RP

SERIES

TECHNICAL MANUAL

VERSION 2.0
JULY 2003

RISO INTERNATIONAL GROUP

RISO KAGAKU CORPORATION (JAPAN)
RISO, INC. (U.S.A.)
RISO EUROPE LIMITED (U.K.)
RISO HONG KONG (HONG KONG)
RISO UK (U.K.)
RISO THAILAND LIMITED (THAILAND)
RISO KOREA LIMITED (KOREA)
RISO DEUTSCHLAND GMBH (GERMANY)
RISO FRANCE (FRANCE)
RISO IBERICA (SPAIN)
RISO CANADA (CANADA)
ZHUHAI RISO TECHNOLOGY (CHINA)
RISO AFRICA (SOUTH AFRICA)
RISOGRAPH ITALIA (ITALY)

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CHAPTER 1: MAINTENANCE

Contents

1. Preface

This manual provides Technical Service Information for the **RISOGRAPH** model **RP** series.

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

CAUTION

[Handling of Lithium Battery]

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

1. **Never let the battery short-circuited.**
   If the (+) and (-) terminals contact each other or metal materials, the battery will be short-circuited. If the batteries are collected and stored inorderly or one upon another, the above-mentioned case will occur.

- DANGER -

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

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

- DANGER -

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

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

- DANGER -

If you disassemble the battery, the gas pouring out of the inside may hurt your throat or the negative lithium may heat up into fire.
If the battery is pressed into deformation, the liquid inside may leak out of the sealed part or the battery may be short-circuited inside an explode.

4. **Never fail to keep the battery out of reach of children.**
   If you put the battery within reach of children, they may swallow it down.
   Should they swallow the battery, immediately consult the doctor.

[Replacement of the Lithium Battery]

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

!! WARNING !!

Important Safety Precautions

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

I. To avoid injuries:
Be sure to disconnect the electrical power before disassembling, assembling,or when making adjustments on the machine.

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

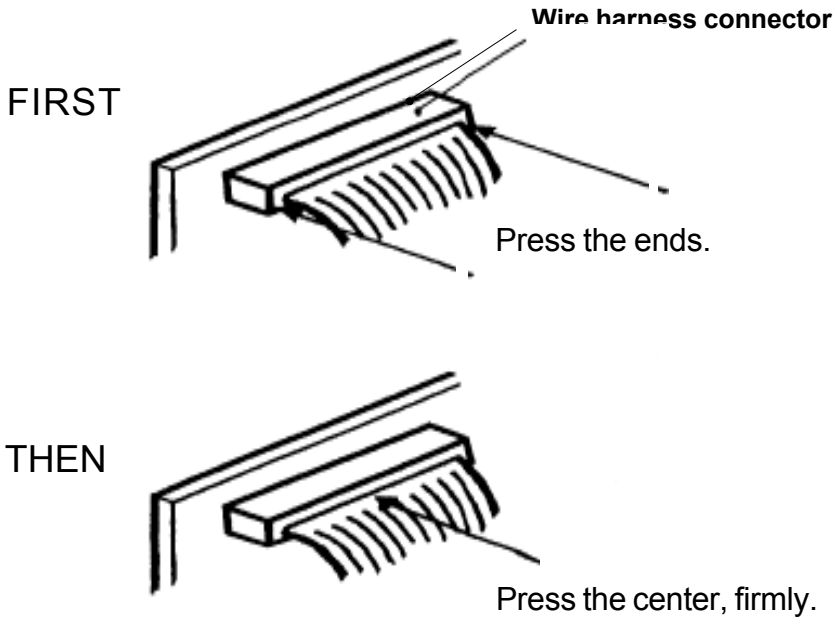
2. WARNING:

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

3. Always connect electrical connectors firmly.

I. To avoid electrical failure:
The connectors must be connected firmly together and onto the PCBs.
Press on the ends of the connectors and then on the middle to ensure a firm fit.

II. Protection of the electrical components:
The electrical components may be damaged due to short circuits caused by a loose connector.



2. Work Precautions

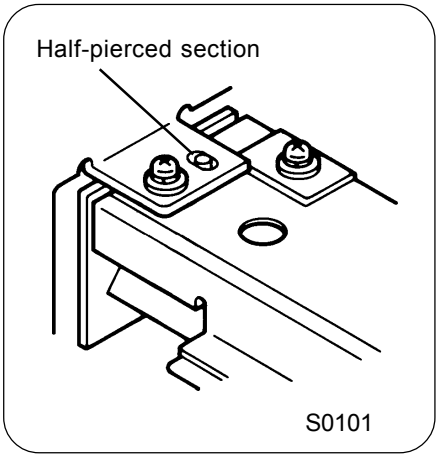
Inspection

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

Removal

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

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



Assembly and Installation

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

Tools

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

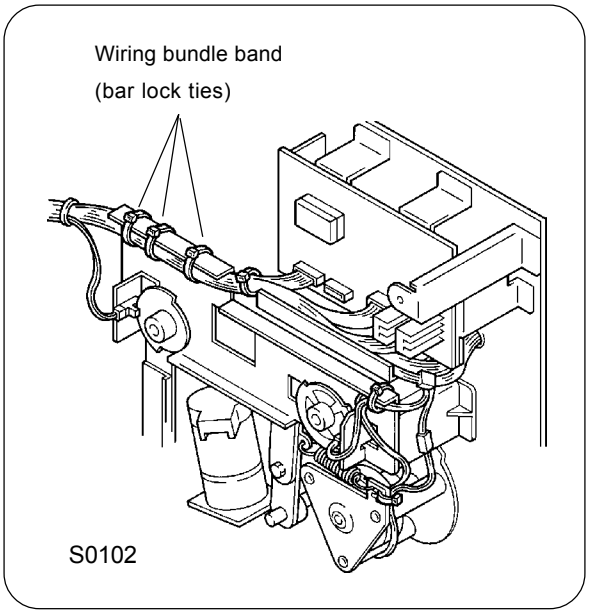
<Standard Tool list>

Type	Tip size	Shaft length, etc.
Phillips screwdriver	No. 2 No. 2 No. 2 No. 1	(250 mm) (100 mm-150 mm) (stubby type) (75 mm-100 mm)
Standard screwdriver	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 (may be double-ended)	5 mm 8 mm Monkey	5.5 mm 7 mm 10 mm 13 mm
Hex wrenches	5.0 mm 4.0 mm 3.0 mm 2.5 mm 2.0 mm 1.5 mm	→ Two pieces are 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
Ring pliers	for C-rings

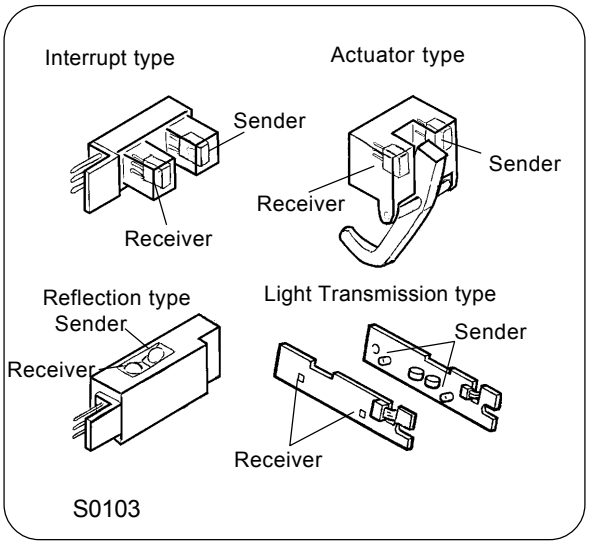
Electrical system work

- ï After removing wire bundles, fasten them with wire bundle bands (bar lock ties) so that they will not sag.
- ï When installing parts, be careful to avoid pinching or damaging the wire bundles.
- ï 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.
- ï Be careful not to drop image scanners, thermal print heads, and other sensors as they can be easily damaged.



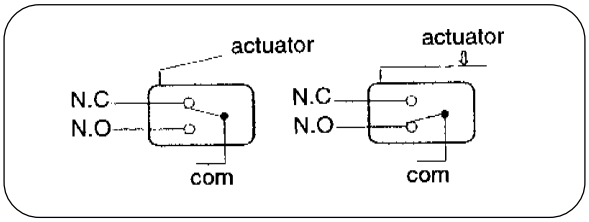
Sensor types

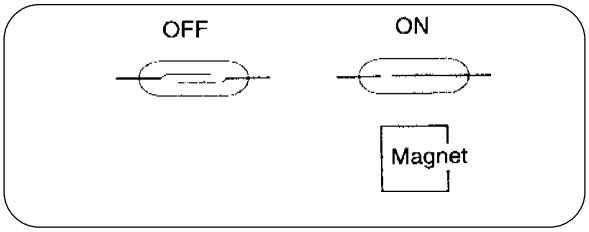
- ï Photo-electric sensors may be broadly divided into the following four types: interrupt types (U-shaped), actuator types, reflective types, and transmittive types.
- ï Magnetic sensors use Hall ICs, which react to the magnetic force in magnets.
- ï Always turn off the power before plugging or unplugging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



Switch types

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





Installation location

- ï Do not install the machine in any of the following locations.

(1) Those subject to direct sunlight or any bright location such as by a window (If you must install in such a location, put a curtain or the like over the window.)
(2) Those where the temperature changes drastically
(3) Those that are too hot, cold, humid, or dry
RECOMMENDED:
Temperature range: 15∞ centigrade - 30∞ centigrade
Humidity range: 40% - 70% No condensation allowed
(4) Those with radiant heat sources and any locations in the direct path of air from air conditioners, heaters
(5) Any poorly ventilated location
(6) Dusty atmosphere
(7) Any tilted location
(Installation height difference: 10 mm max. front - rear, 10 mm max. left - right)

Electrical connection

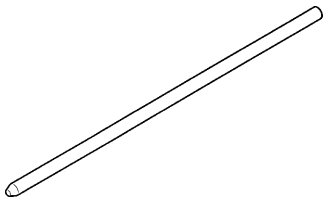
- ï Plug the plug securely into the socket so that there is no problem with the contact in the power supply plug section.
- ï Do not use any triplets or extension cords.
- ï Do not allow any other machine to stand on or crush the power cord.

Ground connection

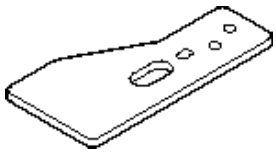
- ï Always ground this machine to prevent electrical shock in the unlikely event of electrical leakage.

JIGs

Following JIGs are available from our parts center if ordered by their part numbers given below.

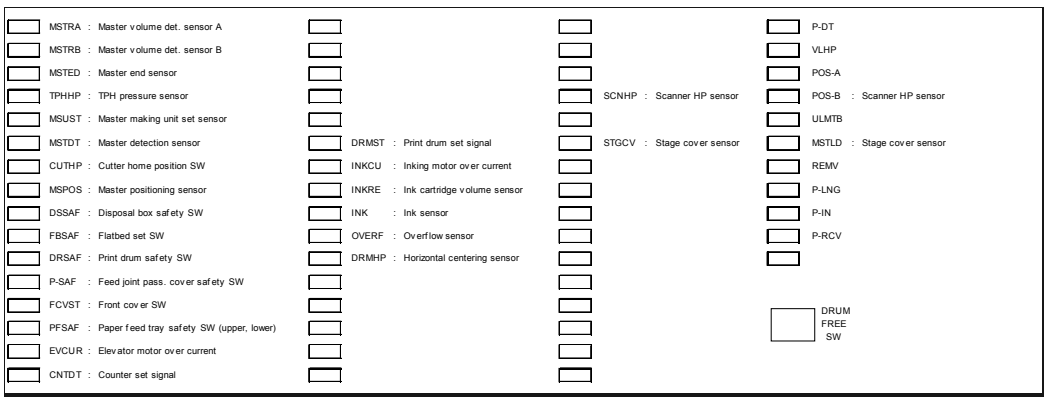


015-26128-008
Drum Shaft JIG



015-26836-002
Drum Stand Plate

030-90010-050
LED Unit

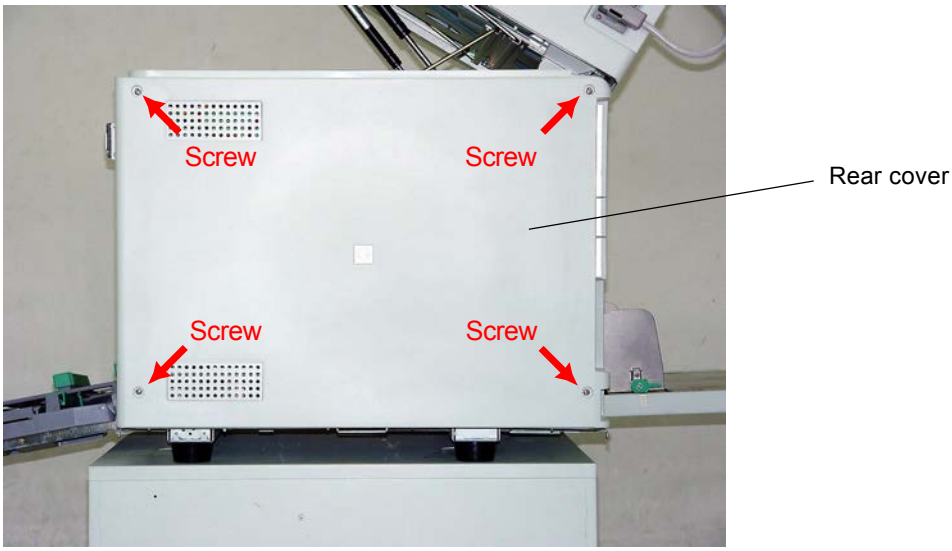


3. Exterior Cover Removal

* Bring the Print drum to position B, disconnect the power cable and other external connector cables, and then remove the covers.

Rear cover

- Open the scanner table.
- Remove the four screws (M4 x 8), and remove the rear cover.



P0101

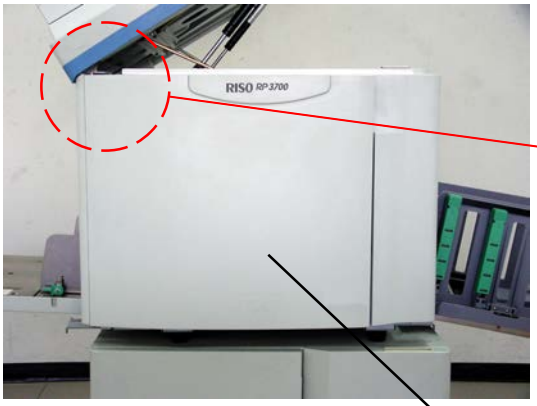
Left cover

- Remove the two screws (M4 x 8), and remove the left cover.

P0116

Front cover

- Open the front cover, remove the screw (M4 x 8) on the upper left hinge, and then remove the front cover.



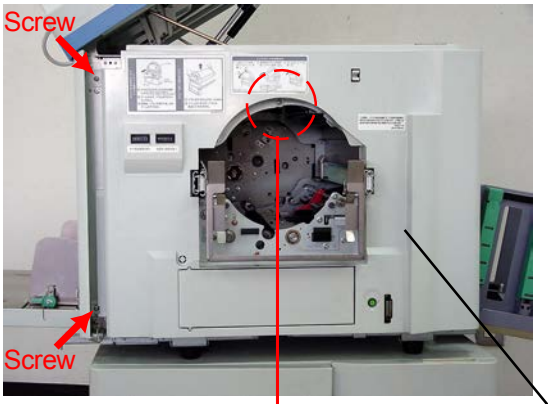
P0102

P0103

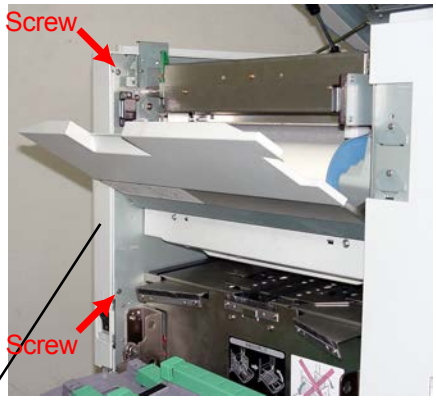
Front cover

Front frame cover

- Remove the print drum, and remove the front cover.
- Open the scanner table.
- Remove the five screws (M4 x 8), and remove the front frame cover.



P0105



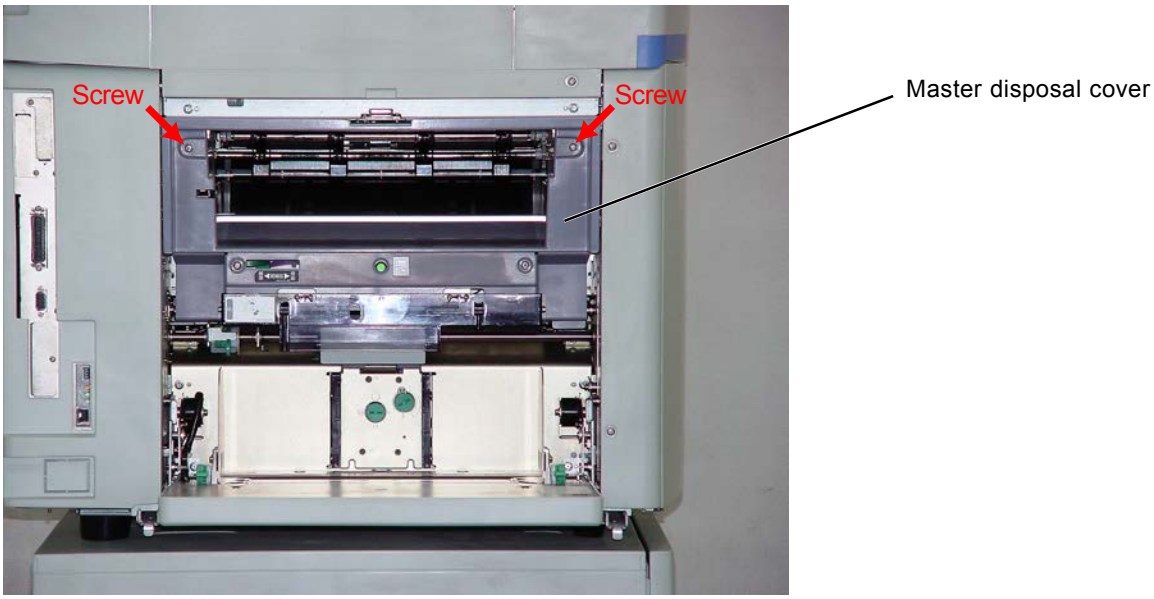
P0106

Front frame cover

P0108

Master disposal cover

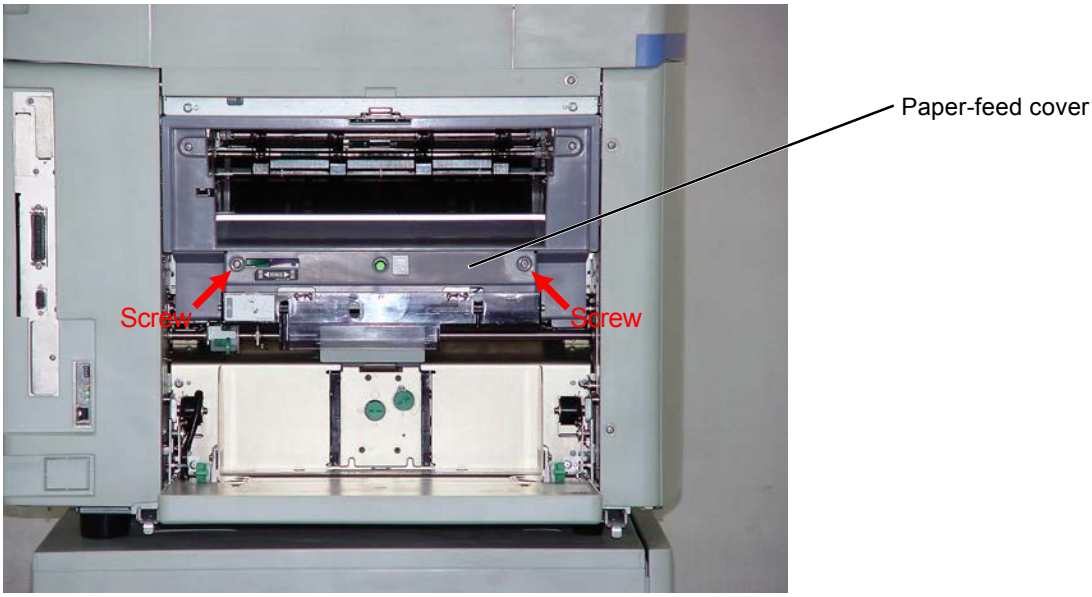
- Remove the master disposal cover.
- Remove the two screws (M4 x 8), and remove the master disposal cover.



P0109

Paper-feed cover

- Remove the two screws (M4 x 8), disconnect the connectors, and then remove the paper-feed cover.

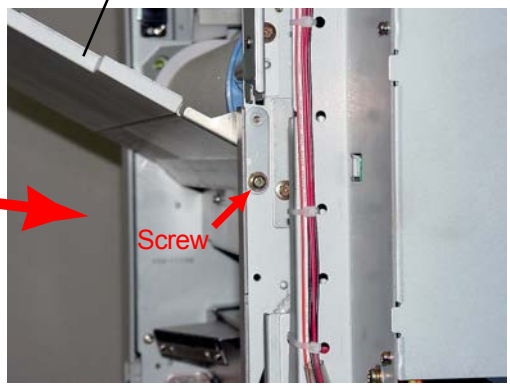


P0120

Master-roll cover

- Remove the rear cover.
- Remove the master-roll cover support plate from the rear by unscrewing a screw (M4 x 8), and remove the master-roll cover.

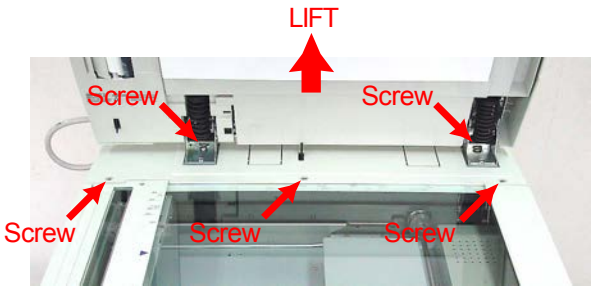
P0110



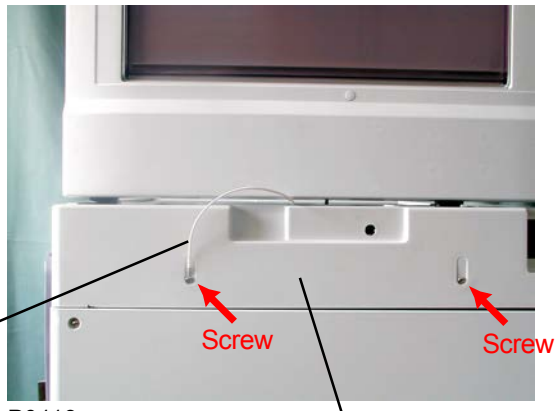
P0111

Scanner-unit cover (rear)

- Remove the two screws (M4 x 8) on the stage cover hinge, detach the ground wire (fastened to the scanner-unit rear cover with M4 x 8 screws), and then remove the stage cover. (In addition, remove the AF and Digitizer if they are equipped.)
- Remove the remaining four screws (M4 x 8), and remove the scanner-unit cover (rear).



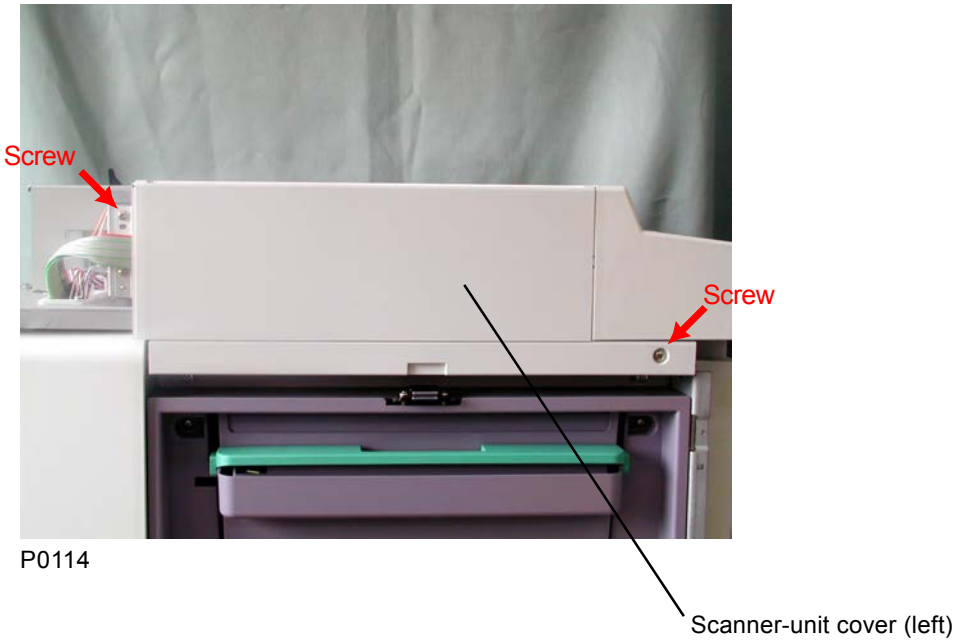
P0112



P0113

Scanner-unit cover (left)

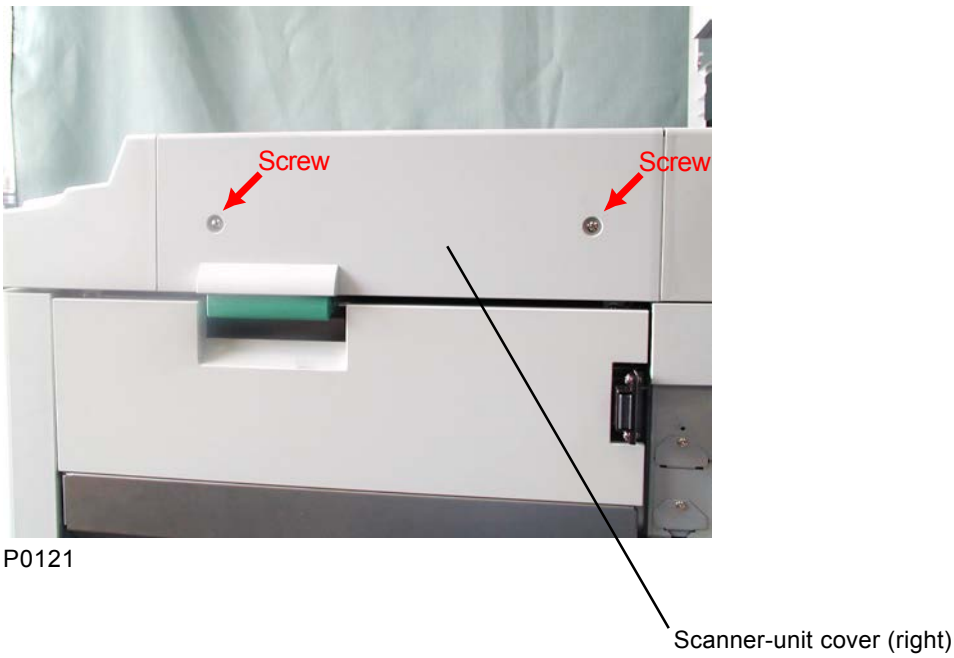
- Remove the scanner-unit cover (rear).
- Remove the scanner-unit cover (left) by removing two screws (M4 x 8).



P0114

Scanner-unit cover (right)

- Remove the scanner-unit cover (rear).
- Remove the scanner-unit cover (right) by removing two screws (M4 x 8).



P0121

Operaiton panel

- Remove the three screws (M4 x 8), disconnect the wire harness from the rear, and then pull the Control panel forward to remove it.

P0115

Operation panel

4. Opening Power Supply Unit and Main PCB Unit

The power-supply unit and main PCB unit can be opened approximately 90 degrees to the left and right, as described below, for maintenance of the mechanism at the rear.

(1) Remove the rear cover (see this chapter).

(2) Disconnect the connector (CN12) at the power-supply unit for the wire harness between the power-supply unit and the main PCB unit.

Power-supply unit

(3) Remove connector (CN10) on power-supply unit for the wire harness from the master-making unit.

(4) Open wire saddle [E] on the main unit, and release the wire harness on top of the power-supply unit.

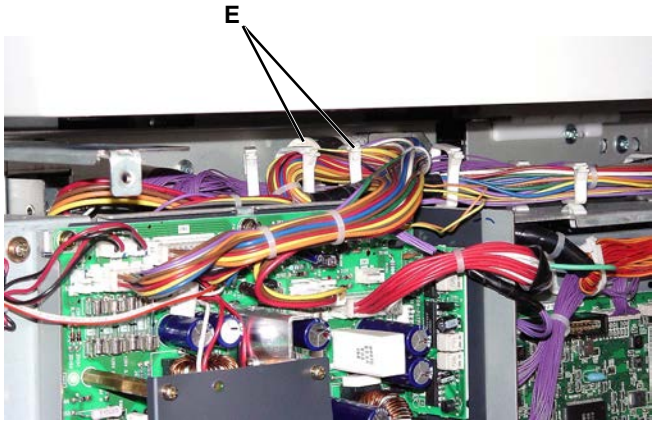
(5) Remove the three screws (M4 x 8), raise the power-supply unit [A] slightly, and open it out to the left by 90 degrees.

Main PCB unit

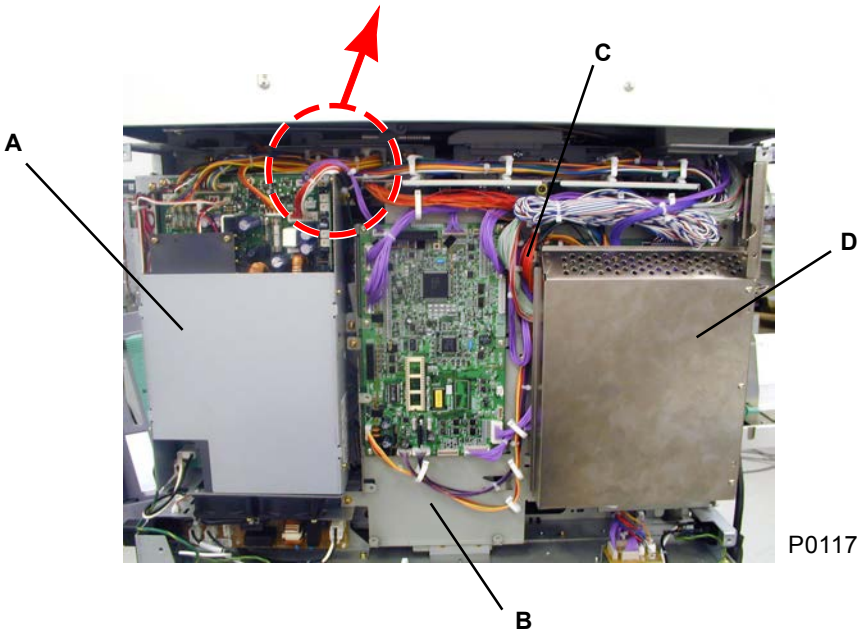
(3) Remove the PCB cover [D] above the main PCB unit by removing five screws (M3 x 6).

(4) Remove the image-processing PCB [C] connector (CN4) for the wire harness on the top left of the main PCB unit.

(5) Remove the five screws (M4 x 8), raise the main PCB unit [B] slightly, and open it out to the right by 90 degrees.



P0119



P0117

A: Power-supply unit
B: Main PCB unit
C: Image-processing PCB
D: PCB cover
E: Wire saddle

CHAPTER 2: MACHINE OUTLINE

Contents

1. Major Features

(1) Large Touch Screen Operation Panel

(2) Multi Tray Paper Feeder (For RP3790, 3590 only)

Standard paper feed tray	(Capacity: 1000 sheets)
Tray 1	(Capacity: 1000 sheets)
Tray 2	(Capacity: 1000 sheets)

(3) Auto Control Stacking Tray (Standard for RP3790, 3590)

(4) Page Renew (Master remaking function)

You can renew a master from the last scanned page, or from data sent from the PC.

(5) Consumable Volume Detection (Not available on 300 dpi machines)

Indicates the remaining percentage of ink, master, paper, and the emptiness of the disposal box.

(6) Double-feed Detection (Not available on 300 dpi machines)

(7) Halftone Curve Adjustment (For RP3790, 3700 only)

You can select from three levels of lightness (highlight) and darkness (shadow) for the graduation when printing halftone images (photographs).

(8) Energy Saving Mode

“Auto Power-off”, “Auto Sleep”, “Fixed Time Power-off”

2. Specifications

Given on this and the next pages are general specifications of the 600 dpi, 400 dpi and 300 dpi machines.

Refer to the users guide on each models for more specific and detailed specifications.

600 dpi machines

Specifications	RP3790	RP3700
Original Size	Max. A3 (297x420mm) or Ledger (11"x17") Min. Business Card (50x90mm) or 2"x3.5"	
Scanning Resolution	600x600dpi	
Paper Size	Max. 340x435mm (13.4"x17.1") Min. 90x140mm (3.5"x5.5") (When using Multi-tray transfer unit) A3/B4/A4/B5/Foolscap (216x340mm) or Ledger/Legal/Letter	Max. 340x435mm (13.4"x17.1") Min. 90x145mm (3.5"x5.5")
Paper Weight	46-210g/m2 (13-lb bond to 110-lb index) (When using Multi-tray transfer unit) 52-104g/m2 (14-lb bond to 28-lb bond)	46-210g/m2 (13-lb bond to 110-lb index)
Image Area	A3 Drum: 290x412mm Ledger Cylinder: 11.4"x16.7"	
Paper Feed Tray Capacity	Multipurpose Paper Feed Tray : 1,000 sheets (64g/m2 or 16-lb bond) Paper Feed Tray 1, 2 : 1,000 sheets each (64g/m2 or 16-lb bond)	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 120 copies per minute)	
Dimensions In use (WxDxH)	1,380x695x1,085mm (54.3"x27.4"x42.7")	1,370x695x660mm (53.9"x27.4"x26.0 ")
In storage (WxDxH)	780x695x1,085mm (30.7"x27.4"x42.7")	755x695x660mm (29.7"x27.4"x26.0")
Weight	Approx. 190kg (419lbs.)	Approx. 121kg (267lbs.)

Specifications are subject to change without notice.

400 dpi machines

Specifications	RP3590	RP3500
Original Size	Max. A3 (297x420mm) or Ledger (11"x17") Min. Business Card (50x90mm) or 2"x3.5"	
Scanning Resolution	400x400dpi	
Paper Size	Max. 340x435mm (13.4"x17.1") Min. 90x140mm (3.5"x5.5") (When using Multi-tray transfer unit) A3/B4/A4/B5/Foolscap (216x340mm) or Ledger/Legal/Letter	Max. 340x435mm (13.4"x17.1") Min. 90x140mm (3.5"x5.5")
Paper Weight	46-210g/m2 (13-lb bond to 110-lb index) (When using Multi-tray transfer unit) 52-104g/m2 (14-lb bond to 28-lb bond)	46-210g/m2 (13-lb bond to 110-lb index)
Image Area	A3 Drum: 290x412mm Ledger Cylinder: 11.4"x16.7"	
Paper Feed Tray Capacity	Multipurpose Paper Feed Tray : 1,000 sheets (64g/m2 or 16-lb bond) Paper Feed Tray 1, 2 : 1,000 sheets each (64g/m2 or 16-lb bond)	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 120 copies per minute)	
Dimensions In use (WxDxH)	1,380x695x1,085mm (54.3"x27.4"x42.7")	1,370x695x660mm (53.9"x27.4"x26.0 ")
In storage (WxDxH)	780x695x1,085mm (30.7"x27.4"x42.7")	755x695x660mm (29.7"x27.4"x26.0")
Weight	Approx. 190kg (419lbs.)	Approx. 121kg (267lbs.)

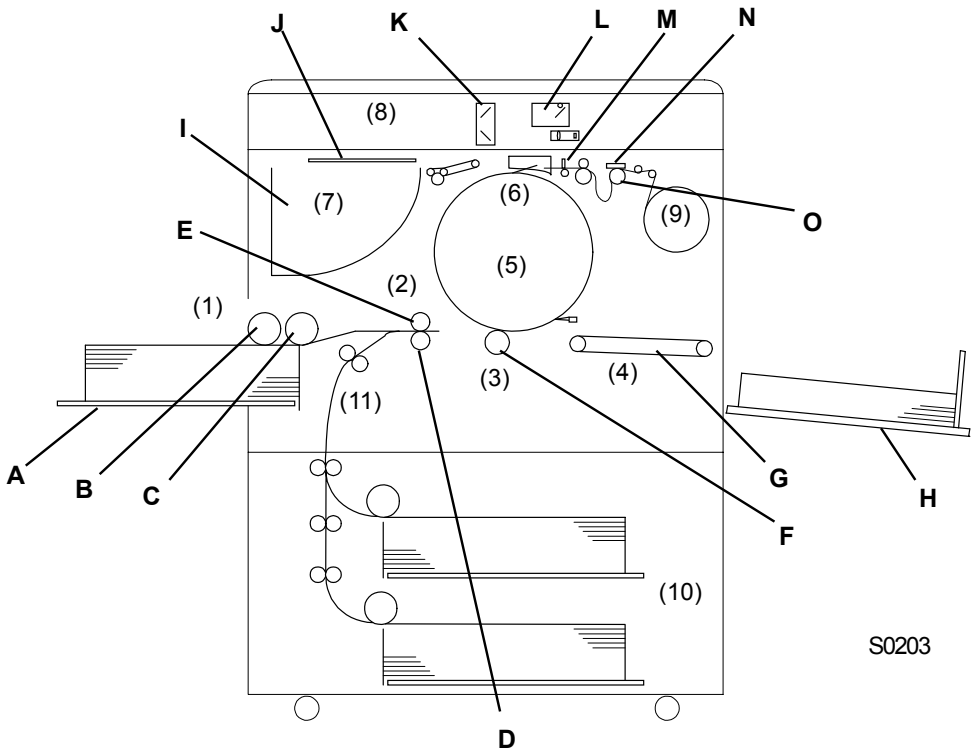
Specifications are subject to change without notice.

300 dpi machines

Specifications	RP3100
Original Size	Max. A3 (297x420mm) or Ledger (11"x17") Min. Business Card (50x90mm) or 2"x3.5"
Scanning Resolution	300x400dpi
Paper Size	Max. 340x435mm (13.4"x17.1") Min. 90x140mm (3.5"x5.5")
Paper Weight	46-210g/m2 (13-lb bond to 110-lb index)
Image Area	A3 Drum: 290x412mm Ledger Cylinder: 11.4"x16.7"
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 120 copies per minute)
Dimensions In use (WxDxH)	1,370x695x660mm (53.9"x27.4"x26.0 ")
In storage (WxDxH)	755x695x660mm (29.7"x27.4"x26.0")
Weight	Approx. 121kg (267lbs.)

Specifications are subject to change without notice.

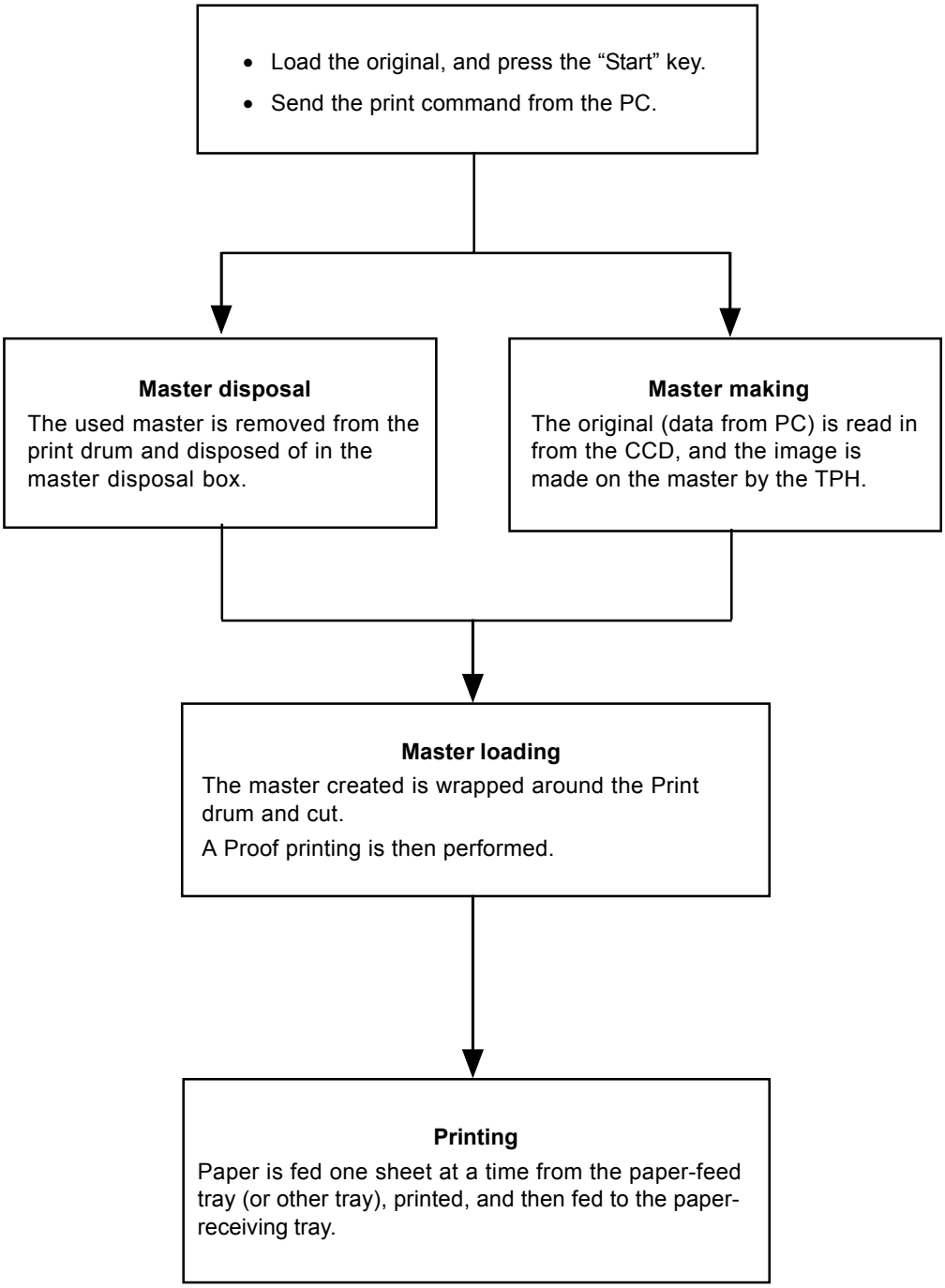
3. Schematic Cross-Sectional View



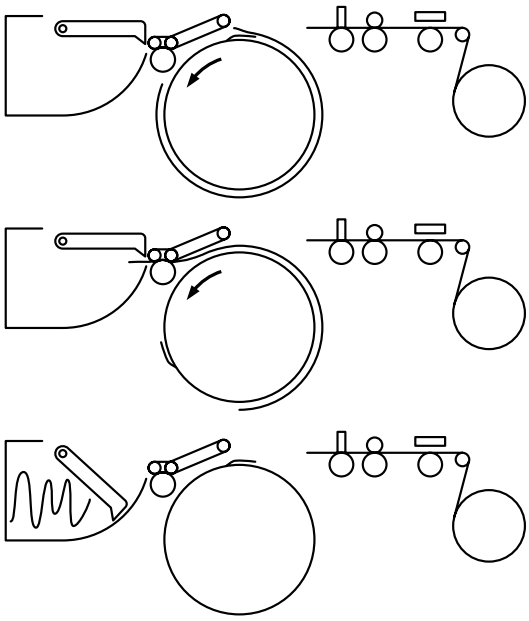
(1)	First paper-feed section	Feeds one sheet at a time to the paper-feed tray.
(2)	Second paper-feed section	Paper fed from the first paper-feed section pauses here before being fed precisely to the print drum and press section.
(3)	Press section	Paper is pressed against the print drum by the pressure roller and fed during printing.
(4)	Paper-ejection section	Printed paper is separated from the print drum by the separator with the air blow, and is then sent to the paper-ejection section.
(5)	Print-drum section	Feeds ink from the ink bottle to the surface of the print drum for printing.
(6)	Clamp section	Opens and closes the clamp plate and master projection plate on the print drum for attachment and release of the Master.
(7)	Master disposal section	Removes the used master from the print drum and ejects it to the master disposal box.
(8)	FB original scanning section	Moves the lamp carriage and mirror carriage to scan the original on the scanner table by CCD.
(9)	Master making section	Feeds in the master, on which the image is created by the TPH. The master created is then fed to the print drum and cut.
(10)	Multi-tray paper-feed section (where equipped)	Feeds one sheet at a time from the specified paper tray.
(11)	Multi-tray transfer unit (where equipped)	Feeds paper between the multi-tray paper-feed section and the second paper-feed section.

A: Paper-feed tray
B: Scraper
C: Pickup roller
D: Timing roller
E: Guide roller
F: Pressure roller
G: Suction unit
H: Paper-receiving tray
I: Master disposal unit
J: Master compression plate
K: Mirror carriage
L: Lamp carriage
M: Cutter
N: TPH
O: Write roller

4. Operation Outline



5. Summary of Master Disposal, Master Making, and Master Loading

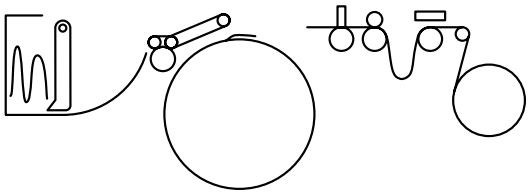


Master Disposal

(1) The clamp plate on the print drum opens, and the master projection plate projects, while the drum rotates to release the master.

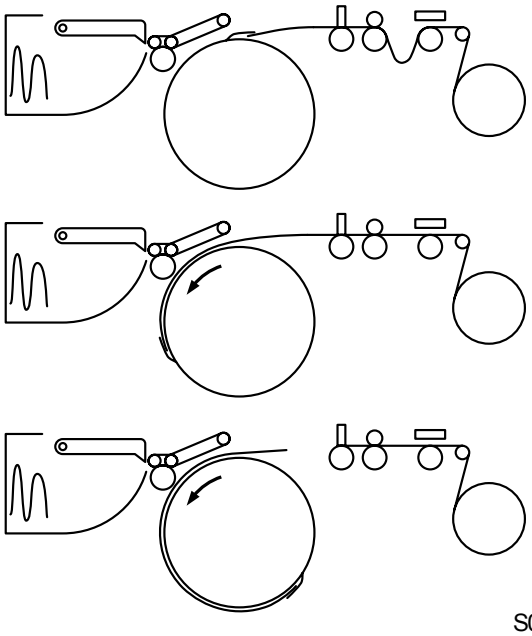
(2) The master disposal roller rotates with the print drum to detach the master and move it to the master disposal box.

(3) The master compression plate activates to compress the master inside the master disposal box.



Master Making

(1) The original is scanned by the CCD, and the image is made on the master by the TPH.



Master Loading

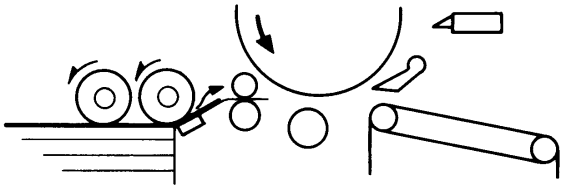
(1) The master is fed to the top of the print drum, where the leading edge is clamped by the clamp plate.

(2) The master is wrapped around the print drum as it rotates.

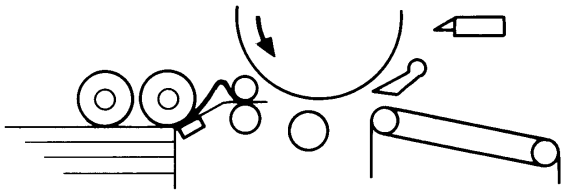
(3) The print drum is rotated, and the master is finally cut by the cutter.

S0201

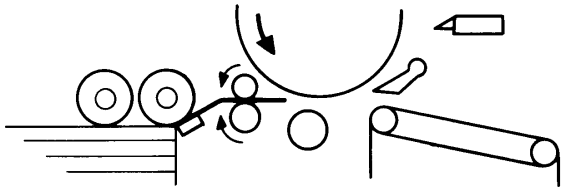
6. Summary of Paper Feeding, Pressing, and Paper Ejection



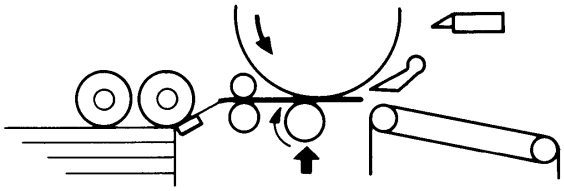
(1) The scraper and pickup roller rotate as the print drum rotates. By the pickup roller and stripper pad, one sheet is fed to the second paper feed section.



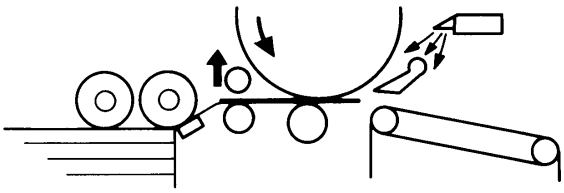
(2) The sheet fed by the first paper-feed section reaches the timing roller and guide roller, where it briefly stops, causing the paper to buckle.



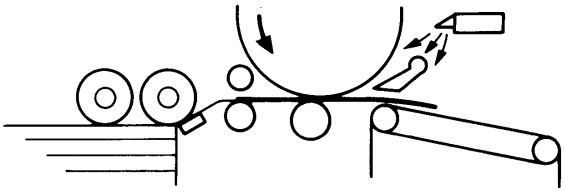
(3) The timing roller and guide roller then rotate to feed the paper to the press section. (This is referred to as the "second paper feed." The scraper and pickup roller spin to prevent slackness in the paper.)



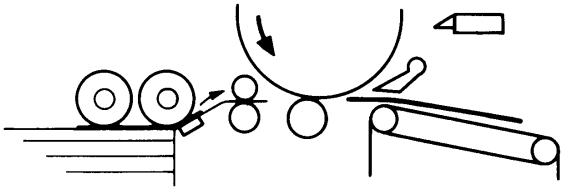
(4) When the paper is fed from the second paper-feed section, the pressure roller rises to press the paper against the print drum. Printing now begins.



(5) The printed paper is separated from the print drum by the separator with the air blow and the separator fan.
The guide roller also rises when the press roller rises to prevent slackness in the paper.



(6) The paper is then sucked against the transfer belt by the suction fan, and fed to the paper-receiving tray.



(7) The next first paper-feed process commences, and the guide roller lowers.

S0202

CHAPTER 3: MAIN DRIVE SECTION

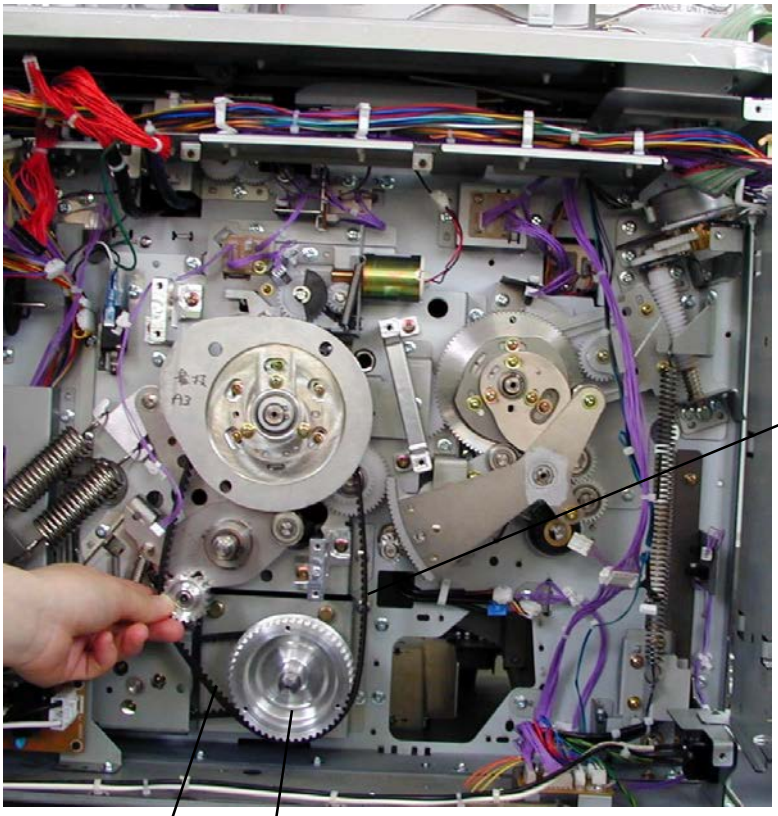
Contents

Mechanism

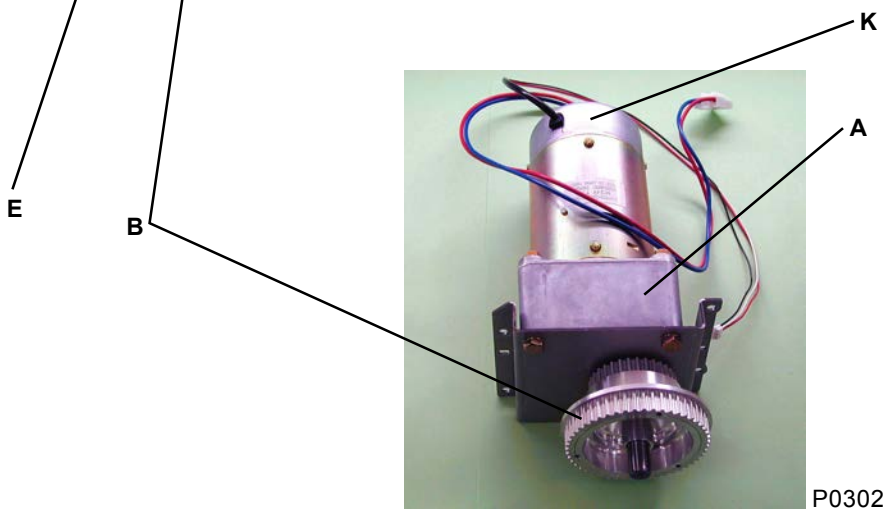
1. Main Drive Section

The motor pulley [B] rotates when the main motor [A] is turned on. This rotation is transmitted to the main pulley (main gear) [D] via the main belt [C], and to the air-pump pulley (air-pump cam plate) [F] via the air-pump belt [E]. The main gear drives the drum gear [G], planet gear [H], cam gear [I], and clutch gear (paper-feed clutch) [J] via the gear train.

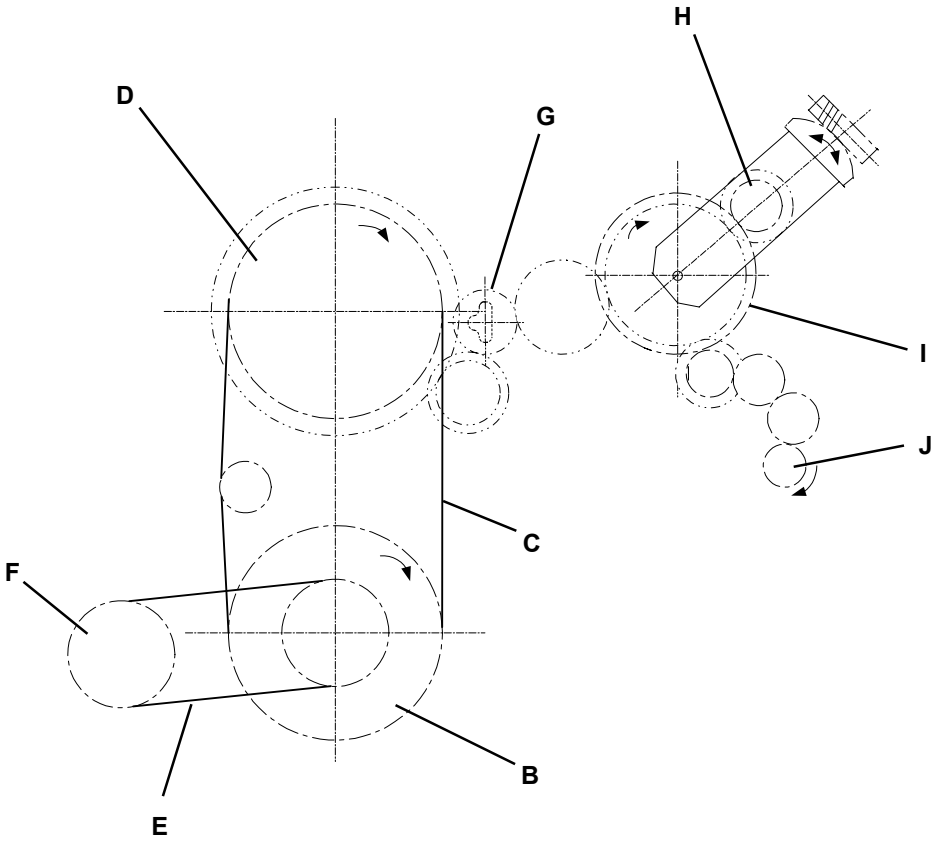
The main-motor limit sensor [K] detects the speed and position of the main motor [A].



P0301



P0302

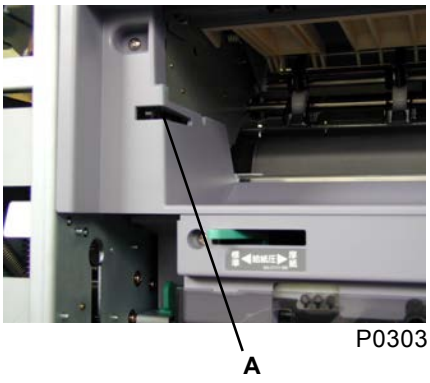


S0301

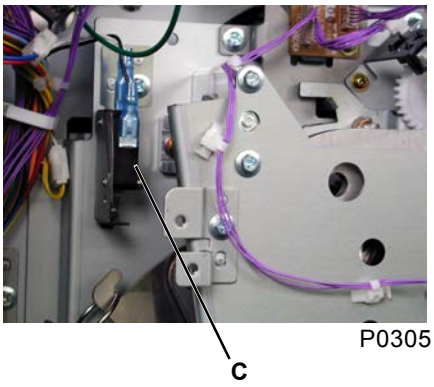
A: Main motor
B: Motor pulley
C: Main belt
D: Main pulley
E: Air-pump belt
F: Air-pump pulley
G: Drum gear
H: Planet gear
I: Cam gear
J: Clutch gear
K: Main-motor limit sensor

2. Main-Motor Safety Mechanism

The following three (four on multi tray machines) safety switches prevent the main motor from being switched on if the respective sections are not properly positioned: Disposal-box safety SW [A], flatbed set SW [B], print-drum safety SW [C], (feed-joint pass-cover safety SW [D]).



P0303



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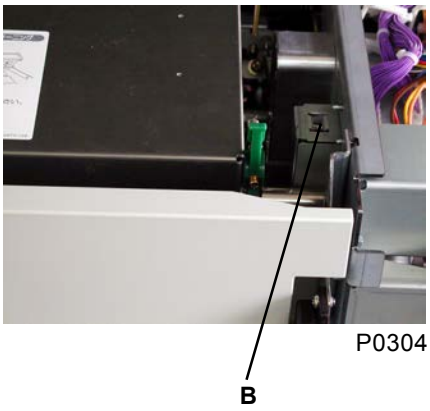
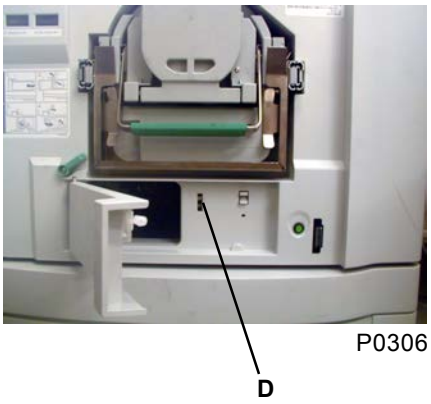


P0304



P0306

(Upper of the two switches)

A: Disposal-box safety SW
B: Flatbed set SW
C: Print-drum safety SW
D: Feed-joint pass-cover safety switch

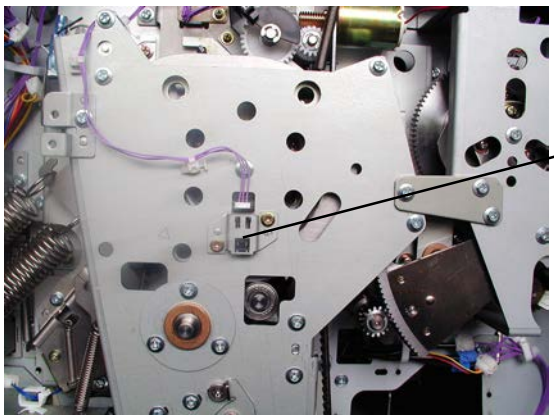
The motors specified below stop if any of the safety switches are detached.

Disposal-box safety SW	Main motor, clamp motor, cutter motor, master disposal motor, master compression motor,TPH power
Flatbed set SW	Main motor, clamp motor, cutter motor, master disposal motor, master compression motor,TPH power
Print-drum safety SW	Main motor, clamp motor, cutter motor, master disposal motor,master compression motor
Feed-joint pass-cover safety SW	Main motor

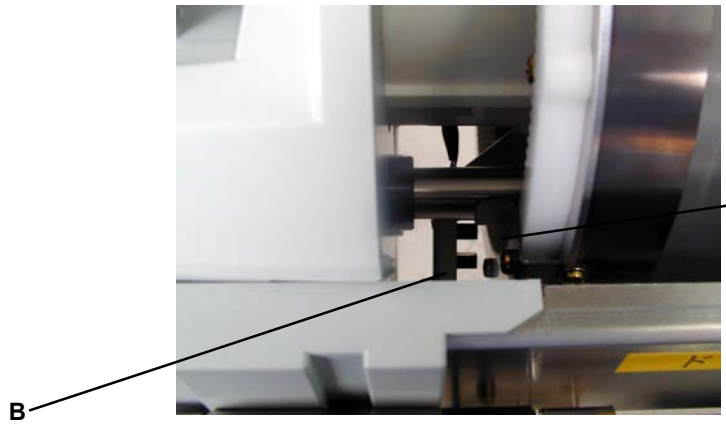
T0301A

3. Print-Drum Position Check Mechanism

- Position B is checked by the Position-B sensor [A] attached to the pressure-cam stay ass'y, and the Position-B detection plate attached to the main-pulley ass'y. Position B is the position of the print drum with the main-motor limit-sensor control pulse + the adjustment rotation amount, after the Position-B detection plate blocks the Position-B sensor light beam. It is the datum position for controlling the machine. (It is the position at which the print drum stops following printing, and at which the print drum is removed.)
- The position of the print drum for master loading and disposal is checked by the Position-A sensor [B] attached to the print-drum stay ass'y and the Position-A detection plate [C] attached to the print drum. It is checked by the main-motor limit sensor, with Position A serving as the datum. Position A is the position of the Print drum with the control pulse + the adjustment rotation amount after the Position-A detection plate blocks the Position-A sensor light beam.
- The Position-A and -B sensors check whether the main drive system is rotating (At print drum revomal, only Position -B sensor is checked).
- The main-motor limit sensor counts 2933 pulses for each revolution of the print drum.



P0307



P0308

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

Removal and Assembly

1. Removing the Main-Motor Unit

(1) Remove the print drum, turn off the power, and then remove the following components:
- Front cover
- Front frame cover (Reinsert the print drum following removal to maintain Position B and ease work.)
- Rear cover

(2) Open the power-supply unit and the main PCB unit to the left and right, respectively.

(3) Loosen the screw (M4 x 8) on the tension plate [A], and then loosen the two screws (M4 x 8) on the idler ass'y [B].

(4) Disconnect the connector on the Position-B sensor [C], and detach the two reuse bands on the wire harness.

(5) Remove the press-shaft support plate [D] with three screws (M4 x 6), and the main-motor support plate [E] with three screws (M4 x 8).

(6) Remove the paper-feed reinforce plate [F] with three screws (M4 x 8).

(7) Remove the pressure-cam-stay reinforce plate [G] with four screws (M4 x 8).

(8) Remove the pressure-cam stay ass'y [H] with seven screws (M4 x 8).

(9) Remove the two screws (M4 x 8) and lift up the noise-filter ass'y [I].

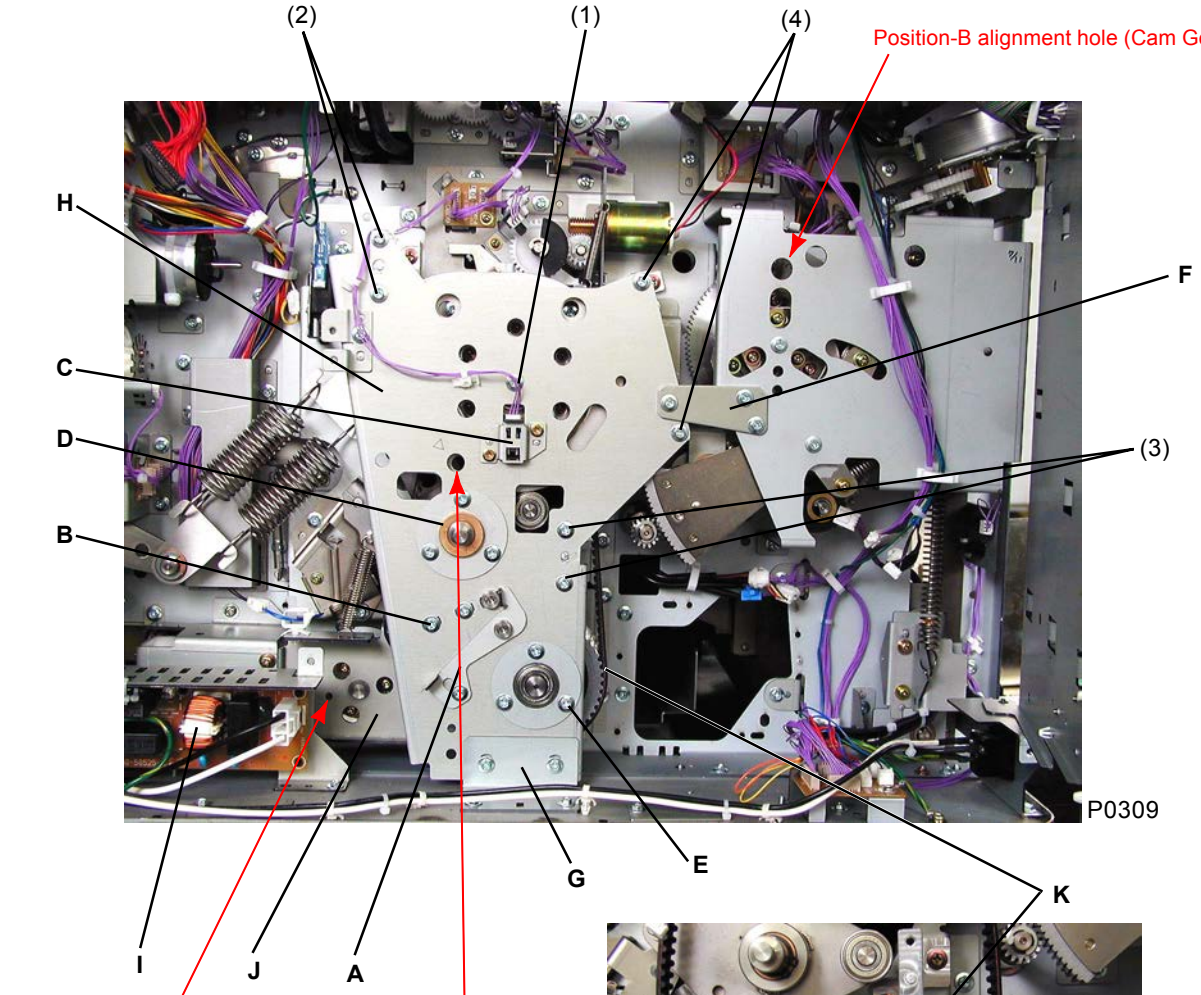
(10) Remove the pressure-lever-A spring, and then remove the air-pump unit [J] with four screws (M4 x 8).

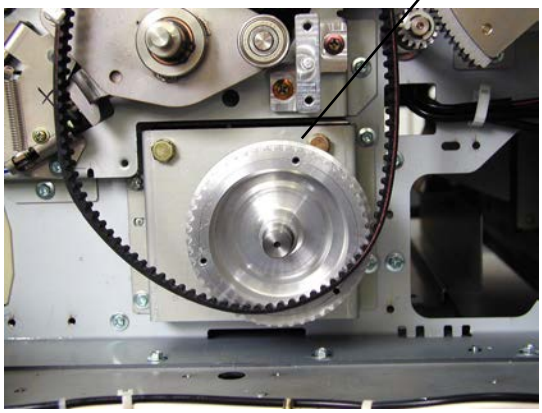
(11) Remove the power-supply wire harness and main-motor limit-sensor connector on the front of the main-motor unit [K], remove the four screws (M4 x 8) at the rear, and then remove the main-motor unit [K].

(Refer to next page for the photographs)

[Precautions on Reassembly]

- Check position B for the print-drum drive after attaching the air-pump unit [J] (push up the air-pump unit to tighten the air-pump belt) and aligning the Position-B alignment hole on the air-pump unit with the air-pump unit [J] linked to the main-motor unit [K] by the air-pump belt. Then, tighten the main belt to the right by rotating the motor pulley slightly, before mounting the idler pulley of the pressure-cam stay ass'y [H].
- When screwing the pressure-cam stay ass'y [H], follow the illustrated sequence.
- When tightening the main belt, press the tension plate and secure at ±1 mm on the scale line.





P0310

A: Tension plate
B: Idler ass'y
C: Position-B sensor
D: Press-shaft support plate
E: Main-motor support plate
F: Paper-feed reinforcing plate
G: Pressure-cam-stay reinforcing plate
H: Pressure-cam stay ass'y
I: Noise-filter ass'y
J: Air-pump unit
K: Main-motor unit

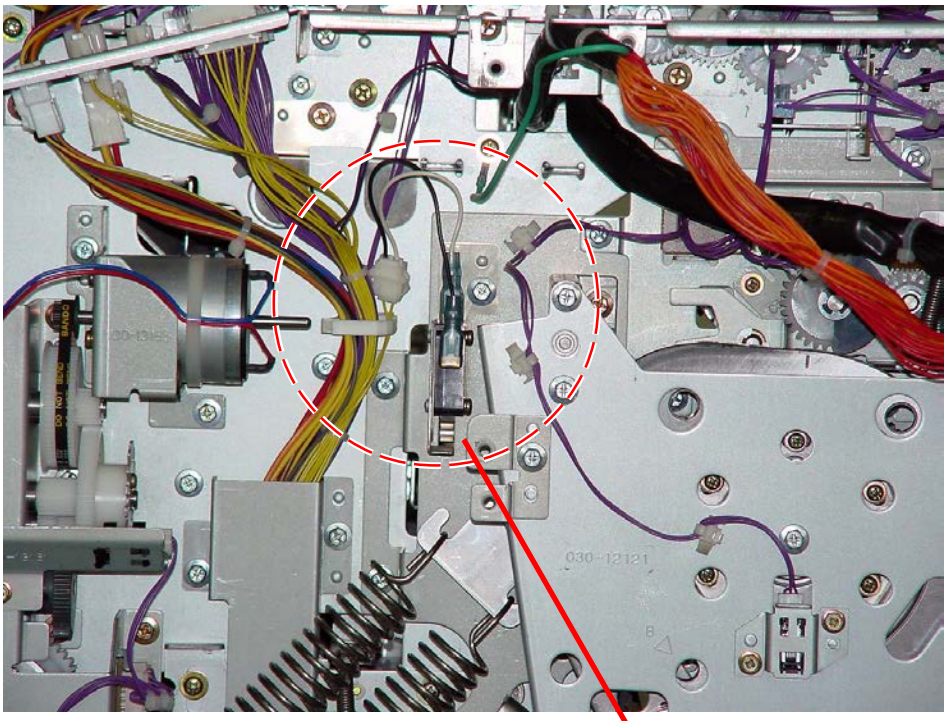
2. Removing the Print-Drum Safety SW

(1) Remove the rear cover.

(2) Open the power-supply unit to the left.

(3) Disconnect the connector, and remove a screw (M4 x 8) to remove the print-drum safety SW [A] together with the main PCB unit.

(4) Remove the two screws (M3 x 14), and remove the print-drum safety SW [A].



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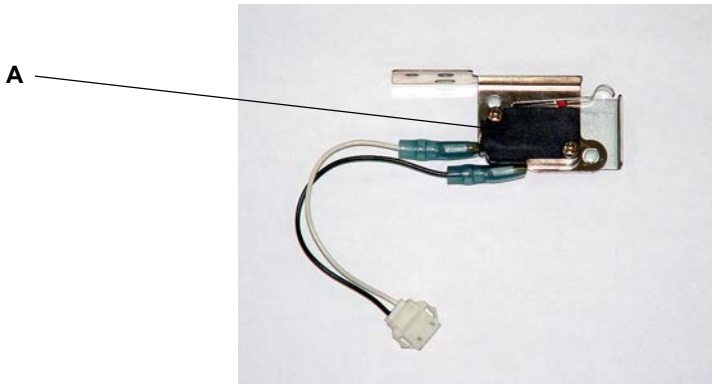


A: Print-drum safety SW

P0312

Adjustment

1. Print-Drum Position-A Adjustment

Checking and adjustment procedure

(1) Pull out the print drum, remove the master attached to it, and put it back in position.

(2) Run test-mode No. 652 (horizontal centering action).

(3) Run test-mode No. 551 (print drum on position A).

(4) Open the scanner table (manually connect the flatbed set SW).

(5) Run test-mode No. 554 (clamp cycle action), and confirm that the print drum does not oscillate when it is adjusted to position A.

(6) If the print drum cannot be inserted smoothly into the groove in the position-A compensator plate or if it oscillates, run test-mode No. 581 (Position-A adjustment) to adjust Position A for the print drum. (For the setting procedure, refer to Chapter 18: Test Mode.)

(7) Repeat starting from step (3) as necessary.

(8) Set (current value – 20) in test-mode No. 581 (Position-A adjustment) to complete the procedure.

Memo

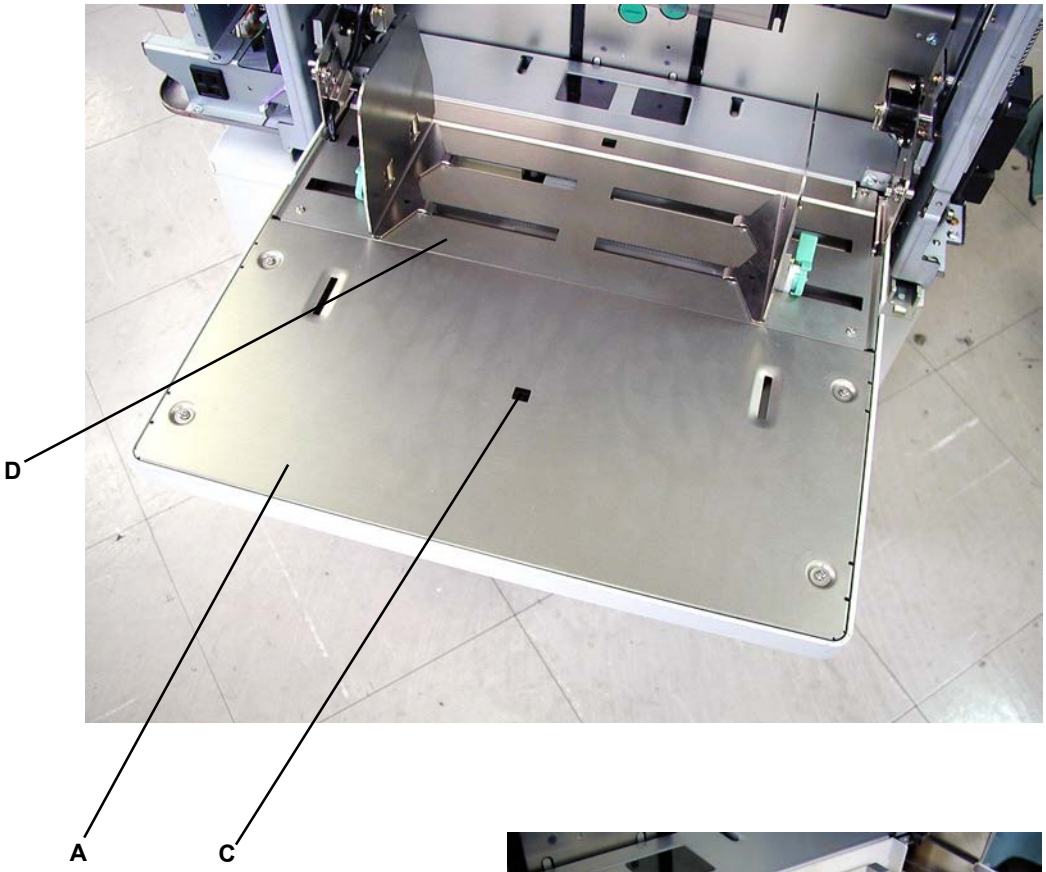
CHAPTER 4: FIRST PAPER-FEED SECTION

Contents

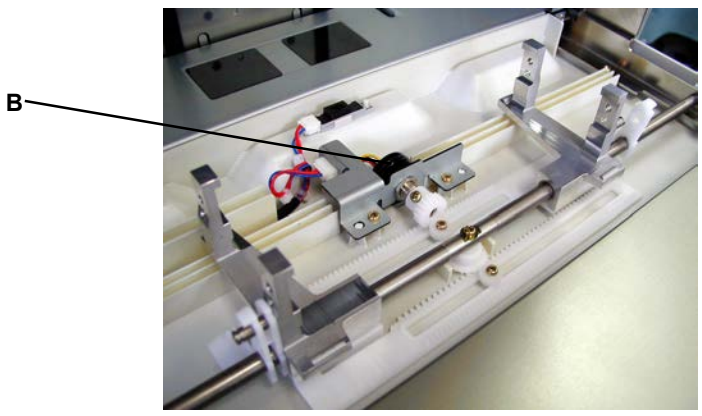
Mechanism

1. Paper-Feed-Tray Mechanism

The paper-feed tray [A] uses the paper-width potentiometer [B] and paper-size detection sensor [C] to determine the size of the paper loaded into the paper-feed tray [A]. The paper-width potentiometer [B] checks the paper width, and the paper-size detection sensor [C] determines the paper length (portrait or landscape orientation). The paper-feed tray is also designed to be held diagonally at an angle to improve paper feeding for envelope printing.



P0401



P0402

With the fence cover [D] detached

A: Paper-feed tray
B: Paper-width potentiometer
C: Paper-size detection sensor
D: Fence cover

The paper sizes detected are processed after being divided into the three size classifications specified below.

- Standard size (1): Specified sizes (See the table below.)
- Standard size (2): User-specified sizes (specified on the “Properties” setting screen)
- Non-standard size: Sizes other than those specified above Divided into Types A and B according to paper length.

Paper sizes detected according to paper width and length (in mm)

Detected paper width (mm)	Paper-size sensor	Paper size
302–292	Paper present	A3
	No paper	A4 landscape
262–252	Paper present	B4
	No paper	B5 landscape
215–205	Paper present	Non-standard (Type A)
	No paper	A4
187–177	Paper present	Non-standard (Type A)
	No paper	B5
105–95	Paper present	Non-standard (Type A)
	No paper	Postcard
Other (excluding user-specified sizes)	Paper present	Non-standard (Type A)
	No paper	Non-standard (Type B)

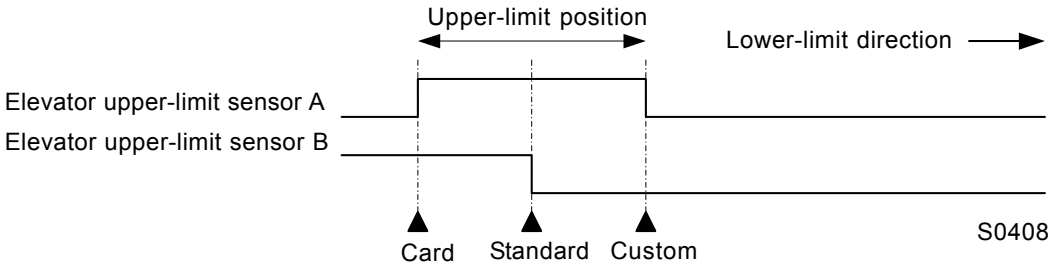
T0403

2. Paper-Feed-Tray Elevation Mechanism

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] (paper present), pressing the START key activates the elevator motor [G] and raises the paper-feed tray [A] until the upper-limit-B detection plate [D] on the scraper ass'y [C] blocks the light beam to the elevator upper-limit-sensor A [F] and elevator upper-limit-sensor B [E]. (The shutoff mode used for activation depends on the paper setting.) During printing, the elevator motor [G] remains on until the light to the relevant elevator upper-limit sensor is blocked.
When there is no paper remaining in the paper-feed tray [A] and light is not received by the paper-detection sensor [B], the elevator motor [G] activates and lowers the paper-feed tray [A] until the light beam to the elevator lower-limit sensor [H] is blocked.
If the feed-tray button [I] is pressed in print standby mode, the elevator motor [G] activates and lowers the paper-feed tray [A] until either the light beam to the elevator lower-limit sensor [H] is blocked or the feed-tray button [I] is pressed again.
If the feed-tray button is pressed while the paper-feed tray is at the lower-limit position and the feed-tray-button LED is illuminated, the paper-feed tray rises until either the feed-tray button is released or the paper-feed tray reaches the upper-limit position.

Paper-feed-tray stop positions

- Three stop positions for the paper-feed tray are detected according to the combined detection states of elevator upper-limit sensor A and elevator upper-limit sensor B.



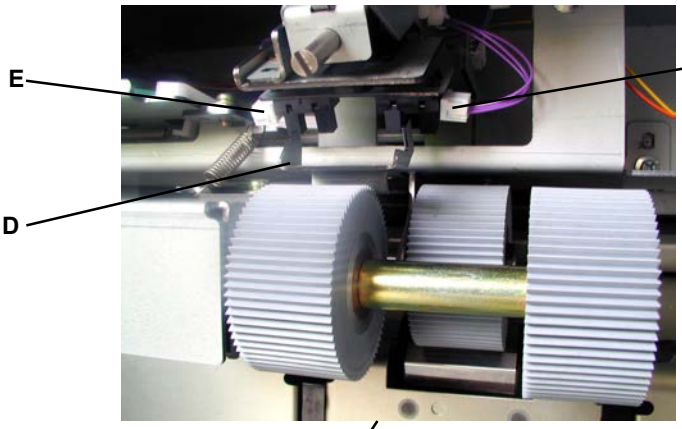
- At which of these three upper-limit positions ("Card," "Standard," or "Custom") the paper-feed tray actually stops depends on the test-mode No. 480 "Elevator upper limit selection" setting.
  Settings: 0: Auto (see below); 1: Standard position; 2: Card position; 3: Custom position
- If the test-mode No. 480 "Elevator upper limit selection" setting is "0: Auto," the paper-feed-tray stop position is selected automatically, as shown in the table below, according to the pressure-adjust-lever position and the "Paper type" specified in "Paper-type information" (set in "Paper-data entry" on the panel sub-screen).

Paper-feed-tray stop position

Pressure-adjust-lever position	Paper-data entry			
	Thin/Light	Standard	Card	Custom
Standard	"Standard" position	"Standard" position	"Card" position	"Custom" position
Card	"Card" position	"Card" position	"Card" position	"Custom" position

T0404

* The pressure-adjust-lever position and the "Paper type" of specified in "Paper-type information" affect the OFF timing for the paper-feed clutch (described later) and the paper-ejection-wing position in the same way as that they affect the paper-feed-tray stop position.



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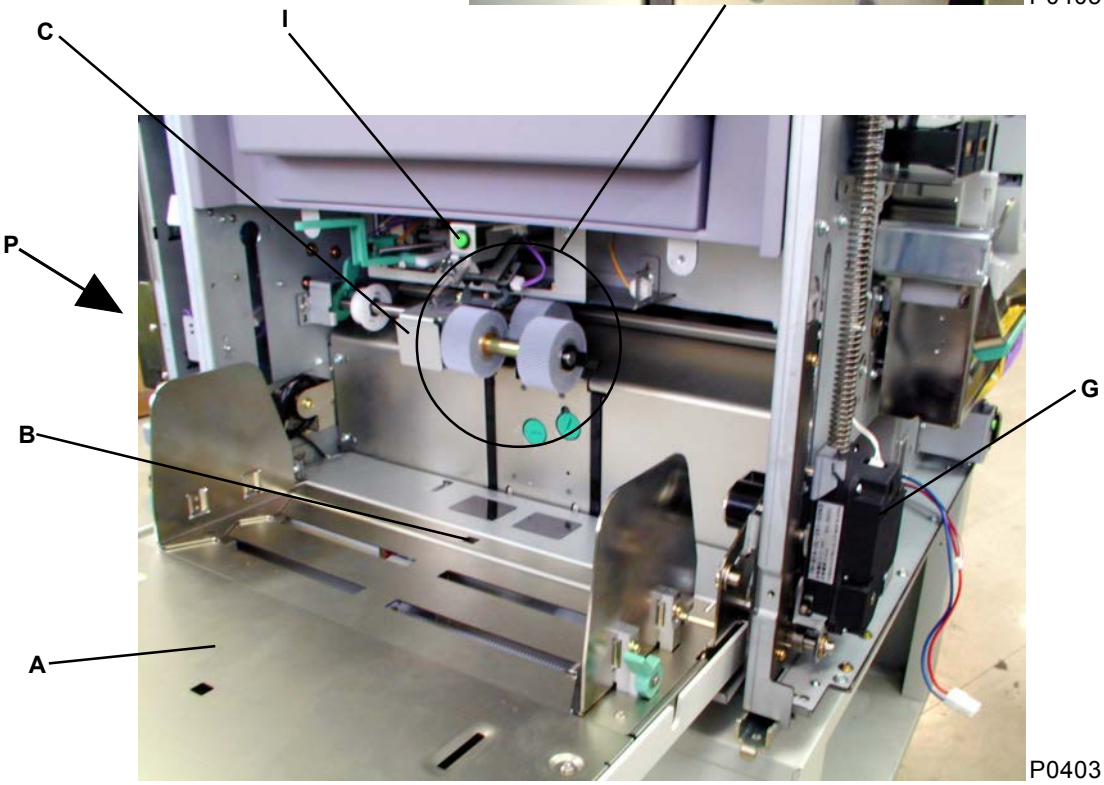
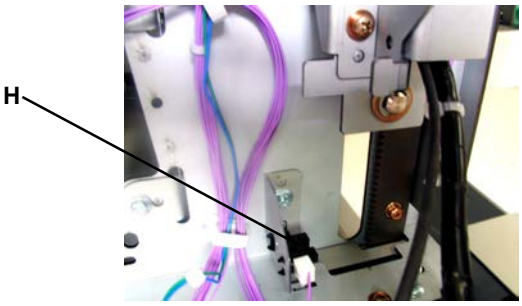


P0403

A: Paper-feed tray
B: Paper-detection sensor
C: Holder plate: Scraper
D: Detection plate: Upper-limit-B
E: Elevator upper-limit-sensor B
F: Elevator upper-limit-sensor A
G: Elevator motor
H: Elevator lower-limit sensor
I: Feed-tray button



P0404

Perspective from arrow P

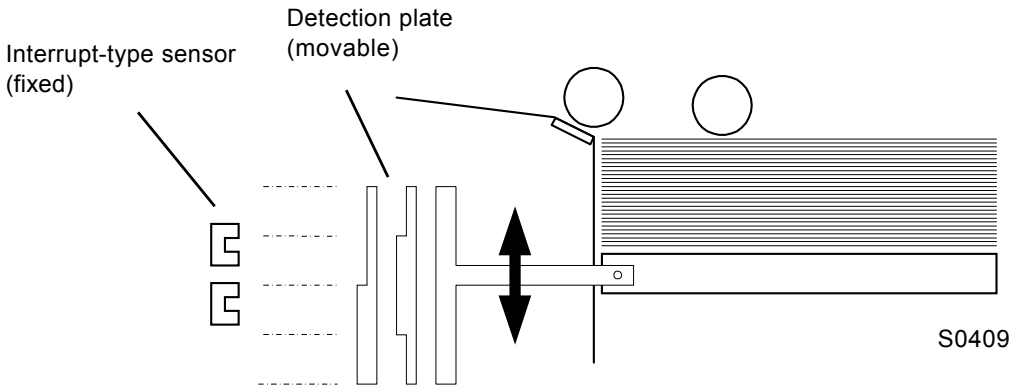
3. Paper-Volume Detection Mechanism (Not Available on 300 dpi)

- The remaining volume of paper loaded into the paper-feed tray is determined by paper-volume detection sensors A and B, and is displayed on the panel.
- The actual position of the paper-feed tray is checked by a -sensor when it reaches the upper-limit position, and the remaining-paper volume is detected. "----" (detection not possible) is displayed on the panel if the paper-feed tray is not at the upper-limit position.

Level	Sensor status		Remaining-paper volume
	Sensor A	Sensor B	
Level 0	OFF	OFF	100–50%
Level 1	ON	OFF	50–30%
Level 2	ON	ON	30–10%
Level 3	OFF	ON	10%–

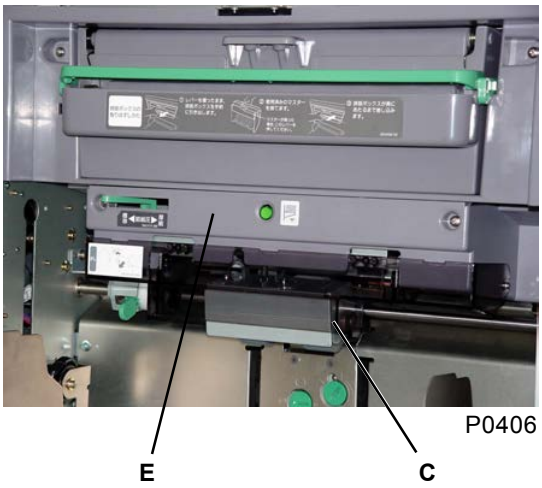
T0405

Principle of remaining-paper volume detection:

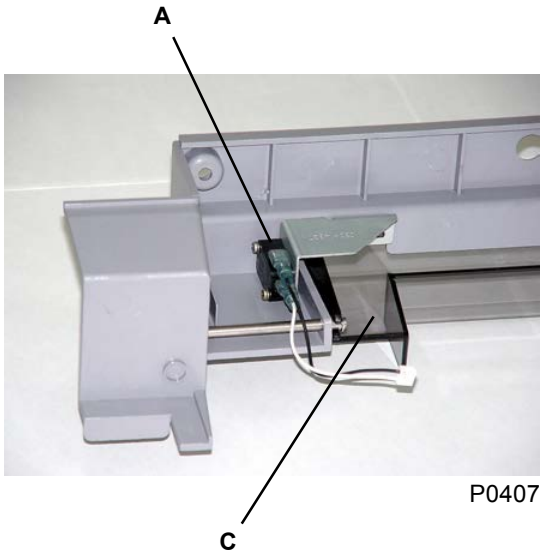


4. Paper-Feed-Tray Elevation Safety Mechanism

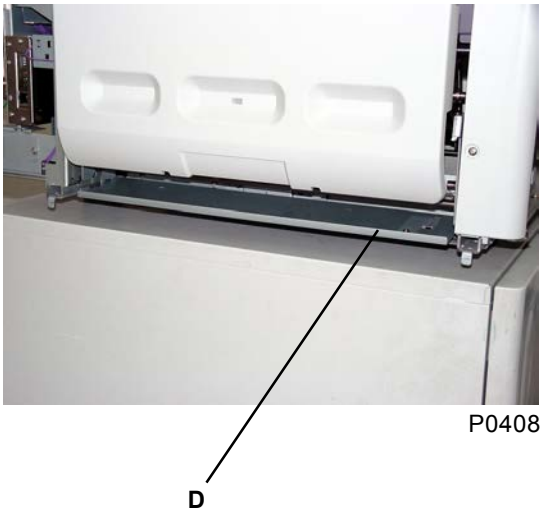
The paper-feed-tray upper SW [A] and paper-feed-tray lower SW [B] ensure safety while the paper-feed tray is being raised or lowered or is stationary.
If the scraper cover [C] is pushed upward, the paper-feed-tray upper SW [A] is tripped. An error is then assumed to have occurred in the paper-feed tray, and the elevator motor stops.
If the lower-limit frame [D] is pushed upward, the paper-feed-tray lower SW [B] is tripped. An error is then assumed to have occurred in the paper-feed tray, and the elevator motor stops.



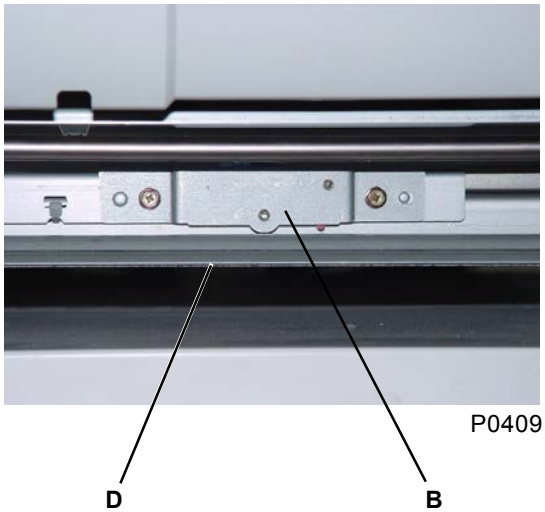
P0406



P0407



P0408



P0409

A: Paper-feed-tray upper SW
B: Paper-feed-tray lower SW
C: Scraper cover
D: Lower-limit frame
E: Paper-feed cover

5. First Paper-Feed Mechanism

When the printing operation commences, the main motor activates to rotate the main pulley (Main gear) via the main belt, and to rotate the print drum and paper-feed clutch gear via the gear train (see Chapter 3).
When the print drum rotates through a preset angle from the zero-degree position calculated from position B (307°), the paper-feed clutch is activated. The scraper [A] and pickup roller [B] rotate to feed the paper into the machine from the paper-feed tray.
The paper fed into the machine blocks the light beam between paper sensors [C] and [D]. The print drum then rotates through a preset angle, and the paper-feed clutch is deactivated, thus completing the first-stage paper feed.
The leading edge of the paper rests against the guide roller [E] and timing roller [F], and stops with the paper buckled. To prevent the pickup roller [B] from being rotated in reverse by stiff paper, the pickup-roller shaft includes a one-way core [G] with a ratchet incorporating a one-way clutch and a paper-release lever [H] for which rotation is regulated partially by a ratchet, which is engaged under spring pressure. (To remove jammed paper from the feed side, the paper-release lever [H] must therefore be moved to the rear to disengage it.)
If the print drum rotates as far as the paper-misfeed detection angle after the paper-feed clutch has been activated, the paper sensors [C] and [D] check for the presence or absence of paper. Multiple paper-feed detection is also performed at the position of the paper sensors.
A one-way clutch acts on the scraper roller [A] and pickup roller [B] so that they spin to prevent the first paper-feed stage from applying the brake after the paper has been fed to the second paper-feed stage.

Print-drum detection angles

- Paper-feed-clutch ON angle = 40° + α + β

  α: Test-mode No. 481 “Paper-feed-clutch ON angle” setting

  β: Compensation value when the vertical print position is not centered

- Paper-feed-clutch OFF angle = 30° following paper-sensor detection + α + β

  α: Test-mode No. 482–485 “Paper-feed-clutch OFF angle” setting
  Selected automatically according to the pressure-adjust-lever position and “Paper type” of “Paper-type information” as shown by chart below.

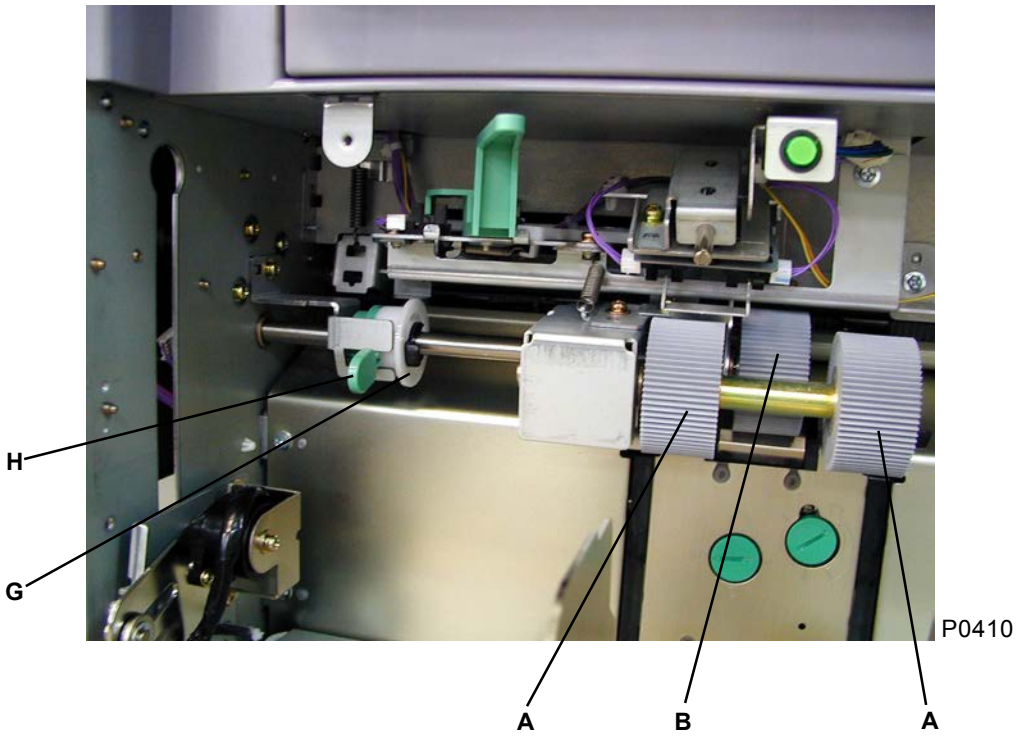
  β: Compensation value depending on the printing speed

Pressure-adjust-lever position	Paper-data entry			
	Thin/Light	Standard	Card	Custom
Standard	Thin/Light	Standard	Card	Custom
Card	Card	Card	Card	Custom

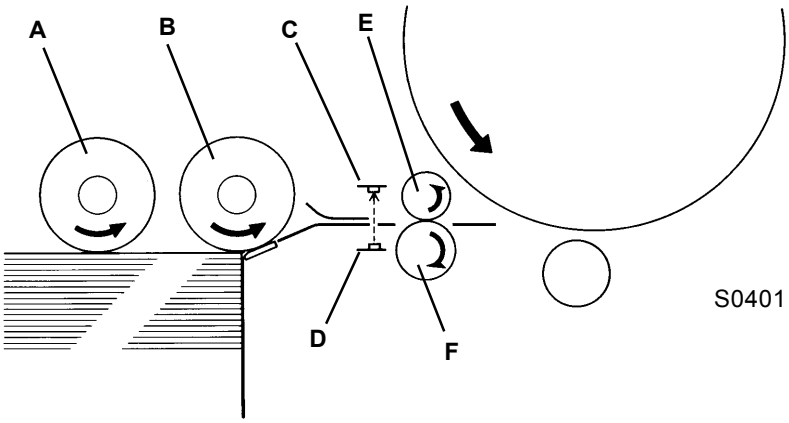
T0406

- Paper-misfeed detection angle = 150° + α

  α: Test-mode No. 486 “Paper-misfeed detection angle” setting



A: Scraper
B: Pickup roller
C: Paper sensor (send)
D: Paper sensor (receive)
E: Guide roller
F: Timing roller
G: One-way core
H: Paper-release lever

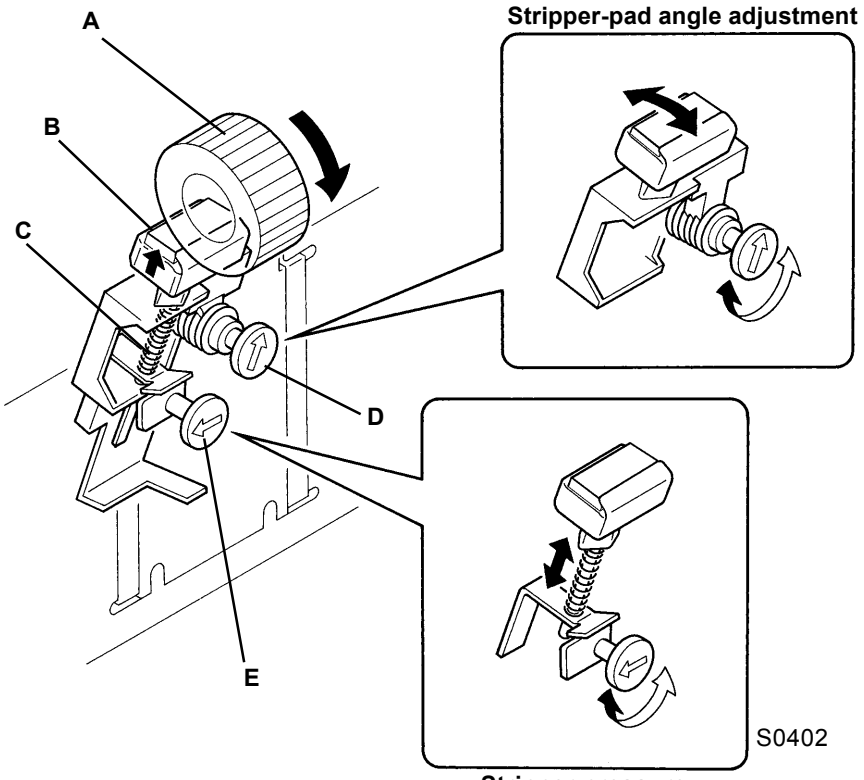


6. Paper-Strip Mechanism

Standard machines

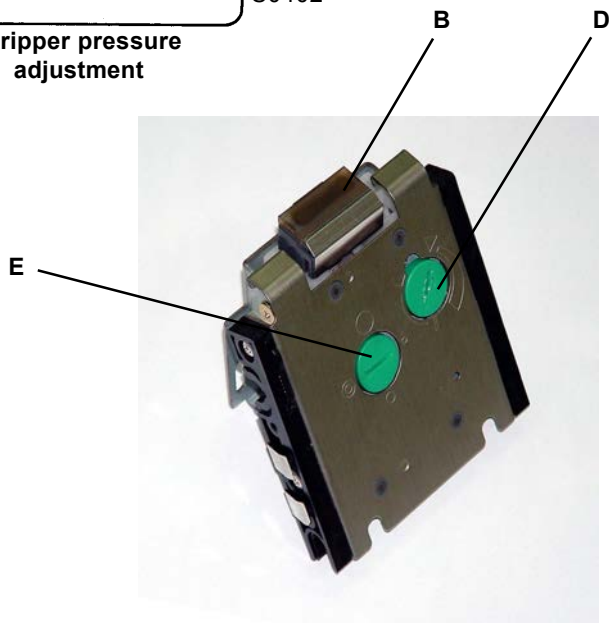
The paper loaded into the paper-feed tray is fed between the pickup roller [A] and stripper pad [B] by the rotating scraper. The paper is then stripped by the pickup roller [A] and stripper pad [B] to ensure that only the uppermost sheet is fed into the machine.
The stripper pad [B] is pressed against the pickup roller [A] by the force of the stripper spring [C], and the sheet is stripped by the resistance applied to the paper fed in strips.

The stripper-pad angle and stripper pressure can be adjusted by the user using the stripper-pad-angle adjust knob [D] and stripper-pressure adjust knob [E].



S0402

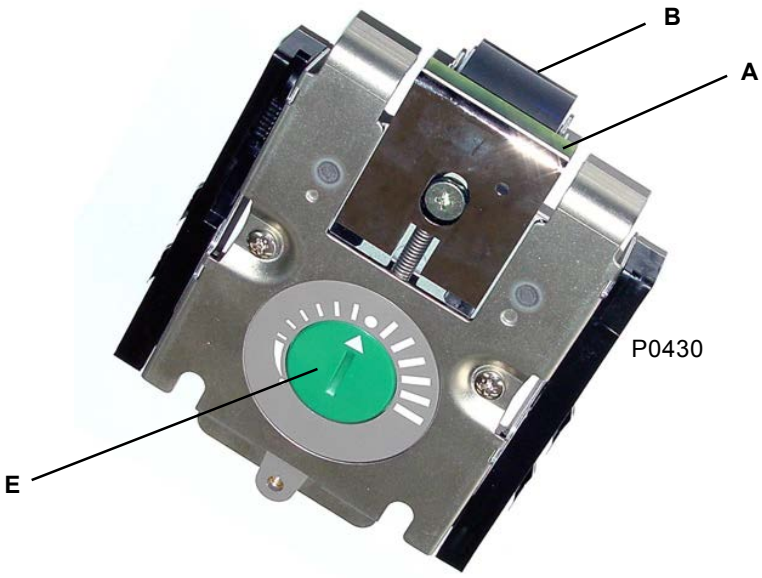
A: Pickup roller
B: Stripper pad
C: Stripper spring
D: Stripper-pad-angle adjust knob
E: Stripper-pressure adjust knob



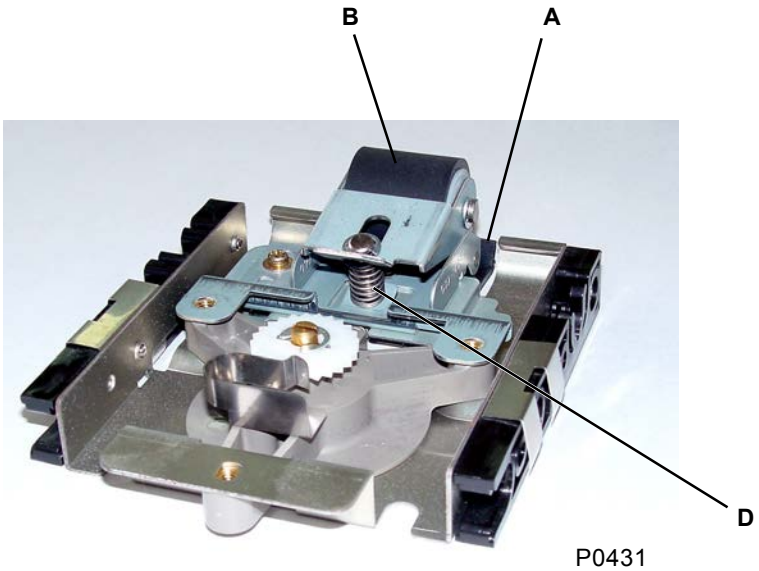
Stripper unit P0411

Stripper unit for multi-tray machines

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



P0430

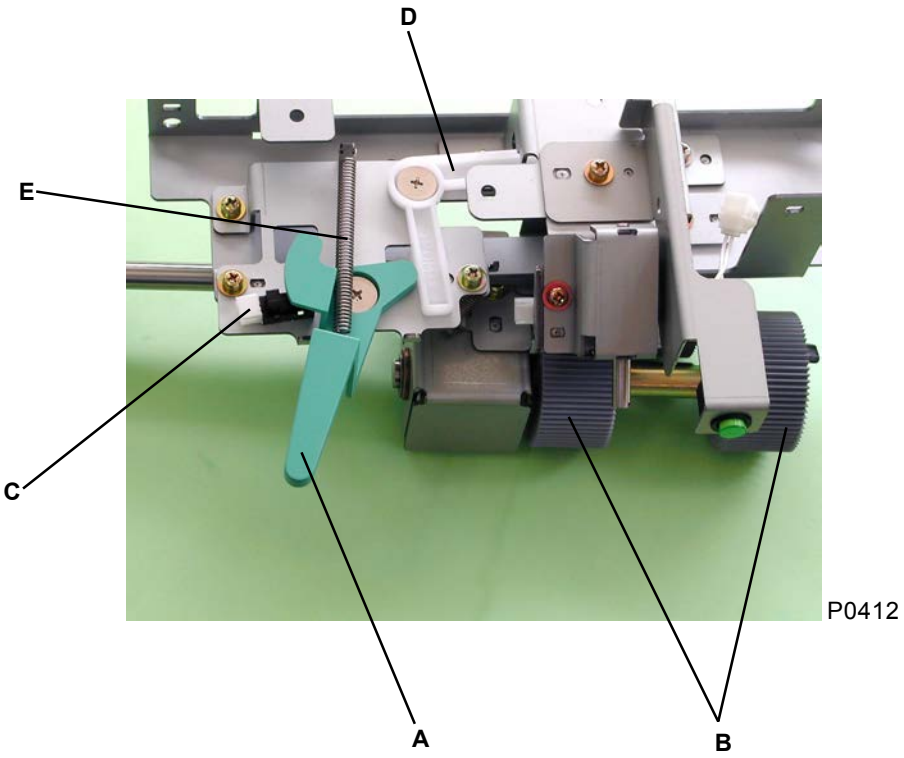


P0431

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

7. Paper-Feed-Pressure Adjust Lever

Moving the pressure-adjust lever [A] to the left or right switches the scraper [B] paper-feed pressure (scraper pressure) between “Normal” (weak) and “Card” (strong). Moving the pressure-adjust lever to the right increases the paper-feed pressure (scraper pressure).
The “Card” setting is detected by the paper-feed pressure sensor (high) [C]. Then, (1) the paper-ejection-wing position, (2) paper-feed-clutch OFF angle (card) (test-mode No. 483), and (3) upper-limit position are set for the card.



