6: 2 pcs) [C] on the ink cartridge set switch PCB cover [A], and then remove the cover.



Removing the ink cartridge set switch PCB

(2) Remove the four connectors on the ink cartridge set switch PCB [B].

(3) Remove the mounting screws (IB lock, M4 x 6: 3 pcs) [D] on the ink cartridge set switch PCB [B], and then remove the PCB.

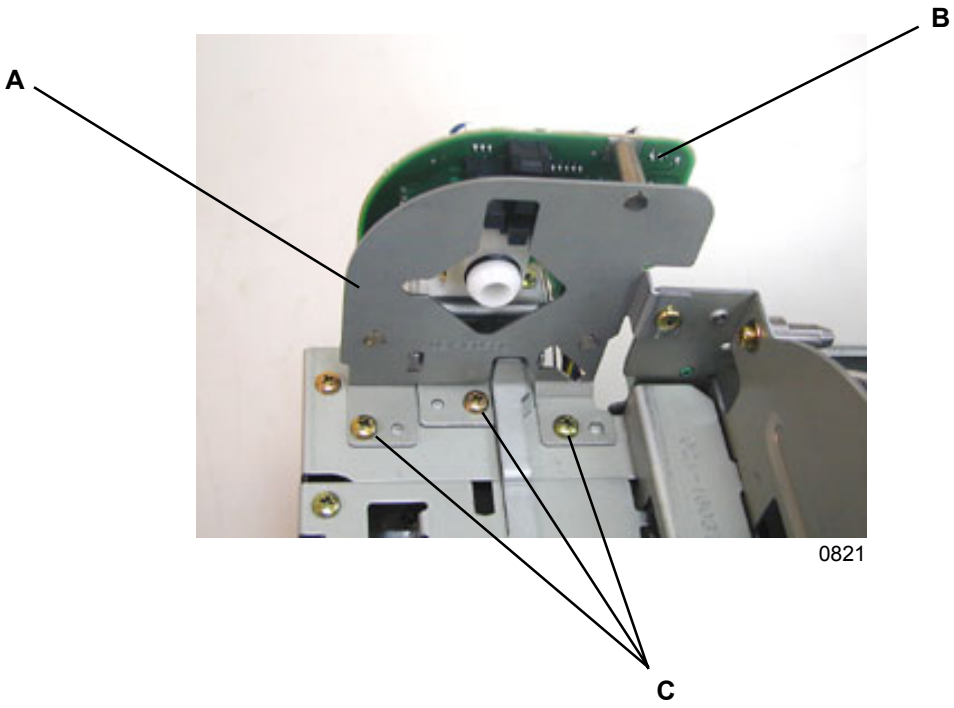


A: Ink cartridge set switch PCB cover
B: Ink cartridge set switch PCB
C: Mounting screws (IB lock, M4 x 6: 2 pcs)
D: Mounting screws (IB lock, M4 x 6: 3 pcs)

3. Removing the Ink Cartridge Set Switch PCB Mounting Bracket

(1) Pull out the print drum, pull out the ink cartridge, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch PCB cover
- Ink cartridge set switch PCB

(2) Remove the mounting screws (IB lock, M4 x 6: 3 pcs) [C] on the ink cartridge set switch PCB mounting bracket [A], and remove the bracket.



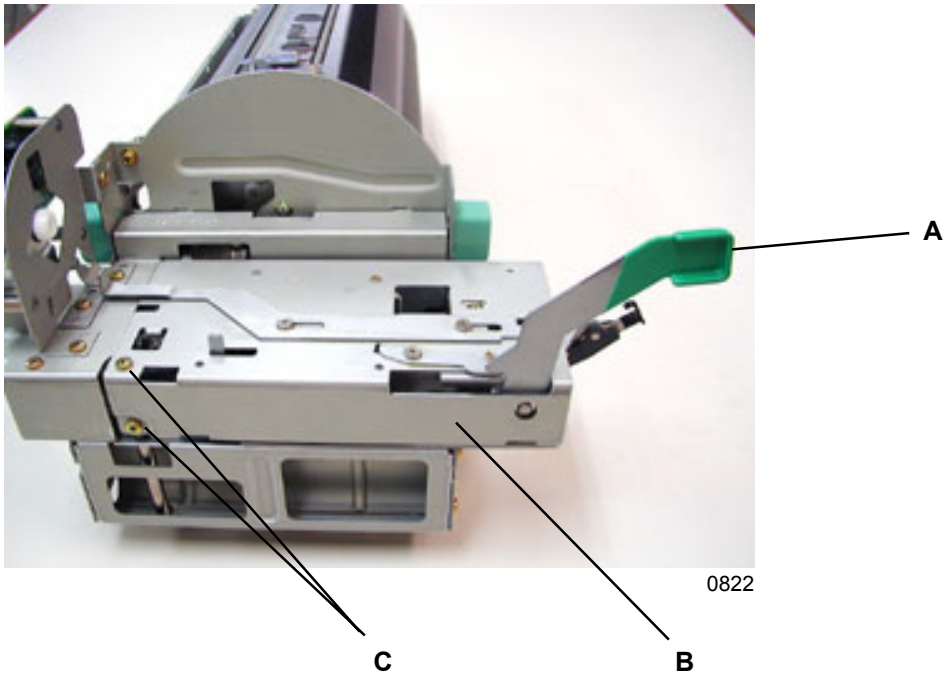
A: Ink cartridge set switch PCB mounting bracket
B: Ink cartridge set switch PCB
C: Mounting screws (IB lock, M4 x 6: 3 pcs)

4. Removing the Swing Base Ass'y

(1) Pull out the print drum, pull out the ink cartridge, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover

(2) Remove the mounting screws (IB lock, M4 x 6: 2 pcs) [C] on the swing base ass'y.

(3) Push the ink cartridge release lever ass'y [A] down, open the swing base ass'y [B], and remove from the print drum.



A: Ink cylinder release lever ass'y
B: Swing base ass'y
C: Mounting screw (IB lock, M4 x 6: 2 pcs)

5. Removing the Ink Cartridge Guide Bottom Ass'y

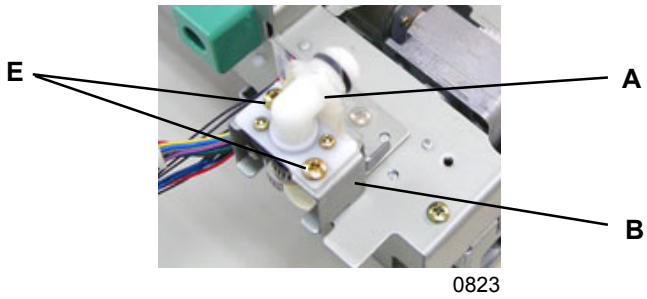
(1) Pull out the print drum, pull out the ink cartridge, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch PCB cover
- Ink cartridge set switch PCB mounting bracket
- Swing base ass'y

(2) Remove the mounting screws (IB lock, M4 x 6: 2 pcs) [E] on the ink intake nozzle [A], and detach the ink intake nozzle [A] from the nozzle bracket [B].

(3) Remove the mounting screws (IB lock, M4 x 6: 3 pcs) [F] on the Ink cartridge guide bottom ass'y [D], and remove the ink cartridge guide bottom ass'y [D].

[Precautions on Reassembly]

• When mounting the ink cartridge ass'y [D], engage the horizontal hooks into the drum front support ass'y [C].



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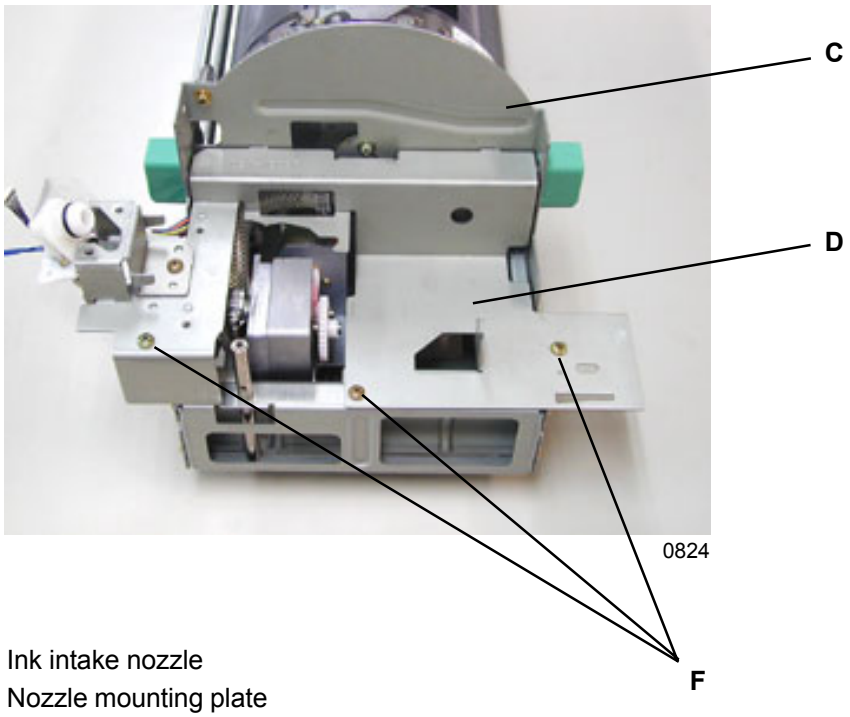

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A: Ink intake nozzle
B: Nozzle mounting plate
C: Drum front support ass'y
D: Ink cartridge guide bottom ass'y
E: Mounting screws (IB lock, M4 x 6: 2 pcs)
F: Mounting screws (IB lock, M4 x 6: 3 pcs)

6. Removing the Ink Pump Unit and Inking Motor

Removing the ink pump unit

(1) Pull out the print drum, pull out the ink cartridge, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch PCB cover
- Ink cartridge set switch PCB mounting bracket
- Swing base ass'y
- Ink cartridge guide bottom ass'y

(2) Remove the mounting screws (M4 x 6: 2 pcs) on the grip lever [A], and remove the grip lever [A].

(3) Remove the mounting screw (M4 x 6: 1 pc) [C] on the pump cover [B], and remove the pump cover [B].

(4) Pull out the ink outlet nozzle [D] from the ink distributor.

(5) Unplug the inking motor connector [E], remove the mounting screws (IB lock, M4 x 6: 3 pcs) on the ink pump unit [F], and remove the ink pump unit [F].

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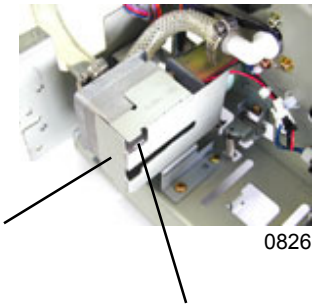

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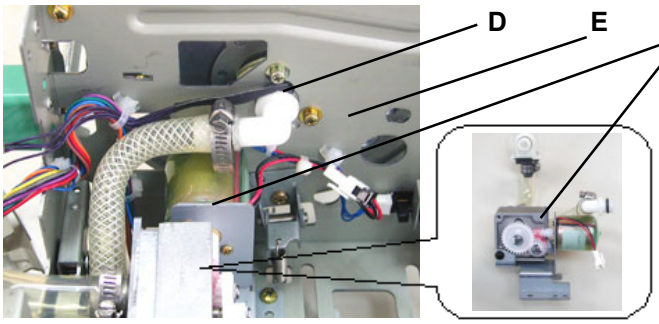

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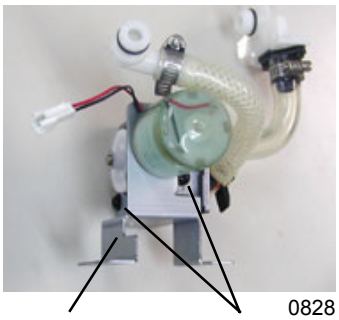
A: Grip lever
B: Pump cover
C: Pump cover mounting screw
D: Ink outlet nozzle
E: Connector
F: Ink pump unit

Removing the inking motor

(4) Remove the mounting screws (IT, M4 x 6: 2 pcs) [F] on the inking motor bracket [D], and then remove the inking motor [E] together with its mounting bracket from the ink pump unit.

(5) Remove the mounting screws (pan-head, 3 x 4: 2 pcs) [G] on the inking motor [E], and detach the inking motor [E] from the Inking motor bracket [D].



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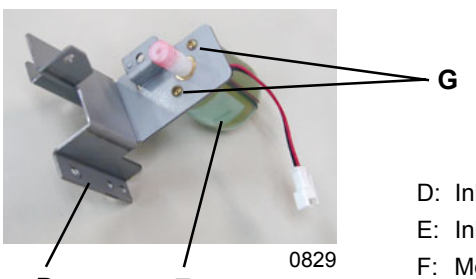


0829

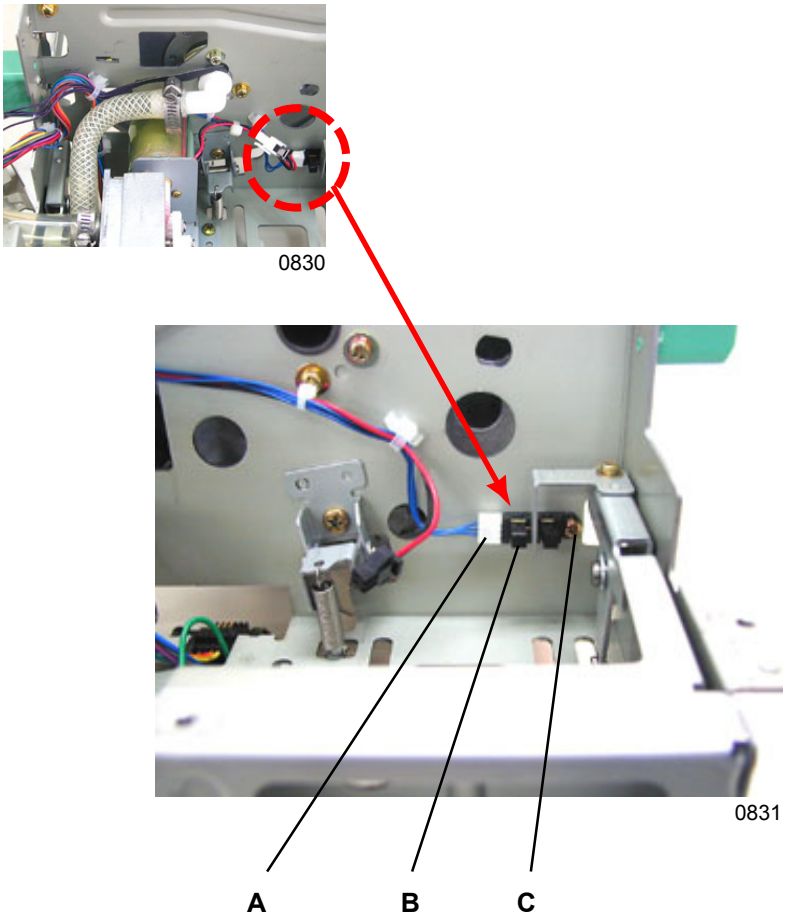
D: Inking motor bracket
E: Inking motor
F: Mounting screws (M4 x 6: 2 pcs)
G: Mounting screws (M3 x 4: 2 pcs)

7. Removing the Print Drum Set Sensor

(1) Pull out the print drum, pull out the ink cartridge, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch cover
- Ink cartridge set switch PCB mounting bracket
- Swing base ass'y
- Ink cartridge guide bottom ass'y

(2) Remove the mounting screw (washer, M3 x 6: 1 pc) [C] on the print drum set sensor [B], and remove the sensor with the connector attached.

(3) Unplug the connector [A] from the print drum set sensor [B].



A: Connector
B: Print drum set sensor
C: Mounting screw (washer, M3 x 6: 1 pc)

8. Removing the Screen

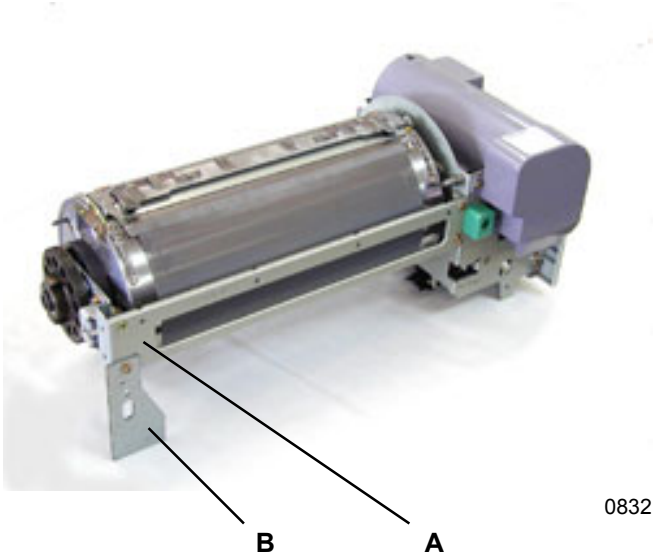
[Suggestion prior to starting work]

- Attaching the print drum stand [B] (Part No. 015-26836-002) to the rear of the print drum side frame ass'y [A] makes the work easier by keeping the print drum level.

(1) Make a confidential master, and pull out the print drum.
(2) Remove the two screen springs [C].
(3) Remove the mounting screws (bind, M4 x 8: 2 pcs), which holds both the clamp plate base [D] and the screen [E], and then pull the screen [E] from underneath the clamp plate base [D] to remove.

[Precautions on Reassembly]

- Take care not to fold the screen [E].



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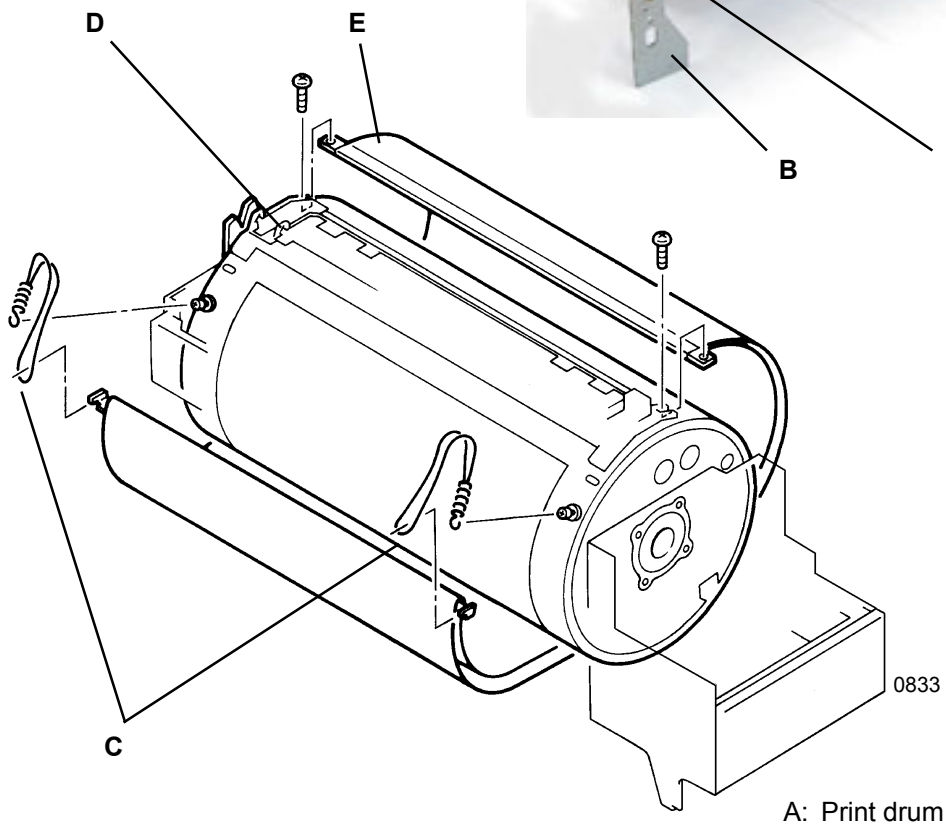
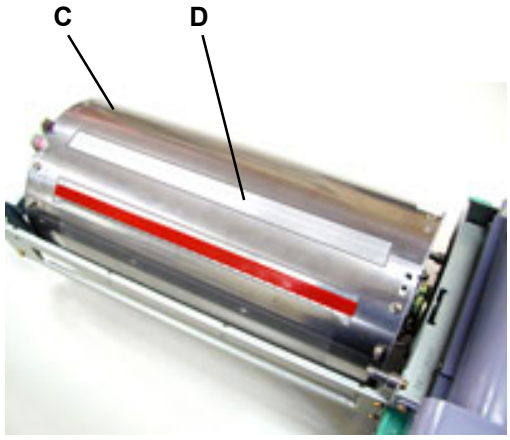


0833

A: Print drum side frame ass'y
B: Print drum stand (015-26836-002)
C: Screen springs
D: Clamp plate base
E: Screen

9. Removing the Print Drum Body

(1) Make a confidential master, pull out the print drum, and remove the following component.
  • Screen
(2) Remove the mounting screws (special screws: 2 pcs) [B] and remove the clamp plate base [A].
(3) Peel off the tape [D] on the print drum body [C] alignment section. (Reuse the tape when reassembling.)
(4) Remove the remaining 12 mounting screws (bind, M4 x 8: 10 pcs and special screws: 2 pcs) on the print drum body [C], and remove the print drum body [C].



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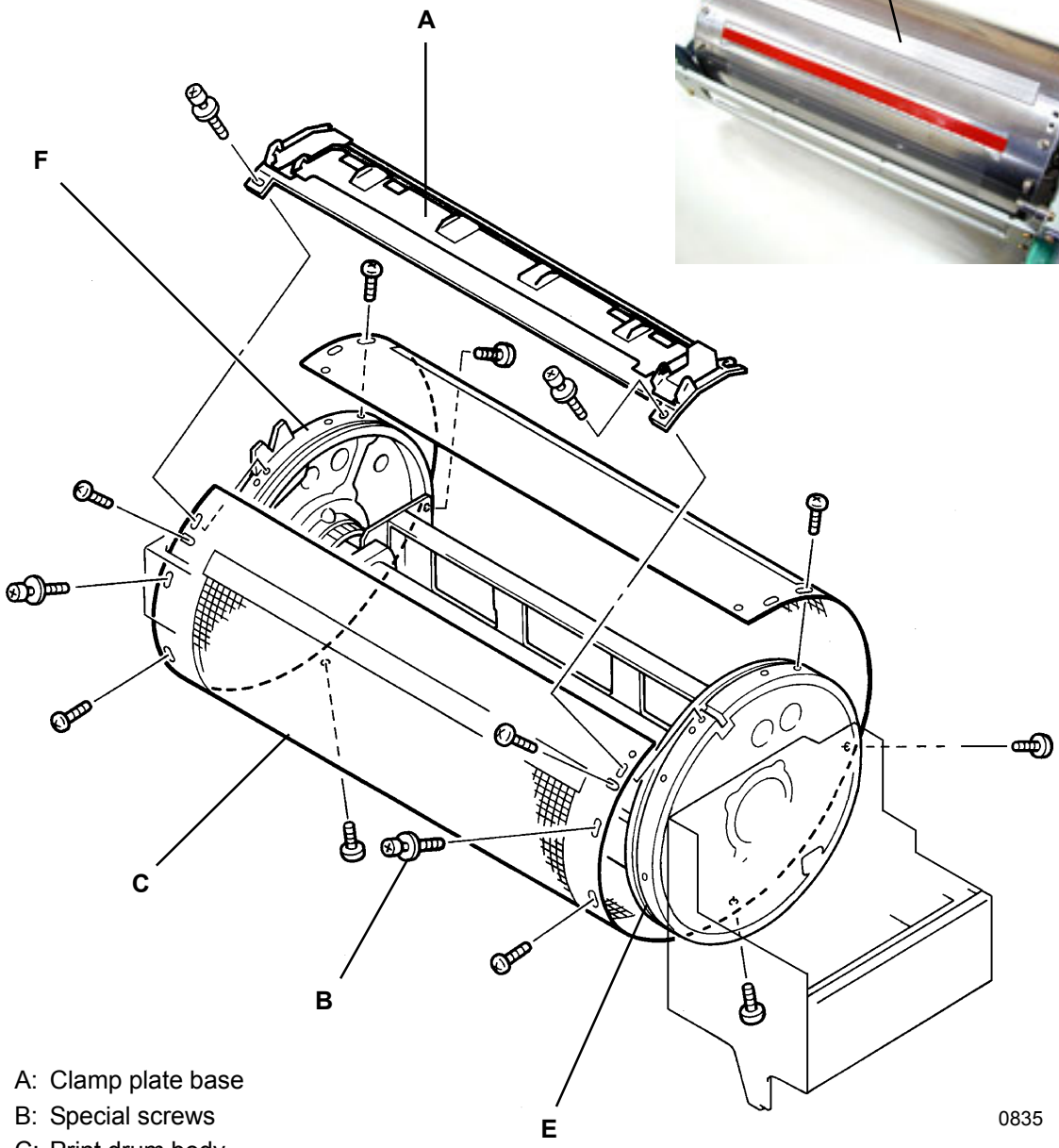

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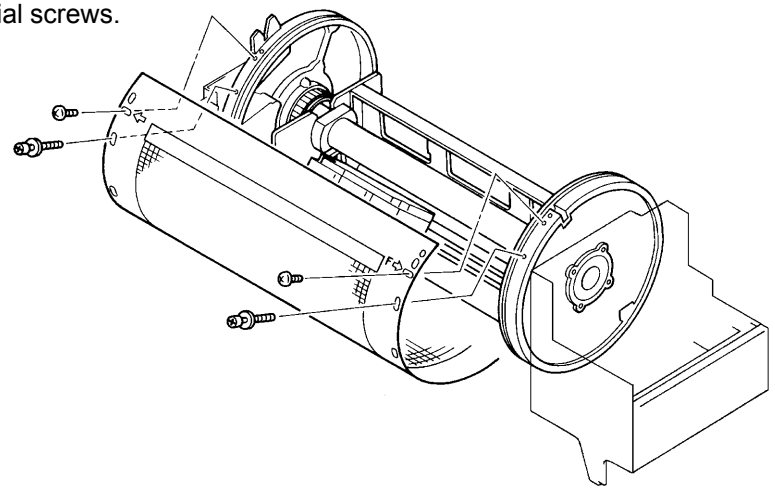
A: Clamp plate base
B: Special screws
C: Print drum body
D: Tape
E: Print drum support (F)
F: Print drum support (R)

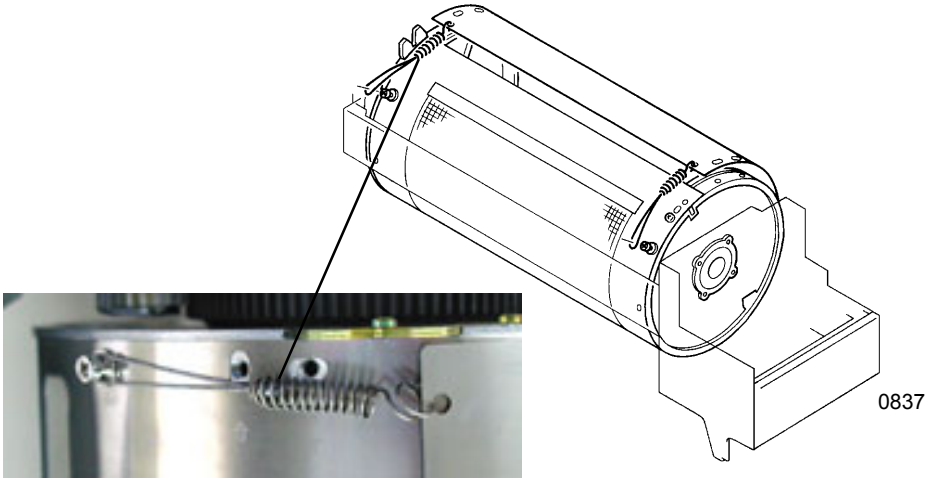
[Precautions on Reassembly: 1]

- Arrow marks (⇨) are engraved on both sides of the print drum body, and **F** is engraved at the front. Likewise, arrow marks (⇨) are engraved on both the right and left print drum supports. Face the side with the "**F**" mark toward the front, align the arrow marks (⇨) on both sides of the print drum body and print drum supports, and then install the standard screws (bind, M4 x 8: 2 pcs) first. Next attach the special screws.



0836

- Hook the screen spring ass'ys into the holes at the edges of the print drum body, and hook the loop ends over the special screws. With the print drum pulled by the springs, install the remaining screws, confirming that the spring tension is exerted on the drum. Before tightening all screws, remove the screen spring ass'ys, check the cautions described in [Precautions on Reassembly: 2], and then tighten the remaining screws and install the clamp plate base.



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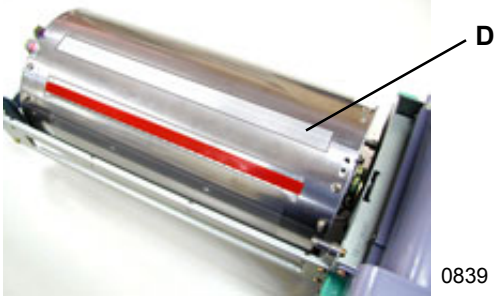
[Precautions on Reassembly: 2]

- Before attaching the clamp plate base to the print drum body, affix the tape [D] to the joint section of the print drum body. If the tape originally attached to the print drum cannot be reused, insulation tape may be used. The tape is used to reduce the noise originating from the joint section of the print drum body during the printing.



0839

D: Tape

10. Removing the Ink Sensor PCB

(1) Pull out the print drum, and remove the following components.
- Screen
- Print drum body

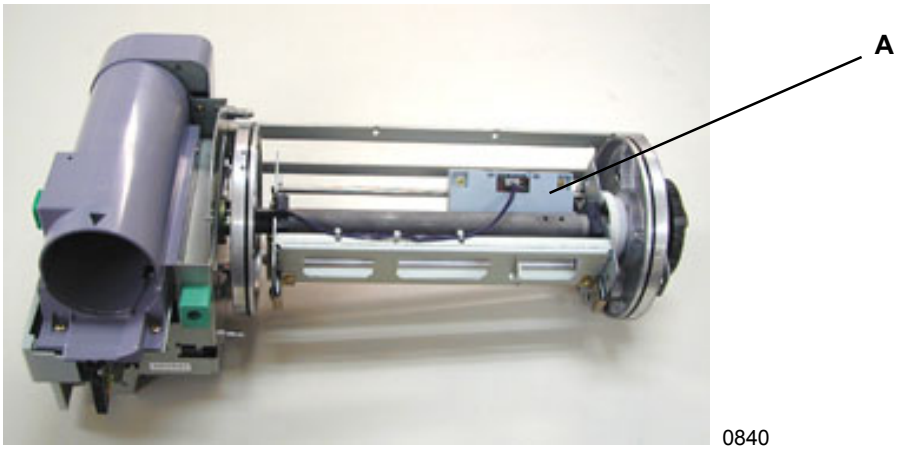
(2) Unplug the connector on the ink sensor PCB [B].

(3) Remove the ink sensor cover [A] mounting screws (double-washer, M3 x 8: 2 pcs), and detach the ink sensor cover [A].

(4) Remove the ink sensor PCB [B] from the ink sensor cover [A].

[Work Precautions]
- Take care not to fold or bend the ink sensor or overflow sensor.
  If they are bent, straighten them out by hand.

[Checking after Reassembly]
- Check that the ink sensor does not touch the doctor roller or driven shaft.



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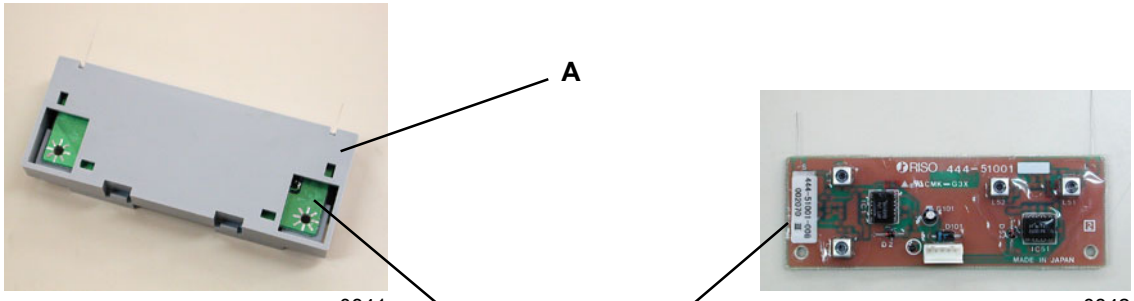

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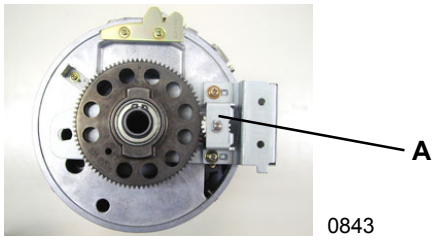
0842

A: Ink sensor cover
B: Ink sensor PCB

11. Removing the Squeegee Roller

(1) Pull out the print drum to remove the ink bottle, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch cover
- Ink cartridge set switch PCB mounting bracket
- Swing base ass'y
- Ink cartridge guide bottom ass'y
- Ink pump unit
- Screen
- Print drum body
- Ink sensor PCB

(2) Remove the two mounting screws on the junction gear ass'y [A], and remove the junction gear ass'y [A].



0843

A: Junction gear ass'y

(3) Remove the mounting screws (IT, M3 x 6: 1 pc each) from the eccentric boss stopper plates [B] located on both ends, detach the eccentric boss stopper plates, and then remove the eccentric bosses [C].

(4) With the print drum at position A, remove the ink blocking plate [D] mounting screws (IB lock, M4 x 6: 1 pc each) through the holes at the right- and left-hand print drum supports, and then remove both ink blocking plates [D].

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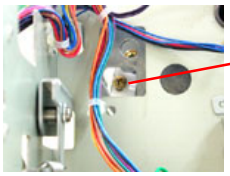

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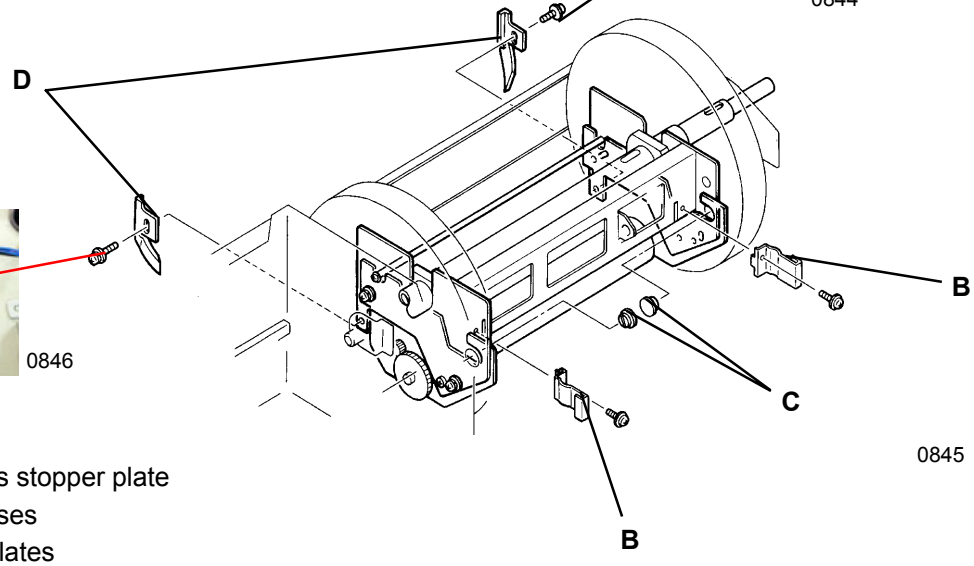
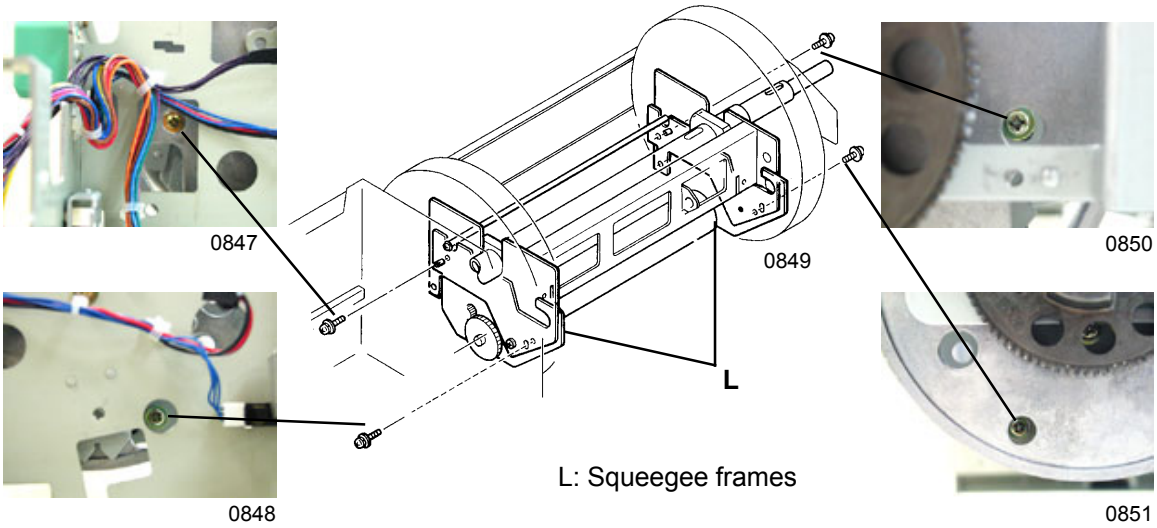


0845

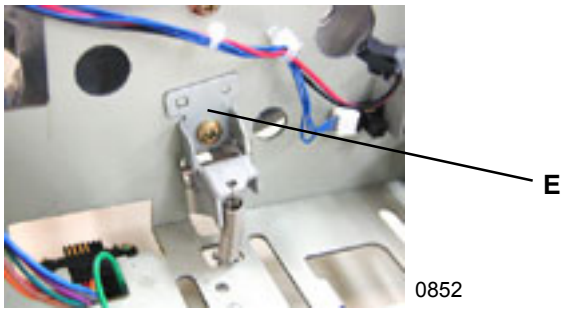
B: Eccentric boss stopper plate
C: Eccentric bosses
D: Ink blocking plates

(5) With the print drum at position-A, remove the mounting screws (double-washer, M4 x 8: 2 pcs each) on the squeegee frames [L] via the holes in the print drum supports (F) and (R).



L: Squeegee frames

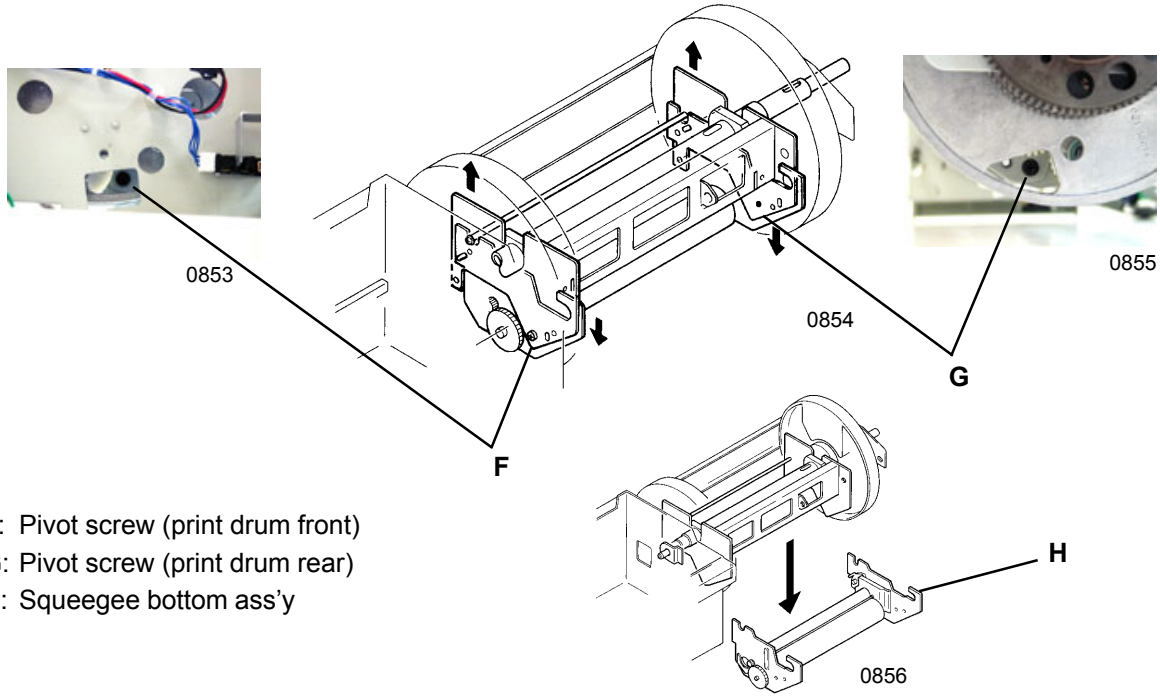
(6) Remove the mounting screw (IB lock, M4 x 6: 1 pc), and remove the print drum lock plate ass'y [E].



E: Print drum lock plate ass'y

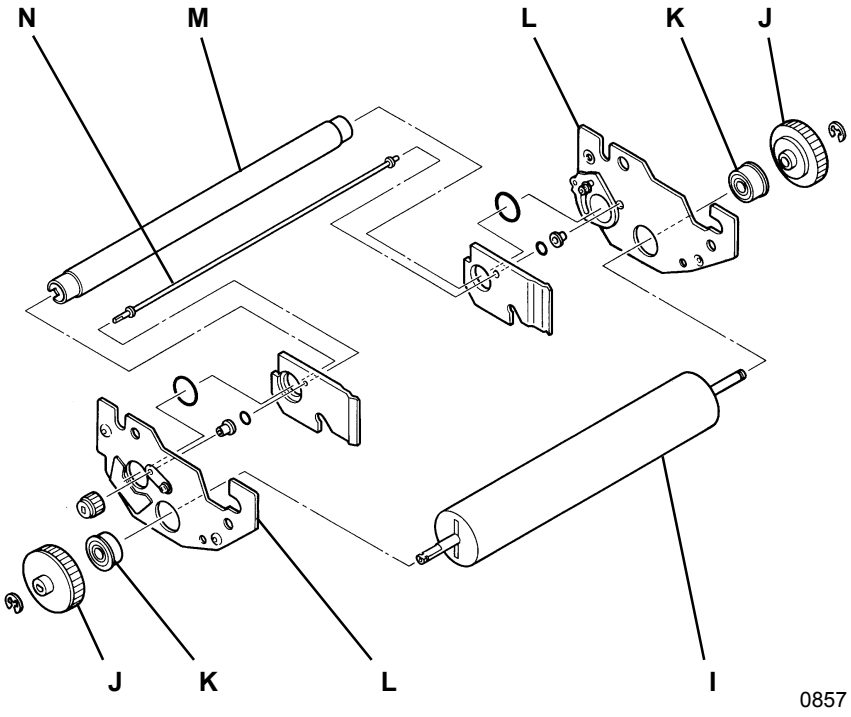
(7) Remove the pivot screw [F] on the front of the print drum via the opening in the print drum support (F) where the print drum lock plate ass'y was removed. Likewise, remove the pivot screw [G] on the front of the print drum via the opening in the Print drum support (R).

(8) Remove the squeegee bottom ass'y [H] from the squeegee unit.



F: Pivot screw (print drum front)
G: Pivot screw (print drum rear)
H: Squeegee bottom ass'y

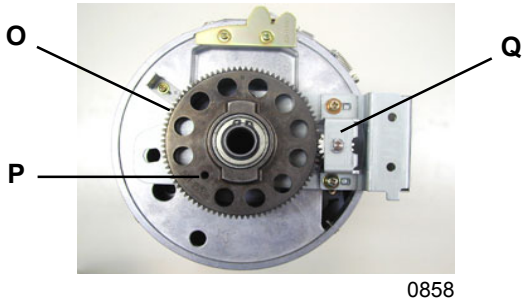
(9) Remove the E-rings on both ends of the squeegee roller [I], remove the gears [J], remove the bearings [K], and then remove the squeegee roller [I] from the squeegee frame [L].
(The doctor roller [M] and driven shaft [N] will also come loose when removing the squeegee roller [I], and are disassembled as shown below.)



I: Squeegee roller
J: Gear
K: Bearing
L: Squeegee frame
M: Doctor roller
N: Driven shaft

[Precautions on Reassembly]

- Align the positioning hole [P] in the joint gear [O] over the positioning holes in the drum rear frame plate and print drum main gear.
- Adjust the position of the junction gear ass'y [Q] to allow a small amount of backlash between the junction gear and the joint gear [O] (and print drum main gear).



O: Joint gear
P: Joint gear positioning holes
Q: Junction gear ass'y

[Adjustment after Reassembly]

- Squeegee gap adjustment
- Ink blocking plate position adjustment
- Squeegee pressure balance adjustment

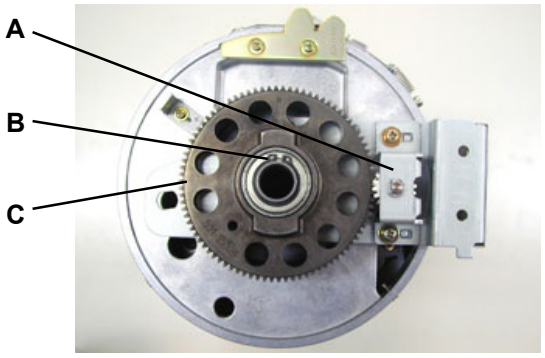
12. Removing the Print Drum Supports (R) and (F)

(1) Pull out the print drum, remove the ink cartridge, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch cover
- Ink cartridge set switch PCB mounting bracket
- Swing base ass'y
- Ink cartridge guide bottom ass'y
- Screen
- Print drum body

(2) Unplug the connector on the ink sensor PCB.

(3) Remove the mounting screws (double-washer, M4 x 8: 2 pcs) on the junction gear ass'y [A], and remove the junction gear ass'y [A].

(4) Remove the C-ring [B] retaining the joint gear [C] on the ink distributor, and remove the joint gear [C].

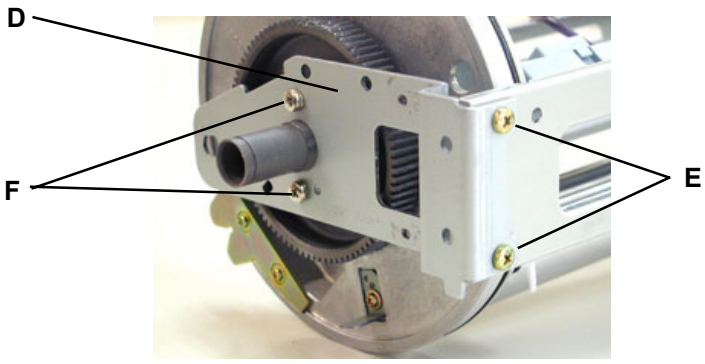


0859

A: Junction gear ass'y
B: C-ring
C: Joint gear

(5) Remove the mounting screws (IB lock, M4 x 6: 2 pcs) [E] retaining the drum rear frame plate [D] to the print drum side frame ass'y.

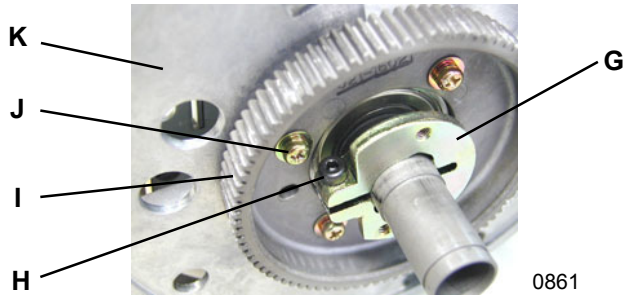
(6) Remove the screws (bind, M4 x 8: 2 pcs) [F] that hold the drum rear frame plate [D] to the drum shaft clamper [G], and slide out the drum rear frame plate [D] from the ink distributor.



0860

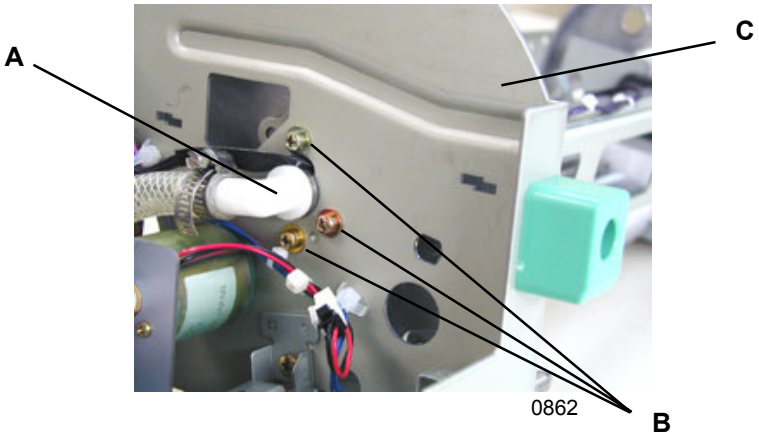
D: Rear frame
E: Mounting screw (IB lock, M4 x 6: 2 pcs)
F: Mounting screw (bind, M4 x 8: 2 pcs)

(7) Loosen the allen bolt [H] on the drum-shaft clamper [G], and pull out the drum-shaft clamper [G] from the ink distributor.
(8) Remove the mounting screws (double-washer, M4 x 12: 4 pcs) [J] on the print drum main gear [I], and slide out the Print drum main gear [I] from the ink distributor.
(9) Pull the print drum support (R) [K] from the ink distributor.



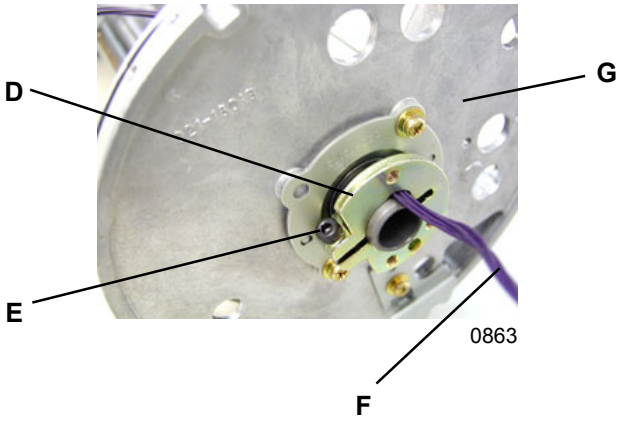
G: Drum shaft clamper
H: 3-mm allen bolts
I: Print drum main gear
J: Mounting screw (double-washer, M4 x 12: 4 pcs)
K: Print drum support (R)

(10) Pull the ink outlet nozzle [A] from the ink distributor.
(11) Remove the mounting screws (double-washer, M4 x 8: 3 pcs) [B] on the drum front support ass'y [C], and remove the drum front support ass'y [C] from the drum shaft clamper.



A: Ink outlet nozzle
B: Mounting screws (double-washer, M4 x 8: 3 pcs)
C: Drum front support ass'y

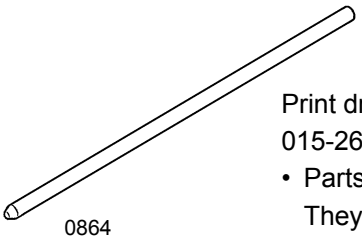
(12) Loosen the allen bolt [E] on the drum-shaft clamper [D], and pull out the drum shaft clamper [D] from the ink distributor.
(13) Slide out the print drum support (F) [G] from the ink distributor, and pull the junction wire harness [F] out through the print drum support (F) [G].



D: Drum shaft clamper
E: 3-mm allen bolt
F: Junction wire harness
G: Print drum support (F)

[Precautions on Reassembly: 1]

- Use the tool (print drum JIG 7) when tightening the drum shaft clamper mounting screws.

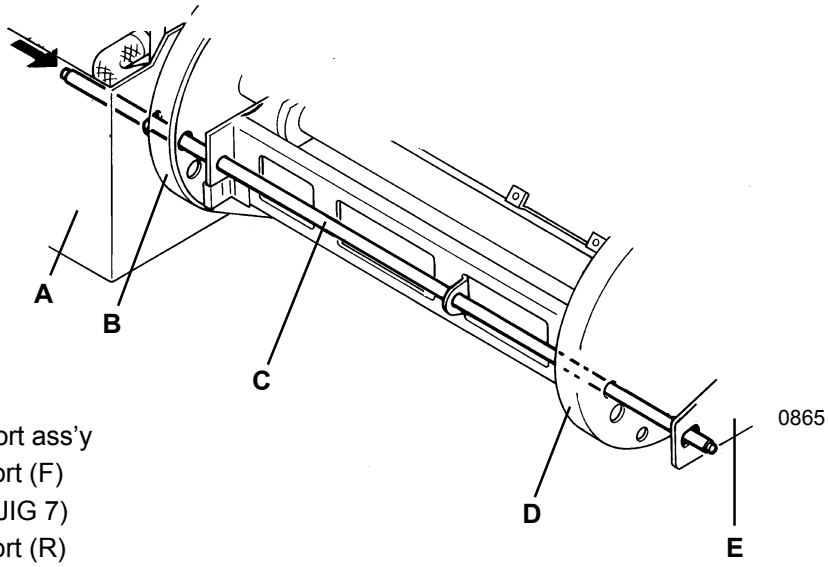


0864

Print drum JIG 7
015-26128-008

- Parts numbers are accurate as of April 2000.
  They are subject to change without prior notice.

- Move the print drum to position A, insert the tool (print drum JIG 7) [C] through the holes in the drum front support ass'y [A], print drum support (F) [B], print drum support (R) [D], and drum rear frame plate [E], and then tighten the allen bolts on both drum shaft clampers.

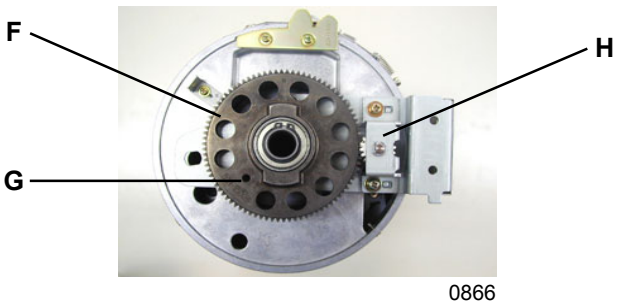


0865

A: Drum front support ass'y
B: Print drum support (F)
C: Tool (print drum JIG 7)
D: Print drum support (R)
E: Drum rear frame plate

[Precautions on Reassembly: 2]

- Align the positioning hole [G] in the joint gear [F] over the positioning holes in the drum rear frame plate and print drum main gear.
- Adjust the position of the junction gear ass'y [H] to allow a small amount of backlash between the junction gear and the joint gear [F] (and print drum main gear).



0866

F: Joint gear
G: Joint gear positioning holes
H: Junction gear ass'y

Adjustment

1. Filter Cleaning

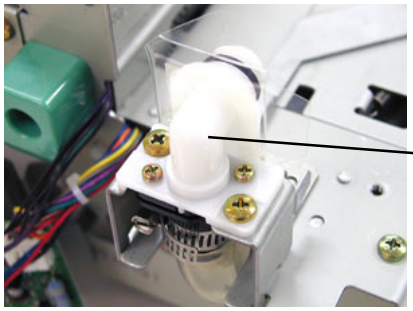
(1) Pull out the print drum, remove the ink cartridge, and remove the following components.
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch cover
- Ink cartridge set switch PCB mounting bracket

(2) Remove the mounting screws (IB lock, M4 x 6: 2 pcs and tapping, M3 x 10: 2 pcs) on the ink intake nozzle [A], and remove the nozzle.

(3) Remove the filter [B] and clean it.

Symptoms

- If foreign matter is drawn into the filter, ink will no longer be drawn in, resulting in a lack of ink in the print drum.



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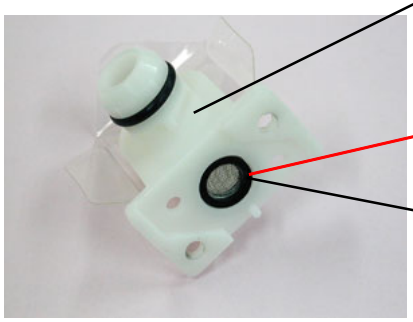

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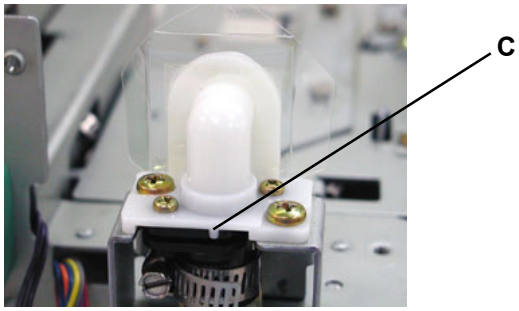
[Precautions on Reassembly]

- Mount the filter [B] with the rounded top facing upwards.
- Engage the lug on the bottom of the ink intake nozzle [A] into the slot in the lower base [C].



0870

A: Ink intake nozzle
B: Filter
C: Lug and slot

2. Squeegee Gap Adjustment

Adjustment

(1) Pull out the print drum, and remove the following components.
- Screen
- Print drum body

(2) Clean out the ink inside the squeegee unit.

(3) Using a feeler gauge, check that the gap between the squeegee roller and doctor roller is in specified setting (0.08 mm ± 0.02 mm at front and rear).

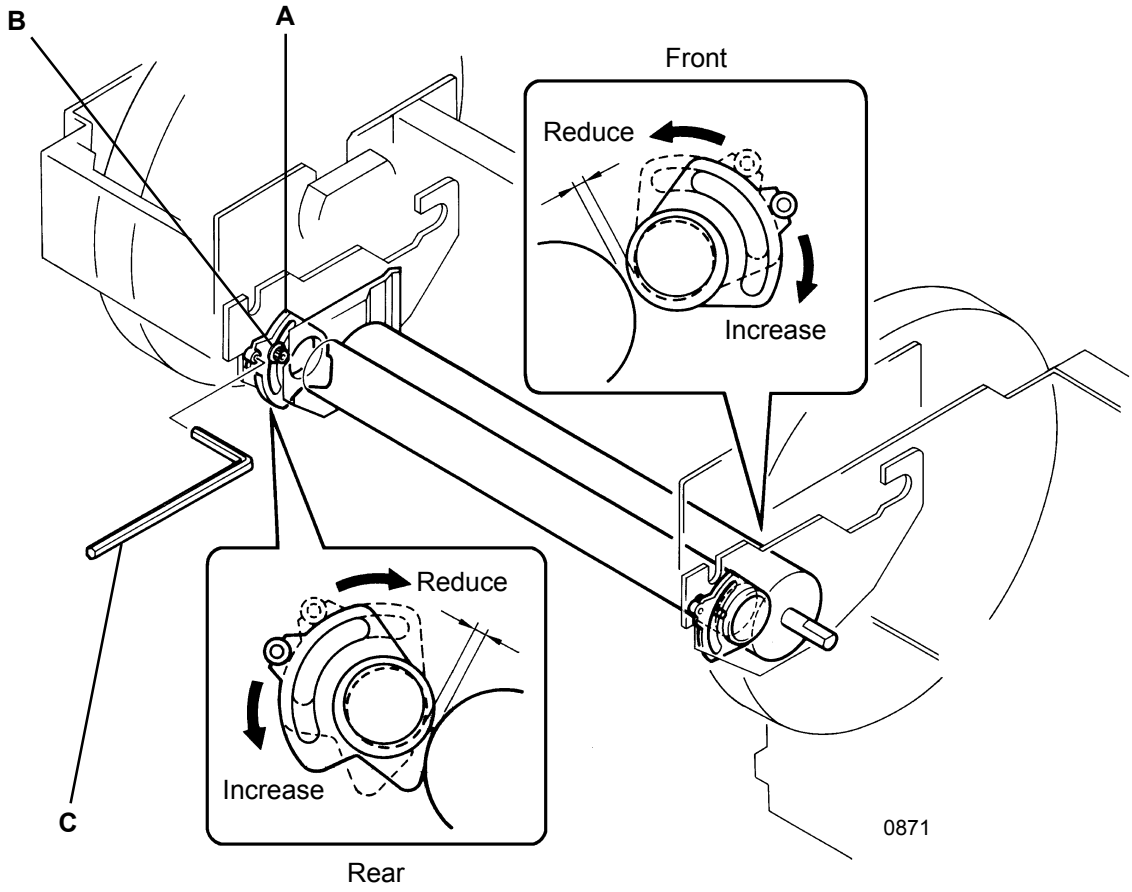
(4) If the gap is not within the standard range, loosen the securing screw on the doctor roller adjustment plate [A].

(5) Insert the allen wrench [C] into the hole in the doctor roller adjust plate [A], and make the adjustment by moving the adjustment plate.

(6) Tighten the retaining screw.

Symptoms

- If the gap is too large, more ink than is necessary will be transferred onto the inside surface of the print drum, causing ink to leak.
- Conversely, if the gap is too small, insufficient ink will be transferred onto the inside surface of the print drum, possibly resulting in uneven printing density due to lack of ink.



A: Doctor roller adjustment plate
B: Allen bolt for 3-mm allen wrench
C: 2.5-mm allen wrench

3. Ink Blocking Plate Position Adjustment

Adjustment (Front)

(1) Pull out the print drum, remove the ink cartridge, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch cover
- Ink cartridge set switch PCB mounting bracket
- Swing base ass'y
- Ink cartridge guide bottom ass'y
- Ink pump unit

(2) Loosen the mounting screw on the ink blocking plate (F) [A] via the opening in the print drum support (F).

(3) Insert a slot-head screwdriver into the slot in the ink blocking plate (F) [A] and move the plate until it is flush with the inside surface of the print drum. Tighten the mounting screw.

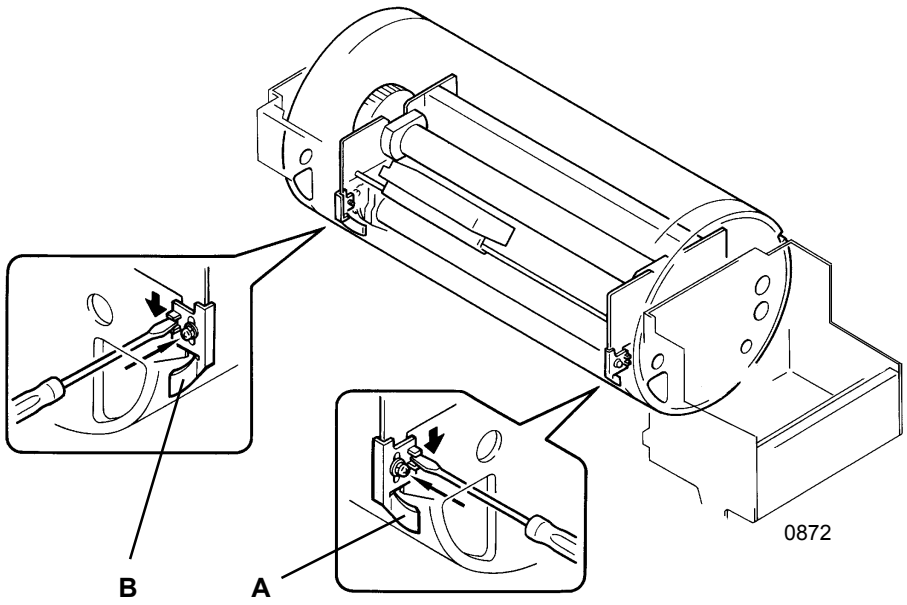
Adjustment (Rear)

(1) Pull out the print drum, and loosen the mounting screw on the ink blocking plate (R) [B] via the opening in the print drum support (R).

(2) Insert a slot-head screwdriver into the slot in the ink blocking plate (R) [B] and move the plate until it is flush with the inside surface of the print drum. Tighten the mounting screw.

Symptoms

- If the ink blocking plates are not flush with the inside surface of the print drum, they will not be able to block the ink exuded to the ends of the squeegee roller. Ink will accumulate inside the print drum, and in the worst cases, ink may leak out from the print drum body.



A: Ink blocking plate (F)
B: Ink blocking plate (R)

4. Squeegee Pressure Balance Adjustment

Checks and adjustment

(1) Create a master with Test Chart No. 15 and print to check the left and right print density balance.
(2) If the left and right print density is not balanced, adjust as shown below.

[Front]

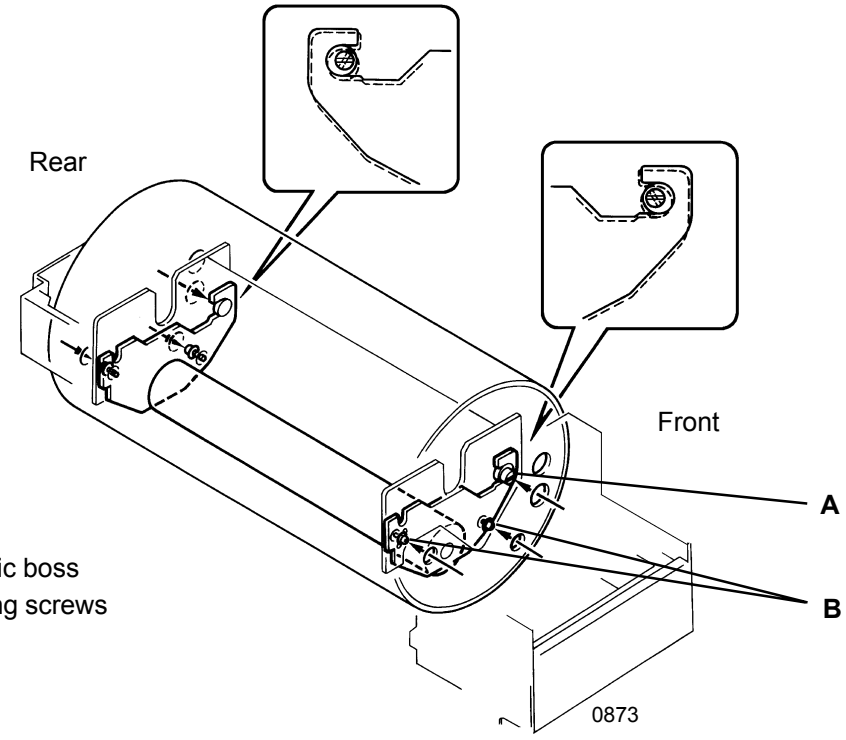
(3) Pull out the print drum, remove the ink cartridge, and remove the following components.
- Print drum front cover
- Ink cartridge guide ass'y
- Drum front upper cover
- Ink cartridge set switch cover
- Ink cartridge set switch PCB mounting bracket
- Swing base ass'y
- Ink cartridge guide bottom ass'y
- Ink pump unit

(4) Loosen the two retaining screws on the squeegee frame via the opening in the print drum support (F).
(5) Insert a slot-head screwdriver via the opening in the print drum support (F), turn the eccentric boss [A], and adjust so that the gap between the squeegee roller and the print drum body is approx. 0.3 mm.
(6) Tighten the two retaining screws [B] on the squeegee frame.

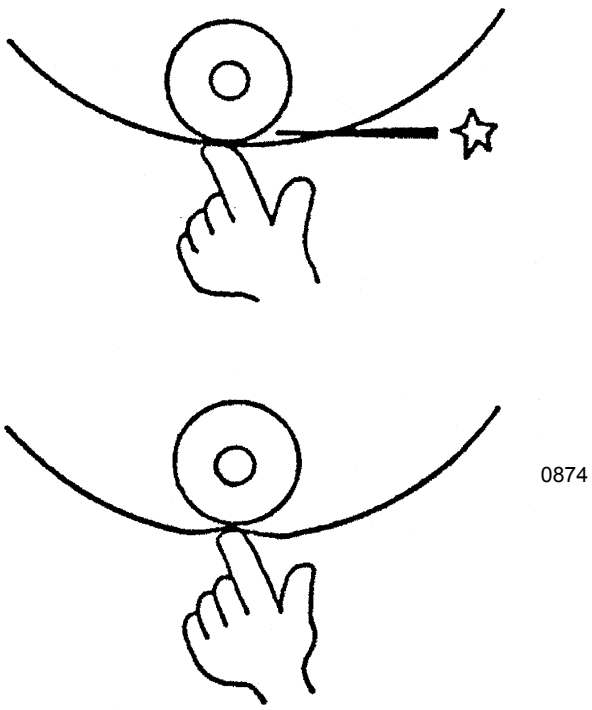
[Rear]

(3) Pull out the print drum, remove the ink cartridge, and remove the following component.
- Junction gear ass'y

(4) Loosen the two retaining screws on the squeegee frame via the opening in the print drum support (R).
(5) Insert a slot-head screwdriver via the opening in the print drum support (R), turn the eccentric boss [A], and adjust so that the gap between the squeegee roller and the print drum body is approx. 0.3 mm.
(6) Tighten the two retaining screws [B] on the squeegee frame.



A: Eccentric boss
B: Retaining screws



- Using your finger, press the print drum from underneath, and adjust the gap to approx. 0.3 mm.
- Set the same amount of gap at the front and rear.

[Checking after Adjustment]

- Run an actual print after the adjustment to check the left and right print density balance.
  If the left and right print density balance is incorrect, the squeegee pressure must be readjusted.

Symptoms

- Incorrect left and right squeegee pressure causes unbalanced print density.
- If the squeegee pressure is too high (gap too small), more ink than is needed will be transferred onto the print drum and may cause ink leakage.
- If the squeegee pressure is too low (gap too large), the print density will be reduced, and excess load will be applied on the print drum and may shorten the life of the drum body.

[Memo]

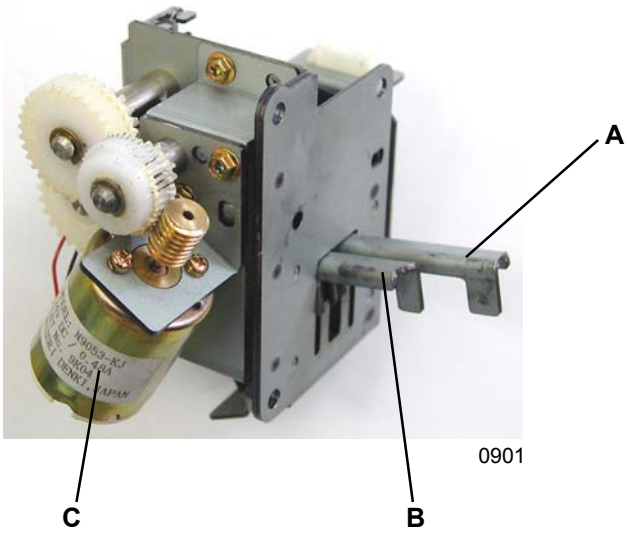
CHAPTER 9: MASTER CLAMP SECTION

Contents

Mechanism

1. Clamp Unit Home Positioning Mechanism

When the Start key is pressed to create confidential or normal masters, the clamp open arm [A] and master release arm [B] are checked to ensure that they have returned to the home position (with the light paths to both clamp sensors A [F] and B [G] open). If they are not at the home position, the clamp motor [C] is activated to move the clamp cam assembly [D] and return the clamp open arm [A] and master release arm [B] to the home position until the light paths to both clamp sensors A [F] and B [G] are open.



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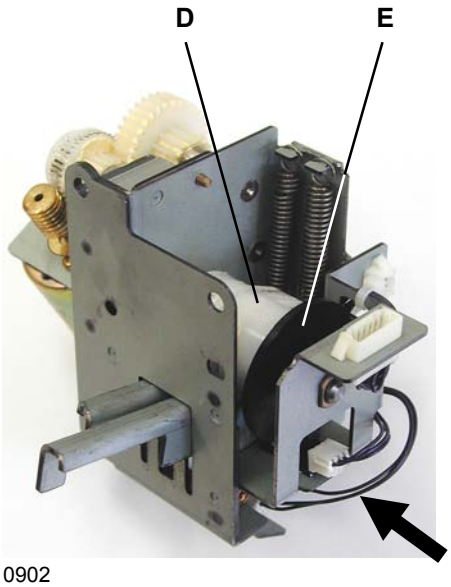

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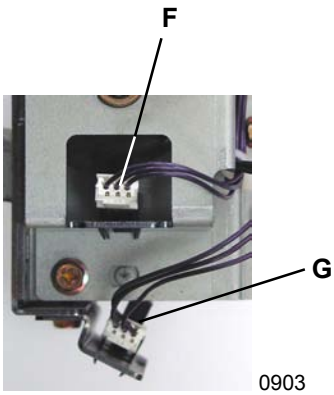

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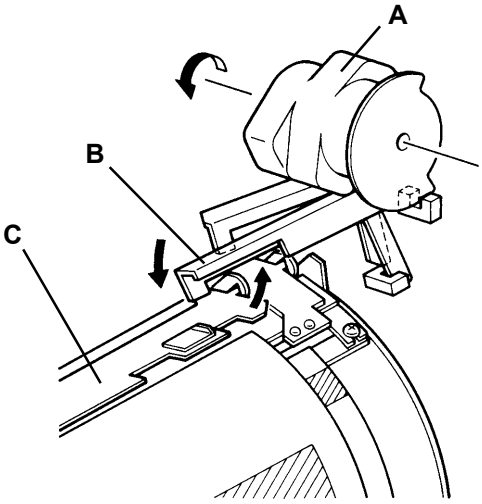
View in the direction of the arrow

A: Clamp open arm
B: Master release arm
C: Clamp motor
D: Clamp cam assembly
E: Clamp encoder sensor
F: Clamp sensor A
G: Clamp sensor B

2. Clamp Plate Master Release Mechanism

When the Start key is pressed to create confidential or normal masters, the print drum makes one turn and checks for the presence of master on the print drum. Once the presence of a master on the drum has been checked, the drum returns to position A, and the clamp plate master release operation starts. The clamp motor activates and rotates the clamp cam assembly [A]. This pushes down the clamp open arm [B] and opens the clamp plate [C]. The master release arm [D] is then pushed down, and the master release bar [E] is raised, releasing the master from the clamp plate [C].
The clamp motor continues to run, and raises the clamp open arm [B] and master release arm [D]. The motor is switched off once the light path to clamp sensor B [G] is opened.

(1) The clamp open arm is pushed down, opening the clamp plate.



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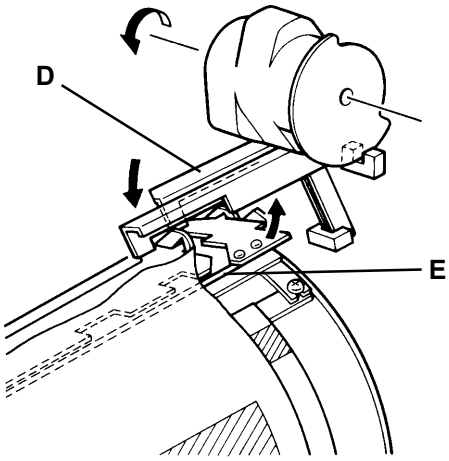
(2) The master release arm is pushed down, raising the master release bar and releasing the master.



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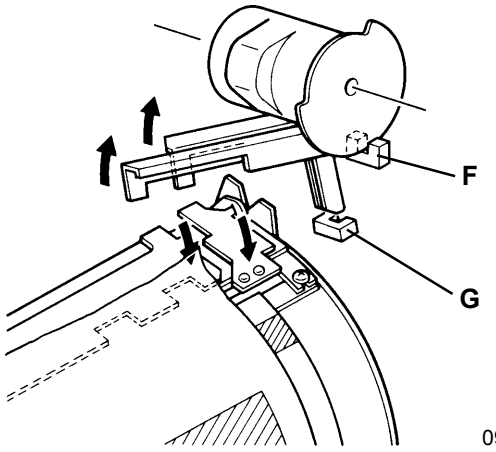
(3) The clamp open arm and master release arm are raised, and the motor switches off once the light path to clamp sensor B is opened.



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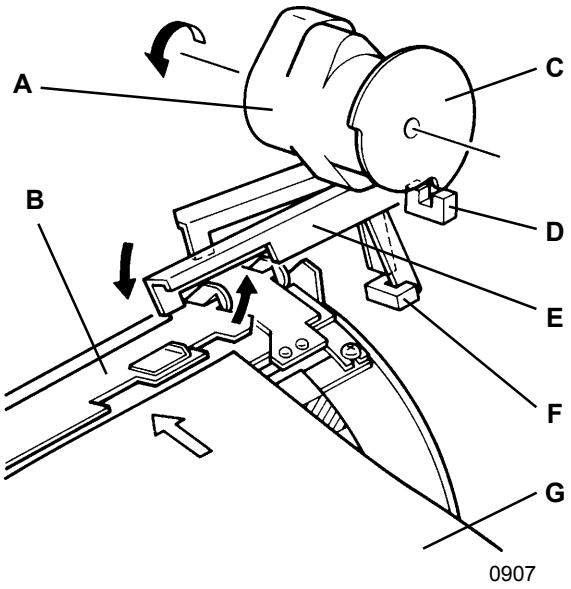
A: Clamp cam assembly
B: Clamp open arm
C: Clamp plate
D: Master release arm
E: Master release bar
F: Clamp sensor A
G: Clamp sensor B

3. Clamp Plate Master Clamp Mechanism

As the used master is removed from the print drum, the print drum makes one revolution and returns to position A, and the clamp plate master clamp operation starts.
The clamp motor activates and rotates the clamp cam assembly [A]. This pushes down the clamp open arm [E] and opens the clamp plate [B].
The clamp motor is switched off once the light path to clamp sensor A [D] is opened. (It stops with clamp plate [B] still open.)
The load pulse motor feeds a set amount of the master [G] onto the print drum, and the clamp motor activates to rotate the clamp cam [A] and raise the clamp open arm [E].
The clamp motor is switched off once the light path to clamp sensor B [F] is opened. (The clamp unit is returned to the home position.)

(1) The clamp open arm [E] is pushed down, opening the clamp plate [B]. The clamp motor is switched off once the light path to clamp sensor A [D] is opened (with clamp plate [B] still open).



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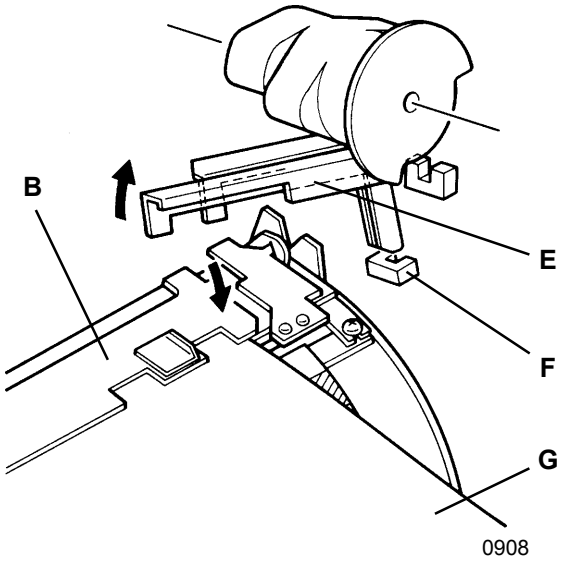
(2) The master [G] is fed onto the print drum, and the clamp motor is switched on, raising the clamp open arm [E]. The clamp motor is switched off once the light path to clamp sensor B [F] is opened. (Returns to home position.)



0908

A: Clamp cam assembly
B: Clamp plate
C: Clamp encoder
D: Clamp sensor A
E: Clamp open arm
F: Clamp sensor B
G: Master

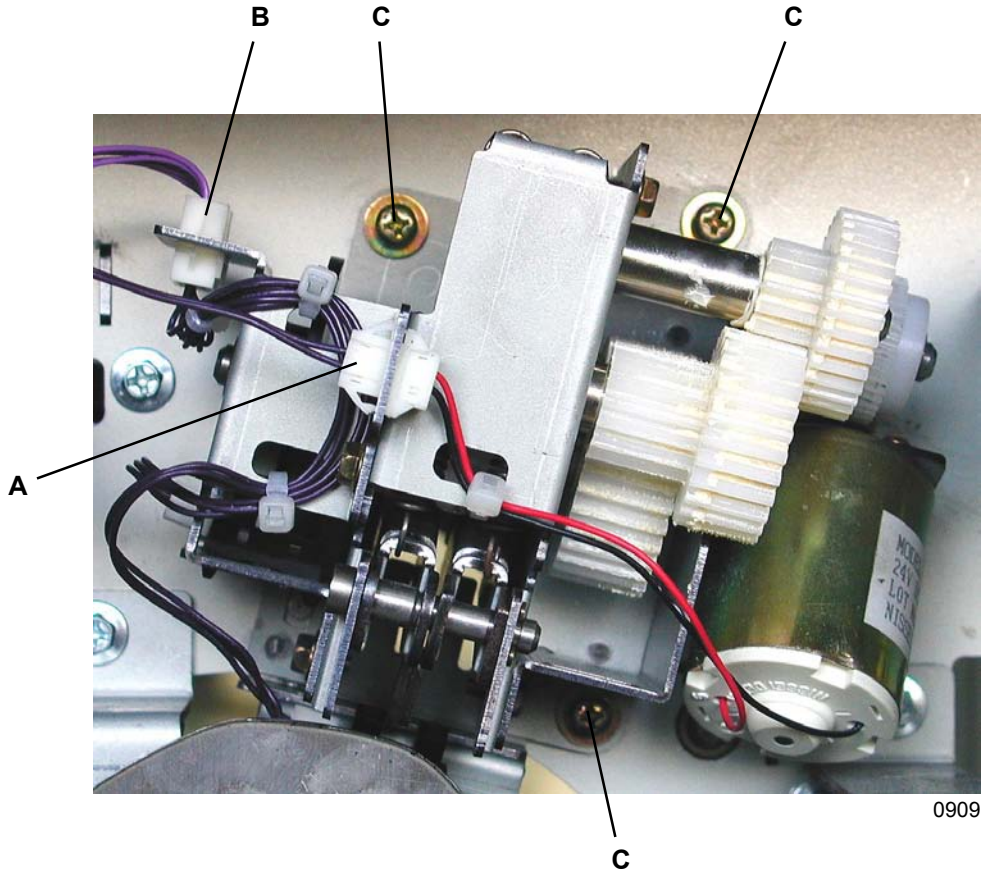
Disassembly

1. Removing the Clamp Unit

(1) Remove the rear cover.
(2) **<RN25 Series>** Remove the PCB cover, and open the main PCB bracket.
<RN20/21 Series> Remove the main PCB.
(3) Unplug the clamp motor connector [A] and sensor connector [B].
(4) Remove the mounting screws (double-washer, M4 x 8: 3 pcs) [C] on the clamp unit, and remove the clamp unit.

[Precautions on Reassembly]

- Align the half-pierced sections.



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A: Clamp motor connector
B: Clamp sensor connector
C: Clamp unit mounting screw

2. Removing the Clamp Motor, Clamp Sensor A, Clamp Sensor B

Removing the Clamp Motor

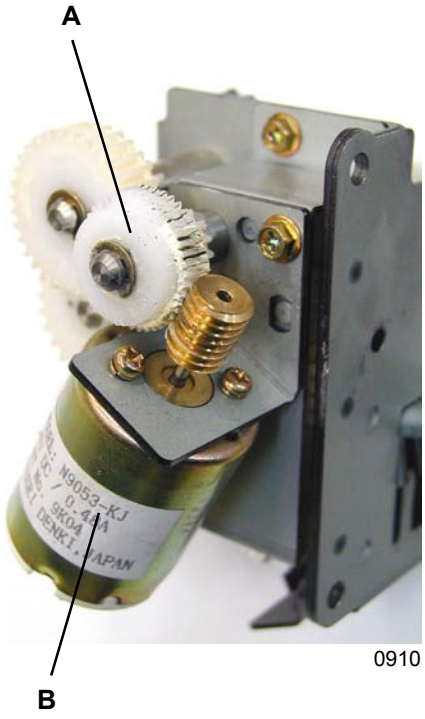
(1) Remove the clamp unit.
(2) Remove the E-ring and remove the worm gear [A].
(3) Unplug the connector [C], remove the mounting screws, and remove the clamp motor [B].

Removal of Clamp Sensor A

(1) Remove the clamp unit.
(2) Remove the mounting screws (RS tight, M3 x 6: 2 pcs) and remove the shaft support bracket [D].
(3) Unplug the connector and remove the clamp sensor A [E].

Removal of Clamp Sensor B

(1) Remove the clamp unit.
(2) Remove the mounting screw (RS tight, M3 x 6: 1 pc) and remove the sensor bracket [F].
(3) Unplug the connector and remove the clamp sensor B [G] from the sensor bracket [F].



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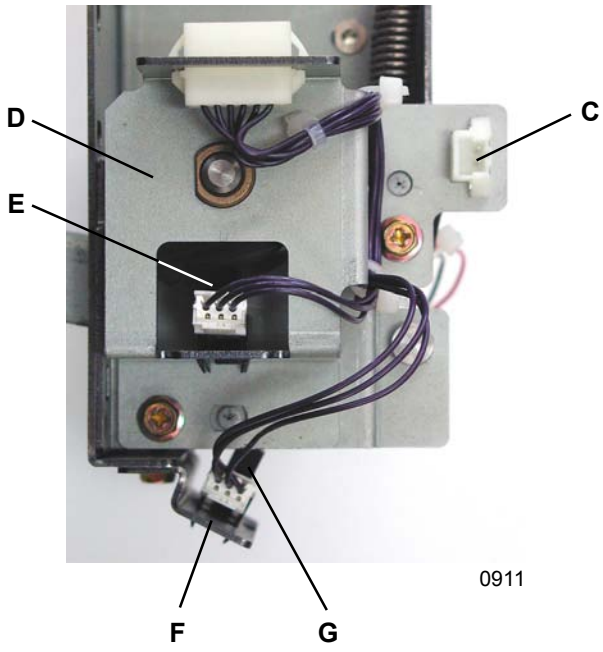

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A: Worm gear
B: Clamp motor
C: Connector
D: Shaft support bracket
E: Clamp sensor A
F: Sensor bracket
G: Clamp sensor B

CHAPTER 10: MASTER REMOVAL SECTION

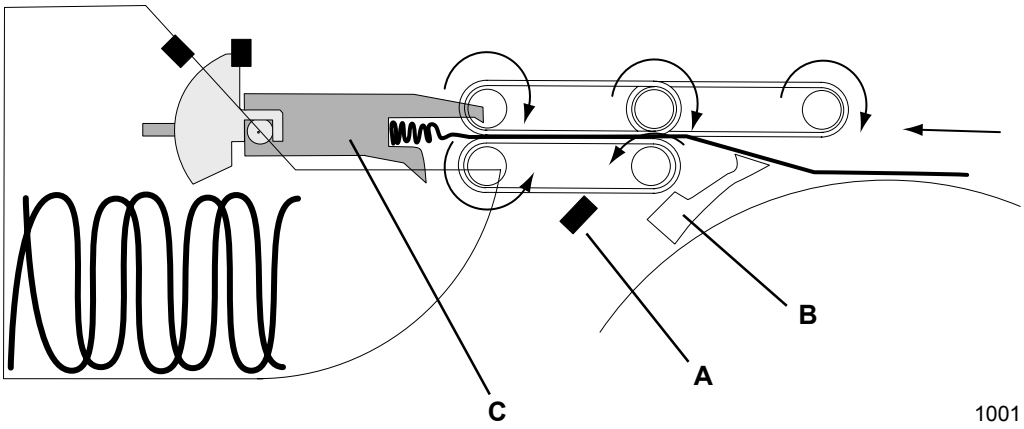
Contents

Mechanism

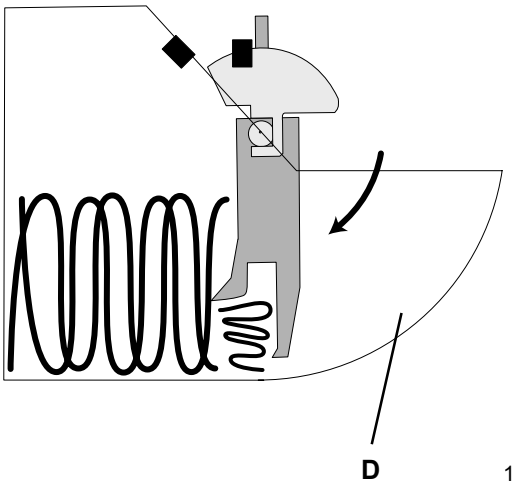
1. Master Removal Mechanism

Masters on the print drum are removed as follows.

(1) At the start of master removal, the master sensor [A] checks whether the master to be removed on the print drum actually exists.
(2) The clamp plate master removal operation is performed with the print drum at position A to release the leading edge of the master from the clamp plate.
(3) The master removal hook [B] then detaches the master from the print drum as the drum is rotated.
(4) The removed master is fed into the master compression plate [C].
(5) The removed master is then compressed, and disposed of in the master disposal box [D].



1001



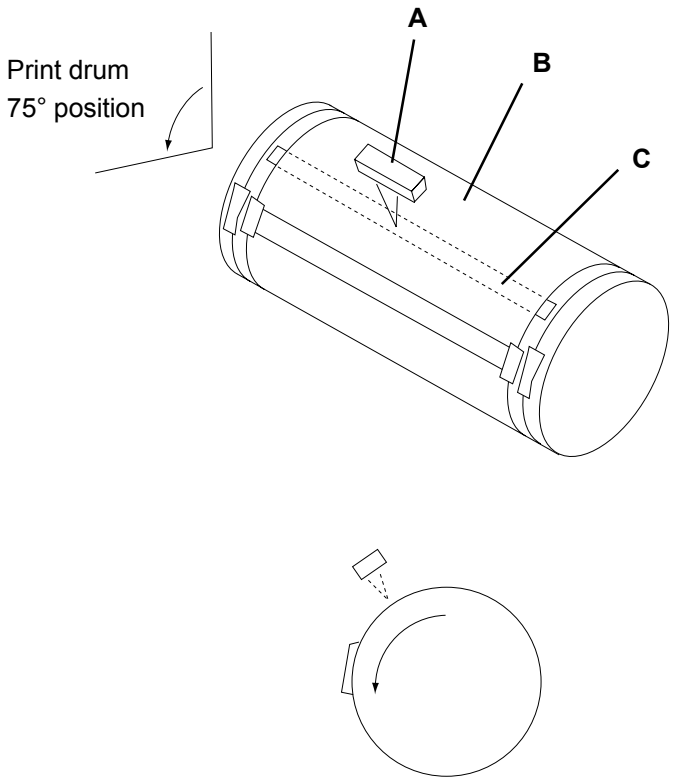
1002

A: Master sensor
B: Master removal hook
C: Master compression plate
D: Master disposal box

2. Master on the Drum (before Master Removal) Check Mechanism

When creating confidential or normal masters, the print drum moves to position A, and with the print drum at the 75° position, the master sensor [A] checks whether or not there is a master [B] on the drum. (The check operation is not performed if information that a master is present has already been stored in the machine's memory.) The drum rotation angle for the check can be adjusted using Test Mode No. 580.

If the light from the master sensor is reflected back, (master present), the master removal sensor checks whether the master is sent to the master disposal box or not during the master removal.

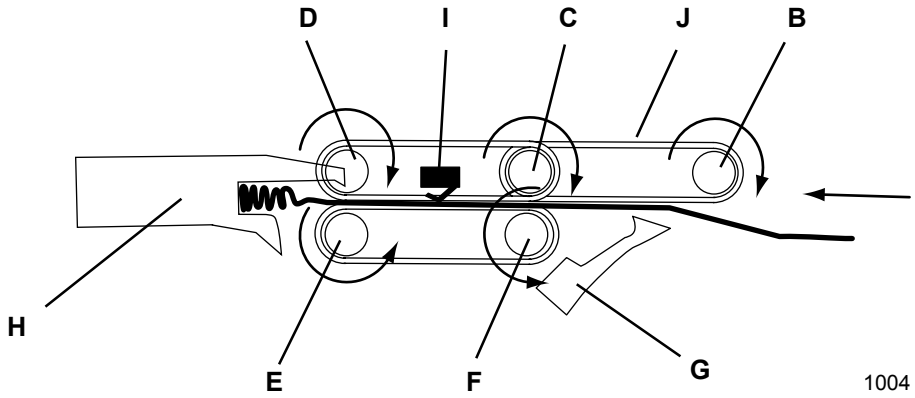


A: Master sensor
B: Master
C: Light absorber strip

1003

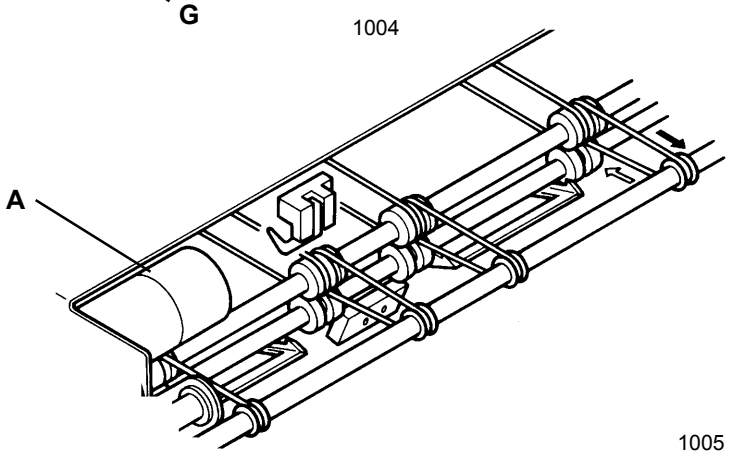
3. Removed Master Vertical Transport Mechanism

When the clamp unit is operated to release the leading edge of the master from the clamp plate, the master removal motor [A] activates, rotating the vertical transport rollers [B, C, D, E, F]. The main motor also rotates the print drum at the same time.
The master is fed between the rollers and pushed into the master compression plate [H].
The master is guided here by the master removal hook [G] and G belt [J].
The main motor and master removal motor [A] stop once the print drum has rotated to position A. (The time at which the master removal motor stops can be adjusted using Test Mode No. 382.)
When the print drum reaches the 70° and 90° positions, the master removal sensor [I] checks whether the master is being fed correctly to the master disposal box. (These drum angles can be adjusted using the Test Modes No. 380 and 381.)
The master removal hook is normally located at a fixed position close to the print drum, but shifts away from the drum when the drum is pulled out.
The print drum rotation speed during master removal can be adjusted using the Test Mode No. 387.



1004

A: Master removal motor
B: Pulley shaft
C: Master removal roller (top)
D: Master removal pulley (top)
E: Master removal pulley (bottom)
F: Master removal roller (bottom)
G: Master removal hook
H: Master compression plate
I: Master removal sensor
J: G belt



1005

4. Disposed Master Compression Mechanism

1) Initializing

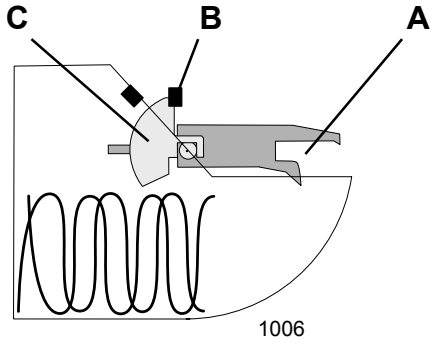
- If the light path on the master compression sensor [B] is open when the power is switched ON or when everything is reset, the master compression motor operates in the compression direction, and when the light path to the master compression sensor is blocked, it operates in reverse until the light path is open again.
- If the light path to the master compression sensor [B] is blocked when the power is switched ON or when everything is reset, the master compression motor operates in the return direction until the light path is open again.
- If the light path to the master compression sensor [B] is blocked when starting master removal, the master compression motor operates in the return direction until the light path is open. (The initializing operation is not performed if the light path to the master compression sensor is open when starting master removal.)

2) Master compression

Once the removed master vertical transport operation is complete, the master compression motor operates in the compression direction to lower the master compression plate [A]. The light path to the master compression sensor is briefly blocked by the master compression sensor plate [C].
When the light path to the master compression sensor is subsequently opened again, the master compression motor stops (the stop time can be adjusted using the Test Mode No. 384), and then operates in the return direction to return the master compression plate to its home position.

3) Ejection of removed master

The master removed by the vertical transport operation is pushed inside the master compression plate [A]. Compression is performed by the master removal motor rotating the master compression plate [A] on the pivot shaft [D]. The piston shaft link [E] also rotates, but it rotates on the piston shaft [F] rather than on the pivot shaft [D]. This causes the piston block [G] to move in the direction in which the master ejects out.



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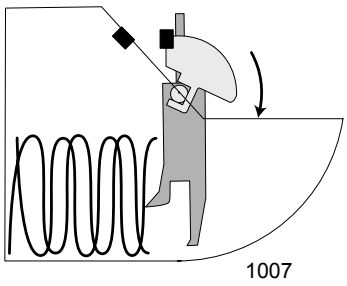
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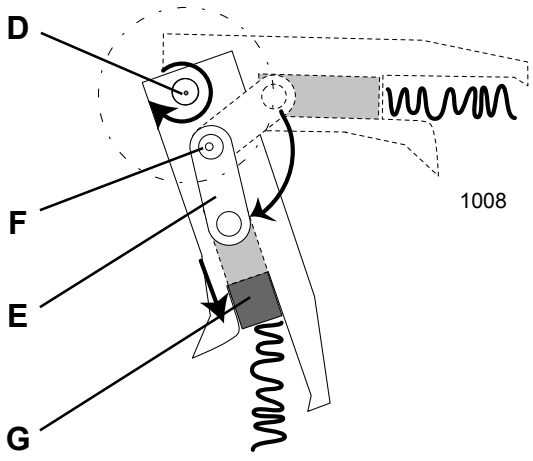


1008

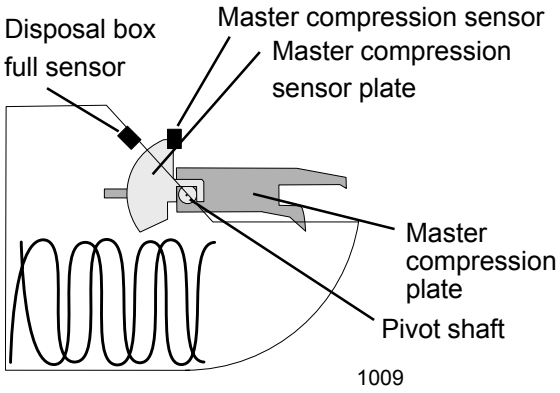
A: Master compression plate
B: Master compression sensor
C: Master compression sensor plate
D: Pivot shaft
E: Piston shaft link
F: Piston shaft
G: Piston block

4) Disposed master full detection

The removed master full detection is performed using the following two mechanisms, and a master full indication is displayed by either.

(1) The number of masters removed after resetting following the previous master full indication is counted, and the master disposal box is determined as full when the count reaches the preset value.
* The preset master full count can be set using the Test Mode No. 386.
The master count is not incremented if a master removal error occurs or if the master to be removed is not detected on the print drum at the start of the master removal operation.

(2) Mechanism for mechanically determining that the master disposal box is full (see below).



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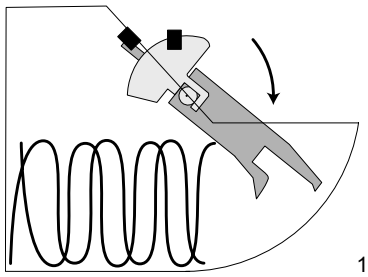
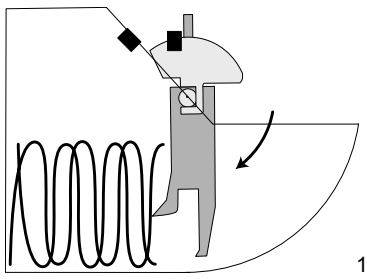
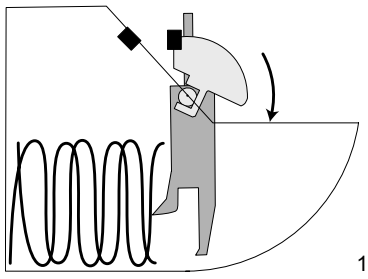
At the start of compression, the light paths to the master compression sensor and disposal box full sensors are open.