P0412

A: Pressure-adjust lever
B: Scraper
C: Paper-feed pressure sensor (high)
D: Pressure arm
E: Pressure-adjust-lever spring

Removal and Assembly

1. Removing the Paper-Feed-Tray Unit

(1) Lower the paper-feed tray to the lower-limit position, and then switch off the power.

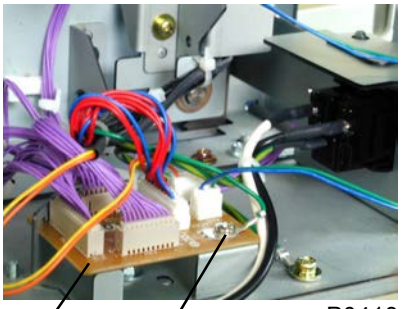
(2) Remove the rear cover.

(3) Open the main PCB unit to the right.

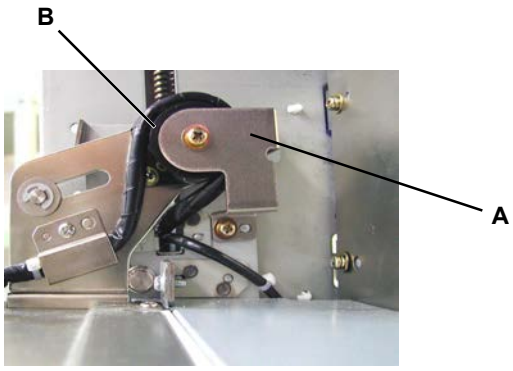
(4) Remove the left and right damper covers [A] on the paper-feed tray with two screws (M4 x 6). Then, remove the right damper (white) with two screws (M3 x 6) and the left damper (black) [B] with two screws (M3 x 6).

(5) From the rear junction PCB (paper feed) [C], unplug the ground wire [E] connecting connectors CN3 and CN5 on the wire harness from the paper-feed-tray unit [D] to the PCB. Cut the wire clamp, then pull the wire harness toward the paper-feed tray.

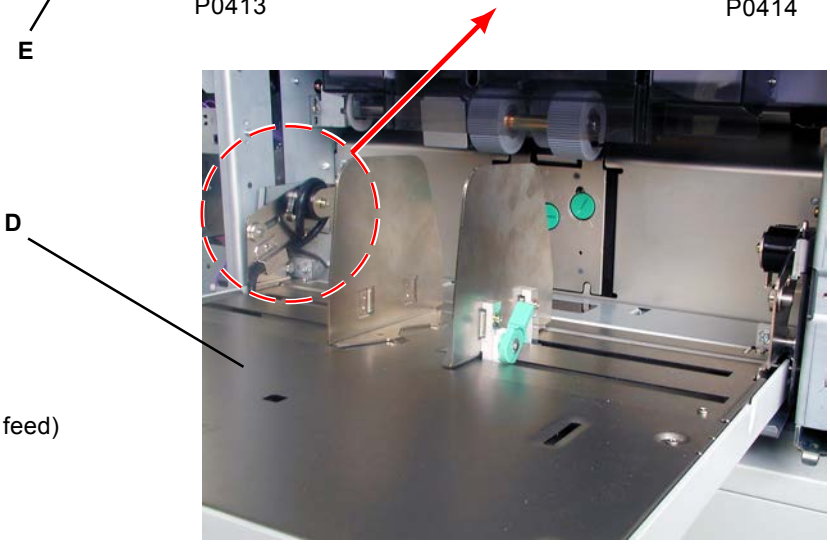
(6) Cut the wire clamps on the wire harness from the paper-feed-tray lower SW, and detach paper-feed-tray [D] by lifting the front of slightly.



P0413



P0414



P0415

A: Damper cover
B: Left damper (black)
C: Junction PCB (paper feed)
D: Paper-feed-tray
E: Ground wire

[Precautions on Reassembly]

- The wire harness on the paper-feed-tray unit must be secured with the wire clamp, as before.
- Be sure to attach the ground screw through the Junction PCB.
- Connect the dampers with the paper-feed-tray unit in the “Envelope” position (the shaft must insert fully into the slot).
- Do not confuse the left and right dampers (identify by color).
- Wind the wire harness on the paper-feed-tray unit once clockwise around the left-hand damper, and then trail out from the rear frame plate.

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

Paper-Size Detection Sensor

(1) Remove the paper-feed tray [A] with four screws (M3 x 6).

(2) Unplug the connector and loosen the mounting clips to detach the paper-size detection sensor [B].

Paper-Width Potentiometer and Paper-Detection Sensor

(1) Remove the left and right paper guides [C] and [D] with two screws (M3 x 8), respectively.

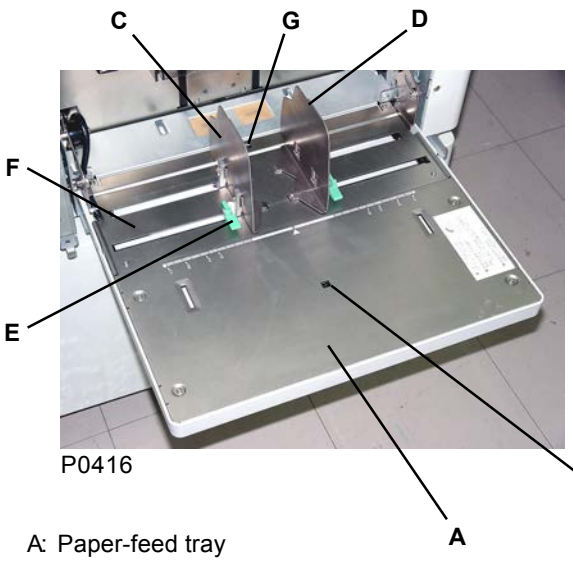
(2) Remove the E-rings, followed by the left and right paper-guide lock levers [E].

(3) Remove the fence cover [F] with four screws (M3 x 6).

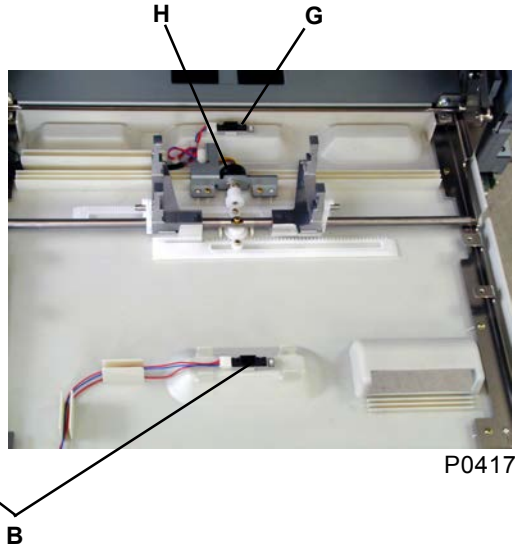
(4) Unplug the connector and loosen the mounting clips to remove the paper-detection sensor [G].

(5) Unplug the connector, remove the two screws (3 x 8), and then remove the paper-width potentiometer [H] together with its bracket.

(6) Remove the screw (M3 x 5) and the gear [I]. Loosen the nut, unplug the connector, and then remove the paper-width potentiometer [H].

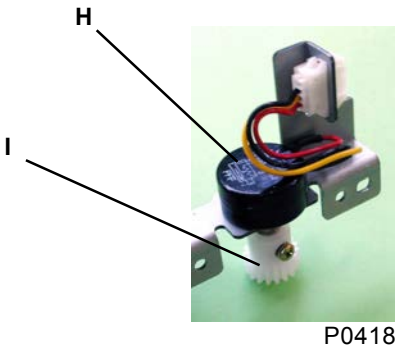


P0416



P0417

A: Paper-feed tray
B: Paper-size detection sensor
C: Paper guide R
D: Paper guide F
E: Paper-guide lock lever
F: Fence cover
G: Paper-detection sensor
H: Paper-width potentiometer
I: Gear



P0418

[Precautions on Reassembly]

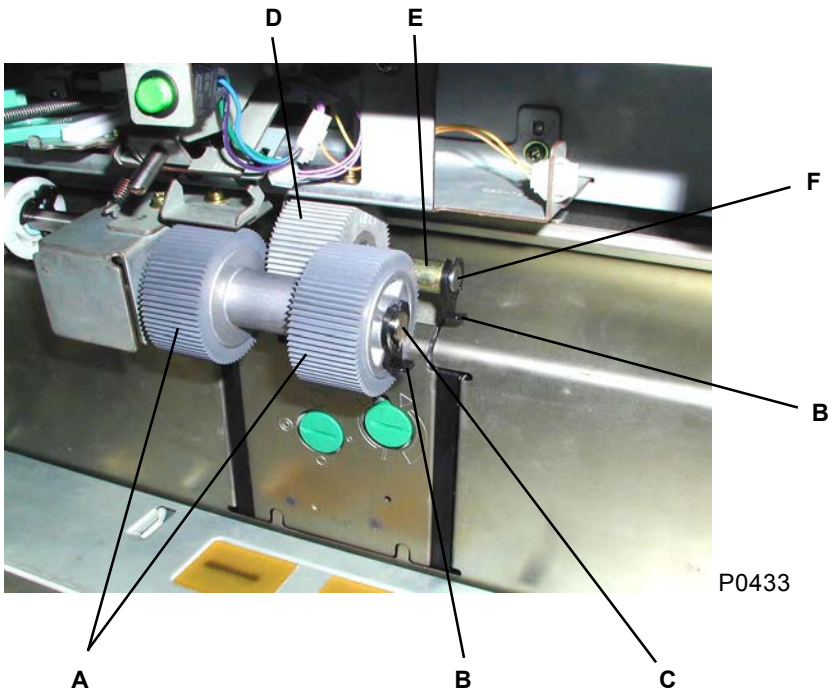
- Fully insert the paper-width potentiometer into the bracket slot, and tighten the nut to fix it approximately 1 mm in front of the point at which the red wire contacts the bracket. (Over-tightening may damage the potentiometer.
- When engaging the paper-width potentiometer with the rack, rotate the potentiometer fully in the clockwise direction with the guides fully closed, and then turn the potentiometer back by one click to engage.
- Adjust the paper-width potentiometer after fitting.

3. Removing the Scraper and Pickup Rollers

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

(2) Remove the paper-feed cover.

(3) Remove the Lock ring [B] from both the Scraper shaft [C] and Pickup roller shaft [C], and slide out the Double-scraper roller ass'y and Pickup roller.



A: Double-scraper roller ass'y
B: Lock ring
C: Scraper shaft
D: Pickup roller
E: Collar
F: Pickup roller shaft

[Precautions on Reassembly]

- The scraper and pickup rollers contain a one-way clutch. When mounted on the shafts properly, the rollers spin freely in the counterclockwise direction. Ribs on the core of the Double scraper roller should face out, and the "RISO" logo on the Pickup roller should face out).
- Insert the Lock rings in the proper location.

4. Removing the Feed-Tray Button and Elevator Upper-Limit Sensor

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

(2) Remove the paper-feed cover.

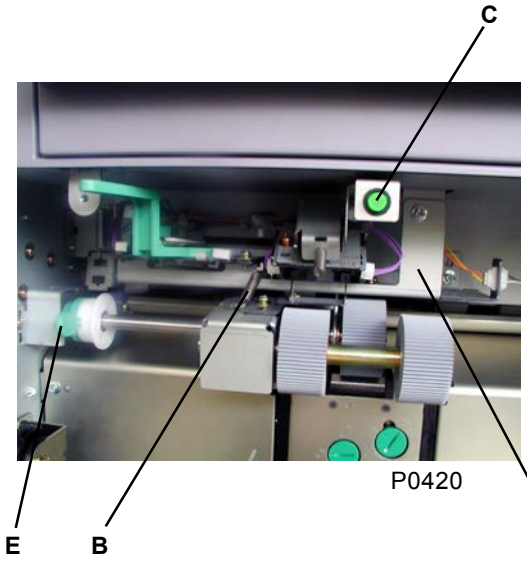
(3) Pull out the scraper (right) and pickup roller.

(4) Remove the E-ring from the pickup-roller shaft, and pull out the metal.

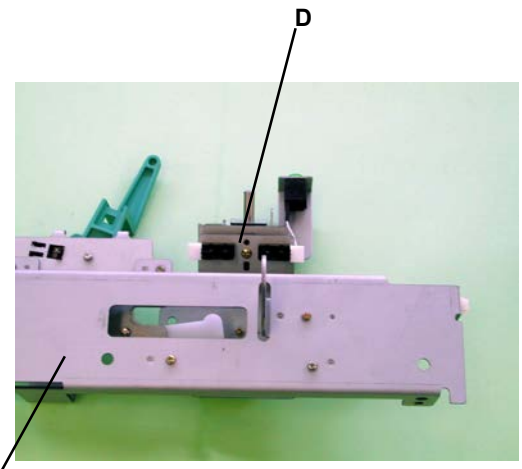
(5) Remove the three screws (M4 x 8), wire-harness connector, and reuse bands from the first paper-feed stay [A], remove the scraper spring [B], and then remove the first paper-feed stay [A].

(6) Remove the feed-tray button [C].

(7) Remove the upper-limit-sensor bracket [D] with one screw, (3 x 6) together with its bracket.



P0420



P0421

A: First paper-feed stay
B: Scraper spring
C: Feed-tray button
D: Upper-limit-sensor bracket
E: Paper-release lever

[Precautions on Reassembly]

- Adjust the position of the upper-limit sensor.

5. Removing the Paper-Feed Clutch

(1) Pull out the print drum, and switch off the power.

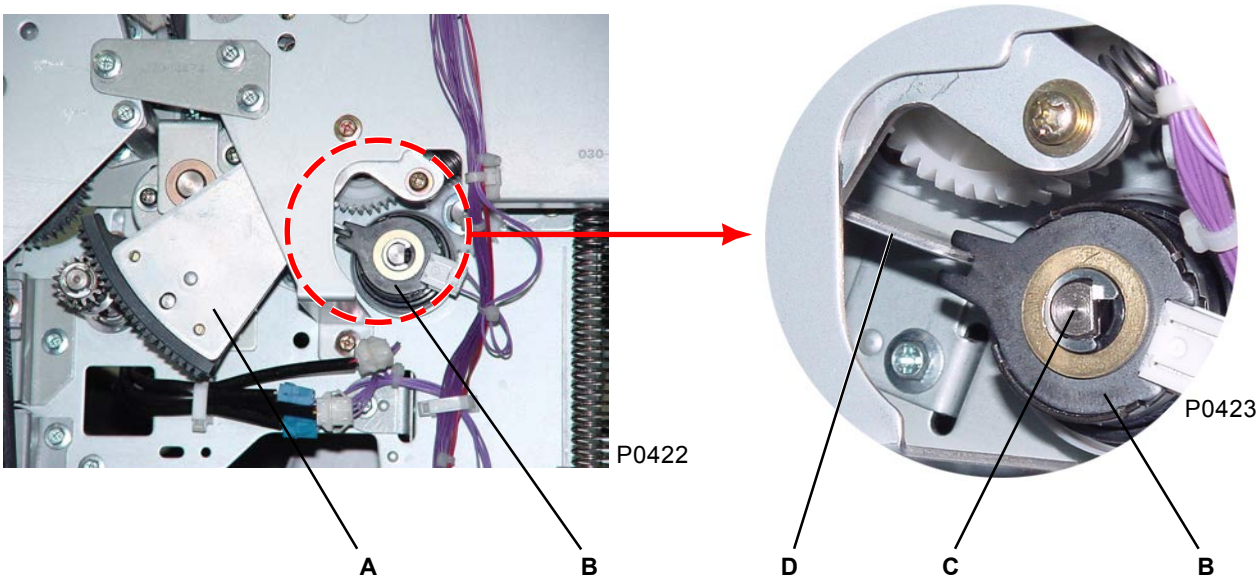
(2) Remove the rear cover.

(3) Open the main PCB unit to the right.

(4) Fully rotate the sector gear ass'y [A] in the counterclockwise direction (to prevent the paper-feed clutch from impinging on the sector gear ass'y during removal), unplug the connector, remove the E-ring, and then remove the paper-feed clutch [B].

[Precautions on Reassembly]

- Align the flat face of the pickup-roller shaft [C] with the corresponding slot on the paper-feed clutch.
- Engage the slot on the clutch with the paper-feed-clutch lock plate [D] on the machine, to prevent the paper-feed-clutch [B] unit from rotating.



A: Sector gear ass'y
B: Paper-feed clutch
C: Pickup-roller shaft
D: Paper-feed-clutch lock plate

6. Removing the Pickup-Roller-Shaft Ass'y

(1) Pull out the print drum, lower the paper-feed tray to the lower-limit position, and then switch off the power.

(2) Remove the rear cover.

(3) Open the main PCB unit to the right.

(4) Remove the paper-feed cover.

(5) Remove the Lock-ring next to the One-way core [G].

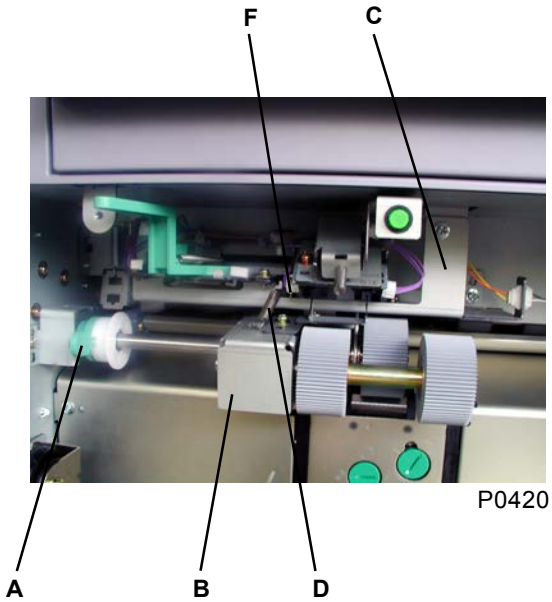
(6) Remove the scraper and pickup rollers.

(7) Remove the paper-feed clutch.

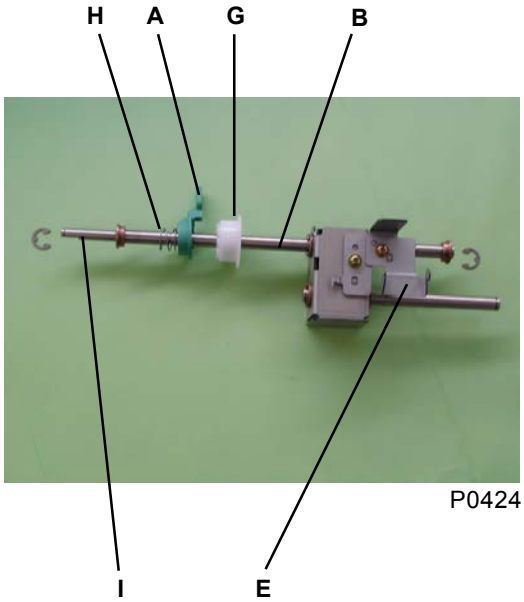
(8) Remove the E-rings and metals from both sides of the pickup-roller shaft.

(9) Remove the scraper spring [D] attached between the pickup-roller-shaft ass'y [B] and the First paper feed stay ass'y [C].

(10) Move the pickup-roller-shaft ass'y [B] to the left, remove the support, and then remove the pickup-roller-shaft ass'y on the paper-feed-tray side. (If the upper-limit-sensor ass'y [F] impinges on the upper-limit-B detection plate [E], lift the upper-limit sensor upwards.)



P0420



P0424

A: Paper-release lever
B: Pickup-roller-shaft ass'y
C: First paper-feed stay ass'y
D: Scraper spring
E: Detection plate; Upper-limit-B
F: Upper-limit-sensor ass'y
G: One-way core
H: Spring
I: Pickup-roller shaft

[Precautions on Reassembly]

- Adjust the position of the upper-limit sensor.

7. Removing the Elevator Motor

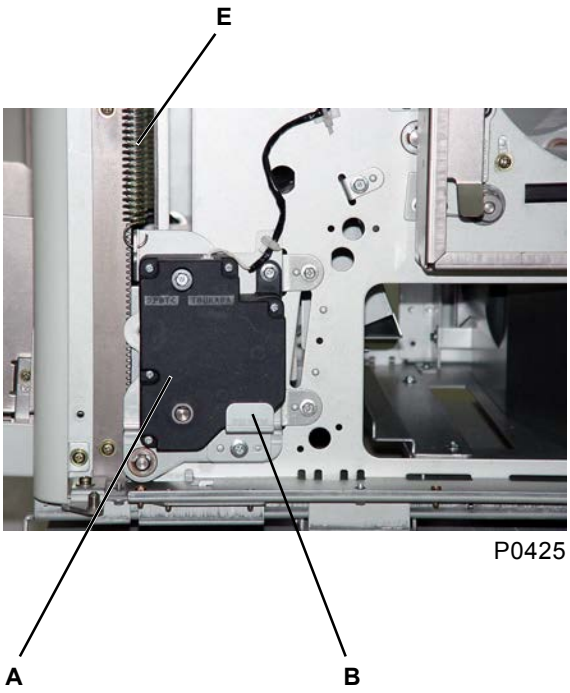
(1) Pull out the print drum, lower the paper-feed tray to the lower-limit position, and then switch off the power.

(2) Remove the front cover, front frame cover, and rear cover.

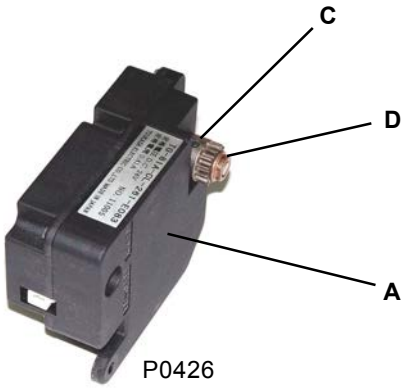
(3) Remove the elevator springs [E] on both sides (to prevent the paper-feed tray from springing up).

(4) Unplug the connector on the elevator motor [A], and remove the two screws (M4 x 10).

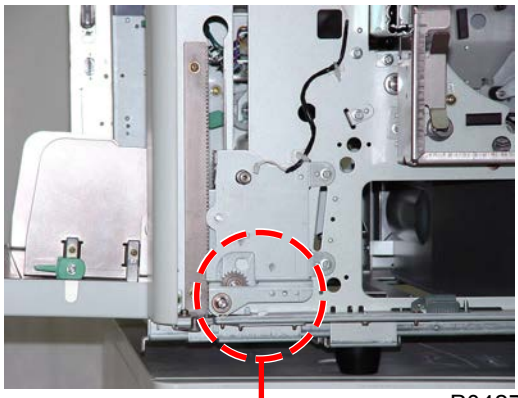
(5) Remove the elevator-motor holder [B] with one screw (M4 x 8), and remove the elevator motor [A]. (Take care not to drop the metal [D] inserted into the elevator-motor-shaft ass'y [C].)

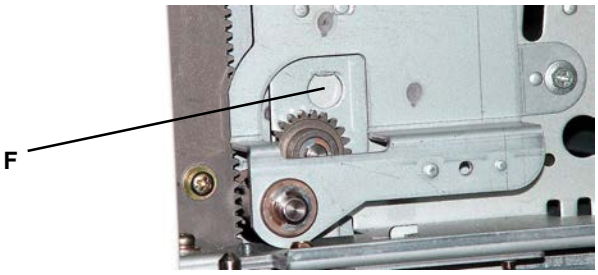


P0425



P0426


P0427



P0439

A: Elevator motor
B: Elevator-motor holder
C: Elevator-motor-shaft ass'y
D: Metal
E: Elevator spring
F: D-cut hole

[Precautions on Reassembly]

- Insert the metal of the elevator-motor-shaft ass'y into the D-cut hole [F] before reassembling.

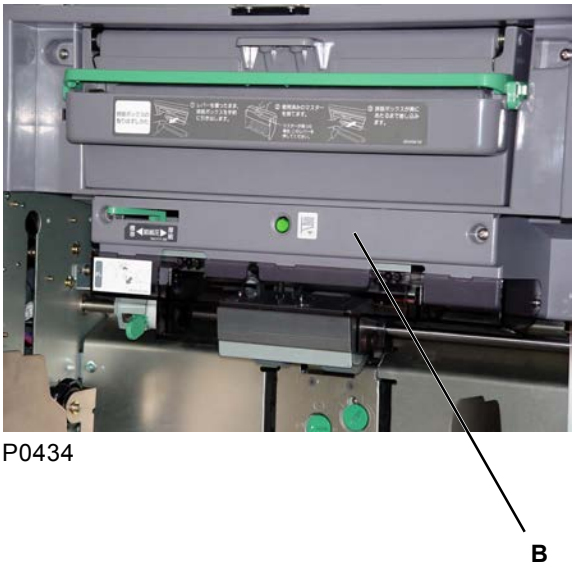
8. Removing the Paper-Feed-Tray Upper Safety SW

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

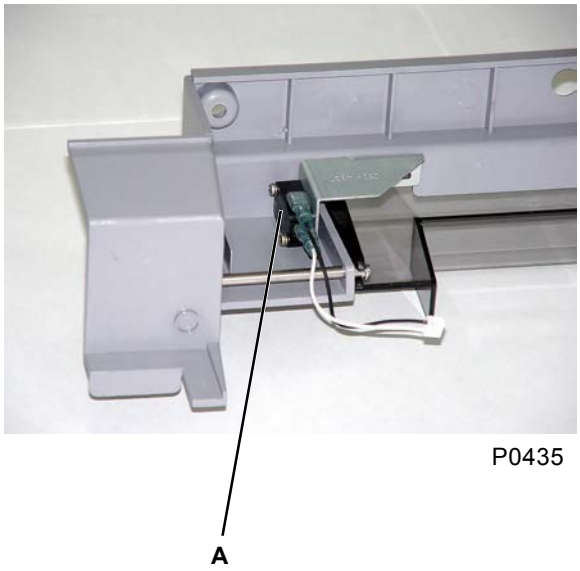
(2) Remove the paper-feed cover [B].

(3) Remove the screw (3 x 6), and then remove the paper-feed-tray upper SW [A] together with its bracket.

(4) Remove the paper-feed-tray upper safety SW [A] with two screws (M3 x 14).



P0434



P0435

A: Paper-feed-tray upper safety SW

B: Paper-feed cover

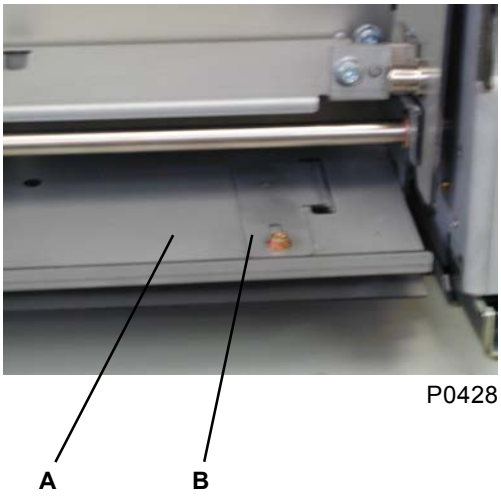
9. Removing the Paper-Feed-Tray Lower Safety SW

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

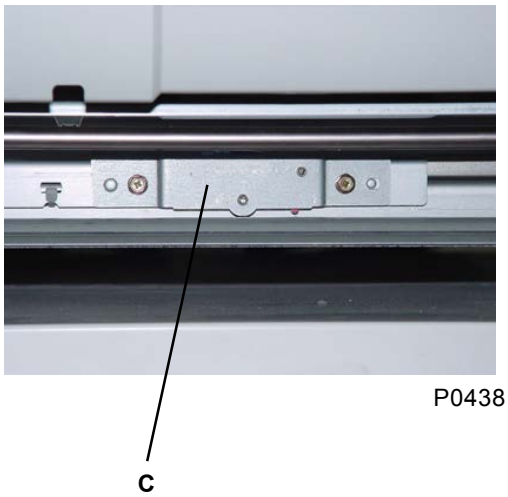
(2) Remove the paper-feed-tray unit.

(3) Remove a screw (M3 x 6) attaching the lower-limit-frame holder [B] to the lower-limit frame [A], and then remove the paper-feed-tray lower SW [C] together with its bracket.

(4) Remove the paper-feed-tray lower safety SW [C] with two screws (M3 x 14).



P0428



P0438

A: Lower-limit frame
B: Lower-limit-frame holder
C: Paper-feed-tray lower safety SW

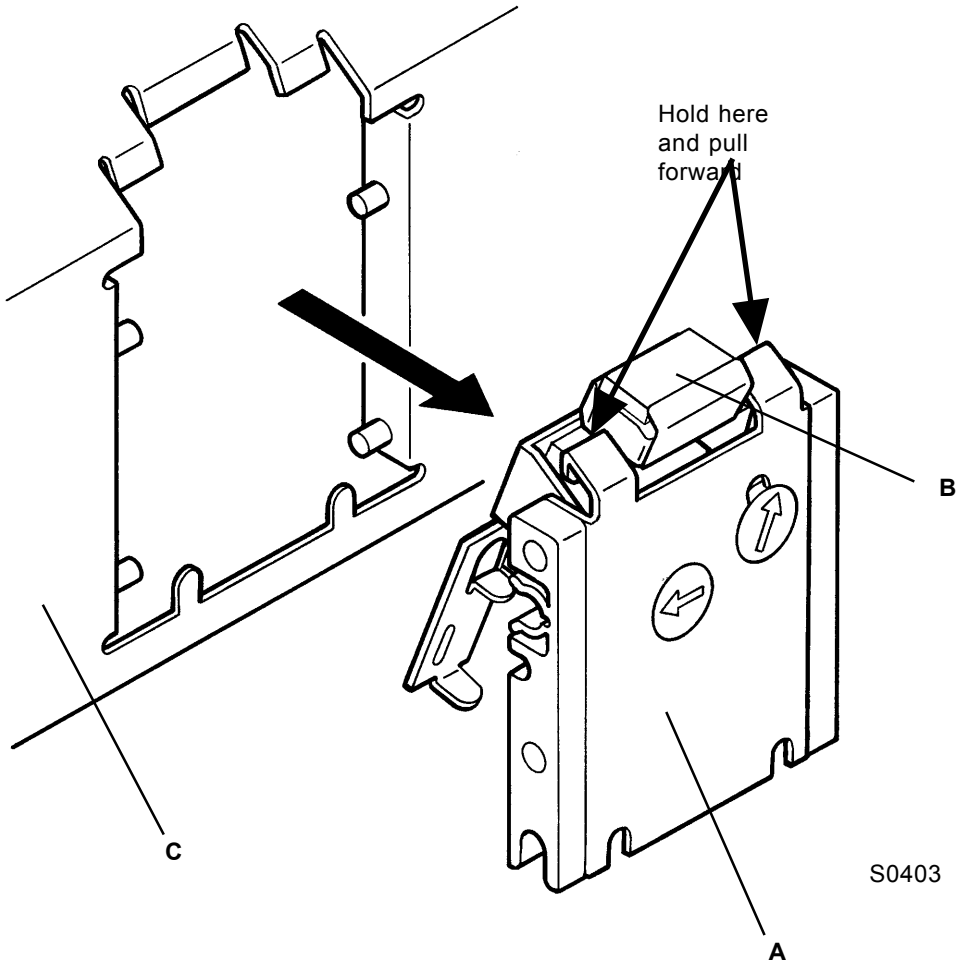
10. Removing the Stripper Unit

(1) Lower the paper-feed tray to the lower-limit position.

(2) Place your finger on the top of the stripper unit [A] and pull forward to remove it [A]. (See Section 12 for details on the stripper unit for multi-tray machines.)

[Precautions on Reassembly]

- Insert the stripper unit onto the paper-guide plate [C] while the stripper pad ass'y [B] is pressed against the paper-guide plate.
- Adjust the stripper.



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

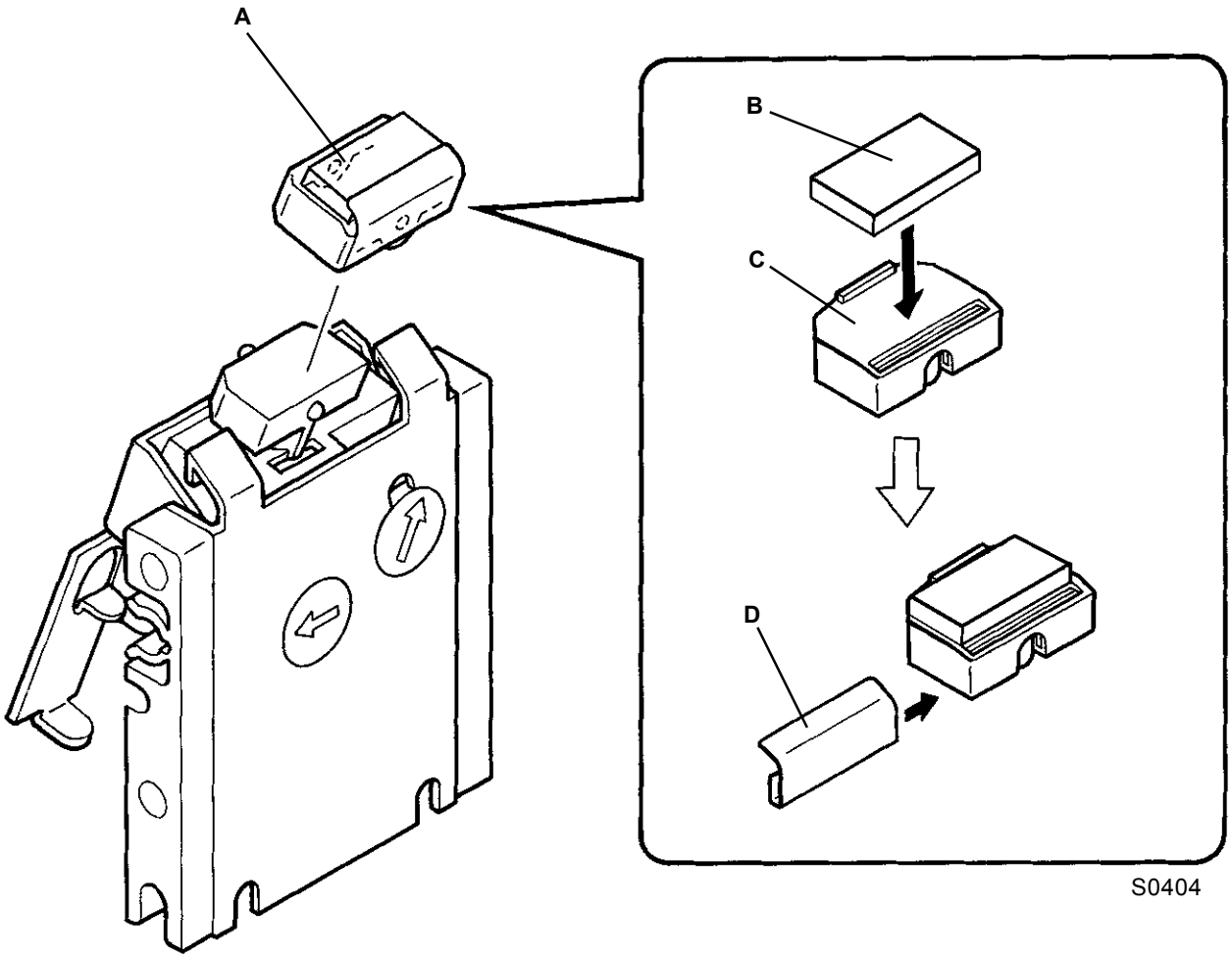
11. Removing the Stripper-Pad Ass'y (Standard Machine)

(1) Lower the paper-feed tray to the lower-limit position, and remove the stripper unit.

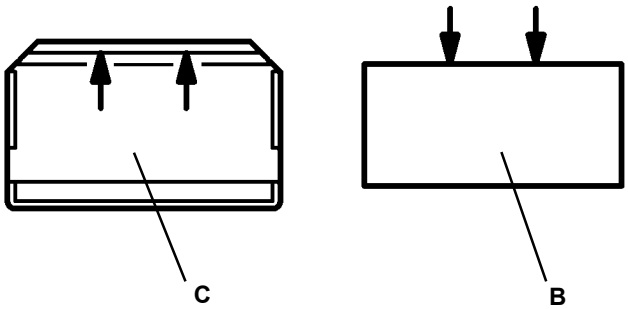
(2) Lift the stripper-pad ass'y [A] by hand and remove it.

[Precautions on Reassembly]

- Attach the stripper pad [B] by pressing the face indicated by the arrow against the face of stripper pad base [C] indicated by the arrow.



S0404



S0405

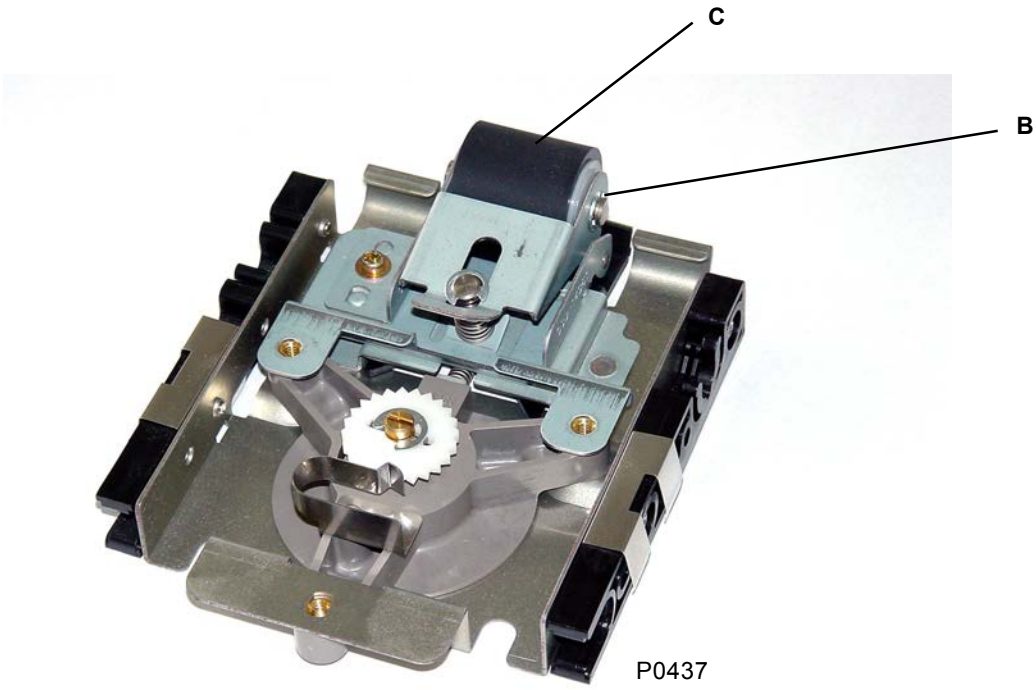
A: Stripper-pad ass'y
B: Stripper pad
C: Stripper-pad base
D: Stripper-pad cover

12. Removing the Stripper Roller (Multi-Tray Machines)

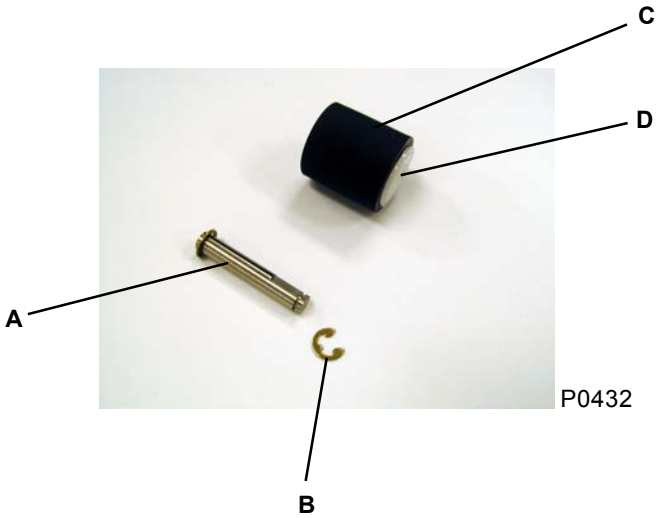
(1) With the paper-feed tray raised to near the upper-limit position, remove a screw (M4 x 6) from the underside of the paper-feed tray.

(2) Lower the paper-feed tray to the lower-limit position, and detach the stripper unit.

(3) Detach the E-ring [B] from the D-cut side of the stripper-roller shaft [A], then remove the stripper roller [C] and stripper-roller clutch [D].



P0437



P0432

A: Stripper-roller shaft
B: E-ring
C: Stripper roller
D: Stripper-roller clutch

Adjustment

1. Elevator Upper-Limit-Sensor Position Adjustment

Procedure

(1) Place the pressure-adjust lever in the “Standard” position, and set the paper type entry to “Standard.”

(2) Remove the paper from the paper-feed tray.

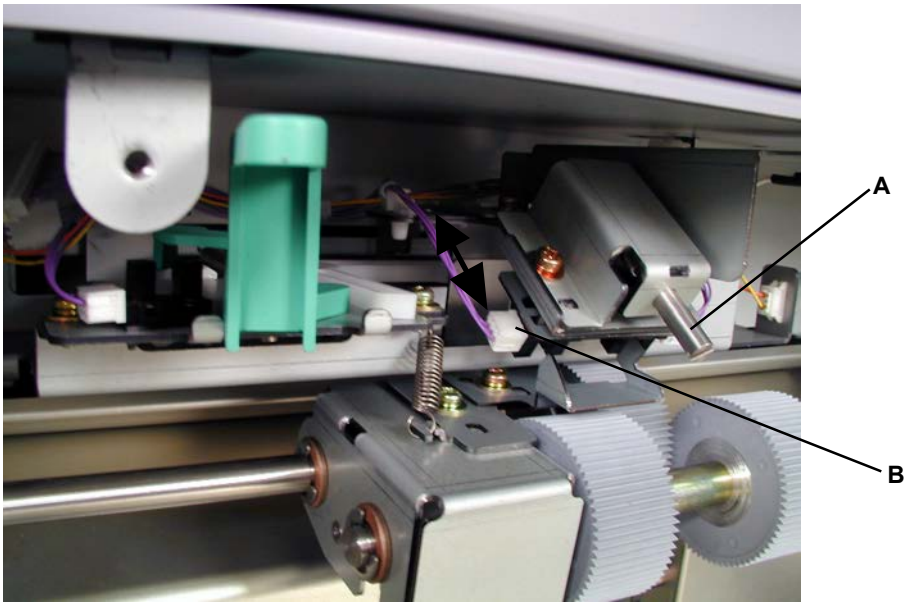
(3) Start test-mode No. 453 (elevator servo), raise the paper-feed tray, and bring it to a complete stop.

(4) Once it has stopped, confirm that the gap between the pickup roller [C] and the paper-feed tray [E] is 1.5 mm to 2.0 mm.

(5) If the gap is not within the specifications, adjust it by rotating the upper-limit adjustment screw [A] and moving the upper-limit-sensor ass’y [B] up or down.

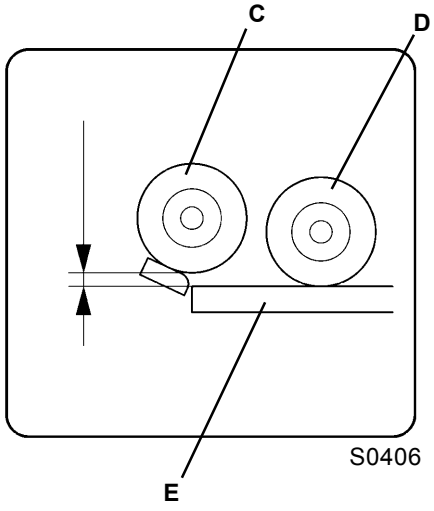
Symptoms

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



P0429

A: Upper-limit adjustment screw
B: Upper-limit-sensor ass’y
C: Pickup roller
D: Scraper
E: Paper-feed tray



S0406

2. Stripper Adjustment

[Standard machines]

Procedure

(1) Use the pressure-adjust lever to set the most suitable paper type prior to printing.

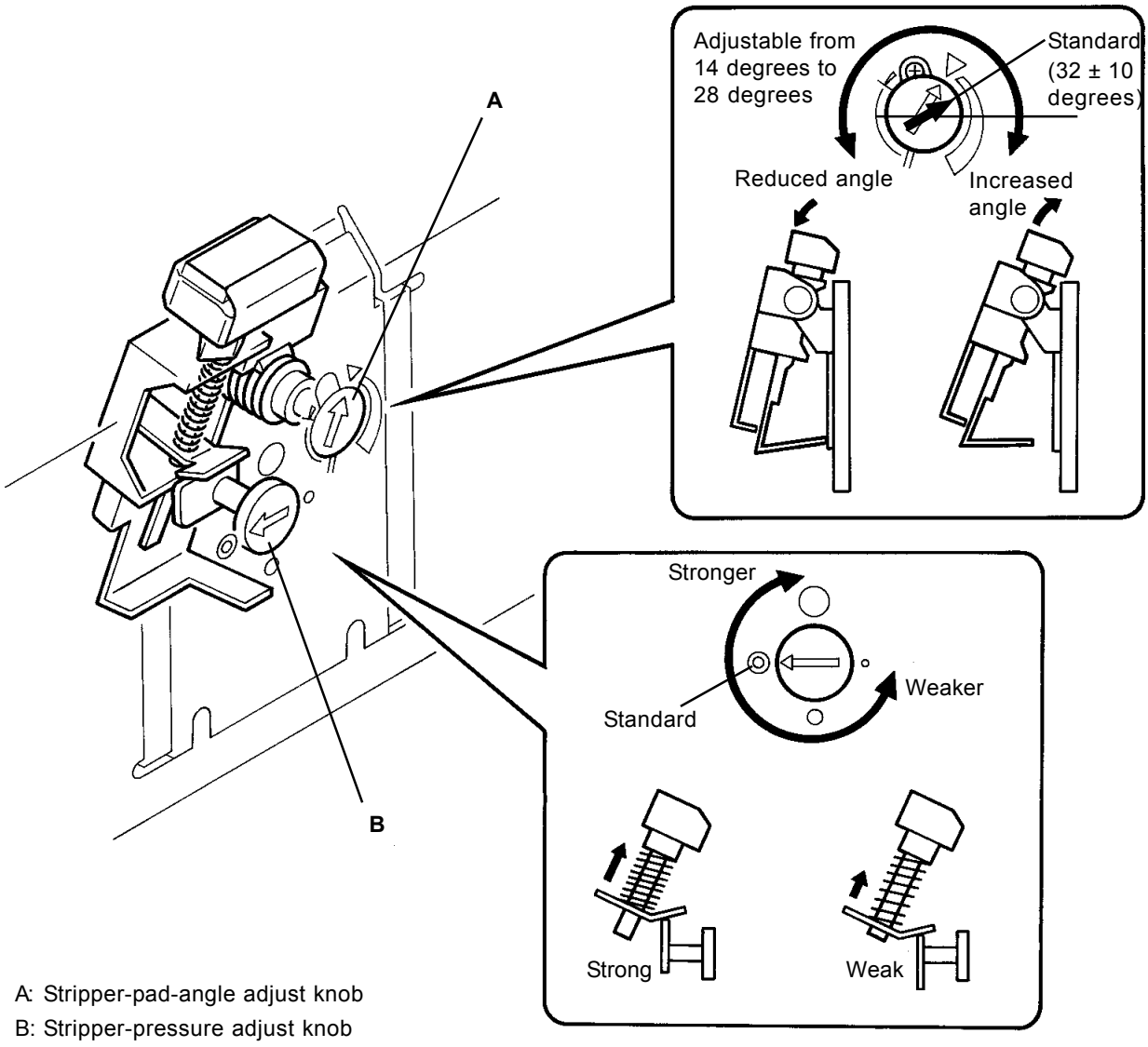
(2) If multiple feeding or misfeeding occurs, adjust the stripper-pad angle and stripper pressure.

1) Multiple feeding

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

2) Misfeeding

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



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

S0407

[Multi-tray machines]

Procedure

(1) Set the pressure-adjust lever to the most suitable paper type prior to printing.

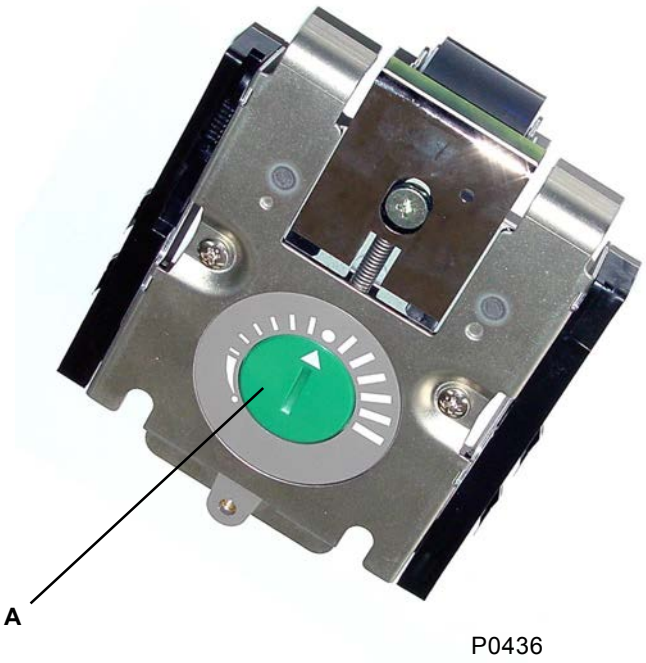
(2) If multiple paper feeding or paper misfeeding occurs, adjust the stripper pressure.

1) Multiple paper feeding

- Turn the stripper-pressure adjust knob [A] clockwise to increase the stripper pressure.

2) Paper misfeeding

- Turn the stripper-pressure adjust knob [A] counterclockwise to reduce the stripper pressure.



P0436

A: Stripper-pressure adjust knob

3. Paper-Feed-Clutch ON Angle Adjustment

Check and adjustment procedure

(1) Execute a test printing to confirm that the paper is fed smoothly.

(2) If the first paper-feed timing is not synchronized, adjust it using test-mode No. 481 (paper-feed-clutch ON angle adjustment). (For the setting procedure, see Chapter 18: Test Modes.)

(3) Repeat the procedure starting from step (1) until the correct timing is achieved.

Symptoms

If the first-stage paper-feed timing is not synchronized, paper jamming or offset printing may occur.

4. Paper-Feed-Clutch OFF Angle Adjustment

Check and adjustment procedure

(1) Execute a test printing to confirm that printing is performed smoothly.

(2) If the paper is excessively or insufficiently buckled and printing is not performed smoothly, run test-modes No. 482–485 (paper-feed-clutch OFF angle adjustment) in accordance with the user-mode paper-type entry. (For the setting procedure, see Chapter 18: Test Modes.)

(3) Repeat the procedure starting from step (1) until the 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 as a result.

5. Paper-Width Potentiometer Adjustment

Check and adjustment procedure

(1) Position the paper guides at 182 mm, and run test-mode No. 450 (paper-size VR adjust: 182 mm).

(2) Position the paper guides at 297 mm, and run test-mode No. 451 (paper-size VR adjust: 297 mm).

(3) With the paper guides at 297 mm, run test-mode No. 471 (paper-width metric data), and confirm that the figure displayed is between 296 mm and 298 mm.

Symptoms

If the size of the paper in the paper-feed tray cannot be determined, the paper-ejection wings and paper guides on the paper-receiving tray (for the auto-control stacking tray) will not be set properly.

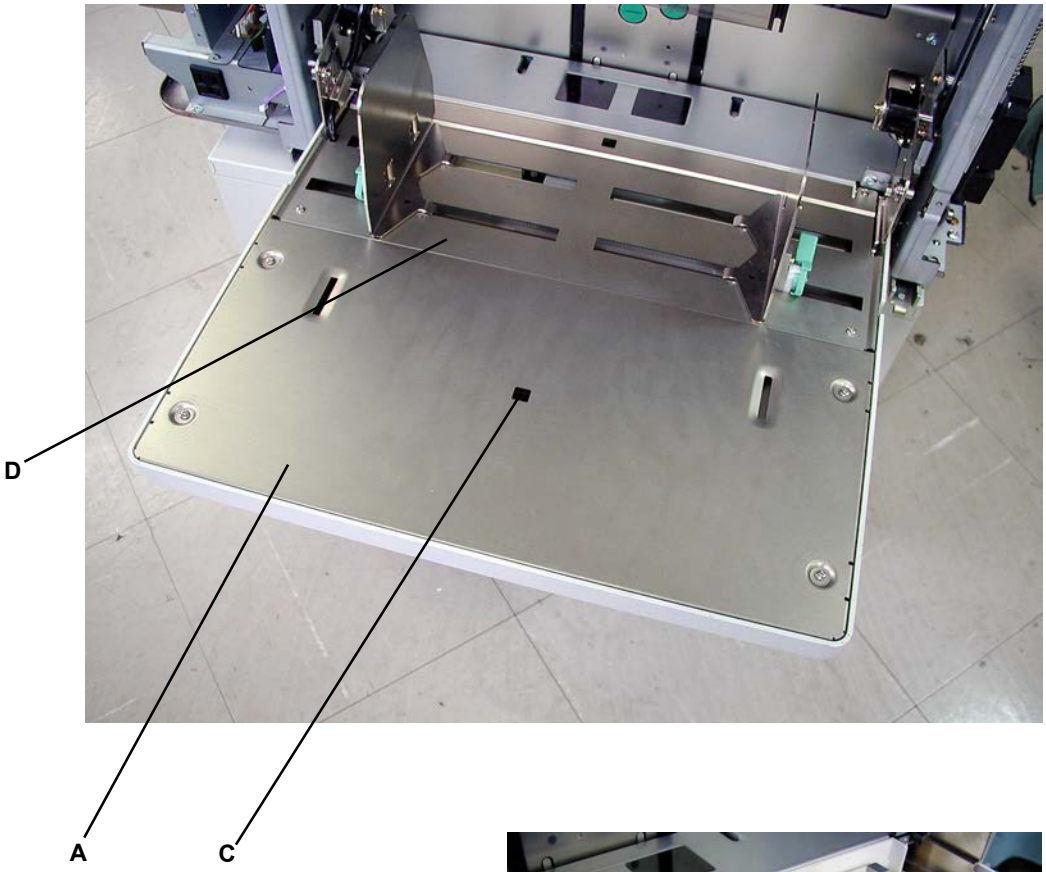
CHAPTER 4 NEW: FIRST PAPER-FEED SECTION (NEW)

Contents

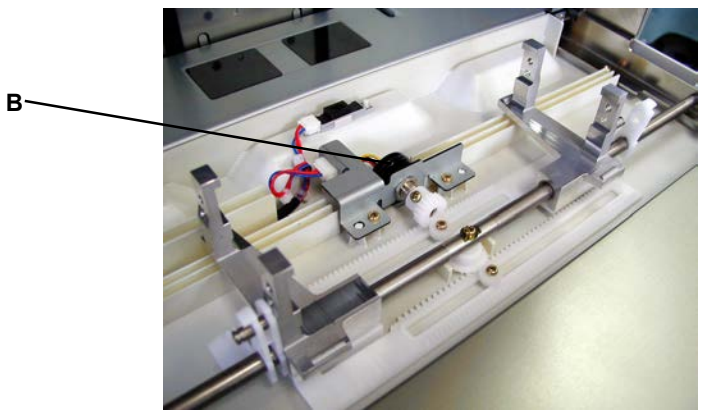
Mechanism

1. Paper-Feed-Tray Mechanism

The paper-feed tray [A] uses the paper-width potentiometer [B] and paper-size detection sensor [C] to determine the size of the paper loaded into the paper-feed tray [A]. The paper-width potentiometer [B] checks the paper width, and the paper-size detection sensor [C] determines the paper length (portrait or landscape orientation). The paper-feed tray is also designed to be held diagonally at an angle to improve paper feeding for envelope printing.



P0401n



P0402n

With the fence cover [D] detached

A: Paper-feed tray
B: Paper-width potentiometer
C: Paper-size detection sensor
D: Fence cover

The paper sizes detected are processed after being divided into the three size classifications specified below.

- Standard size (1): Specified sizes (See the table below.)
- Standard size (2): User-specified sizes (specified on the “Properties” setting screen)
- Non-standard size: Sizes other than those specified above Divided into Types A and B according to paper length.

Paper sizes detected according to paper width and length (in mm)

Detected paper width (mm)	Paper-size sensor	Paper size
302–292	Paper present	A3
	No paper	A4 landscape
262–252	Paper present	B4
	No paper	B5 landscape
215–205	Paper present	Non-standard (Type A)
	No paper	A4
187–177	Paper present	Non-standard (Type A)
	No paper	B5
105–95	Paper present	Non-standard (Type A)
	No paper	Postcard
Other	Paper present	Non-standard (Type A)
(excluding user-specified sizes)	No paper	Non-standard (Type B)

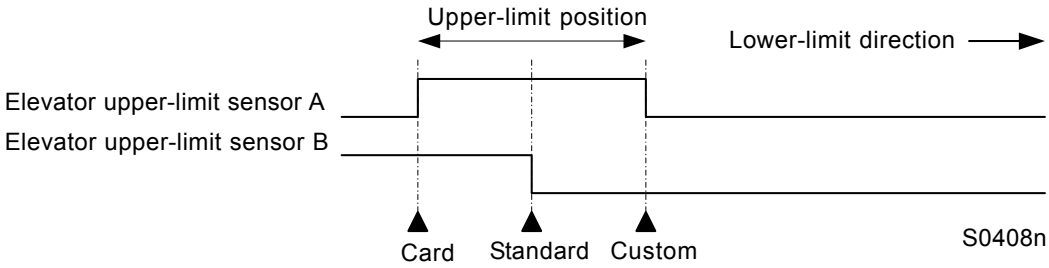
T0401

2. Paper-Feed-Tray Elevation Mechanism

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] (paper present), pressing the START key activates the elevator motor [G] and raises the paper-feed tray [A] until the upper-limit-B detection plate [D] on the scraper ass'y [C] blocks the light beam to the elevator upper-limit-sensor A [F] and elevator upper-limit-sensor B [E]. (The shutoff mode used for activation depends on the paper setting.) During printing, the elevator motor [G] remains on until the light to the relevant elevator upper-limit sensor is blocked.
When there is no paper remaining in the paper-feed tray [A] and light is not received by the paper-detection sensor [B], the elevator motor [G] activates and lowers the paper-feed tray [A] until the light beam to the elevator lower-limit sensor [H] is blocked.
If the feed-tray button [I] is pressed in print standby mode, the elevator motor [G] activates and lowers the paper-feed tray [A] until either the light beam to the elevator lower-limit sensor [H] is blocked or the feed-tray button [I] is pressed again.
If the feed-tray button is pressed while the paper-feed tray is at the lower-limit position and the feed-tray-button LED is illuminated, the paper-feed tray rises until either the feed-tray button is released or the paper-feed tray reaches the upper-limit position.

Paper-feed-tray stop positions

- Three stop positions for the paper-feed tray are detected according to the combined detection states of elevator upper-limit sensor A and elevator upper-limit sensor B.



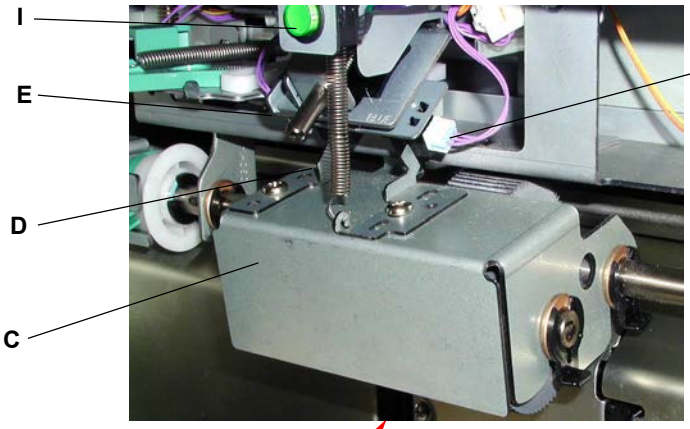
- At which of these three upper-limit positions ("Card," "Standard," or "Custom") the paper-feed tray actually stops depends on the test-mode No. 480 "Elevator upper limit selection" setting.
  Settings: 0: Auto (see below); 1: Standard position; 2: Card position; 3: Custom position
- If the test-mode No. 480 "Elevator upper limit selection" setting is "0: Auto," the paper-feed-tray stop position is selected automatically, as shown in the table below, according to the pressure-adjust-lever position and the "Paper type" specified in "Paper-type information" (set in "Paper-data entry" on the panel sub-screen).

Paper-feed-tray stop position

Pressure-adjust-lever position	Paper-data entry			
	Thin/Light	Standard	Card	Custom
Standard	"Standard" position	"Standard" position	"Card" position	"Custom" position
Card	"Card" position	"Card" position	"Card" position	"Custom" position

T0402n

* The pressure-adjust-lever position and the "Paper type" of specified in "Paper-type information" affect the OFF timing for the paper-feed clutch (described later) and the paper-ejection-wing position in the same way as that they affect the paper-feed-tray stop position.



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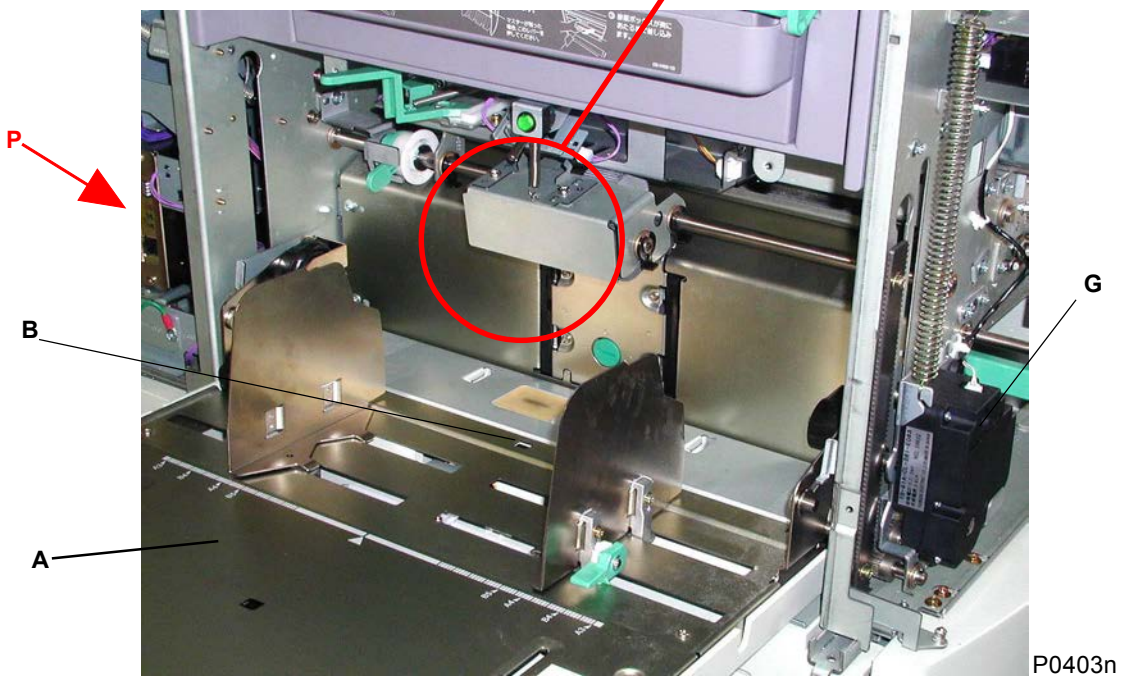
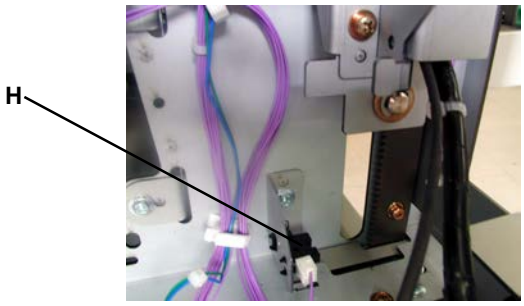


P0403n

A: Paper-feed tray
B: Paper-detection sensor
C: Holder plate: Scraper
D: Detection plate: Upper-limit-B
E: Elevator upper-limit-sensor B
F: Elevator upper-limit-sensor A
G: Elevator motor
H: Elevator lower-limit sensor
I: Feed-tray button



P0404n

Perspective from arrow P

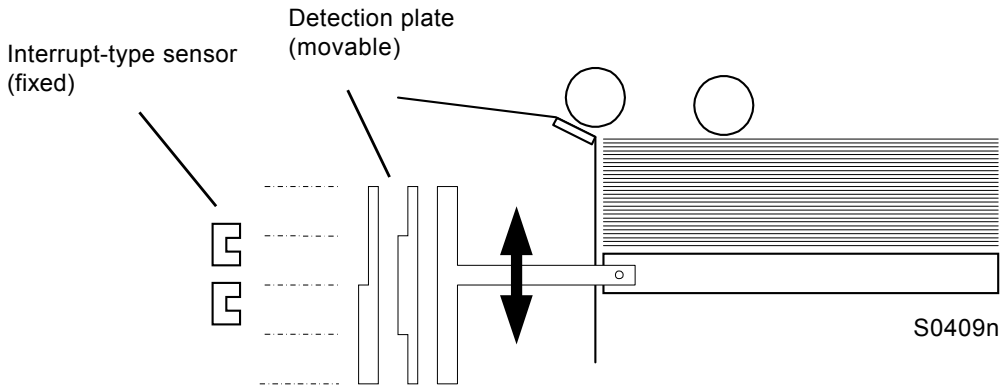
3. Paper-Volume Detection Mechanism (Not Available on 300 dpi)

- The remaining volume of paper loaded into the paper-feed tray is determined by paper-volume detection sensors A and B, and is displayed on the panel.
- The actual position of the paper-feed tray is checked by a -sensor when it reaches the upper-limit position, and the remaining-paper volume is detected. "----" (detection not possible) is displayed on the panel if the paper-feed tray is not at the upper-limit position.

Level	Sensor status		Remaining-paper volume
	Sensor A	Sensor B	
Level 0	OFF	OFF	100–50%
Level 1	ON	OFF	50–30%
Level 2	ON	ON	30–10%
Level 3	OFF	ON	10%–

T0403n

Principle of remaining-paper volume detection:

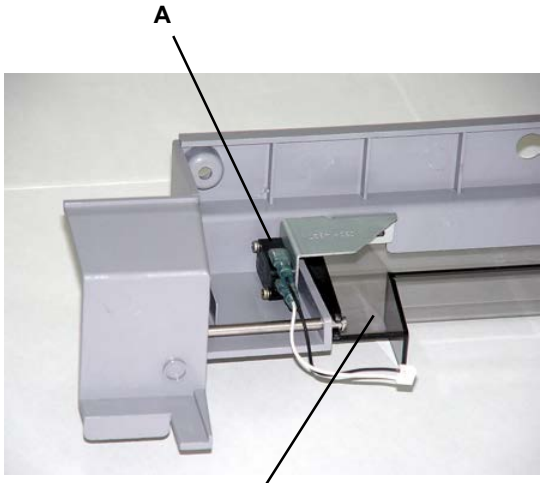


S0409n

4. Paper-Feed-Tray Elevation Safety Mechanism

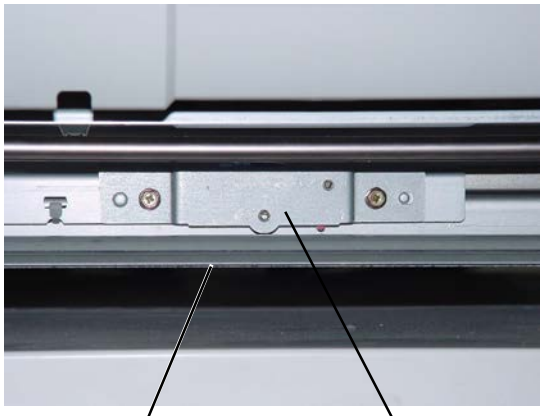
The paper-feed-tray upper SW [A] and paper-feed-tray lower SW [B] ensure safety while the paper-feed tray is being raised or lowered or is stationary.
If the scraper cover [C] is pushed upward, the paper-feed-tray upper SW [A] is tripped. An error is then assumed to have occurred in the paper-feed tray, and the elevator motor stops.
If the lower-limit frame [D] is pushed upward, the paper-feed-tray lower SW [B] is tripped. An error is then assumed to have occurred in the paper-feed tray, and the elevator motor stops.

P0406n



P0407n

P0408n



P0409n

A: Paper-feed-tray upper SW
B: Paper-feed-tray lower SW
C: Scraper cover
D: Lower-limit frame
E: Paper-feed cover

5. First Paper-Feed Mechanism

When the printing operation commences, the main motor activates to rotate the main pulley (Main gear) via the main belt, and to rotate the print drum and paper-feed clutch gear via the gear train (see Chapter 3).
When the print drum rotates through a preset angle from the zero-degree position calculated from position B (307°), the paper-feed clutch is activated. The scraper [A] and pickup roller [B] rotate to feed the paper into the machine from the paper-feed tray.
The paper fed into the machine blocks the light beam between paper sensors [C] and [D]. The print drum then rotates through a preset angle, and the paper-feed clutch is deactivated, thus completing the first-stage paper feed.
The leading edge of the paper rests against the guide roller [E] and timing roller [F], and stops with the paper buckled. To prevent the pickup roller [B] from being rotated in reverse by stiff paper, the pickup-roller shaft includes a one-way core [G] with a ratchet incorporating a one-way clutch and a paper-release lever [H] for which rotation is regulated partially by a ratchet, which is engaged under spring pressure. (To remove jammed paper from the feed side, the paper-release lever [H] must therefore be moved to the rear to disengage it.)
If the print drum rotates as far as the paper-misfeed detection angle after the paper-feed clutch has been activated, the paper sensors [C] and [D] check for the presence or absence of paper. Multiple paper-feed detection is also performed at the position of the paper sensors.
A one-way clutch acts on the scraper roller [A] and pickup roller [B] so that they spin to prevent the first paper-feed stage from applying the brake after the paper has been fed to the second paper-feed stage.

Print-drum detection angles

- Paper-feed-clutch ON angle = 40° + α + β

  α: Test-mode No. 481 “Paper-feed-clutch ON angle” setting

  β: Compensation value when the vertical print position is not centered

- Paper-feed-clutch OFF angle = 30° following paper-sensor detection + α + β

  α: Test-mode No. 482–485 “Paper-feed-clutch OFF angle” setting
  Selected automatically according to the pressure-adjust-lever position and “Paper type” of “Paper-type information” as shown by chart below.

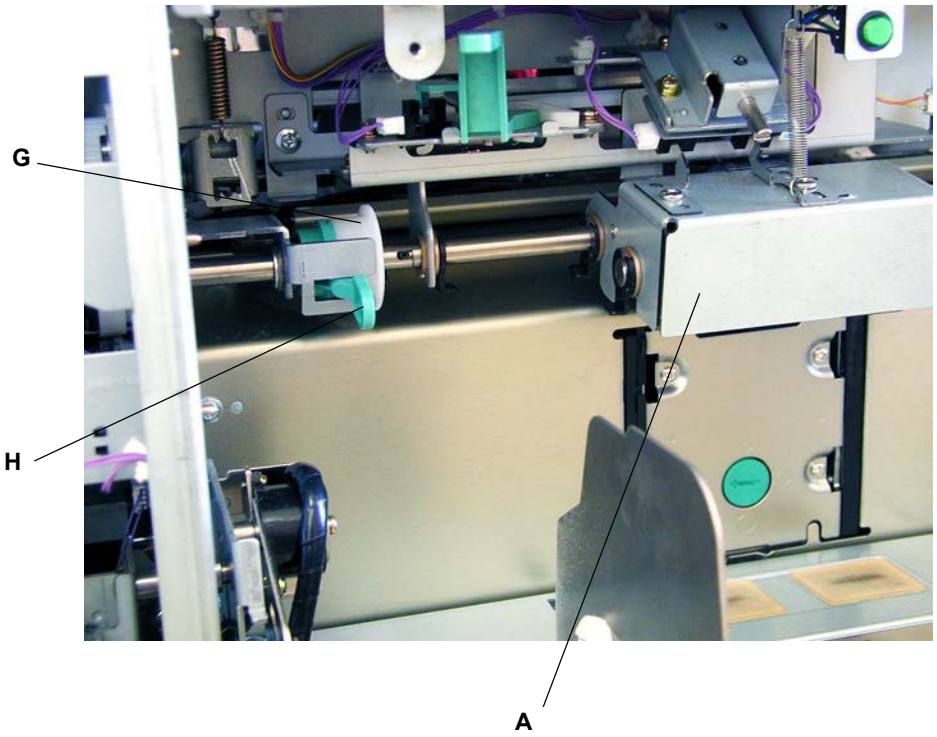
  β: Compensation value depending on the printing speed

Pressure-adjust-lever position	Paper-data entry			
	Thin/Light	Standard	Card	Custom
Standard	Thin/Light	Standard	Card	Custom
Card	Card	Card	Card	Custom

T0404n

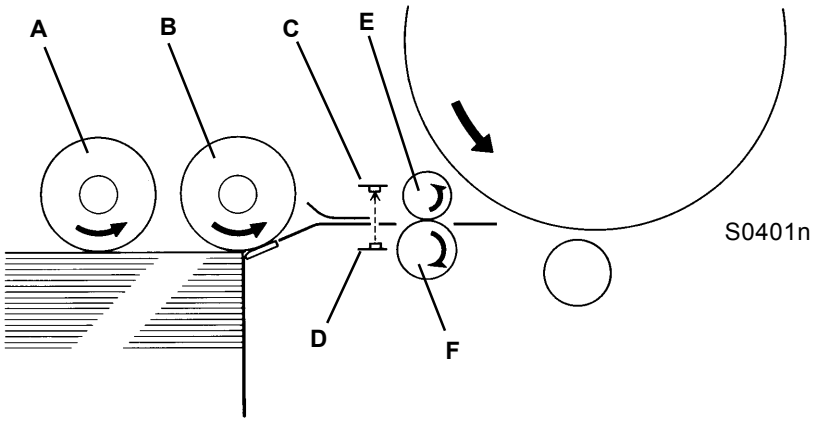
- Paper-misfeed detection angle = 150° + α

  α: Test-mode No. 486 “Paper-misfeed detection angle” setting



P0410n

A: Double scraper roller ass'y
B: Pickup roller
C: Paper sensor (send)
D: Paper sensor (receive)
E: Guide roller
F: Timing roller
G: One-way core
H: Paper-release lever



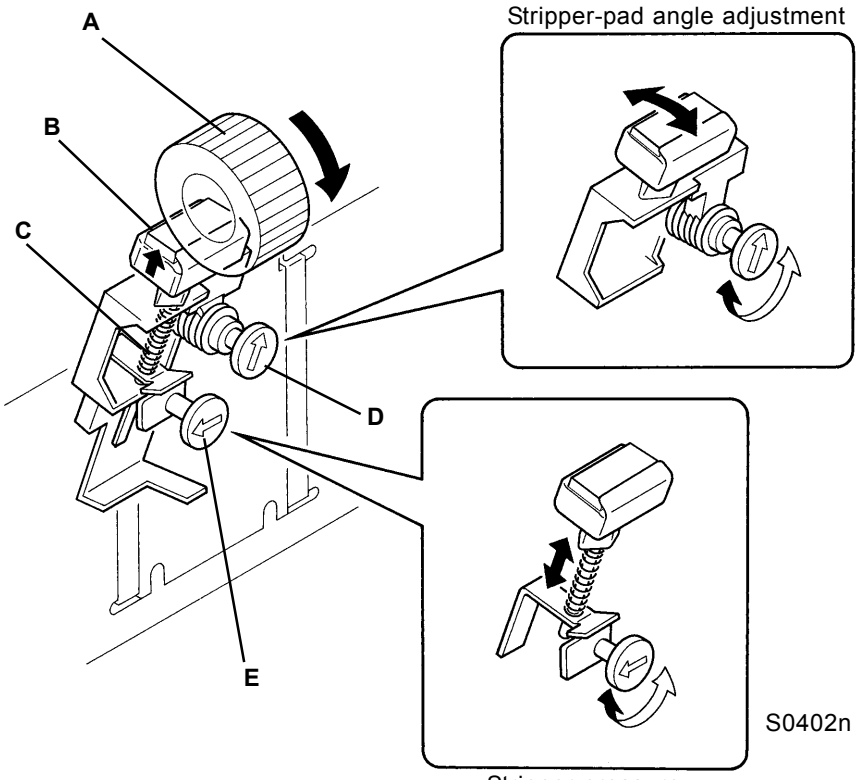
S0401n

6. Paper-Strip Mechanism

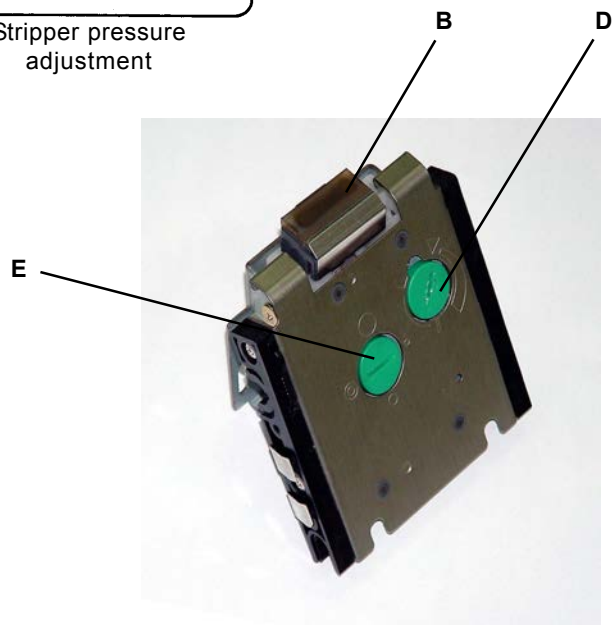
Standard machines

The paper loaded into the paper-feed tray is fed between the pickup roller [A] and stripper pad [B] by the rotating scraper. The paper is then stripped by the pickup roller [A] and stripper pad [B] to ensure that only the uppermost sheet is fed into the machine.
The stripper pad [B] is pressed against the pickup roller [A] by the force of the stripper spring [C], and the sheet is stripped by the resistance applied to the paper fed in strips.

The stripper-pad angle and stripper pressure can be adjusted by the user using the stripper-pad-angle adjust knob [D] and stripper-pressure adjust knob [E].



S0402n

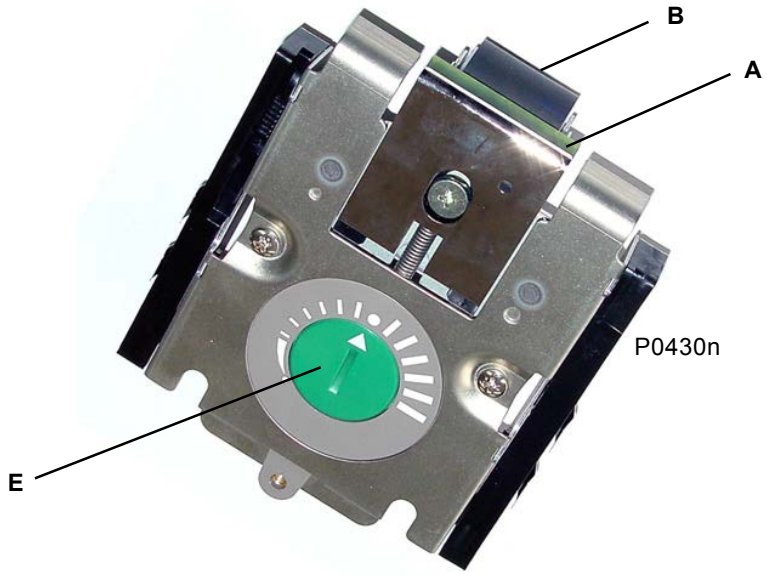


Stripper unit P0411n

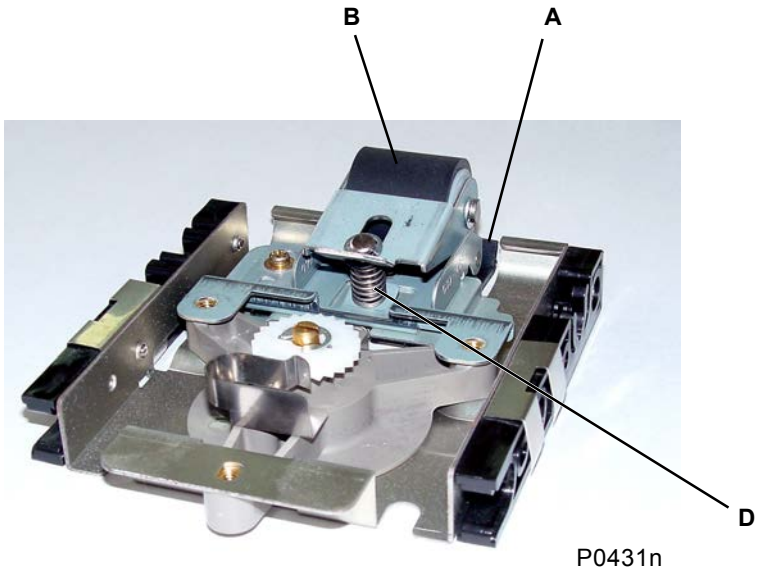
A: Pickup roller
B: Stripper pad
C: Stripper spring
D: Stripper-pad-angle adjust knob
E: Stripper-pressure adjust knob

Stripper unit for multi-tray machines

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



P0430n

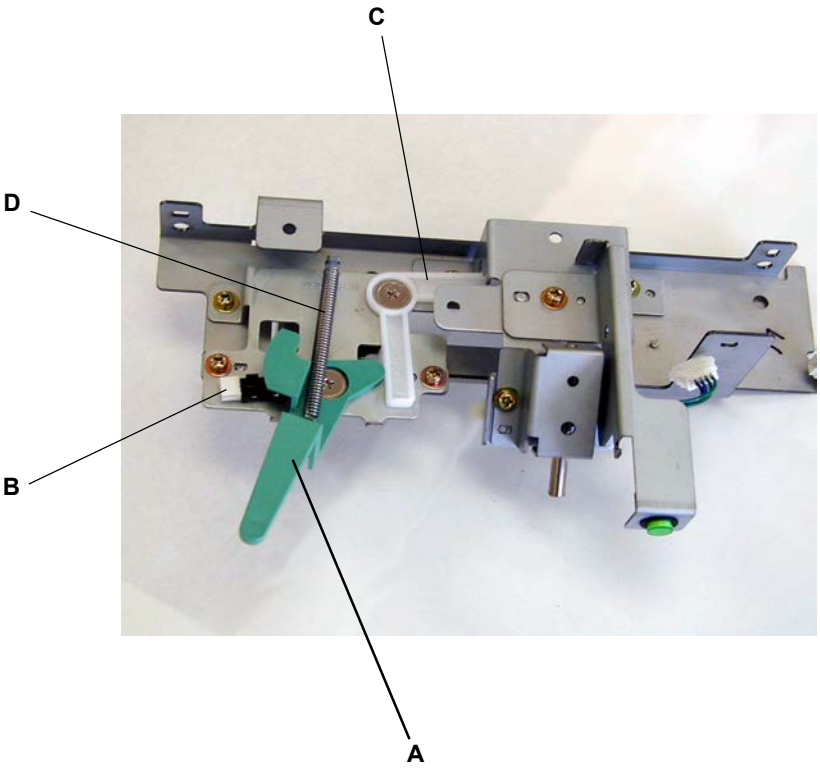


P0431n

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

7. Paper-Feed-Pressure Adjust Lever

Moving the pressure-adjust lever [A] to the left or right switches the scraper [B] paper-feed pressure (scraper pressure) between “Normal” (weak) and “Card” (strong). Moving the pressure-adjust lever to the right increases the paper-feed pressure (scraper pressure).
The “Card” setting is detected by the paper-feed pressure sensor (high) [C]. Then, (1) the paper-ejection-wing position, (2) paper-feed-clutch OFF angle (card) (test-mode No. 483), and (3) upper-limit position are set for the card.



P0412n

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

Removal and Assembly

1. Removing the Paper-Feed-Tray Unit

(1) Lower the paper-feed tray to the lower-limit position, and then switch off the power.

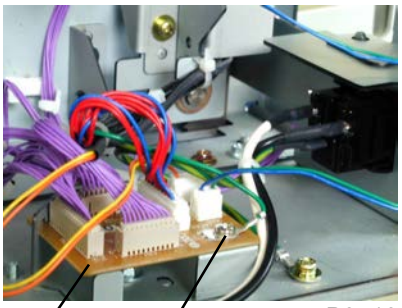
(2) Remove the rear cover.

(3) Open the main PCB unit to the right.

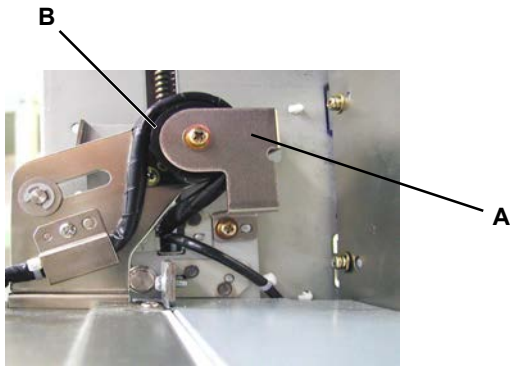
(4) Remove the left and right damper covers [A] on the paper-feed tray with two screws (M4 x 6). Then, remove the right damper (white) with two screws (M3 x 6) and the left damper (black) [B] with two screws (M3 x 6).

(5) From the rear junction PCB (paper feed) [C], unplug the ground wire [E] connecting connectors CN3 and CN5 on the wire harness from the paper-feed-tray unit [D] to the PCB. Cut the wire clamp, then pull the wire harness toward the paper-feed tray.

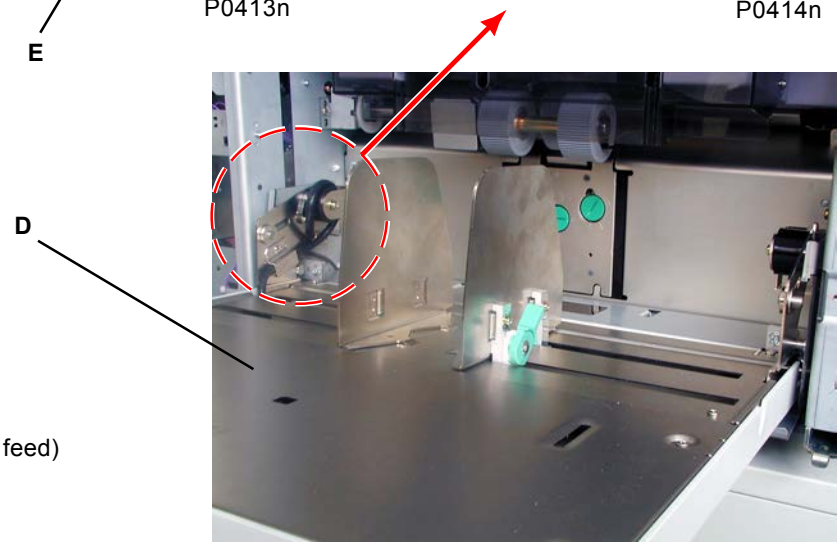
(6) Cut the wire clamps on the wire harness from the paper-feed-tray lower SW, and detach paper-feed-tray [D] by lifting the front of slightly.



P0413n



P0414n



P0415n

A: Damper cover
B: Left damper (black)
C: Junction PCB (paper feed)
D: Paper-feed-tray
E: Ground wire

[Precautions on Reassembly]

- The wire harness on the paper-feed-tray unit must be secured with the wire clamp, as before.
- Be sure to attach the ground screw through the Junction PCB.
- Connect the dampers with the paper-feed-tray unit in the “Envelope” position (the shaft must insert fully into the slot).
- Do not confuse the left and right dampers (identify by color).
- Wind the wire harness on the paper-feed-tray unit once clockwise around the left-hand damper, and then trail out from the rear frame plate.

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

Paper-Size Detection Sensor

(1) Remove the paper-feed tray [A] with four screws (M3 x 6).

(2) Unplug the connector and loosen the mounting clips to detach the paper-size detection sensor [B].

Paper-Width Potentiometer and Paper-Detection Sensor

(1) Remove the left and right paper guides [C] and [D] with two screws (M3 x 8), respectively.

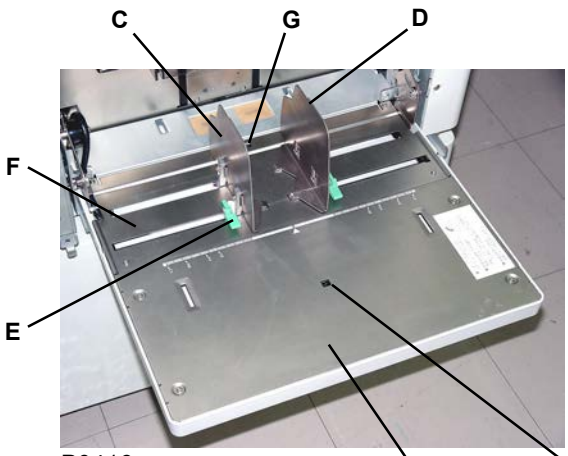
(2) Remove the E-rings, followed by the left and right paper-guide lock levers [E].

(3) Remove the fence cover [F] with four screws (M3 x 6).

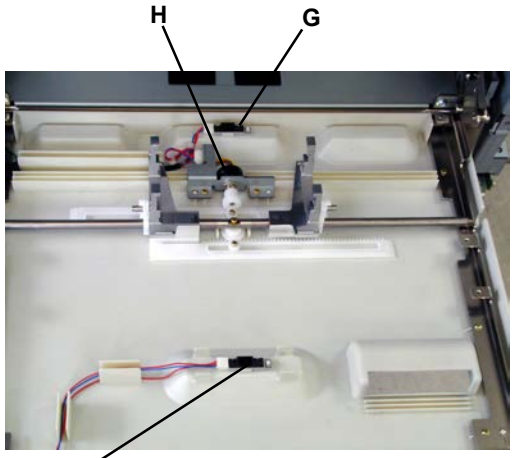
(4) Unplug the connector and loosen the mounting clips to remove the paper-detection sensor [G].

(5) Unplug the connector, remove the two screws (3 x 8), and then remove the paper-width potentiometer [H] together with its bracket.

(6) Remove the screw (M3 x 5) and the gear [I]. Loosen the nut, unplug the connector, and then remove the paper-width potentiometer [H].

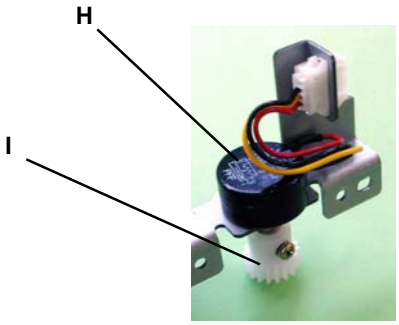


P0416n



P0417n

A: Paper-feed tray
B: Paper-size detection sensor
C: Paper guide R
D: Paper guide F
E: Paper-guide lock lever
F: Fence cover
G: Paper-detection sensor
H: Paper-width potentiometer
I: Gear



P0418n

[Precautions on Reassembly]

- Fully insert the paper-width potentiometer into the bracket slot, and tighten the nut to fix it approximately 1 mm in front of the point at which the red wire contacts the bracket. (Over-tightening may damage the potentiometer.
- When engaging the paper-width potentiometer with the rack, rotate the potentiometer fully in the clockwise direction with the guides fully closed, and then turn the potentiometer back by one click to engage.
- Adjust the paper-width potentiometer after fitting.

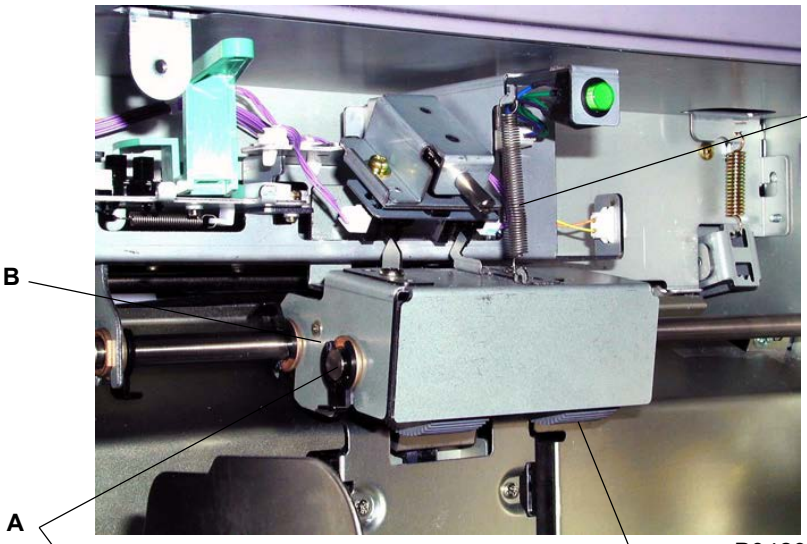
3. Removing the Double Scraper Roller

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

(2) Remove the paper-feed cover.

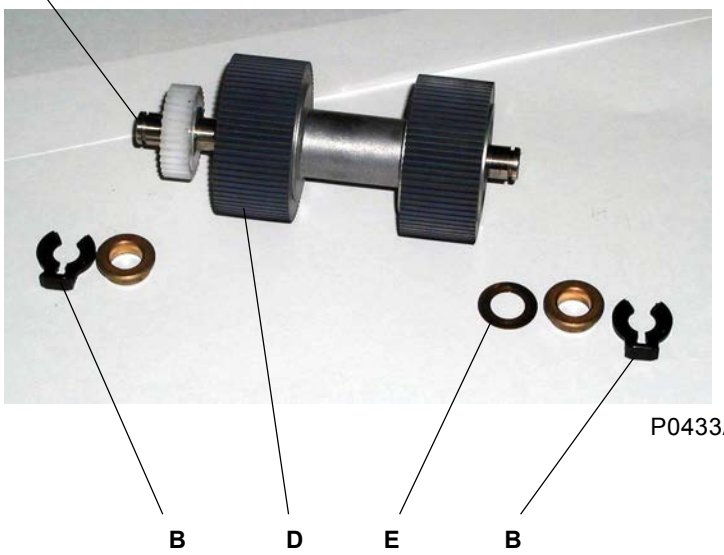
(3) Remove the Lock rings [B] from both ends of the Scraper shaft [A], and detach the Double scraper roller ass'y [C] after removing metal bushing from both ends of the shaft.

(4) Taking care not to lose the Copper washer [E], separate the Double scraper roller [D] from the assembly.



P0429n

A: Scraper shaft
B: Lock ring
C: Double scraper roller ass'y
D: Double scraper roller
E: Copper washer
F: Scraper spring



P0433An

[Precautions on Reassembly]

- The scraper and pickup rollers contain one-way clutch. When mounted on the shafts properly, the ribs on the roller core should face out.
- Do not forget to insert the Copper washet [E], and insert the Lock rings in the proper location.

4. Removing the Pickup Roller and Scraper Assembly

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

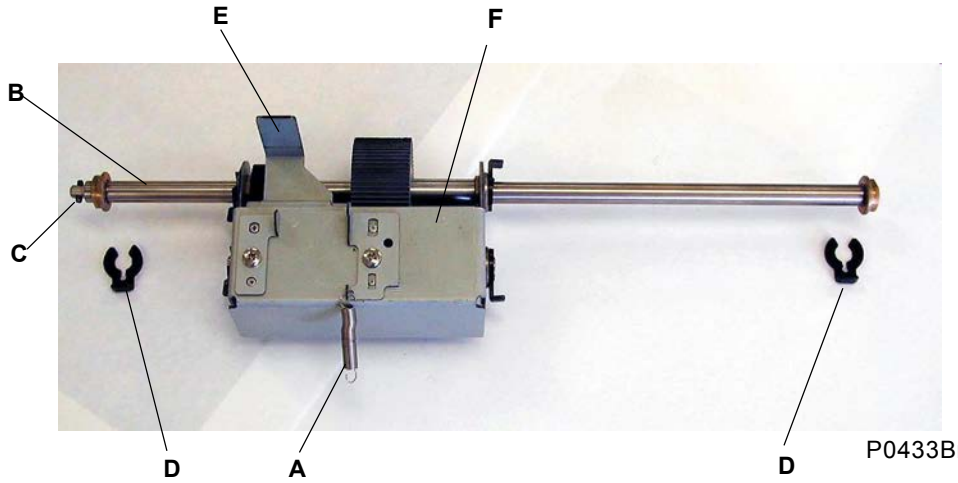
(2) Remove the paper-feed cover.

(3) Remove the Scraper spring [A].

(4) Remove the two Lock rings [D] from the Pickup roller shaft [B], and remove the Scraper ass'y [E] together with the two metal bushings.

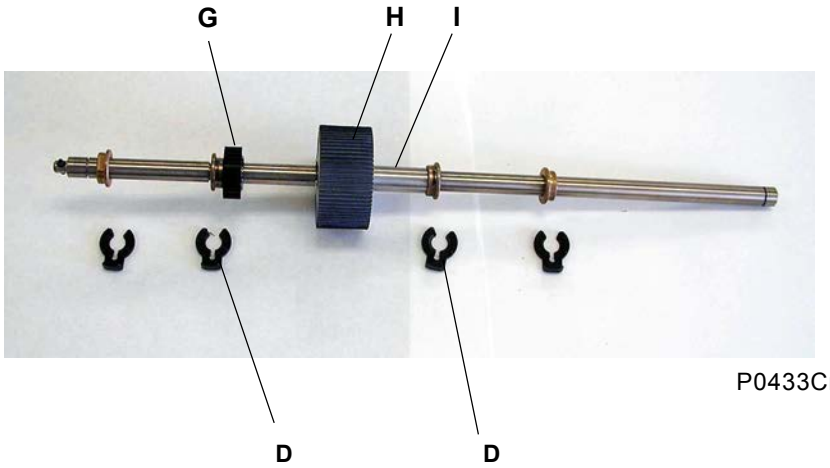
(5) From the Scraper ass'y [E], remove the two Lock rings [D] from the Pickup roller shaft [B] on the Scraper unit [F].

(6) Remove the Pickup roller [H] together with the Pickup roller shaft ass'y [G], and detach the Pickup roller [H] by removing two metal bushings and one Collar [I] from the right hand side of the Pickup roller shaft [B].



P0433Bn

A: Scraper spring
B: Pickup roller shaft
C: Coupling section
D: Lock ring
E: Scraper ass'y
F: Scraper unit
G: Pickup roller shaft ass'y
H: Pickup roller
I: Collar



P0433Cn

[Precautions on Reassembly]

- The Pickup roller contains one-way clutch. When put back correctly, the "RISO" logo on the Pickup roller should face out.

5. Removing Elevator SW and Upper Limit Sensor

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

(2) Remove the paper-feed cover.

(3) Remove the Scraper ass'y. (refer to the previous page)

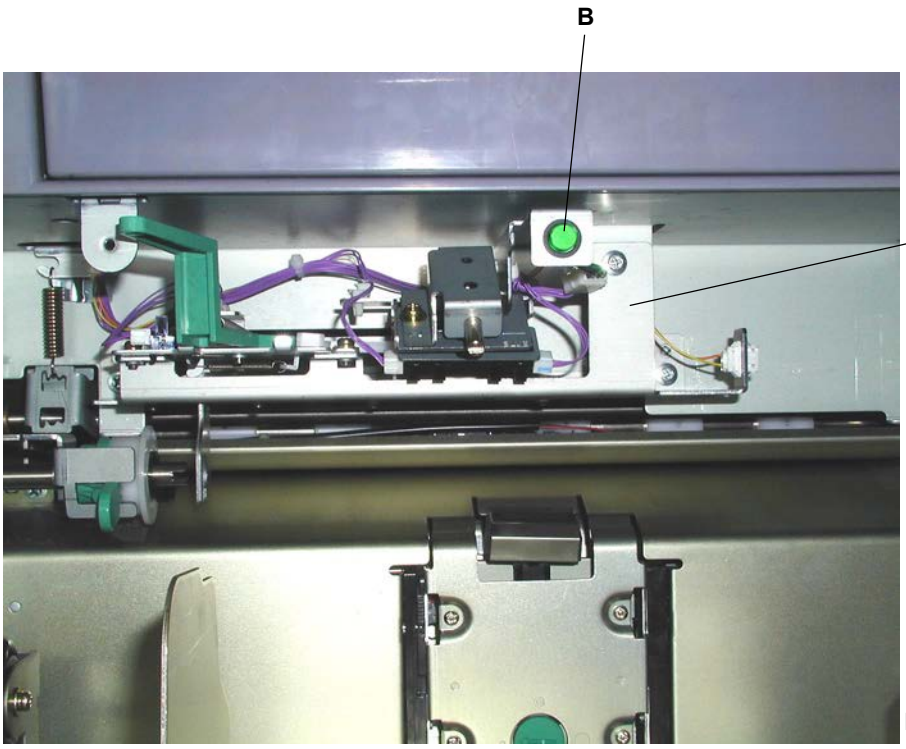
(4) Remove three screws (M4 x8) from the 1st Paper feed stay ass'y [A], unplug connector and detach reusable wire harness band, and dismount the 1st paper feed ass'y [A] from the machine.

(5) Remove the Elevator SW [B] from the dismounted 1st Paper feed stay ass'y [A].

(6) Remove the Upper limit sensor bracket, with the sensor attached, by removing one M3 x 6 screw.

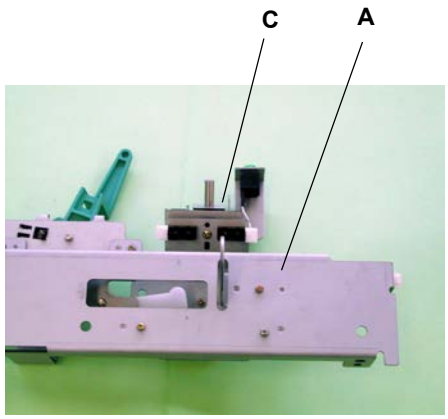
[Precautions on Reassembly]

- Make sure to do the Elevator upper limit sensor position adjustment after putting back the Upper limit sensor.



P0433Dn

A: 1st Paper feed stay ass'y
B: Elevator SW
C: Upper limit sensor bracket



P0421n

6. Removing Paper Feed Clutch and Paper Feed Clutch Shaft

(1) Lower the paper-feed tray to the lower-limit position, and then switch off the power.

(2) Remove the rear cover and open the Main PCB unit to the right.

(3) Remove the paper-feed cover.

(4) Rotate the Sector gear ass'y [A] all the way towards the counterclockwise direction to make the way for the Paper feed clutch to come out.

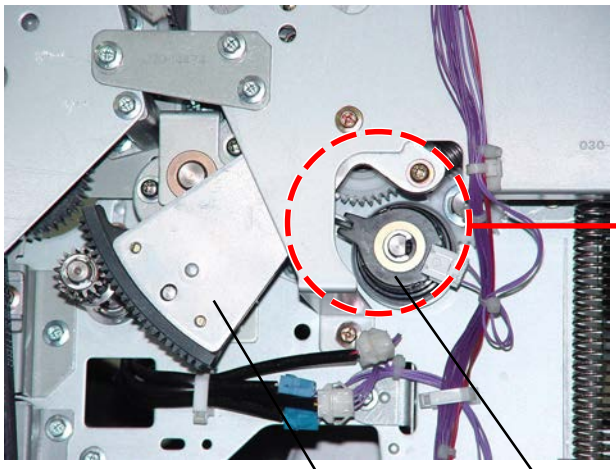
(5) Unplug the wire harness connector from the Clutch, remove one E-ring, and dismount the Paper feed clutch [B] from the machine.

(6) Remove the Scraper ass'y. (refer to page 16)

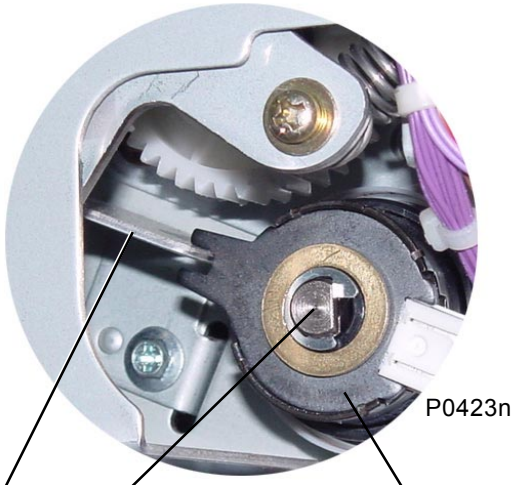
(7) Being careful not to let the One-way core [E], Paper release lever [G], and spring to fly out, remove the Lock ring [F] located on the right of the One-way core [E].

(8) Remove one E-ring on the left of the Anti-reverse lock plate and remove metal bushing.

(9) Pull out the Paper-feed clutch out from the machine.

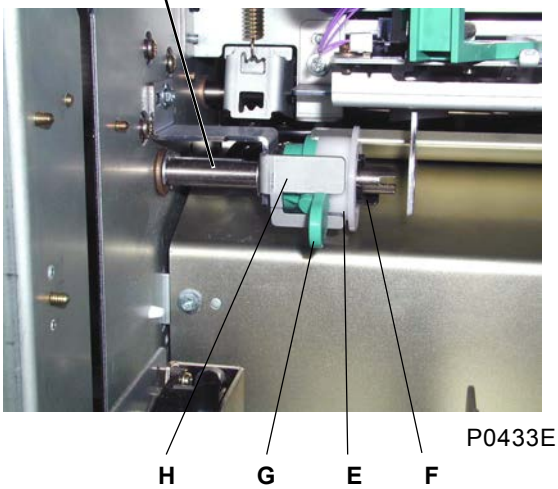


P0422n



P0423n

A: Sector gear ass'y
B: Paper-feed clutch
C: Paper-feed clutch shaft
D: Paper-feed clutch lock plate
E: One-way core
F: Lock ring
G: Paper release lever
H: Anti-reverse lock plate



P0433En

[Precautions on Reassembly]

- Match the flat surface of the Paper-feed clutch shaft with the flat surface in the hole of the Paper feed clutch.
- Engage the slot on the clutch with the paper-feed-clutch lock plate [D] on the machine, to prevent the paper-feed-clutch [B] unit from rotating.

7. Removing the Elevator Motor

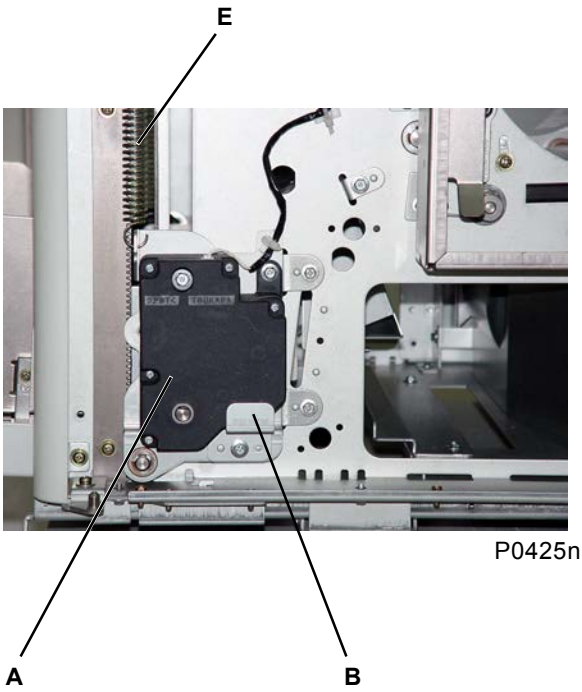
(1) Pull out the print drum, lower the paper-feed tray to the lower-limit position, and then switch off the power.

(2) Remove the front cover, front frame cover, and rear cover.

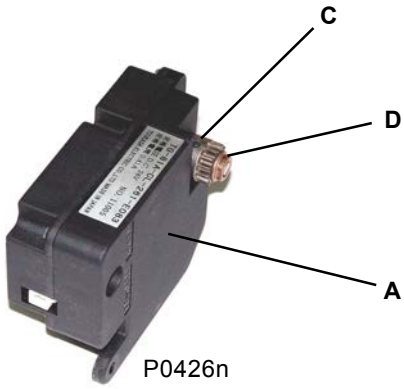
(3) Remove the elevator springs [E] on both sides (to prevent the paper-feed tray from springing up).

(4) Unplug the connector on the elevator motor [A], and remove the two screws (M4 x 10).

(5) Remove the elevator-motor holder [B] with one screw (M4 x 8), and remove the elevator motor [A]. (Take care not to drop the metal [D] inserted into the elevator-motor-shaft ass'y [C].)

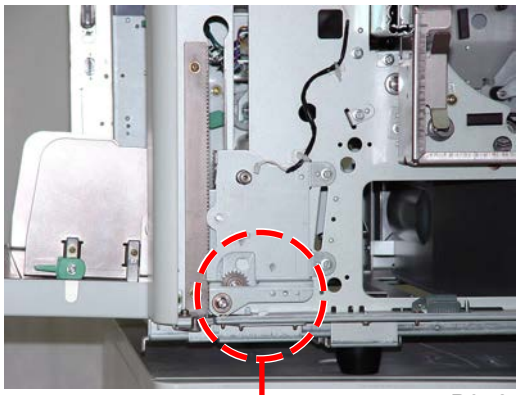


P0425n

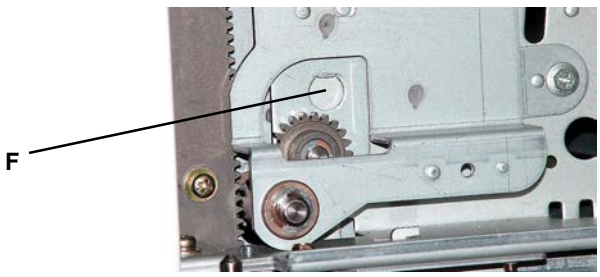


P0426n

A: Elevator motor
B: Elevator-motor holder
C: Elevator-motor-shaft ass'y
D: Metal
E: Elevator spring
F: D-cut hole



P0427n



P0439n

[Precautions on Reassembly]

- Insert the metal of the elevator-motor-shaft ass'y into the D-cut hole [F] before reassembling.

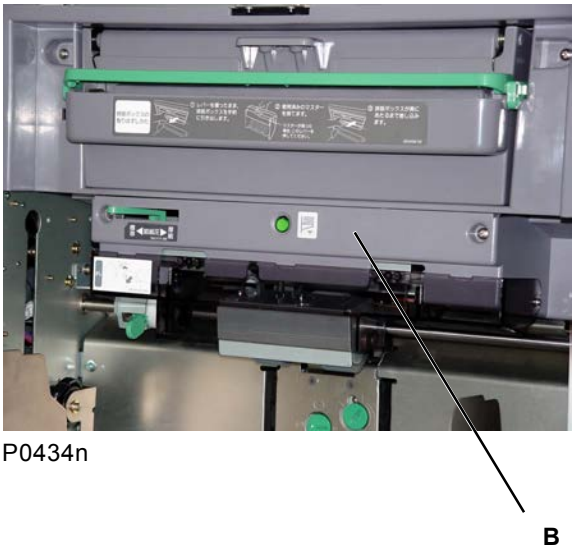
8. Removing the Paper-Feed-Tray Upper Safety SW

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

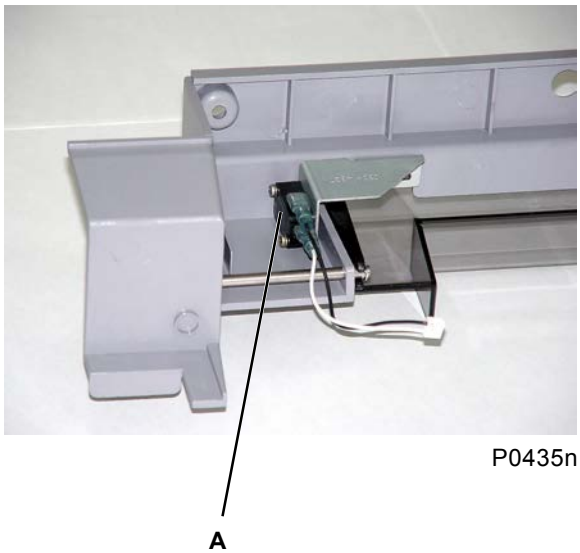
(2) Remove the paper-feed cover [B].

(3) Remove the screw (3 x 6), and then remove the paper-feed-tray upper SW [A] together with its bracket.

(4) Remove the paper-feed-tray upper safety SW [A] with two screws (M3 x 14).



P0434n



P0435n

A: Paper-feed-tray upper safety SW

B: Paper-feed cover

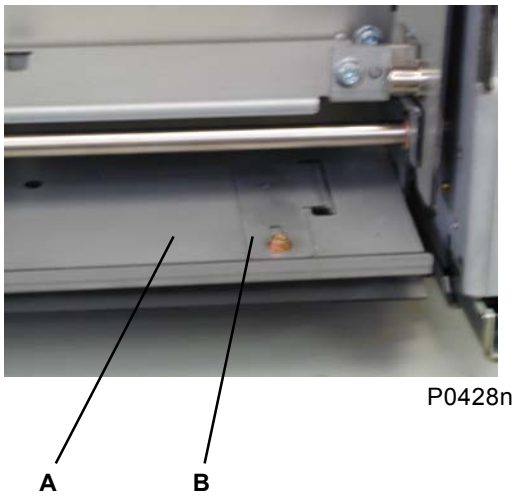
9. Removing the Paper-Feed-Tray Lower Safety SW

(1) Lower the paper-feed tray to the lower-limit position, and switch off the power.

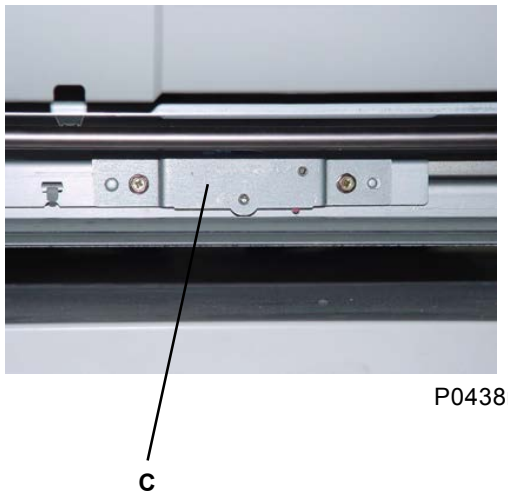
(2) Remove the paper-feed-tray unit.

(3) Remove a screw (M3 x 6) attaching the lower-limit-frame holder [B] to the lower-limit frame [A], and then remove the paper-feed-tray lower SW [C] together with its bracket.

(4) Remove the paper-feed-tray lower safety SW [C] with two screws (M3 x 14).



P0428n



P0438n

A: Lower-limit frame

B: Lower-limit-frame holder

C: Paper-feed-tray lower safety SW

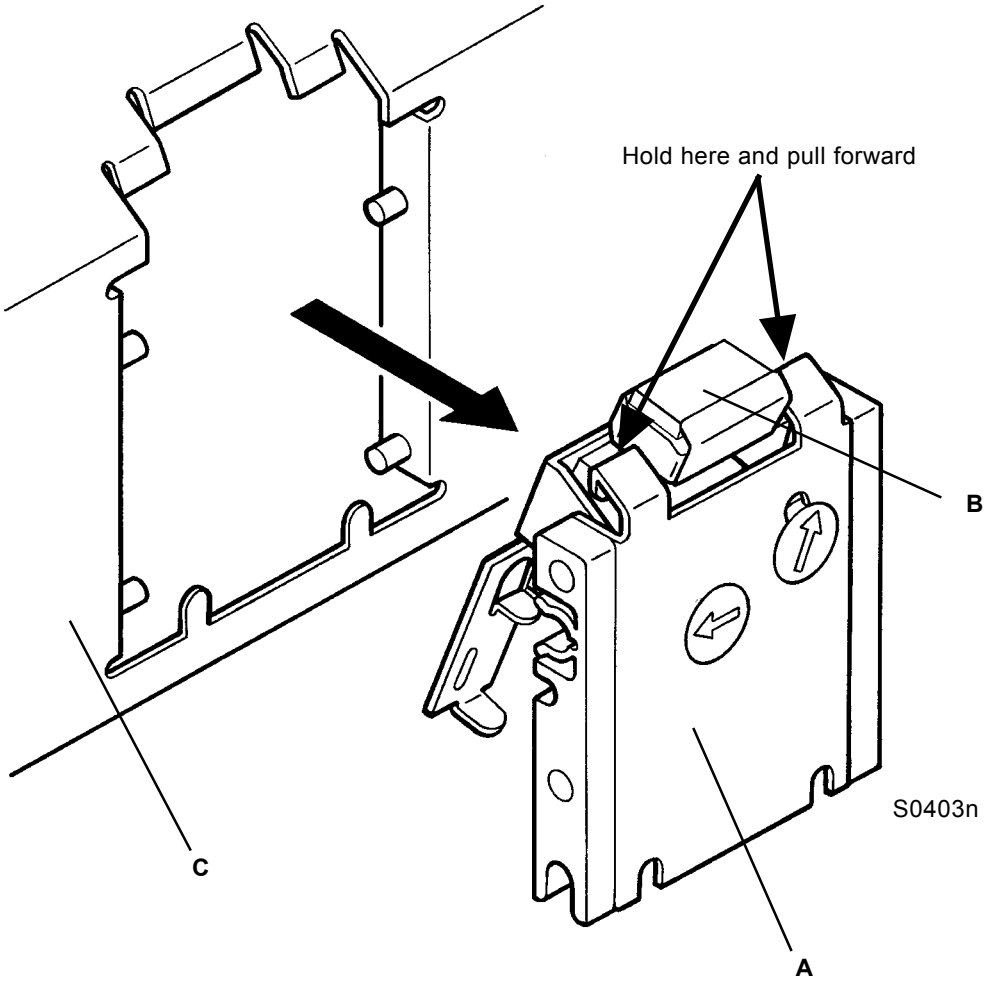
10. Removing the Stripper Unit

(1) Lower the paper-feed tray to the lower-limit position.

(2) Place your finger on the top of the stripper unit [A] and pull forward to remove it [A]. (See Section 12 for details on the stripper unit for multi-tray machines.)

[Precautions on Reassembly]

- Insert the stripper unit onto the paper-guide plate [C] while the stripper pad ass'y [B] is pressed against the paper-guide plate.
- Adjust the stripper.



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

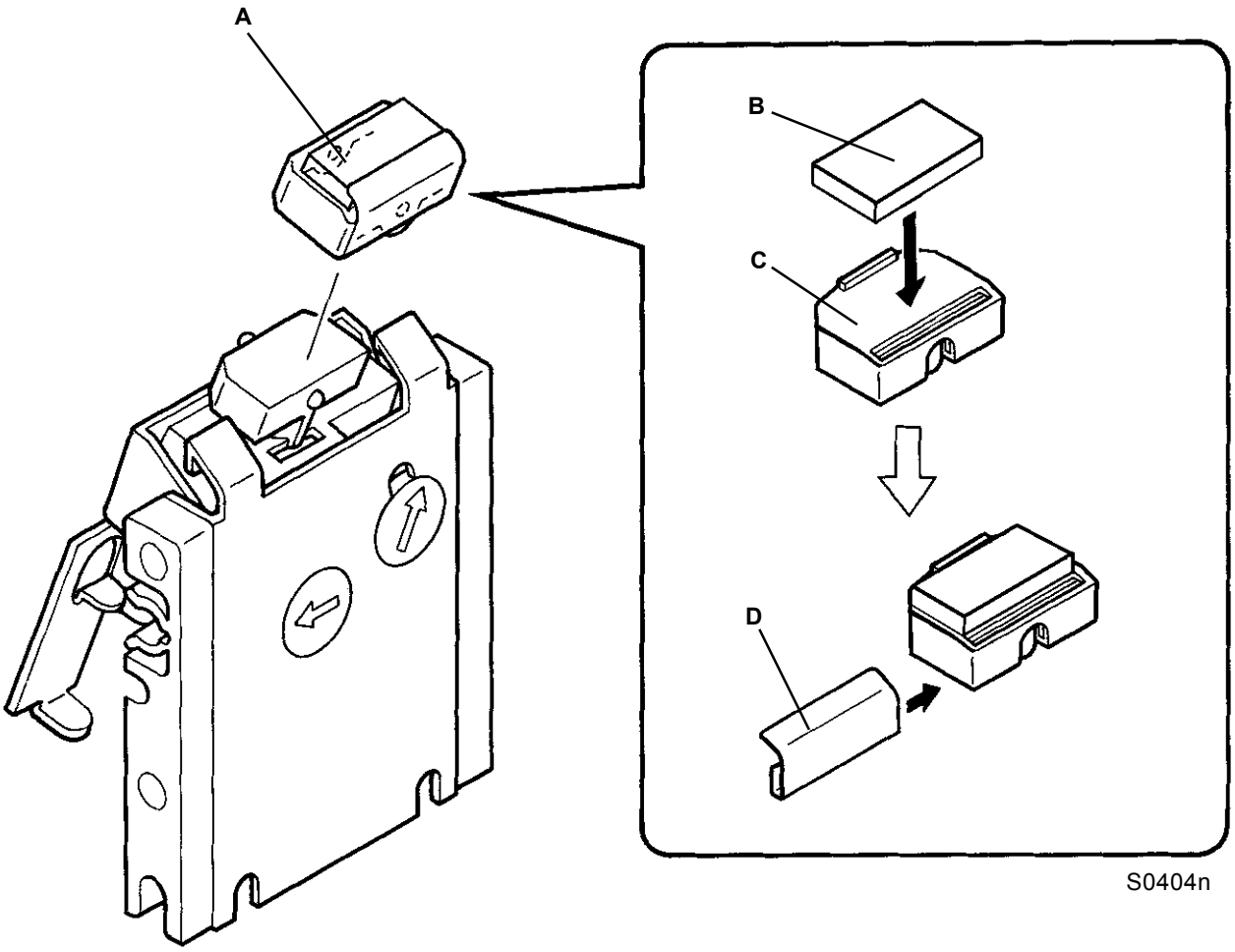
11. Removing the Stripper-Pad Ass'y (Standard Machine)

(1) Lower the paper-feed tray to the lower-limit position, and remove the stripper unit.

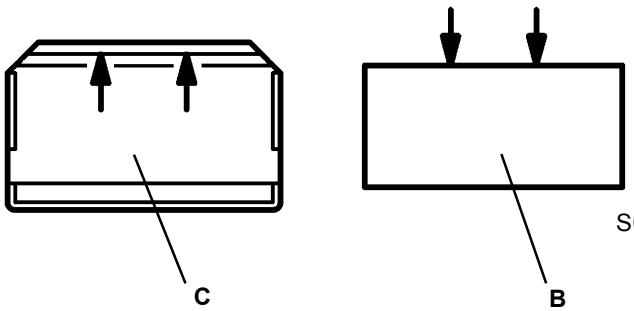
(2) Lift the stripper-pad ass'y [A] by hand and remove it.

[Precautions on Reassembly]

- Attach the stripper pad [B] by pressing the face indicated by the arrow against the face of stripper pad base [C] indicated by the arrow.



S0404n



S0405n

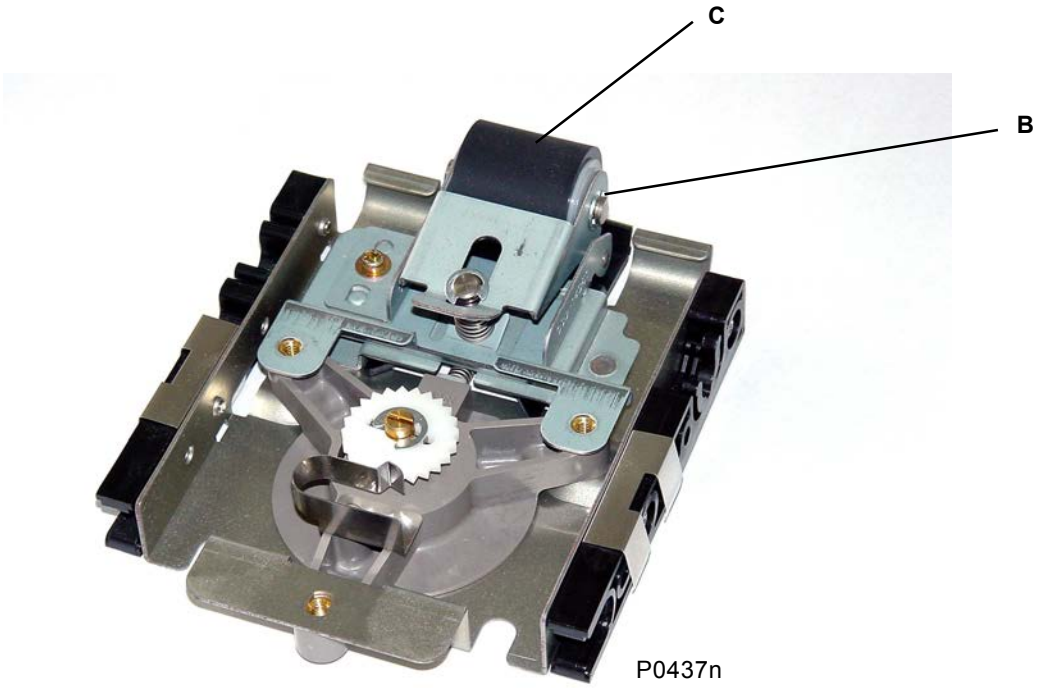
A: Stripper-pad ass'y
B: Stripper pad
C: Stripper-pad base
D: Stripper-pad cover

12. Removing the Stripper Roller (Multi-Tray Machines)

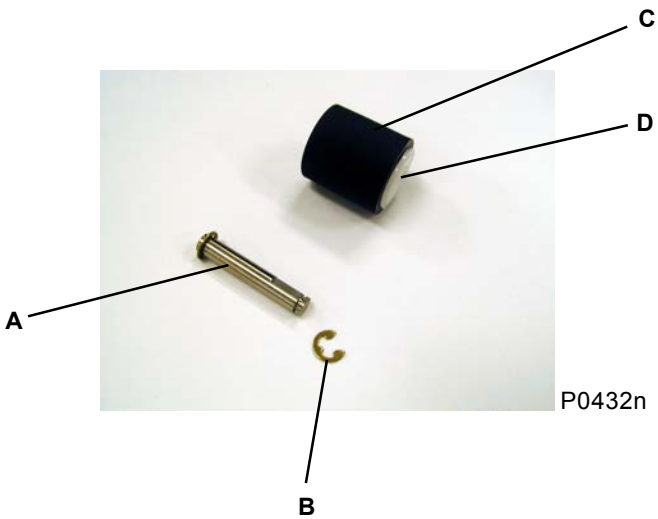
(1) With the paper-feed tray raised to near the upper-limit position, remove a screw (M4 x 6) from the underside of the paper-feed tray.

(2) Lower the paper-feed tray to the lower-limit position, and detach the stripper unit.

(3) Detach the E-ring [B] from the D-cut side of the stripper-roller shaft [A], then remove the stripper roller [C] and stripper-roller clutch [D].



P0437n



P0432n

A: Stripper-roller shaft
B: E-ring
C: Stripper roller
D: Stripper-roller clutch

Adjustment

1. Elevator Upper-Limit-Sensor Position Adjustment

Procedure

(1) Place the pressure-adjust lever in the “Standard” position, and set the paper type entry to “Standard.”

(2) Remove the paper from the paper-feed tray.

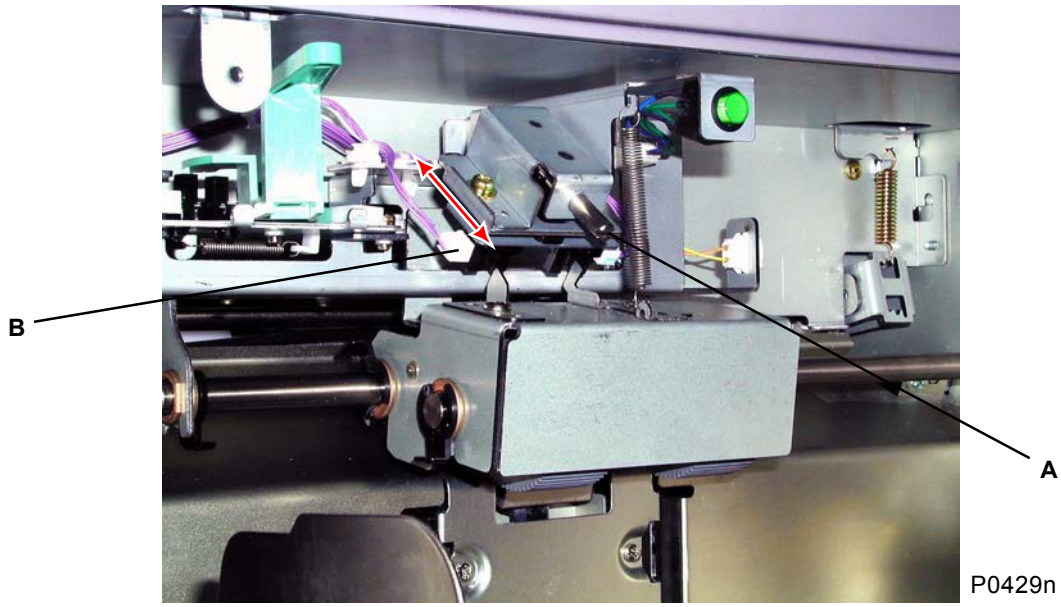
(3) Start test-mode No. 453 (elevator servo), raise the paper-feed tray, and bring it to a complete stop.

(4) Once it has stopped, confirm that the gap between the pickup roller [C] and the paper-feed tray [E] is 1.5 mm to 2.0 mm.

(5) If the gap is not within the specifications, adjust it by rotating the upper-limit adjustment screw [A] and moving the upper-limit-sensor ass’y [B] up or down.

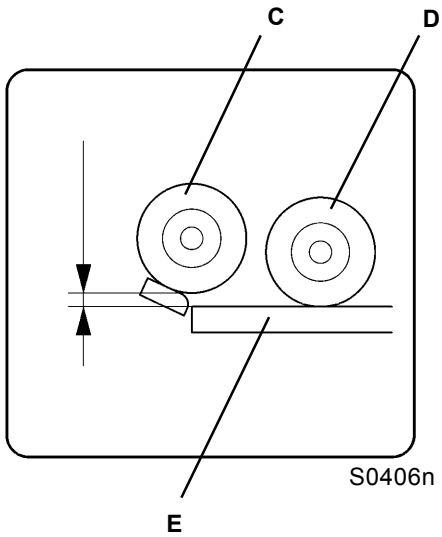
Symptoms

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



P0429n

A: Upper-limit adjustment screw
B: Upper-limit-sensor ass’y
C: Pickup roller
D: Scraper
E: Paper-feed tray



S0406n

2. Stripper Adjustment

[Standard machines]

Procedure

(1) Use the pressure-adjust lever to set the most suitable paper type prior to printing.

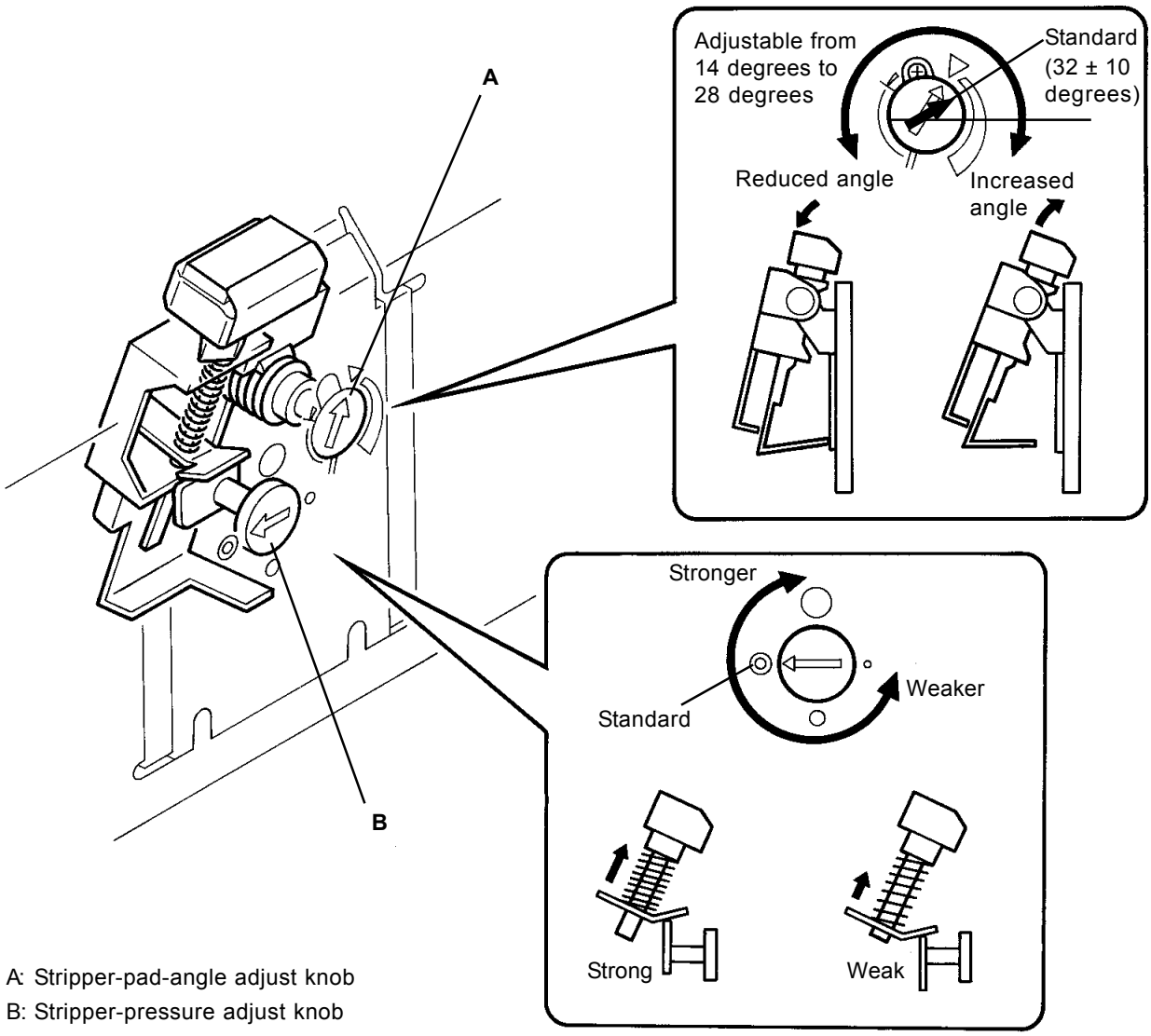
(2) If multiple feeding or misfeeding occurs, adjust the stripper-pad angle and stripper pressure.

1) Multiple feeding

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

2) Misfeeding

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



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

S0407n

[Multi-tray machines]

Procedure

(1) Set the pressure-adjust lever to the most suitable paper type prior to printing.

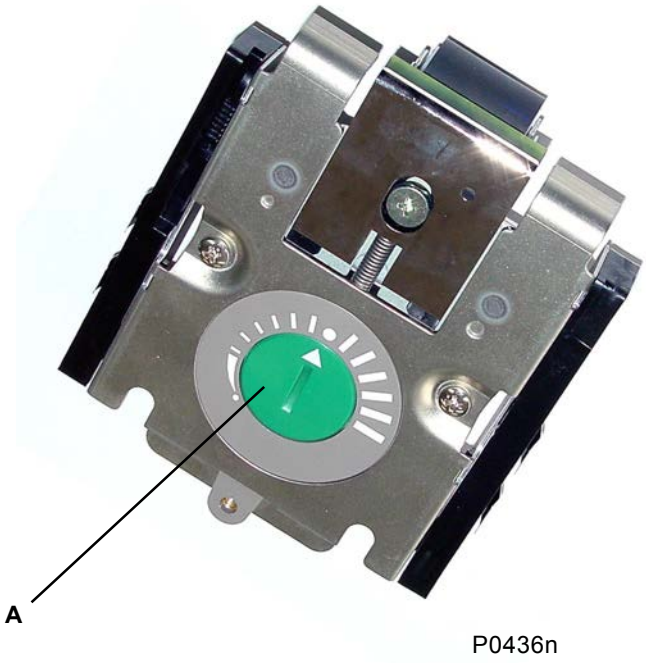
(2) If multiple paper feeding or paper misfeeding occurs, adjust the stripper pressure.

1) Multiple paper feeding

- Turn the stripper-pressure adjust knob [A] clockwise to increase the stripper pressure.

2) Paper misfeeding

- Turn the stripper-pressure adjust knob [A] counterclockwise to reduce the stripper pressure.



P0436n

A: Stripper-pressure adjust knob

3. Paper-Feed-Clutch ON Angle Adjustment

Check and adjustment procedure

(1) Execute a test printing to confirm that the paper is fed smoothly.

(2) If the first paper-feed timing is not synchronized, adjust it using test-mode No. 481 (paper-feed-clutch ON angle adjustment). (For the setting procedure, see Chapter 18: Test Modes.)

(3) Repeat the procedure starting from step (1) until the correct timing is achieved.

Symptoms

If the first-stage paper-feed timing is not synchronized, paper jamming or offset printing may occur.

4. Paper-Feed-Clutch OFF Angle Adjustment

Check and adjustment procedure

(1) Execute a test printing to confirm that printing is performed smoothly.

(2) If the paper is excessively or insufficiently buckled and printing is not performed smoothly, run test-modes No. 482–485 (paper-feed-clutch OFF angle adjustment) in accordance with the user-mode paper-type entry. (For the setting procedure, see Chapter 18: Test Modes.)

(3) Repeat the procedure starting from step (1) until the 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 as a result.

5. Paper-Width Potentiometer Adjustment

Check and adjustment procedure

(1) Position the paper guides at 182 mm, and run test-mode No. 450 (paper-size VR adjust: 182 mm).

(2) Position the paper guides at 297 mm, and run test-mode No. 451 (paper-size VR adjust: 297 mm).

(3) With the paper guides at 297 mm, run test-mode No. 471 (paper-width metric data), and confirm that the figure displayed is between 296 mm and 298 mm.

Symptoms

If the size of the paper in the paper-feed tray cannot be determined, the paper-ejection wings and paper guides on the paper-receiving tray (for the auto-control stacking tray) will not be set properly.

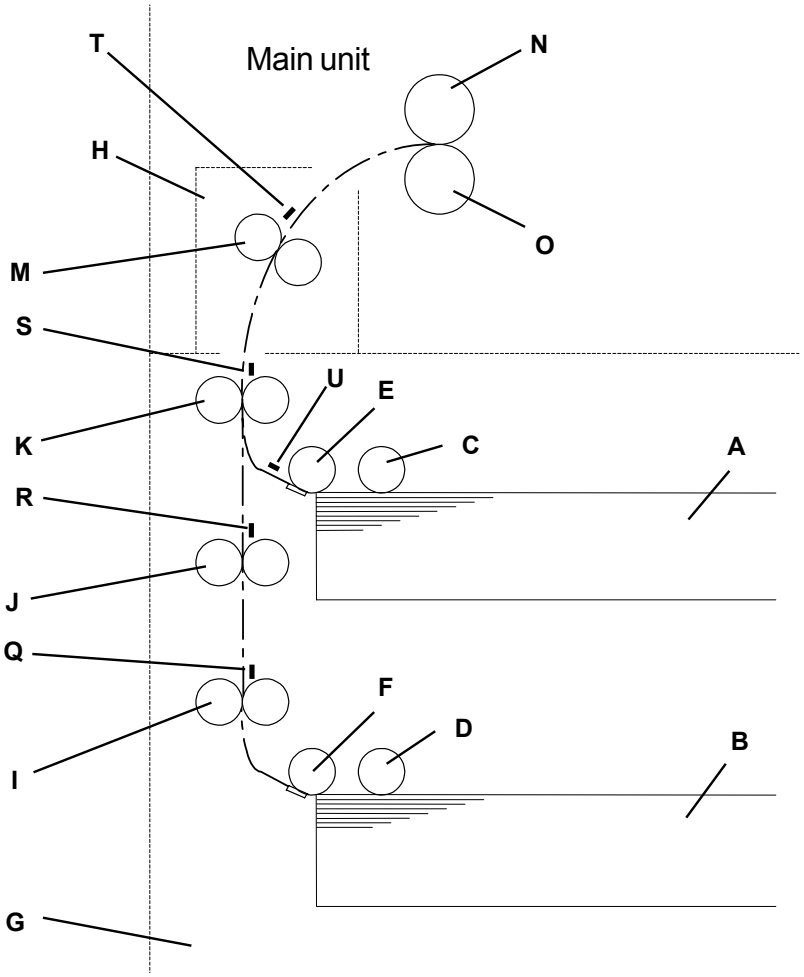
CHAPTER 5: MULTI-TRAY PAPER FEEDER

Contents

Mechanism

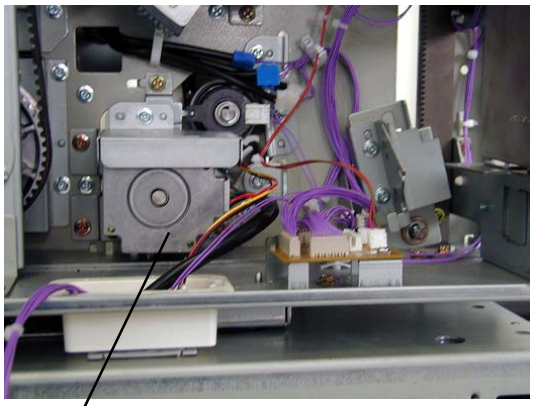
1. Overall Mechanism

The multi-feed-tray mechanism consists of the multi-tray paper feeder [G] and vertical transfer unit [H]. The multi-tray paper feeder [G] consists of the upper and lower paper trays (paper tray 1 [A] and paper tray 2 [B]) housed in the stand, their respective scrapers [C] and [D], pickup rollers [E] and [F], and the transfer mechanism. The vertical transfer unit [H] consists of the vertical transfer rollers housed in the main unit for feeding paper to the second paper-feed section. Selection of the desired paper-feed tray on the panel determines which paper-feed clutch (multi-feed-tray clutch) is activated.
The scrapers [C] and [D], pickup rollers [E] and [F], are driven by the multi-feed-tray transfer motor [L] via the multi-feed-tray 1 and 2 feed clutch. Paper-feed rollers 1 to 3 [I], [J], and [K] are driven by the multi-feed-tray transfer motor [L] via the multi-feed-tray transfer clutch 1 to 3. Paper-feed roller 4 [M] is driven by the multi-feed-tray pickup motor [P] via the multi-feed-tray transfer clutch 4.

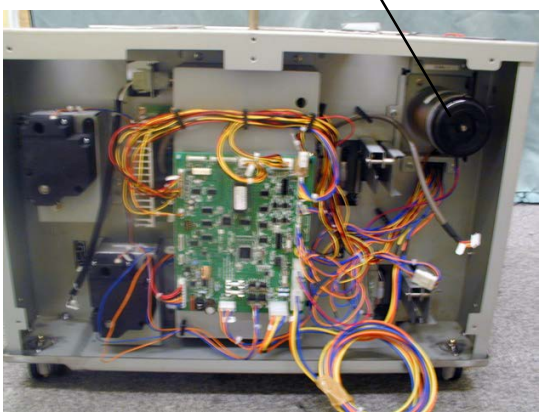


S0501

P0501



P0502

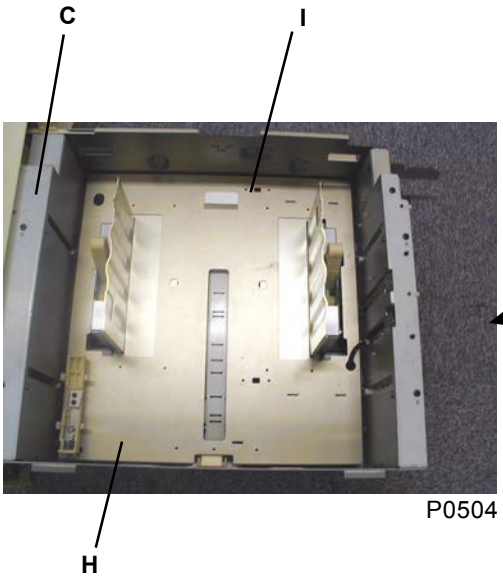


P0503

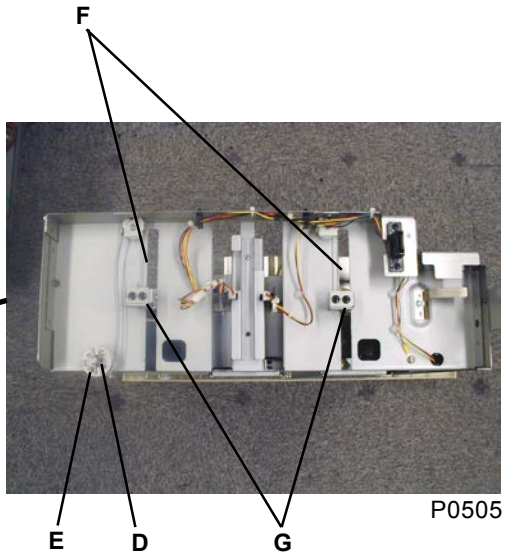
A: Paper tray 1
B: Paper tray 2
C: Scraper 1
D: Scraper 2
E: Pickup roller 1
F: Pickup roller 2
G: Multi-tray paper feeder
H: Vertical transfer unit
I: Paper-feed roller 1
J: Paper-feed roller 2
K: Paper-feed roller 3
L: Multi-feed-tray transfer motor
M: Paper-feed roller 4
N: Guide roller
O: Timing roller
P: Multi-feed-tray pickup motor
Q: Multi-tray feed sensor 1
R: Multi-tray feed sensor 2
S: Multi-tray feed sensor 3
T: Multi-tray feed sensor 4
U: Multi-tray 1 pickup sensor

2. Paper-Tray Elevation Mechanism

The end of the drive shaft [A] driven by the elevator motor is fitted with a coupling [B]. This engages with the coupling pin [D] on the wire wind shaft fitted to each paper-feed tray [C] when the paper-feed trays [C] are in the stand. The wire wind shaft passes from the rear to the front of each paper-feed tray, and suspends the support bracket [G] and the table [H] attached to the support bracket [G] by the two wires [F] attached to the wire wind pulleys [E] fitted on either side of the shaft. The table [H] can therefore be raised and lowered by rotating the wire wind pulley [E].
The paper-detection sensor [I] checks whether there is paper in the paper-feed trays. Setting the trays when light is received at the paper-detection sensor [I] (paper present) activates the elevator motor until the scraper ass'y blocks the light beam to the upper-limit sensor.
If a paper-feed tray is pulled out, the coupling is disconnected and the table [H] lowers under its own weight to the lower-limit position.

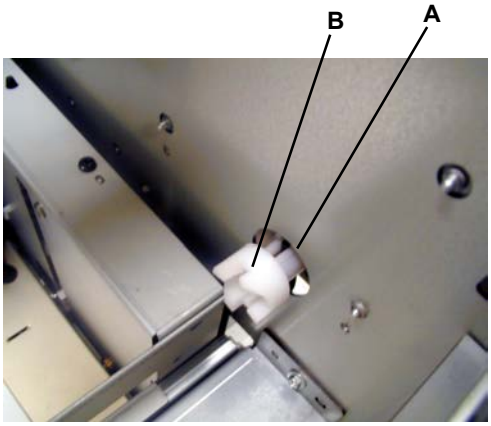


P0504



P0505

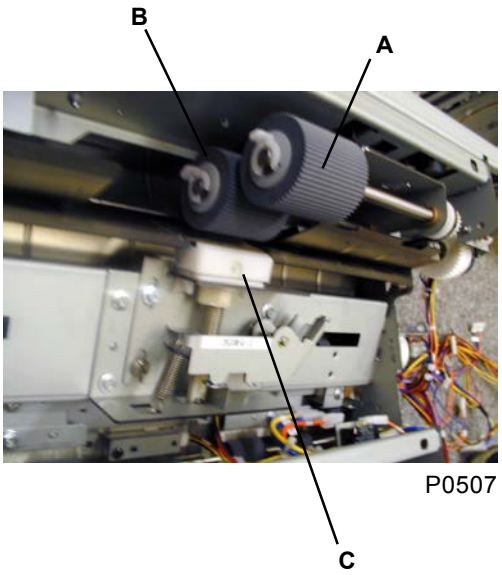
A: Drive shaft
B: Coupling
C: Paper-feed tray
D: Coupling pin
E: Wire wind pulley
F: Wire
G: Support bracket
H: Table
I: Paper-detection sensor



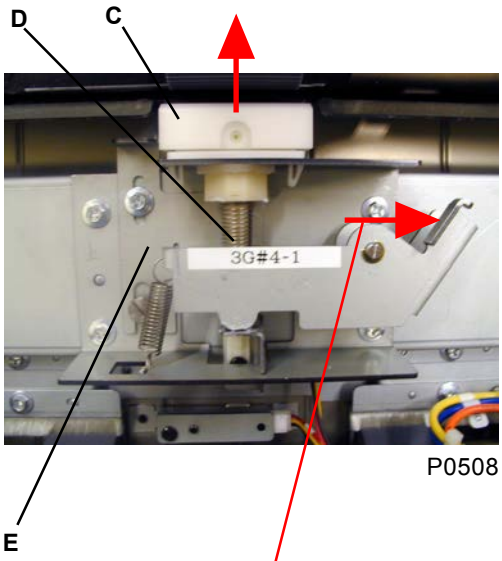
P0506

3. Paper-Stripping Mechanism

The paper loaded into the paper-feed tray is fed between the pickup roller [B] and stripper pad [C] by the rotating scraper [A]. The paper is then stripped by the pickup roller [B] and stripper pad [C] to ensure that only the uppermost sheet is fed into the machine.
The stripper pad [C] is pressed against the pickup roller [B] by the force of the stripper spring [D], and the resistance applied to the paper fed in strips the sheet.
The stripper pressure can be adjusted by raising and lowering the stripper adjust plate [E].
The stripper pad [C] retracts below the pickup roller [B] when a paper-feed tray is removed.



P0507



P0508

When pushed in this direction by the paper-feed tray, the stripper pad rises up and is pushed against the pickup roller.

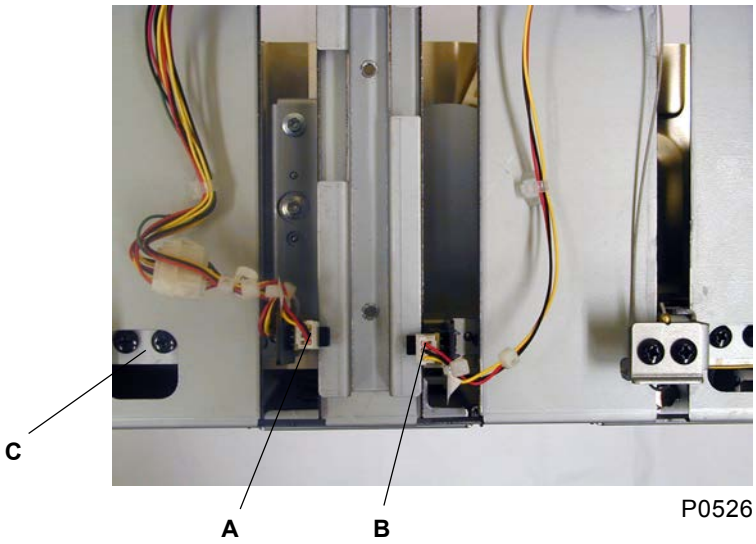
A: Scraper
B: Pickup roller
C: Stripper pad
D: Stripper spring
E: Stripper adjust plate

4. Paper-Volume Detection Mechanism

- The remaining volume of paper loaded on the table [C] is determined by multi-feed tray volume sensor 1 and 2 (fixed on the table), and is displayed on the panel.
- The actual position of the paper-feed tray is checked by a -sensor when it reaches the upper-limit position, and the remaining-paper volume is detected. "----" (detection not possible) is displayed on the panel if the paper-feed tray is not at the upper-limit position (the paper-feed-tray is pulled out).

Sensor status		Remaining-paper volume detected
Sensor 1	Sensor 2	
ON	ON	100–50%
OFF	ON	50–30%
OFF	OFF	30–10%
ON	OFF	10%–

View from the rear of the tray



A: Multi-feed-tray volume sensor 1
B: Multi-feed-tray volume sensor 2
C: Table

5. First-Paper-Feed Mechanism

At a certain drum angle from position B, which is calculated from the drum speed of two rotations before, the multi-feed-tray clutch of the respective tray activates, and by switching each transfer clutch ON and OFF in order, the paper is fed and stops when the paper is pressed against the timing roller.

Assist Control

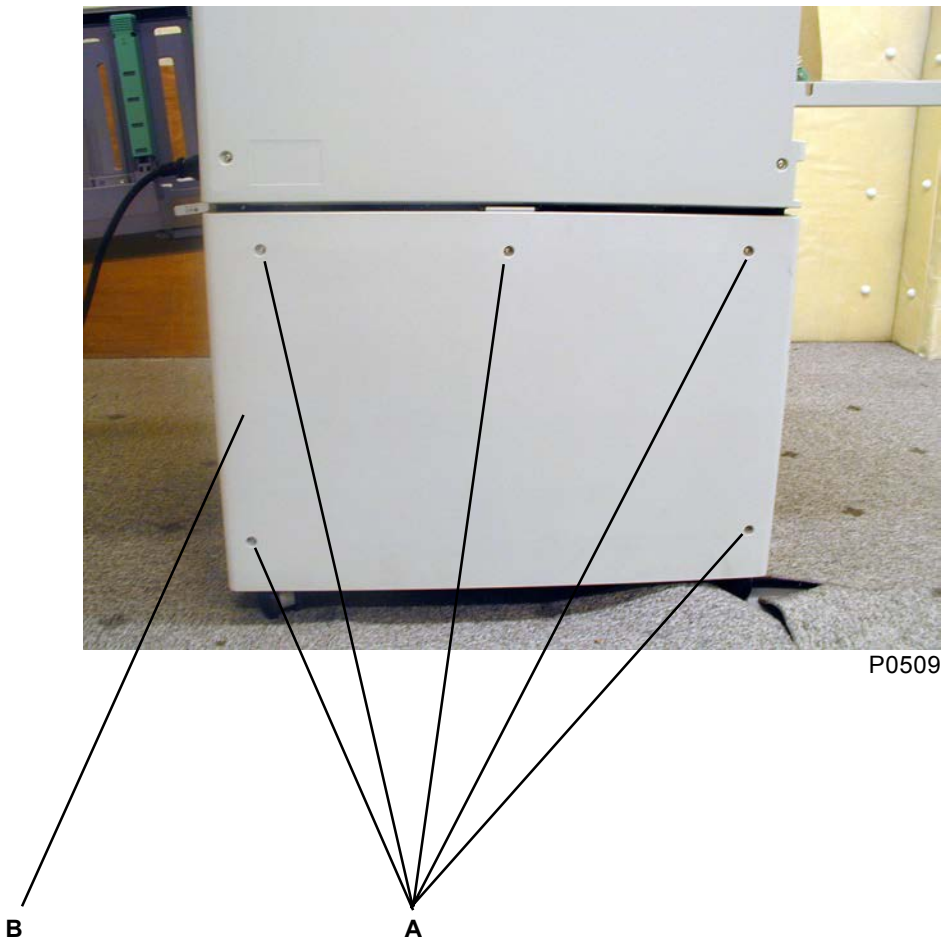
When tray 1 is selected and if A3-size paper is detected, the multi-feed-tray pickup motor rotates at the same speed as the drum after the paper is pressed against the timing roller, and the multi-feed-tray transfer clutch 4 switches ON at drum degree 278.5° and switches OFF at 310.5°. This is called the Assist Control in feeding from multi-feed-tray No.1.

The Assist Control feature can be activated or deactivated by test mode No.894.

Removal and Assembly

1. Removing the MTPF Rear Cover

(1) Remove the five screws (M4 x 8) [A], and then remove the MTPF rear cover [B] by lifting it slightly.



P0509

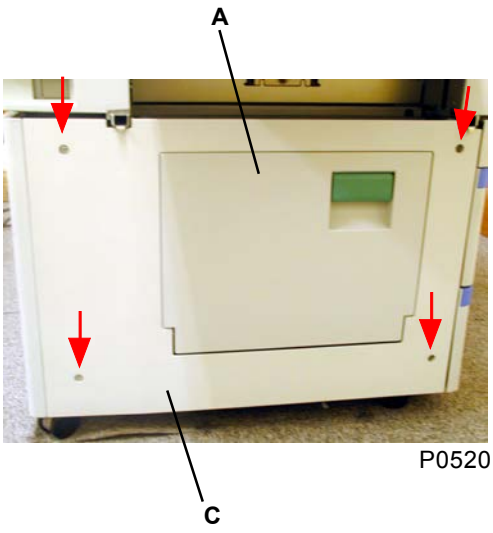
A: Screw
B: MTPF rear cover

2. Removing the MTPF Left-Hand Cover

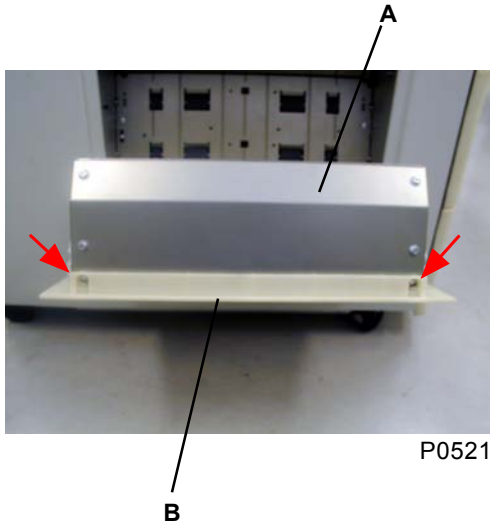
(1) Remove the MTPF rear cover.

(2) Open the multi-tray transfer unit [A], and then remove the multi-tray transfer-unit cover [B] with two screws (M4 x 10).

(3) Remove the four screws (M4 x 10), and then remove the MTPF left-hand cover [C] by lifting it slightly.



P0520



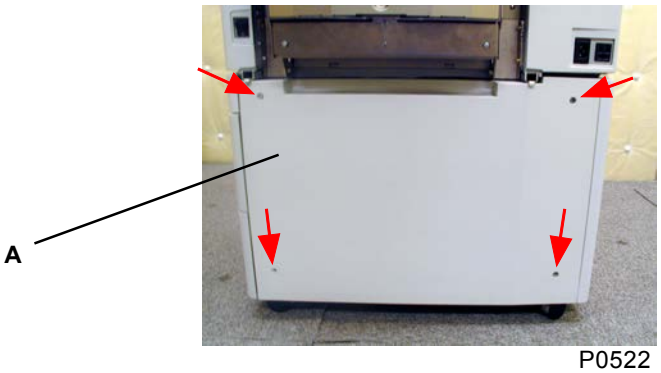
P0521

A: Multi-tray transfer unit
B: Multi-tray transfer-unit cover
C: MTPF left-hand cover

3. Removing the MTPF Right-Hand Cover

(1) Remove the MTPF rear cover.

(2) Remove the four screws (M4 x 10), and then remove the MTPF right-hand cover [A] by lifting it slightly.



P0522

A: MTPF right-hand cover

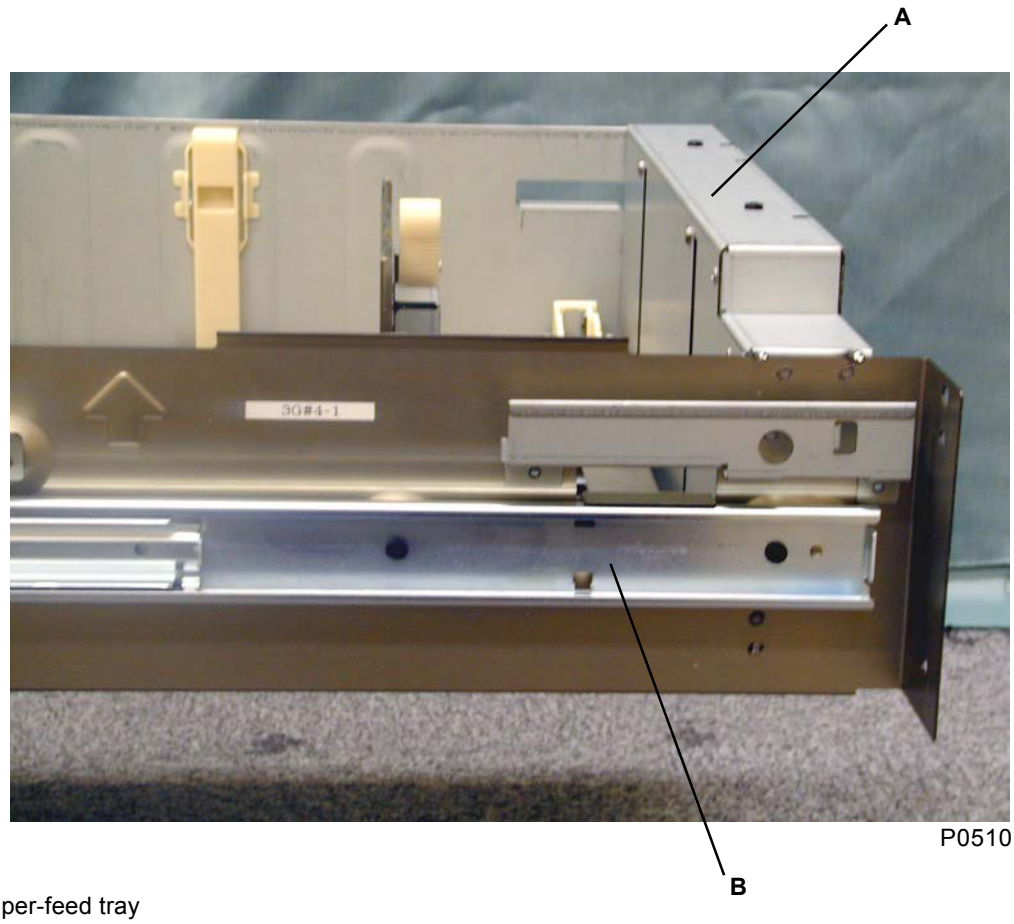
4. Removing the Paper-Feed Trays

The paper-feed trays [A] consist of the upper (paper tray 1) and lower (paper tray 2) trays, but the removal procedure is the same for either.

(1) Remove the three screws (M4 x 6) from the slide rail [B] on the paper-feeding side, the two screws (M4 x 6) from the slide rail on the paper-ejection side, and then remove the paper-feed tray upwards.

[Precautions on Reassembly]

- Align the half-pierced sections (two locations each) on both sides.



P0510

A: Paper-feed tray

B: Slide rail

5. Removing the Multi-Feed-Tray Paper-Width Potentiometer

(1) Remove the paper-feed trays (see this chapter).

(2) Remove the paper-feed-tray cover with four screws (4 x 8).

(3) Remove the two screws (M4 x 6) each from the two support brackets [B] at the front and rear, which support the table [A] for the paper-feed trays.

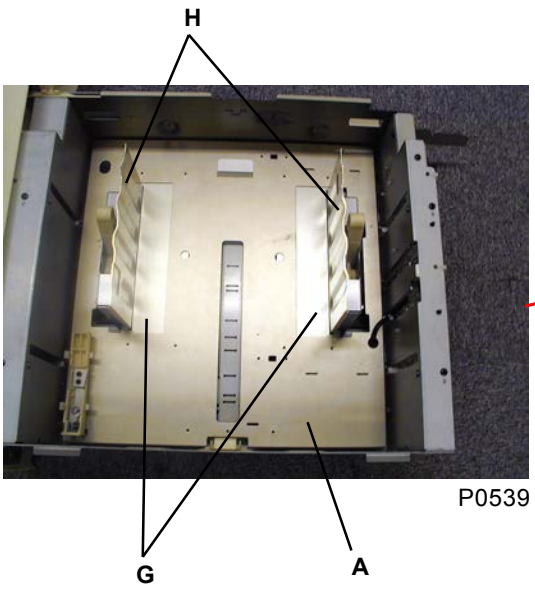
(4) Unplug the connectors from the multi-feed-tray volume sensor 1 [E] and multi-feed-tray volume sensor 2[F] fitted to the table [A], cut the wire clamp on the wire harness and remove the connectors, and then remove the table [A]. (The two cover tables [G] are removed at the same time.)

(5) Remove the paper-width-potentiometer cover [C] with one screw (M4 x 8).

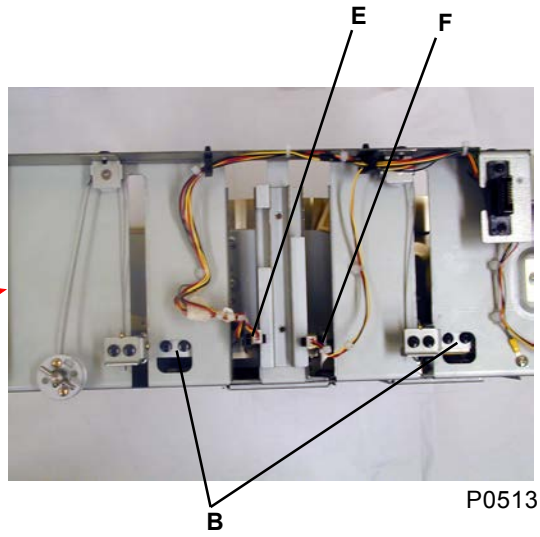
(6) Unplug the connector, remove the nut, and then remove the multi-feed-tray paper-width potentiometer [D].

[Precautions on Reassembly]

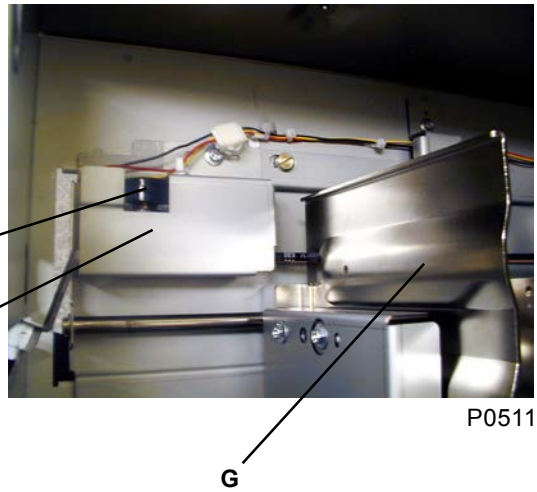
- When fitting the multi-feed-tray paper-width potentiometer [D], move the side paper guides [H] to the innermost position, and rotate the potentiometer fully in the clockwise direction. Adjust the pulley bracket on the opposite side of the potentiometer to tighten the timing belt properly.



P0539



P0513



P0511

A: Table
B: Support bracket
C: Paper-width-potentiometer cover
D: Multi-feed-tray paper-width potentiometer
E: Multi-feed-tray volume sensor 1
F: Multi-feed-tray volume sensor 2
G: Cover table
H: Side paper guide

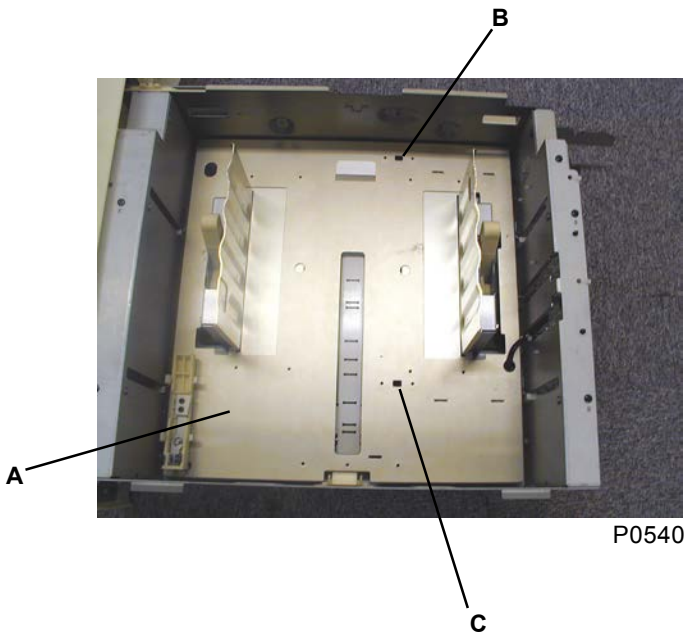
6. Removing the Paper-Detection Sensor and Paper-Size Detection Sensor

(1) Remove the paper-feed trays (see this chapter).

(2) Remove the paper-feed-tray cover with four screws (4 x 8).

(3) Remove the two screws (M4 x 6) each from the two support brackets at the front and rear, which support the table [A] for the paper-feed trays.

(4) Unplug the connectors from the paper-detection sensor [B] and paper-size detection sensor [C] attached to the underside of the table [A], and then remove sensors with one screw (M3 x 6) together with the bracket.



P0540

A: Table

B: Paper-detection sensor

C: Paper-size detection sensor

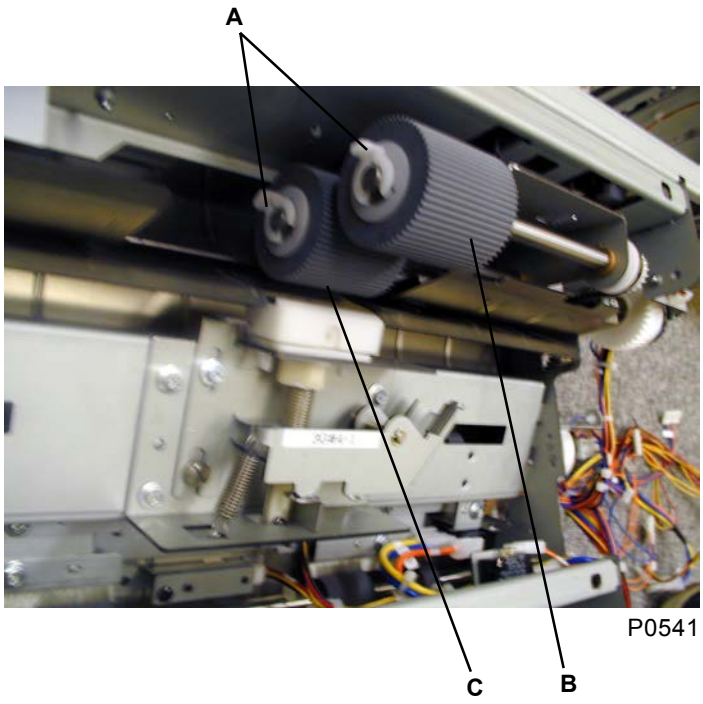
7. Removing the Pickup Roller and Scraper

(1) Remove the paper-feed trays (see this chapter).

(2) Insert your hand into the opening in the paper-feed tray, and remove the lock ring [A]. Remove the scraper [B] and pickup roller [C].

[Precautions on Reassembly]

- The scraper and pickup rollers contain a one-way clutch. When mounted correctly, the rollers spin freely in the clockwise direction (with the marking at the front).



P0541

A: Lock ring
B: Scraper
C: Pickup roller

8. Removing the Clutches of First Paper-Feed-Section

(1) Remove the MTPF rear cover (see this chapter).

(2) Remove the multi-tray transfer unit and MTPF left-hand cover (see this chapter).

(3) Remove the multi-feed-tray transfer motor.

(4) Open the front cover of RP, and remove the MTPF knurl screw from the bottom plate by opening the feed-joint-passage cover. Remove the rear cover of RP, and remove the MTPF securing plate. Lift the paper-feeding side of RP about 20 mm, and insert something adequate that can maintain a 20 mm gap between the multi-tray paper feeder and RP.

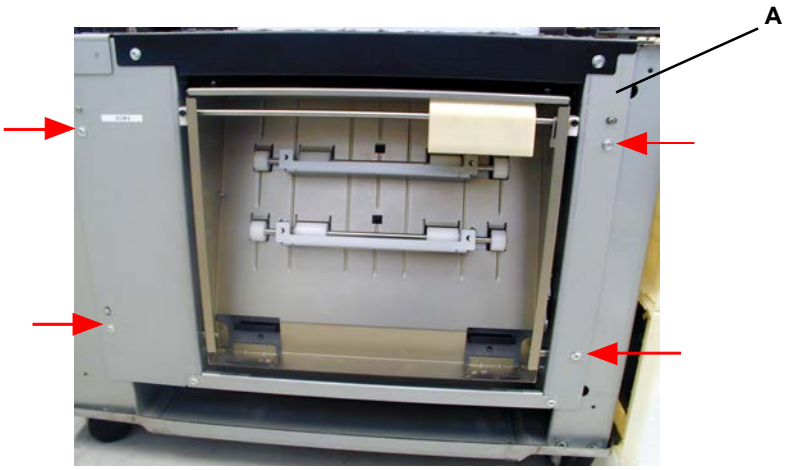
(5) Pull out tray 1 and 2.

(6) Unplug the connetector, and four screws (M4 x 8), and then remove the first paper-feed unit [A].

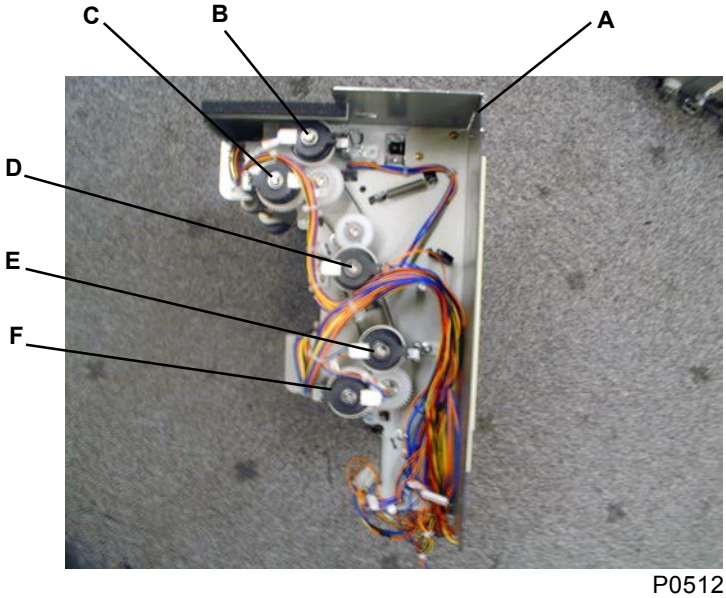
(7) Unplug the connector, detach the E-ring, and then remove the clutches [B], [C], [D], [E], [F].

[Precautions on Reassembly]

- Engage the slots on the clutches with the mounting bracket.



P0523



P0512

A: First paper-feed-section clutches
B: Multi-feed-tray transfer clutch 3
C: Multi-feed-tray 1 feed clutch
D: Multi-feed-tray transfer clutch 2
E: Multi-feed-tray transfer clutch 1
F: Multi-feed-tray 2 feed clutch

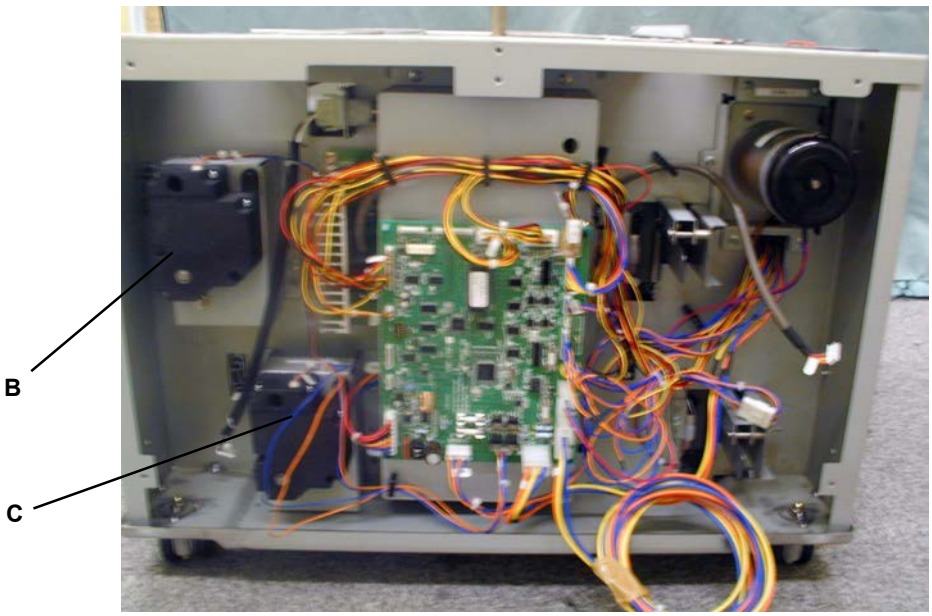
9. Removing the Elevator Motor

(1) Remove the MTPF rear cover (see this chapter).

(2) Unplug the connector, remove the two screws (M4 x 10), and then remove multi-feed-tray elevator motor 1 [B] and multi-feed-tray elevator motor 2 [C].

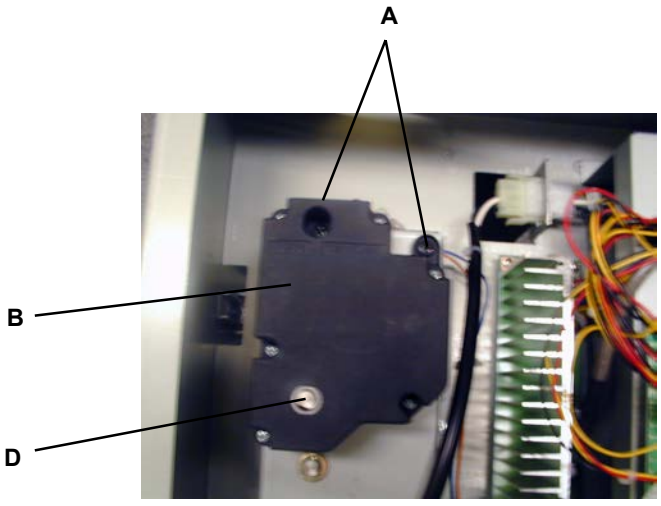
[Precautions on Reassembly]

- Align the flat face of the shaft [D] with the D-slot on the elevator motor.



P0537

A: Screw
B: Multi-feed-tray elevator motor 1
C: Multi-feed-tray elevator motor 2
D: Shaft



P0514

10. Removing the Stripper Unit

(1) Remove the MTPF rear cover (see this chapter).

(2) Remove the multi-tray transfer unit and MTPF left-hand cover (see this chapter).

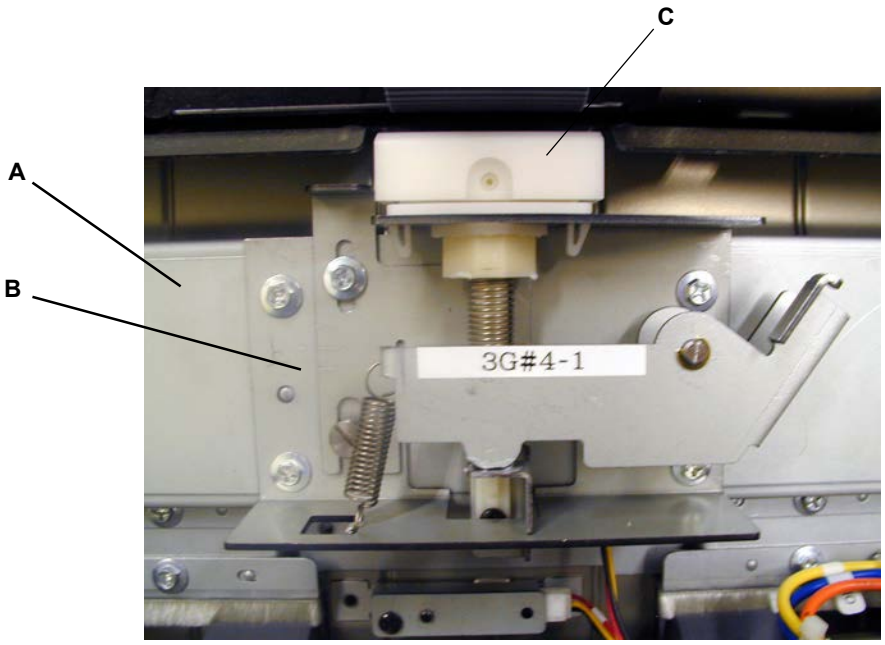
(3) Remove the multi-feed-tray transfer motor.

(4) Open the front cover of RP, and remove the MTPF knurl screw from the bottom plate by opening the feed-joint-passage cover. Remove the rear cover of RP, and remove the MTPF securing plate. Lift the paper-feeding side of RP about 20 mm, and insert something adequate that can maintain a 20 mm gap between the multi-tray paper feeder and RP.

(5) Pull out tray 1 and 2.

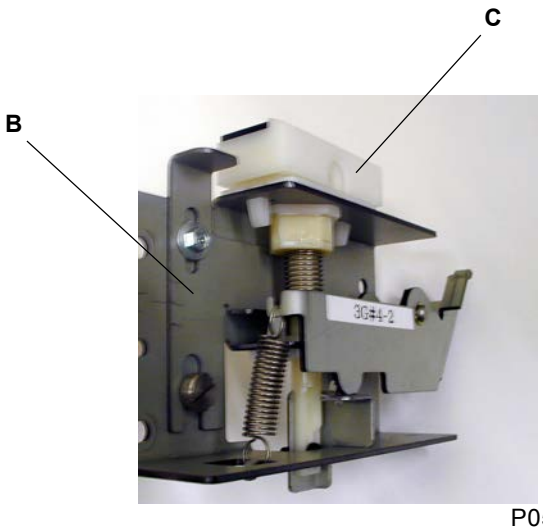
(6) Unplug the connetector, and four screws (M4 x 8), and then remove the first paper-feed unit [A].

(7) Remove the stripper unit [B] with four screws (M4 x 8).



P0508

A: First paper-feed unit
B: Stripper unit
C: Stripper pad ass'y



P0515

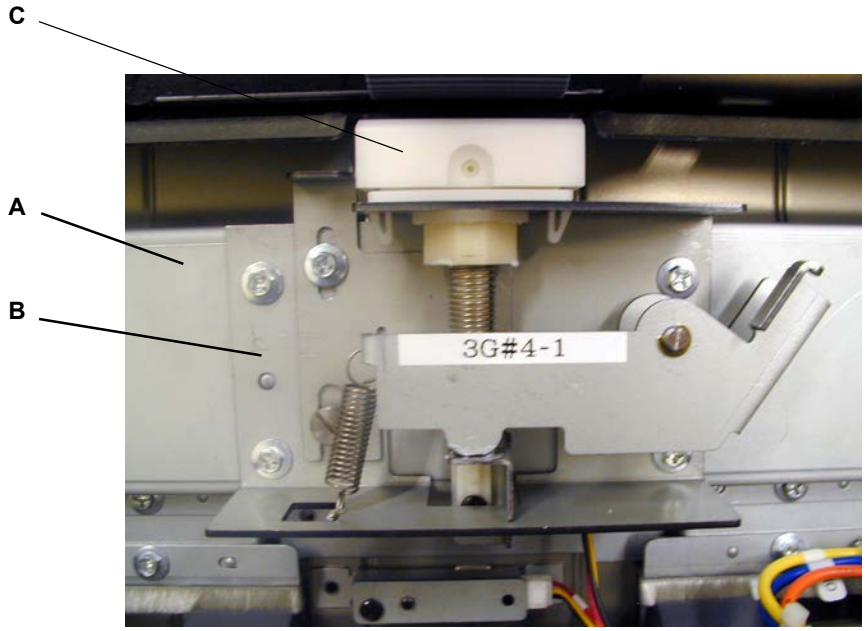
11. Removing the Stripper Pad Ass'y

(1) Remove the MTPF rear cover (see this chapter).

(2) Remove the MTPF right-hand cover (see this chapter).

(3) Pull out the corresponding tray.

(4) Lift the stripper pad ass'y upward and remove it.



P0508

A: First paper-feed unit
B: Stripper unit
C: Stripper pad ass'y

12. Removing the Nip Release Solenoid

(1) Remove the MTPF rear cover (see this chapter).

(2) Remove the multi-tray transfer unit and MTPF left-hand cover (see this chapter).

(3) Remove the multi-feed-tray transfer motor.

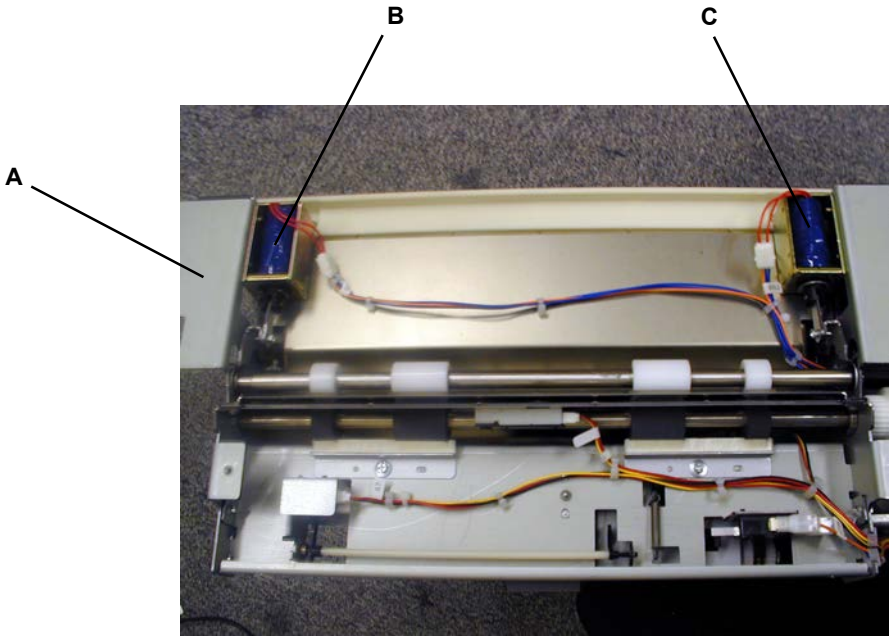
(4) Open the front cover of RP, and remove the MTPF knurl screw from the bottom plate by opening the feed-joint-passage cover. Remove the rear cover of RP, and remove the MTPF securing plate. Lift the paper-feeding side of RP about 20 mm, and insert something adequate that can maintain a 20 mm gap between the multi-tray paper feeder and RP.

(5) Pull out tray 1 and 2.

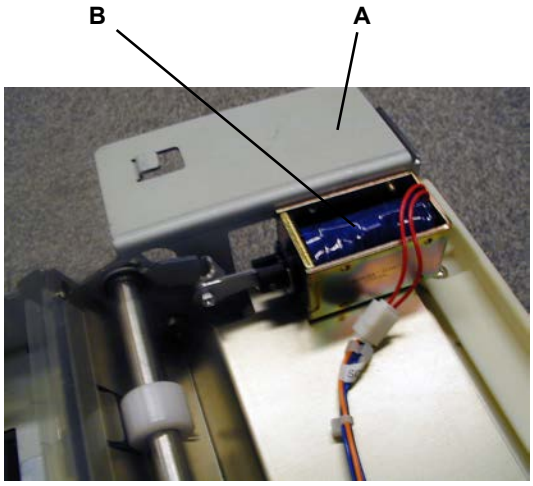
(6) Unplug the connetector, and four screws (M4 x 8), and then remove the first paper-feed unit [A].

(7) Remove the first paper-feed unit cover with two screws (M4 x 8).

(8) Remove both nip release solenoids [B] and [C] with two screws (M3 x 6) on each.



P0516



P0517

A: First paper-feed unit
B: Nip release solenoid 1
C: Nip release solenoid 2

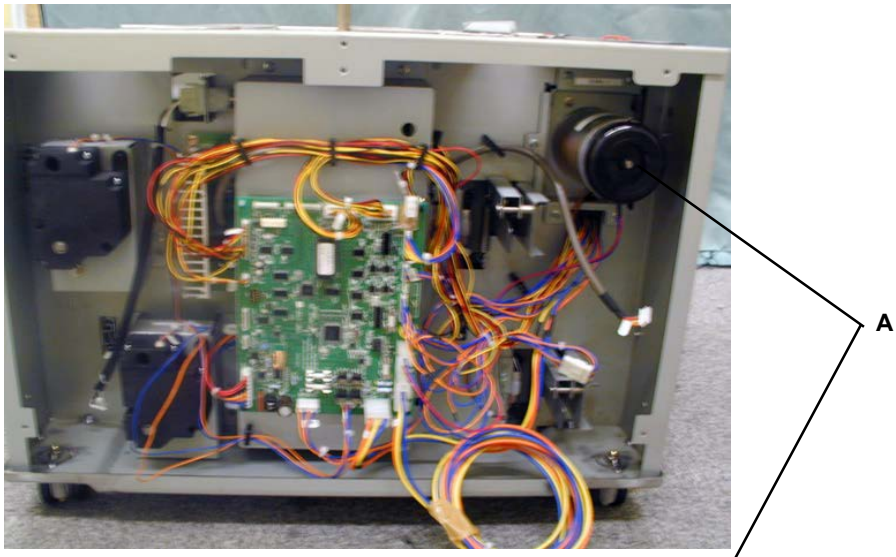
13. Removing the Multi-Feed-Tray Transfer Motor

(1) Remove the MTPF rear cover (see this chapter).

(2) Unplug the two connectors, remove the five screws (M4 x 10), and then remove the multi-feed-tray transfer motor [A].

[Precautions on Reassembly]

- Align the pin on the multi-feed-tray transfer motor with the pin on the stand.



P0538

A: Multi-feed-tray transfer motor

P0518

14. Removing the Multi-Feed-Tray Transfer Clutch 4

(1) Remove the rear cover (see Chapter 1).

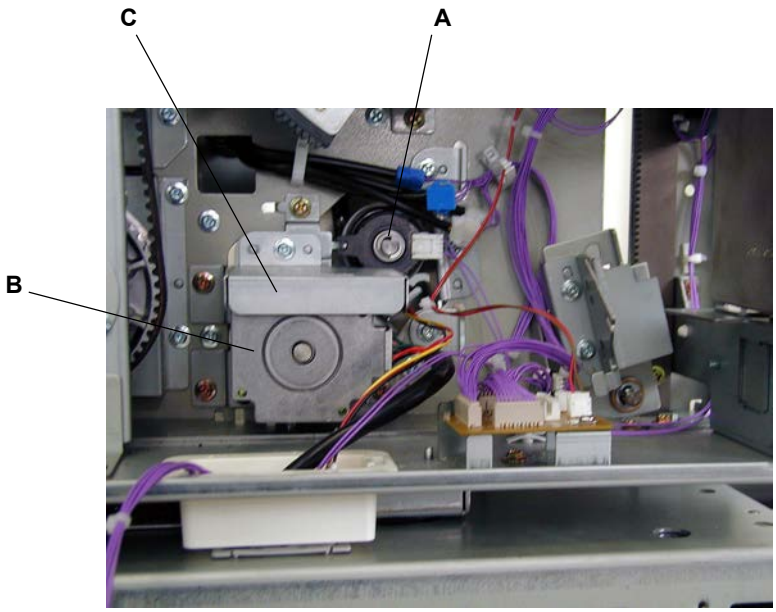
(2) Open the main PCB unit 90 degrees to the right (see Chapter 1).

(3) Remove Cover [C] of the Multi-feed-tray pickup motor [B] by removing one M4x8 screw.

(4) Unplug the connector, detach the E-ring, and then remove the multi-feed-tray transfer clutch 4 [A].

[Precautions on Reassembly]

- Engage the slot on the clutch with the bracket on the multi-feed-tray pickup motor [B].



P0534

A: Multi-feed-tray transfer clutch 4
B: Multi-feed-tray pickup motor
C: Cover

15. Removing the Multi-Feed-Tray Pickup Motor

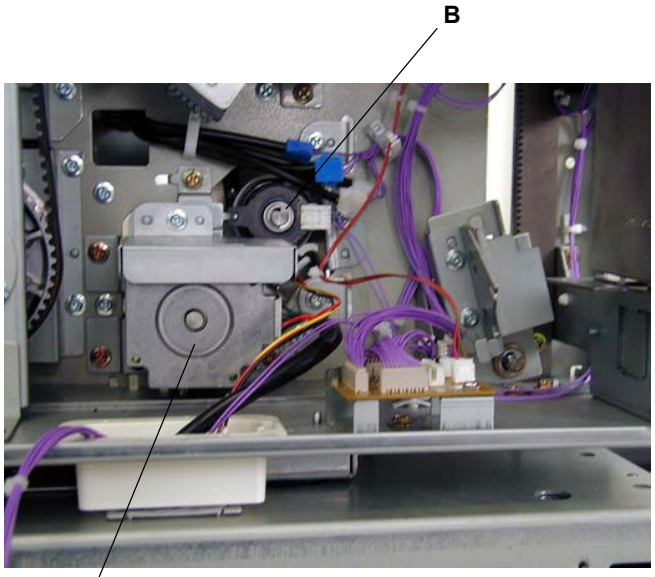
(1) Remove the rear cover (see Chapter 1).

(2) Open the main PCB unit 90 degrees to the right (see Chapter 1).

(3) Unplug the connector, and remove the multi-feed-tray pickup motor [A] with four screws (M4 x 8).

[Precautions on Reassembly]

- Engage the bracket on the motor with the slot on the multi-feed-tray transfer clutch 4 [B].
- Set the position of the motor on right adjusted.



P0535

A: Multi-feed-tray pickup motor
B: Multi-feed-tray transfer clutch 4

P0519

16. Removing the Vertical Transfer Unit

(1) Remove the release knob [A] with one screw (M3 x 6) and remove the front-frame cover [B].

(2) Remove the guide-plate lower ass'y (see chapter 6), and then remove all four (two on each side) guide-plate stay A [I] with one screw (M4 x 8) each.

(3) Remove the multi-feed-tray pickup motor [C].

(4) Unplug the connector of multi-feed-tray transfer clutch 4 [D].

(5) Remove the release knob shaft [E] with two screws (M3 x 8) together with the metal.

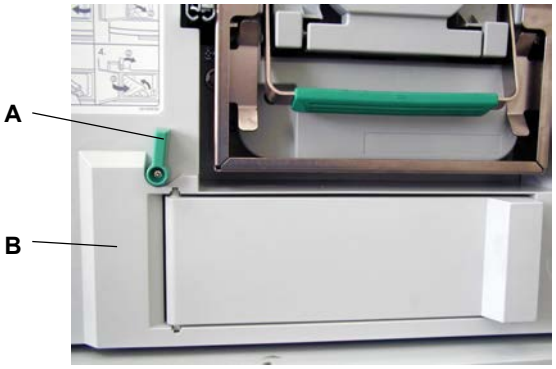
(6) Remove the release lever ass'y [F] with one screw (M4 x 8).

(7) Remove the two positioning shaft [G] on the front side with two screws each (M4 x 8).

(8) Unplug the connector, and remove the two screws (M4 x 8) on the rear, and the four screws (M4 x 8) on the paper feeding side, and pull the vertical transfer unit [H] out fron the paper feeding side.

[Precautions on Reassembly]

- Attach the vertical transfer unit [H], while opening the vertical transfer guide plate [M], and make sure that the joint plate [J] is pinched by the transfer guide plate[M].



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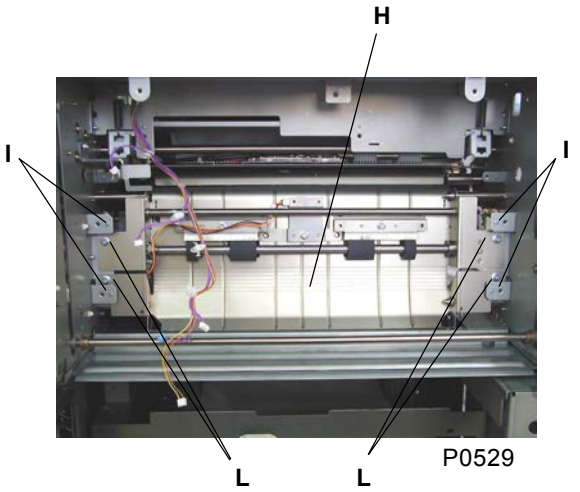

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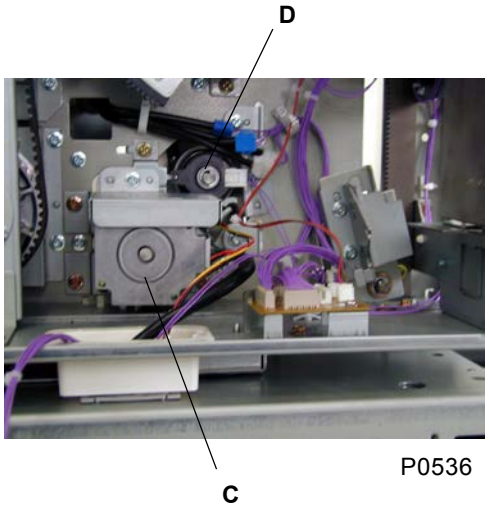

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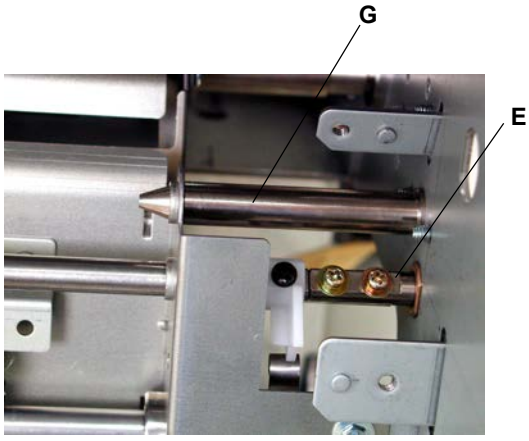

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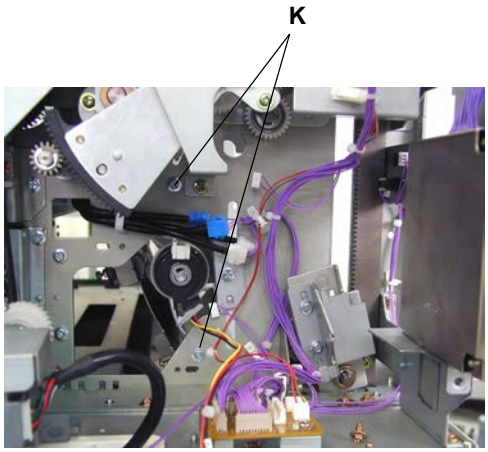

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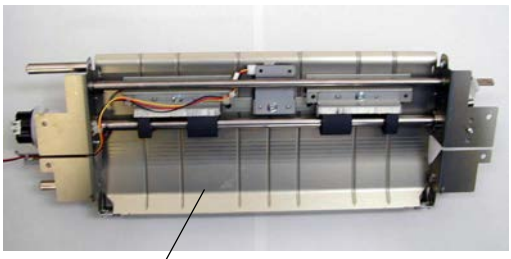
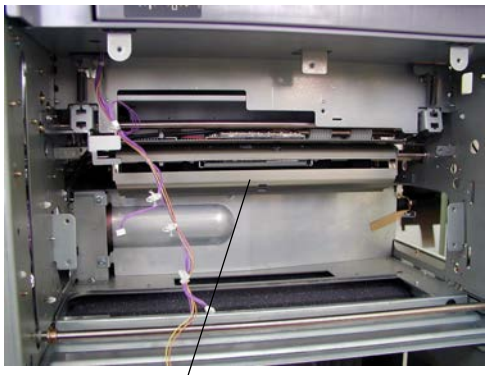


P0532



P0533

A: Release knob
B: Front-frame cover
C: Multi-feed-tray pickup motor
D: Multi-feed-tray transfer clutch 4
E: Release knob shaft
F: Release lever ass'y
G: Positioning shaft
H: Vertical transfer unit
I: Guide-plate stay A
J: Joint plate
K: Screw
L: Screw
M: Vertical transfer guide plate

Adjustment

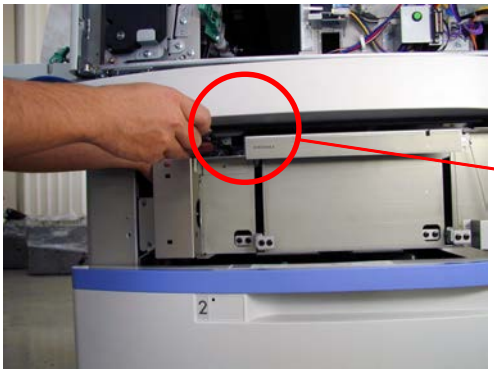
1. Upper Limit Position Adjustment

(1) Pull out the corresponding tray, and remove the tray cover with four screws (M4 x 8). (For adjustment of tray 1, also remove the roller cover with three screws (M4 x 8).)

(2) Set the tray back in. (The table elevates to the upper limit position.)

(3) Confirm that the gap between the scraper and the table is 0 mm to 1 mm.

(4) If the gap is not within the specifications, loosen the adjustment plate mounting screw [A] and raise or lower the adjustment plate [B]. (The change of the upper limit position is equal to the slide amount of the adjustment plate.)



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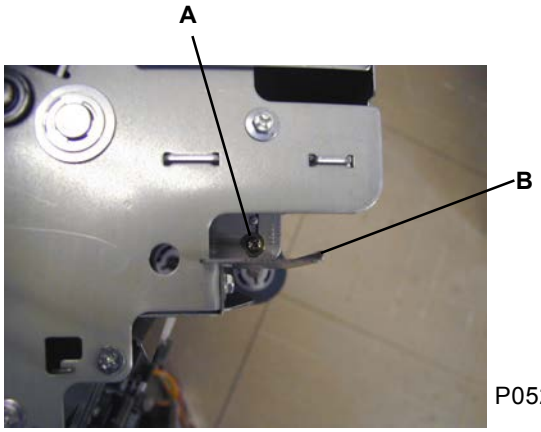
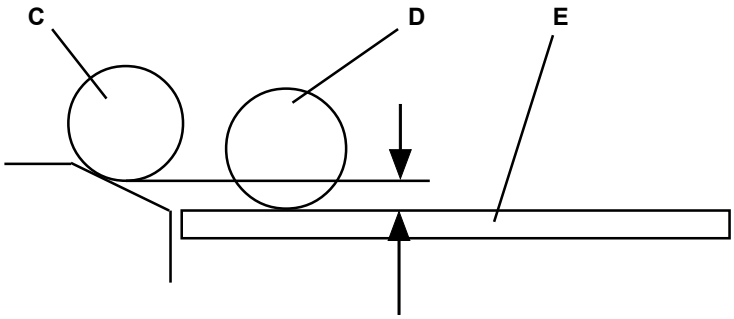


P0525

View with Roller cover and the cover of Tray 1 removed.



A: Adjustment plate mouning screw
B: Adjustment plate
C: Pickup roller
D: Scraper
E: Table

2. Stripper Pressure Adjustment

(1) Remove the corresponding paper-feed tray.

(2) Loosen the screw [B] on the top of the stripper unit [A] to adjust stripper pressure. Raising the stripper adjust plate [C] increases the stripper pressure.

P0542

A: Stripper unit
B: Screw
C: Stripper adjust plate

3. Paper-Width Potentiometer Adjustment

Check and adjustment procedure

Tray 1 (upper tray)

(1) Position the paper guides on Tray 1 (upper tray) at 182 mm, and run test-mode No. 857 (multi-feed 1 size VR adj. 182 mm).

(2) Position the paper guides on Tray 1 (upper tray) at 297 mm, and run test-mode No. 858 (multi-feed 1 size VR adj. 297 mm).

(3) With the paper guides at 297 mm, run test-mode No. 872 (feed-tray 1 paper-width data (mm)), and confirm that the figure displayed is between 296 mm and 298 mm.

Tray 2 (lower tray)

(1) Position the paper guides on tray 2 (lower tray) at 182 mm, and run test-mode No. 859 (multi-feed 2 size VR adj. 182 mm).

(2) Position the paper guides on tray 2 (lower tray) at 297 mm, and run test-mode No. 860 (multi-feed 2 size VR adj. 297 mm).

(3) With the paper guides at 297 mm, run test-mode No. 873 (feed-tray 2 paper-width data (mm)), and confirm that the figure displayed is between 296 mm and 298 mm.

4. Vertical Print Position Adjustment

If the vertical print position of each tray is not the same as when using the standard paper feed tray, adjust the vertical print position of the tray concerned, selecting an appropriate procedure depending on the accuracy required, **“Rough adjustment”** or **“Fine adjustment”**.

You cannot select both of them at the same time.

Be sure to use the paper of the type/size which is actually to be loaded in the tray concerned when making adjustment.

Rough Adjustment

(1) Without changing the master on the print drum, make print samples of when using the Standard paper feed tray, Tray 1, and Tray 2 respectively.

Important ! : Always keep the print speed constant.

(2) Compare the difference between the print sample of the Standard paper feed tray and Tray 1. Then the difference between the print sample of the Standard paper feed tray and Tray 2.

(3) Run test-mode No. 1400 and input “0” (Rough adjustment mode). Then press “Start”.

(4) Adjust the print position of Tray 1 and 2 respectively, by the setting of test-mode No. 1401(for Tray 1) and 1402(for Tray 2).

The adjustment range is between -10 (-1.0 mm) to +10 (+1.0 mm), by increments of 5 (0.5 mm).

To shift the print position toward the paper top direction, adjust the setting towards the + direction.

Fine Adjustment

(1) Without changing the master on the print drum, make print samples of each print speed (proof print, speed 1, 2, 3 , 4, and 5), using the Standard paper feed tray, Tray 1, and Tray 2

Important ! : Be sure to take print samples after the print speed becomes stable.

(2) Compare the differnce between the print sample of the Standard paper feed tray and Tray 1. Then the difference between the print sample of the Standard paper feed tray and Tray 2.

(3) Run test-mode No. 1400 and input “1” (Fine adjustment mode). Then press “Start”.

(4) Adjsut the print position by running the relevant test-modes individually assigned to each print speed and tray.

The adjustable range is between -60 (-6.0 mm) to +20(+2.0 mm), by increments of 5 (0.5 mm).

To shift the print position toward the paper top direction, adjust the setting towards the + direction.

Tray 1		**Tray 2**	
Proof print:	Test-mode No. 1403	Proof print:	Test-mode No. 1409
Speed 1:	Test-mode No. 1404	Speed 1:	Test-mode No. 1410
Speed 2:	Test-mode No. 1405	Speed 2:	Test-mode No. 1411
Speed 3:	Test-mode No. 1406	Speed 3:	Test-mode No. 1412
Speed 4:	Test-mode No. 1407	Speed 4:	Test-mode No. 1413
Speed 5:	Test-mode No. 1408	Speed 5:	Test-mode No. 1414

5. Paper Feed Range (Buckle) Adjustment

If paper jam error A07-409 frequently occurs when feeding from the Multi-tray paper feeder, adjust the feed range (buckle amount) for the respective paper types and tray.

Test mode 890 : Multi-Feed Tray Feed Range / Card

Test mode 891 : Multi-Feed Tray Feed Range / Stdrd (Standard)

Test mode 892 : Multi-Feed Tray Feed Range / Light

Test mode 893 : Multi-Feed Tray Feed Range / Custm (Custom)

You can select which tray to adjust by choosing [1] or [2] on the upper right corner of the display.

Excessive feed range may cause fold marks on the top of the paper.

Memo

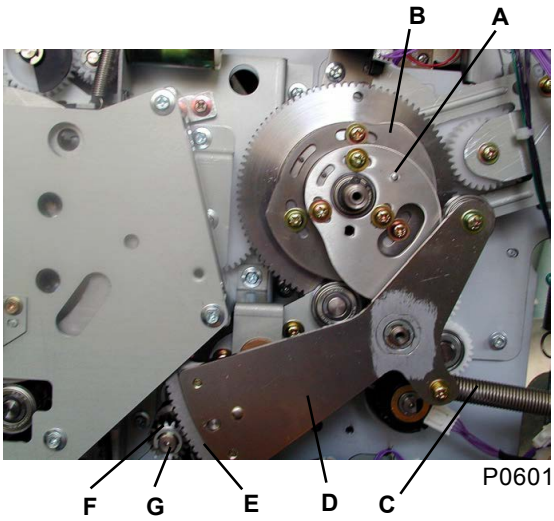
CHAPTER 6: SECOND PAPER-FEED SECTION

Contents

Mechanism

1. Second Paper-Feed Mechanism

When the main motor operates during printing, the timing cam [A] and guide-roller cam [B] rotate clockwise.
The rotation of the timing cam [A] is converted into reciprocating motion of the sector-gear assembly [D] which is always pressed toward counter clockwise direction by the sector-gear spring [C]. The sector gear [E] on the sector-gear ass'y [D] engages with the timing gear [G] linked to the timing roller [F] via the spring clutch. The timing roller [F] is rotated counterclockwise only when the sector gear [E] rotates clockwise. The timing roller [F] does not rotate when the sector gear [E] rotates counterclockwise.
The action of the load spring [H] attached to the front of the timing roller [F] continuously applies a load to the timing roller [F], to ensure that the timing roller [F] stops immediately when it is not rotated.
The guide roller [I] is continuously pressed against the timing roller [F] by the guide-roller spring. This causes the guide roller [I] to rotate clockwise when the timing roller [F] rotates counterclockwise.
As the guide-roller cam [B] rotates, the protrusion pushes against the timing lever [K] attached to the guide-roller shaft [J] and raises the guide roller [I].
During printing, the guide roller [I] moves down and contacts the timing roller [F] during the first paper-feed operation, and the timing roller [F] stops rotating once the guide roller [I] rises.



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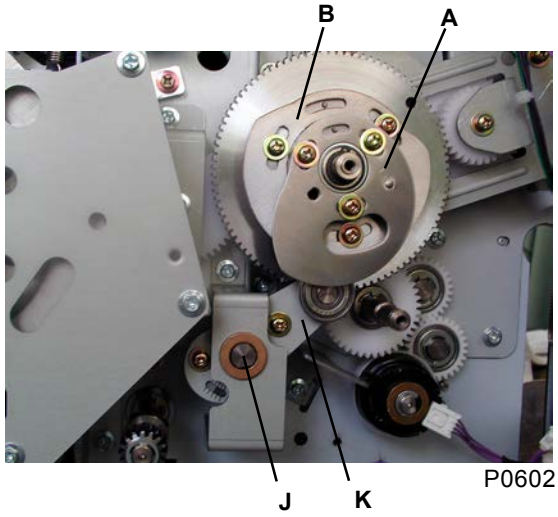

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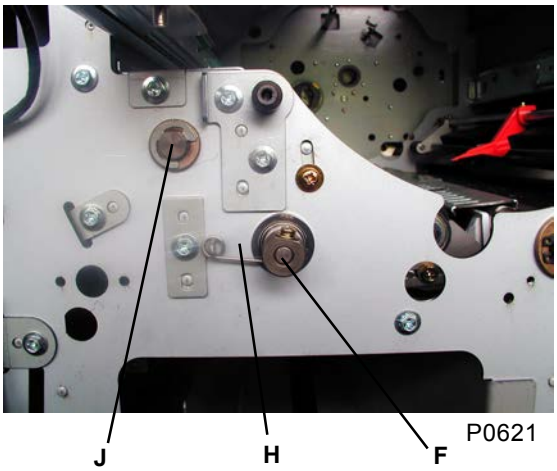


P0621

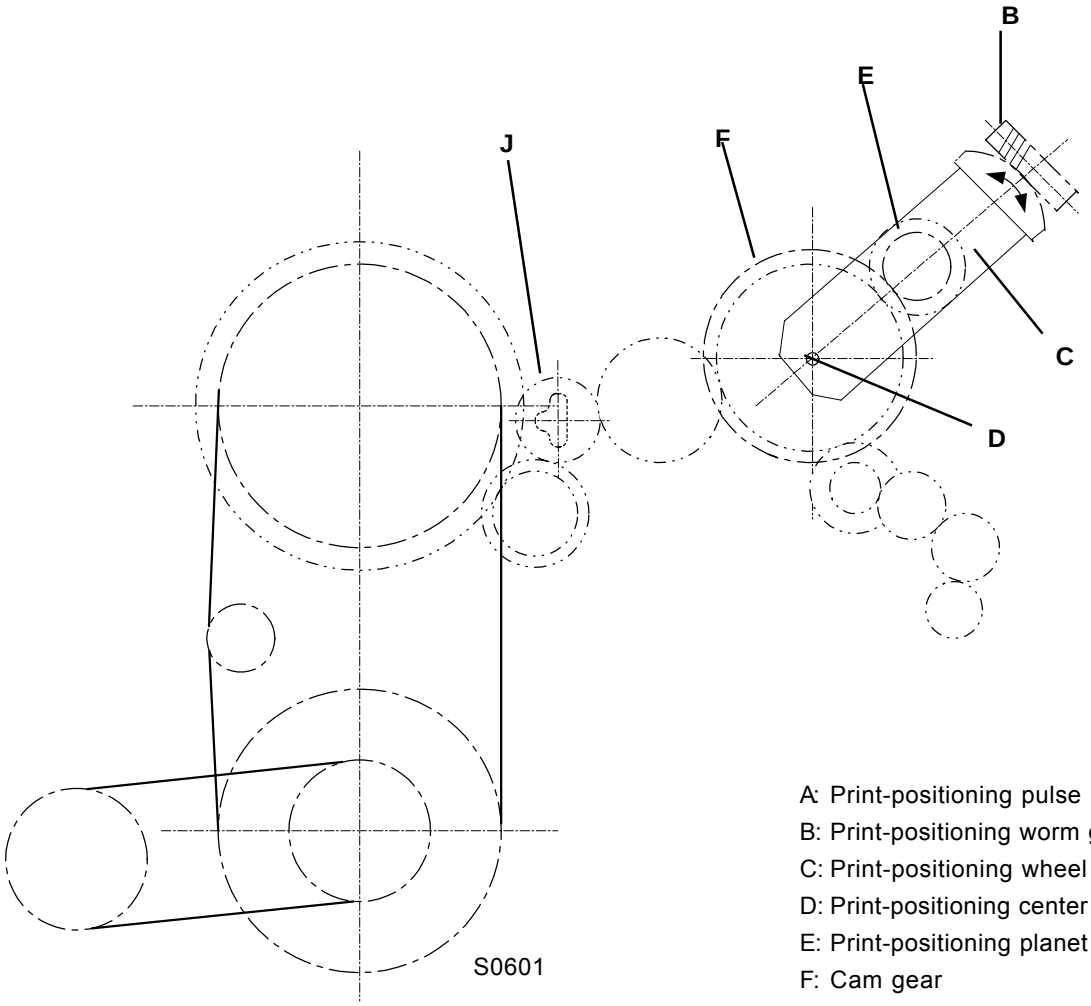
P0604

A: Timing cam
B: Guide-roller cam
C: Sector-gear spring
D: Sector-gear assembly
E: Sector gear
F: Timing roller
G: Timing gear
H: Load spring
I: Guide roller
J: Guide-roller shaft
K: Timing lever

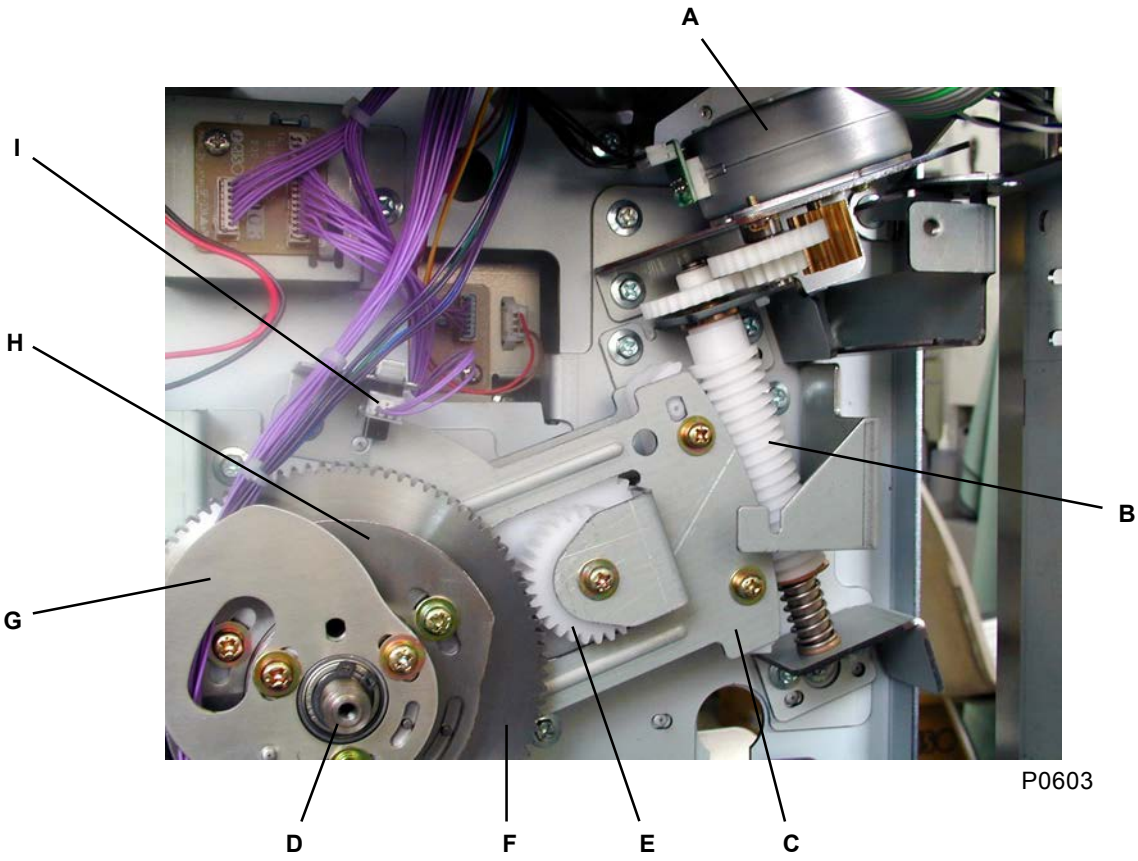
2. Vertical Print-Positioning Mechanism

Pressing the <◀> or <▶> print-position keys on the panel activates the print-positioning pulse motor [A], which rotates the print-positioning worm gear [B], causing the print-positioning wheel assembly [C] to rotate around the print-positioning center shaft [D]. As the print-positioning wheel ass'y [C] rotates, the print-positioning planet gear [E] alters the timing of the cam gear [F] (timing gear [G] and guide-roller cam [H]) in relation to the drum rotation mechanism, to alter the vertical print position.
The center position is checked by the vertical-centering sensor [I].
Pressing the <▶> key (up) rotates the print-positioning wheel ass'y in the counterclockwise direction. The cam gear [F] rotates counterclockwise (clockwise in normal printing) and delays the timing of the timing cam combined with the cam gear [F] (delays the second paper-feed timing) to move the print position upward.
Pressing the <◀> key (down) reverses the action and moves the print position downward.