1010

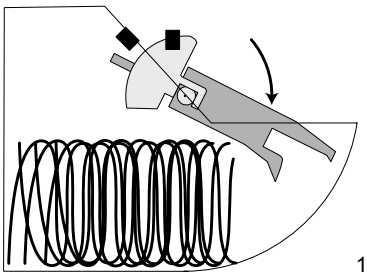
When the master compression motor operates to start master compression, the master compression sensor is immediately blocked by the master compression sensor plate. As the operation continues, the disposal box full sensor is briefly blocked by the master compression plate, but is then opened.


1011

Once the master inside the master disposal box has been sufficiently compressed, the master compression plate stops rotating, but the master compression sensor plate continues to rotate.
(The master compression plate is mounted to the pivot shaft via a spring, whereas the master compression sensor plate is mounted directly to the pivot shaft.)


1012

[When there is room still in the master disposal box for more incoming removed masters]
As the master compression plate compresses all the way in, the light beam of the master compression sensor becomes open and the compression operation stops. The master compression plate returns to the home position.



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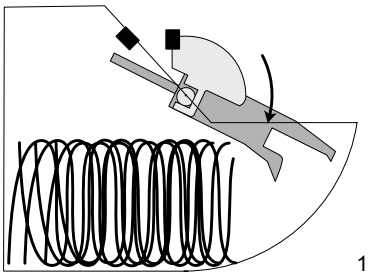


1014

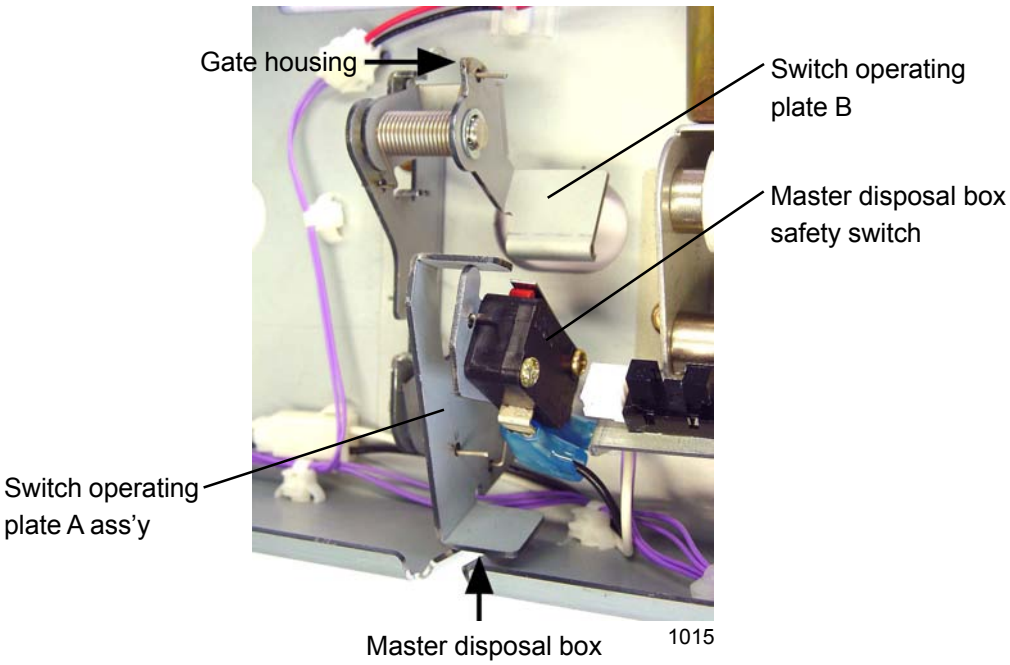
[When the master disposal box becomes full]

As the master disposal box becomes full, the master compression plate stops rotating before the removed master full sensor is blocked.

The master full indication appears when the master compression sensor receives light without the master disposal box full sensor being blocked.

5. Disposal Box Safety Switch

The master disposal box safety switch checks whether the master disposal box and master disposal gate housing are properly positioned.
If the gate housing is locked and correctly set, the switch operating plate B rotates and moves closer to the master disposal box safety switch. With the master disposal box set in position, the switch operating plate A ass'y rotates and presses the master disposal box safety switch.
The master disposal box full indication is reset if the master disposal box safety switch is released (the master disposal box removed) for more than 5 seconds. The master disposal box count memory is also reset to zero.



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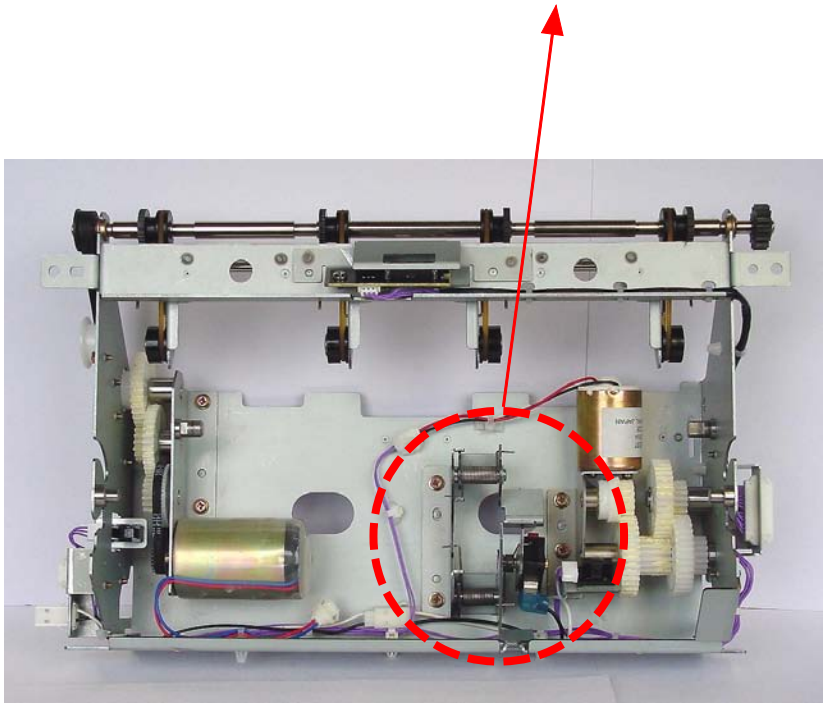


1016

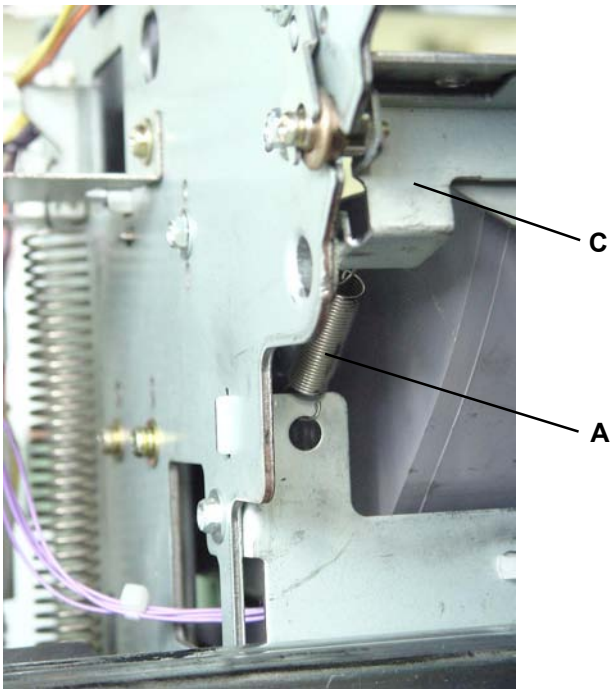
Disassembly

1. Removing the Master Removal Hook

(1) Pull out the print drum, switch off the power, and remove the front cover.
(2) Remove the spring [A] from the master removal hook bracket.
(3) Remove the bearing fixing plate [B]. (RS tight, M4 x 8: 1 pc)
(4) Remove the master removal hook [C] together with the master removal hook bracket. (If it cannot be removed, it is caught on the front screw of the master removal unit mounting screws. Remove this screw.)

[Precautions on Reassembly]

- Do not drop the inside bearing when mounting the master removal hook bracket.



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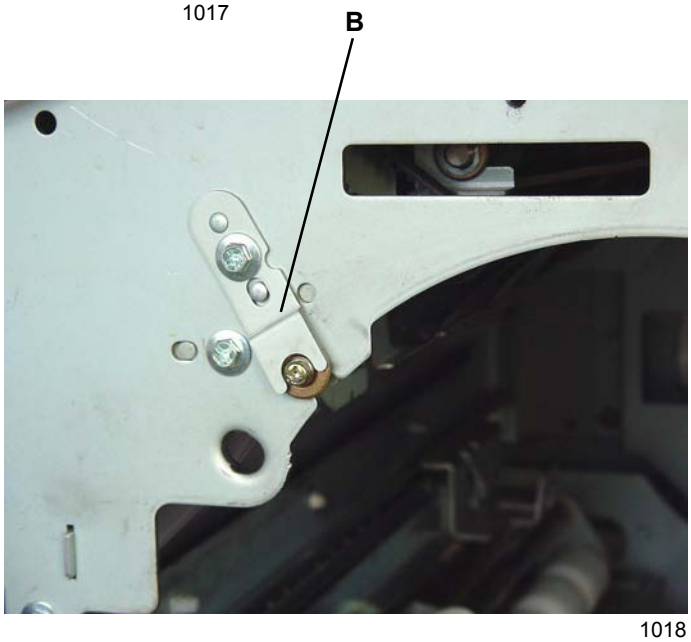
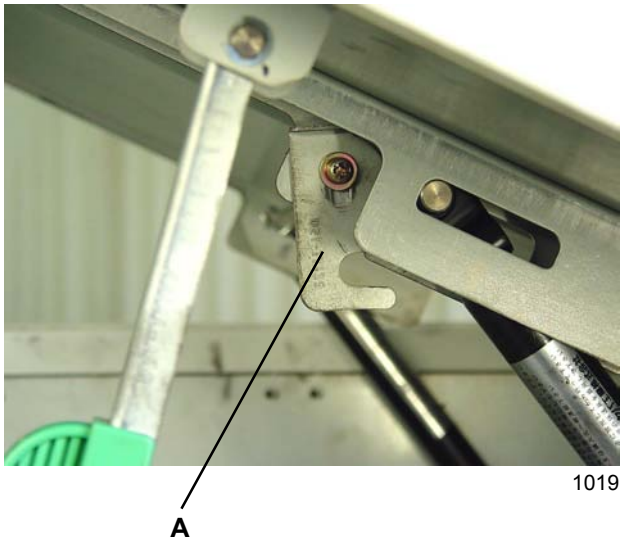


1018

A: Spring of the master removal hook bracket
B: Bearing fixing plate
C: Master removal hook bracket and master removal hook

2. Removing the Master Removal Unit

(1) Open the scanner table, and loosen the lock plate [A] to free.
(2) Open the scanner table further, and set the stopper plate [B] in the servicing position.
(3) Remove the front frame cover and rear cover.
(4) Remove the housing cover [C] (RS tight, M3 x 6: 2 pcs).



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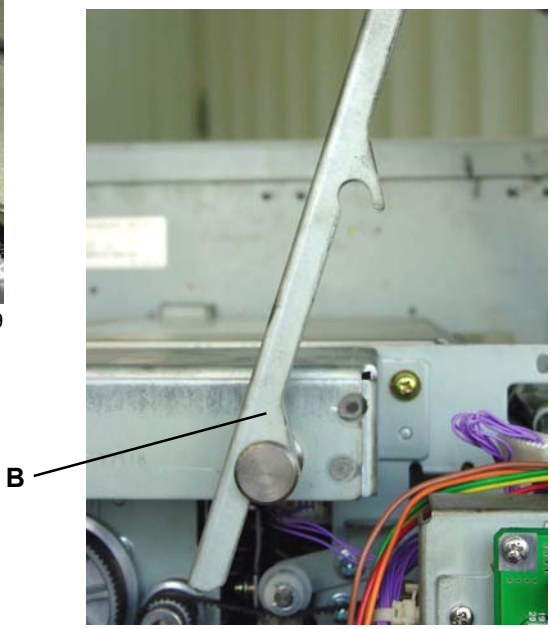

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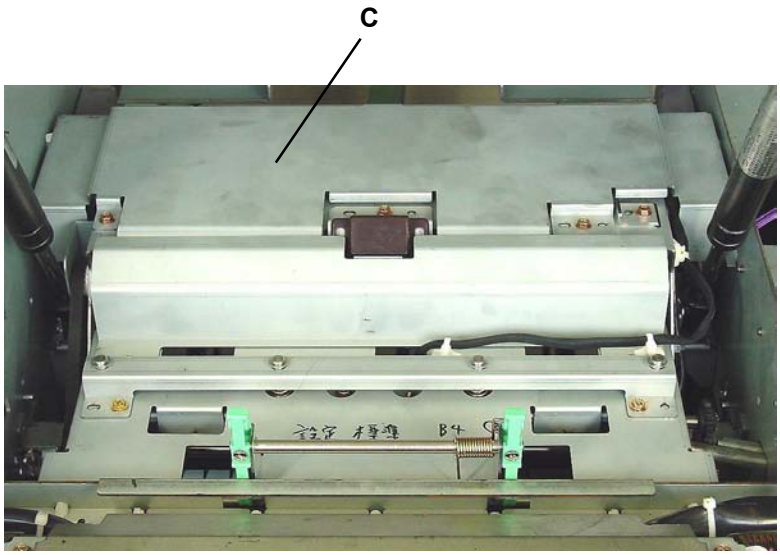
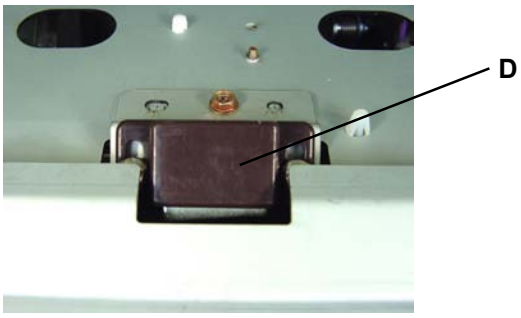
Servicing position



1021

A: Lock plate
B: Stopper plate
C: Housing cover

(5) Remove the magnetic catch [D], together with the mounting bracket (RS tight, M3 x 6: 1 pc).
(6) Remove the detachment prevention plate [E] (RS tight, M3 x 6: 1 pc).
(7) Remove the harness connector [F] and reusable band [G] from the master jam sensor.



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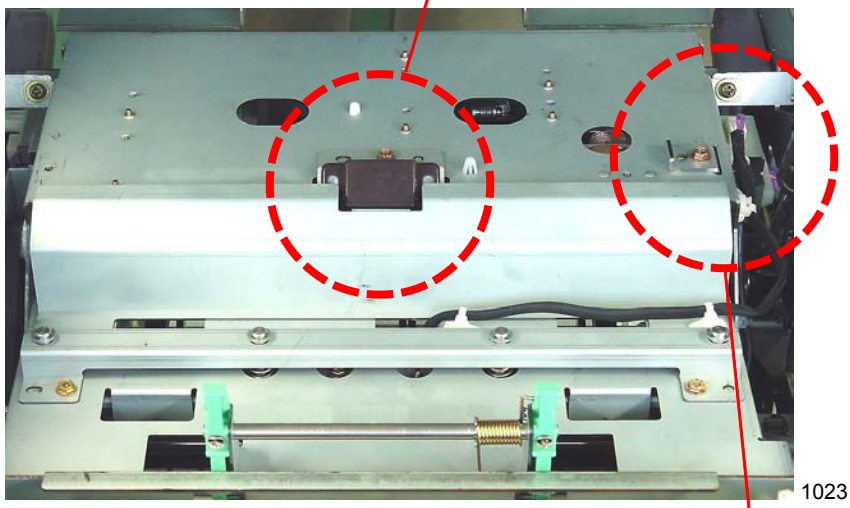

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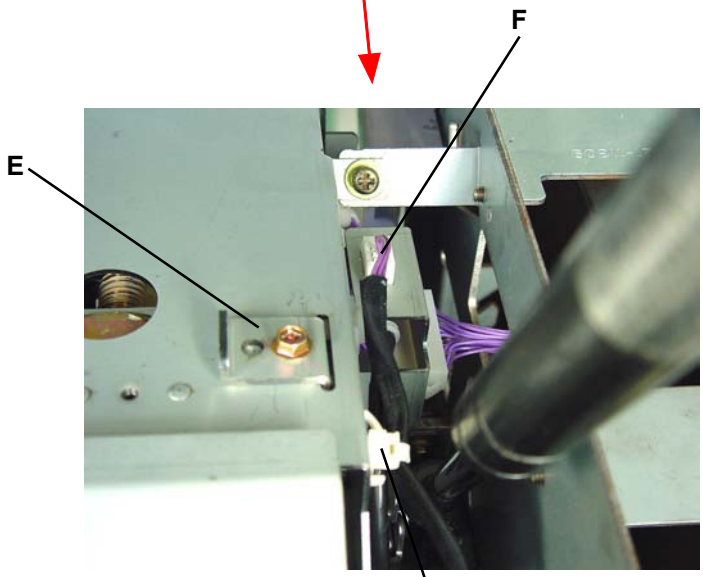
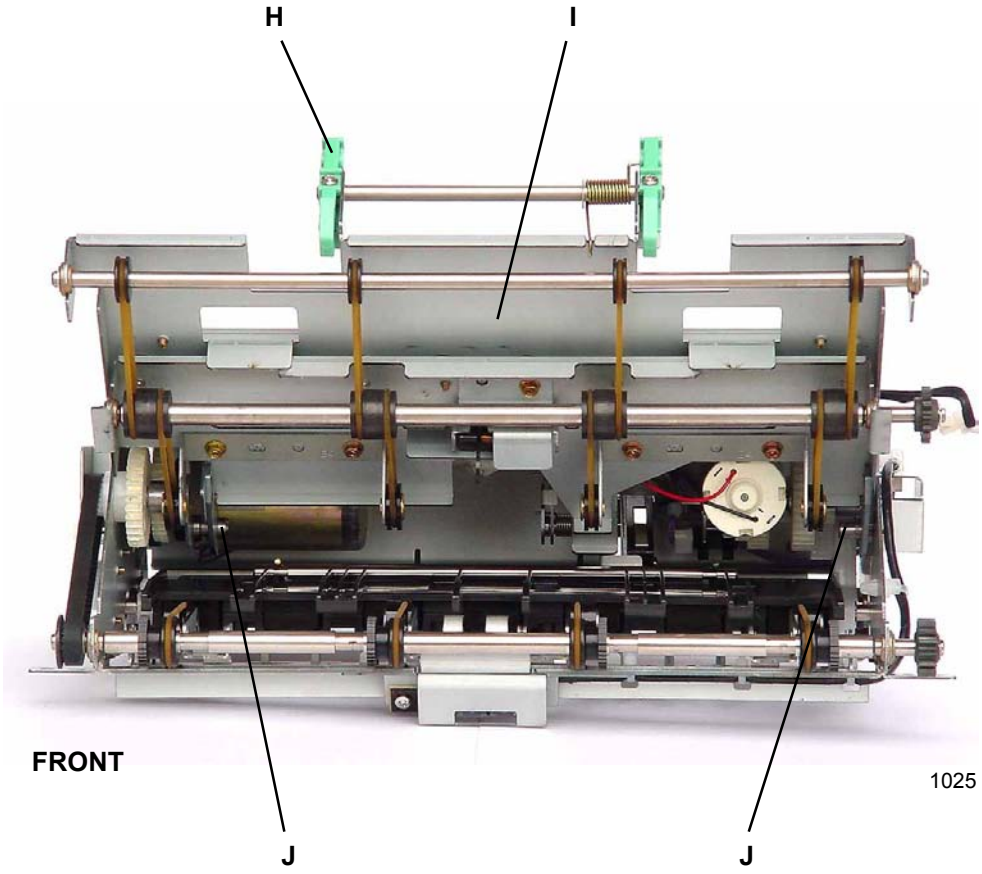


1024

D: Magnet catch
E: Detachment prevention plate
F: Connector
G: Reusable band

(8) Unlock the release lever. With the master disposal gate housing fully open, slide the master disposal gate housing toward the front, and then pull it out horizontally in the direction of paper ejection.

* The ends of the master disposal gate housing are engaged with the compression shaft on both sides. As the sections engaged with the shaft are open on the front, as shown in the diagram, the master disposal gate housing can be removed by sliding it toward the front while holding the open sections wide open.



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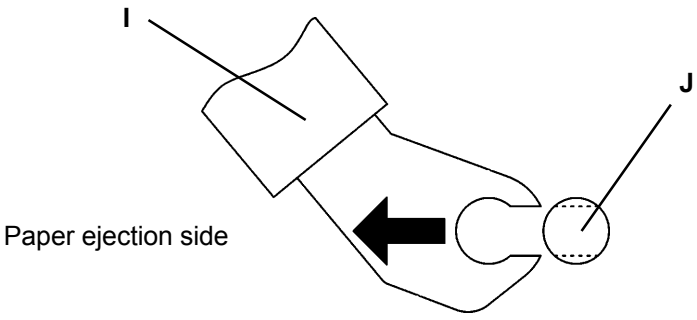
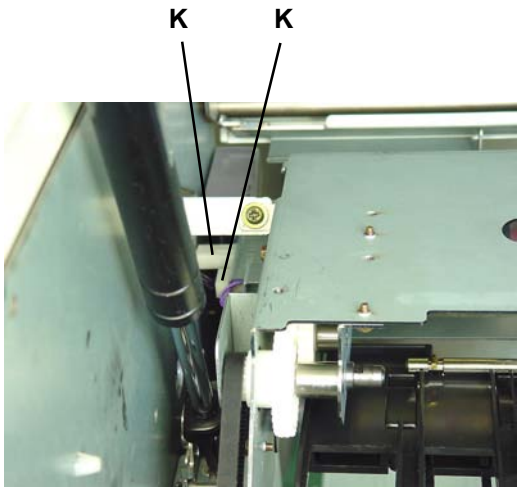


1026

H: Release lever
I: Master disposal gate housing
J: Compression shaft

(9) Disconnect the two connectors [K] from the front and one connector [L] from the rear.
(10) Remove the screws (RS tight, M4 x 8: 4 pcs) indicated by the arrows in the diagram, and dismount the master removal unit [M].



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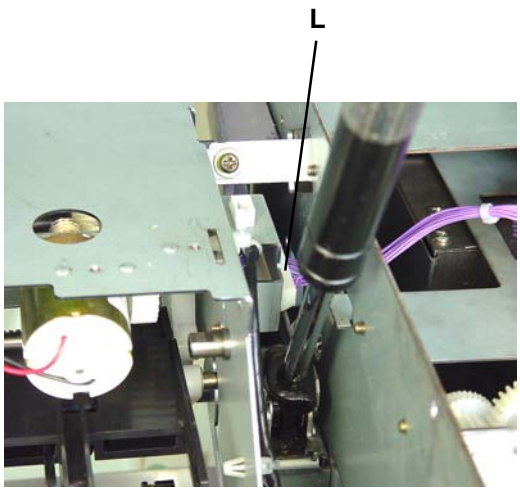

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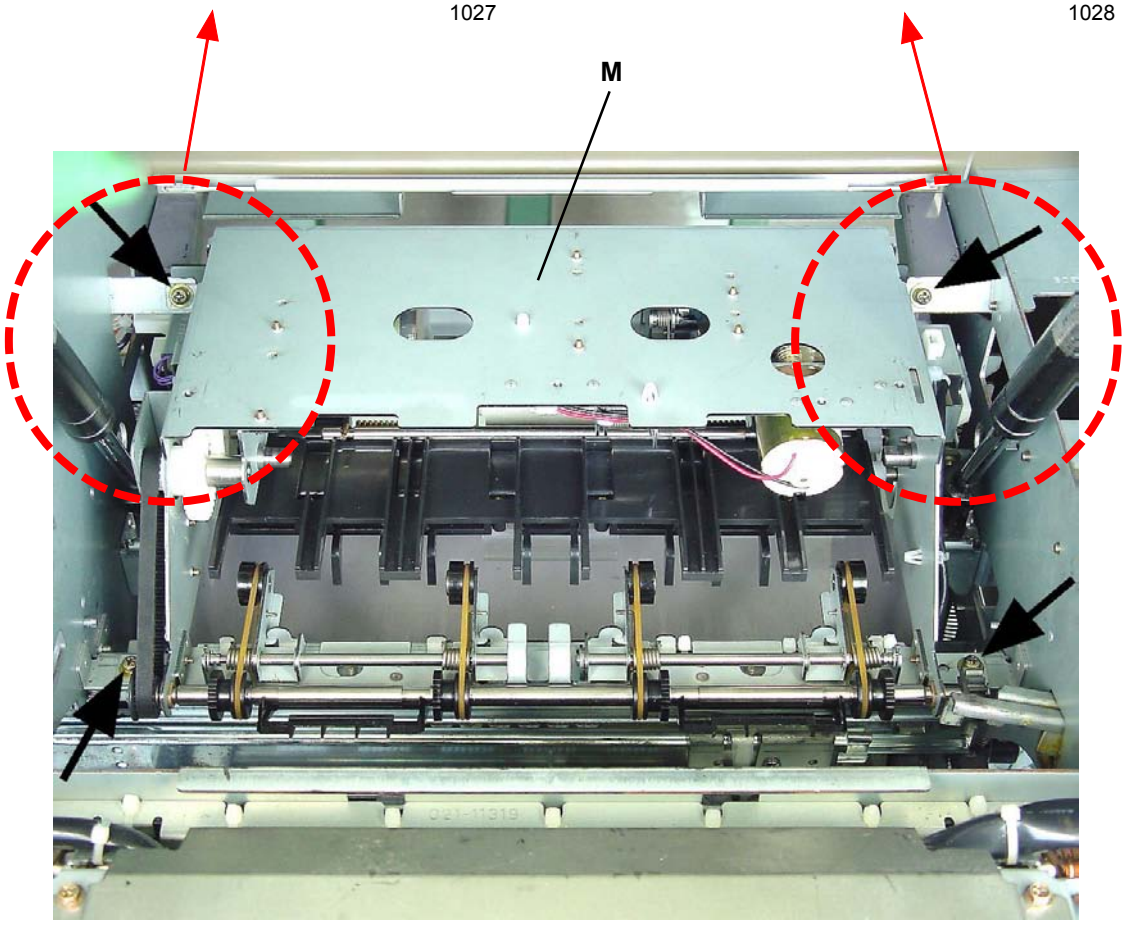
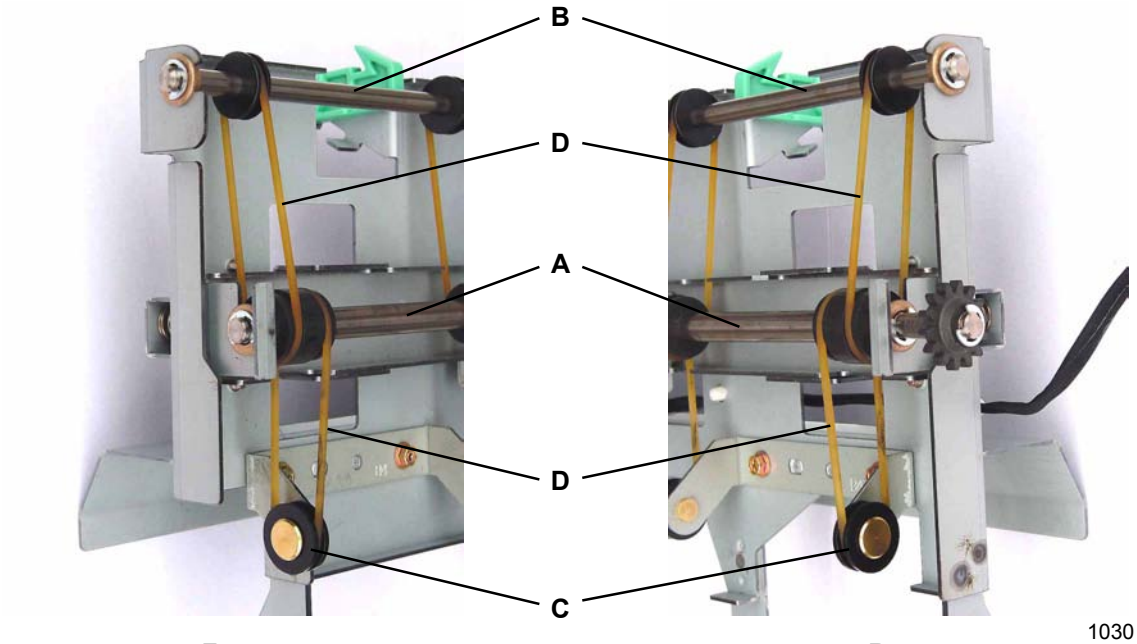


1029

K: Connectors (2 locations) on the front
L: Connector (1 location) on the rear
M: Master removal unit

3. Removing the Master Disposal Gate Housing

(1) Remove the E-rings and bearings on both sides of the pulley shaft [B], and remove the pulley shaft.
(2) Remove the E-rings, bearings, and gears on both sides of the master removal roller (top) [A], and remove the roller.
(3) Remove the G belts [D] from the master removal pulleys (top) [C].



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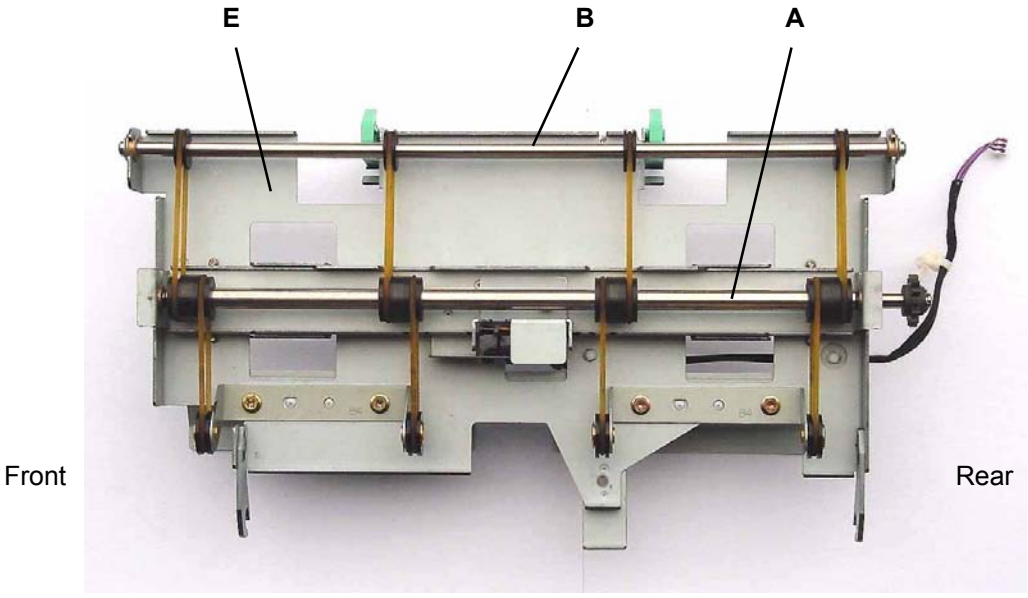
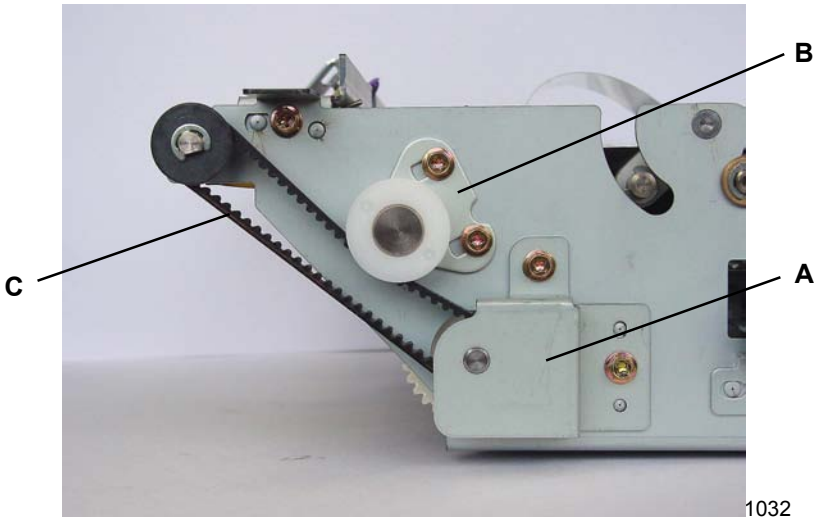


1031

A: Master removal roller (top)
B: Pulley shaft
C: Master removal pulley (top)
D: G belt
E: Master disposal gate housing

4. Removing the Master Removal Roller (Bottom)

(1) Remove the belt retainer [A] (RS tight, M3 x 6: 2 pcs).
(2) Loosen the two screws on the H tensioner ass'y [B], and remove the timing belt [C].
(3) Remove the E-rings, bearings, gears, and pulleys from both sides of the master removal roller (bottom) [D], and detach the master removal roller (bottom).



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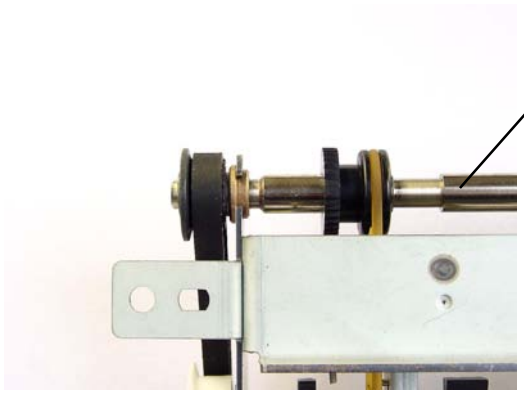

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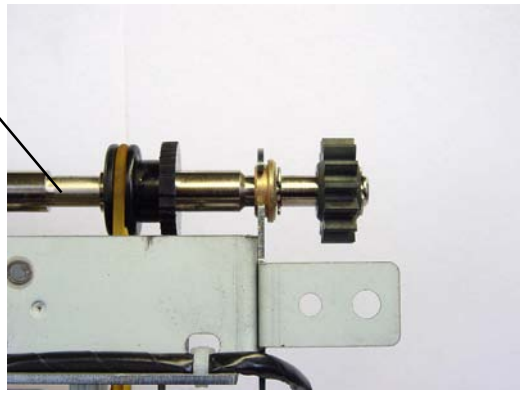
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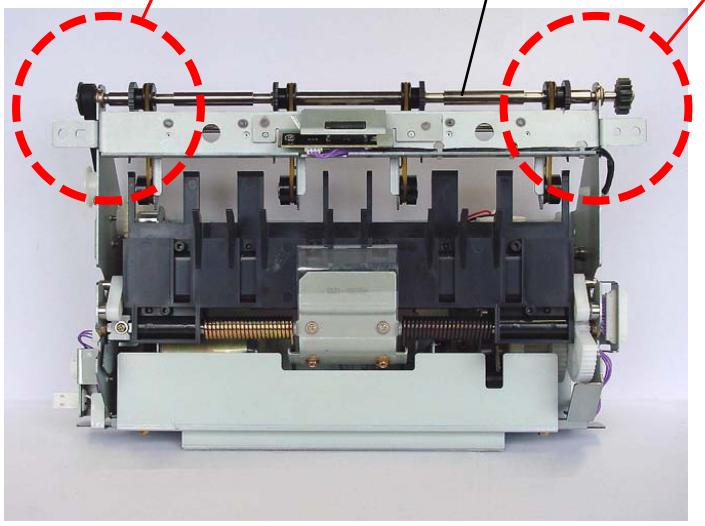
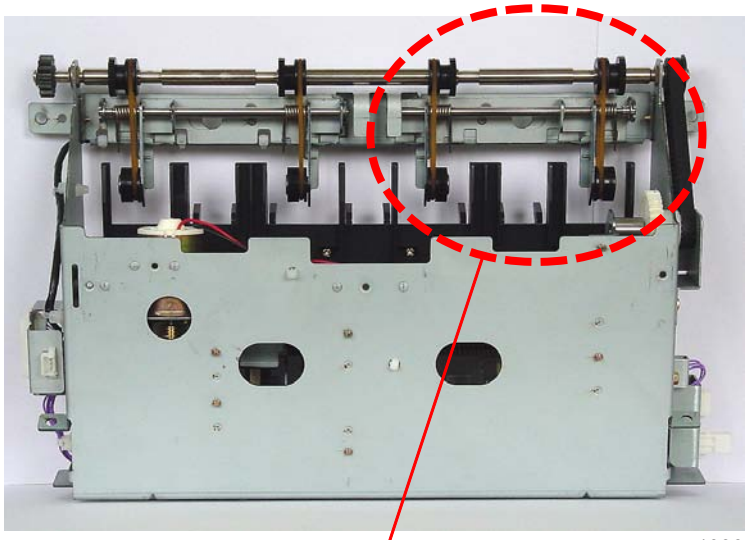


1035

A: Belt retainer
B: H tensioner ass'y
C: Timming belt
D: Master removal roller (bottom)

(4) Remove the E-ring, slide the shaft in the direction indicated by the arrow, align the shaft groove [E] with the notch [F] in the sheet metal, and then remove the master removal pulley bottom ass'y [G] (the master removal pulley bottom ass'y is symmetrical).
(5) Remove the G belts [H].



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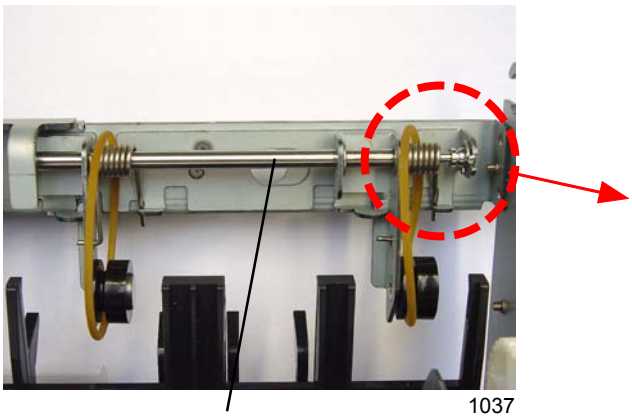

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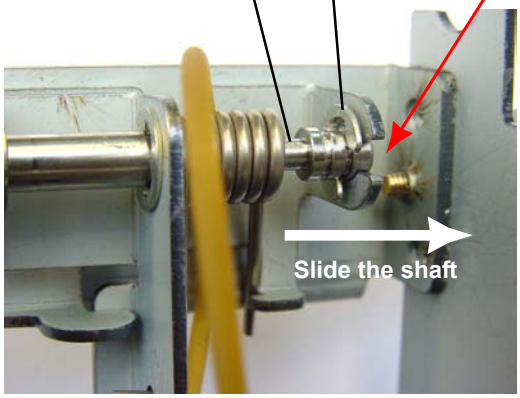

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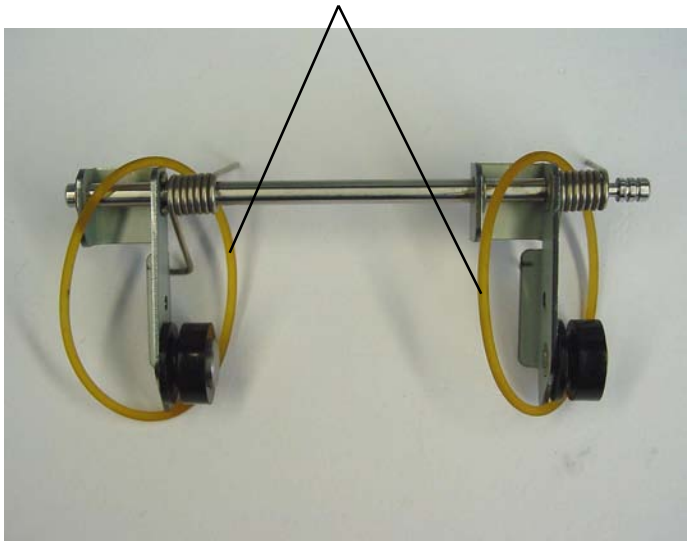


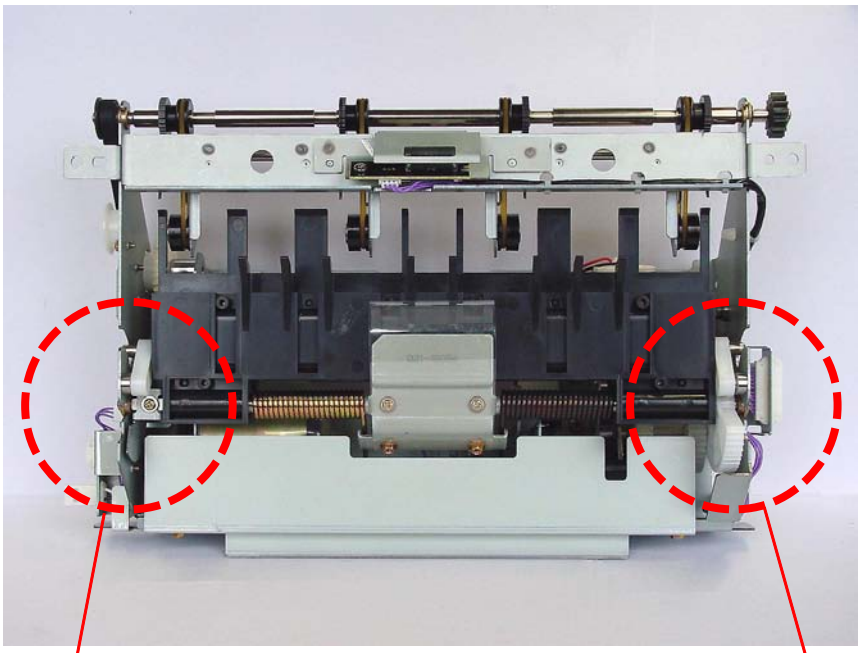
1039

Master pulley bottom ass'y

E: Shaft groove
F: Notch
G: Master pulley bottom ass'y
H: G belts

5. Removing the Master Compression Plate

(1) Remove the E-rings and bearings from both sides of the compression shaft [A].



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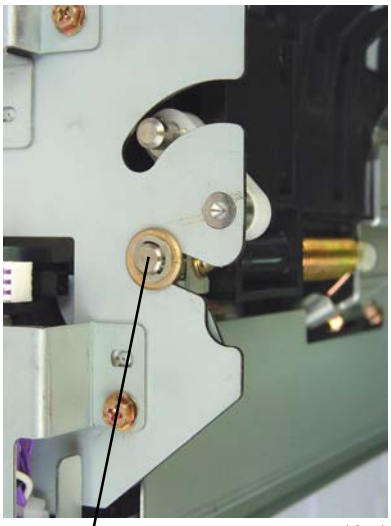

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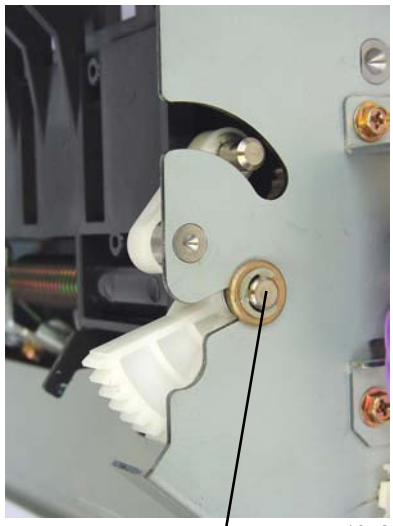
A



1042

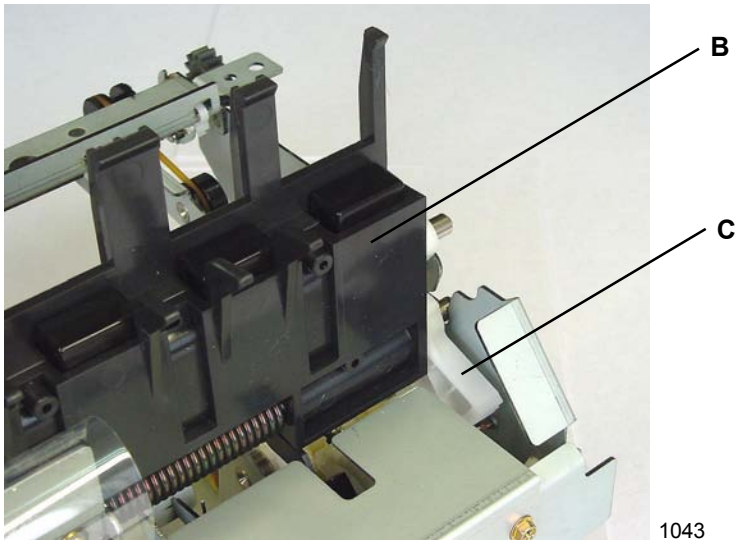
A

A: Compression shaft

(2) Rotate the compression shaft to move the master compression plate [B] to the master compressing position.
   * Lifting up the compression gear [C] together with the shaft, to disengage the gear, allowing the shaft to be rotated.

(3) Remove the E-rings from both sides of the piston shaft [D], slide the shaft, and then remove the piston-shaft links [E] from both sides.

(4) Remove the master compression plate from the unit, together with the shaft.



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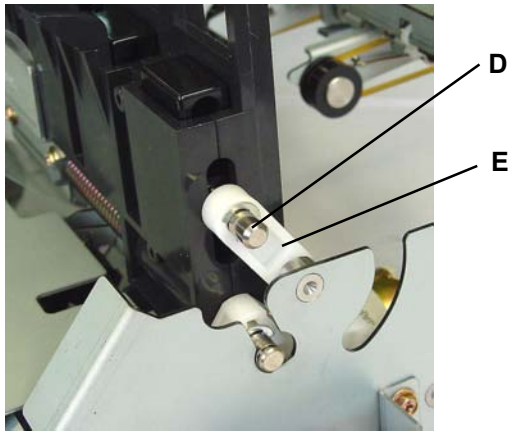

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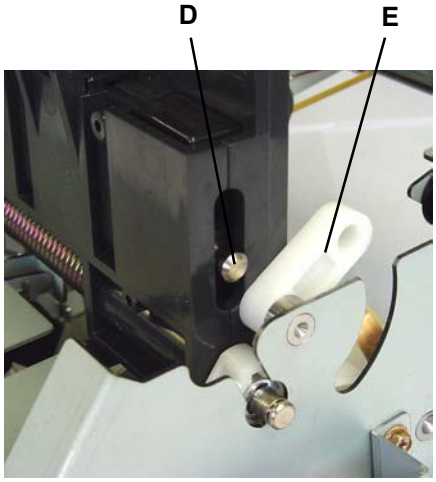

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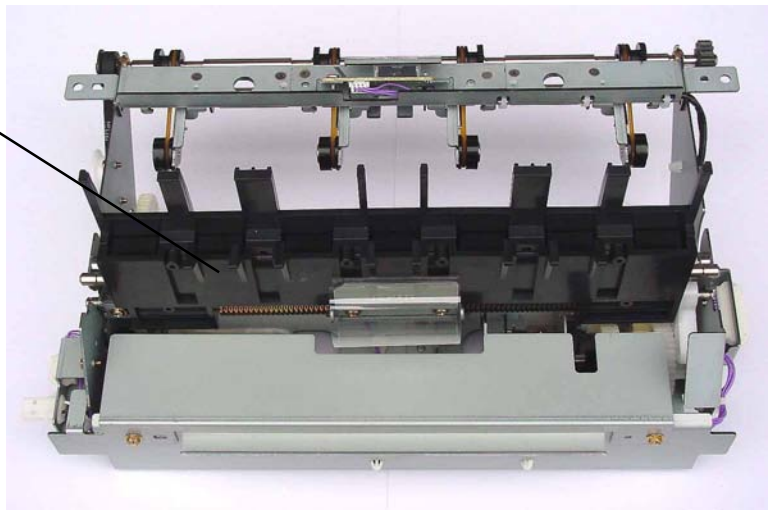
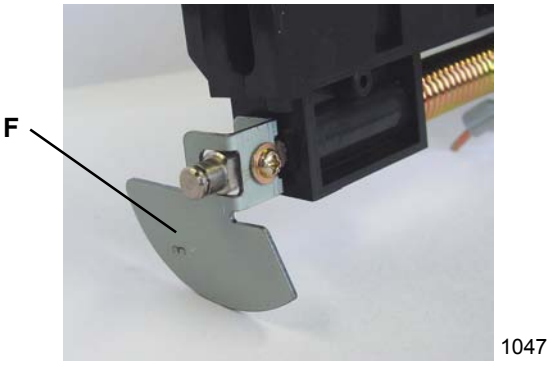


1046

B: Compression plate
C: Compression gear
D: Piston shaft
E: Piston shaft link

(5) Remove the mounting screw (IT, M3 x 6: 1 pc) and detach the master compression sensor plate [F].
(6) Remove the E-ring, and remove the compression gear [C].
(7) Remove the master compression plate sheet (parts for the prevention of master entanglement) [G] from the master compression plate holder [H] (RS tight, M3 x 6: 2 pcs).
(8) Disengage the compression spring [I] from the master compression plate holder, remove the mounting screws (IT, M3 x 6: 2 pcs), and remove the master compression plate holder from the compression shaft [A].
(9) Remove the compression shaft from the master compression plate [B].
(10) Pull out the piston shaft from the master compression plate, and remove the piston blocks [J].



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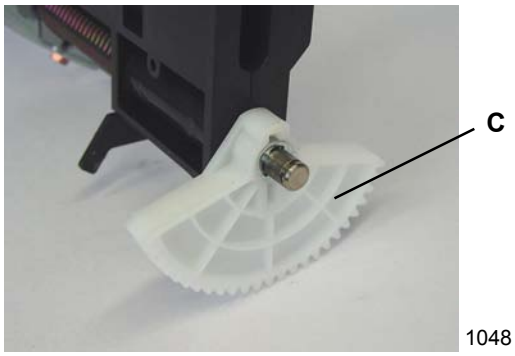

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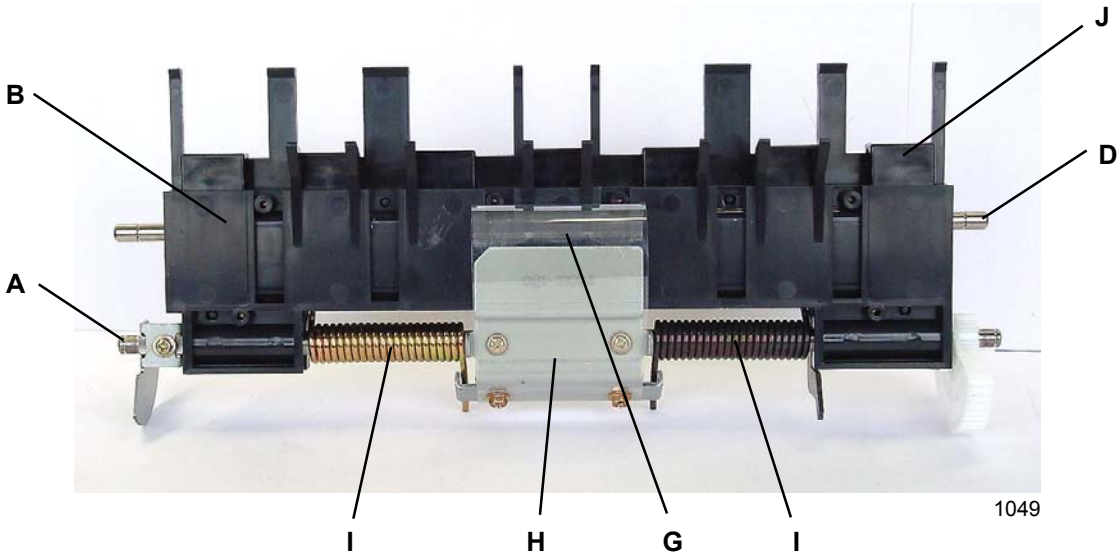


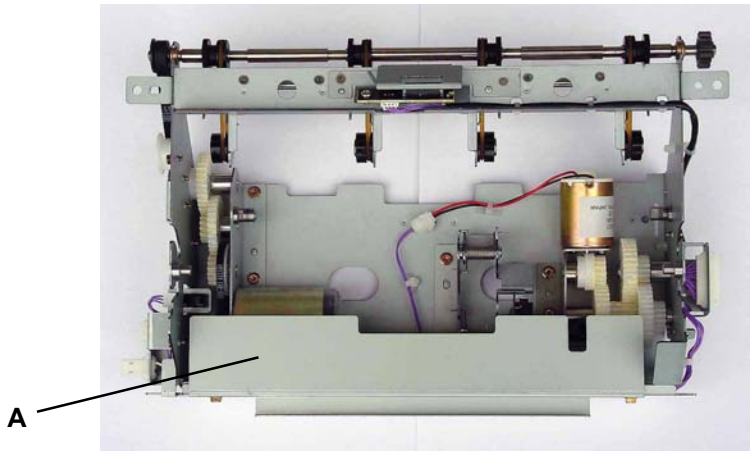
1049

A: Compression shaft
B: Master compression plate
C: Compression gear
D: Piston shaft
E: Piston shaft link
F: Master compression sensor plate
G: Master compression plate sheet
H: Master compression plate holder
I: Compression spring
J: Piston block

1050

6. Removing the Motors

(1) Remove the master compression plate.
(2) Remove the master removal cover [A] (RS tight, M3 x 6: 2pcs).
(3) Remove the master removal motor ass'y [B] (RS tight, M3 x 6: 2 pcs).
(4) Remove the compression motor ass'y [C] (RS tight, M3 x 6: 2 pcs).
(5) Remove the master disposal box safety switch unit [D] (RS tight, R3 x 6: 2 pcs).



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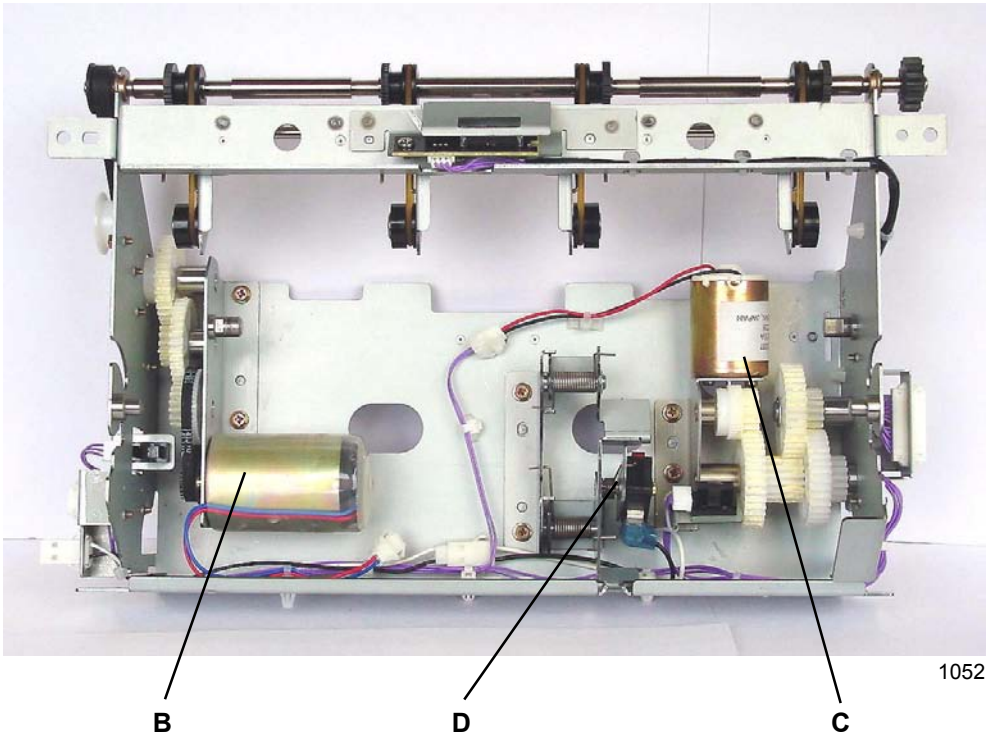


1052

A: Master removal cover
B: Master removal motor ass'y
C: Compression motor ass'y
D: Master disposal box safety switch unit

CHAPTER 11: FB ORIGINAL SCANNING SECTION (NEW SCANNER)

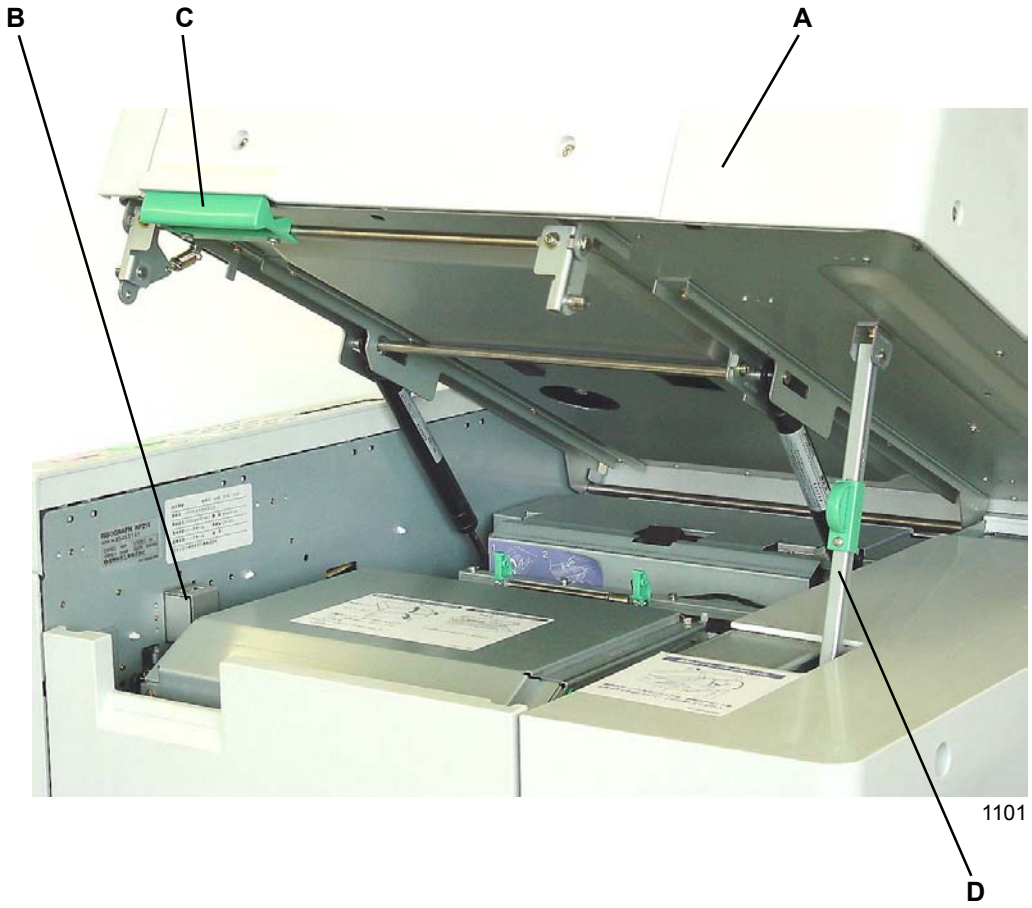
Contents

[Memo]

Mechanism

1. Scanner Table Setting System

The flatbed set switch [B] checks whether the scanner table [A] is closed.
This switch also acts as a safety switch, which cuts the power supply to the main motor and clamp motor, and thermal power to the TPH if the scanner table is open.

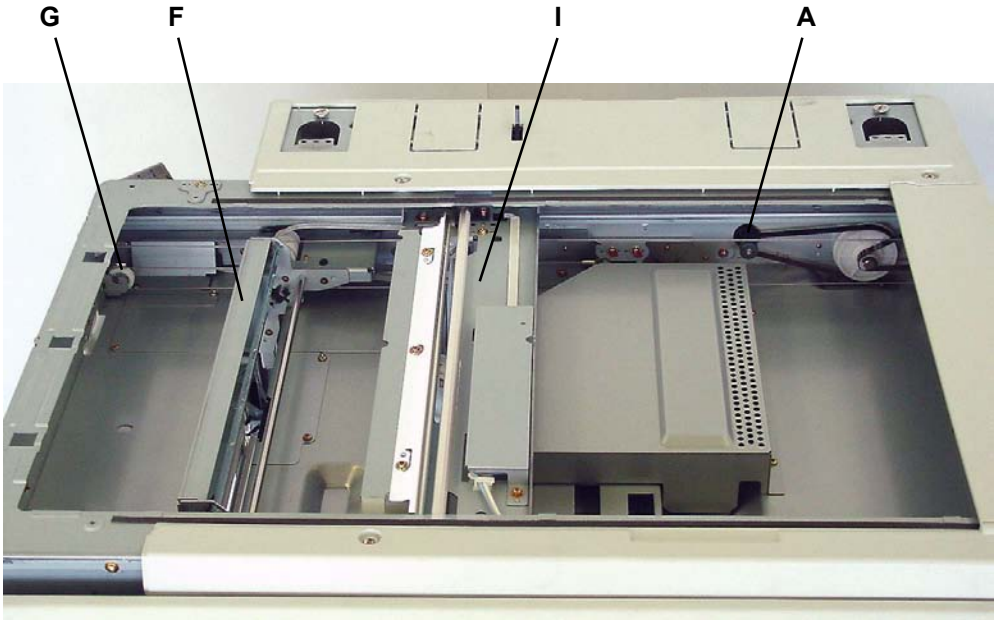


1101

A: Scanner table
B: Flatbed set switch
C: Scanner table open lever
D: Scanner unit support shaft

2. Original Scanning Mechanism

The FB read pulse motor [A] drives the front and rear wire spool pulleys [D] via the 2-stage reduction pulleys linked by the timing belts [B], [C]. The front and rear wire spool pulleys are configured symmetrically.
One end of the wire [E] is secured to the frame, while the other end is wound onto pulley No. 2 [G] mounted on the mirror carriage [F]. The wire is wound onto the rear wire spool pulley via the fixed pulley [H] secured to the frame, attached to the lamp carriage [I], and then secured to the frame via pulley No. 1 [J] on the mirror carriage. The lamp carriage is mounted with one original illumination lamp [K], a reflector [L], a lamp inverter [M], and mirror No. 1 [M], and the mirror carriage is provided with mirrors No. 2 [N] and No. 3 [O].
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 [J] is activated, the original surface can be scanned while maintaining a constant distance between the original and the center of the lens mounted on the frame. The original on the scanner table illuminated by the lamp is reflected via mirrors No. 1, 2, and 3, and is then focused onto the CCD [R] by the lens [Q] in the CCD ass’y [P].



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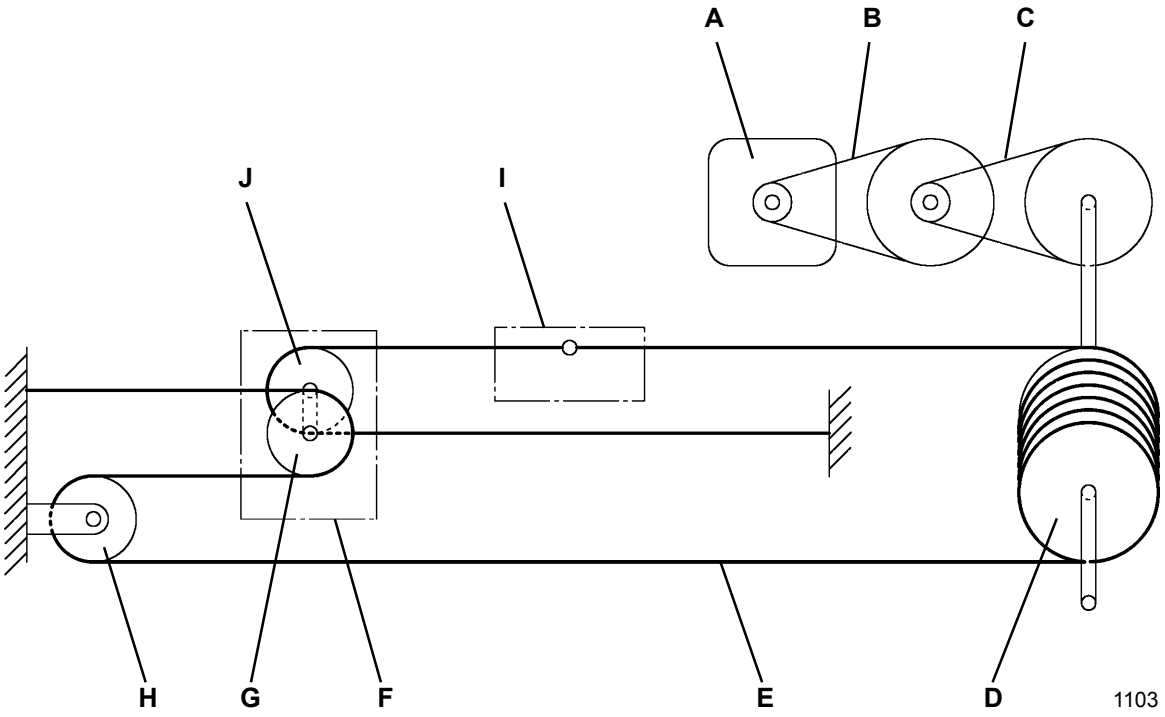
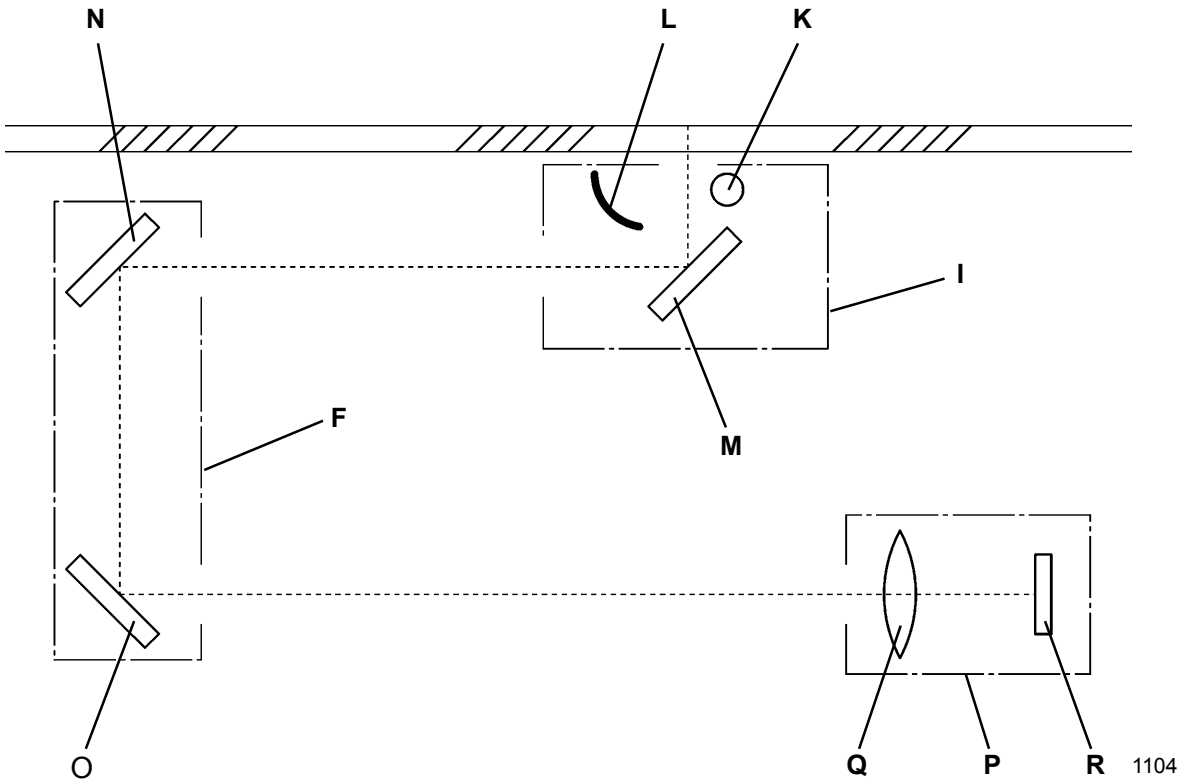
A: FB read pulse motor
B: Timing belt No. 1
C: Timing belt No. 2
D: Wire spool pulley
E: Wire
F: Mirror carriage
G: Pulley No. 2
H: Pulley
I: Lamp carriage
J: Pulley No. 1
K: Original illumination lamp
L: Reflector
M: Mirror No. 1
N: Mirror No. 2
O: Mirror No. 3
P: CCD ass’y
Q: Lens
R: CCD

Drive-system diagram



Optical-system diagram



3. Flatbed Initialization Movement

Initialization is performed in the following situations to bring the flatbed unit to standby mode.

- When power is switched on
- When everything has been reset

Initialization operation

The FB/AF HP sensor [A] is checked; if it is ON (light blocked), the flatbed read pulse motor [B] rotates in the feed direction until the sensor turns OFF (receives light), and moves the lamp carriage [C] to the right in the photograph. When the FB/AF HP sensor turns OFF, the flatbed read pulse motor rotates in the return direction and, after the FB/AF HP sensor switches from OFF to ON, the motor operates for a distance of 8 mm before its operation stops. (This position is referred to as the “home position.”)
If the FB/AH HP sensor is OFF at the time of operation start, the flatbed read pulse motor rotates in the return direction to move the lamp carriage a distance of 8 mm (if the FB/AF HP sensor turns ON during this operation, the above-described operation, which is carried out when the sensor is ON at the time of operation, starts), then the flatbed read pulse motor moves in the feed direction by a distance of 8 mm. Then, the flatbed read pulse motor rotates in the return direction and, after the FB/AF HP sensor switches from OFF to ON, the motor operates for a distance of 8 mm before its operation stops.
When the power switch is ON, the initialization operation is conducted, then offset adjustment and gain adjustment are performed. Then, the operation to be conducted when the sensor is OFF at the time of operation start is performed, and the initialization operation ends.

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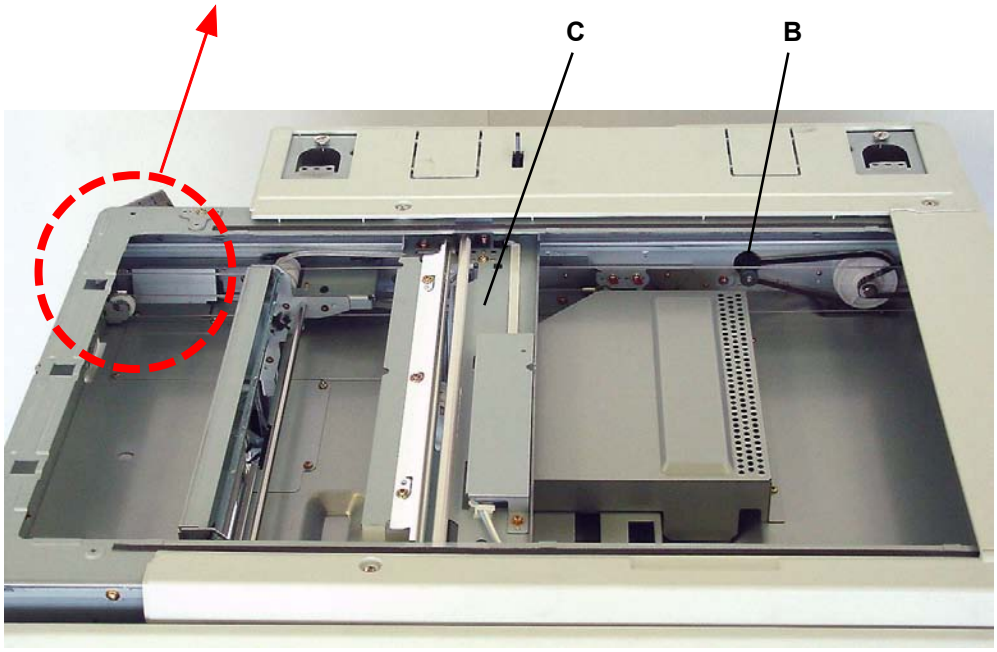
A: FB/AF HP sensor
B: Flatbed read pulse motor
C: Lamp carriage



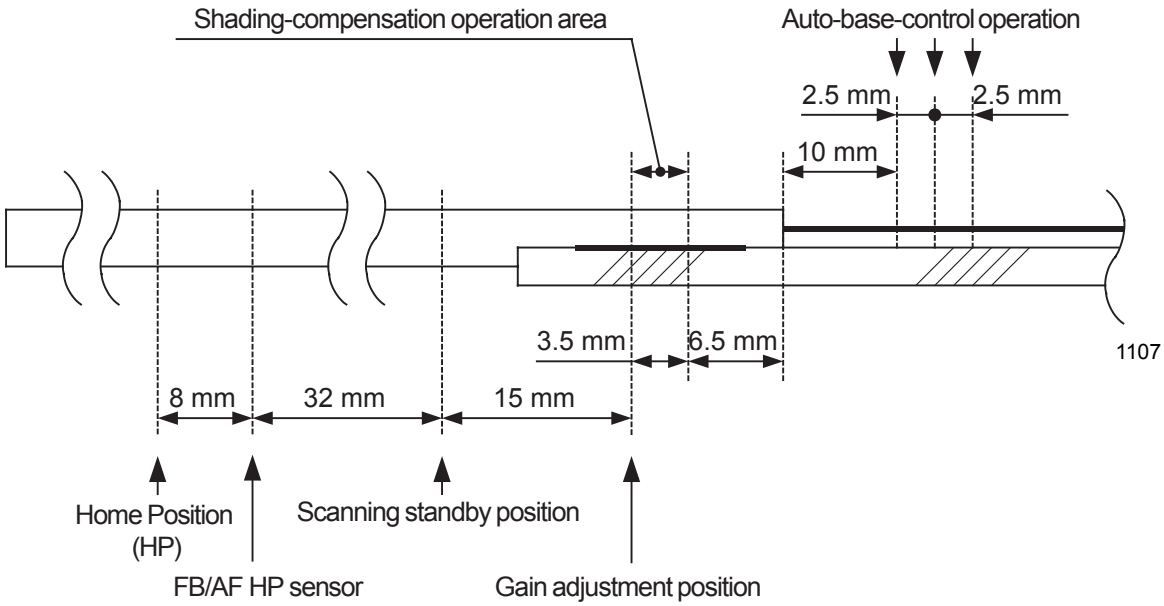
1106

4. Stage-Glass Original Detection Mechanism

The flatbed original detection sensor checks whether an original has been placed on the stage glass. As soon as the stage cover is closed halfway, blocking the light path to the stage-cover sensor, the flatbed original detection sensor checks whether there is an original on the stage glass [A]. If the flatbed original detection sensor is receiving light (original present), the indication on the panel changes to “Ready to make master” (RN20/21 Series: Master/Print indication changes to “Master”), then the lamp illuminates and the shading-compensation and auto-base-control operations are performed. The lamp carriage is then sent to the scanning standby position. If the Start key is pressed within 60 seconds, the scanning operation starts.
If the Start key is not pressed within 60 seconds, the lamp turns off and the lamp carriage is returned to the home position.

5. Flatbed Automatic Base Control

When an original is set and the stage cover is closed, or when the original scanning density is set to AUTO and the operation starts from the home position, flatbed auto base control (ABC) is conducted after shading compensation is performed.
With an original set on the scanner table, when the cover open sensor turns ON or the Start key is pressed, the lamp illuminates and the flatbed read pulse motor rotates in the feed direction. After the FB/AF HP sensor switches from ON to OFF, the motor operates for a distance of 47 mm, pauses for a set period of time, and then performs the shading compensation operation while operating for a distance of 3.5 mm. It then moves a distance of 16.5 mm (10 mm from the leading edge of the original), and the image sensor scans the surface density of the original. After this, the lamp carriage moves approximately 2.5 mm twice and scans the surface density of the original. (Total 3 times)
The flatbed read pulse motor then operates in reverse (in the return direction) to return the lamp carriage to the scanning standby position, and proceeds to FB scanning operation.



6. FB Original Scanning Movement (Book Mode OFF)

* In the case of the RN25 Series, this operation is conducted with the Book mode OFF.
When the Start key is pressed, the FB read pulse motor activates, and the lamp carriage starts to move in the feed direction. After the top 4 mm (5 mm in the case of the RN20/21 Series) of the original is skipped, the print signal turns ON and the original scanning operation 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 home position.

7. Book-Mode Pre-Scan Mechanism (RN25 Series)

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 feed direction (speed of 50% reproduction rate). 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 home position to complete the pre-scan operation. Book-mode scanning is performed next.

8. Book-Mode Scanning Mechanism (RN20/21 Series)

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 feed 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 home position, and the scanning operation ends.

Disassembly

1. Removing the Scanner Unit

(1) Start Test Mode No. 154 (Scanner Lock Action), open the scanner table, secure the mirror carriage using the scanner-unit securing screws, and then close the scanner table.
(2) Switch off the power, and remove the following covers:
- Stage cover
- Scanner-unit cover, left
- Scanner-unit cover, rear
- Scanner-unit cover, front
- Scanner-unit cover, right
- Rear cover
- PCB cover

(3) Remove the two reusable bands, and remove the cover-open sensor (double-washer, M4 x 8: 1 pc).
(4) Disconnect the relay PCB connector.
(5) Disconnect the flatbed read pulse-motor connector, and detach the harness from the two cord clamps.
(6) Disconnect the scanner harness from the image PCB.
(7) Remove the four screws (double-washer, M4 x 8) securing the scanner unit to the hinge plate.
(8) Remove the six screws (double-washer, M4 x 8) from the scanner unit, and then remove the scanner unit by lifting it upward. (This is a heavy precision component. Handle with care.)

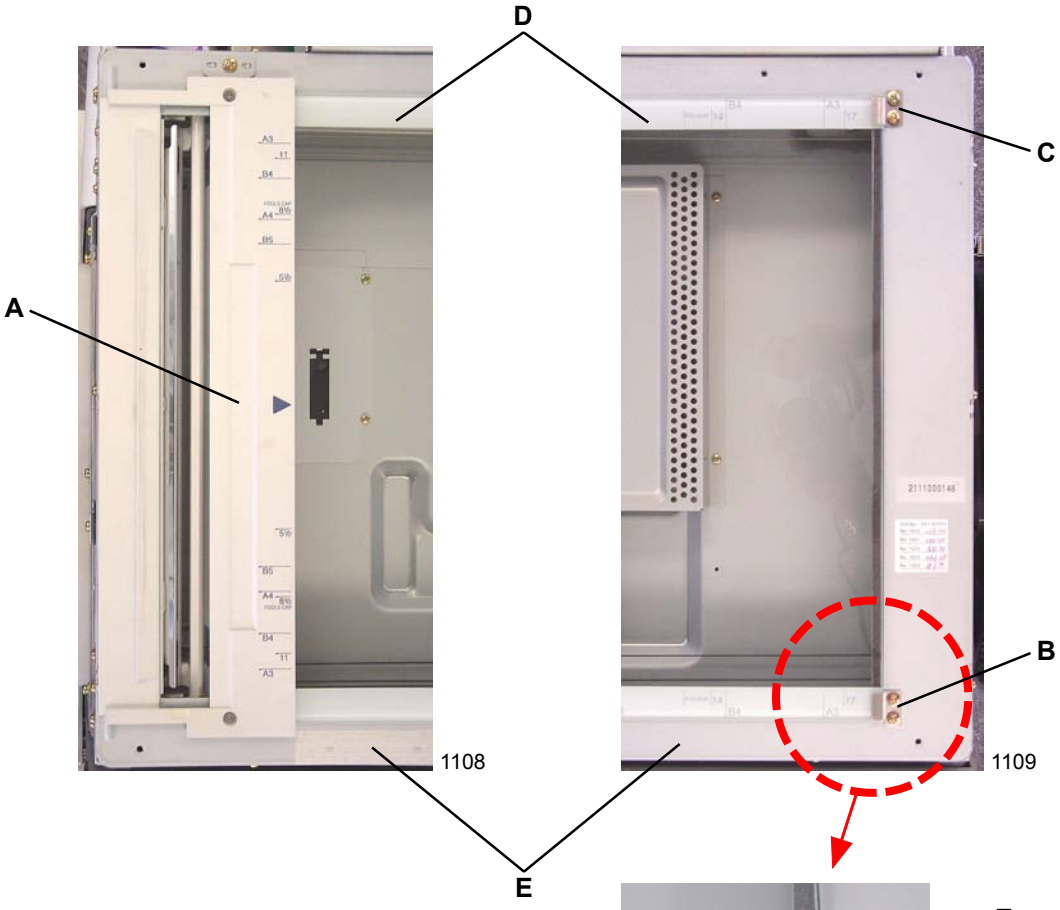
[Precautions on Reassembly]

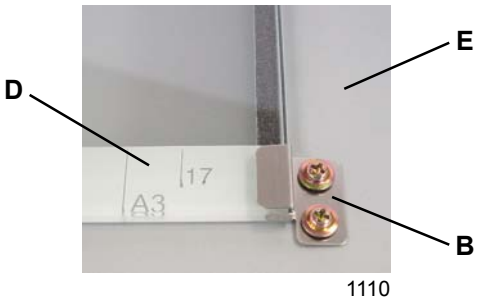
- After reassembling, open the scanner table and remove the scanner unit securing screws on the mirror carriage. Clear the error message using test mode No. 155 (Scanner Release Action).
- Prior to reassembly, write down the information on the label at the right side of the top panel of the scanner unit. Following reassembly, activate the factory-testing mode and set the scanner.

2. Removing the Stage Glass

(1) Switch off the power, and remove the following covers:
- Stage cover
- Scanner-unit cover, left
- Scanner-unit cover, rear
- Scanner-unit cover, front
- Scanner-unit cover, right

(2) Remove the two stepped screws, and remove the original stopper [A].
(3) Remove the flat spring F [B] and flat spring R [C] (IT, M3 x 6: 2 pcs each).
(4) Lift the stage glass [D] to remove it.





1110

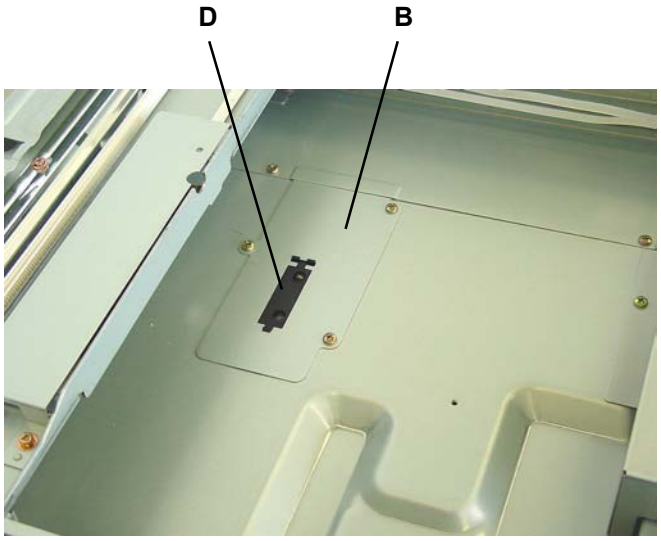
A: Original stopper
B: Flat spring F
C: Flat spring R
D: Stage glass
E: Scanner unit

[Stage-glass reinstallation procedure]

(1) Place the stage glass on the scanner unit [E].
(2) Install the original stopper.
(3) Press the stage glass against the original stopper.
(4) Install the flat springs F and R using screws, while pushing them toward the original stopper.
(5) Reinstall the covers.

3. Removing the Flatbed Original Detection Sensor

(1) Switch off the power, and remove the stage glass.
(2) Remove the mounting screws (bind, M3 x 6: 3 pcs), disconnect the connector [A], and remove the flatbed original detection sensor together with the sensor cover [B].
(3) Disengage the three claws of the flatbed original detection sensor [C] from the sensor cover, and remove the flatbed original detection sensor [D].



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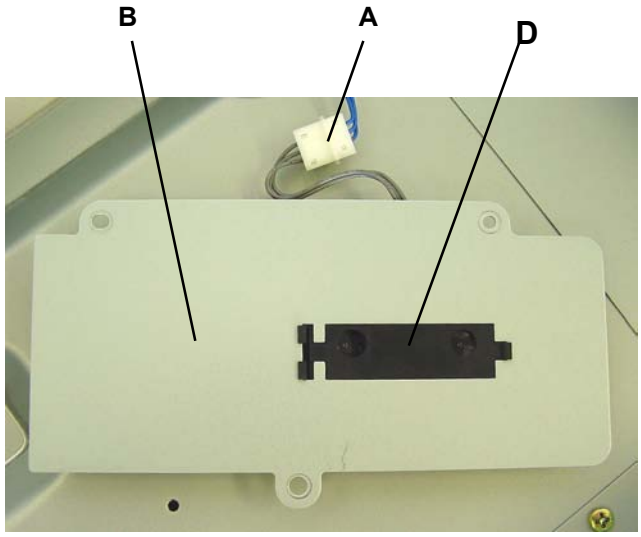

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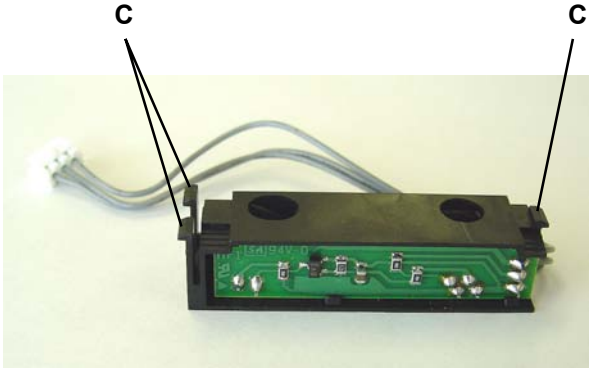


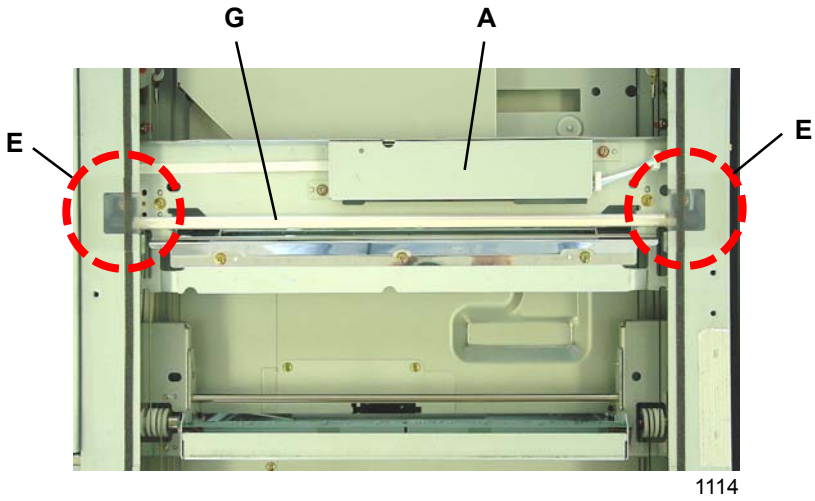
1113

Flatbed original detection sensor

A: Connector
B: Sensor cover
C: Claws of flatbed original detection sensor
D: Flatbed original detection sensor

4. Removing the Lamp

(1) Start Test Mode No. 158 (scanner lamp replacement position set), and switch off the power.
(2) Remove the stage glass.
(3) Remove the mounting screws (double-washer, M3 x 6: 2 pcs), and detach the inverter cover [A].
(4) Remove the lamp harness [C] from the two cord clamps [B], release the lock, and disconnect the connector [D].
(5) With the films [F] peeled from the scanner-unit notched sections [E], remove the mounting screws (double-washer, M3 x 6: 1 pc each) from both sides, and dismount the lamp [G].



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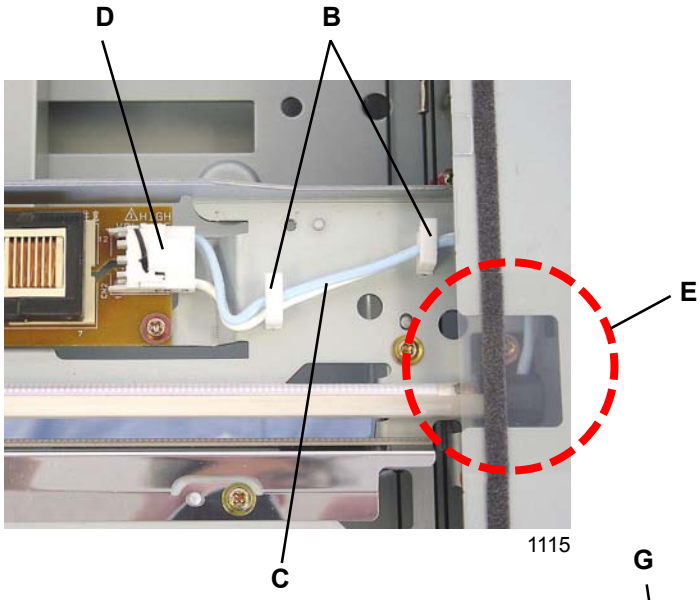

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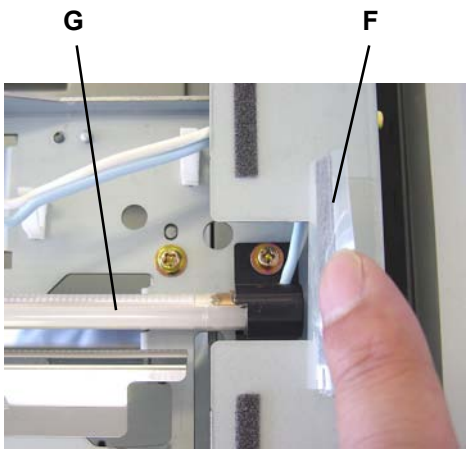


1116

A: Inverter cover
B: Cord clamp
C: Lamp harness
D: Connector
E: Scanner-unit notched section
F: Film
G: Lamp

5. Removing the CCD Unit

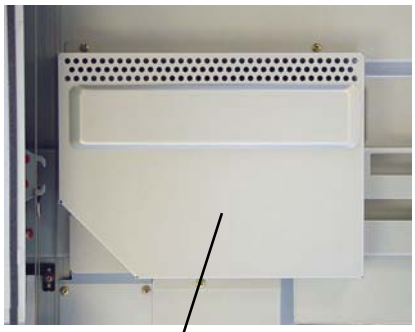
(1) Switch off the power, and remove the stage glass.
(2) Remove the mounting screws (bind, M3 x 6: 3 pcs), and dismount the CCD cover [A].
(3) While holding the CCD PCB [B], remove the CCD cable [C].
(4) Remove the mounting screws (double-washer, M3 x 6: 3 pcs), and remove the CCD unit [D].

[CCD-unit reinstallation procedure]

(1) The replacement CCD unit has been adjusted at the factory with the positioning parts [E] attached to the front and rear. Therefore, align the holes in the positioning parts with the protrusions on the scanner unit, and secure the CCD unit in place using three screws.
(2) Remove the mounting screws, and remove the positioning parts from the front and rear.
(3) Install the CCD cable to the CCD PCB.

[Precautions on Reassembly]

- To prevent damaging the CCD PCB, hold the CCD PCB when installing the CCD cable.



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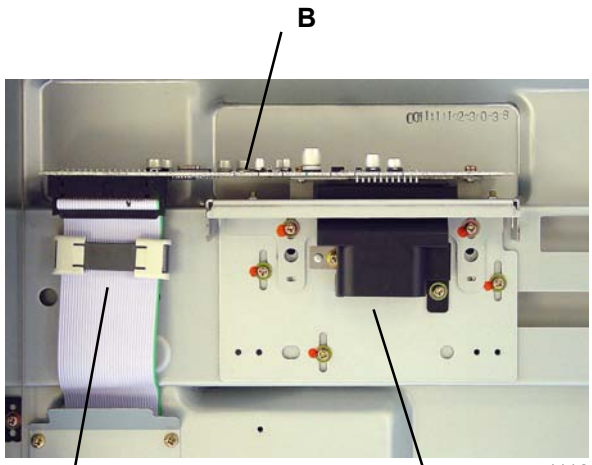

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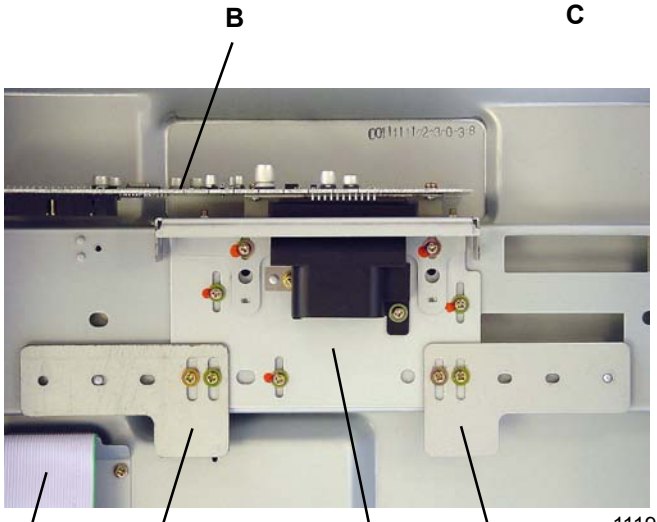
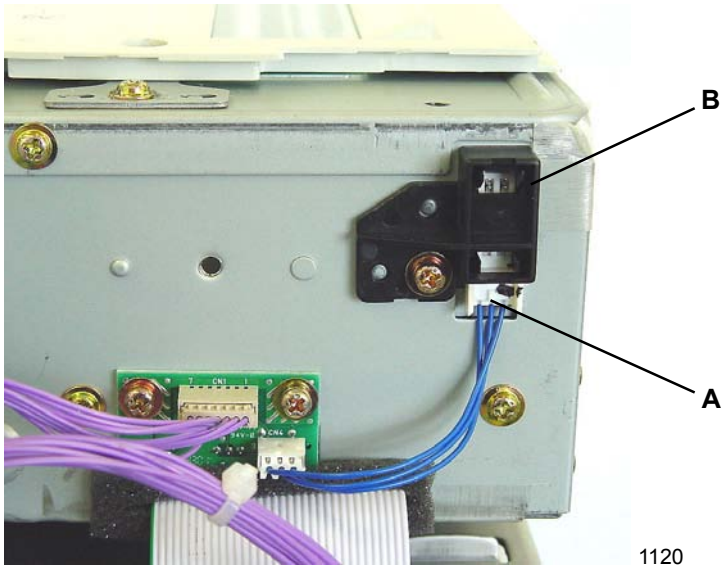


1119

A: CCD cover
B: CCD PCB
C: CCD cable
D: CCD unit
E: Positioning part

6. Removing the FB/AF HP Sensor

(1) Switch off the power, and remove the left scanner-unit cover.
(2) Remove the mounting screw (double-washer, M3 x 6: 1 pc), disconnect the connector [A], and remove the FB/AF HP sensor [C] together with the sensor bracket [B].
(3) Disengage the claws of the FB/HP sensor from the sensor bracket, and remove the sensor.



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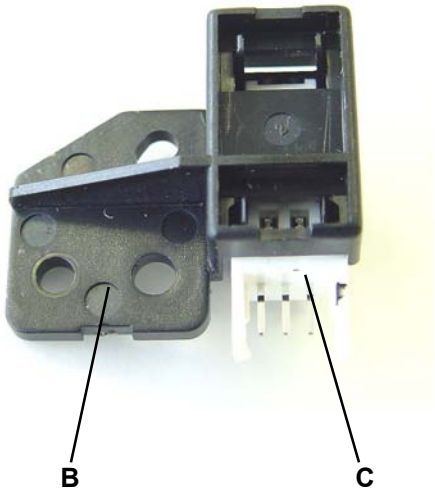


1121

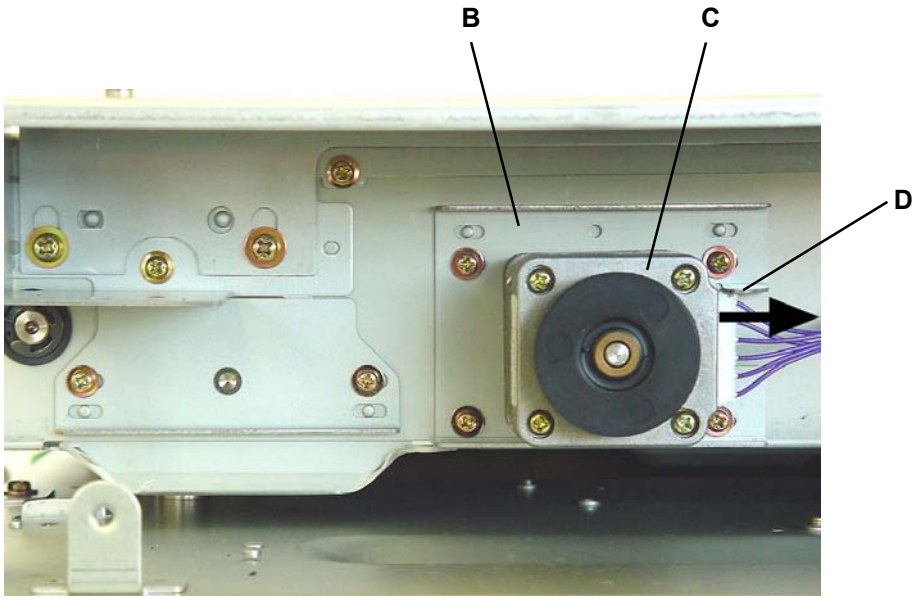
A: Connector
B: Sensor bracket
C: FB/AF HP sensor

7. Removing the Flatbed Read Pulse Motor

(1) Switch off the power, and remove the stage glass.
(2) Remove the mounting screws (double-washer, M3 x 6: 4 pcs), remove the timing belt [A] located inside the scanner unit, and remove the flatbed read pulse motor [C] together with the bracket [B].
(3) Remove the mounting screws (double-washer, M3 x 6: 2 pcs), and detach the flatbed read pulse motor from the bracket.

[Precautions on Reassembly]

- Pull the bent section [D] of the bracket in the direction indicated by the arrow to apply adequate tension to the timing belt when reinstalling the flatbed read pulse motor.



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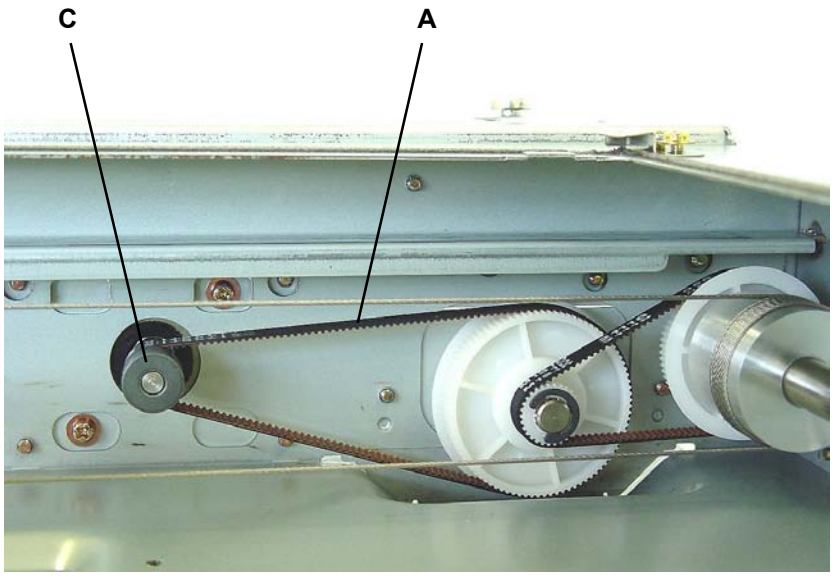


1123

A: Timing belt
B: Bracket
C: Flatbed read pulse motor
D: Bent section

Adjustment

1. FB Read Pulse Motor Speed Adjustment

Checks and adjustment

(1) Set B4-size paper in the paper-feeding tray, place Test Chart No. 15 on the stage glass, and create an original-size master.
(2) Lay the print on top of the test chart original to check that the image elongation and shrinkage of the print is within ±1.4% at the 310-mm line of the test chart original.
(3) If the elongation or shrinkage is more than the specified range, adjust using Test Mode No. 182 (FB Scan Image Elongation and Shrinkage Adjustment).

* Before conducting this adjustment, be sure to adjust the master image.

2. FB Scan Start Position Adjustment

Checks and adjustment

(1) Set B4-size paper in the paper-feeding tray, place Test Chart No. 15 on the stage glass, create an original-size master, and print.
(2) Check the prints. Confirm that 4 ±2 mm (5 ±2 mm in the case of the RN20/21 Series) of the top scan skip check graduations is skipped.
(3) If the scanning start position is out of the specified range, adjust using Test Mode No. 181 (FB Scan Start Position Adjustment).

3. FB Horizontal Scan Position Adjustment

Checks and adjustment

(1) Set B4-size paper in the paper-feeding tray, place Test Chart No. 15 on the stage glass, create an original-size master, and print.
(2) Inspect the master made on the print drum, and check that pattern “e” is not omitted on both the left and right of the image on the master.
(3) If the pattern is omitted, adjust using Test Mode No. 180 (FB Horizontal Scan Position Adjustment).

CHAPTER 12: FB ORIGINAL SCANNING SECTION (Previous Scanner)

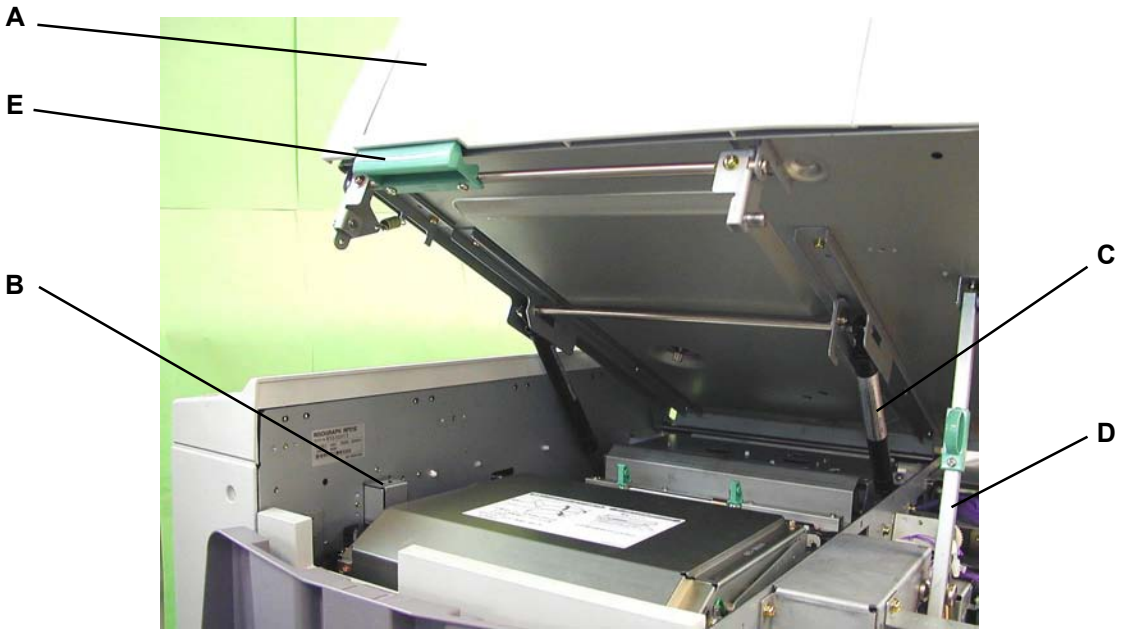
Contents

[Memo]

Mechanism

1. Scanner Table Setting System

The flatbed set switch [B] checks whether or not the scanner table [A] has been set correctly.
The switch also has a safety-switch function that cuts off the power supply to the main motor and clamp motor, as well as the thermal power, when the scanner table is open.

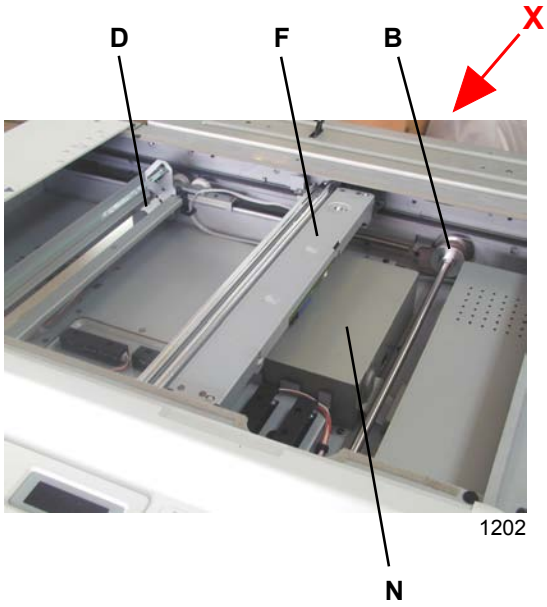


1201

A: Scanner table
B: Flatbed set switch
C: Damper spring
D: Scanner unit support shaft
E: Scanner table open lever

2-1. Scanning Mechanism (RN25 Series)

The FB read pulse motor [A] drives the front and rear wire-spool pulleys [B] 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 [C] is secured to the frame via the spring [Q], and is attached to the lamp carriage [F] via sliding pulley 2 [E] mounted on the mirror carriage [D]. It is wound approximately 7 times around the wire-spool pulley [B] from the opposite side via fixed pulley 2 [G] secured to the frame. It is then attached to the frame via fixed pulley 1 [H] mounted on the frame, and sliding pulley 1 [I] mounted on the mirror carriage [D].
The mirror carriage [D] and lamp carriage [F] are able to move horizontally along the rails attached to the respective sliders.
The mirror carriage [D] carries two mirrors (mirror 2 [J] and mirror 3 [K]), and the lamp carriage [F] carries the original illumination lamp [L] (and lamp inverter) and mirror 1 [M].
The mechanism uses a “full/half-rate mirror scanning” system, in which the mirror carriage [D] moves 1/2 L mm as the lamp carriage [F] moves L mm in the same direction. This means that when the FB read pulse motor [A] 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 [M], 2 [J], and 3 [K], and is then focused onto the CCD [P] by the lens [O] in the lens ass’y [N].



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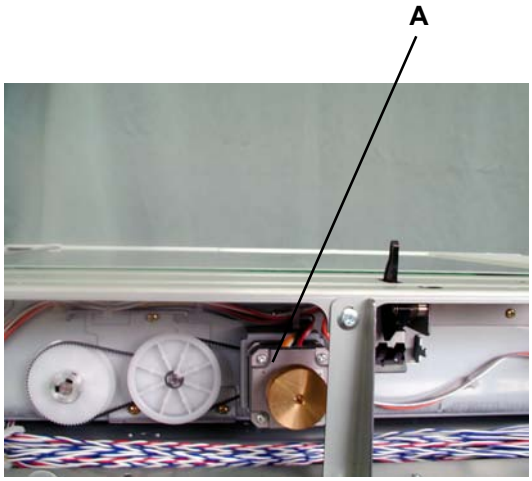
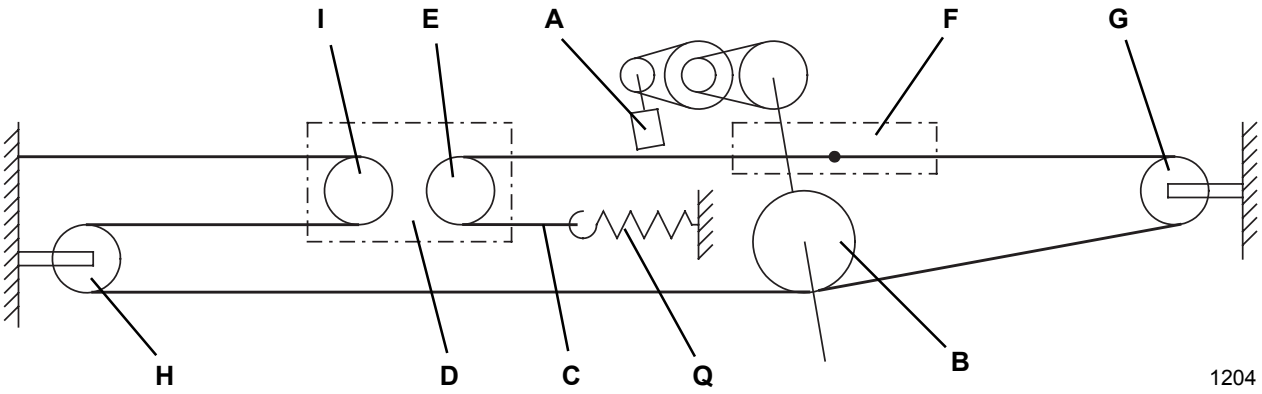


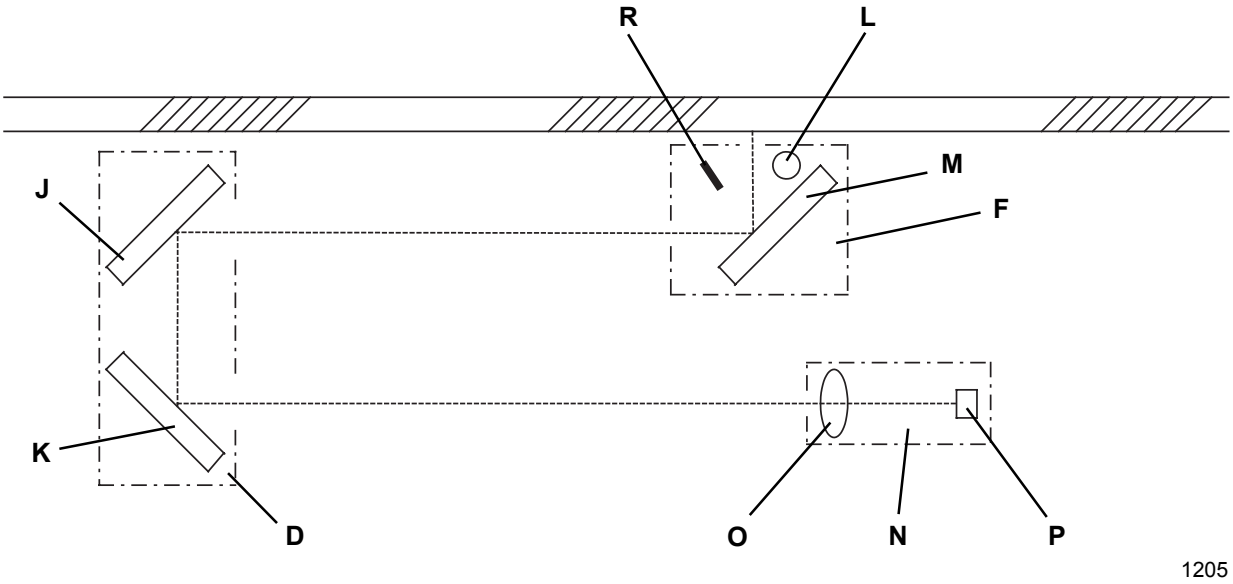
View in direction from X
1203

A: FB read pulse motor
B: Wire-spool pulley
C: Wire
D: Mirror carriage
E: Sliding pulley 2
F: Lamp carriage
G: Fixed pulley 2
H: Fixed pulley 1
I: Sliding pulley 1
J: Mirror 2
K: Mirror 3
L: Lamp
M: Mirror 1
N: Lens ass’y
O: Lens
P: CCD
Q: Spring
R: Reflector

Drive-system diagram

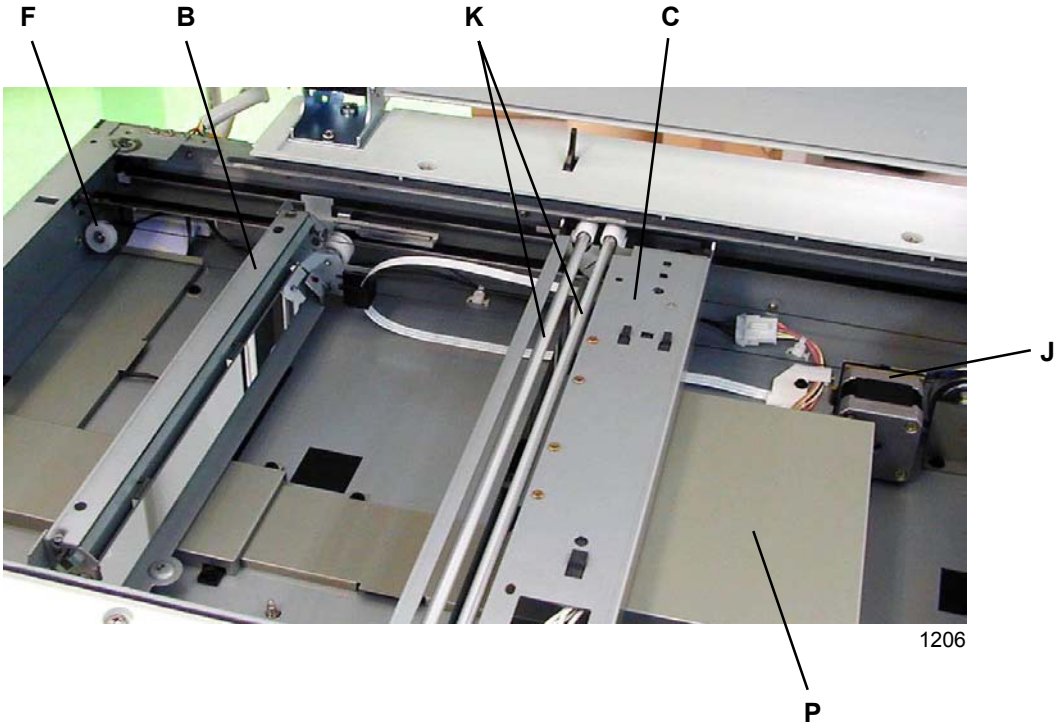


Optical-system diagram



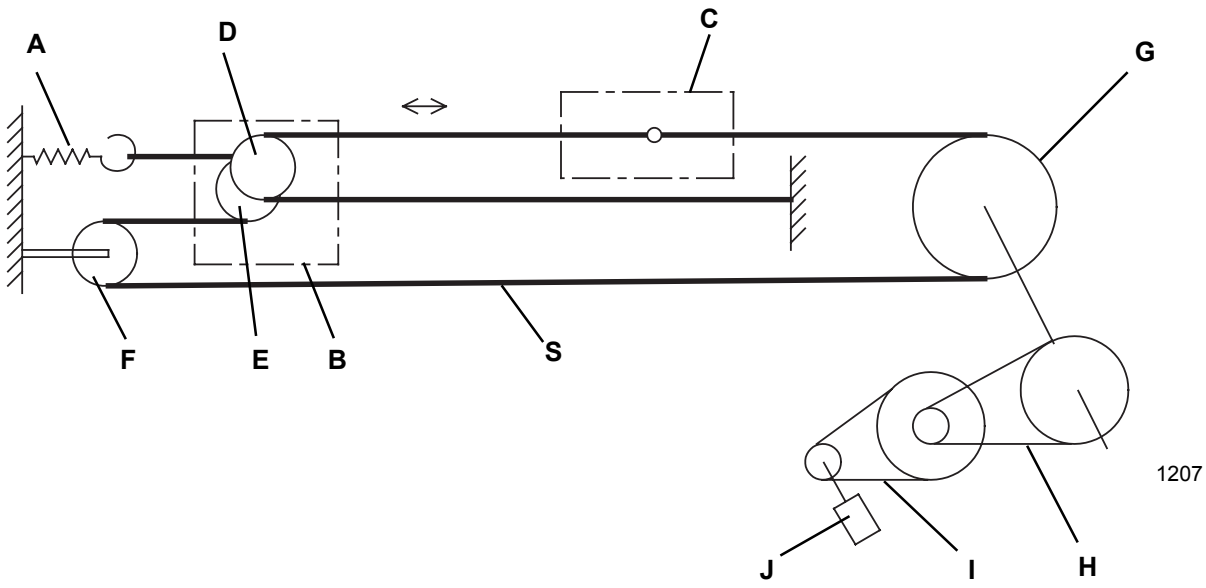
2-2. Original Scanning Mechanism (RN20/21 Series)

The FB read pulse motor [J] drives the front and rear wire spool pulleys [G] via the 2-stage reduction pulleys linked by the timing belts [H] and [I]. The front and rear wire spool pulleys are configured symmetrically.
The wire [S] has one end secured to the frame via coil spring [A], and is wound onto sliding pulley 2 [E] mounted on the mirror carriage [B]. It is wound approximately 6.5 times around the rear wire spool pulley [G] via the fixed pulley [F] secured to the frame. It is then attached to the lamp carriage [C] and then secured to the frame via sliding pulley 1 [D] mounted on the mirror carriage [B]. The lamp carriage [C] carries two original illumination lamps [K] (and lamp inverters) and mirror 1 [M], and the mirror carriage carries the two mirrors [N] and [O].
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 [J] is activated, the original surface can be scanned while maintaining a constant distance between the original and the center of the lens mounted on the frame. 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 [R] by the lens [Q] in the lens ass’y [P].

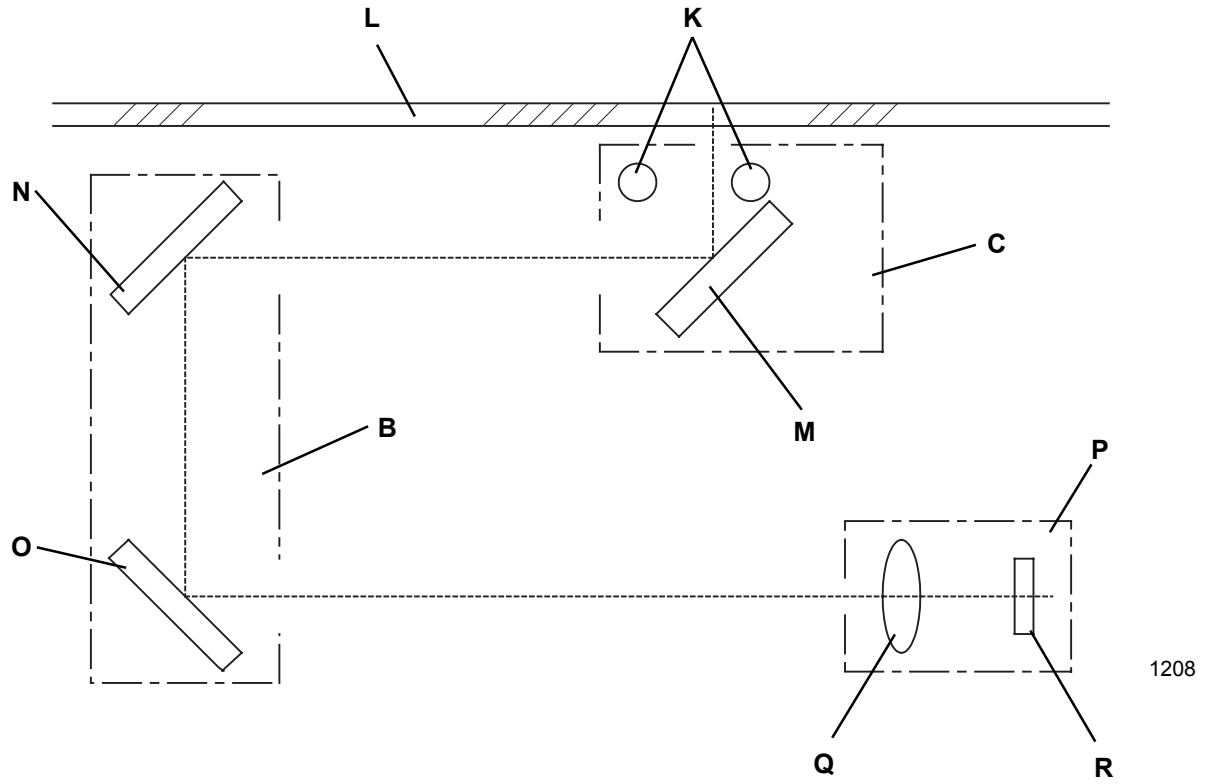


A: Spring
B: Mirror carriage
C: Lamp carriage
D: Sliding pulley 1
E: Sliding pulley 2
F: Fixed pulley
G: Wire spool pulley
H: Scanner timing belt 1
I: Scanner timing belt 2
J: Flatbed read pulse motor
K: Lamp
L: Stage glass
M: Mirror 1
N: Mirror 2
O: Mirror 3
P: Lens ass’y
Q: Lens
R: CCD
S: Wire

Drive-system diagram



Optical-system diagram



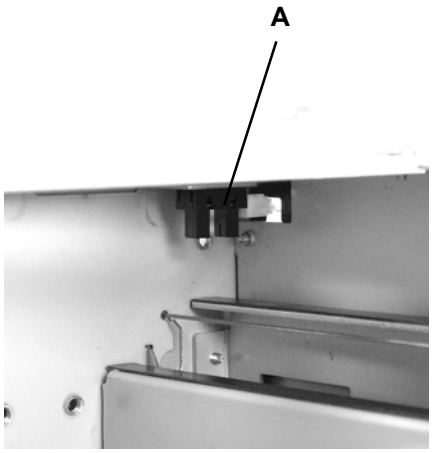
3. Flatbed Initialization

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 [A] 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 [B] to the left in the photograph. Once the FB/AF HP sensor [A] turns ON (blocked), it is moved a further set distance before the operation ends (this is the “home position”).
The detection plate on the FB/AF HP sensor [A] is attached to the lamp carriage [B].
No movement is made if the FB/AF HP sensor [A] is ON from the start.



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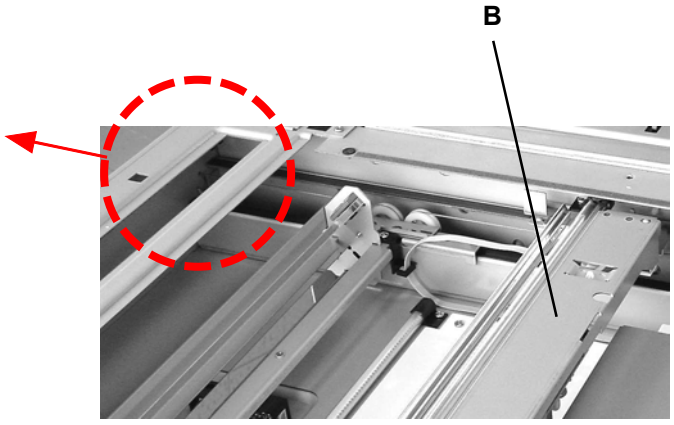

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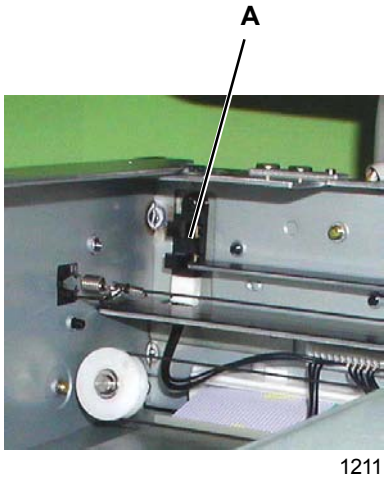
< RN25 Series >



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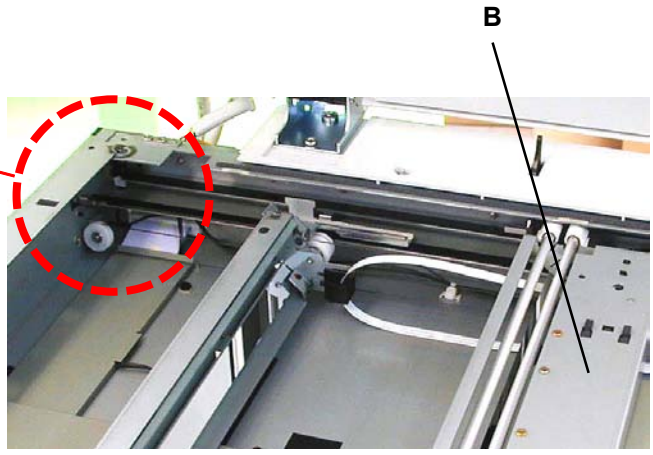

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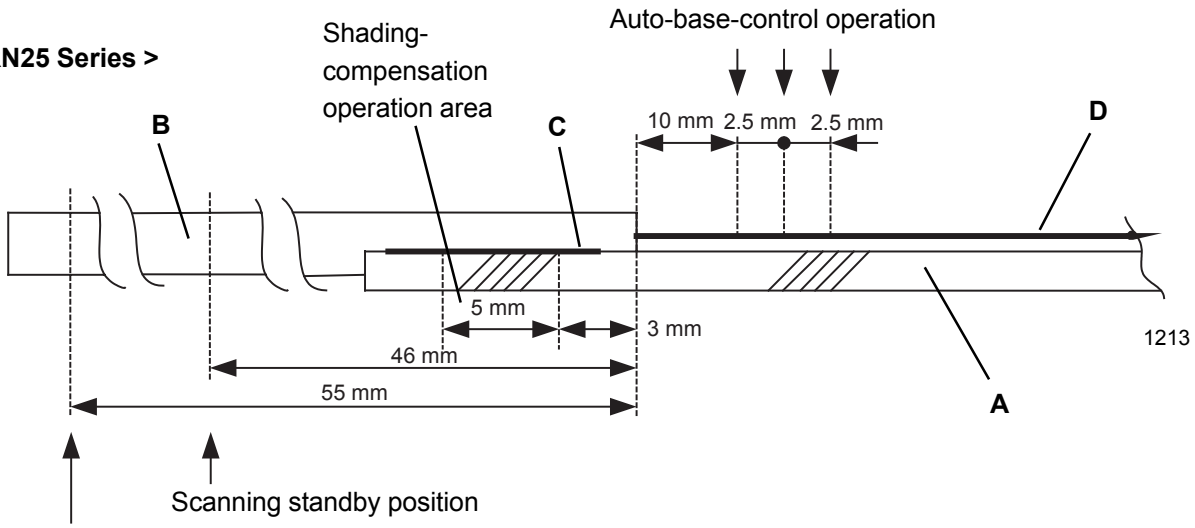
< RN20/21 Series >

A: FB/AF HP sensor
B: Lamp carriage

4. Stage-Glass Original Detection Mechanism

The flatbed original detection sensor checks whether an original has been placed on the stage glass. As soon as the stage cover is closed halfway, blocking the light path to the stage-cover sensor, the flatbed original detection sensor checks whether there is an original on the stage glass [A]. If the flatbed original detection sensor is receiving light (original present), the indication on the panel changes to “Ready to make master” (210: Master/Print indication changes to “Master”), then the lamp illuminates and the shading-compensation and auto-base-control operations are performed. The lamp carriage is then sent to the scanning standby position.
If the Start key is not pressed within 60 seconds, the lamp turns off and the lamp carriage returns to the home position. The shading-compensation and auto-base-control operations are not performed until the Start key is pressed to start the scanning operation.
If the Start key is pressed within 60 seconds, the lamp carriage starts the scanning operation.

< RN25 Series >



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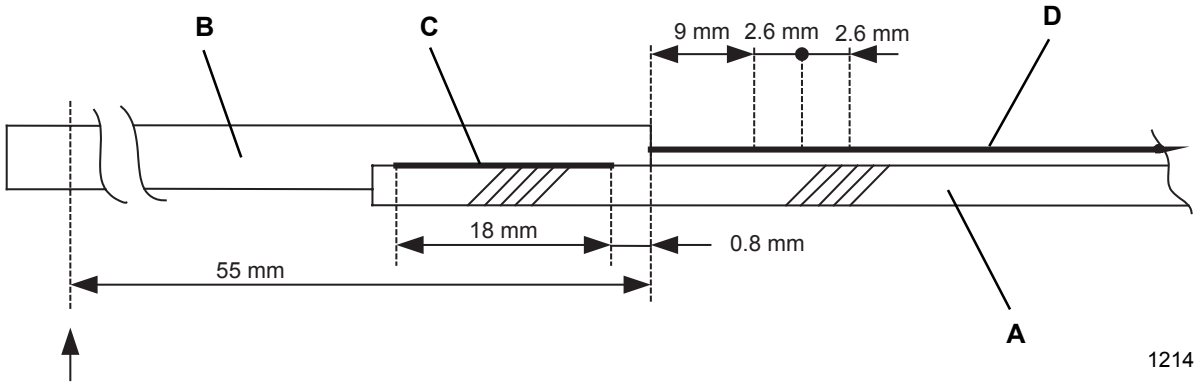


Scanning line (lamp carriage) when FB/AF HP sensor switches from ON to OFF

A: Stage glass
B: Original stopper
C: Shading plate
D: Original

5. FB Original Scanning Movement

* In the case of the RN25 Series, this operation is conducted with the Book mode OFF.
When the Start key is pressed, the FB read pulse motor activates, and the lamp carriage starts to move in the feed direction. After the top 4 mm (5 mm in the case of the RN20/21 Series) of the original is skipped, the print signal turns ON and the original scanning operation 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 home position.

6. Book-Mode Pre-Scan Mechanism (RN25 Series)

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 feed direction (speed of 50% reproduction rate). 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 home position to complete the pre-scan operation. Book-mode scanning is performed next.

7. Book-Mode Scanning Mechanism (RN25 Series)

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 feed 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 home position, and the scanning operation ends.

[Memo]

Disassembly

1. Removing the Scanner Unit

(1) Start the Test Mode No. 154 (Scanner Lock Action) to move the carriage to the lock position, open the scanner table, secure the mirror carriage with the screws used for equipment transport, and then close the scanner table.
(2) Switch off the power, and remove the following covers:
- Rear cover
- Stage cover (if equipped with AF and digitizer, remove them also.)
- Scanner-unit cover, left
- Scanner-unit cover, rear
- Scanner-unit cover, front
- Scanner-unit cover, right

< RN25 Series >

(3) Disconnect the two control-panel connectors, remove the five mounting screws (RS tight, M4 x 8), and then remove the control panel. (This is done to prevent damage to the control panel.)
(4) Disconnect the FB read pulse motor and FB/AF HP sensor connectors from the scanner unit. Disconnect the three connectors from the SCAN-IF400-PCB.
(5) Remove the cover-open sensor ass'y with one screw (double-washer, M4 x 8), and disconnect the connector.
(6) Remove the four screws (double-washer, M4 x 8) securing the scanner unit to the hinge plate.
(7) Remove the six screws (double-washer, M4 x 8) from the scanner unit, and then remove the scanner unit by lifting it upward. (This is a heavy precision component. Handle with care.)

< RN20/21 Series >

(3) Detach the two connectors from the scanner unit. (Flat cables on main PCB connectors)
(4) Remove the two screws (double-washer, M4 x 8) on the two stage cover brackets that secure the scanner unit.
(5) Remove the stage cover sensor assembly with the screw (double-washer, M4 x 8).
(6) Remove the six screws (double-washer, M4 x 8) on the scanner unit, and remove the unit upwards. (Take care when handling, as this is a heavy precision unit.)

[Precautions on Reassembly]

- After reassembling, open the scanner table and remove the transport lock screw on the mirror carriage. Clear the error message using Test Mode No. 155 (Scan Release Action).

< RN20/21 Series >

- When mounting the scanner, align the half-pierced sections of the two front alignment brackets and those on the two Stage cover brackets.

< RN25 Series >

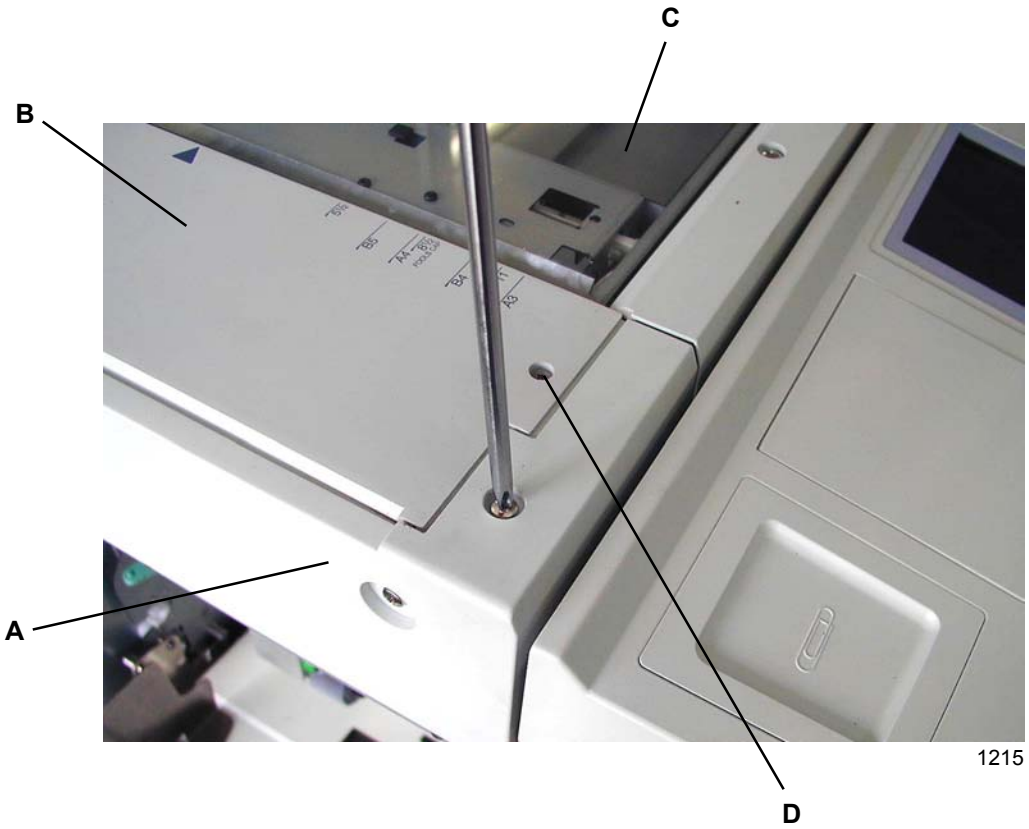
Prior to reassembly, write down the information on the label at the right side of the top panel of the scanner unit. Following reassembly, activate the factory-testing mode and set the scanner.

2. Removing the Stage Glass

(1) Switch off the power, and remove the left-hand scanner cover.
(2) Remove the two special stepped screws [D], and remove the original stopper [B] by moving it slightly to the left (paper-feed side) and then lifting.
(3) Lift up the left-hand side (paper feed side) of the Stage glass [C] slightly, and slide it out towards the paper feed side.

[Precautions on Reassembly]

- Push the stage glass firmly against the right-hand side (ejection side) after placing it on the scanner unit frame.



A: Scanner unit cover (left)
B: Original stopper
C: Stage glass
D: Special stepped screw

3. Removing the Flatbed Original Detection Sensor

(1) Switch off the power.
(2) Remove the stage glass.

< RN25 Series >

(3) Unplug the connector and remove the flatbed original detection sensor [A] with one screw (RS tight, M3 x 6).

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(3) Unplug the connector, and remove the flatbed original detection sensor [B] by removing one screw (IT, M3 x 8).

[Precaution on Reassembly]

< RN25 Series >

- Align the protrusions (two locations) on the underside of the sensor with the holes in the scanner base plate.

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- Engage the hooks on the bottom of the flatbed original detection sensor into the holes in the bracket.

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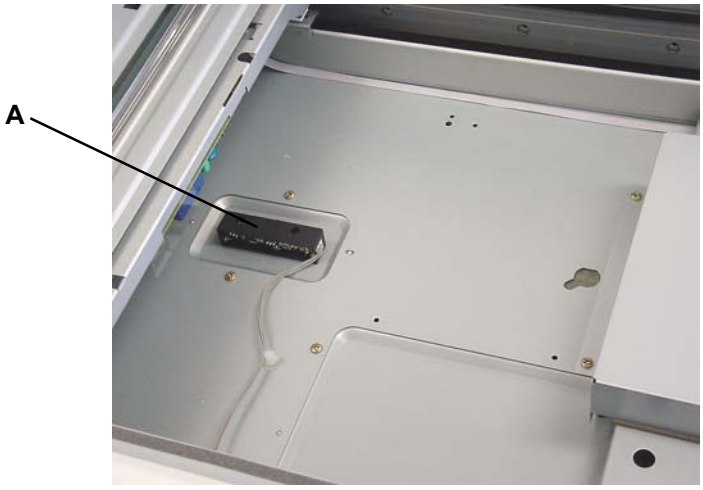

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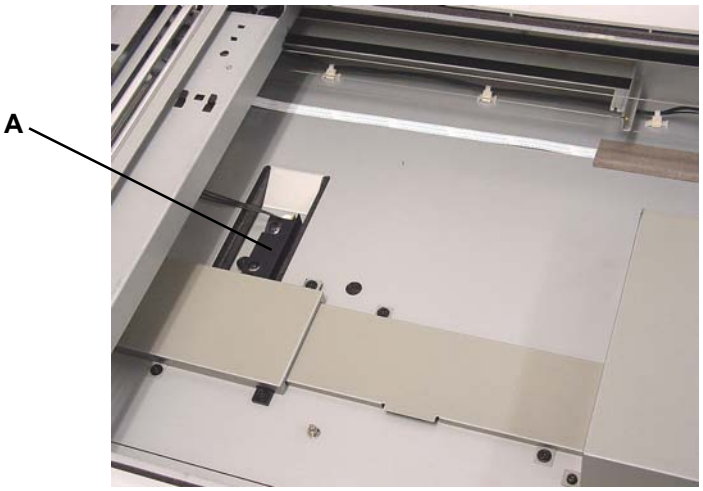
< RN20/21 Series >

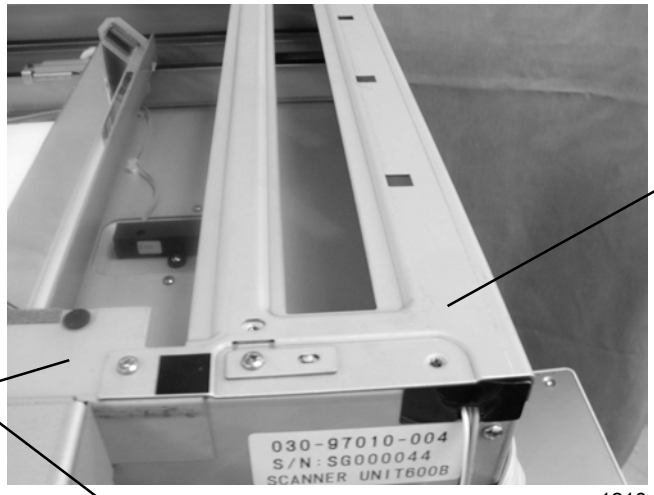


1217

A: Flatbed original detection sensor

4-1. Removing the Lamp (RN25 Series)

(1) Switch off the power.
(2) Remove the stage glass.
(3) Remove the screws (RS tight, M3 x 6: 4 pcs), and detach the top L stay [A].
(4) Bring the lamp carriage [C] to the large cutaway section on the scanner frame [B] from which the top L stay [A] was removed.
(5) Remove the two screws (small pan-head, M3 x 6), detach the wire harness from the wire clamp and wire saddle, and then remove the lamp [D].



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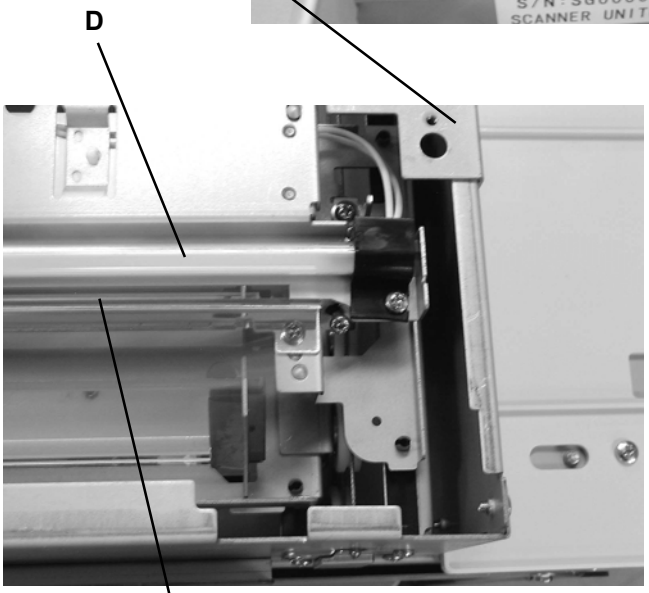

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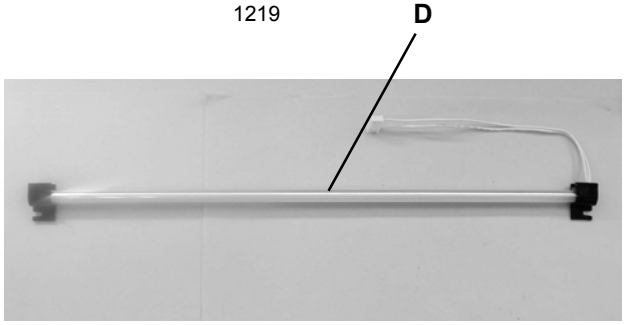

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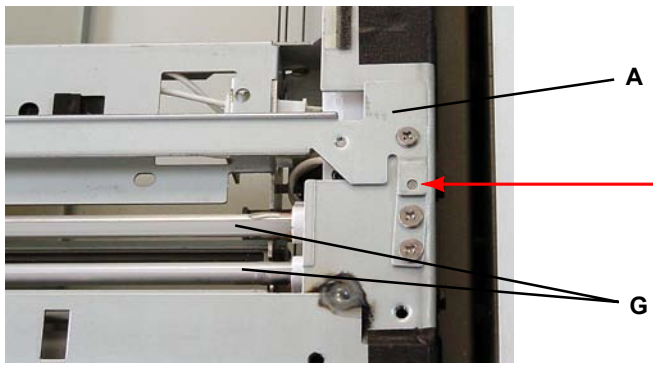
A: Top L stay
B: Scanner frame
C: Lamp carriage
D: Lamp

4-2. Removing the Lamp (RN20/21 Series)

(1) Switch off the power, and remove the stage glass.
(2) Remove the stage glass holder [A] by removing two special screws.
(3) Push the lamp carriage [B] by hand (taking care not to touch optical components) and move it to the cutaway [C] in the scanner unit frame.
    * **Perform the following procedures on the cutaway section on the operation panel side of the scanner unit.**
(4) Remove the lamp wire harness stopper [D], a plastic sheet which prevents the lead wires of the lamps from lifting up, by removing one screw (M3 x 6).
(5) Remove the wire harness connectors [E] of the lamps.
(6) Remove the lamps [G].
    a) To remove the lamp on the right-hand side (paper ejection side) of the lamp carriage: Remove the lamp bracket (with screw hole) [F] by removing screw (M3 x 4), and then remove the lamp [G] by gently sliding it out towards the front.
    b) To remove the lamp on the left-hand side (paper feed side) of the lamp carriage: Standing in front of the paper-feed tray, push back the top portion of the lamp bracket [H] to unlock it from the lamp carriage and pull it up gently to disengage it from the lamp carriage. Gently slide the lamp [G] out.

[Precautions on Reassembly]

- Slide the slits on the ends of the lamp [G] into the guide rails on the lamp brackets [F], [H] to hold the lamp in position. Slide the lamp into the lamp bracket on the rear first, and then into the removed bracket in the front. Then mount the front lamp bracket onto the lamp carriage.
- Mount the lamp wire harness stopper [D] on the lamp carriage while pushing down the lead wires.
- Secure the stage glass holder [A] on the scanner unit by fitting the positioning holes on the both ends firmly into the positioning pins before tightening the screws.



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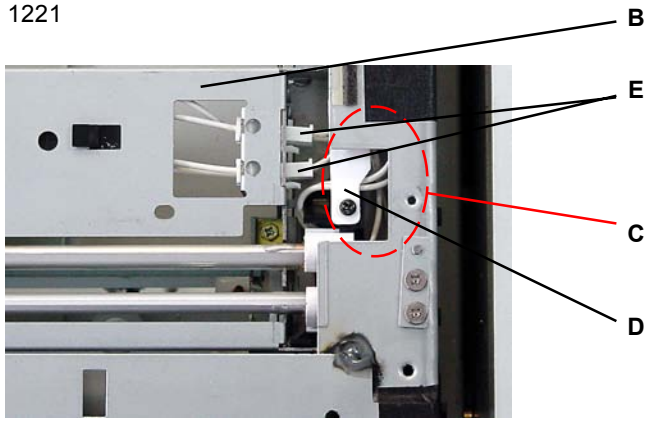

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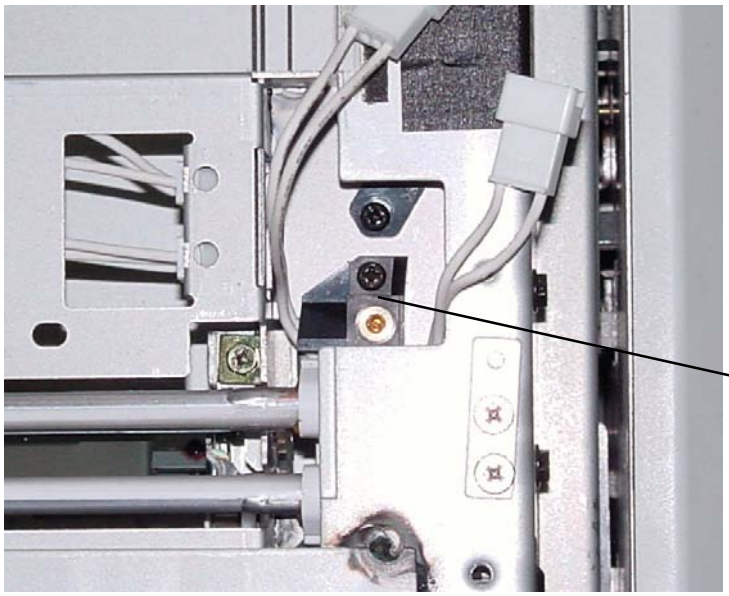
A: Stage glass holder
B: Lamp carriage
C: Cutaway
D: Lamp wire harness stopper
E: Connectors
F: Lamp bracket (with screw hole)
G: Lamp
H: Lamp bracket



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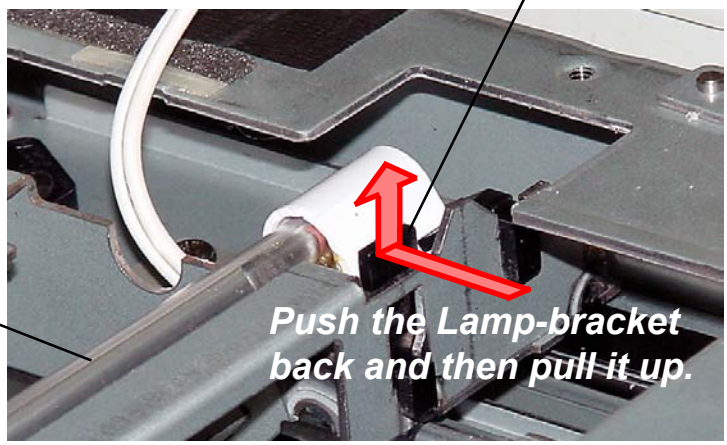

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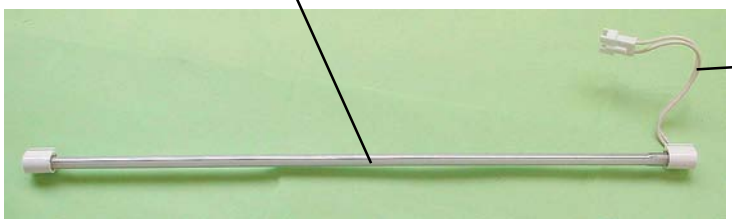

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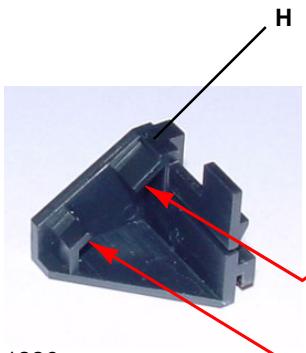

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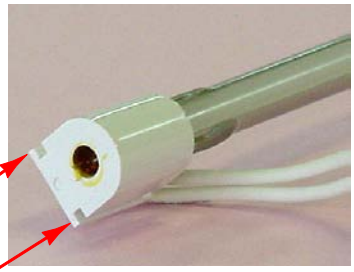

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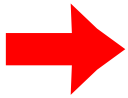

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Engage

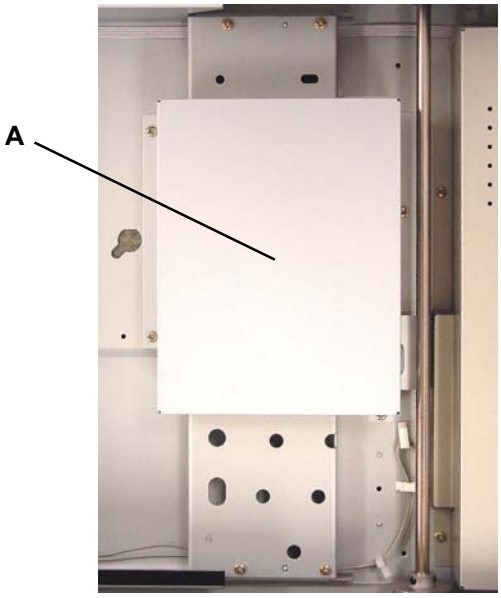
5-1. Removing the Lens Ass'y (RN25 Series)

(1) Switch off the power.
(2) Remove the stage glass.
(3) Remove the mounting screw (bind, M3 x 6: 5 pcs), and detach the lens cover [A].
(4) Remove the four screws (double-washer, M3 x 8), and then remove the lens ass'y [B].

* Never loosen any screws other than those indicated by the arrows in the photograph.

[Precautions on Reassembly]

- Align the half-pierced sections on the front and rear of the lens ass'y.
- Do not touch the lens or other optical components.



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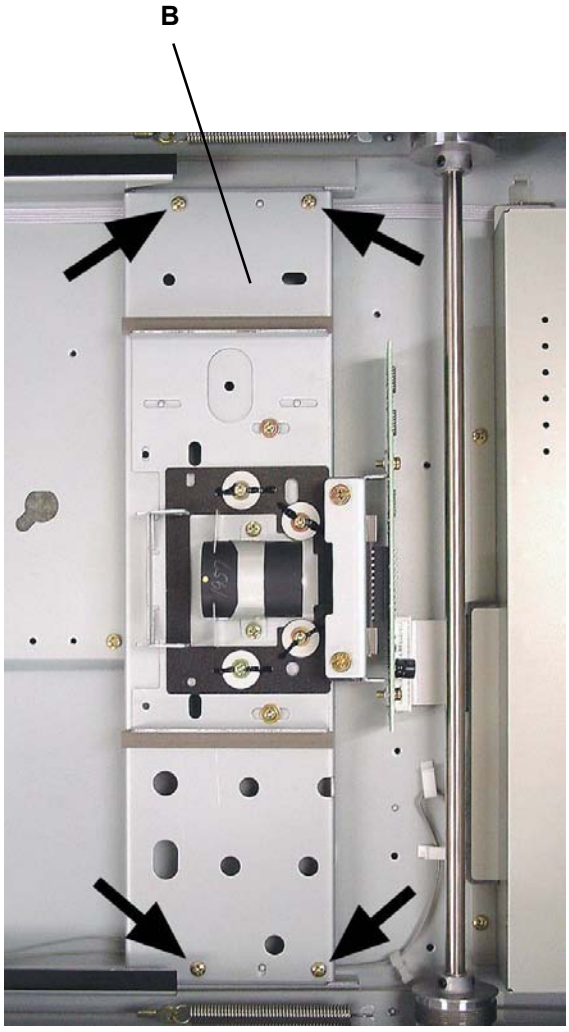


1230

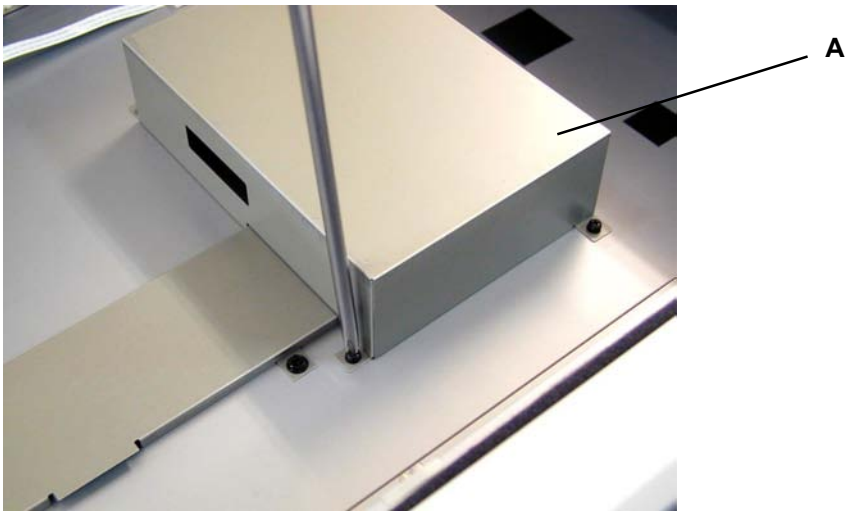
A: Lens cover
B: Lens ass'y

5-2. Removing the Lens Ass'y (RN20/21 Series)

(1) Switch off the power.
(2) Remove the stage glass.
(3) Remove the lens cover [A] by unscrewing the mounting screws (double-washer, M3 x 6: 3 pcs).
(4) Remove the three cap screws (M3 x 6 + PW), detach the ground wire and connector, and then remove the lens ass'y [B].

[Precautions on Reassembly]

- Align the two half-pierced sections [C] on the front of the lens ass'y.
- Do not loosen any screws other than those specified.
- Do not touch the lens or other optical components.



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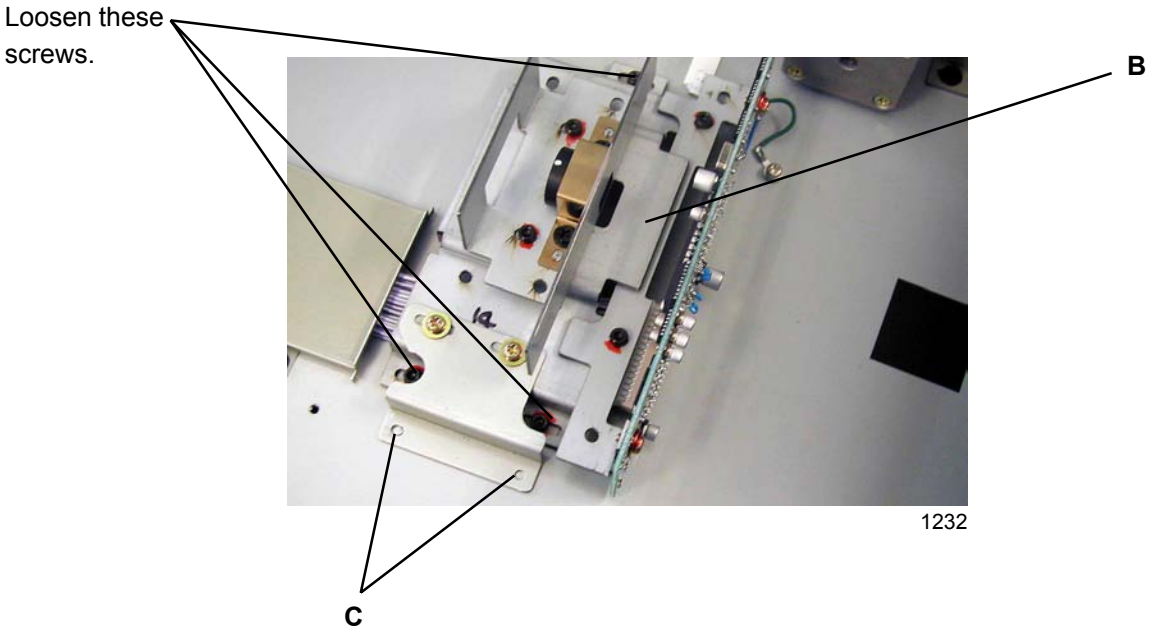


1232

A: Lens cover
B: Lens ass'y
C: Half-pierced sections

Adjustment

1. FB Image Elongation & Shrinkage Adjustment

The adjustment method is the same as that for the new scanner. Refer to the adjustment instructions in Chapter 11 “FB Original Scanning Section (New Scanner).”

2. FB Scan Start Position Adjustment

The adjustment method is the same as that for the new scanner. Refer to the adjustment instructions in Chapter 11 “FB Original Scanning Section (New Scanner).”

3. FB Horizontal Scan Position Adjustment

The adjustment method is the same as that for the new scanner. Refer to the adjustment instructions in Chapter 11 “FB Original Scanning Section (New Scanner).”

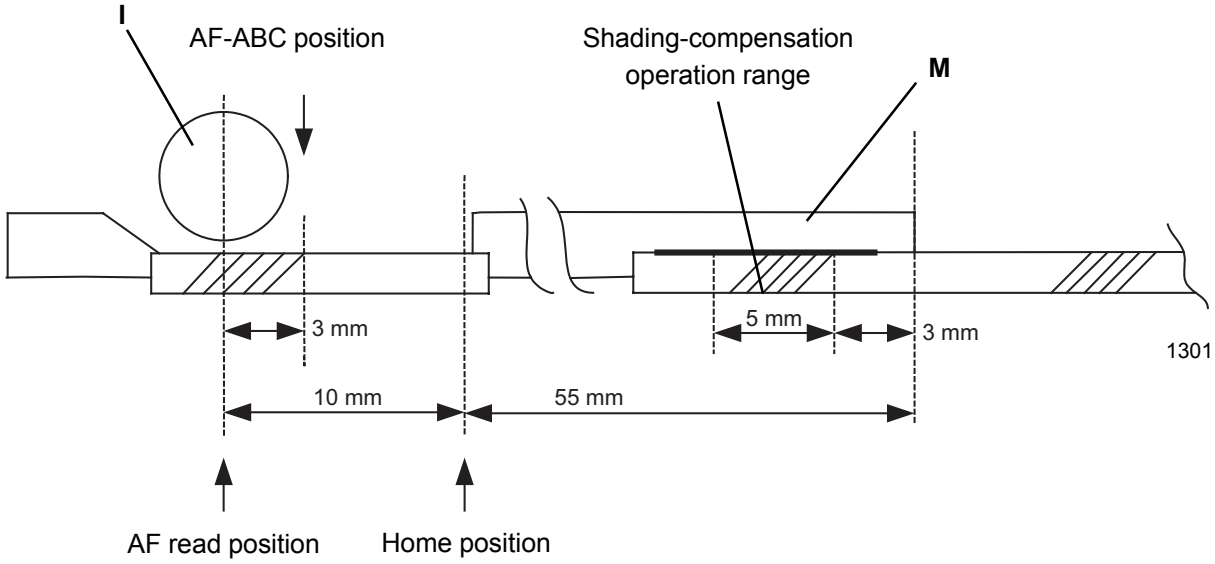
CHAPTER 13: AF SCANNING SECTION (RN25 Series)

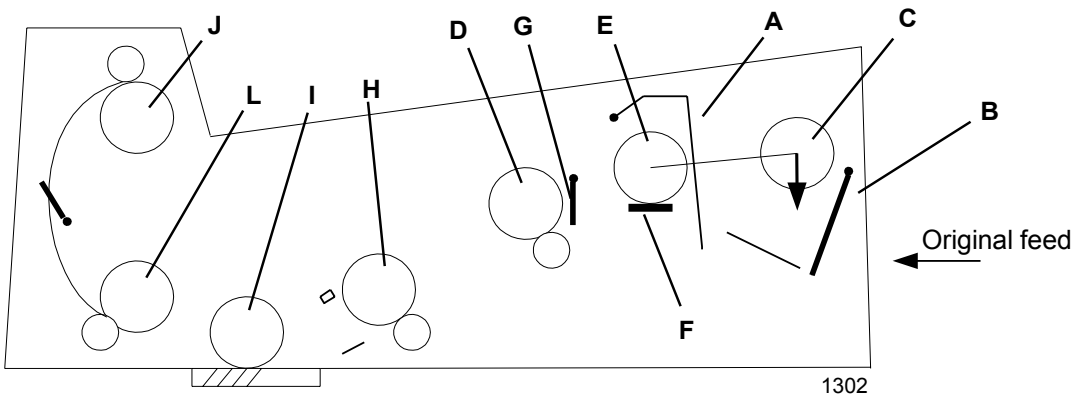
Contents

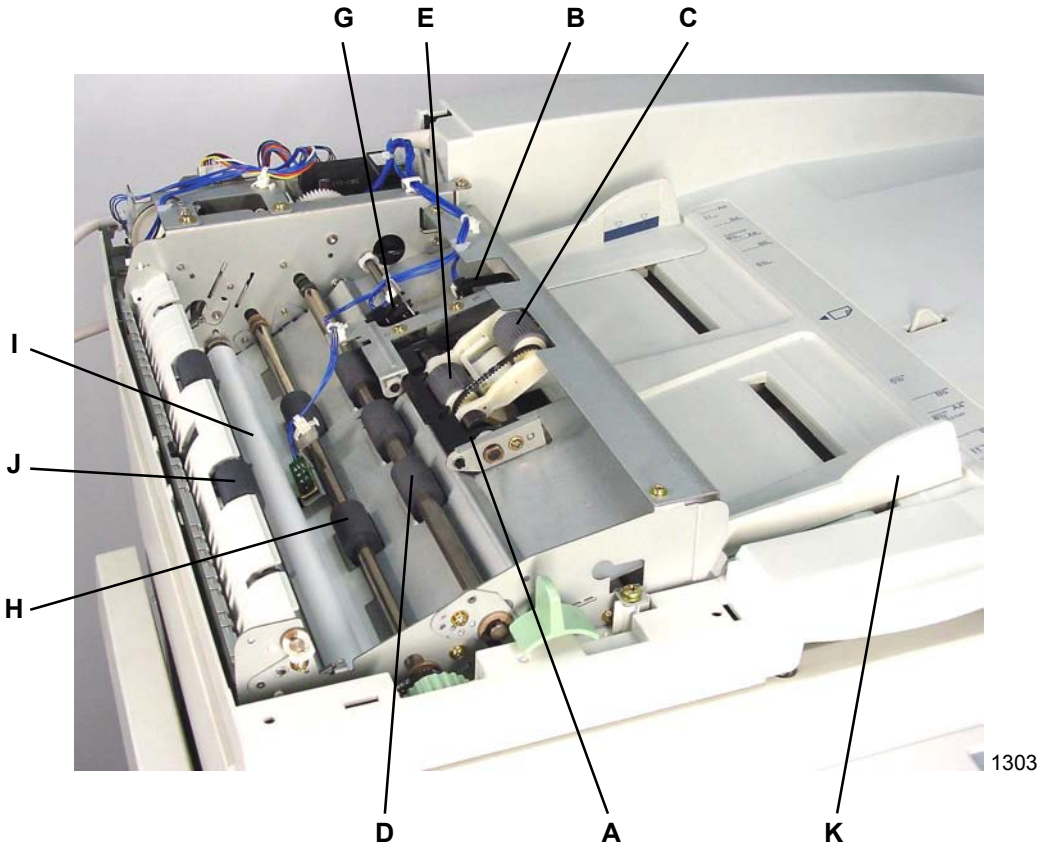
Mechanism

1. AF Original Set Mechanism

When an original is set along the original guide fence [K] and pushed up against the original stopper gate [A], the AF original detection sensor [B] turns ON (receives light) and the Master/Print indication on the panel changes to “Ready to make master.”
After a set length of time, the AF read pulse motor operates in the reverse direction, lowering the pickup roller [C] in the direction indicated by the arrow and withdrawing the original stopper gate [A] upward. (In this step, the one-way clutch incorporated between the registration-roller gear and registration-roller shaft prevents the registration roller [D] from rotating.)
When the pickup roller [C] descends and presses against the original, the pickup roller [C] and original stripper roller [E] rotate in the original transport direction, and a single original is fed forward by the action of the original stripper roller [E] and the original stripper pad [F]. This activates the AF original registration sensor [G] (light blocked), and the edge of the original is stopped by the stationary registration roller [D].
When the AF original registration sensor [G] turns ON, after a preset length of time the AF read pulse motor starts rotating in the forward direction. This raises the pickup roller [C] and turns the registration roller [D], the two read rollers [H] [L], the white roller [I], and the original ejection roller [J], all of which are linked by the timing belt, in the feed direction.
The original stops temporarily when it moves 90 mm from the original set position.
Meanwhile, when the AF original detection sensor [B] turns ON, the lamp carriage in the scanner unit conducts a series of operations from lamp illumination to shading compensation, then moves to the AF read position and stops in the standby mode.
If the Start key is not pressed within 60 seconds, the lamp turns off and the lamp carriage returns to the home position. Only when the Start key is pressed, the shading compensation operation is conducted (as well as the auto-base-control operation if the original scanning density is set to AUTO), and the scanning operation begins.
When the Start key is pressed within 60 seconds, the scanning operation starts immediately if the original scanning density is not set to AUTO. If it is set to AUTO, the lamp carriage returns to the home position, and the shading-compensation and auto-base-control operations are performed before the scanning operation starts.







A: Original stopper gate
B: AF Original detection sensor
C: Pickup roller
D: Registration roller
E: Original stripper roller
F: Original stripper pad
G: AF original registration sensor
H: Read roller 1
I: White roller
J: Original ejection roller
K: Original guide fence
L: Read roller 2
M: Original stopper (AF)

2. AF Set Detection Mechanism

Whether the AF is closed over the stage glass or not is checked by the AF cover set sensor [E].

The AF cover set sensor [E] is attached on the AF unit.

E: AF cover set sensor

1340

3. AF Original Scanning Mechanism (with Automatic Base Control)

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

Once the AF original set operation is complete, pressing the Start key moves the lamp carriage to the shading position. After performing the shading-compensation operation, the lamp carriage moves to the AF-ABC position. Meanwhile, the AF read pulse motor rotates in the forward direction, rotating the registration roller, the two read rollers, the white roller, and the original ejection roller in the feed direction. After the AF original IN sensor turns ON (light blocked), the paper is fed for a distance of 22.5 mm and stops. At this position (AF-ABC position), the image sensor scans the surface density of the original. Then, the flatbed read pulse motor moves the lamp carriage back by 3 mm in the return direction (to the AF read position).

The AF read pulse motor immediately rotates in the forward direction and, at the same time, the print signal turns ON and the original scanning operation starts.

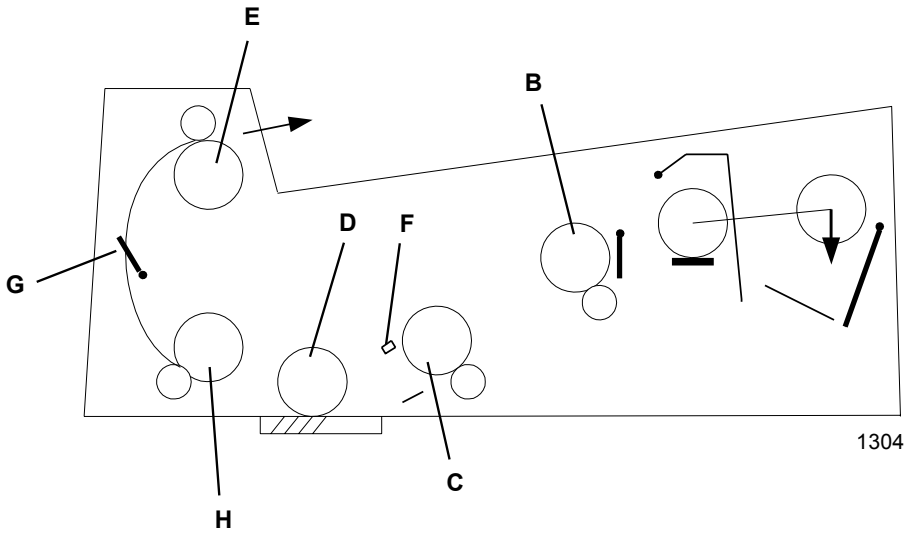
When a preset length of time elapses after the AF original IN sensor turns OFF (receives light) due to the passing of the original, the print signal turns OFF. As soon as the scanning operation is complete, the AF read pulse motor starts operating at high speed.

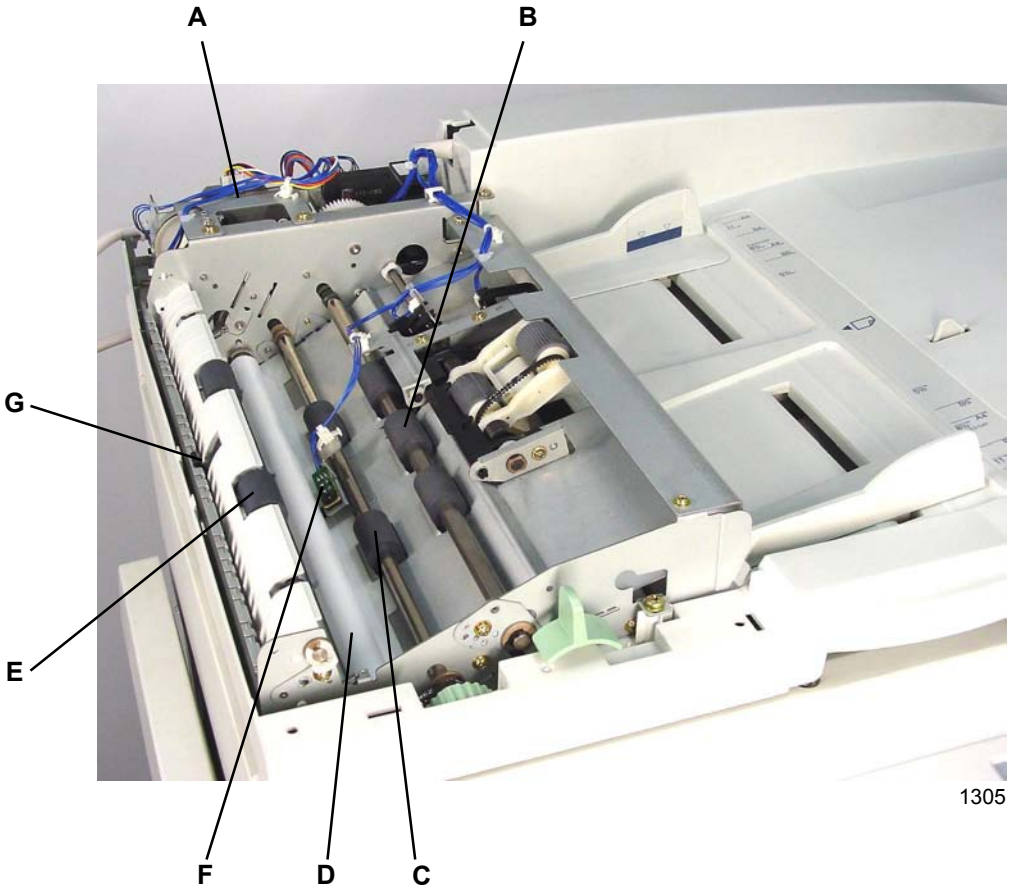
When the AF original ejection sensor turns OFF, the original is sent a preset distance and then the AF read pulse motor stops. The lamp carriage returns to the home position, and the AF read operation ends.

The auto-base control function is inactive in the Photo, mixed Text/Photo, and Dot-screening modes.

4. AF Original Scanning Mechanism

When the Start key is pressed after the AF original set operation is complete, the AF read pulse motor [A] rotates in the forward direction, turning the registration roller [B], the two read rollers [C] [H], the white roller [D], and the paper ejection roller [E] in the feed direction. When the AF original IN sensor [F] turns ON (light blocked), the original is sent a distance of 25.5 mm, and then the print signal turns ON and the original scanning operation starts. (The pickup roller returns to the standby position.)
When a preset length of time has elapsed after the AF Original IN sensor [F] turns OFF (receives light) due to the passing of the original, the print signal turns OFF and, at the same time, the AF read pulse motor [A] starts operating at high speed.
After the AF original ejection sensor [G] turns OFF, the original is sent a preset distance, and then the AF read pulse motor [A] stops. The lamp carriage returns to the home position, and the AF read operation ends.



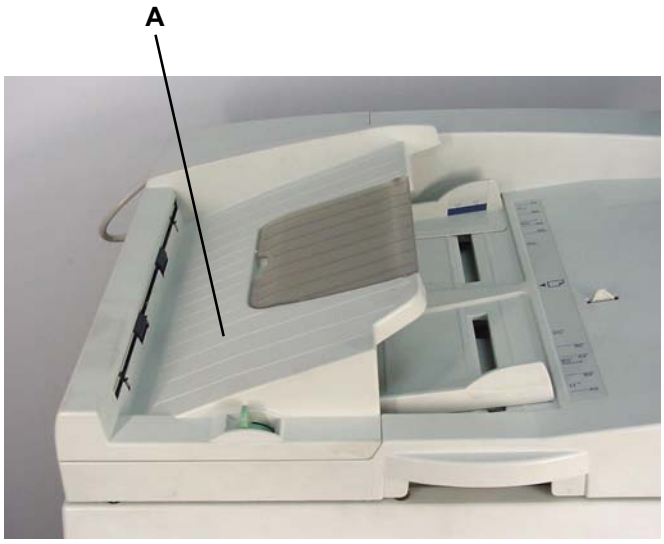


A: AF read pulse motor
B: Registration roller
C: Read roller 1
D: White roller
E: Paper ejection roller
F: AF original IN sensor
G: AF original ejection sensor
H: Read roller 2

Removal and Assembly

1. Removing the Original Pickup Asembly

(1) Remove the top cover [A] by loosening the screws (M4 x 6: 3 pcs) on the front of the top cover and removing the screws (4 x 10: 2 pcs) from the rear.
(2) Disconnect the two connectors and the reusable band [C], remove the screws (M3 x 4: 2 pcs), and detach the sensor-bracket assembly [B].



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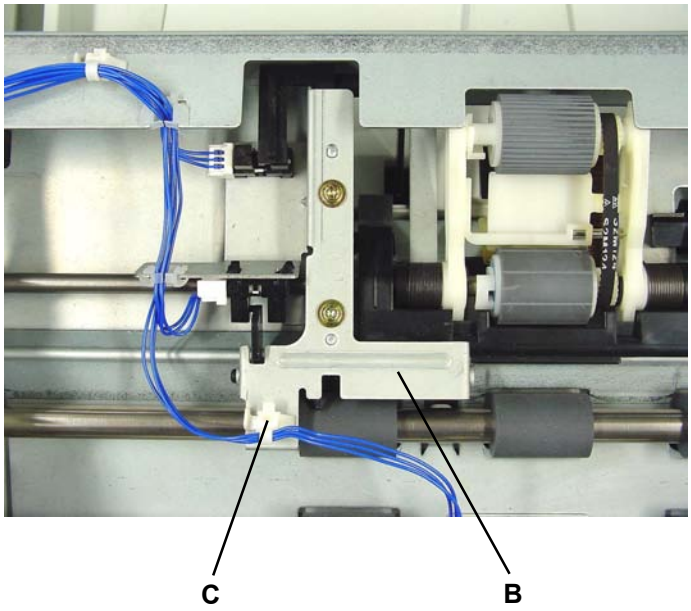
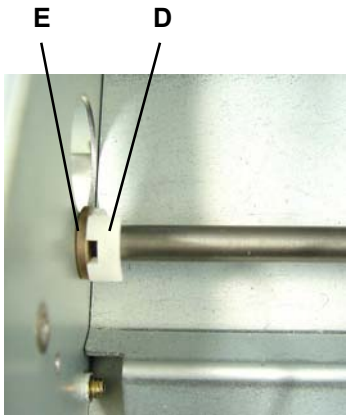


1307

A: Top cover
B: Sensor-bracket assembly
C: Reusable band

(3) Remove the resin clips [D] from both sides, pull the bearing metals [E] toward the inside, and remove the original pickup assembly [F] by passing the drive gear on the rear of the assembly through the hole on the side panel.



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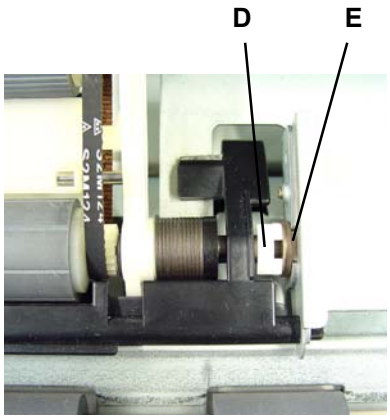

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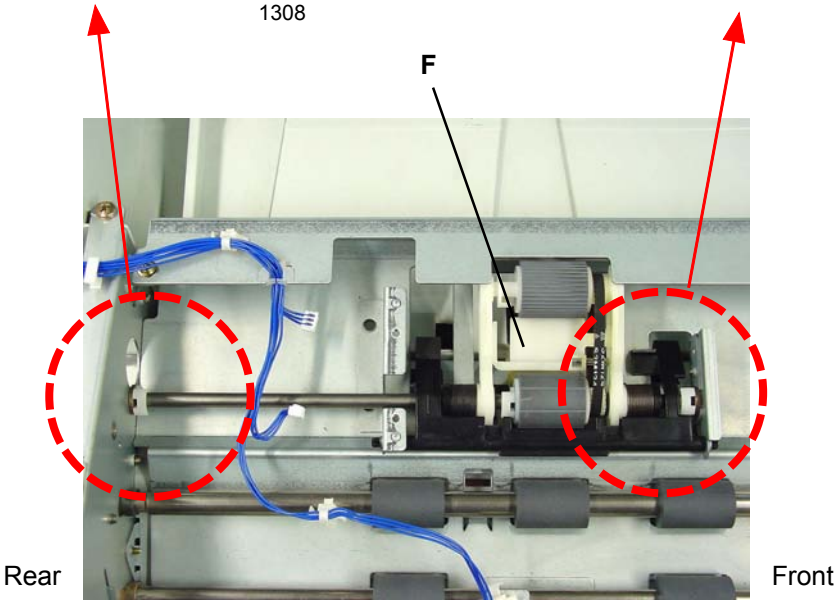

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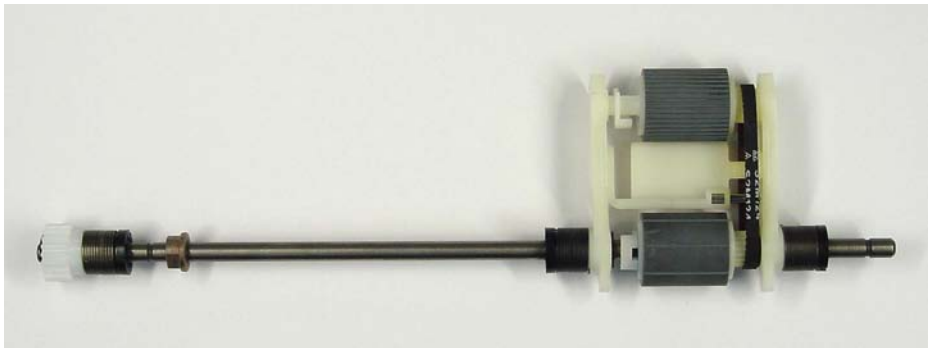


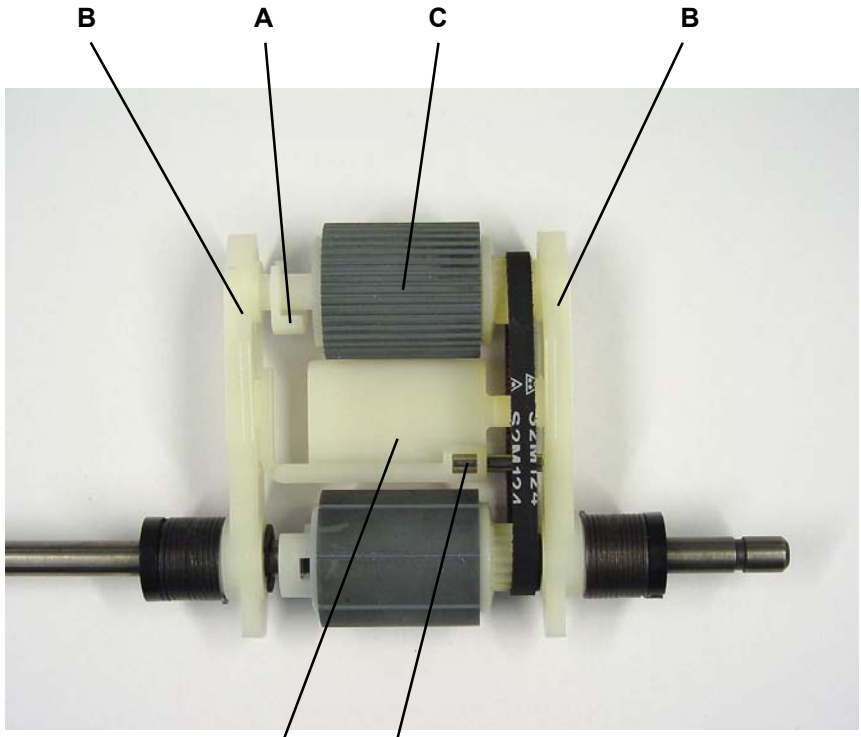
Original pickup assembly

1311

D: Resin clip
E: Bearing metal
F: Original pickup assembly

2. Removing the Original Pickup Roller

(1) Remove the original pickup assembly (refer to the removal instructions in this Chapter).
(2) Remove the resin clip [A], open the end of the K holder [B], and remove the pickup roller [C]. (Note that the K holder C [D] and parallel pin [E] may fall during disassembly.)



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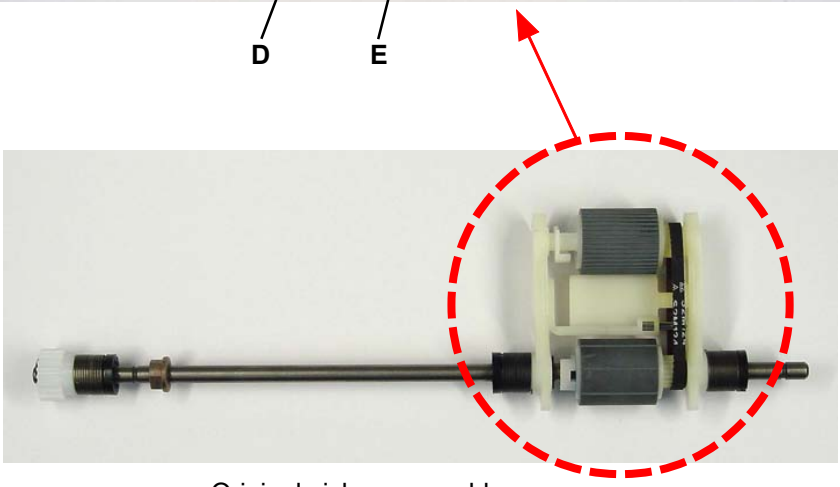

1313

Original pickup assembly

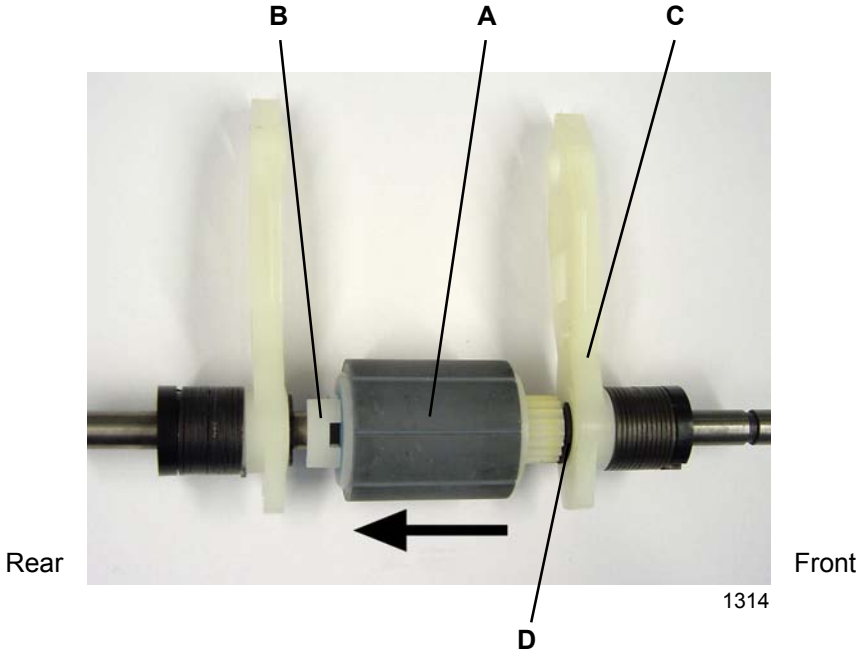
A: Resin clip
B: K holder
C: Original pickup roller
D: K holder C
E: Parallel pin

3. Removing the Original Stripper Roller

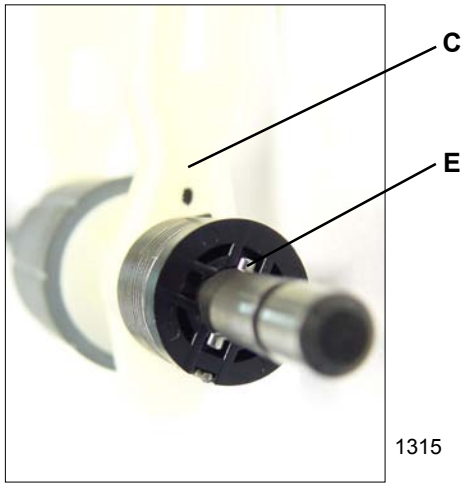
(1) Remove the original pickup assembly (refer to the removal instructions in this Chapter).
(2) Remove the K holder C, parallel pin, and pickup roller (refer to the removal instructions in this Chapter).
(3) Remove the resin clip [B] from the rear of the original stripper roller [A], and move the original stripper roller in the direction indicated by the arrow.
(4) Remove the E-ring [D], move the K holder F assembly [C] slightly in the direction indicated by the arrow, pull out the parallel pin holding the K holder F assembly [C] in place from the shaft, and remove the K holder F assembly [C].
(5) Remove the original stripper roller [A].

[Precautions on Reassembly]

- When installing the parallel pin to hold the K holder F assembly in place, be sure to insert it into the shallower groove on the K holder F assembly.
- The original stripper roller must be installed with the correct orientation. Be sure to position the gear side on the front of the machine.



A: Original stripper roller
B: Resin clip
C: K holder F assembly
D: E-ring
E: Parallel pin



Installation of the K holder F assembly and parallel pin

4. Removing the Original Stripper Pad Assembly

(1) Remove the original pickup assembly (refer to the removal instructions in this Chapter).

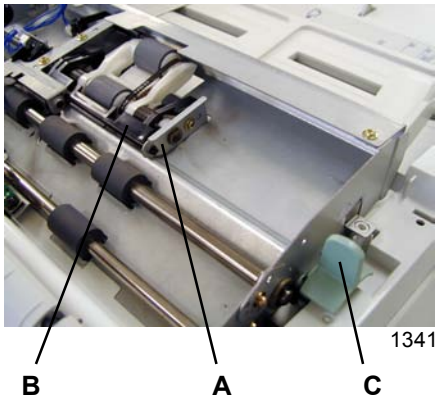
(2) Detach original stopper bracket [A] by removing one screw (M3 x 4), and remove the original stopper [B].

(3) Using the original release lever [C], elevate down the original stripper section.

(3) Being careful not to drop the spring under the original stripper pad assembly [D], slide back the assembly to disengage it out from the hooks and then take it out from the AF unit through the opening.

[Precautions on Reassembly]

- In putting the original stripper pad assembly [D] back into the AF unit, place an adhesive tape [E] on the assembly (ref: photograph), and elevate down the original stripper section by using the original release lever [C]. Push the assembly down into the opening under the stripper sheet [F] and attach the spring firmly onto the assembly.
- Use the attached adhesive tape to pull the original stripper pad assembly [D] to hook it onto the AF unit.
- Remove the adhesive tape once the original stripper pad assembly [D] is fixed in its position.



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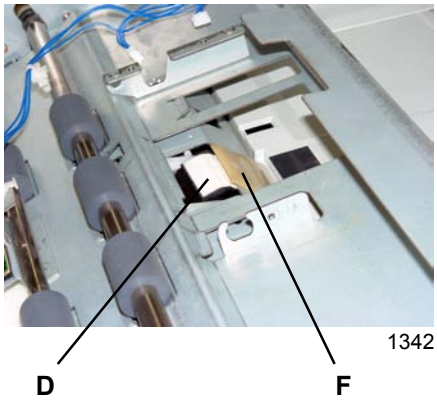

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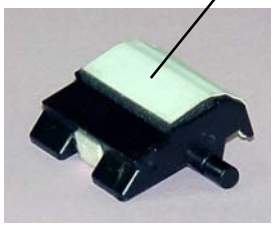
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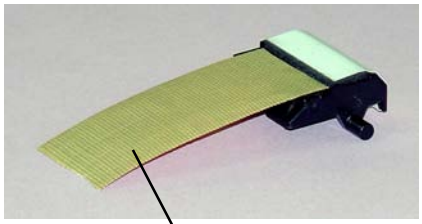

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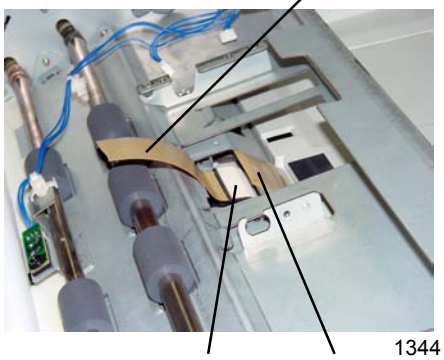


1344

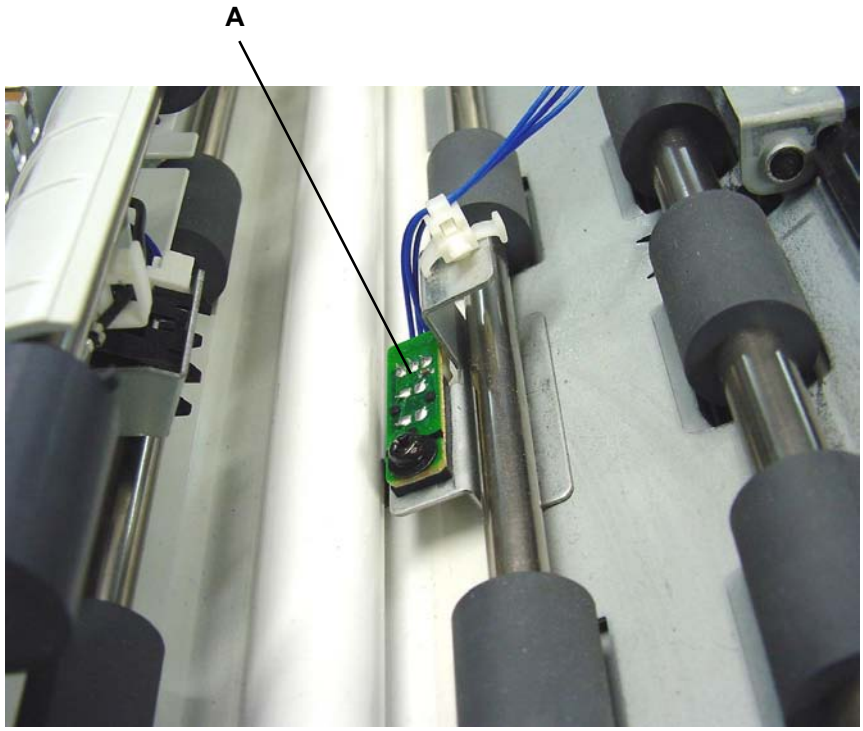
A: Original stopper bracket
B: Original stopper
C: Original release lever
D: Original stripper pad assembly
E: Adhesive tape
F: Stripper sheet

5. Removing the AF Original IN Sensor

(1) Remove the top cover by loosening the screws (M4 x 6: 3 pcs) on the front of the top cover and removing the screws (M4 x 10: 2 pcs) from the rear.
(2) Remove the screw (M3 x 8: 1 pc), disconnect the connector, and remove the AF original IN sensor [A].

[Precautions on Reassembly]

- Following reassembly, adjust the AF original IN sensor by using Test Mode No. 752 (AF-Read-Sensor Sensitivity Adjustment).

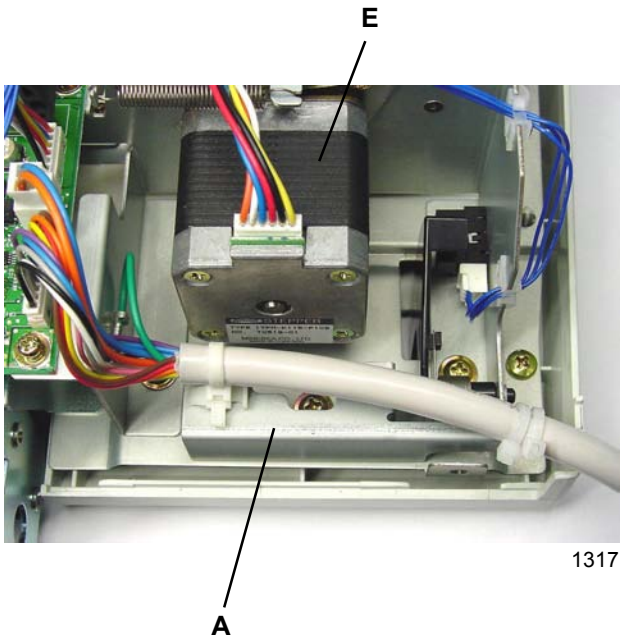


1316

A: AF original IN sensor

6. Removing the AF Read Pulse Motor

(1) Remove the top cover by loosening the screws (M4 x 6: 3 pcs) on the front of the top cover and removing the screws (M4 x 10: 2 pcs) from the rear.
(2) Remove the screw (M4 x 6: 1 pc), and move the harness-bracket assembly [A] to the side.
(3) Remove the open lever [B] together with the open-lever spring [C].
(4) Detach the tension spring [D], remove the mounting screws (M3 x 6: 2 pcs), and then remove the AF read pulse motor [E] together with the motor tension bracket [F].



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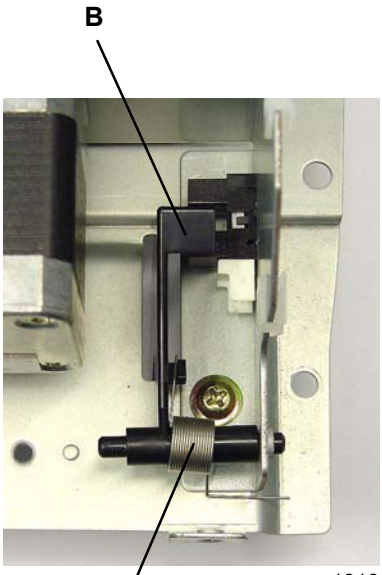

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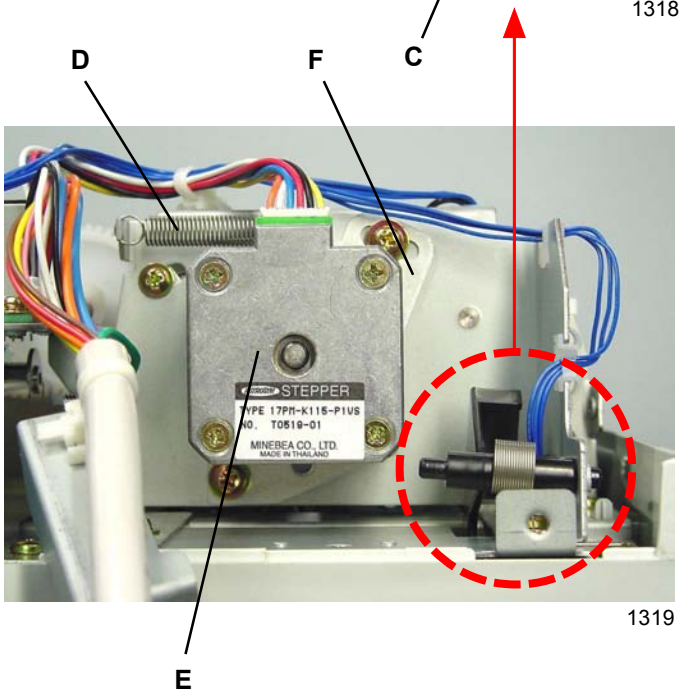
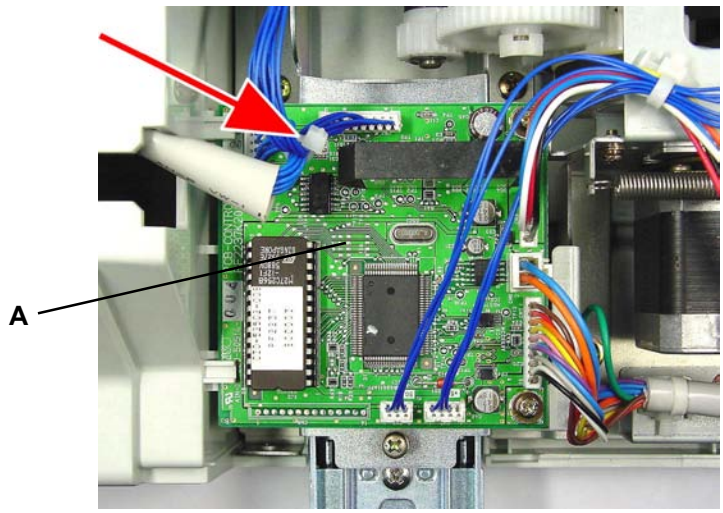


1319

A: Harness-bracket assembly
B: Open lever
C: Open-lever spring
D: Tension spring
E: AF read pulse motor
F: Motor tension bracket

7. Removing Other Rollers

(1) Detach the AF unit from the machine.
(2) Remove the top cover by loosening the screws (M4 x 6: 3 pcs) on the front of the top cover and removing the screws (M4 x 10: 2 pcs) from the rear.
(3) Disconnect the connector, and remove the Control PCB [A] (M3 x 6: 2 pcs).
(4) Cut the band indicated by the arrow in the photograph, remove the mounting screws (PM4 x 10: 7 pcs; M4 x 10 + Washer: 2 pcs on the front), and detach the AF mechanism unit.