< Refer to the illustration below and photograph on top of next page. >



A: Print-positioning pulse motor
B: Print-positioning worm gear
C: Print-positioning wheel assembly
D: Print-positioning center shaft
E: Print-positioning planet gear
F: Cam gear
G: Timing cam
H: Guide-roller cam
I: Vertical-centering sensor
J: Drum gear



P0603

3. Multi-Paper-Feed Detection Mechanism

The multi-paper-feed detection mechanism is not avaialble on 300 dpi machines.

On 400dpi and 600dpi machines, the Multi-Paper-Feed Det. Sensor activates only when the paper is fed from the standard straight feeding tray. The sensor does not activate when the papers are fed from the multi-feed-tray.

- During the paper feeding, both the Multi-Paper-Feed Det. Sensor and Paper Sensor check whether more than one paper is fed at one time or not. The Multi-Paper-Feed Det. Sensor looks at the amount of light passed though the paper, and the Paper Sensor looks at the length of the paper which fed through.
- During the printing operation, when the first sheet of paper is fed, the Multi-Paper-Feed Det. Sensor checks the amount of light which passes through the sheet, for the continuous length of 120mm in 1mm interval from the position the Paper Sensor catches the leading edge of the paper. The machine memorizes the average amount of the light which penetrated through the paper. From the second sheet on, the amount of light penetrated is compared with this average figure. If the amount of light penetrated through is not within 80% to 120% of the memorized data, the machine judges that multiple paper feeding has occurred, and stops.
- At the same time, the Paper Sensor measures the length of the first sheet during the printing operation and memorizes the length. From the second sheet, the length of the sheet is checked against the memorized length. If the paper fed differs more than 80mm in length from the memorized length, the machine judges that multiple paper feed has occurred and stops.
- Whether to make this feature active or inactive is selected by the item “Double Feed Check” found in the Properties in the Catalog folder of the operations panel. (Default setting = ON).

Removal and Assembly

1. Removing the Timing Roller

(1) Remove the print drum and switch off the power.

(2) Remove the following covers:

- Front cover, front frame cover, rear cover

(3) Open the main PCB unit to the right.

(4) Remove the load-spring assembly [A] on the front-cover side with one screw (M3 x 8), and then remove the plastic washer and bearing.

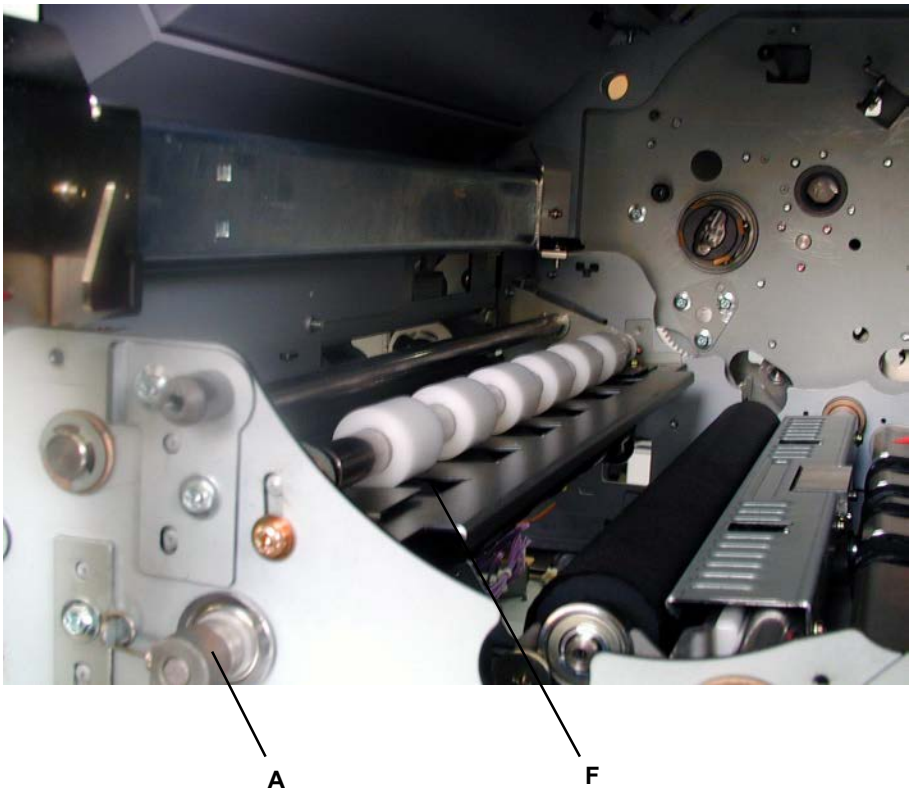
(5) Detach the e-ring from the rear, remove the timing-gear assembly [C], loosen the two set screws, and then remove the spring-clutch assembly [D].

(6) Detach the e-ring from the rear, and remove the bearing [E].

(7) Press the timing roller [F] toward the rear, and detach it from the front frame plate. After detaching it from the front frame plate, remove it toward the front through the rectangular hole in the vertical transport area.

[Precautions on Reassembly]

- Before tightening the set screws on the spring-clutch assembly [D], attach the e-ring to the timing-gear assembly [C], slide it toward the e-ring, and then tighten the set screws.



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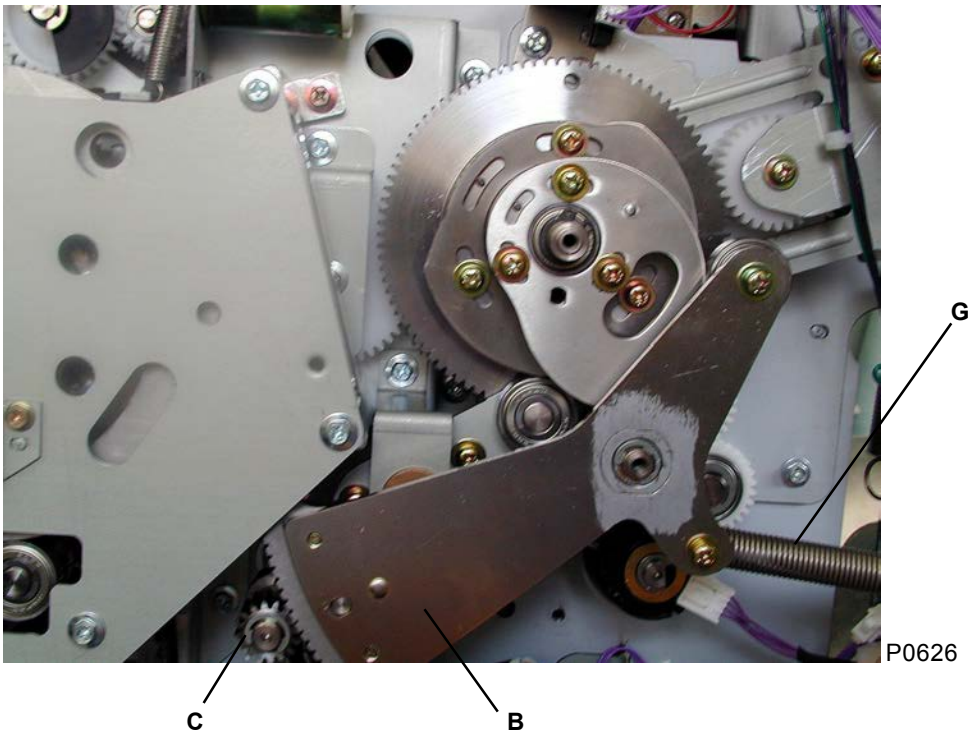

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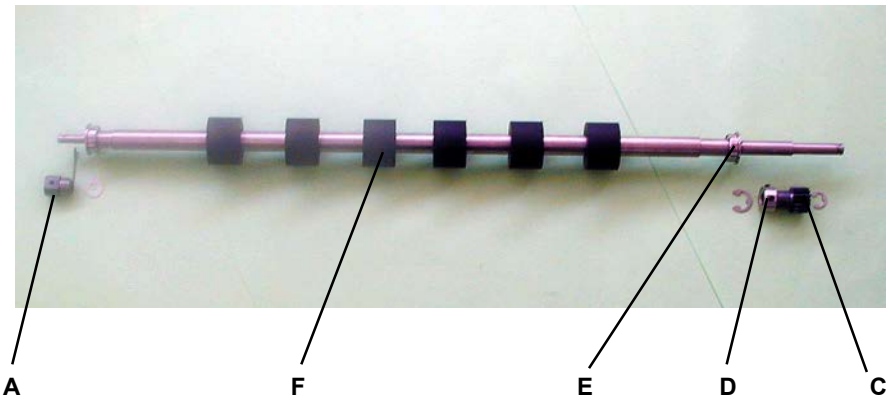


P0605

A: Load-spring assembly
B: Sector-gear assembly
C: Timing-gear assembly
D: Spring-clutch assembly
E: Bearing
F: Timing roller
G: Sector-gear spring

2. Removing the Guide-Plate Lower Assembly

(1) Lower the paper-feed tray to the lower-limit position. (On the multi-feed-tray machine, first raise the paper-feed-tray all the way up and remove the screws on the Stripper unit before lowering the tray all the way down.)

(2) Pull out the print drum, and switch off the power.

(3) Remove the following components:

- Front-cover
- Front frame cover
- Rear cover
- Paper-feed cover
- Stripper unit

(4) Open the main PCB unit to the right.

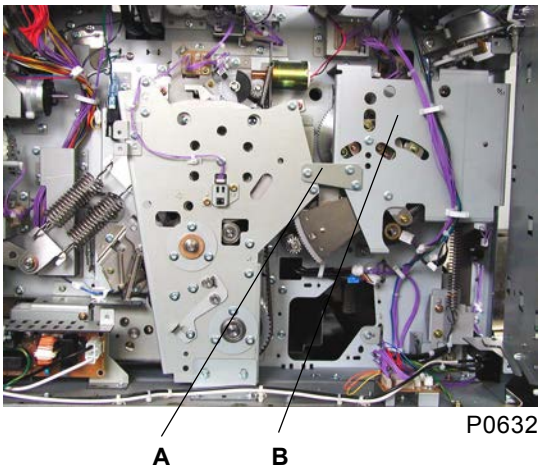
(5) Detach the two elevator springs, and then remove the following components:

- Paper-feed tray
- First paper-feed stay. (refer to page 4-16)
- Pickup-roller-shaft assembly
- Scraper assembly

Standard machines (machines without multi-feed-trays):

(6) Remove the rotation stopper [C] with one screw (M4 x 6), and the stripper back side cover [D] with two screws (M4 x 8).

(7) Removve the six screws (M4 x 8) from guide-plate lower assembly [E], and remove the guide-plate stay A [F] near the upper right corner of the elevator motor with one screw (M4 x 8). Then remove the guide-plate lower assembly [E].



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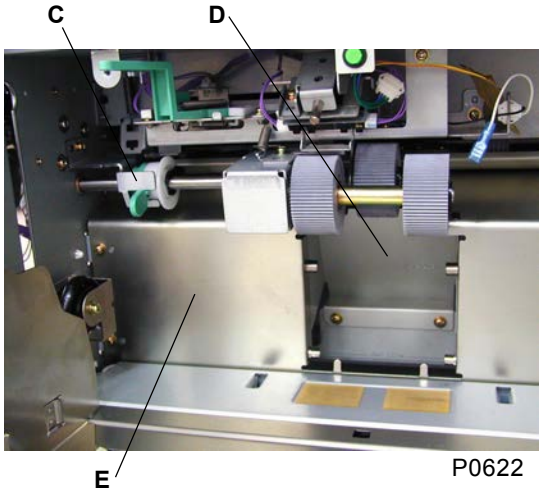
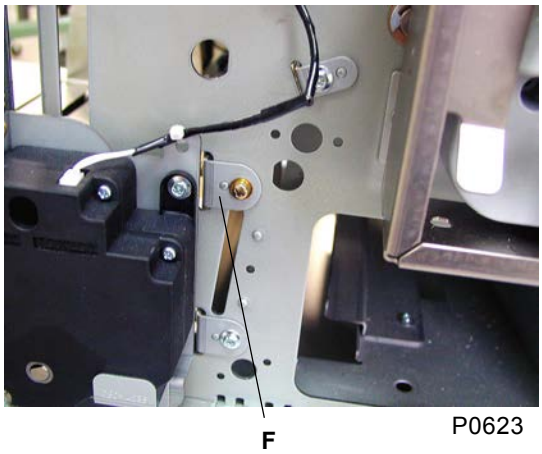


P0622



P0623

A: Paper-feed reinforce plate
B: Paper-feed base cover
C:Rotation stopper
D: Stripper back side cover
E: Guide-plate lower assembly
F: Guide-plate stay A

Memo

Multi-tray machines

(6) Remove the two elevator springs and elevator motor. (refer to Chapter 4)

(7) Remove the lower-limit frame [A] and lower-limit-frame holder [B] with one screw (M3 x 6).

(8) Detach a screw (M4 x 8) [D] from the rear of the E support plate R [C], and screw (M4 x 8) holding the E reinforce-plate assembly [E]. Lift the E support plate R [C], pull out the caster from the circular hole, and then remove the E support plate R [C].

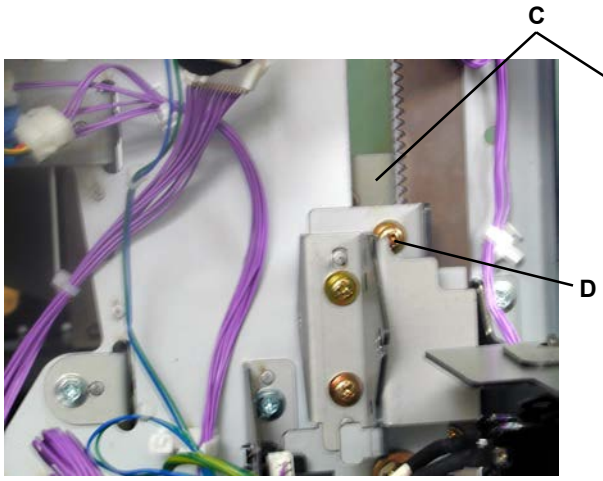
(9) Remove the screw (M4 x 8) [G] holding the motor mounting assembly, and the screw (M4 x 8) holding the E reinforce-plate assembly [E]. Remove the E reinforce-plate assembly [E], and then remove the E support plate F [F].

(10) Remove the guide-plate lower ass'y [H] with six screws (M4 x 8).

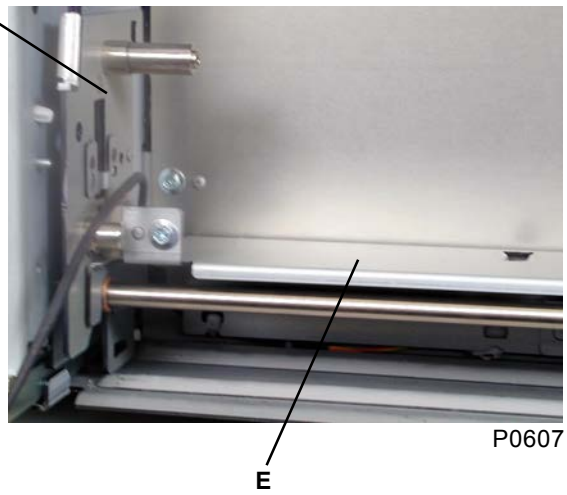
[Precautions on Reassembly]

- Align the half-pierced sections on the E support plate F and R ass'ys with the E reinforce-plate assembly.
- Confirm that the flanges on the left and right casters are inserted between the rack and sides frame plate.

P0634



P0606



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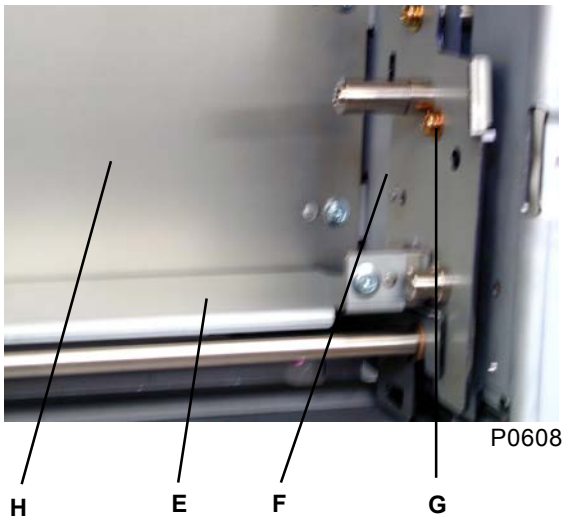


P0608

A: Lower-limit frame
B: Lower-limit-frame holder
C: E support plate R
D: Screw
E: E reinforce-plate assembly
F: E support plate F
G: Screw
H: Guide-plate lower assembly

3. Removing the Guide-Plate Center and Upper Assembly

Guide-plate upper ass'y

(1) Pull out the print drum and switch off the power.

(2) Remove the following components:

- Front cover
- Front frame cover
- Paper-feed cover
- Rear cover

(3) Open the main PCB unit to the right.

(4) Remove the two guide-roller springs [A].

(5) Remove the guide-roller cover ass'y [B] with one screw (M3 x 8) from the front side.

(6) Unplug the two connectors (3-pin white, 3-pin blue) at the rear side (see the photograph below).

(7) Insert your hand into the print-drum opening, detach the screw (M3 x 8) from the front of the guide-plate upper assembly [C], and then loosen the screw (M3 x 8) at the rear.

(8) Remove the guide-plate upper ass'y [C] through the print-drum opening.

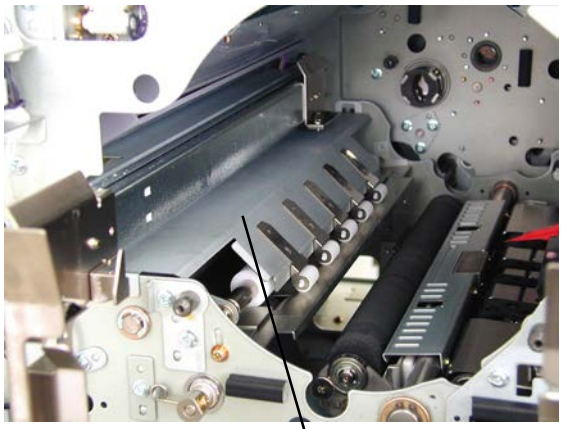
Guide-plate center ass'y

(1) Remove the guide-plate upper assembly [C].

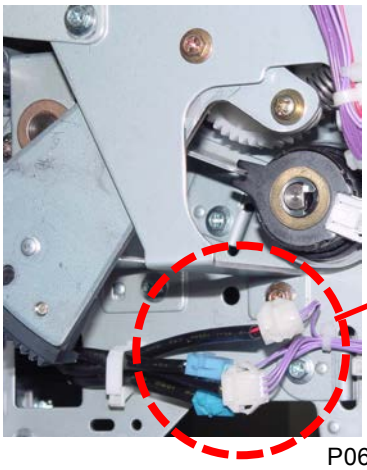
(2) Unplug the two connectors (2-pin white, 2-pin blue) at the rear side (see the diagram below).

(3) Insert your hand into the print-drum opening, detach the two screws (M3 x 8), and remove the guide-plate center ass'y [D] through the rectangular hole in the vertical-transport area.

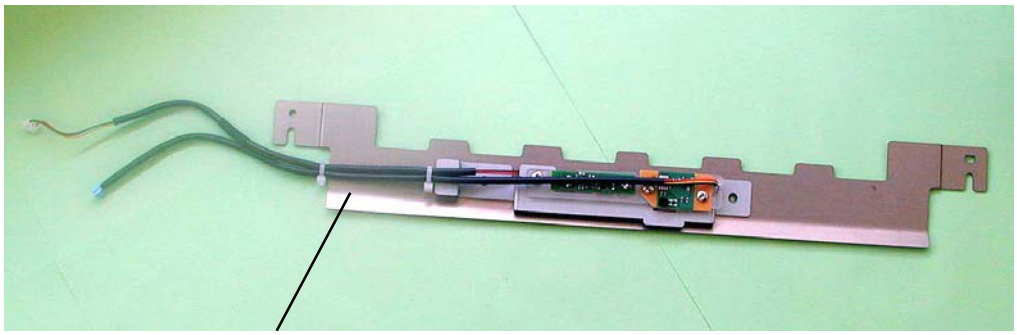
P0609



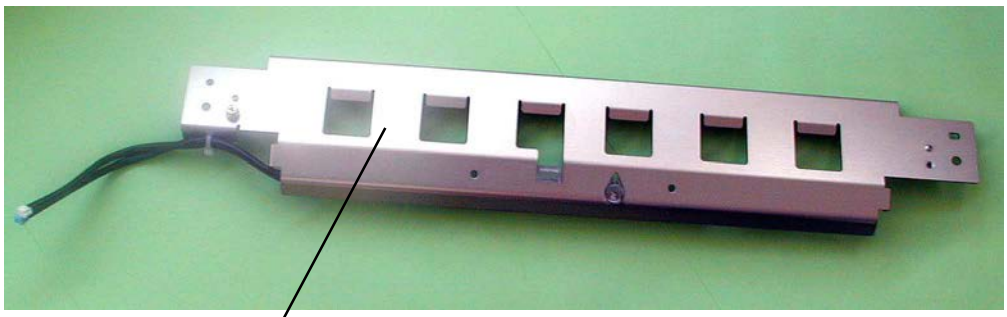
P0610



P0611



P0612



P0613

A: Guide-roller spring
B: Guide-roller cover assembly
C: Guide-plate upper assembly
D: Guide-plate center assembly

[Precautions on Reassembly]

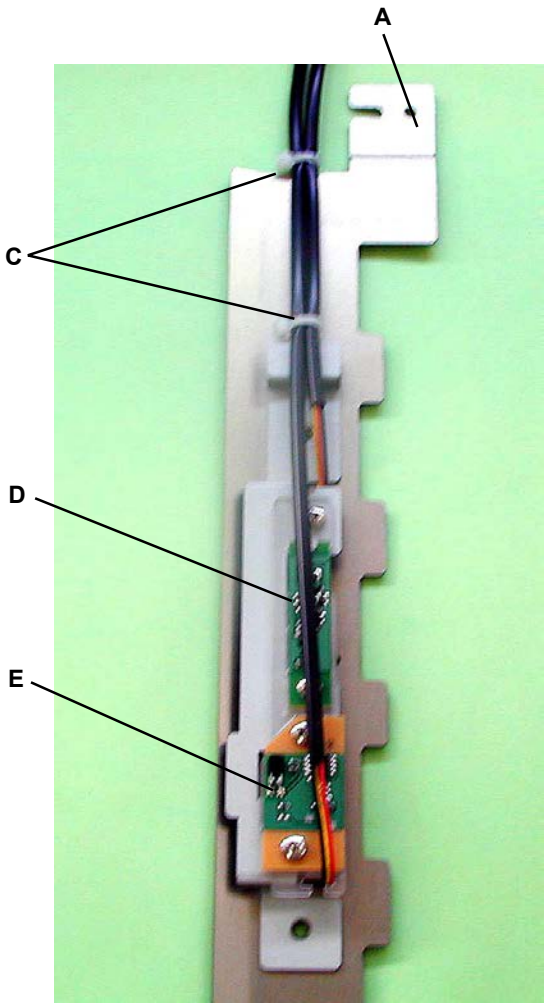
- Adjust the Multi-paper-feed det. sensor after putting back all the parts on the machine by using test mode No. 457, refering to page 22 of this chapter.

4. Removing the Paper Sensor and Multi-Paper-Feed Det. Sensor

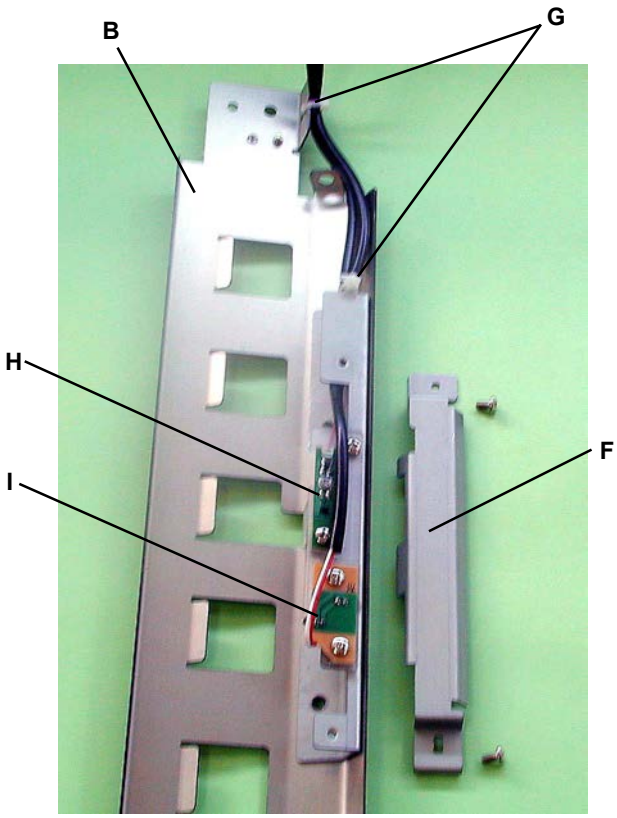
(1) Remove the guide-plate upper ass'y [A] and guide-plate center assembly [B] (see this chapter).

(2) Cut the two wire clamps [C] on the guide-plate upper assembly [A]. Remove the screw (M3 x 6) and then remove the paper sensor (receive) [D]. Remove the two screws (M3 x 6) and then remove the multi-paper-feed det. sensor (receive) [E].

(3) Remove the paper-sensor cover [F] from the guide-plate center assembly [B] with two screws (M3 x 6). Cut the two wire clamps [G], remove the screw (M3 x 6), and then remove the paper sensor (send) [H]. Remove the two screws (M3 x 6) and then remove the multi-paper-feed det. sensor (send) [I].



P0614



P0615

A: Guide-plate upper assembly
B: Guide-plate center assembly
C: Wire clamps
D: Paper sensor (receive)
E: Multi-paper-feed det. sensor (receive)
F: Paper-sensor cover
G: Wire clamps
H: Paper sensor (send)
I: Multi-paper-feed det. sensor (send)

[Precautions on Reassembly]

- When attaching the sensor to the guide-plate upper assembly, fix the transparent plastic cover while pressing it toward the paper-feed tray side.
- Adjust the Multi-paper-feed det. sensor after putting back all the parts on the machine by using test mode No. 457, refering to page 22 of this chapter.

5. Removing the Guide Roller

(1) Lower the paper-feed tray to the lower-limit position. (For multi-tray machines, remove the mounting screw of the stripper unit while the paper-feed tray is at the upper-limit position in advance.)

(2) Pull out the print drum, and switch off the power.

(3) Remove the guide-plate lower ass'y (see this chapter).

(4) Remove the paper-feed reinforce plate with three screws (M4 x 8), detach the sector-gear spring, and then remove the paper-feed base cover with six screws (M4 x 8).

(5) Remove the paper-feed cover, and remove the two guide-roller springs.

(6) Detach the e-ring and then remove the sector-gear spring.

(7) Remove the guide-roller support [A] with two screws (M4 x 8).

(8) Remove the timing lever [B] with two screws (M4 x 8).

(9) Remove the timing base [C] with one screw (M4 x 8).

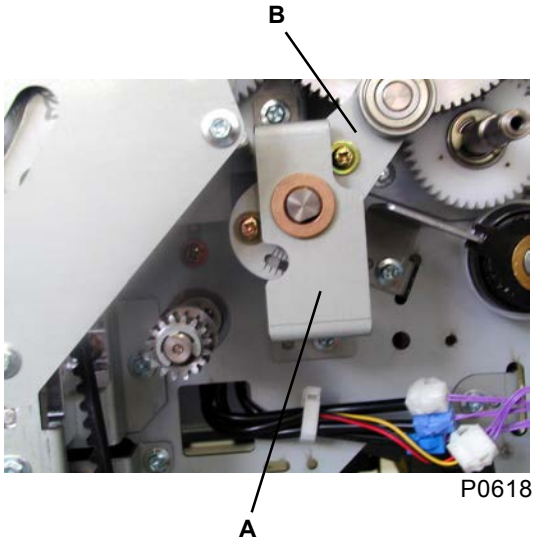
(10) Detach the e-rings from the front and rear, and then remove the metal.

(11) Remove the guide-roller cover ass'y [D] with one screw (M3 x 8).

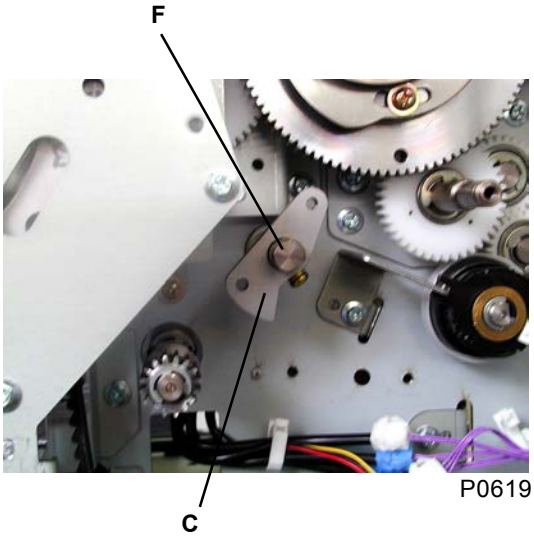
(12) Rotate the guide roller[E] slightly in the counterclockwise direction from the print-drum opening. Push it toward the rear, and detach it from the front-frame plate, and pull it out from the front.

[Precautions on Reassembly]

- When attaching the Timing base [C] onto the Guide-roller shaft [F], push it all the way in until it hits the start of the flat-cut on the shaft and stops firmly on the shaft before tightening the shaft.

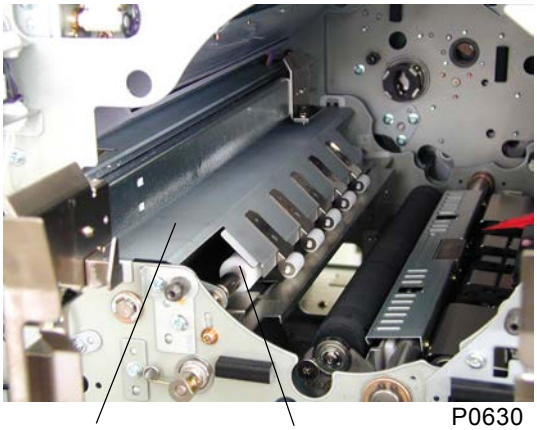


P0618



P0619

A: Guide-roller support
B: Timing lever
C: Timing base
D: Guide-roller cover assembly
E: Guide-roller assembly
F: Guide-roller shaft



P0630

6. Removing the Vertical-Centering Sensor

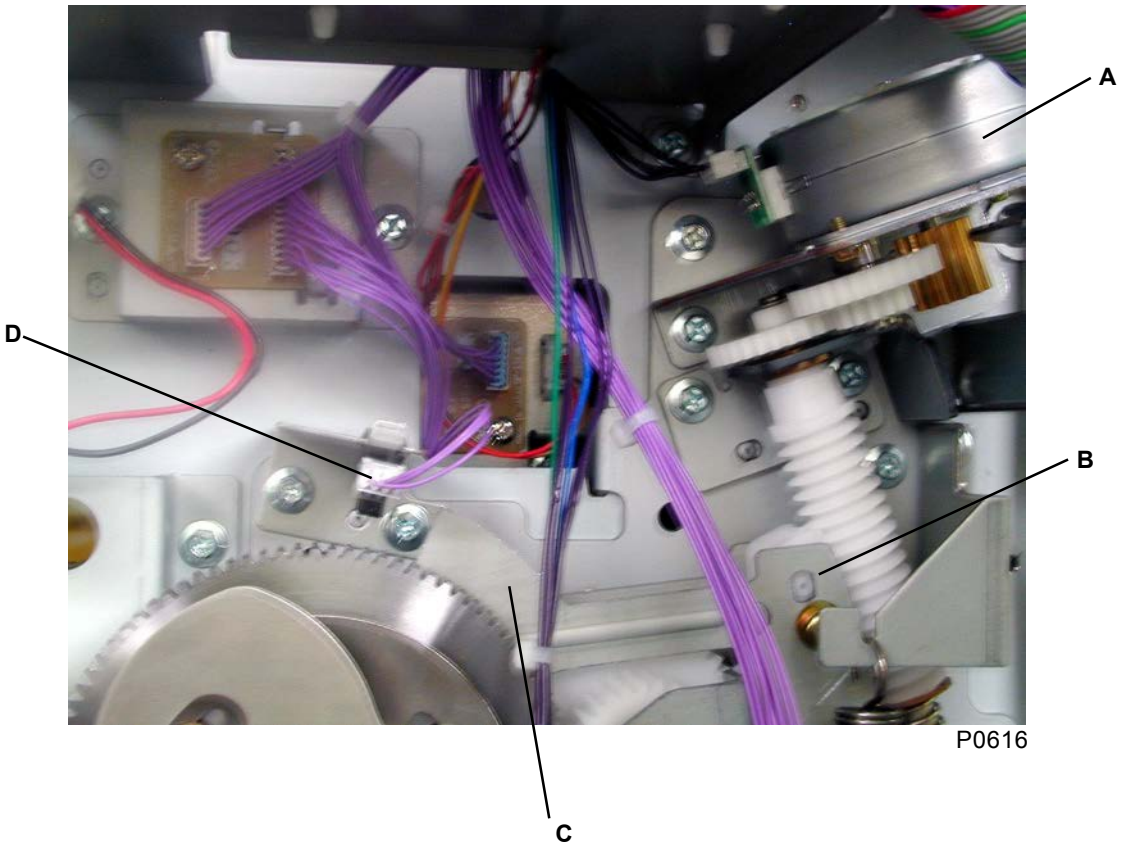
(1) Switch off the power, and remove the rear cover.

(2) Open the main PCB unit to the right.

(3) Detach the paper-feed reinforce plate with three screws (M4 x 8), detach the sector-gear spring, and then remove the paper-feed base cover with six screws (M4 x 8).

(4) Rotate the gear on the print-positioning pulse motor [A] to the right by hand to move the print-positioning arm R [C], which acts as the sensor detection plate on the print-positioning wheel assembly [B], sufficiently away from the vertical-centering sensor [D].

(5) Unplug the connector and then remove the vertical-centering sensor [D] with two screws (M4 x 8), together with the bracket.



P0616

A: Print-positioning pulse motor

B: Print-positioning-wheel assembly

C: Print-positioning arm R

D: Vertical-centering sensor

7. Removing the Print-Positioning Pulse Motor

(1) Switch off the power, and remove the rear cover.

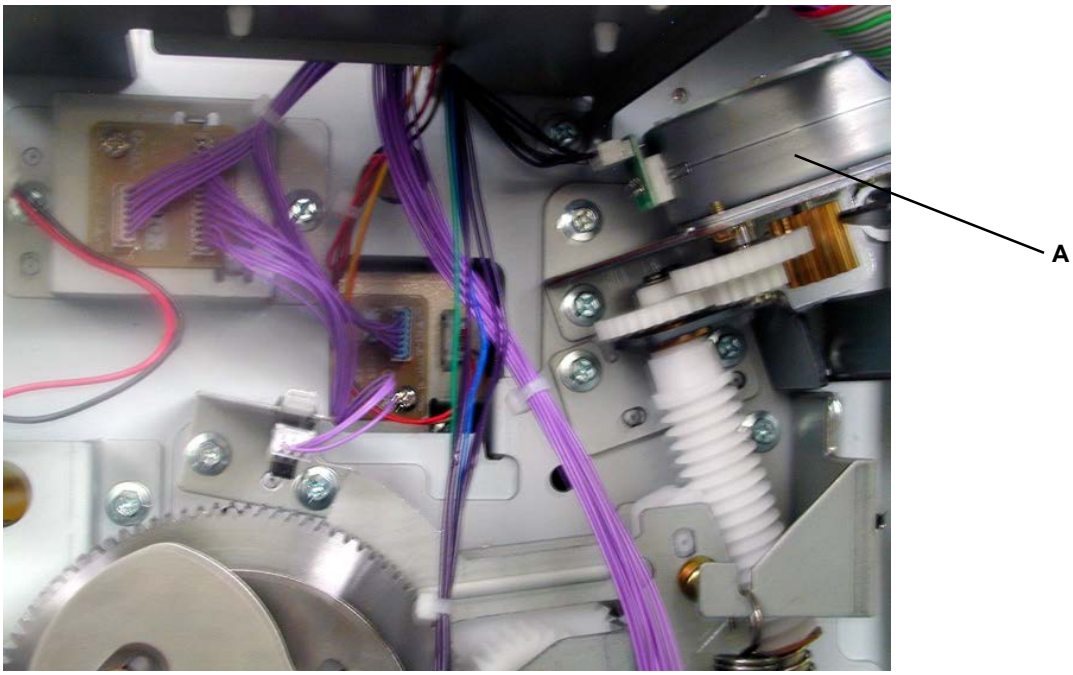
(2) Open the main PCB unit to the right.

(3) Detach the paper-feed reinforce plate with three screws (M4 x 8), detach the sector-gear spring, and then remove the paper-feed base cover with six screws (M4 x 8).

(4) Unplug the connector and then remove the print-positioning pulse-motor assembly [A] with two screws (M4 x 8).

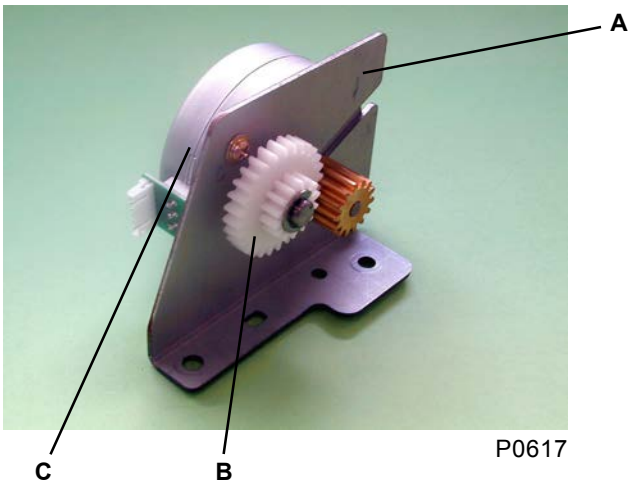
(5) Detach the e-ring, and then detach the stepped gear [B].

(6) Remove the print-positioning pulse motor [C] with two screws (M3 x 6).



P0631

A: Print-positioning pulse-motor assembly
B: Stepped gear
C: Print-positioning pulse motor



P0617

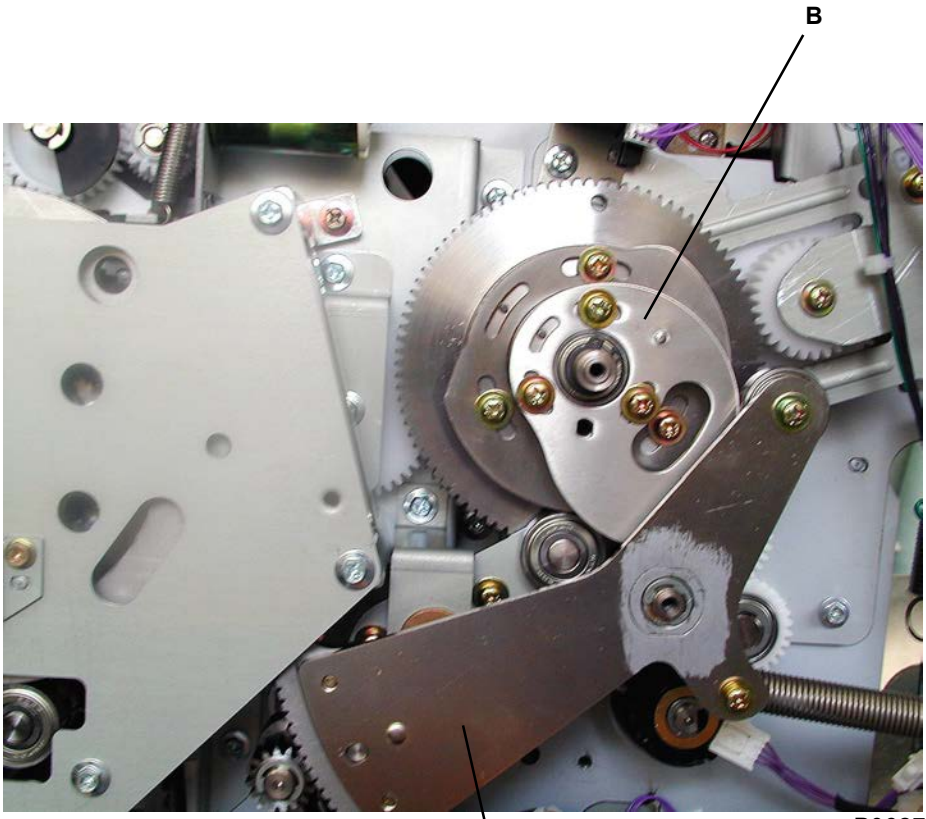
8. Removing the Sector-Gear Assembly

(1) Switch off the power and then remove the rear cover.

(2) Open the main PCB unit to the right.

(3) Detach the paper-feed reinforce plate with three screws (M4 x 8), detach the sector-gear spring, and then remove the paper-feed base cover with six screws (M4 x 8).

(4) Detach the e-ring, and remove the sector-gear assembly [A].



P0627

A: Sector-gear assembly

B: Timing cam

Adjustment

1. Timing-Lever Position Adjustment

Procedure

(1) Centralize the printing position, pull out the print drum, and then switch off the power.

(2) Remove the rear cover.

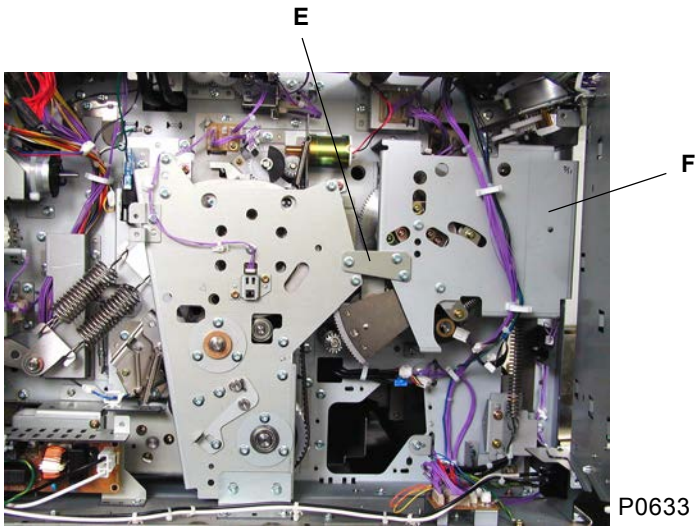
(3) Open the main PCB unit to the right.

(4) Detach the paper-feed reinforce plate [E] with three screws (M4 x 8), detach the sector-gear spring, and then remove the paper-feed base cover [F] with six screws (M4 x 8).

(5) Confirm that the gap between the roller [D] (bearing) on the timing lever [A] and the indentation on the guide-roller cam [B] is between 2.9mm and 3.5 mm.

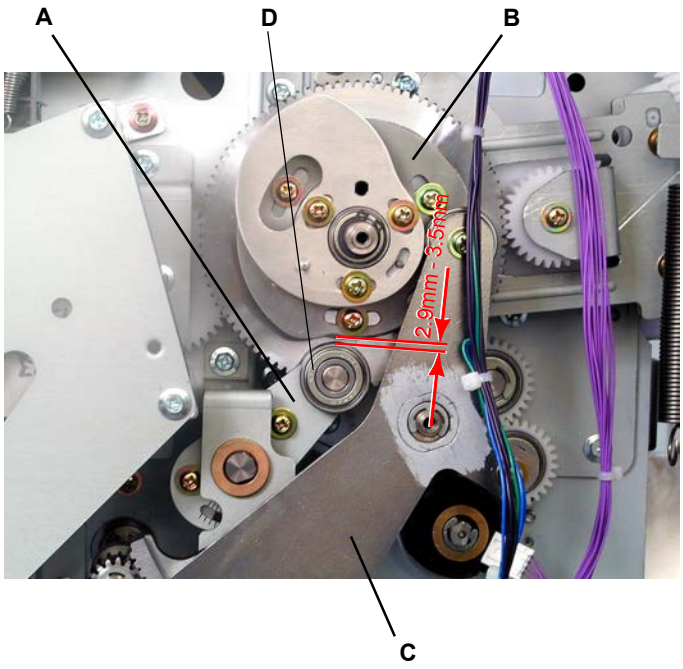
(6) If the gap is improper, detach the e-ring and remove the sector gear [C].

(7) Loosen the two screws holding the timing lever [A], and adjust the gap before retightening.



P0633

A: Timing lever
B: Guide-roller cam
C: Sector gear
D: Roller
E: Paper-feed reinforce plate
F: Paper-feed base cover



P0620

2. Guide-Roller-Cam Position Adjustment

This adjustment changes the timing of the closing and opening movement of the guide roller against the timing roller.

Keeping the test mode No.683 selected to the default setting of [1] (new cam position), check that smooth paper feed action is made by the opening and closing timing of the guide roller.

If paper jamming or registration problem occurs due to the guide roller timing, adjust the position of the guide roller cam [A].

Rotating the cam in the clockwise direction will advance the up-and-down movement timing of the guide roller. Rotating the cam in the other direction (counterclockwise direction) will delay the timing.

The default cam position is where the cam is rotated 2.9 degrees in the clockwise direction from the point in which the 2mm pin on the cam-gear [C] is at the center of the elongated hole on the guide roller cam [A]. **(Refer to the photograph below)**

3. Timing-Cam Position Adjustment

This adjustment changes the paper feeding timing of the second paper feed area.

Keeping the test mode No.683 selected to the default setting of [1] (new cam position), check that the vertical print position of the images are in correct position.

If the paper feed timing is either too early or too late and affects the vertical print position, adjust the position of the timing cam [B].

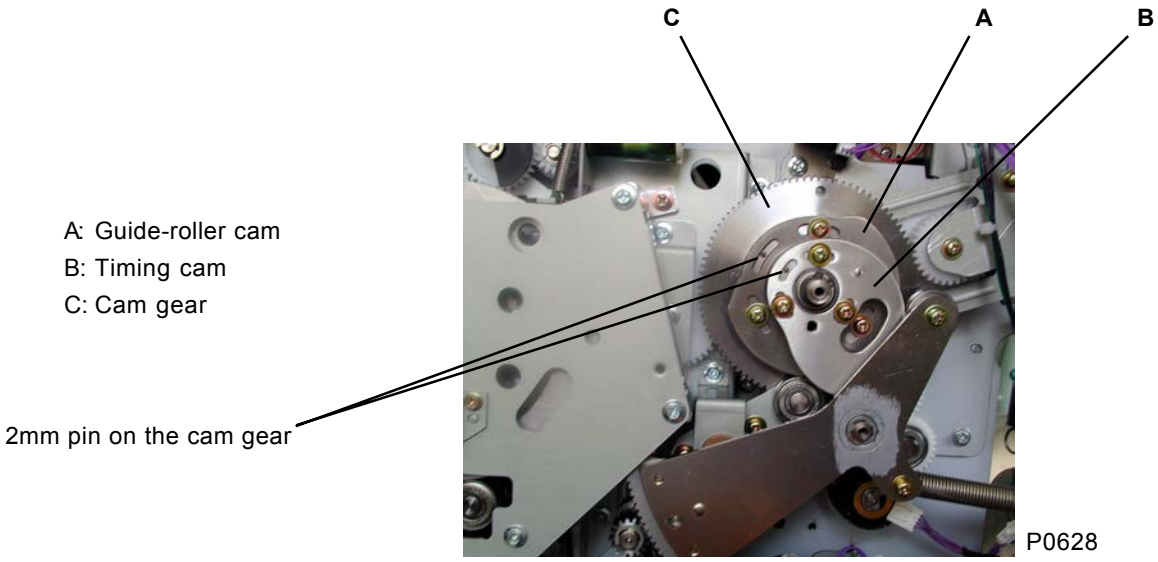
Precaution:

The vertical print position adjustment by test-mode No. 281 [Write start-position adjustment], refering to the next page, must be tried before moving the cam. If test mode No.281 corrects the problem, there is no need to change the cam position. The cam adjustment should only be made if test mode No.281 does not solve the vertical print position adjustment.

Rotating the cam in the clockwise direction will advance the paper feed timing and brings the image vertically down. In vise versa, by rotating the cam in the counterclockwise direction will delay the paper feed timing, resulting in image moving vertically upward.

The default cam position is where the cam is rotated 2.9 degrees in the clockwise direction from the point in which the 2mm pin on the cam-gear [C] is at the center of the elongated hole on the timing cam [A]. **(Refer to the photograph below)**

A: Guide-roller cam
B: Timing cam
C: Cam gear



P0628

4. Vertical-Print-Position Adjustment

(1) With the vertical print positioning key set at the center, make a master and print an original to check the vertical-print-position offset.

(2) Examine the printed image and confirm that the vertical printing offset is within the standard range (within 3 mm).

(3) If the offset is out of the range, adjust it using test-mode No.281 (Write start-position adjustment).

5. Multi-Paper-Feed Det.-Sensor Adjustment

(1) Run test-mode No. 405 (paper sensor), and confirm that long beep tones are emitted.

(2) Set a blank white sheet of paper, which is within the machine specification and of which the operator uses the most often, into the feed area until the audible tone changes to short beeps. Exit from test mode No.405 after the audible tone changes to short beeps.

(3) Keeping the sheet of paper in above position, activate test-mode No.457 (Auto Multi-Paper-Feed Det. Adj.). The sensor sensitivity adjustment is automatically made.

(4) Next, still keeping the sheet of paper in above position, activate test-mode No.472 (Multi-Paper-Feed Det. A/D Data) and confirm that the number displayed on the operation panel is between 350 and 450.

If the number displayed after activating test mode No.472 is out of the range between 350 and 450, try the adjustment from the beginning. If the result is still not good, the blank white sheet of paper used for the adjustment could be out of the machine specification.

6. Paper Sensor (Send) Adjustment

This adjustment should only be used as a temporary aid until the replacement of the paper sensor when the sensor does not detect the paper (the light emitted is too weak to pass through the paper).

Precaution:

1. The existing paper sensor should be replaced at earliest convenience.
2. Do not increase the light emission excessively.
3. Never adjust the volume dial on the Paper Sensor (Receive).

Procedure

(1) Rotate the light emission control volume dial in the clockwise direction to raise the light emitted, taking caution not to turn the dial excessively.

(2) After turning the volume dial on the paper sensor (send), using a blank white sheet of paper of which the operator uses the most often and which is within the machine specification, check that the beep sound made by test mode No.405 beeps in long pitches without the paper between the paper sensor and at short beep sound pitches with the paper in between the paper sensor.

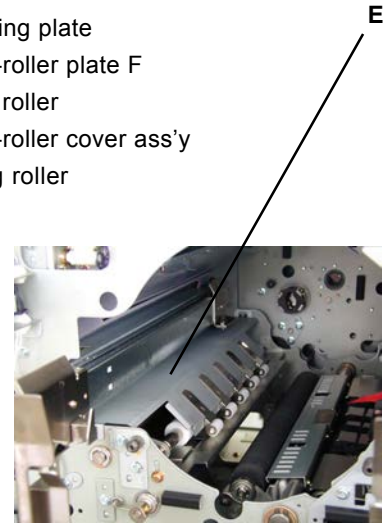
7. Paper Skew Adjustment

If paper skewing is detected during the printing, the correction can be tried by either or both of the following method.

1) Adjusting the parallelism of the Guide Roller against the Timing Roller:

1. Remove the guide-roller cover ass'y [E] with one screw (M3 x 8) from the front side.
2. By loosening two black-colored Allen bolt screws [A], the adjusting plate [B] can be moved against the guide-roller plate F [C] to adjust the parallelism between the guide roller [D] and the timing roller [F] by sliding the front end of the guide roller back and forth.
3. The standard position of the guide roller is where the 4mm diameter hole on the adjusting plate [B] meets the elongated hole on the guide roller plate F [C].

A: Allen bolt screws
B: Adjusting plate
C: Guide-roller plate F
D: Guide roller
E: Guide-roller cover ass'y
F: Timing roller



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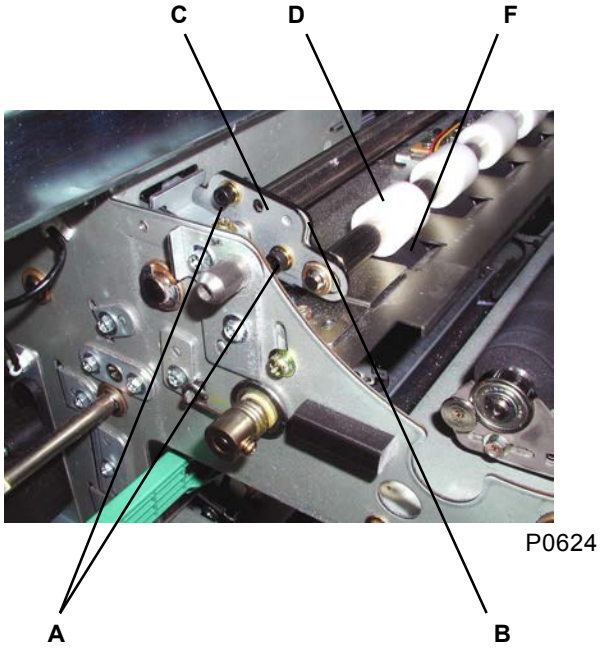
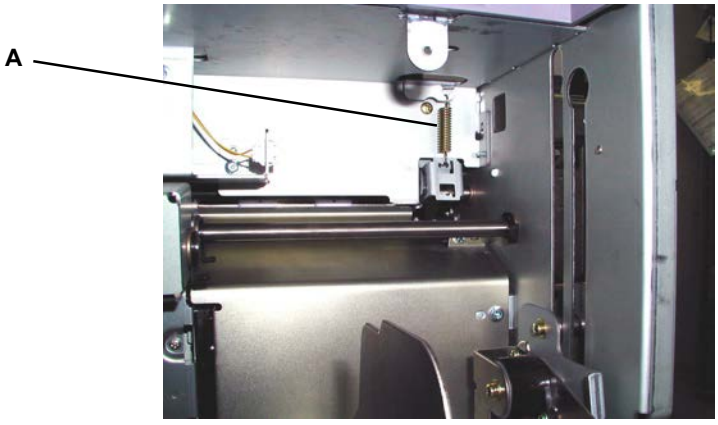


P0624

2) Adjusting the hooking position of the Guide-roller Spring to change the spring pressure:

1. Lower the paper feed tray all the way down.
2. Remove the paper-feed cover and change the hooking position of the guide-roller spring [A] at the bottom for the each of the two springs to change the pressure for the left and right.

A: Guide-roller spring



P0625

CHAPTER 7: PRESS SECTION

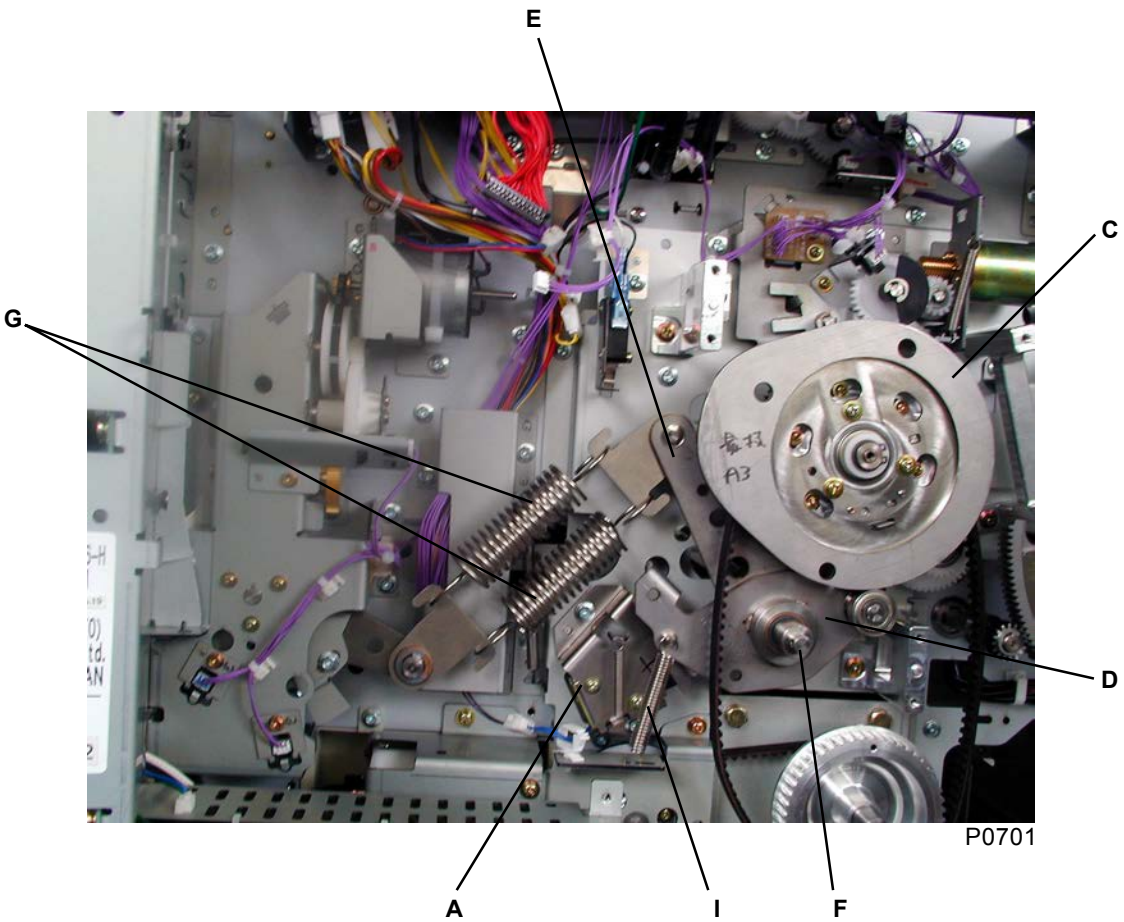
Contents

Mechanism

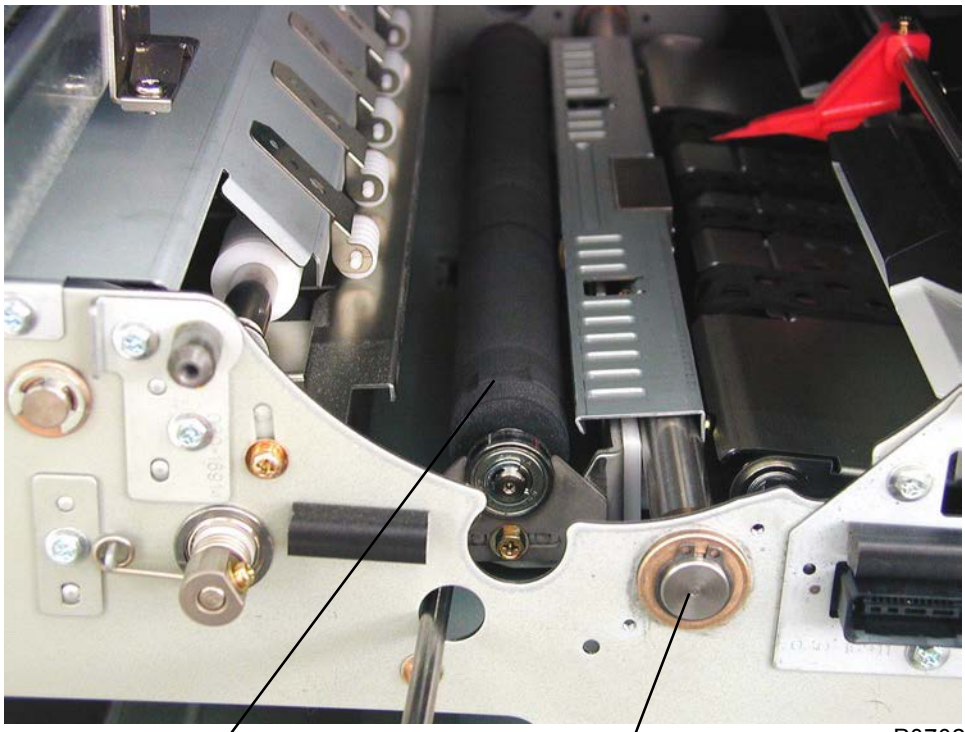
1. Press Mechanism

The main motor activates when printing begins, and the pressure solenoid [A] activates once the print drum rotates to the datum position.
As the clamp-plate base on the print drum approaches the pressure roller [B], the protrusion on the pressure cam [C] pushes against the pressure-lever-A ass'y [D] to rotate it clockwise. This rotary motion causes the pressure-lever-A ass'y [D] to push against the pressure-lever-B ass'y [E] in the clockwise direction. The pressure shaft [F] attached to the pressure-lever-B ass'y [E] therefore also rotates in the clockwise direction, and the pressure roller [B] descends to retract the clamp plate base on the print drum.
Once the protrusion on the pressure cam [C] has passed, the pressure-lever-A ass'y [D] rotates counterclockwise. Likewise, the pressure-lever-B ass'y [E] is pulled by the tension of the two pressure springs [G], and rotates together with the pressure-lever-A ass'y [D]. The pressure roller [B] therefore rises and is pressed against the print drum.
During printing, the pressure solenoid [A] remains activated.
Upon completion of printing, the pressure solenoid [A] is deactivated once the print drum reaches the datum position.
When the pressure solenoid [A] deactivates, the pressure-lever-B ass'y [E] is arrested by the slot in the solenoid lever [H], preventing it from rotating any further in the counterclockwise direction. This prevents the pressure shaft [F] attached to the pressure-lever-B ass'y [E] from rotating counterclockwise, thereby preventing the pressure roller [B] from pressing against the print drum.
The datum position for activating/deactivating the pressure solenoid = 150° + α

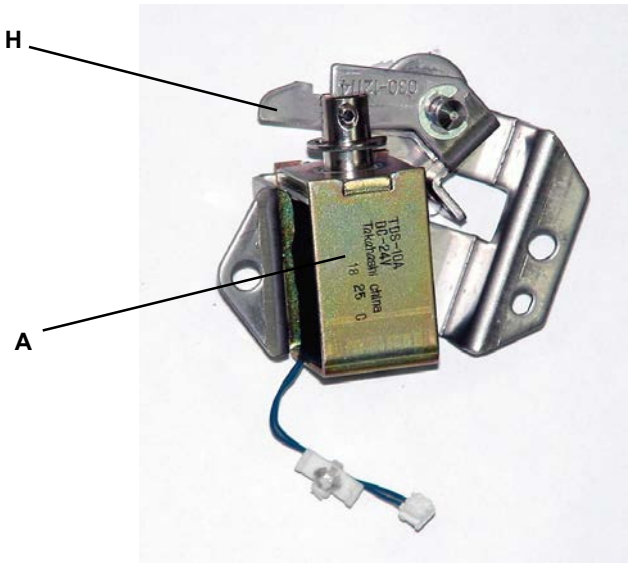
α: Setting in test-mode No. 486 "Paper-misfeed detection angle"



P0701



P0702

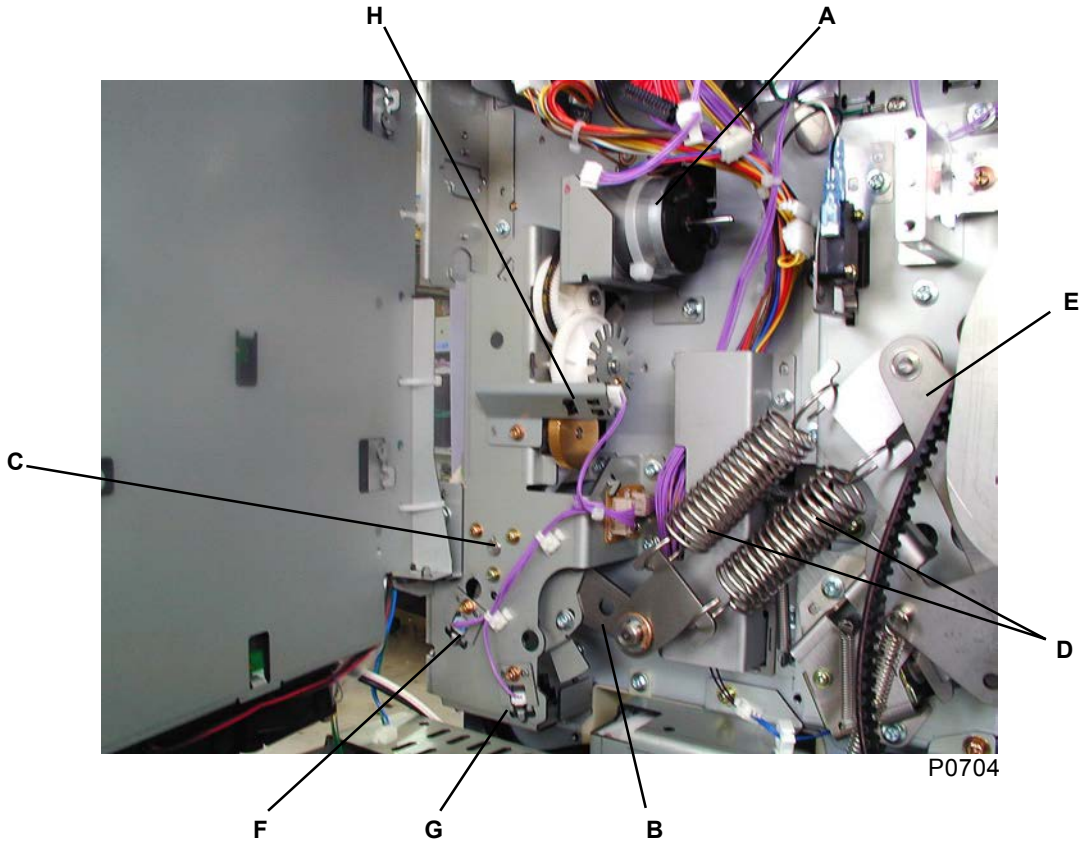


P0703

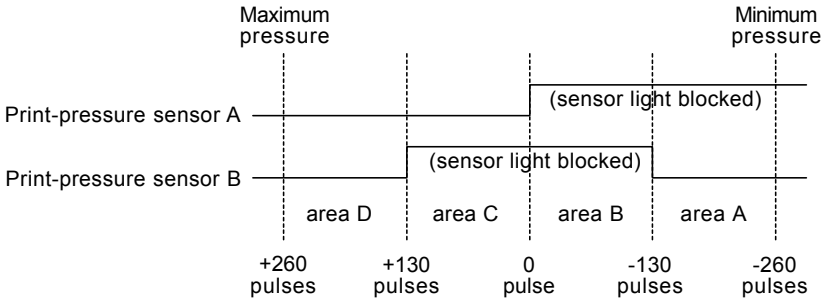
A: Pressure solenoid
B: Pressure roller
C: Pressure cam
D: Pressure-lever-A ass'y
E: Pressure-lever-B ass'y
F: Pressure shaft
G: Pressure spring
H: Solenoid lever
I: Pressure-lever-A spring

2. Pressure-Control Mechanism

Pressing the [◀] or [▶] print-density key on the panel activates the pressure-control motor [A] and rotates the pressure-control gear plate [B] around the pressure-control shaft [C] via the gear mechanism. The rotation of the pressure-control gear plate [B] varies the tension of the pressure spring [D].
This alters the pressure acting on the pressure-lever-B ass'y [E], and varies the print density by varying the pressure (printing pressure) of the pressure roller against the print drum. The pressure-control motor [A] 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 has been standing, and the internal temperature of the print drum.
Print-pressure sensor A [F] and print-pressure sensor B [G] check the standard printing-pressure position simultaneously. The rotation of the pressure-control motor is calculated by the print-pressure limit sensor [H] fitted midway along the gear mechanism.



A: Pressure-control motor
B: Pressure-control gear plate
C: Pressure-control shaft
D: Pressure spring
E: Pressure-lever-B ass'y
F: Print-pressure sensor A
G: Print-pressure sensor B
H: Print-pressure limit sensor



S0701

Removal and Assembly

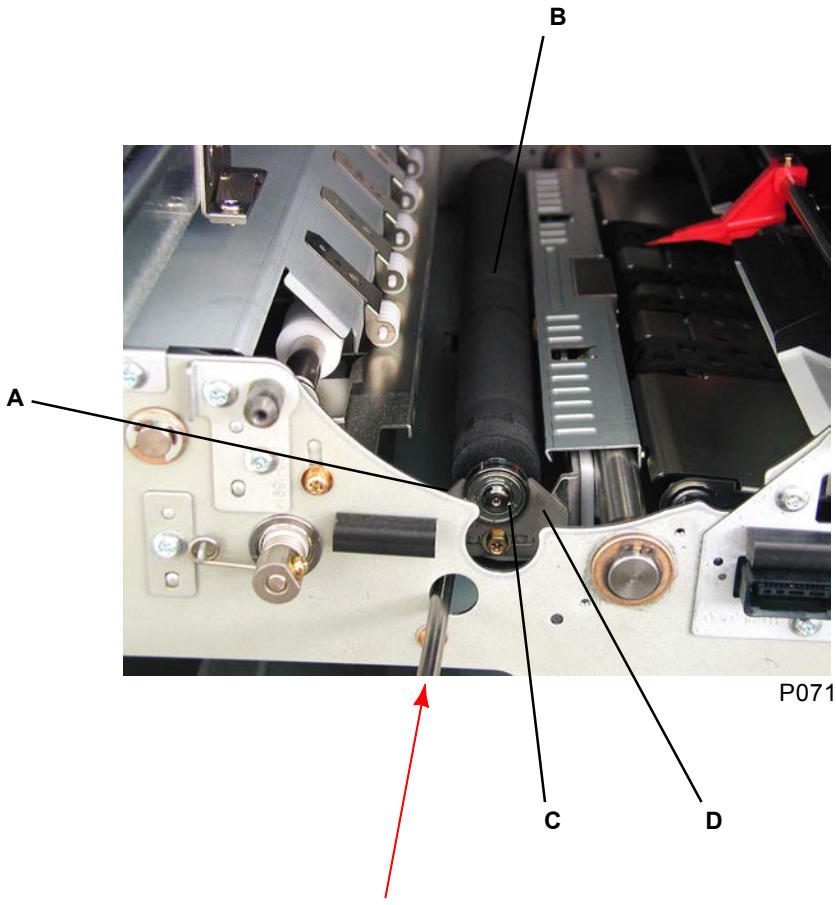
1. Removing the Pressure Roller

(1) Pull out the print drum and switch off the power.

(2) Insert a screwdriver through the opening in the front frame plate, and remove the stepped screw [A].

(3) Slide the bearing [C] on the pressure roller [B] forward until it disengages from the pressure-roller bracket [D], and then lift it upward to remove it.

A: Stepped screw
B: Pressure roller
C: Bearing
D: Pressure-roller bracket



P0717

2. Removing the Pressure Solenoid

(1) Remove the rear cover.

(2) Open the power-supply unit and main PCB unit 90 degrees to the left and right, respectively.

(3) Remove the two pressure springs [A]. (To ease removal, adjust to the minimum pressure position using test-mode No. 658, “Print-pressure maintenance position.”)

(4) Unplug the connector, remove the two screws (M4 x 8) on the solenoid base ass’y [B], and then remove the solenoid base ass’y [B].

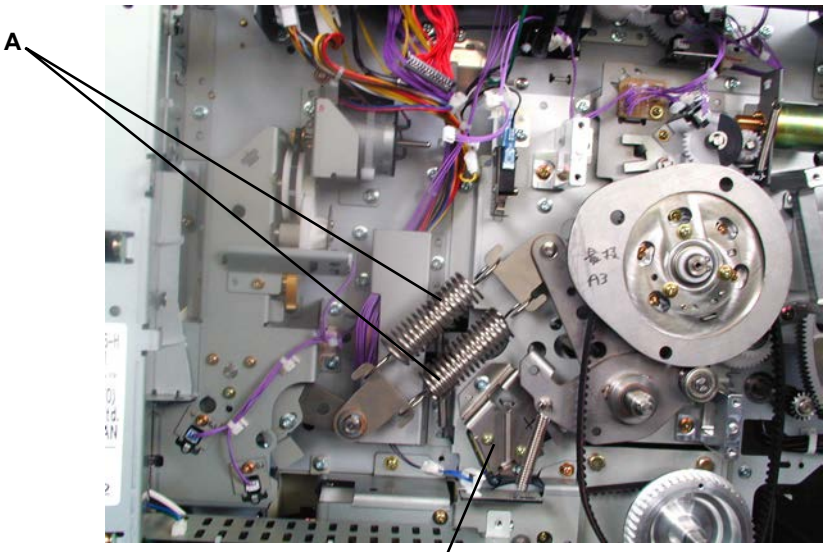
(5) Remove the two screws (3 x 6), and then remove the pressure solenoid [C].

[Work Precautions]

- The pressure springs are extremely powerful. Exercise caution to avoid injury during removal or refitting.

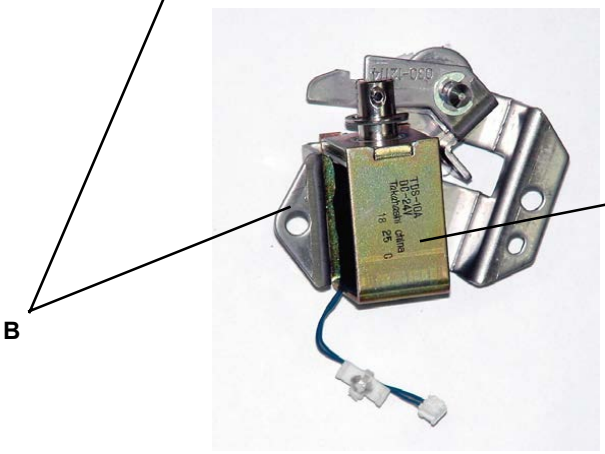
[Precautions on Reassembly]

- Align the half-pierced sections when attaching the solenoid base ass’y.



P0714

A: Pressure springs
B: Solenoid base ass’y
C: Pressure solenoid



P0705

Memo

3. Removing Pressure Levers A and B

(1) Make a confidential master, and then move the print drum to position B.

(2) Remove the rear cover.

(3) Open the power-supply unit and main PCB unit 90 degrees to the left and right, respectively.

(4) Remove the pressure-cam-stay ass'y.

(5) Remove the pressure-lever-A spring [A] and the two pressure springs [B]. (To ease removal of the pressure springs, adjust to the minimum pressure position using test-mode No. 658, "Print-pressure maintenance position.")

(6) Detach the C-ring [C], and remove the pressure-lever-A ass'y [D].

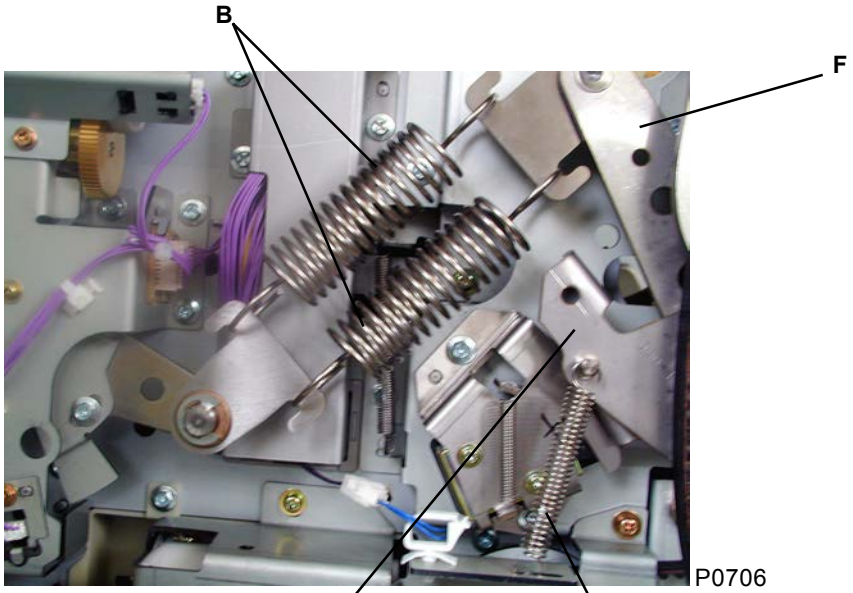
(7) Loosen the two Allen screws (3 mm) [E] using an Allen wrench, and remove the pressure-lever-B ass'y [F] from the pressure shaft [G].

[Work Precautions]

- The pressure springs are extremely powerful. Take care to avoid injury when removing or refitting them.

[Precautions on Reassembly]

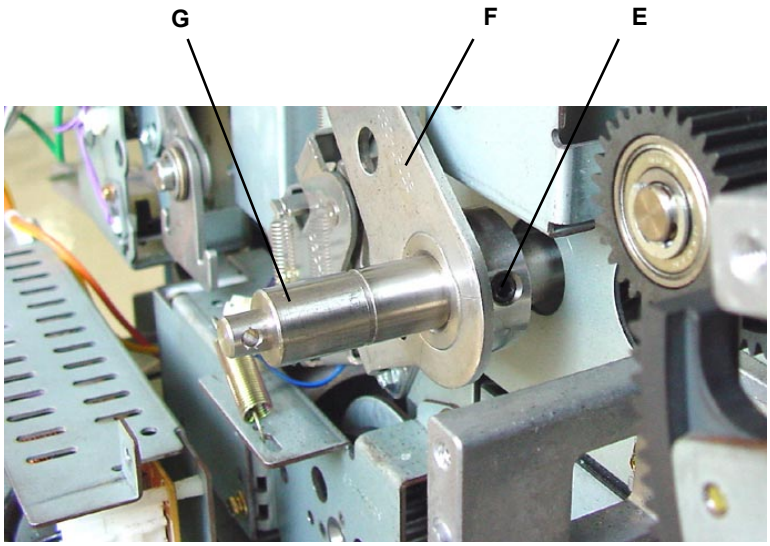
- Adjust the mounting position of the pressure-lever-B ass'y.



P0706

P0707

A: Pressure-lever-A spring
B: Pressure springs
C: C-ring
D: Pressure-lever-A ass'y
E: Allen screw
F: Pressure-lever-B ass'y
G: Pressure shaft



P0708

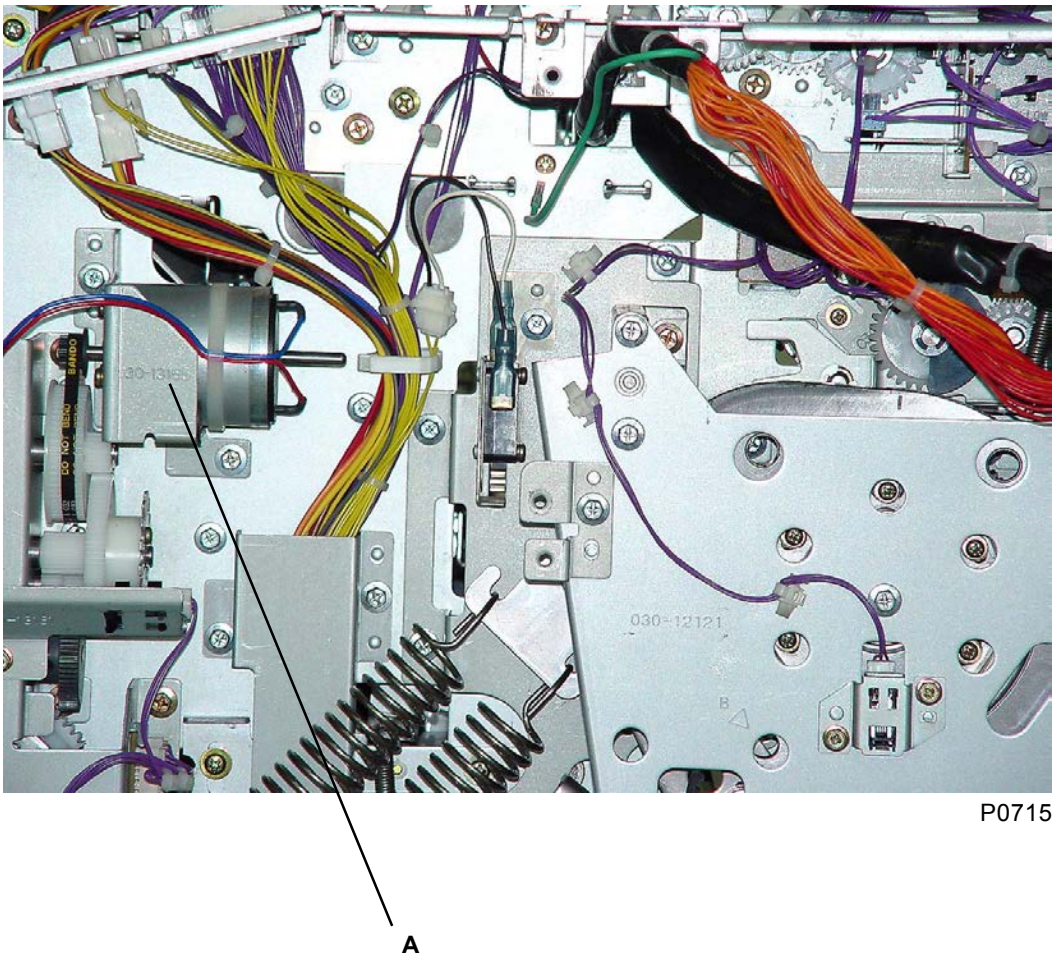
4. Removing the Pressure-Control Motor

(1) Remove the rear cover.

(2) Open the power-supply unit 90 degrees to the left.

(3) Unplug the connector, remove the two screws (M4 x 8), and then remove the pressure-control motor [A] together with its bracket.

(4) Remove pressure-control motor [A] with three screws (M3 x 6).



P0715

A: Pressure-control motor

5. Removing Print-Position Sensors A and B

(1) Run test-mode No. 654 (print-pressure home action).

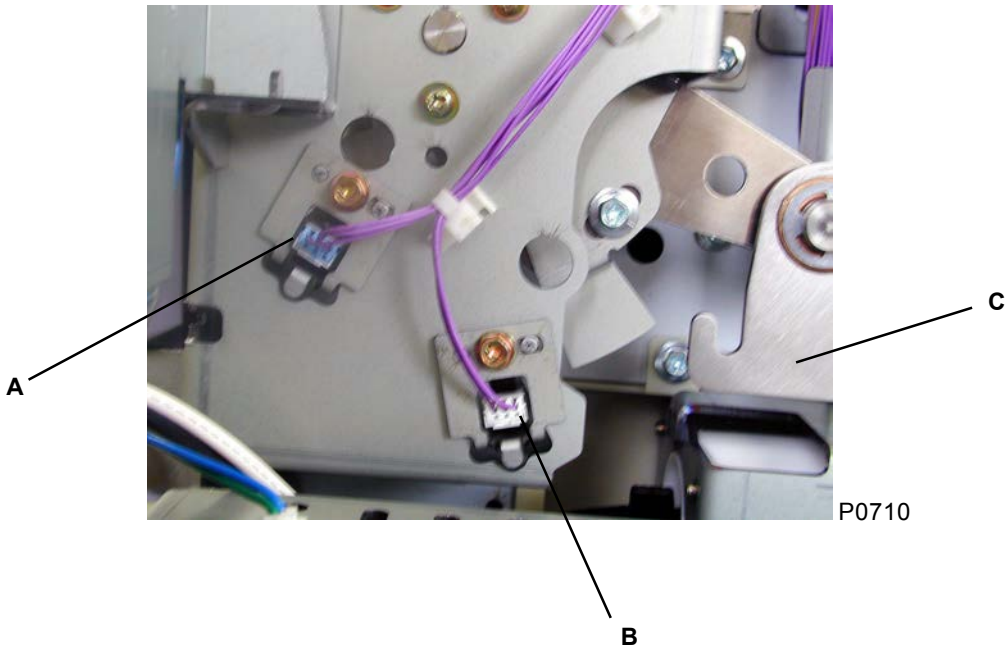
(2) Remove the rear cover.

(3) Open the power-supply unit 90 degrees to the left.

(4) Remove the two pressure springs, and rotate the pressure-control motor fully in the clockwise (maximum pressure) direction. (Exercise caution to prevent the pressure hook [C] from catching on the lower bracket.)

(5) Unplug the connector, remove the screw (M3 x 6), and then remove print-pressure sensor A [A] together with its bracket.

(6) Unplug the connector, remove the screw (M3 x 6), and then remove print-pressure sensor B [B] together with its bracket.



P0710

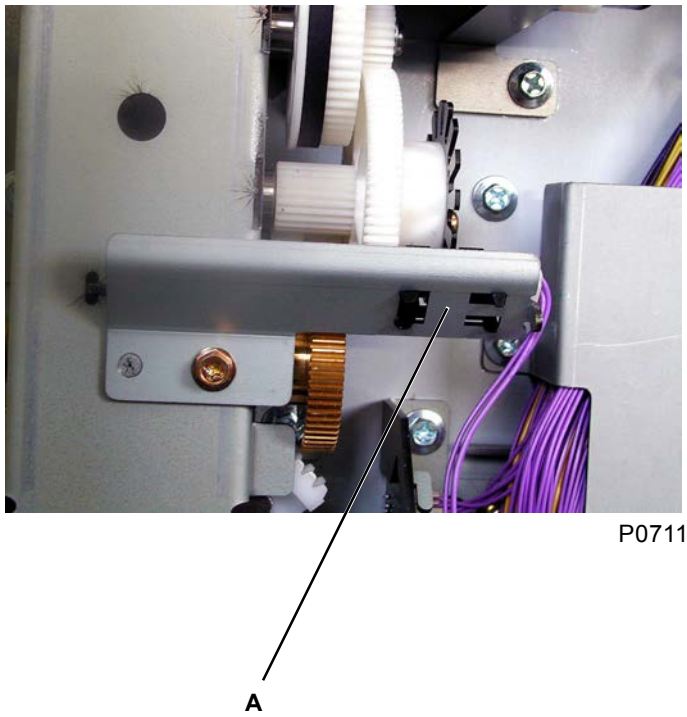
A: Print-position sensor A
B: Print-position sensor B
C: Pressure hook

6. Removing the Print-Pressure Limit Sensor

(1) Remove the rear cover.

(2) Open the power-supply unit 90 degrees to the left.

(3) Unplug the connector, remove the screw (M3 x 6), and then remove the print-pressure limit sensor [A] together with its bracket.



P0711

A: Print-pressure limit sensor

Memo

Adjustment

1. Checking the Mounting Position of Pressure Lever B

[Work Precautions]

- The pressure springs are extremely powerful. Exercise caution to avoid injury during removal or refitting.

Checking Procedure

(1) Make a confidential master, and then move the print drum to position B.

(2) Turn off the power and remove the rear cover.

(3) Open the power-supply unit and main PCB unit 90 degrees to the left and right, respectively.

(4) Connect the power and activate test mode No. 653 “Print-pressure maintenance position” to ease the tension of the pressure springs for easier removal of the springs.

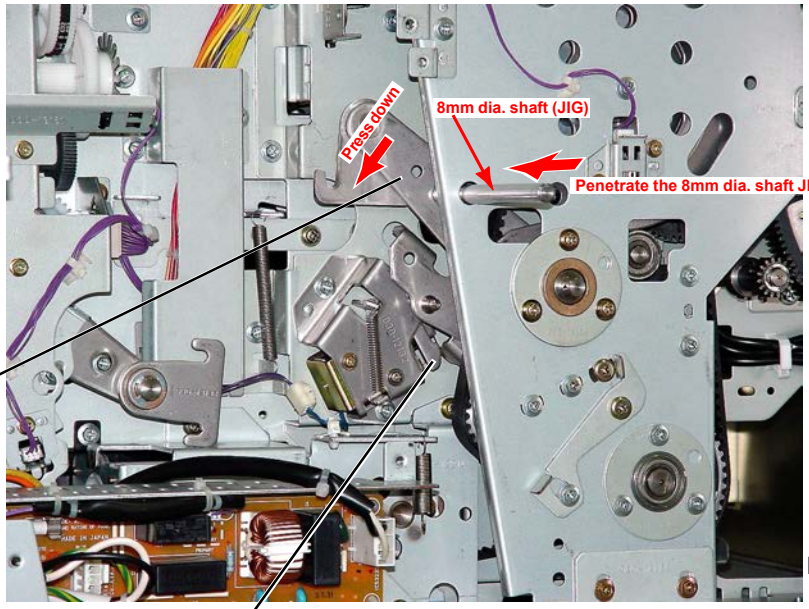
(5) Turn off the machine power and unplug the power cord from the machine.

(6) Remove the two pressure springs, and unhook the pressure-lever-B [C] from the solenoid lever [B].

(7) Pull down the pressure-lever-B [C] by hand to raise the pressure roller against the print drum to hit against the print drum with the pressure equivalent to normal printing.

(8) Insert 8mm-diameter shaft Jig through the hole on the pressure-cam stay assembly [M], and confirm that the shaft fits through the hole on the pressure-lever-B [C] assembly and though the machine frame.

(9) If the shaft does not penetrate through, position of the pressure-lever-B [C] needs to be adjusted.

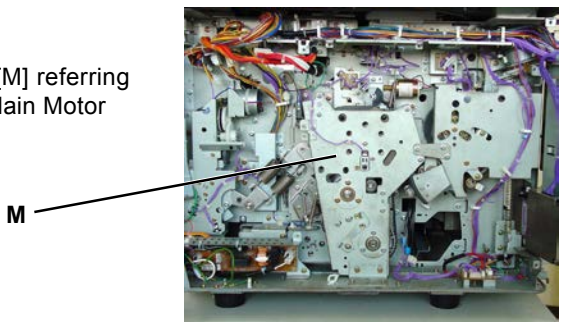


B: Solenoid lever
C: Pressure-lever-B
M: Pressure-cam stay assembly

P0730

Adjusting Procedure

(10) Remove the pressure-cam stay assembly [M] referring to the instruction given on “Removing the Main Motor Unit” described on Chapter 3.

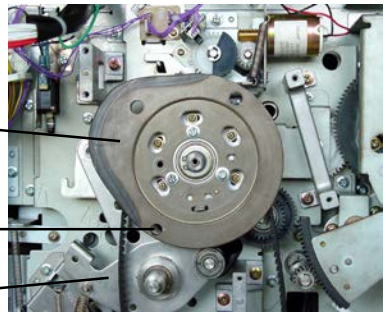


P0725

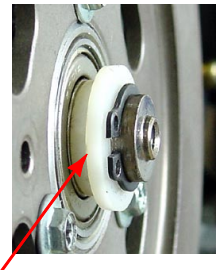
(11) Remove the pressure-lever-A spring, detach the C-ring, and then remove the pressure-lever-A ass'y [N] from the pressure shaft.

(12) Detach the C-ring and stepped washer [G] from the main driveshaft, remove the pressure-cam ass'y [H], and then loosen the two Allen screws [E] on the pressure-lever-B [C]. Then, with the 8-mm-dia. jig inserted into the 8-mm-dia. alignment hole [D], hook one of the two removed pressure springs between the 8mm dia. shaft Jig and the main driveshaft, and retighten two Allen screws [E]. Push the pressure-lever-B [C] all the way towards the rear frame plate when tightening the two Allen screws.

Refer to next page for the precautions on reassembly.

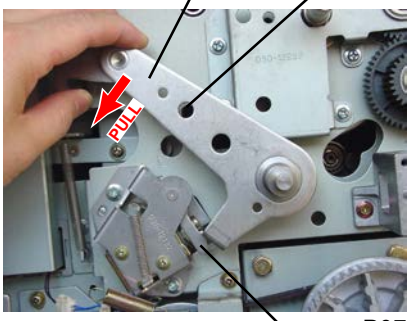


P0727

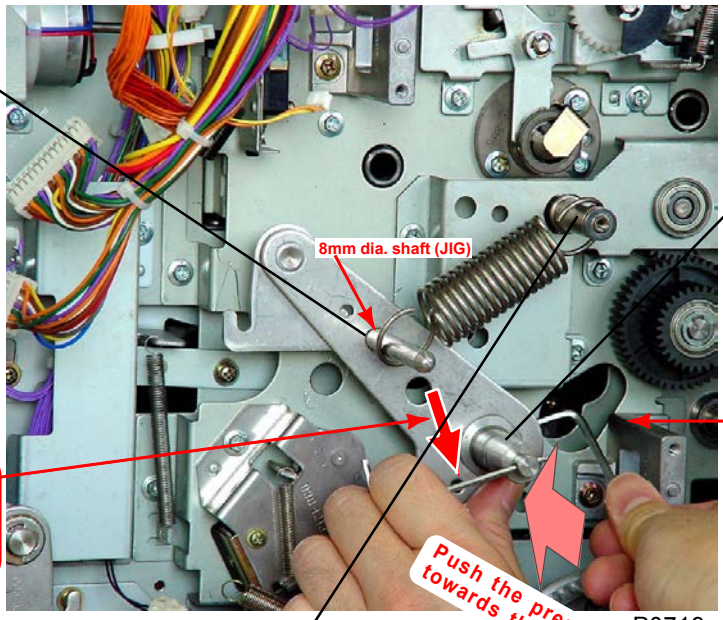


P0720

G Smaller diameter of the stepped plastic washer faces inward.

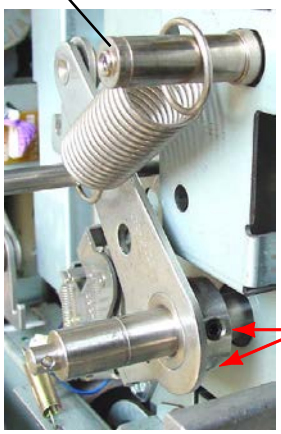


P0726



P0719

A: Pressure shaft
B: Solenoid lever
C: Pressure-lever-B
D: 8-mm-dia. alignment hole (pressure-lever-B assembly)
E: Allen screw
F: Main driveshaft
G: Stepped washer
H: Pressure-cam assembly
I: 8-mm-dia. alignment hole (Pressure cam assembly)
N: Pressure-lever A assembly

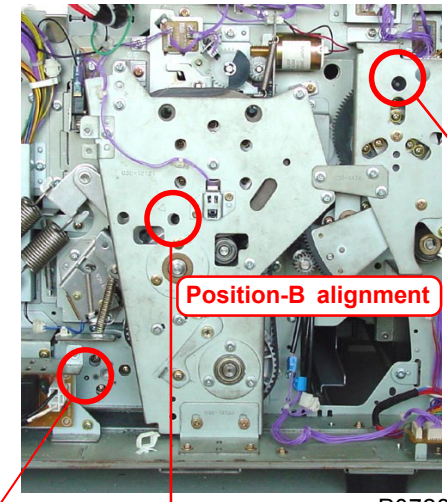


P0729

Precautions on Reassembly continues on next page.

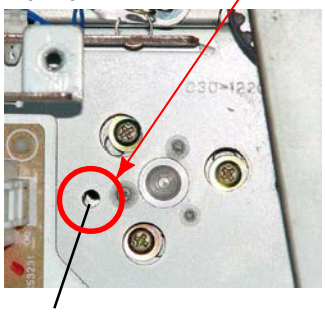
[Precautions on Reassembly]

- When installing the pressure-cam assembly, confirm that the print drum is at position B (check the alignment holes [L] on the paper-feed base cover [J] and cam gear [K]), and then align the 8-mm-dia. alignment hole [I] on the pressure-cam ass'y. Insert the white colored stepped plastic washer over the pressure cam-ass'y with the smaller outer diameter facing inward.

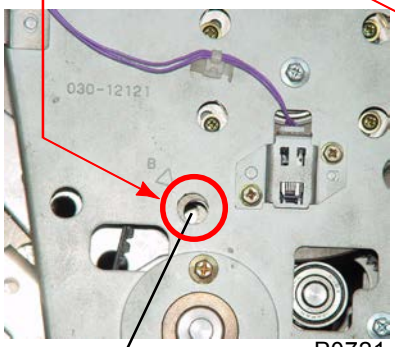


P0728

P0723

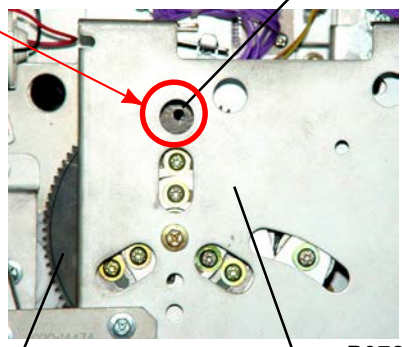


Also confirm that the position-B hole for the Air pump unit is aligned.



P0721

D & I



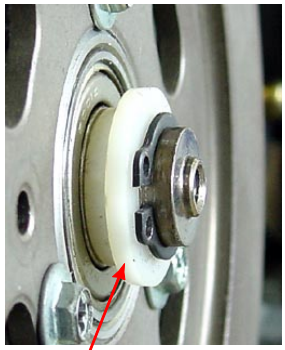
L

K

J

P0722

D: 8-mm-dia. alignment hole (pressure-lever-B ass'y)
G: Stepped washer
I: 8-mm-dia. alignment hole (Pressure cam ass'y)
J: Paper-feed base cover
K: Cam gear
L: Alignment hole



P0720

G

Smaller diameter of the stepped plastic washer faces inward.

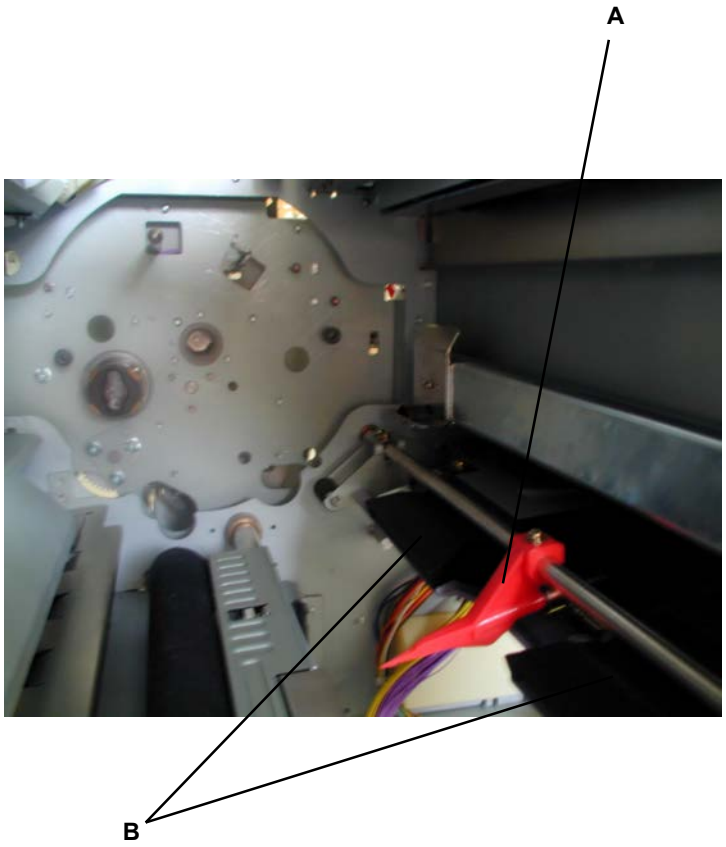
CHAPTER 8: PAPER-EJECTION SECTION

Contents

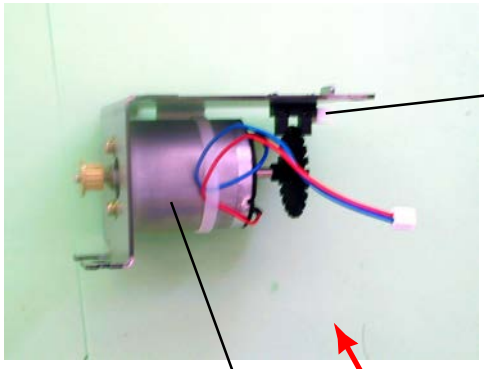
Mechanism

1. Paper-Ejection Mechanism

Printed paper is first separated from the print drum by the separator [A] with air-blow nozzles and by two separation fans [B].
The paper is then sent to the paper-receiving tray by the transfer belts [C] on the suction unit [H].
The transfer belts [C] are driven when the paper-ejection motor [D] activates.
A suction fan [E] is located below the transfer belts [C] to suck the paper onto the transfer belts [C].
The paper-ejection sensor [F] checks whether the paper is ejected correctly.
The paper-ejection limit sensor [G] checks the rotation of the paper-ejection motor [D] to ensure that the speed of the transfer belts [C] is slightly greater than the corresponding print-drum rotation speed, and to ensure smooth paper ejection from the print drum.



P0801



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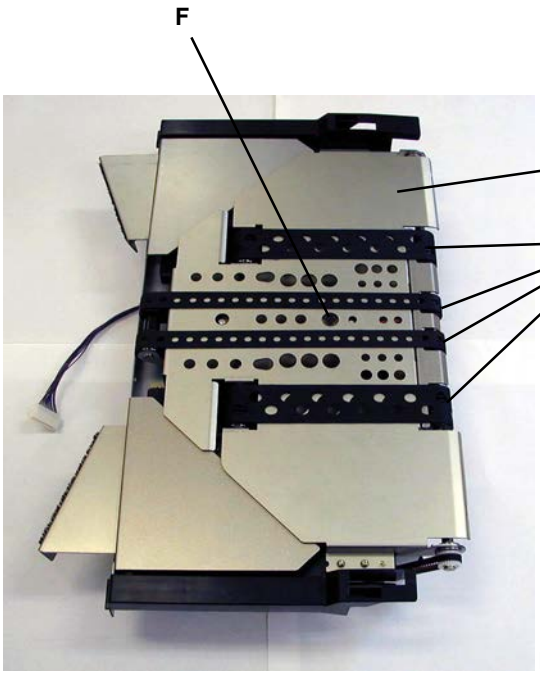
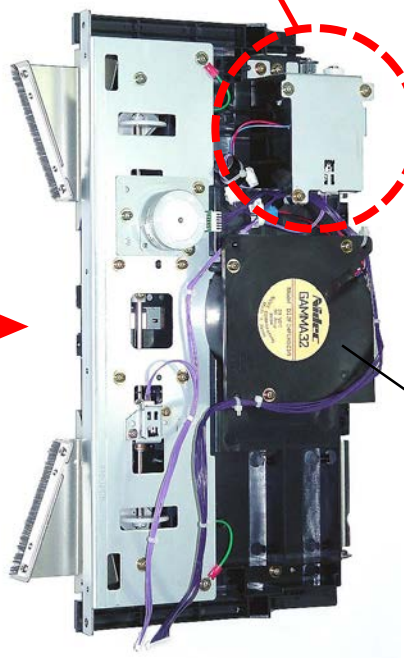


P0802

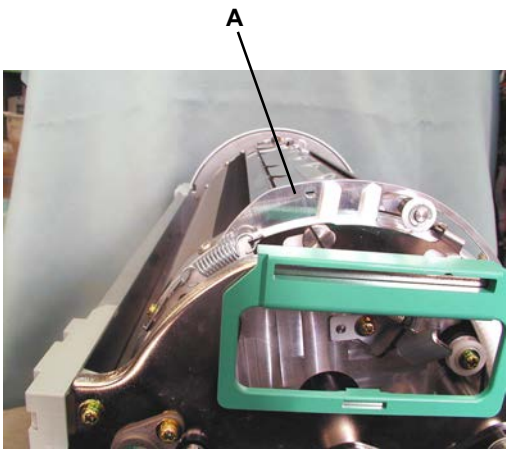


P0803

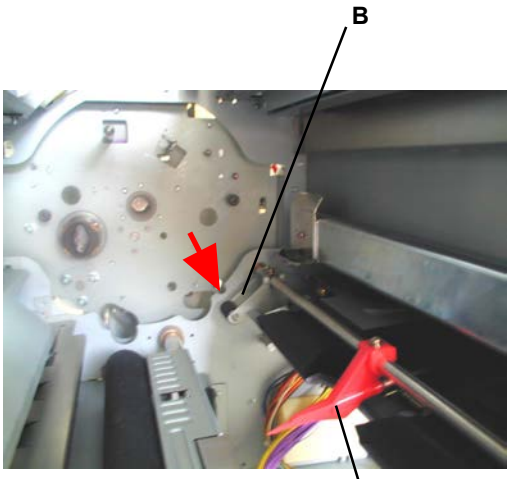
A: Separator
B: Separation fans
C: Transfer belts
D: Paper-ejection motor
E: Suction fan
F: Paper-ejection sensor (send)
G: Paper-ejection limit sensor
H: Suction unit

2. Separator Elevation Mechanism

The separator is close to the print drum when the paper is being separated from the print drum. As the print drum rotates and the clamp-plate base approaches the separator, the separator arm [B] is pushed in the direction indicated by the arrow by the raised section of the drum flange R [A], causing the separator [C] to move away from the print drum.
Likewise, when the print drum is pulled out, the release lever [D] is returned by the release spring [E] to push the release arm [F], causing the separator [C] to move away from the print drum.



Print drum viewed from the rear P0805



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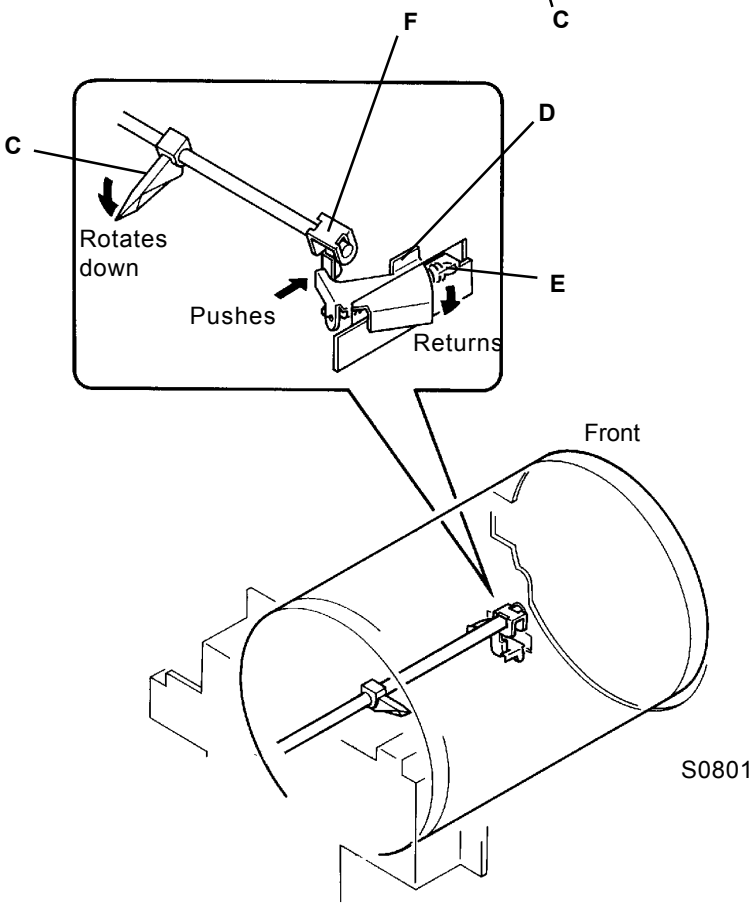


S0801

A: Drum-flange-R raised section
B: Separator arm
C: Separator
D: Release lever
E: Release spring
F: Release arm

3. Paper-Ejection-Wing Mechanism

The left- and right-hand paper-ejection wings on the suction unit, and the end of the belt at the center, move up or down, to suit the paper-ejection requirements.

- The paper-ejection wings are raised and lowered by the paper-ejection-wing motor, and the home position of the paper-ejection wings is detected by the paper-ejection-wing home sensor.
- The position of the paper-ejection wings is determined by the relationship between the stop position of the paper-ejection-wing motor and the home position. Five basic positions (P1 to P5) can be selected in accordance with the pressure-adjust lever, paper size (paper-width potentiometer), paper-data entry, and optional-device (sorter) connection.
- When changing the paper-ejection-wing position, the paper-ejection-wing motor automatically operates in the direction in which the position can be reached the fastest.
- The above five positions (P1 to P5) can be selected in accordance with the machine configuration if "Auto" is selected in "Eject-wing control" in the panel sub-window (Functions). If "Special" is selected, the paper-ejection wings move to the position set in test-mode No. 490, "Paper-ejection-wing target pos."

  * "Special" cannot be selected in "Eject-wing control" in the Functions window if test-mode No. 490, "Paper-ejection-wing target pos" has not been set in advance by the service technician.

Paper-ejection-wing position

Pressure-adjust-lever position	Paper-data entry				With a sorter connected
	Thin/Light	Standard	Card	Custom	
Standard	P4	P5	P2	P5	P1
	P4	P4	P2	P3	P1
Card	P2	P2	P2	P2	P1
	P2	P2	P2	P2	P1

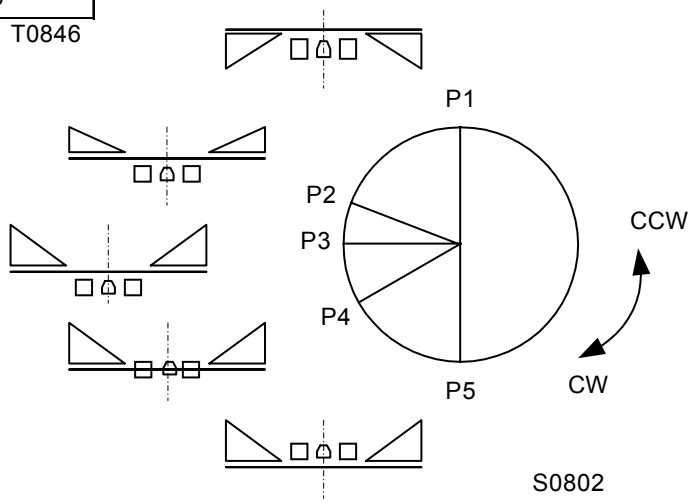
T0845

* Upper/Lower: Paper width of 220 mm or more/paper width of 219 mm or less.
* P3 is set regardless of the above settings if the paper size is set to "Postcard."

Wing positions: Number of pulses from the home position

Position	Clockwise	Counterclockwise
P1 (HP)	0	0
P2	1550	370
P3	1450	470
P4	1280	640
P5	960	960

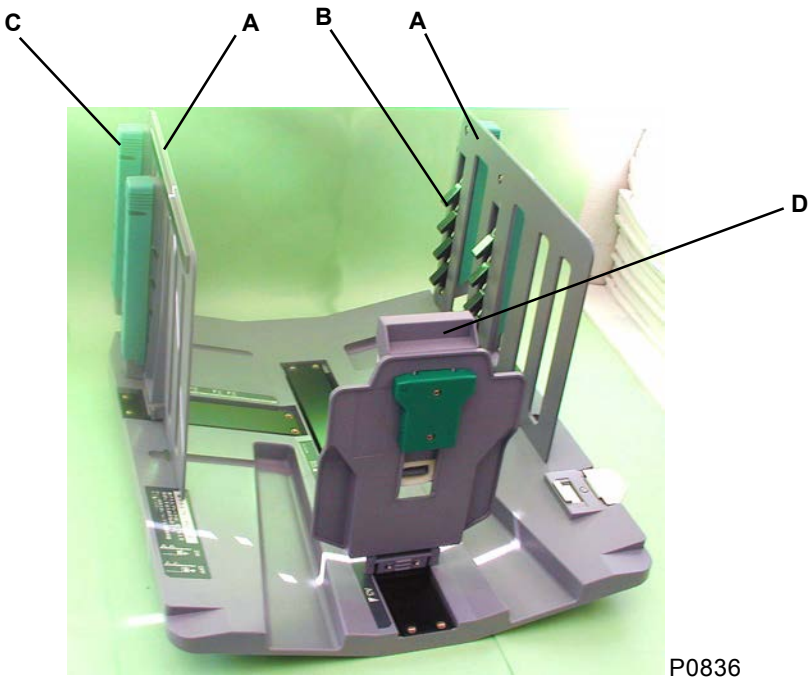
T0846



S0802

4. Paper-Receiving Tray Unit

Printed paper ejected curved downwards is dropped into the V-shaped paper-receiving tray, which is curved upwards, by the paper arrangers [B] fitted to the paper guides [A] on the paper-receiving tray. This improves paper stacking.
Moving the paper-arranger knob [C] up or down extends or retracts the paper arrangers to suit the paper size.
Depending on the type of paper used, the paper stop cushion [D] can also be moved up or down to improve paper stacking.



P0836

A: Paper guide
B: Paper arrangers
C: Paper-arranger knob
D: Paper stop cushion

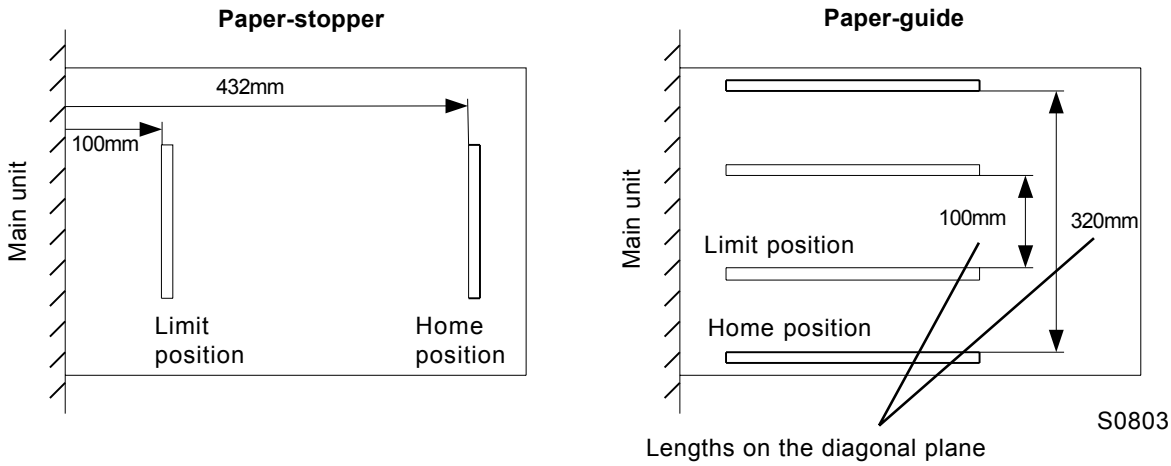
5. Auto-Control Stacking Tray (Optional)

- The paper stopper and paper guides are moved simultaneously when master making or printing starts. If the paper guides are folded down, the motor switches are deactivated and the paper guides do not move.
- The paper-guide movement depends, as specified below, on the amount of paper in the paper-receiving tray.

Paper in the paper-receiving tray		Action
No paper		Returns to the home position and then moves to the paper-guide position
Paper present	Paper in the paper-receiving tray < paper in the paper-feed tray	Returns to the home position and then moves to the paper-guide position
	Paper in the paper-receiving tray ≥ paper in the paper-feed tray	Does not move

T0847

- Only the paper-stopper returns to the home position if “paper-stopper HP SW” [A] is pressed in standby.
  - Whether to move only the paper-stopper to the home position, only the paper-guides to the home position, or both to the home position can be selected by test mode No. 1415.
- The paper-guide position corresponds to “paper size” + “HP adjustment” + “paper-type adjustment.”
- Paper-guide range of movement



S0803

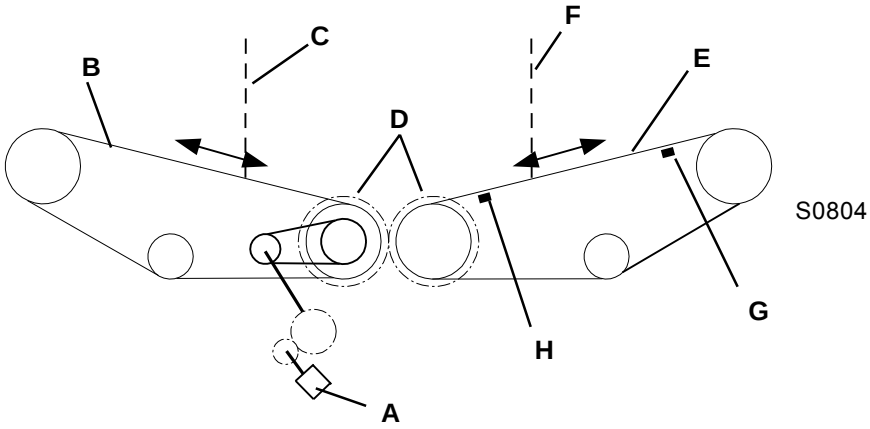
Lengths on the diagonal plane

A: Paper-stopper HP button

P0806

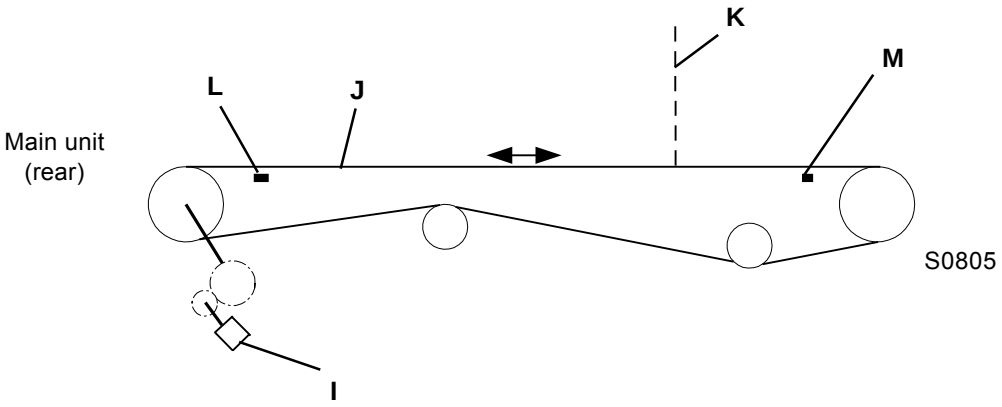
Paper-guide positioning mechanism

The paper-guide belt (left) [B] is driven by the paper-guide motor [A], which moves the paper guide (left) [C] horizontally. The paper-guide belt (right) [E] is driven by the gears [D], which moves the paper guide (right) [F] horizontally, and symmetrically, interlocked with the paper guide (left) [C]. The paper-guide HP sensor [G] and paper-guide limit sensor [H] are positioned at the end and center, respectively, of the range of movement of the paper guide (right), to detect its position.

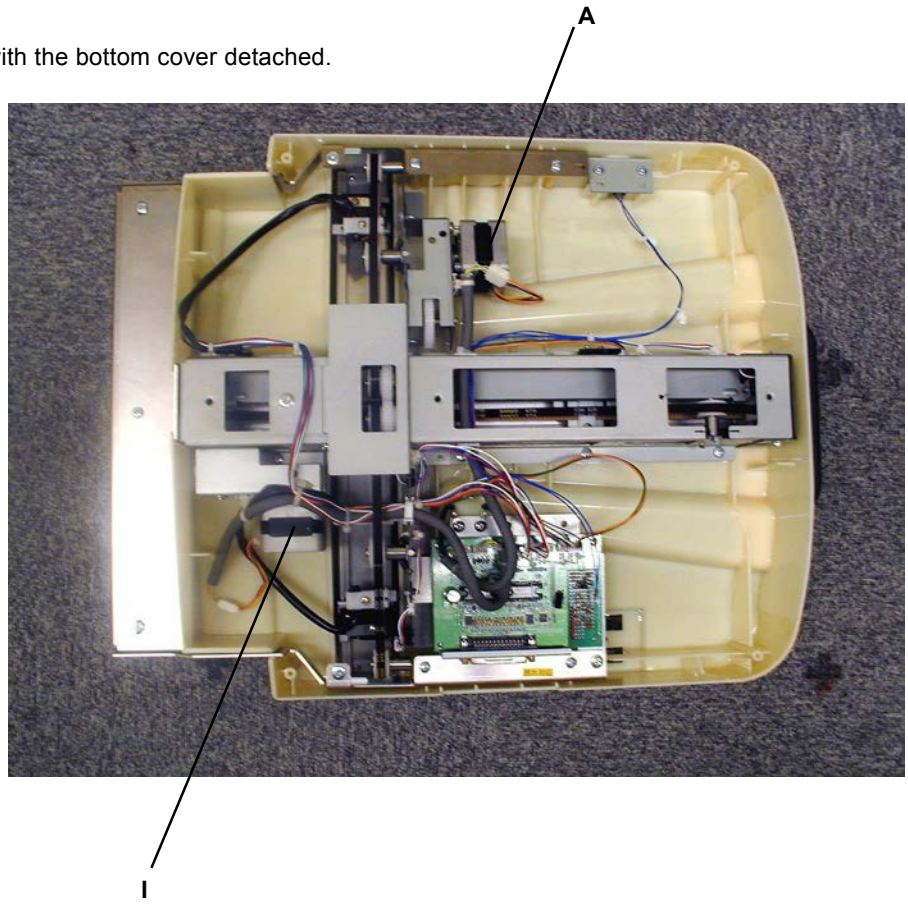


Paper-stopping positioning mechanism

The center belt [J] is driven by the paper-stopper motor [I], which moves the paper stopper [K] backward and forward. The paper-stopper limit sensor [L] and paper-stopper HP sensor [M] are positioned at the rear and front, respectively, of the range of movement of the paper stopper, to detect its position.



View with the bottom cover detached.



P0807

A: Paper-guide motor
B: Paper-guide belt (left)
C: Paper guide (left)
D: Gears
E: Paper-guide belt (right)
F: Paper guide (right)
G: Paper-guide HP sensor
H: Paper-guide limit sensor
I: Paper-stopper motor
J: Center belt
K: Paper stopper
L: Paper-stopper limit sensor
M: Paper-stopper HP sensor

Removal and Assembly

1. Removing the Separator Ass'y

(1) Pull out the print drum, switch off the power, and remove the front frame cover.

(2) Remove the separator-fan unit.

(3) Remove the mounting screw (M3 x 8) from the separator [A], slide off the air-hose band, and then detach the air hose [B].

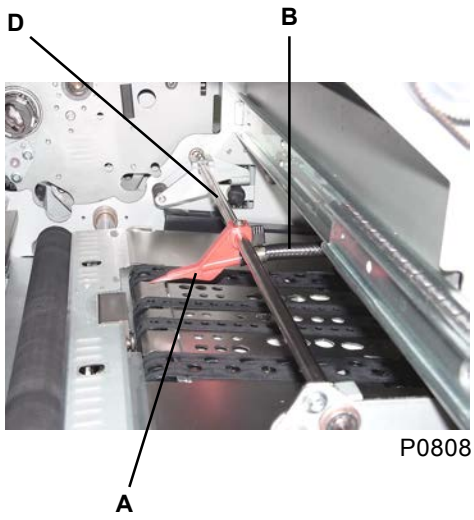
(4) Remove the mounting screw (M3 x 8) from the release lever [C].

(5) Detach the E-ring from the front of the separator shaft [D], and remove the metal [E].

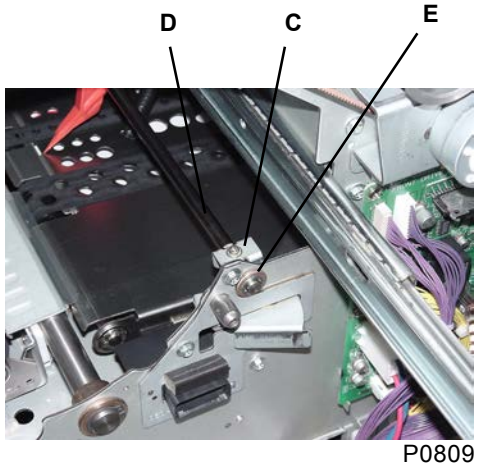
(6) Push the separator shaft [D] back slightly, and lift it up. Slide the release lever [C] and separator [A] forward, and remove both parts.

[Precaution on Reassembly]

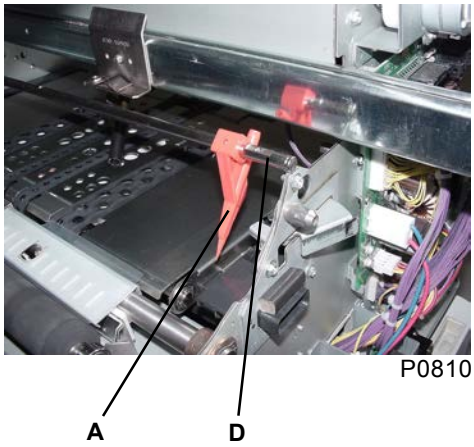
- Slide the air-hose band with the grip section horizontally toward the rear.



P0808



P0809



P0810

A: Separator
B: Air hose
C: Release lever
D: Separator shaft
E: Metal

2. Removing the Air-Pump O-ring

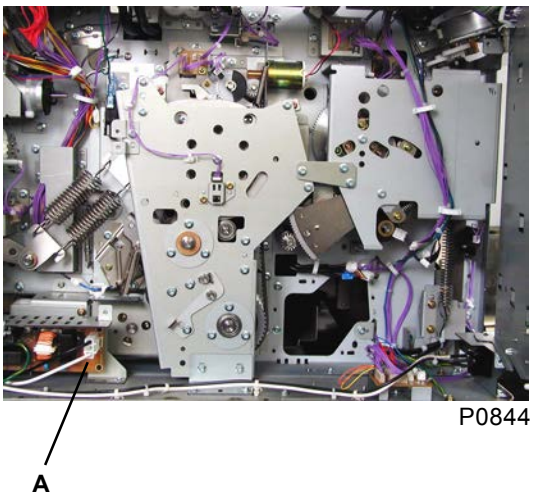
(1) Pull out the print drum, switch off the power, and remove the rear cover.

(2) Open the power-supply unit and main PCB unit to the left and right, respectively.

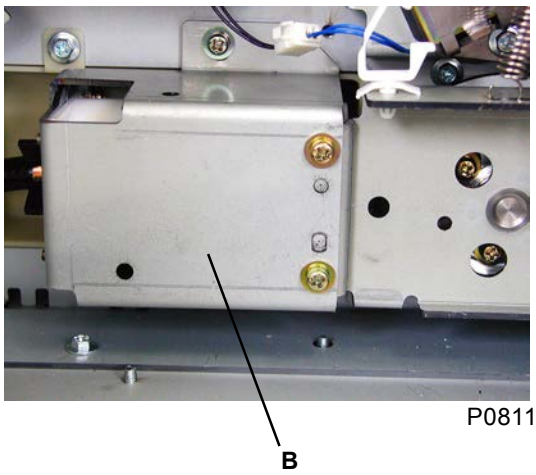
(3) Loosen the noise-filter ass'y [A] by removing two screws (M4 x 8).

(4) Rotate the main belt by hand to move the piston to the far right.

(5) Detach the air-pump-base ass'y [B] by removing four screws (M4 x 8) to expose the air-pump O-ring [C].

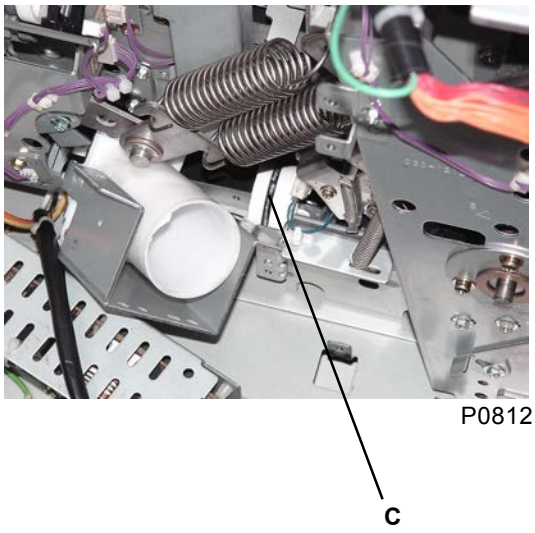


P0844



P0811

A: Noise-filter ass'y
B: Air-pump-base ass'y
C: Air-pump O-ring



P0812

3. Removing the Air Pump Ass'y

(1) Pull out the print drum, switch off the power, and remove the rear cover.

(2) Open the power-supply unit and main PCB unit to the left and right, respectively.

(3) Loosen the noise-filter ass'y by removing two screws (M4 x 8), and keep the ass'y suspended.

(4) Unplug the connector from the Position-B sensor, and detach the two reusable bands.

(5) Remove the main-motor support plate and press-shaft support plate by removing three screws (M4 x 8) each.

(6) Detach the pressure-lever-A spring and the air hose, unclip the reusable band holding the pressure-solenoid wire harness, and then remove the air-pump ass'y [A] by removing four screws (M4 x 8).

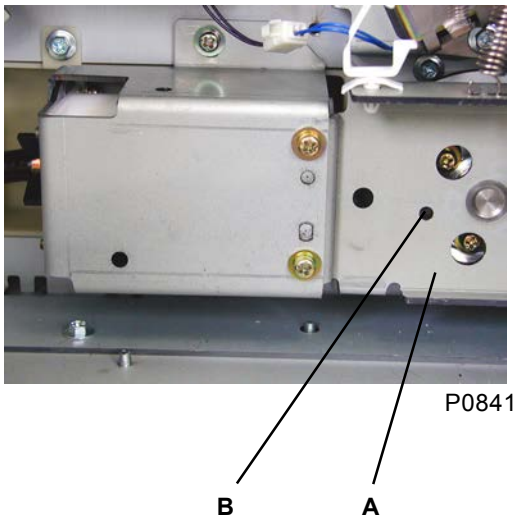
(7) Detach the reinforce plate for pressure-cam stay by removing four screws (M4 x 8).

(8) Loosen the main belt and remove the pressure-cam stay by removing seven screws (M4 x 8).

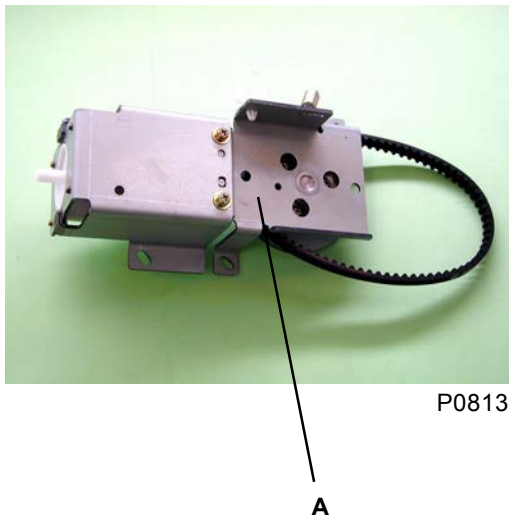
(9) Remove the pressure lever A spring and the air hose, and loosen the reusing band which holds wires of pressure solenoid. Then remove the air-pump ass'y by removing four screws (M4 x 8).

[Precaution on Reassembly]

- Align the air-pump piston with the Position-B alignment hole [B].



P0841



P0813

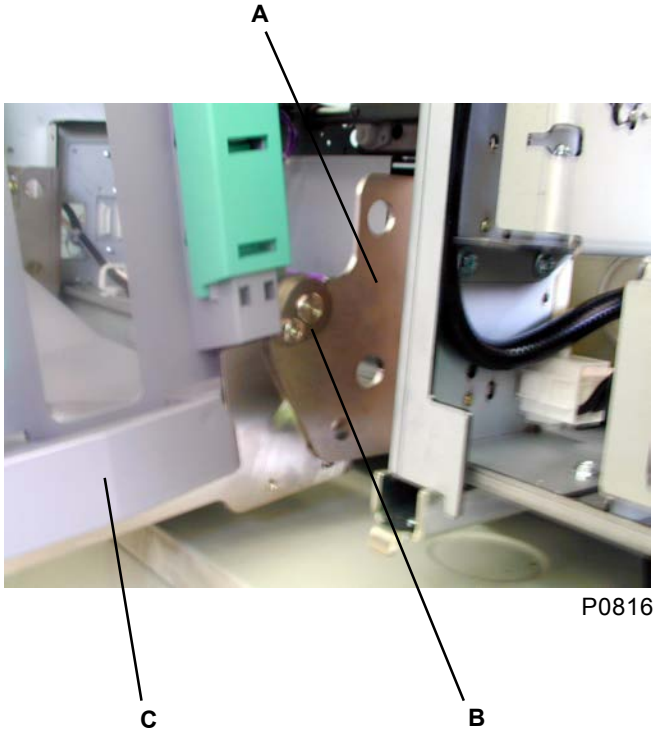
A: Air-pump ass'y

B: Position-B alignment hole

4. Removing the Paper-Receiving Tray Unit

(1) Remove the fix plates [B] attached on the left- and right-hand sides of the paper-receiving-tray bracket [A], by removing their respective screws (M4 x 6).

(2) Fold down the paper guides on the paper-receiving tray [C], and lift the paper-receiving tray [C] to an angle of approximately 45°. Push the paper-receiving tray forward slightly and then pull it out upwards.



P0816

A: Paper-receiving-tray bracket
B: Fix plate
C: Paper-receiving tray

5. Removing the Suction Unit

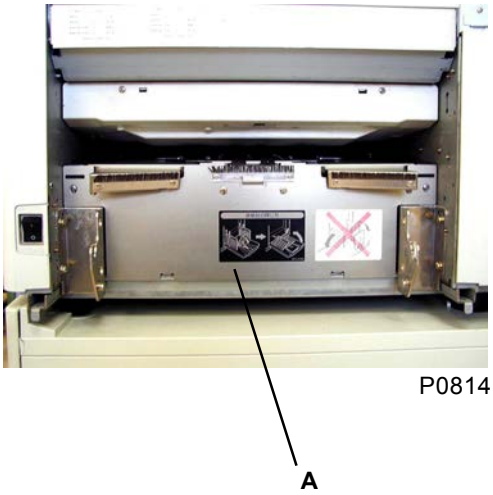
(1) Switch off the power, and remove the de-electricity plate [A] with four screws (M4 x 8).

(2) Unplug the two wire-harness connectors from the suction unit [B] inside the front frame plate, and unclip the wire harness from the reusable band.

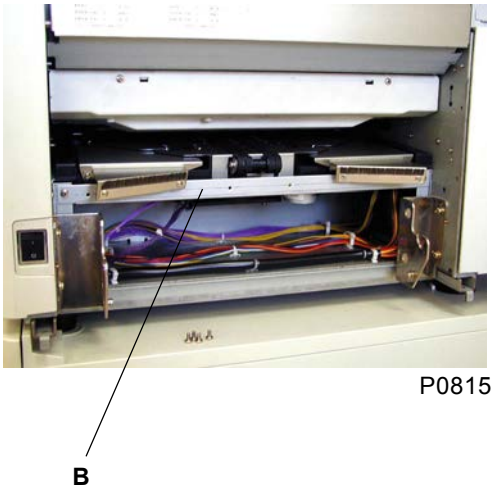
(3) Detach the suction unit [B] with two screws (M4 x 8), and remove it by pulling it toward the paper-ejection side.

[Precaution on Reassembly]

- Install the suction unit by engaging its left- and right-hand ends with the shaft protruding from the front and rear frame plate.



P0814



P0815

A: De-electricity plate

B: Suction unit

6. Removing the Transfer Belts

(1) Switch off the power, and remove the suction unit (see this chapter).

(2) Detach the suction drive belt [B] from the paper-ejection motor [A], unplug the connector on the paper-ejection sensor (send) [G], and then remove the transfer-belt ass'y [C] with five screws (M4 x 8).

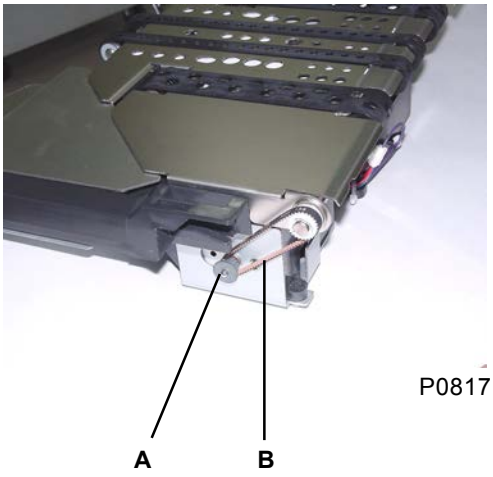
(3) Slide the left- and right-hand side transfer belts [D] to the edge of the transfer-belt ass'y [C], and remove them.

(4) Remove the suction box [E] with two screws (M4 x 6).

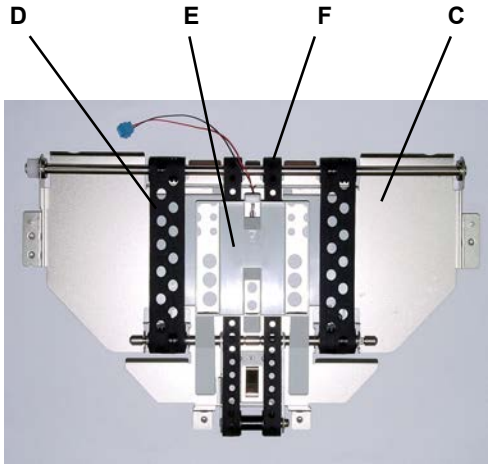
(5) Slide the left- and right-hand center transfer belts [F] to the edge, and remove them.

[Precautions on Reassembly]

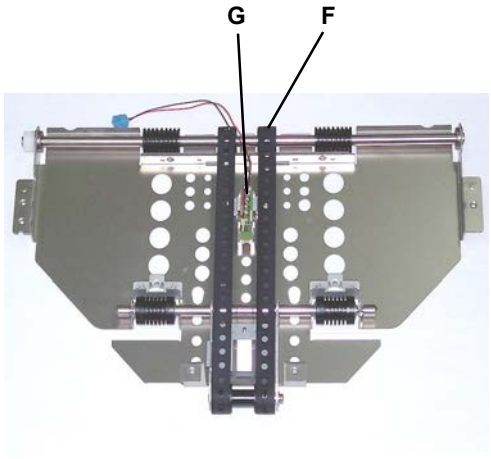
- Mount the belts with the delustered side facing outward.
- Engage the wire harness of the paper-ejection sensor (send) with the suction box and thread it through the slot.



P0817



P0818



P0819

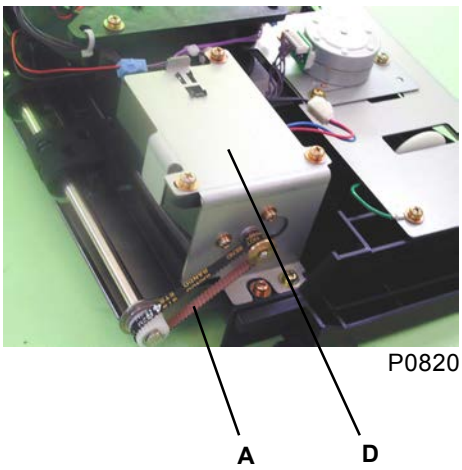
A: Paper-ejection motor
B: Suction drive belt
C: Transfer-belt ass'y
D: Side transfer belts
E: Suction box
F: Center transfer belts
G: Paper-ejection sensor (send)

7. Removing the Paper-Ejection Motor

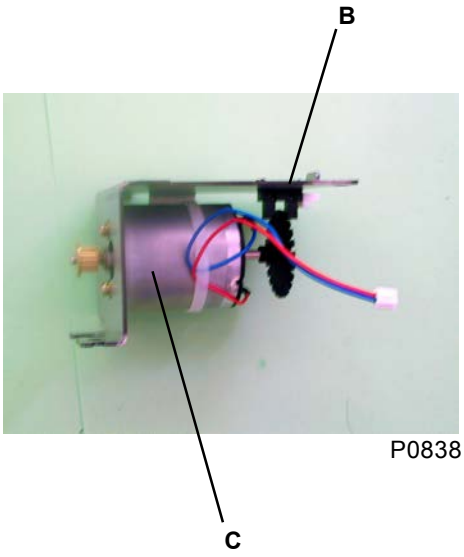
(1) Switch off the power, and remove the suction unit.

(2) Unplug the connector on the paper-ejection motor, detach the suction drive belt [A], unplug the connector on the paper-ejection limit sensor [B], and then remove the paper-ejection motor [C] with four screws (M4 x 8) together with the bracket [D].

(3) Remove the paper-ejection motor [C] with three screws (M3 x 6).



P0820



P0838

A: Suction drive belt
B: Paper-ejection limit sensor
C: Paper-ejection motor
D: Bracket

8. Removing the Paper-Ejection-Wing Motor

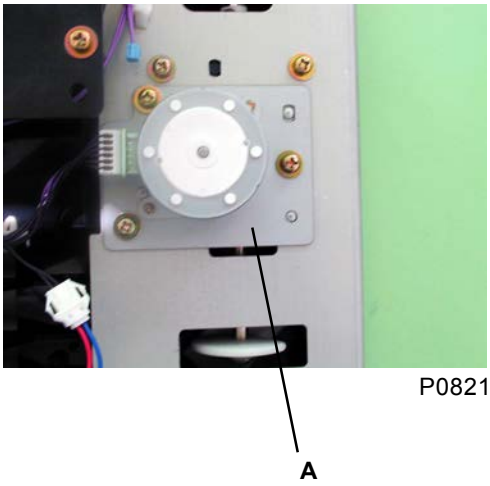
(1) Switch off the power, and remove the suction unit.

(2) Unplug the connector, remove the three screws (M3 x 8), and then remove the paper-ejection-wing-motor ass'y [A] with the bracket.

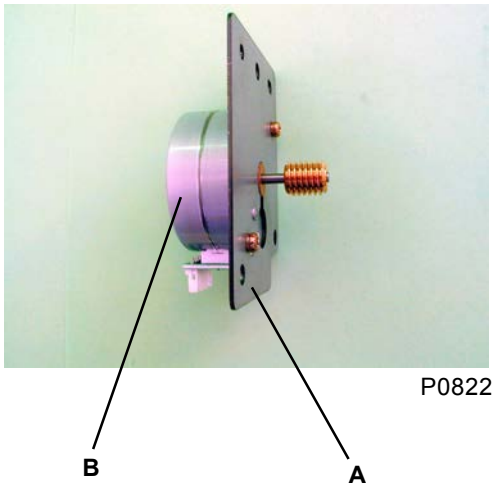
(3) Remove the two screws (M3 x 5), and then remove the paper-ejection-wing motor [B].

[Precaution on Reassembly]

- Align the half-pierced sections when installing the paper-ejection-wing-motor ass'y.



P0821



P0822

A: Paper-ejection-wing-motor ass'y

B: Paper-ejection-wing motor

9. Removing the Wing Camshaft Unit

(1) Switch off the power, and remove the suction unit.

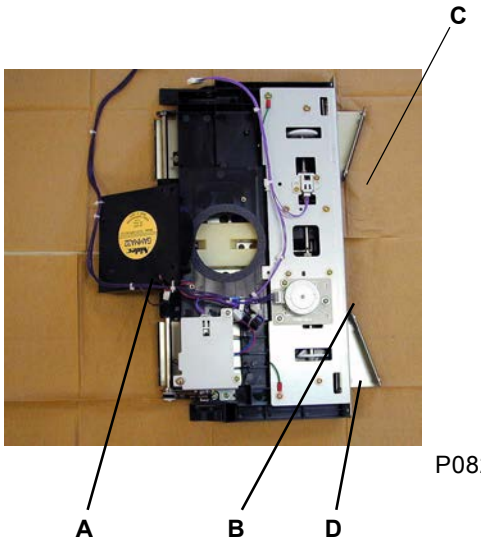
(2) Remove the suction fan [A] with three screws (M4 x 40).

(3) Detach the two reusable bands, unplug the connectors from the paper-ejection-wing motor [B] and paper-ejection-wing home sensor [C], and then remove the wing control base ass'y [D] with eight screws (M4 x 8).

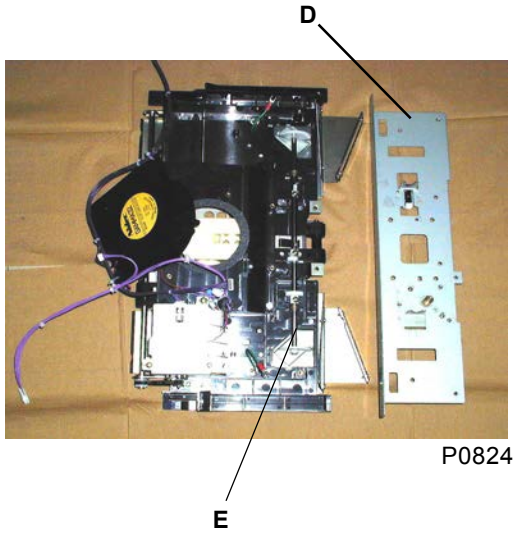
(4) Remove the wing camshaft unit [E].

[Precautions on Reassembly]

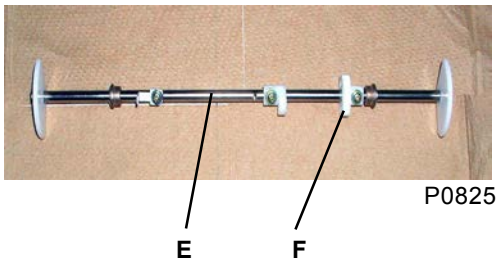
- Note the direction of the wing camshaft unit during installation. The drive gear [F] should be on the paper-ejection-wing-motor side.
- The flange on the metals should be outside of the respective plastic bushes.
- Fix the ground wires to both ends of the wing control base ass'y [D] with using the screws.



P0823



P0824



P0825

A: Suction fan
B: Paper-ejection-wing motor
C: Paper-ejection-wing home sensor
D: Wing control base ass'y
E: Wing camshaft unit
F: Drive gear

10. Removing the Paper-Ejection Sensor (Send)

(1) Switch off the power, and remove the suction unit.

(2) Detach the suction drive belt from the paper-ejection motor, unplug the connector from the paper-ejection sensor (send) [D], and then remove the transfer-belt ass'y [A] with five screws (M4 x 8).

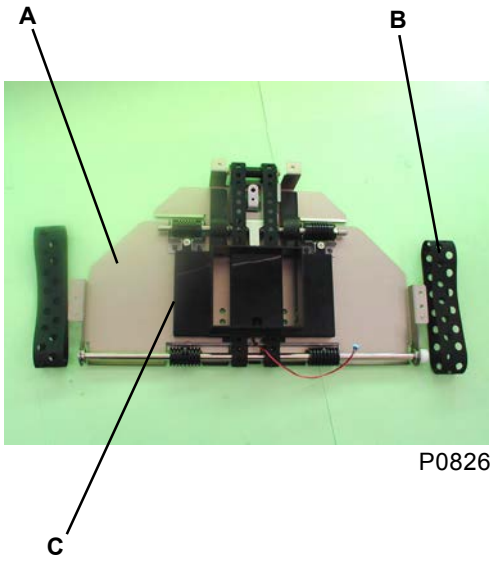
(3) Slide the left- and right-hand side transfer belts [B] to the edge of the transfer-belt ass'y [A], and remove them.

(4) Remove the suction box [C] with two screws (M4 x 6).

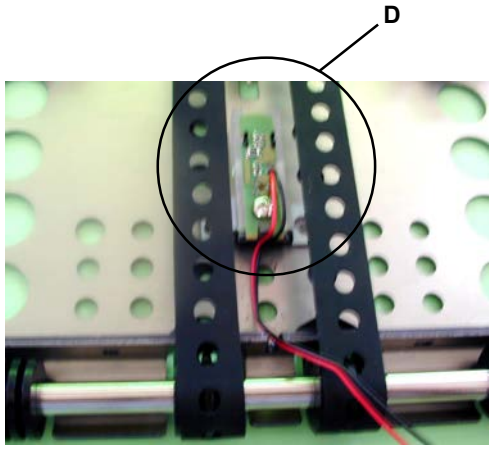
(5) Remove the paper-ejection sensor (send) [D] with one screw (M3 x 6).

[Precaution on Reassembly]

- Confirm that the transparent cylindrical protrusion on the paper-ejection sensor (send) is fully inserted into the hole in the bracket.



P0826



P0827

A: Transfer-belt ass'y
B: Side transfer belt
C: Suction box
D: Paper-ejection sensor (send)

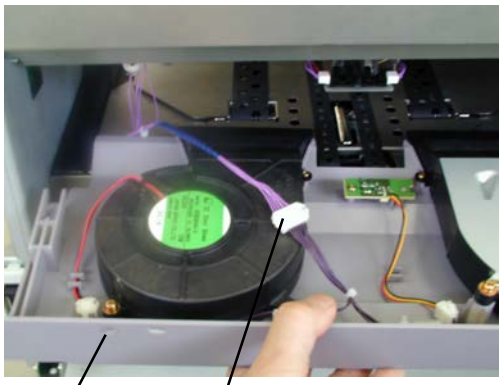
11. Removing the Separation-Fan Unit

(1) Remove the two screws (M4 x 8), unplug the Connector [A], and then remove the separation-fan unit [B].

[Precaution on Reassembly]

- Install the separation-fan unit [B] by engaging the left- and right-hand ends onto the shaft protruding from the front and rear frame plate.

P0843



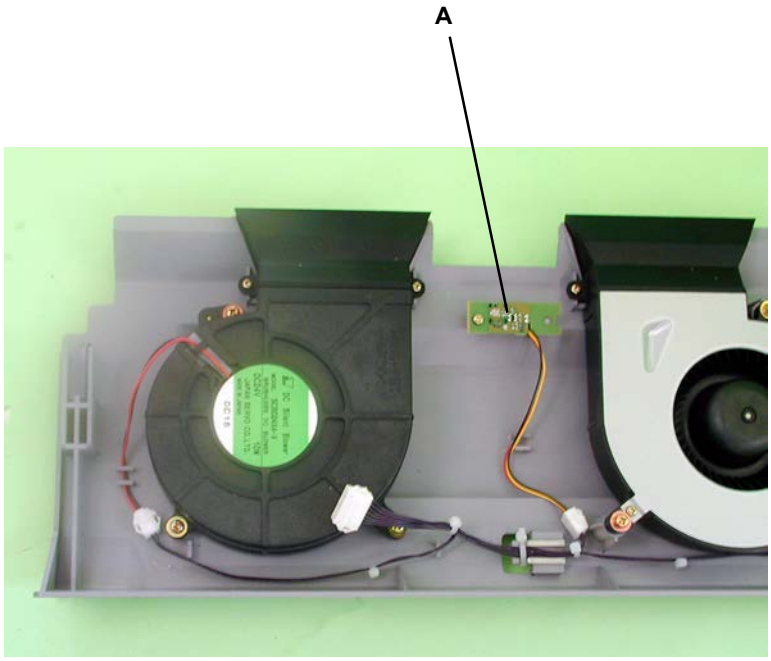
P0829

A: Connector
B: Separation-fan unit

12. Removing the Paper-Ejection Sensor (Receive)

(1) Remove the separation-fan unit.

(2) Unplug the connector, and remove the paper-ejection sensor (receive) [A] with one screw (M3 x 6).



P0830

A: Paper-ejection sensor (receive)

13. Removing the Paper-Guide Motor and Paper-Stopper Motor (Auto-Control Stacking Tray)

(1) Remove the auto-control stacking tray.

(2) Remove the bottom cover with seven screws (4 x 8).

(3) Remove the left- and right-hand paper guides and the paper stopper, each with two screws (M3 x 6).

(4) Remove the sixteen screws (4 x 8), and separate the auto-stack-tray main unit [A] from the plastic body [B].

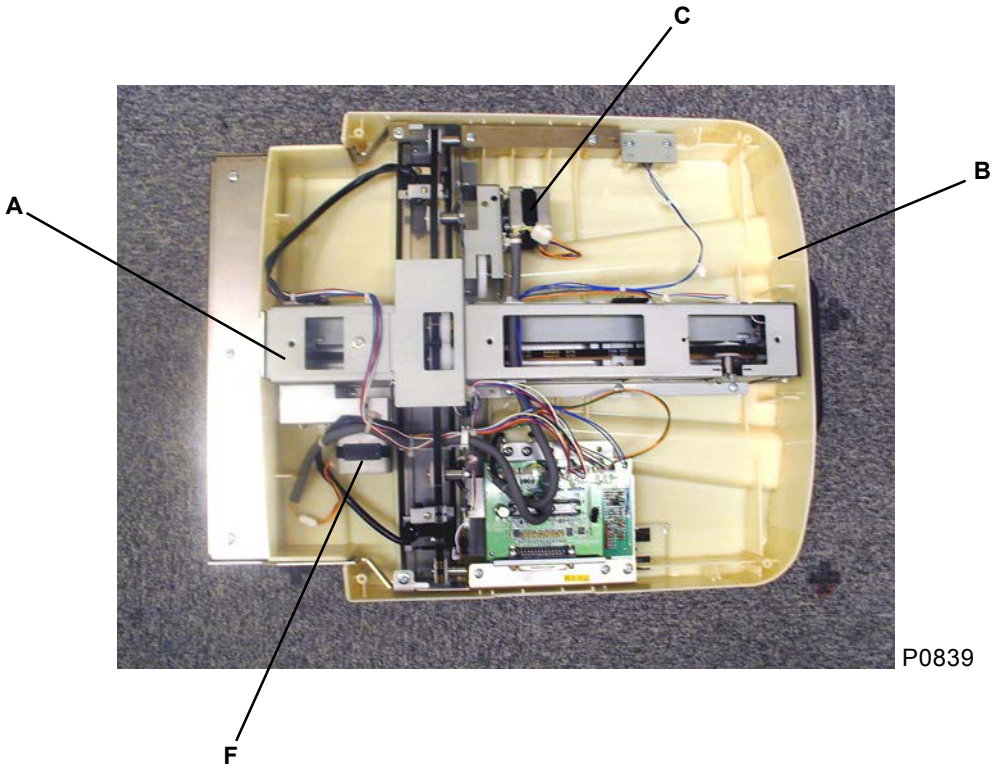
Paper-guide-motor ass'y

(5) Unplug the connector, detach the reusable band, remove the three screws (M4 x 8), and then remove the paper-guide-motor ass'y [C].

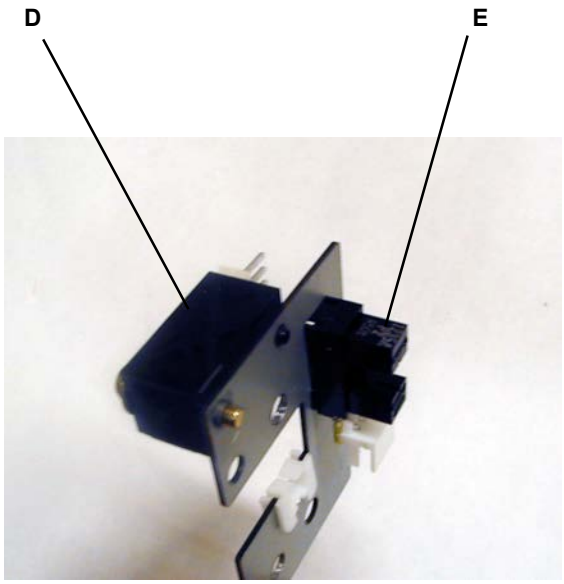
Paper-stopper-motor ass'y

(5) Unplug the connector, and remove the auto-stacking paper-det. sensor [D] and paper-stopper limit sensor [E], together with the bracket with two screws (M4 x 8).

(6) Unplug the connector, detach the two reusable bands, remove the three screws (M4 x 8), and then remove the paper-stopper-motor ass'y [F].



P0839



P0835

A: Auto-stack-tray main unit
B: Plastic body
C: Paper-guide-motor ass'y
D: Auto-stacking paper-det. sensor
E: Paper-stopper limit sensor
F: Paper-stopper-motor ass'y

14. Removing the Paper-Stopper HP Sensor (Auto-Control Stacking Tray)

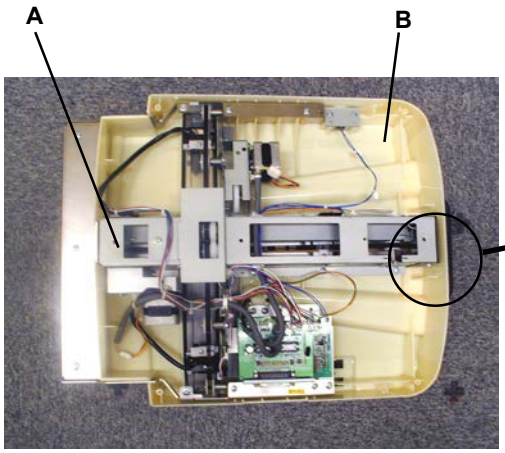
(1) Remove the auto-control stacking tray.

(2) Remove the bottom cover with seven screws (4 x 8).

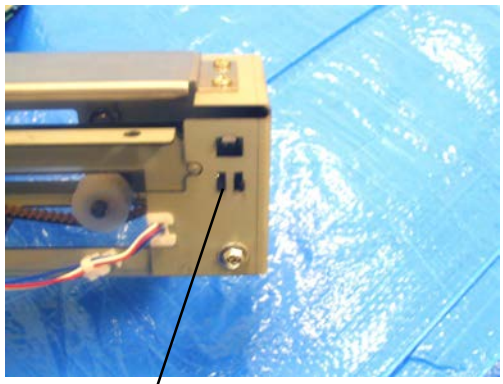
(3) Remove the left- and right-hand paper guides and the paper stopper, each with two screws (M3 x 6).

(4) Remove the sixteen screws (4 x 8), and separate the auto-stack-tray main unit [A] from the plastic body [B].

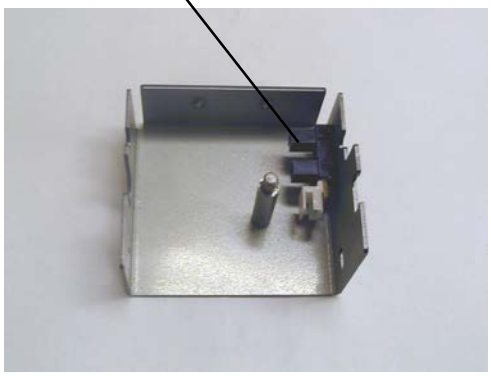
(5) Remove the two (M3 x 6) and two (M4 x 8) screws, unplug the connector, and then remove the paper-stopper HP sensor [C] together with the bracket.



P0840



P0832



P0833

A: Auto-stack-tray main unit

B: Plastic body

C: Paper-stopper HP sensor

15. Removing the Paper-Guide Belt (Auto-Control Stacking Tray)

(1) Remove the auto-control stacking tray.

(2) Remove the bottom cover with seven screws (4 x 8).

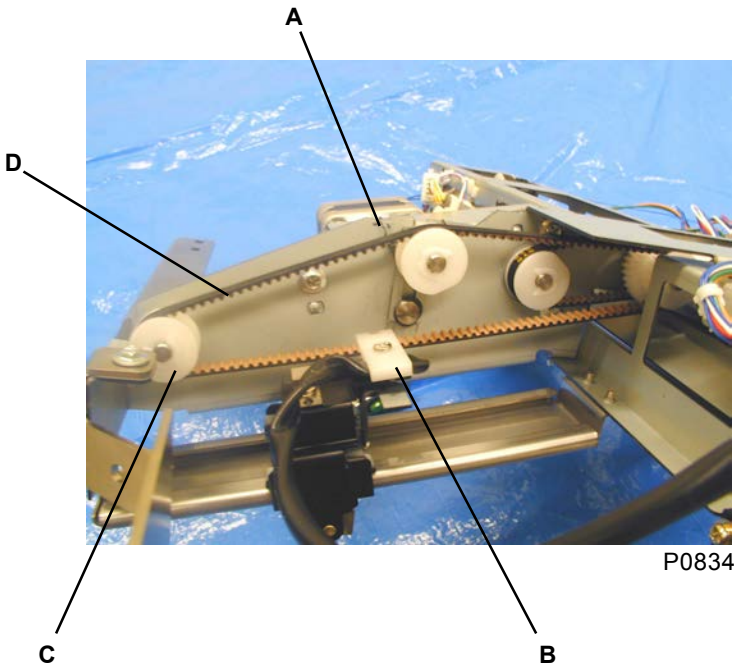
(3) Remove the idler spring [A].

(4) Remove the belt clamp [B] with one screw (M3 x 8).

(5) Detach the plastic clamps from the pulleys [C] at both ends, remove the pulleys [C], and then remove the left- and right-hand paper-guide belts [D].

[Precaution on Reassembly]

- Align the left- and right-hand paper-guide positions when installing the clamps and belts.



P0834

A: Idler spring
B: Belt clamp
C: Pulley
D: Paper-guide belt

Adjustment

1. Adjusting the Separator Position

Adjustment

(1) Create a master and perform printing using test chart No. 15. Confirm that the paper does not jam on the print drum and that there are no black lines on the center of the printed sheet. (The separator position is OK if no jamming occurs on the print drum with a margin of 5 mm at the top of the prints.)

(2) If jamming occurs or black lines appear on the printed sheet, stop the print drum at position B, switch off the power, remove the rear cover, and then remove the separator-fan unit.

(3) Open the power-supply unit and main PCB unit to the left and right, respectively.

(4) Insert a penlight into the top of the suction unit from the paper-ejection side, and inspect the tip of the separator through the rectangular hole [A] in the center left of the pressure-cam stay ass'y at the rear.

(5) Loosen screw 1 [C] on the separator-adjust plate [B].

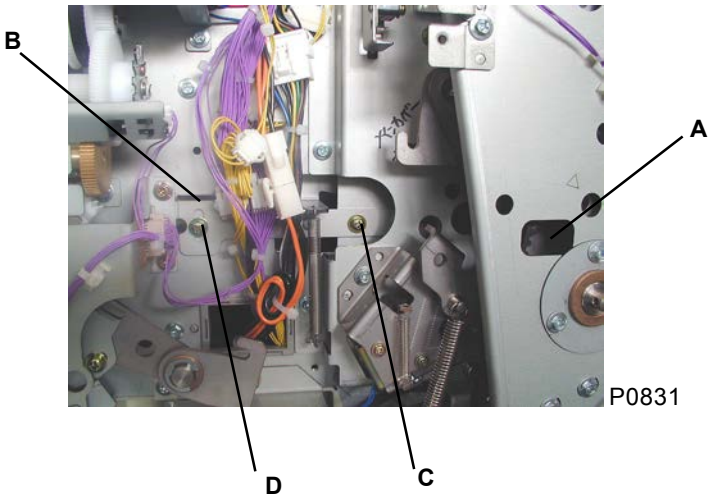
(6) Loosen screw 2 [D] on the separator-adjust plate [B], and move the separator-adjust plate up or down so that the gap between the separator tip and the print-drum surface is 1.4 mm to 2.0 mm. Finally, tighten screw 2 [D] and screw 1 [C].

[Precaution on Reassembly]

- Confirm that there is slack in the air hose and that the screws on the separator and lever are tightened to the shaft.

Symptoms

- If the tip of the separator contacts the print drum, it will scratch the surface of the master, causing black lines to appear on the center of the printed sheets.
- Conversely, if the gap is too large, the paper will not be properly separated from the print drum, adhering to it.



P0831

A: Rectangular hole
B: Separator-adjust plate
C: Screw 1
D: Screw 2

2. Adjusting the Air-Pump Cam-Plate Position

Adjustment

(1) Move the print drum to position B, switch off the power, and remove the rear cover.

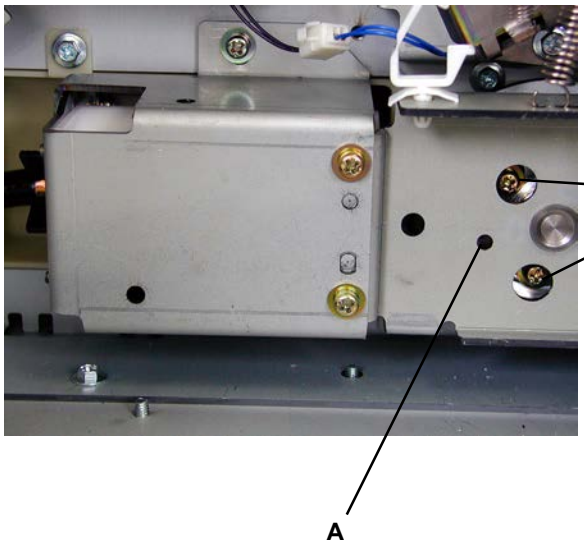
(2) Open the power-supply unit and main PCB unit to the left and right, respectively.

(3) Confirm that the Position-B alignment hole [A] on the main unit is aligned with the air-pump cam plate.

(4) If it is out of alignment, loosen the three mounting screws [B] on the piston ass'y, and adjust its position.
(Rotating the air-pump cam plate clockwise relative to the timing gear brings forward the timing of the air emission.)

Symptoms

- If the air-pump cam-plate mounting position is not aligned, the timing of the air emission will be offset, resulting in improper paper ejection.



P0842

A: Position-B alignment hole
B: Mounting screws

3. Adjusting the Paper-ejection Sensor (Send)

This adjustment should only be used as a temporary aid until the replacement of the sensor when the light emitted from the sensor is not strong enough to be caught by the (Receive) side of the sensor when no paper present between the (Send) and (Receive) sensors, resulting in paper-jam at paper receiving area even though there is no paper jammed in the area.

Precaution:

1. The existing paper-ejection sensor should be replaced at earliest convenience.
2. Do not increase the light emission excessively.
3. Never adjust the volume dial on the Paper-ejection sensor (Receive).

Adjustment Procedure

(1) Rotate the light emission control volume dial in the clockwise direction to raise the volume of the light emitted, taking caution not to turn the dial excessively.

(2) After making above adjustment, insert a blank white sheet of paper which is used the most on the machine and activate test mode No. 406. Check the beep sound with and without the paper. If the beep sound changes accordingly with and without the paper between the sensor (send) and (receive), the adjustment is completed.

CHAPTER 9: PRINT-DRUM SECTION

Contents

Mechanism

1. Print-Drum Position Check Mechanism

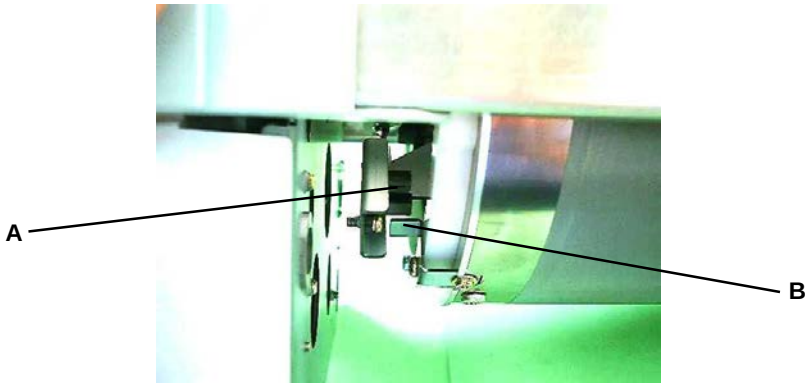
The print-drum position is checked by the Position-A sensor [A] and Position-B sensor [C].
The fine position is checked by the main-motor limit sensor, with Position A used as the datum.
(Position A is 0°; one revolution is 360°.)

Position A (0°)

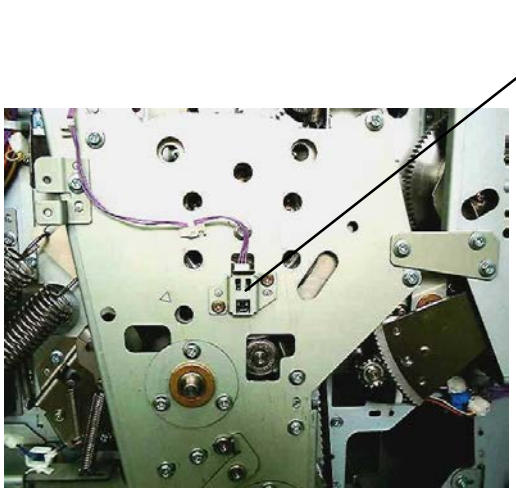
This is the position at which the light beam from the Position-A sensor [A] is blocked by the Position-A detection plate [B], and is the datum stop position for master loading.

Position B (307°)

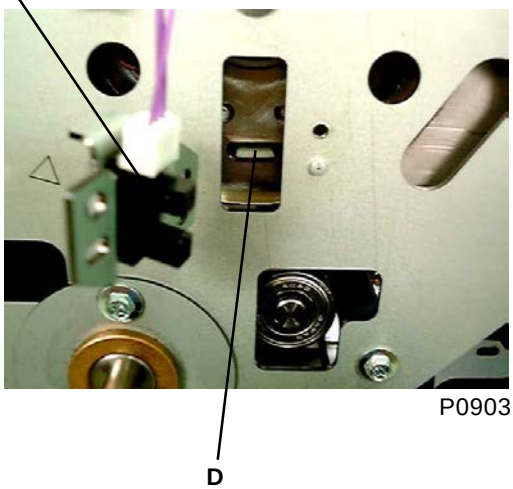
This is the position at which the print drum rotates 307° from Position A, and the light beam from the Position-B sensor [C] is blocked by the Position-B detection plate [D]. It is the position for removing the print drum.



P0901



P0902



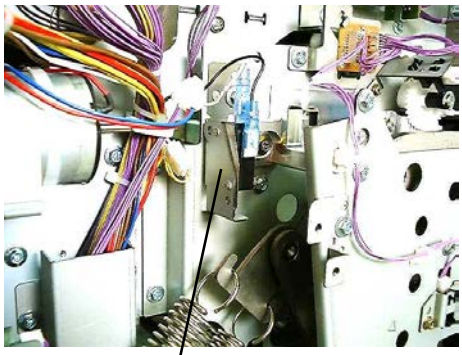
P0903

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

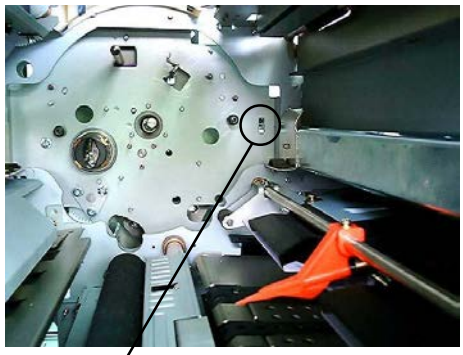
2. Print-Drum Lock Mechanism

Print-drum safety SW

The print-drum safety SW [A] and print durm drawer connector (print drum set signal) checks whether the print drum is correctly positioned in the machine.



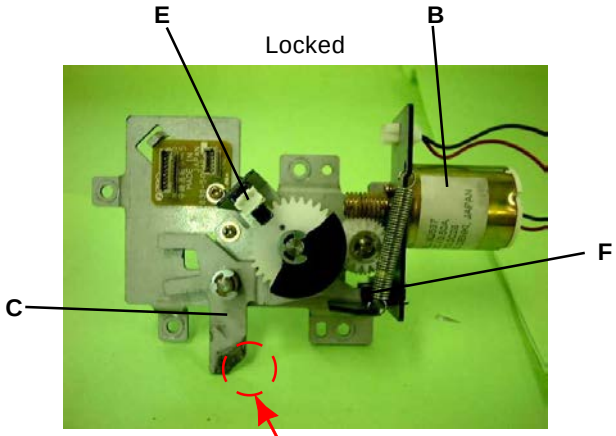
P0904



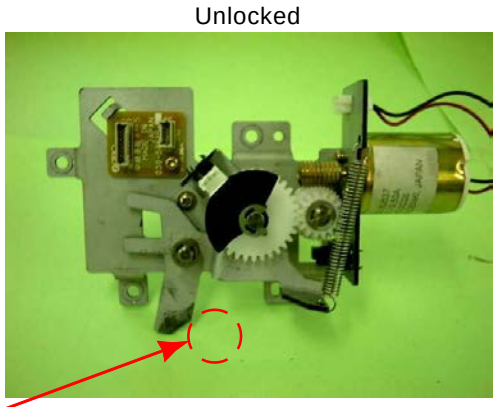
P0905

Drum release button

When the drum release button is pressed, the printing position (vertical/horizontal) is stored, then the print drum is moved to the home position, and it is brought to position B. Once the print drum reaches position B, the print-drum locking motor [B] activates to remove the release lever [C] from the print-drum center shaft [D] and unlock the print drum. When the print-drum lock-position sensor [F] goes OFF and the print-drum lock-cam sensor [E] goes ON, the print-drum locking motor [B] goes OFF, a check is performed to determine whether the print drum has been removed (whether the print-drum safety SW [A] and print drum set signal is OFF). Once it has been confirmed that the print drum has been removed, the print-drum locking motor [B] activates again. It goes OFF when the print-drum lock-position sensor [F] goes ON and the print-drum lock-cam sensor [E] goes OFF, returning the print-drum locking unit to the locked state.



P0906



P0907

A: Print-drum safety SW
B: Print-drum locking motor
C: Release lever
D: Print-drum center shaft (showing shaft position)
E: Print-drum lock-cam sensor
F: Print-drum lock-position sensor

Print-drum lock initialization

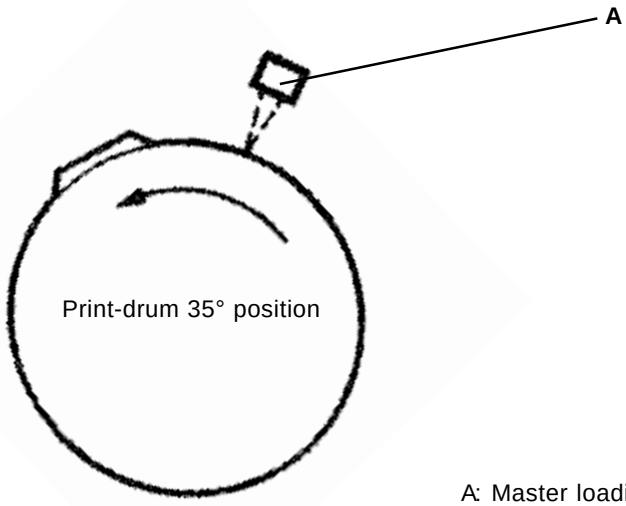
The initialization operation when the power is switched on or “All reset” may vary depending on the status of print-drum lock-position sensor and print-drum lock-cam sensor, and whether the print drum is installed.

1) When the print drum is installed, initialization is not performed if the print-drum locking unit is locked (print-drum lock-position sensor: ON; print-drum lock-cam sensor: OFF).
2) When the print drum is installed, if the print-drum locking unit is not locked (print-drum lock-position sensor: ON; print-drum lock-cam sensor: OFF), the print-drum locking motor activates until the print drum is unlocked (print-drum lock-position sensor: OFF; print-drum lock-cam sensor: ON). Once it has been confirmed that the print drum is not currently installed, the print-drum locking motor activates again until the print drum is locked (print-drum lock-position sensor: ON; print-drum lock-cam sensor: OFF). The message “Install print drum” is then displayed on the panel.
3) If the print drum is not installed, initialization is not performed if the print-drum locking unit is locked (print-drum lock-position sensor: ON; print-drum lock-cam sensor: OFF). The message “Install print drum” is displayed on the panel.
4) When the print drum is not installed, if the print-drum locking unit is not locked (print-drum lock-position sensor: ON; print-drum lock-cam sensor: OFF), the print-drum locking motor activates until the print drum is locked (print-drum lock-position sensor: ON; print-drum lock-cam sensor: OFF). The message “Install print drum” is displayed on the panel.

3. Master on Print-Drum Check Mechanism

This mechanism checks whether there is a master on the print drum when printing starts.
The print drum begins to rotate when the START key is pressed and, when the print drum reaches the 35° position, the master loading sensor [A] checks whether there is a master on the print drum.
The information checked by the master loading sensor [A] 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 loading sensor [A] (no master present) when the print drum reaches the 35° position at the start of printing, it is assumed that there is no master on the print drum.

P0908

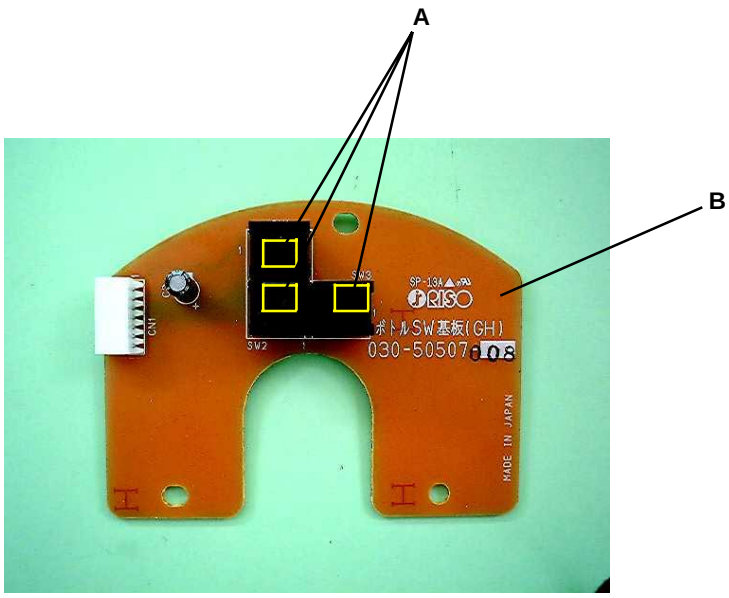


S0901

A: Master loading sensor

4. Ink-Cartridge Set-SW PCB

The ink-cartridge set-SW PCB [B] contains a number of sensors [A] (number varies by machine type) for checking whether the correct ink cartridge is set. The ink cartridge can be identified based on the combination of sensors [A] pressed by the protrusions on the end of the ink cartridge.



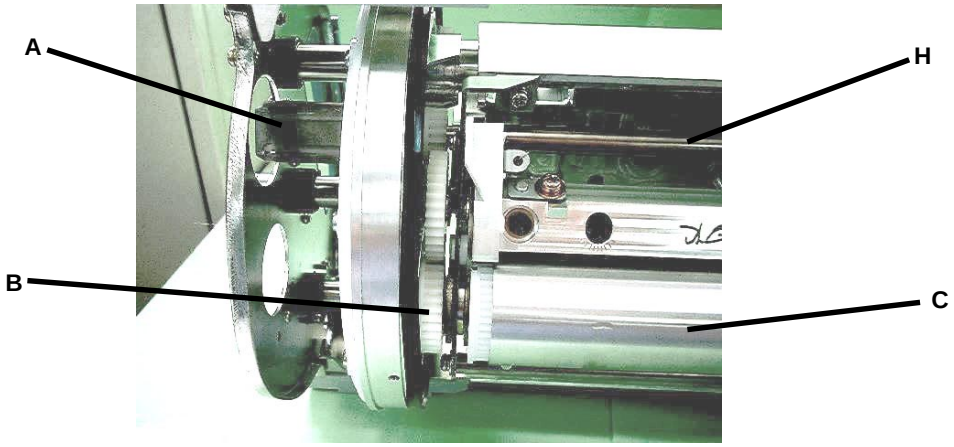
P0909

A: Ink-cartridge set sensor

B: Ink-cartridge set-SW PCB (600 dpi Black)

5. Print-Drum Rotation Mechanism

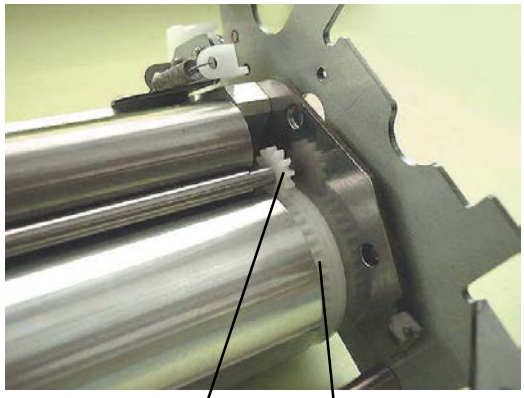
When the main motor activates, the flange drive gear R [A] is driven to rotate the flange driveshaft [H]. The rotation of flange drive shaft [H] rotates the squeegee roller [C] via three gears.
The squeegee drive gear [B] incorporates a one-way clutch, which prevents the squeegee roller [C] from rotating in the reverse direction.
The gear [F] (inside the ink block R [E]) on the drive side of the ink driveshaft [D] engages with the gear [G] on the side of the squeegee roller [C] to rotate the ink driveshaft [D].



P0910

With ink block R removed

P0911

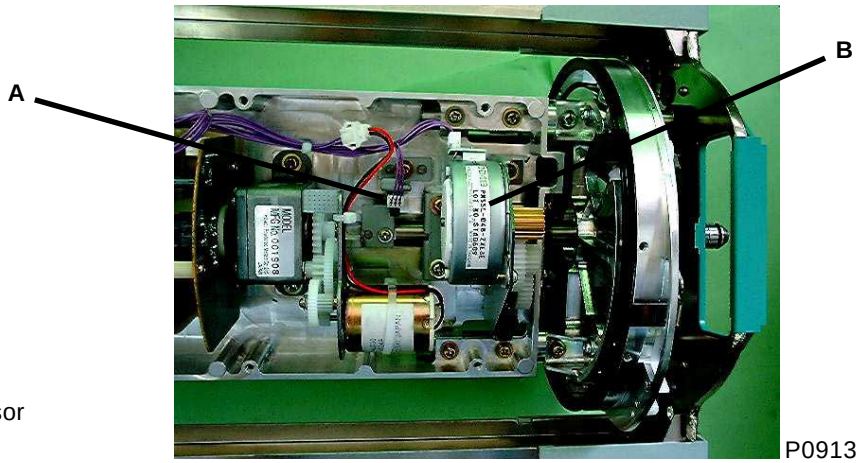


P0912

A: Flange drive gear R
B: Squeegee drive gear
C: Squeegee roller
D: Ink driveshaft
E: Ink block R
F: Gear on the drive side of the ink driveshaft
G: Gear on the side of the squeegee roller
H: Flange driveshaft

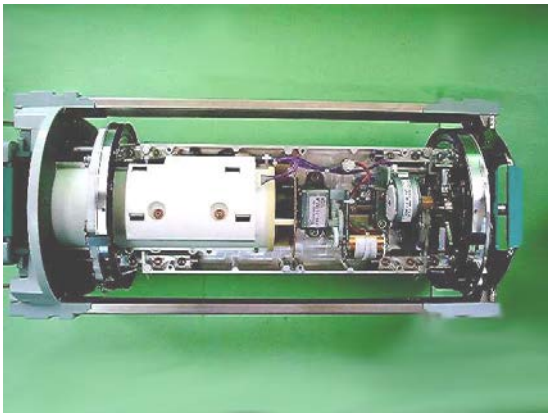
6. Horizontal-Movement Mechanism

Pressing the < ▲ > or < ▼ > print-position key on the operation panel activates the horizontal pulse motor [B], which moves the print drum to the left or right (the < ▲ > key moves it toward the drive side, and the < ▼ > key moves it toward the operation-panel side). The print drum can be moved within a range of 10 mm to the left or right.
The print drum moves 0.5 mm each time the print-position keys are pressed (for up to 1 second). Holding down the print-position keys (for more than 1 second) moves the print drum continuously in 0.5-mm steps. If [Fine] is selected, the per-step shift distance is 0.25mm instead of normal 0.5mm steps.
The horizontal-centering sensor [A] checks whether the print drum is at the horizontal center position.



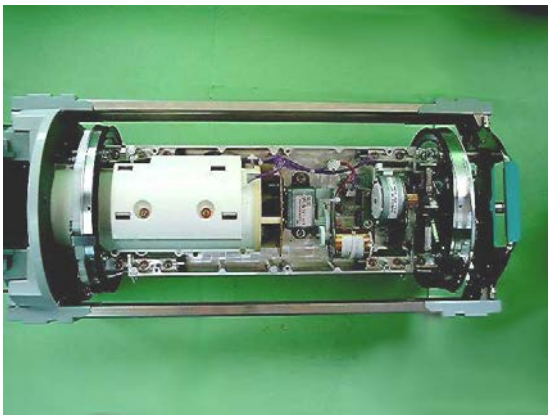
A: Horizontal-centering sensor
B: Horizontal pulse motor

P0913



Print drum moved toward the drive side

P0914

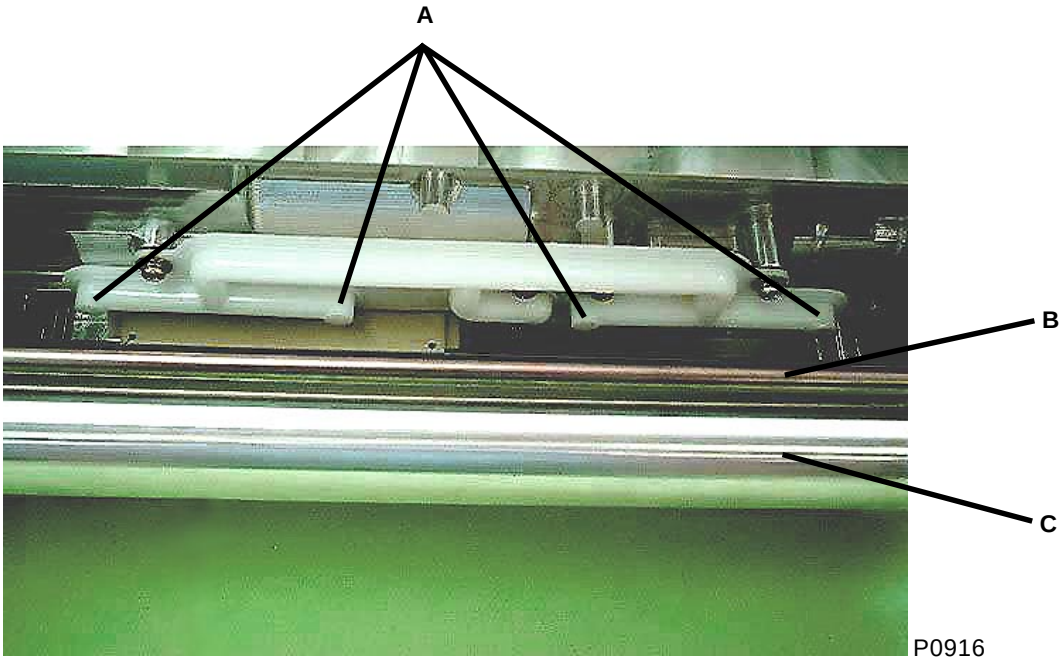


Print drum moved toward the operation-panel side

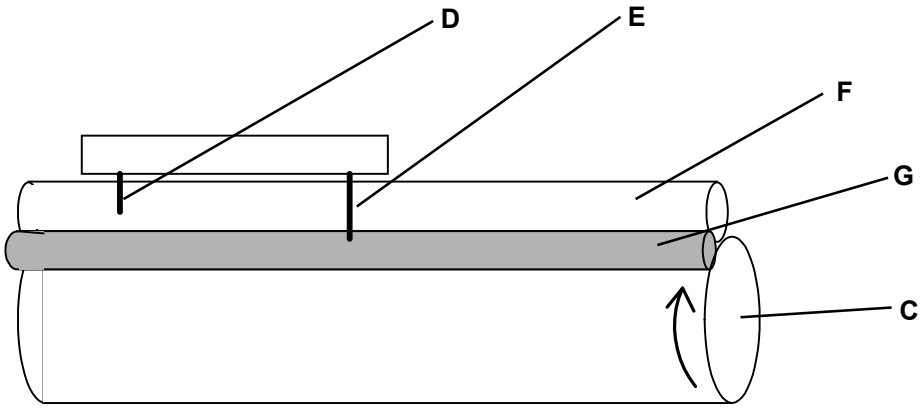
P0915

7. Inking Mechanism

When the main motor is operating and the print drum is rotating, if the ink moves away from the ink sensor [E], the inking motor activates to draw ink in from the ink cartridge. The ink drawn in is fed onto the squeegee roller [C] via the holes [A] in the ink distributor. The inking motor is switched off when the ink reaches the ink sensor [E].
The ink deposited on the squeegee roller [C] forms an ink bead [G] between the squeegee roller [C] and the doctor roller [F]. The ink driveshaft [B] is rotated to form a smooth ink bead [G].
The ink is fed into the print drum via a small gap between the squeegee roller [C] and the doctor roller [F].
If the ink overflows inside the print drum, it is detected by the overflow sensor [D], which stops the machine.



P0916

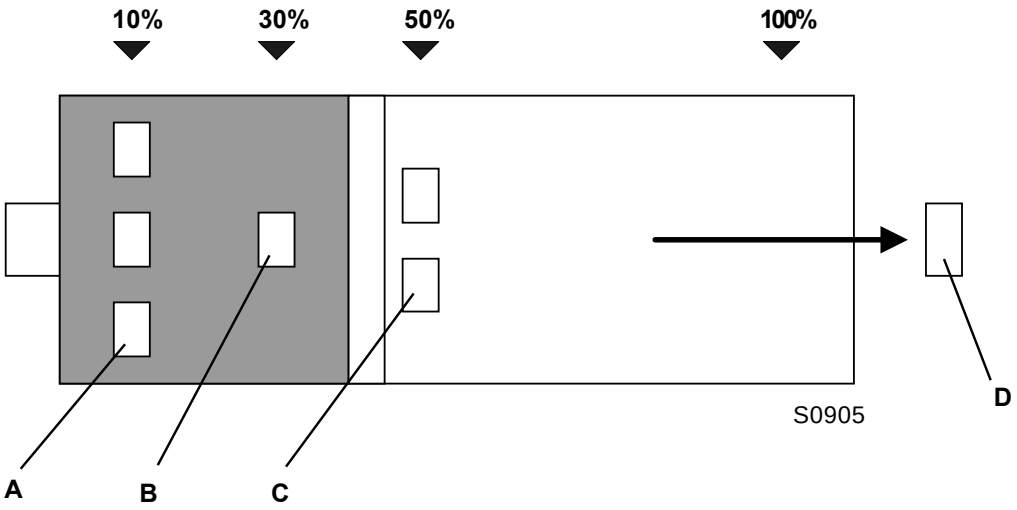


S0904

A: Holes in the ink distributor
B: Ink driveshaft
C: Squeegee roller
D: Overflow sensor
E: Ink sensor
F: Doctor roller
G: Ink bead

8. Ink-Cartridge Volume Detection Mechanism (excludes 300 dpi)

The amount of ink remaining in the ink cartridge is calculated based on the amount of light emitted by the six LEDs (ink-volume det. sensor (send) [A]) arranged in three rows along the side of the ink cartridge, and is detected by the photodetector (ink-volume det. sensor (receive) [B]) at the bottom of the ink cartridge.
The rows of LEDs are illuminated in sequence to determine the remaining ink level based on the point at which at light from the LED rows is received by the photodetector.
The remaining ink level is identified in four levels, as 0–10%, 10–30%, 30–50%, or 50–100%.



A: Ink-volume det. sensor 1 (send)
B: Ink-volume det. sensor 2 (send)
C: Ink-volume det. sensor 3 (send)
D: Ink-volume det. sensor (receive)

Removal and Assembly

1. Removing the Print-Drum Locking Unit

(1) Bring the print drum to position B, pull out the print drum, and then switch off the power.

(2) Remove the rear cover.

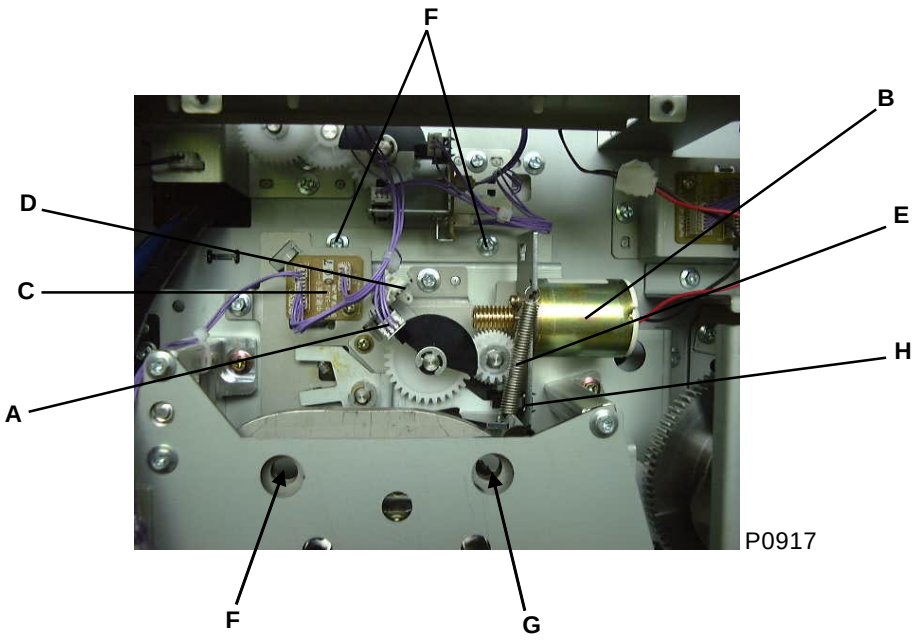
(3) Open the main PCB unit to the right.

(4) Unplug the following connectors:

- Print-drum lock-cam sensor [A] connector
- Print-drum locking-motor [B] connector
- Junction PCB [C] connectors (x2)
- Reuse band [D]

(5) Detach the spring [E] from the print-drum locking unit.

(6) Remove the three mounting screws [F] (M4 x 8) from the print-drum locking unit. Loosen the mounting screw [G] (M4 x 8), and then unplug the connector on the print-drum lock-position sensor [H] while pulling out the print-drum locking unit.



P0917

A: Print-drum lock-cam sensor
B: Print-drum locking motor
C: Junction PCB
D: Reuse band
E: Spring
F: Mounting screws on print-drum locking unit
G: Mounting screw on print-drum locking unit
H: Print-drum lock-position sensor

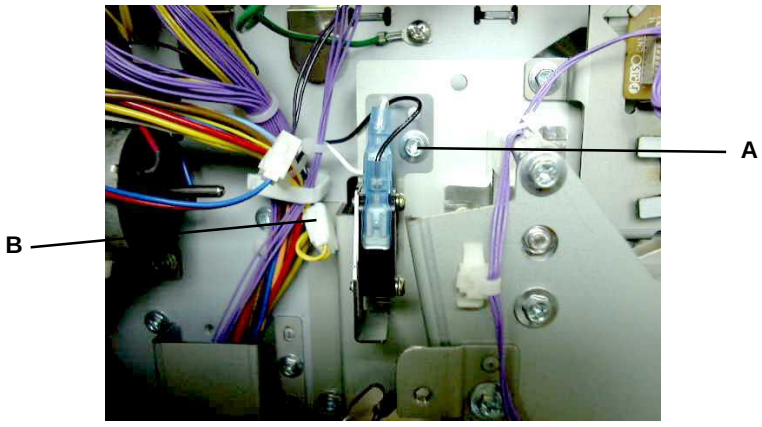
2. Removing the Print-Drum Safety-SW Ass'y and Position-B Sensor Ass'y

Print-drum safety-SW ass'y

(1) Switch off the power and then remove the rear cover.

(2) Open the power-supply unit and main PCB unit to the left and right, respectively.

(3) Detach the mounting screw [A] (M4 x 8) from the print-drum safety-SW ass'y, unplug the connector [B] from the print-drum safety-SW ass'y, and then remove the print-drum safety-SW ass'y.



P0918

[Precautions on Reassembly]

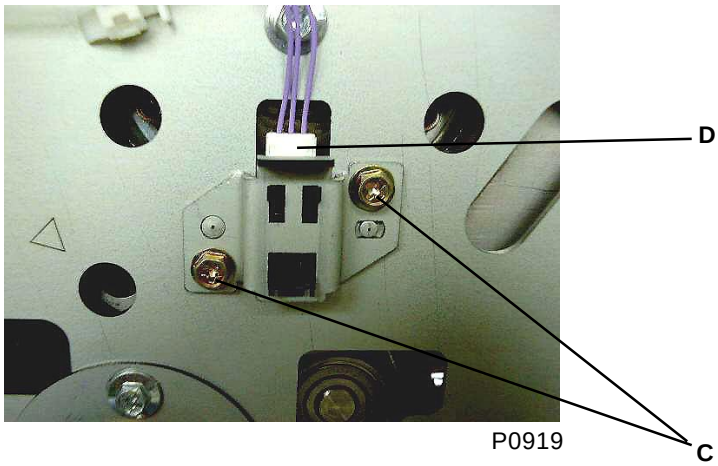
- Align the half-pierced sections.

Position-B sensor ass'y

(1) Switch off the power and then remove the rear cover.

(2) Open the main PCB unit to the right.

(3) Remove the two mounting screws [C] (M3 x 6) from the Position-B sensor ass'y, unplug the connector [D] from the Position-B sensor ass'y, and then remove the Position-B sensor ass'y.



P0919

[Precautions on Reassembly]

- Align the half-pierced sections.

A: Mounting screw on the print-drum safety-SW ass'y
B: Connector on the print-drum safety-switch ass'y
C: Mounting screws on the Position-B sensor ass'y
D: Connector on the Position-B sensor ass'y

3. Removing the Drum Cover (Center) and Drum Cover (Outer)

Removing the drum cover (center)

(1) Pull out the print drum and then remove the ink cartridge.

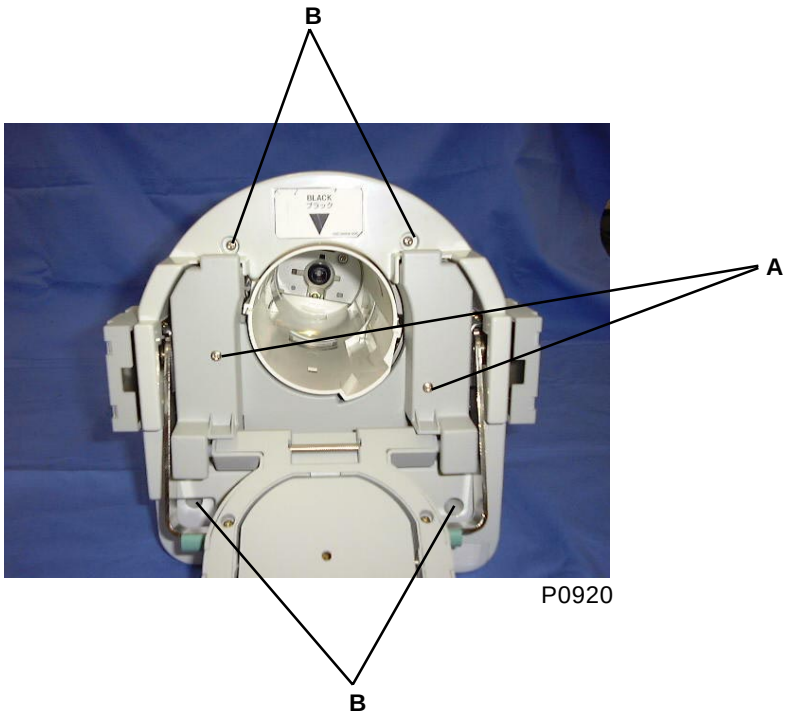
(2) Remove the two mounting screws [A] (3 x 6) from the drum cover (center), and then remove the drum cover (center).

Removing the drum cover (outer)

(1) Pull out the print drum and then remove the ink cartridge.

(2) Remove the drum cover (center).

(3) Remove the four mounting screws [B] (3 x 6) from the drum cover (outer), and then remove the drum cover (outer).



P0920

A: Mounting screws on the drum cover (center)
B: Mounting screws on the drum cover (outer)

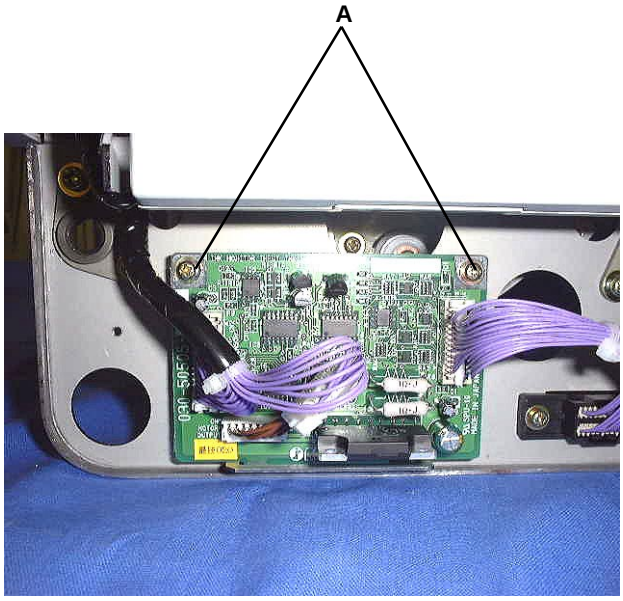
4. Removing the Drum Control PCB

(1) Pull out the print drum, remove the ink cartridge, and then remove the following components:

- Drum cover (center)
- Drum cover (outer)

(2) Unplug the three connectors from the drum control PCB.

(3) Remove the two mounting screws [A] (3 x 8) from the drum control PCB, and then remove the drum control PCB.



P0921

A: Mounting screws on the drum control PCB

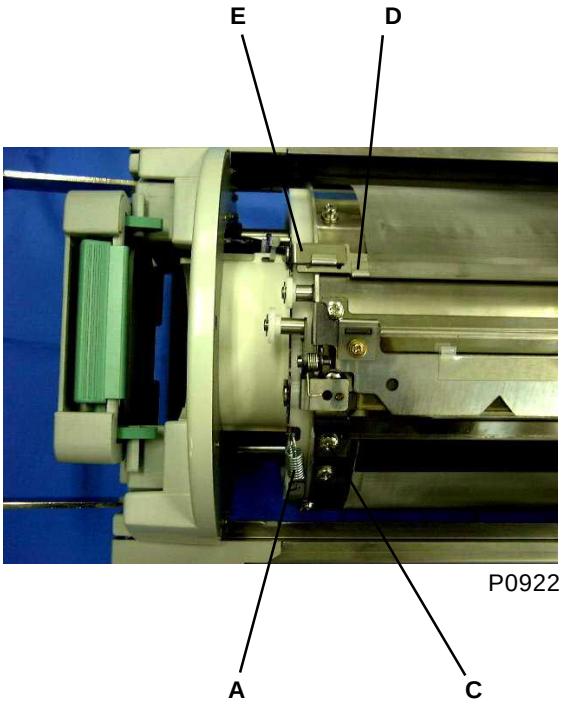
5. Removing the Screen

(1) Pull out the print drum after making a confidential master.

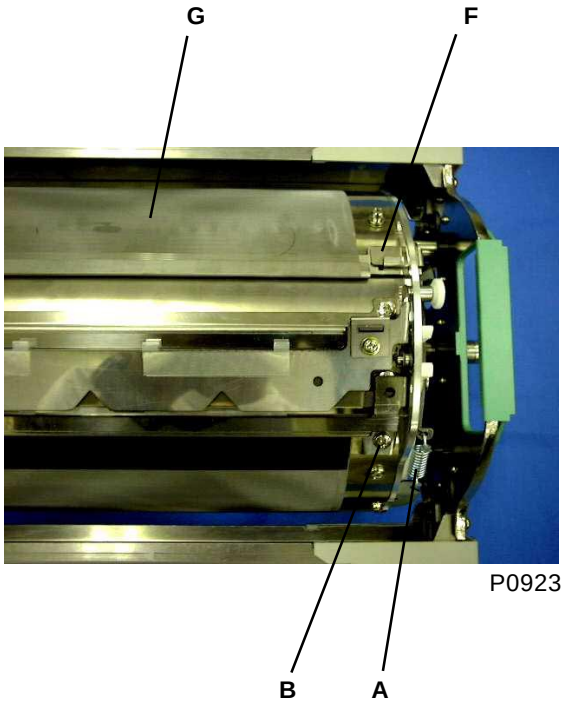
(2) Detach the screen springs [A] on both end.

(3) Remove the mounting screw [B] (M4 x 6) on the drive side of the clamp-plate base holding the screen, and loosen the mounting screw [C] (M4 x 6) on the panel side of the clamp plate base.

(4) Detach the screen end hanger [D] from screen tension plate F [E] and screen tension plate R [F], and then remove the screen [G].



P0922



P0923

A: Screen spring
B: Mounting screw on the drive side of the clamp-plate base
C: Mounting screw on the panel side of the clamp-plate base
D: Screen end hanger
E: Screen tension plate F
F: Screen tension plate R
G: Screen

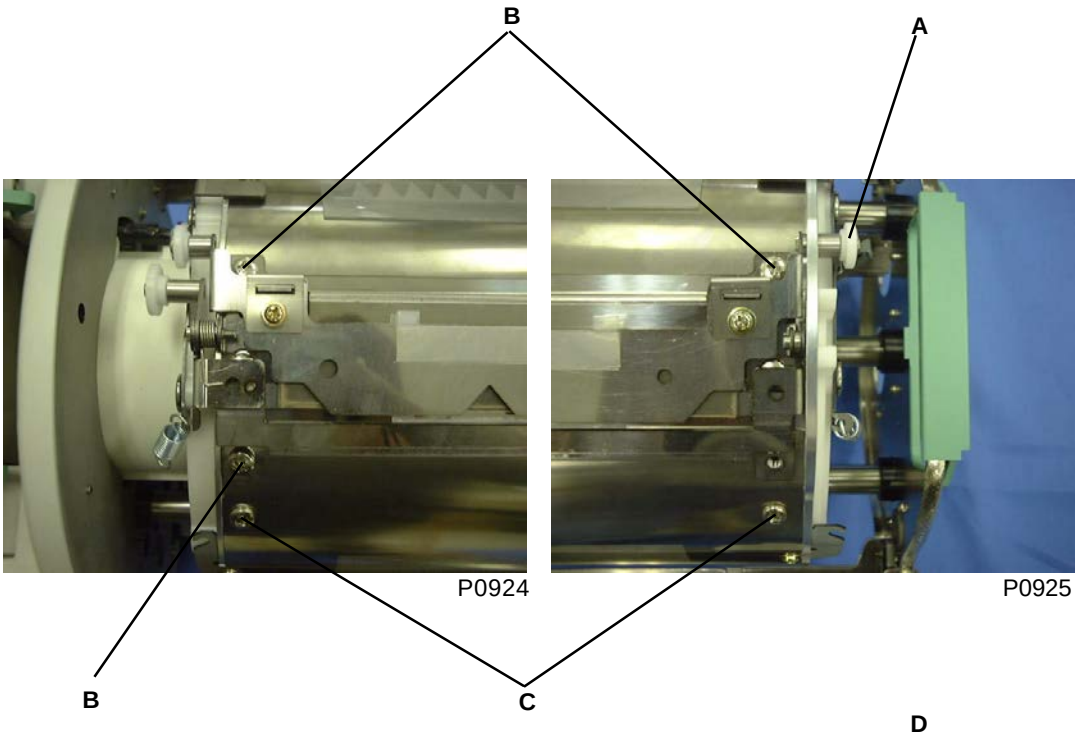
6. Removing the Drum Body

(1) Pull out the print drum after making a confidential master, and then remove the screen.

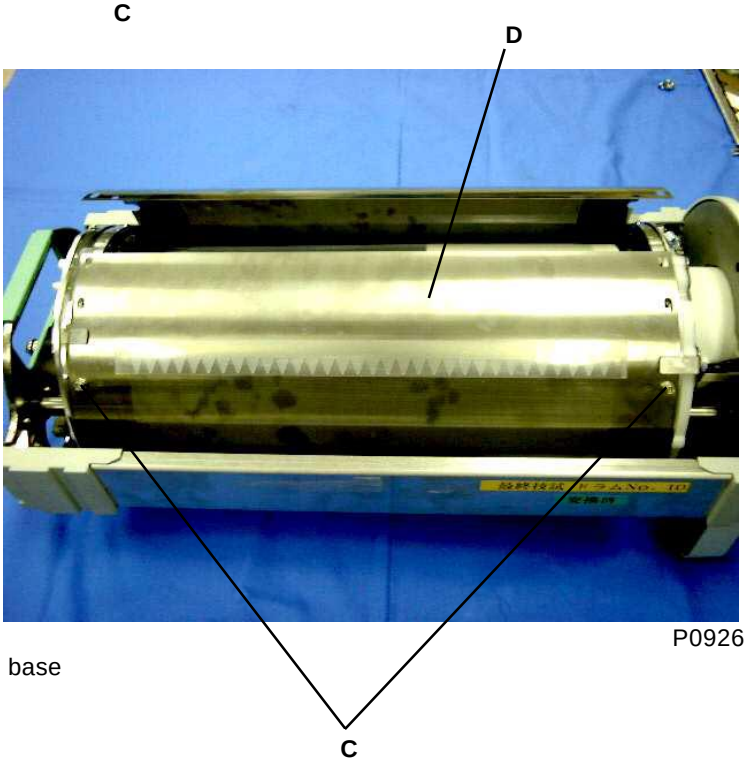
(2) Remove the clamp-plate collar [A] on the drive side (one e-ring).

(3) Remove the three mounting screws [B] (4 x 6) from the clamp-plate base, and then remove the clamp-plate base.

(4) Remove the ten mounting screws [C] (M4 x 6) from the print-drum body, and then remove the print-drum body [D].



P0924 P0925

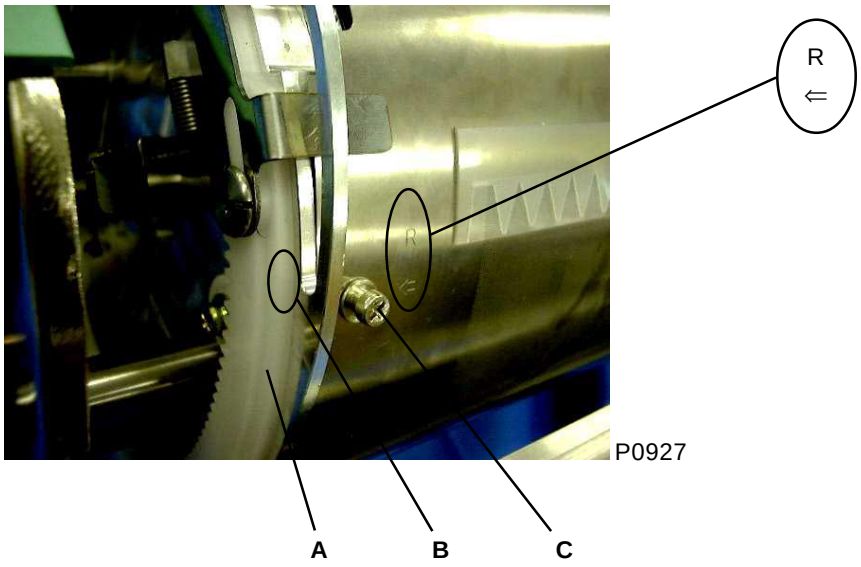


P0926

A: Clamp-plate collar
B: Mounting screws on the clamp-plate base
C: Mounting screws on print-drum body
D: Print-drum body

[Precautions on Reassembly]

(1) "R" is engraved on the drive side of the print-drum body, "F" is engraved on the front, and arrows are engraved on both sides.
Align the side marked "R" with the drive side, align the arrow mark [B] engraved on the flange R [A] with the arrow on the drive side, and then temporarily secure in this position using the mounting screw [C] (4 x 6).
In the same way, align the arrow mark engraved on the flange F with the arrow on the front side, and temporarily secure in this position using the mounting screw (4 x 6).



P0927

A: Flange R
B: Arrow mark engraved on flange R
C: Mounting screw (4 x 6)

(2) Loosely tighten the remaining eight screws (M4 x 6), and then fully tighten all screws in sequence while pulling on the print-drum body to prevent the development of a gap between the print-drum body and the stepped section of flange F and flange R, so that the print-drum body does not lift away from the flange.

7. Removing the Horizontal-Pulse-Motor Ass'y

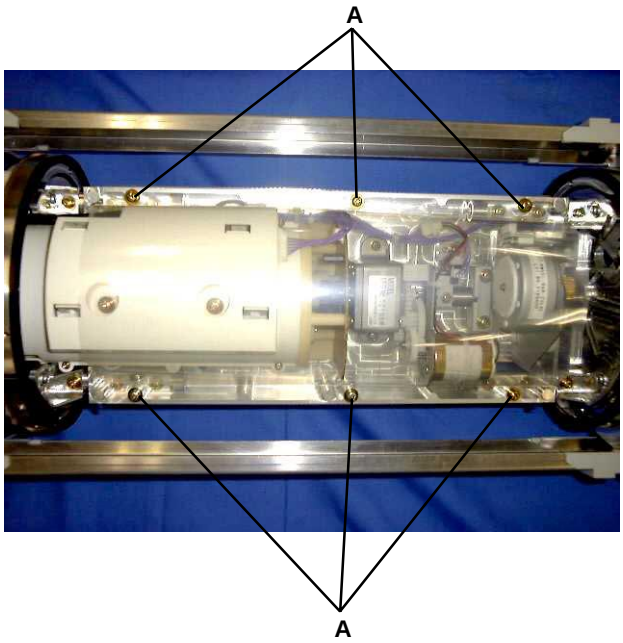
(1) Pull out the print drum after making a confidential master, and then remove the following components:

- Screen
- Print-drum body

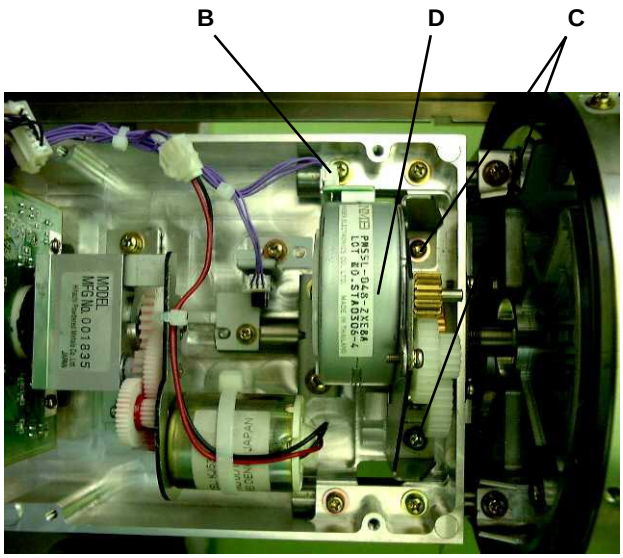
(2) Remove the six mounting screws [A] (4 x 8) from the ink guard, and then remove the ink guard.

(3) Unplug the connector [B] from the horizontal pulse motor.

(4) Remove the two mounting screws [C] (4 x 8) from the horizontal-pulse-motor ass'y, and then remove the horizontal-pulse-motor ass'y [D].



P0928



P0929

A: Mounting screws on the ink guard
B: Connector on the horizontal pulse motor
C: Mounting screws on the horizontal-pulse-motor ass'y
D: Horizontal-pulse-motor ass'y

8. Removing the Ink-Pump Unit and Ink-Cartridge Set-SW PCB

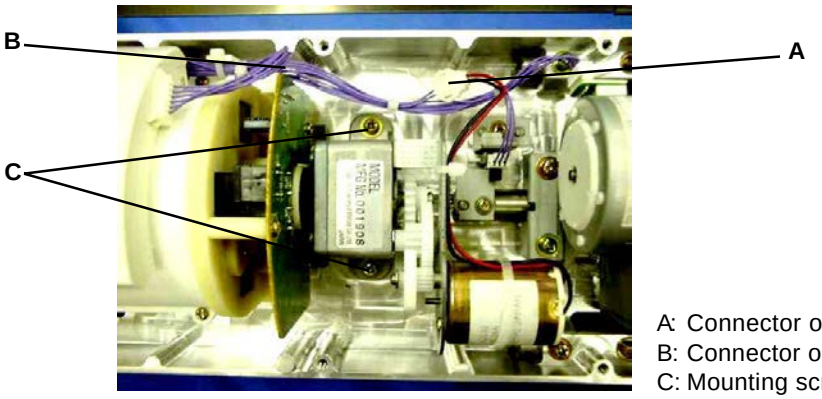
Removing the ink-pump unit

(1) Pull out the print drum after making a confidential master, and then remove the following components:

- Screen
- Print-drum body
- Ink guard

(2) Unplug the Connector [A] from the inking motor, and the connector [B] from the ink-cartridge set-SW PCB.

(3) Remove the two mounting screws [C] (4 x 8) from the ink-pump unit, and then remove the ink-pump unit.



P0930

A: Connector on the inking motor
B: Connector on the ink-cartridge set-SW PCB
C: Mounting screws on the ink-pump unit (4 x 8)

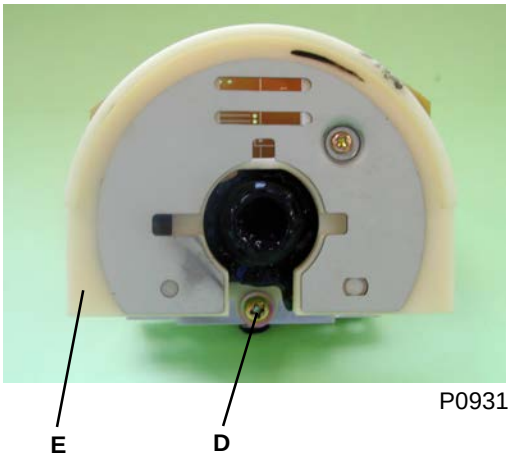
Removing the ink-cartridge set-SW PCB

(1) Pull out the print drum after making a confidential master, and then remove the following components:

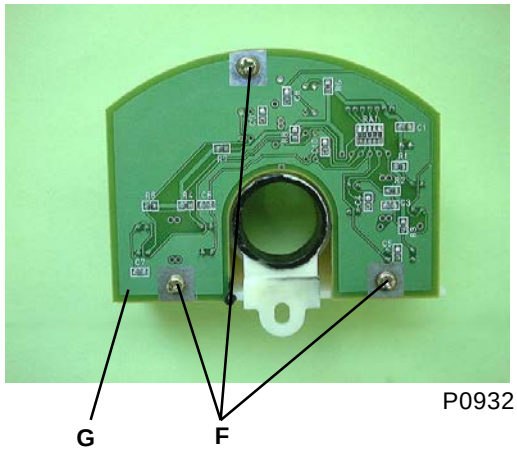
- Screen
- Print-drum body
- Ink guard
- Ink-pump unit

(2) Remove the mounting screw [D] (4 x 8) from the ink-cartridge set-switch PCB ass'y, and then remove the ink-cartridge set-SW PCB ass'y [E] from the ink-pump unit.

(3) Remove the three mounting screws [F] (3 x 6) from the ink-cartridge set-switch PCB, and then remove the ink-cartridge set-SW PCB [G].