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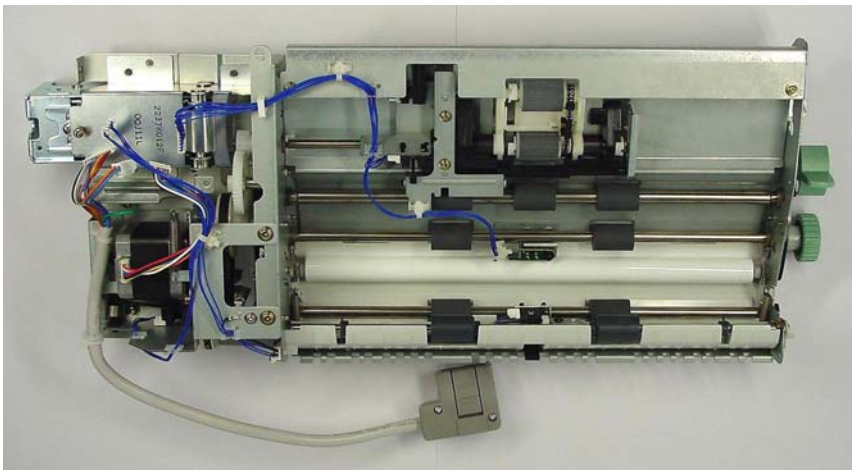

1321

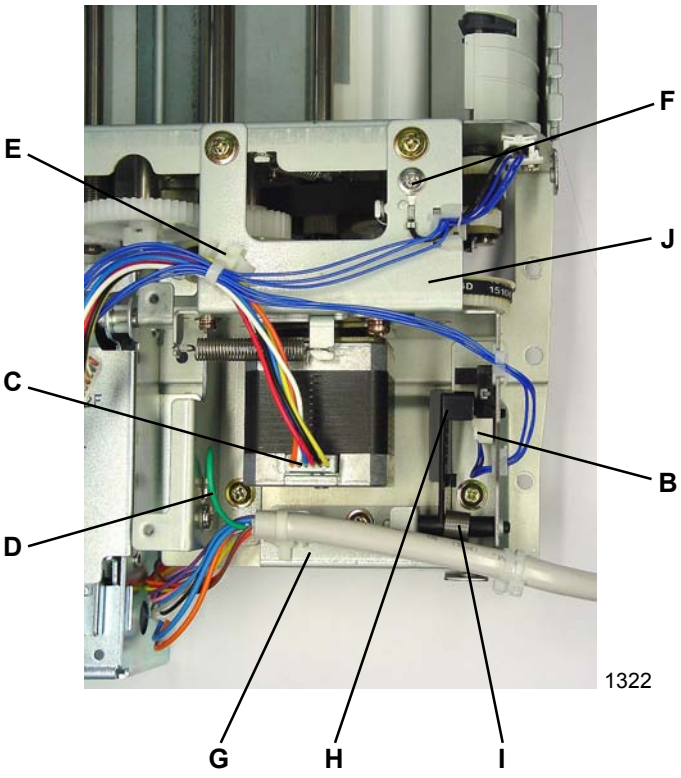
AF mechanism unit

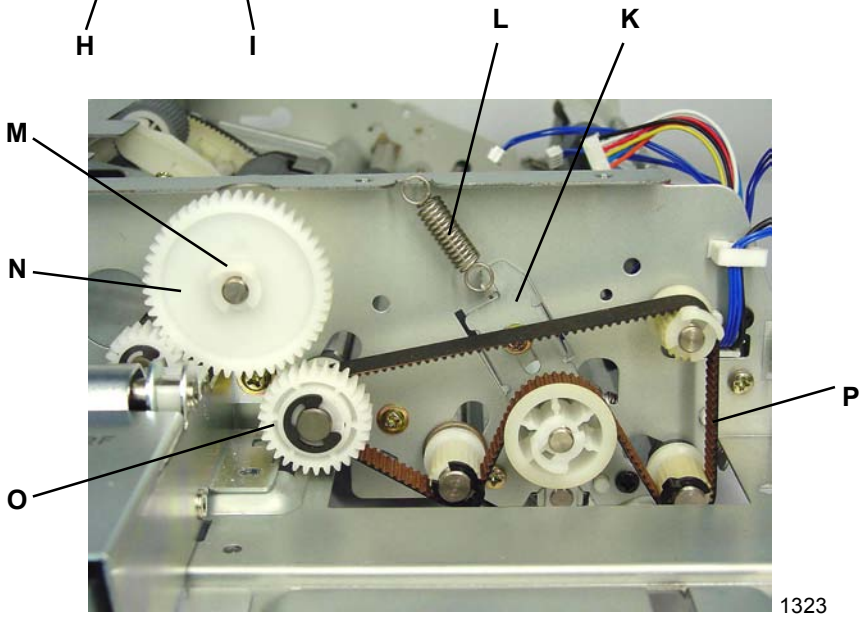
A: Control PCB
B: AF cover set sensor connector
C: AF read pulse motor connector
D: Ground wire
E: Reusable band
F: Ground wire from the harness-bracket assembly
G: Harness-bracket assembly
H: Sensor actuator disc
I: Actuator disc spring
J: Motor-bracket ass'y
K: Idler ass'y
L: Idler spring
M: Resin clip
N: Spur gear
O: Gear ass'y
P: Timing belt No.1

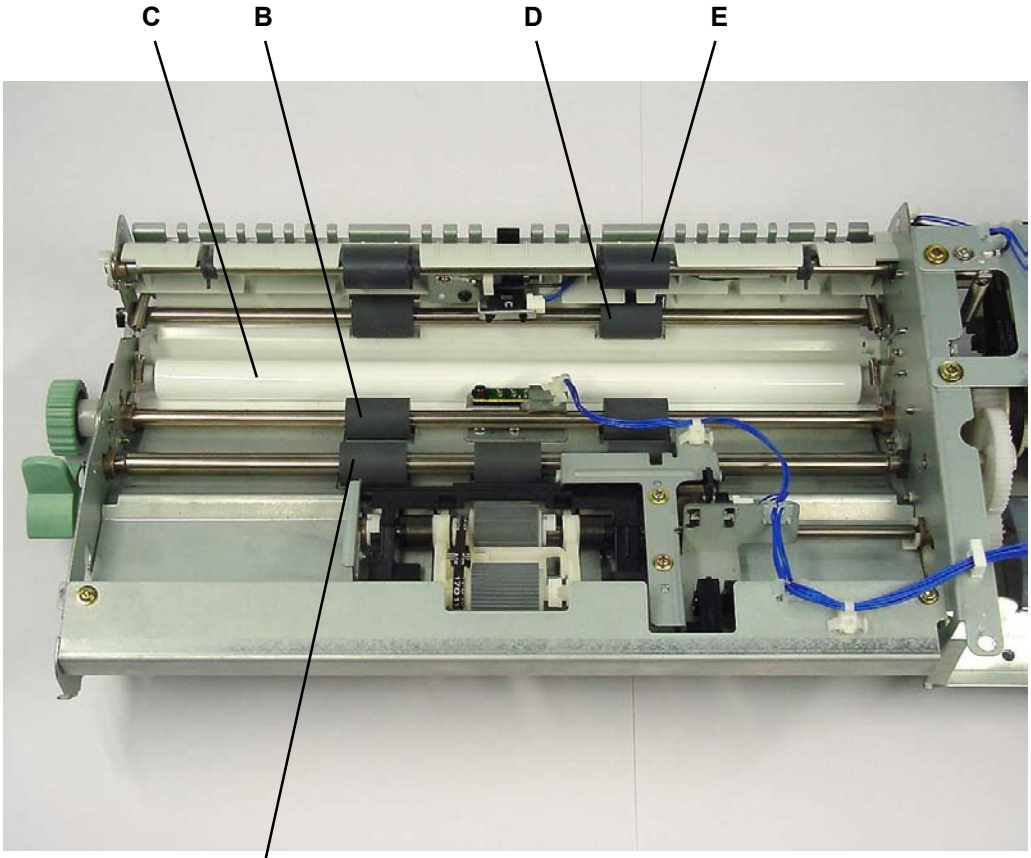
(5) Disconnect the AF cover set switch connector [B] and AF read pulse motor connector [C], and detach the ground wire [D] by removing screw (M3 x 6: 1 pc).
(6) Remove the reusable band [E], detach the harness from the three harness clamps, and move the harness to the side.
(7) Detach the ground wire [F] from the harness-bracket assembly by removing screw (M4 x 6: 1 pc).
(8) Detach the harness-bracket assembly [G] by removing screw (M4 x 6: 1 pc).
(9) Remove the sensor actuator disc [H] together with the actuator disc spring [I].
(10) Detach the motor-bracket assembly [J] by removing screws (M4 x 6: 4 pcs).
(11) Loosen the idler assembly [K] securing screws, and remove the idler spring [L].
(12) Remove the resin clip [M], spur gear [N], E-ring, gear assembly [O], and timing belt No. 1 [P], in that order.

[Precautions on Reassembly]

- The gear assembly has a built-in one-way clutch. Be sure to install the gear assembly with the stamped face toward the front.





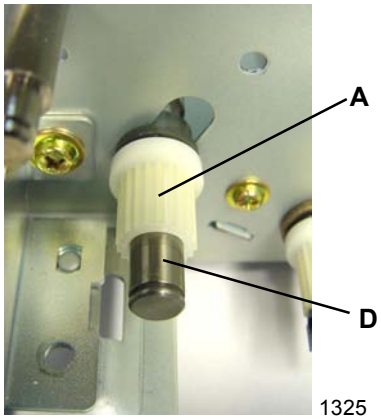


< Layout of the rollers >

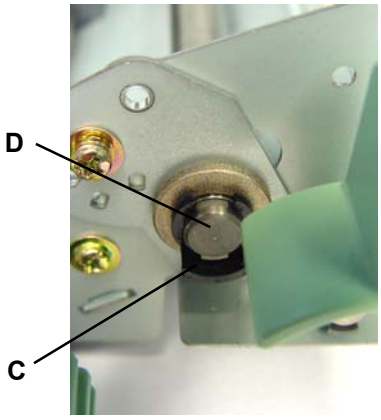
A: Registration roller
B: Read roller No. 1
C: White roller
D: Read roller No. 2
E: Original ejection roller

Removing the registration roller

(13) Remove the timing pulley [A] from the rear side of the roller. Also remove the parallel pin [B] at the same time.
(14) Remove the E-ring, and detach the bearing metal.
(15) Remove the resin clip [C] from the front side of the roller, and detach the bearing metal.
(16) Remove the registration roller [D].

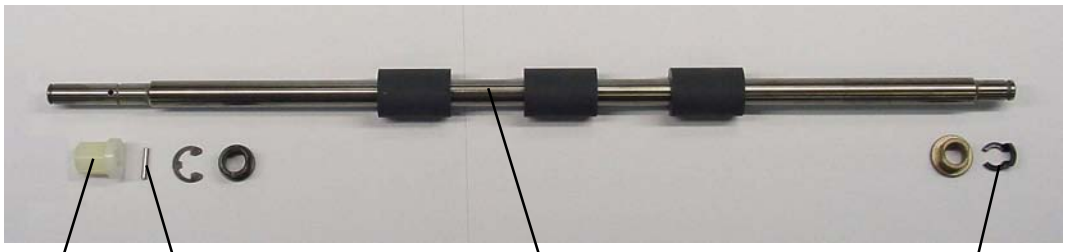


1325



1326

Rear Front



1327

A: Timing pulley
B: Parallel pin
C: Resin clip
D: Registration roller

Removing the read roller No. 1

* Before removing the read roller No. 1, detach the registration roller.

(13) Remove the resin clip [A] from the rear side of the roller, and detach the timing pulley [B]. Also remove the parallel pin [C] at the same time.

(14) Remove the E-ring, and detach the bearing metal.

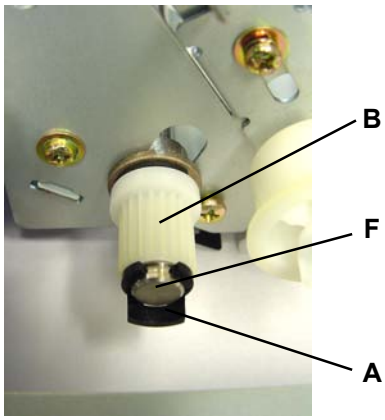
(15) Remove the E-ring from the front side of the roller, and detach the dial [D]. Also remove the parallel pin [C] at the same time.

(16) Remove the timing-pulley assembly [E], remove the E-ring, and detach the bearing metal.

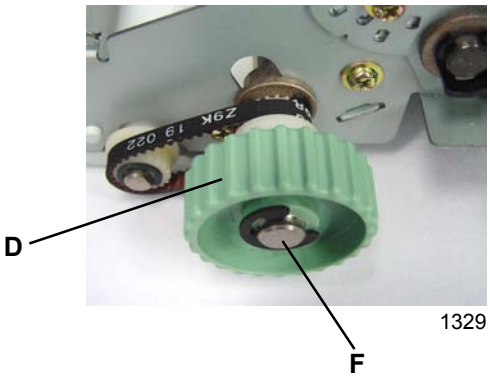
(17) Remove the read roller No. 1 [F].

[Precautions on Reassembly]

- The timing-pulley assembly [E] has a built-in one-way clutch. Be sure to install the gear assembly with the stamped face toward the front.

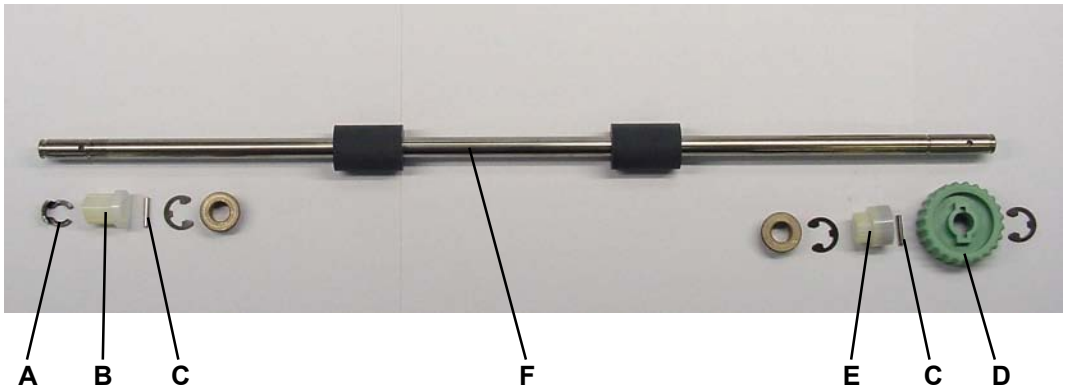


1328



1329

Rear Front

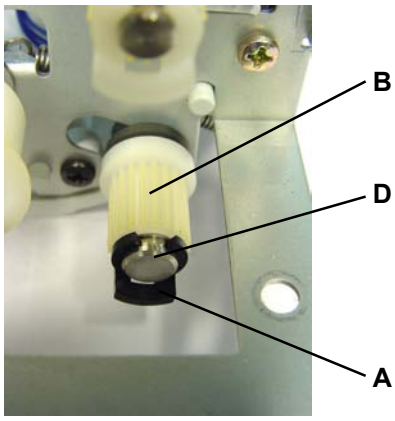


1330

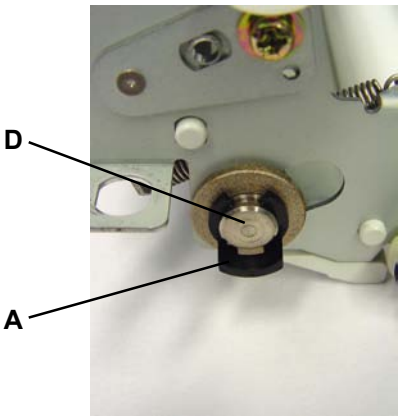
A: Resin clip
B: Timing pulley
C: Parallel pin
D: Dial
E: Timing-pulley assembly
F: Read roller No.1

Removing the read roller No. 2

(13) Remove the resin clip [A] from the rear side of the roller, and detach the timing pulley [B]. Also remove the parallel pin [C] at the same time.
(14) Remove the E-ring, and detach the bearing metal.
(15) Remove the resin clip [A] from the front side of the roller, and detach the bearing metal.
(16) Remove the read roller No. 2 [D].

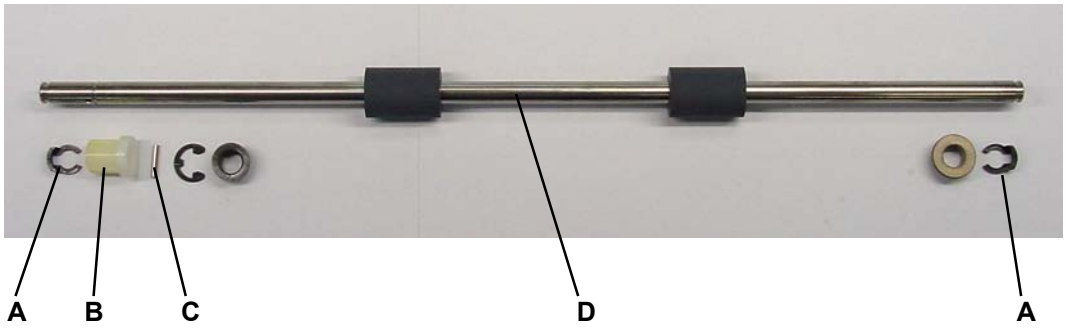


1331



1332

Rear Front

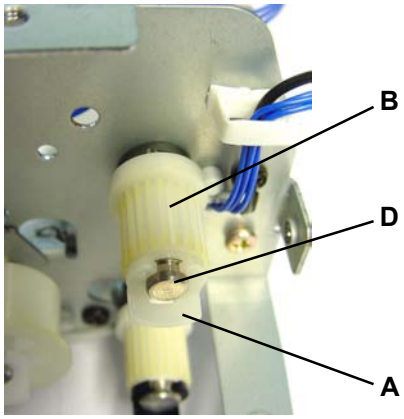


1333

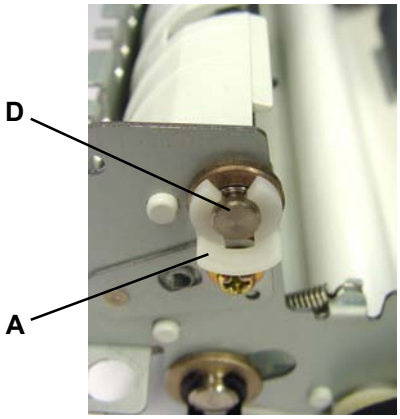
A: Resin clip
B: Timing pulley
C: Parallel pin
D: Read roller No. 2

Removing the original ejection roller

(13) Remove the resin clip [A] from the rear side of the roller, and detach the timing pulley [B]. Also remove the parallel pin [C] at the same time.
(14) Remove the E-ring, and detach the bearing metal.
(15) Remove the resin clip [A] from the front side of the roller, and detach the bearing metal.
(16) Remove the original ejection roller [D].ı

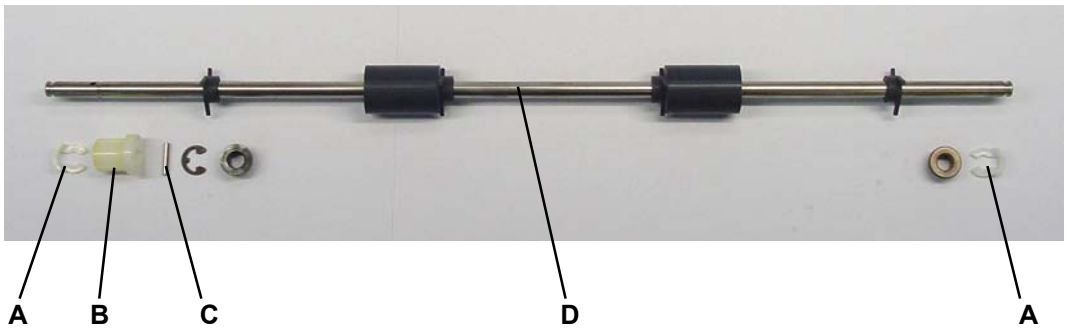


1334



1335

Rear Front



1336

A: Resin clip
B: Timing pulley
C: Parallel pin
D: Original ejection roller

Adjustment

1. AF Read Pulse-Motor Speed Adjustment (Elongation & Shrinkage)

Checks and procedure

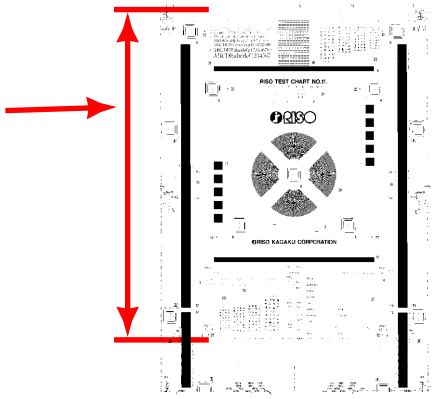
(1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using **test chart No.11** on the AF unit, and make prints.

(2) Lay the print on top of the original to confirm that the image elongation or shrinkage is within ±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).

* **Prior to adjustment, adjust the image elongation and shrinkage by first adjusting the write pulse-motor speed (see chapter 14).**

Test chart No.11



1350

2. AF Scan Start-Position Adjustment

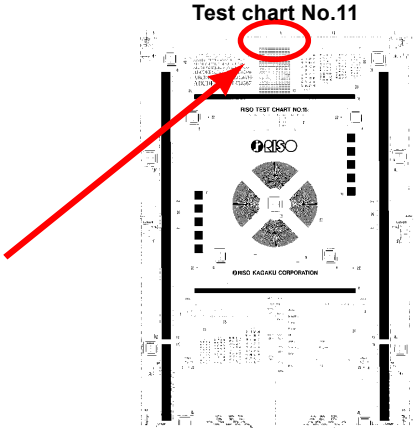
Checks and procedure

(1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using **test chart No.11 on** the AF unit, and make prints.

(2) Examine the prints to confirm that the scanning start position is at 4 mm ± 1 mm on the top vertical scale on the test chart No.11 printed image.

(3) If the 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



1351

3. AF Horizontal-Scan Position Adjustment

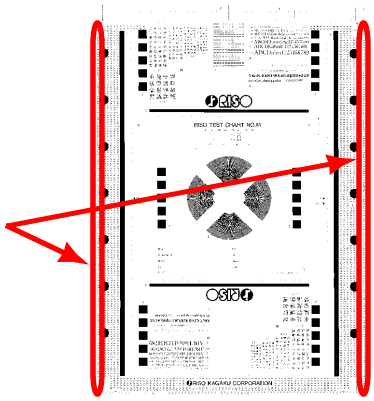
Checks and procedure

(1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using **test chart No.14** on the AF unit.

(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 on the created master.

(3) If not all the “e” images are made on the master, make adjustment using test mode No.782 (AF Horizontal Scan Position Adjustment).

Test chart No.14



1352

4. AF Original IN Sensor Sensitivity Adjustment

Adjustment

(1) Without an original, execute **Test Mode No. 752** ***[AF Original IN Sensor Sensitivity Adjustment]***. This will automatically adjust the sensitivity of the sensor.

*** This adjustment must be made after replacing the sensor.**

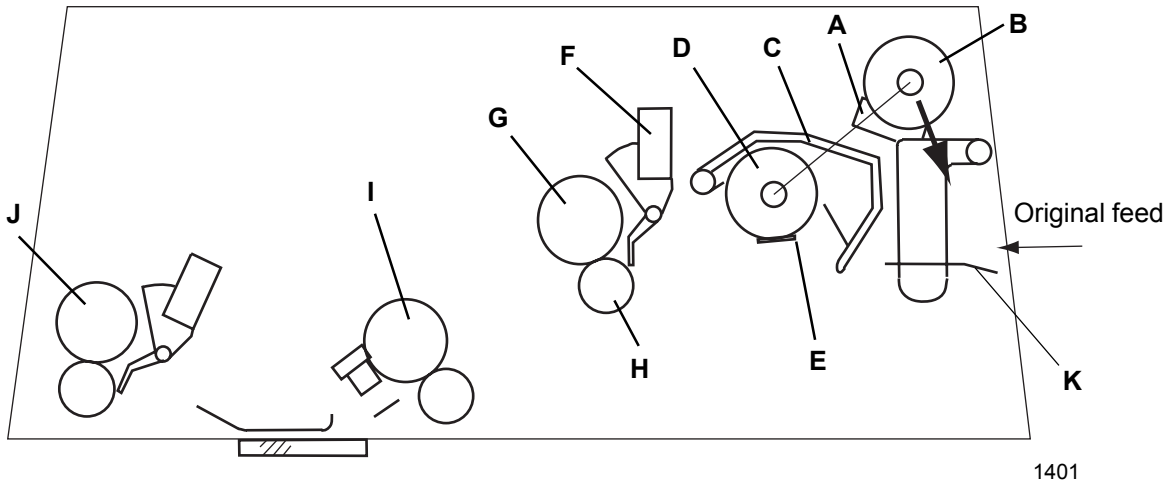
CHAPTER 14: AF SCANNING SECTION (RN20/21 Series)

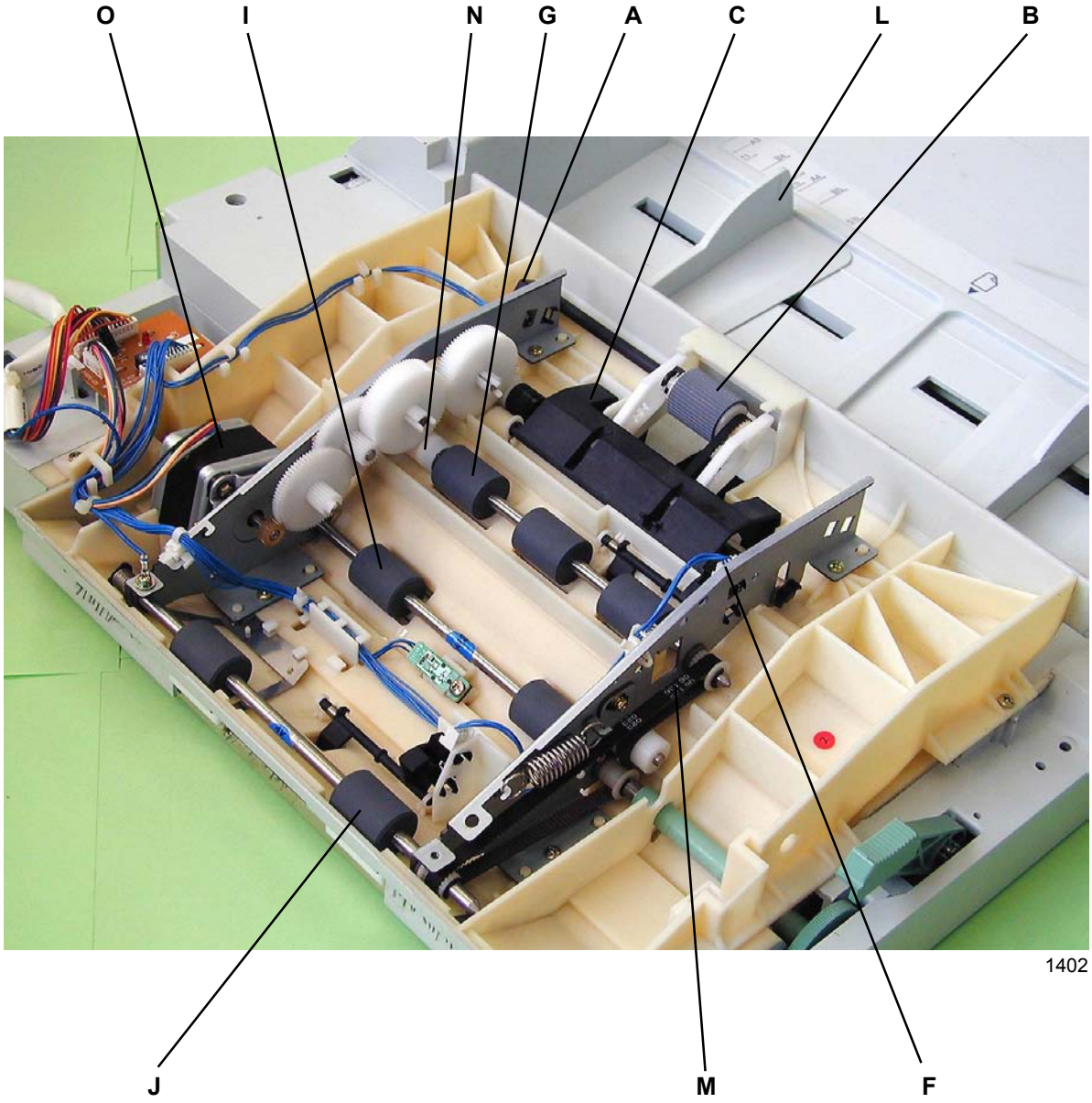
Contents

Mechanism

1. AF Original Set Mechanism

When the original is set along the original guide fence and pushed up against the original stopper gate [C], the AF original detection sensor [A] is activated (light path open) and the Master/Print indicator on the panel switches to “Master.” The thermal pressure motor operates to lower the thermal head until the TPH pressure sensor is activated.
After a preset interval, the AF read pulse motor [O] reverses to lower the pickup roller [B] in the direction shown by the arrows and withdraw the original stopper gate [C] upwards. (The one-way clutch incorporated between the registration roller gear [N] and registration roller shaft prevents the registration roller [G] from rotating here.)
Once the pickup roller [B] descends to push against the original, the pickup roller [B] and original stripper roller [D] rotate in the original transport direction, and a single original is fed forward by the action of the original stripper roller [D] and original stripper pad [E]. This activates the AF original registration sensor [F] (light path blocked) and the edge of the original is stopped by the stationary registration roller [G].
Once a preset interval has elapsed from when the AF original registration sensor [F] was activated, the AF read pulse motor [O] operates in the forward direction. This raises the pickup roller [B] and at the same time rotating the registration roller [G], original read roller [I], and original ejection roller [J], which are all linked by the timing belt [M], in the feed direction.
The original stops briefly after it has been moved 100 mm from the original set position.





A: AF original detection sensor
B: Pickup roller
C: Original stopper gate
D: Original stripper roller
E: Original stripper pad
F: AF registration sensor
G: Registration roller
H: Registration driven roller
I: Original read roller
J: Original ejection roller
K: Original pickup pad
L: Original guide fence
M: Timing belt
N: Registration roller gear
O: AF read pulse motor

2. AF Original Scanning Mechanism (with Automatic Base Control)

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

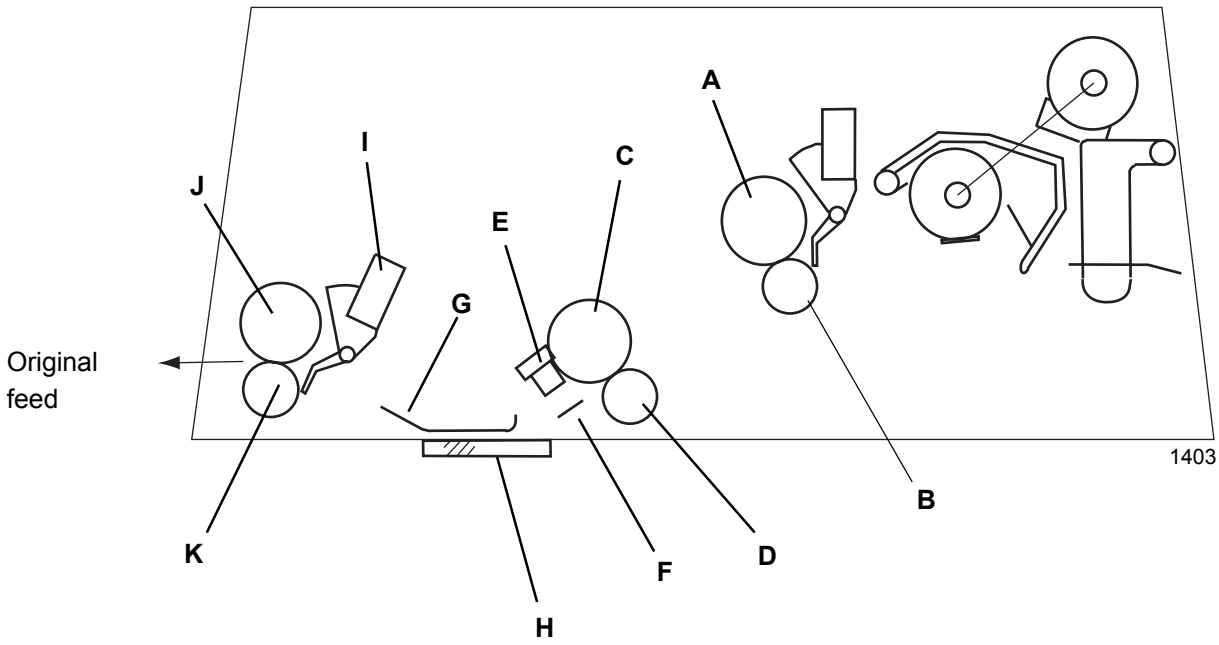
Once the AF original setting operation is complete, pressing the Start key illuminates the lamp.
The flatbed read pulse motor is activated immediately, moving the lamp carriage in the feed direction to the shading position. Shading adjustment is performed before moving back in the return direction and stopping at the ABC scanning position (3 + a) mm in front of the normal ABC scanning position.
At the same time, the AF read pulse motor rotates in the forward direction, turning the registration roller, read roller, and original ejection roller in the feed direction. After the AF read sensor turns ON (light blocked), the original is fed for a distance of 26.9 mm and stops. At this position, the image sensor scans the surface density of the original. The FB read pulse motor then moves the lamp carriage back (3 + a) mm in the return direction (normal AF original scanning position).
The AF read pulse motor rotates immediately in the forward direction and, at the same time, the print signal turns ON and the original scanning operation starts.
When a preset length of time has elapsed after the AF read sensor turns OFF (receives light) due to the passing of the original (or immediately when the write pulse motor rotates prior to the preset time for paper-size adjustment according to the user setting), the print signal turns OFF. As soon as the scanning operation is complete, the AF read pulse motor starts operating at high speed.
When the AF original ejection sensor turns OFF, the original is fed for a preset distance and then the AF read pulse motor stops to end the AF read operation.
The auto-base control function is inactive in the Photo, Text/Photo, and Dot-screening modes.

* Compensation value a = Test Mode No. 184 (AF-ABC Mirror Position Adjustment)

Note: ABC stands for "Auto Base Control."

3. AF Original Scanning Mechanism

Once the AF original setting operation is complete, pressing the Start key illuminates the lamp.
The flatbed read pulse motor immediately activates, moving the lamp carriage in the feed direction to the shading position. Shading adjustment is performed before moving back in the return direction and stopping at the normal AF scanning position.
At the same time, the AF read pulse motor [M] operates in the forward direction, rotating the registration roller [A], original read roller [C], and original ejection roller [J] in the feed direction. The original is fed forward 29.9 mm after the AF read sensor [E] activates (light path blocked), activating the read/write signal and initiating a scan of the original. (The pickup roller returns to the standby position.)
The read/write signal is deactivated for a preset interval after the AF read sensor [E] is deactivated (light path open) when the original is moved away (or immediately if the write pulse motor has rotated the equivalent of the paper size as previously specified in the user settings). The AF read pulse motor [M] then operates at high speed as soon as scanning is complete.
Once the original is transported a preset distance after the AF original ejection sensor [I] deactivates, the AF read pulse motor [M] stops. This completes the AF original scanning operation.



A: Registration roller
B: Registration driven roller
C: Original read roller
D: Original read driven roller
E: AF read sensor
F: Reflecting plate
G: Shading plate
H: AF stage glass
I: AF original ejection sensor
J: Original ejection roller
K: Original ejection driven roller

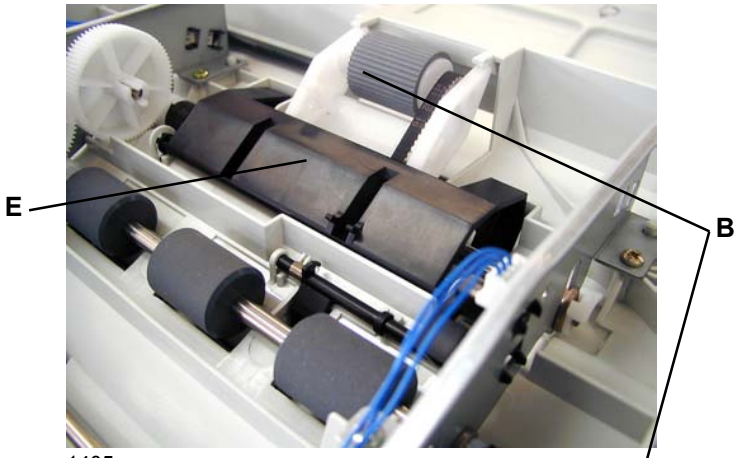
Disassembly

1. Removing the Original Scraper Ass'y

(1) Switch off the power and open the AF unit. Now remove the two screws (P tight, M3 x 10), and remove the AF cover [A]. Finally, close the AF unit.

(2) Remove the plastic lock rings [C] from both sides of the original scraper ass'y [B], and then remove the bearing bushes [D]. Lift up the original stopper gate [E] to remove the original scraper ass'y.

1404



1405

1406

A: AF cover
B: Original scraper Ass'y
C: Lock ring
D: Bearing bush
E: Original stopper gate

2. Removing the Pickup Roller

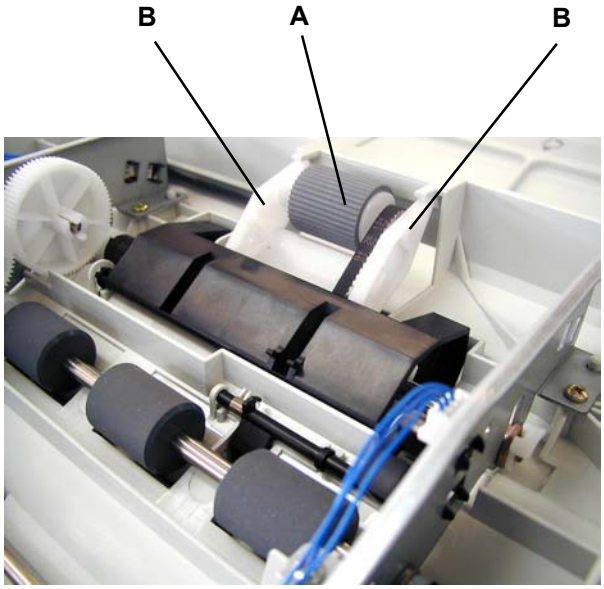
(1) Switch off the power and open the AF unit. Now remove the two screws (P tight, M3 x 10), and remove the AF cover. Finally, close the AF unit.

(2) Pull apart both ends of the pickup roller frame ass'y [B] holding the pickup roller [A], and remove the pickup roller [A].

* Take care not to drop the washer on the right-hand side gear of the pickup roller.

[Precautions on Reassembly]

- Do not forget to insert the washer on the right-hand side gear on the pickup roller.



1407

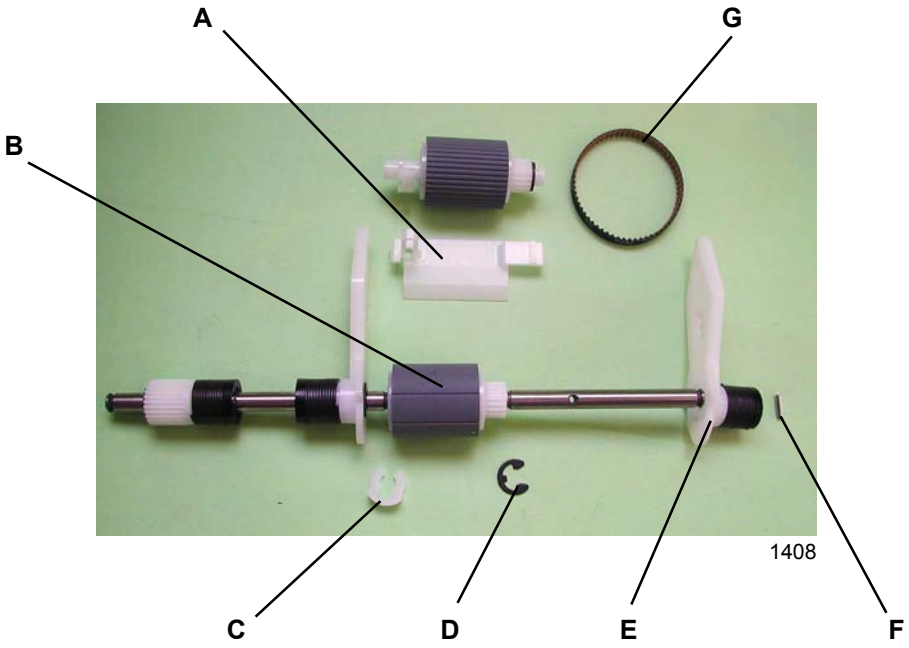
A: Pickup roller
B: Pickup roller frame ass'y

3. Removing the Original Stripper Roller

(1) Switch off the power and open the AF unit. Now remove the two screws (P tight, M3 x 10), and remove the AF cover. Finally, close the AF unit.
(2) Remove the original scraper ass'y.
(3) Remove the pickup roller.
(4) Remove the intermediate guide [A].
(5) Remove the plastic lock ring [C] on the left-hand side of the original stripper roller [B], move the original stripper roller [B] to the left, and then remove the right-hand E-ring [D]. Move the pickup roller frame ass'y (right) [E] to the left, pull out the Pin [F] and then remove it to the right.
* Take care not to drop the washer fitted to the gear side of the original stripper roller.

[Precautions on Reassembly]

- Fit the gear on the right-hand side as shown in the photograph, as the original scraper roller contains a one-way clutch. Also, do not forget to insert the washer on the gear side.
- When engaging the pin into the pickup roller frame ass'y (right), insert it into the shallower slot.



A: Intermediate guide
B: Original stripper roller
C: Lock ring
D: E-ring
E: Pickup roller frame ass'y (right)
F: Pin
G: Timing belt

4. Removing the AF Original Detection, Read, and Original Ejection Sensors

(1) Switch off the power and open the AF unit. Now remove the two screws (P tight, M3 x 10), and remove the AF cover. Finally, close the AF unit.

Removing the AF original detection sensor

(2) Remove the connector, free the actuator by hand, and release the clips on the AF original detection sensor [A] to remove it.

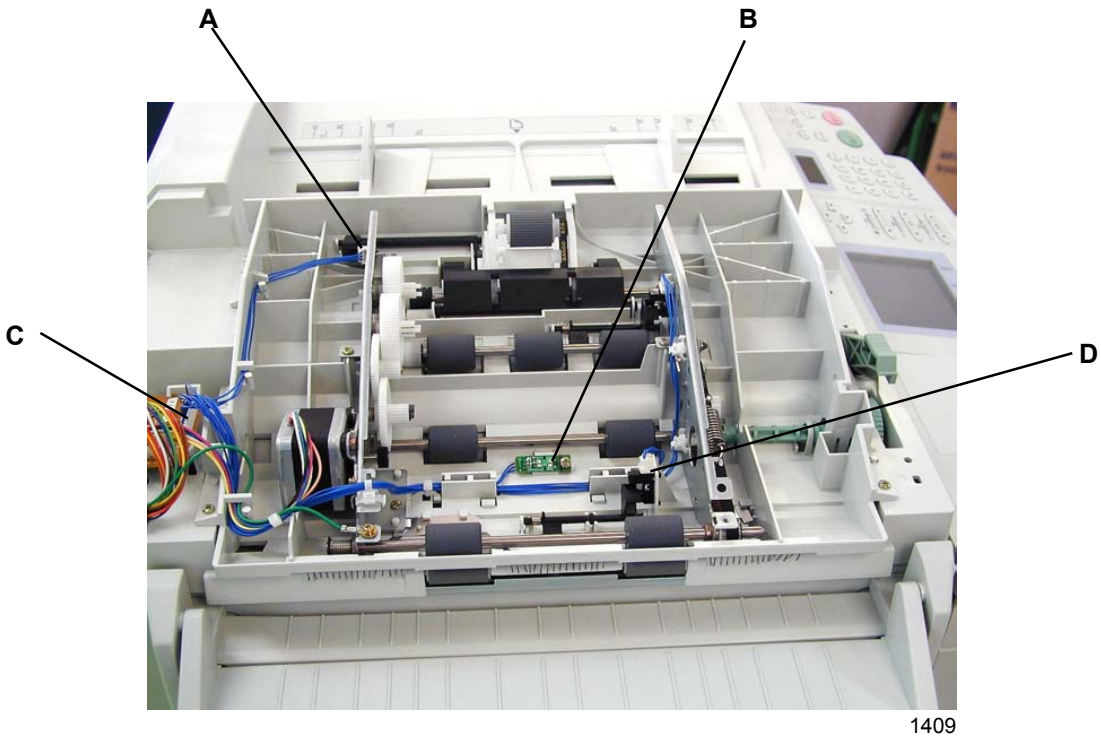
Removing the AF read sensor

(2) Remove the connector, remove the screw (P tight, M3 x 10), and then remove the AF read sensor [B].

* After attaching it again, turn variable resistor VR1 on top of the AF-PCB [C] to readjust LED1 to maximum brightness.

Removing the AF original ejection Sensor

(2) Remove the connector, free the actuator by hand, and release the clips on the AF original ejection sensor [D] to remove it.



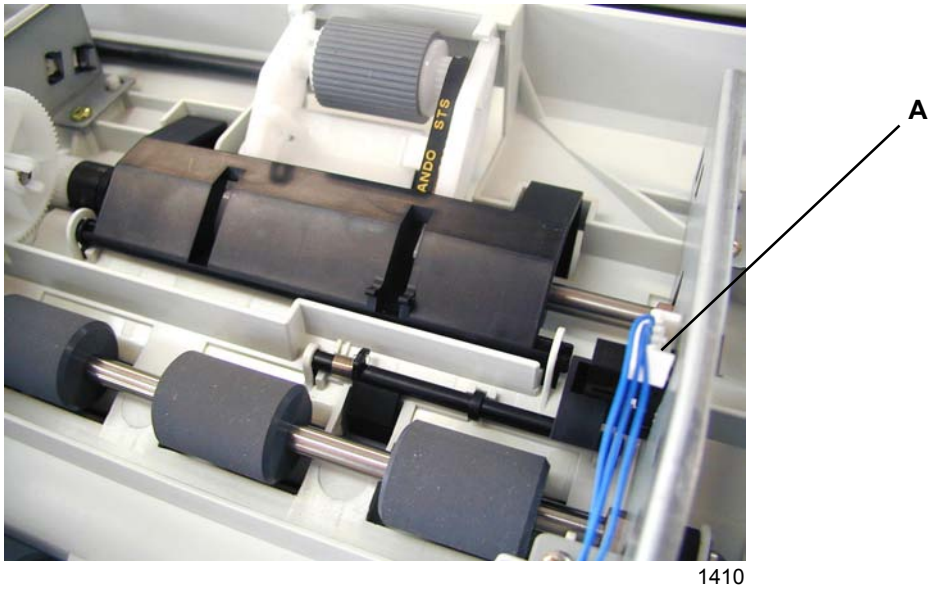
1409

A: AF original detection sensor
B: AF read sensor
C: AF-PCB
D: AF original ejection sensor

5. Removing the AF Original Registration Sensor

(1) Switch off the power and open the AF unit. Now remove the screw (P tight, M3 x 10), and remove the AF cover. Finally, close the AF unit.

(2) Remove the connector, lift up the actuator and move it to the left end, and release the clips on the AF original registration sensor [A] to remove it.



1410

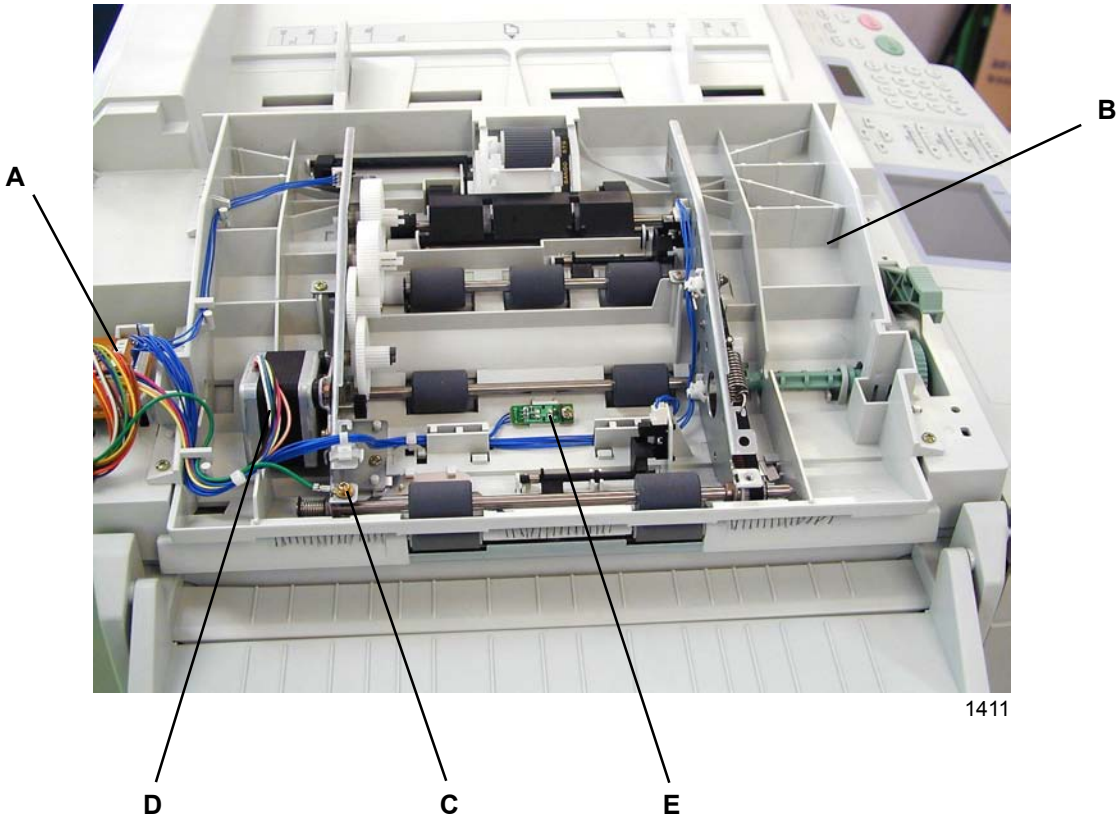
A: AF original registration sensor

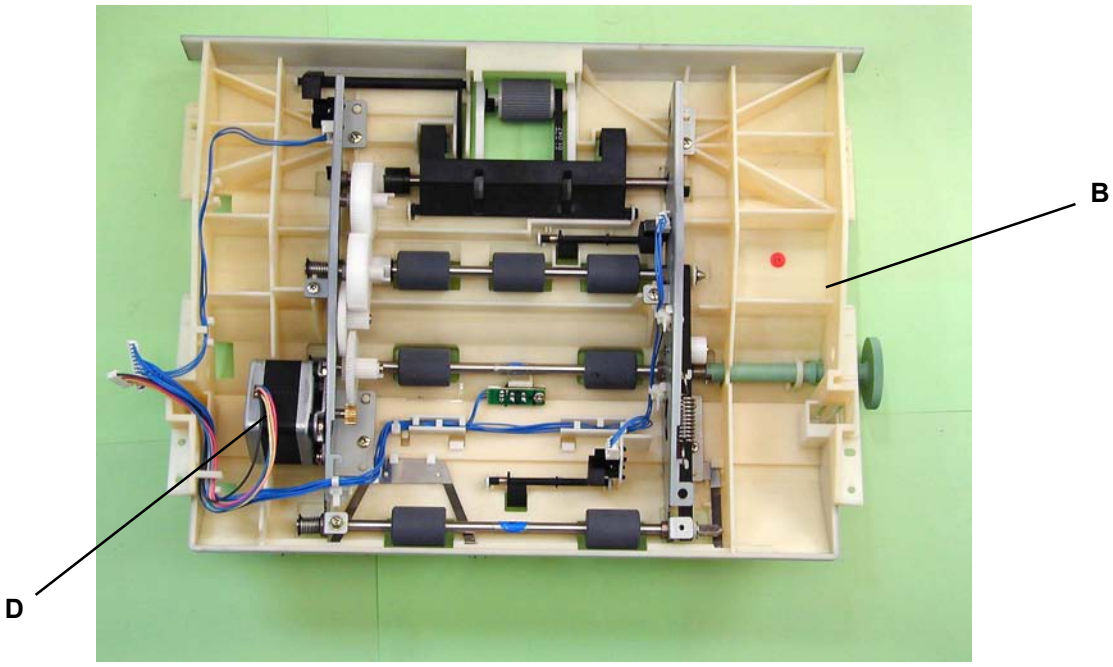
6. Removing the AF Read Pulse Motor

(1) Switch off the power and open the AF unit. Now remove the two screws (P tight, M3 x 10), and remove the AF cover. Finally, close the AF unit.
(2) Detach connectors CN1 and CN3 on the AF-PCB [A], and remove the ground screw [C] on the AF upper guide ass'y [B] together with the other screws (double-washer, M3 x 6).
* Take care not to drop the rosette washer fitted beneath the ground screw.
(3) Remove the AF upper guide ass'y [B] and four screws (P tight, M3 x 6).
(4) Remove the AF read pulse motor [D] and two screws (double-washer, M3 x 6).

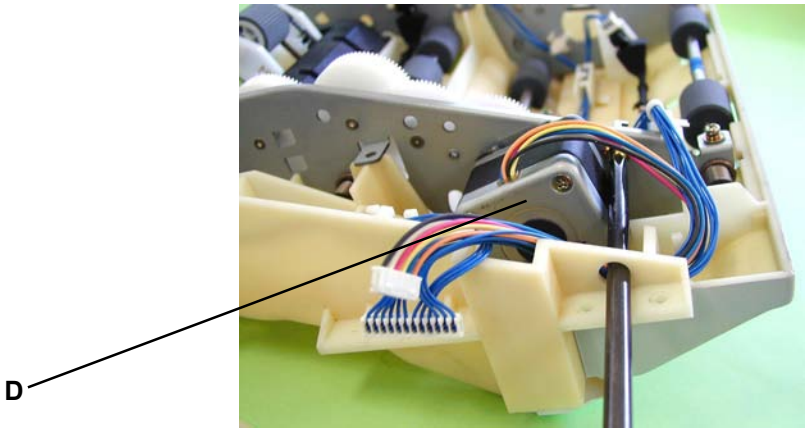
[Precautions on Reassembly]

- When mounting the AF upper guide ass'y, engage the two aligning pins.
- When attaching the ground screw, do not forget to insert the rosette washer.
- After mounting the AF upper guide ass'y, readjust the original IN sensor. Turn variable resistor VR1 on top of the AF-PCB to readjust LED1 to maximum brightness.





1412



1413

A: AF-PCB
B: AF upper guide ass'y
C: Ground screw
D: AF read pulse motor
E: AF read sensor

7. Removing the Registration Roller, Original Read Roller, and Original Ejection Roller

(1) Switch off the power and open the AF unit. Now remove the two screws (P tight, M3 x 10), and remove the AF cover. Finally, close the AF unit.
(2) Detach connectors CN1 and CN3 on the AF-PCB, and remove the ground screw on the AF upper guide ass'y together with the screw (double-washer, M3 x 6).
    * Take care not to drop the rosette washer fitted beneath the ground screw.
(3) Remove the AF upper guide ass'y [A] and four screws (P tight, M3 x 10).
(4) Lift up the jam release dial [B] towards the top left to pull it out.
(5) Remove the idler spring [G], loosen the two screws on the idler [F], and then loosen the tension on the timing belt [H].
(6) Remove the three screws (P tight, M3 x 10) from both the AF guide frame (front) [I] and AF guide frame (rear) [J], and then remove the frames.

Removing the Registration Roller

(7) Remove the front E-ring [P], rear E-ring [M], washer [K], thrust spring [L], and washer [K]. Next, pull out the timing gear [Q], which is protrudes onto the front flat face, and then remove the registration roller [C].
    * Take care, as the washer and thrust spring may fly out when the E-ring is removed.

Removing the Original Read Roller

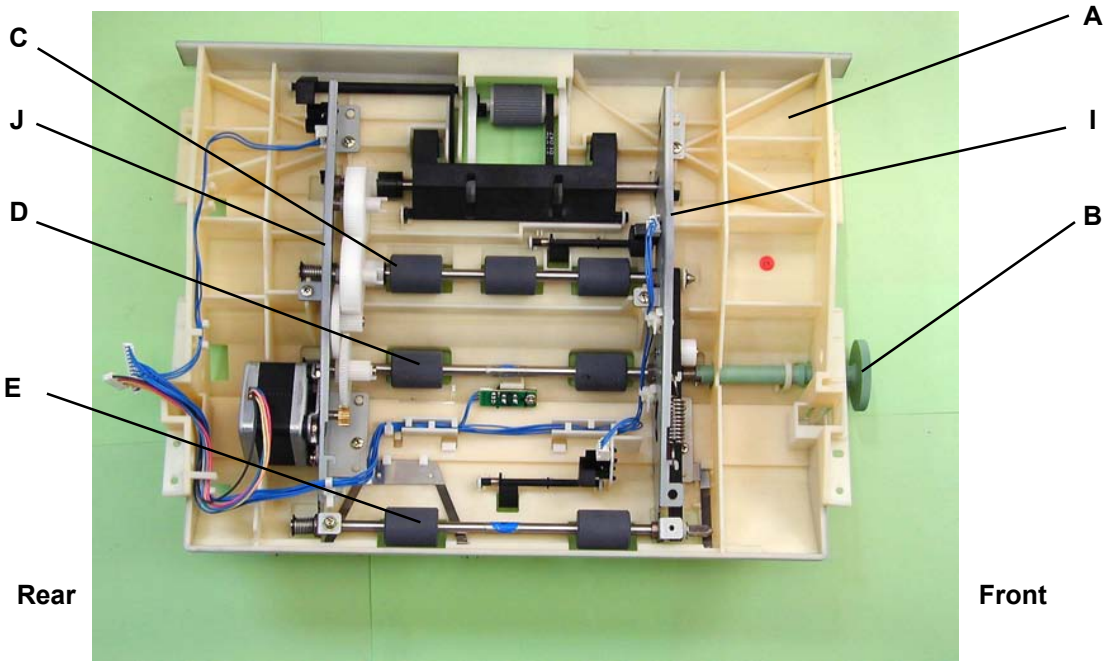
(7) Remove the front clutch spring [O], E-ring [P], rear E-ring [M], washer [K], thrust spring [L], and washer [K]. Next, pull out the timing gear [Q], which protrudes onto the front flat face, and then remove the original read roller [D].
    * Take care, as the washer and thrust spring may fly out when the E-ring is removed.

Removing the Original Ejection Roller

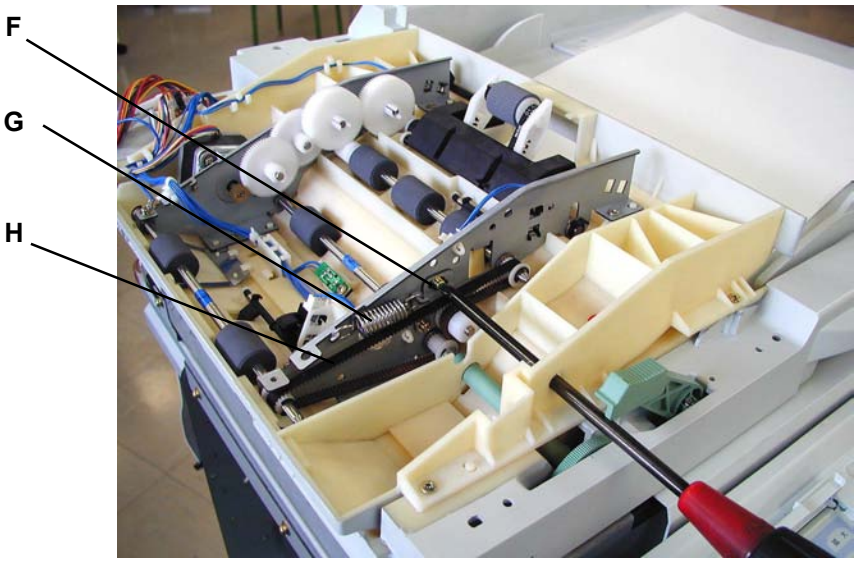
(7) Remove the front E-ring [P], rear E-ring [M], washer [K], thrust spring [L], and washer [K]. Next, pull out the timing gear [Q], which protrudes onto the front flat face, and then remove the original ejection roller (top) [E].
    * Take care, as the washer and thrust spring may fly out when the E-ring is removed.

[Precautions on Reassembly]

- Each roller is equipped with a thrust spring on the rear side. Be sure to place the washers before and after the thrust spring, and then install the E-ring to secure them in place.
- Note the insertion direction of the lugs on each timing gear.
- Attach the AF timing belt as shown in the photograph.
- Engage the three pins in each case when securing the AF guide frame (front) and AF guide frame (rear). Also check that the bearing bushes are fitted correctly on each roller.



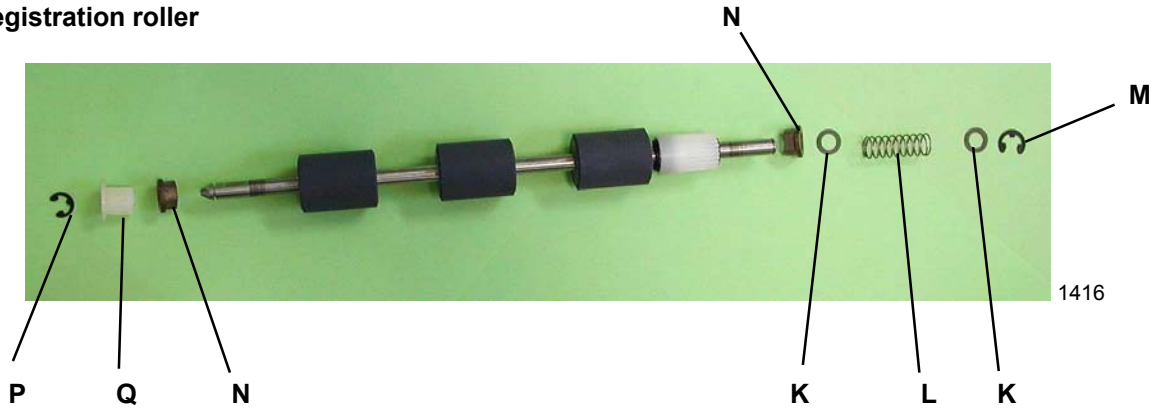
1414



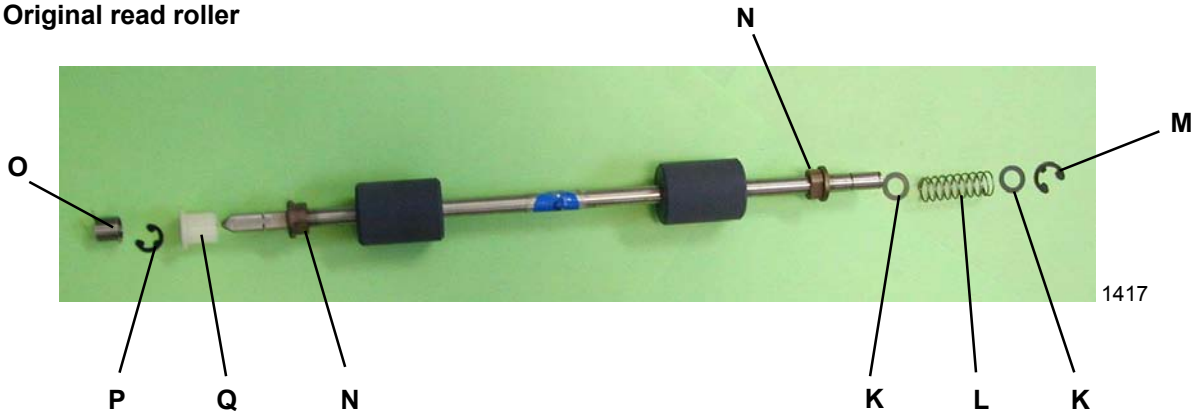
1415

A: AF upper guide ass'y
B: Jam release dial
C: Registration roller
D: Original read roller
E: Original Ejection Roller
F: Idler
G: Idler spring
H: Timing belt
I: AF guide frame (front)
J: AF guide frame (rear)

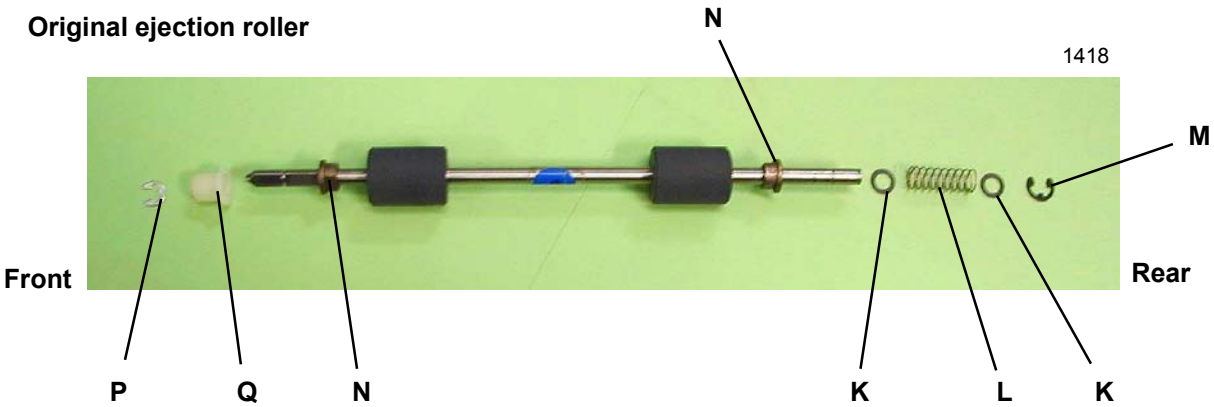
Registration roller



Original read roller



Original ejection roller



K: Washer
L: Thrust spring
M: E-ring
N: Bearing bush
O: Clutch spring
P: E-ring
Q: Timing gear

Adjustment

1. AF Scan Start Position Adjustment

Checks and adjustment

(1) Set B4-size paper in the paper-feeding tray, place the Test Chart No. 15 on the AF unit, create an original-size master, and print.
(2) Check the prints. Confirm that 5 ±2 mm of the top scan skip check graduations is skipped.
(3) If the position is outside the specified parameters, adjust using the Test Mode No. 186 (AF Scanning Start Position Adjustment).

2. AF Horizontal Scan Position Adjustment

Checks and adjustment

(1) Set B4-size paper in the paper-feeding tray. Using the AF unit, create an original-size master with the Test Chart No. 15, and then print.
(2) Examine the master created on the print drum, and check that pattern “e” on the left and right of the original is not missing.
(3) If the pattern is missing, adjust using the Test Mode No. 185 (AF Horizontal Scan Position Adjustment).

3. AF Image Elongation & Shrinkage Adjustment

Checks and adjustment

(1) Set B4-size paper in the paper-feeding tray, place Test Chart No. 15 on the AF unit, create an original-size master, and then print.
(2) Lay the print on top of the original to check that the image elongation and shrinkage is within ±1.4% at the 310-mm line.
(3) If the elongation and shrinkage is outside the specified parameters, adjust using the Test Mode No. 187 (AF Scan Image Elongation & Shrinkage Adjustment).
* Before making this adjustment, perform master image adjustment.

4. AF Read Sensor Sensitivity Adjustment

Checks and adjustment

(1) Open the AF unit, remove the two screws (P tight, M3 x 10), and then remove the AF cover. Finally, close the AF unit.
(2) Turn variable resistor VR1 on top of the AF-PCB to adjust LED1 to maximum brightness.

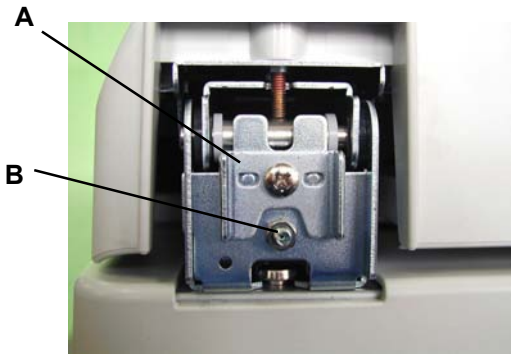
Checks after adjustment

- Check that LED1 on top of the AF-PCB clears when the original (thin Riso paper inlet) is detected by the AF read sensor.

5. AF Image Skew Adjustment

Checks and adjustment

(1) Set B4-size paper in the paper-feeding tray. Using the AF unit, create an original-size master with the Test Chart No. 15, and then print.
(2) Lay the print on top of the original with the 310-mm lines at the side parallel, and check that the skew (X) of the leading 180-mm line is within 2 mm.
(3) If the skew is outside the specified parameters, adjust as follows.
(4) Remove the screw (bind, M4 x 6) on the AF mount plate [A], rotate through 180° to open the AF unit to 90°, and then loosen the two AF unit retaining screws (bind, M4 x 10).
(5) Loosen the nut [B] on the hinge assembly (right), and turn the AF slide screw [C] (clockwise if as in Figure 2, and counterclockwise if as in Figure 1) to adjust dimension **T**. Turning the screw clockwise increases dimension T.
(6) Tighten the two AF unit retaining screws, and then tighten the nuts with the AF slide screw secured.
(7) Make a master and print, and repeat the procedure from the beginning if the skew is still outside the specified parameters.



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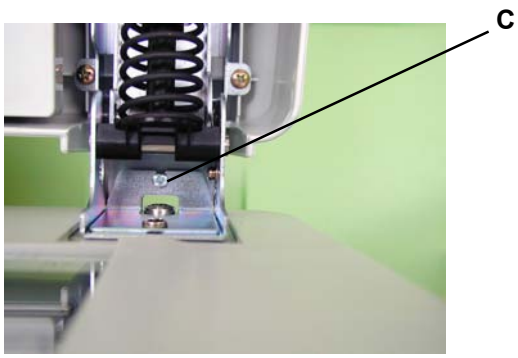

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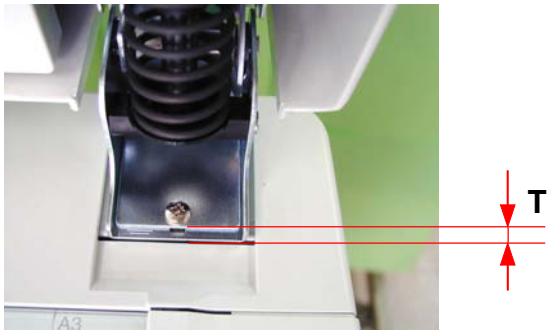


1421

A: AF mount plate
B: Nut
C: AF slide screw

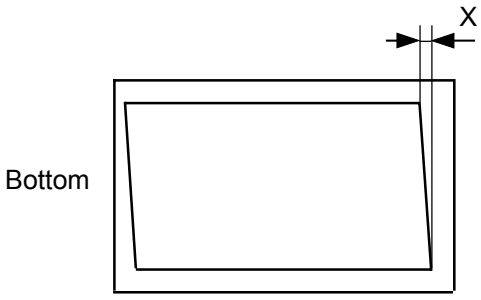


Figure 1

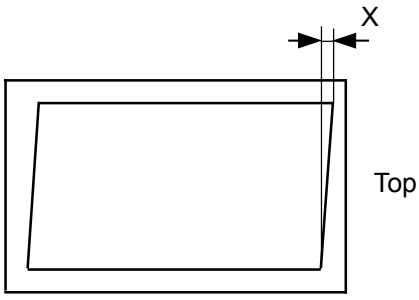


Figure 2

[Memo]

CHAPTER 15: MASTER MAKING SECTION

Contents

Mechanism

1. Master Making & Master Loading

The master making & master loading mechanism is made up of the following components.

1) Scanner Table Set Detection Mechanism

The flatbed set switch [A] confirms that the original is positioned on the scanner table.
The master loading unit sensor [B] confirms that the master loading unit is set.
The master end sensor [C] confirms that master roll has ran out of master.

2) Master Cutting Mechanism

The master cutting operation is performed by the cutter motor [D], and the cutter motor stop position is confirmed by the cutter home position switch [E].

3) Thermal Print Head Elevation Mechanism

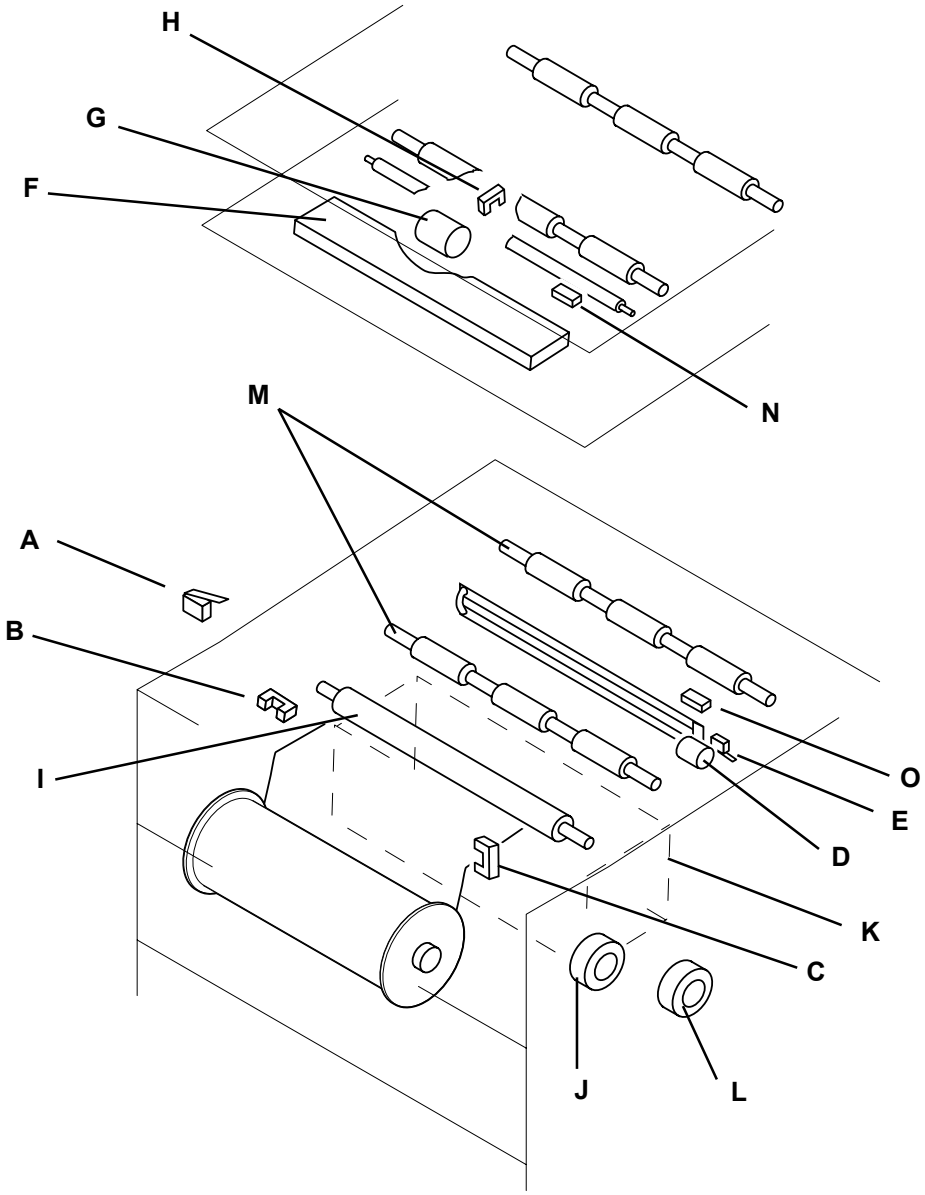
The thermal print head (TPH) [F] is raised and lowered by the thermal pressure motor [G], and the position is confirmed by the TPH pressure sensor [H].

4) Master Making Section Mechanism

Master making is performed by lowering the thermal print head [F] and transporting the master clamped between it and the write roller [I]. The master is transported by the write roller, which is driven by the write pulse motor [J]. Created masters are stored inside the master stocker [K].

5) Master Loading Mechanism

Masters that have been created are fed to the print drum and clamped, and then loaded by rotating the print drum.
The master is transported by the load roller [M], which is driven by the load pulse motor [L].



1501

A: Flatbed set switch
B: Master loading unit sensor
C: Master end sensor
D: Cutter motor
E: Cutter home position switch
F: Thermal print head
G: Thermal pressure motor
H: TPH pressure sensor
I: Write roller
J: Write pulse motor
K: Master stocker
L: Load pulse motor
M: Load roller
N: Master detection sensor
O: Master positioning sensor

2. Scanner Table Set Detection Mechanism

Scanner table and master loading set detection mechanism

The flatbed set switch [A] confirms that the scanner table is closed.

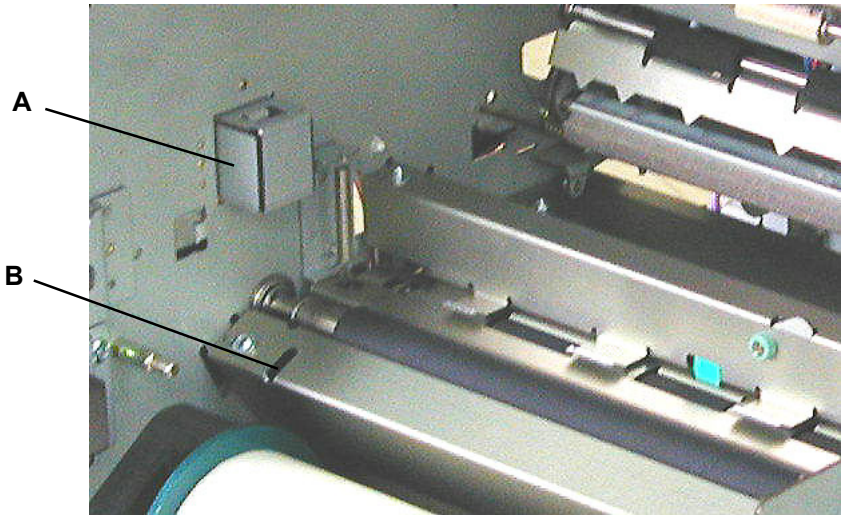
The flatbed set switch [A] is the interlocking switch for the main motor, and this forces the main motor, clamp motor, and TPH power to an emergency stop if the scanner table is opened while the system is operating.

The master loading unit switch [B] confirms that the master loading unit is set, and the master setting operation is performed once the master loading unit is set.

Master end detection

The end of the master roll is confirmed by the master end sensor [C] detecting the black end mark attached to the end of the master on the master roll.

The master end sensor [C] checks every 10 ms while the master is being transported, and gives an indication on the panel when the end mark is detected twice in succession.



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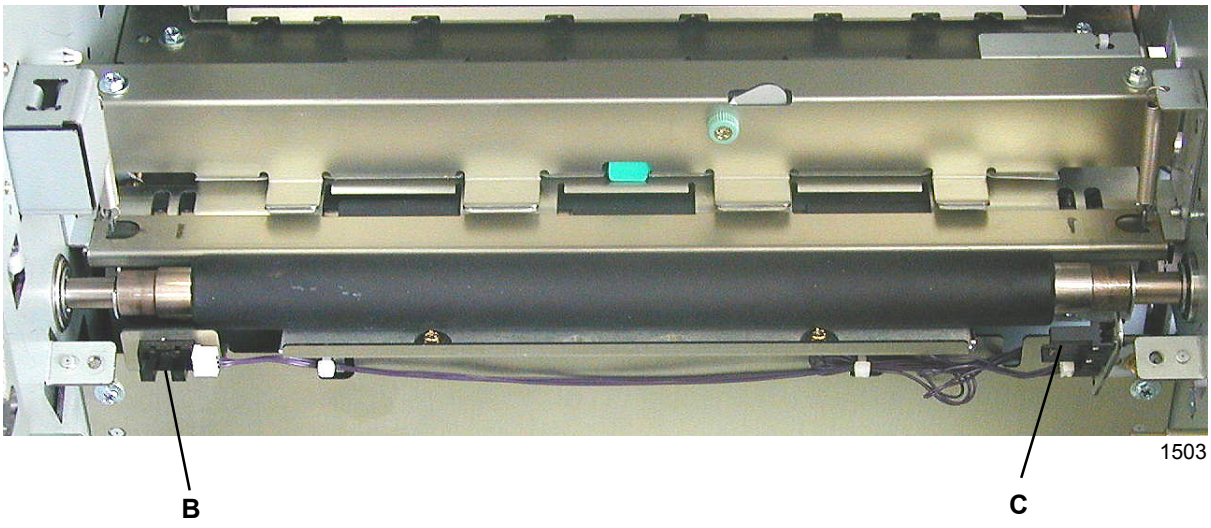
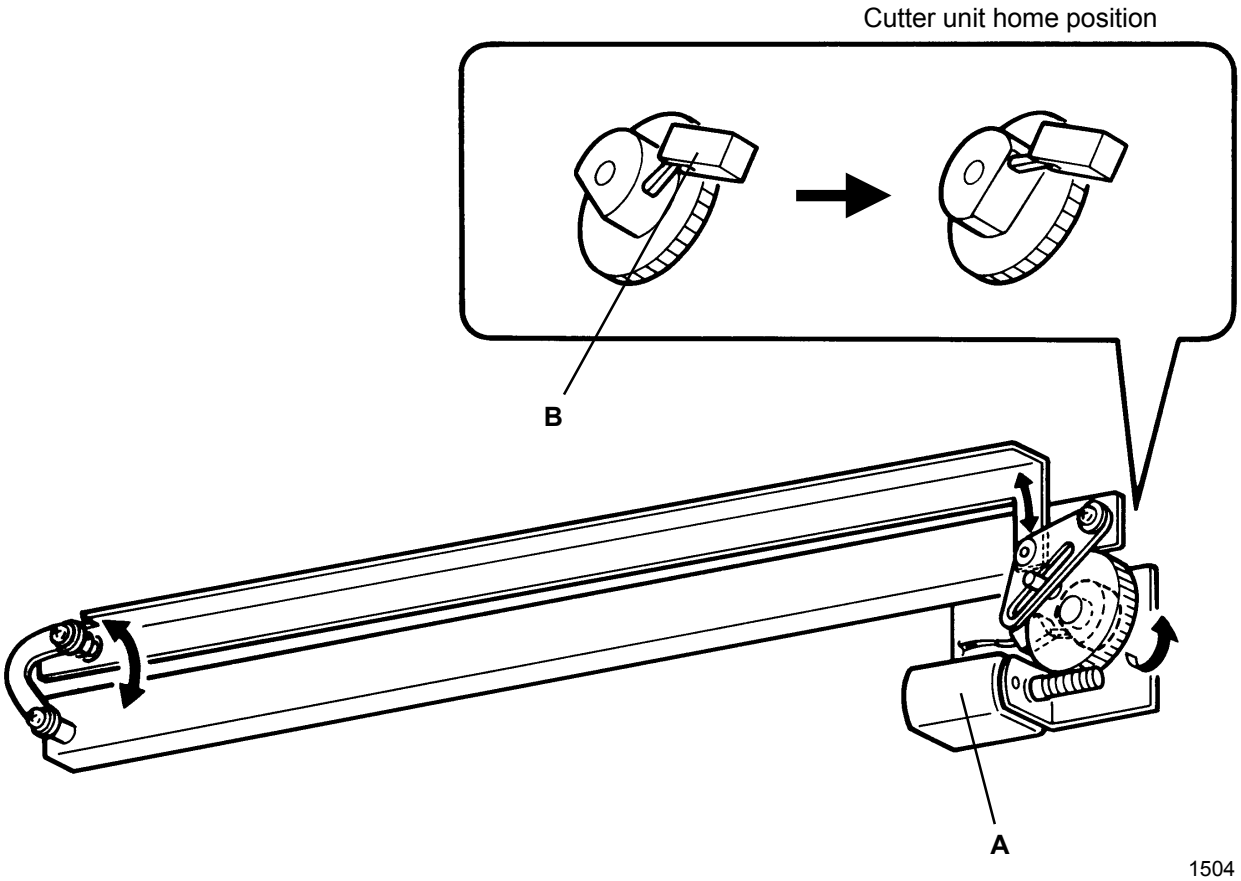


1503

A: Flatbed set switch
B: Master loading unit switch
C: Master end sensor

3. Master Cutting Mechanism

The master is cut by the upper cutter of the cutter unit being moved up and down by the cutter motor [A]. The cutter motor rotates in a constant direction, and the cutter home position switch [B] confirms the position of the upper cutter.
The cutter is at the home position when it is not pressing against the cutter home position switch [B], and if the switch is depressed briefly after the cutter motor starts, the motor stops when the switch is no longer depressed.



A: Cutter motor
B: Cutter home position switch

4. Thermal Print Head Elevation Mechanism

Thermal print head elevation

When the system is on standby or when winding the master onto the print drum after master making, the thermal print head is raised from the write roller. Conversely, for master making and during transport, the thermal print head is lowered and pressed onto the write roller.

The thermal print head is raised and lowered by the pressure release cam [B], which is driven by the thermal pressure motor [A].

The pressure release cam [B] is an eccentric cam, which raises and lowers the TPH pivot plate [C] as it rotates. The raised and lowered stop positions for the motor are detected by the TPH pressure sensor [E], which is blocked by the pressure detection disc [D]. The sliding plate [F] and blade link [G] are also moved by the vertical action of the thermal head.

Thermal print head raised position

In the thermal print head raised position, the load roller No. 1 [H] and load roller (top) [I] also rise.

At the same time, the blade cushion [J] descends, and applies back tension to the master while it is being wound onto the print drum to prevent creases in the master.

Thermal print head lowered position

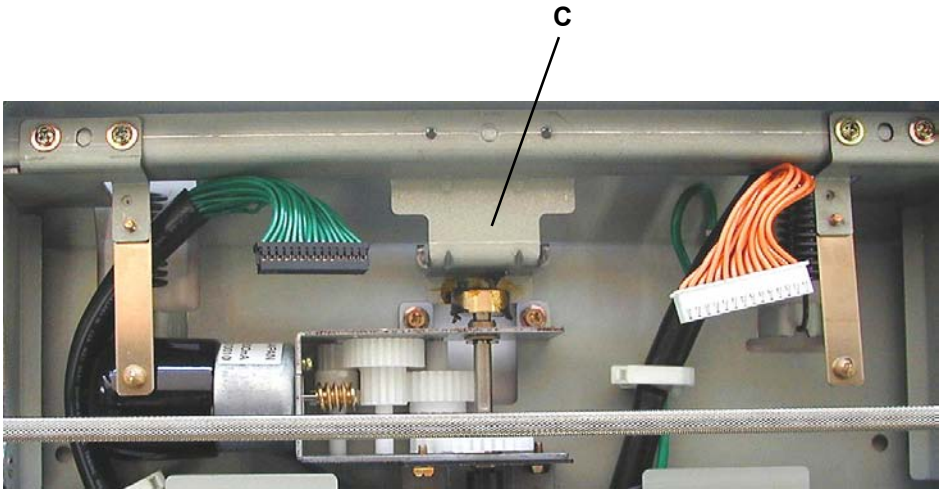
In the thermal print head lowered position, the load roller No. 1 (top) [H] and load roller (top) [I] also descend to allow the master to be transported. At the same time, the blade cushion [J] rises.

Initialization

This moves the thermal print head to the pressure release (raised) position when power is switched on, or when everything is reset.

Loading guide plate operation

- In the clamp plate master release operation at the start of master ejection, the front edge of the loading guide plate is raised by the master release bar to prevent it from obstructing the leading edge of the freed master on the drum.
- In the clamp plate master clamping operation at the start of master loading, only the front edge sheet of the loading guide plate is raised by the clamp plate, so as to prevent it from obstructing the master loading operation.
- During master loading, the master being loaded is back-tensioned by the sponge fitted to the bottom of the front edge sheet of the loading guide plate.



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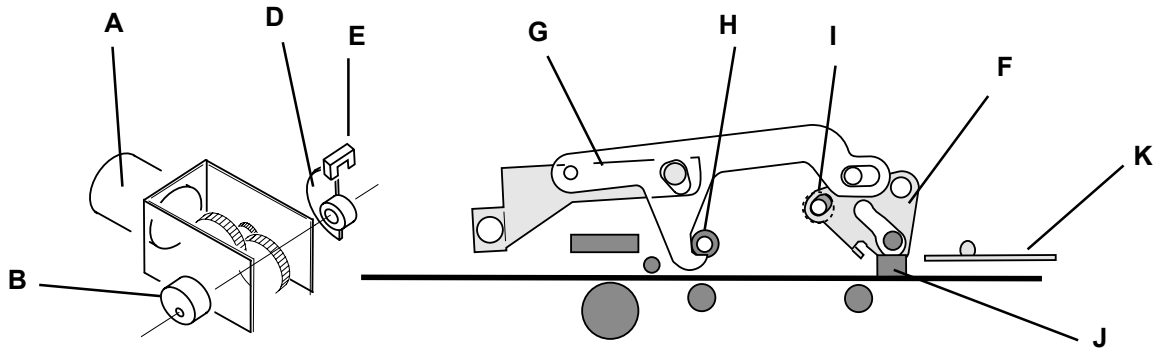

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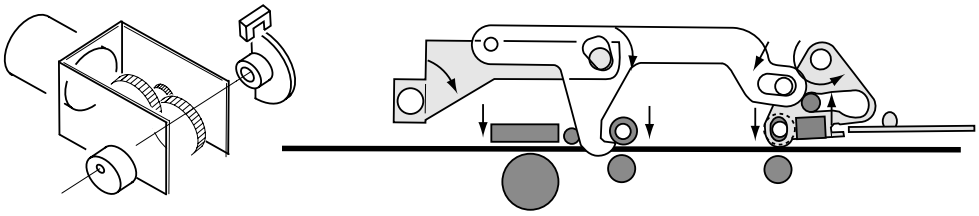


1507

A: Thermal pressure motor
B: Pressure release cam
C: TPH pivot plate
D: Pressure detection disc
E: TPH pressure sensor
F: Sliding plate
G: Blade link
H: Load roller No. 1 (top)
I: Load roller (top)
J: Blade cushion
K: Loading guide plate

5. Master Positioning Mechanism

The master-positioning operation is performed to bring the master to the master-positioning sensor when the master-loading unit is opened/closed or after the master is cut during the master-making process.

For master roll replacement

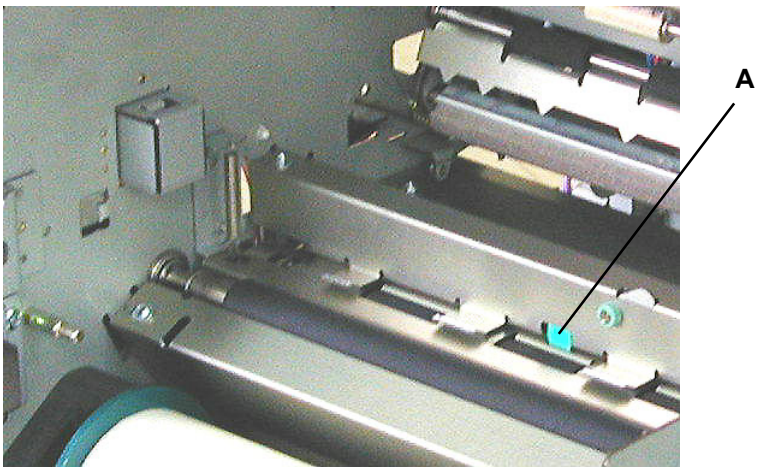
(1) Insert the leading edge of the new master roll to the master stopper gate [A], and close the master loading unit.
Closing the master loading unit raises the master stopper gate.
The master loading unit switch monitors operations every 10 ms and determines that the master loading unit is closed when the light path is blocked twice in succession. The master is then checked by the master detection sensor [B].

(2) The thermal print head is lowered by the thermal pressure motor, and the write pulse motor and load pulse motor operate to transport the master to the master positioning sensor [C].

(3) Once the light path to the master positioning sensor [C] is blocked by the master, the write pulse motor alone operates in reverse to return the master 2 mm. The motor then stops and the thermal print head is raised.

For master cutting

Steps (2) to (3) above are performed following master cutting.



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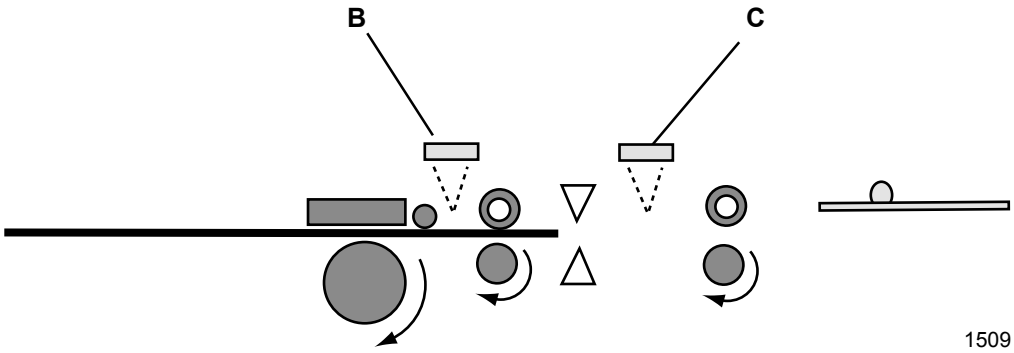
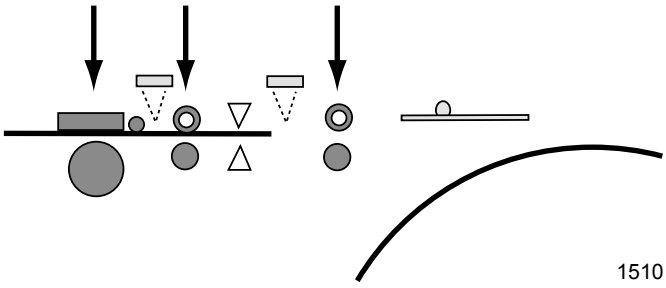


1509

A: Master stopper gate
B: Master detection sensor
C: Master positioning sensor

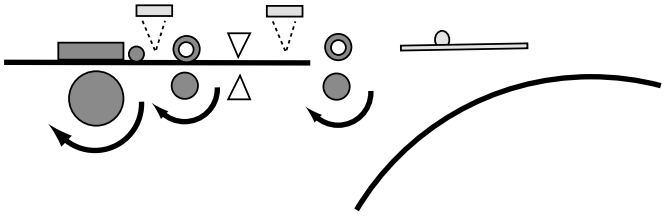
6. Master Making

The sequence of operations from master making to master mounting is as described below.



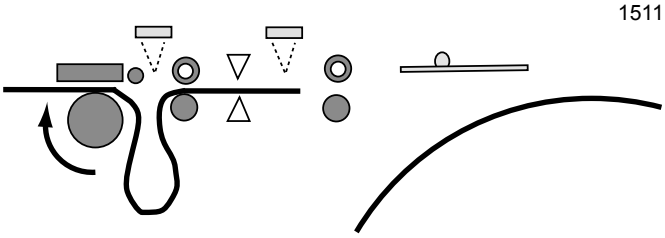
1510

(1) At the start of master making, the thermal print head is lowered to clamp the master between it and the write roller.



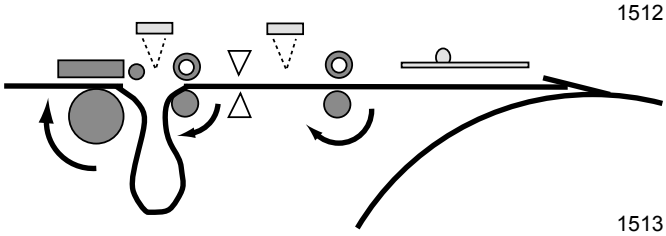
1511

(2) The write pulse motor and load pulse motor operate to transport the master to the master positioning sensor, where it waits for scanning system preparations to be completed.



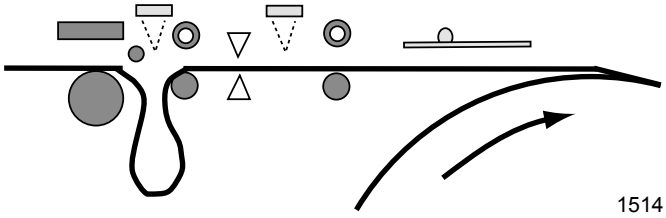
1512

(3) Once master making can be started, the write pulse motor operates to transport the master to the writing start position before master making commences. The master created is then stored in the master stocker.



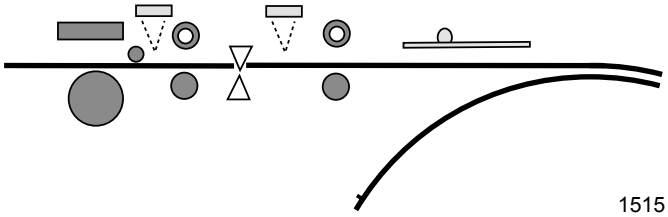
1513

(4) Once the master making in step (3) starts, the load pulse motor operates to transport the leading edge of the master to the clamp plate, where it is clamped.



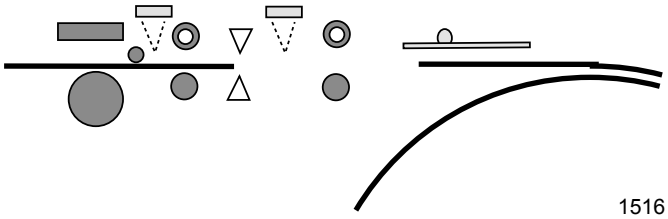
1514

(5) Once master making is finished, the thermal print head is raised, and the print drum rotates as the master is wound onto it.



1515

(6) The print drum pauses at the 220° position, where the master is cut.



1516

(7) After the print drum has rotated a further 15°, the Master positioning sensor confirms that the master has been cut.
Cutting has been performed correctly if the light path to the sensor is blocked (no master).
If the light path to the sensor is open, it is determined that an error has occurred.
In this case, the cutting operation is repeated, the Master positioning sensor confirms whether the master has been cut after the print drum has rotated a further 15°. If it is cut, “A03 Cutting error” is displayed, and if it is not cut, “T13 Cutter motor lock” is displayed.

(8) The master setting operation is performed.

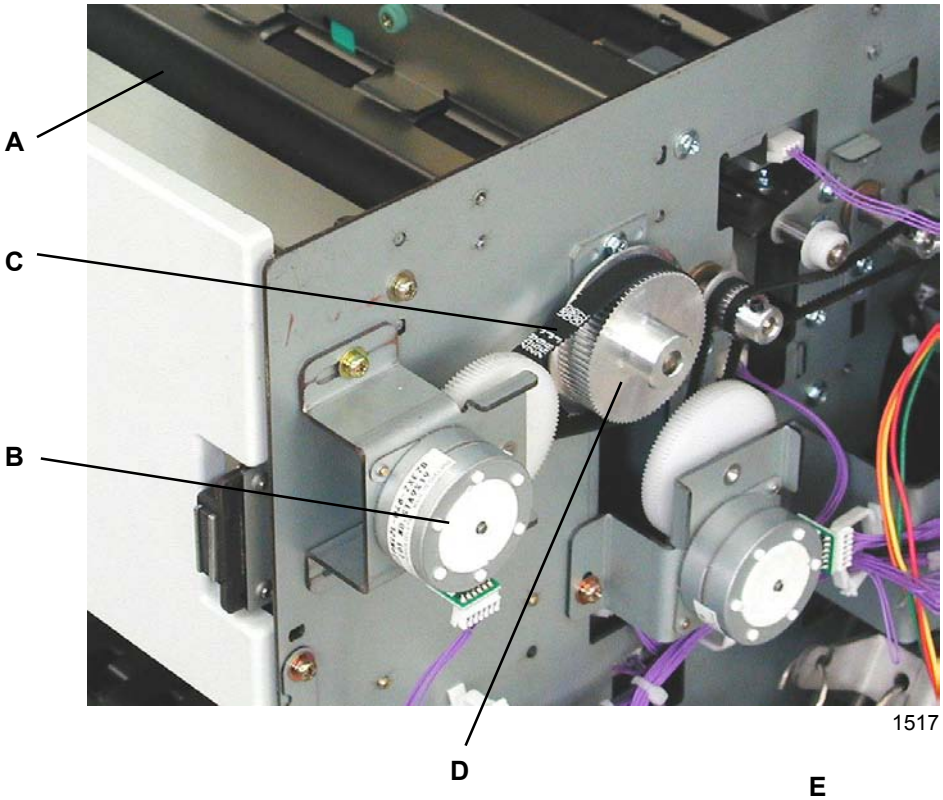
Disassembly

1. Removing the Write Roller

(1) Switch off the power, open the scanner table, and detach the rear cover (in the case of the RN25 Series, also open the System PCB bracket).
(2) Loosen the mounting bracket screws (RS tight, M4 x 8: 2 pcs) on the write pulse motor [B], and remove the belt [C].
(3) Remove the pulley [D]. (Set screw, M2 x 6: 1 pc)
(4) Remove the bearing stopper [E] and pull out the bearing. (RS tight, M4 x 6: 1 pc)
(5) Pull out the write roller [A].

[Precautions on Reassembly]

- Take care not to drop the bearing when mounting the write roller (particularly the front).



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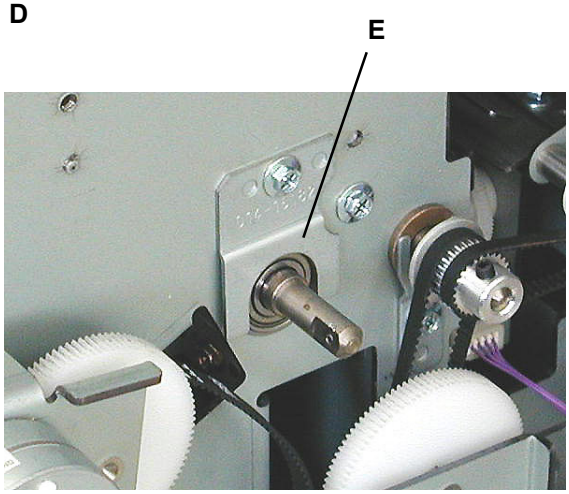
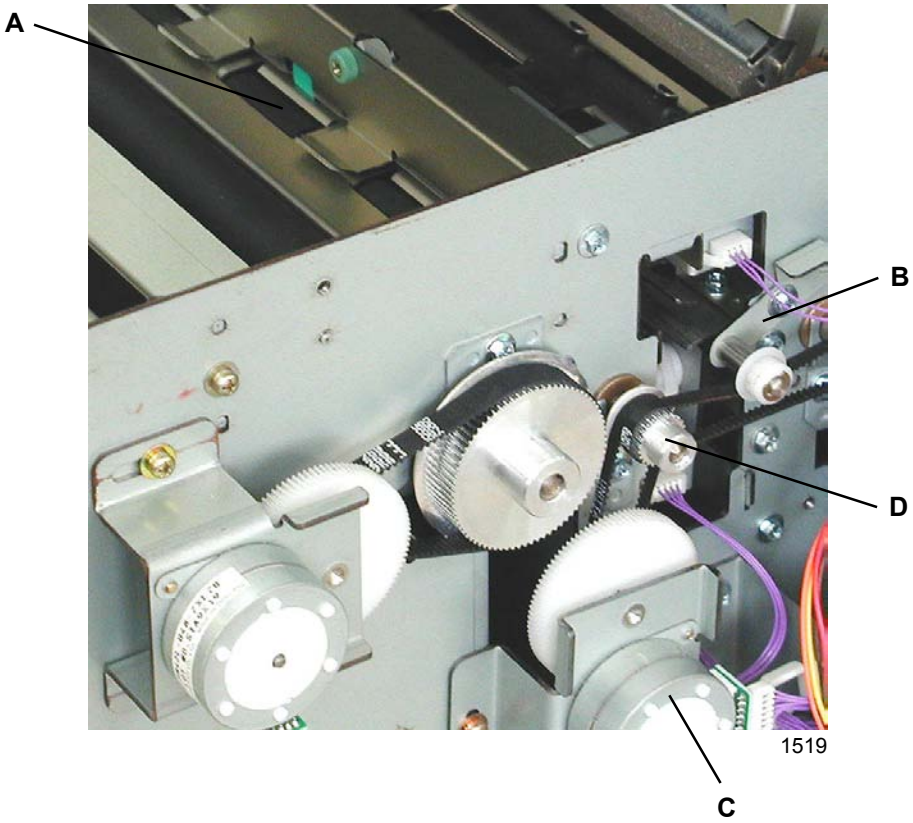


1518

A: Write roller
B: Write pulse motor
C: Timing belt
D: Pulley
E: Bearing stopper

2. Removing the Load Roller (Bottom)

(1) Switch off the power, open the scanner table, and detach the rear cover (in the case of RN25 series, also open the System PCB bracket).
(2) Loosen the screw (RS tight, M4 x 8: 1 pc) on the tension assembly [B], loosen the mounting bracket screws (RS tight, M4 x 8: 2 pcs) on the load pulse motor [C], and then remove the belt.
(3) Remove the pulley [D]. (Set screw, M2 x 6: 1 pc)
(4) Remove the bearing fixing plate [E] and pull out the bearing. (RS tight, M4 x 8: 1 pc)
* Removing the rear bearing here simplifies subsequent disassembly or reassembly work.



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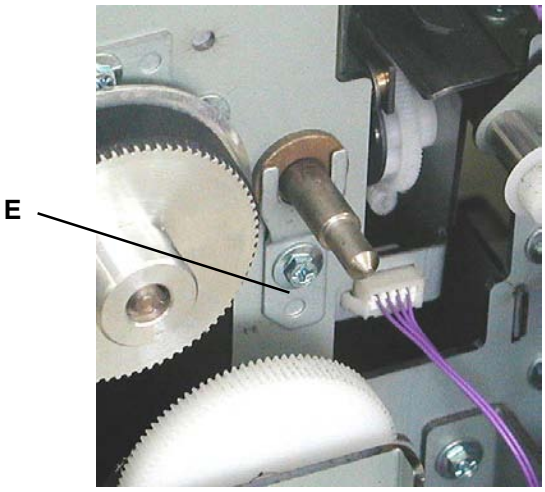
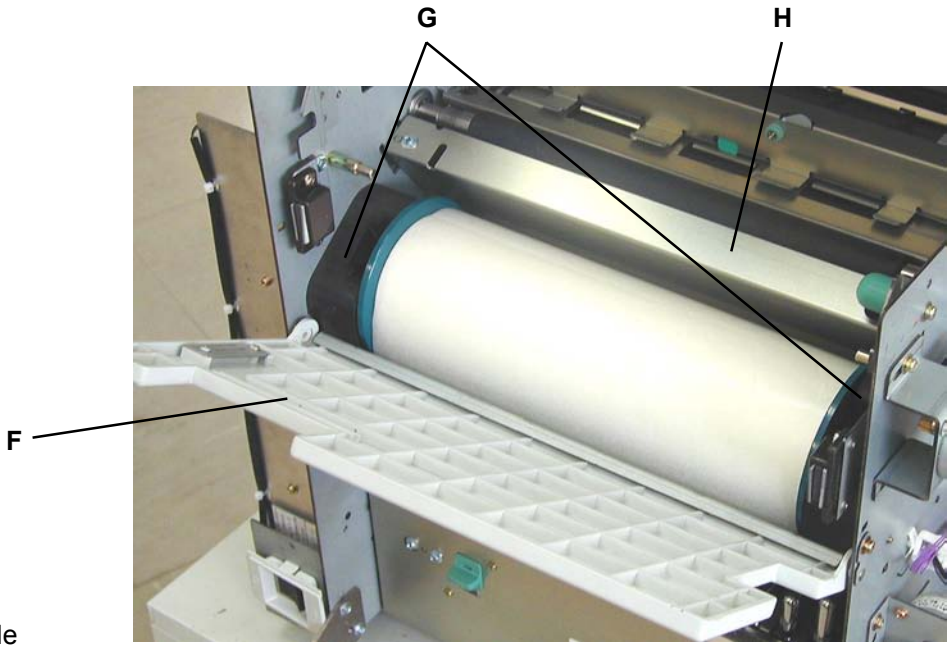


1520

A: Load roller (bottom)
B: Tension assembly
C: Load pulse motor
D: Pulley
E: Bearing fixing plate

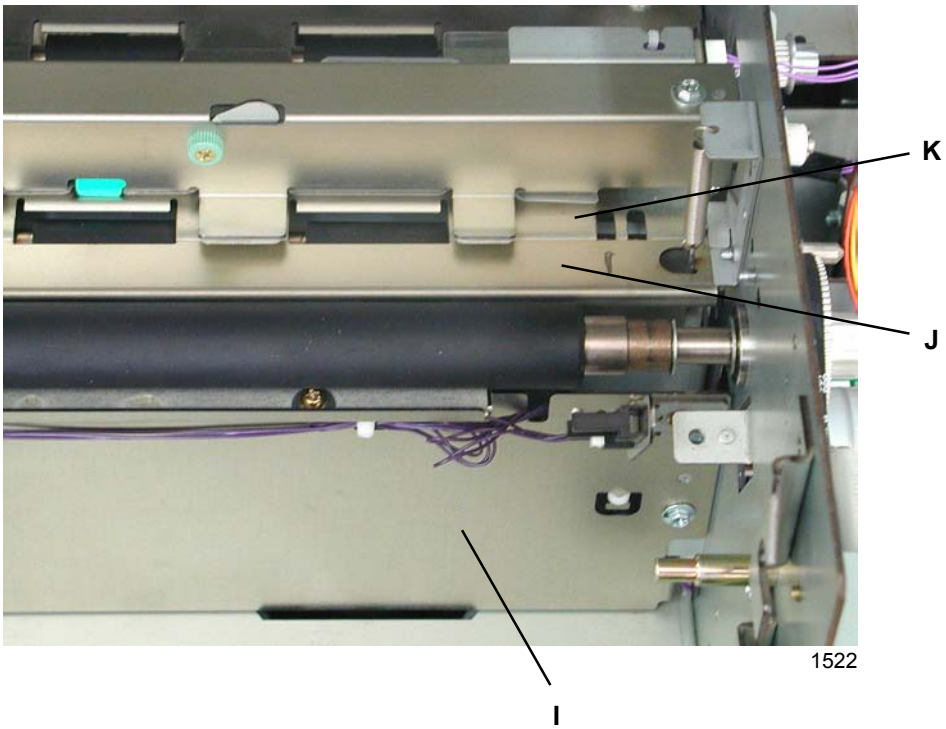
(5) Remove the master roll, and remove the master cover [F]. (Double-washer, M4 x 6: 1 pc)
(6) Remove the master holders [G] on both sides. (Bind, M3 x 6: 2 pcs each)
(7) Remove the master set guide [H]. (RS tight, M4 x 8: 2 pcs)



1521

F: Master cover
G: Master holder
H: Master set guide

(8) Unplug the rear connector, and remove the stocker cover [I]. (RS tight, M4 x 8: 2 pcs)
(9) Remove the springs on both sides, and then remove the master guide [J].
(10) Remove the load roller guide [K] (RS tight, M4 x 8: 2 pcs), and then remove the load roller (bottom).

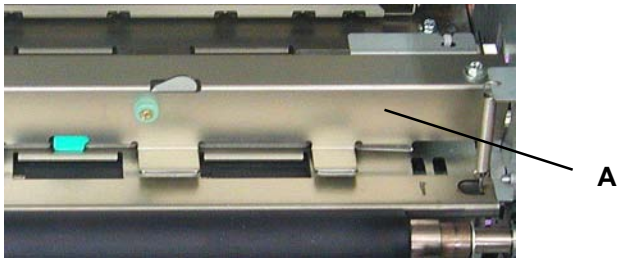


1522

I: Stocker cover
J: Master guide
K: Load roller guide

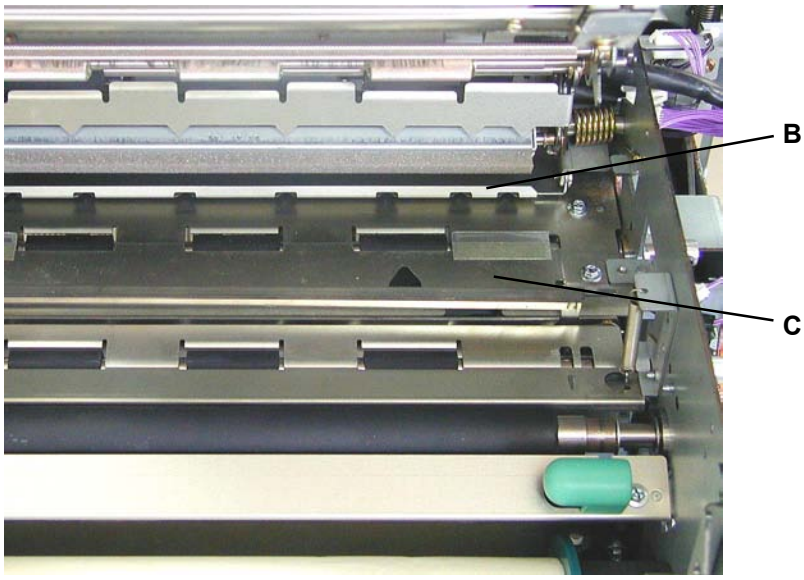
3. Removing the Cutter Unit

(1) Switch off the power, detach the rear cover, and pull out the print drum (in the case of RN25 series, also open the System PCB bracket).
(2) Open the scanner table and open the master loading unit.
(3) Unplug the rear connector, and remove the cutter cover [A]. (RS tight, M4 x 8: 2 pcs)

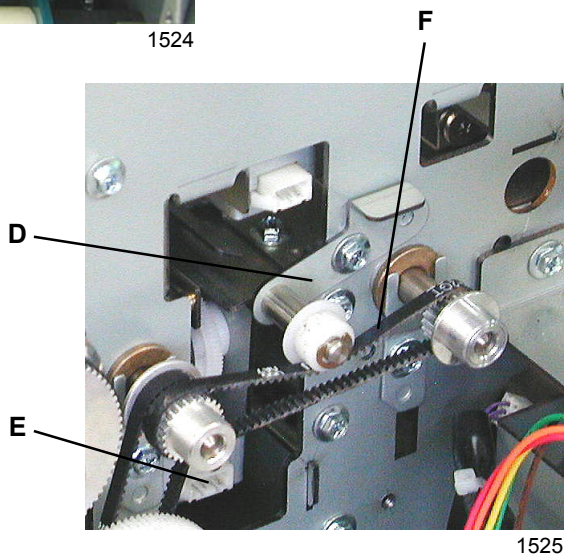


1523

(4) Remove the cutter guide plate [C]. (RS tight, M4 x 8: 2 pcs)
(5) Remove the cutter unit mounting screws. (Stepped screw: 2 pcs)
(6) Loosen the tension assembly [D] screw, detach the timing belt [F], unplug the cutter unit connector [E], and then remove the cutter unit.



1524

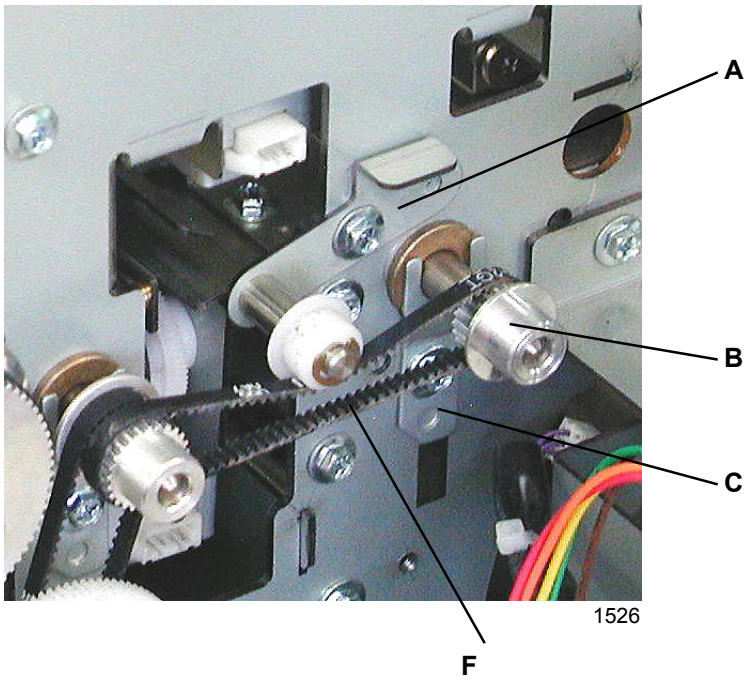


1525

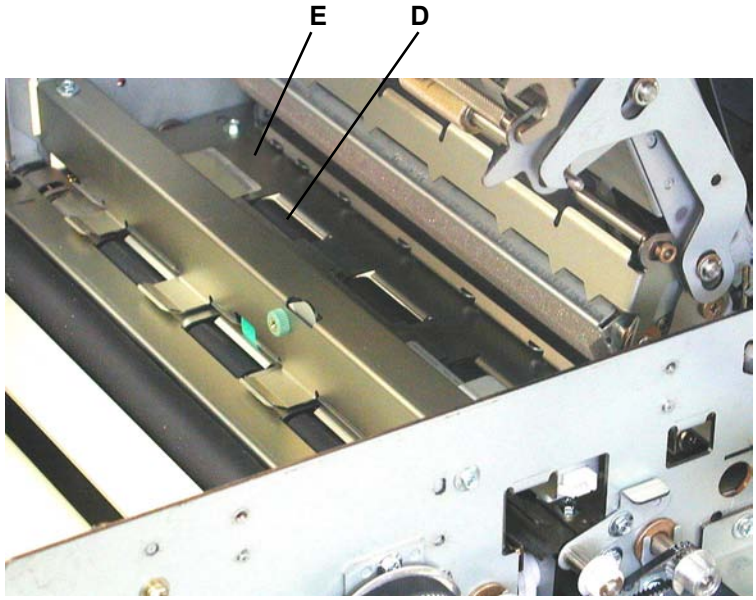
A: Cutter cover
B: Loading guide (plate)
C: Cutter guide plate
D: Tension assembly
E: Cutter unit connector
F: Timing belt

4. Removing the Load Roller

(1) Switch off the power, detach the rear cover, and pull out the print drum (in the case of RN25 series, also open the System PCB bracket).
(2) Open the scanner table and open the master loading unit.
(3) Remove the cutter unit.
(4) Remove the loading guide (bottom) [E]. (RS tight, M4 x 8: 2 pcs)
(5) Loosen the screw (RS tight, M4 x 8: 1 pc) on the tension assembly [A], and remove the timing belt [F].
(6) Remove the pulley [B] (Set screw, M2 x 6: 1 pc) and bearing fixing plate [C] (RS tight, M4 x 8: 1 pc).
(7) Remove the Load roller [D].



1526

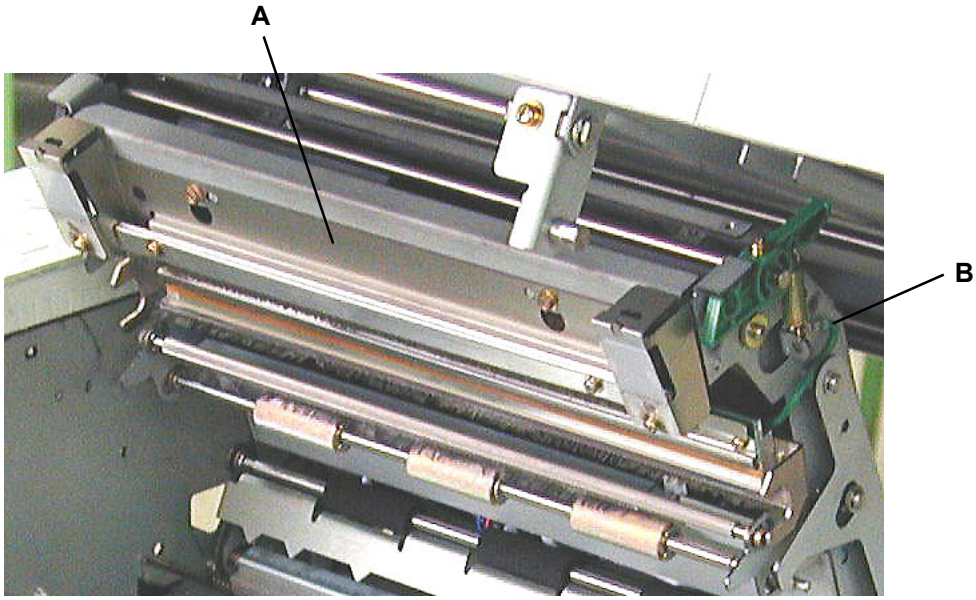


1527

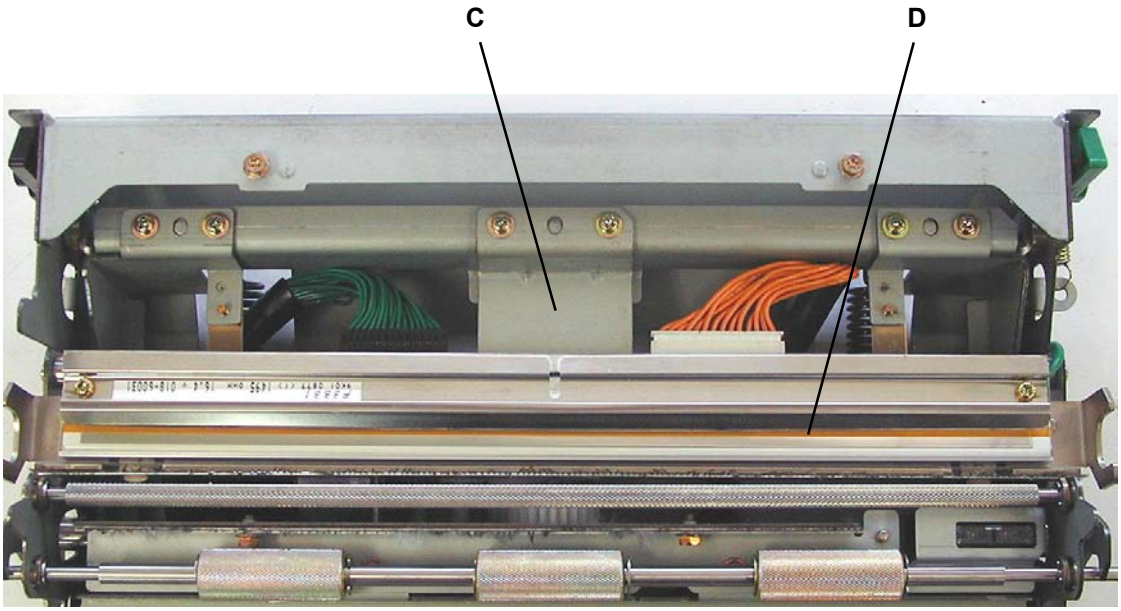
A: Tension assembly
B: Pulley
C: Bearing fixing plate
D: Load roller
E: Loading guide (bottom)
F: Timing belt

5. Removing the Thermal Print Head

(1) Lift up the master loading unit, and remove the master loading unit bottom cover [A]. (Screws only need be loosened.)
(2) Remove the ground wire [B] mounting screw. (RS tight, M3 x 6: 1 pc)
(3) Remove the mounting screws on the TPH bracket [C]. (IT, M3 x 6: 2 pcs)
(4) Unplug the two connectors, and remove the thermal print head [D] together with the TPH bracket.



1528

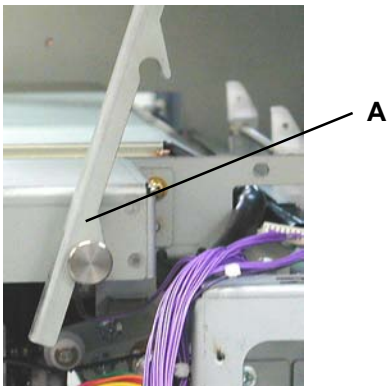


1529

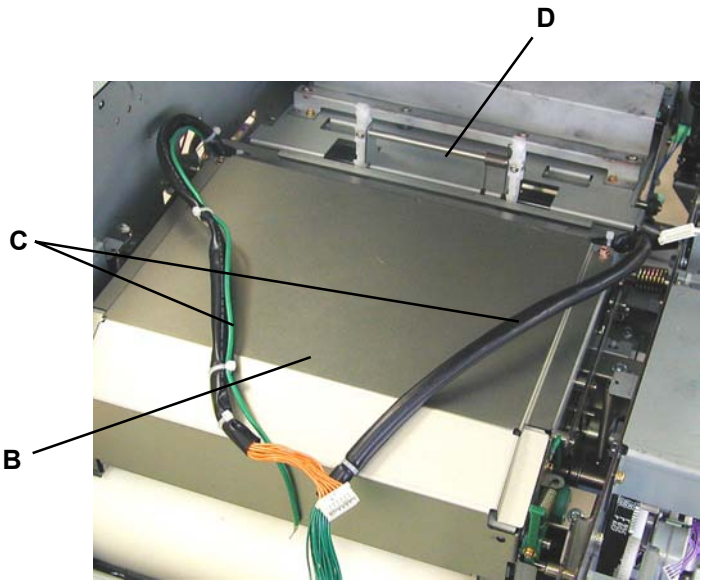
A: Master loading unit bottom cover
B: Ground wire
C: TPH bracket
D: Thermal print head

6. Removing the Master Loading Unit

(1) Move the scanner table unit to the servicing position [A].
(2) Remove the master loading unit upper cover [B]. (RS tight, M3 x 6: 4 pcs)
(3) Remove the wire harness and ground wire [C], and place them on the master loading unit.
(4) Open the master disposal gate housing [D].
(5) With the master loading unit opened as wide as possible, unhook the springs [E] on both sides.
(6) Lift up the master loading unit and remove.



1530



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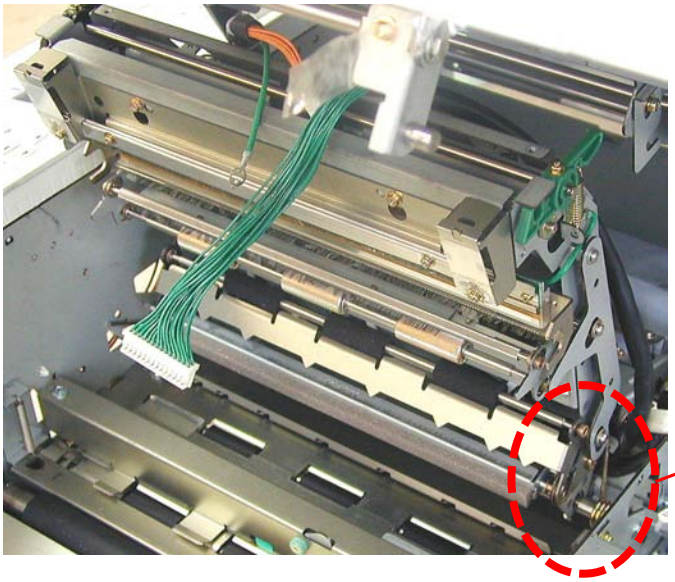
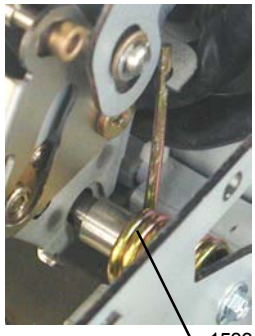

1532

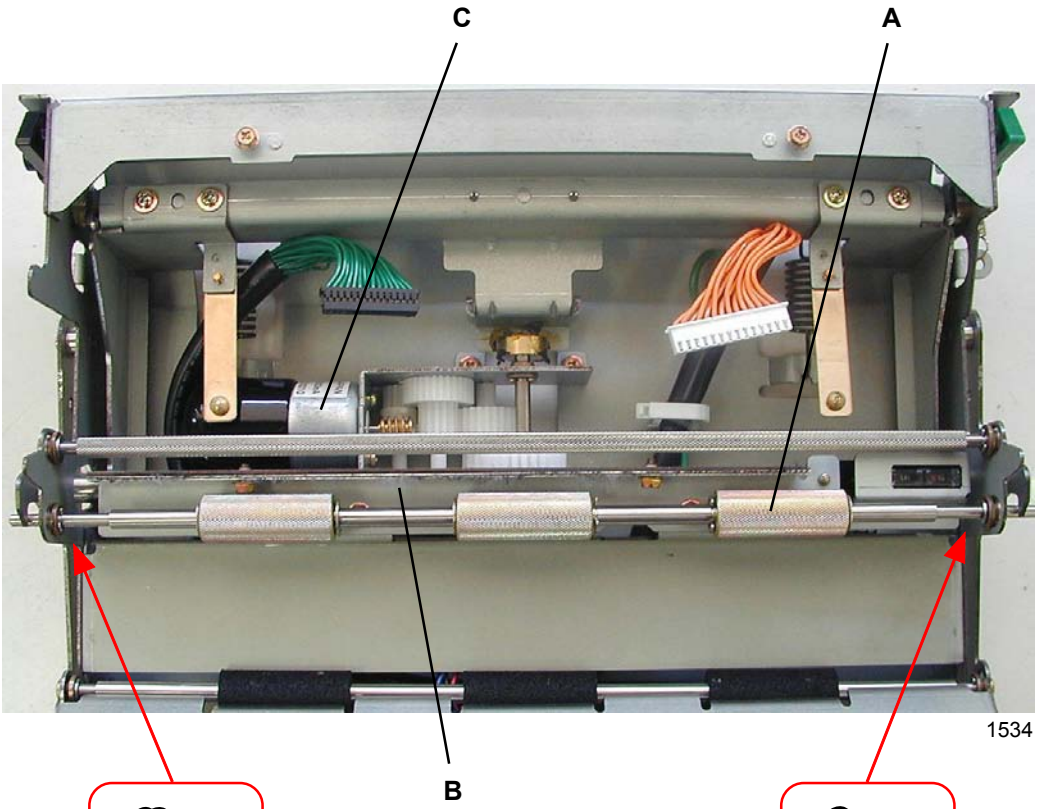


1533

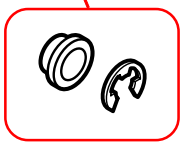
A: Servicing position
B: Master loading unit upper cover
C: Wire harness and ground wire
D: Master disposal gate housing
E: Spring

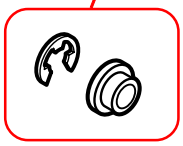
7. Removing the Thermal Pressure Motor

(1) Remove the TPH unit.
(2) Remove the E-rings and bearings, and then remove the load roller No. 1 (top) [A].
(3) Remove the de-electricity brush plate [B]. (RS tight, M3 x 6: 2 pcs)
(4) Remove the thermal pressure motor [C] as a unit. (RS tight, M3 x 6: 4 pcs)



1534


1535


1536

A: Load roller No. 1 (top)
B: De-electricity brush plate
C: Thermal pressure motor

Adjustment

1. Thermal Power of Thermal Print Head

The thermal power must always be set before making masters after the thermal print head has been replaced.

< RN25 Series >

Checks and adjustment

(1) Switch off the power to the system.
(2) Connect a multimeter across pin 1 (+) and pin 3 (-) of CN108 on the Power supply unit.
(3) Run the Test Mode No. 238.
(Switch the thermal print head voltage ON/OFF using the Start/Stop keys.)
(4) Check to confirm that the voltage indicated by the tester corresponds to the value shown in the setting table (next page) according to the thermal head resistance.
(5) If different, adjust using VR401 (coarse adjustment) and VR402 (fine adjustment) on the Power supply unit.

< RN20/21 Series >

Checks and adjustment

(1) Switch off the power to the system.
(2) Connect a multimeter across pin 1 (+) and pin 3 (-) of CN108 on the Power supply unit.
(3) Run the Test Mode No. 238.
(Switch the thermal print head voltage ON/OFF using the Start/Stop keys.)
(4) Check to confirm that the voltage indicated by the tester corresponds to the value shown in the setting table (next page) according to the thermal head resistance.
(5) If different, adjust using VR301 (coarse adjustment) and VR302 (fine adjustment) on the Power supply unit.

[Precautions during Setting]

- Adjustments must be made after the thermal print head has been installed.
- A voltage will not be applied across the thermal print head unless the scanner table is positioned and the Test Mode No. 238 is run.

TPH Resistanace and Voltage Table			
For 400 dpi		For 300 dpi	
TPH resistance (W)	Voltage (V)	TPH resistance (W)	Voltage (V)
1989 - 1996	14.9	1403 - 1413	15.9
1997 - 2022	15.0	1414 - 1431	16.0
2023 - 2049	15.1	1432 - 1449	16.1
2050 - 2076	15.2	1450 - 1467	16.2
2077 - 2104	15.3	1468 - 1485	16.3
2105 - 2131	15.4	1486 - 1503	16.4
2132 - 2159	15.5	1504 - 1522	16.5
2160 - 2187	15.6	1523 - 1540	16.6
2188 - 2215	15.7	1541 - 1559	16.7
2216 - 2243	15.8	1560 - 1577	16.8
2244 - 2271	15.9	1578 - 1596	16.9
2272 - 2300	16.0	1597 - 1615	17.0
2301 - 2329	16.1	1616 - 1634	17.1
2330 - 2358	16.2	1635 - 1653	17.2
2359 - 2387	16.3	1654 - 1672	17.3
2388 - 2416	16.4	1673 - 1692	17.4
2417 - 2446	16.5	1693 - 1711	17.5
2447 - 2475	16.6	1712 - 1731	17.6
2476 - 2505	16.7	1732 - 1750	17.7
2506 - 2535	16.8	1751 - 1770	17.8
2536 - 2565	16.9	1771 - 1790	17.9
2566 - 2596	17.0	1791 - 1810	18.0
2597 - 2626	17.1	1811 - 1830	18.1
2627 - 2657	17.2	1831 - 1850	18.2
2658 - 2688	17.3	1851 - 1871	18.3
2689 - 2691	17.4	1872 - 1891	18.4
------	------	1892 - 1898	18.5

T1537

2. Master Feeding Adjustments

1) Master cut position adjustment

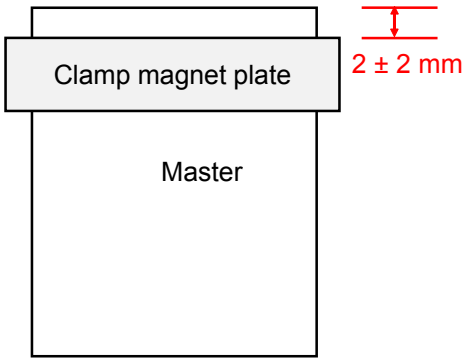
This adjustment sets the master cutting timing (print drum stop position for cutting).

Checks and adjustment

(1) Adjust if the tail end of the master mounted on the print drum is either too long or too short.
(2) Run the Test Mode No. 284 and adjust.
* Increasing the settings increases the length of each master.

2) Master clamp range adjustment

Adjust the master clamp range when it is mounted.



Checks and adjustment

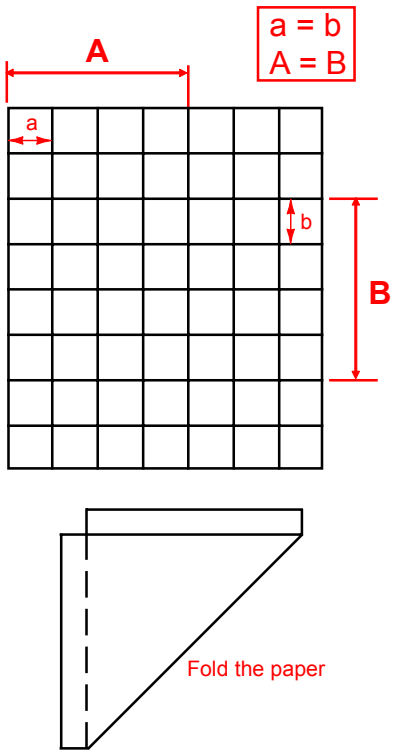
(1) Make a normal and confidential master, and then check the length of the master protruding from the clamp magnet plate.
If the amount protruding is within 2 mm ±2 mm, it is normal. If it is outside this range, adjust as shown below.
(2) Run the Test Mode No. 283 and adjust.
* Increasing the settings increases the amount of protrusion.

Note:

The relative positioning of already-made masters wound onto the print drum will change if the clamp range is adjusted. The master scanning start position must therefore be readjusted, and it must also be confirmed that the vertical printing position adjustment is correct.

3-1) Master making image elongation & shrinkage adjustment (RN25 Series)

Adjust the write pulse motor speed for master making.



Checks and adjustment

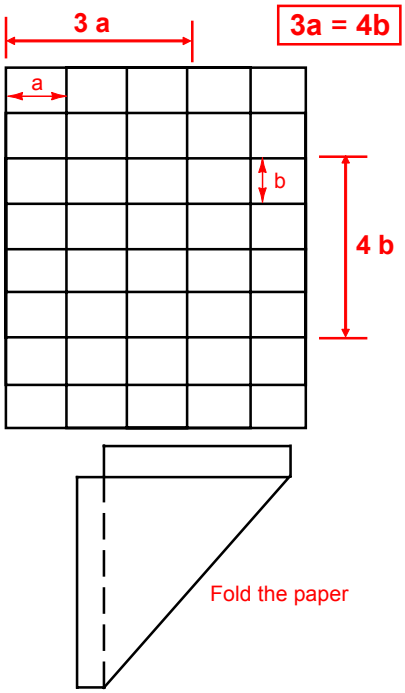
(1) Run the Test Mode No. 051 Test Print (Cross stripes), and produce an actual print.
Adjustment is correct if the length and width of the blocks are the same, making each block a square. (Check by folding paper and illuminating from behind.)
If it is not correct, adjust as shown below.
(2) Run the Test Mode No. 287 and adjust.

Note:

The scanning volume and vertical printing position must be readjusted after adjusting the elongation and shrinkage.

3-2) Master making image elongation & shrinkage adjustment (RN20/21 Series)

The adjustment is made by setting the write pulse motor speed in master making.



Checks and adjustment

(1) Run the Test Mode No. 051 Test Print (Crossed stripes), and produce an actual print.
Printing is correct if the length of three blocks horizontally is the same as that for four blocks vertically. (Check by folding paper and illuminating from behind.)
If it is not correct, adjust as shown below.

(2) Run the Test Mode No. 287 and adjust.

Note:

The scanning volume and vertical printing position must be readjusted after adjusting the elongation and shrinkage.

4) Write start position adjustment

This is to adjust the write start position (distance from the time the master positioning sensor ON to when the read/write signal goes ON) to acheive a leading edge margin of 5mm on top of the prints. The master-clamp-range adjustment must be made in advanve.

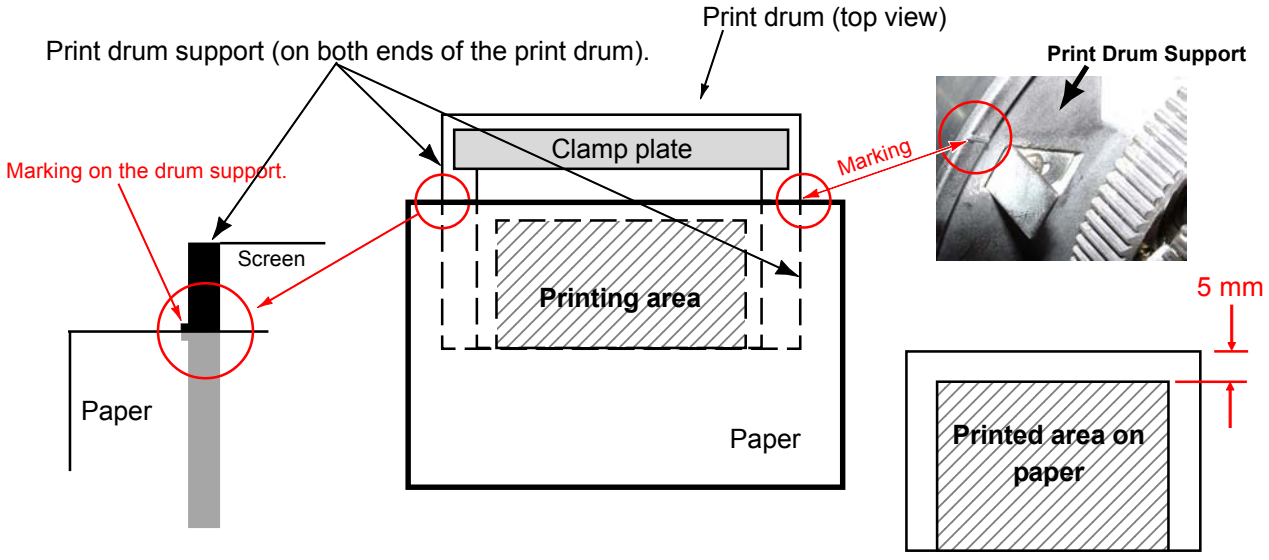
Checks and adjustment

(1) Confirming that the master lamp range is correctly adjusted, run Test Mode No. 050 to make a checkered-flag test print image.

(2) Cover the print drum surface with a paper in landscape way, aligning the leading edge of the paper against the marking on the print drum support on both ends of the drum as shown in the diagram, and then transfer the ink to the paper by rubbing from the top of the paper by hand.
The position is correct if the leading edge margin is 5 mm. If it is not correct, adjust as shown below.

(3) Run the Test Mode No. 281 and adjust.

* Increasing the settings lowers the write start position on the master, which brings the image down and increases the leading-edge margin.



5) Master making length adjustment

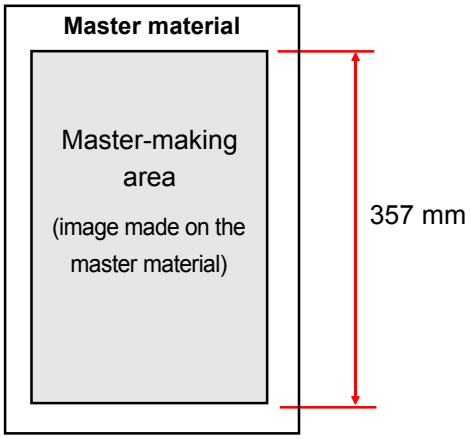
This is to adjust the master making area (vertical image area length) so that there will be a 2mm white margin at the bottom of the paper when prints are made.
Precaution: The master clamp range must be adjusted before making this adjustment.

Checks and adjustment

(1) Run the Test Mode No. 050 Test Print (checkered-flag image), remove the master created from the print drum, and measure the length of the image
The master making length is correct if the total length of the image created is 357 mm.
If it is not correct, adjust by following procedure.

(2) Run Test Mode No. 282 and make adjustment.

* Increasing the settings increases the length of the master making area.



[Memo]

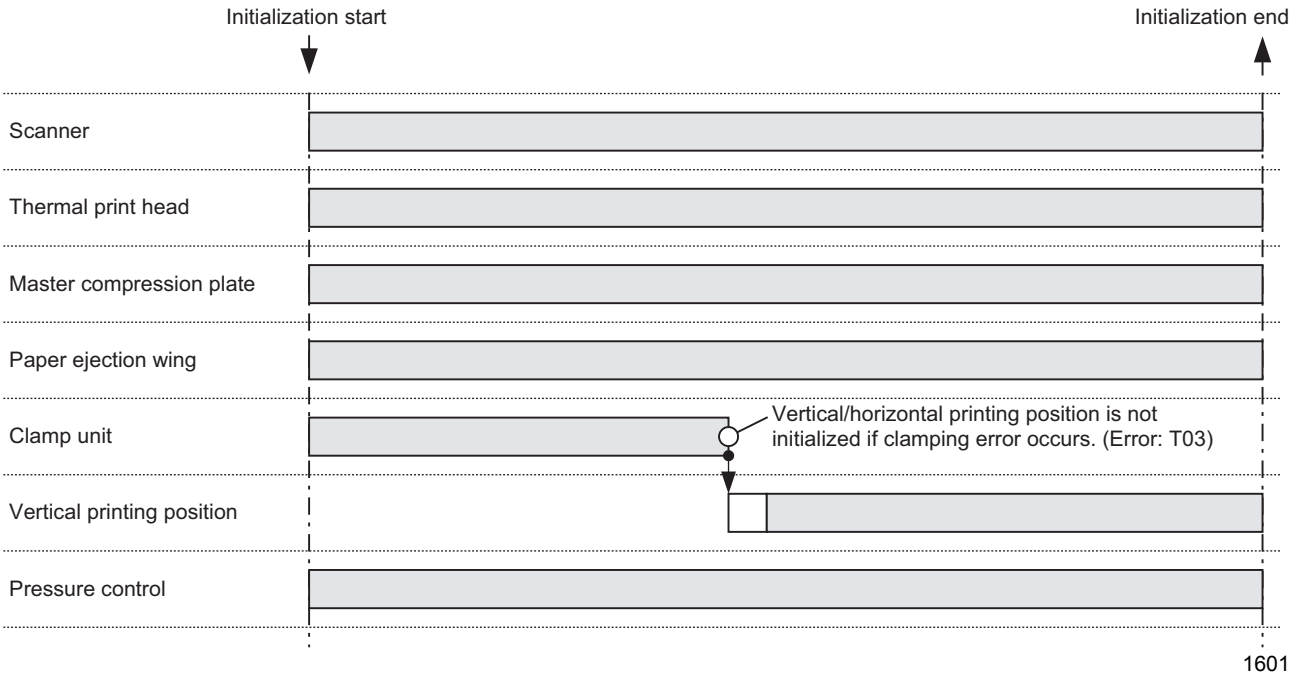
CHAPTER 16: TIMING CHARTS

Contents

Initialization Operations

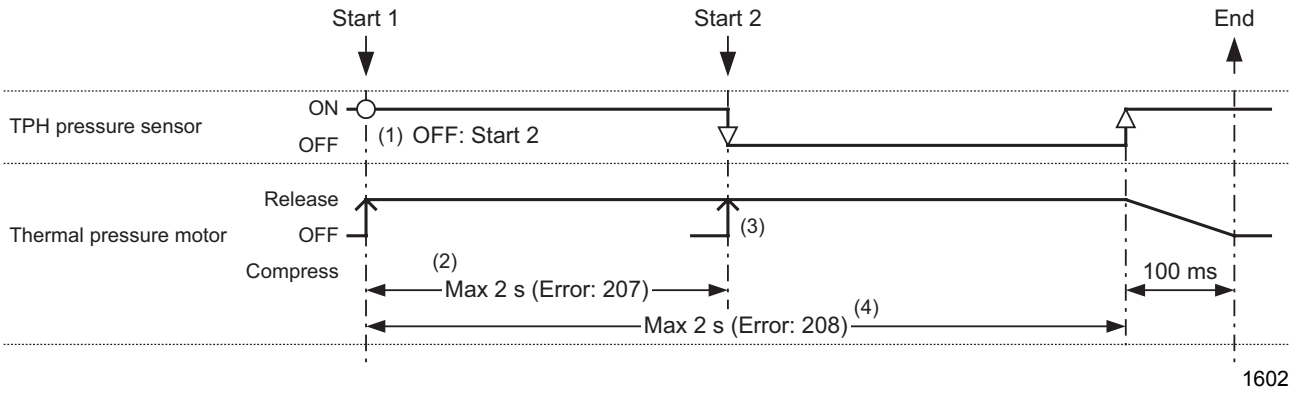
1. Overall Initialization Operation

Returns the following items to their home positions when the power is switched on or when everything is reset.



2. Individual Initialization Operations

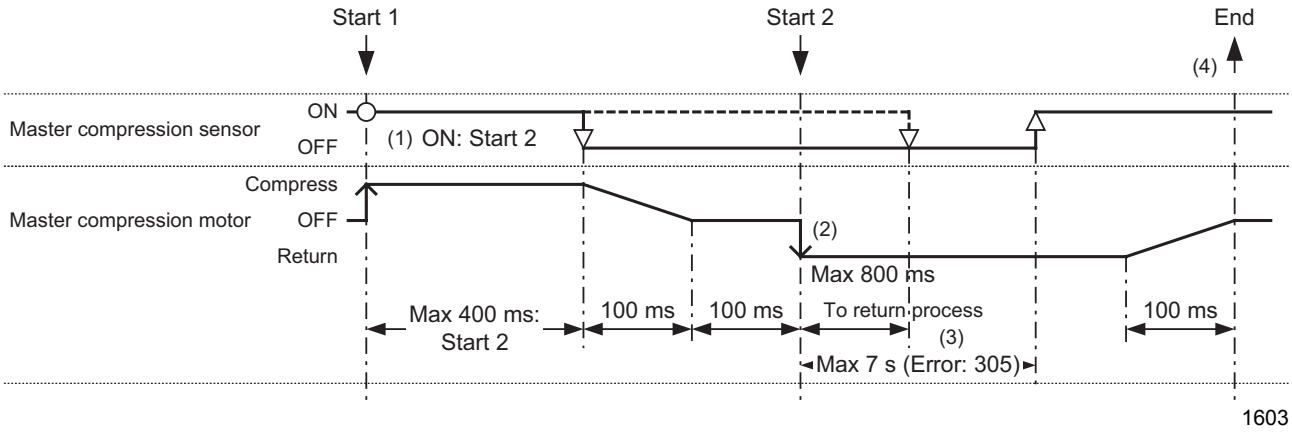
[Thermal Print Head Initialization Operation]



When ON: TPH pressure sensor: Blocked

(1) The TPH pressure sensor is checked on starting, and the operation starts from Start 1 if it is ON, and from Start 2 if it is OFF. At Start 1, the thermal pressure motor operates in the compressing direction until the TPH pressure sensor goes OFF.
(2) A time-out occurs at 2 seconds here, and error message [T19-207] is displayed.
(3) The thermal pressure motor operates in the release direction until the TPH pressure sensor goes ON.
A time-out occurs at 2 seconds here, and error message [T19-208] is displayed.
(4) Initialization ends once the TPH pressure sensor goes ON.

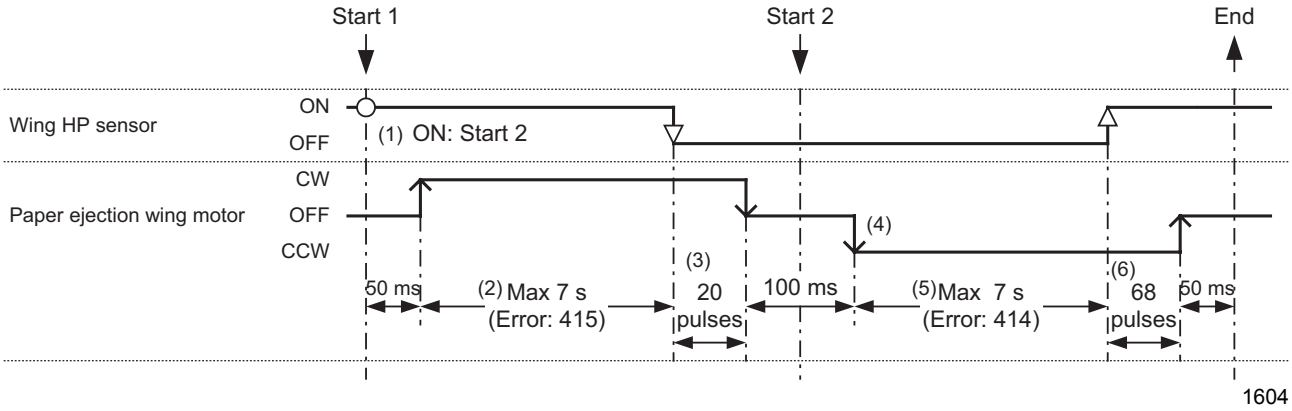
[Master Compression Plate Initialization Operation]



When ON: Master removal sensor: Open, Master compression sensor: Open, Disposal box full sensor: Open

(1) The master compression sensor is checked on starting, and the operation starts from Start 1 if it is ON, and from Start 2 if it is OFF. At Start 1, the master compression motor operates in the compressing direction until the master compression sensor goes OFF.
A time-out occurs at 400 ms here, and the process moves to Start 2.
(2) The master compression motor operates in the return direction until the master compression sensor goes ON.
(3) A time-out occurs at 7 seconds here, and error message [T12-305] is displayed.
(4) Initialization ends once the master compression sensor goes ON and the master compression motor stops.

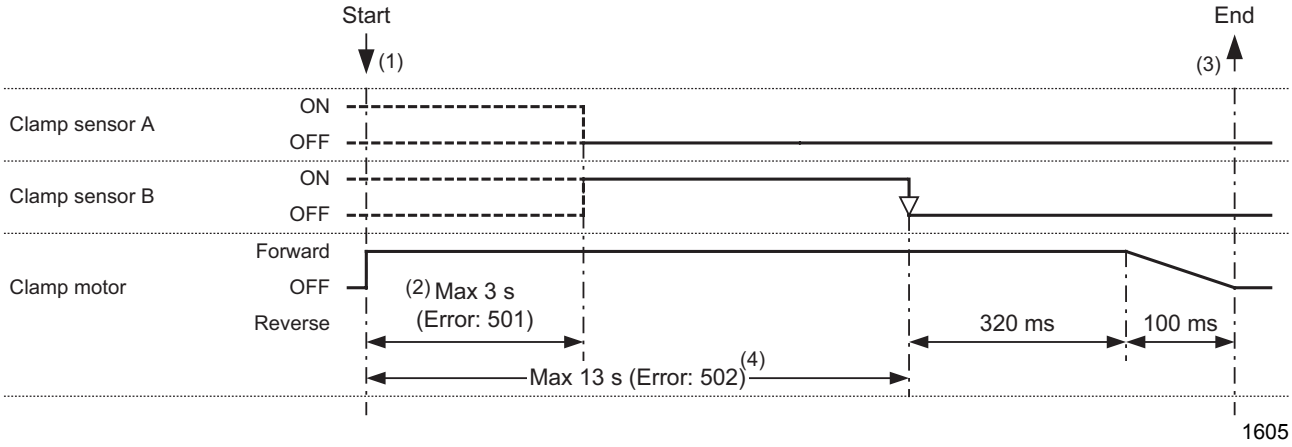
[Paper Ejection Wing Initialization Operation]



When ON: Wing HP sensor: Blocked

(1) The wing HP sensor is checked at startup; operation starts from Start 1 if it is ON, and from Start 2 if it is OFF. At Start 1, the paper ejection wing motor operates in the clockwise direction until the wing HP sensor turns OFF.
(2) A timeout occurs at 7 seconds here and an error message [T20-415] is displayed.
(3) After the wing HP sensor switches from ON to OFF, the paper ejection wing motor operates for 20 pulse revolutions and stops.
(4) After 100 ms, the paper ejection wing motor rotates in the counterclockwise direction until the wing HP sensor turns ON.
(5) A timeout occurs at 7 seconds here and an error message [T20-414] is displayed.
(6) After the wing HP sensor switches from OFF to ON, the paper ejection wing motor operates for 68 pulse revolutions and stops. This completes the initialization operation.

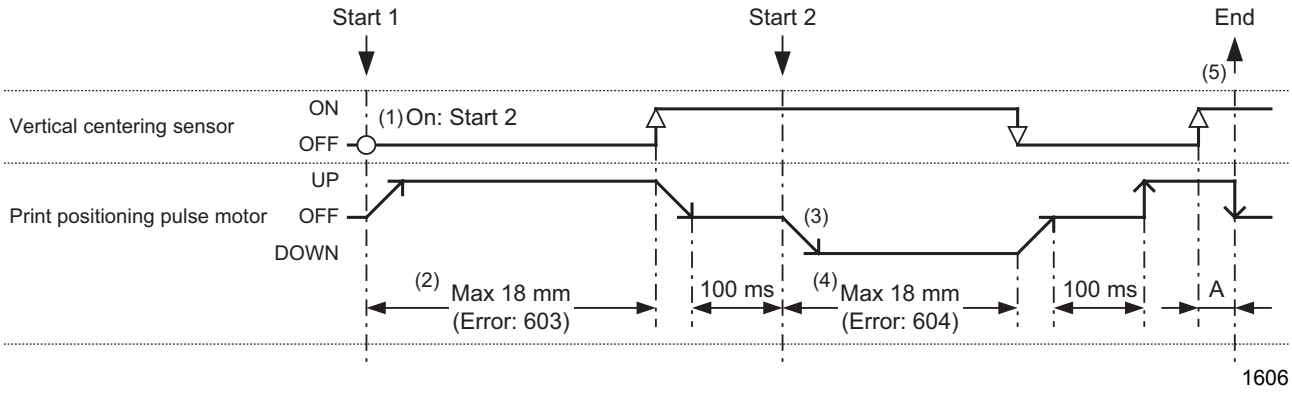
[Clamp Unit Home Positioning Operation]



When ON: Clamp sensor A: Blocked, Clamp sensor B: Blocked

(1) On starting, the system checks that clamp sensor A and clamp sensor B are both OFF. If either is ON, clamp initialization is performed.
(2) If the clamp sensors do not change even after the clamp motor operates, a time-out occurs at 3 seconds, and the error message [T03-501] is displayed.
(3) Initialization ends once both clamp sensor A and clamp sensor B are OFF.
(4) A time-out occurs at 13 seconds if both the sensors do not go OFF after the clamp motor operates, and error message [T03-502] is displayed.

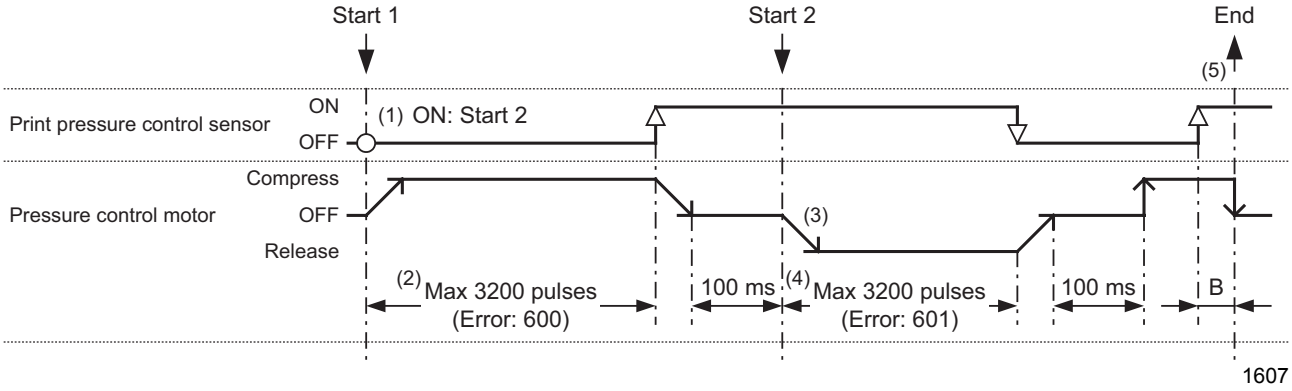
[Vertical Printing Position Initialization Operation]



When ON: Vertical centering sensor: Blocked

(1) The vertical centering sensor is checked on starting, and the operation starts from Start 1 if it is OFF, and from Start 2 if it is ON. At Start 1, the print positioning pulse motor operates in the upward direction until the vertical centering sensor goes ON.
(2) A time-out occurs at 18 mm here, and error message [T05-603] is displayed.
(3) The print positioning pulse motor operates in the downward direction until the vertical centering sensor goes OFF.
(4) A time-out occurs at 18 mm here, and error message [T05-604] is displayed.
(5) The print positioning pulse motor operates in the upward direction once again, and then moves the equivalent of A mm after the vertical centering sensor goes ON, before stopping. (A = 0.5 mm + value set in Test Mode No. 680)

[Pressure Initialization Operation]



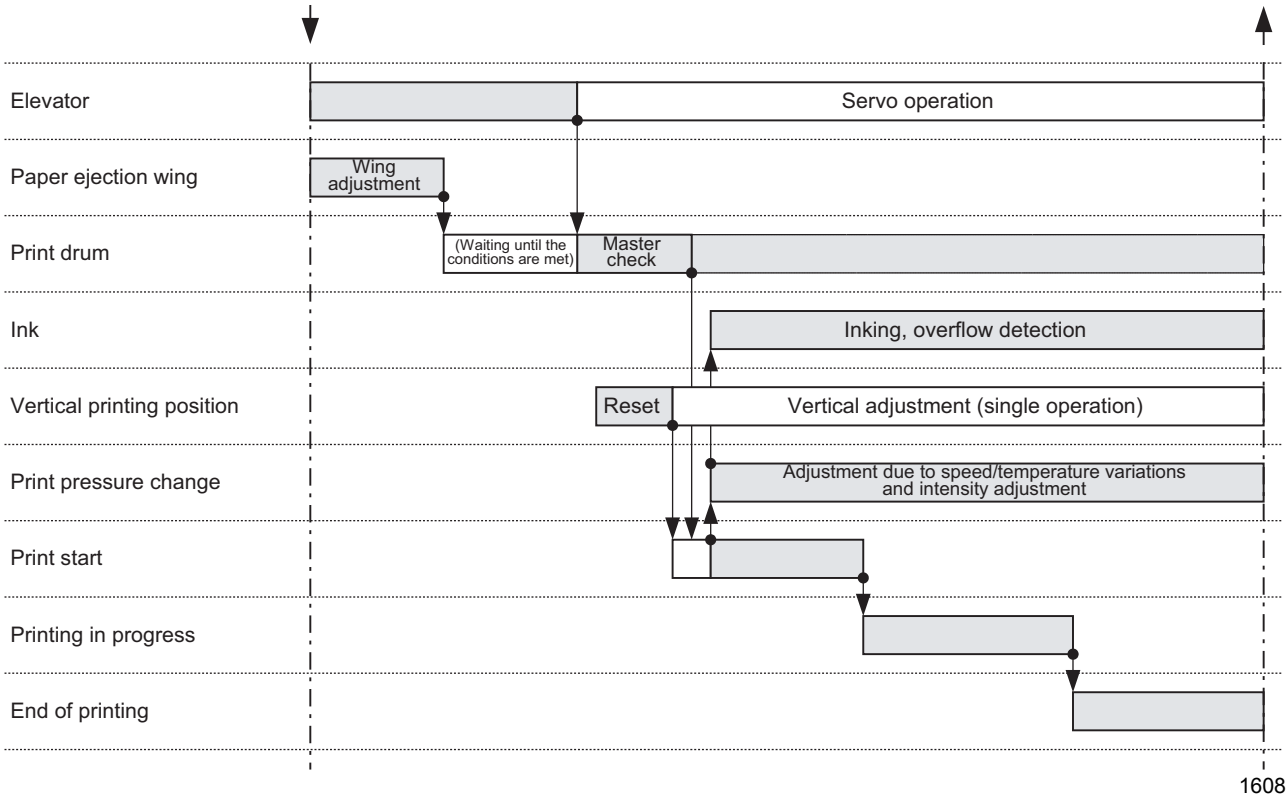
When ON: Print pressure control sensor: Blocked

(1) The print pressure control sensor is checked on starting, and the operation starts from Start 1 if it is OFF, and from Start 2 if it is ON. At Start 1, the pressure control motor operates in the direction of compression until the print pressure control sensor goes ON.
(2) A time-out occurs at 3200 pulses here, and error message [T11-600] is displayed.
(3) The pressure control motor operates in the release direction until the print pressure control sensor goes OFF.
(4) A time-out occurs at 3200 pulses here, and error message [T11-601] is displayed.
(5) The pressure control motor operates in the direction of compression once again, and then moves the equivalent of B pulses after the print pressure control sensor goes ON, before stopping. (B = 10 pulses + value set in Test Mode No. 682)

[Memo]

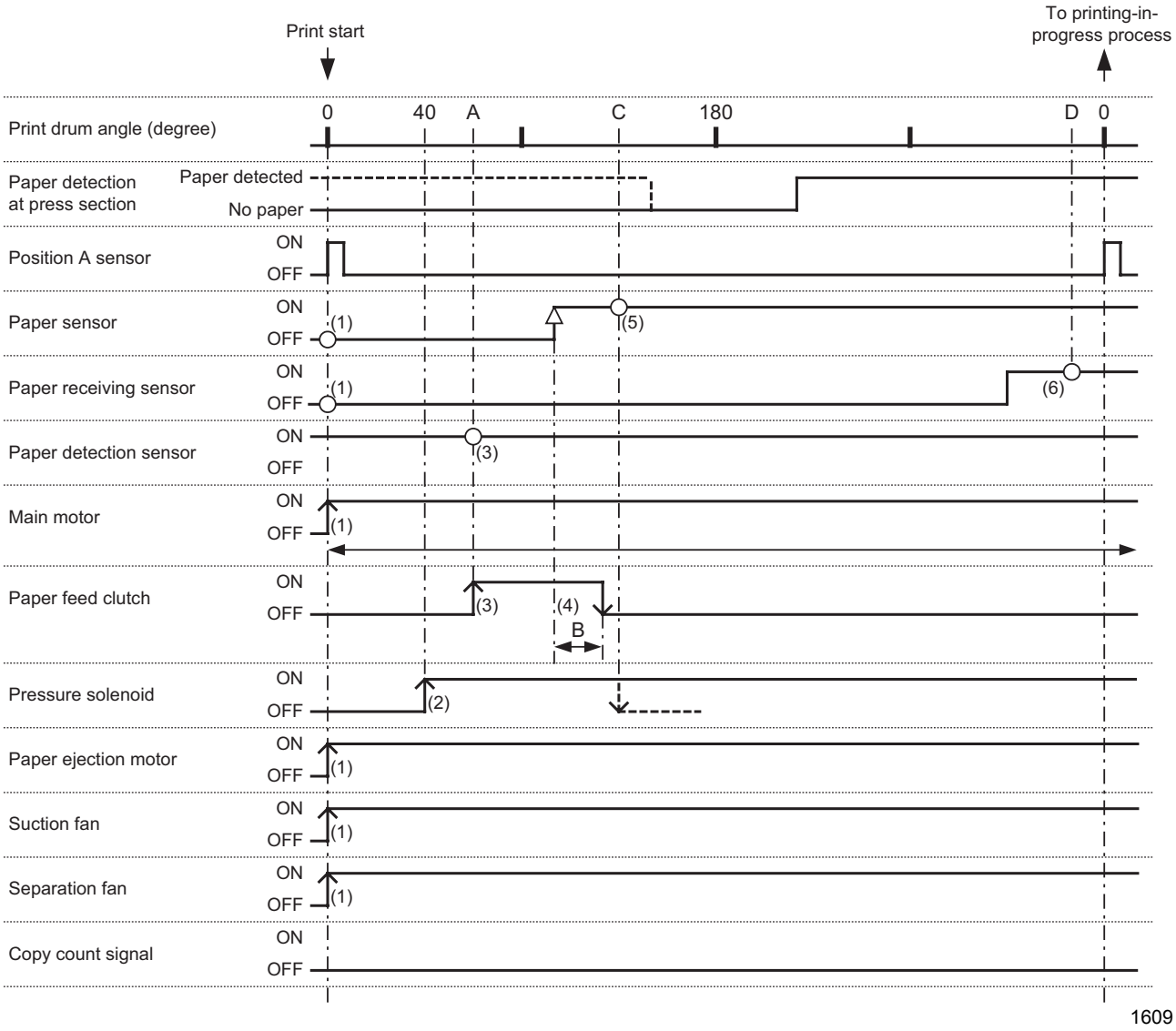
Printing Operations

1. Normal Overall Printing Operation



2. Individual Printing Operations

[Print Start Operation]



When ON: Position A sensor: Blocked, paper sensor: Blocked, Paper ejection sensor: Open, Paper detection sensor: Open

(1) The paper receiving sensor is checked on starting printing, and error message [A09-417] is displayed if it is ON (paper jam from start).
The paper sensor is checked on starting printing, and error message [A07-418] is displayed if it is ON (paper jam from start).
On starting printing, the main motor, paper ejection motor, suction fan, and separation fan are switched ON.
The print drum initially rotates at speed 1 here, and increments by one speed level at the drum angle of 220° for each sheet printed.

(2) The pressure solenoid is activated at the drum angle of 40°, and subsequently remains ON until printing ends.

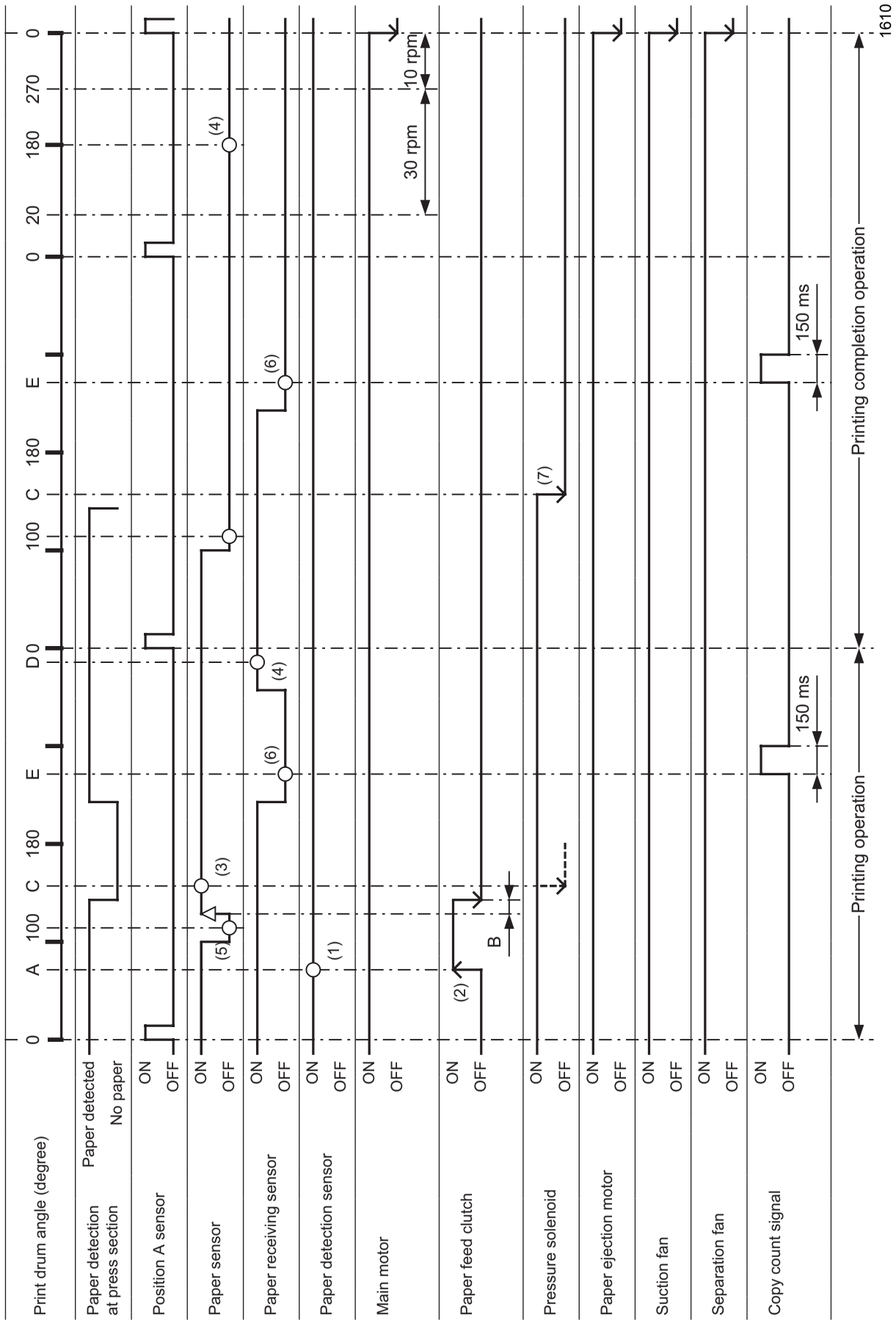
(3) The paper detection sensor is checked at the drum angle of A°, and the paper feed clutch is activated if paper is present.
Error message [C04-402] is displayed if no paper is present.
A = a + values set in Test Modes Nos. 495 through 498
a: 65° (NORMAL), 67° (CARD), 65° (THIN), 67° (CUSTOM)

(4) The paper is transported, and the paper feed clutch is deactivated once the print drum has rotated B° from when the paper is detected by the paper sensor.
B = b + values set in Test Modes Nos. 482 through 485 + the correction value for the corresponding print-drum rotation speed
b: 21° (NORMAL), 41° (CARD), 21° (THIN), 21° (CUSTOM)

(5) If the paper sensor does not detect the paper by the time the print drum has rotated to angle C, it determines that no paper has been picked up, and moves to the three-cycle no-paper pickup operation.
C = 143° + value set in Test Mode No. 486 + value set in Test Modes Nos. 495 through 498

(6) If the paper receiving sensor does not detect the paper by the time the print drum has rotated to angle D, it determines that a paper jam has occurred, and moves to the print-end operation.
The paper sensor is checked at 180° before the print drum stops, error message [A07-409] is displayed if paper is present, and [A08-410] is displayed if there is no paper.
D = 350° + value set in Test Mode 487

[Print In Progress - End Operation]



(1) The paper detection sensor is checked at the drum angle A, and the paper feed clutch is activated if paper is present.
Error message [C04-402] is displayed if no paper is present.
A = a + values set in Test Modes Nos. 495 through 498
a: 65° (NORMAL), 67° (CARD), 65° (THIN), 67° (CUSTOM)

(2) The paper is transported, and the paper feed clutch is deactivated once the print drum has rotated B° from when the paper is detected by the paper sensor.
B = b + values set in Test Modes Nos. 482 through 485 + the correction value for the corresponding print-drum rotation speed
b: 21° (NORMAL), 41° (CARD), 21° (THIN), 21° (CUSTOM)

(3) If the paper sensor does not detect the paper by the time the print drum has rotated to angle C, it determines that no paper has been picked up, and moves to the three-cycle no-paper pickup operation.
C = 143° + value set in Test Mode No. 486 + value set in Test Mode Nos. 495 through 498

(4) If the paper receiving sensor does not detect the paper by the time the print drum has rotated to angle D, it determines that a paper jam has occurred, and moves to the print-end operation.
The paper sensor is checked at 180° before the print drum stops, error message [A07-409] is displayed if paper is present, and [A08-410] is displayed if there is no paper.
D = 350° + value set in Test Mode No. 487

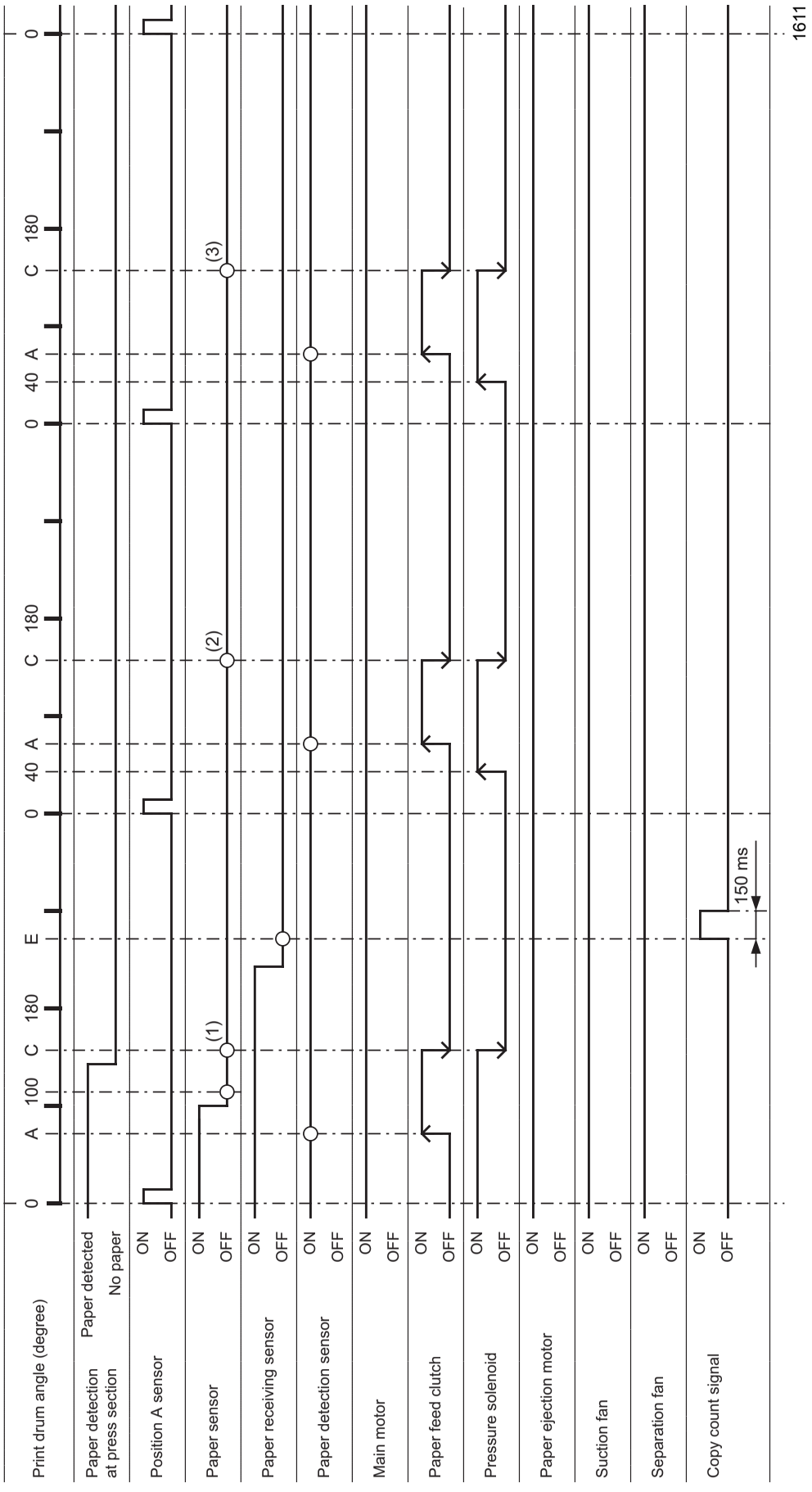
(5) If the paper does not pass beyond the paper sensor by the time the print drum has rotated to 100°, it determines that a paper jam has occurred, and moves to the print-end operation. Error message [A07-413] is displayed.

(6) The paper receiving sensor is checked at the drum angle, E. If the paper is still present, it determines that a paper jam has occurred, moves to the print-end operation, and error message [A09-411] is displayed. If normal, the copy count is incremented.
E = 250° + value set in Test Mode No. 488

(7) On completion of printing, the pressure solenoid is deactivated when the print drum has rotated to angle C.

(8) For the final revolution, the print-drum speed decreases to 30 rpm at a print-drum angle of 20°, and to 10 rpm at 270°. The main motor, paper ejection motor, suction fan, and separation fan stop when the print drum is detected at Position A.

[Three-Cycle No-Paper Pickup Operation]



(1) If the paper sensor does not detect the paper by the time the print drum has rotated to angle C, it determines that no paper has been picked up, and moves to the three-cycle no-paper pickup operation.

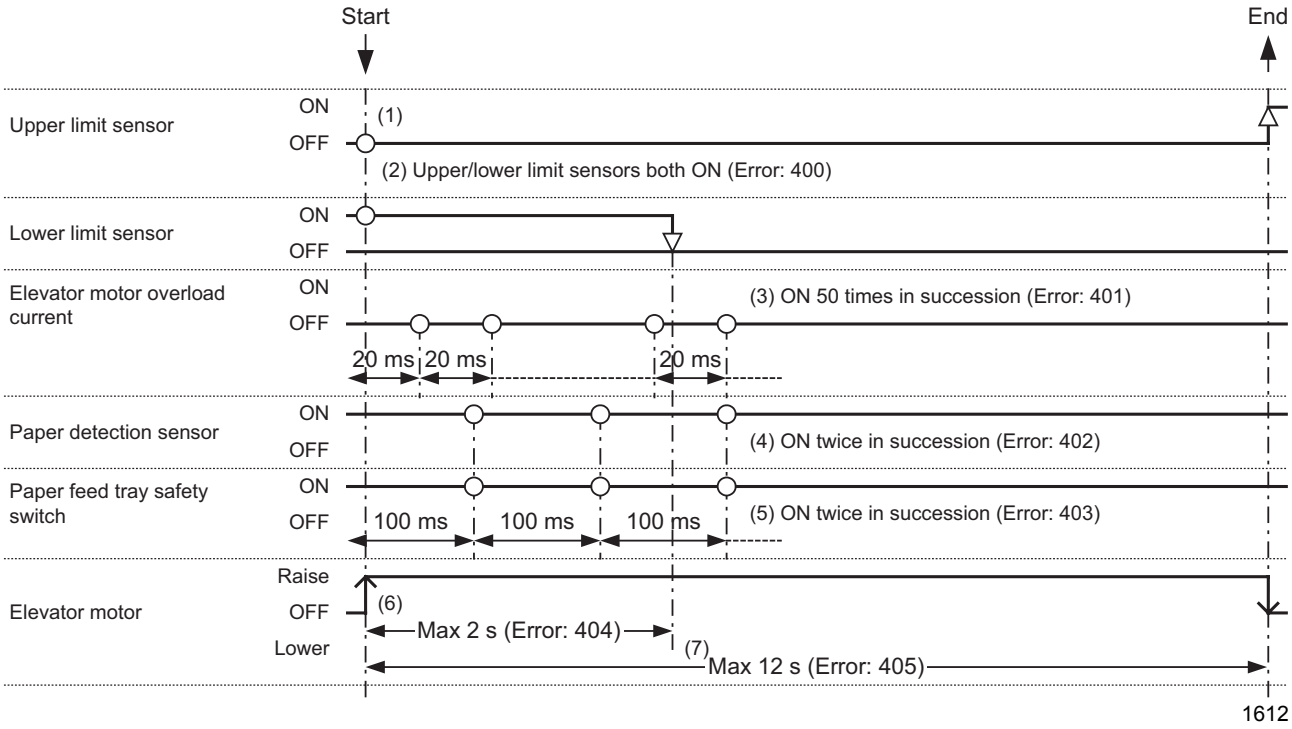
C = 143° + value set in Test Mode No. 486 + value set in Test Mode Nos. 495 through 498

(2) The paper feed operation is performed a second time, and returns to the normal operation if the paper sensor detects the paper by the time the print drum has rotated to angle C.

(3) The paper feed operation is performed a third time, and returns to the normal operation if the paper sensor detects the paper by the time the print drum has rotated to angle C. If paper is not detected, it moves to the print-end operation, and error message [A07-412] is displayed.

3. Elevator Operations

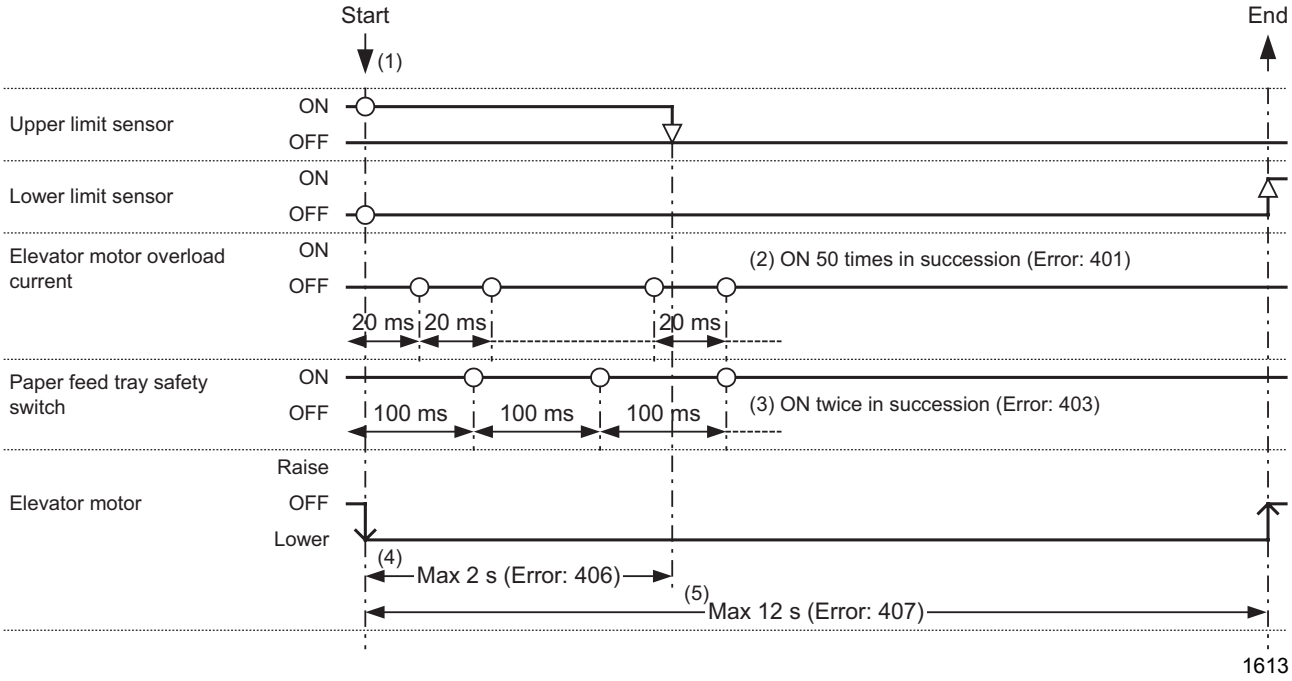
[Elevator Raise Operation]



When ON: Upper limit sensor: Blocked, Lower limit sensor: Blocked, Paper detection sensor: Open

(1) The operation ends if the upper limit sensor is ON from the start.
If the upper limit sensor is OFF, the elevator operates until the upper limit sensor goes ON.
(2) Error message [T02-400] is displayed if both the upper and lower limit sensors are ON at the start.
(3) The elevator motor overload current is continually monitored at 20 ms intervals while the elevator is operating, and error message [T02-401] is displayed if an overload current is detected 50 times in succession.
(4) The paper detection sensor is continually monitored at 100 ms intervals while the elevator is operating, and error message [C04-402] is displayed if no paper is detected twice in succession.
(5) The paper feed tray safety switch is continually monitored at 100 ms intervals while the elevator is operating, and error message [A06-403] is displayed if it is detected as OFF twice in succession.
(6) If the lower limit sensor takes more than 2 seconds to go OFF after the elevator starts, a time-out occurs, and error message [T02-404] is displayed.
(7) If the upper limit sensor takes more than 12 seconds to go ON after the elevator starts, a time-out occurs, and error message [T02-405] is displayed.

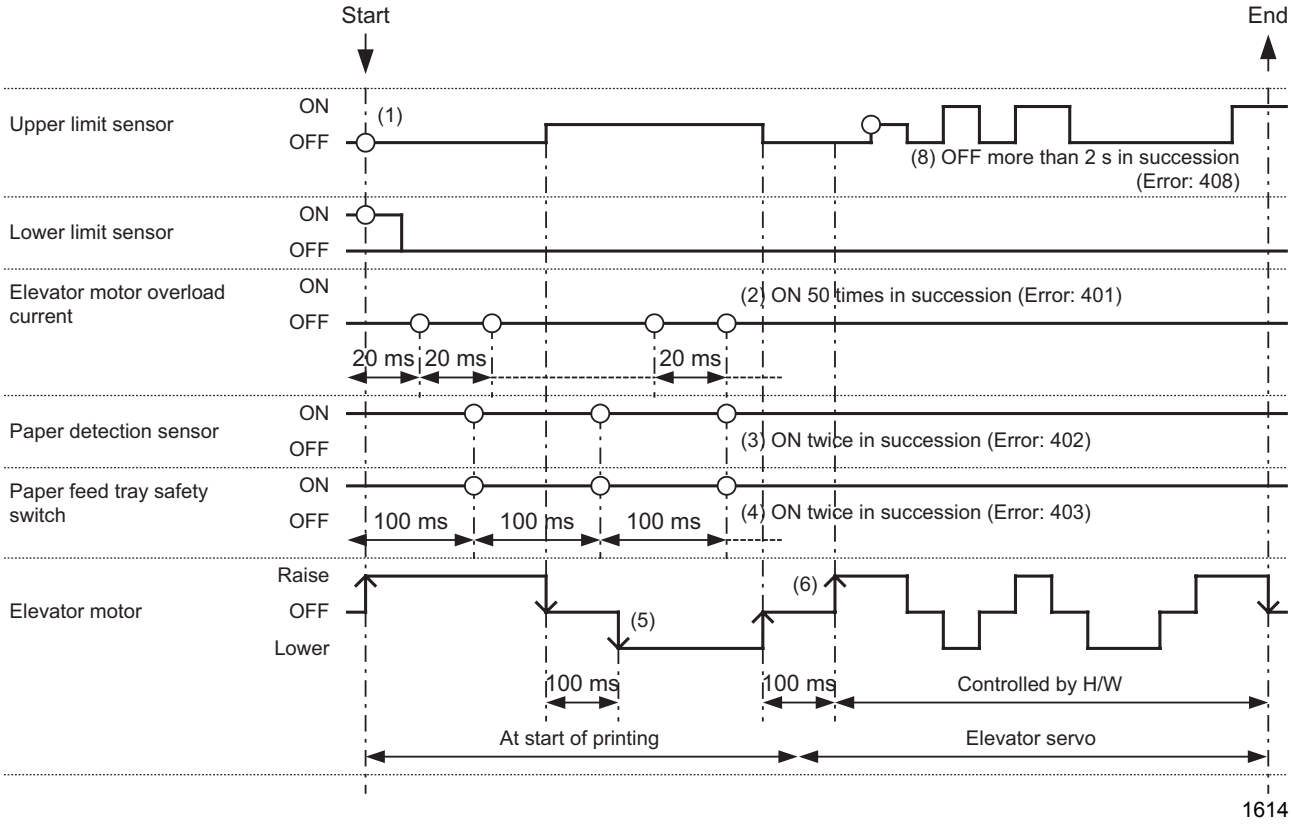
[Elevator Lower Operation]



When ON: Upper limit sensor: Blocked, Lower limit sensor: Blocked, Paper feed tray safety switch: Depressed

(1) The operation ends if the lower limit sensor is ON from the start.
If the lower limit sensor is OFF, the elevator operates until the lower limit sensor goes ON.
(2) The elevator motor overload current is continually monitored at 20 ms intervals while the elevator is operating, and error message [T02-401] is displayed if an overload current is detected 50 times in succession.
(3) The paper feed tray safety switch is continually monitored at 100 ms intervals while the elevator is operating, and error message [A06-403] is displayed if it is detected as OFF twice in succession.
(4) If the upper limit sensor takes more than 2 seconds to go OFF after the elevator starts, a time-out occurs, and error message [T02-406] is displayed.
(5) If the lower limit sensor takes more than 12 seconds to go ON after the elevator starts, a time-out occurs, and error message [T02-407] is displayed.

[Elevator Servo Operation]

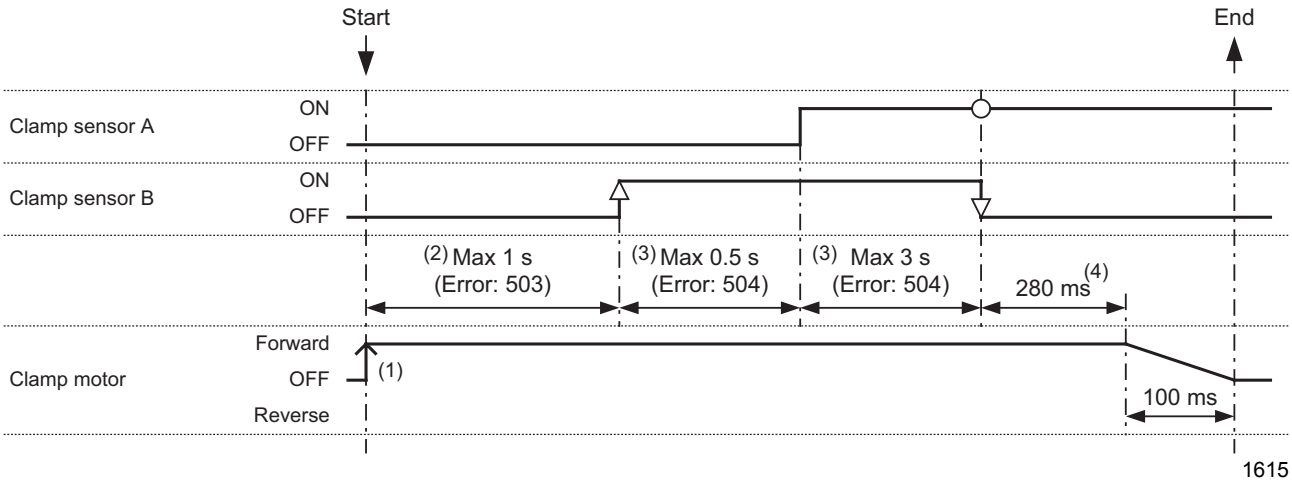


When ON: Upper limit sensor: Blocked, Lower limit sensor: Blocked, Paper detection sensor: Open, Paper feed tray safety switch: Depressed

(1) The operation ends if the upper limit sensor is ON from the start.
If the upper limit sensor is OFF, the elevator operates until the upper limit sensor goes ON.
(2) The elevator motor overload current is continually monitored at 20 ms intervals while the elevator is operating, and error message [T02-401] is displayed if an overload current is detected 50 times in succession.
(3) The paper detection sensor is continually monitored at 100 ms intervals while the elevator is operating, and error message [C04-402] is displayed if no paper is detected twice in succession.
(4) The paper feed tray safety switch is continually monitored at 100 ms intervals while the elevator is operating, and error message [A06-403] is displayed if it is detected as OFF twice in succession.
(5) If the upper limit sensor goes ON, the elevator briefly descends until the upper limit sensor goes OFF.
(6) The elevator then rises until the upper limit sensor goes ON again.
(7) The elevator servo operation is subsequently performed.
(8) If the upper limit sensor remains OFF for more than 2 seconds during the elevator servo operation, error message [T02-408] is displayed.

4. Print Drum Peripheral Operations

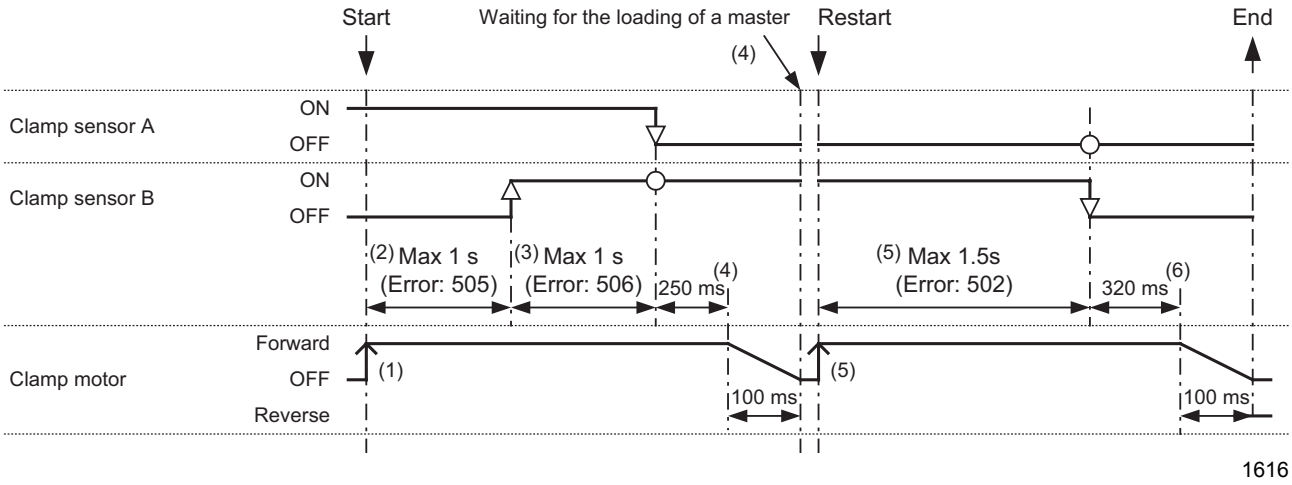
[Clamp Release]



When ON: Clamp sensor A: Blocked, Clamp sensor B: Blocked

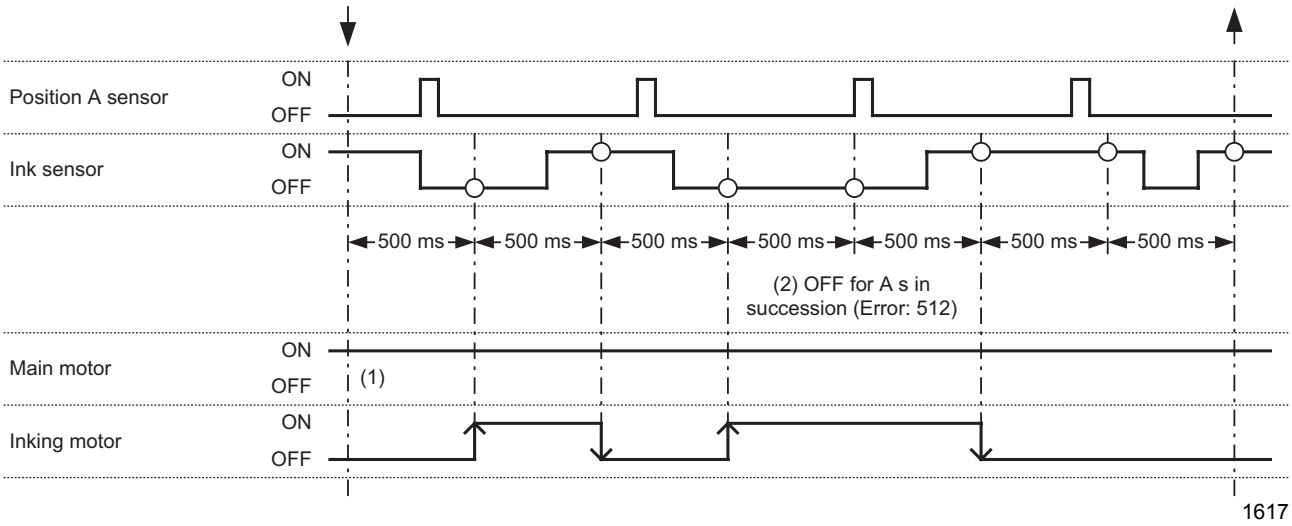
(1) The clamp motor operates in the forward direction on starting.
(2) A time-out occurs and error message [T03-503] is displayed if clamp sensor B does not go ON within 1 second of the clamp motor starting.
(3) A timeout occurs and an error message [T03-504] is displayed if the clamp sensor A does not turn ON within 0.5 seconds after the clamp sensor B switches from OFF to ON, or if the clamp sensor B does not turn OFF within 3 seconds after the clamp sensor A switches from OFF to ON.
(4) When clamp sensor B goes OFF with clamp sensor A ON, the clamp motor operates for a further 280 ms before stopping.

[Master Clamp Operation]



(1) The clamp motor operates in the forward direction on starting.
(2) A time-out occurs and error message [T03-505] is displayed if clamp sensor B does not go ON with 1 second of the clamp motor starting.
(3) A timeout occurs and an error message [T03-506] is displayed if the clamp sensor A does not turn OFF within 1 second after the clamp sensor B switches from OFF to ON.
(4) With the clamp sensor B ON, when the clamp sensor A switches from ON to OFF, the clamp motor rotates for 250 ms, stops, and waits for the loading of a master.
(5) After a master is loaded, the clamp motor rotates again in the forward direction. If the clamp sensor B does not turn OFF within 1.5 seconds in this process, an error message [T03-502] is displayed.
(6) With the clamp sensor A ON, when the clamp sensor B switches from ON to OFF, the clamp motor rotates for 320 ms and then stops to complete the operation.

[Inking Operation (No Ink Detection)]



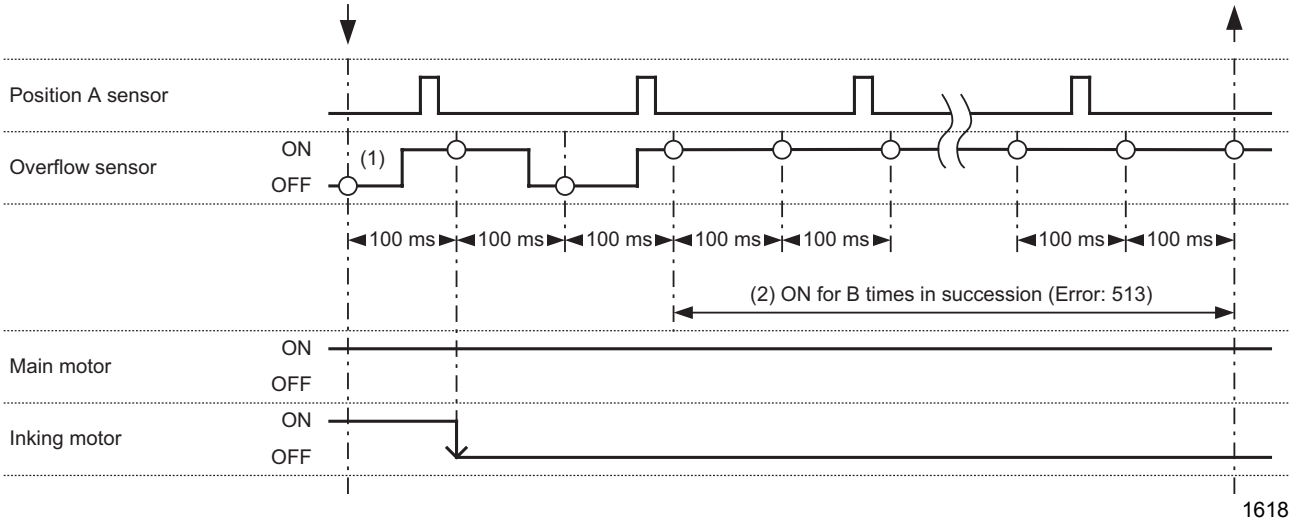
(1) Inking is performed with the main motor ON.

(2) The ink sensor is monitored at 500 ms intervals, and if it is detected as OFF, the inking motor is activated until the ink sensor goes ON. A time-out occurs at A s here, and the ink cartridge is determined as empty. Error message [C01-512] is displayed.