P0931



P0932

D: Mounting screw on the ink-cartridge set-SW PCB ass'y
E: Ink-cartridge set-SW PCB ass'y
F: Mounting screws on the ink-cartridge set-SW PCB
G: Ink-cartridge set-SW PCB

9. Removing the Ink Sensor

(1) Pull out the print drum after making a confidential master, and then remove the following components:

- Screen
- Print-drum body

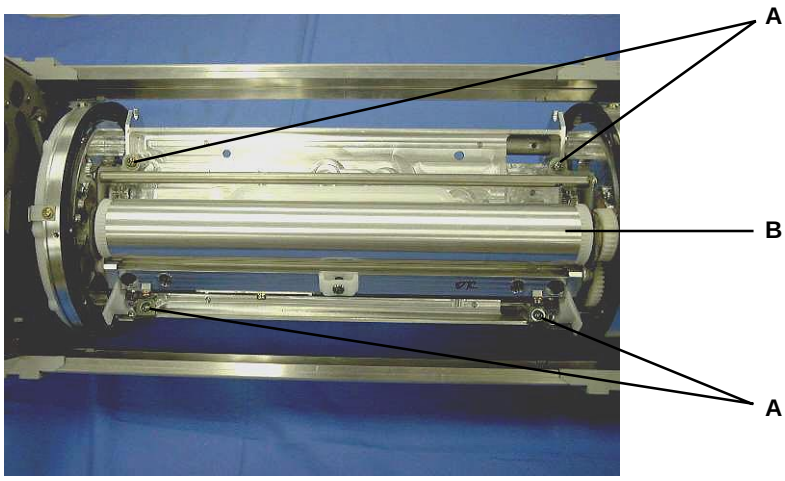
(2) Remove the four mounting screws [A] (4 x 8) from the squeegee sub ass'y, unplug the connector from the ink sensor [D] while pulling out the squeegee sub ass'y [B], and then remove the squeegee sub ass'y [B].

(3) Remove one screw (3 x 8) and take off the ink sensor PCB-cover.

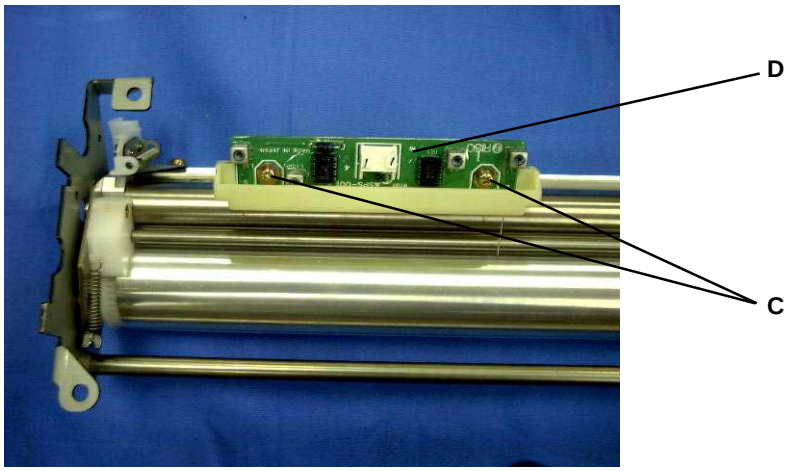
(4) Remove the two mounting screws [C] (3 x 8) from the ink sensor, and then remove the ink sensor [D].

[Precautions on Reassembly]

- In putting back the ink sensor, confirm that there is 3mm to 4mm distance between the tip of the ink sensor probe needle and the ink drive shaft.



P0933



P0934

A: Mounting screws on the squeegee sub ass'y
B: Squeegee sub ass'y
C: Mounting screws on the ink sensor
D: Ink sensor

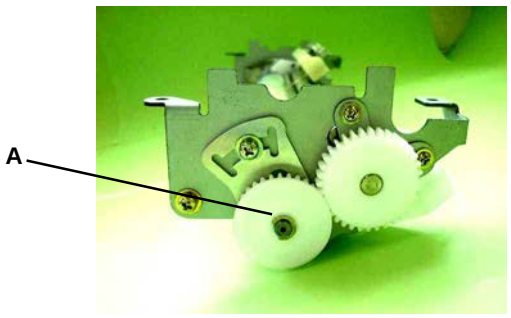
10. Removing the Squeegee Roller

(1) Pull out the print drum after making a confidential master, and then remove the following components:

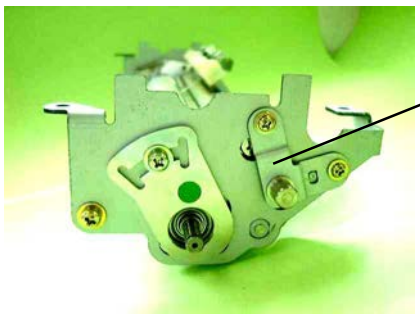
- Screen
- Print-drum body
- Squeegee sub ass'y

(2) Detach the e-ring [A] retaining the white spur gear on the drive side of the squeegee sub ass'y, and then remove the two spur gears.

(3) Remove the two mounting screws (3 x 6) from the idler base [B], and then remove the idler base [B].

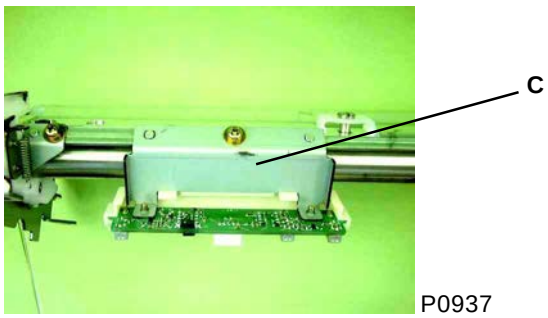


P0935



P0936

(4) Remove a mounting screw (4 x 8) from the ink-sensor ass'y [C], and then remove the ink-sensor ass'y [C].

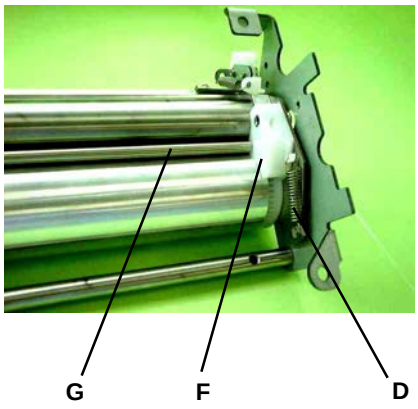


P0937

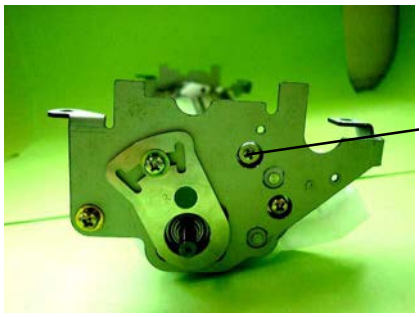
A: E-ring retaining the spur gear
B: Idler base
C: Ink-sensor ass'y

(5) Detach the ink-block springs [D] from both sides.

(6) Remove the ink-block mounting screws [E] from both sides, and then remove the ink block [F] and ink driveshaft [G] from both sides.



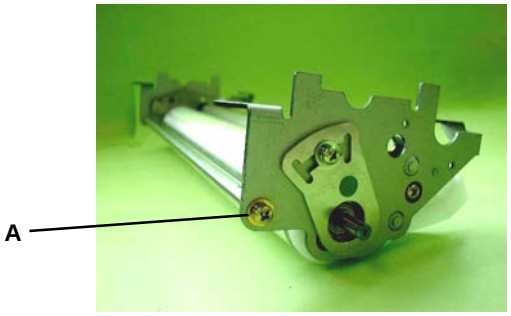
P0938



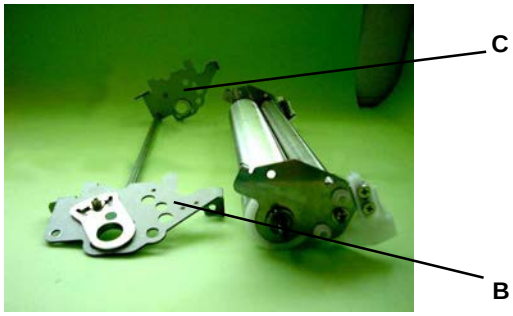
P0939

D: Ink-block spring
E: Ink-block mounting screw
F: Ink block
G: Ink driveshaft

(7) Remove the mounting screw [A] (4 x 8) from the squeegee-base R ass'y, and then remove the squeegee-base R ass'y [B] and squeegee-base F ass'y [C] from the squeegee-base R ass'y.



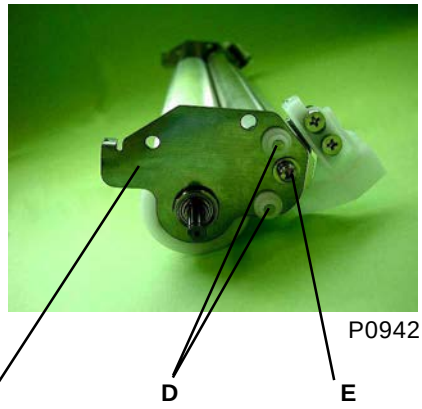
P0940



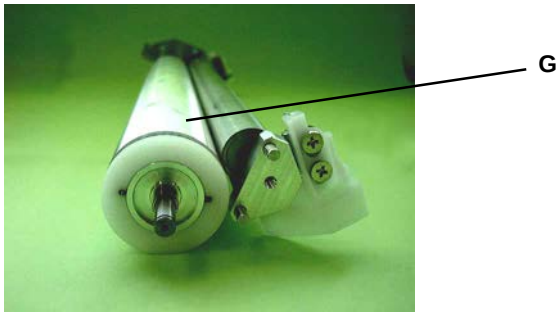
P0941

A: Mounting screw on the squeegee-base R ass'y
B: Squeegee-base R ass'y
C: Squeegee-base F ass'y

(8) Remove the two squeegee holders [D] from the squeegee base R, remove a mounting screw [E] (4 x 8) from the squeegee base R, remove the squeegee base R [F], and then pull out the squeegee roller [G].



P0942

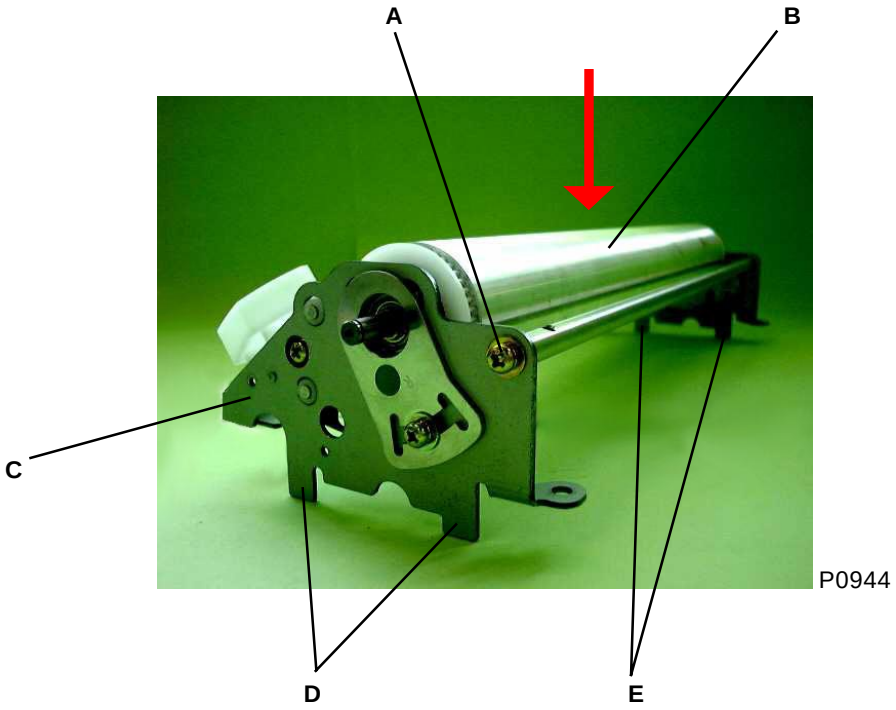


P0943

D: Squeegee holders
E: Mounting screw on the squeegee base R
F: Squeegee base R
G: Squeegee roller

[Precautions on Reassembly]

- When tightening the mounting screw [A] on the squeegee-base R ass'y, place the squeegee sub ass'y upside down on a flat surface, and tighten the mounting screw [A] while pressing down on the squeegee roller [B] from above so that the squeegee base R [C] is parallel to the side of the squeegee roller [B].
- Confirm that all of the legs [D, E] on the squeegee base R and squeegee base F are in contact evenly with the flat surface.
- Confirm that the ink sensor is positioned 3 to 4 mm from the ink driveshaft.
- Confirm that the ink driveshaft rotates when the squeegee roller [B] is rotated.



P0944

A: Mounting screw on the squeegee-base R ass'y
B: Squeegee roller
C: Squeegee base R
D: Legs on the squeegee base R
E: Legs on the squeegee base F

[Adjustment after Reassembly]

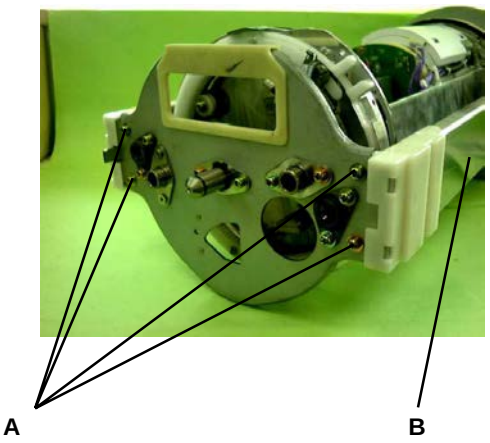
- Squeegee gap adjustment
- Squeegee pressure adjustment

11. Removing the Flange F Ass'y and Flange R Ass'y

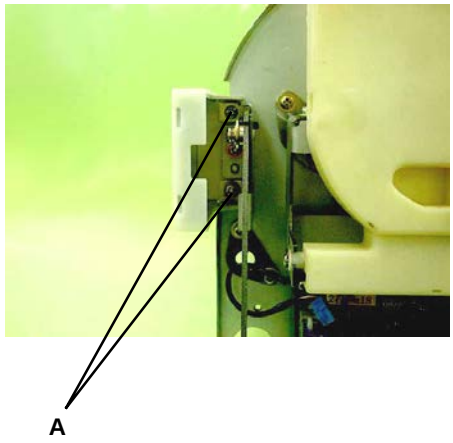
(1) Pull out the print drum after making a confidential master, and then remove the following components:

- Drum cover (center)
- Drum cover (outer)
- Screen
- Print-drum body

(2) Remove the four mounting screws [A] (front: 4 x 8; rear: 4 x 10) from the side frame ass'ys [B], and then remove both side frame ass'ys [B].



P0945

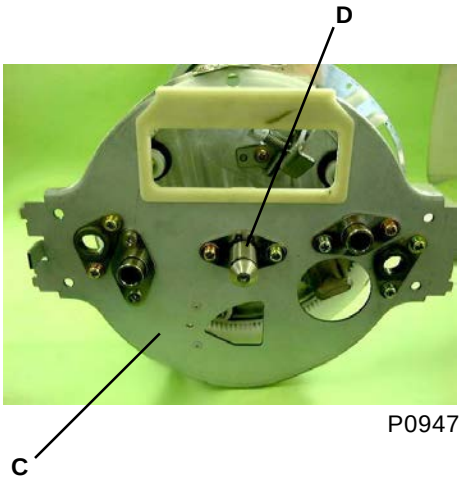


P0946

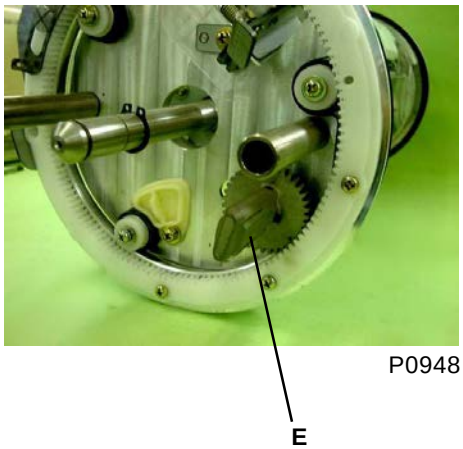
Removing the Flange R ass'y

(3) Detach the C-ring [D] securing the drum support plate R [C], screw (4 x 8) holding the ground wire, and then remove the drum support plate R [C].

(4) Loosen the two retaining screws (4 x 6) on the flange drive gear R [E], and then remove the flange drive gear R [E].



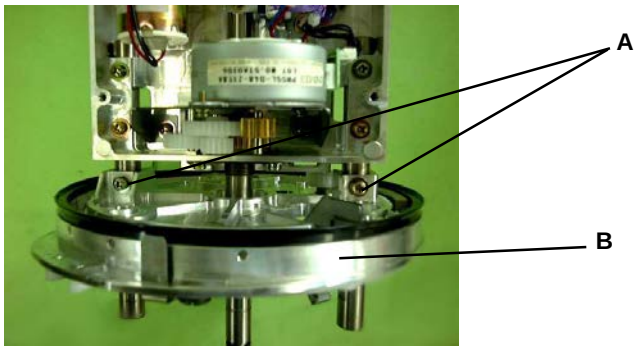
P0947



P0948

A: Mounting screws on the side frame ass'y
B: Side frame ass'y
C: Drum support plate R
D: C-ring
E: Flange drive gear R

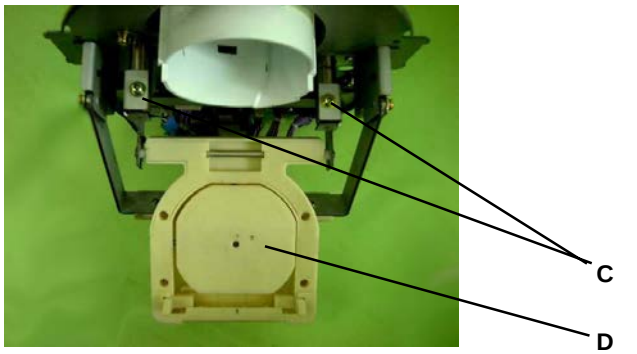
(5) Remove the two mounting screws [A] (4 x 8) from the flange R ass'y [B], and then remove the flange R ass'y [B].



P0949

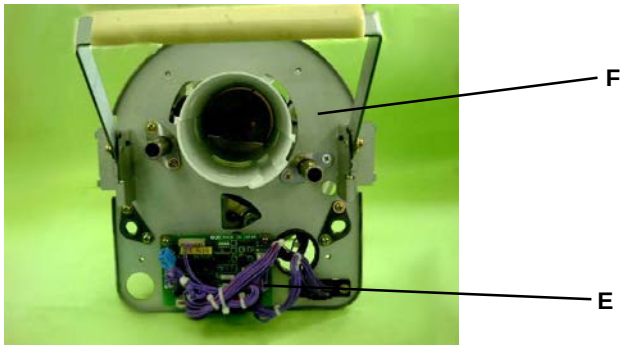
Removing the Flange F Ass'y

(3) Remove the two mounting screws [C] (4 x 8) from the bottle stopper ass'y [D], pull out the ink-volume-sensor connector, and then remove the bottle stopper ass'y [D].



P0950

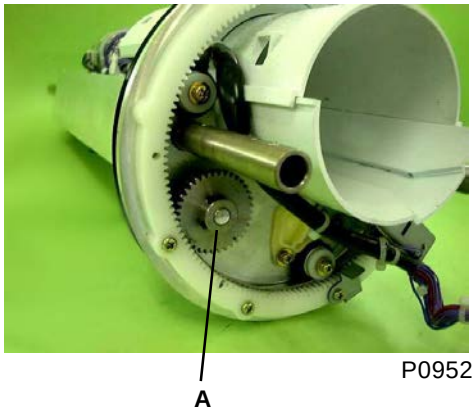
(4) Pull out the connector from the drum control PCB [E], and then remove the drum support plate F [F].



P0951

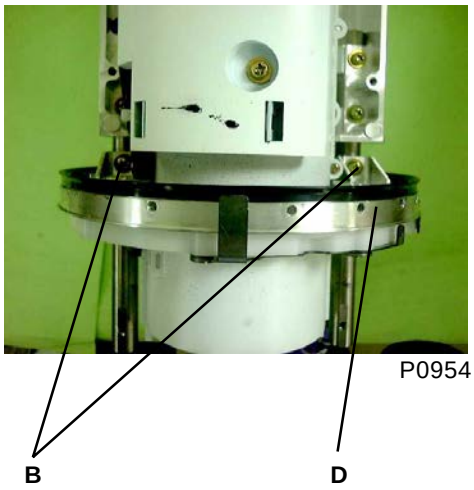
A: Mounting screws on the flange R ass'y
B: Flange R ass'y
C: Mounting screws on thebottle stopper ass'y
D: Bottle stopper ass'y
E: Drum control PCB
F: Drum support plate F

(5) Loosen the two retaining screws (4 x 6) on the flange drive gear F [A], and then remove the flange drive gear F [A].

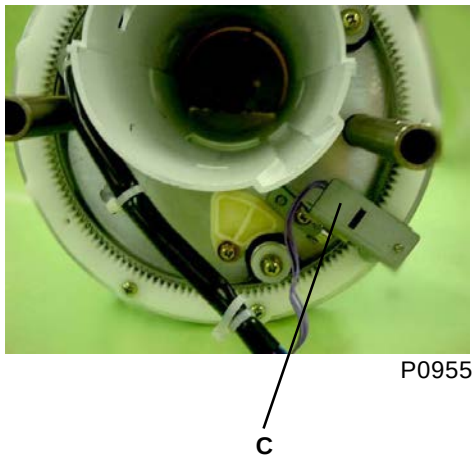


P0952

(6) Remove the two mounting screws [B] (4 x 8) from the flange F ass'y, pull out the connector from the Position-A sensor [C], and then remove the flange F ass'y [D].



P0954

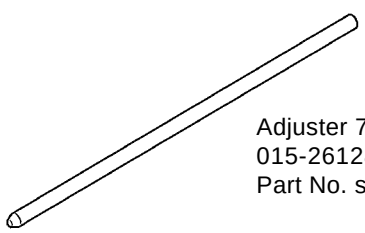


P0955

A: Flange drive gear F
B: Mounting screws on the flange F ass'y
C: Position-A sensor
D: Flange F ass'y

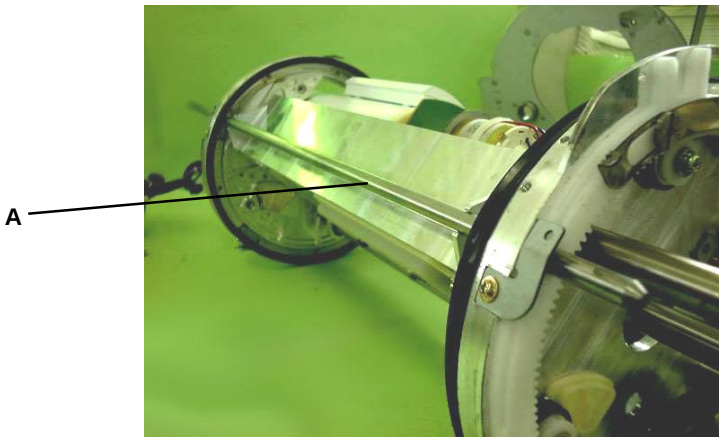
[Precautions on Reassembly]

- Use the jig (Adjuster 7) [A] to secure the flange drive gear F and flange drive gear R.



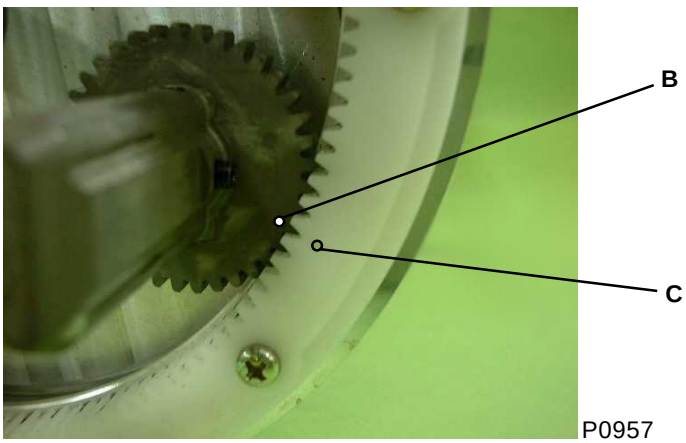
Adjuster 7
015-26128-008
Part No. subject to change without notice.

- Position both the flange F ass'y and flange R ass'y at position B, and then insert the jig (Adjuster 7) through the holes in the flange R ass'y, main frame, and flange F ass'y.



P0956

- Align the marking [C] on flange R with the marking [B] on flange drive gear R, and then insert the flange drive gear R and secure.



P0957

- Insert the flange-drive-gear F retaining screw into the flange drive gear F in an accessible position, and secure.

A: Jig (Adjuster 7)
B: Marking on flange drive gear R
C: Marking on flange R

Adjustment

1. Squeegee Gap Adjustment

(1) Pull out the print drum after making a confidential master, and then remove the following components:

- Screen
- Print-drum body

(2) Using a gap gauge, confirm that the gap between the squeegee roller and the doctor roller is within the specified dimensions (0.10 to 0.14 mm at the front and rear).

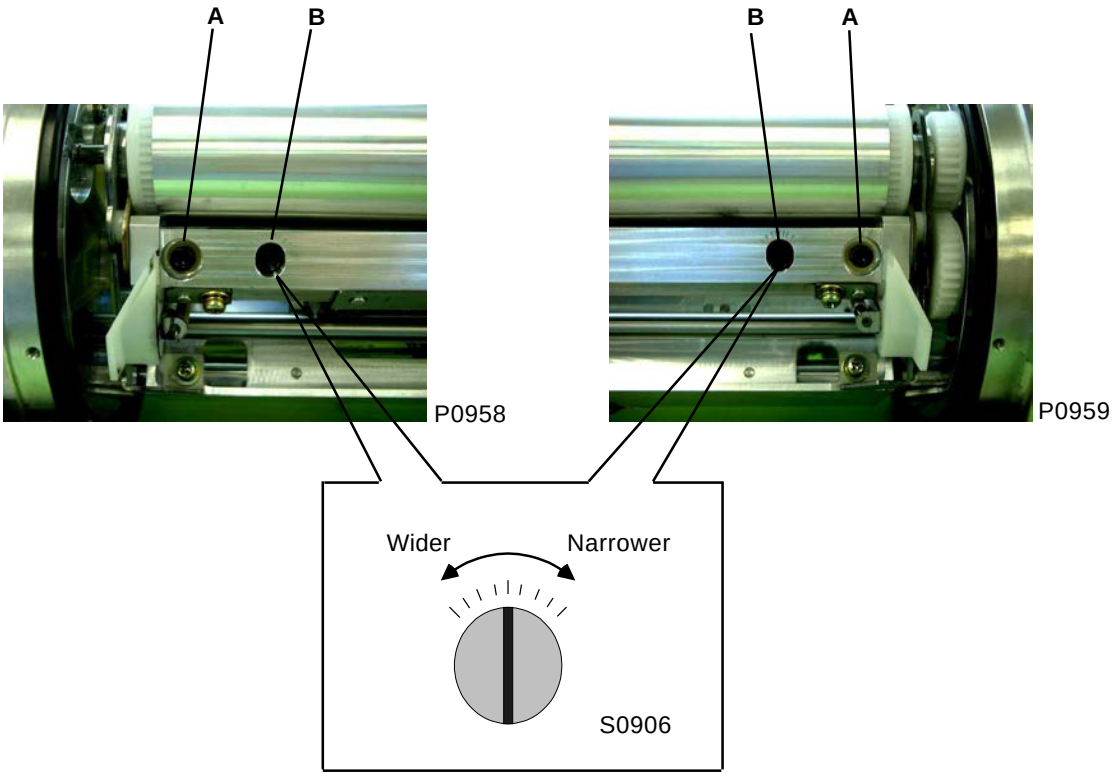
(3) If the gap is out of the specifications, loosen the retaining screw [A] on the doctor roller.

(4) Adjust the gap size by turning the gap adjustment cam [B] using a flathead screwdriver.

(5) Tighten the retaining screw [A] on the doctor roller.

Symptoms

- If the gap is too wide, an excessive amount of ink will be transferred onto the inside surface of the print drum, causing ink to leak out.
- Conversely, if the gap is too narrow, the printing density will be reduced.

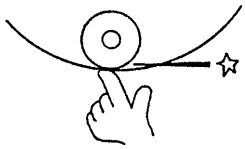


A: Retaining screw on the doctor roller

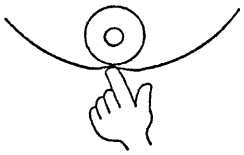
B: Gap adjustment cam

2. Squeegee Pressure Adjustment

(1) Pull out the print drum, and press it from underneath to confirm that the gap between the squeegee roller and print drum is approximately 0.3 mm at both the front and rear.



Virtually no gap (squeegee pressure too high)



Gap of approximately 0.3 mm (OK)

S0903

(2) If the pressure is not correct, adjust as shown below.

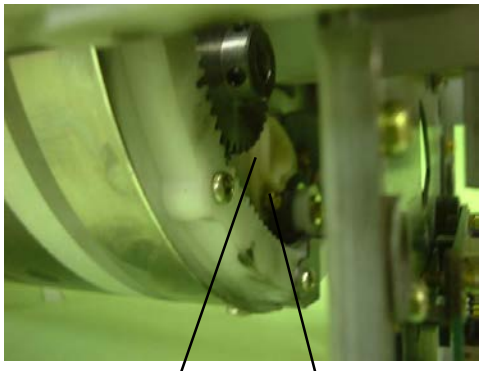
Front

(3) Remove drum cover (center) and drum cover (outer).

(4) Insert a screwdriver via the opening in the drum support plate F, remove a mounting screw [A] (4 x 8) from the squeegee pressure-adj. cover [B], and then remove the squeegee pressure-adj. cover [B].

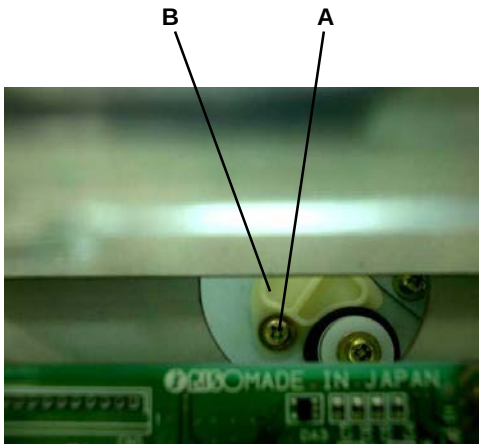
(5) Removing the squeegee-pressure-adj. cover [B] reveals the squeegee pressure-adj. plate [D] inside. Loosen the retaining screw [C] on the squeegee pressure-adj. plate [D].

(6) Using a flathead screwdriver, move the squeegee pressure-adj. plate [D] to adjust the squeegee pressure. Moving the squeegee pressure-adj. plate [D] in the print-drum rotation direction reduces the squeegee pressure, and moving it in the opposite direction increases the squeegee pressure.

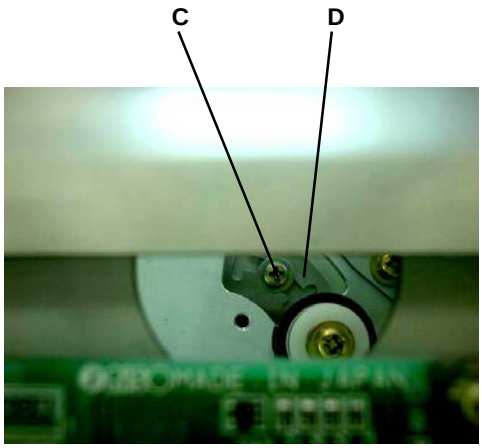


P0960

A: Mounting screw on the squeegee pressure-adj. cover
B: Squeegee pressure-adj. cover
C: Retaining screw on the squeegee pressure-adj. plate
D: Squeegee pressure-adj. plate



P0961



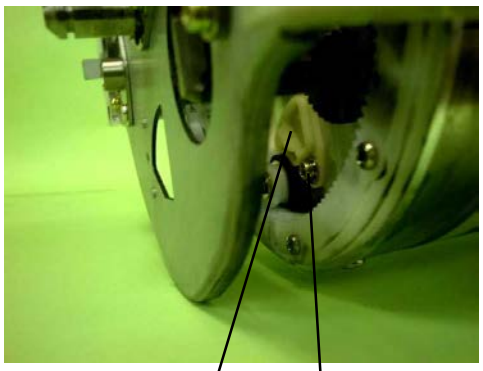
P0962

Rear

(3) Insert a screwdriver via the opening in the drum support plate R, remove a mounting screw [A] (4 x 8) from the squeegee pressure-adj. cover [B], and then remove the squeegee pressure-adj. cover [B].

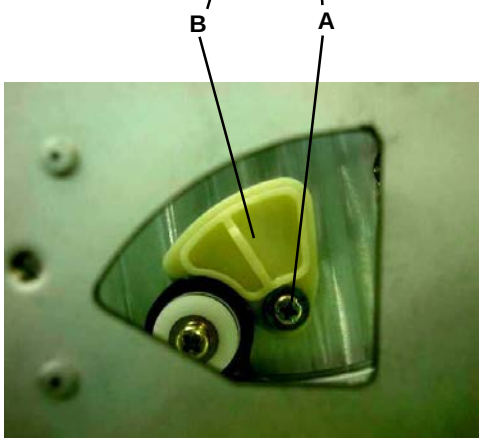
(4) Removing the squeegee pressure-adj. cover [B] reveals the squeegee pressure-adj. plate [D] inside. Loosen the retaining screw [C] on the squeegee pressure-adj. plate [D].

(5) Using a flathead screwdriver, move the squeegee pressure-adj. plate [D] to adjust the squeegee pressure. Moving the squeegee pressure-adj. plate [D] in the print-drum rotation direction reduces the squeegee pressure, and moving it in the opposite direction increases the squeegee pressure.

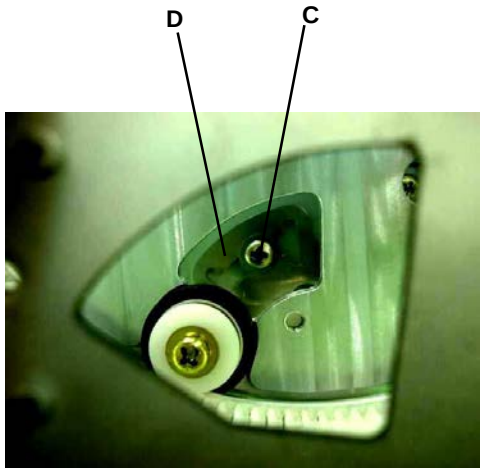


P0963

A: Mounting screw on the squeegee pressure-adj. cover
B: Squeegee pressure-adj. cover
C: Retaining screw on the squeegee pressure-adj. plate
D: Squeegee pressure-adj. plate



P0964



P0965

[Precautions on Reassembly]

- After adjustment, perform actual printing and check the balance between right and left.

[Symptoms]

- Incorrect left and right squeegee pressure will cause poorly balanced left and right printing density.
- If the squeegee pressure is too high, ink leakage may occur.
- If the squeegee pressure is too low, the print density will be reduced and an excess load may be applied to the print drum.

CHAPTER 10: MASTER-CLAMP SECTION

Contents

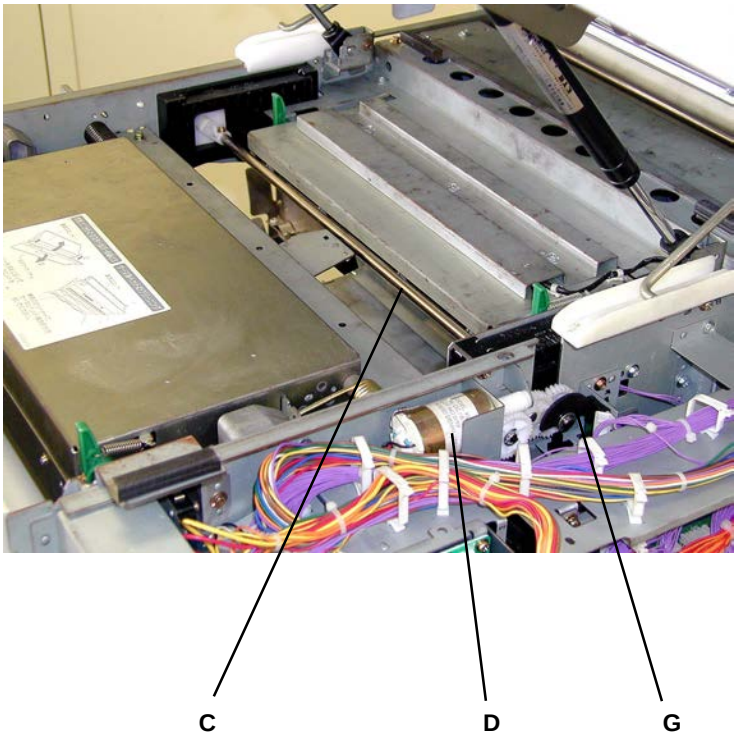
Mechanism

1. Mechanism

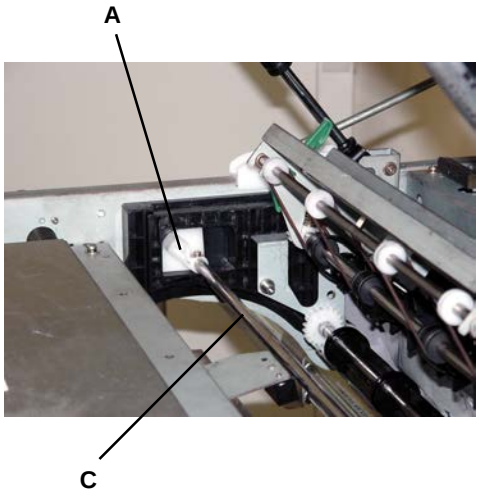
The clamp slide plate F (moved up and down by the rotating cam), which is engaged with the clamp cam F [A], is mounted at the front. The clamp slide plate R, which is engaged with the clamp cam R [B], and the compensation slide plate (moved up and down by a different cam), are mounted at the rear.
Both clamp cams [A] and [B] are fixed to the clamp shaft [C], which is rotated from the rear by the clamp motor [D] via the worm gear. (The clamp motor normally rotates counterclockwise, except during initialization, so the clamp shaft rotates counterclockwise when viewed from the rear.)
A cam for opening and closing the clamp plate [K] on the print drum and a cam for opening and closing the master projection plate [L] are located side by side on the clamp slide plate F, on the side opposite the print drum.
A cam for opening and closing the clamp plate on the print drum (opposite the cam on the clamp slide plate F) is located on the clamp slide plate R, on the side opposite the print drum.
A projection [F] is located on the compensation slide plate on the side opposite the print drum, to conform the Position-A compensator [E] on the print drum.
The clamp sensor plate [G] is attached to the rear end of the clamp shaft [C], and clamp sensor A [H] clamp sensor B [I] (both ON when blocked) are positioned around the plate. Clamp sensor C [J] is also attached, with part of the clamp slide plate R serving as the sensor plate. (The sensor is ON [blocked] when the clamp slide plate R is at the home position.)
The correlation between the sensor ON/OFF status and the various slide-plate positions is specified in the table below.

Clamp slide plate F Clamp slide plate R	Compensation slide plate	Clamp sensor		
		A	B	C
HP	HP	OFF	OFF	ON
Down	HP	OFF	ON	OFF
Down	Down	ON	ON	OFF
HP	Down	ON	OFF	ON

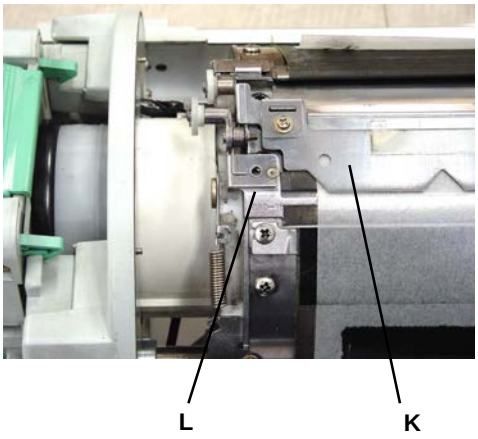
T1002



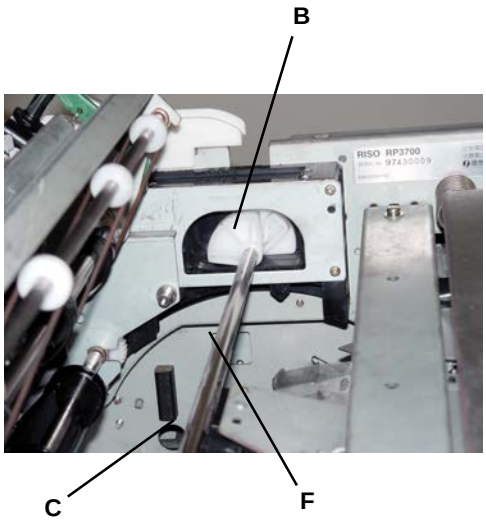
P1001



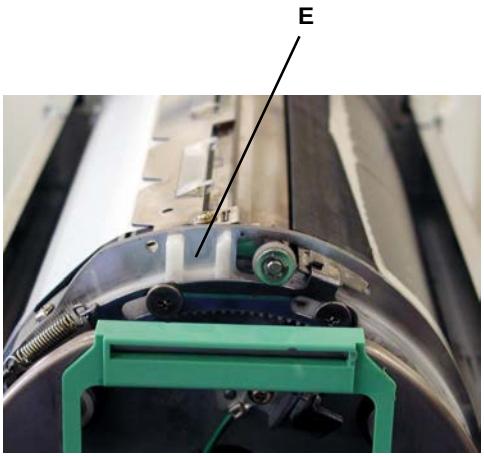
P1002



P1003

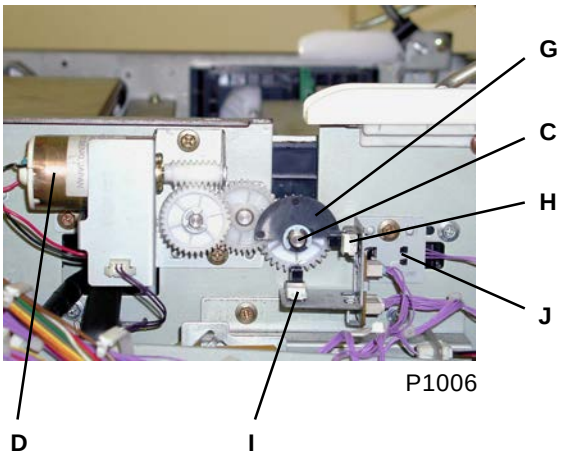


P1004



P1005

A: Clamp cam F
B: Clamp cam R
C: Clamp shaft
D: Clamp motor
E: Position-A compensator
F: Projection
G: Clamp sensor plate
H: Clamp sensor A
I: Clamp sensor B
J: Clamp sensor C
K: Clamp plate
L: Master projection plate



P1006

2. Clamp Unit Initialization

If clamp sensors A, B, and C are not at the home position (HP) when the START key is pressed to start confidential or master making, the clamp motor rotates in the clockwise or counterclockwise direction, depending on the status. With clamp sensor B OFF (open), the clamp motor turns OFF when clamp sensor A changes from ON (blocked) to OFF (open) to bring the sensors to the home position.

3. Master Projection (Before master disposal)

When master making is started, the print drum is brought to Position B and the clamp motor rotates counterclockwise until clamp sensor B turns ON (blocked). This lowers the clamp cam and master projection cam. The main motor then rotates, and the two cams above open the clamp plate (approx. 15 seconds) -> open the master projection plate -> close the clamp plate -> close the master projection plate. The leading edge of the master is then lifted and fed to the master disposal section. The main motor finally stops the next time it reaches position A.

4. Master Clamping Action

The clamp motor rotates in the counterclockwise direction again until clamp sensor A turns ON (blocked). This lowers the Position-A compensation cam. The clamp plate is kept open by the clamp cam and the master projection cam which remains lowered while position-A compensation is performed.
Once the master is transported by the load roller to the specified position, the clamp motor rotates in the counterclockwise direction until clamp sensor A turns OFF (open). This raises the clamp cam and closes the clamp plate to end to the master-clamp operation. (Clamp sensors B and C stop at their home positions.) The main motor continues to rotate before finally stopping at position B.
This completes the process of winding the master around the print drum.

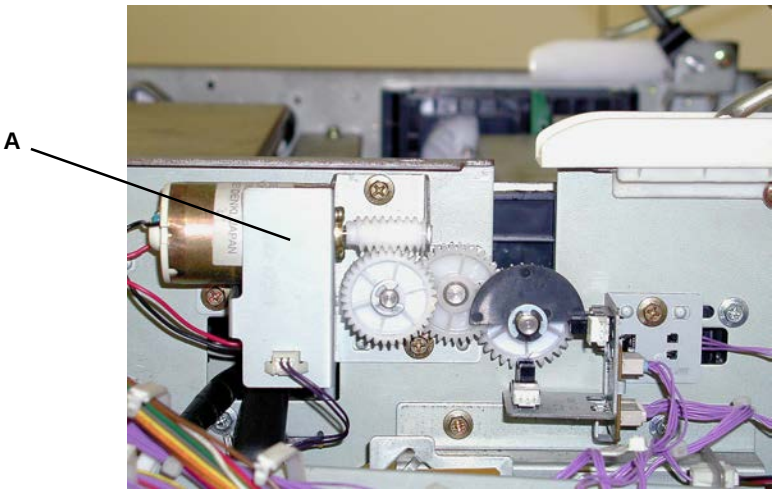
Removal and Assembly

1. Removing the Master-Clamp Unit

(1) Turn off the power and remove the rear cover.

(2) Open the power-supply unit and main PCB unit to the left and right, respectively.

(3) Unplug the connector, then remove the clamp control unit [A] with three screws (M4 x 8).



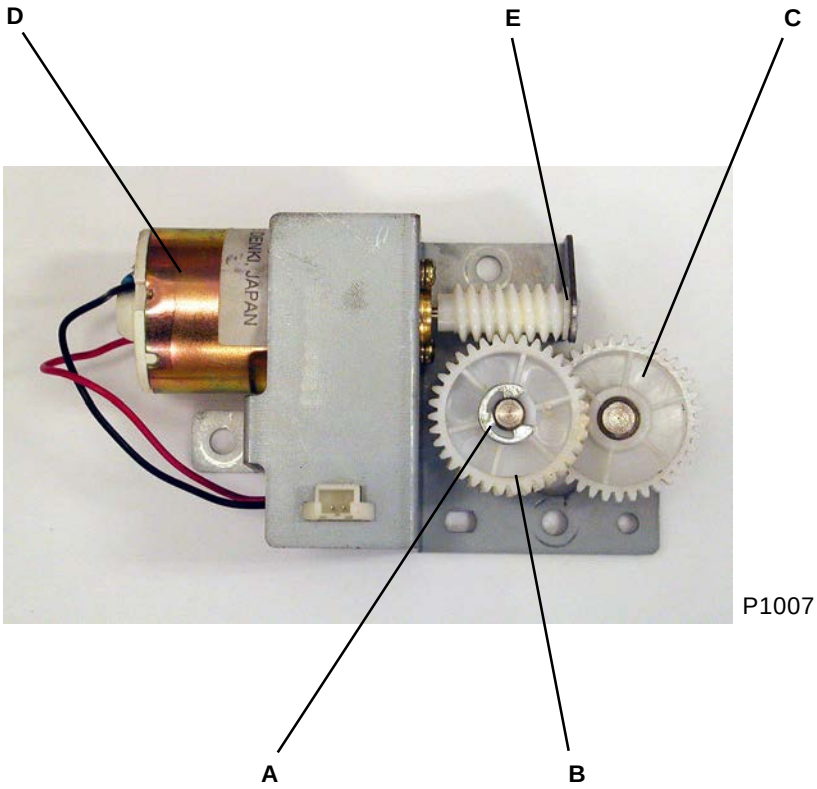
P1013

A: Clamp control unit

2. Removing the Clamp Motor

(1) Turn off the power and remove the master-clamp unit. (Refer to previous page)

(2) Unplug the connector, detach the E-ring [A], helical gear [B], and spur gear [C], and then remove the clamp motor [D] with two screws (M3 x 5). (Be careful not to drop the worm-gear plate [E] on the end of the worm gear.)



P1007

A: E-ring
B: Helical gear
C: Spur gear
D: Clamp motor
E: Worm-gear plate

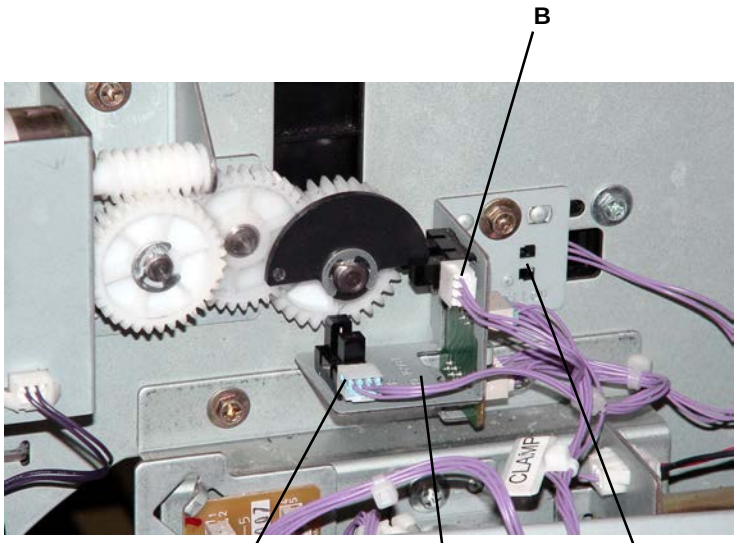
3. Removing Clamp Sensors A, B, C

(1) Turn off the power and remove the rear cover.

(2) Open the power-supply unit and main PCB unit to the left and right, respectively.

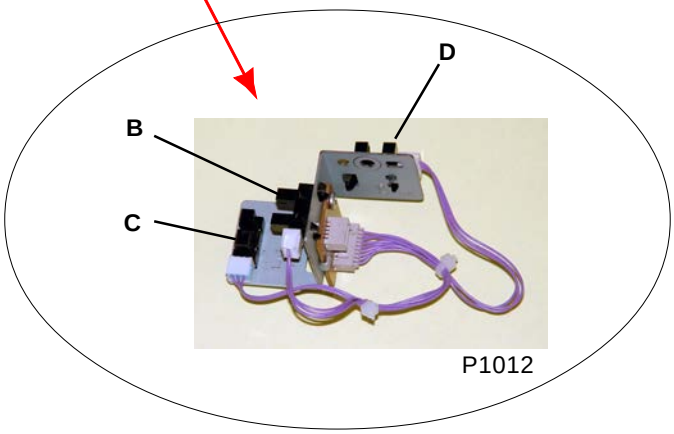
(3) Unplug the connector and remove the clamp-sensor ass'y [A] with one screw (M4 x 8), together with the bracket.

(4) Unplug the respective connectors, then remove clamp sensor A [B], clamp sensor B [C], and clamp sensor C [D].



P1008

A: Clamp-sensor ass'y
B: Clamp sensor A
C: Clamp sensor B
D: Clamp sensor C



P1012

4. Removing Clamp Shaft Assembly

(1) Remove the print drum, turn off the power, and remove the front cover, front frame cover and rear cover.

(2) Open the power-supply unit and main PCB unit to the left and right, respectively.

(3) Loosen the scanner-table stopper plate, open the scanner table as far as the service position, and set the scanner support shaft [G] in place.

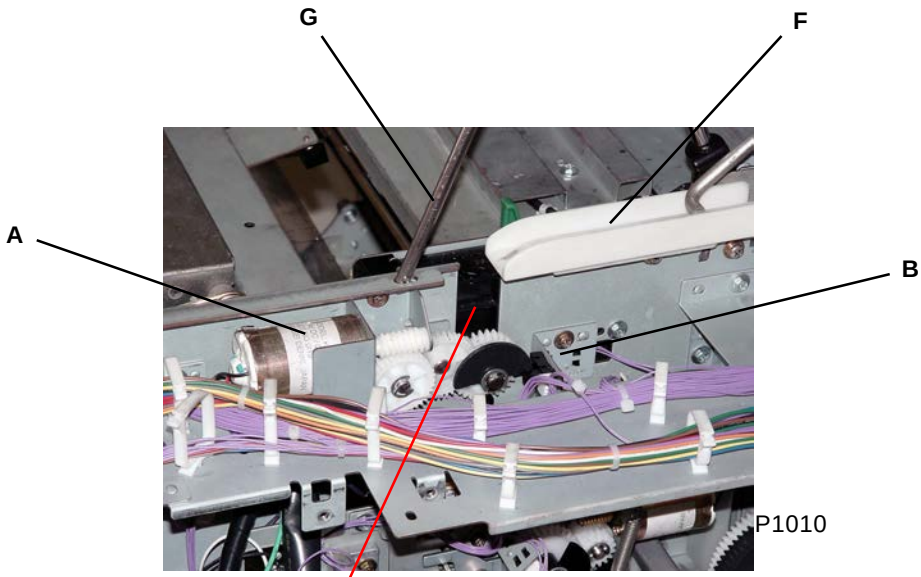
(4) Remove the torsion spring guides [F] with one screw (M4 x 8) each from the front and rear frame plates.

(5) Remove the master-clamp unit [A] and clamp shaft assembly [C]. (Refer to previous pages)

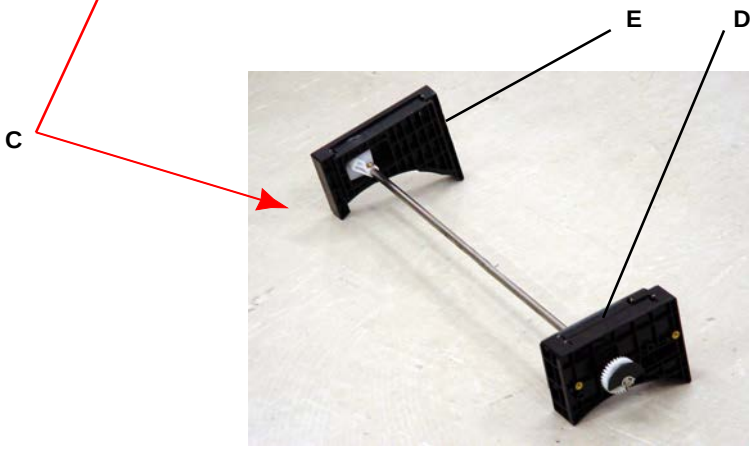
(6) Open the master-disposal upper ass'y and remove the clamp shaft assembly by removing two screws (M4 x 8) on the front and rear frame of the machine.

[Precautions on Reassembly]

- Make sure to fit the two positioning pins on both the clamp slide plates F and R into the positioning holes on the front and rear frame of the machine before tightening the screws



P1010



P1011

A: Master clamp unit
B: Clamp sensor assembly
C: Clamp shaft assembly
D: Clamp slide guide plate R
E: Clamp slide guide plate F
F: Torsion spring guide
G: Scanner support shaft

CHAPTER 11: MASTER DISPOSAL SECTION

Contents

Mechanism

1. Master Disposal System

Masters on the print drum are disposed of as follows:

(1) At the start of master disposal, the master loading sensor checks whether the master to be disposed of on the print drum is actually present. (The check operation is not performed if a master is known to be present.)

(2) While the print drum is rotated from position B, the clamp plate opens -> the master projection plate opens -> the clamp plate closes -> master projection plate closes. The leading edge of the master is then released and fed into the vertical-transport section.

(3) The removed master is transported vertically and fed into the master disposal box.

(4) The master compression operation is then performed to compress the removed master inside the master disposal box.

2. Master on Drum (Before Master Removal) Check Mechanism

When confidential or master making is begun, the print drum is moved to position B. When the print drum reaches the 35° position, the master loading sensor checks whether there is a master on the print drum. (The check operation is not performed if information indicating that a master is present has been stored in the machine's memory.)
The drum rotation angle for this check can be adjusted using test mode No. 580.
If the light from the master loading sensor is reflected back (master present), the master-disposal jam sensor checks whether the master has been sent to the master disposal box by following vertical-transport mechanism.

3. Vertical-Transport Mechanism

As the print drum rotates, the leading edge of the released master is fed into the master disposal box by the master disposal roller, which is rotated by the master disposal motor.
The main motor stops once the print drum reaches position A, and the master disposal motor stops one second later.
(The time at which the master disposal motor stops can be adjusted using test mode No. 382.)
When the print drum reaches the 120° and 180° positions, the master-disposal jam sensor checks whether the master is being fed correctly to the master disposal box. (These print drum angles can be adjusted using test modes Nos. 380 and 381.)
The print-drum rotation speed during master disposal can be adjusted using test mode No. 387.

4. Master Compression Mechanism

1) Initializing

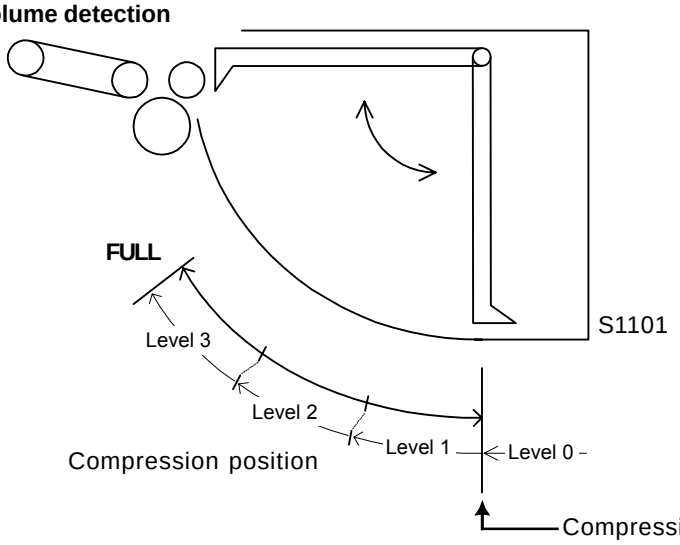
If the master compression sensor is ON (open) when the power is switched on or “All reset” is performed, the operation ends.
If the sensor is OFF (blocked), the master compression motor is activated in the reverse direction until the master compression sensor turns ON.

2) Master compression, master full, Disposal-box volume detection-(not available on 300 dpi)

- Upon completion of the vertical transport operation, the master disposed of inside the master disposal box is compressed by the master compression plate operated by the master compression motor.
- The rotation of the master compression motor (master-compression-plate position) is detected by the pulse count from the master-compression-motor limit sensor after the master compression sensor turns OFF. The speed of the master compression motor is determined based on the time required for one pulse count to be received from the master-compression-motor limit sensor.
- If compression is performed when the master disposal box is empty, the master compression motor stops once a set number of pulses are counted from the master-compression-motor limit sensor after the master compression sensor turns OFF (compression limit position). The master compression motor operates in the reverse direction after stopping for a set length of time, and then stops again when the master compression sensor turns ON.
- If compression is performed when the master disposal box is partly filled, the motor is subjected to a load as compression is fully applied, and the speed decreases. Once the motor speed drops below a preset speed (when the master-compression-motor limit-sensor pulse interval exceeds the preset value), the master compression motor stops (“compression detection position”). The master compression motor operates in the reverse direction after stopping for a set length of time, and then stops again when the master compression sensor turns ON.
- If the “compression detection positon” (the master-compression-motor limit-sensor pulse interval exceeds the preset value) comes before the master-compression-motor limit-sensor pulse count exceeds the preset value during compression (disposal-box-full position), a disposal-box-full indication is given.
- The disposal-box volume indicator checks and indicates how many more masters can be disposed of in the master disposal box. It displays the disposal-box volume according to the compression detection position at one of three levels which is equally divided distance between the “compression limit position” and “disposal-box-full position into three parts.”

Compression limit position: ..... Value set in test mode No. 383 “Compression-limit-position count”
Default: 163 pulses
Disposal-box-full position: ..... Value set in test mode No. 386 “Full box compression count”
Default: 122 pulses
Compression detection position: ..... Value set in test mode No. 385 “Compress. Load Application Time”
Default: 53 ms

Disposal-box volume detection



Disposal-box volume indication

Compression position		Indication
Level 0	→	100-50%
Level 1	→	50-30%
Level 2	→	30-10%
Level 3	→	10-0%

5. Disposal-Box Safety SW

The disposal-box safety SW [A] checks whether the master disposal box is set correctly.
The main motor, clamp motor, master compression motor, cutter motor, and master disposal motor cannot be activated while the disposal-box safety SW [A] is OFF.
The master-disposal-box full indication is reset if the disposal-box safety SW [A] is OFF (master disposal box removed) for more than 5 seconds.

P1124

A: Disposal-box safety SW

Removal and Assembly

1. Removing the Master-Disposal Upper Assembly

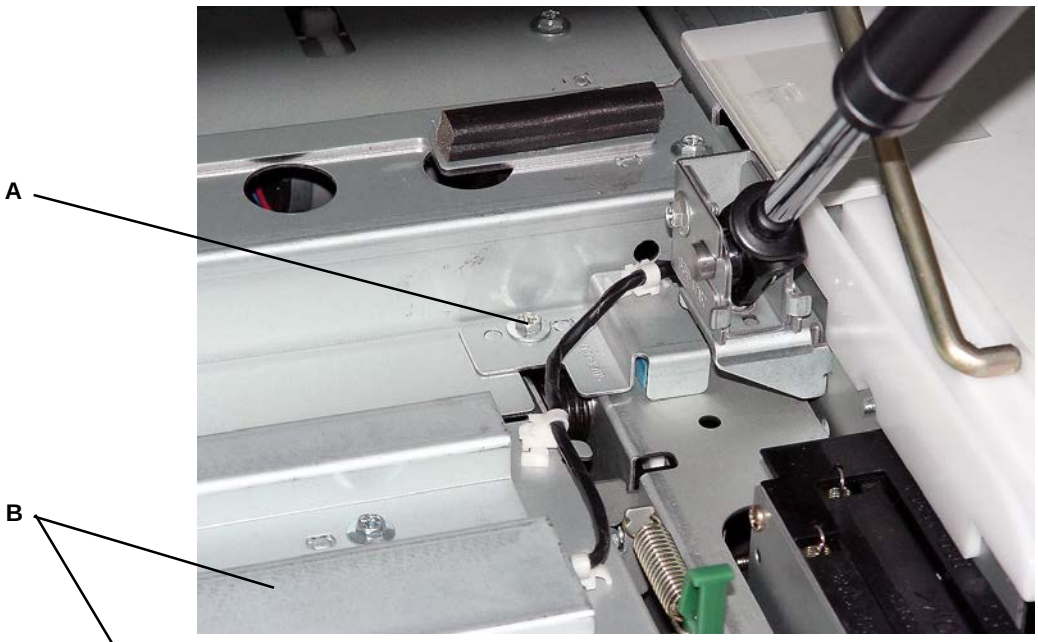
(1) Open the scanner table.

(2) Remove the stopper plate [A] with one screw (M4 x 8), and then unplug the connector.

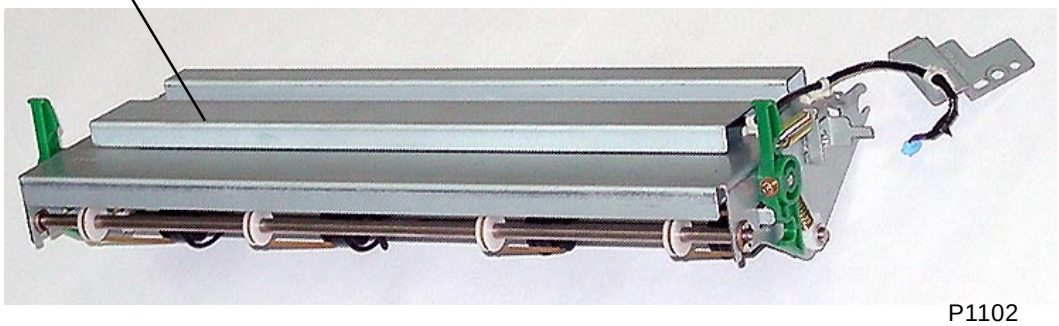
(3) Press the lever to open the master-disposal upper ass'y [B], and then lift it at 90° position to detach the assembly [B].

[Precaution on Reassembly]

- Engage the end of the master-disposal upper assembly spring with the master-disposal upper assembly.



P1101



P1102

A: Stopper plate

B: Master-disposal upper assembly

2. Removing the Disposal Unit

(1) Pull out the print drum, switch off the power, and remove the front cover, front frame cover, and rear cover.

(2) Detach the master disposal box, and remove the master disposal cover.

(3) Open the main PCB unit to the right.

(4) Loosen the scanner-table stopper plate, open the scanner table as far as the service position, and set the scanner support shaft in place.

(5) Remove the FB dampers [A] with by removing one screw, each (M4 x 8) with their brackets, from the front and rear frame plates.

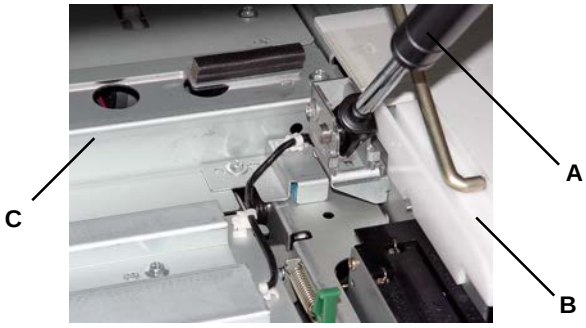
(6) Remove the torsion spring guides [B] by removing one screw (M4 x 8) each from the front and rear frame plates.

(7) Unplug the connectors from the wire harness connected to the master disposal unit (front: x1; rear: x2).

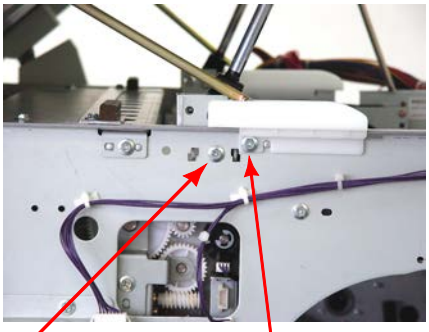
(8) Remove the two screws (M4 x 8) on the paper-feeding side and the two screws (M4 x 8) on the unit upper face, then remove the disposal unit [C] upward at an angle.

[Precaution on Reassembly]

- Align the half-pierced sections (2 locations) on the paper-feeding side.



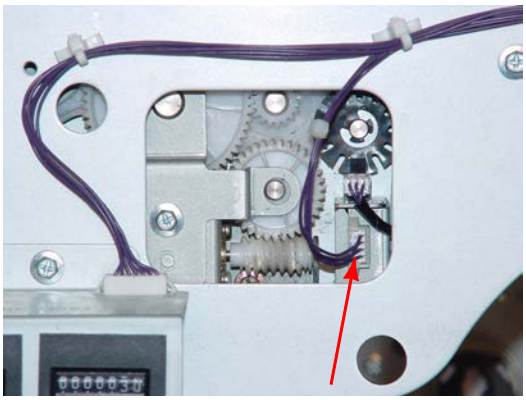
P1125



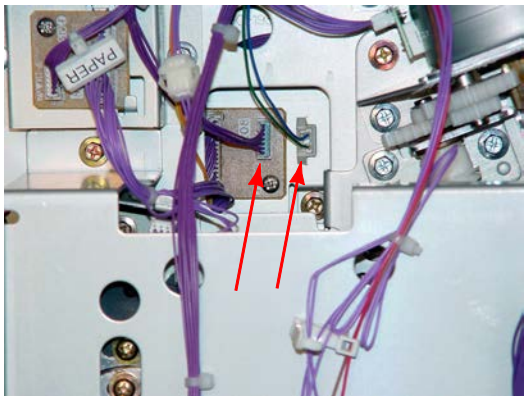
P1133

Screw for FB Damper Bracket.

Screw for Torsion Spring Guide.



Front connector P1103

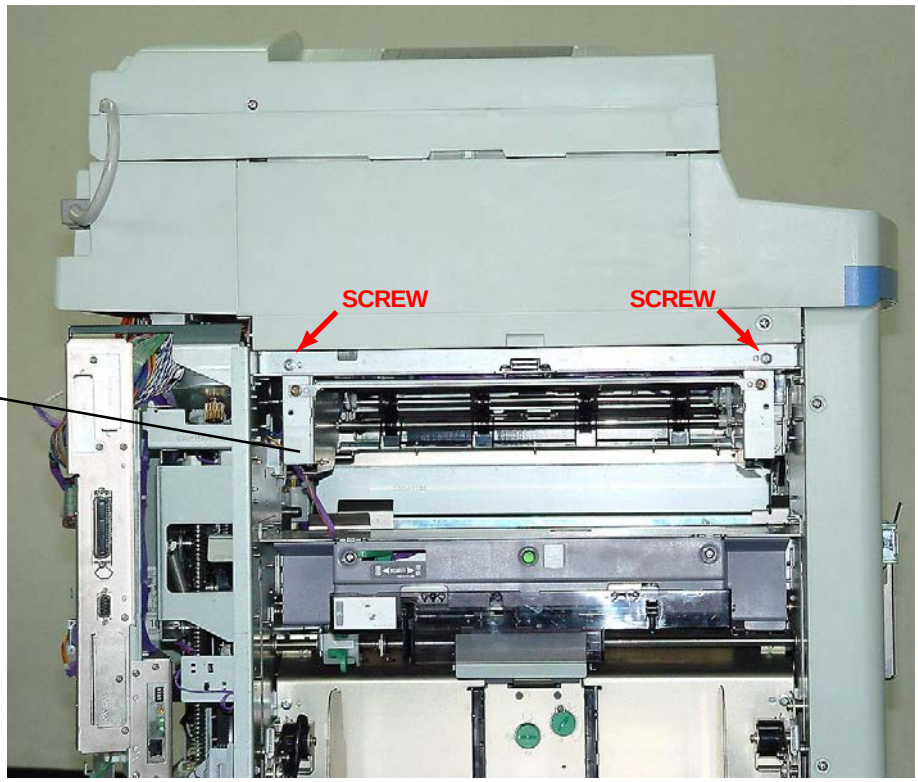


Rear connectors P1104

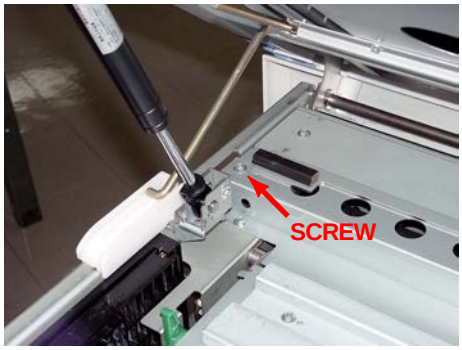
A: FB damper

B: Torsion spring guide

C: Disposal unit

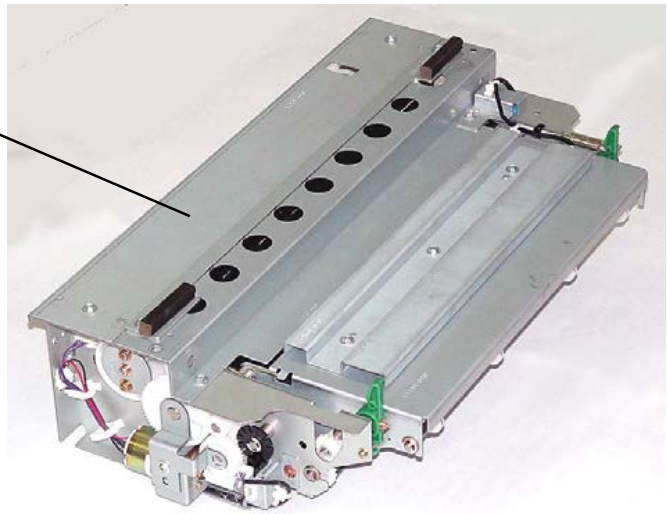


P1105



P1106a

P1106b



C: Disposal unit

P1107

3. Removing the Compression-Plate Assembly

(1) Remove the master disposal unit [A] from the machine (see this chapter), and detach the master-disposal upper assembly [B] from the unit (see this chapter).

(2) Detach the master-disposal upper-ass'y spring from the hook on the master-disposal upper assembly (both sides).

(3) Detach the rear master-disposal upper-assembly stopper plate by removing one screw (M4 x 8).

(4) Detach the front compression-gear cover [C] by removing one screw (M4 x 8), and remove gear 1 [D] (the master compression plate drops down).

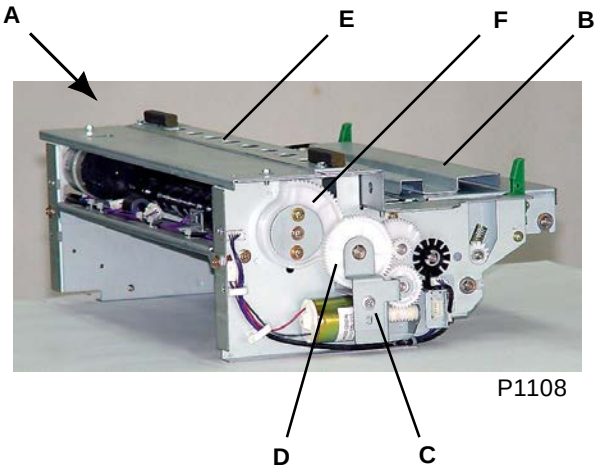
(5) Remove the master-disposal stay D [E] by removing four screws (M4 x 8).

(6) Detach the master-disposal-sector gear [F] by removing one screw (M4 x 8) from the front of the master-compression-plate assembly shaft, and detach the screw (M4 x 8) and washer [G] from the rear.

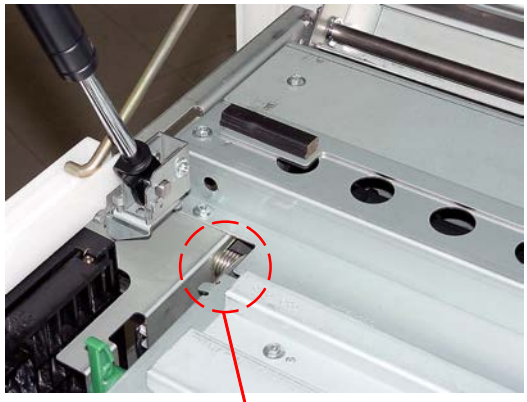
(7) Detach the metals from both ends of the shaft on the master-compression-plate assembly [H], then remove the master-compression-plate assembly [H] from the slots in the master-disposal-unit support plates F and R.

[Precautions on Reassembly]

- Be sure to attach the washer [G] when fitting the metal at the rear end.
- Keep the master-compression-plate ass'y level when attaching gear 1 [D].

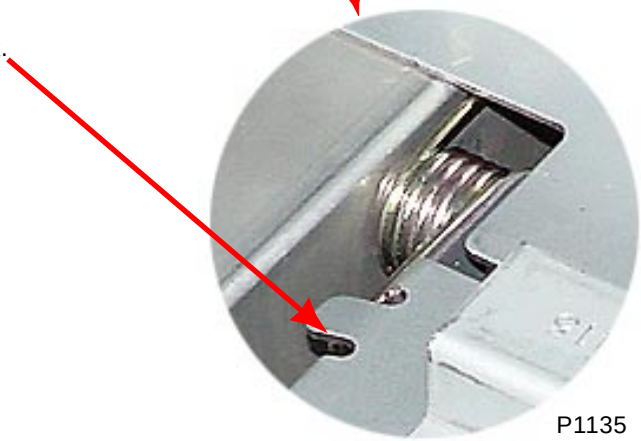


P1108



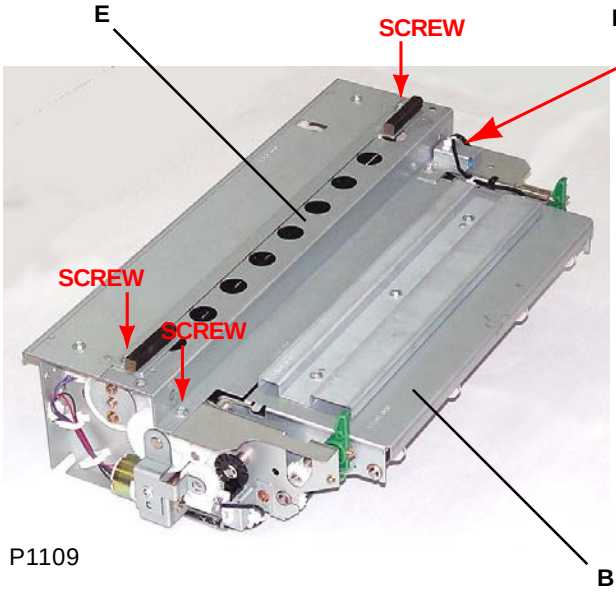
P1134

Detach the master-disposal upper-ass'y spring from the hook.



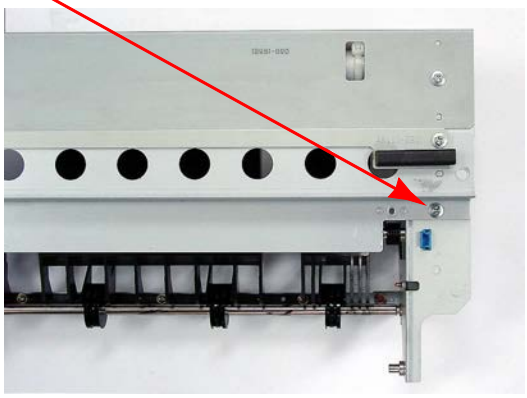
P1135

A: Master disposal unit
B: Master-disposal upper assembly
C: Compression gear cover
D: Gear 1
E: Master-disposal stay D
F: Master-disposal sector gear

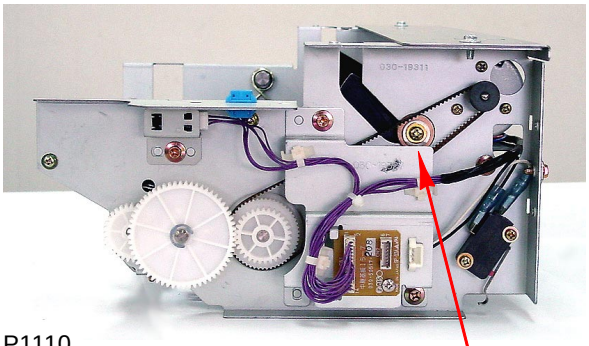


P1109

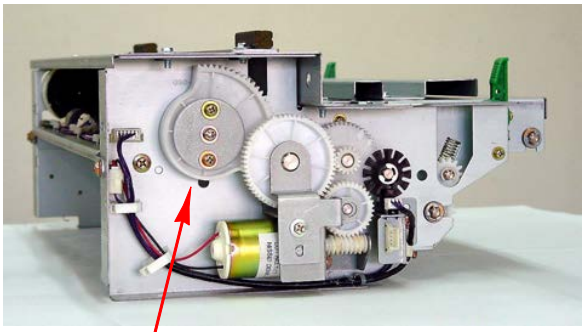
Fourth SCREW hidden under the Master-disposal upper assembly.



P1136

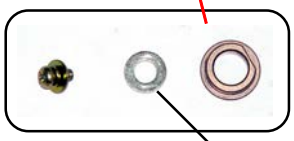


P1110



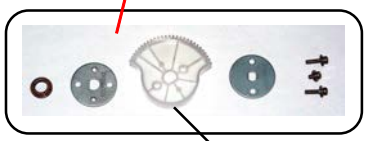
P1130

REAR

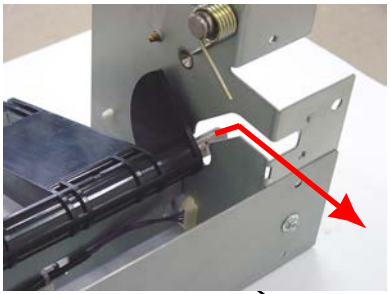


P1132

FRONT



P1131



P1111

Slide the Master-compression-plate assembly out though the slit.

P1112

B: Master-disposal upper assembly
E: Master-disposal stay D
F: Master-disposal sector gear
G: Washer
H: Master-compression-plate assembly

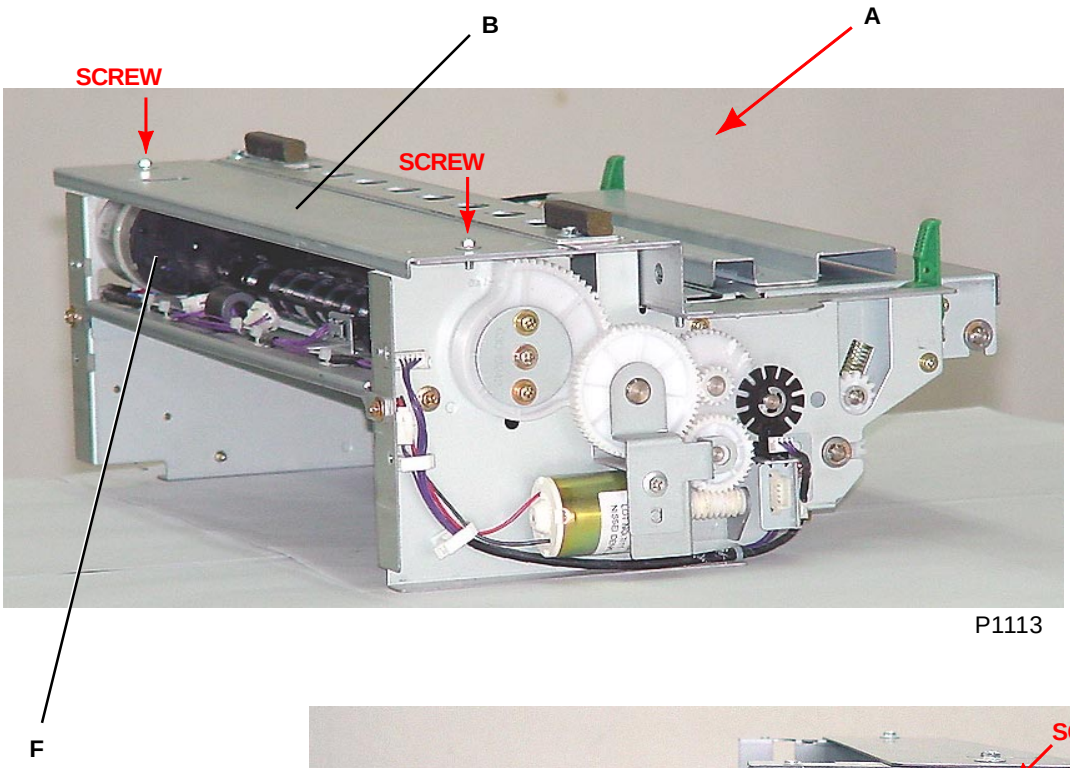
4. Removing the Master Disposal Motor

(1) Remove the master disposal unit [A] from the machine (see this chapter).

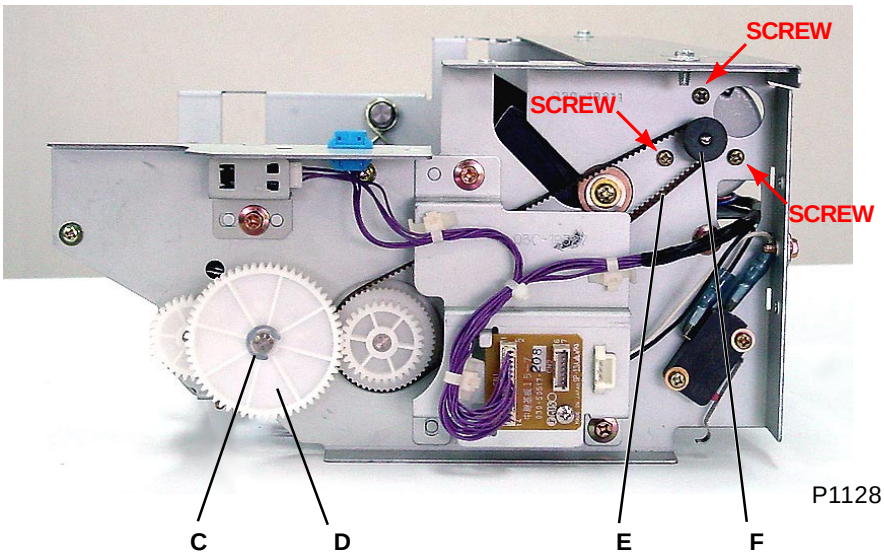
(2) Remove master-disposal stay A [B] by removing two screws (M4 x 8).

(3) Detach E-ring [C] and remove gear 5 [D]. Then loosen master-disposal-motor belt [E].

(4) Cut two wire clamps, and unplug the connector of the motor wire harness. Remove three screws (M3 x 5), to detach the master disposal motor [F].



P1113



P1128

A: Master disposal unit
B: Master-disposal stay A
C: E-ring
D: Gear 5
E: Master-disposal-motor belt
F: Master disposal motor

5. Removing the Master Compression Motor

(1) Remove the master disposal unit from the machine (see this chapter).

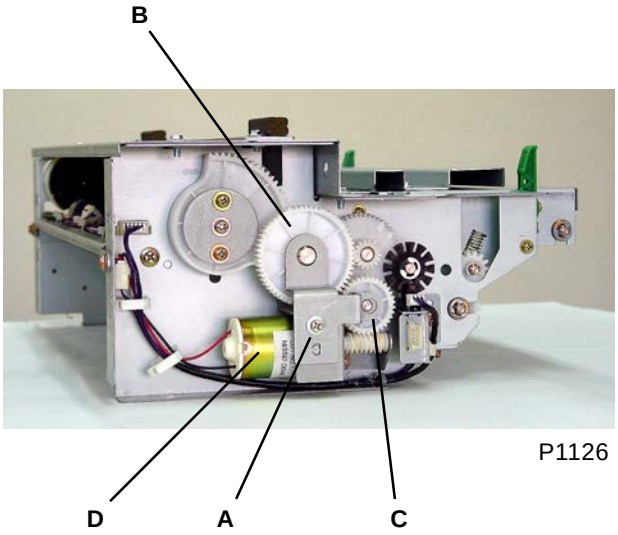
(2) Detach the front compression-gear cover [A] by removing one screw (M4 x 8), remove gear 1 [B], and then remove gear 2 [C].

(3) Unplug the connector and remove the master compression motor [D] by removing three screws (M4 x 8), together with the bracket.

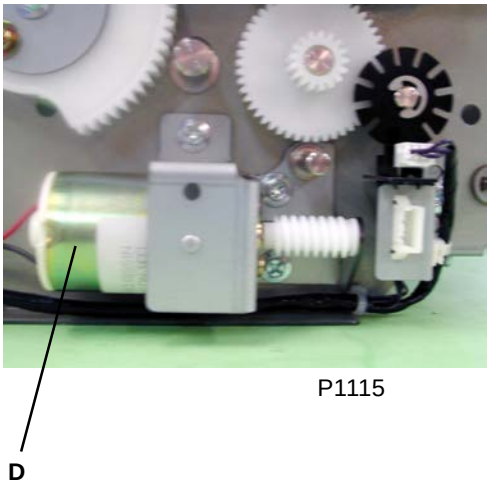
(4) Remove the master compression motor [D] by removing two screws (M3 x 5). Be careful not to lose the plastic washer [E] which falls off when the motor is removed.

[Precautions on Reassembly]

- Be sure to insert the plastic washer [E] on the tip of the motor shaft.
- Position the master-compression-plate assembly level when attaching gear 1.

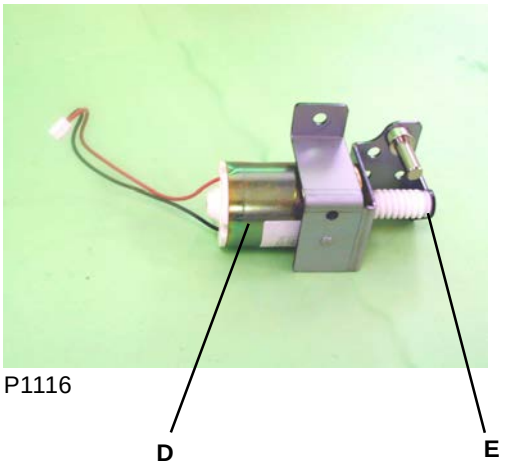


P1126



P1115

A: Compression-gear cover
B: Gear 1
C: Gear 2
D: Master compression motor
E: Plastic washer



P1116

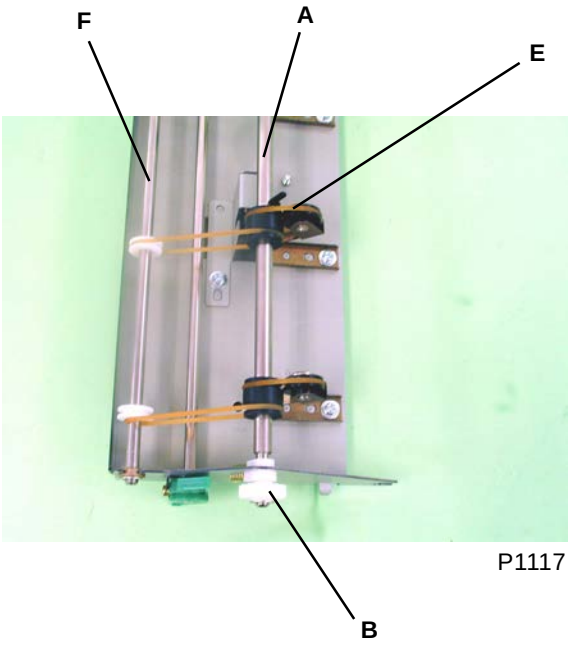
6. Removing the Master Disposal Belt

(1) Remove the master-disposal upper assembly from the machine (see this chapter).

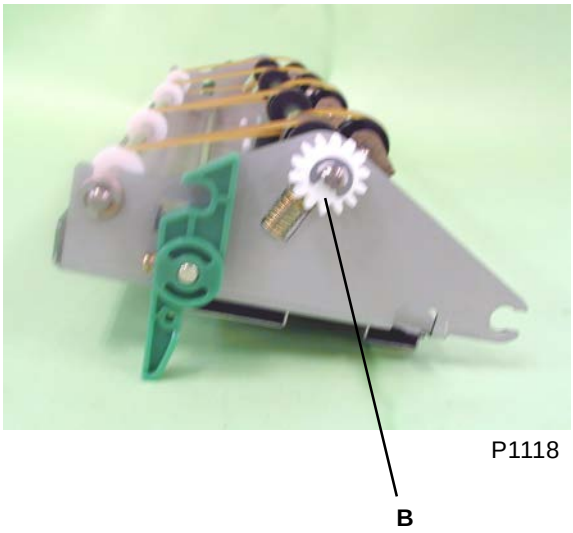
(2) Detach the gear [B] from the master disposal roller [A] by removing E-ring, and detach the master-disposal-roller support [C] and master-disposal-roller spring [D].
Detach E-ring from the opposite end, detach the master-disposal-roller support [C] and master-disposal-roller spring [D], and then remove the master disposal roller (rubber) [A].

(3) Remove the master disposal belt (short) [E].

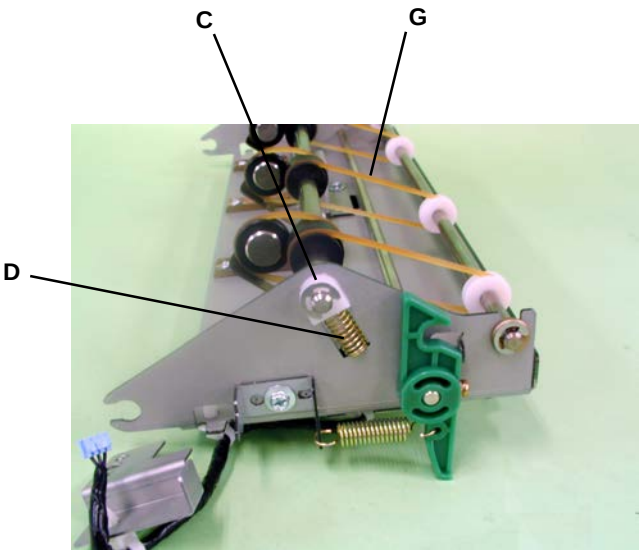
(4) Detach the E-rings and metals from both ends of the pulley shaft [F], detach the pulley shaft [F], and then remove the master disposal belt (long) [G].



P1117



P1118



P1119

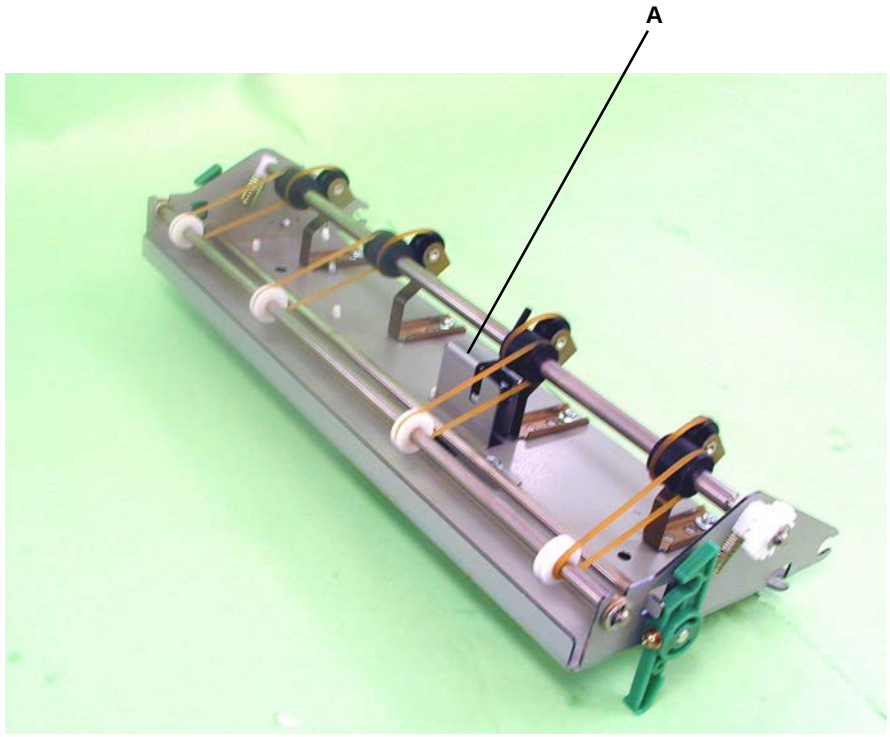
A: Master disposal roller
B: Gear
C: Master-disposal-roller support
D: Master-disposal-roller spring
E: Master disposal belt (short)
F: Pulley shaft
G: Master disposal belt (long)

7. Removing the Master-Disposal Jam Sensor

(1) Remove the master-disposal upper assembly from the machine (see this chapter).

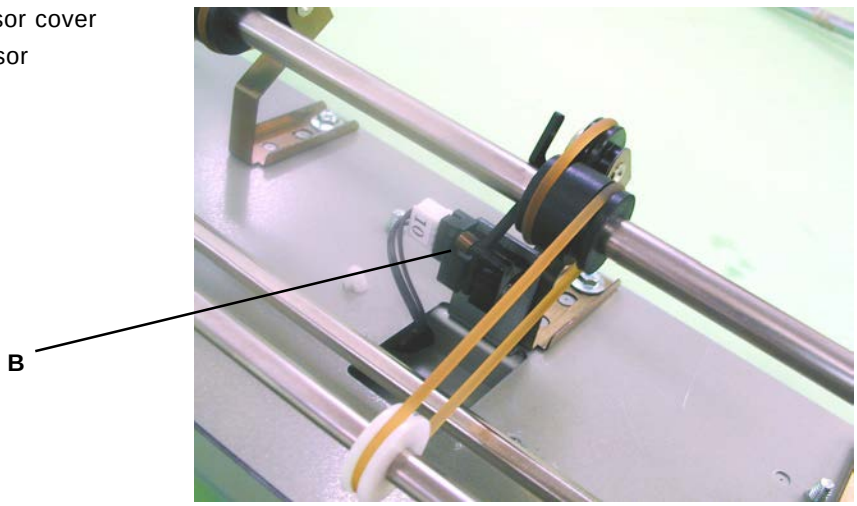
(2) Remove the master-disposal jam-sensor cover [A] by removing one screw (M4 x 8).

(3) Unplug the connector, and then remove the master-disposal jam sensor [B].



P1120

A: Master-disposal jam-sensor cover
B: Master-disposal jam sensor

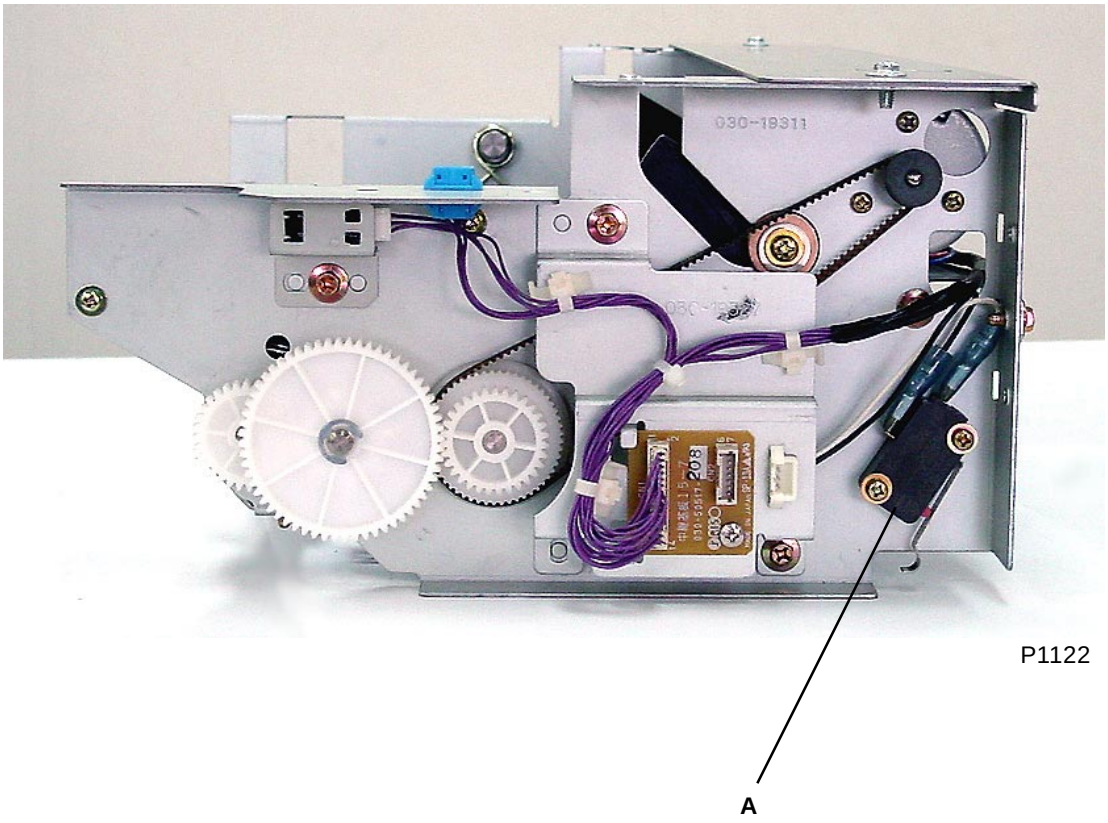


P1121

8. Removing the Disposal-Box Safety SW

(1) Remove the master disposal unit.

(2) Unplug the connector, and then remove the disposal-box safety SW [A] by removing two screws (M3 x 14).



P1122

A: Disposal-box safety SW

9. Removing Other Sensors

Remove the master disposal unit (see this chapter).

Disposal top-cover sensor

(1) Unplug the connector and remove the disposal top-cover sensor [A] by removing one screw (M4 x 8), together with the bracket.

Master-disposal-motor limit sensor

(1) Remove the master disposal motor (see this chapter).

(2) Unplug the connector, and then remove the master-disposal-motor limit sensor [B].

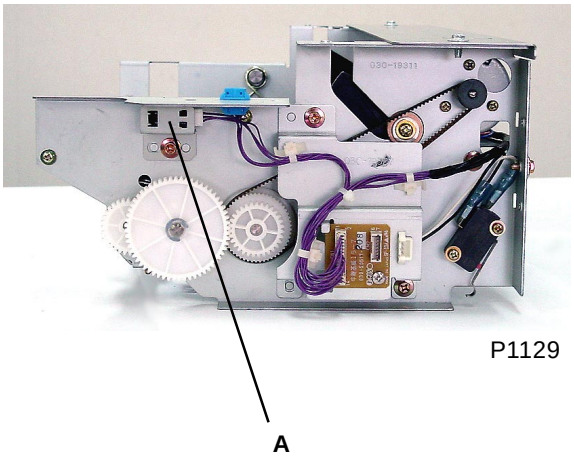
Master compression sensor

(1) Remove the master-compression-plate assembly (see this chapter).

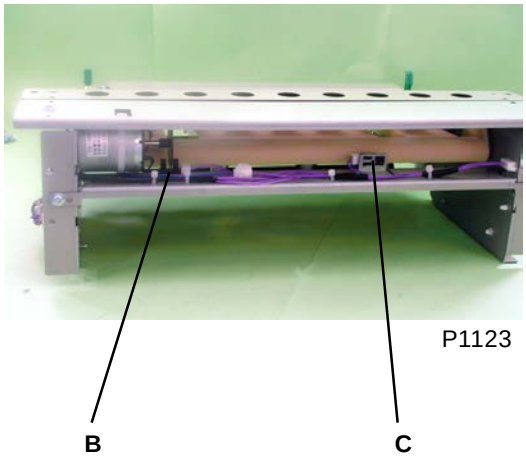
(2) Unplug the connector, and then remove the master compression sensor [C].

Master-compression-motor limit sensor

(1) Unplug the connector and remove the master-compression-motor limit sensor [D] by removing one screw (M4 x 8), together with the bracket.

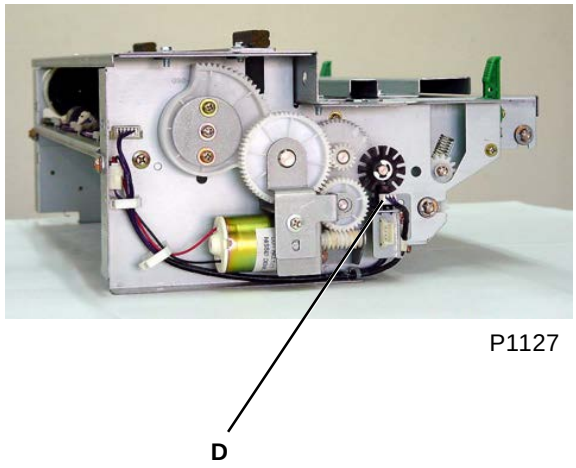


P1129



P1123

A: Disposal top-cover sensor
B: Master-disposal-motor limit sensor
C: Master compression sensor
D: Master-compression-motor limit sensor



P1127

MEMO

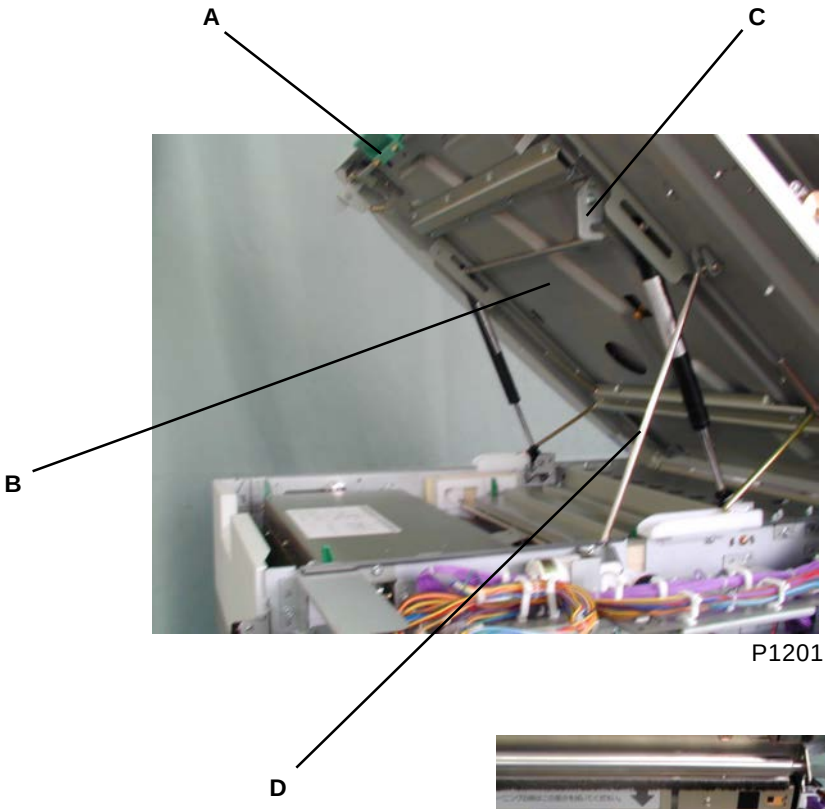
CHAPTER 12: FB ORIGINAL SCANNING SECTION

Contents

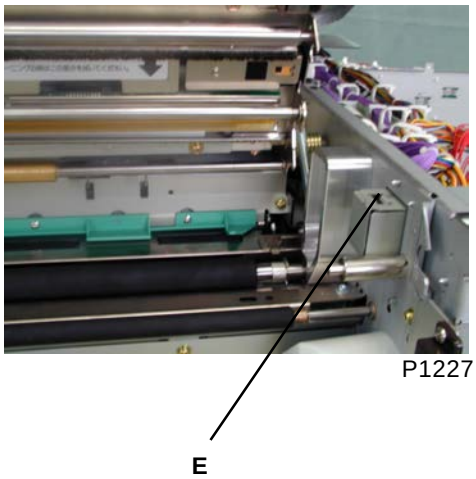
Mechanism

1. Scanner-Table Setting Mechanism

The scanner table [B] can be opened using the scanner-table open lever [A].
It can be opened to a wider angle by loosening the stopper [C] and inserting the scanner support shaft [D] into the hole
(this is referred to as the “service position”).
The flatbed set SW [E] is used to check whether the scanner table has been set correctly.
This switch also serves as a safety switch, cutting the power supply to the main motor, clamp motor, cutter motor, master disposal motor, and thermal power head (TPH) if the scanner table is open.



P1201



P1227

A: Scanner-table open lever
B: Scanner table
C: Stopper
D: Scanner support shaft
E: Flatbed set switch

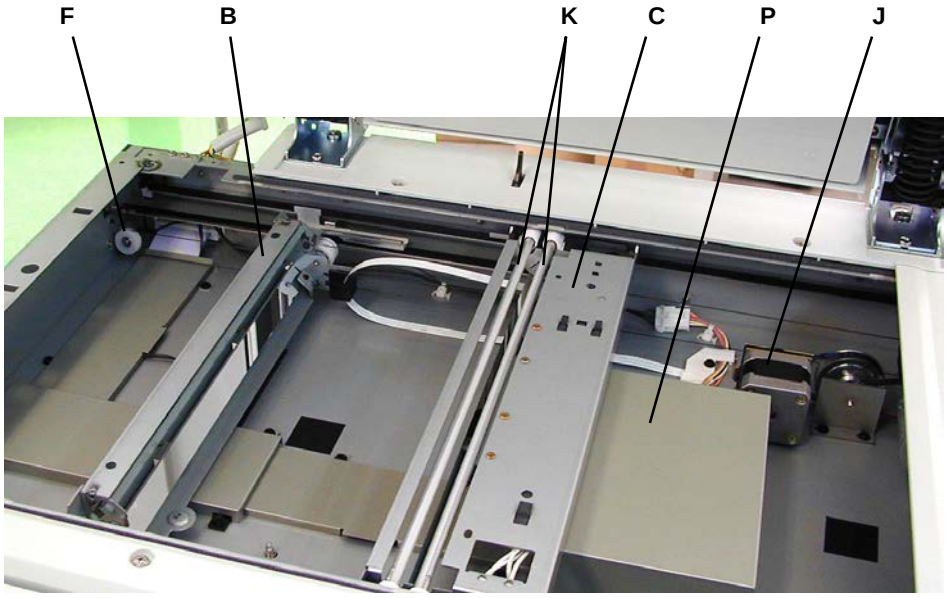
Memo

2. Original Scanning Mechanism (300 dpi PREVIOUS scanner unit)

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].

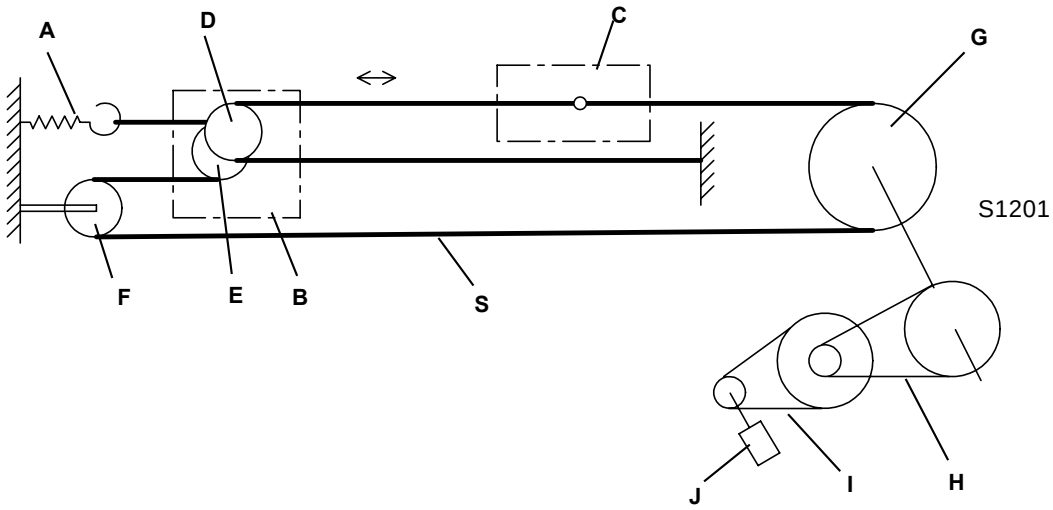
The mechanism uses a “full/half-rate mirror scanning” system, in which the mirror carriage moves 1/2 L mm as the lamp carriage moves L mm in the same direction. This means that when the FB read pulse motor [J] is activated, the original surface can be scanned while maintaining a constant distance between 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].



P1213

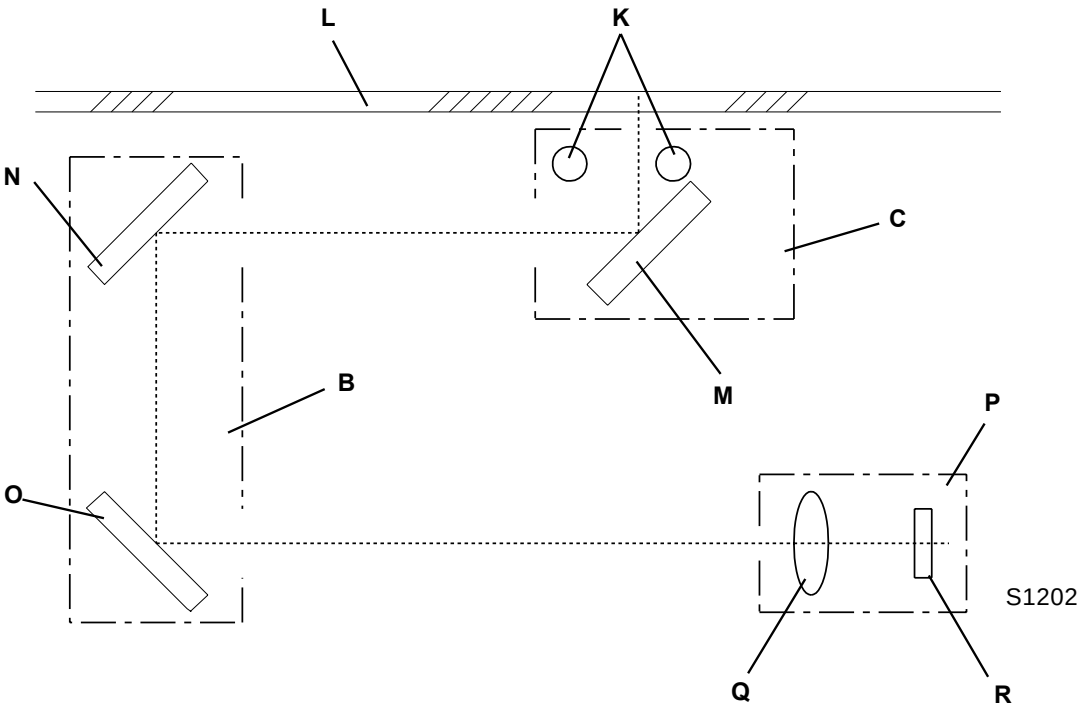
A: Spring
B: Mirror carriage
C: Lamp carriage
D: Sliding pulley 1
E: Sliding pulley 2
F: Fixed pulley
G: Wire spool pulley
H: Timing belt 1
I: Timing belt 2
J: FB read pulse motor
K: Original illumination lamp
L: Stage glass
M: Mirror 1
N: Mirror 2
O: Mirror 3
P: Lens ass’y
Q: Lens
R: CCD
S: Wire

Drive-system diagram



S1201

Optical-system diagram



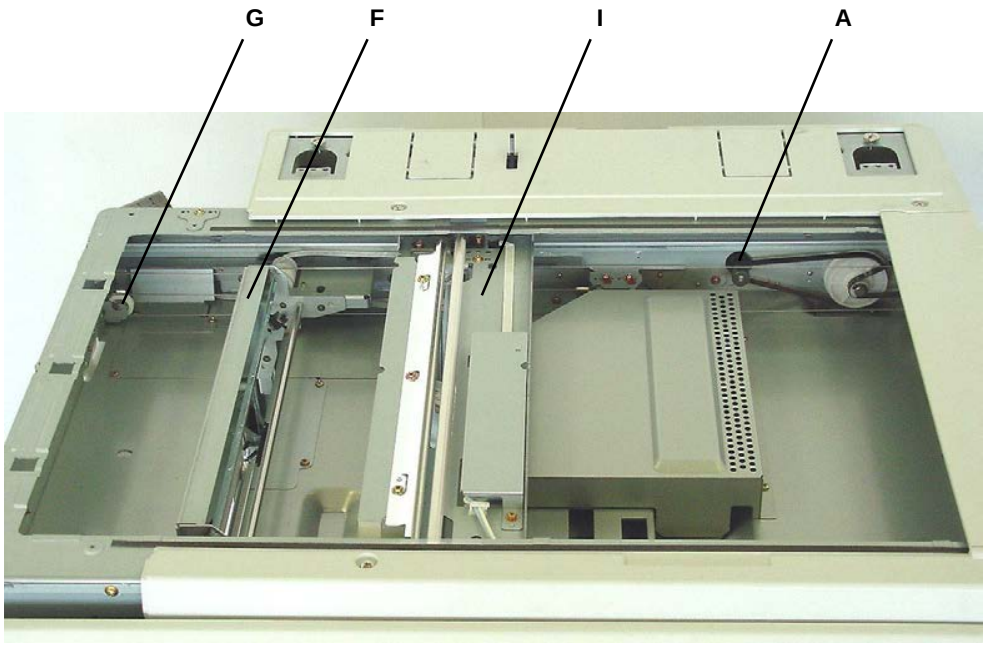
S1202

3. Original Scanning Mechanism (300 dpi NEW scanner unit)

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].

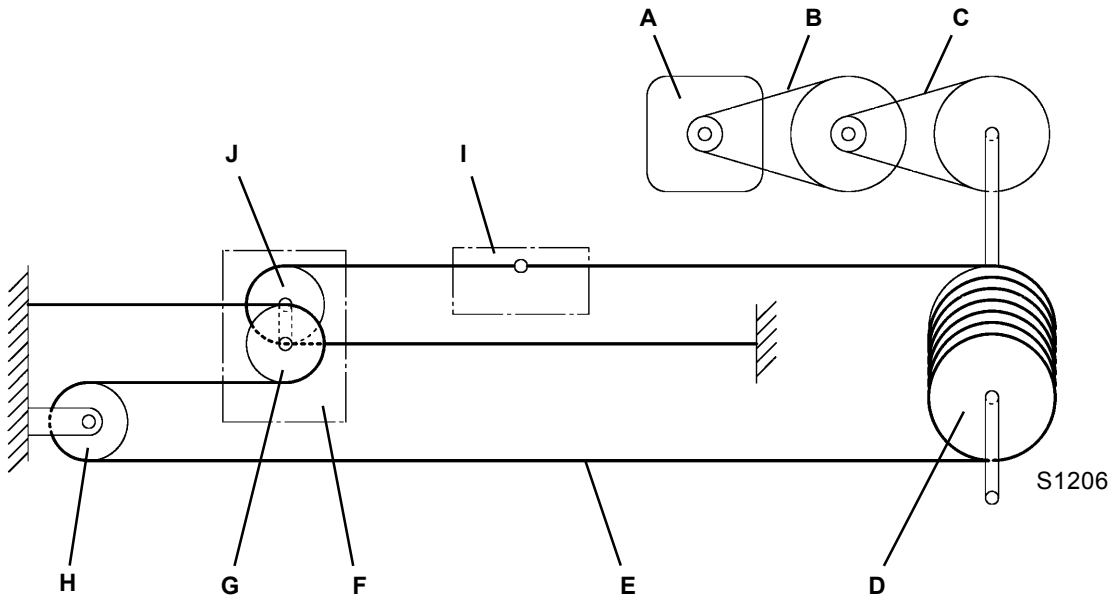
The mechanism uses a “full/half-rate mirror scanning” system, in which the mirror carriage moves 1/2 L mm as the lamp carriage moves L mm in the same direction. This means that when the FB read pulse motor [J] is activated, the original surface can be scanned while maintaining a constant distance between 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].



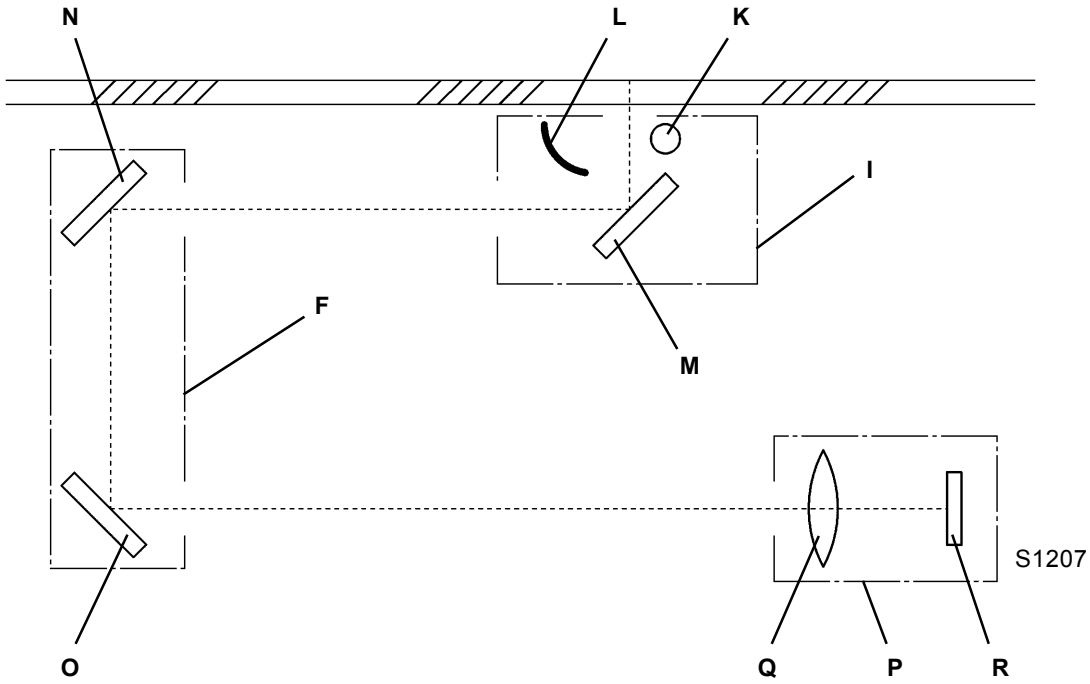
P1228

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



4. Original Scanning Mechanism (400 dpi & 600 dpi)

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.

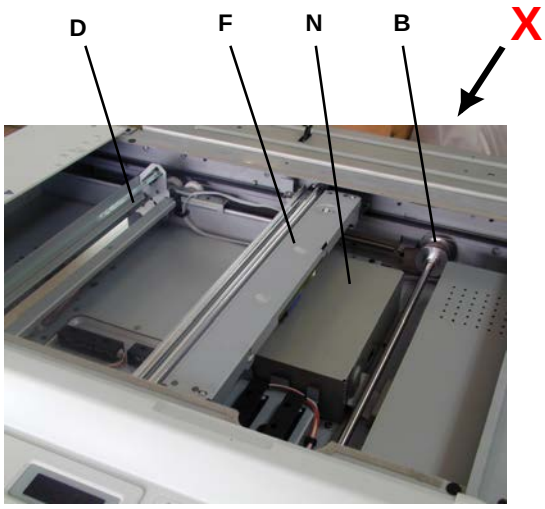
The front and rear wire-spool pulleys are configured symmetrically.

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].

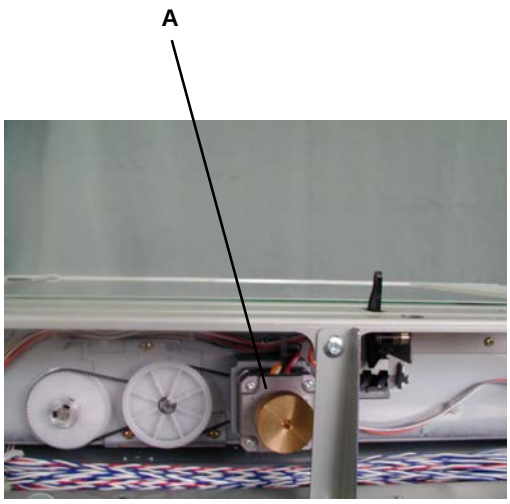
The mirror carriage [D] and lamp carriage [F] are able to move horizontally along the rails attached to the respective sliders.

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].



P1202

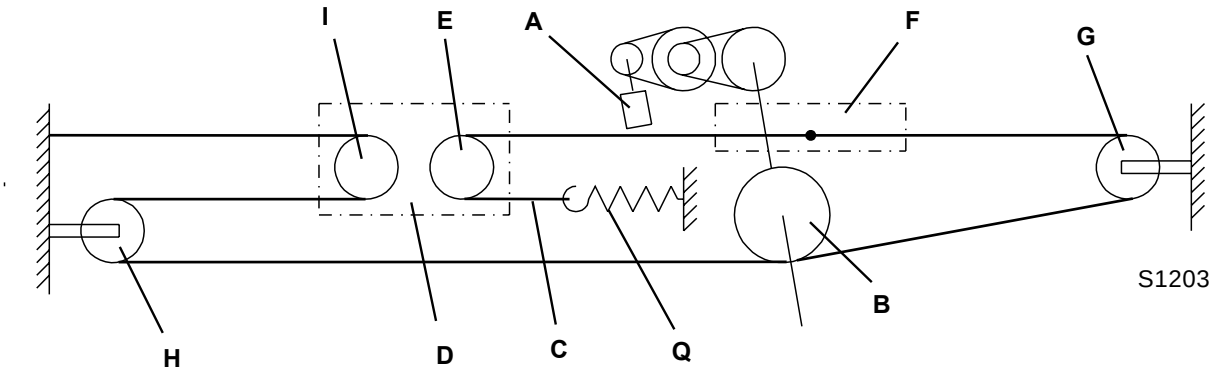


P1203

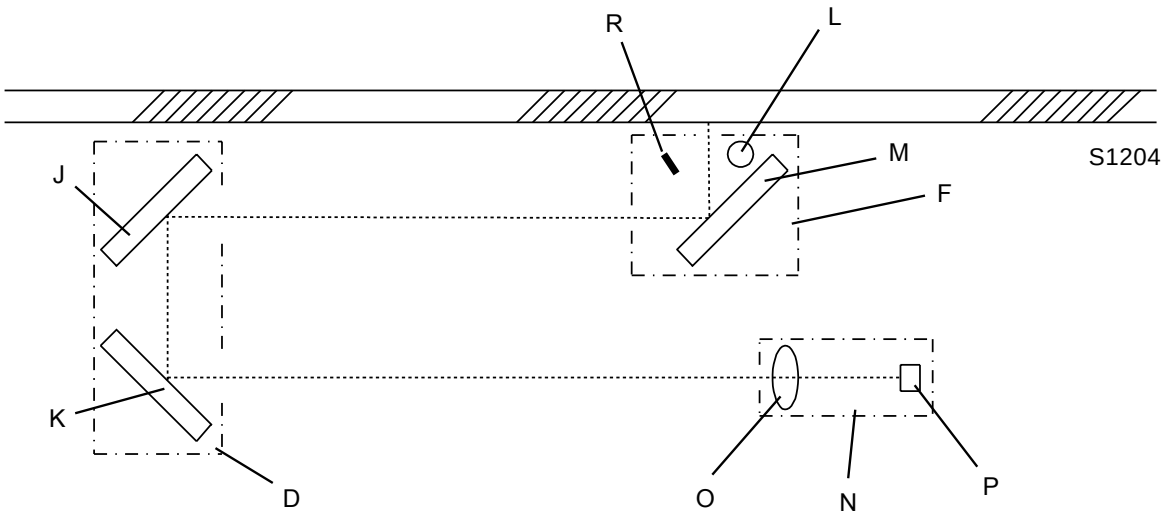
Viewed from X direction

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



5. Flatbed Initialization (300 dpi previous scanner, 400 dpi & 600 dpi)

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.
On 600-dpi machines, the flatbed is moved to the shading-compensation position after moving to the home position. Then, the lamp illuminates, and peak detection is performed as part of the shading compensation operation. The lamp finally turns off, and the flatbed is returned to the home position.

P1210

P1211

A

B

A: FB/AF HP sensor
B: Lamp carriage

6. Flatbed Initialization (300 dpi NEW scanner)

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

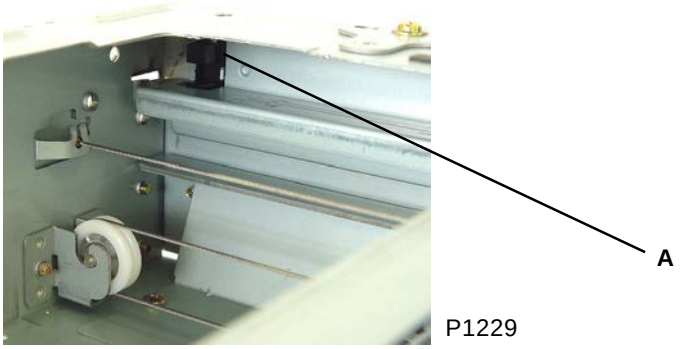
- When the power is switched on
- When “All reset” is performed

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 scanning direction until the sensor turns OFF (receives light), and moves the lamp carriage [C] to the scanning direction (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.”)

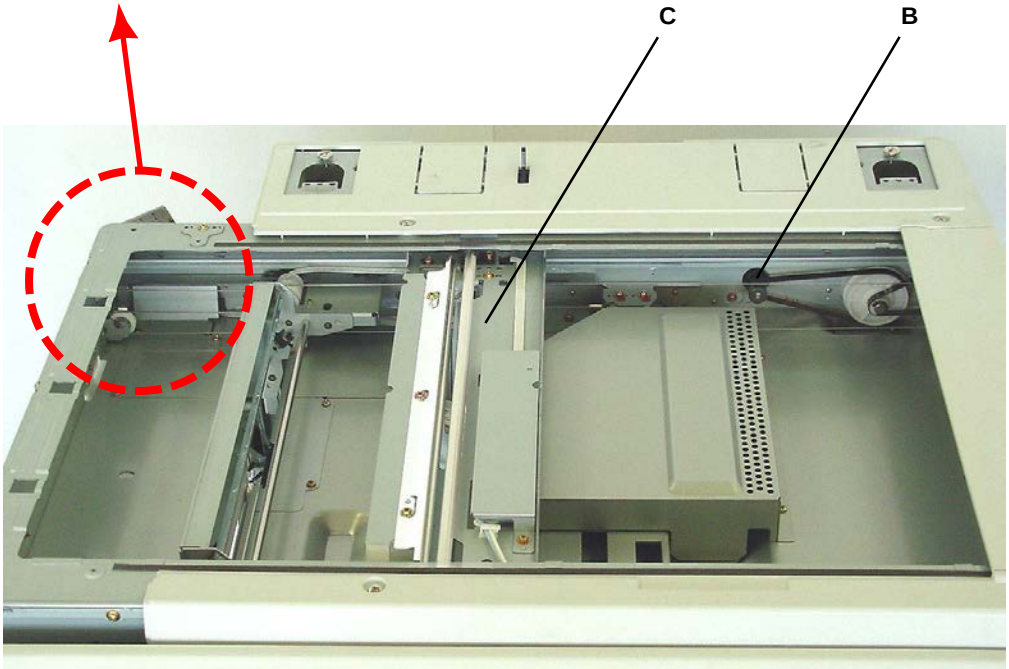
If the FB/AF HP sensor is OFF at the time of operation start, the flatbed read pulse motor rotates in the return direction to move the lamp carriage a distance of 8 mm (if the FB/AF HP sensor turns ON during this operation, the above-described operation, which is carried out when the sensor is ON at the time of operation, starts), then the flatbed read pulse motor moves in the scanning 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 shading-compensation is 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.



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

P1229

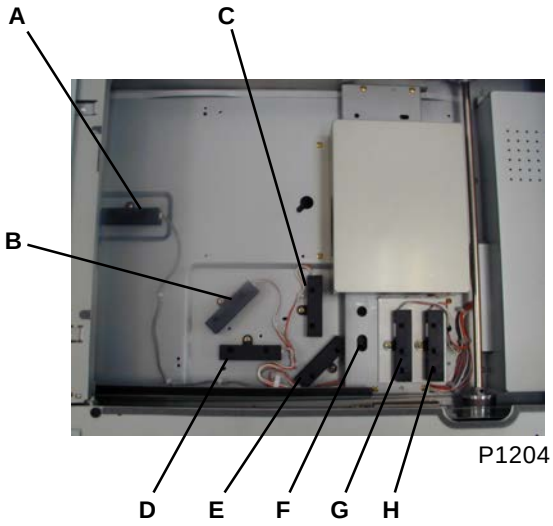


P1230

7. Original Size-Detection Mechanism (excludes 300 dpi)

If the flatbed original det. sensor [A] detects its reflected light (original present), the size of the original is detected based on the detection statuses of flatbed original size sensors 1 to 7 [B], [C], [D], [E], [F], [G], and [H] (reflection-type sensors). The size of the original is determined as shown in the table below.

A: Flatbed original det. sensor
B: Flatbed original size sensor 1
C: Flatbed original size sensor 2
D: Flatbed original size sensor 3
E: Flatbed original size sensor 4
F: Flatbed original size sensor 5
G: Flatbed original size sensor 6
H: Flatbed original size sensor 7



P1204

Flatbed original size sensor No.							Detected originial size
1	2	3	4	5	6	7	
1	1	0	0	0	0	0	A5
1	1	0	0	1	0	0	B5
1	0	0	0	0	0	0	A5-R
1	0	1	0	0	0	0	B5-R
1	1	1	1	0	0	0	A4-R
1	1	0	0	1	1	1	FOOLSCAP
1	1	1	0	1	1	1	B4
1	1	0	0	1	1	0	A4
1	1	1	1	1	1	1	A3

T1207

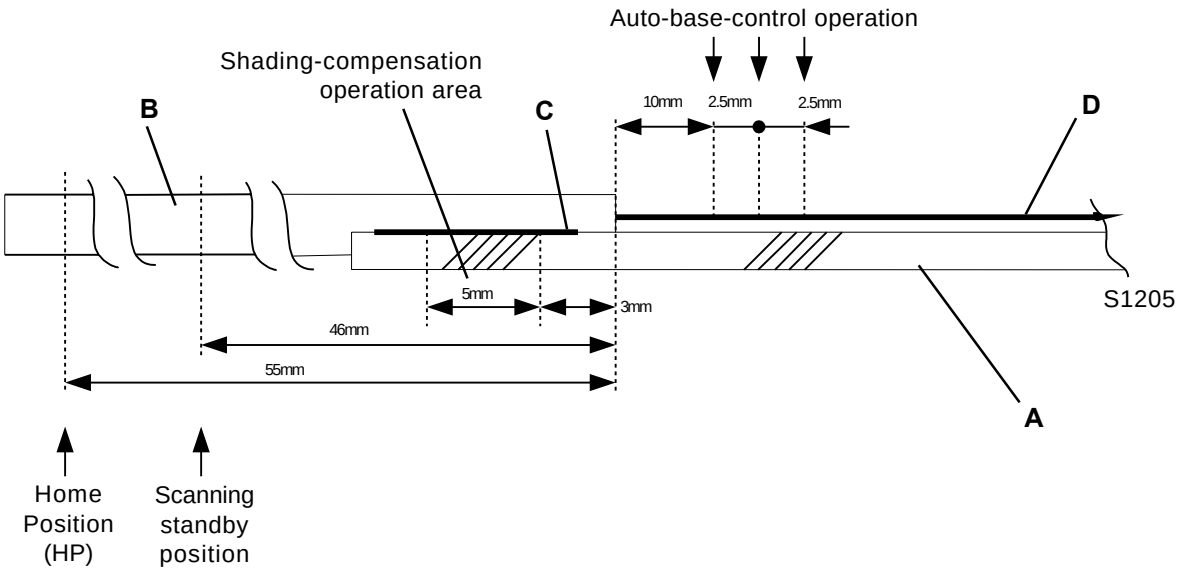
* "1" indicates sensor light reflected back (original present), and "0" indicates sensor light not reflected back (no original).
* The original size will not be identified for combinations other than those listed.

8. Stage-Glass Original Detection Mechanism

(300 dpi previous scanner, 400 dpi & 600 dpi)

The flatbed original det. 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 det. sensor checks whether there is an original on the stage glass [A]. If the light emitted from the flatbed original det. sensor is reflected back (original present), the indication on the panel changes to “Ready to make master.” 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. *[With the scanner units with flatbed original size sensors to detect the original size, e.g. 400 dpi and 600 dpi units, the same action is made if any one of the flatbed original size sensors detects its own reflected light (original present) even though the flatbed original det. sensor is not detecting the original.]*
If the START key is pressed within 60 seconds, the lamp carriage starts the scanning operation.

If the START key is not pressed within 60 seconds, the lamp turns off and the lamp carriage is returned to the home position. If the START key is subsequently pressed, the shading-compensation and auto-base-control operations are repeated, and the lamp carriage starts the scanning operation.



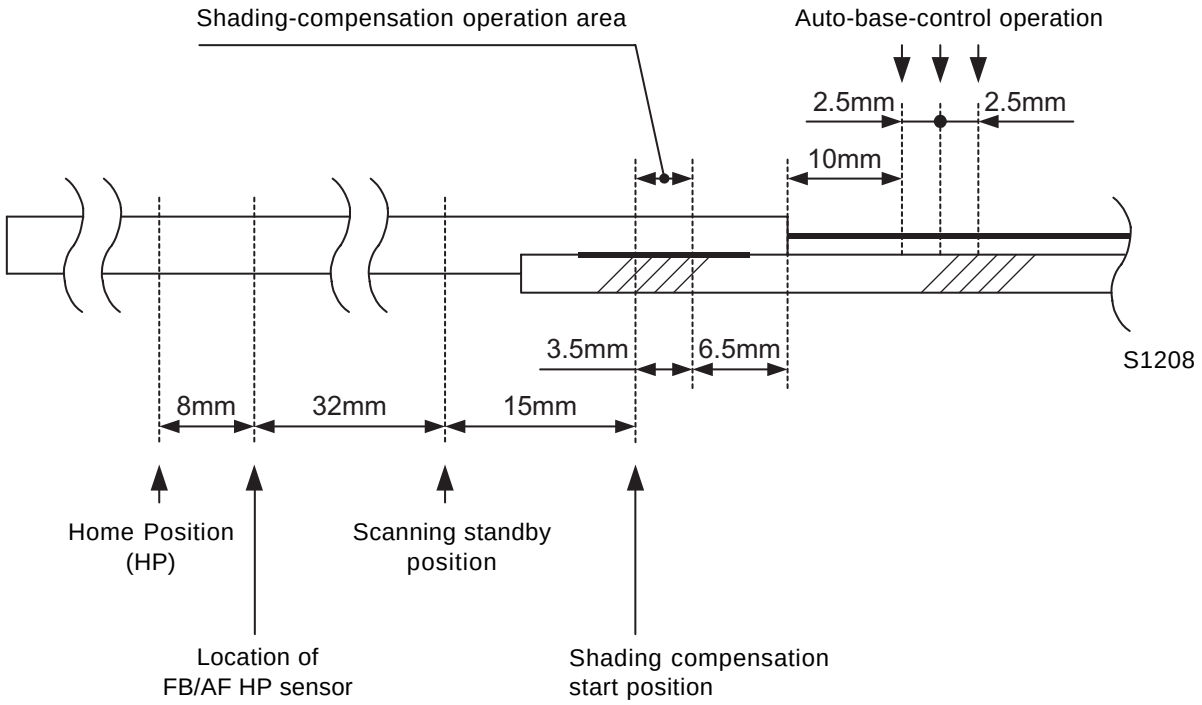
A: Stage glass
B: Original stopper
C: Shading plate
D: Original

9. Stage-Glass Original Detection Mechanism

(300 dpi NEW scanner unit)

The flatbed original det. 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 det. sensor checks whether there is an original on the stage glass [A]. If the light emitted from the flatbed original det. sensor is reflected back (original present), the indication on the panel changes to “Ready to make master.” 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 lamp carriage starts the scanning operation.

If the START key is not pressed within 60 seconds, the lamp turns off and the lamp carriage is returned to the home position. If the START key is subsequently pressed, the shading-compensation and auto-base-control operations are repeated, and the lamp carriage starts the scanning operation.



10. FB Original Scanning Movement (Book Mode OFF)

When the START key is pressed, the FB read pulse motor activates, and the lamp carriage starts to move in the scanning direction. After the top 4 mm of the original is skipped, the read/write signal is activated and scanning of the original starts.
Once scanning has been performed for the specified distance, the lamp turns off, and the scanning operation ends. The lamp carriage is then returned to the home position.

11. Book-Mode Pre-Scan Mechanism

When an original is placed on the stage glass and the START key is pressed, the lamp illuminates, the FB read pulse motor is activated, and the lamp carriage starts to move in the scanning direction (300-dpi and 400-dpi machines: speed of 50% reproduction rate; 600-dpi machines: speed of 25% 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.

12. Book-Mode Scanning Mechanism

Once the pre-scan operation is complete, the lamp illuminates, the FB read pulse motor is activated, and the lamp carriage starts to move in the scanning direction for the shading-compensation operation.
The read/write signal is activated, and scanning of the original starts.
Once scanning has been performed for the specified distance, the lamp turns off and the FB read pulse motor stops briefly. The motor activates again and the lamp carriage is then returned to the home position, and the scanning operation ends.

Removal and Assembly

1. Removing the Scanner Unit

(1) Move the carriage to the locking position using test mode No. 154 (scanner lock action), open the scanner table [D], secure the mirror carriage with the scanner-unit securing screw, and then close the scanner table.

(2) Switch off the power, and remove the rear cover.

(3) Remove the two screws (M4 x 8) from the stage cover and remove the ground-wire screw (M4 x 8) holding the scanner-unit cover (rear), and then remove the stage cover. (In addition, remove the AF unit and digitizer if they are provided.)

(4) Remove the scanner-unit cover (rear) by removing four screws (M4 x 8).

(5) Remove the scanner-unit cover (left) by removing two screws (M4 x 8).

(6) Remove the scanner-unit cover (right) by removing two screws (M4 x 8).

(7) Detach the operation panel by removing three screws (M4 x 8), pull out the flat cable from the slot in the scanner unit, and place it in the paper-feed tray for the time being. Detach the wire harness protection plate [E] by removing two screws (M4 x8).

(8) Unplug the FB read pulse motor connectors (400-dpi and new 300-dpi scanners only) and FB/AF HP sensor connectors (400-dpi only) attached to the scanner unit. Then unplug the connector from the rear of the scanner unit (previous type 300-dpi scanner); unplug the connector from the junction PCB (new type 300-dpi scanner).

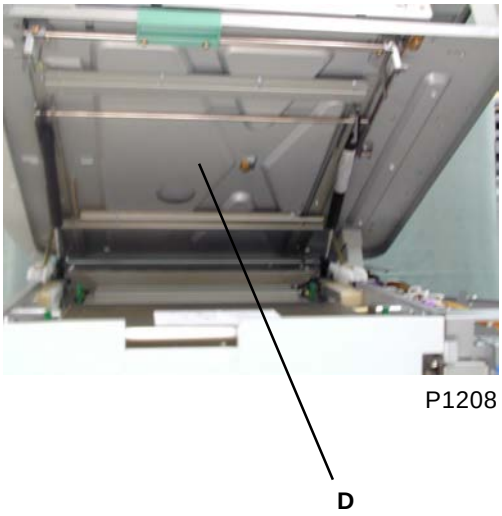
(9) Remove the stage-cover sensor [A] with by removing one screw (M4 x8), and unplug the connector.

(10) Remove the four screws (M4 x 8) securing the scanner unit [C] to the hinge bracket [B].

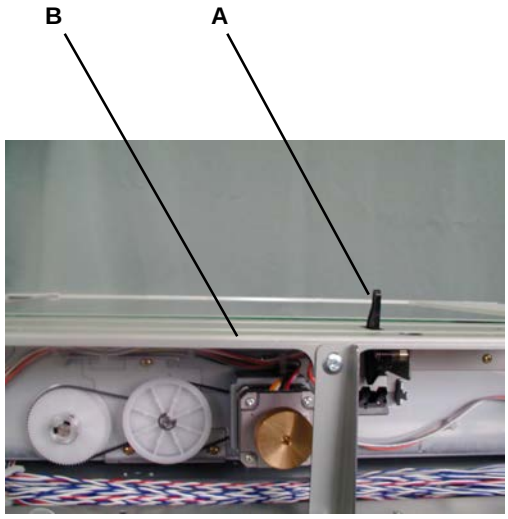
(11) Remove the four screws (M4x8) from the scanner unit [C], unplug the connector underneath (cable running between the rear of the scanner unit and IF-PCB for the previous type 300-dpi scanner; cable running to the image processing PCB for the new type 300-dpi scanner) and then remove the scanner unit by lifting it upward. (Exercise caution during handling, as this is a heavy precision unit.)

[Precautions on Reassembly]

- After the reassembly, open the scanner table [D] and remove the scanner-unit securing screw. Then, clear the error status using test mode No. 155 (scanner release action).
- For the 600-dpi, 400-dpi, and new 300-dpi scanner machines, note the figures written on the label affixed to the top right of the scanner unit prior to reassembly. After the reassembly, start up “Factory mode,” as described on pages 12-30 and 12-31 of this chapter, to adjust the scanner unit setting. (Apart from the fact that no menu screen appears, the procedure for Factory mode is the same as for normal test modes.)

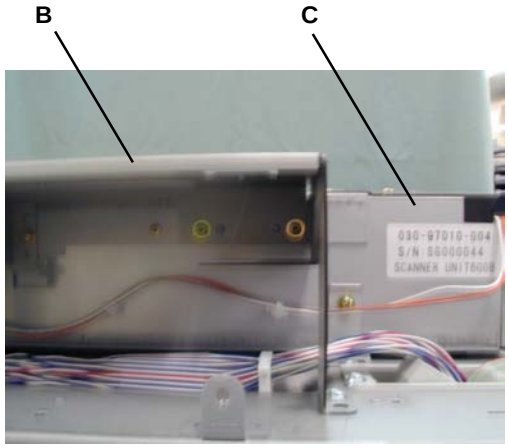


P1208

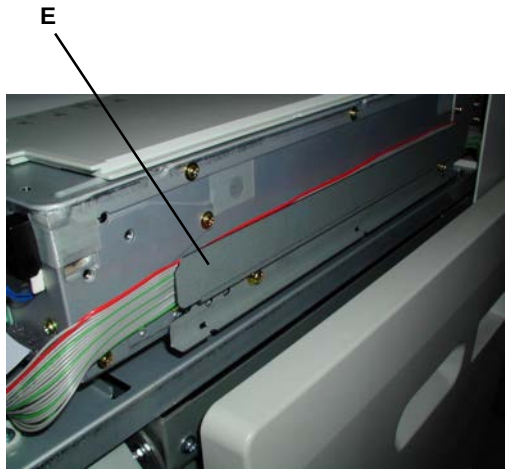


P1225

A: Stage-cover sensor
B: Hinge bracket
C: Scanner unit
D: Scanner table
E: Wire harness protection plate



P1209



P1224

2. Removing the Stage Glass

(300 dpi previous scanner, 400 dpi & 600 dpi)

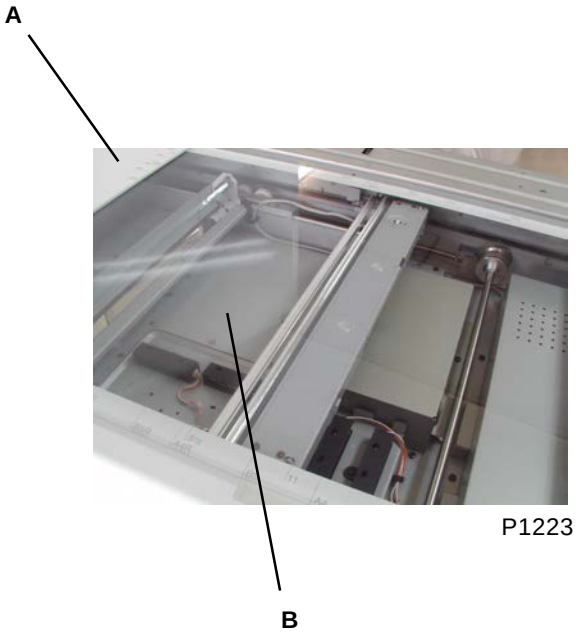
(1) Remove the two screws (M4 x 8) from the stage cover and remove the ground-wire screw (M4 x 8) holding the scanner-unit cover (rear), and then remove the stage cover. (In addition, remove the AF unit and digitizer if they are provided.)

(2) Detach the scanner-unit cover (rear) by removing four screws (M4 x 8).

(3) Detach the scanner-unit cover (left) by removing two screws (M4 x 8).

(4) Remove the two special stepped screws from the original stopper [A], and then remove the original stopper [A]. (The original stopper has hooks engaged at the bottom. Slide it toward the paper-feed side before lifting it upward.)

(5) Remove the stage glass [B].



P1223

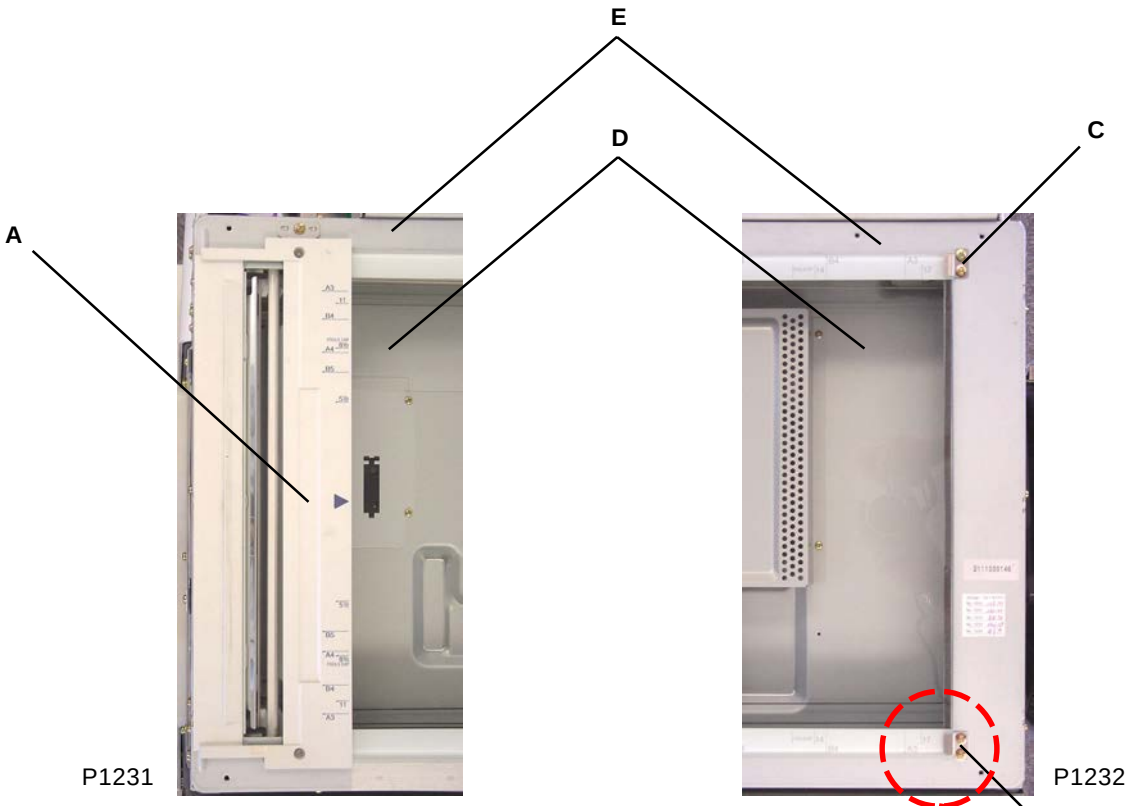
A: Original stopper
B: Stage glass

3. Removing the Stage Glass

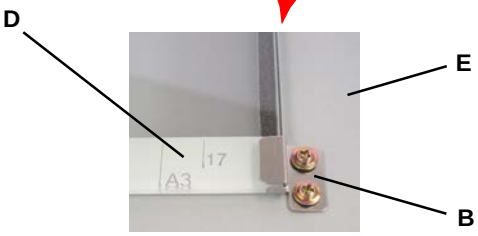
(300 dpi NEW scanner unit)

(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] by removing two M3 x 6 screws each.
(4) Remove the stage glass [D].



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



P1233

[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.

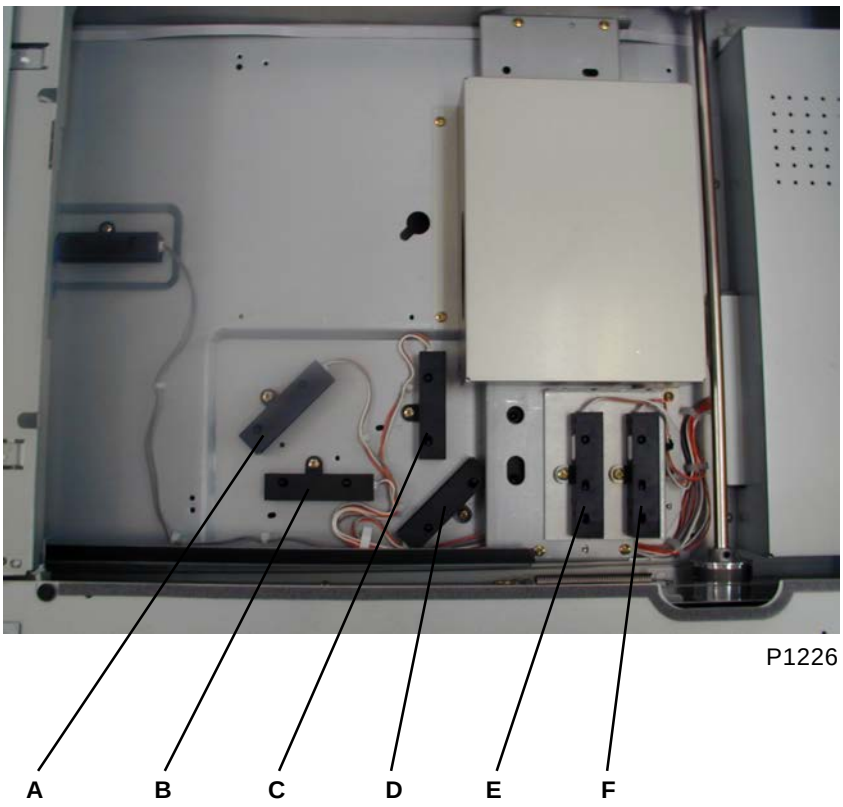
4. Removing the Flatbed Original Size Sensors (excludes 300 dpi)

(1) Switch off the power.
(2) Remove the stage glass. (Refer to page 12-18)
(3) Unplug the connectors and detach the flatbed original size sensors [A], [B], [C], [D], [E], [F] by removing one screw (M3 x 6) on each sensor.

[Precaution on Reassembly]

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

600 dpi & 400 dpi



P1226

A: Flatbed original size sensor 1
B: Flatbed original size sensor 2
C: Flatbed original size sensor 3
D: Flatbed original size sensor 4
E: Flatbed original size sensor 5
F: Flatbed original size sensor 6

5. Removing the Flatbed Original Det. Sensor

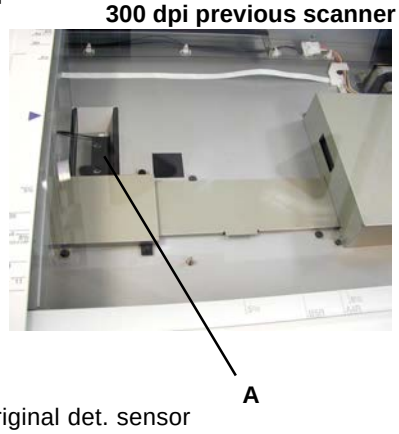
(300 dpi previous scanner, 400 dpi & 600 dpi)

(1) Switch off the power.
(2) Remove the stage glass. (Refer to page 12-18)
(3) Unplug the connector and detach the flatbed original det. sensor [A] by removing one screw (M3 x 6 for 600-dpi and 400-dpi; M3 x 8 for 300-dpi with previous type scanner).

[Precaution on Reassembly]

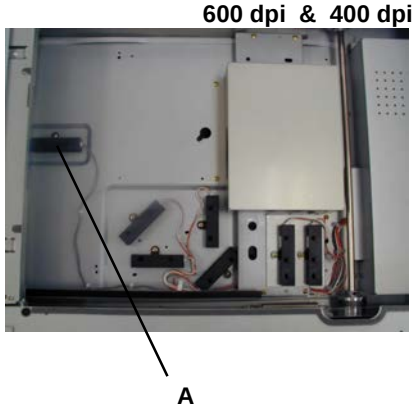
- Align the protrusions (two locations) on the underside of the sensor with the holes in the scanner base plate.

300 dpi previous scanner



P1212

600 dpi & 400 dpi



P1243

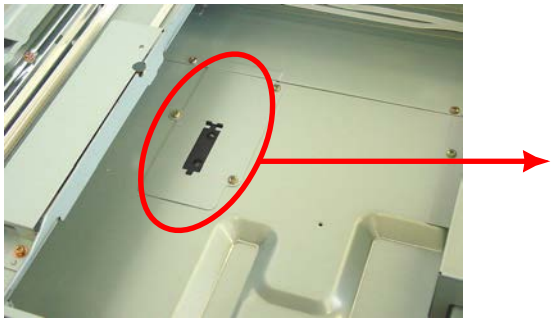
A: Flatbed original det. sensor

6. Removing the Flatbed Original Det. Sensor

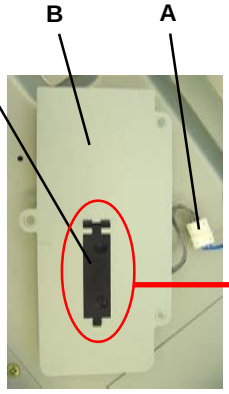
(300 dpi NEW scanner unit)

(1) Switch off the power.
(2) Remove the stage glass. (Refer to page 12-19)
(3) Unplug connector [A], and detach the flatbed original det. sensor together with the sensor cover [B] by removing three screws (M3 x 6).
(4) Disengage the three claws of the flatbed original detection sensor [C] from the sensor cover, and remove the flatbed original detection sensor [D].

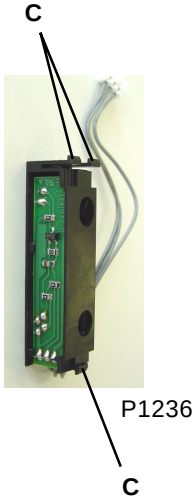
300 dpi new scanner



P1234



P1235



P1236

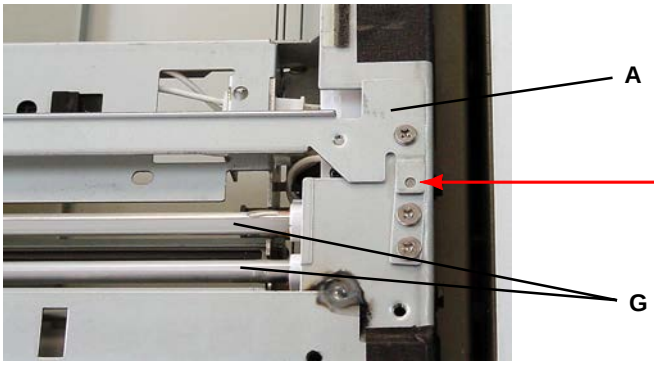
A: Connector
B: Sensor cover
C: Claws on the sensor
D: Flatbed original detection sensor

7. Removing the Lamp (300 dpi PREVIOUS scanner unit)

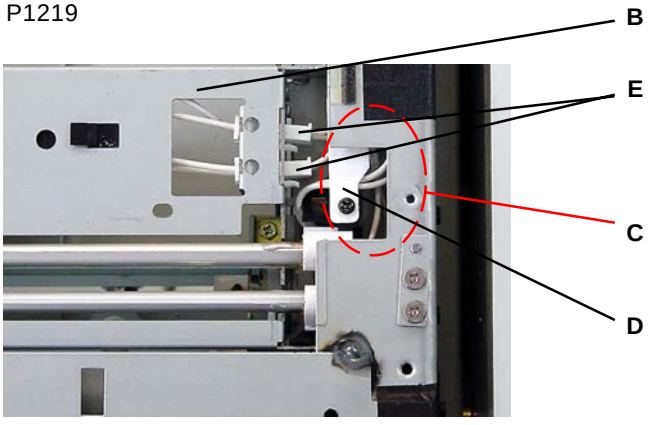
(1) Switch off the power, and remove the stage glass.
(2) Remove the stage glass holder [A] by removing two special screws.
(3) Push the lamp carriage [B] by hand (taking care not to touch optical components) and move it to the cutaway [C] in the scanner unit frame.
*** Perform the following procedures 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.

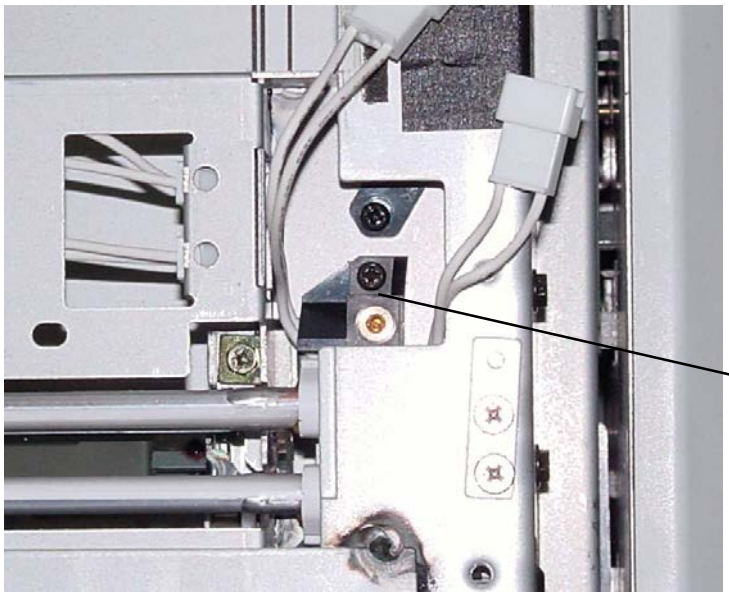


P1219

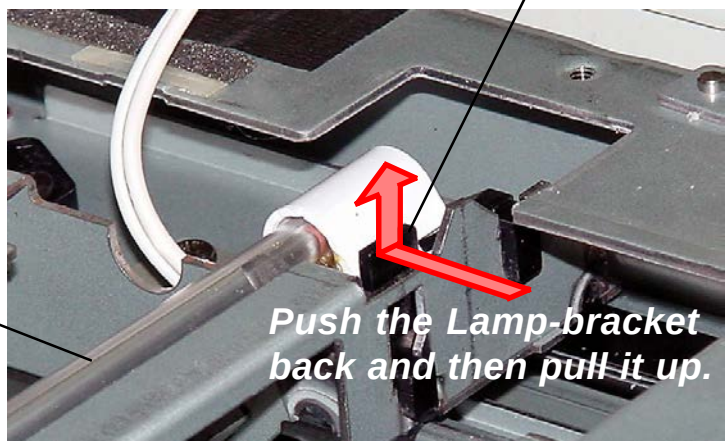


P1215

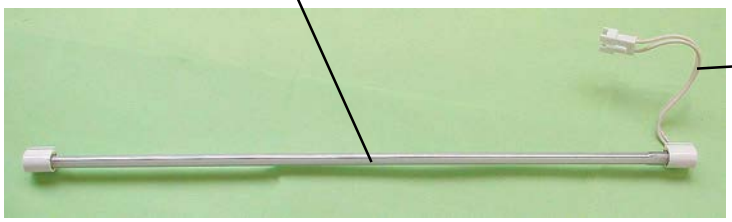
A: Stage glass holder
B: Lamp carriage
C: Cutaway
D: Lamp wire harness stopper
E: Connectors
F: Lamp bracket (with screw hole)
G: Lamp
H: Lamp bracket



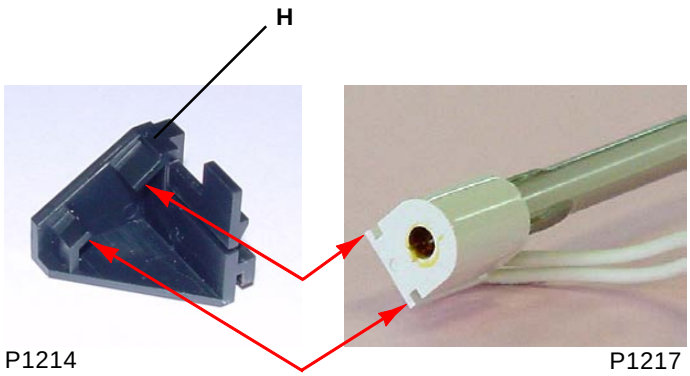
P1216



P1247



P1218



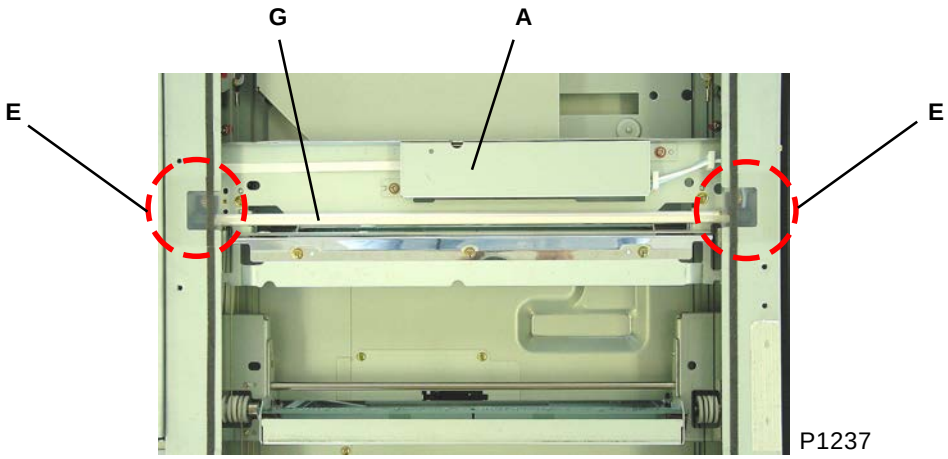
P1214

P1217

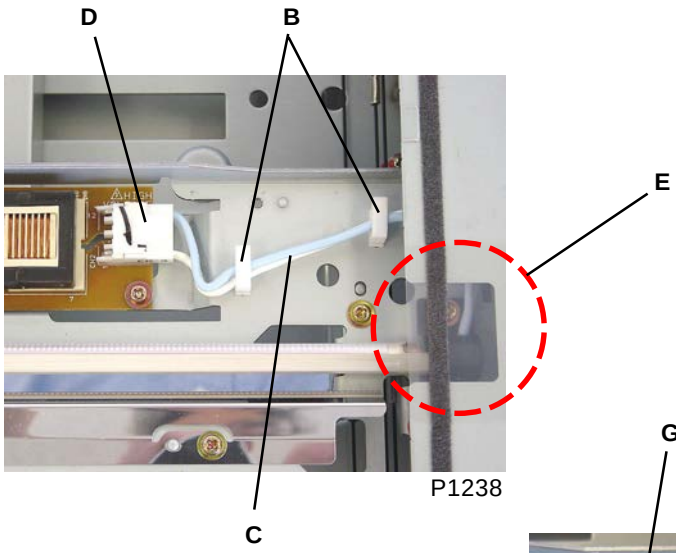
P1246

8. Removing the Lamp (300 dpi NEW scanner unit)

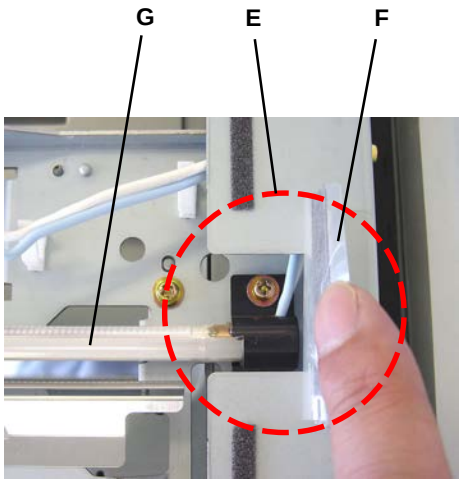
(1) Start Test Mode No.158 (scanner lamp replacement position set), and switch off the power.
(2) Remove the stage glass.
(3) Remove the mounting screws (double-washer, M3 x 6: 2 pcs), and detach the inverter cover [A].
(4) Remove the lamp harness [C] from the two cord clamps [B], release the lock, and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



P1237



P1238

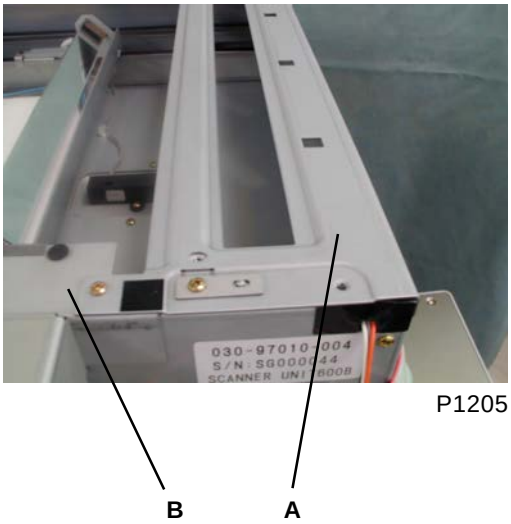


P1239

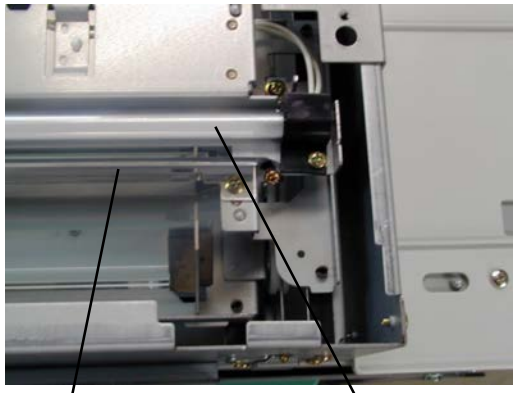
A: Inverter cover
B: Cord clamp
C: Lamp harness
D: Connector
E: Scanner-unit cutaway section
F: Film
G: Lamp

9. Removing the Lamp (400 dpi & 600 dpi)

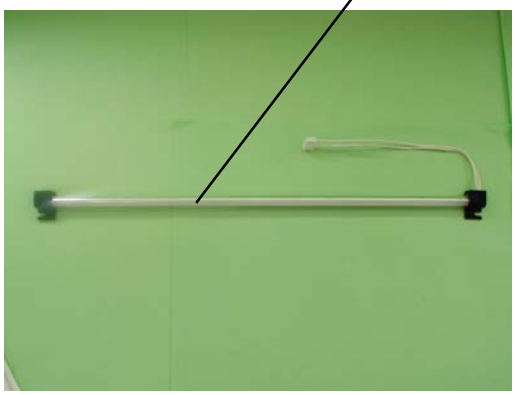
(1) Switch off the power.
(2) Remove the stage glass (see this chapter).
(3) Detach the top L stay [A] by removing four screws [M3 x 6]
(4) Bring the lamp carriage [C] to the large cutaway section on the scanner frame [B] from which the top L stay [A] was removed.
(5) Remove the two screws (M3 x 6), detach the wire harness from the wire clamp and wire saddle, and remove the lamp [D].



P1205



P1206



P1207

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

10. Removing the Lens Assembly (300 dpi PREVIOUS scanner unit)

(1) Switch off the power.

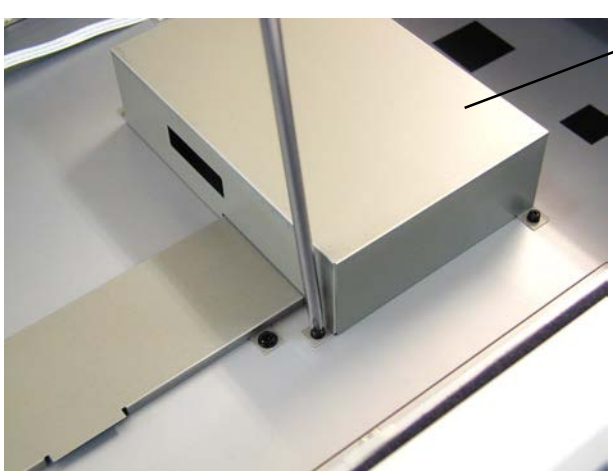
(2) Remove the stage glass (see this chapter).

(3) Detach the lens cover by removing three screws (M3 x 6).

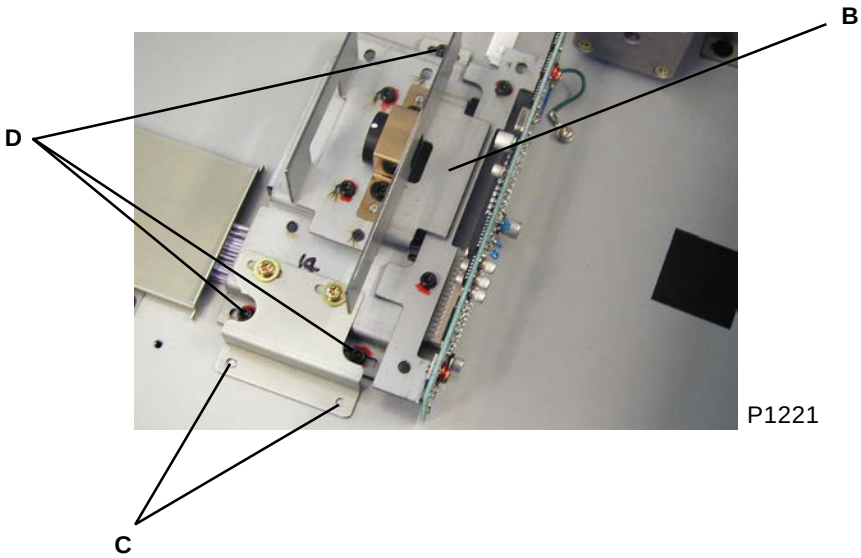
(4) Remove three cap screws (M3 x 6) with washers attached, and then detach the lens assembly after removing the ground wire and connector.

[Precautions on Reassembly]

- Set the two half-pierce alignment pins on the front of the lens assembly in position when putting the lens ass'y back on the scanner unit.
- Do not loosen any screws other than those specified.
- Do not touch the lens or other optical components.



P1220



P1221

A: Lens cover
B: Lens assembly
C: Half-pierce alignment pins
D: The three screws to remove

11. Removing the Lens Assembly (300 dpi NEW scanner unit)

(1) Switch off the power.

(2) Remove the stage glass (see this chapter).

(3) Detach the cover [A] by removing three screws (M3 x 6).

(4) Holding and supporting the CCD-PCB [B] by hand, disconnect the CCD-cable [C] from the PCB.

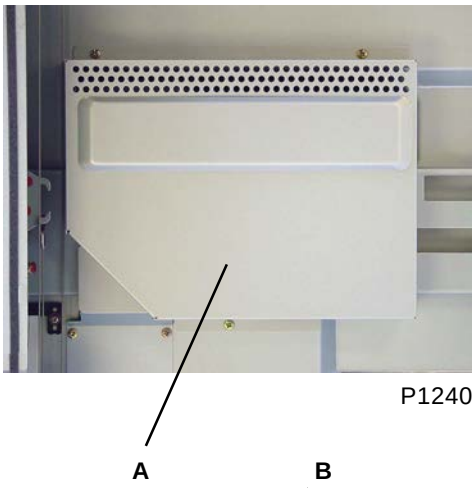
(5) Detach the lens assembly [D] by removing three screws [M3 x 6].

<< Assembly Instructions >>

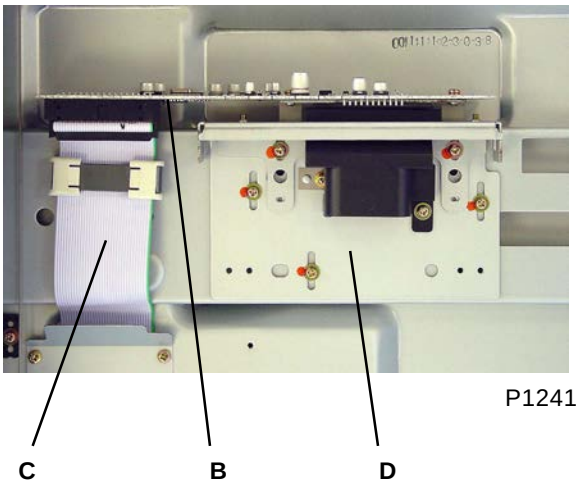
1. The new lens assembly comes with the position alignment plates [E] attached on the front and rear. Install the lens assembly on the scanner unit using the three screws after inserting the positioning pins on the scanner unit into the positioning holes on the alignment plates.
2. Remove the screws holding the position alignment plates [E] onto the new lens assembly [D], and remove the two plates from the lens assembly [D].
3. Attach the CCD-cable [C] back on the CCD-PCB [B].

[Precautions on Reassembly]

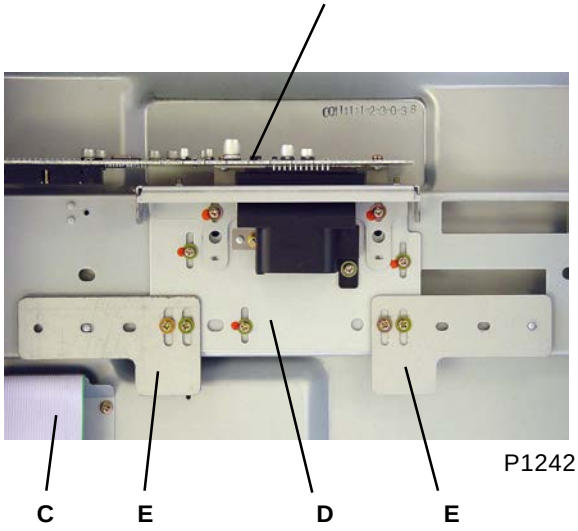
- In attaching the CCD-cable [C] back on the CCD-PCB [B], hold and support the PCB to prevent its breakage.



P1240



P1241



P1242

A: Cover
B: CCD-PCB
C: CCD-cable
D: Lens assembly
E: Position alignment plates

12 Removing the Lens Assembly (400 dpi & 600 dpi)

(1) Switch off the power.

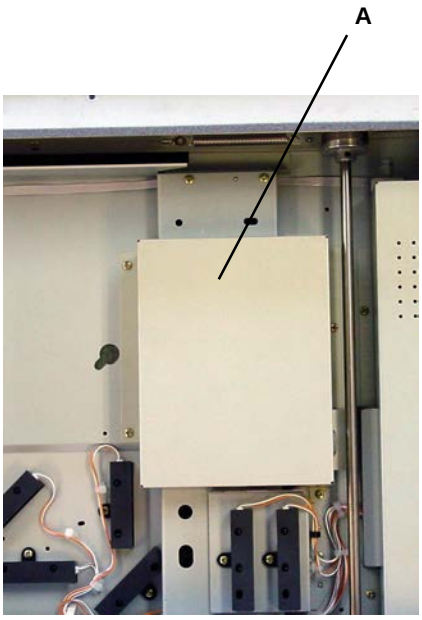
(2) Remove the stage glass (see this chapter).

(3) Detach the lens cover [A] by removing five screws (M3 x 6).

(4) Detach the lens assembly [B] by removing two screws [M3 x 8].

[Precautions on Reassembly]

- In attaching the lens assembly back on the scanner unit, fit the two positioning pins into the elongated holes [C].
- Do no loosen any screws other than those specified.
- Do not touch the lens or other optical components.
- When installing a new lens assembly, align it against the scale [D] on its rear portion, as indicated on the instructions sheet included in the new lens assembly shipment.



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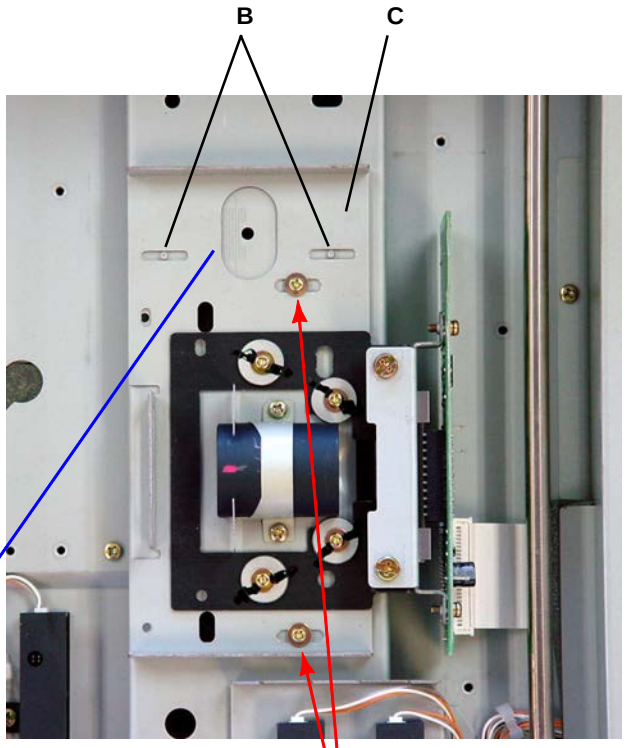
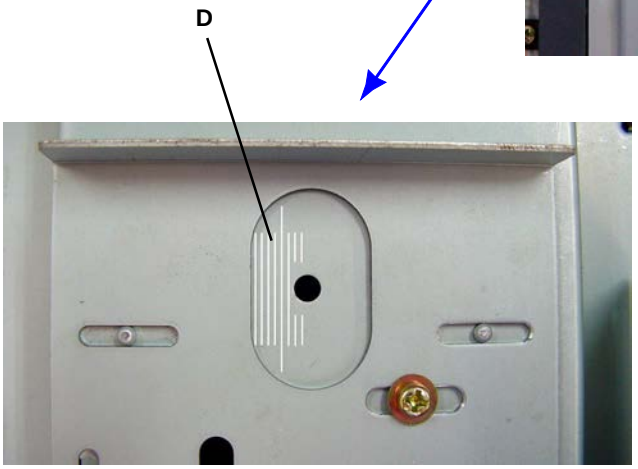


P1244



P1245

The two screws to remove

A: Lens cover
B: Elongated holes and pins
C: Lens assembly
D: Scale

Adjustment

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

Checks and procedure

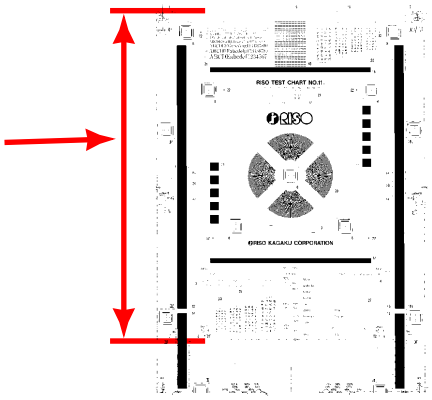
(1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using **test chart No.11** on the stage glass, and make prints.

(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.182 (FB 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



S1209

2. FB Scan Start-Position Adjustment

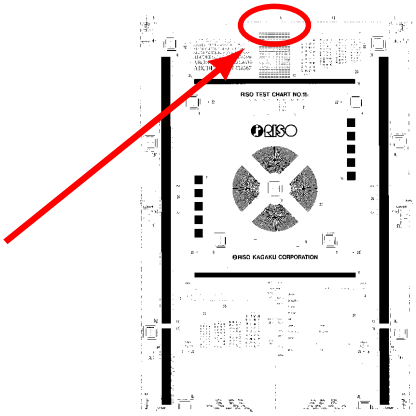
Checks and procedure

(1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using **test chart No.11 on** the stage glass, 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.181 (FB Scan Start Position Adjustment).

Test chart No.11



S1210

3. FB Horizontal-Scan Position Adjustment

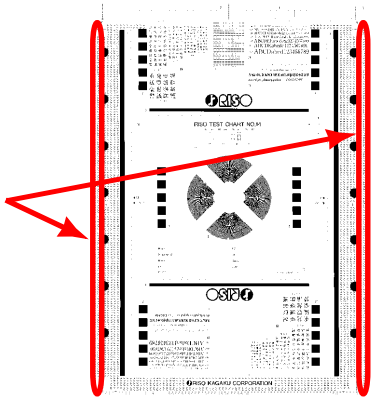
Checks and procedure

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

(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.180 (FB Horizontal Scan Position Adjustment).

Test chart No.14



S1211

4. Adjustment when the Scanner Unit is replaced

When the scanner units are replaced, “Factory Mode” test modes must be activated and new settings for each scanner unit must be input.
Apart from the fact that no menu screen appears, the procedure for Factory mode is the same as for normal test modes.

Prior to the assembly of the new scanner unit onto the machine, note the figures written on the label affixed to the top right of the scanner unit prior to reassembly.

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.
(4) Exit from the test mode.
(5) Turn the machine power OFF and then back ON.

For 400-dpi and 600-dpi scanner units

No.	Data settings	
1203	Setting No.1 (Sub-scanning start-position.)	
	Description	Enter the number on the sticker affixed to the scanner unit.
	Setting	Range: 0 to 255 Unit: 1 Default: 128
1204	Setting No.2 (Main-scanning start-position.)	
	Description	Enter the number on the sticker affixed to the scanner unit.
	Setting	Range: 0 to 255 Unit: 1 Default: 55 (400-dpi) 48 (600-dpi)
1205	Setting No.3 (Sub-scanning reproduction size compensation.)	
	Description	Enter the number on the sticker affixed to the scanner unit.
	Setting	Range: 0 to 255 Unit: 1 Default: 50

T1230

NOTE: The data settings for 300-dpi NEW scanner unit are given on the next page.

For 300 dpi NEW scanner unit

(This procedure is not necessary for 300 dpi PREVIOUS type scanner unit)

No.	Data settings	
1220	Setting No.1 (Sub-scanning-position deviation compensation)	
	Description	Enter the number on the sticker affixed to the scanner unit.
	Setting	Range: 68 to 188 Unit: 1 Default: 128
1221	Setting No.2 (Main-scanning-position deviation compensation)	
	Description	Enter the number on the sticker affixed to the scanner unit.
	Setting	Range: 92 to 164 Unit: 1 Default: 128
1222	Setting No.3 (Sub-scanning magnification compensation)	
	Description	Enter the number on the sticker affixed to the scanner unit.
	Setting	Range: 0 to 100 Unit: 1 Default: 50
1223	Setting No.4 (Offset adjustment)	
	Description	Enter the number on the sticker affixed to the scanner unit.
	Setting	Range: 0 to 255 Unit: 1 Default: 255
1224	Setting No.5 (Gain adjustment)	
	Description	Enter the number on the sticker affixed to the scanner unit.
	Setting	Range: 0 to 255 Unit: 1 Default: 0

T1231

NOTE: The data settings for 400-dpi & 600-dpi scanner units are given on the previous page.

NOTE

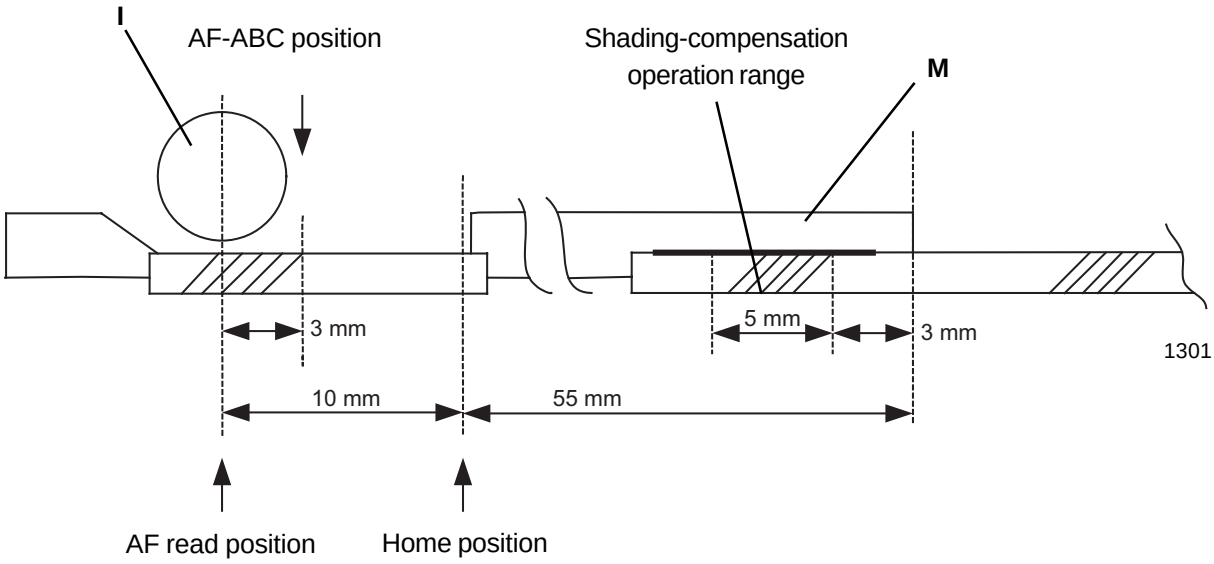
CHAPTER 13: AF SCANNING SECTION

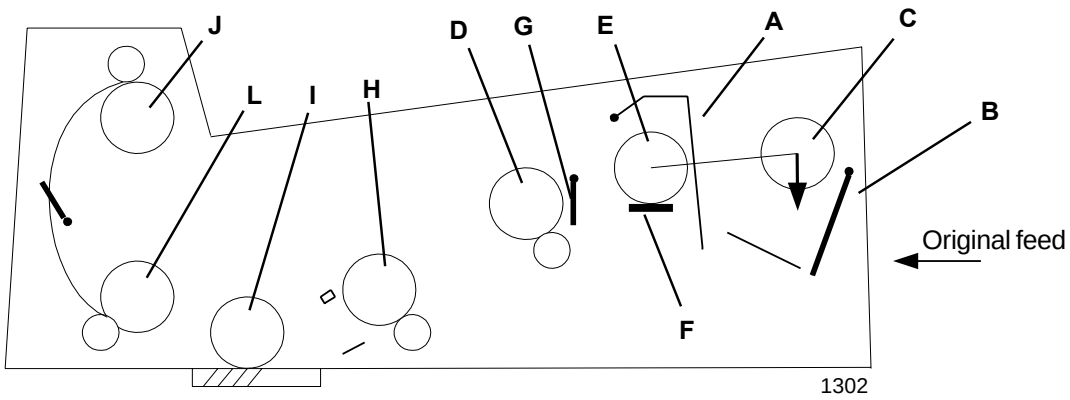
Contents

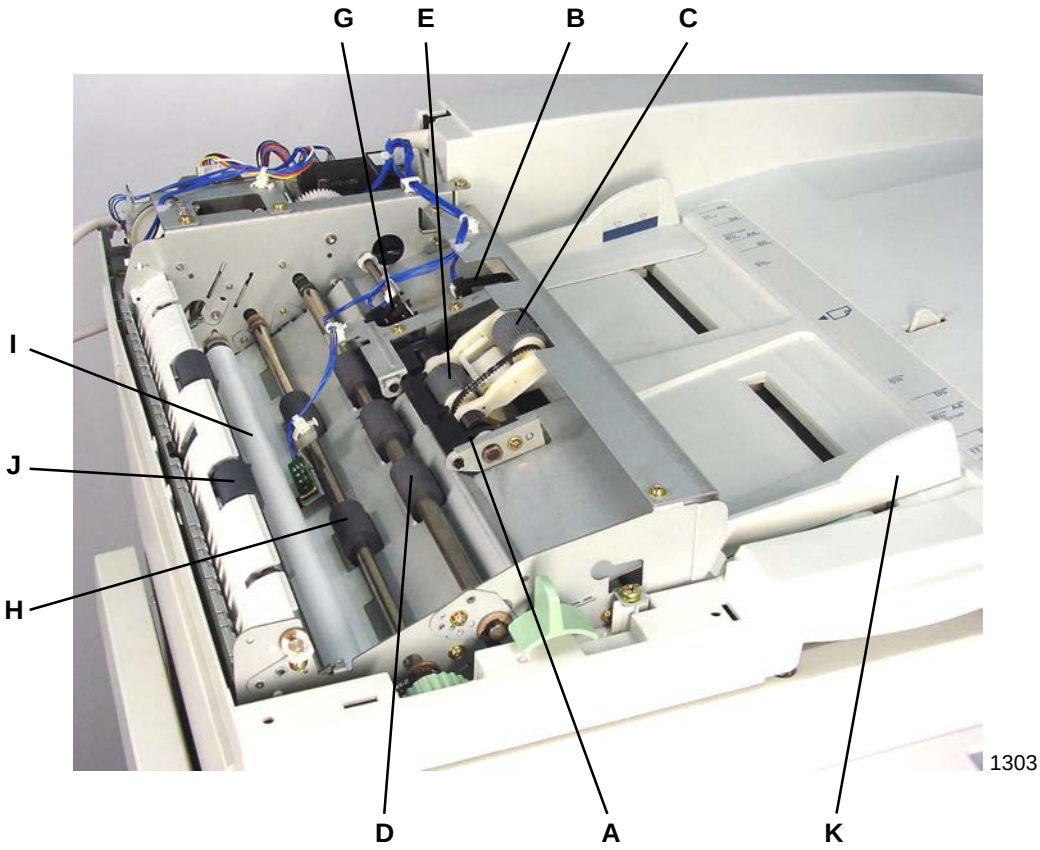
Mechanism

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.



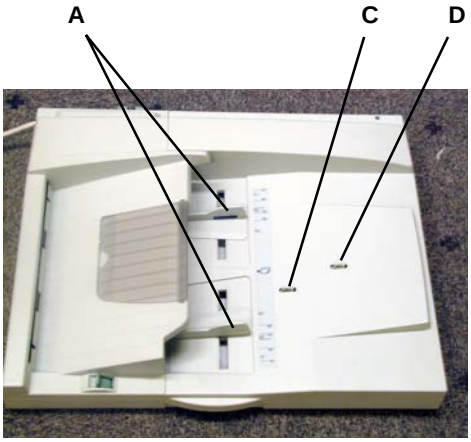




A: Original stopper gate
B: AF Original detection sensor
C: Pickup roller
D: Registration roller
E: Original stripper roller
F: Original stripper pad
G: AF original registration sensor
H: Read roller 1
I: White roller
J: Original ejection roller
K: Original guide fence
L: Read roller 2
M: Original stopper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

2. AF Original Size-Detection Mechanism

The width of the original is detected by the AF guide potentiometer [B] linked to original guide fences [A], which are aligned with the original. The length of the original is detected by AF original size sensor 1 [C] and AF original size sensor 2 [D]. The original size is then determined as shown in the table below.



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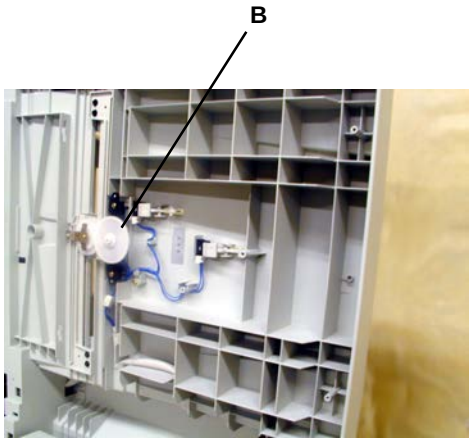

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A: Original guide fences
B: AF guide potentiometer
C: AF original size sensor 1
D: AF original size sensor 2

Sensor 1	Sensor 2	Original-guide-fence width (mm)						
		Less than 114	114 to 138.24	138.25 to 164	165 to 195	196 to 223.4	223.5 to 276	277 or over
OFF	OFF	Postcard	B6	A5		A5 landscape	B5 landscape	A4 landscape
ON	OFF				B5	A4		
ON	ON					Foolscap	B4	A3

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3. 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

4. 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.

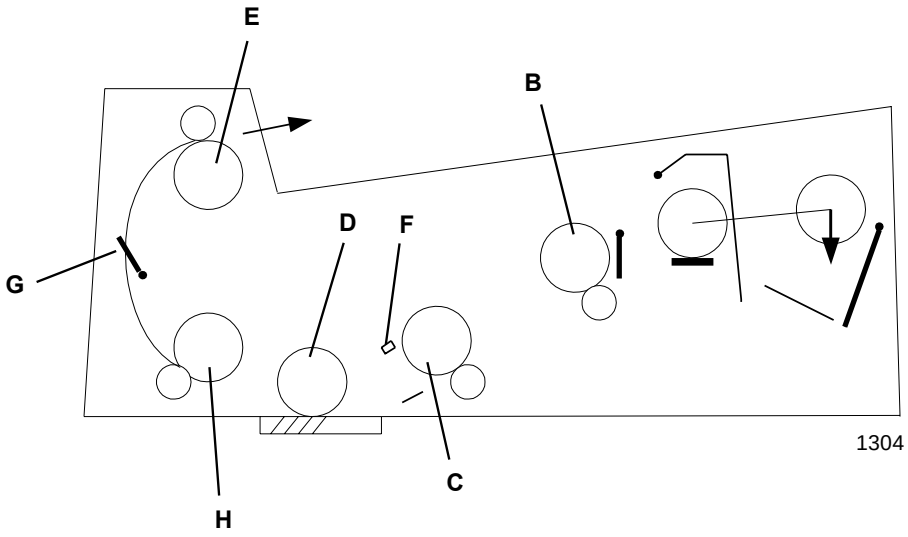
When a preset length of time elapses after the AF original IN sensor turns OFF (receives light) due to the passing of the original, the print signal turns OFF. As soon as the scanning operation is complete, the AF read pulse motor starts operating at high speed.

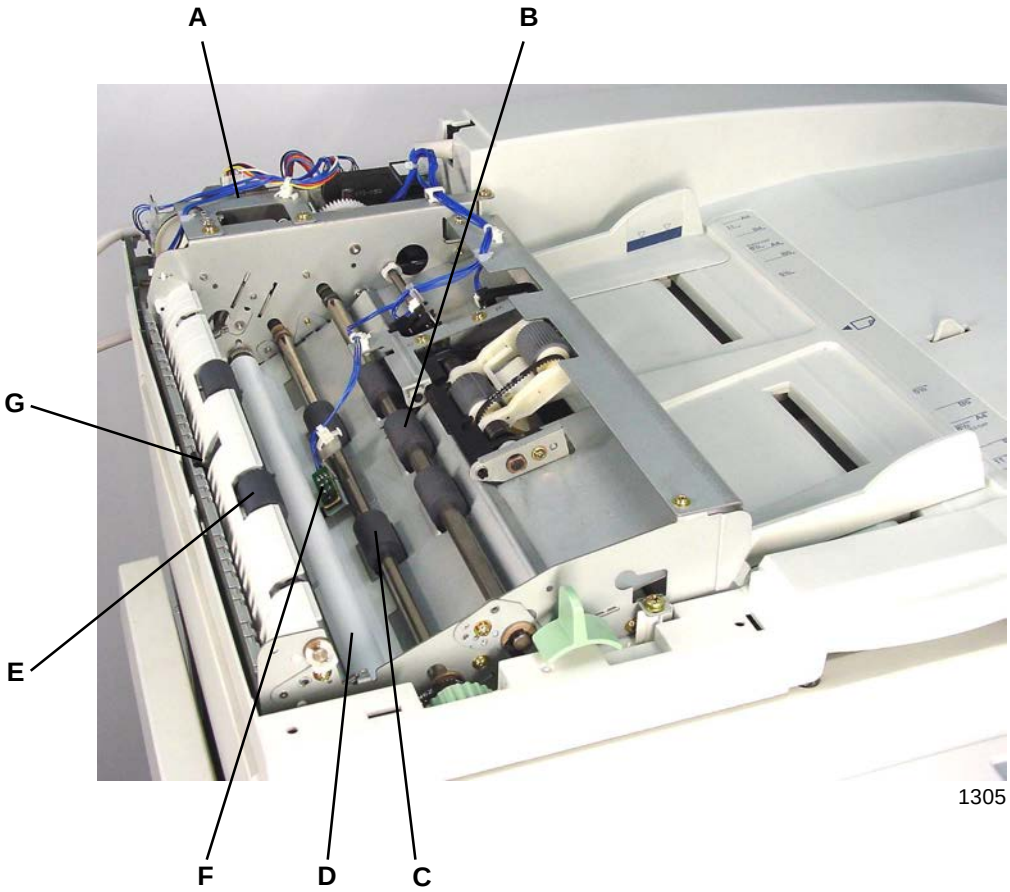
When the AF original ejection sensor turns OFF, the original is sent a preset distance and then the AF read pulse motor stops. The lamp carriage returns to the home position, and the AF read operation ends.

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

5. 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.



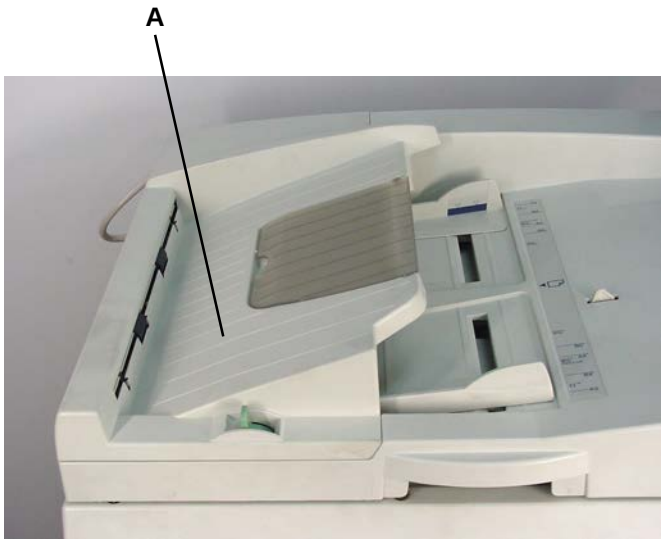


A: AF read pulse motor
B: Registration roller
C: Read roller 1
D: White roller
E: Paper ejection roller
F: AF original IN sensor
G: AF original ejection sensor
H: Read roller 2

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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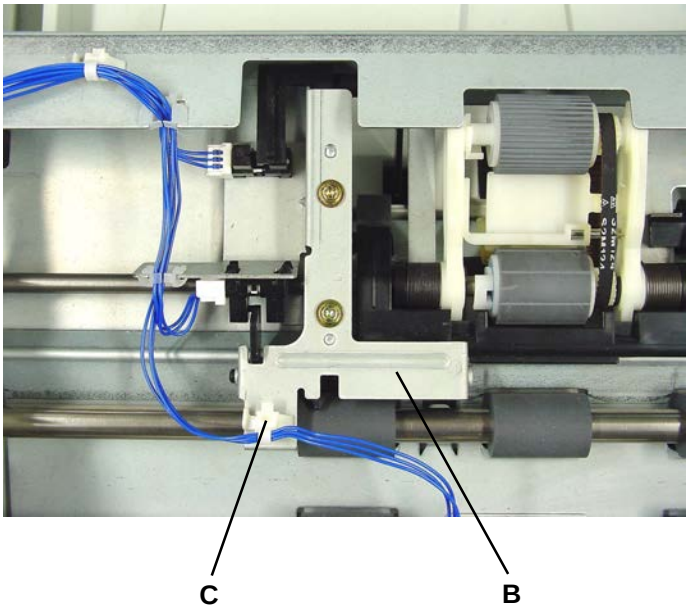
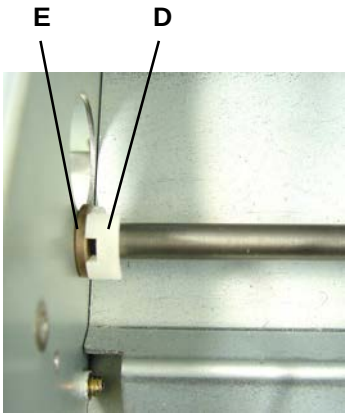


1307

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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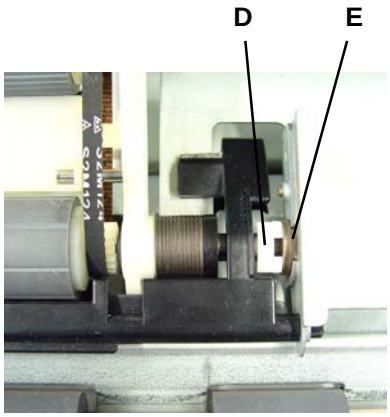

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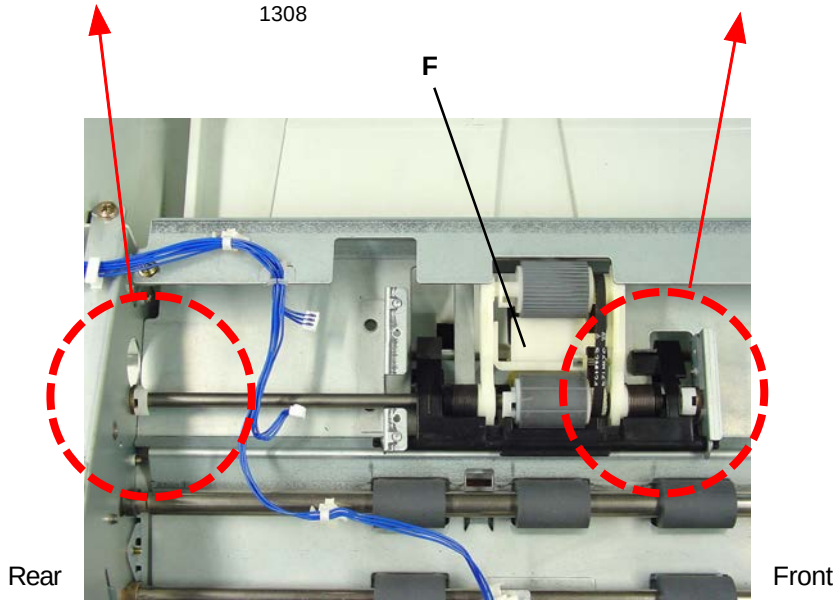

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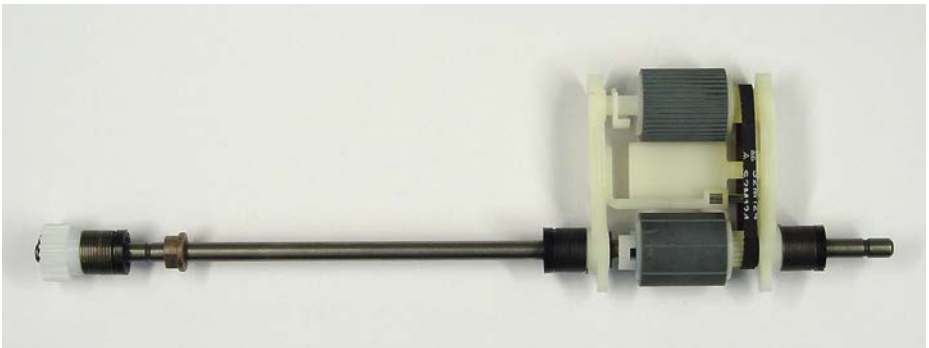


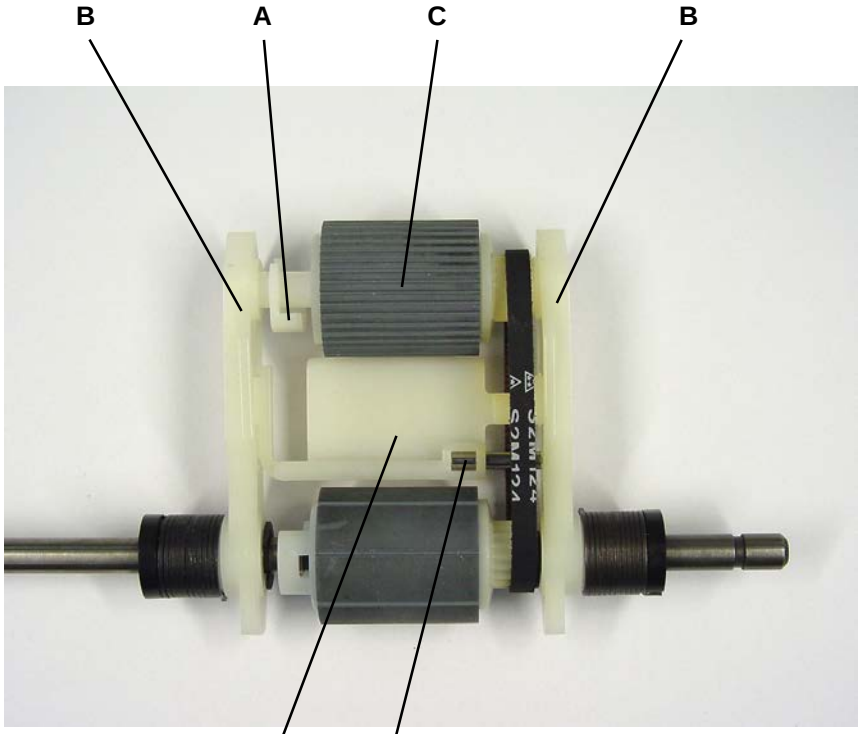
Original pickup assembly

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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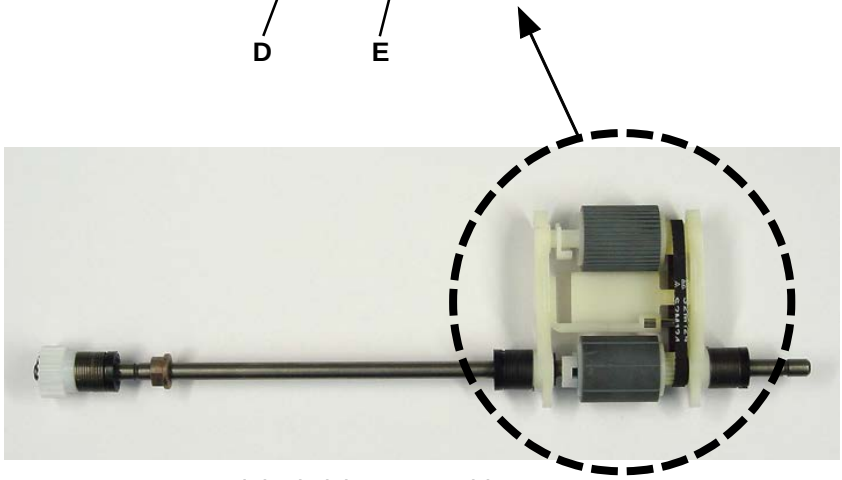


1313

Original pickup assembly

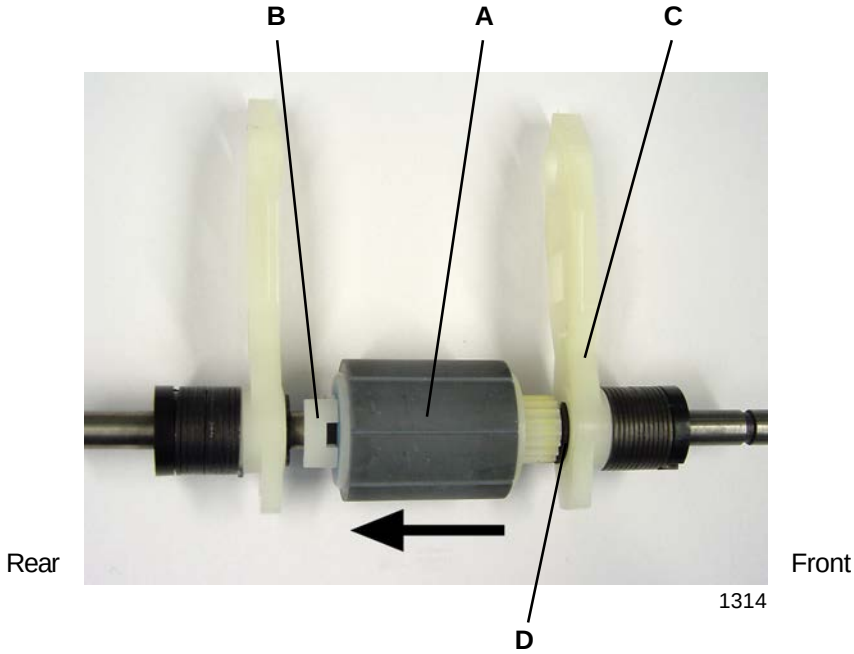
A: Resin clip
B: K holder
C: Original pickup roller
D: K holder C
E: Parallel pin

3. Removing the Original Stripper Roller

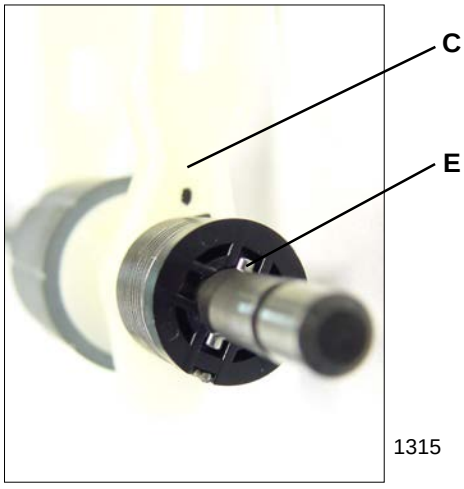
(1) Remove the original pickup assembly (refer to the removal instructions in this Chapter).
(2) Remove the K holder C, parallel pin, and pickup roller (refer to the removal instructions in this Chapter).
(3) Remove the resin clip [B] from the rear of the original stripper roller [A], and move the original 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).

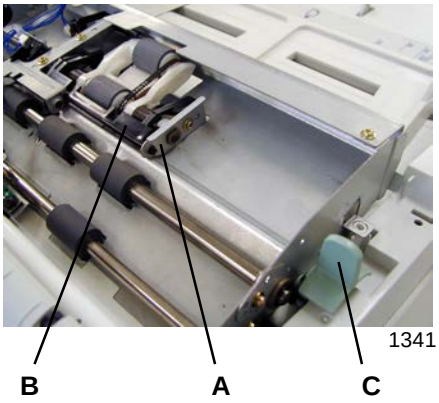
(2) Detach original stopper bracket [A] by removing one screw (M3 x 4), and remove the original stopper [B].

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

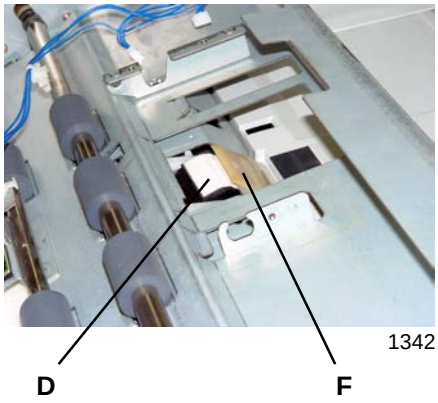
(3) Being careful not to drop the spring under the original stripper pad assembly [D], slide back the assembly to disengage it out from the hooks and then take it out from the AF unit through the opening.

[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.



1341



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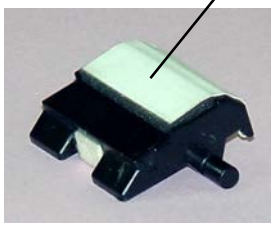
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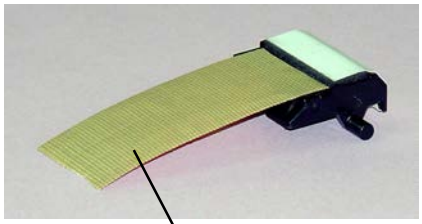
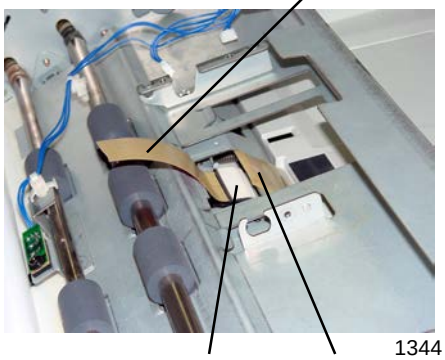


1345



1344

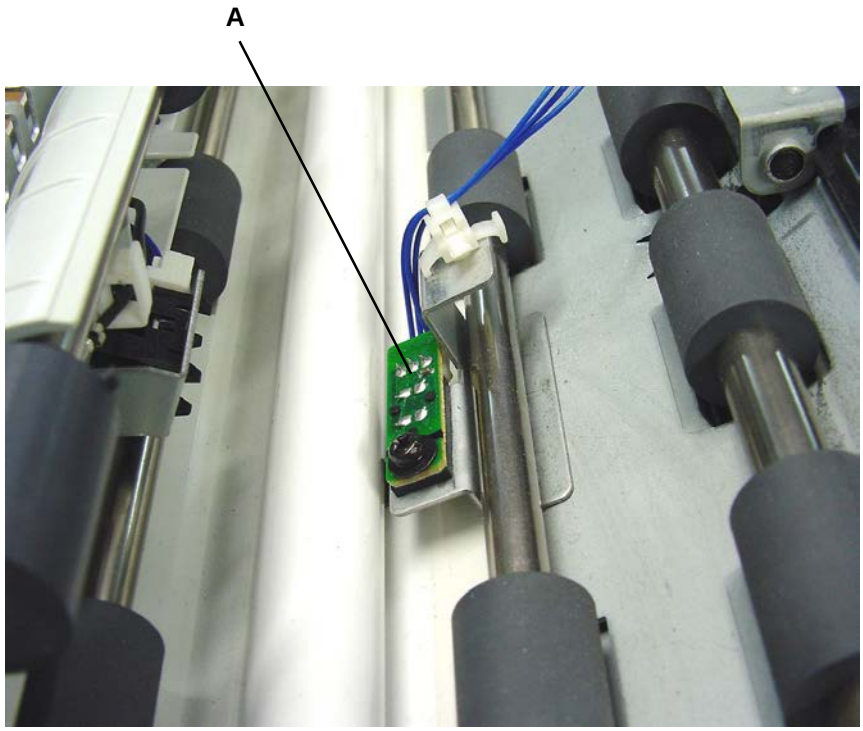
A: Original stopper bracket
B: Original stopper
C: Original release lever
D: Original stripper pad assembly
E: Adhesive tape
F: Stripper sheet

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).