Normally: A = Value set in Test Mode No. 583 (initially 20 s)

After ink replacement: A = Value set in Test Mode No. 584 (initially 40 s)

[Inking Operation (Overflow Detection)]

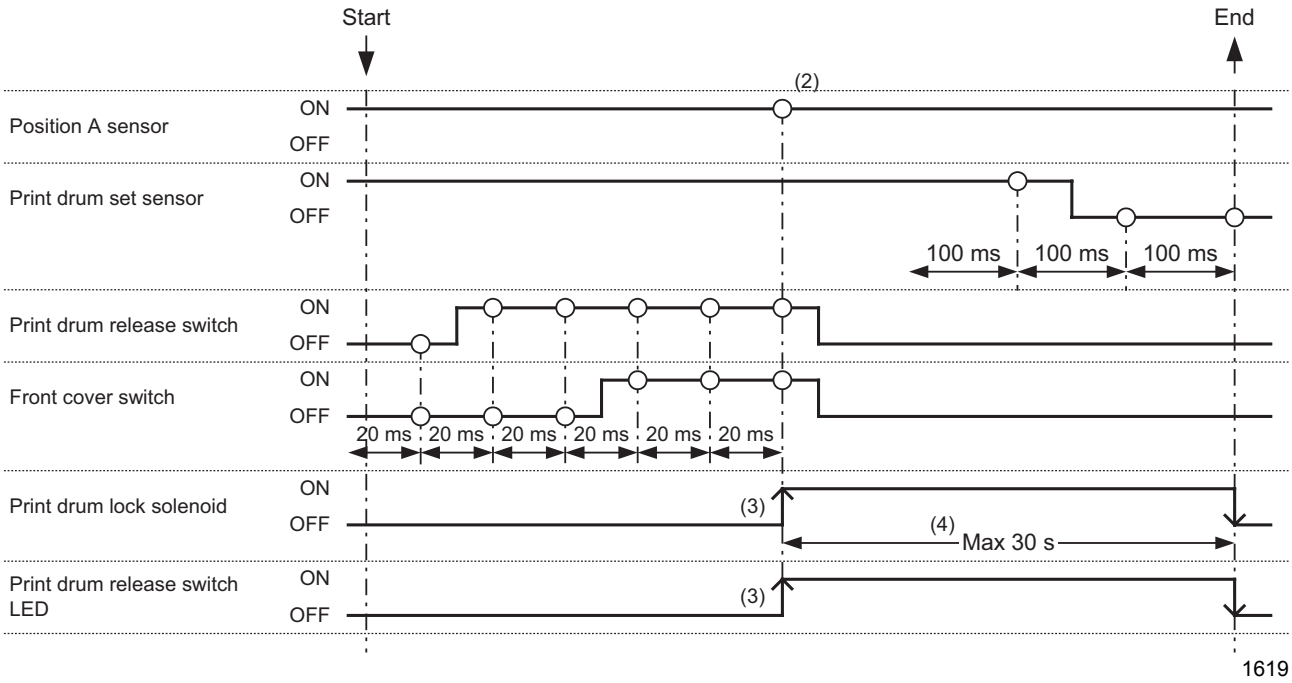


(1) The overflow sensor is monitored at 100 ms intervals, and if it is detected as ON, the inking motor is stopped for period (2) irrespective of the ink sensor status.

(2) If the overflow sensor is detected as ON B times in succession, an overflow is determined to have occurred, and error message [T04-513] is displayed.

B = Value set in Test Mode No. 585 (initially 50 times)

[Print Drum Solenoid Lock Release]



(1) The print-drum set sensor is monitored at 100 ms intervals, while the print-drum release switch and front cover switch are monitored at 20 ms intervals.

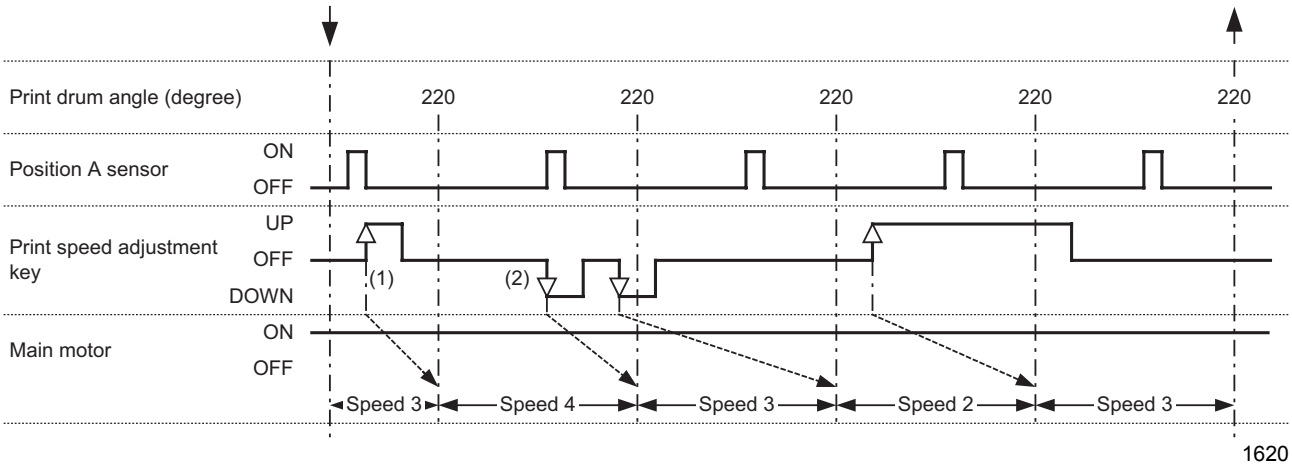
(2) If the print drum release switch is detected as having been depressed five times in succession, or if the print drum front cover is detected as having been depressed three times in succession, the position A sensor is checked. If the position A sensor is OFF, the print drum rotates to position A. (In this process, the print drum release switch LED blinks.)

(3) The print drum lock solenoid and print drum release switch LED are switched ON until the print drum set sensor goes OFF (until the print drum is removed) to allow the print drum to be removed at position A.

(4) If the print drum is left at the removal position without being removed, a time-out occurs at 30 seconds, and the print drum lock solenoid and print drum release switch LED are switched OFF.

5. Print Adjustment Operations

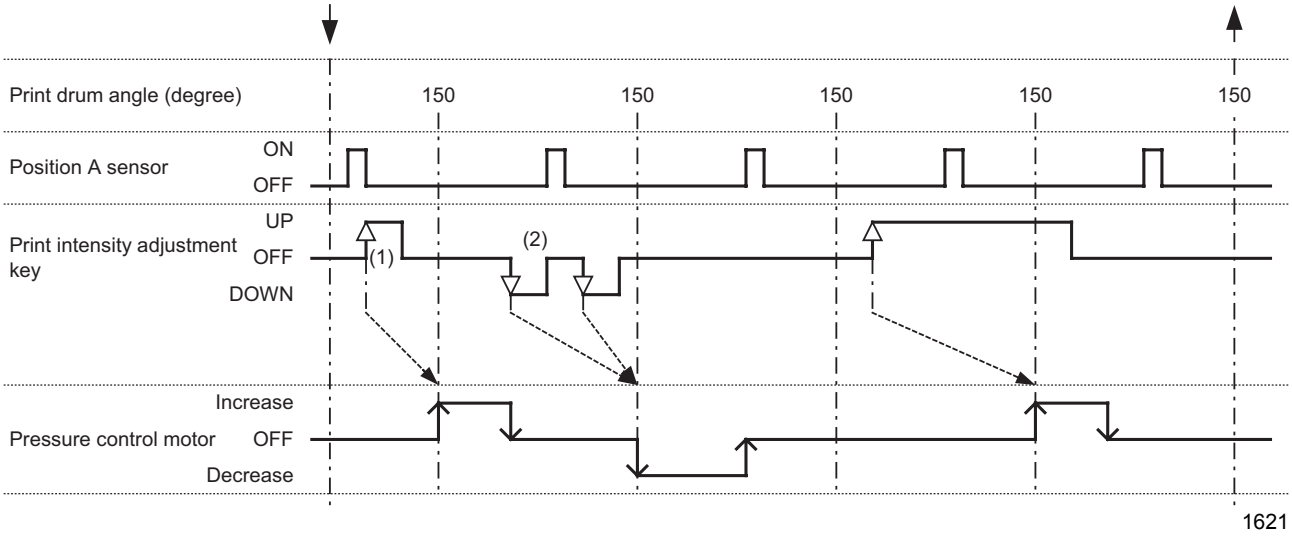
[Print Speed Change]



(1) If the print speed adjustment key is pressed, the speed does not change immediately, but rather at the next time the print drum reaches the 220° position.

(2) If the print speed adjustment key is pressed twice, the speed only changes by one level per revolution, and so two revolutions are required to reach the specified speed.

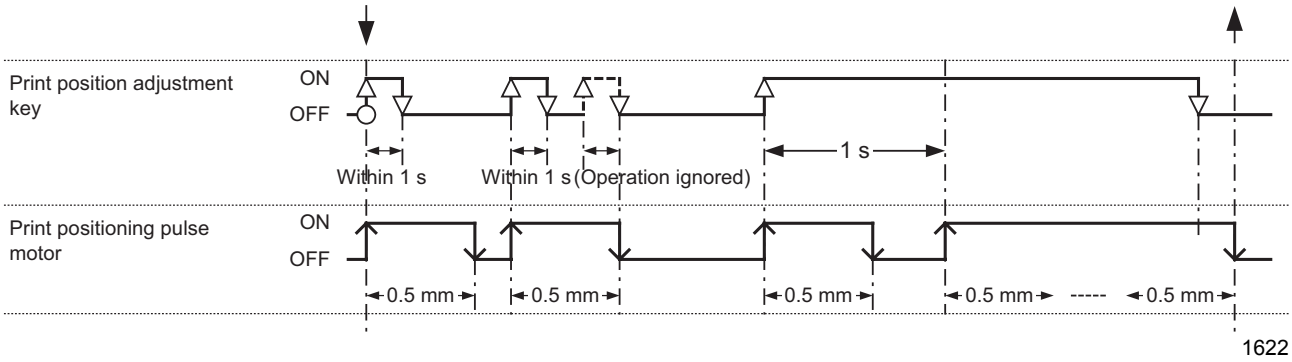
[Print Density Change]



(1) If the print desity adjustment key is pressed, the print density does not change immediately, but rather at the next time the print drum reaches the 150° position.

(2) Likewise, when the print density adjustment key is pressed twice, the intensity changes as specified the next time the print drum reaches the 150° position.

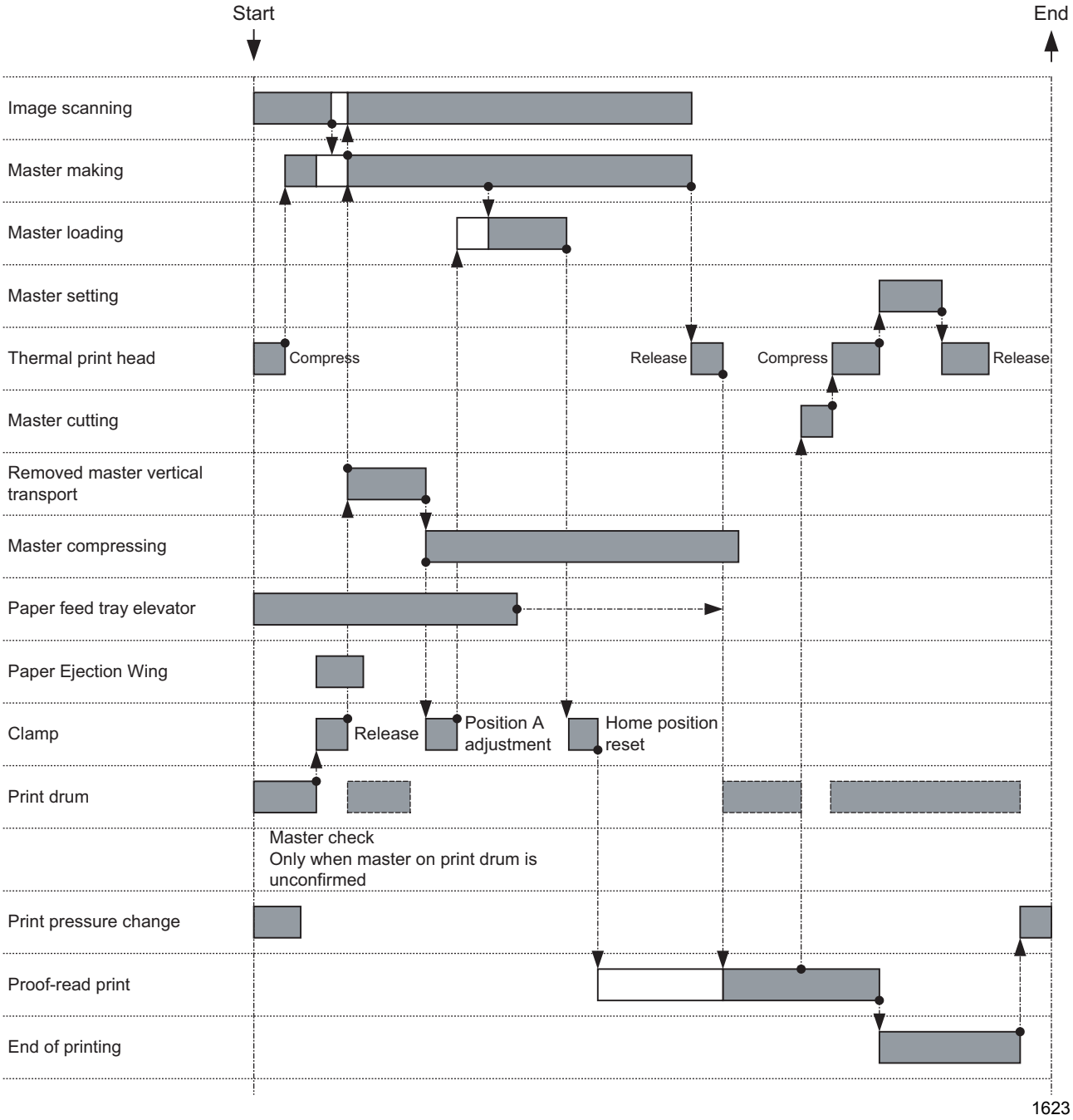
[Vertical Print Positioning Operation]



(1) If the print position adjustment key is pressed once (within 1 second), the position is immediately changed 0.5 mm.
(2) If the print position adjustment key is pressed twice (within 1 second), the second press is ignored if pressed while the position is being moved for the first press.
(3) If the print position adjustment key is pressed for more than 1 second, the position is moved 0.5 mm for the first 1 second pressed, and then continuously in 0.5 mm increments for as long as the key is pressed.

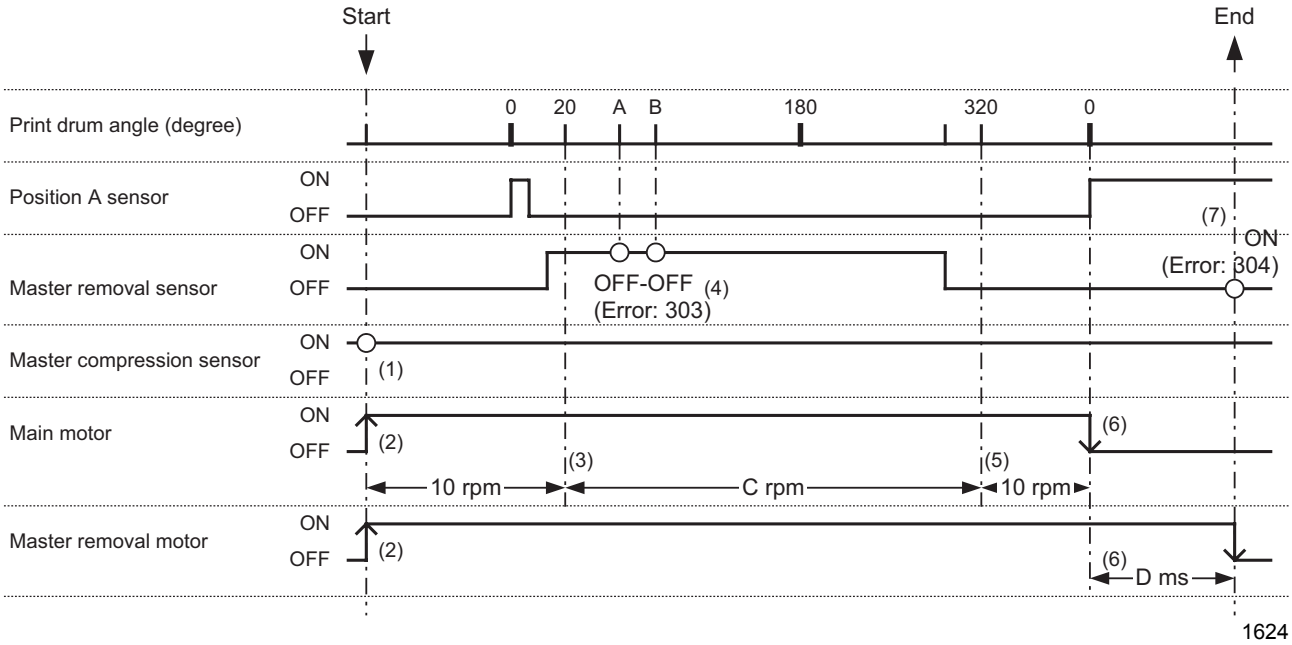
Master Removal Operations

1. Overall Timing in Normal Master Making



2. Individual Master Removal Operations

[Removed Master Vertical Transport Operation]



When ON: Position A sensor: Blocked, Master removal sensor: Open, Master compression sensor: Open

The removed master vertical transport operation starts after the print drum clamp plate releasing operation ends.

(1) The master compression sensor is checked on starting, and the master compression plate is initialized if it is OFF.

(2) The main motor and master removal motor are operated to vertically transport the removed master while rotating the print drum.

(3) The main motor operates at 10 rpm until it reaches a print drum angle of 20º, and then rotates at C rpm thereafter.
C = value set in Test Mode No. 387 (initially 15 rpm)

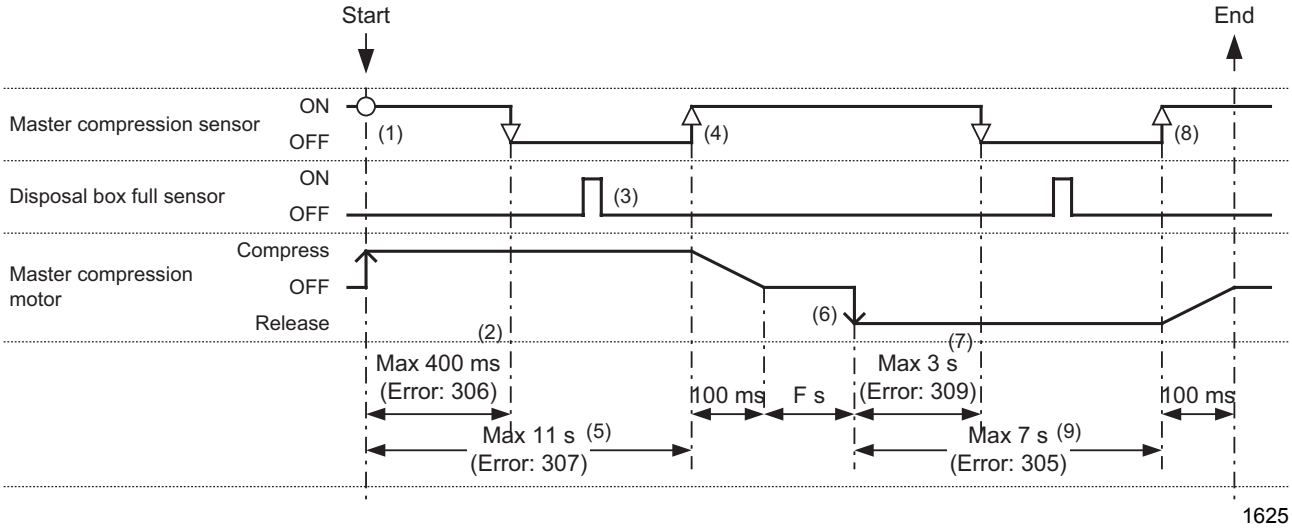
(4) The progress of the removed master is checked twice by the master removal sensor at print drum angles A° and B°, and is judged to be normal if the sensor is ON at both points. If it is OFF at one point, error message [A04-303] is displayed.
A = value set in Test Mode No. 380 (initially 70°)
B = value set in Test Mode No. 381 (initially 90°)

(5) At a print-drum angle of 320°, the main-motor speed changes from C rpm to 10 rpm.

(6) The main motor stops when the Position A sensor turns ON, then the master removal motor stops after D ms.

(7) In this process, the master jam sensor is checked. If it is ON, an error message [A04-304] is displayed.
D = value set in Test Mode No. 382 (initially 0 s)

[Disposed Master Compressing Operation]



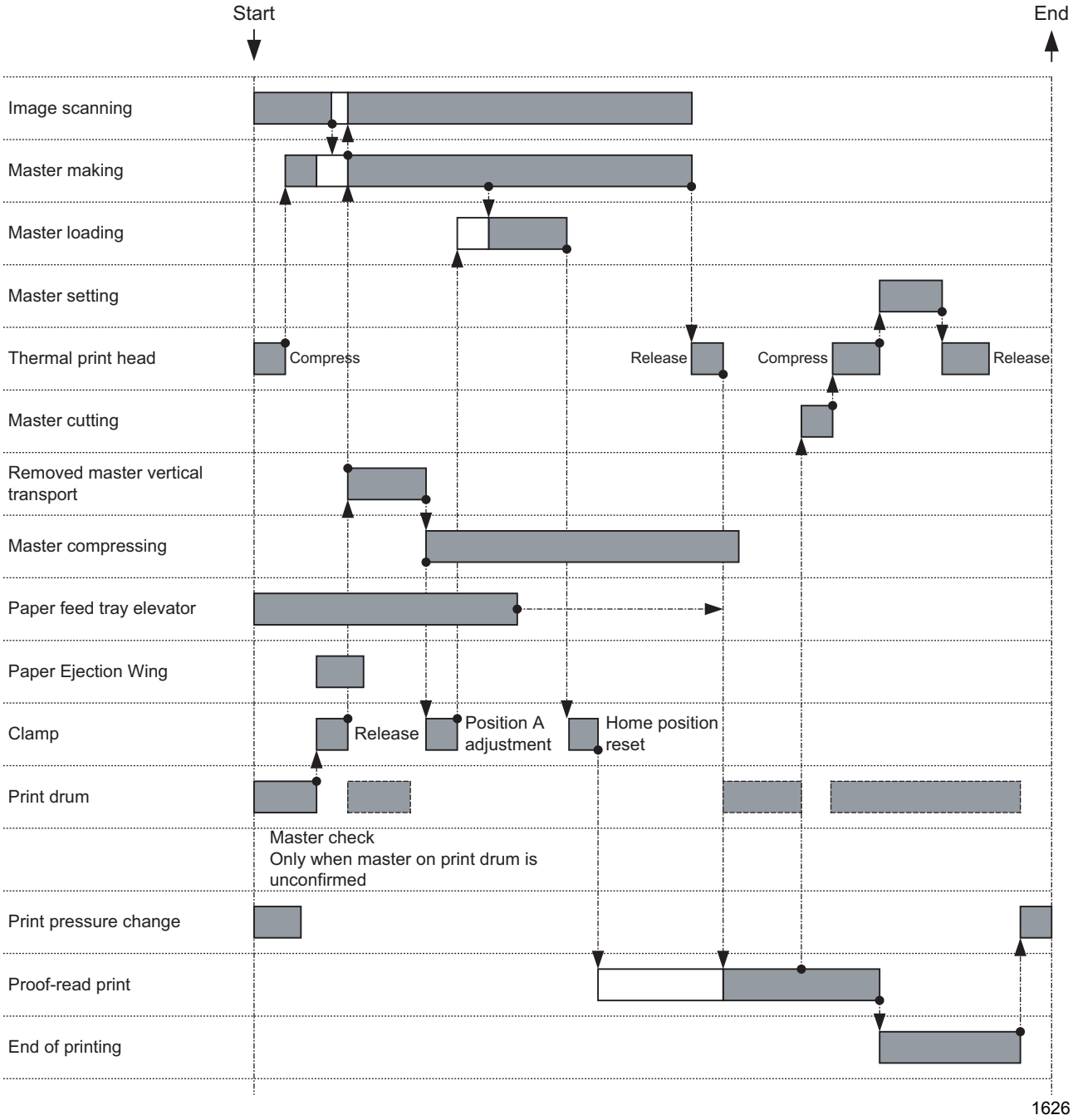
When ON: Master compression sensor: Open, Disposal box full sensor: Open

The disposed master compressing operation starts after the removed master vertical transport operation ends.

(1) At startup, the master compression sensor is checked. If it is ON, the master compression motor rotates in the compression direction. If it is OFF, the master compression plate is initialized.
(2) The master compression sensor temporarily goes OFF. A time-out occurs here at 400 ms, and error message [T12-306] is displayed.
(3) The master disposal box full sensor switches from OFF to ON, then to OFF again.
(4) The master compression motor stops once the master compression sensor goes back ON again.
(5) A time-out occurs at 11 seconds after the start of master compression here, and error message [T12-307] is displayed.
Similarly, if (3) is not detected, the disposal box is judged to be full, and error message [C03-313] is displayed.
(6) The master compression motor reverses F s after the motor stops.
F = value set in Test Mode No. 384 (initially 1 second)
(7) The master compression sensor goes OFF while the master compression motor operates in reverse.
A time-out occurs here at 3 seconds after reversing, and error message [T12-309] is displayed.
(8) The master compression motor stops once the master compression sensor goes back ON.
(9) A time-out occurs here at 7 seconds after reversing, and error message [T12-305] is displayed.

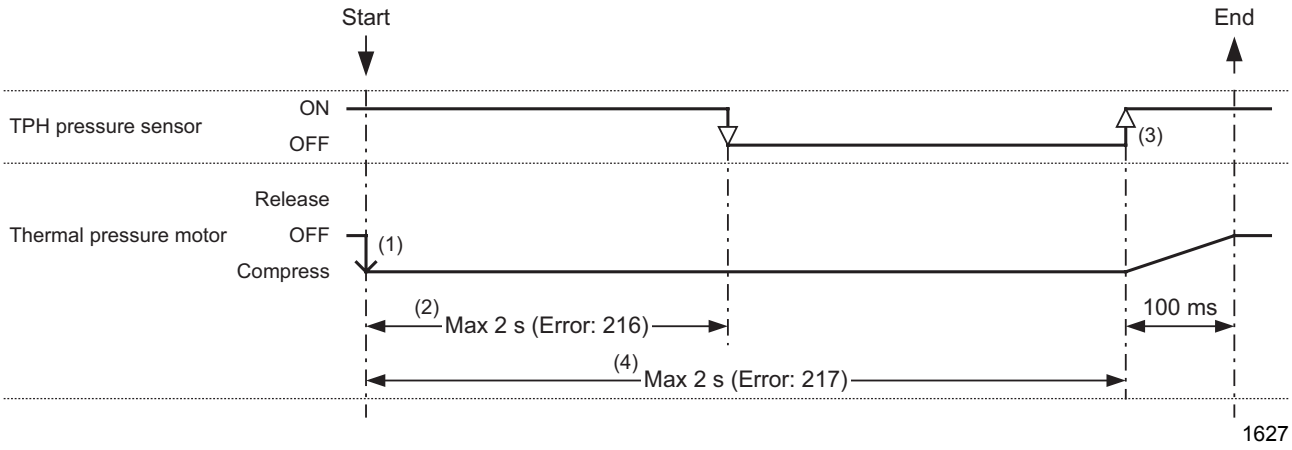
Master Making Operation

1. Overall Timing in Normal Master Making



2. Individual Master Making Operation

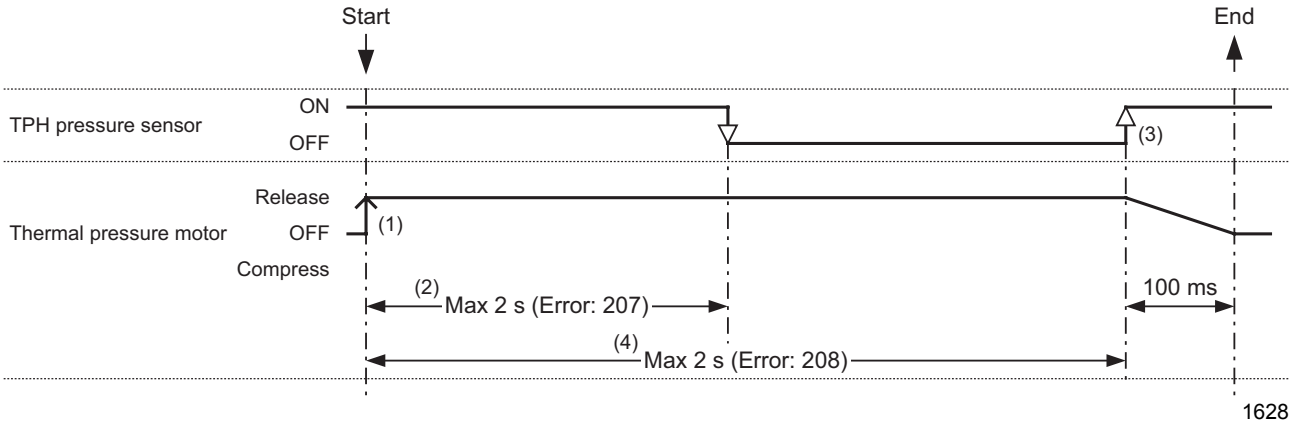
[Thermal Print Head Compression Operation]



When ON: TPH pressure sensor: Blocked

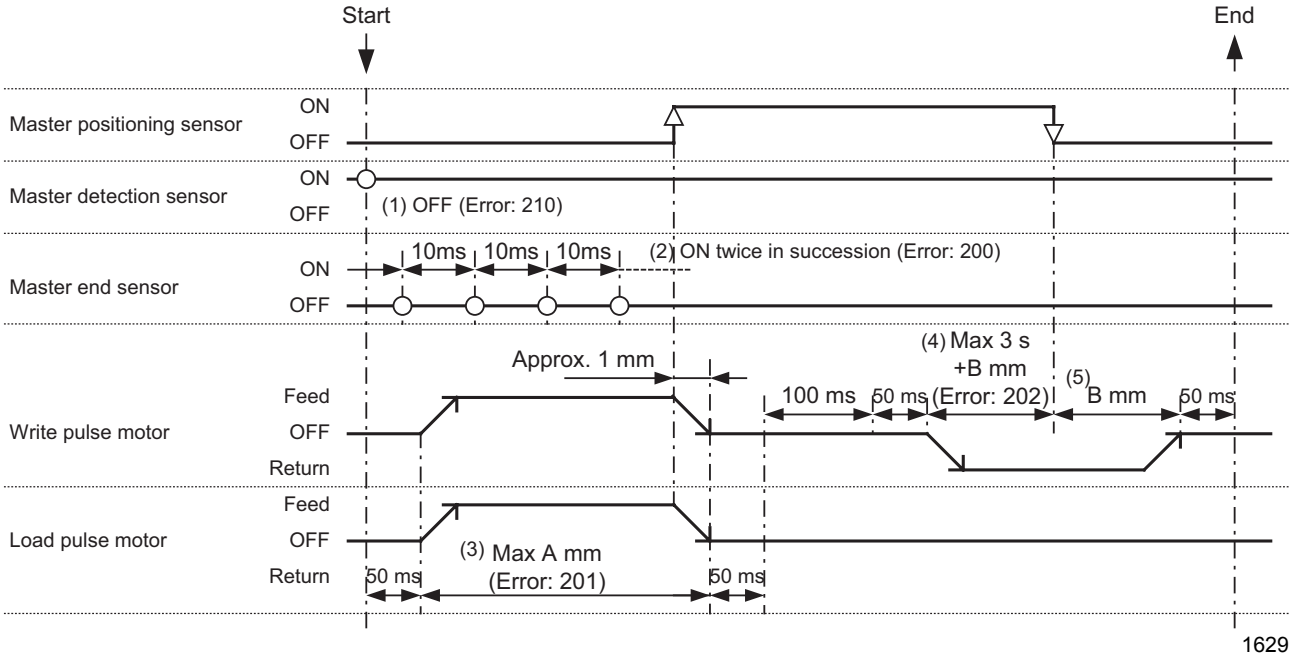
(1) At startup, the thermal pressure motor rotates in the compression direction until the TPH pressure sensor turns temporarily OFF and then back ON again.
(2) If the TPH pressure sensor does not switch from ON to OFF after 2 seconds from startup, an error message [T19-216] is displayed.
(3) When the TPH pressure sensor switches from OFF to ON, the thermal pressure motor stops and ends the compression operation.
(4) A timeout occurs at 2 seconds from startup, and an error message [T19-217] is displayed.

[Thermal Print Head Release Operation]



(1) At startup, the thermal pressure motor rotates in the pressure-release direction until the TPH pressure sensor turns temporarily OFF and then back ON again.
(2) If the TPH pressure sensor does not switch from ON to OFF after 2 seconds from startup, an error message [T19-207] is displayed.
(3) When the TPH pressure sensor switches from OFF to ON, the thermal pressure motor stops and ends the pressure-release operation.
(4) A timeout occurs at 2 seconds from startup and an error message [T19-208] is displayed.

[Master Positioning Operation]



When ON: Master positioning sensor: Open, Master detection sensor: Open, Master end sensor: Blocked

The master-positioning operation starts after the master-loading unit is set or the master is cut during the master-making process.

(1) The master detection sensor detects whether a master is present on starting. If the master detection sensor is OFF, error message [D05-210] is displayed.

(2) The master end sensor is checked at 10 ms intervals, and if an end mark is detected twice in succession, error message [C02-200] is displayed.

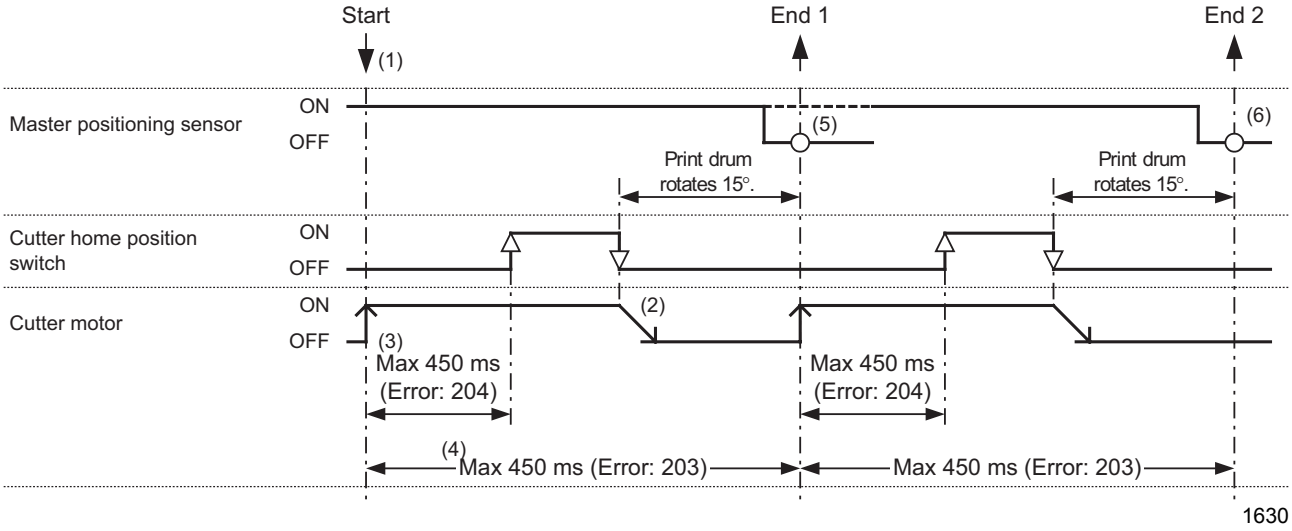
(3) The write pulse motor and load pulse motor operate in the feed direction until the master positioning sensor goes ON. A time-out occurs here when it has fed 80 mm when setting the master loading unit and 30 mm when inching after cutting, and error message [A01-201] is displayed.

(4) The write pulse motor and load pulse motor operate in the return direction until the master positioning sensor goes OFF. A time-out occurs here when it has fed 3 s + B mm, and error message [A01-202] is displayed.

(5) The master is moved a further B mm in the return direction after the master positioning sensor goes OFF, and then motor then stops, ending the master positioning operation.

B = value set in Test Mode No. 280

[Master Cutting Operation]



When ON: Master positioning sensor: Open, Master end sensor: Blocked

When the master making operation starts, the cutter home position switch is checked at the start of the master cutting operation. Error message [A17-209] is displayed if it is ON.

(1) The Master cutting operation starts after the print drum stops at angle A during master loading.
A = 220° + value set in Test Mode No. 284

(2) The cutter motor operates. When the cutter HP switch turns ON temporarily and then OFF again, the motor stops.

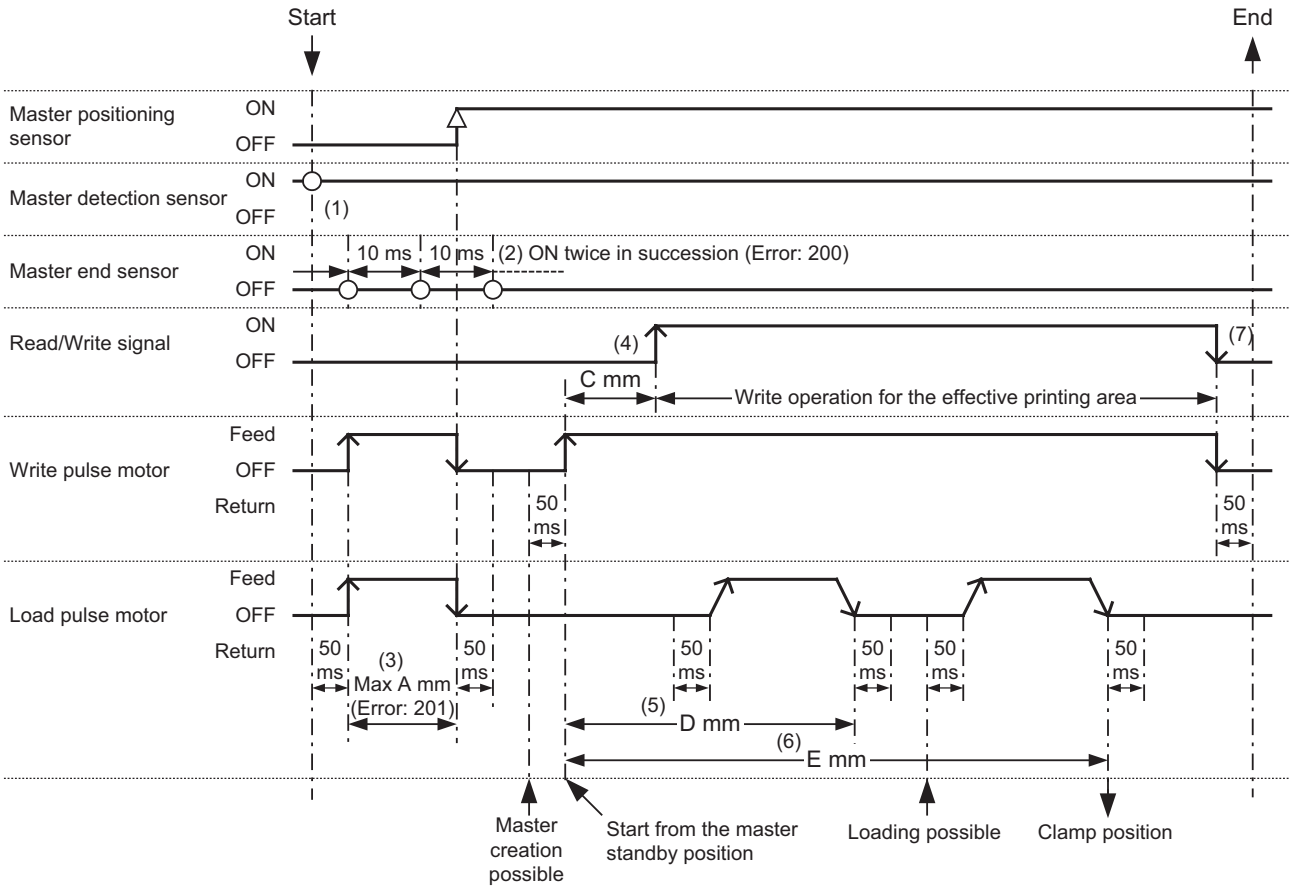
(3) A time-out occurs at 450 ms before the switch goes ON, and error message [T13-203] is displayed.

(4) Likewise, a time-out occurs at 450 ms before the switch goes back OFF again, and error message [T13-204] is displayed.

(5) The print drum rotates, and the master positioning sensor is checked when the print drum reaches the 15° position.
If the master positioning sensor is OFF, the process is normal, and master cutting ends.
If the master positioning sensor is ON, master cutting is repeated.

(6) The print drum rotates, and the master positioning sensor is rechecked when the print drum reaches the 15° position.
If the master positioning sensor is OFF, error message [A03-206] is displayed.
If the master positioning sensor is ON, error message [T13-205] is displayed.

[Master Making Operation]



When ON: Master positioning sensor: Open, Master detection sensor: Open, Master end sensor: Blocked

The master loading and master making operation start once the thermal print head compressing is complete.

(1) The master detection sensor checks for the presence of a master on starting.

(2) The master end sensor is checked at 10 ms intervals during the master transport operation, and if the end mark is detected twice in succession, error message [C02-200] is displayed.

(3) The write pulse motor and load pulse motor operate in the feed direction until the master positioning sensor goes ON. A time-out occurs here when the master is fed A mm, and error message [A01-201] is displayed.

A = 2 mm + value set in Test Mode No. 280

(4) When the clamp-release operation for master removal ends, the write pulse motor operates to send the master to the printing start position, and then the write operation begins.

C = 7.5 mm + value set in Test Mode No. 281

(5) The load pulse motor operates to transport the leading edge of the master to the master loading position.

D = 90 mm

(6) Once the removed master vertical transport ends and the print drum position A adjustment is complete, the load pulse motor operates to transport the leading edge of the master to the clamp position.

E = 132.6 mm + value set in Test Mode No. 283

(7) Master creation ends once master creation is complete for the effective printing area.

CHAPTER 17: PANEL MESSAGES

Contents

Explanation of Panel Messages

1. Error-Code Displays

- If an error occurs, an error message is displayed together with a graphic and an error code to indicate the problem to the user.
- Error-code displays consist of an “error type” indicating the type of error and an “error-point number” indicating the error situation.

  Example: T99-123 T99: Error type
  123: Error point

1. Error type

The order of error priority is as specified below.

Error type	Error description
T	Serviceman-call error
A	Jam error
B	Option error
C	Consumable error
D	Set check error
E	Warning (Serviceman call)
F	Warning (Other)
G	Jam errors (assortment of Jam errors which includes error type A and error type B)
L	Link mode error

2. Error point

The error-point classifications are as specified below.

Error point	Error description
0** 9**	System, panel
1**	Scanning section, Image processing
2**	Master making section
3**	Master-disposal section
4**	Paper-feed/ejection section
5**	Print-drum area
6**	Printing adjustment section
7**	Accessories

1) List of Panel Messages

Error type	Description	Model
T01	Main motor lock	300 & 400 dpi
T02	Elevator motor lock	300 & 400 dpi
T03	Clamp motor lock	300 & 400 dpi
T04	Overflow	300 & 400 dpi
T05	Print-positioning pulse-motor lock	300 & 400 dpi
T07	Digitizer error	400 dpi
T08	Computer interface error	300 & 400 dpi
T09	Option error (paper eject)	400 dpi
T11	Pressure-control motor	300 & 400 dpi
T12	Master-disposal-section motor lock	300 & 400 dpi
T13	Cutter motor lock	300 & 400 dpi
T14	Flatbed error	300 & 400 dpi
T15	Auto document feeder (AF) error	300 & 400 dpi
T17	Solenoid counter not connected	300 & 400 dpi
T19	Thermal-pressure motor lock	300 & 400 dpi
T20	Paper-ejection-section motor lock	400 dpi
T23	Scanner lock not released	300 & 400 dpi
T24	Inking motor lock	300 & 400 dpi
T25	No battery	300 & 400 dpi
T93	NET-C hardware error	Link-mode machine
T94	TPH error	400 dpi
T95	NVRAM error	400 dpi
T96	Drum communication error	300 & 400 dpi
T98	Hardware error	300 & 400 dpi

Error type	Description	Model
A01	Master feed error	300 & 400 dpi
A02	Master loading error	300 & 400 dpi
A03	Cutting error	300 & 400 dpi
A04	Master-disposal error	300 & 400 dpi
A05	Master present in the master-disposal section	300 & 400 dpi
A06	Check paper-feed tray	300 & 400 dpi
A07	Paper-feed error	300 & 400 dpi
A08	Paper jam on print drum	300 & 400 dpi
A09	Paper-ejection error	300 & 400 dpi
A10	AF original feed error	300 & 400 dpi
A16	Awaiting master removal	300 & 400 dpi
A17	Cutter error	300 & 400 dpi
A18	Print-drum unlocked	300 & 400 dpi
A34	Rewind master roll	300 & 400 dpi

Error type	Description	Model
B01	Keycard counter: No card	300 & 400 dpi
B02	Sorter: Serviceman-call error	400 dpi
B03	Sorter: Jam error	400 dpi
B04	Sorter: Open error	400 dpi
B05	Sorter: Other error	400 dpi
B21	Data storage: Read/write error	400 dpi
B22	ST sorter: Power off	400 dpi
B23	ST sorter: No tape	400 dpi
B24	ST sorter: Tape jam	400 dpi
B25	Sorter: Full error	400 dpi
B26	Sorter: Print-on-bin error	400 dpi
B27	Sorter: Staple error	400 dpi
B28	Sorter: Size error	400 dpi
B31	Communication error during Link-mode data transmission	Link-mode machine
B33	IP-address setting error	Link-mode machine

Error type	Description	Model
C01	Replace ink cartridge	300 & 400 dpi
C02	Replace master roll	300 & 400 dpi
C03	Master-disposal box full	300 & 400 dpi
C04	No paper on paper feed tray	300 dpi

Error type	Description	Model
D01	Print drum not set	300 & 400 dpi
D02	Incorrect print drum	300 & 400 dpi
D03	Ink cartridge not set	300 & 400 dpi
D04	Incorrect ink cartridge	300 & 400 dpi
D05	Master not set	300 & 400 dpi
D07	Master-disposal box not set	300 & 400 dpi
D09	Master-making unit not set	300 & 400 dpi
D10	Scanner table not set	300 & 400 dpi
D11	Front cover not set	300 & 400 dpi

Error type	Description	Model
E01	Replace battery	300 & 400 dpi
E02	Maintenance call	300 & 400 dpi

Error type	Description	Model
L01	Communication error in MIB information acquisition	Link-mode machine

Error type	Description	Model
F01	No master on drum	300 & 400 dpi
F02	Master image larger than paper size: 1	300 & 400 dpi
F04	Original not set (multi-original program)	300 & 400 dpi
F05	Print quantity under “minimum print quantity”	300 & 400 dpi
F10	Master image larger than paper size: 2	300 & 400 dpi
F14	No paper	400 dpi
F16	AF cannot be used for QT-4	400 dpi
F21	AF multi-up: Original not set	300 & 400 dpi
F22	FB multi-up: Original not set	300 & 400 dpi
F23	Communication error: D to P	400 dpi
F25	Incorrect image resolution	400 dpi
F32	Data storage area full	400 dpi
F34	Cannot print with the master on the drum	400 dpi
F37	AF cannot be used in book mode	400 dpi
F43	D-to-P original/output paper nonconformance	400 dpi
F49	Printer-Auto-Selection to linked printer disabled: Job setting error	Link-mode machine
F50	Printer-Auto-Selection to linked printer disabled: Linked printer error	Link-mode machine
F51	No Original on Scanner Table: Duplex Scanning Mode	Link-mode machine
F52	Printing from Linked Printer Disabled: Configuration Data being acquired	Link-mode machine
F53	More than 999 copies at one time not possible from linked printer	Link-mode machine
F54	Printer-Auto-Selection to linked printer disabled: Selected paper not in linked printer	Link-mode machine
F55	Printer-Auto-Selection to linked printer disabled: Receiving print data from PC	Link-mode machine
F56	Printer-Auto-Selection to linked printer disabled: Config. Data being acquired	Link-mode machine
F57	Printing from Linked Printer Disabled: Processing print data from PC	Link-mode machine
F58	Printing from Linked Printer Disabled: Initializing NET-C	Link-mode machine
F59	Printer-Auto-Selection to linked printer disabled: Initializing NIC	Link-mode machine
F60	Printer-Auto-Selection to linked printer disabled: Print quantity selected is Zero	Link-mode machine

2) Details on Panel Messages

1. Serviceman-call errors

Error type	T01 [Main-motor lock]	
Panel display	T01-*** !!System Error!!	
	Press Reset Key If Recovery has failed, call service	400 dpi
	Press the lower right "Jam Reset" key. If recovery has failed, call Service & quote the Error Code T01-***.	300 dpi
Reset method	Jam reset → Recovery operation	
Error point	Error conditions	
520	The main motor limit sensor does not change for more than 5 pulses while the main motor is operating, even after the elapse of 100 ms, and this occurs more than two times in succession.	
521	The position A sensor does not change while the motor is operating, even after 3033 pulses have elapsed.	
523	Main-motor overload current	
524	Clamp sensor A or B was activated during print-drum operation (except during master removal).	
536	The position A sensor changed from blocked to activated while at position A.	

Error type	T02 [Elevator motor lock]	
Panel display	T02-*** !!System Error!!	
	Press Reset Key. If recovery has failed, call Service.	400 dpi
	Press the lower right "Jam Reset" key. If recovery has failed, call Service & quote the Error Code T02-***.	300 dpi
Reset method	Jam reset or switch on power again	
Error point	Error conditions	
400	Both the upper and lower limit sensors were blocked at the same time.	
401	An overload current was detected in the elevator motor.	
404	The lower-limit sensor does not activate within 2 seconds after the elevator motor operates in the raising direction from the lower-limit position.	
405	The upper-limit sensor is not blocked within 12 seconds after the elevator motor operates in the raising direction.	
406	The upper-limit sensor is not activated within 2 seconds after the elevator motor operates in the lower direction from the upper-limit position.	
407	The lower-limit sensor is not blocked within 12 seconds after the elevator motor operates in the lowering direction.	
408	The upper-limit sensor is activated continuously for at least 2 seconds during operation of the elevator servo.	

Error type	T03 [Clamp motor]	
Panel display	T03-*** !!System Error!!	
	Press Reset Key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T03-***.	300 dpi
Reset method	Jam reset → Recovery operation	
Error point	Error conditions	
501	The light path condition of both the clamp sensors A and B do not change within 3 seconds after the clamp motor operates during clamp initialization movement.	
502	Clamp sensor A or B is still blocked after the clamp motor activates and a specified length of time elapses.	
503	During clamp plate master removal movement, the light path of clamp sensor B is not blocked within 1 second after the clamp motor activated.	
504	The light path of clamp sensor A is not blocked within 0.5 seconds after the light path of clamp sensor B is blocked, or the clamp sensor B does not become unblocked within 3 seconds after the light path of clamp sensor A is blocked.	
505	The clamp sensor B does not become blocked within 1 second after the clamp motor activates during master clamping movement.	
506	The light path of clamp sensor A is not unblocked within 1 second after the light path of clamp sensor B is blocked during master clamping movement.	
507	The clamp motor does not activate when Test Mode No. 554 (Clamp Cycle Action - 3 Cycles) is activated.	
508	The clamp motor activated but does not stop at the designated position when Test Mode No. 554 (Clamp Cycle Action - 3 Cycles) is activated.	
545	The print drum is not at position A when the clamp operation starts.	

Error type	T-04 [Overflow]	
Panel display	T04-*** !!System Error!!	
	Press Reset Key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T04-***.	300 dpi
Reset method	Jam reset → Recovery operation	
Error point	Error conditions	
513	The overflow sensor is ON for a set number of times in succession.	

Error type	T05 [Print-positioning pulse-motor lock]	
Panel display	T03-*** !!System Error!!	
	Press Reset Key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T05-***.	300 dpi
Reset method	Jam reset → Recovery operation (home positioning), or switch power on again.	
Error point	Error conditions	
603	The vertical-centering sensor does not change from activated to blocked, even when the print-positioning pulse motor is moved 18 mm in the blocking direction.	
604	The vertical-centering sensor does not change from blocked to activated, even when the print-positioning pulse motor is moved 18 mm in the activating direction.	
612	The 1-step vertical movement key was pressed with undefined position data. (This error may occur following the recovery operation.)	

Error type	T07 [Digitizer error]	
Panel display	T07-*** !!System Error!! Turn Main-Power SW OFF then ON. If recovery has failed, call Service.	400 dpi model only
Reset method	Switch power on again.	
Error point	Error conditions	
001	Communication error with the digitizer CPU	

Error type	T08 [Computer interface error]	
Panel display	T08-*** !!System Error!! Turn Main-Power SW OFF then ON.	
	If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T08-***.	300 dpi
Reset method	Switch power on again.	
Error point	Error conditions	
002	Communication error with the computer interface	

Error type	T09 [Option error (paper eject)]	
Panel display	T09-*** !!System Error!! Turn Main-Power SW OFF then ON. If recovery has failed, call Service.	400 dpi model only
Reset method	Switch power on again.	
Error point	Error conditions	
003	Sorter power is OFF when RN power is ON.	
700	Sorter communication: CTS does not switch to L within 3 seconds after the power is switched ON.	
701	Sorter communication: The machine type status was not returned within 200 ms after the initialization command was sent.	
710	Sorter communication: Transmission timeout	
711	Sorter communication: CTS does not change.	
712	Sorter communication: The retry command was sent but not received.	
720	Sorter communication: The retry command was received two times in succession.	

Error type	T11 [Pressure-control motor lock]	
Panel display	T11-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T11-***.	300 dpi
Reset method	Jam reset → Recovery operation (home positioning), or switch power on again.	
Error point	Error conditions	
600	The print-pressure HP sensor does not change from activated to blocked even when the pressure-control motor is operated by 3200 pulses in the pressurizing direction during print pressure-control HP operation.	
601	The print-pressure HP sensor does not change from blocked to activated even when the pressure-control motor is operated by 3200 pulses in the release direction during print pressure-control HP operation.	

Error type	T12 [Master-disposal-section motor lock]	
Panel display	T12-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T12-***.	300 dpi
Reset method	Jam reset → Recovery operation	
Error point	Error conditions	
305	The light path of the master compression sensor does not change to unblocked condition within 7 seconds after the compression motor rotates in the decompressing direction.	
306	The light path of the master compression sensor does not change to blocked condition within 400ms after the compression motor rotates in the compressing direction.	
307	The light path of the master compression sensor does not change to unblocked condition within 11 seconds after the compression motor rotates in the compressing direction.	
309	The light path of the master compression sensor does not change to blocked condition within 3 seconds after the compression motor rotates in the decompressing direction. Or master compression plate home positioning was not successful.	

Error type	T13 [Cutter motor lock]	
Panel display	T13-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T13-***.	300 dpi
Reset method	Jam reset → Recovery operation	
Error point	Error conditions	
203	Cutter HP SW does not go OFF within 450 ms after the cutter motor is activated.	
204	Cutter HP SW does not go ON within 450 ms after the cutter motor is activated.	
205	The master-positioning sensor is activated when the print drum rotates through the preset angle following cutting; the master-positioning sensor remains activated during subsequent rotation and cutting.	

Error type	T14 [Flatbed error]	
Panel display	T14-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Turn Main-Power SW OFF then ON. If recovery has failed, call Service & quote the Error Code T14-***.	300 dpi
Reset method	Jam reset.	400 dpi
	Switch power on again.	300 dpi
Error point	Error conditions	
100	Flatbed home position sensor does not go ON at the point when it should go OFF → ON (when moved the predetermined amount for FB original scanning or when moving to the AF scanning position).	300 dpi
101	Flatbed home position sensor does not go OFF at the point when it should go ON → OFF (when moved the predetermined amount for FB original scanning or when moving to the AF scanning position).	
110	Communication error with shading IC. [* For machines equipped with previous scanner model]	
112	The FB/AF HP sensor does not go OFF within the set time.	400 dpi
113	The FB/AF HP sensor does not go ON within the set time.	
114	Incorrect main-unit setting data	
115	The scanner operation is not completed within the set time.	
116	Timeout for black-shading wait (Black compensation is not completed within the specified time.) [* With new scanner only for 300 dpi machines]	400 dpi & 300 dpi
117	Timeout for white-shading wait (White compensation is not completed within the specified time.) [* With new scanner only for 300 dpi machines]	
118	Software error (Scanner is called even though it is not between tasks.) [* With new scanner only for 300 dpi machines]	
123	Timeout for offset-adjustment wait (Offset adjustment is not completed within the specified time.) [* Machines equipped with new scanner only]	400 dpi
124	Timeout for gain-adjustment wait (Gain adjustment is not completed within the specified time.) [* Machines equipped with new scanner only]	
125	Offset adjustment process not completed. [* Machines equipped with new scanner only]	
126	Gain adjustment process not completed. [* Machines equipped with new scanner only]	
160	Scanner not connected.	400 dpi & 300 dpi
163	Scanner movement not completed within the set time. [* Machines equipped with new scanner only]	300 dpi
164	Timeout for offset-adjustment wait (Offset adjustment is not completed within the specified time.) [* Machines equipped with new scanner only]	
165	Offset adjustment process not completed. [* Machines equipped with new scanner only]	
166	Timeout for gain-adjustment wait (Gain adjustment is not completed within the specified time.) [* Machines equipped with new scanner only]	
167	Gain adjustment process not completed. [* Machines equipped with new scanner only]	
168	Scanner gate-array memory write error. [* Machines equipped with new scanner only]	

Reference: 300 dpi old scanner unit = 021-97140-xxx Unit/FB-Scanner;CE
300 dpi new scanner unit = 021-97111-xxx Unit/FB-Scanner;300C

400 dpi old scanner unit = 021-97500-xxx Unit/FB-Scanner;M
400 dpi new scanner unit = 021-97510-xxx Unit/FB-Scanner;400XC

Error type	T15 [AF error]	
Panel display	T15-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Turn Main-Power SW OFF then ON. If recovery has failed, call Service & quote the Error Code T15-***.	300 dpi
Reset method	Jam reset.	400 dpi
	Switch power on again.	300 dpi
Error point	Error conditions	
004	Communication error with the AF/CPU units	400 dpi
100	AF read-sensor adjustment error	
101	AF-EEPROM error	
110	AF operation not completed within the set time	
114	AF detection signal became OFF while AF in operation.	300 dpi
115	Operation clock of AF transport motor is not correct.	
120	Communication error from the AF unit (NAK twice, undefined error, etc.)	400 dpi
121	Communication timeout error from the AF unit (Receive timeout)	
122	AF unit detects sequence error from the Risograph	
130	Timeout error for receiving the Risograph AF command	
131	Risograph received an undefined command from the AF unit.	
132	Risograph detected a communication sequence error from the AF unit.	
133	Risograph AF communication error (ACK, NAK, or received-channel error)	
134	Risograph could not send to the AF within the set time.	
161	AF connection error	

Error type	T17 [Solenoid counter not connected]	
Panel display	T17-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T17-***.	300 dpi
Reset method	Set the solenoid counter connection signal to ON.	
Error point	Error conditions	
020	The solenoid counter is not connected.	

Error type	T19 [Thermal-pressure motor lock]	
Panel display	T19-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T19-***.	300 dpi
Reset method	Jam reset	
Error point	Error conditions	
207	The light path of the TPH pressure sensor does not change to unblocked state within 2 seconds after the thermal-pressure motor activates in the pressure release direction.	
208	The light path of the TPH pressure sensor does not change to blocked state within 2 seconds after the thermal-pressure motor activates in the pressure release direction.	
216	The light path of the TPH pressure sensor does not change to unblocked state within 2 seconds after the thermal-pressure motor activates in the pressurize direction.	
217	The light path of the TPH pressure sensor does not change to blocked state within 2 seconds after the thermal-pressure motor activates in the pressurize direction.	

Error type	T20 [Paper-ejection-section motor lock]	
Panel display	T20-*** !!System Error!! Press Reset key. If recovery has failed, call Service.	400 dpi model only
Reset method	Jam reset	
Error point	Error conditions	
414	The paper-ejection-wing home sensor, when OFF, does not change to ON within 7 seconds after the paper-ejection-wing motor activates in the clockwise direction.	
415	The paper-ejection-wing home sensor, when ON, does not change to OFF within 7 seconds after the paper-ejection-wing motor activates in the clockwise direction.	

Error type	T23 [Scanner lock not released]	
Panel display	T23-*** Image scanner is locked!! Unlock it.	400 dpi & 300 dpi
Reset method	Release the scanner lock using test mode. (Test Mode No. 155)	
Error point	Error conditions	
111	The scanner is in lock mode.	

Error type	T24 [Inking motor lock]	
Panel display	T24-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T24-***.	300 dpi
Reset method	Jam reset or switch power on again.	
Error point	Error conditions	
539	Inking-motor current overload	

Error type	T25 [No battery]	
Panel display	T25-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T25-***.	300 dpi
Reset method	Replace the battery. * The machine does not operate when this message comes up.	
Error point	Error conditions	
026	The residual battery voltage is below 2.3 V when the power is ON.	400 dpi
	The residual battery voltage is below 1.5 V when the power is ON.	300 dpi

Error type	T93 [NET-C hardware error]	
Panel display	T93-*** !!System Error!! Press Reset key. If recovery has failed, call Service.	Link-mode machine only
Reset method	Switch power on again.	
Error point	Error conditions	
932	There is no response from NET-C. (For example, NET-C hardware reset is not detected by NET-C, or an initialization interrupt signal from the main unit is not recognized.)	
933	There is no response for 90 seconds during the initialization of NET-C.	

Error type	T94 [TPH not connected]	
Panel display	T94-*** !!System Error!! Press Reset key. If recovery has failed, call Service.	400 dpi machine only
Reset method	Jam reset or switch power on again.	
Error point	Error conditions	
225	The TPH code is electrically OPEN-HI (all set to 1), indicating that the TPH connector may be disconnected.	

Error type	T95 [NVRAM error]	
Panel display	T95-*** !!System Error!! Press Reset key. If recovery has failed, call Service.	400 dpi machine only
Reset method	Switch power on again.	
Error point	Error conditions	
056	Check-sum error in the MCTL NVRAM	
059	The serial-number data sent from SH-PCB does not match the MCTL PCB serial-number data.	

Error type	T96 [Drum communication error]	
Panel display	T96-*** !!System Error!!	
	Press Reset key. If recovery has failed, call Service.	400 dpi
	Press the lower right “Jam Reset” key. If recovery has failed, call Service & quote the Error Code T96-***.	300 dpi
Reset method	Jam reset or switch power on again.	
Error point	Error conditions	
543	Status not returned from the print drum even though a status request was sent.	
544	Error interruption from print drum	

Error type	T98 [Hardware error]	
Panel display	T98-*** !!System Error!! Press Reset key.	
	If recovery has failed, call Service.	400 dpi
	If recovery has failed, call Service & quote the Error Code T98-***.	300 dpi
Reset method	Switch power on again.	
Error point	Error conditions	
005	Hardware error	400 dpi & 300 dpi
006	Memory check sum error. Memory contents have changed since power was last switched off. * If this error occurs, a memory fault is identified the next time the power is switched on, and the memory (test mode, user mode, memory mode, and error backup details) is cleared.	300 dpi
028	AMF PCB is fitted to a model that should not be equipped with AMF PCB, or AMF PCB was not fitted to a model that should be equipped with AMF PCB. * In the models with the new scanner, this error indication is displayed when the PCB for the domestic market is mounted with an EEPROM for overseas products, or vice versa.	
029	For the A/D value of the paper-width potentiometer, the value set for 210 mm is smaller than the value set for 105 mm. * When this error occurs, it is necessary to conduct the procedure for paper-width-potentiometer compensation adjustment from the beginning.	400 dpi & 300 dpi
034	Unsuccessful data input into RN EEPROM.	300 dpi
035	Check-sum error on RN EEPROM.	
036	RN memory error	
037	The value set in Test Mode No. 451 (Paper-Width-Potentiometer Compensation: 210 mm/297 mm) deviates significantly from the paper width selected in Test Mode No. 491 (Paper Size VR Adjustment Selection).	400 dpi & 300 dpi
038	The types of PCB and ROM differ.	300 dpi
039	A data error occurred in the EEPROM in the main unit	
046	The DIMM capacity does not match.	400 dpi
051	Touch-panel communication error	
052	SH-PCB EEPROM check-sum error	
053	Failed to read the saved data of memory settings (program, mode, user paper).	
054	Failed to write the saved data of memory settings (program, mode, user paper).	
055	The machine type code from SH-PCB does not match with the type data from the MTCL-PCB.	
057	SRAM backup error in the SH-PCB	
058	SH-PCB: EEPROM serial number information data is all set to zero.	
063	The test-mode setting data stored was set outside the adjustment range.	

Error type	T98 [Hardware error]	
Panel display	T98-*** !!System Error!! Press Reset key.	
	If recovery has failed, call Service.	400 dpi
	If recovery has failed, call Service & quote the Error Code T98-***.	300 dpi
Reset method	Switch power on again.	
Error point	Error conditions	
064	An undefined command was sent in communication between SH-PCB and MCTL PCB.	400 dpi model only
065	Communication error 01 between SH-PCB and MCTL PCB (MCTL PCB side): Not all bytes are complete in the receive command.	
066	Communication error 02 between SH-PCB and MCTL PCB (MCTL PCB side): Not used at present.	
067	Communication error 03 between SH-PCB and MCTL PCB (MCTL PCB side): Not used at present.	
068	Communication error 04 between SH-PCB and MCTL PCB (MCTL PCB side): NAK transmitted three times.	
069	Communication error 05 between SH-PCB and MCTL PCB (MCTL PCB side): No response from ACK.	
070	Communication error 06 between SH-PCB and MCTL PCB (MCTL PCB side): Transmission prohibited by SH (CTS = 1).	
071	Communication error 07 between SH-PCB and MCTL PCB (MCTL PCB side): Command received in transmission-response waiting time.	
072	Communication error 08 between SH-PCB and MCTL PCB (SH-PCB side): FB command received in a mode other than the download mode.	
073	Communication error 09 between SH-PCB and MCTL PCB (SH-PCB side): FC/FD command received in a mode other than the download mode.	
074	Communication error 10 between SH-PCB and MCTL PCB (SH-PCB side): FE command received (with MCTL PCB not programmed).	
075	Communication error 11 between SH-PCB and MCTL PCB (SH-PCB side): Not all bytes are complete in the receive command.	
076	Communication error 12 between SH-PCB and MCTL PCB (SH-PCB side): ACK received out of sequence.	
077	Communication error 13 between SH-PCB and MCTL PCB (SH-PCB side): NAK transmitted three times (1).	
078	Communication error 14 between SH-PCB and MCTL PCB (SH-PCB side): NAK transmitted three times (2).	
079	Communication error 15 between SH-PCB and MCTL PCB (SH-PCB side): No response from ACK.	
080	Communication error 16 between SH-PCB and MCTL PCB (SH-PCB side): Transmission prohibited on MCTL PCB (CTS = 1).	
081	Communication error 17 between SH-PCB and MCTL PCB (SH-PCB side): MCTL PCB download mode erroneously transmitted.	
082	Communication error 18 between SH-PCB and MCTL PCB (SH-PCB side): MCTL CTS remained “1” for 2 seconds.	
083	Communication error 19 between SH-PCB and MCTL PCB (SH-PCB side): FA command received at a time other than startup.	
084	Communication error 20 between SH-PCB and MCTL PCB (SH-PCB side): 80 command not received for 10 seconds at power ON.	

Error type	T98 [Hardware error]	
Panel display	T98-*** !!System Error!! Press Reset key.	
	If recovery has failed, call Service.	400 dpi
	If recovery has failed, call Service & quote the Error Code T98-***.	300 dpi
Reset method	Switch power on again.	
Error point	Error conditions	
085	Failed to read the saved data of user settings (properties, test-mode adjustment values).	400 dpi
086	Failed to write the saved data of user settings (properties, test-mode adjustment values).	
087	No saved data of memory settings (program, mode, user paper) has been set.	
088	No saved data of user settings (properties, test-mode adjustment values) has been set.	
089	DIP switch No. 1 on the ROSE PCB is set to ON (PCB check setting).	
090	Machine code of memory settings (program, mode, user paper) does not match.	
091	Check-sum of memory settings (program, mode, user paper) does not match.	
092	Machine code of user settings (properties, test-mode adjustment values) does not match.	
093	Check-sum of user settings (properties, test-mode adjustment values) does not match.	
095	Check-sum of user settings (properties, test-mode adjustment values) does not match during standby.	
096	Check-sum of memory settings (program, mode, user paper) does not match during standby.	
097	Test mode adjustments stored in the drum is outside the adjustment range.	
099	ROSE: An undefined interrupt processing has occurred.	
119	Image PCB error. [* Printers equipped with new type scanner only]	400 dpi & 300 dpi
219	The TPH size code does not match the machine-type code data.	400 dpi
220	The TPH resolution code does not match the machine-type code data.	
540	Data read/write error onto the EEPROM on the print drum.	400 dpi & 300 dpi
541	Data write error onto the EEPROM on the print drum.	
542	Check-sum error on the print drum EEPROM.	

2-1. Jam errors

Also refer to page No.17-24 for other error-type-A Jam errors which come up under “G” code error.

Error type	A01 [Master feed error]
Panel display	A01-*** Master misfeed Rewind master roll and reset master in place.
Reset method	Master-making-unit sensor: Unblocked → Blocked, then master-positioning sensor OFF. (Or switch power on again.)
Error point	Error conditions
201	The master-positioning sensor does not go ON even after the write pulse motor and load pulse motor are activated for max. 80mm during master-positioning, and max. 30mm during master making.
202	The master-positioning sensor was not blocked even if the master was rewound during master loading (max. 3 seconds + master rewinding amount set in Test Mode). Or the master-positioning sensor was not blocked even if the master was rewound up to 8 mm, when the master-positioning sensor was receiving light at the start of master creation.
211	The master-positioning sensor stays ON during master-positioning, test-printing, or normal printing operation.
215	The write pulse motor/load pulse motor did not operate properly (gate-array control error).

Error type	A02 [Master loading error]
Panel display	A02-*** Master misfeed Rewind master roll and reset master in place.
Reset method	Master-making unit sensor: Unblocked → Blocked, and master positioning sensor: OFF. Then recovery operation.
Error point	Error conditions
509	The master-loading sensor was OFF (master not detected) when the master on the drum was checked at a specified drum angle during the master-loading operation.

Error type	A03 [Cutting error]	
Panel display	A03-*** Master is not correctly wound onto print drum.	
	Check the master on the print drum.	400 dpi
	Remove master from print drum.	300 dpi
Reset method	Print-drum set sensor: Unblocked → Blocked, and then recovery operation. * When this error occurs, if the print drum is at position A, the print-drum lock is automatically released.	
Error point	Error conditions	
206	Master cut was successful after master cut retry.	

Error type	A04 [Master-disposal error]
Panel display	A04-*** Master-Disposal Error Pull out print drum and discard master.
Reset method	Print-drum set sensor: Unblocked → Blocked, then recovery operation. * When this error occurs, if the print drum is at position A, the print-drum lock is automatically released.
Error point	Error conditions
303	Master-disposal jam sensor was unblocked at both 70 and 90 degrees drum angle.
304	The master-disposal jam sensor was blocked at completion of master-disposal operation.

Error type	A05 [Master present in the master-disposal section]
Panel display	A05-*** Master lammed in disposal unit Open scanner table and disposal entrance cover, then remove master
Reset method	Master-disposal box switch: OFF → ON, and master-disposal jam sensor: Blocked. (Or switch power on again.)
Error point	Error conditions
312	The master-disposal jam sensor was unblocked at the start of master making operation.

Error type	A06 [Check paper-feed tray]
Panel display	A06-*** Check paper-feed tray
Reset method	The paper-feed-tray lower safety switch goes ON. (Or switch power on again.)
Error point	Error conditions
403	The paper-feed-tray lower safety switch is OFF.

Error type	A07 [Paper-feed error]	
Panel display	A07-*** Paper jammed. Check paper feed side, and press the lower right “Jam Reset” key.	300 dpi only
Reset method	Unblock the light path of the paper sensor and reset the jam.	
Error point	Error conditions	
409	The paper-ejection sensor was blocked when the paper should have arrived, and the paper sensor was blocked at 180°, just before stopping.	
412	The paper sensor was activated three times in succession when a paper misfeed was detected (paper misfeed).	
413	The paper sensor was blocked when paper passed the paper sensor (lengthwise error).	
418	The paper sensor was blocked at the start of operation.	
429	The paper sensor was blocked when the recovery operation ended.	
432	The paper sensor was blocked when a paper-feed retry was conducted by non-pickup operation.	

Error type	A08 [Paper jam on print drum]	
Panel display	A08-*** Paper jammed. Pull out print drum and remove jammed paper.	300 dpi only
Reset method	Print drum set sensor: Unblocked → Blocked. (Or switch power on again.) * When this error occurs, if the print drum is at position A, the print-drum lock is automatically released.	
Error point	Error conditions	
410	The paper-ejection sensor was blocked when paper should have arrived, and the paper sensor was blocked at 180◦, just before stopping.	
430	An error message is displayed to prompt the user to pull out the print drum and check the paper after the recovery operation ends.	

Error type	A09 [Paper-ejection error]	
Panel display	A09-*** Paper jammed. Check paper ejection side, and press the lower right “Jam Reset” key.	300 dpi only
Reset method	Turn the paper-ejection sensor blocked and reset the jam.	
Error point	Error conditions	
410	The paper-ejection sensor was activated when the paper should have left the paper-ejection sensor.	
417	The paper-ejection sensor was activated at the start of operation.	
431	The paper-receiving sensor was receiving light when the recovery operation ended.	

Error type	A10 [AF original feed error]	
Panel display	A10-*** Paper jammed. Remove paper while pressing the reset button. Press the lower right “Jam Reset” key.	300 dpi only
Reset method	Block the AF original detection sensor, and reset the jam.	
Error point	Error conditions	
104	AF original feed error (1): The original detection sensor was already receiving light when the power was turned ON or a jam was reset.	
105	AF original feed error (2): The original did not leave the read sensor when the original was fed a distance of 114 mm after the original registration sensor started receiving light.	
106	AF original feed error (3): The original did not leave the paper-receiving sensor when the original was fed a distance of 117 mm after the read sensor started receiving light.	
107	AF original feed error (4): Did not reach original registration sensor even when fed 182 mm after start of feeding in.	
108	AF original feed error (5): Did not reach original read sensor even when fed 138 mm after start of scanning.	
109	AF original feed error (6): The original did not reach the paper-receiving sensor when the original was fed a distance of 117 mm after the read sensor became blocked.	
169	AF emergency stop	

Error type	A16 [Awaiting master removal]	
Panel display	A16-***	
	Master remains on print drum. Pull out print drum and remove master.	400 dpi
	Remove master from print drum. Pull out print drum and remove master mounted on print drum.	300 dpi
Reset method	Print-drum set sensor: Unblocked → Blocked, then recovery operation. * When this error occurs, if the print drum is at position A, the print-drum lock is automatically released.	
Error point	Error conditions	
525	During the emergency stop, the master material is not cut due to cutter motor lock.	

Error type	A17 [Cutter fault]
Panel display	A17-*** !!System Error!! Remove master and close master creation unit.
Reset method	Master-making unit sensor: Unblocked → Blocked; master-detection sensor: OFF, and then recovery operation.
Error point	Error conditions
209	The cutter home-position switch was ON (micro-switch pressed) during master setting at the start of master making. * For 300 dpi machine, this error indication is displayed when the cutter returns to the home position during cutter-motor lock recovery.

Error type	A18 [Print drum unlocked]
Panel display	A18-*** Print drum has been unlocked To lock it again, pull it out and then set it back in place
Reset method	Pull out the print drum.
Error point	Error conditions
528	The print drum can be pulled out.

Error type	A34 [Rewind Master Roll]
Panel display	A34-*** Rewind master roll and reset master in place. Check the next message.
Reset method	Master-making unit sensor: Unblocked → Blocked; and master-positioning sensor: Blocked, and then recovery operation
Error point	Error conditions
218	The master must be reset for error recovery.

2-2. Jam errors (Detailed information on G-code errors) [400 dpi machines only]

Error type	A07 [Paper-feed error]	
Error point	Error conditions	
409	The paper-ejection sensor was blocked when the paper should have arrived, and the paper sensor was blocked at 180◦, just before stopping.	400 dpi only
412	The paper sensor was activated three times in succession when a paper misfeed was detected (paper misfeed).	
413	The paper sensor was blocked when paper passed the paper sensor (lengthwise error).	
418	The paper sensor was activated at the start of operation.	
432	The paper sensor was blocked when paper feed retry action started after paper misfeed.	

Error type	A08 [Paper jam on print drum]	
Error point	Error conditions	
410	The paper receiving sensor was blocked when paper should have arrived, and the paper sensor was OFF at 180◦, just before stopping.	400 dpi only

Error type	A09 [Paper-ejection error]	
Error point	Error conditions	
411	The paper receiving sensor was unblocked when the paper should have left the paper receiving sensor.	400 dpi only
417	The paper receiving sensor was unblocked at the start of operation.	

Error type	A10 [AF original feed error]	
Error point	Error conditions	
102	AF registration sensor jam	400 dpi only
103	AF read sensor jam	
104	AF original ejection sensor jam	
105	Original not arriving at the AF registration sensor.	
106	Original not arriving at the AF read sensor.	
107	Original not arriving at the AF original ejection sensor.	
109	Original jam due to opening of AF cover during AF scanning.	
162	Tried to scan from AF with no original on AF unit.	

3-1. Option errors

Also refer to page No.17-28 for error-type-B Jam error which come up under “G” code error.

Error type	B01 [Keycard counter: No card]
Panel display	B01-*** Insert card into Keycard counter.
Reset method	Insert card.
Error point	Error conditions
730	Keycard counter: No card

Error type	B02 [Sorter: Serviceman-call error]	
Panel display	B02-*** Check sorter panel display.	400 dpi only
Reset method	Check the indication on the panel of the sorter.	
Error point	Error conditions	
702	An error command was received (Serviceman-call error) from the sorter.	

Error type	B04 [Sorter: Open error]	
Panel display	B04-*** The sorter cover is open.	400 dpi only
Reset method	Check the sorter cover.	
Error point	Error conditions	
707	An error command was received (Open error) from the sorter.	

Error type	B05 [Sorter: Other errors]	
Panel display	B05-*** Check sorter panel display.	400 dpi only
Reset method	Cancel the sorter error.	
Error point	Error conditions	
709	An error command was received (Other errors) from the sorter.	

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.	400 dpi only
Reset method	Switch power on again.	
Error point	Error conditions	
714	Data-storage file-name error	
715	Data-storage access error	
716	Other data-storage error	

Error type	B22 [ST sorter: Power off]	
Panel display	B22-*** !!ST Sorter Has No Power!! Turn ON Power Switch of it.	400 dpi only
Reset method	Jam reset (Check the power switch of the ST sorter.)	
Error point	Error conditions	
721	With the “Tape separation” function set ON, no power is supplied to the job separator when start key is pressed.	
727	After cluster-A signal turned ON, BUSY-signal stayed “L” for 7 seconds. (Power was cut off during Job separator operation.)	

Error type	B23 [ST sorter: No tape]	
Panel display	B23-*** No paper tape in ST sorter Replace tape roll.	400 dpi only
Reset method	Jam reset (Check and set paper tape in ST sorter.)	
Error point	Error conditions	
722	The tape detection signal is [H] (no tape) when the Busy signal is [H] (power ON), the [Tape Separation] function is set to ON, and the Start key is ON.	
723	The tape detection signal is [H] (no tape) when the Busy signal changes from [L] to [H] (after operation completion) after the tape output instruction is received.	

Error type	B24 [ST sorter: Tape jam]	
Panel display	B24-*** Paper-tape jam in ST sorter Check the tape.	400 dpi only
Reset method	Jam reset (Check and remove the jammed tape from ST sorter.)	
Error point	Error conditions	
724	The tape jam-detection signal is [L] (tape remaining) when the Busy signal is [H] (power ON), the [Tape Separation] function is set to ON, and the Start key is ON.	
725	The tape-jam detection signal is [H] within 1.2 seconds after the cluster-A signal turns ON (tape misfeed).	
726	The tape-jam detection signal is [L] when the BUSY signal changes from [L] to [H] (or after 7 sec. at [L]) after the cluster-A signal goes ON (tape discharge error).	

Error type	B25 [Sorter: Full error]	
Panel display	B25-*** Check sorter panel display.	400 dpi only
Reset method	TM5000: Remove paper and close the door.	
Error point	Error conditions	
716	Error command (Full error) received from the sorter	

Error type	B26 [Sorter: Print-on-bin error]	
Panel display	B26-*** Check sorter panel display.	400 dpi
Reset method	TM5000: Remove paper and close the door.	
Error point	Error conditions	
705	Error command (Paper-on-bin error) received from the sorter	

Error type	B27 [Sorter: Staple error]	
Panel display	B27-*** Check sorter panel display.	400 dpi
Reset method	TM5000: Refill staples or clear staple jam.	
Error point	Error conditions	
706	Error command (Staple error) received from the sorter	

Error type	B28 [Sorter: Size error]	
Panel display	B28-*** Check sorter panel display.	400 dpi
Reset method	TM50000: Change the paper-size setting.	
Error point	Error conditions	
708	Error command (Size error) received from the sorter	

Error type	B31 [Linked Printer: Communication error during data transmission]	
Panel display	B31-*** Data transfer Error for Linked Printer Check Network and Linked Printers Then Transfer Data Again	Link-mode machine
Reset method	Check the linked printer operation panel or network connection.	
Error point	Error conditions	
920	An error is detected by NET-CT. (No response received, communication interrupted, NET-C's TCP/IP not operating, non-standard interrupt command received from main unit, etc.)	

Error type	B33 [IP-address setting error]	
Panel display	B33-*** No IP Address Assigned to This Printer Contact Network Administrator	Link-mode machine
Reset method	Assign correct IP address	
Error point	Error conditions	
931	IP address is not assigned to RN. With no IP address assigned, the link is enabled on the linked printer.	

3-2. Option errors (Detailed information on G-code errors) [400 dpi machine]

Error type	B03 [Sorter: Jam error]	
Error point	Error conditions	400 dpi
703	Error command (Jam error) received from the sorter	

4. Consumable errors

Error type	C01 [Replace ink cartridge]
Panel display	C01-*** No ink Replace ink cartridge.
Reset method	Ink-cartridge set sensor: OFF → ON
Error point	Error conditions
512	The ink sensor did not go ON even when inking was performed for the preset period.

Error type	C02 [Replace master roll]
Panel display	C02-*** No master Replace master roll.
Reset method	Master-making unit sensor: Unblocked → Blocked and master detection sensor: Blocked → Unblocked
Error point	Error conditions
200	The master end was detected twice in succession at 10 ms intervals during master transport.

Error type	C03 [Master disposal box full]
Panel display	C03-*** Empty master disposal box.
Reset method	Disposal-box safety switch: OFF for more than 5 seconds and then ON.
Error point	Error conditions
308	Master disposal box detected as full by disposal box full sensor
313	Master disposal box detected as full by software master count

Error type	C04 [No paper]	
Panel display	C04-*** Set paper.	300 dpi only
Reset method	Activate paper detection sensor.	
Error point	Error conditions	
402	Paper detection sensor was blocked.	

5. Set check errors

Error type	D01 [Print drum not set]
Panel display	D01-*** Set print drum in place.
Reset method	Turn the print-drum safety switch ON, and deactivate the print-drum set sensor.
Error point	Error conditions
526	The print-drum set sensor was activated with the print-drum safety switch ON following print-drum setting.
527	The print-drum set sensor was activated with the print-drum safety switch OFF (with the print drum removed).
547	The print-drum set sensor was blocked with the print-drum safety switch OFF following print-drum setting.
548	The print-drum set sensor was activated with the print-drum safety switch OFF following print-drum setting.

Error type	D02 [Incorrect print drum]
Panel display	D02-*** Wrong-type print drum installed Set the correct print drum.
Reset method	Replace with correct print drum. (Machine type and print drum code must match.)
Error point	Error conditions
532	Incorrect print drum is used.

Error type	D03 [Ink cartridge not set]
Panel display	D03-*** Install ink cartridge.
Reset method	Ink-cartridge set sensor: ON
Error point	Error conditions
533	The ink-cartridge set sensor is OFF.

Error type	D04 [Incorrect ink cartridge]
Panel display	D04-*** Wrong-type ink cartridge installed Set the correct ink cartridge.
Reset method	Replace with correct ink cartridge.
Error point	Error conditions
534	Incorrect ink cartridge is used.

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	Master detection sensor: ON
Error point	Error conditions
210	The master detection sensor is OFF (not detecting master).

Error type	D07 [Master disposal box not set]
Panel display	D07-*** Set master disposal box in place.
Reset method	Disposal-box safety switch: ON
Error point	Error conditions
310	The disposal-box safety switch is OFF.

Error type	D09 [Master-making unit not set]
Panel display	D09-*** Close master-making unit.
Reset method	Master-making-unit sensor: Blocked
Error point	Error conditions
212	The master-making-unit sensor is activated (sensor light path is free).

Error type	D10 [Scanner table not set]
Panel display	D10-*** Close scanner table.
Reset method	Flatbed set switch: ON
Error point	Error conditions
213	The flatbed set switch is OFF.

Error type	D11 [Front cover not set]
Panel display	D11-*** Close front cover.
Reset method	Front-cover switch: ON
Error point	Error conditions
535	The front-cover switch is OFF.

6. Warning (Serviceman call)

Error type	E01 [Replace battery]	
Panel display	A16-*** !! Battery Replacement !!	
	Call Service.	400 dpi
	Call Service. (To continue the process, press the lower right “Jam Reset” key.)	300 dpi
Reset method	Jam reset	
Error point	Error conditions	
010	The battery voltage was less than 2.5 V when the power was switched ON (weak battery: time to replace battery).	400 dpi
	The battery voltage was less than 2.1 V when the power was switched ON, Reset button pressed, or when operation ended (weak battery: time to replace battery).	300 dpi

Error type	E02 [Maintenance call]	
Panel display	E02-*** !! Maintenance !!	
	Call Service.	400 dpi
	Call Service. (To continue the process, press the lower right “Jam Reset” key.)	300 dpi
Reset method	Jam reset	
Error point	Error conditions	
011	The master counter reached the value set in test mode when the power was tuned ON, the unit was reset, or operation ended.	
012	The copy counter reached the value set in test mode when the power was turned ON, the unit was reset, or operation ended.	
022	The maintenance counter inside the print drum reached the value set in test mode when the power was turned ON, the unit was reset, or operation ended.	

7. Warning (Other)

Error type	F01 [No master on drum]
Panel display	No master on print drum Make a new master.
Reset method	Jam reset.
Error point	Error conditions
015	There is no master on the print drum at the start of printing.

Error type	F02 [Master image larger than paper size: 1]	
Panel display	Page format larger than paper size !! Possible Ink Smudges on Prints !!	
	(Continue → Start key)	400 dpi
	Continue → Start key/Cancel → Stop key	300 dpi
Reset method	Jam reset, or press the Start key.	
Error point	Error conditions	
018	The paper size does not match the image on the print drum at the start of printing.	

Error type	F04 [Original not set (Multi-page mode)]
Panel display	Place another original and press the Start key. To cancel, press the Stop key.
Reset method	Set original and press the Start key, or press the Stop key.
Error point	Error conditions
013	The original is not set when multi-page mode was started.

Error type	F05 [Print quantity under "Minimum print quantity"]
Panel display	Minimum value is programmed. Enter print quantity over [***].
Reset method	Set a print quantity over the minimum print quantity.
Error point	Error conditions
019	In master making, the print quantity selected is under the minimum print quantity.

Error type	F10 [Master image larger than paper size: 2]	
Panel display	Page format larger than paper size !!Possible ink smudges on prints!!	
	(Continue → Test Print key)	400 dpi
	Continue → Test Print key/Cancel → Stop key	300 dpi
Reset method	Jam reset, or press the Test Print key.	
Error point	Error conditions	
021	The paper size does not match the image on the print drum at the start of test printing.	

Error type	F14 [No Paper]	
Panel display	Add paper.	400 dpi
Reset method	Load the paper.	
Error point	Error conditions	
402	Paper detection sensor was OFF.	

Error type	F16 [AF cannot be used for QT-4]	
Panel display	!!No QT-4 Sheets for Original Scanning in AF!! Place original on the platen glass.	400 dpi
Reset method	Remove the original from the AF.	
Error point	Error conditions	
039	The original was set on the AF when operation was started with QT-4 selected.	

Error type	F21 [AF multi-up: Original not set]	
Panel display	Place another original. To cancel, press the Stop key.	
Reset method	Set original on the AF, or cancel the operation by pressing the Stop key.	
Error point	Error conditions	
030	Next original is requested on AF for multi-up operation.	300 dpi
032	The next original is not in placed on AF for multi-up operation.	400 dpi

Error type	F22 [FB multi-up: Original not set]	
Panel display	Place another original and press the Start key. To cancel, press the Stop key	
Reset method	Place the original on flatbed and press the Start key, or stop FB multi-up operation by the Stop key.	
Error point	Error conditions	
031	Next original is requested on flatbed for multi-up operation.	300 dpi
033	The next original is not placed on flatbed for multi-up operation.	400 dpi

Error type	F23 [Remote communication error]	
Panel display	Communication Error Check communication devices and cables, then press the “Enter” key.	400 dpi
Reset method	Jam reset	
Error point	Error conditions	
044	Communication error in remote mode (D to P data mode)	

Error type	F25 [Incorrect image resolution]	
Panel display	!!The Image Resolution of the Current Data has Just been Converted!! (Continue → Start key)	400 dpi
Reset method	Jam reset or press the Start key.	
Error point	Error conditions	
045	Data was received with an inconsistent image resolution (D to P data mode).	

Error type	F32 [Data storage area full]	
Panel display	!!Data-Storage Area Full!! Clear old storage data to take in coming ones.	400 dpi
Reset method	Jam reset (Check the available memory size.)	
Error point	Error conditions	
713	Insufficient memory available when data is written to the data-storage area	

Error type	F34 [Cannot print on master loaded]	
Panel display	Cannot print master on print drum. Remake the master or replace the print drum.	400 dpi
Reset method	Jam reset or pull out the print drum.	
Error point	Error conditions	
049	The master (metered master) on the print drum is not printable at the start of printing operation.	

Error type	F37 [AF cannot be used in book mode]	
Panel display	!!AF Cannot be Used In Book Mode!! Use scanner table.	400 dpi
Reset method	Cancel book mode or remove the original from AF.	
Error point	Error conditions	
050	The original was set on the AF with book mode set when master making is started.	

Error type	F43 [D-to-P original/output paper nonconformance]	
Panel display	Incorrect Paper Size Check Paper Size. (To resume, press the Start key.)	400 dpi
Reset method	Check the paper size, or press the Start key.	
Error point	Error conditions	
900	The output paper size does not match the size of the original at the start of D-to-P master making.	

Error type	F49 [Printer-Auto-Selection to linked printer disabled: Job setting error]	
Panel display	!! No Printout on Linked Printer with the Current Print Job Setting !! Print will Start here (Continue → START Key)	Link-mode machine
Reset method	Press the Close key, the Reset key, or the Stop key to abort. Press the Start key to start (output from the main unit).	
Error point	Error conditions	
906	Auto-printer-selection is disabled with current job setting.	

Error type	F50 [Printer-Auto-Selection to linked printer disabled: Linked printer error]	
Panel display	!! Linked Printer Error - No Printout on Linked Printer !! Print will Start here (Continue → START Key)	Link-mode machine
Reset method	Press the Close key, the Reset key, or the Stop key to abort. Press the Start key to start (output from the main unit).	
Error point	Error conditions	
910	Auto-printer-selection is disabled with linked printer error.	

Error type	F51 [No Original on Scanner Table: Duplex Scanning Mode]	
Panel display	<Duplex Processing for Linked Printer> Reverse-Page Scan → START or Simplex → STOP	Link-mode machine
Reset method	Press START Key (reverse side page scanning), or STOP or RESET (print front page only).	
Error point	Error conditions	
911	No original on Scanner Table (Duplex Scanning: Waiting for original).	

Error type	F52 [Printing from Linked Printer Disabled: Configuration Data being acquired]	
Panel display	Acquiring Linked Printer Configuration Data Please Wait a Moment	Link-mode machine
Reset method	Change the mode	
Error point	Error conditions	
912	Cannot print from linked printer (Configuration data not acquired).	

Error type	F53 [More than 999 copies at one time not possible from linked printer]	
Panel display	!! No More than 999 Copies on Linked Printers !! Use This Printer (Number is to be Reset)	Link-mode machine
Reset method	Change the mode, or START Key to start (print out from RN).	
Error point	Error conditions	
913	Designated print quantity on linked printer over the limit.	

Error type	F54 [Printer-Auto-Selection to linked printer disabled: Selected paper not in linked printer]	
Panel display	!! Selected Paper Size is Not Available on Linked Printers !! Print will Start here (Continue → START Key)	Link-mode machine
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints fromRN.	
Error point	Error conditions	
923	Auto-printer-selection is disabled due to the selected paper not in the linked printer.	

Error type	F55 [Printer-Auto-Selection to linked printer disabled: Receiving print data from PC]	
Panel display	!! No Printout on Linked Printers while Receiving Print Data from PC !! Print will Start here (Continue → START Key)	Link-mode machine
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RN.	
Error point	Error conditions	
924	Auto-printer-selection is disabled while receiving print data from PC.	

Error type	F56 [Printer-Auto-Selection to linked printer disabled: Config. Data being Acquired]	
Panel display	!! No Printout on Linked Printers while Acquiring Their Config. Data !! Print will Start here (Continue → START Key)	Link-mode machine
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RN.	
Error point	Error conditions	
925	Auto-printer-selection is disabled with no config. data in linked printer.	

Error type	F57 [Printing from Linked Printer Disabled: Processing print data from PC]	
Panel display	Processing Print Data from PC Linked Printers are Not Available while Processing Current Data	Link-mode machine
Reset method	Change the mode.	
Error point	Error conditions	
926	Cannot print from linked printer (Processing job from PC).	

Error type	F58 [Printing from Linked Printer Disabled: Initializing NET-C]	
Panel display	Starting Up RISORINC-NET Please Wait a Moment	Link-mode machine
Reset method	Change the mode.	
Error point	Error conditions	
927	Cannot print from linked printer (Initializing NET-C).	

Error type	F59 [Printer-Auto-Selection to linked printer disabled: Initializing NIC]	
Panel display	!! No Printout on Linked Printers while Starting Up RISORINC-NET !! Print will Start here (Continue → START Key)	Link-mode machine
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RN.	
Error point	Error conditions	
928	Auto-printer-selection is disabled due to initializing of NET-C.	

Error type	F60 [Printer-Auto-Selection to linked printer disabled: Print quantity selected is Zero]	
Panel display	!! No Printout on Linked Printers with "0" as Number of Copies !! Print will Start here (Continue → START Key)	Link-mode machine
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RN.	
Error point	Error conditions	
929	Auto-printer-selection is disabled with print quantity selected as Zero.	

8. MIB (Management Information Base) error

Error type	L01 [Communication error in MIB information acquisition]	
Panel display	L01-*** !! No Linked Printer Detected !! Check Cable Connection and Power Supply for Linked Printers	Link-mode Machine
Reset method	Check linked printer power source and cable connections, or change the output to one of other linked printers.	
Error point	Error conditions	
914	Printer information request error. Unable to transmit data even after 3 second wait / No reply from the linked printer / Link disconnected from the linked printer / TCP/IP of the NET-C is not activating / Data interruption from RN, etc.	
915	No information reply back from the linked printer. No reply back from NET-C even after 50 seconds wait.	
916	Communication error from the linked printer. Linked printer power OFF / Linked printer does not support SNIP, etc.	
917	Laser Beam Printer (LBP) communication error (network error during NET-C initialization)	

2. G-Code Indication (400 dpi machines only)

A paper-jam error (including an AF original feed error, sorter: jam error) is assigned internal error codes such as [A**] and [B**], but when the error codes are combined, the panel displays error message [G**]. The "**" indication in [G**] is the sum of the numeric values corresponding to the bits of applicable errors (the 5 types shown below) for paper jams.
The detailed error code is displayed when the "*" (asterisk) key is pressed.

Error type	G** [Paper jam]	
Panel display	G*** Paper jam Check the indicated areas and press the [OK] button.	400 dpi

Error type	Error name	Bit	Corresponding value
A10	AF original feed error	Bit 0	1
B03	Sorter: jam error	Bit 1	2
A07	Paper-feed error	Bit 2	4
A08	Paper jam on print drum	Bit 3	8
A09	Original ejection error	Bit 4	16

Example: When errors A08 and B03 occur, the panel displays [G10].

3. Backed-up Errors

The errors listed below are backed up and are not cleared even when the machine power is switched OFF once and turned ON once again.

Error type	Description
T01	Main motor lock
T03	Clamp motor lock
T13	Cutter motor lock
A02	Master loading error
A03	Cutting error
A04	Master disposal error
A08	Paper jam on print drum
A16	Awaiting master removal
A17	Cutter error
C01	Replace ink cartridge
C02	Replace master roll
C03	Master disposal box full

CHAPTER 18: TEST MODE

Contents

1. Procedures

1) Start-up Procedure

< 400 dpi machines >

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

< 300 dpi machines >

Switch on power while pressing the “Master/Print” and “Text/Photo” keys on the panel simultaneously. This starts the 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.

* During data setting, pressing the “Start” key confirms the changed data and returns to standby mode. Pressing the “Stop” key cancels the settings and returns 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.
< 400 dpi machines >
• Press the unit name on the LCD screen. (Unit name is highlighted.)
• The Test mode sub-menu appears.
< 300 dpi machines >
• Highlight the unit name using the Up/Down keys or function keys, and then press the “Enter” key.
• The Test mode sub-menu appears.
(2) Select the test item to be run from the Test mode sub-menu.
< 400 dpi machines >
Press the test item on the LCD screen. (Test item is highlighted.)
< 300 dpi machines >
Highlight the test item using the cursor keys or function keys, and then press the “Enter” key.
(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.

* During data setting, pressing the “Start” key confirms the changed data and returns to standby mode. Pressing the “Stop” key cancels the settings and returns 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. The moving parts may lock if moved over the limit position, and may result in damaged part(s).

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 “Stop” or “Start” key is pressed.

(2) A continuous audible tone (buzzer) is emitted to indicate an error. To cancel the error, press “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 “*” key to change the +/- display.

(3) **< 400 dpi machines >** Once the settings have been changed, press the “Start” key to confirm the data and return to standby mode. Pressing the “Stop” key cancels the settings and returns to standby mode.

< 300 dpi machines > Once settings have been changed, press the “Enter” or “Start” key to confirm the data and return to standby mode.

* The settings will be changed to their programmed default values if values beyond the specified setting ranges are entered. The settings will also be changed to the programmed default values if values are entered in units other than the units specified.

3. System/Control Panel Test Mode

No.	Sensors, switches	Detection status	Model
001	Wakeup Key Check	Key pressed	400 dpi
No.	**Motors, solenoids**	**Remarks**	**Model**
030	Beep Sound Check 1	0.1-second intervals	ALL
031	Beep Sound Check 2	0.5-second intervals	
032	Wakeup LED ON	Illuminates	400 dpi
No.	**Unit checks**		**Model**
050	Test Print A (Checkered) Creates a master for test pattern 1 (Checkered).		ALL
051	Test Print B (Cross stripes) Creates a master for test pattern 2 (Cross stripes).		
052	Test Print C (Dot 1) Creates a master for test pattern 3 (Dot 1).		400 dpi
053	Test Print D (Dot 2) Creates a master for test pattern 4 (Dots 2).		
054	Test Print E (Dot 1 + Cross stripes) Creates a master for test pattern 5 (Dot 1 + Cross stripes).		
055	Test Print F (Dot 2 + Cross stripes) Creates a master for test pattern 6 (Dot 2 + Cross stripes).		
056	Paper-Feed Test (Cycle) Passes paper through. * The “Speed” key can be used.		ALL
057	Low-Speed Printing Operation Prints continuously at 15 rpm.		
058	Stepped Printing Operation Press the “Start” key to switch on the suction and move the paper ejection wings. Prints at 15 rpm only while the “Test print” key is pressed. Printing stops as soon as the key is released, and resumes if the key is pressed again. Press “Stop” to switch off the suction.		400 dpi
059	Auto Power-OFF Signal Output Switches off the power.		ALL
060	Panel Key Test Displays the key number for the key pressed.		
061	Panel LCD Test Runs the test display.		
062	Panel LED Test Runs the test display.		
063	Unit Initialization Resets the mechanical sections to their home positions (TPH, master compression plate, clamp, vertical print positioning, print pressure, paper ejection wings [255/215]).		
064	System Configuration Data Output Creates a master for the CI system data.		400 dpi
065	LCD Base-Point Compensation Perform the following adjustments in sequence: 1) Touch two diagonally opposite points on the panel, and calculate its position. 2) Touch five points on the check screen to determine whether they are correctly compensated.		
066	Data-Setting & Error-History Output Creates a master for the list of data-setting changes and the error history.		

No.	Data checks	Display details	Model
070	System-Parameter Adjustment Record	Lists the Test Mode No. and setting for non-default items during data setting.	ALL
071	SW Action Record	Displays the error code (D**) for the set switch that caused operation to stop. * 400 dpi machines: Up to the 8 most recent items * 300 dpi machines: The one most recent item	
072	Error Record	Displays a list of the error numbers of errors (error types: T, A, B) generated in normal mode in the past. * 400 dpi machines: Up to the 60 most recent errors * 300 dpi machines: Up to the 8 most recent errors	
073	Maintenance Count	Displays all maintenance counter values. * 400 dpi machines: Displayed in the unit of one sheet * 300 dpi machines: Master count displayed in the unit of 100 sheets (“9999” means “999900”) Total count and print-drum count displayed in the unit of 1000 sheets (“9999” means “9999000”)	
074	Current Battery A/D Data	Displays the remaining battery-voltage level (A/D).	300 dpi
	Current Battery Voltage	Displays the current residual battery digital value and voltage. Digital value: 0-255 (full at 255) Voltage: 0-3.3 V (displays x10 values)	400 dpi
075	Current Battery Voltage	Displays the current residual battery voltage in (mV).	300 dpi
	Loader Version Display	Displays the program loader version for both SH-PCB and MCTL-PCB.	400 dpi
078	Optional Configuration Check	Displays whether any peripheral options are currently connected. Displays the version if the peripheral unit if the unit contains ROM.	

No.	Data setting		Model
080	Clear Error Status Data		ALL
	Description	Forcibly clears jam. Consumable errors cannot be cleared.	
	Setting	None	
081	Clear User Memory		
	Description	Clears data in user memory (results to default values).	
		* Always save data on paper before resetting.	
	Setting	None	
082	Clear Test-Mode Data Setup		
	Description	Sets all settings made in normal mode to the default values. * Cannot be selected from the menu screen (in the case of 400 dpi machines). * Always save data on paper before resetting.	
	Setting	None	
083	Maintenance-Master Count Entry		
	Description	Sets the number of masters for which the maintenance-call message is displayed.	
	Setting	Range: 0 to 9999 (x100) Unit: 1 (x100) Default: 0	
084	Maintenance-Copy Count Entry (400 dpi machines) Maintenance Main Unit Print Count Setting (300 dpi machines)		
	Description	Sets the number of prints for which the maintenance-call message is displayed.	
	Setting	Range: 0 to 9999 (x1000) Unit: 1 (x1000) Default: 0	

No.	Data setting		Model
085	Maintenance-Drum Meter Entry (400 dpi machines) Maintenance Print-Drum Print Count Setting (300 dpi machines)		ALL
	Description	Sets the number of print-drum prints for which the maintenance-call message is displayed (set for each print drum).	
	Setting	Range: 0 to 9999 (x1000) Unit: 1 (x1000) Default: 0	
086	Black-Priority Shrinkage-Mode Change		400 dpi
	Description	Sets the effective range for the black-priority process in shrinkage printing (effective for the reduction of cyclic patterns).	
	Setting	Range: 0 (all ON mode [black priority ON in 99% to 50% shrinkage]) 1 (magnification auto-change mode [black priority OFF in 99% to 87% shrinkage, and black priority ON in 86% to 50% shrinkage]) Default: 0 (all ON mode [black priority ON in 99% to 50% shrinkage])	
	Auto Idle Period		300 dpi
	Description	If adjusted to any setting from 1 to 12, the setting by this test mode will override the setting of 6 hours or 12 hours by User mode. If OFF is selected by the User mode, the auto idle period will be OFF regardless of the test mode setting.	
	Setting	Range: 0 (conform to the User mode setting), 1 to 12 (1 to 12 hours) Unit: 1 Default: 0 (conforms to the User mode setting)	
087	Maintenance-Master Count Clear (Master)		ALL
	Description	Clears the master count (within the software) for displaying the maintenance-call message.	
	Setting	None	
088	Maintenance-Copy Count Clear (Print)		
	Description	Clears the print count (within the software) for displaying the maintenance-call message.	
	Setting	None	
089	Maintenance-Drum Meter Clear		
	Description	Clears the print-drum print count (within the software) for displaying the maintenance-call message.	
	Setting	None	
090	Print Quantity Display Recovery		
	Description	Sets the conditions for print-quantity reset.	
	Setting	Range: 0 (Auto-print ON: reset; Auto-print OFF: reset) 1 (Auto-print ON: reset; Auto-print OFF: not reset) 2 (Auto-print ON: not reset; Auto-print OFF: reset) 3 (Auto-print ON: not reset; Auto-print OFF: not reset) Default: 1 (Auto-print ON: reset; Auto-print OFF: not reset)	
091	Panel Black/White Reversal		400 dpi
	Description	Reverses the black/white mode of the touch-panel display	
	Setting	Range: 0 (Normal), 1 (Reversed) Default: 0 (Normal)	
	Serviceman contact setting		300 dpi
	Description	Sets serviceman contact address and retailer name for displaying on error screens.	
	Setting	Set using special serviceman contact setting screen. * Space if not set.	
093	Black-Priority Shrinkage-Mode Change		300 dpi
	Description	Sets the effective range for the black-priority process in shrinkage printing (effective for the reduction of cyclic patterns).	
	Setting	Range: 0 (all ON mode [black priority ON in 99% to 50% shrinkage]) 1 (magnification auto-change mode [black priority OFF in 99% to 87% shrinkage, and black priority ON in 86% to 50% shrinkage]) Default: 0 (all ON mode [black priority ON in 99% to 50% shrinkage])	

No.	Data setting		Model
094	Minimum Print Number Setting Enable		400 dpi
	Description	Sets Changeable or Unchangeable for the minimum print number set by the Administrator.	
	Setting	Range: 0 (Unchangeable), 1 (Changeable)	
		Default: 1 (Changeable)	
	Description	Enables or disables the minimum print number set in the User mode.	300 dpi
	Setting	Range: 0 (Disabled), 1 (Enabled) Default: 1 (Enabled)	
095	Counter Action Control (400 dpi machines)		ALL
	Solenoid Counter Enable/Disable Setting (300 dpi machines)		
	Description	Enables or disables the print counters (solenoid counter, software counter). The counters remain disabled until the power is switched OFF. When the power is switched OFF, the setting returns to the default (Enabled).	
	Setting	Range: 0 (Disabled), 1 (Enabled) Default: 1 (Enabled)	
097	Fine Image Mode Control		400 dpi
	Description	Selection of either to display or hide the “Fine Image Mode Control” selection on the Administrator Settings window.	
	Setting	Range: 0 (Disabled) 1 (Fine mode 1: Makes master-making at slow speed.) 2 (Fine mode 2: Controls the TPH power.) Default: 0 (Disabled)	
	Multi Up Auto Selection		300 dpi
	Description	Selection of whether to enable or disable the Multi Up selection after each job.	
	Setting	Range: 0 (Disabled), 1 (Enabled) Default: 1 (Enabled)	
098	Counter Resumed Stop		400 dpi
	Description	Enables or disables the print counters (solenoid counter, software counter). The setting is stored even when the power is switched OFF.	
	Setting	Range: 0 (Disabled), 1 (Enabled) Default: 1 (Enabled) * Cannot be selected from the Menu screen. * Test mode No. 960 must be activated in advance to activate this test mode. * Enter either 0 or 1 and press the “Start” key to set.	
099	Warning Display Control		400 dpi
	Description	Selection of whether to display the warning messages [F02] and [F10] regarding wrong size at the start of printing.	
	Setting	Range: 0 (Disabled), 1 (Enabled) Default: 1 (Enabled)	
	Description	Selection of whether to display the warning message [Possible ink smudges.....].	300 dpi
	Setting	Range: 0 (Enabled), 1 (Disabled) Default: 0 (Enabled)	

4. Process/Scanning Test Mode

No.	Sensors, switches	Detection status	Model
100	FB/AF HP sensor	Carriage at home position	ALL
101	Flatbed Original Det. Sensor	Detecting (original present)	
110	Stage Cover Sensor	Stage cover closed	400 dpi
	AF Registration Sensor	Light blocked	300 dpi
111	AF Read Sensor	Light blocked (reflection blocked)	300 dpi
112	AF Original Ejection Sensor	Light blocked	
113	AF Original Detection Sensor	Light received (original present)	
117	Stage Cover Sensor	Light blocked	
119	AF Unit Detection Sensor	Signal present (AF unit connected)	

No.	Motors, solenoids	Remarks	Model
130	CCD Lamp		ALL
132	AF Read Pulse Motor (CW)		300 dpi
133	AF Read Pulse Motor (CCW)		

No.	Unit checks	Model
150	Shading Operation Runs the Shading Operation.	ALL
151	Scanner Home Action Returns the scanner to the home position.	
152	Scanner 1 Cycle Action	
	Performs one A3 size scanner operation cycle. * 400 dpi machines: Adjusts the speed in accordance with the reproduction size set in Test Mode No. 187. * 300 dpi machines: Adjusts the speed in accordance with the reproduction size set in Test Mode No. 192.	
153	Scanner AF Action Moves the Scanner to the AF Scanning Position.	
154	Scanner Lock Action Moves the scanner to the lock position for transport. *Error message displayed.	
155	Scanner Release Action Cancels the error status set in Test Mode No. 154	
156	Scanner Cycle Continuous Action [* For a new scanner only] Repeats the motion of Test Mode No. 152.	400 dpi
	AF 1 Cycle Action Performs one AF operation cycle. * Adjusts the speed in accordance with the reproduction size set in test mode No. 192	300 dpi
157	Lamp Carriage Action [* For a new scanner only] Lamp carriage moves to home position → Lamp carriage transfers in scanning direction → 1 second halts after lamp carriage transfer of equivalent to ledger length → Lamp carriage returns → Stops at home position. * Adjusts the speed in accordance with the reproduction size set in Test Mode No. 187.	400 dpi
	AF Feed Action Performs original feed action. * Adjusts the speed in accordance with the reproduction size set in Test Mode No. 192.	300 dpi
158	Scanner Lamp Replace Positioning [* For a new scanner only] Moves the scanner to lamp replacing position.	ALL

No.	Data setting		Model
180	FB Horizontal Scan Position Adjustment		ALL
	Description	Adjusts the original horizontal scan position on the flatbed. AF set separately.	
	Setting	Range: -30 to +30 (-3.0 mm to +3.0 mm) * + is to left. [-35 to +40 (-3.5 mm to +4.0 mm)] Unit: 5 (0.5 mm) Default: 0 mm * Values in [ ] are for the 300 dpi machines with the previous scanner model.	
181	FB Scan Start Position Adjustment		
	Description	Adjusts the original scanning start position (scan skip amount) on the flatbed.	
	Setting	Range: -60 to +60 (-6.0 mm to +6.0 mm) * + is downward. Unit: 1 (0.1 mm) Default: 0 mm	
182	FB Scan Image Elongation and Shrinkage Adjustment		
	Description	Adjusts the original scanning speed.	
	Setting	Range: -100 to +100 (-10.0% to +10.0%) * + for elongation on the 300 dpi machines * + for shrinkage on the 400 dpi machines. Units: 1(0.1%) Default: 0%	
183	Line-Copy Slice Level Adjustment		400 dpi
	Description	Sets the slice level for line mode. Lighter for larger values.	
	Setting	[New scanner] Range: -32 to +32 Unit: 1 Default: 0 (for the 400 dpi machines), -10 (for the 300dpi machines) [Previous scanner] Range: -16 to +16 Unit: 1 Default: 2 (for the 400 dpi machines), 0 (for the 300dpi machines)	
	Edge Stress Slice Level Adjustment [* For a new scanner only]		300 dpi
	Description	Sets the slice level for edge emphasis for text/photo printing.	
	Setting	Range: 0 to 255 Unit: 1 Default: 40	
184	ABC Slice Level Adjustment		400 dpi
	Description	Sets the slice level for ABC (auto base control). Lighter for larger values.	
	Setting	[New scanner] Range: -32 to +32 Unit: 1 Default: 0 (for the 400 dpi machines), 8 (for the 300dpi machines) [Previous scanner] Range: -16 to +16 Unit: 1 Default: -1 (for the 400 dpi machines), 0 (for the 300dpi machines)	
	AF-ABC Mirror Position Adjustment		300 dpi
	Description	Adjustment of ABC (auto base control) read position by mirror position for AF scanning.	
	Setting	Range: -20 to +20 (-2.0 mm to +2.0 mm) * + makes the read start position earlier. Unit: 1 (0.1 mm) Default: 0 mm	

No.	Data setting		Model
185	Stray White Dot Erasure		400 dpi
	Description	The image processing function compensates if stray white dots of specified size exist.	
	Setting	[New scanner] * Setting not required [Previous scanner] Range: 0 (OFF) 1 (Deletion of 1x1 points) 2 (Deletion of 2x2 points) 3 (Deletion of 2x3 points) Default: 2	
	AF Horizontal Scan Position Adjustment		300 dpi
	Description	Adjusts original horizontal scanning position using AF.	
	Setting	Range: -35 to +40 (-3.0 mm to +4.0 mm) * + moves to left. Unit: 5 (0.5 mm) Default: 0 mm	
186	Stray Black Dot Erasure		400 dpi
	Description	The image-processing function compensates if stray black dots of specified size exist.	
	Setting	[New scanner] * Setting not required [Previous scanner] Range: 0 (OFF) 1 (Deletion of 1x1 points) 2 (Deletion of 2x2 points) 3 (Deletion of 2x3 points) Default: 2	
	AF Scan Start Position Adjustment		300 dpi
	Description	Adjusts the original scanning start position (scan skip amount) using AF.	
	Setting	Range: -60 to +60 (-6.0 mm to +6.0 mm) * + moves down. Unit: 1 (0.1 mm) Default: 0	
187	Cycle Test Scanning Speed Adjustment		400 dpi
	Description	Sets the scanning speed (reproduction rate) of Test Mode No. 152 (Scanner One Cycle).	
	Setting	Range: 50 to 200 (50% to 200%) Unit: 1 (1%) Default: 100%	
	AF Scan Image Elongation and Shrinkage Adjustment		300 dpi
	Description	Adjusts original scanning speed using AF. (Transport motor speed)	
	Setting	Range: -100 to +100 (-10.0% to +10.0%) * + elongates. Unit: 1 (0.1%) Default: 0	
188	Line Edge Stress Level Adjustment		400 dpi
	Description	Adjusts the line edge stress.	
	Setting	[New scanner] * Setting not required [Previous scanner] Range: 0 to 15 Unit: 1 Default: 8 (for the 400 dpi model), 11 (for the 300dpi model)	
	Slice Level Setting		300 dpi
	Description	Sets text mode slice level. (Finer for larger values)	
	Setting	Range: -32 to +32 [-16 to +16] Units: 1 Default: -10 [0] * Values in [ ] are for the previous scanner model.	

No.	Data setting		Model
189	Halftone-Curve Selection (Photo)		400 dpi
	Description	Selects the matrix forming the halftone-curve base for photo mode.	
	Setting	Range: 0 to 8 Unit: 1 Default: 4	
	ABC Slice Level Setting		300 dpi
	Description	Sets ABC (automatic base control) slice level. (Finer for larger values)	
	Setting	Range:-32 to +32 [-16 to +16] Units: 1 Default: 8 [0] * Values in [ ] are for the previous scanner model.	
190	Halftone-Curve Selection (Dot)		400 dpi
	Description	Selects the matrix forming the halftone-curve base for dot mode.	
	Setting	Range: 0 to 8 Unit: 1 Default: 4	
	Line Edge Stress Level (Text) [* For a new scanner only]		300 dpi
	Description	Line edge emphasize slice level adjustment	
	Setting	Range: 0 to 255 Unit: 1 Default: 40	
191	Smoothing Effect Photo [* For a new scanner only]		300 dpi
	Description	Adds smoothing effect on photographs (effective against moire).	
	Setting	Range: 0 to 15 Unit: 1 Default: 7	
192	Scanning Speed (for 1 cycle)		300 dpi
	Description	Sets the change rate for setting FB and scanning AF scanning pulse motor speeds.	
	Setting	Range: 50 to 200 (50% to 200%) Unit: 1 (1%) Default: 100%	
193	Trimming Slice Level Adjustment		400 dpi
	Description	Sets the slice level for trimming. Larger values make trimming more difficult.	
	Setting	Range: -16 to +16 Unit: 1 Default: -2	
	AF Registration Loop amount		300 dpi
	Description	Adjusts slack when feeding into AF.	
	Setting	Range: -30 to +30 (-3.0 mm to +3.0 mm) Unit: 1 (0.1 mm) Default: 0 mm	

No.	Data setting		Model
194	Line Edge Stress Level Adjustment (Text) [* For a new scanner only]		400 dpi
	Description	Adjusts the line edge stress.	
	Setting	[New scanner] Range: 0 to 31 Unit: 1 Default: 11 (for both 400 dpi and 300 dpi machines) [Previous scanner] * Setting not required.	
	Edge Stress Level Adjustment		300 dpi
	Description	Adjusts the edge stress.	
	Setting	Range: 0 to +31 [0 to +15] Unit: 1 Default: 11 * Values in [ ] are for the previous scanner model.	
195	Line Edge Stress Slice Level Adjustment (Text) [* For a new scanner only]		400 dpi
	Description	Sets the threshold value for the line edge stress in text printing.	
	Setting	[New scanner] Range: 0 to 255 Unit: 1 Default: 60 (for 400 dpi machines), 40 (for 300 dpi machines) [Previous scanner] * Setting not required.	
	Halftone-Curve Selection (Photo)		300 dpi
	Description	Selects the matrix forming the halftone-curve base for photo mode.	
	Setting	Range: 0 to 24 * Refer to the halftone-curve matrix below. Unit: 1 Default: 12	
196	Edge Stress Level Adjustment (Text/Photo) [* For a new scanner only]		400 dpi
	Description	Sets the threshold value for the line edge stress in text/photo printing.	
	Setting	[New scanner] Range: 0 to 31 Unit: 1 Default: 0 (for 400 dpi machines), 2 (for 300 dpi machines) [Previous scanner] * Setting not required.	
	Halftone-Curve Selection (Dot)		300 dpi
	Description	Selects the matrix forming the halftone-curve base for Dot mode.	
	Setting	Range: 0 to 24 * Refer to the halftone-curve matrix below. Unit: 1 Default: 12	
197	Edge Stress Slice Level Adjustment (Text/Photo) [* For a new scanner only]		400 dpi
	Description	Sets the threshold value for edge emphasize in text/photo printing.	
	Setting	[New scanner] Range: 0 to 255 Unit: 1 Default: 60 (for 400dpi machines), 40 (for 300 dpi machines) [Previous scanner] * Setting not required.	
	Halftone-Curve Selection (AM)		300 dpi
	Description	Adjustsment the halftone curve for text/photo printing.	
	Setting	Range: 0 to 24 * Refer to the halftone-curve matrix below. Unit: 1 Default: 12	

No.	Data setting		Model
198	Smoothing Effect on Photo [* For a new scanner only]		400 dpi
	Description	Adds smoothing effect on photographs (effective against moire).	
	Setting	[New scanner] Range: 0 to 15 Unit: 1 Default: 7 (for both 400 dpi and 300 dpi machines) [Previous scanner] * Setting not required.	
	Halftone-Curve Selection (AM Dot)		300 dpi
	Description	Adjusts the halftone curve for text/photo dot images.	
	Setting	Range: 0 to 24 * Refer to the halftone-curve matrix below. Unit: 1 Default: 12	
199	Auto Multi-Up Recovery		400 dpi
	Description	Selects if the Multi-up stays active or becomes inactive after one Multi-up operation.	
	Setting	Range: 0 (Change to Inactive), 1 (Stays Active) Default: 1 (Stays Active)	
	Line Edge Stress Level Adjust (Test/Photo) [* For a new scanner only]		300 dpi
	Description	Adjusts the line edge stress in text/photo printing.	
	Setting	Range: 0 to 31 * The larger the number is, the stronger the line edge becomes. Unit: 1 Default: 2	

5. Master Making Test Mode

No.	Sensors, switches	Detection status	Model
200	Master-Positioning Sensor	Blocked (master present)	ALL
201	Master End Sensor	Unblocked (master end label detected)	
202	Master Detection Sensor	Blocked (master present)	
203	Cutter Home-Position Switch	Switch OFF (cutter at home position)	
204	TPH Pressure Sensor	Blocked (detection plate present)	
205	Master-Making-Unit Set Sensor	Blocked (master-making unit/cover set)	
206	Flatbed Set Switch	Switch ON (flatbed set)	
No.	**Motors, solenoids**	**Remarks**	**Model**
230	Thermal-Pressure Motor (CW)		ALL
231	Thermal-Pressure Motor (CCW)		
232	Write Pulse Motor CS (feed)		
233	Write Pulse Motor CCW (reverse)		
234	Load Pulse Motor CW (feed)		
235	Load Pulse Motor CCW (reverse)		
237	Cutter Motor		
238	Thermal-Power Control		
No.	**Unit checks**		**Model**
250	Cutter-Motor 1 Cycle Action Performs cutting.		ALL
251	Thermal Press. Motor Action (+). Moves the TPH in the compressive direction.		
252	Thermal Press. Motor Action (-). Moves the TPH in the release direction.		
No.	**Data check**	**Display details**	**Model**
270	TPH Thermistor A/D Data	Displays the A/D values for the TPH thermistor.	ALL
271	TPH Thermistor Temperature Data	Displays the TPH-thermistor A/D values as temperatures in degrees Celsius. (Displays the value of x100 for the 300 dpi machines)	

No.	Data setting		Model
280	Master Front-End Position Adjustment		ALL
	Description	Adjusts the small amount of return movement after the master-positioning sensor goes ON during master setting or following master cutting. * The leading edge of the master should escape from master-positioning sensor in standby mode.	
	Setting	Range: 0 to +50 (0 to +5.0 mm) Unit: 1 (0.1 mm) Default: +20 (2.0 mm)	
281	Write Start-Position Adjustment		
	Description	Adjusts the master-making start position (distance from master-positioning sensor ON to read/write-signal ON).	
	Setting	Range: -30 to +50 (-3.0 mm to +5.0 mm). * + is downward. Unit: 1 (0.1 mm) Default: 0 mm	
282	Master-Making Length Adjustment		
	Description	Adjusts the master-making area (scanning length).	
	Setting	Range: -100 to +100 (-10.0 mm to +10.0 mm) relative to datum. * + increases length. Unit: 1 (0.1 mm) Default: 0 mm	
283	Master-Clamp-Range Adjustment		
	Description	Adjusts the master-clamp range during loading of the master.	
	Setting	Range: -100 to +100 (-10.0 mm to +10.0 mm) *+ increases clamp amount. Unit: 1 (0.1 mm) Default: 0 mm	
284	Master Cut-Position Adjustment (Cutting angle)		
	Description	Adjusts the length of one master (cutting timing).	
	Setting	Range: -100 to +200 (-10.0° to +20.0° drum rotation) * + increases the master length. Unit: 1 (0.1°) Default: 0°	
285	Master-Image Front-Margin Adjustment		400 dpi
	Description	Adjusts the master margin (mask amount in image processing) at the right hand side (machine operation side) of the copy.	
	Setting	Range: -30 to +30 (-3.0 mm to +3.0 mm) * + increases margin. Unit: 5 (0.5 mm) Default: 0 mm	
286	Master-Image Rear-Margin Adjustment		
	Description	Adjusts the master margin (mask amount in image processing) at the left hand side (machine drive side) of the copy.	
	Setting	Range: -30 to +30 (-3.0 mm to +3.0 mm) * + increases margin. Unit: 5 (0.5 mm) Default: 0 mm	
287	Master Creation Image Elongation and Shrinkage Adjustment		400 dpi
	Description	Adjusts frequency setting for the master creation pulse motor.	
	Setting	Range: -100 to +100 (-10.0% to +10.0%) * + elongates. Units: 1 (0.1%) Default: 0%	
	Description	Adjusts the speed of the write pulse motor.	300 dpi
	Setting	Range: -100 to +100 (-10.0% to +10.0%) relative to datum. * + shrinks. Unit: 1 (0.1%) Default: 0%	

6. Master Disposal Test Mode

No.	Sensors, switches	Detection status	Model
300	Master-Disposal Jam Sensor	Open (master present)	ALL
301	Master Compression Sensor	Open	
302	Disposal-Box-Full Det. Sensor	Blocked	
303	Disposal-Box Safety Switch	Switch ON (master disposal box set). * Flatbed safety SW and Print drum safety SW must be switched ON for the detection.	

No.	Motors, solenoids	Remarks	Model
330	Master Disposal Motor	Clockwise direction only	ALL

No.	Unit checks	Model
350	Compression-plate home action Returns the compression plate to the home position.	ALL
351	Master compression-cycle action. Performs one compression cycle.	
352	Compression Plate Action DOWN Performs one step (500 ms) compressing down movement of the compression plate. Caution: This test mode does not rely on error check - Do not go over the limit.	300 dpi
353	Compression Plate Action UP Performs one step (500 ms) returning up movement of the compression plate. Caution: This test mode does not rely on error check - Do not go over the limit.	

No.	Data check	Display details	Model
371	Master-Removal Software Counter	Displays the count stored.	400 dpi
	Master-Disposal Software Counter		300 dpi

No.	Data settings		Model
380	Master-Disposal-Jam Det. Angle 1		ALL
	Description	Sets the first print-drum-angle for checking for disposal jams.	
	Setting	Range: 0 to 3600 (0° to 360°) Unit: 10 (1°) Default: 700 (70°)	
381	Master-Disposal-Jam Det. Angle 2		
	Description	Sets the second print-drum angle for checking for disposal jams.	
	Setting	Range: 0 to 3600 (0° to 360°) Unit: 10 (1°) Default: 900 (90°)	
382	Master-Disposal-Motor Duration		
	Description	Sets the master-removal-motor stop timing after the print drum stops at position A.	
	Setting	Range: 0 to 2000 (0 second to 2 seconds) Unit: 10 (0.01 second) Default: 0 (0 second)	
386	Master Disposal Box Capacity		
	Description	Sets the master disposal count for the full detection.	
	Setting	Range: 30 to 50 (30 to 50 counts) Unit: 1 (1 count) Default: 50 (50 counts)	
387	Disposal Drum Rotation Speed		
	Description	Sets the print-drum speed for master removal.	
	Setting	Range: 10 to 60 (10 rpm to 60 rpm) Unit: 5 (5 rpm) Default: 15 (15 rpm)	
389	Clear Master Disposal Count		
	Description	Clears the removed master count memory.	
	Setting	None	

7. Paper Feed/Eject Test Mode

No.	Sensors, switches	Detection status	Model
400	Paper Detection Sensor	Light received (paper present)	ALL
401	Paper-Size Detection Sensor	Light received (paper present)	
402	Upper Limit Sensor	Blocked (blockage plate present)	300 dpi
	Elevator Upper-Limit Sensor A	Blocked (blockage plate present)	400 dpi
403	Elevator Upper-Limit Sensor B	Blocked (blockage plate present)	
404	Elevator Lower-Limit Sensor	Blocked (paper-feed tray at lower limit)	ALL
405	Paper-Feed Sensor (Paper sensor)	Blocked (paper present)	
406	Paper-Ejection Sensor	Blocked (paper present)	
408	Paper-Feed-Tray Lower Safety SW	Switch ON (depressed) * For the detection, the three safety switches (Flatbed safety SW, Print drum safety SW, and Disposal box safety SW) must be switched ON.	
409	Feed-Tray Down Button	Switch ON (depressed)	
412	Paper-Ejection-Limit (Encoder) Sensor	Blocked (blockage plate present)	
413	Paper-Ejection-Wing Home Sensor	Blocked (ejection wings at home position)	400 dpi
414	Paper-Feed Pressure Sensor	Blocked (pressure-adjust lever at card position)	

No.	Motors, solenoids	Remarks	Model
430	Paper-Ejection Motor	One direction only (ejection direction)	ALL
431	Suction Fan		
432	Separation Fan		

No.	Unit checks	Model
450	Paper Size VR Adjustment (105 mm) Sets a VR value of 105 mm (adjustment of paper width potentiometer). * This test mode must be done before Test Mode No. 451.	ALL
451	Paper-Width Potentiometer Compensation 210 mm Sets a potentiometer value of 210 mm. * Make sure 210 mm is selected in Test Mode No. 491 (paper-width-potentiometer selection) * Perform this after Test Mode No. 450.	
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 second at the upper and lower limits.	
453	Elevator-Motor Servo Action Performs servo action.	
454	Paper Ejection & Suction Action Activates the paper ejection motor and suction fan simultaneously.	
455	Paper-Ejection-Wing Home Action Moves the ejection wings to the home position.	400 dpi
456	Paper-Ejection-Wing Target Shift Moves to the position set in Test Mode No. 490.	

No.	Data check	Display details	Model
470	Paper-Width A/D Data	Displays 10-bit data following A/D conversion.	ALL
471	Paper-Width Metric Data	Displays the paper width in (mm) x 10 figures.	

No.	Data settings		Model
480	Elevator Upper-Limit Selection		400 dpi
	Description	Selects the paper-feed-tray stop position (paper-feed position). Tray position will be interlocked with the pressure-adjust lever in auto operation. Selections 1 and 2 are fixed positions.	
	Setting	Range: 0: Auto 1: Standard 2: Card Default: 0 (Auto)	
482 483 484 485	Paper-Feed-Clutch OFF-Angle / Standard Paper-Feed-Clutch OFF-Angle / Card Paper-Feed-Clutch OFF-Angle / Thin Paper-Feed-Clutch OFF-Angle / Custom		ALL
	Description	Adjusts the angle timing for deactivating the paper-feed clutch in accordance with the paper type.	
	Setting	Range: -150 to +150 (-15.0° to +15.0°) * + delays OFF timing. Unit: 2 (0.2°) Default: 0°	
486	Paper Misfeed Det. Angle/IN		
	Description	Sets the angle timing for detecting paper misfeed of the first paper feed area.	
	Setting	Range: -200 to +200 (-20.2° to +20.0°) * + delays detection. Unit: 2 (0.2°) Default: 0°	
487	Paper-Eject Jam Det. Angle/IN		
	Description	Adjusts the angle timing for detecting a paper jam during paper-ejection IN.	
	Setting	Range: -150 to +150 (-15.0° to +15.0°) * + delays detection. Unit: 2 (0.2°) Default: 0°	
488	Paper-Eject Jam Det. Angle/OUT		
	Description	Adjusts the angle timing for detecting a paper jam during paper-ejection OUT.	
	Setting	Range: -150 to +150 (-15.0° to +15.0°) * + delays detection. Unit: 2 (0.2°) Default: 0°	
489	Paper-Ejection-Wing Position Adjustment		400 dpi
	Description	Sets the adjustment amount for moving the ejection wing.	
	Setting	Range: -100 to +100 (-100 pulses to +100 pulses) Unit: 1 (1 pulse) Default: 0 pulse	
490	Paper-Ejection Wing Target Position (For Test Mode No. 456)		
	Description	Sets the ejection-wing movement amount for Test Mode No. 456.	
	Setting	Range: 0 to +4000 (0 pulse to +4000 pulses) Unit: 1 (1 pulse) Default: 0 pulse	

No.	Data settings		Model
491	Paper Size VR Adjustment Selection		ALL
	Description	Sets the paper-width type for paper-width-potentiometer compensation. This value determines the size used in the execution of Test Mode No. 451.	
	Setting	Range: 0: Paper width 210 mm. 1: Paper width 297 mm. Default: 1: (Paper width 297 mm.) --- **Should be selected to 0 (paper width 210 mm)**	
494	Paper Feed Clutch ON Angle (A3) * For models capable of feeding A3-size paper **(Not available)**		400 dpi
	Description	Adjusts the ON timing of the paper feed clutch for A3 paper against drum.	
	Setting	Range: 0 to +100 (0° to +10.0°) * + delays ON timing. Unit: 2 (0.2°) Default: 0°	
495 496 497 498	Paper Feed Clutch ON-Angle / Standard Paper Feed Clutch ON-Angle / Card Paper Feed Clutch ON-Angle / Thin Paper Feed Clutch ON-Angle / Custom		ALL
	Description	Adjusts the ON timing of the paper feed clutch against drum angle.	
	Setting	Range: -200 to +200 (-20.0° to +20.0°) * + delays ON timing. Unit: 2 (0.2°) Default: 0°	
499	Suction Unit Selection		400 dpi
	Description	Selection of OLD type or NEW type suction unit.	
	Setting	Range: 0 (New type unit) 1 (Old type unit) Default: 0 (New type unit)	

8. Print Drum Test Mode

No.	Sensors, switches	Detection status	Model
500	Position-A Sensor	Blocked (blockage plate present)	ALL
502	Main-Motor Limit (Encoder) Sensor	Blocked (blockage plate present)	
503	Clamp Sensor A	Blocked (blockage plate present)	
504	Clamp Sensor B	Blocked (blockage plate present)	
506	Master Loading Sensor	Light received (master present)	
509	Ink Sensor	In contact with ink	
510	Overflow Sensor	In contact with ink	
511	Ink-Cartridge Set SW 1	Switched ON	
512	Ink-Cartridge Set SW 2	Switched ON	
513	Ink-Cartridge Set SW 3	Switched ON	
514	Ink-Cartridge Set SW 4	Switched ON	
515	Ink-Cartridge Set SW 5	Switched ON	
516	Drum Free Rotation SW	Switched ON	
517	Front-Cover Switch	Switched ON (front cover closed)	
518	Print-Drum Lever Switch (Drum release button)	Switched ON	
519	Print-Drum Set Sensor	Blocked (blockage plate present)	
520	Print-Drum Safety Switch	Switched ON (drum set) * Flatbed set SW must be ON for detection.	

No.	Motors, solenoids	Remarks	Model
530	Main-Motor Action (15 rpm)		ALL
531	Main-Motor Action (30 rpm)		
532	Clamp-Motor Action (Normal direction)	Counterclockwise direction	
533	Clamp-Motor Action (Reverse direction)	Clockwise direction	
535	Print-Drum Withdrawal SW-LED		

No.	Unit checks	Model
550	Variable Print-Drum Rotation Use the speed keys to rotate the print drum. * The variable-speed timing is the same as that for normal printing.	ALL
551	Print Drum on Position A Stops the print drum at position A * Position including adjustment values.	
553	Clamp Home Action Resets the clamp unit to the home position.	
554	Clamp Cycle Action (3 cycles) Press the “Start” key and then perform the operations specified below for each step. Cycle 1: Clamp open action for master release action. Cycle 2: Clamp open action for master loading. Cycle 3: Clamp close action for master clamping.	
557	Inking Action Performs the following operations in sequence: (1) Pumps ink as drum rotates without pressure (until ink sensor goes ON). (2) Makes a confidential master. (3) Rotates the drum 30 times with pressure from pressure roller.	
558	Print-drum ink drainage Performs the printing operation without inking action.	

No.	Data checks	Display details	Model
570	Print-Drum FG Count	Displays the FG value.	ALL
571	Print-Drum Rotation Angle	Displays the print-drum angle.	
572	Print-Drum-Temperature A/D Data	Displays the ink-thermistor A/D value.	
573	Print-Drum Temperature Scale	Displays the ink-thermistor A/D value converted to °C (°C x 10).	

No.	Data settings				Model
580	Master-Det. Print-Drum Angle				ALL
	Description	Adjusts the drum angle in detecting the master during master loading.			
	Setting	Range: -200 to +100 (-20.0° to +10.0°) * (+ delays detection.) Unit: 2 (0.2°) Default: 0 (0°)			
581	Print-Drum Position-A Adjustment				
	Description	Adjusts the print-drum position-A stop position.			
	Setting	Range: 1 to 127 (1 to 127 seconds) Unit: 1 (1 second) Default: 20 (20 seconds)			
583	Inking time (normal)				
	Description	Sets the maximum inking time duration before ink cartridge replacement message is displayed in normal printing operation. This setting is stored in the print-drum memory.			
	Setting	Range: 1 to 127 (1 to 127 seconds) Unit: 1 (1 second) Default: 20 (20 seconds)			
584	Inking Time (Replacement)				
	Description	Sets the maximum inking time duration before ink cartridge replacement message is displayed after replacing the ink bottle. This setting is stored in the print-drum memory.			
	Setting	Range: 1 to 127 (1 to 127 seconds) Unit: 1 (1 second) Default: 40 (40 seconds)			
585	Ink Overflow Detection Frequency				
	Description	Sets the number of detection cycles for the overflow sensor to determine that an overflow has occurred. This data is stored in the print-drum memory.			
	Setting	Range: 1 to 200 (1 to 200 times) Unit: 1 (1 time) Default: 50 (50 times)			
586	Inking Drum Rotation Speed				
	Description	Sets minimum print drum rotation speed during inking action.			
	Setting	Range: 5 to 100 (5 to 100 rpm) Unit: 5 (5 rpm) Default: 15 (15 rpm)			
587	Ink Color Code				400 dpi
	Description	Sets the ink color name on each printing drum.			
	Setting	Range: 33: Black 34: Blue 35: Blue 2 36: Blue 3 37: Blue 4 38: Red 39: Red 2 40: Red 3 41: Red 4 42:Green 43: Green 2 44: Green 3 45: Yellow 46: Yellow 2 47: Brown 48: Brown 2 49: Purple 50: Purple 2 51: Gray 52: Gray 2 53: Light gray 54: Light gray 2 55: Orange 56: Orange 2 57: Gold 58: Gold 2 59: Silver 60: Silver 2 61: Pink 62: Pink 2 63: Custom 64. Color Default: 33 (Black) * Use No. 64 when specifying the print drum only as COLOR.			

No.	Data settings		Model
588	Print Drum Code		
	Description	Sets the print drum code. * Refer to the print-drum-type code-setting table.	
	Setting	Range: 1 to 16 Units: 1 Default: 3 * Run Test mode No.557 (inking operation) after setting.	300 dpi
	Setting	Range: 1 to 255 Units: 1 Default: 1 * Run Test mode No.557 (inking operation) after setting.	400 dpi
589	1st Print Speed (Black drum)		
	Description	Speed table for determining the speed of proofread copy printing (black drum).	
	Setting	Range: -1 Special (FP measure) 0: Slow +1: Normal +2: Fast Default: +1 Normal * The -1 selection is available only on 400 dpi machines.	
590	1st Print Speed (Color drum)		
	Description	Speed table for determining the speed of proofread copy printing (color drum).	
	Setting	Range: -1 Special (FP measure) 0: Slow +1: Normal +2: Fast Default: +1 Normal * The -1 selection is available only on 400 dpi machines.	ALL
591	Drum Release Signal Control		
	Description	With the front cover opened, selection of whether to activate or deactivate the buzzer until the print drum lock is released.	
	Setting	Settings: 0: Buzzer OFF 1: Buzzer ON Default: 1: Buzzer ON	
592	Idling Rolling Time Selection		
	Description	Selection to increase the number of print drum rotations with the activation of the pressure roller during machine idling action.	
	Setting	Range: 0: Normal number of rotations. 1: 1.5 times more than the normal number of rotations. 2: 2 times more than the normal number of rotations. 3: 3 times more than the normal number of rotations. Default: 0: Normal number of rotations.	400 dpi

9. Printing Test Mode

No.	Sensors, switches	Detection status	Model
600	Print-Pressure Home Sensor	Blocked (blockage plate present)	ALL
601	Vertical-Centering Sensor	Blocked (blockage plate present)	

No.	Unit checks	Model
650	Vertical-Centering Action Returns the print drum to the vertical center position.	ALL
651	Vertical Cycle Action Performs one vertical cycle.	
654	Print-Pressure Home Action Resets the print pressure to HP.	
655	Print-Pressure Cycle Action Performs one print-pressure cycle.	
656	Paper-Feed Test Performs paper-feed action. * Speed keys can be used. * Vertical movement can be performed using the Vertical key.	
657	Low -Speed Printing Test Prints at 15 rpm. * Vertical movement can be performed using the Vertical key.	

No.	Data settings		Model
680	Vertical Center Position Adjustment		ALL
	Description	Shifts (offsets) the horizontal print home position.	
	Setting	Range: -100 to +500 (-100 pulses to +500 pulses) 70 pulses = 0.5 mm *+ shifts up. Unit: 1 (1 pulse) Default: 0 (0 pulse)	
682	Print-Pressure Home Position Adjustment		
	Description	Shifts (offsets) the print-pressure home position.	
	Setting	Range: -50 to +50 (-50 pulses to +50 pulses) * + increases compression. Unit: 1 (1 pulse) Default: 0 (0 pulse)	
684	Paper Information Automatic Reset		400 dpi
	Description	Selects w hether the paper-size and paper-type settings are returned to their defaults or the previous settings are maintained at pow er ON and All Reset.	
	Setting	Range: 0: Both the paper size and paper type remain the same as before. 1: Only the paper size returns to the default (paper type remains the same). 2: Only the paper type returns to the default (paper size remains the same). 3: Both the paper size and paper type return to the default. Default: 0 Both the paper size and paper type remain the same as before. * The default paper size is AUTO, and the default paper type is NORMAL.	

No.	Data settings		Model
688	Maximum-Print-Quantity Setting Enable		400 dpi
	Description	Enables and disables the maximum-print-number setting, and sets the maximum print number.	
	Setting	Range: 0 (Maximum-print-number setting disabled), 1 to 9999 (1 sheet to 9999 sheets) Unit: 1 (1 sheet) Default: 0 (Maximum-print-number setting disabled) * Cannot be selected from the menu screen.	
694	1st Print Ejection Speed Adjustment: (for proof print printing)		ALL
695	Paper Ejection Speed 1 Adjustment: (for printing speed No. 1)		
696	Paper Ejection Speed 2 Adjustment: (for printing speed No. 2)		
697	Paper Ejection Speed 3 Adjustment: (for printing speed No. 3)		
698	Paper Ejection Speed 4 Adjustment: (for printing speed No. 4)		
699	Paper Ejection Speed 5 Adjustment: (for printing speed No. 5)		
	Description	Paper ejection motor speed adjustment for each printing speed.	
	Setting	Range: -2 to +2 * + increases speed. Unit: 1 Default: 0	

10. Accessories Test Mode

No.	Sensors, switches	Detection status	Model
700	AF Registration Sensor	Blocked (original present)	400 dpi
701	AF Read Sensor	Blocked (original present)	
702	AF Original Ejection Sensor	Blocked (original present)	
703	AF Original Detection Sensor	Original present	
707	AF-Unit Cover Switch	Stage cover (AF) set	
708	AF-Unit Signal Det. Check	AF connected	
709	Job Separator Tape Jam Sensor	ON at the time of jam	
710	Job Separator Tape Det. Sensor	On at tape present	
711	Job Separator Power Switch	Switched ON	

No.	Motors, solenoids	Remarks	Model
730	AF Read Pulse-Motor CW		400 dpi

No.	Unit checks	Model
750	AF Cycle Action Performs one AF scanning cycle Feed in original. → Reset scanner to HP. → Shading compensation → Move scanner to scanning position. → AF scanning and ejection → Reset scanner to HP. * AF scanning speed set by Test Mode No. 785 applies.	400 dpi
	Interface Firmware Downloading Enables downloading of new program on the flash memory of the Interface unit. * Computer must be connected.	300 dpi
751	AF Feed Action Performs AF feed operation. * AF scanning speed set by Test Mode No. 785 applies.	400 dpi
	Interface Test Page Printing Performs test page printing with the computer interface connected. This test mode can be executed only once when the power is switched ON. Not guaranteed for the second and subsequent executions.	300 dpi
752	AF Read-Sensor Sensitivity Adjustment Adjusts the sensitivity of the AF read sensor.	400 dpi
755	AF-ABC Operation Start: Shading compensation → Moves to AF-ABC position (lamp ON at AF-ABC position). Stop: Lamp goes OFF, returns to home position.	
756	Digitizer Resetting Resets the digitizer internal data to the default values. * Test mode No. 787 (Editor Data Skip Range Adjustment) also resets to the default setting.	
757	Storage-Memory Initialization Resets the storage memory by deleting data. * Only one card should be inserted at one time in one of the two slots in the machine for initialization. * Two cards cannot be initialized at one time.	
758	Storage-Memory Check Checks the capacity, used and available space in the storage memory. * Only one card should be inserted at one time in one of the two slots in the machine for the checking. * Two cards cannot be checked at one time.	
759	Job Separator Tape Feed and Stamp Makes 2 stamping action and then feeds the tape out.	

No.	Data checks	Display details	Model
772	Storage-Memory Card Data	Displays the storage-memory card data in the card slot. * Downloading of data from the card starts when the power is switched ON. Therefore, insert the card after turning ON the power switch. * Display: 0: No Card in the slot 1: SH-PCB (ROSE) program download card 2: MCTL PCB (mechanical) program download card 3: Upgrading Card 4: DM-32 Memory Card 255: Others * The PC card or Slot 1/2 can be selected. * To select 1/2, use the print-drum 1/2 selection button. (Slot 1 on PCB side = Slot A)	400 dpi
773	Storage-Memory Properties	Displays the capacity, used memory, available space, and volume label of the storage memory. * Insert only one memory card in the slot. * Two cards cannot be checked at one time.	

No.	Data settings		Model
780	AF Scan Mirror-Position Adjustment		400 dpi
	Description	Adjusts the stop position of the mirror (carriage) during AF scanning.	
	Setting	Range: -20 to +20 (-2.0 mm to +2.0 mm) * + is downward. Unit: 1 (0.1 mm) Default: 0 (0 mm)	
781	AF-Base Mirror-Position Adjustment		
	Description	Adjusts the stop position of the mirror (carriage) during AF-ABC.	
	Setting	Range: 0 to +30 (0 mm to +3.0 mm) * + is upward. Unit: 1 (0.1 mm) Default: 0 (0 mm)	
782	AF Horizontal Scan Position Adjustment		
	Description	Adjusts the horizontal position when the original is scanned by using the AF. FB set separately	
	Setting	Range: -30 to +30 (-3.0 mm to +3.0 mm) * + is to left. Unit: 5 (0.5 mm) Default: 0 (0 mm)	
783	AF Scan Start Position Adjustment		
	Description	Adjusts the scan start position (scan skip amount) when the original is scanned by using the AF.	
	Setting	Range: -60 to +60 (-6.0 mm to +6.0 mm) * + is downward. Unit: 1 (0.1 mm) Default: 0 (0 mm)	
784	AF Image Elongation & Shrinkage Adjustment		
	Description	Adjusts the scanning speed when the original is scanned by using the AF. (Adjusts the AF read pulse motor frequency.)	
	Setting	Range: -50 to +50 (-5.0% to +5.0%) * + shrinks. Unit: 1 (0.1%) Default: 0 (0%)	
785	AF Cycle-Action Speed Adjustment (For one cycle)		
	Description	Sets the scanning speed (reproduction size) for the AF cycle action specified in Test Mode No. 750 and the AF feed action in Test Mode No. 751.	
	Setting	Range: 50 to +200 (50% to +200%) Unit: 1 (1%) Default: 100 (100%)	
786	AF Scan End-Signal Output Time		
	Description	Adjusts the scanning end position when the original is scanned through AF.	
	Setting	Range: -63 to +63 (-6.3 mm to +6.3 mm) * + is downward. Unit: 1 (0.1 mm) Default: 0 (0 mm)	

No.	Data settings		Model
787	Editor Data Skip Range Adjustment		400 dpi
	Description	Sets the scanning distance after the digitizer receives digitizer VSYNC (ignores noise in the initial section).	
	Setting	Range: 0 to +255 (0 mm to +25.5 mm) Unit: 1 (0.1 mm) Default: 0 (0 mm)	
790	RLP Printing-Position Adjustment (Main Scan)		Link-mode machine
	Description	Adjusts the linked printer printing position (main scanning direction). * This setting affects all linked printers when multiple linked printers are used.	
	Setting	Range: -50 to +50 (-50 mm to +50 mm) * + indicates the downward direction. Unit: 1 (0.1 mm) Default: 0 mm	
791	RLP Printing-Position Adjustment (Sub-Scanning)		
	Description	Adjusts the linked printer printing position (sub-scanning direction). * This setting affects all linked printers when multiple linked printers are used.	
	Setting	Range: -50 to +50 (-50 mm to +50 mm) * + indicates the leftward direction. Unit: 1 (0.1 mm) Default: 0 mm	
792	0 Print Warning Indication ON/OFF		
	Description	When the automatic sorting function is ON, the master-making operation starts when the print number is 0 in the P-to-P mode. This parameter sets whether the warning (F60) is displayed before the master-making operation starts.	
	Setting	Range: 0 (Without warning), 1 (With warning) Default: 0 (Without warning)	
793	RLP Hold Output Enable/Disable		
	Description	Sets whether to hold output temporarily when output is produced from the linked printer sorter, stacker, or by electronic sorting using the AF.	
	Setting	Range: 0 (Disabled), 1 (Enabled) Default: 1 (Enabled)	
794	RLP Both-Side Automatic Reset		
	Description	Turns OFF the both-side setting or sets the automatic reset at the end of both-side printing.	
	Setting	Range: 0 (OFF), 1 (Reset) Default: 1 (Reset)	
795	Resolution-Conversion Processing Pattern (Text/Photo)		Link-mode machine
	Description	For linked printer output in the text/photo mode of the link-mode machine, the resolution conversion is based on “random interpolation,” but “normal interpolation” can produce better image quality depending on the type of original. This parameter allows the interpolation method to be changed. * Note: A change in the interpolation method does not always improve the image quality. Depending on the type of original, the image quality may degrade. Therefore, use this function carefully.	
	Setting	Range: 0 (Random interpolation), 1 (Normal interpolation) Default: 0 (Random interpolation) * Cannot be selected from the menu screen.	
796	Resolution-Conversion Processing Pattern (Text/Photo, Dot)		
	Description	For linked printer output in the text/photo mode and dot mode of the link-mode machine, resolution conversion is based on “normal interpolation,” but “random interpolation” can produce better image quality depending on the type of original. This parameter allows the interpolation method to be changed. * Note: A change in the interpolation method does not always improve the image quality. Depending on the type of original, the image quality may degrade. Therefore, use this function carefully.	
	Setting	Range: 0 (Normal interpolation), 1 (Random interpolation) Default: 0 (Normal interpolation) * Cannot be selected from the menu screen.	

No.	Data settings		Model
797	Resolution-Conversion Processing Pattern (Photo)		Link-mode machine
	Description	For linked printer output in the photo mode of the link-mode machine, resolution conversion is based on “random interpolation,” but “normal interpolation” can produce better image quality depending on the type of original. This parameter allow s the interpolation method to be changed. * Note: A change in the interpolation method does not alw ays improve the image quality. Depending on the type of original, the image quality may degrade. Therefore, use this function carefully.
	Setting	Range: 0 (Random interpolation), 1 (Normal interpolation) Default: 0 (Random interpolation) * Cannot be selected from the menu screen.
798	Resolution-Conversion Processing Pattern (Photo, Dot)		
	Description	For linked printer output in the photo mode and dot mode of the link-mode machine, resolution conversion is based on “normal interpolation,” but “random interpolation” can produce better image quality depending on the type of original. This parameter allow s the interpolation method to be changed. * Note: A change in the interpolation method does not alw ays improve the image quality. Depending on the type of original, the image quality may degrade. Therefore, use this function carefully.
	Setting	Range: 0 (Normal interpolation), 1 (Random interpolation) Default: 0 (Normal interpolation) * Cannot be selected from the menu screen.

11. “Factory Mode” test mode

The “Factory Mode” test modes are for used for factory settings, and are not used in normal maintenance work. For the 400 dpi and 300 dpi machines with the new scanner model, however, when the scanner unit is replaced, the “Factory Mode” test modes must be used to enter settings.
For a software version upgrade in the 400 dpi machines, it may be necessary to use the “Factory Mode” test mode to display the loader version and check whether version upgrade is possible.

Instructions for entering the “Factory Mode” test mode:

(1) Start up the normal test mode.
(2) Enter 9874 using the numeric keys, and then press Start key.
(3) Enter the “Factory Mode” test mode No. to execute, and press the Start key.

No.	Data checks		Display details	Model
1301	System Loader Version		Displays the loader version of SH-PCB	400 dpi
1302	Mechanical-Controller Loader Version		Displays the loader version of H8-PCB.	
No.	**Data settings**			**Model**
1203	Setting No.1 on Old-type Scanner (Ref: Scanner unit part number 021-97500-xxx)			400 dpi
	Description	Enter the number on the sticker affixed to the scanner unit. (Sub-scanning start-position.)		
	Setting	Range: 39 to 217 Unit: 1 Default: 128		
1204	Setting No.2 on Old-type Scanner (Ref: Scanner unit part number 021-97500-xxx)			
	Description	Enter the number on the sticker affixed to the scanner unit. (Main-scanning start-position.)		
	Setting	Range: 0 to 110 Unit: 1 Default: 55		
1205	Setting No.3 on Old-type Scanner (Ref: Scanner unit part number 021-97500-xxx)			
	Description	Enter the number on the sticker affixed to the scanner unit. (Sub-scanning reproduction size compensation.)		
	Setting	Range: 0 to 100 Unit: 1 Default: 50		

NOTE: Data settings (No.1 through No.5) for New-type scanner unit 021-97510-xxx are given on next page.

No.	Data settings		Model
1220	Setting No.1 on New-type Scanner (Ref: Scanner unit part No. 021-97510-xxx)		ALL
	Description	Enter the factory setting indicated on the sticker affixed to the scanner. (Sub-scanning-position deviation compensation)	
	Setting	Range: 68 to 188 Unit: 1 Default: 128	
1221	Setting No.2 on New-type Scanner (Ref: Scanner unit part No. 021-97510-xxx)		
	Description	Enter the factory setting indicated on the sticker affixed to the scanner. (Main-scanning-position deviation compensation)	
	Setting	Range: 92 to 164 Unit: 1 Default: 128	
1222	Setting No.3 on New-type Scanner (Ref: Scanner unit part No. 021-97510-xxx)		
	Description	Enter the factory setting indicated on the sticker affixed to the scanner. (Sub-scanning magnification compensation)	
	Setting	Range: 0 to 100 Unit: 1 Default: 50	
1223	Setting No.4 on New-type Scanner (Ref: Scanner unit part No. 021-97510-xxx)		
	Description	Enter the factory setting indicated on the sticker affixed to the scanner. (Offset adjustment)	
	Setting	Range: 0 to 255 Unit: 1 Default: 255	
1224	Setting No.5 on New-type Scanner (Ref: Scanner unit part No. 021-97510-xxx)		
	Description	Enter the factory setting indicated on the sticker affixed to the scanner. (Gain adjustment)	
	Setting	Range: 0 to 255 Unit: 1 Default: 0	

NOTE: Data settings (No.1 through No.3) for Old-type scanner unit 021-97500-xxx are given on previous page.

[Reference Information] Print Drum Code Settings

Code	Size	Type
3	B4	Black
4		Color
5	A4	Black
6		Color
11	Legal	Black
12		Color
13	Letter	Black
14		Color

[Reference Information] Halftone-Curve Matrix (for 300 dpi machine)

	Light ←		White	→ Dark	
Light	0	1	2	3	4
↑	5	6	7	8	9
Black	10	11	12	13	14
↓	15	16	17	18	19
Dark	20	21	22	23	24

[Memo]

CHAPTER 19: MISCELLANEOUS PRECAUTIONS

Contents

1. Software Downloading Procedure (RN25 Series)

(1) Switch OFF the power.
(2) Remove the left-hand (viewed from the front) card-slot cover with one screw (M3 x 6) from the rear cover.
(3) Remove DM-32 memory card if inserted.
(4) Insert the two downloading cards containing the new software.
(5) When the power is switched ON again, the yellow LED flashes on the rear of the main PCB (loading). Loading is complete once the yellow and green LEDs illuminate continuously. (If the red LED lights up during the process, a download error has occurred. Repeat the procedure from the beginning.)
(6) Switch OFF the power, and remove the two cards.
(7) Reinsert the DM-32 memory card if it was originally inserted.
(8) Install the card-slot cover with one screw, and switch ON the machine power.

<Link-Mode Machine>

- As the Link-Mode model has only one card slot, download from one card at a time.
- Download the software for ROSE first, and then the Mechanical software the second. The two software must be downloaded in one succession, switching the power OFF each time the download card is inserted or removed.

2. ROM Replacement (RN20/21 Series)

Switch off the power, remove the rear cover, and then replace the ROM on the main PCB.

* When replacing the ROM, it is not necessary to clear or set data.

3. Battery Replacement

Replace the battery on the main PCB with the power to the machine switched on.

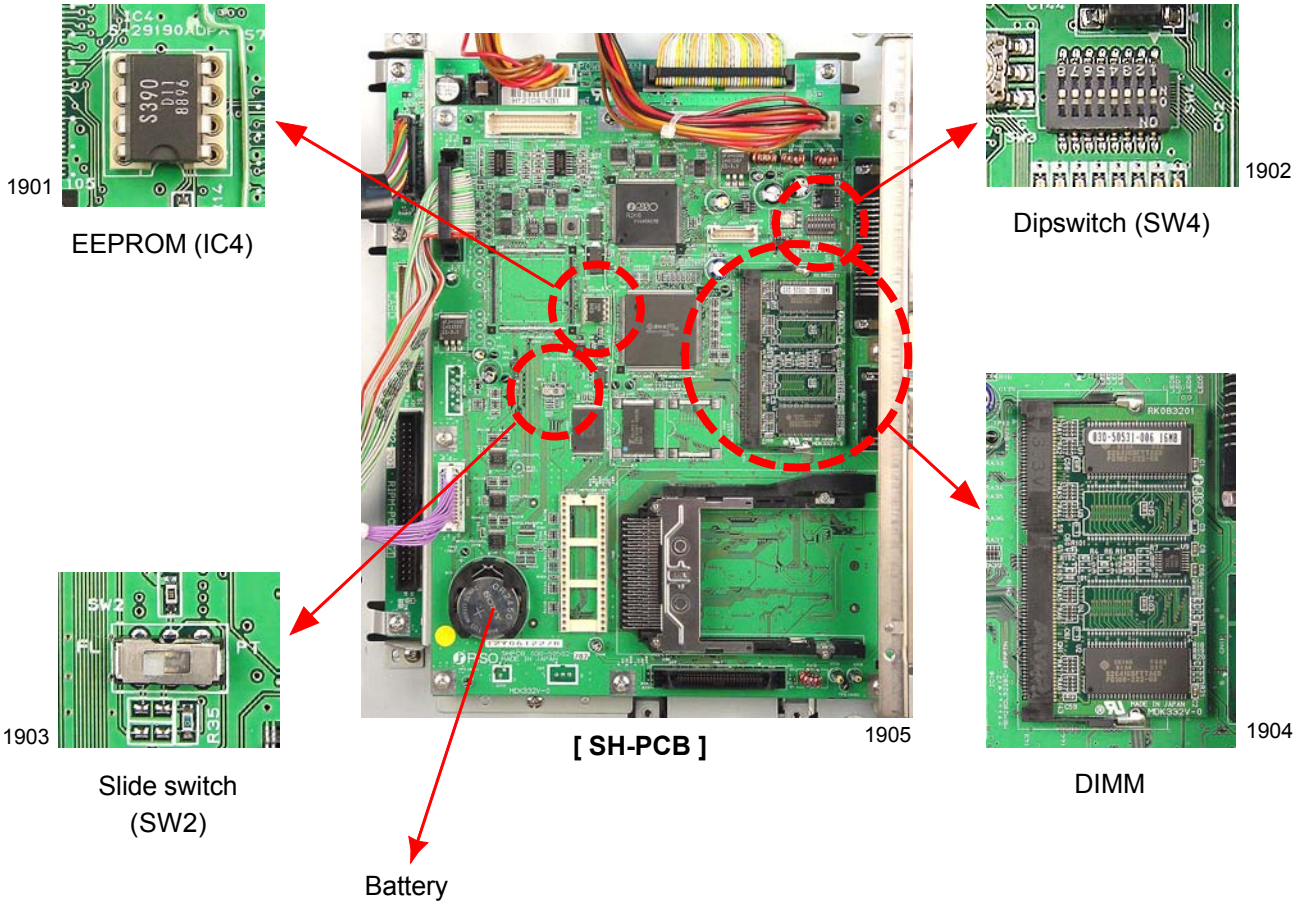
*** Be sure to switch the machine power ON before removing the old battery and installing the new battery. If the battery replacement procedure is made with the machine power OFF, many data kept in the PCB with the battery power will be lost.**

4. Replacement of the SH-PCB (RN25 Series)

(1) When the SH-PCB is replaced, it is necessary to enter settings in the test modes. Write down the following information before replacing the SH-PCB.
  * Items in Test Mode No. 070 (System-Parameter Adjustment Record)
  * Settings in Preference, Memory, Program, and Other Settings on the sub-screen
(2) Switch off the power, remove the DIMM EEPROM (IC4) and battery, and then replace the SH-PCB.
(3) Turn all the dipswitches (SW4) on the new SH-PCB OFF. Set the slide switch (SW2) to “FL”.
(4) Install the previously removed DIMM and EEPROM onto the new SH-PCB, and then install the PCB.
(5) Download the software (see this chapter).
(6) Start test mode.

- continues to next page -

(7) Run test modes No. 80 (Clear Error Status Data), 81 (Clear User Memory), 82 (Clear Test-Mode Data Setup).
(8) Set the details noted in step (1).
(9) Run Test Mode No. 491 (Paper Size VR Adjustment Selection), and set “1” for a model capable of feeding A3-size paper, and “0” for other models (not compatible with A3-size paper).
(10) Execute Test Mode No. 450 (Size VR Adjustment: 105 mm) and Test Mode No. 451 (Paper-Width Potentiometer Compensation: 210/297 mm) consecutively.
(11) Switch off the power and then switch it on again.
(12) Confirm that the machine starts up correctly.
(13) Set the clock in the “Properties” setting to complete the procedure.



5. Main PCB Replacement (RN20/21 Series)

(1) When the Main PCB is replaced, it is necessary to enter settings in the test modes. Write down the following information before replacing the Main PCB.
  * Items in Test Mode No. 070 (System-Parameter Adjustment Record)
  * Changes in settings in the User mode

(2) Switch off the power, remove the IC 18, ROM, and battery, and then remove the Main PCB.
(3) Install the removed IC 18, ROM, and battery to a new Main PCB, and install that Main PCB in the main unit.
(4) Start test mode.
(5) Execute Test Modes Nos. 080 (Clear Error-Status Data), 081 (Clear User Memory), and 082 (Clear Test-Mode Data Setup).
(6) Enter the details noted down in step (1).
(7) Run Test Mode No. 588 (Print Drum Code), and enter the code of the currently set print drum (refer to Chapter 18 “Test Mode”).
(8) Run Test Mode No. 557 (Inking Action).
(9) Execute Test Mode No. 491 (Paper-Width-Potentiometer Compensation Selection), and set “1” for a model capable of feeding A3-size paper or “0” for other models (not compatible with A3-size paper).
(10) Execute Test Mode No. 450 (Paper Size VR Adjustment: 105 mm) and Test Mode No. 451 (Paper Size VR Adjustment: 210/297 mm) consecutively.

* For A3-size paper compatible machines, perform the following when conducting Test Mode No. 451:

(11) Switch off the power and then switch it on again.
(12) Confirm that the machine starts up correctly.
(13) In the User mode, set the date and time. This completes the replacement procedure.

6. Mechanical Control (MCTL) PCB Replacement (RN25 Series)

(1) Switch off the power, and remove the old MCTL PCB.
(2) Install the new MCTL PCB.
(3) Download the software.
(4) Start test mode.
(5) Run test mode No. 80 (Clear Error-Status Data).
(6) Switch off the power and then switch it on again.
(7) The procedure is complete if the machine starts up correctly.

7. Drum-Control PCB Replacement

(1) Pull out the print drum, and replace the PCB with a new one.
(2) Install a new Drum-Control PCB, and set the print drum in the machine.
(3) Enter the Test mode.
(4) Using Test Mode No. 095 (Solenoid-Counter Enable/Disable Setting), disable the solenoid counter. (The solenoid counter must be disabled before the replacement work is conducted.)
(5) Run Test Mode No. 588 (Print Drum Code), and enter the print-drum code (refer to Chapter 18 “Test Mode”).
(6) Execute Text Mode No. 557 (Inking Action).
(7) In the case of RN25 Series, run Test Mode No. 587 (Ink Color Code) and enter the No. of the ink color used.
(8) Switch off the power and then switch it on again.
(9) Confirm that the machine starts up correctly.

8. Print Position Adjustment

*** Check and adjust the mechanical sections first.**
It is important that the mechanical sections, such as the main unit drive section, paper feed section, and print drum, have been correctly adjusted before making the print position adjustments listed below.

(1) Adjust master making image elongation and shrinkage.
(2) Adjust scanning image elongation and shrinkage.
(3) Adjust the master clamp amount.
(4) Adjust scanning start position.
(5) Adjust the master making start position.
(6) Adjust the vertical print home position.
- If the print position is offset from the original even after performing adjustment steps (1) to (5), measure the offset, and adjust by the offset amount in Test Mode No. 680 (Vertical Center Adjustment).

*** Adjusting the AF (Auto-Document-Feeder) print positioning.**
Make test-mode adjustments on the Flatbed (FB) scanning unit before making the test-mode adjustments on the Auto-Document-Feeder (AF) scanning unit.

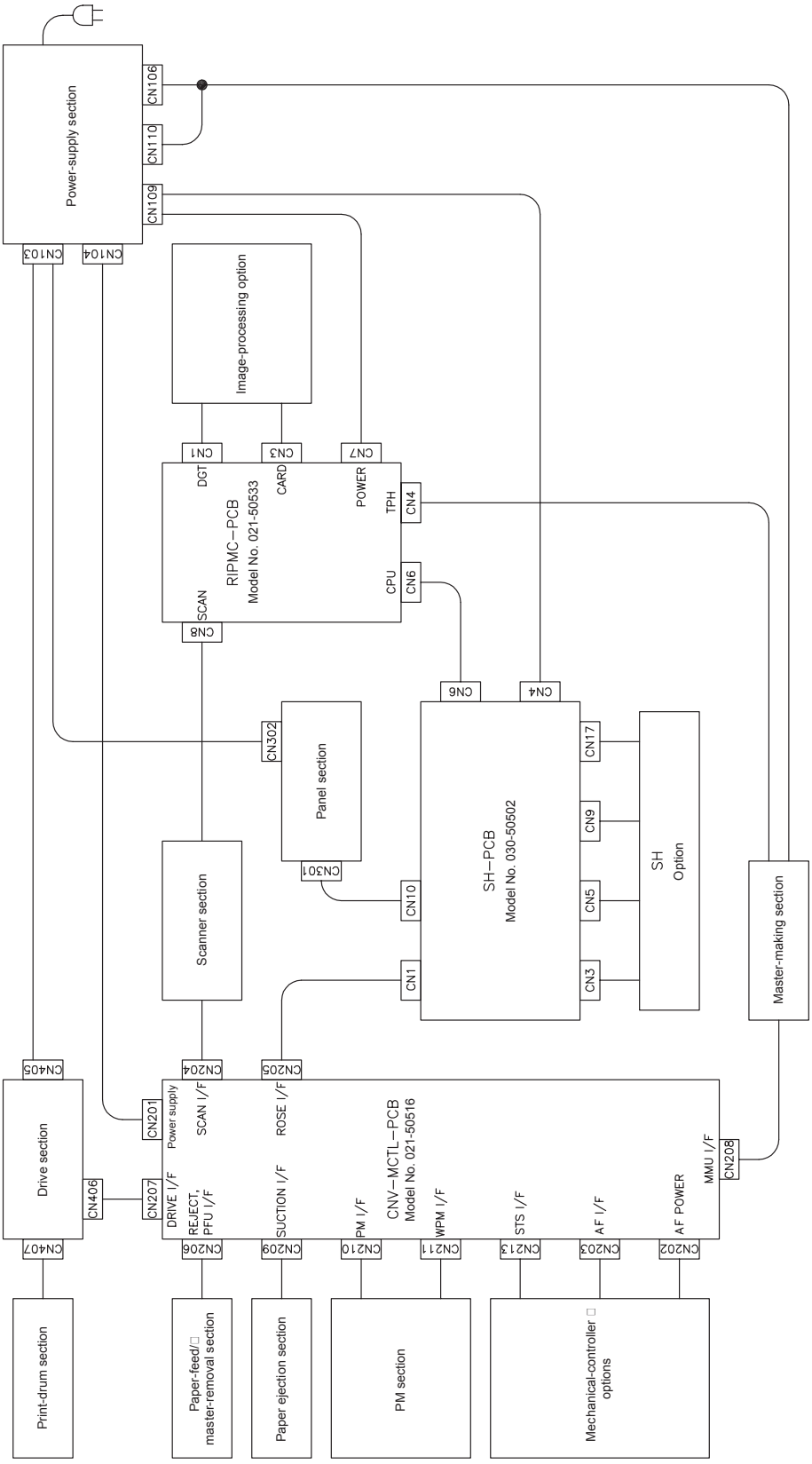
[Memo]

CHAPTER 20: ELECTRICAL DIAGRAMS (RN25 Series)

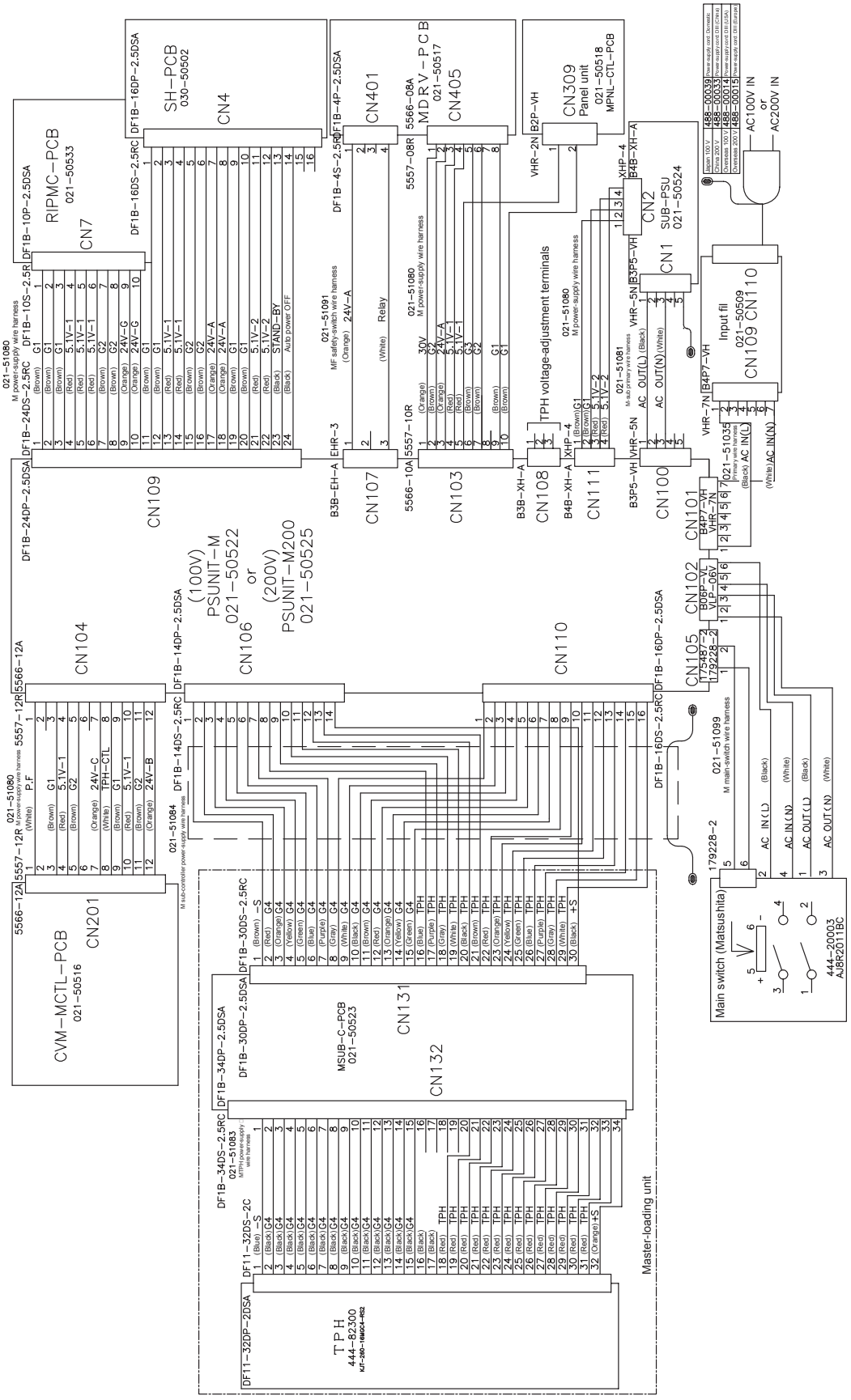
Contents

1. Connections

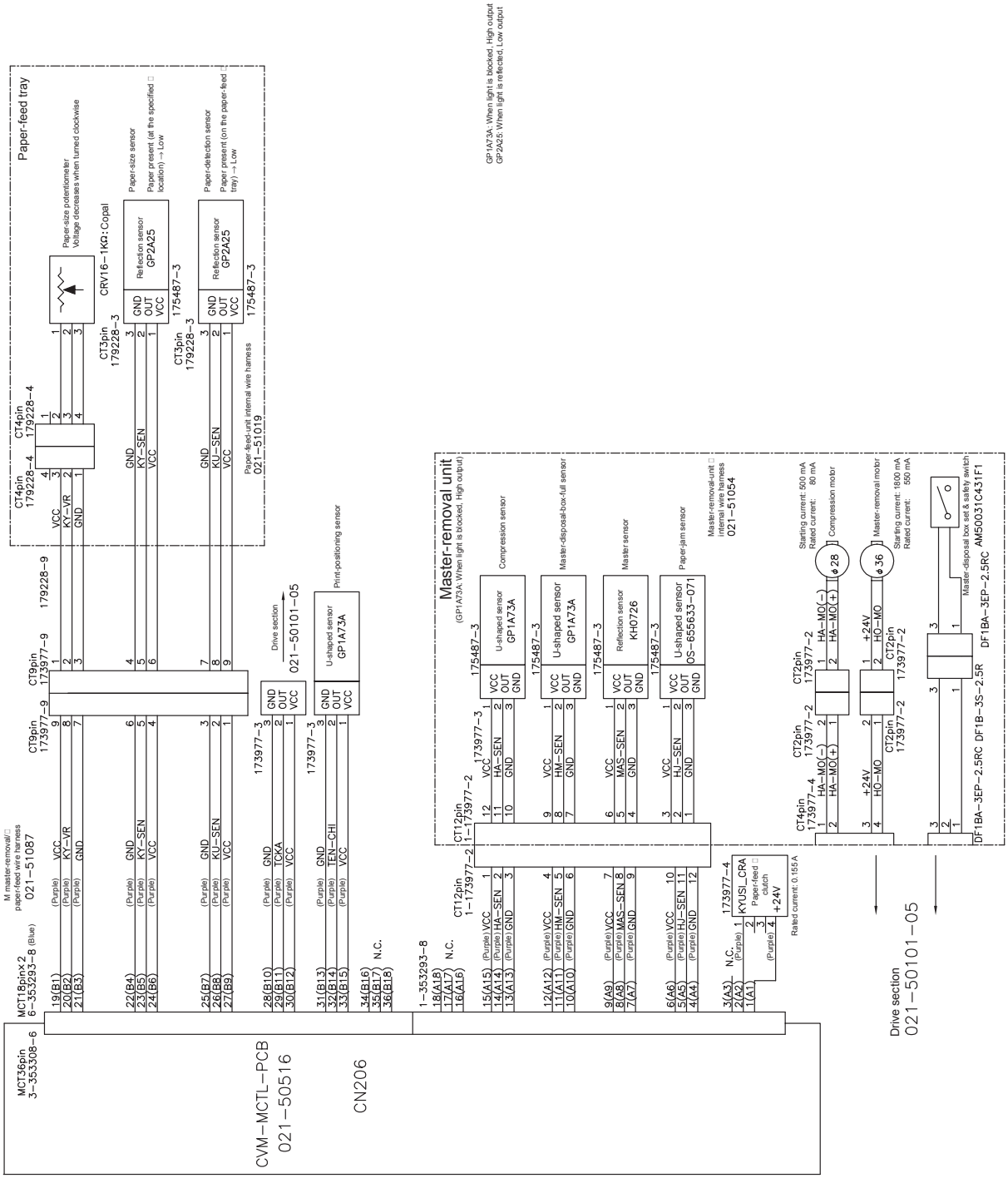
1) Block Chart



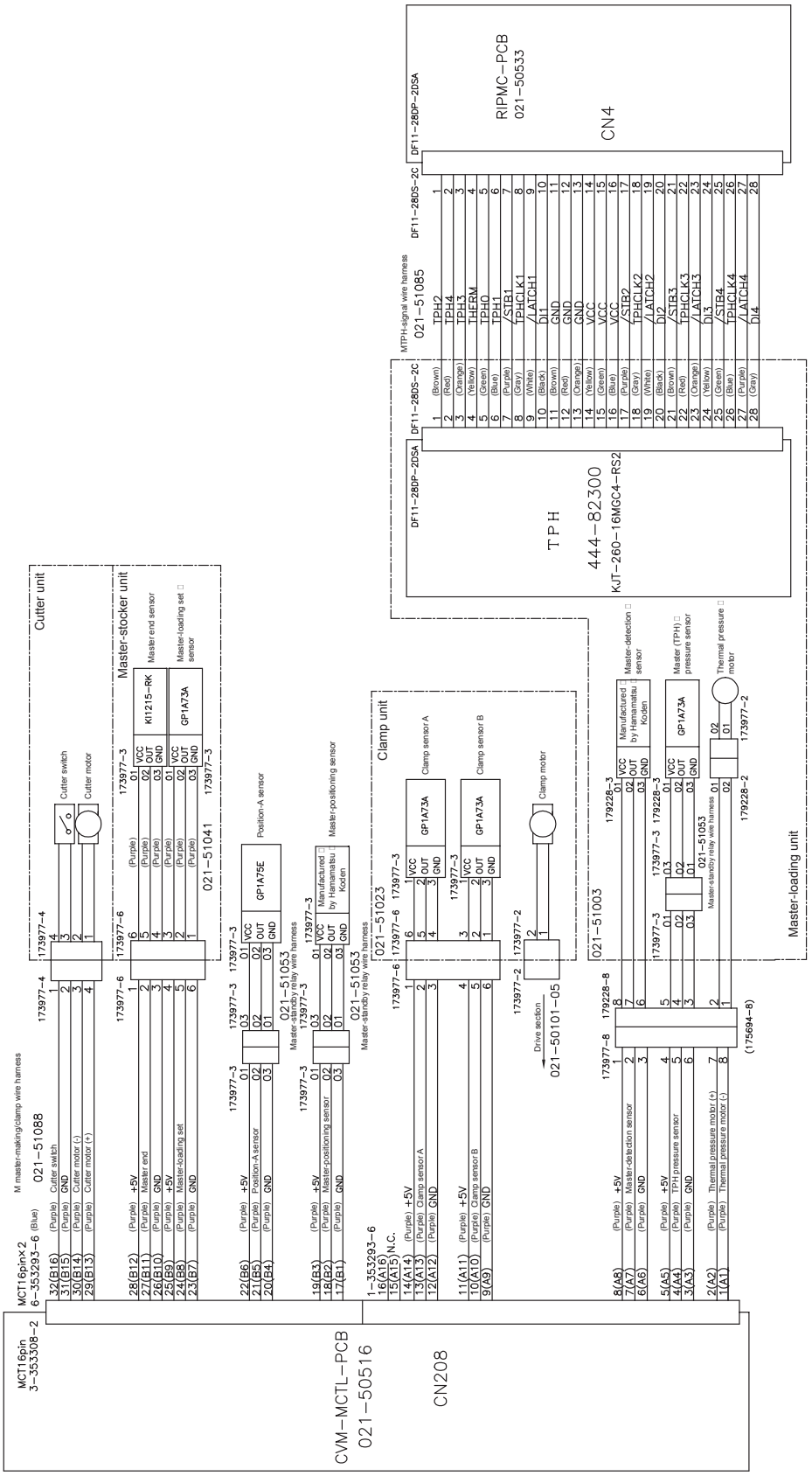
2) Power-Supply Section



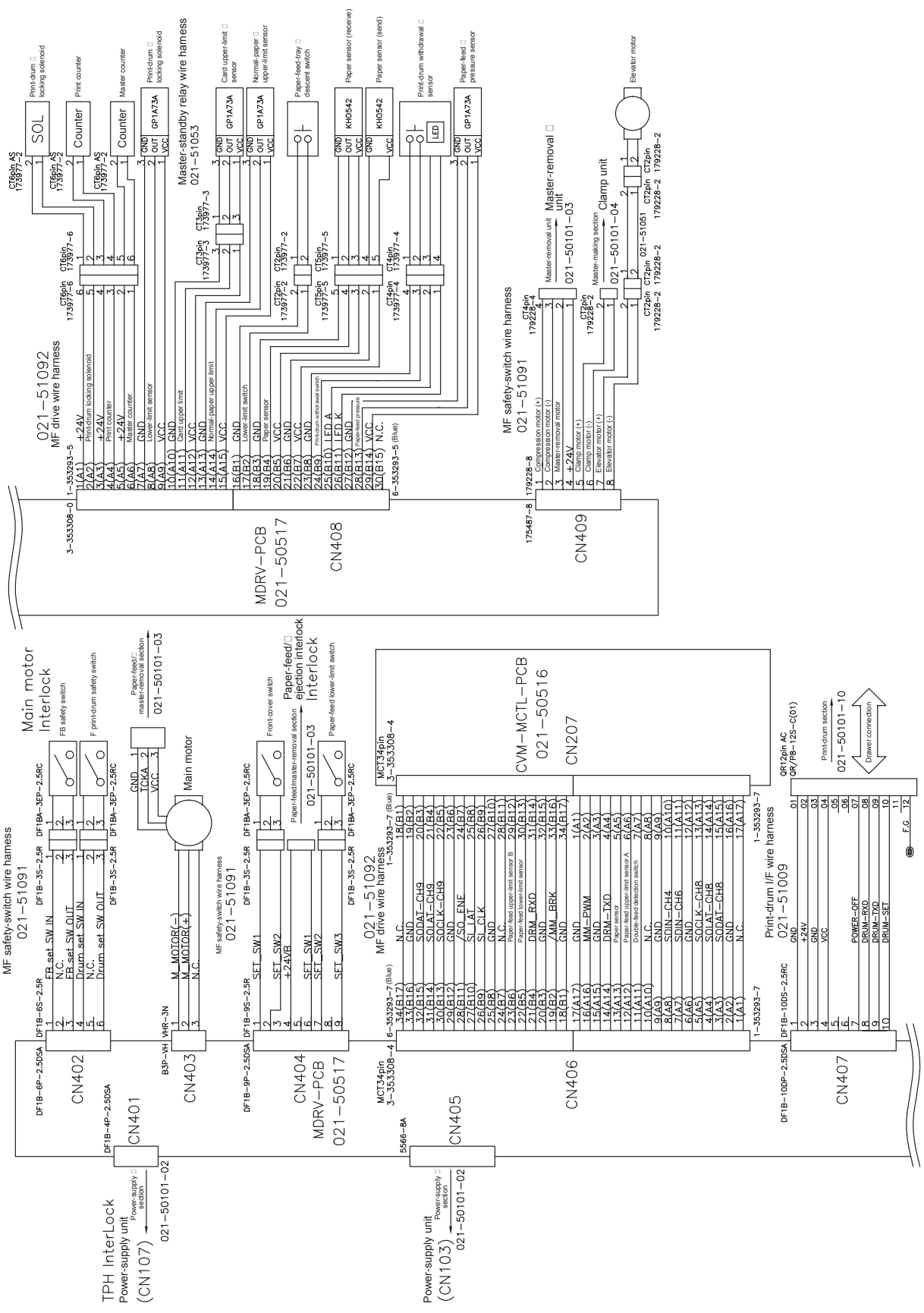
3) Paper-Feed/Master-Removal Section



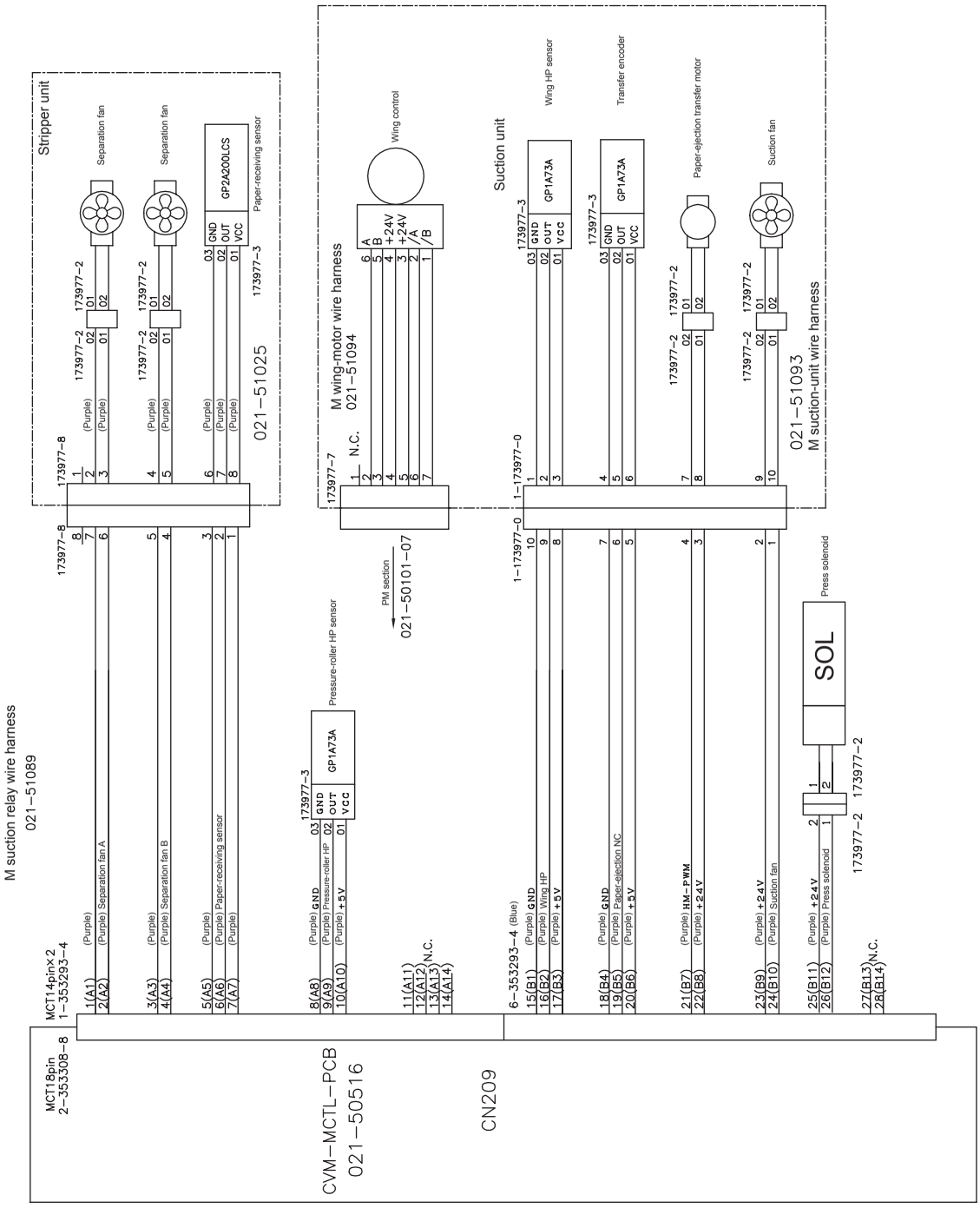
4) Master-Making Section



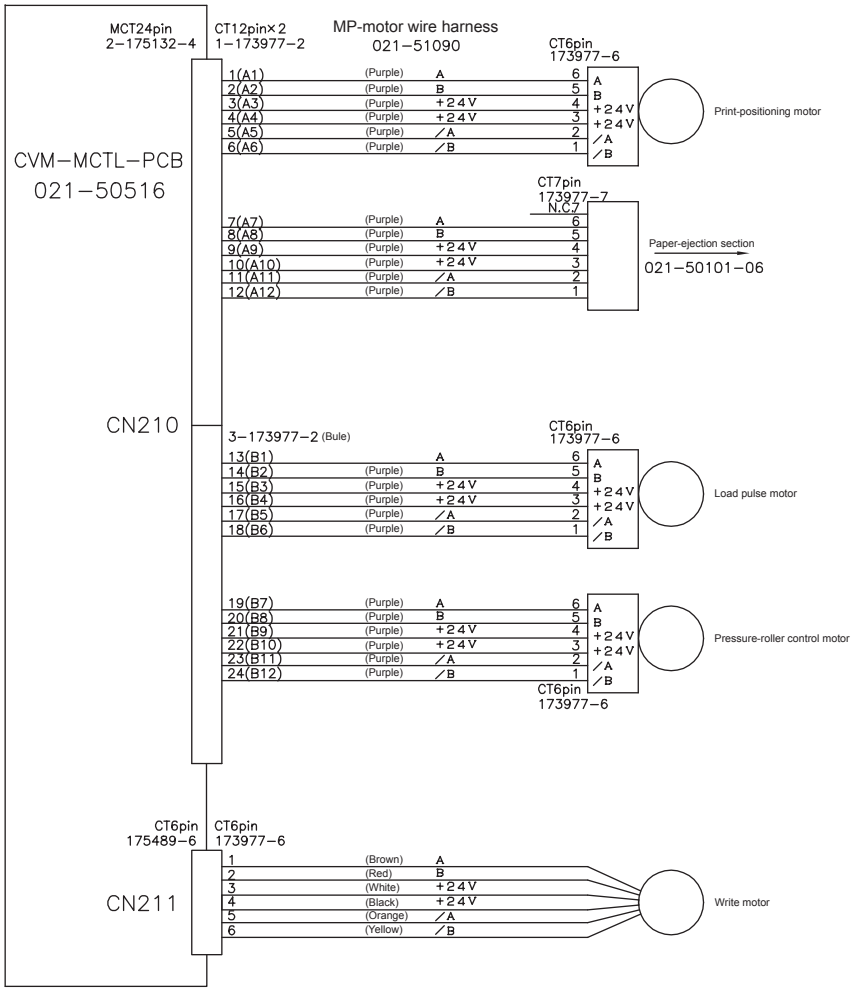
5) Drive Section



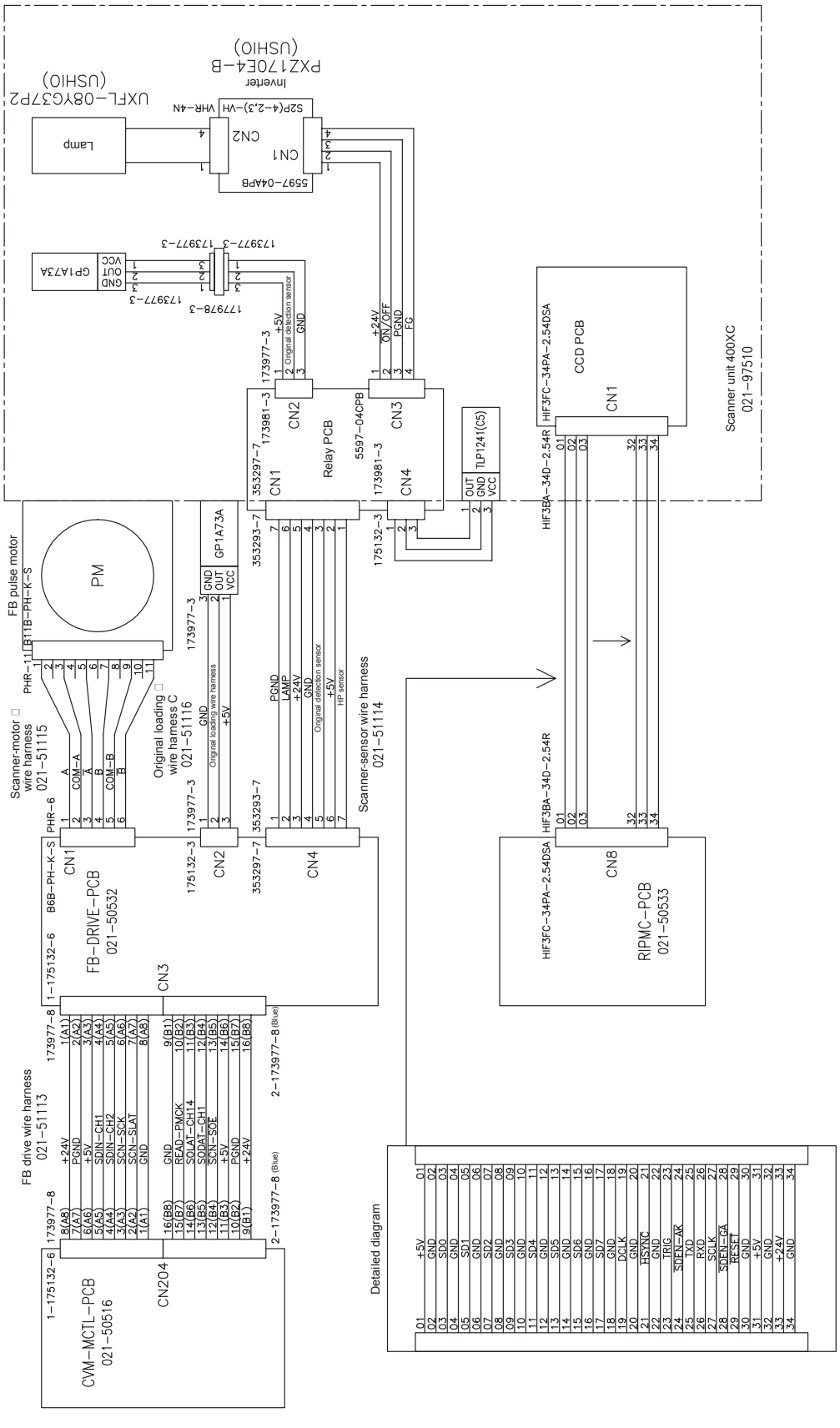
6) Paper-ejection section



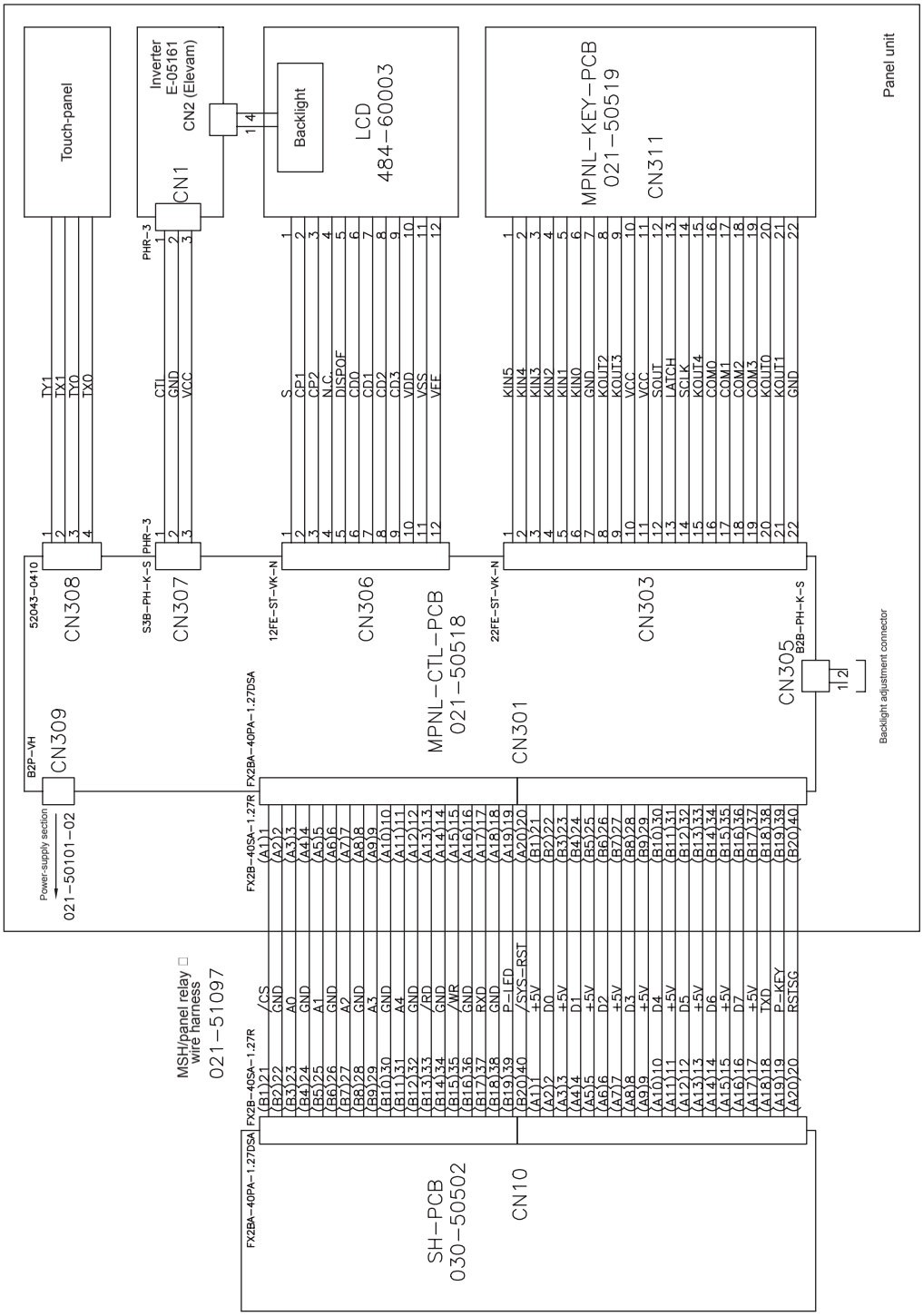
7) Pulse Motor Section



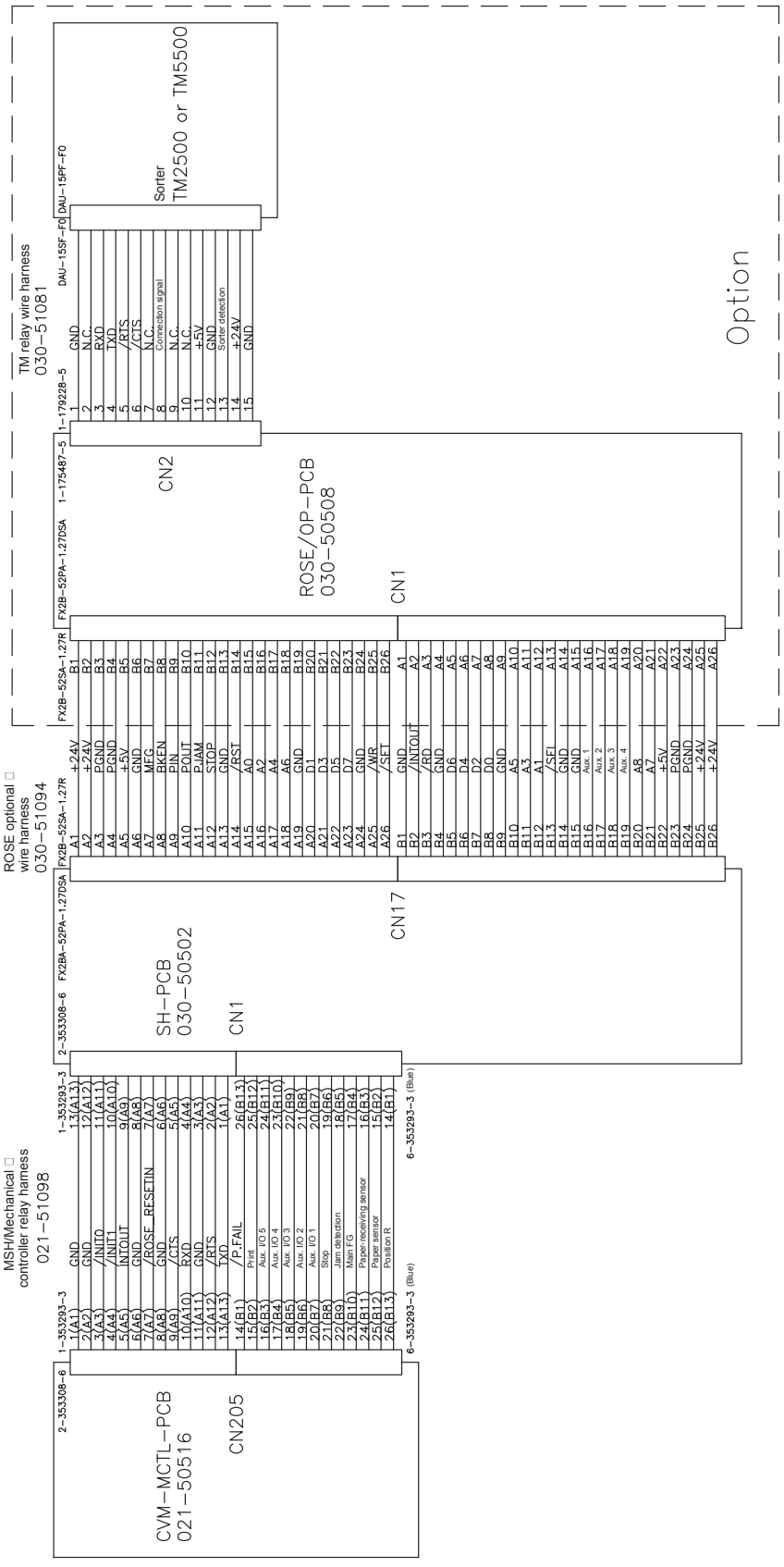
8) Scanner Section



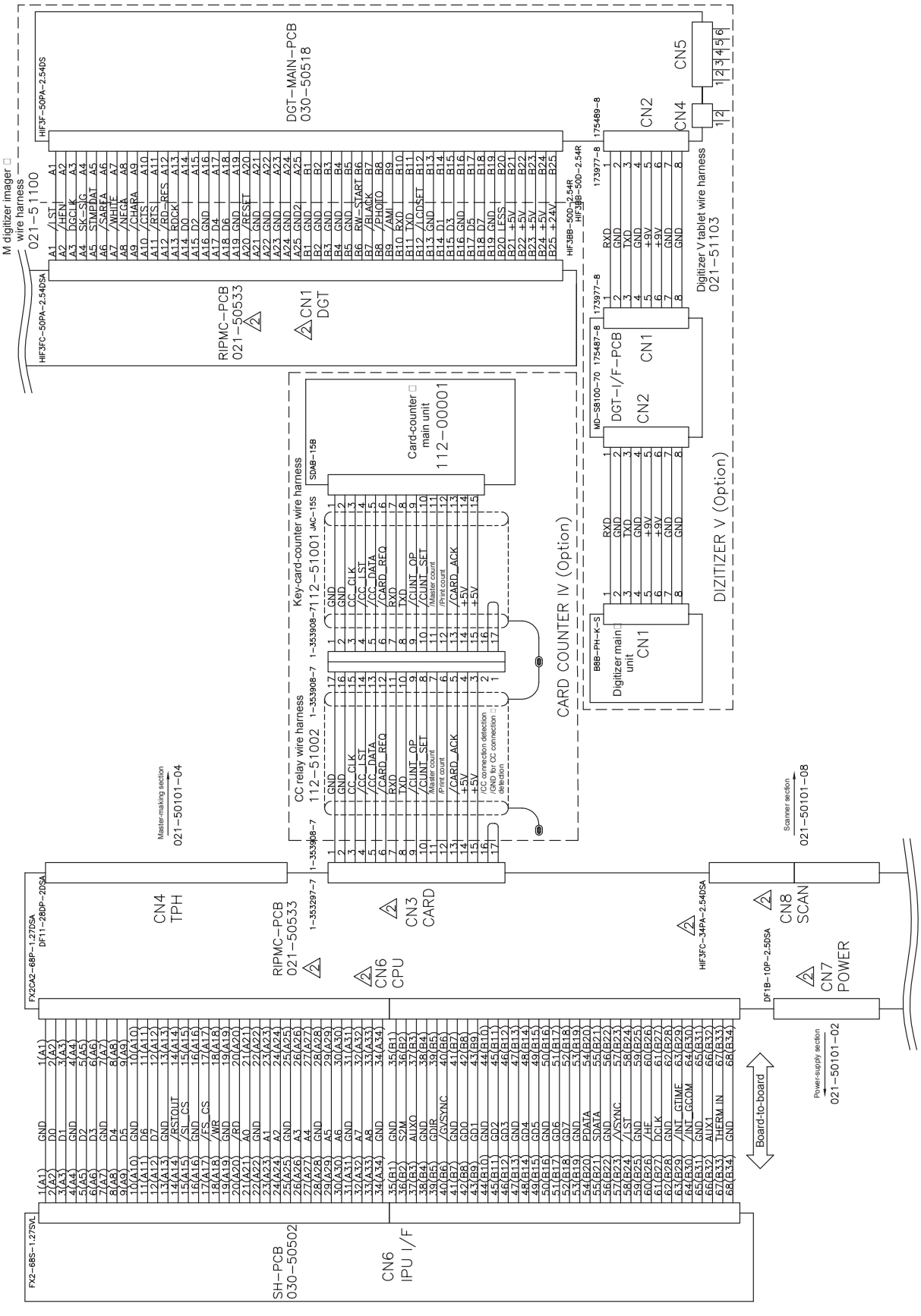
9) Panel Section



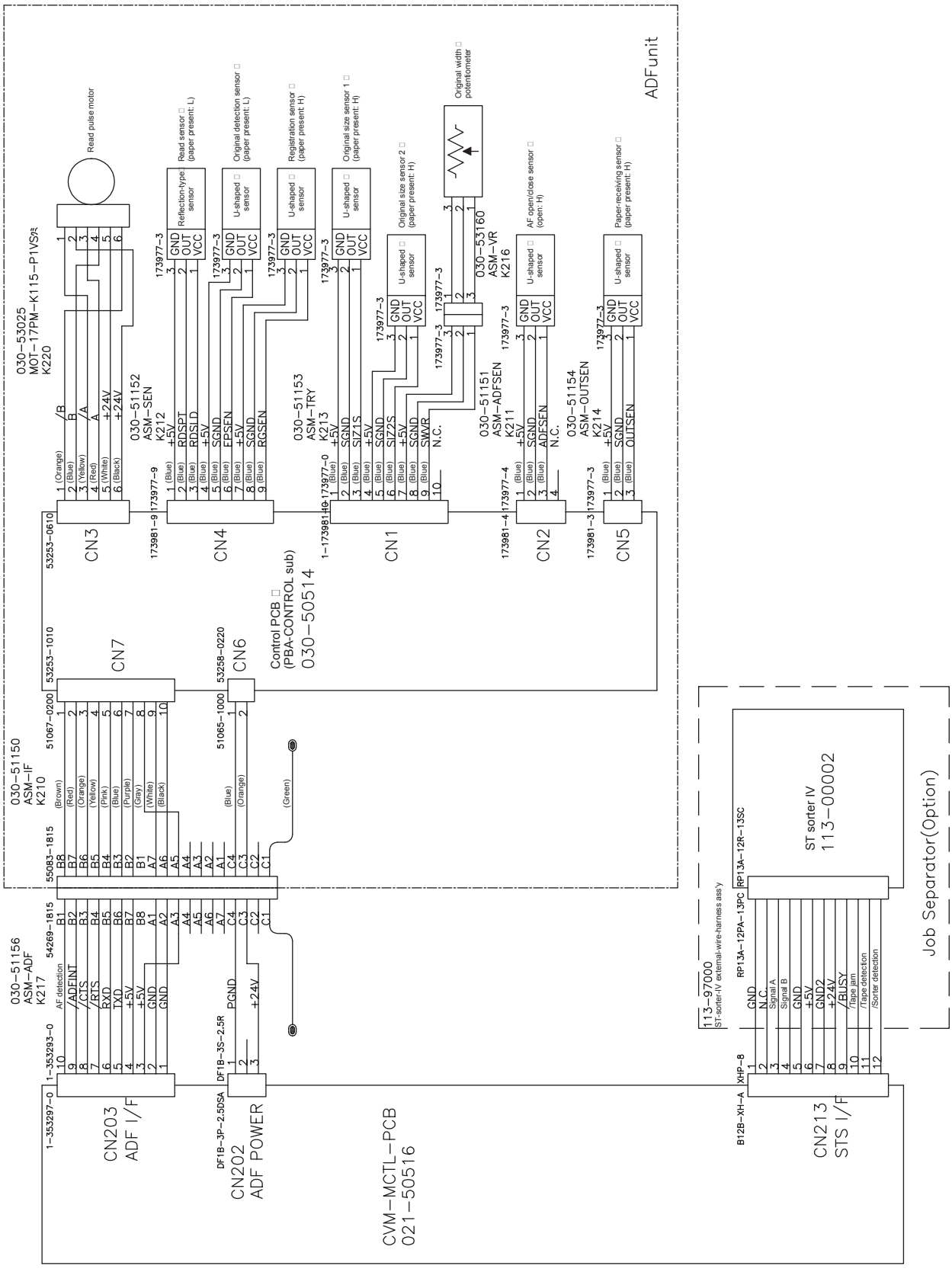
10) SH/Option


Option
TM relay wire harness
030-51081
DAU-15SF-FO
DAU-15PF-FO
1-179228-5
Sorter
TM2500 or TM5500
GND
N.C.
RXD
TXD
/RTS
/CTS
N.C.
Connection signal
N.C.
N.C.
+5V
GND
Sorter detection
GND
+24V
GND
CN2
ROSE/OP-PCB
030-50508
1-175487-5
FX2B-52PA-1.27DSA
FX2B-52SA-1.27R
CN1
ROSE optional
wire harness
030-51094
2-353308-6
FX2BA-52PA-1.27DSA
SH-PCB
030-50502
CN17
CN1
MSH/Mechanical
controller relay harness
021-51098
1-353293-3
6-353293-3 (Blue)
CVM-MCTL-PCB
021-50516
CN205

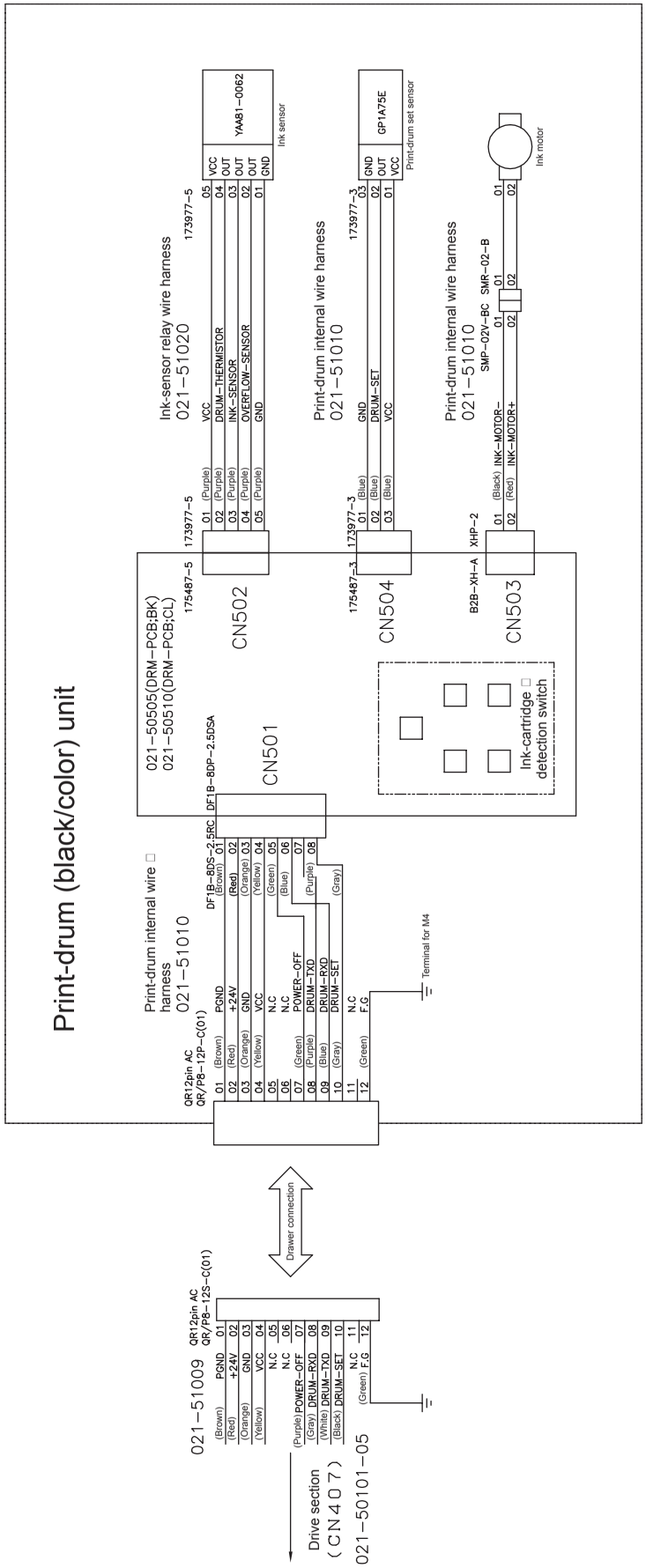
11) RIPM/Option



12) Mechanical Controller/Option

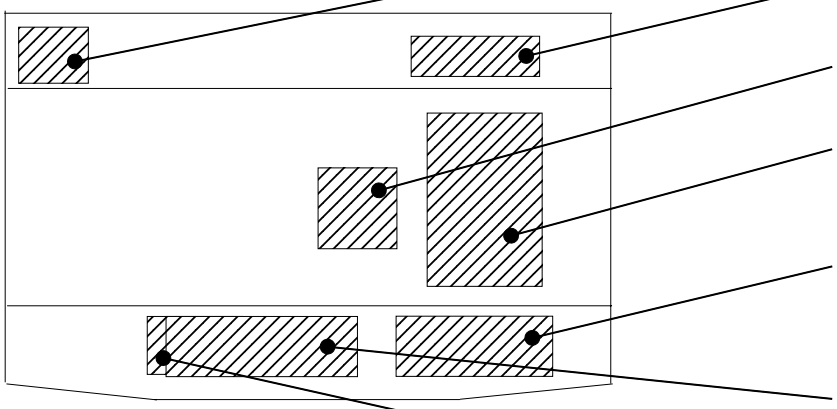


13) Print-Drum Section



2. PCB Layout

Top view



AF-PCB

Scan-IF400-PCB

CCD

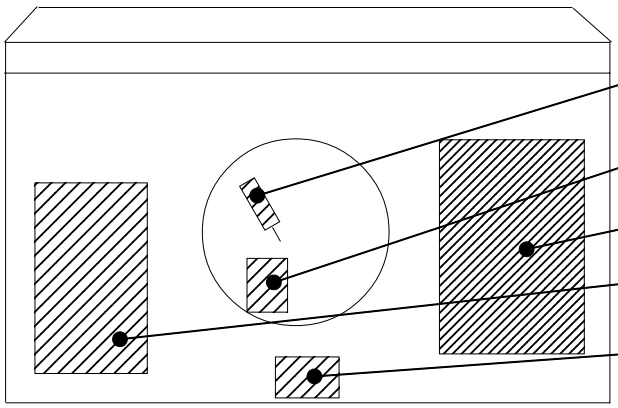
Scanner Control PCB

Panel Key PCB

Panel Control PCB (MPNL-CTL-PCB)

Panel LCD

Front view



Ink-Sensor PCB

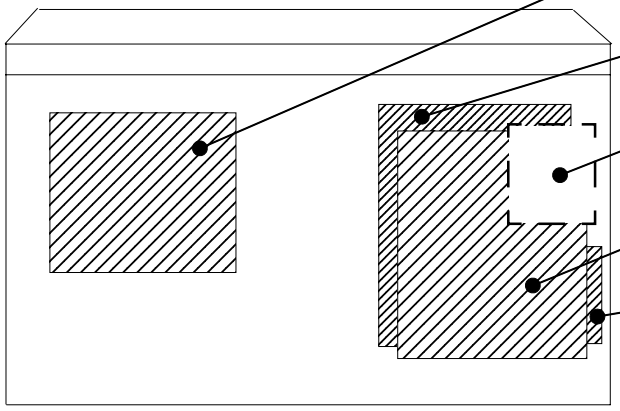
Drum Control PCB

Power-Supply Unit

Drive PCB (MDRV-PCB)

Sub-Power-Supply PCB (SUB-PSU)

Rear view



Mechanical Control PCB (CVM-MCTL-PCB)

Image PCB (RIPM-PCB)

RISORINC NET-B

Main PCB (SHPCB)

Interface Board: SH (ROSE/OP-PCB)

3. PCB Function Chart

PCB	Function
Main PCB (SH-PCB)	Overall control, computer interface control
Power-supply unit (PSUNIT, PSUNIT-200)	Supply of power to various units
Mechanical Control PCB (CVM-MCTL-PCB)	Motor and sensor control
Image PCB (RIPM-PCB)	Image processing
Drive PCB (MDRV-PCB)	Operation of various parts
Panel Control PCB (MPNL-CTL-PCB)	Panel and display control
Panel Key PCB (MPNL-KEY-PCB)	Key input device
Drum Control PCB (DRM-PCB; BK, DRM-PCB; CL)	Print-drum internal control
Ink-Sensor PCB (YAA81-0062)	Ink bead detection, print-drum internal temperature detection
RISORINC-NET2	Network connection
ROSE/OP-PCB	TM2500/5000 control
SCAN-IF400PCB	Scanner pulse-motor control
AF-PCB	AF control
Sub-Power-Supply PCB (SUB-PSU)	Sub Power Supply

4. Power-Supply-Unit Fuse Chart

The fuses differ between the 100V and 200V machines.

Fuse No.	110V-120V machine	220V-240V machine	System	Phenomenon/affected parts
F1	125 V 10A	250 V 6.3 A	Main	Main electrical power (No Power if this fuse defective)
F2	125 V 3.15 A	255 V 3.15 A	+24 VA	Elevator motor Clamp motor Master-removal motor Thermal-pressure motor Ink motor Print-drum locking solenoid Copy counter Master counter
F3	125 V 3.15 A	250 V 3.15 A	+24 VB	Suction motor Press solenoid Print-positioning pulse motor Wing motor Loading motor Pressure-roller motor Write pulse motor
F4	125 V 3.15 A	250 V 3.15 A	+24 VG	Option
F5	125 V 8 A	250 V 8 A	+30 V	Main Motor
F6	125 V 3.15 A	250 V 3.15 A	+24 VC	Separation fan Suction fan Thermal-pressure motor Cutter motor Paper-feed clutch FB pulse motor Option

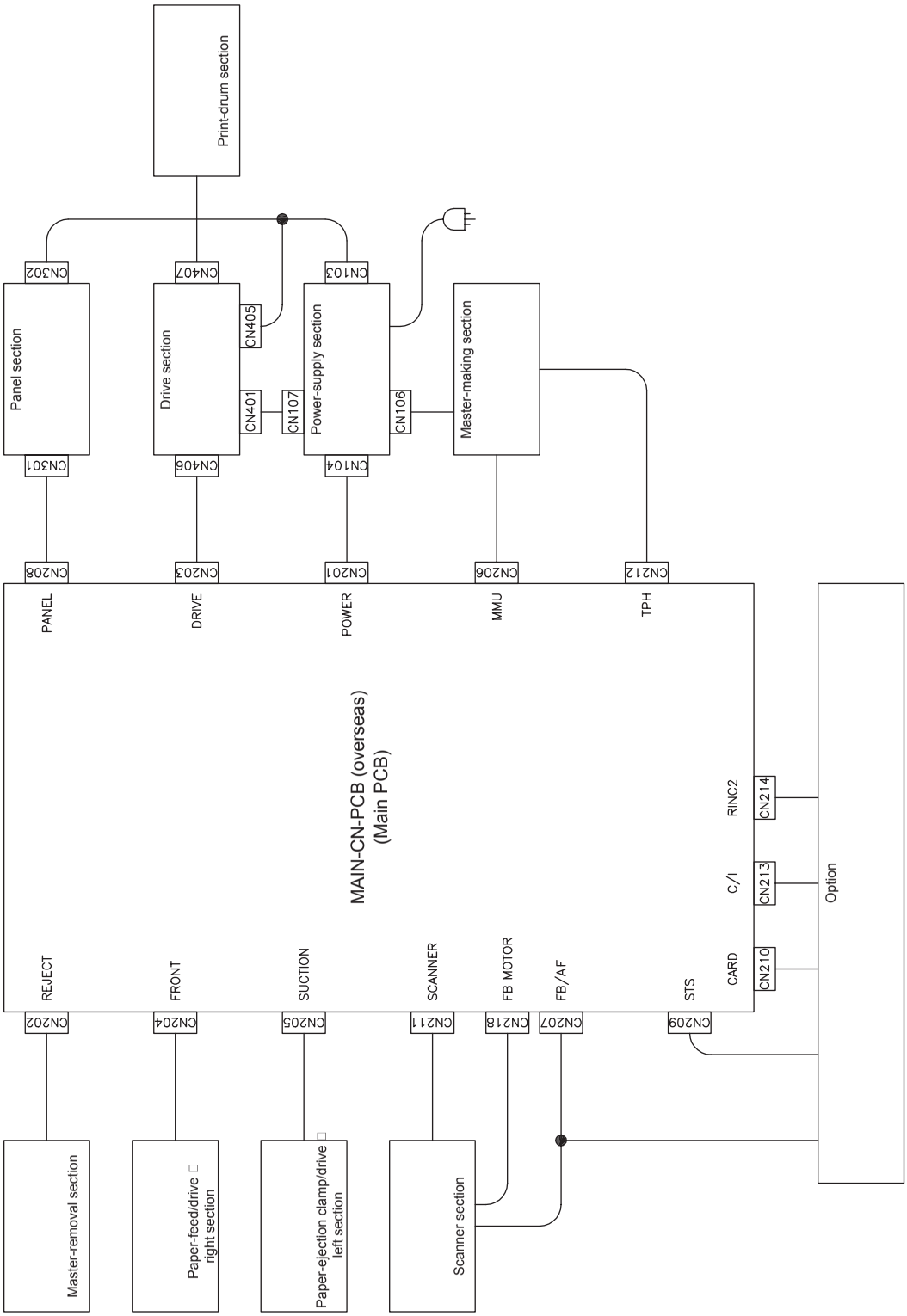
[Memo]

CHAPTER 21: ELECTRICAL DIAGRAMS (RN20/21)

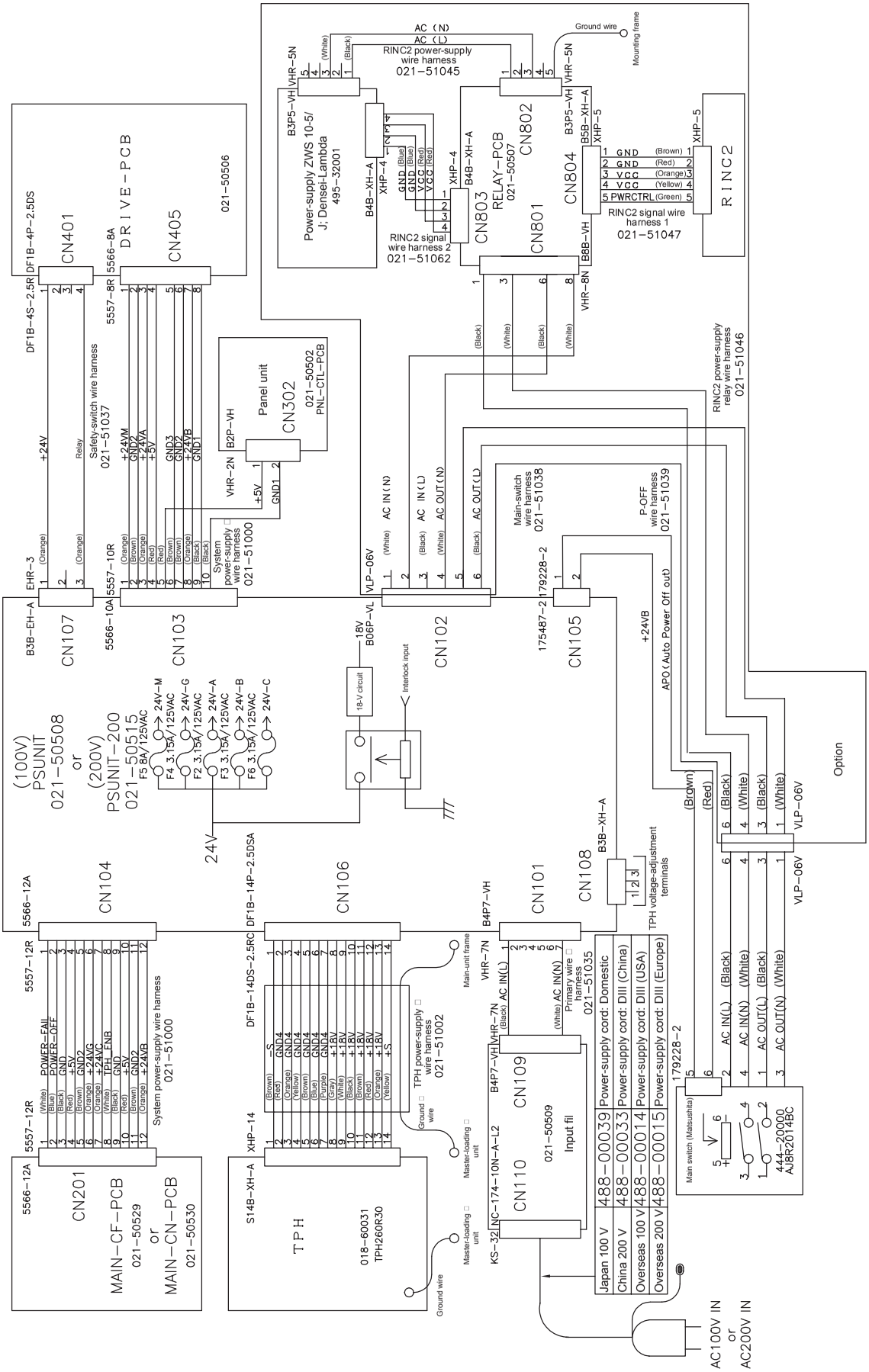
Contents

1. Connections

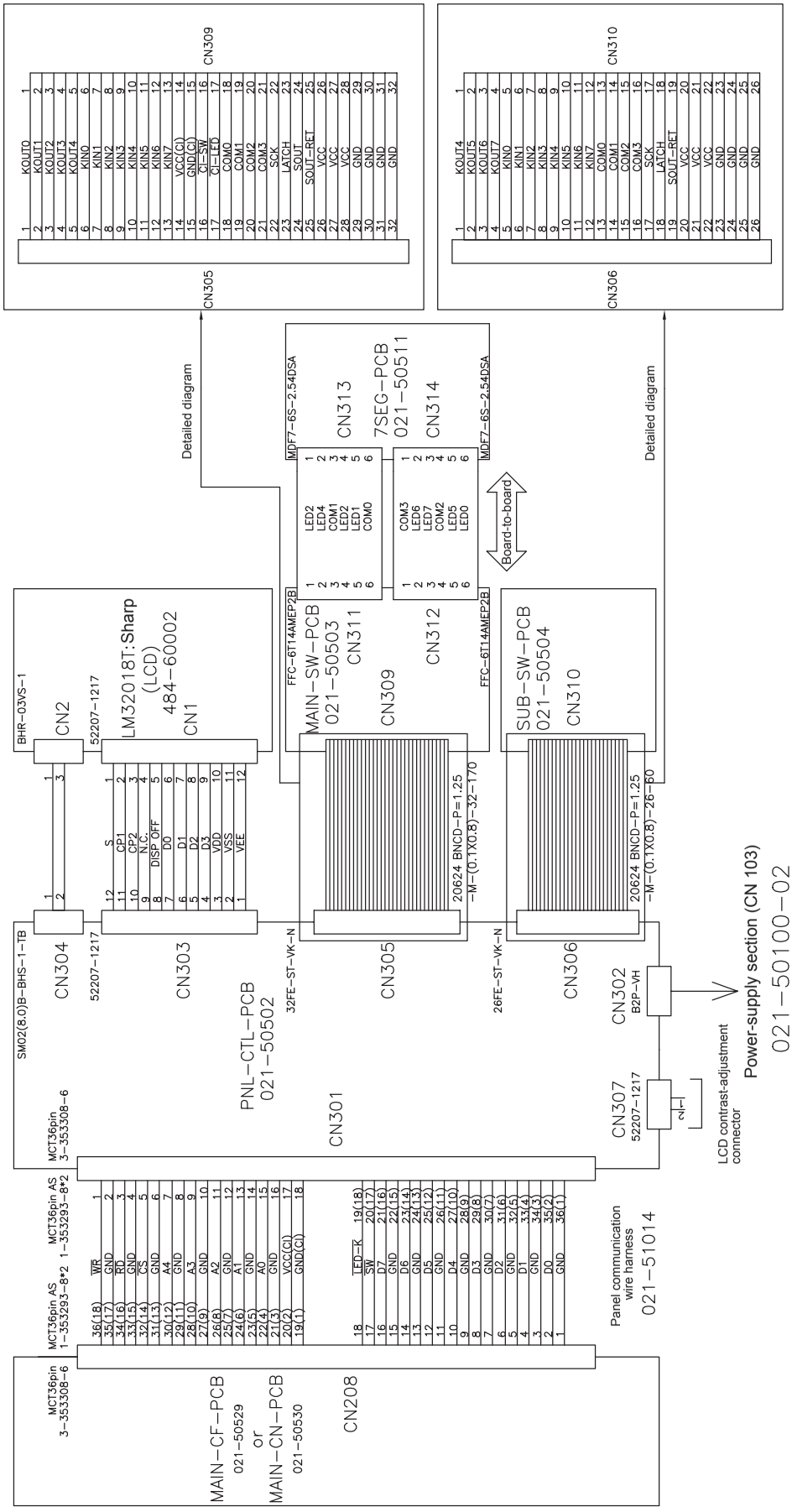
1) Block Chart



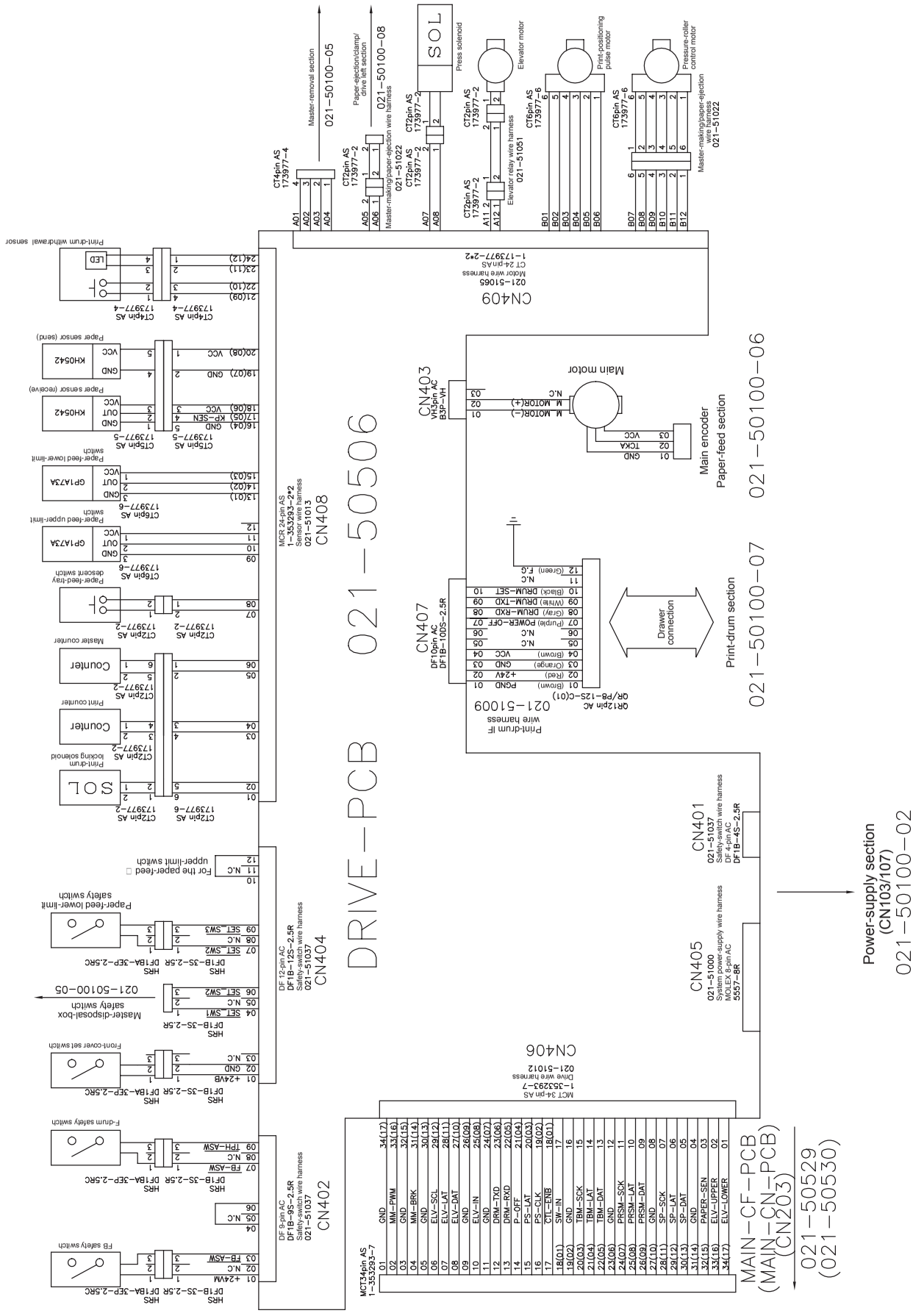
2) Power-supply section



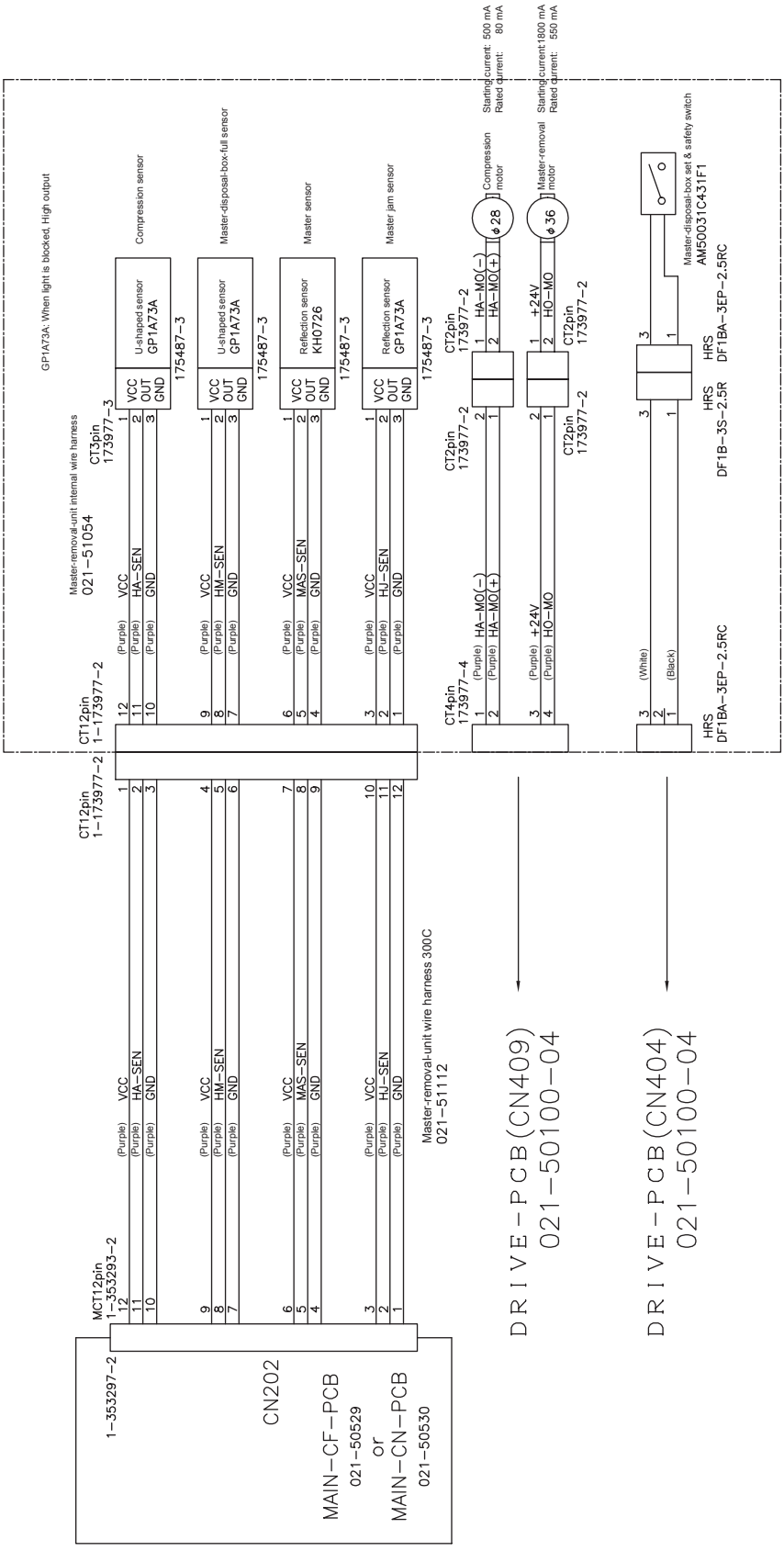
3) Panel Section



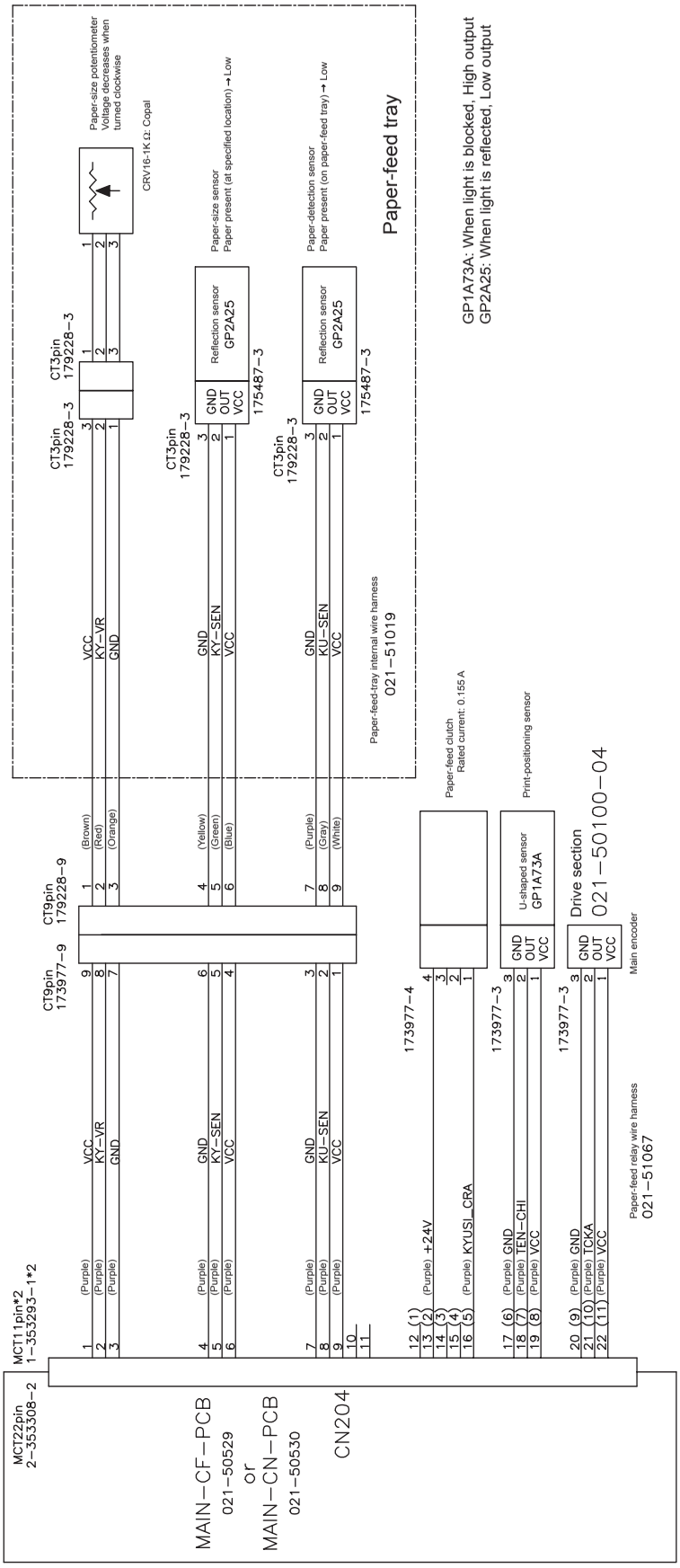
4) Drive Section



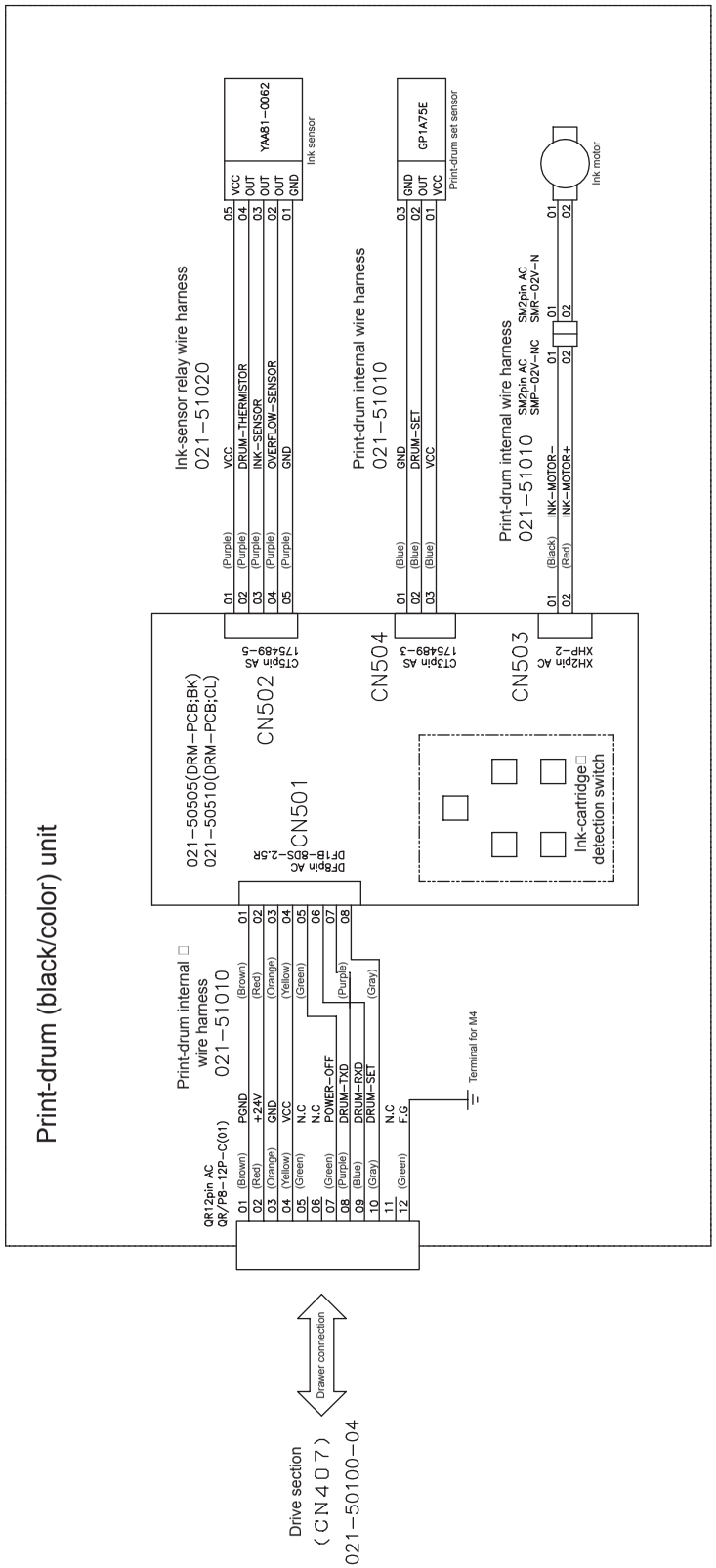
5) Master-Removal Section



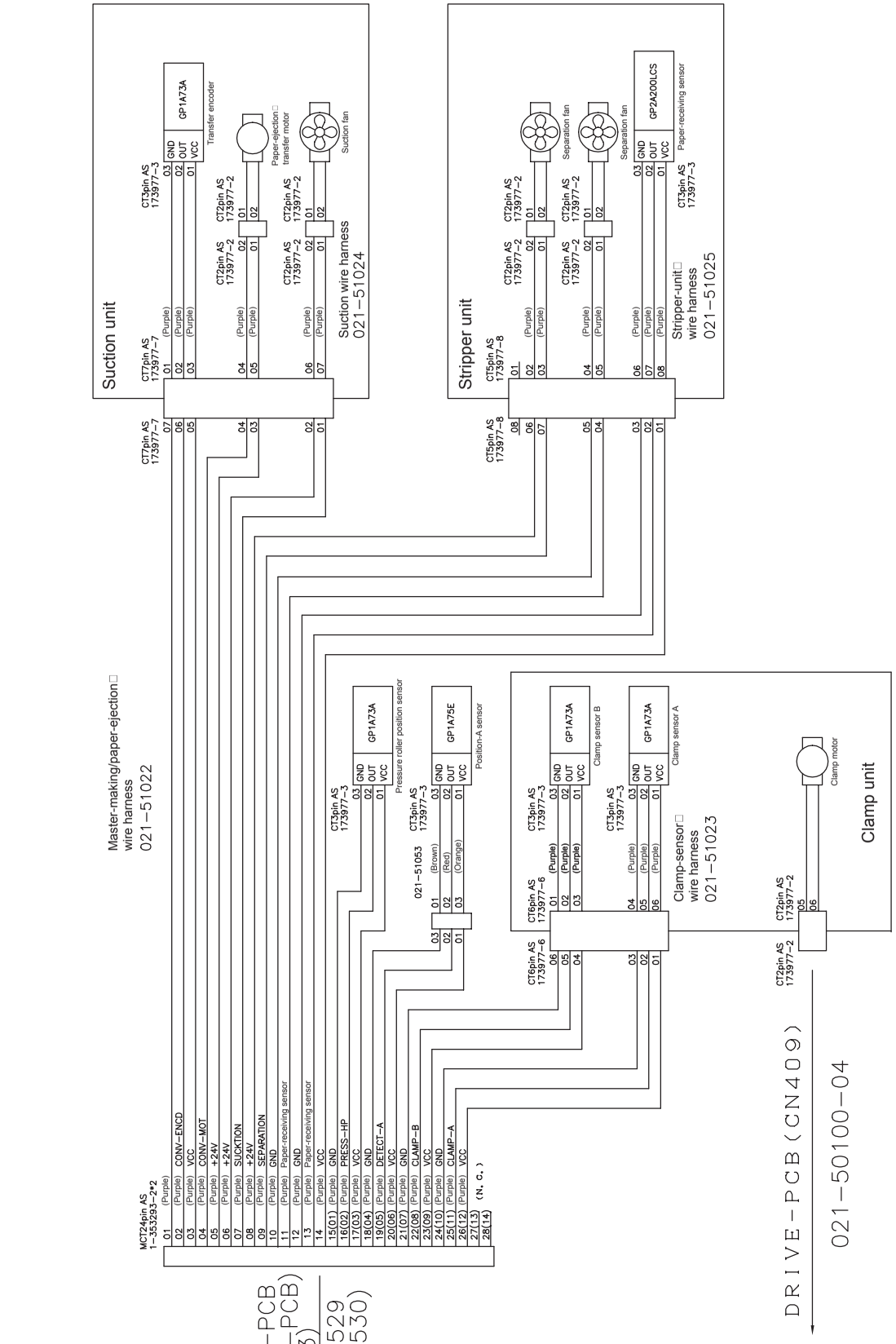
6) Paper-Feed Section



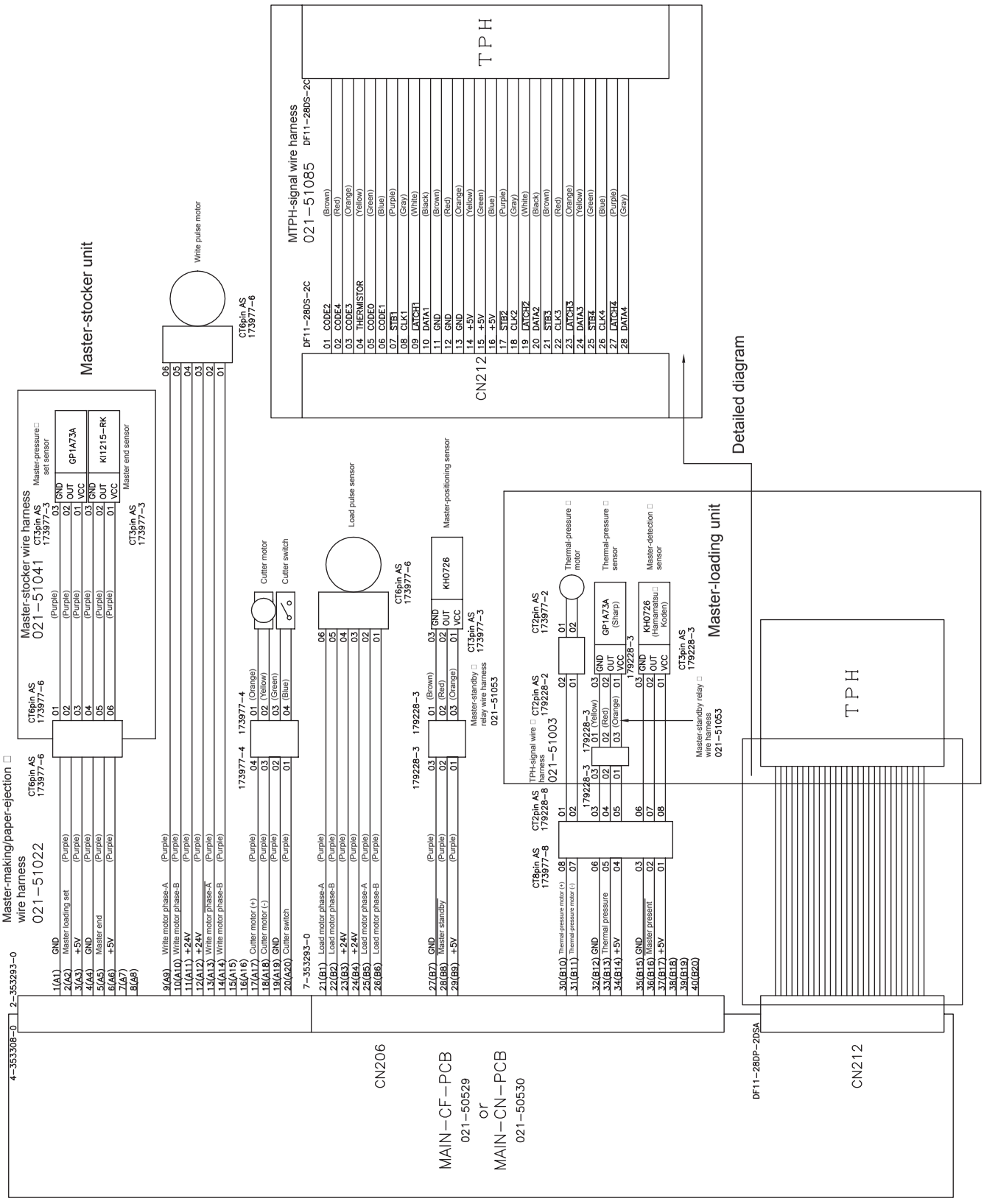
7) Print-Drum Section

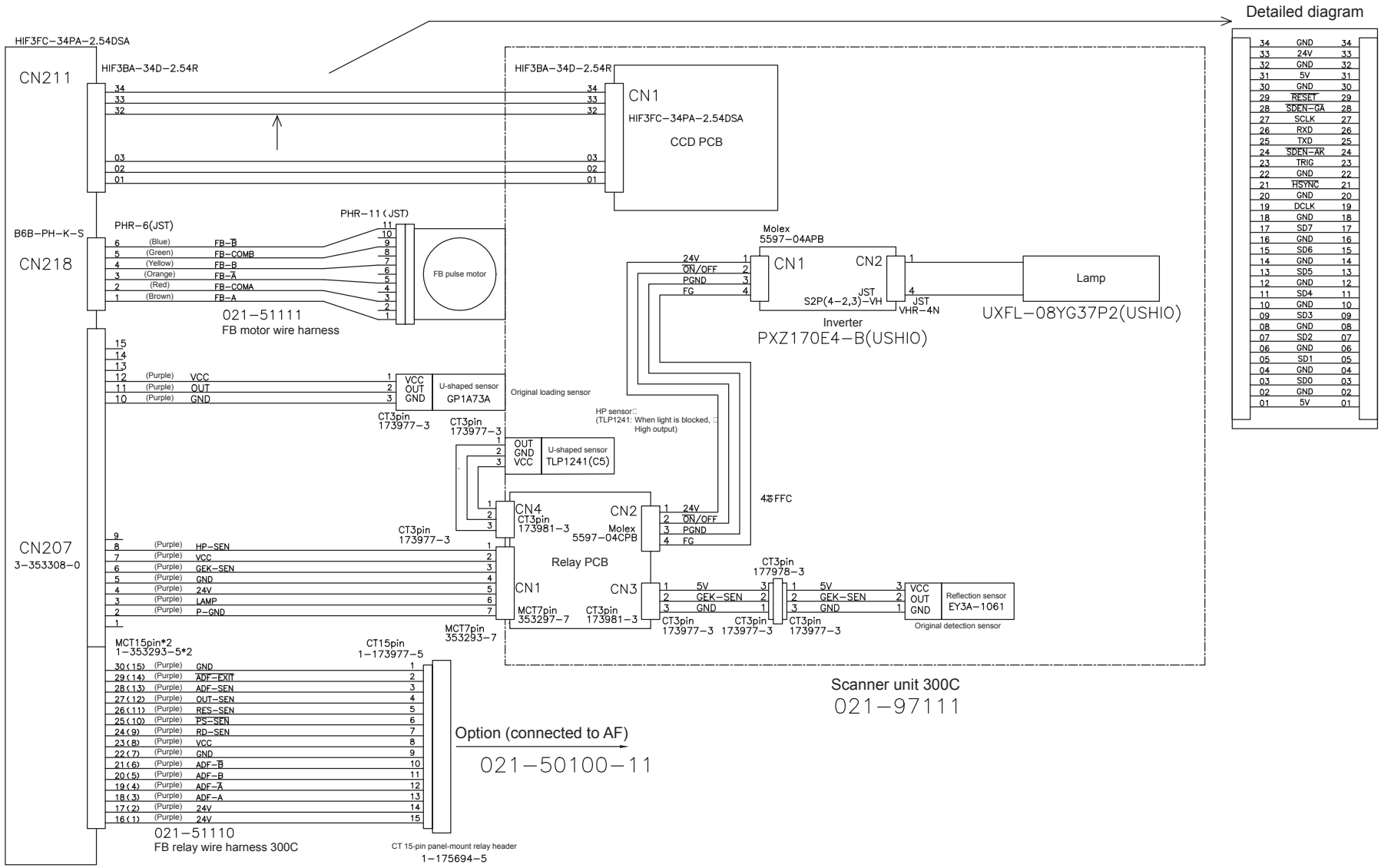


8) Paper-Ejection Section

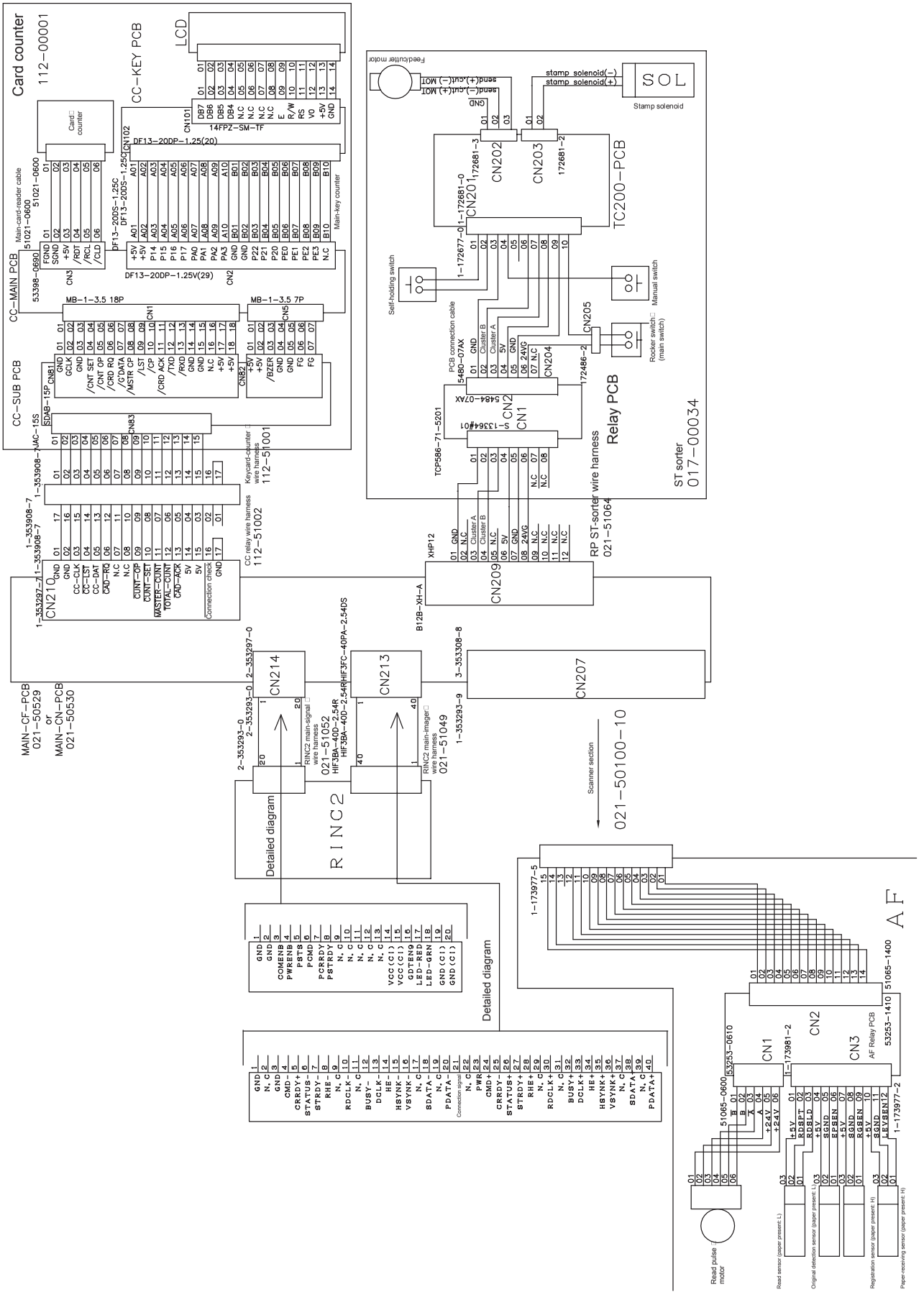


9) Master-Making Section



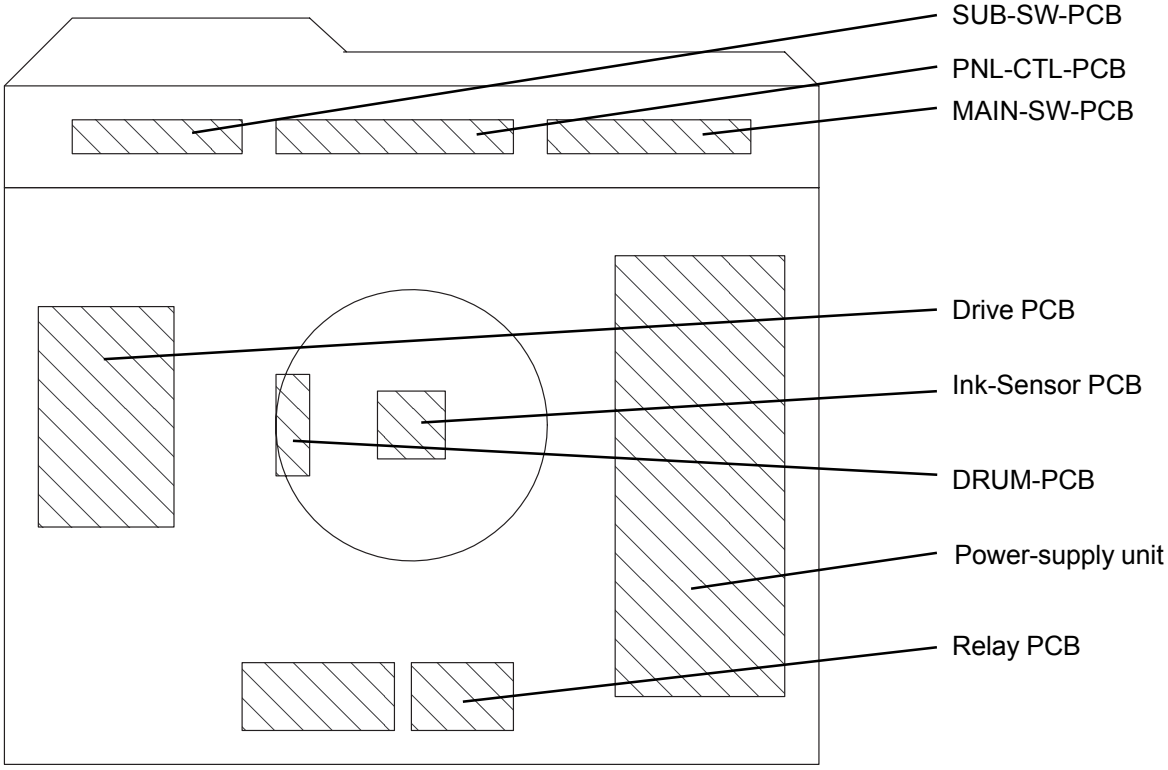

Detailed diagram
34 GND 34
33 24V 33
32 GND 32
31 5V 31
30 GND 30
29 RESET 29
28 SDEN-GA 28
27 SCLK 27
26 RXD 26
25 TXD 25
24 SDEN-AR 24
23 TRIG 23
22 GND 22
21 HSYNC 21
20 GND 20
19 DCLK 19
18 GND 18
17 SD7 17
16 GND 16
15 SD6 15
14 GND 14
13 SD5 13
12 GND 12
11 SD4 11
10 GND 10
09 SD3 09
08 GND 08
07 SD2 07
06 GND 06
05 SD1 05
04 GND 04
03 SDO 03
02 GND 02
01 5V 01
HIF3FC-34PA-2.54DSA
CN211
HIF3BA-34D-2.54R
34
33
32
03
02
01
HIF3BA-34D-2.54R
CN1
HIF3FC-34PA-2.54DSA
CCD PCB
B6B-PH-K-S
CN218
PHR-6(JST)
6 (Blue) FB-B
5 (Green) FB-COMB
4 (Yellow) FB-B
3 (Orange) FB-A
2 (Red) FB-COMA
1 (Brown) FB-A
PHR-11(JST)
11
10
9
8
7
6
5
4
3
2
1
FB pulse motor
021-51111
FB motor wire harness
Molex
5597-04APB
CN1
CN2
24V 1
ON/OFF 2
PGND 3
FG 4
JST
S2P(4-2,3)-VH
JST
VHR-4N
Lamp
UXFL-08YG37P2(USHIO)
Inverter
PXZ170E4-B(USHIO)
15
14
13
12 (Purple) VCC 1
11 (Purple) OUT 2
10 (Purple) GND 3
VCC
OUT
GND
U-shaped sensor
GP1A73A
Original loading sensor
CT3pin
173977-3
CT3pin
173977-3
HP sensor□
(TLP1241: When light is blocked, □
High output)
OUT
GND
VCC
U-shaped sensor
TLP1241(C5)
4芯FFC
CN4
CT3pin
173981-3
CN2
Molex
5597-04CPB
24V
ON/OFF
PGND
FG
CT3pin
173977-3
CN207
3-353308-0
9
8 (Purple) HP-SEN 1
7 (Purple) VCC 2
6 (Purple) GEK-SEN 3
5 (Purple) GND 4
4 (Purple) 24V 5
3 (Purple) LAMP 6
2 (Purple) P-GND 7
1
Relay PCB
CN1
MCT7pin
353297-7
CN3
CT3pin
173981-3
5V
GEK-SEN
GND
CT3pin
177978-3
CT3pin
173977-3
CT3pin
173977-3
CT3pin
173977-3
VCC
OUT
GND
Reflection sensor
EY3A-1061
Original detection sensor
MCT7pin
353293-7
MCT15pin*2
1-353293-5*2
CT15pin
1-173977-5
30(15) (Purple) GND 1
29(14) (Purple) ADF-EXIT 2
28(13) (Purple) ADF-SEN 3
27(12) (Purple) OUT-SEN 4
26(11) (Purple) RES-SEN 5
25(10) (Purple) PS-SEN 6
24(9) (Purple) RD-SEN 7
23(8) (Purple) VCC 8
22(7) (Purple) GND 9
21(6) (Purple) ADF-B 10
20(5) (Purple) ADF-B 11
19(4) (Purple) ADF-A 12
18(3) (Purple) ADF-A 13
17(2) (Purple) 24V 14
16(1) (Purple) 24V 15
021-51110
FB relay wire harness 300C
CT 15-pin panel-mount relay header
1-175694-5
Option (connected to AF)
021-50100-11
Scanner unit 300C
021-97111
MAIN-CF-PCB/MAIN-CN-PCB
021-50529/021-50530

11) Option

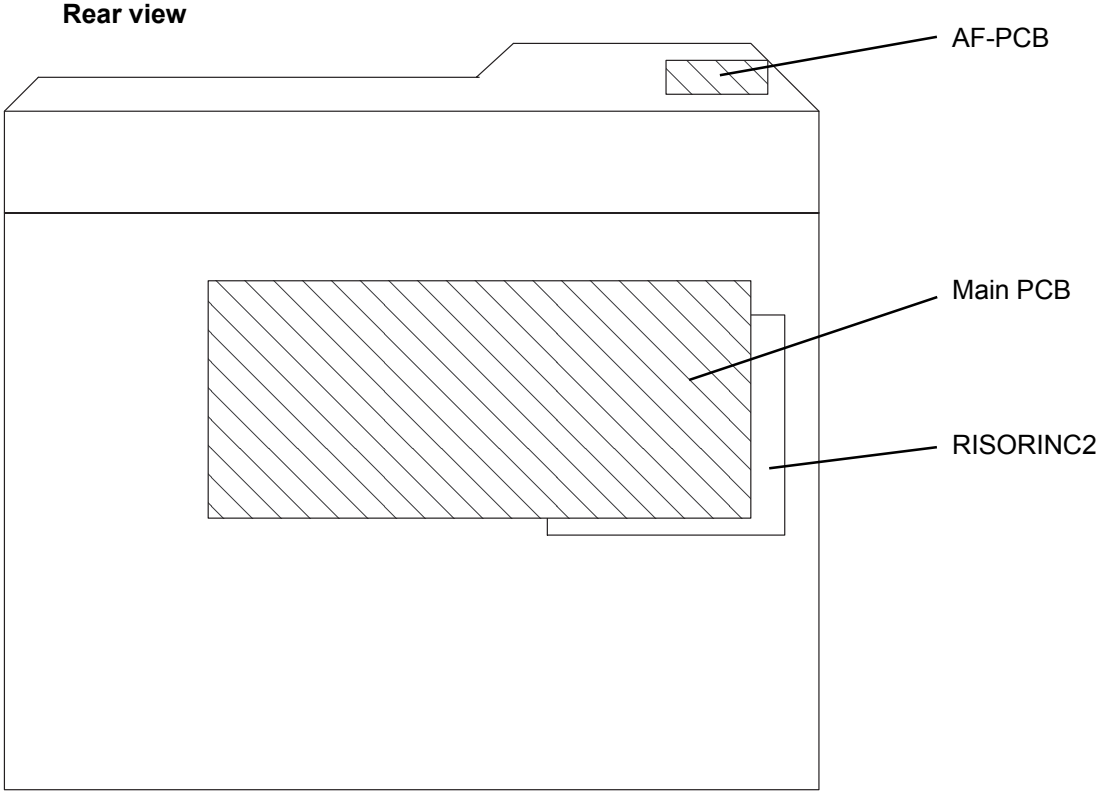

Card counter
112-00001
CC-KEY PCB
LCD
CC-MAIN PCB
CC-SUB PCB
TC200-PCB
Relay PCB
ST sorter
017-00034
Stamp solenoid
Feed/cutter motor
Self-holding switch
Manual switch
Rocker switch (main switch)
PCB connection cable
Main-card-reader cable
Main-key counter
Keycard-counter wire harness
112-51001
CC relay wire harness
112-51002
RP ST-sorter wire harness
021-51064
MAIN-CF-PCB
021-50529
or
MAIN-CN-PCB
021-50530
RINC2
Detailed diagram
RINC2 main-signal wire harness
021-51052
RINC2 main-imager wire harness
021-51049
Scanner section
021-50100-10
AF
AF Relay PCB
Read pulse motor
Read sensor (paper present: L)
Original detection sensor (paper present: L)
Registration sensor (paper present: H)
Paper-receiving sensor (paper present: H)

2. PCB Layout

Front view



Rear view



3. PCB Function Chart

PCB	Function
Main PCB (System PCB)	Overall control
Power-supply unit (PSUNIT, PSUNIT-200)	Supply of power to various units
Drive PCB (DRIVE-PCB)	Operation of various parts
AF-PCB (PDA-AF)	AF control
Panel Control PCB (PNL-CTL-PCB)	Panel and display control
Panel Switch PCB (MAIN-SW-PCB)	Key input device
Sub Switch PCB (SUB-SW-PCB)	Key input device
Print-Drum PCB (DRM-PCB: BK, DRM-PCB: CL)	Print-drum internal control
Ink-Sensor PCB (YAA81-0062)	Ink vortex detection, print-drum internal temperature detection
Relay PCB (RELAY-PCB)	RISORINC2 control
SC Power-Supply PCB (Power-supply unit: SC3K)	Power supply to RISORINC2
RISORINC2 (RINC2PCB: 64 MB)	Computer interface function, image control

4. Power-Supply-Unit Fuse Chart

The fuses differ between the 100V and 200V machines.

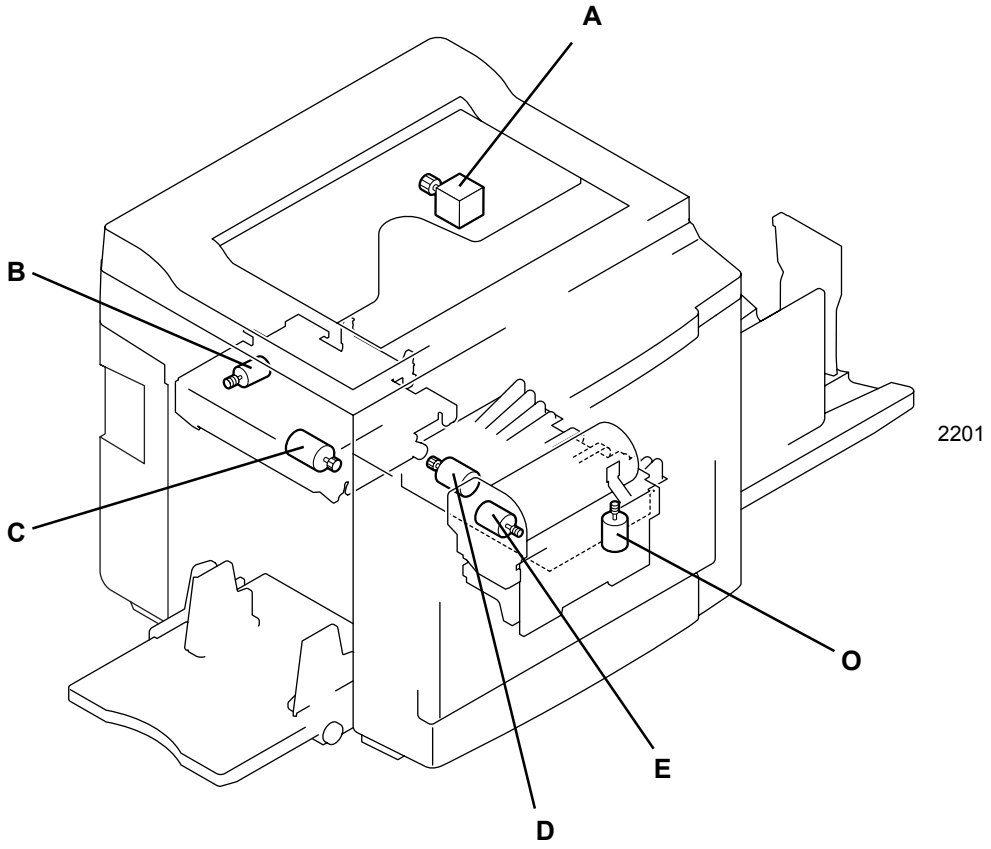
Fuse No.	110V-120V machine	220V-240V machine	System	Phenomenon/affected parts
F1	125 V 10 A	250 V 6.3 A	Main	Main Power Supply (No power if this fuse defective)
F2	125 V 3.15 A	250 V 3.15 A	+24 VA	Locking solenoid Copy counter Master counter Press solenoid Print-positioning pulse motor Pressure-roller motor Ink motor
F3	125 V 3.15 A	250 V 3.15 A	+24 VB	FB pulse motor AF transfer motor Write pulse motor Thermal-pressure motor Paper-feed clutch Paper-ejection transfer motor Cutter motor Load pulse motor Compression motor Master-removal motor Elevator motor Clamp motor
F4	125 V 3.15 A	250 V 3.15 A	+24 VG	Option
F5	125 V 8 A	250 V 8 A	+24 VM	Main motor
F6	125 V 3.15 A	250 V 3.15 A	+24 VC	Separation fan Suction fan

[Memo]

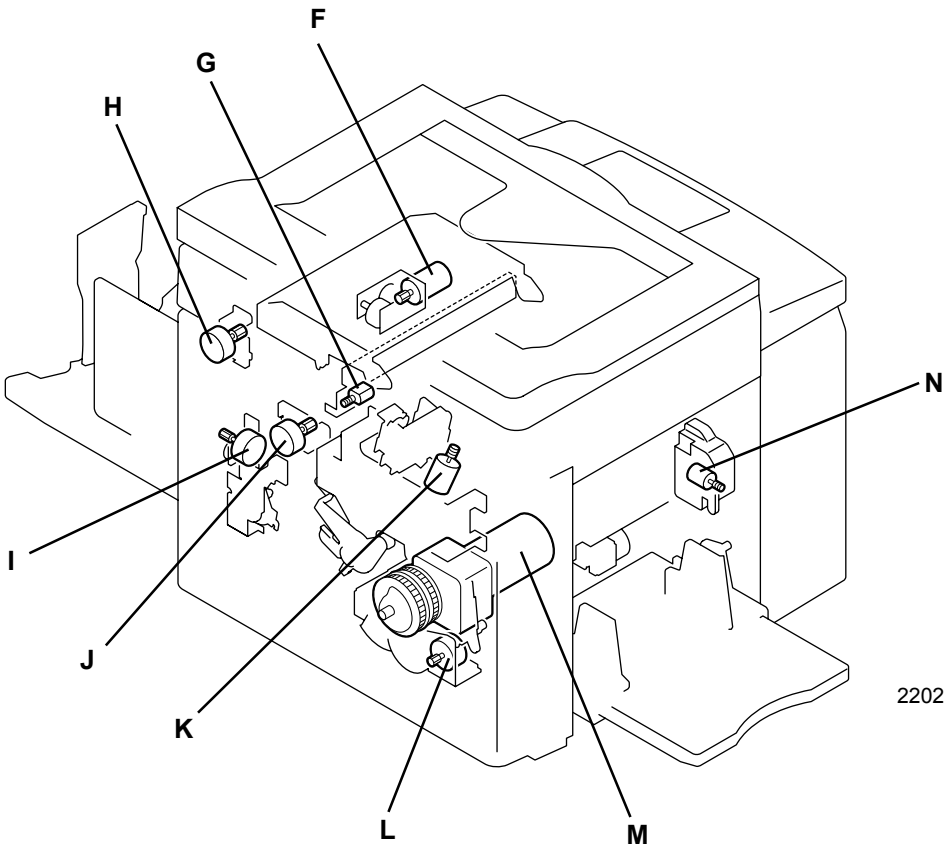
CHAPTER 22: ELECTRICAL COMPONENTS

Contents

1. Motors



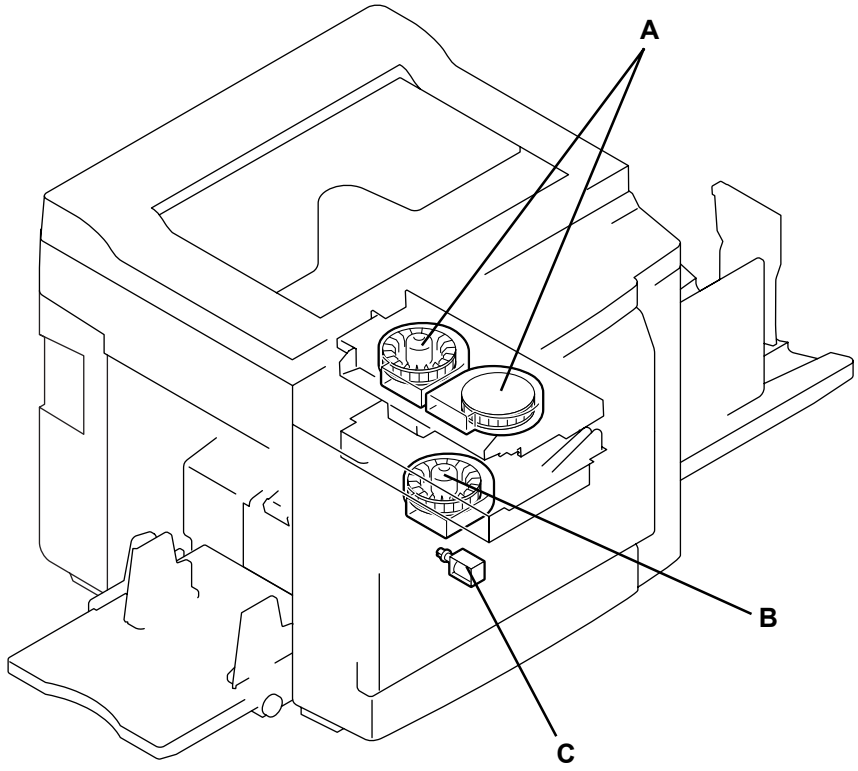
2201



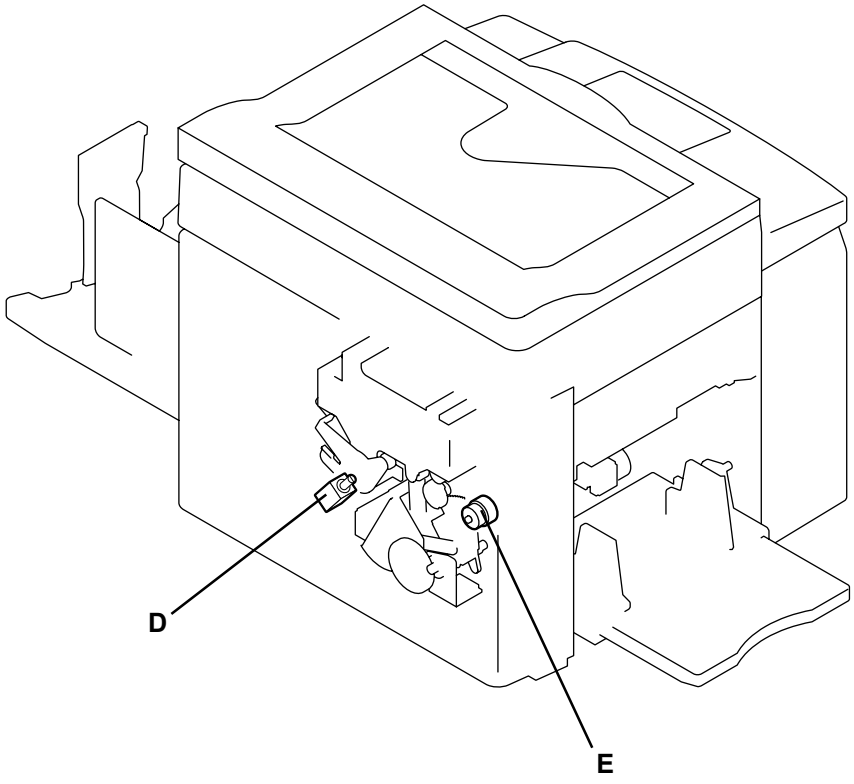
2202

Symbol	Name of part	Function	Test Mode No.
A	FB read pulse motor	Transports the lamp carriage and mirror carriage.	152
B	Compression motor	Compresses removed masters in the master-disposal box.	351
C	Master removal motor	Rotates the master-removal vertical feed roller.	330
D	Paper ejection motor	Drives the transfer belts.	430
E	Ink pump motor	Drives the ink pump.	------
F	Thermal pressure motor	Moves the thermal head in the vertical directions.	230 231
G	Cutter motor	Operates the cutter.	237
H	Write pulse motor	Rotates the platen roller.	232 233
I	Pressure control motor	Rotates the print-pressure-gear assembly.	655
J	Load pulse motor	Rotates the loading roller.	234 235
K	Clamp motor	Operates the clamp-open arm and master-release arm.	532 533
L	Print positioning pulse motor	Moves the print-positioning-plate assembly.	651
M	Main motor	Rotates the drive section.	530 531
N	Elevator motor	Moves the paper-feed tray in the vertical directions.	452
O	Paper ejection wing motor (RN25 Series)	Resets the paper-ejection home position.	455

2. Fans, Solenoids, Electromagnetic Clutch



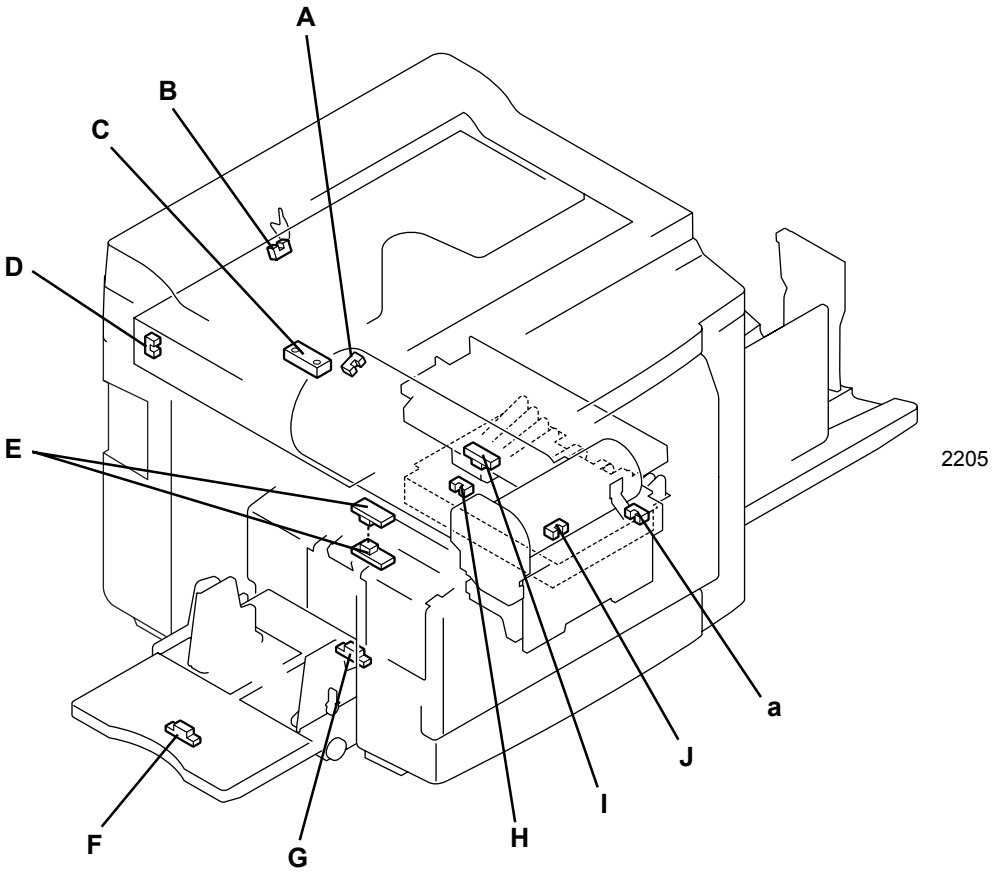
2203



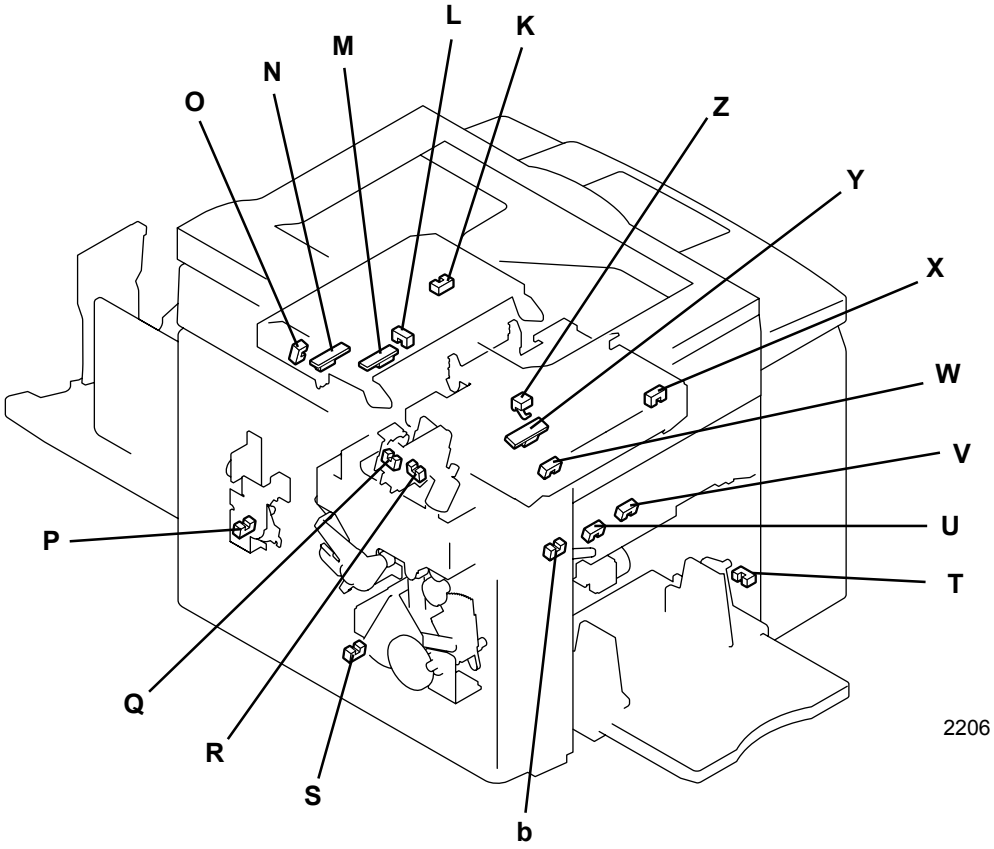
2204

Symbol	Name of part	Function	Test Mode No.
A	Separation fan	Helps remove paper from the print drum.	432
B	Suction fan	Helps adhere paper to the transfer belts.	431
C	Print-drum locking solenoid	Locks or unlocks the print drum to or from the main unit.	-----
D	Press solenoid	Operates the solenoid lever.	-----
E	Paper-feed clutch	Rotates the scraper and pickup roller.	-----

3. Photo-Sensors



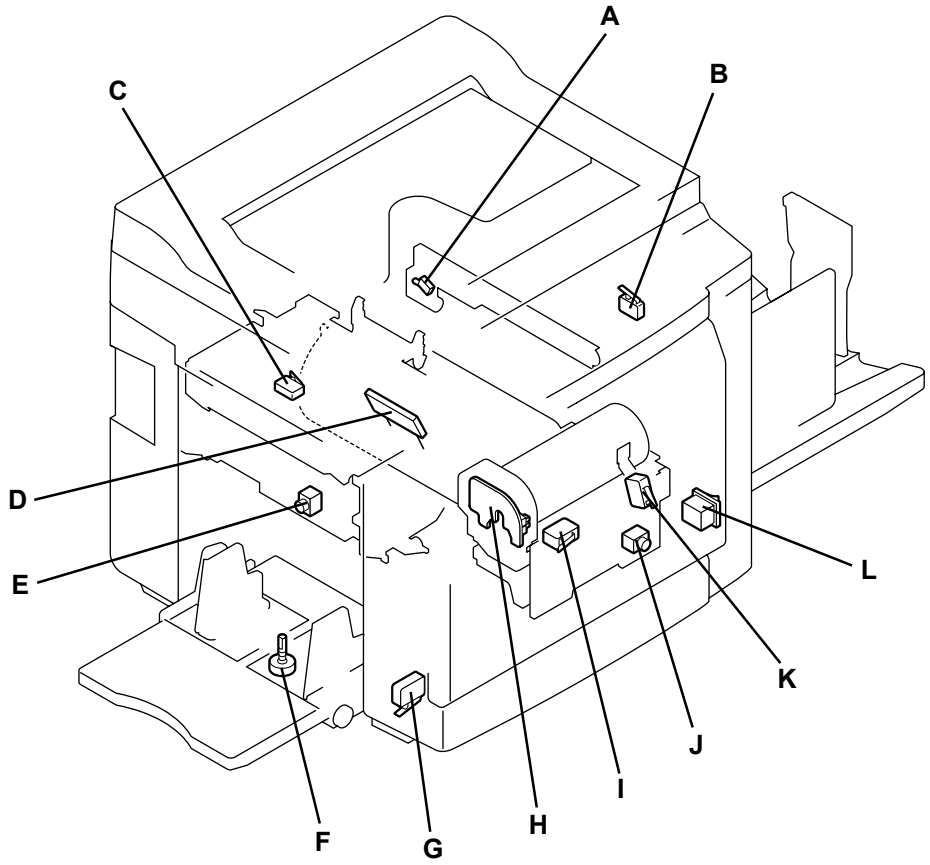
2205



2206

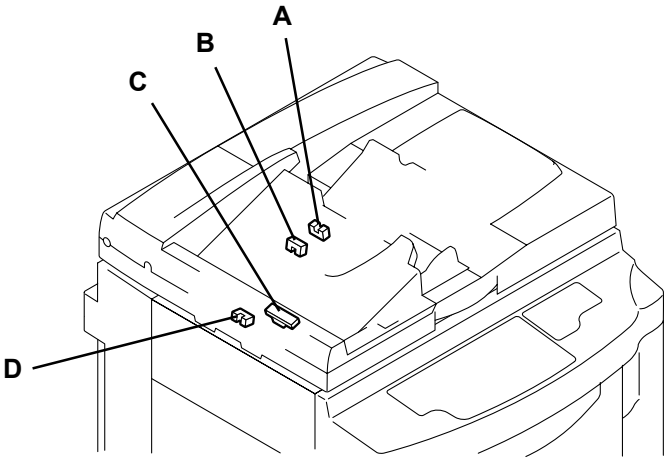
Symbol	Name of part	Type	Function	Test Mode No.
A	Position A sensor	Interrupt	Checks Position A	500
B	Cover-open sensor	Interrupt	Checks whether the stage cover is open or closed.	110 (RN25 Series) 117 (RN20/21)
C	FB original detection sensor	Reflection	Checks whether there is an original on the flatbed.	101
D	FB/AF HP sensor	Interrupt	Checks the lamp-carriage home position.	100
E	Paper sensor	Penetration	Checks the first-stage paper feed.	405
F	Paper size detection sensor	Reflection	Checks the length of the paper on the paper-feed tray.	401
G	Paper detection sensor	Reflection	Checks whether there is paper on the paper-feed tray.	400
H	Paper ejection encoder sensor	Interrupt	Checks the speed of the paper ejection motor.	412
I	Paper ejection sensor	Reflection	Checks whether paper is ejected.	406
J	Print drum set sensor	Interrupt	Checks the print-drum set position.	519
K	Master loading set sensor	Interrupt	Checks the master-loading set position.	205
L	TPH pressure sensor	Interrupt	Checks the thermal-head vertical position.	204
M	Master positioning sensor	Reflection	Checks the master standby position and master cutting.	200
N	Master detection sensor	Reflection	Checks the master set position.	202
O	Master end sensor	Interrupt	Checks the master roll end.	201
P	Print-pressure control sensor	Interrupt	Checks the print-pressure home position.	600
Q	Clamp sensor A	Interrupt	Checks the clamp operation.	503
R	Clamp sensor B	Interrupt	Checks the clamp operation.	504
S	Vertical-centering sensor	Interrupt	Checks the vertical home position of printing.	601
T	Paper-feed lower-limit sensor	Interrupt	Checks the paper-feed-tray lower-limit position.	404
U	Paper-feed upper-limit sensor A (RN25 Series) Paper-feed lower-limit sensor (RN20/21 Series)	Interrupt	Checks the paper-feed-tray upper-limit position.	402
V	Paper-feed upper-limit sensor B (RN25 Series)	Interrupt	Checks the paper-feed-tray upper-limit position.	403
W	Master compression sensor	Interrupt	Checks the master-compression plate home position.	301
X	Master-disposal-box full sensor	Interrupt	Checks whether the master disposal box is full.	302
Y	Master sensor	Reflection	Checks whether there is a master on the print drum.	506
Z	Master jam sensor	Actuator	Checks the master vertical feed.	300
a	Wing HP sensor (RN25 Series)	Interrupt	Checks the paper-ejection-wing home position.	413
b	Paper-feed pressure sensor (RN25 Series)	Interrupt	Checks the paper-feed-pressure lever position.	414

4. Other Sensors, Switches, and Potentiometers

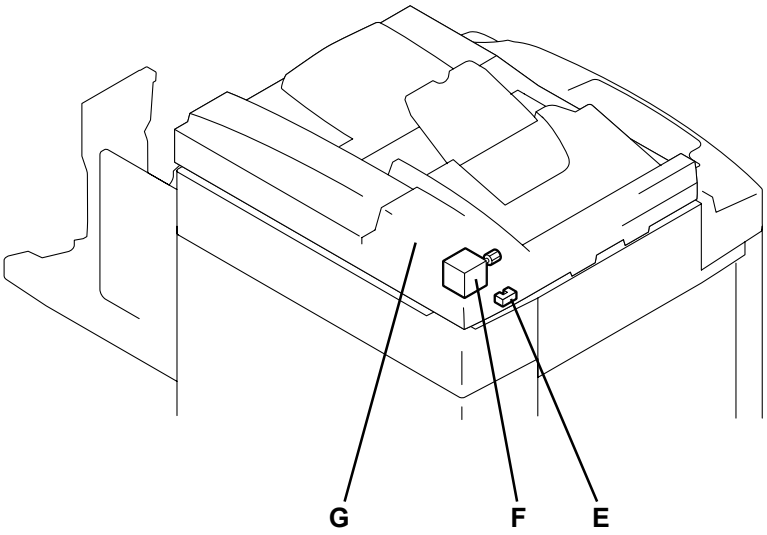


Symbol	Name of part	Function	Test Mode No.
A	Cutter HP switch	Checks the cutter home position.	203
B	Flatbed set switch	Checks the scanner-table set position. Forcibly turns OFF the main motor, clamp motor, and TPH power supply.	206
C	Master-disposal-box safety switch	Checks the master-disposal-box set condition. Forcibly turns OFF the master-removal motor and compression motor.	303
D	Ink sensor Overflow sensor	Checks the presence of the ink bead in the drum. Checks for ink overflow.	509 510
E	Elevator descent switch	Lowers the paper-feed tray manually.	409
F	Paper-width potentiometer	Checks the width of the paper on the paper-feed tray.	-----
G	Paper-feed-tray descent safety switch	Forcibly turns OFF the elevator motor.	408
H	Ink-cartridge set switches 1–5	Checks the ink-cartridge set position.	511 512 513 514 515
I	Print-drum set safety switch	Forcibly turns OFF the main motor and clamp motor.	520
J	Print-drum removal switch	Sets the print drum at position A.	518
K	Front cover set switch	Checks the front-frame-cover set position.	517
L	Power switch	Turns the main power ON/OFF.	-----

5-1. Electrical Parts of AF - Optional (RN25 Series)



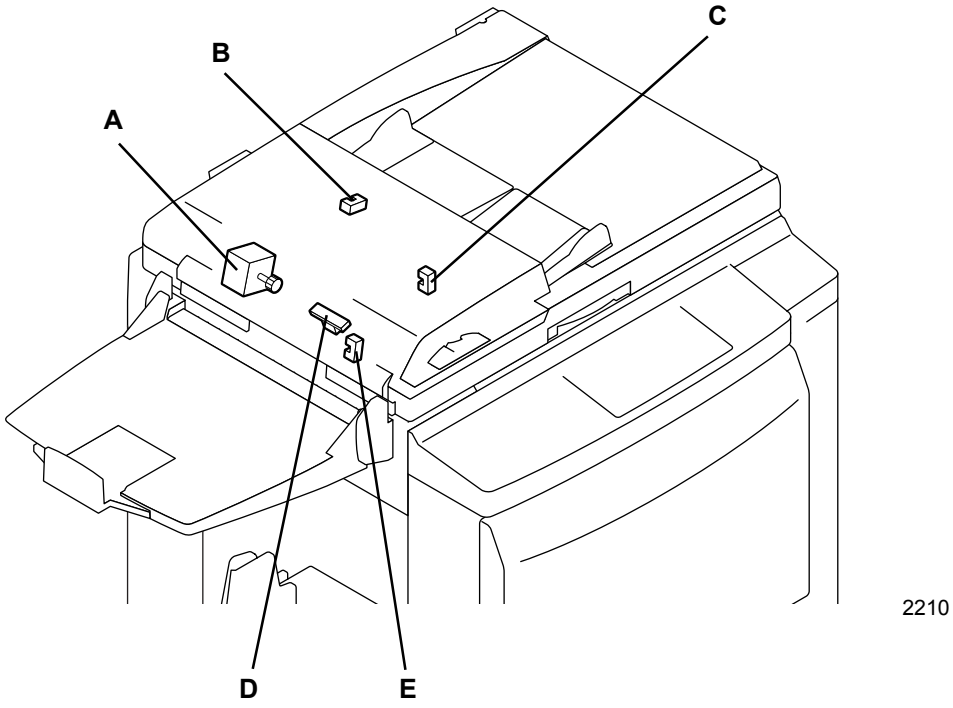
2208



2209

Symbol	Name of part	Function	Test Mode No.
A	AF original detection sensor	Checks the AF original set position.	703
B	AF registration sensor	Checks the original transfer.	700
C	AF read sensor	Checks the original transfer.	701
D	AF original ejection sensor	Checks the original ejection.	702
E	AF cover set sensor	Checks the AF set position.	707
F	AF read pulse motor	Drives the AF original transfer roller.	730

5-2. Electrical Parts of AF - Optional (RN20/21 Series)



Symbol	Name of part	Function	Test Mode No.
A	AF read pulse motor	Drives the AF original transfer roller.	132 133
B	AF original detection sensor	Checks the presence of the originials on the AF unit.	113
C	AF registration sensor	Checks the original transfer.	110
D	AF read sensor	Checks the original transfer.	111
E	AF original ejection sensor	Checks the original ejection.	112