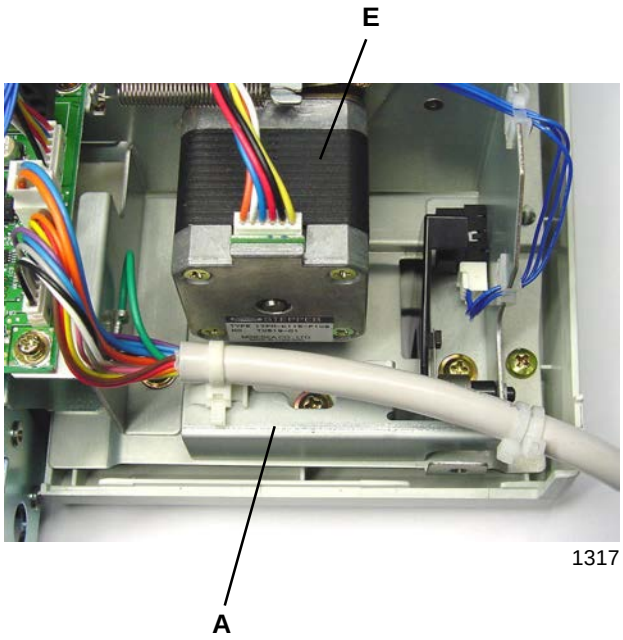


1316

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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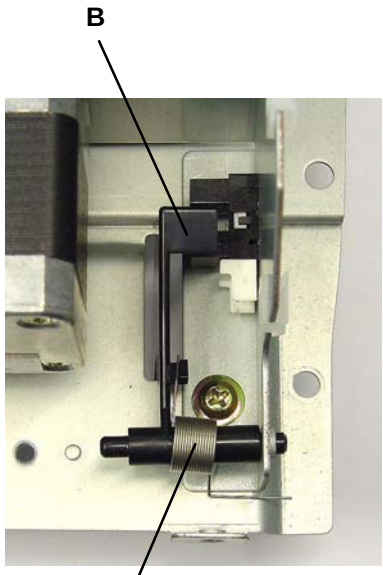

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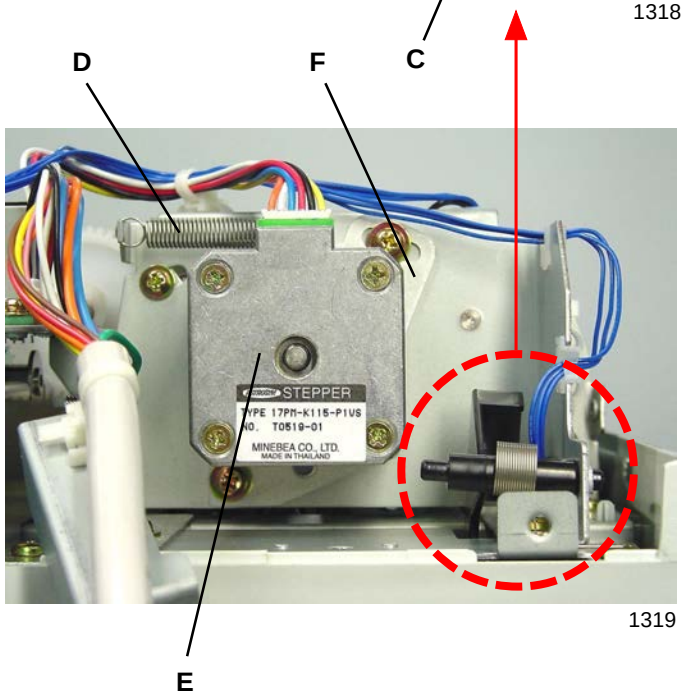
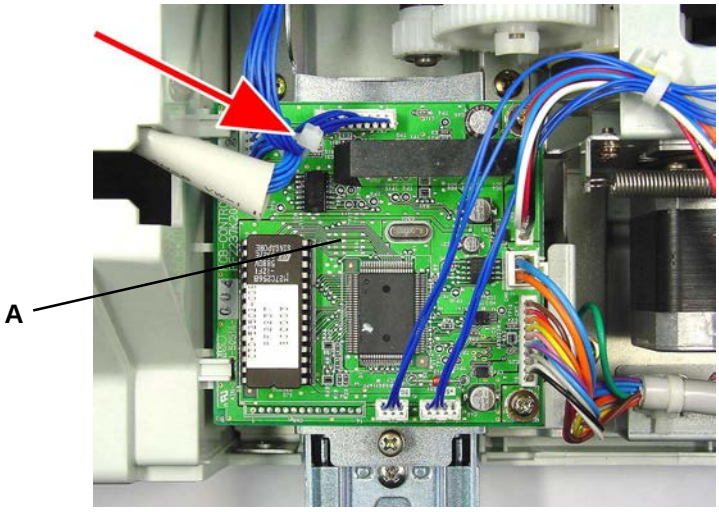


1319

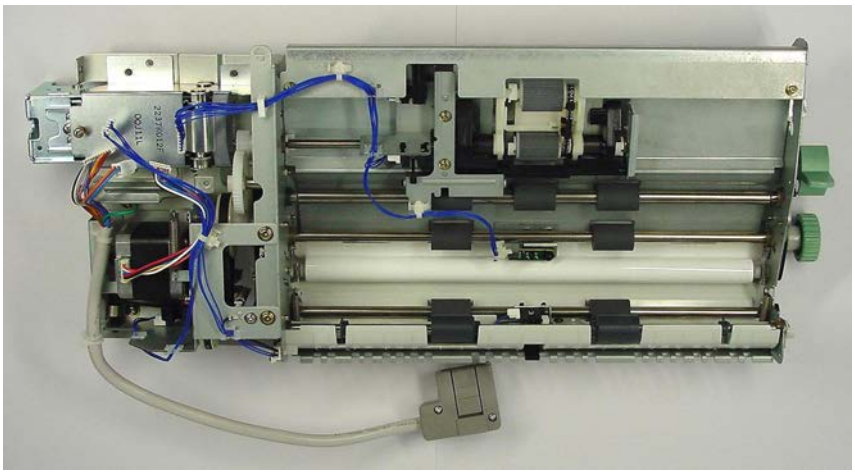
A: Harness-bracket assembly
B: Open lever
C: Open-lever spring
D: Tension spring
E: AF read pulse motor
F: Motor tension bracket

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.



1320


1321

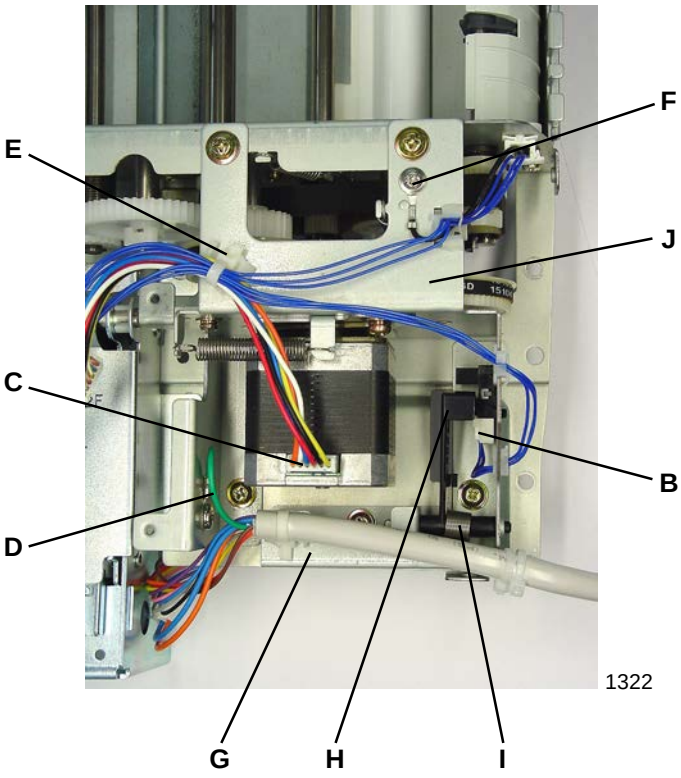
AF mechanism unit

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

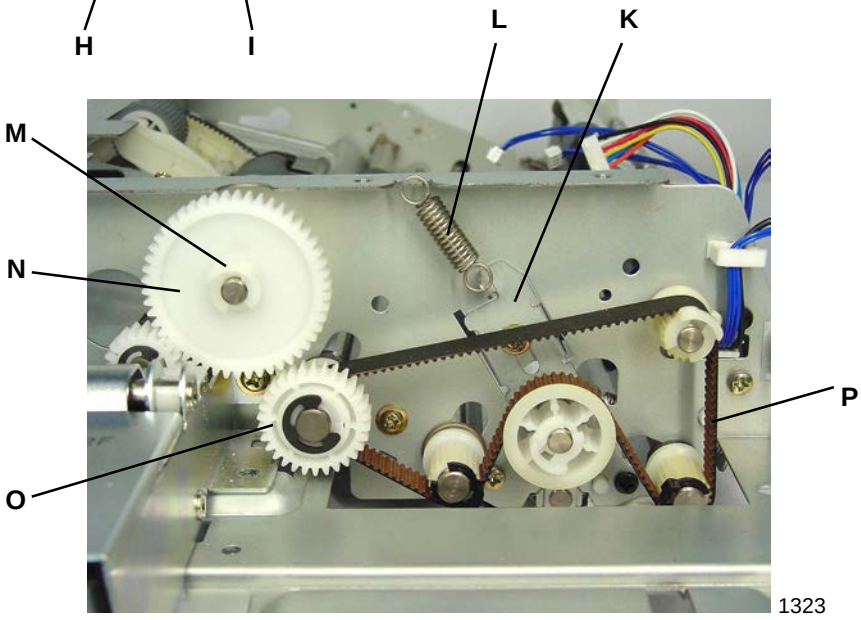
(5) Disconnect the AF cover set switch connector [B] and AF read pulse motor connector [C], and detach the ground wire [D] by removing screw (M3 x 6: 1 pc).
(6) Remove the reusable band [E], detach the harness from the three harness clamps, and move the harness to the side.
(7) Detach the ground wire [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]

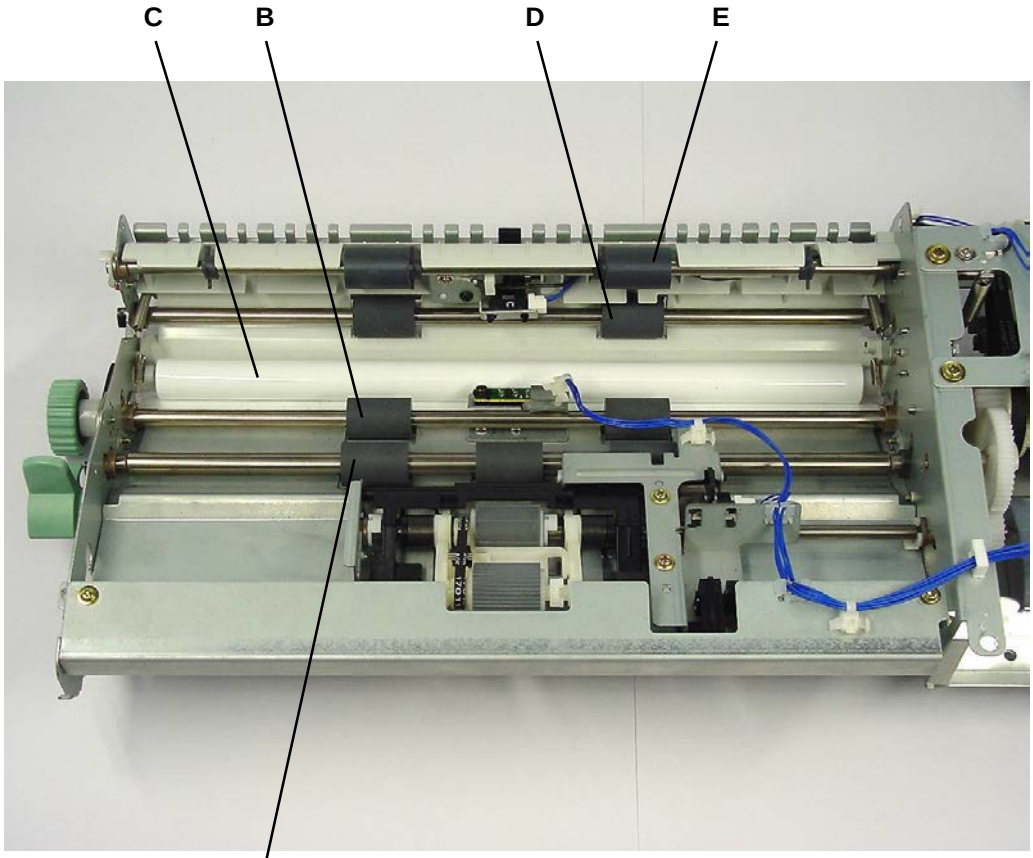
- The gear assembly has a built-in one-way clutch. Be sure to install the gear assembly with the stamped face toward the front.



1322



1323

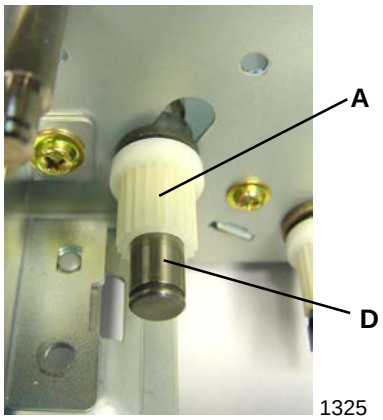


< Layout of the rollers >

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].



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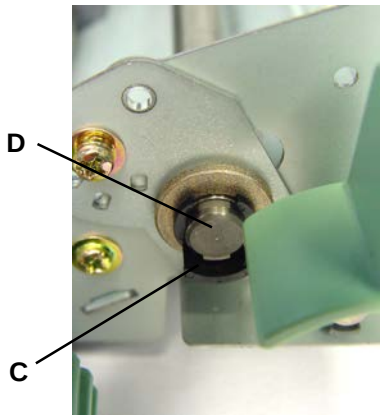
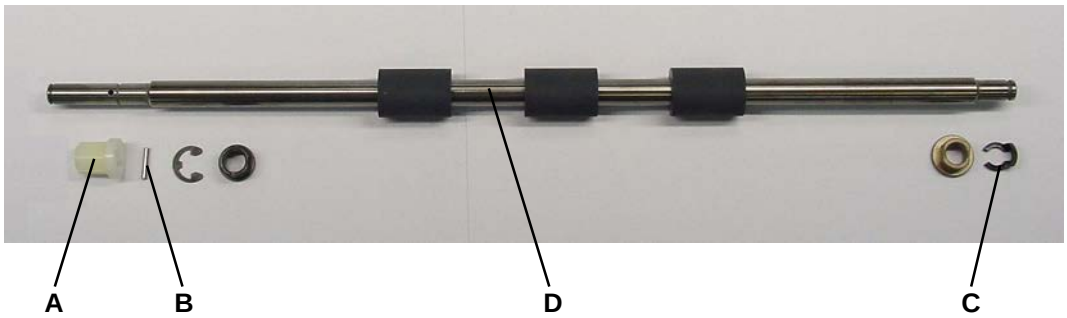


1326

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.

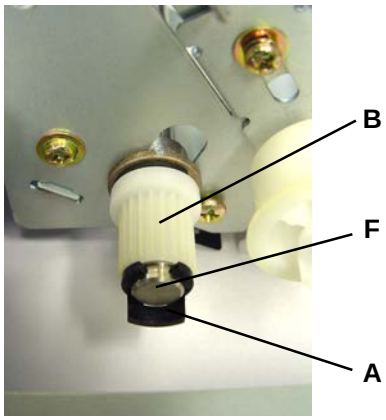
(15) Remove the E-ring from the front side of the roller, and detach the dial [D]. Also remove the parallel pin [C] at the same time.

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

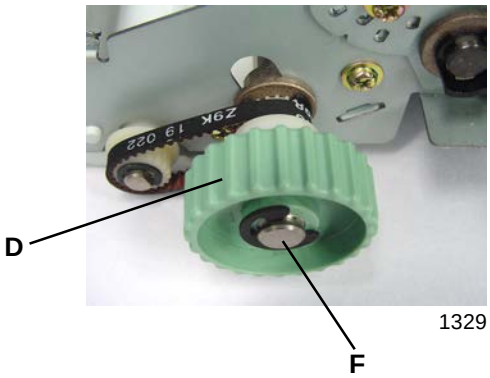
(17) Remove the read roller No. 1 [F].

[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.

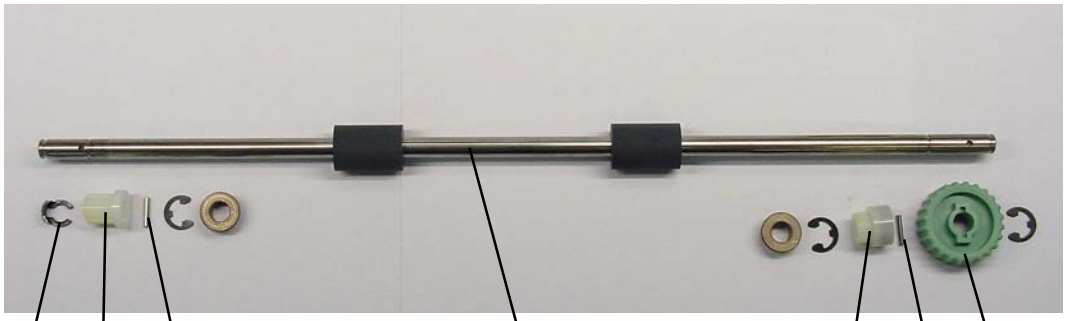


1328



1329

Rear Front

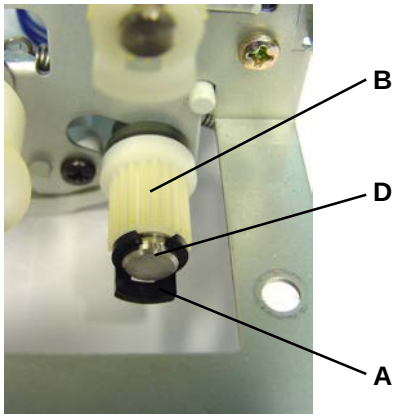


1330

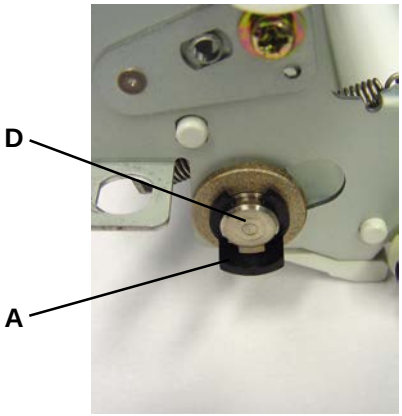
A: Resin clip
B: Timing pulley
C: Parallel pin
D: Dial
E: Timing-pulley assembly
F: Read roller No.1

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].

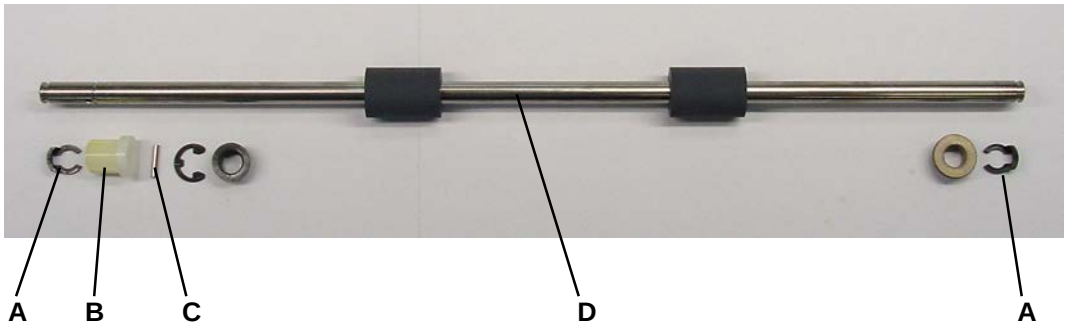


1331



1332

Rear Front

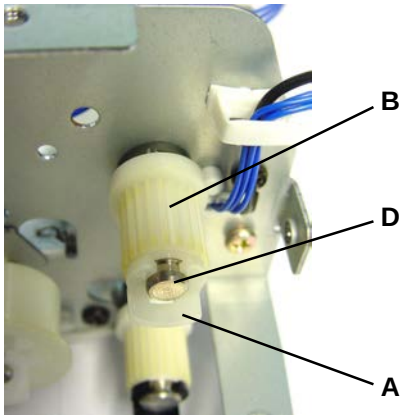


1333

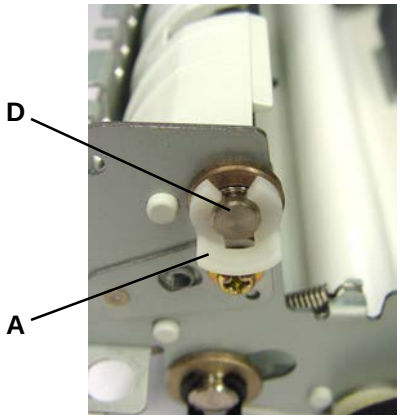
A: Resin clip
B: Timing pulley
C: Parallel pin
D: Read roller No. 2

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].

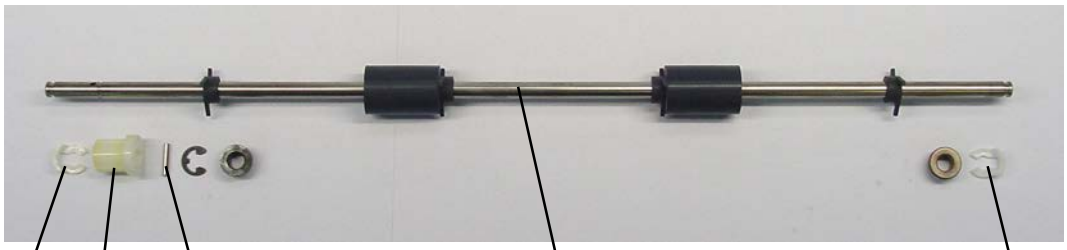


1334



1335

Rear Front



1336

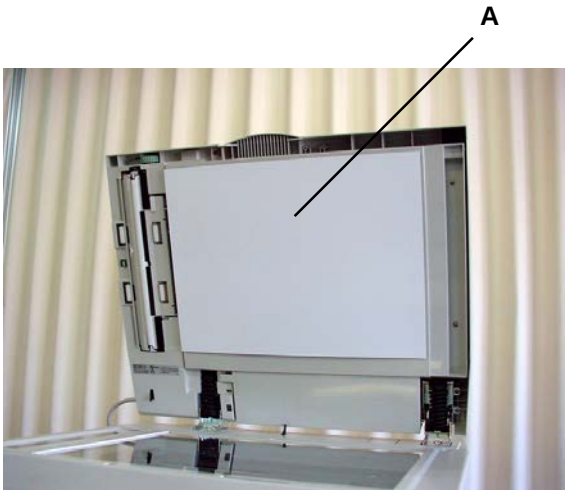
A: Resin clip
B: Timing pulley
C: Parallel pin
D: Original ejection roller

8. Removing the AF Original Guide Fence Potentiometer Assembly

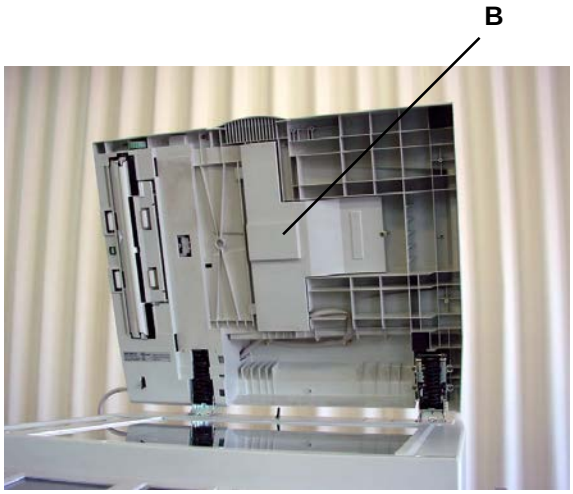
(1) Open the AF unit.
(2) Detach the stage-cover assembly [A] by removing screws (M3 x 10+Plastic washer: 2 pcs).
(3) Detach the bottom cover [B] by removing screw (M4 x 6: 1 pc).
(4) Unplug connector, and remove the AF originial guide fence potentiometer assembly [E] by removing screws (M3 x 10: 2 pcs).

[Precautions on Reassembly]

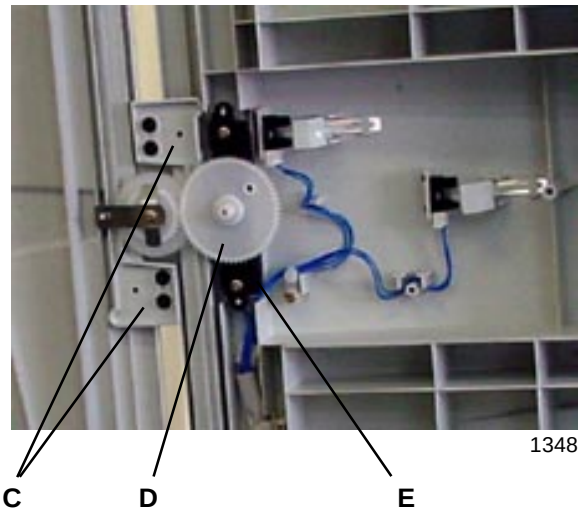
- Before putting back the potentiometer assembly, slide the original guide fences [C] to the innermost (closed) position, and rotate the gear [D] of the potentiometer assembly in the counterclockwise direction all the way. Then rotate it back one tooth and mount the potentiomenter assembly back on the AF unit.
- After the assembly is back on the AF unit, activate test mode No.753 [AF-guide min.-width VR value] with the original guide fence closed all the way. Then activate test mode No.754 [AF-guide max.-width VR value] with the original guide fence opened wide all the way.



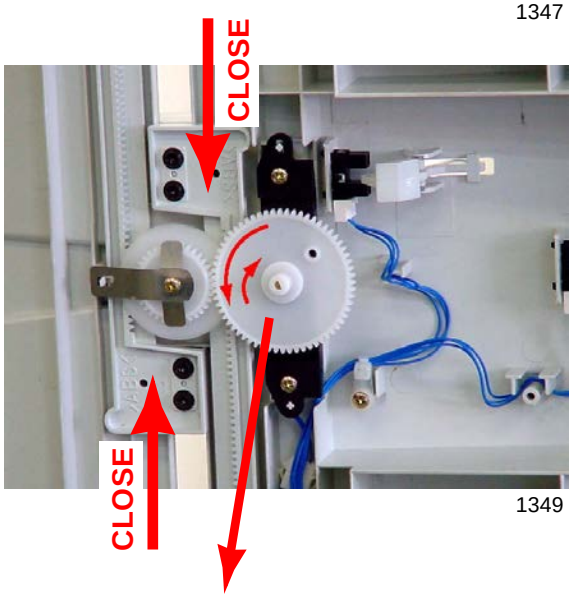
1346



1347



1348



1349

A: Stage cove assembly
B: Bottom cover
C: Original guide fence
D: Gear
E: Potentiometer assembly

1. Close the original guides all the way in.
2. Rotate the potentiometer in the counterclockwise direction all the way.
3. Then return it in the clockwise direction for one tooth and join the gears, and screw it back on the AF unit.

Adjustment

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

Checks and procedure

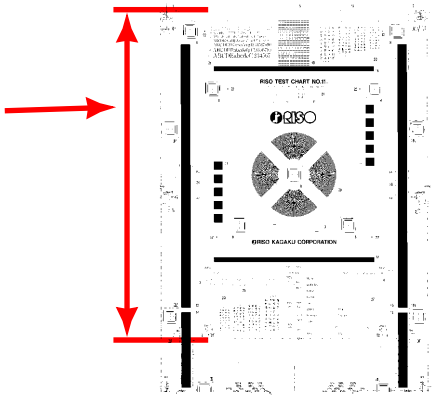
(1) Place A3 size printing paper on the paper feed tray. Make 1 to 1 size master using **test chart No.11** on the AF unit, and make prints.

(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

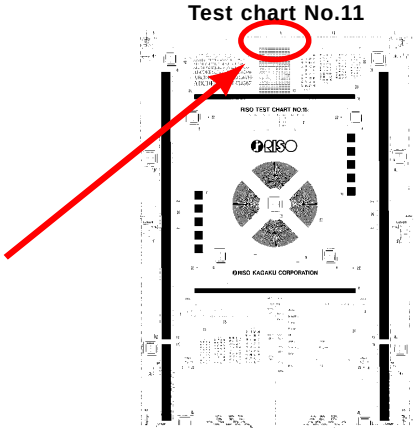
Checks and procedure

(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

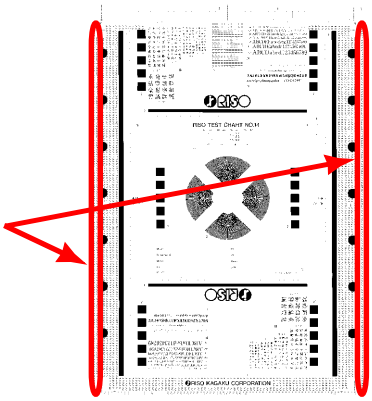
Checks and procedure

(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.182 (AF Horizontal Scan Position Adjustment).

Test chart No.14



1352

4. AF Original Guide Fence Potentiometer Adjustment

Adjustment

(1) Slide the original guide fence to the innermost (closed) position, and run **test mode No.753** ***[AF-guide min.-width VR value].***

(2) Then slide the original guide fence to the outermost (opened) position, and run **test mode No.754** ***[AF-guide max.-width VR value].***

5. 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: MASTER MAKING SECTION

Contents

Mechanism

1. Master Making and Loading System

The master making and loading mechanism consists of the following components:

1) Set Detection Mechanism

The flatbed set switch checks whether the scanner table is set.
The master-making-unit sensor checks whether the master-making unit is set.
The master end sensor [A] checks whether the end of the master roll has been reached.
The master detection sensor [B] checks for the master.

2) Master volume detection mechanism (excludes 300 dpi machines)

Master volume det. sensor A [C] and master volume det. sensor B [D] check the master volume, as shown in the table below, based on the combination of the two actuators mounted on the master volume det. lever [E], which rotates while in contact with the master roll.

Sensor status		Master volume display
Sensor A	Sensor B	
ON	ON	100 – 50%
OFF	ON	50 – 30%
OFF	OFF	30 – 10%
ON	OFF	10% –

T1401

* ON indicates sensor light path blocked; OFF indicates light path open.

3) Master Cutting Mechanism

The master cutting operation is performed by the cutter motor, and the stop position of the cutter [F] is checked by the cutter home-position switch.

4) TPH Elevation Mechanism

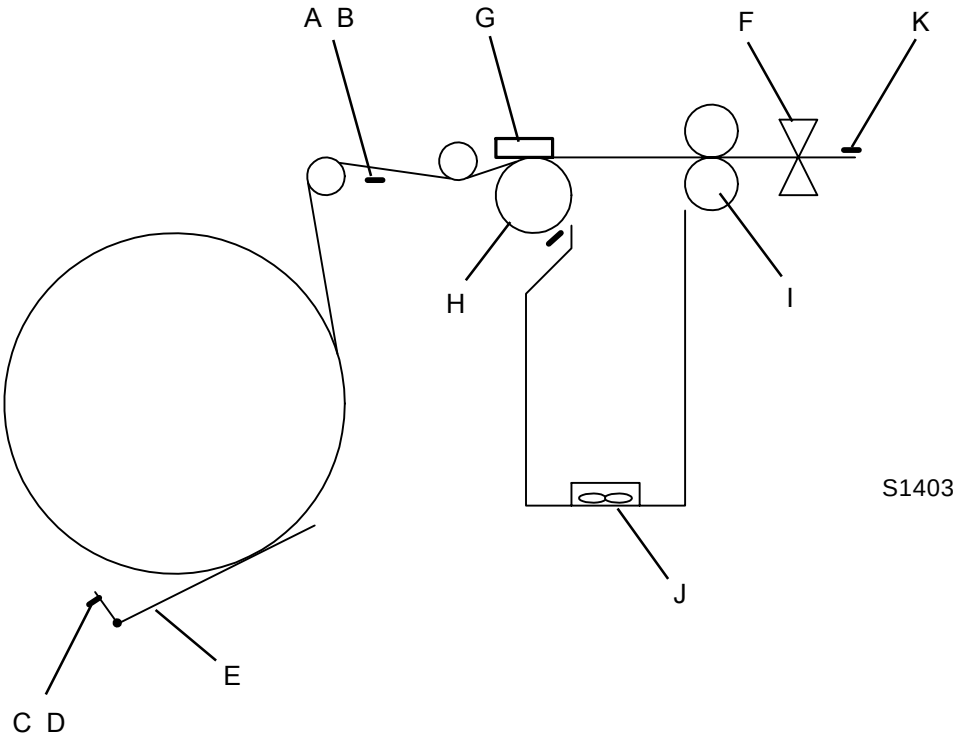
The TPH [G] is raised and lowered by the thermal-pressure motor, and the position is checked by the TPH pressure sensor.

5) Master Making Mechanism

Master making is performed by lowering the TPH [G] and transporting the master clamped between it and the write roller [H]. The master is transported by the write roller, which is driven by the write pulse motor.

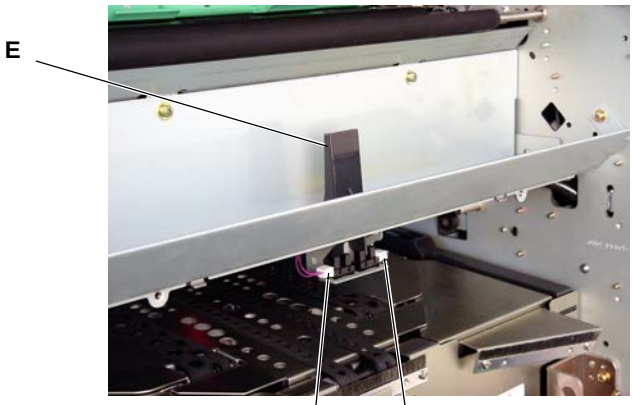
6) Master Loading Mechanism

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 (lower) [I], which is driven by the load pulse motor.



S1403

P1409



P1436

A: Master end sensor
B: Master detection sensor
C: Master volume det. sensor A
D: Master volume det. sensor B
E: Master volume det. lever
F: Cutter
G: TPH
H: Write roller
I: Load roller (lower)
J: Storage fan
K: Master positioning sensor

2. Set Detection Mechanism

Scanner table and master-making unit set detection mechanism

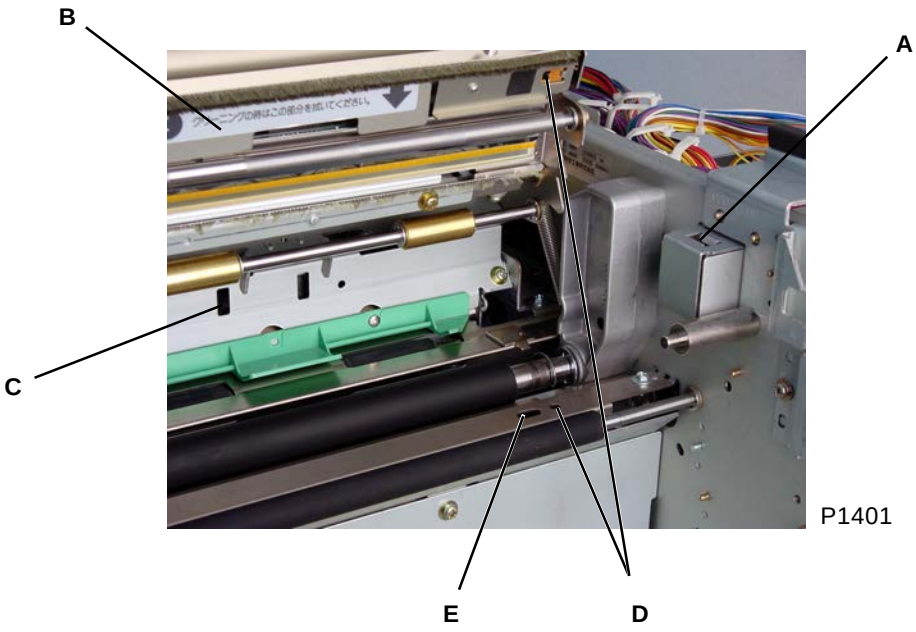
The flatbed set switch [A] checks whether the scanner table is closed.
This interlocking switch for the main motor forces the main motor, clamp motor, cutter motor, master disposal motor, and TPH power to an emergency stop if the scanner table is opened while the system is operating.
The master-loading-unit sensor [C] checks whether the master making unit [B] is set. The master-stopper gate is opened, and the master-setting operation is performed once the master reaches the specified location (pressed against the master stopper gate) and the master making unit is set.

Master end detection

The end of the master roll is checked by the master end sensor [D], which detects the black end mark on the master roll.
The master end sensor checks every 10 ms while the master is being transported, and an indication is given on the panel when the end mark is detected twice in succession.

Master set detection

The master detection sensor [E] checks whether the master his reached the specified position. A panel indication is given if the master detection sensor is OFF (blocked) at the start of master making.

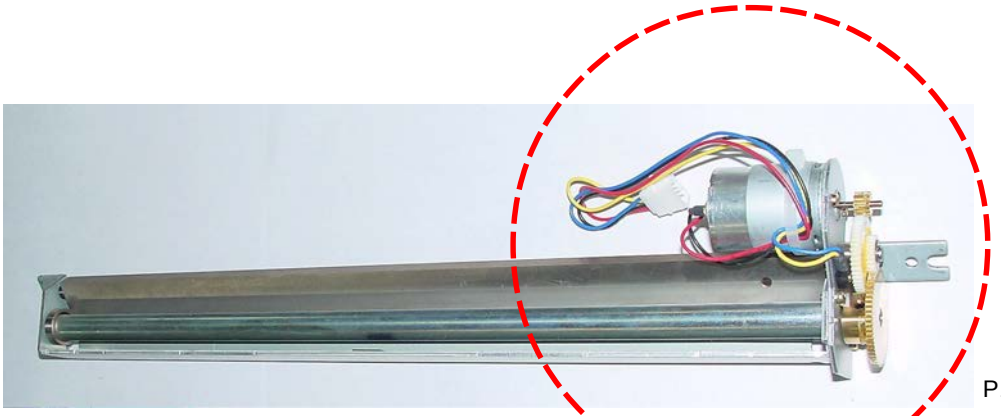


P1401

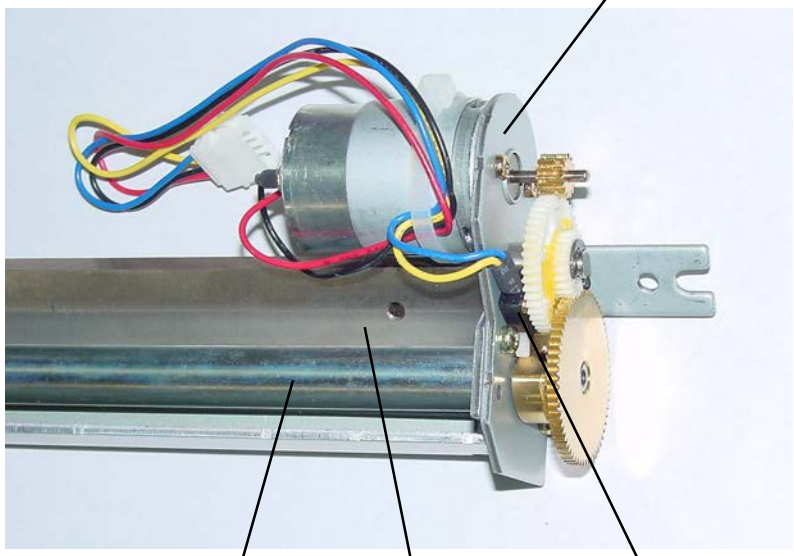
A: Flatbed set switch
B: Master making unit
C: Master-loading-unit sensor
D: Master end sensor
E: Master detection sensor

3. Master Cutting Mechanism

When the cutter motor [A] is activated, the rotary blade [B] begins to rotate and depresses the cutter HP switch [C]. The cutter motor [A] remains activated until the cutter HP switch [C] is released. This mechanism ensures that the rotary blade [B] always makes one revolution.



P1402



P1403

A: Cutter motor
B: Rotary blade
C: Cutter HP switch
D: Stationary blade

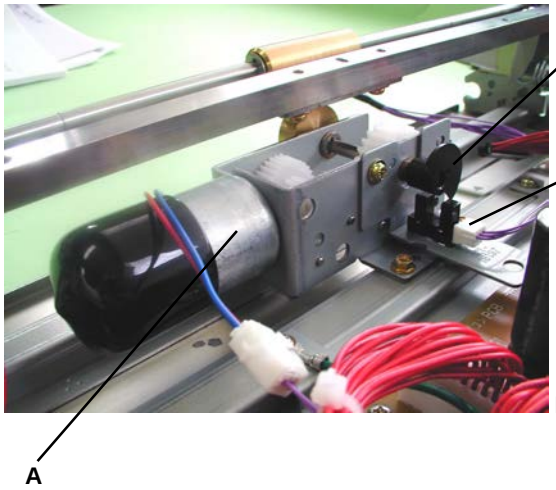
4. TPH Elevation Mechanism

TPH elevation

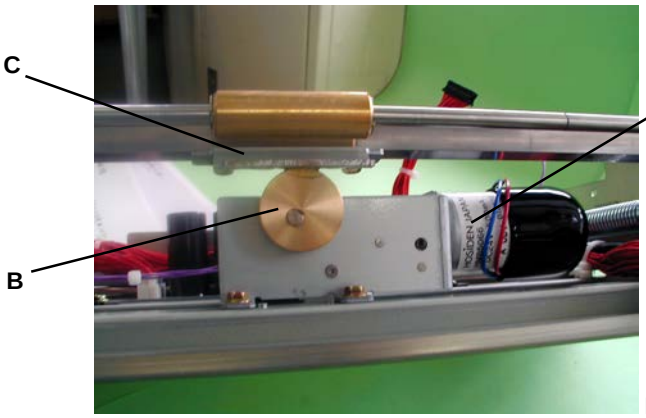
When the system is at standby or when the master is wound onto the print drum following master making, the TPH is raised from the write roller. Conversely, for master making and during transport, the TPH is lowered and pressed onto the write roller.
The TPH is raised and lowered by the pressure-release cam [B], which is driven by the thermal-pressure motor [A].
The pressure-release cam [B] is an eccentric cam that raises and lowers the pressure-release plate [C] as it rotates.
The raising and lowering stop positions for the motor are detected by the TPH pressure sensor [E], which is blocked by the pressure-detection disc [D].

Initialization

The TPH is moved to the pressure-release position (raised from the write roller) by the initialization when the power is switched on, or when everything is reset.



P1404



P1405

View from the other side

A: Thermal-pressure motor
B: Pressure-release cam
C: Pressure-release plate
D: Pressure-detection disc
E: TPH pressure sensor

5. Master Positioning Mechanism

The master positioning operation is performed to transport the master to the master positioning sensor when the master making unit is opened or closed and during master making.

For master-roll replacement

(1) Insert the leading edge of the new master roll into the master stopper gate [A], and close the master making unit [B] to raise the master stopper gate.

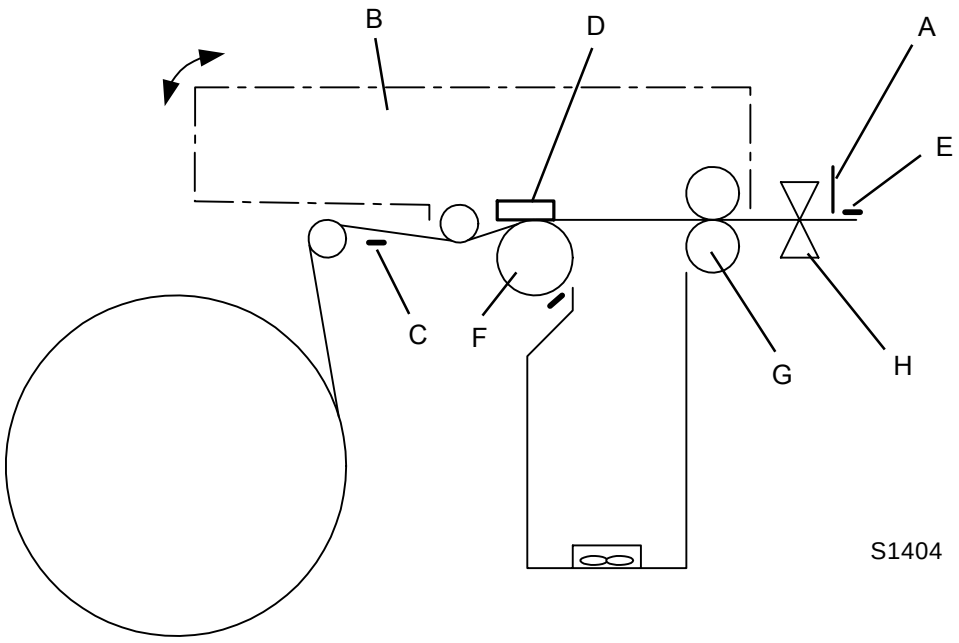
- The master-making-unit sensor monitors operations every 10 ms, and determines that the master making unit is closed when the light path is blocked twice in succession.
- The master is then checked by the master detection sensor [C].

(2) The TPH [D] 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 [E].

(3) When the light path to the master positioning sensor [E] is blocked by the master, the write pulse motor alone operates in reverse to return the master 5 mm. The motor then stops and the TPH [D] is raised.

For master cutting

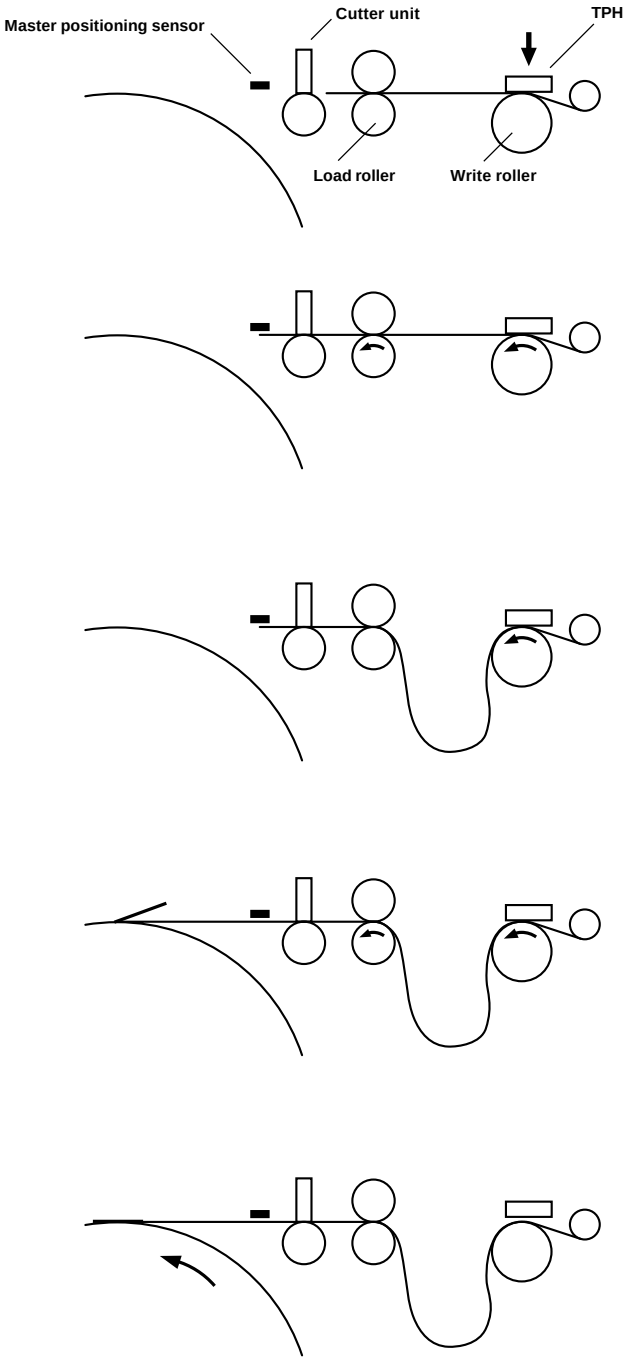
Steps (2) to (3) above are performed following master cutting.



A: Master stopper gate
B: Master making unit
C: Master detection sensor
D: TPH
E: Master positioning sensor
F: Write roller
G: Load roller (lower)
H: Cutter

6. Master Making

The sequence of operations from master making to master loading on the drum is as described below.



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

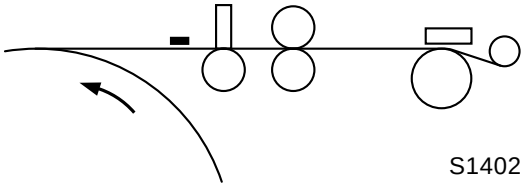
(2) The write pulse motor and load pulse motor operate to transport the master to the master positioning sensor, where it waits for the completion of scanning-system preparations.

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

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

(5) Upon completion of master making, the TPH is raised and the print drum rotates as the master is wound onto it.

S1401



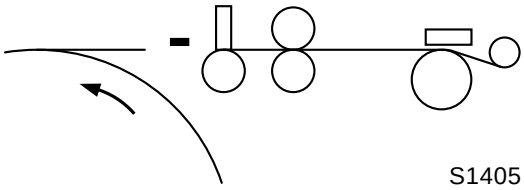
S1402

(6) The print drum rotates through X° (see the table below) from Position A, and the master is cut.

(The master is cut while it is moving.)

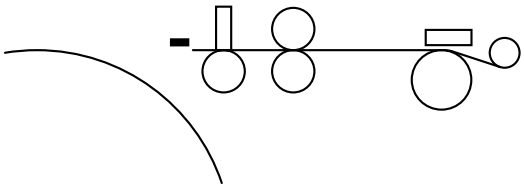
Print-drum size	Master cut timing in print drum rotation angle
A3 drum	265.4 degrees
B4 drum	229.6 degrees
A4 landscape drum	135.4 degrees

T1402



S1405

(7) After the print drum has rotated a further 20°, the master positioning sensor checks whether 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, an error is determined to have occurred. In such a case, the cutting operation is repeated, and the master-positioning sensor determines whether the master has been cut after the print drum has rotated a further 20°. An error message is displayed irrespective of the sensor detection status.



S1406

(8) The master setting operation is performed.

Removal and Assembly

1. Removing the Write Roller

600-dpi machines

(1) Pull out the print drum, switch off the power, and then remove the rear cover.

(2) Swing open the power-supply unit to the left.

(3) Remove the front cover and front frame cover.

(4) Remove the write-roller pulley [A] by removing one screw (M4 x 8).

(5) Remove the write-pulse-motor ass'y [B] by removing three screws (M4 x 8).

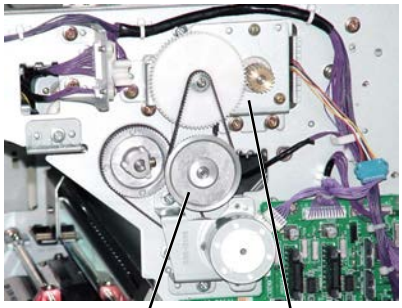
(6) Open the scanner table, master making unit, and master-roll cover (plastic cover located in front of the master roll).

(7) Remove the far left 10-mm size E-ring [G] located on the shaft of the write roller [D] next to the write-roller holder F [E].

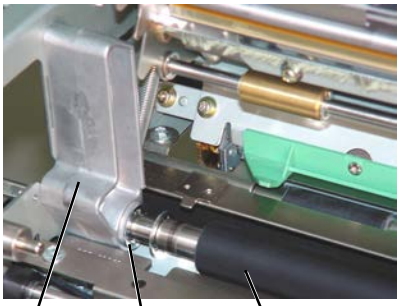
(8) Free the write-roller holder F [E] by removing two screws (M4 x 8) from the machine front frame, and free the write-roller holder R [F] by removing two screws (M4 x 8) from the machine rear frame.

(9) Slide both the write-roller holder F [E] and write-roller holder R [F] inward a little bit. Holding the write-roller holders, slide the whole assembly with the write roller attached towards the front-side of the machine to disengage the rear-end of the write roller shaft from the machine rear frame.

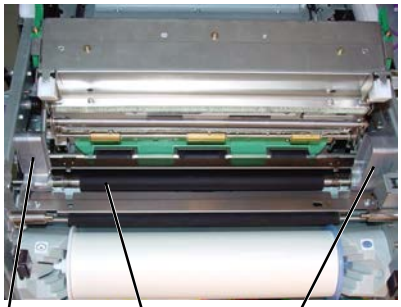
(10) Remove the assembly out of the machine, and separate the write-roller from the write-roller holders.



P1406

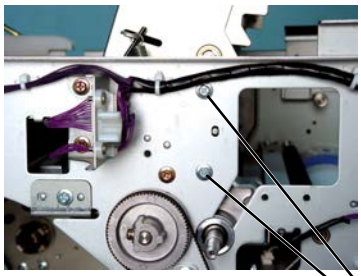


P1407



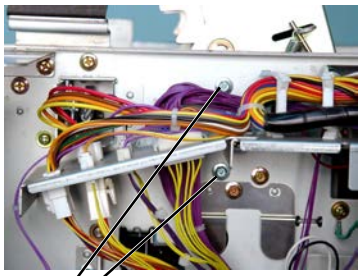
P1408

A: Write-roller pulley
B: Write-pulse-motor ass'y
C: 10-mm E-ring
D: Write roller
E: Write-roller holder F
F: Write-roller holder R



P1437

FRONT



REAR

P1438

Screws to remove the Write-roller holders F & R.

300-dpi & 400-dpi machines

(1) Pull out the print drum, switch off the power, and then remove the rear cover.

(2) Pull out the power-supply unit to the left.

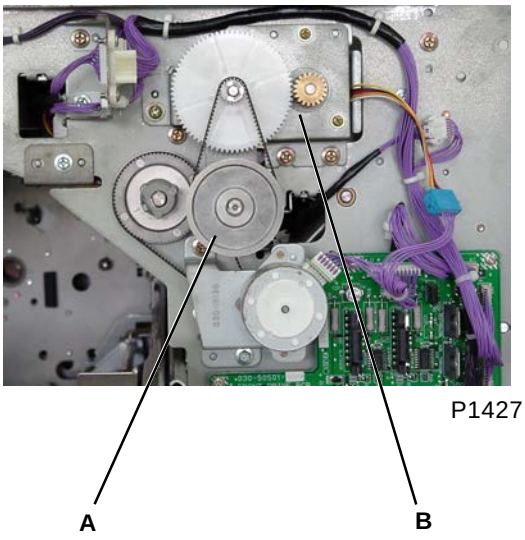
(3) Remove the front cover and front frame cover.

(4) Remove the write-roller pulley [A] by removing one screw (M4 x 8).

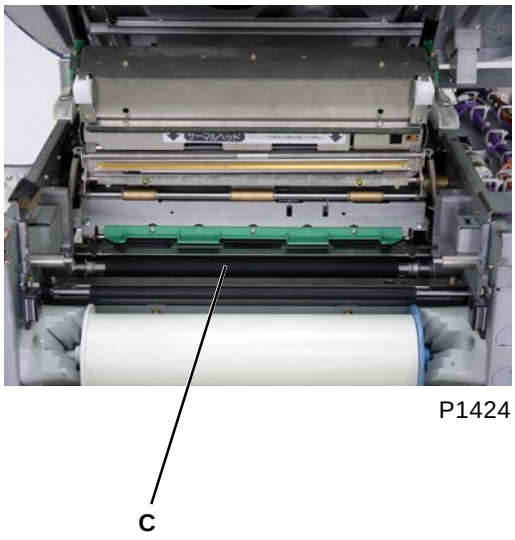
(5) Remove the write-pulse-motor ass'y [B] by removing three screws (M4 x 8).

(6) Open the scanner table, master making unit, and master-roll cover (plastic cover located in front of the master roll).

(8) Slide the write roller [C] slightly to the front, and lift it using the rectangular mounting holes for the write-pulse-motor ass'y. Detach the rear of the write roller from the rear frame plate, and then remove the write roller [C] toward the paper-ejection side. (Take care not to drop the rear bearing inside the machine.)



P1427



P1424

A: Write-roller pulley

B: Write-pulse-motor ass'y

C: Write roller

2. Removing the Load Roller (lower)

(1) Pull out the print drum, switch off the power, and then remove the following components:
- Front cover
- Front frame cover
- Rear cover

(2) Pull out the power-supply unit to the left.

(3) Remove the rear write-roller plate [A] by removing one screw (M4 x 8).

(4) Detach the timing belt, and remove the write-roller pulley [B] by removing one screw (M4 x 8).

(5) Detach the timing belt, and remove the load-roller pulley [C] by removing one screw (M4 x 8).

(6) Remove the cutter cover [G] by removing two screws (M4 x 6).

(7) Remove the master-making-unit upper stay [D] by removing two screws (M4 x 8).

(8) Detach the master guide springs [E] from both sides of the master making unit. Detach the master-making-unit springs F and R [F] from the hooks, and fully open the master making unit.

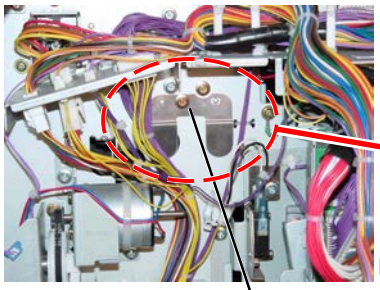
(9) Remove the master guide spring bracket [H] from the left and right machine frames, each by removing one screw (M4 x 8).

(10) Remove the master guide plate [I], and then remove the load-roller guide [J] by removing two screws (M4 x 8).

(11) Remove the E-rings and bushings from both ends of the load roller (lower) [K], and slide the load roller (lower) [K] to the rear before removing it from the print-drum opening in the front.

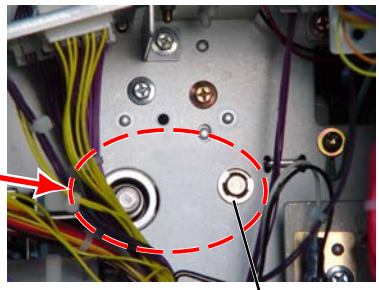
[Precaution on Reassembly]

- The bushings to fit on the ends of the shaft of the load roller (lower) should be inserted from the outside of the machine frames with the flanges on the outside.



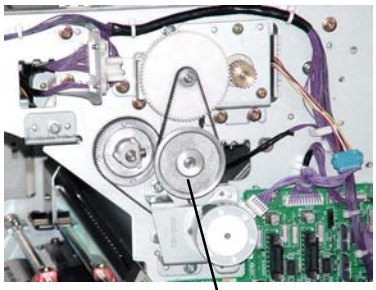
P1430

A



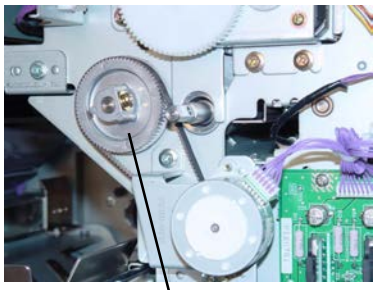
P1429

E-ring and bushing



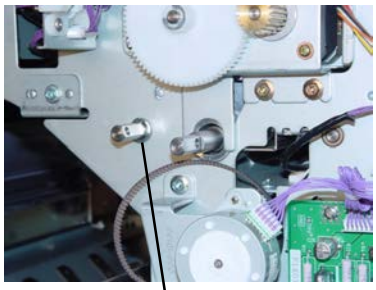
P1428

B



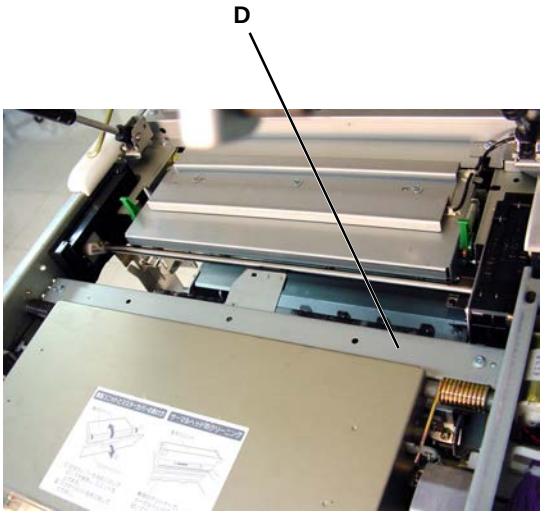
P1439

C

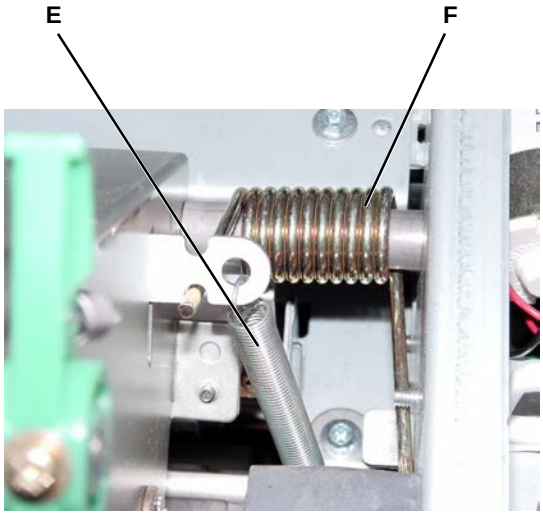


P1440

E-ring and bushing

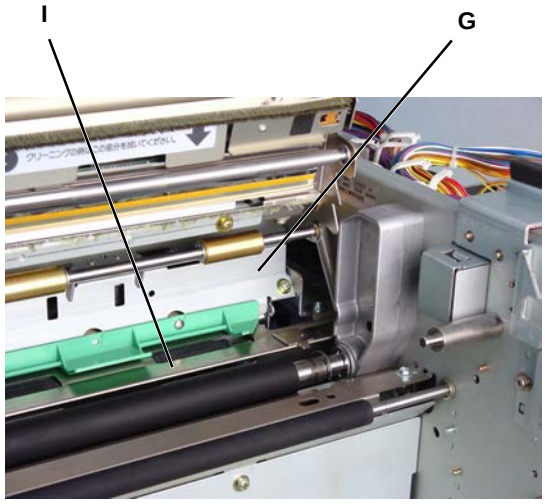


P1410

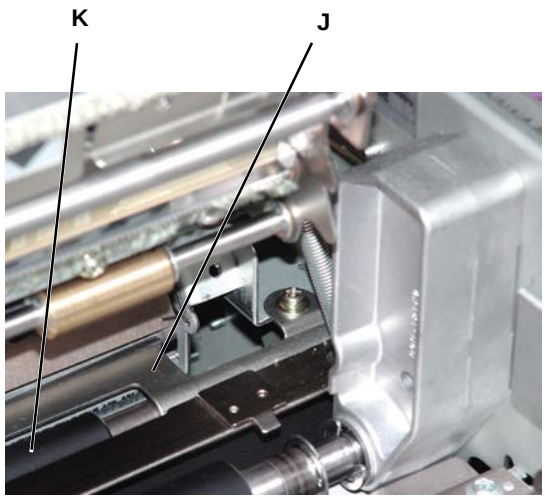


P1411

P1441



P1412



P1413

A: Write-roller plate
B: Write-roller pulley
C: Load-roller pulley
D: Master-making-unit upper stay
E: Master-guide spring
F: Master-making-unit spring R
G: Cutter cover
H: Master-guide spring bracket
I: Master-guide plate
J: Load-roller guide
K: Load roller (lower)

3. Removing the Cutter Unit

(1) Pull out the print drum, switch off the power, and then remove the following components:
- Front cover
- Front frame cover

(2) Open the master-roll cover and scanner table.

(3) Remove the cutter cover assembly [A] by removing two screws (M4 x 6).

(4) Remove the master-making-unit upper stay [F] by removing two screws (M4 x 8).

(5) Open the master making unit.

(6) Under where the master-making-unit upper stay [F] was, unhook from the wire-saddle the two thick wire harness, both wrapped in black, going out to the rear of the machine from the master making unit, and also one wire harness, wrapped in black, going out to the front of the machine from the master making unit. [Ref: Photograph bellow.]

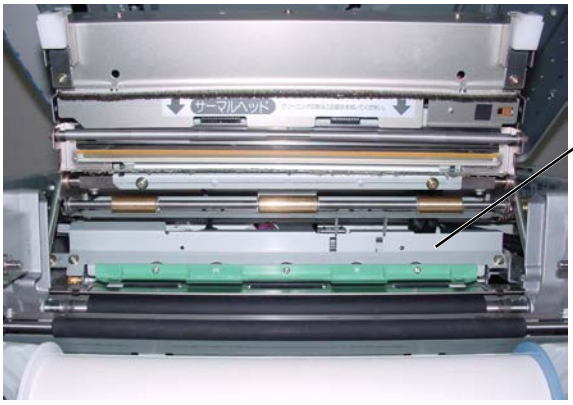
(7) Unplug the connector [C] of the cutter unit from the junction connector located at the front of the machine, above the print-drum opening.

(8) Remove two screws (M4 x 8) which hold the load-roller guide [D] onto the cutter unit assembly.

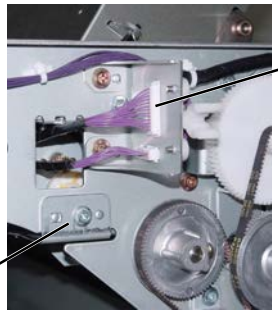
(9) Hold the cutter unit assembly [B] firmly to prevent it from dropping, remove one screw (M4 x 8) in the front, and then pull it forward slightly to disengage the rear of the assembly from the frame of the machine. Then remove the assembly out from the print-drum opening in the front.

(10) To separate cutter unit [E] from the assembly, unplug one connector and remove one screw (M4 x 6).

[Precautions on Reassembly]
- Align the half-pierced sections (locating pins) when installing the cutter assembly on the machine.
- Do not damage the master loading sensor [G] when handling the cutter unit assembly.
- The cutter unit assembly [B] should be positioned under the load-roller guide [D].

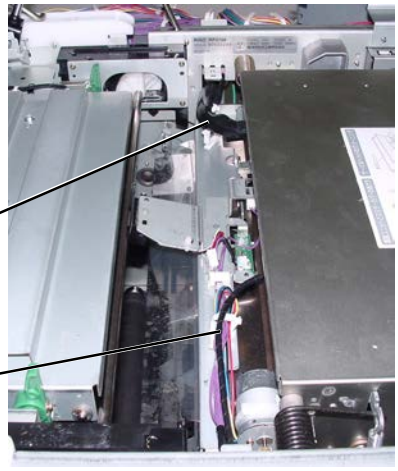


P1425

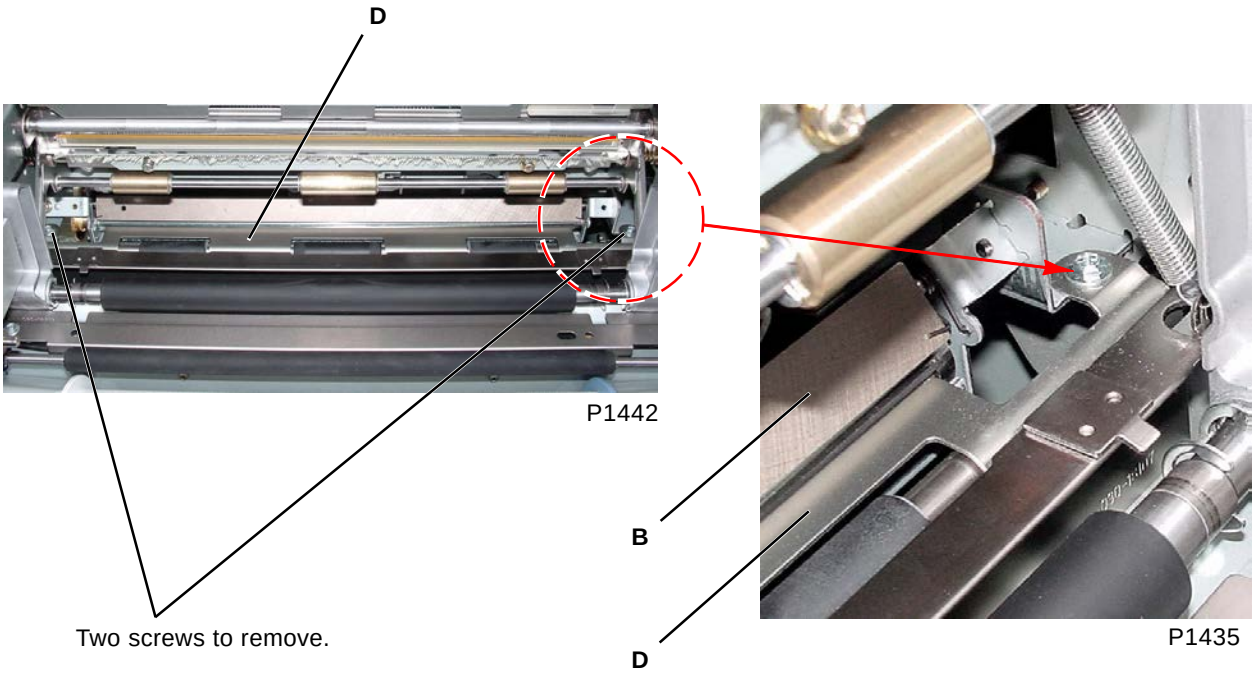


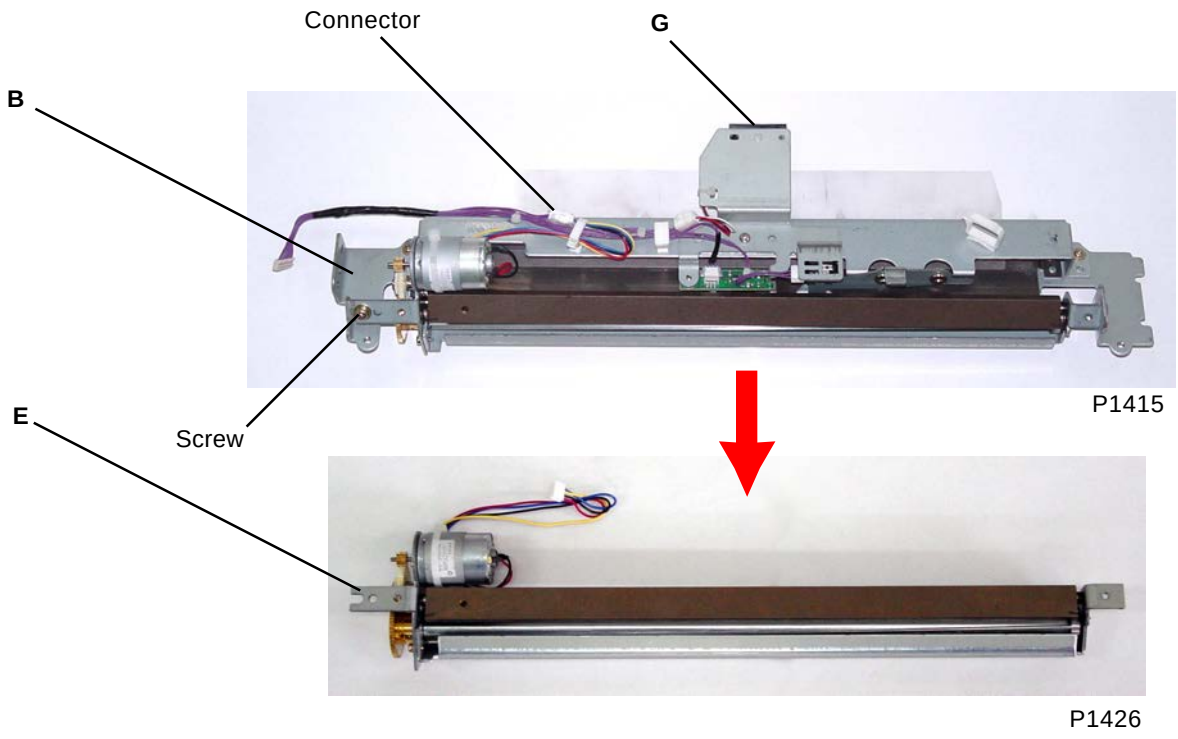
P1414

P1431



P1443





A: Cutter cover assembly
B: Cutter unit assembly
C: Connector
D: Load-roller guide
E: Cutter unit
F: Master-making-unit upper stay
G: Master loading sensor

4. Removing the Master Loading Sensor, Master Positioning Sensor, and Master-Making-Unit Sensor

(1) Switch off the power and open the scanner table.

(2) Remove the master-making-unit upper stay [A] by removing two screws (M4 x 8).

(3) Remove one screw (M3 x 6) to let the sensor bracket [B] free from the cutter unit assembly (with the wire harness still attached), and release the wire harness from the two wire saddles.

Master loading sensor

(4) Cut the wire clamp, unplug the connector, and then remove the master loading sensor [C] with one screw (M3 x 6).

Master positioning sensor

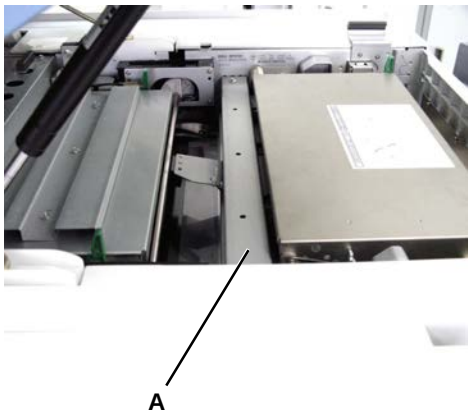
(4) Unplug the connector, and remove the master positioning sensor [D] by removing one screw (M3 x 6).

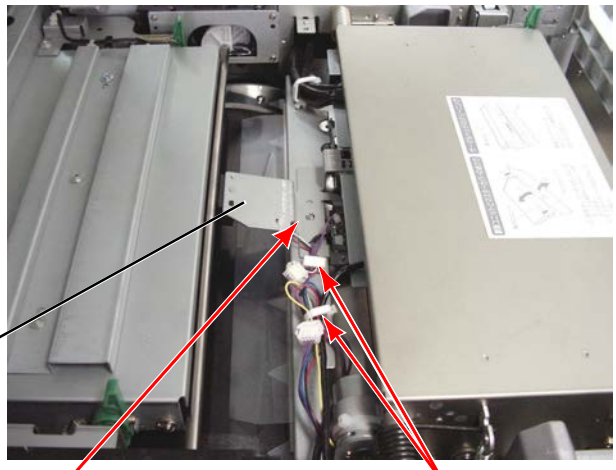
Master-making-unit sensor

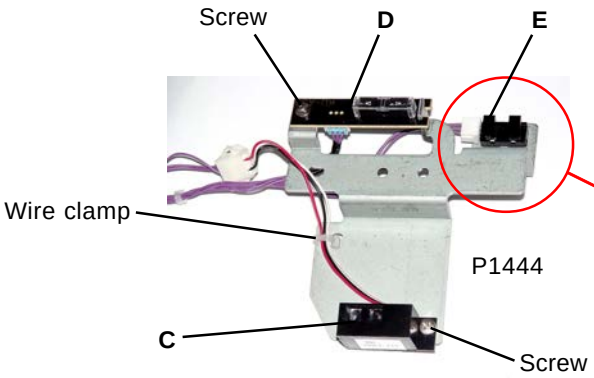
(4) Unplug the connector, and unhook the master-making-unit sensor [E] from the bracket.

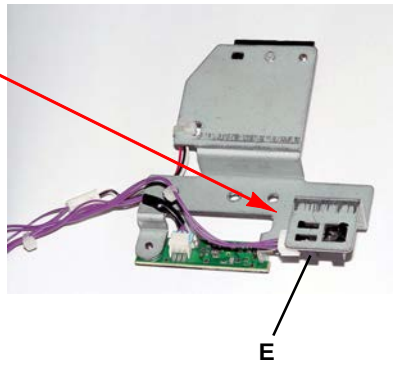
[Precaution on Reassembly]

- Align the half-pierced section on the sensor bracket.









A: Master-making-unit upper stay
B: Sensor bracket
C: Master loading sensor
D: Master positioning sensor
E: Master-making-unit sensor

5. Removing the TPH

(1) Open the master-roll cover and scanner table, and then open the master making unit.

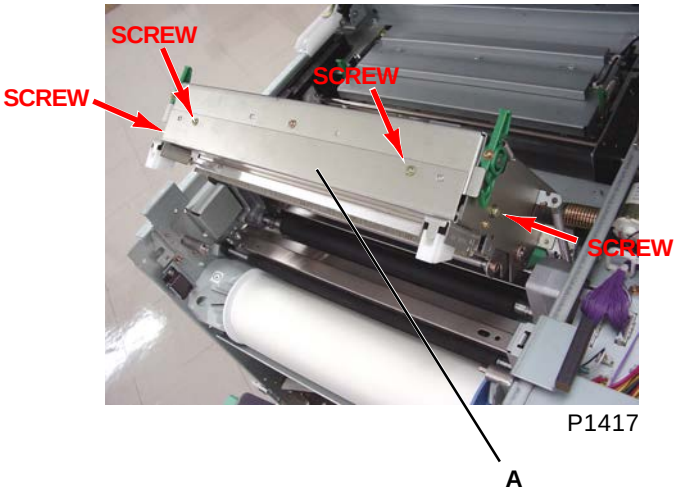
(2) Remove four screws (M3 x 6) from the master-making-unit lower cover [A] and lift the the cover enough to unplug the master end sensor. Then completely detach the cover from the master making unit.

(3) Detach the ground wire of the TPH from the master making unit by loosening one screw (M3 x 6).

(4) Then remove the TPH from the master making unit by removing two screws (M4 x 8) and unplugging two connectors from the TPH. **Becareful in handling the TPH - Do not drop it.**

[Precautions on Reassembly]

- After replacing the TPH, always adjust the thermal power by entering the resistance value test mode No. 288. Check the prints and if the image is off-centered, use test mode No. 294 (TPH Horizontal-Write-Position Adjust) to adjust the image centering.
- Be sure to plug the master end sensor connector when attaching the master-making-unit lower cover [A].



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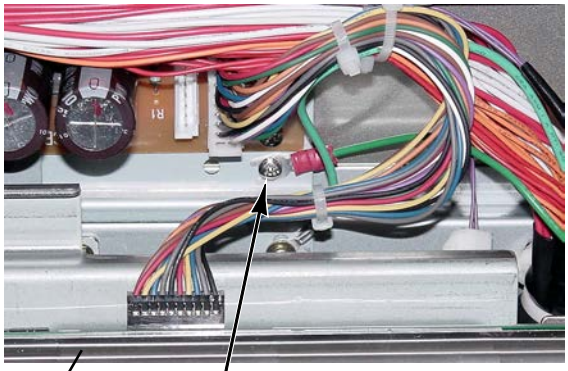
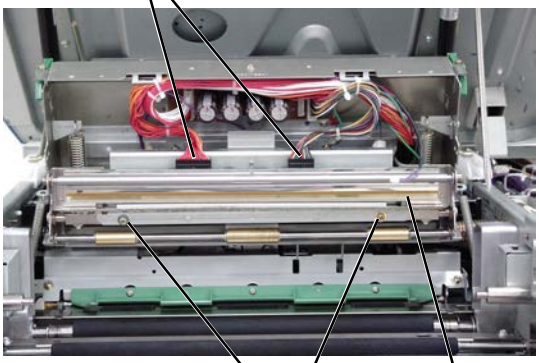
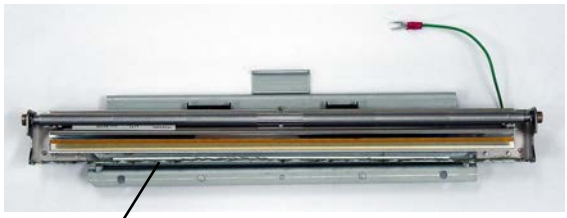


P1446



P1418



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A: Master-making-unit lower cover

B: TPH

6. Removing the Master Making Unit

(1) Open the scanner table and master making unit (place the scanner table in the service position).

(2) Pull out the print drum, switch off the power, and remove the following components:

- Front cover
- Front frame cover
- Rear cover

(3) Open the power-supply unit and main PCB unit to the left and right, respectively.

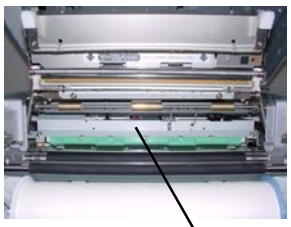
(4) Remove the cutter-cover assembly [A] by removing two screws (M4 x 6).

(5) Remove the master-making-unit upper stay [B] by removing two screws (M4 x 8).

(6) Detach the master guide springs [C] attached on both sides of the master making unit [E]. Fully open the master making unit [E], and detach the master-making-unit springs F and R [D] on the master making unit [E] from the hooks.

(7) Remove from wire saddle two wire harness running to the rear of machine from the master making unit [E]. Cut one wire harness band which holds one of the two wire harness to the rear frame of the machine. Remove one screw (M4 x 6) from the rear machine frame to free ground wire extending out from that wire harness. Then remove from another wire saddle one wire harness running to the front of the machine from the master making unit. Unplug the connector of that wire harness from the junction connector located at front of the machine.

(8) Open the master making unit [E] to 105° angle position and lift it up. Then remove it out towards the paper-ejection side of the machine.



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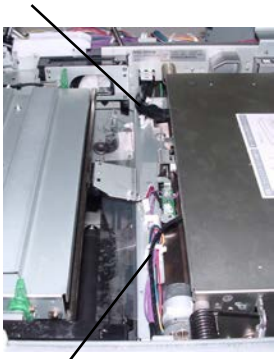
Unhook two wire harness from wire saddle.



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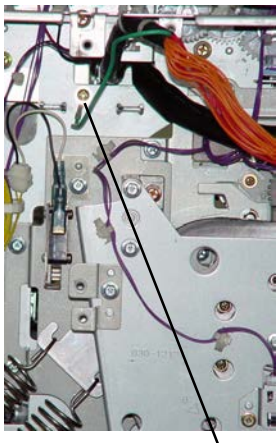
Unhook one wire harness from wire saddle.



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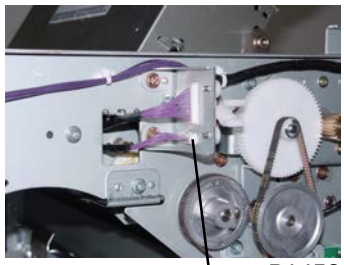
Remove this screw to free the ground wire.



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Unplug the connector.

A: Cutter cover assembly

B: Master-making-unit upper stay

C: Master guide spring (also on the other side)

D: Master-making-unit spring R (spring F is on the other side)

E: Master making unit

7. Removing the Thermal-Pressure-Motor Assembly

(1) Remove the TPH (see this chapter).

(2) Remove the master making unit (see this chapter).

(3) Remove the master-making-unit lower cover.

(4) Place the master making unit upside down, and detach the two TPH pressure springs [B].

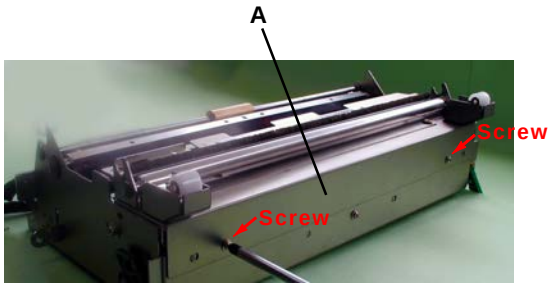
(5) Detach the E-rings and metals from both sides of the roller, and remove the load roller (upper) [D].

(6) Unplug the connector, and remove the thermal-pressure-motor ass'y [E] with four screws (M3 x 8).

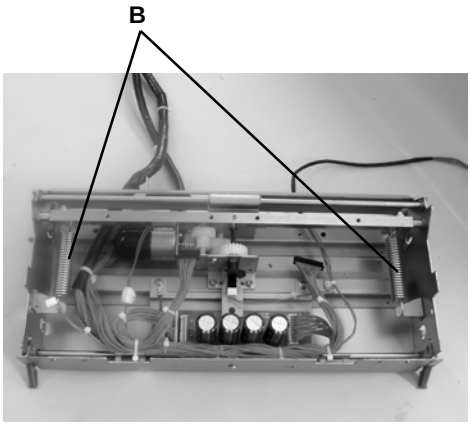
(7) Remove the TPH pressure-sensor bracket [C] with two screws (M3 x 6).

[Precaution on Reassembly]

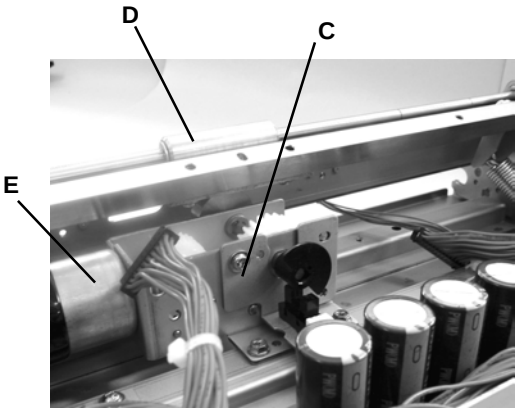
- Align the half-pierced sections when installing the thermal-pressure-motor assembly.



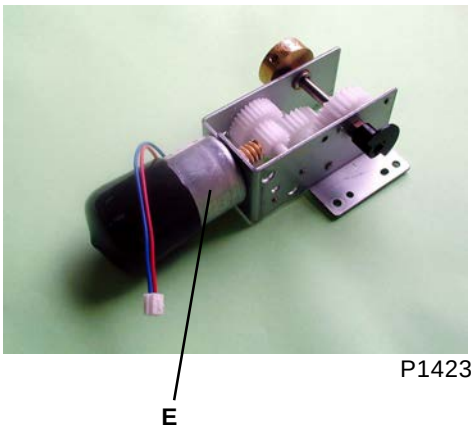
P1420



P1421



P1422



P1423

A: Master-making-unit lower cover
B: TPH pressure springs
C: TPH pressure-sensor bracket
D: Load roller (upper)
E: Thermal-pressure-motor assembly

Adjustment

1. Thermal Power of TPH

After the TPH has been replaced, the thermal power must always be set before masters are made.

Checks and procedure

(1) Open the master making unit and look at the TPH resistance values printed on the sticker attached on the TPH unit.

(2) Run test mode No. 288 and confirm that correct TPH resistant value is input.

Setting range: 1200–5300 Ω (600 dpi)
1200–2600 Ω (400 dpi)
1200–2400 Ω (300 dpi)

Setting unit: 1 (1 Ω)

Default: 1200 (1200 Ω)

2. Horizontal Writing Position of TPH

This adjusts the horizontal print position of the TPH.

Checks and procedure

(1) By the operation panel key, select the horizontal print position to the center. Place A3-size paper in the paper-feed tray and start up test mode No.50 to make (test print-A) image and make copies.

(2) Compare the white margin on the left and the right of the print and confirm that they are equal.

(3) If not, run test mode No. 294 to shift the image to the center.

Setting range: -30 to +30 (-3.0 mm to +3.0 mm) relative to the datum position
* (+ moves to the left)

Setting unit: 1 (0.1 mm)

Default: 0 (0 mm)

NOTE:

If the available paper size is narrower than A3 in width, and if this adjustment must be made, send an image from a PC, a center-line going from top to bottom. Fold the print in half and confirm that the center-line image is at the center of the sheet. If the printed line is off-centered, make above adjustment. The PC image (center-line) can be downloaded on DM-32 card and carried, if necessary.

3. Master Feeding Adjustments

1) Length adjustment of a master

This adjusts the master cutting timing (print-drum stop position for cutting).

Checks and procedure

(1) Adjust if the end of the master loaded onto the print drum is too long or too short.

(2) Run test mode No. 284 to adjust.

Setting range: -100 to +100 (-10.0° to +10.0°)

Setting unit: 2 (0.2°)

Default: 0 (0°)

* Increasing the settings increases the length of each master.

2) Master-clamp range adjustment

This adjusts the amount of master clamped under the clamp plate.

Checks and procedure

(1) Make a master and operate Confidential-making, then set the amount of master-clamp from the edge of the clamp plate. 23 mm ± 2 mm is considered normal. If it is outside this range, adjust as shown below.

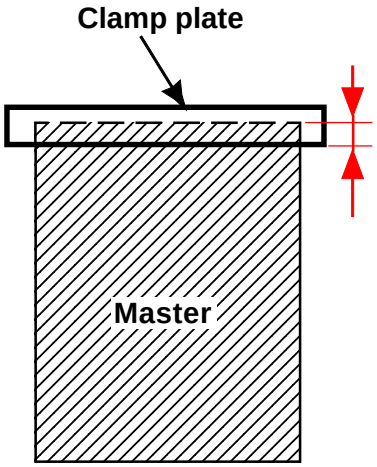
(2) Run test mode No. 283 to adjust the amount of master- clamp.

Setting range: -100 to +100 (-10.0 mm to +10.0 mm)

Setting unit: 1 (0.1 mm)

Default: 0 (0 mm)

* Increasing the settings increases the clamp amount.



Note:

The relative positioning of previously made masters loaded onto the print drum will change if the clamp amount is adjusted. “Write-start position adjustment” must therefore be repeated, and it must also be confirmed that the vertical print-position adjustment is correct.

3) Master-making elongation and shrinkage adjustment

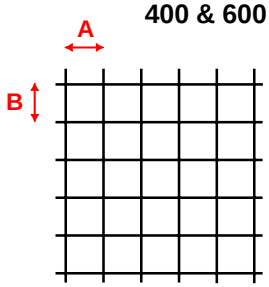
This adjusts the write pulse-motor speed for master making.

Checks and procedure

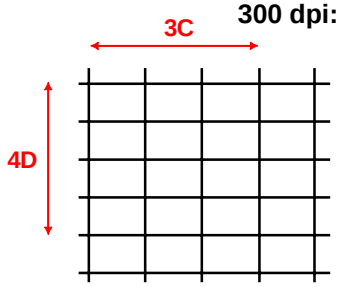
(1) Run test-mode No. 051 test print B (check) to produce an actual print. Fold the print at 45° and confirm that the vertical and horizontal lines coincide when overlaid (for 400 dpi & 600 dpi).
For 300 dpi, the lengths of 3 lines combined cross-ways should equal to 4 lines combined vertically.

NOTE:

400 & 600 dpi: A = B



300 dpi: 3C = 4D



If the line lengths do not align, adjust as shown below.

(2) Run test mode No. 287 to adjust the write pulse motor speed.

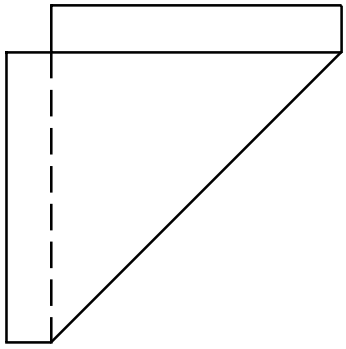
Setting range: -100 to +100 (-10.0% to +10.0%)

Setting unit: 1 (0.1%)

Default: 0 (0%)

* Increasing the settings elongates the image vertically.

Fold the print at 45 degrees and check the horizontal and vertical line alignment.



4) Write-start position adjustment

This adjusts the write-start position (distance from master positioning sensor ON to read/write signal ON). This adjustment corresponds to the adjustment for a leading-edge margin of 5 mm with properly adjusted amount of the master-clamp.

Checks and procedure

(1) Run test-mode No. 050 (test print A). Confirm that the amount of master-clamp has been correctly adjusted (refer to previous page).

(2) Cover the print-drum surface, aligning the leading edge of the paper with the leading edge of the printing area on the drum, and then transfer the ink to the paper by rubbing the paper from above. The position is correct if the leading-edge margin is 4 mm ± 1 mm. If it is not correct, adjust as shown below.

(3) Run test mode No. 281 to adjust the position.

Setting range: -50 to +50 (-5.0 mm to +5.0 mm)

Setting unit: 1 (0.1 mm)

Default: 0 (0 mm)

* Increasing the settings lowers the write-start position, which increases the paper leading-edge white margin and brings the printing area downward.

5) Master-making length adjustment

This adjusts the master making length. With the condition that the master-clamped amount is correctly adjusted (refer to page 8-21), this adjustment is to make the bottom white margin on the prints to 2 mm.

Checks and procedure

(1) Run test-mode No. 050 (test print A), remove the created master created from the print drum, and measure the total length of the image made on the master.
The correct length of the image should be 413 mm to 414 mm.
If it is outside this range, adjust as shown below.

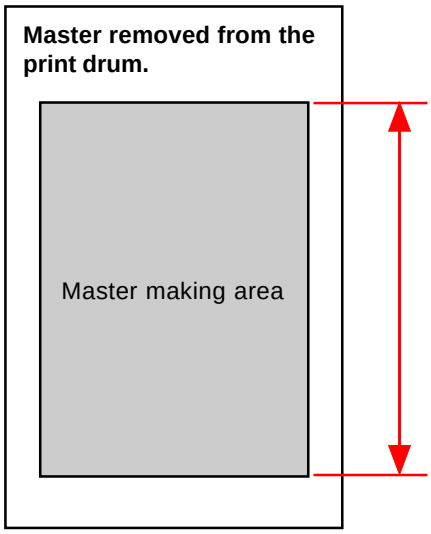
(2) Run test mode No. 282 to adjust the master-making length.

Setting range: -100 to +100 (-10.0 mm to +10.0 mm)

Setting unit: 1 (0.1 mm)

Default: 0 (0 mm)

* Increasing the settings increases the length of the master making area.



Memo

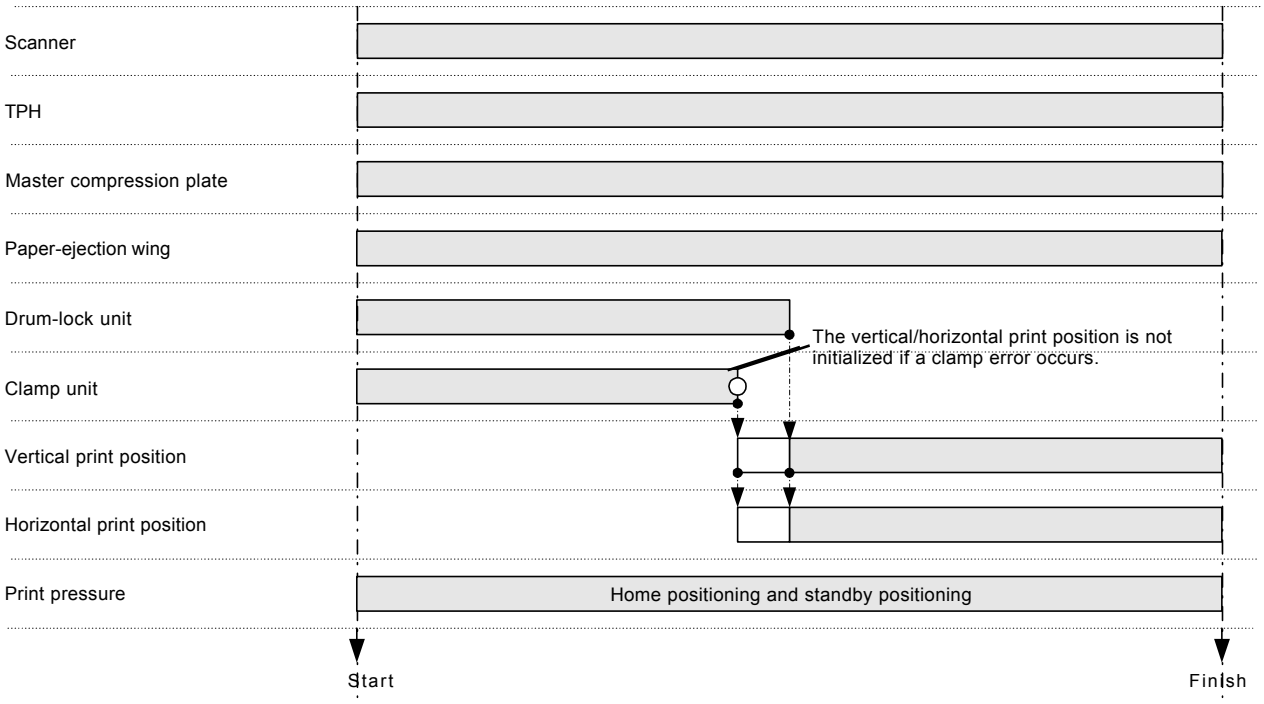
CHAPTER 15: TIMING CHARTS

Contents

Initialization Operations

1. Overall Initialization Operation

Returns the following items to their home positions when the power is switched ON or when “All reset” is performed:



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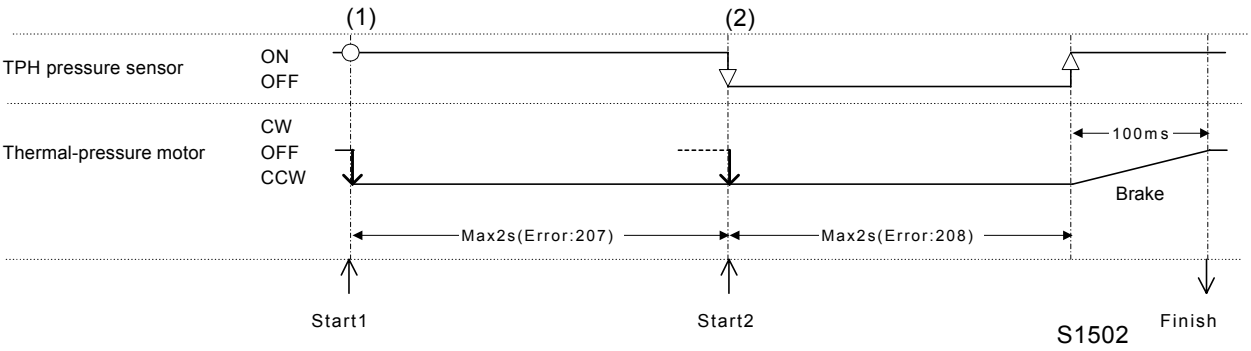
2. Individual Initialization Operations

[TPH Initialization Operation]



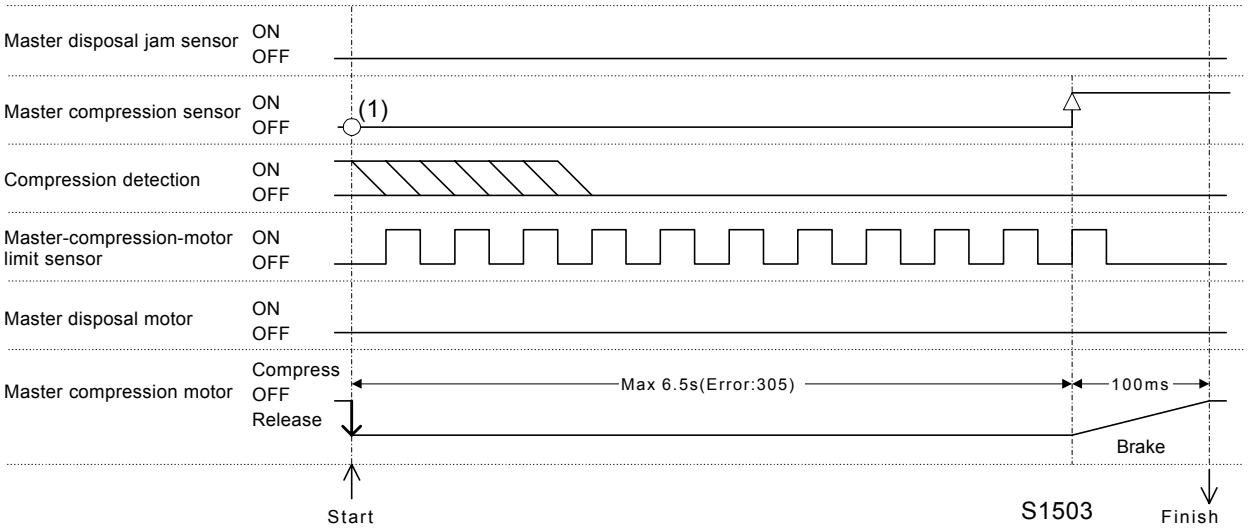
* When ON: TPH pressure sensor: Blocked

(1) The TPH pressure 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 thermal-pressure motor operates in the pressure-release direction until the TPH pressure sensor turns OFF. A timeout occurs at 2 s here, and error message [T19-207] is displayed.

(2) The thermal-pressure motor operates in the pressure-release direction until the TPH pressure sensor turns ON. A timeout occurs at 2 s here, and error message [T19-208] is displayed.

(3) Initialization ends once the TPH pressure sensor turns ON.

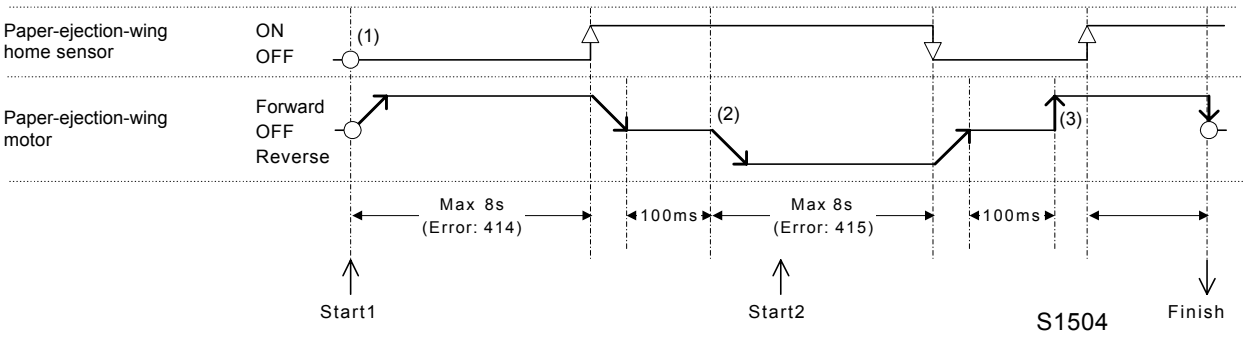
[Master-Compression-Plate Initialization Operation]



* When ON: Master compression sensor: Open

(1) The master compression sensor is checked at startup, and operation ends if it is ON. If the sensor is OFF, the master compression motor operates in the return direction until the master compression sensor turns ON. A timeout occurs at 6.5 s here, and error message [T12-305] is displayed.

[Paper-Ejection-Wing Initialization Operation]



* When ON: Paper-ejection-wing home sensor: Blocked

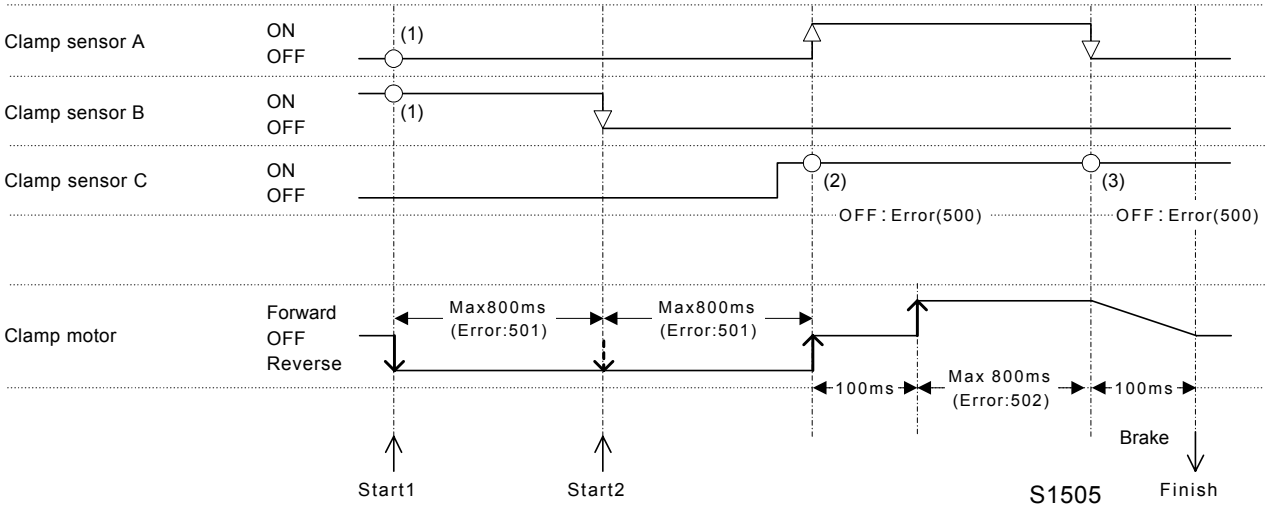
(1) The paper-ejection-wing home sensor is checked at startup; operation starts from Start 1 if it is OFF, and from Start 2 if it is ON. At Start 1, the paper-ejection-wing motor operates in the forward direction until the paper-ejection-wing home sensor turns ON. Error message [T20-414] is displayed if the paper-ejection-wing home sensor does not turn ON within 8 s.

(2) The paper-ejection-wing motor operates in the reverse direction until the paper-ejection-wing home sensor turns OFF. Error message [T20-415] is displayed if the paper-ejection-wing home sensor does not turn OFF within 250 ms.

(3) The paper-ejection-wing motor operates in the forward direction until the paper-ejection-wing home sensor turns ON, and then stops after rotating a further (10 + a + b) pulses
(a = value set in test mode No. 489).

[Clamp-Unit Initialization]

Clamp Initialization 1



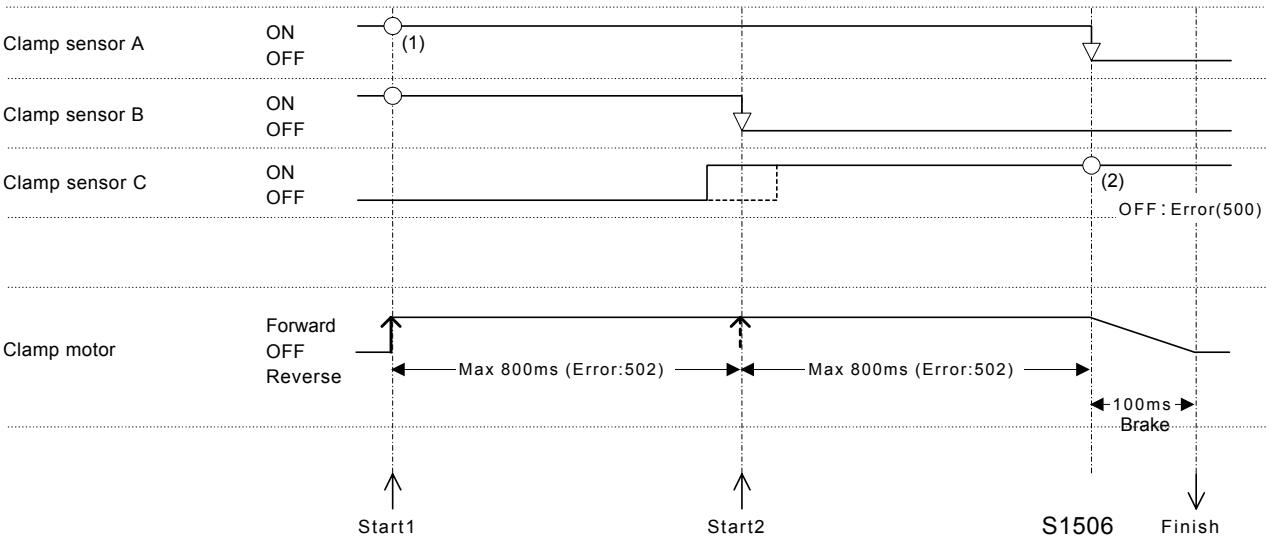
* When ON: Clamp sensor A: Blocked; Clamp sensor B: Blocked; Clamp sensor C: Blocked

(1) Clamp sensor A is checked at startup, and operation switches to Clamp Initialization 2 if it is ON. Clamp sensor B is checked, and operation starts from Start 2 if it is OFF. At Start 1, the clamp motor operates in the reverse direction until clamp sensor A turns ON. Error message [T03-501] is displayed if clamp sensors A and B do not change within 800 ms.

(2) Clamp sensor C is checked once clamp sensor A turns ON, and error message [T03-500] is displayed if the sensor is OFF.

(3) The clamp motor operates in the forward direction until clamp sensor A turns OFF. Error message [T03-500] is displayed if clamp sensor C is OFF.

Clamp Initialization 2

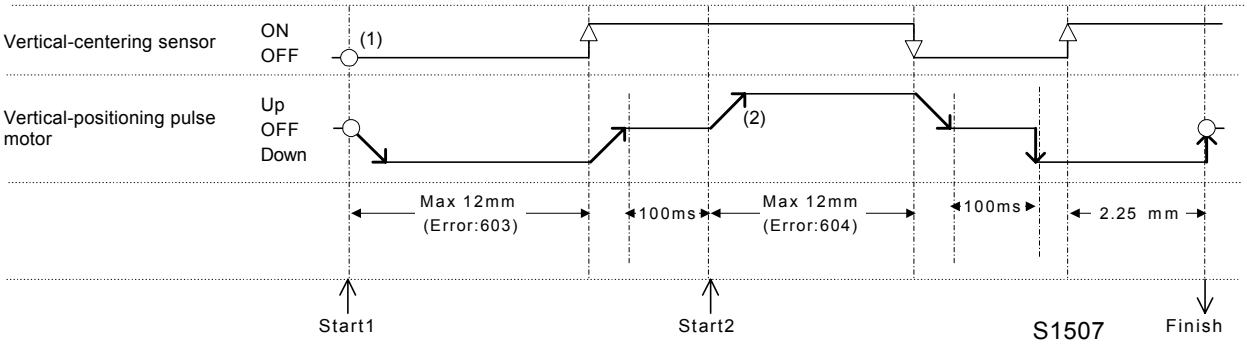


* When ON: Clamp sensor A: Blocked; Clamp sensor B: Blocked; Clamp sensor C: Blocked

(1) Clamp sensor A is checked at startup, and the operation switches to Clamp Initialization 1 if it is OFF. Clamp sensor B is checked, and the operation starts from Start 2 if it is OFF. At Start 1, the clamp motor operates in the forward direction until clamp sensor A turns OFF. Error message [T03-502] is displayed if clamp sensors A and B do not change within 800 ms.

(2) Error message [T03-500] is displayed if clamp sensor C is OFF when clamp sensor A turns OFF.

[Vertical-Print-Position Initialization]



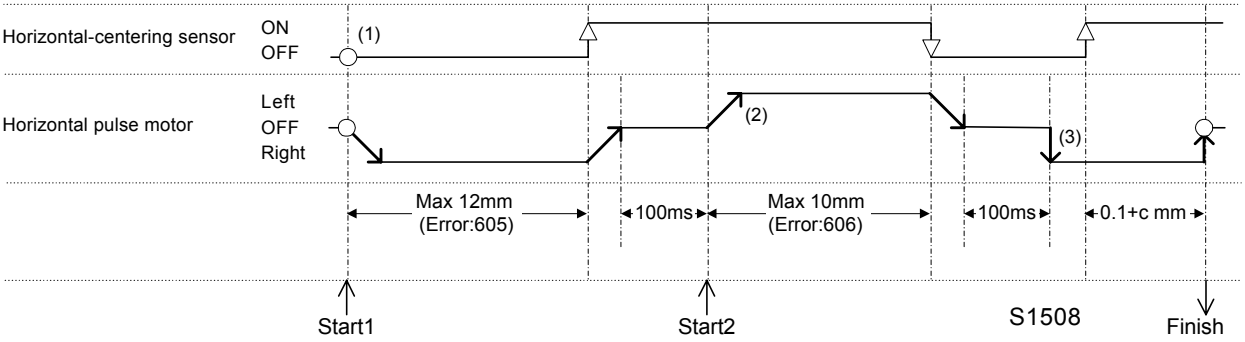
* When ON: Vertical-centering sensor (Blocked)

(1) The vertical-centering sensor is checked at startup; 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 downward direction until the vertical-centering sensor turns ON. A timeout occurs at 12 mm here, and error message [T05-603] is displayed.

(2) The print-positioning pulse motor operates in the upward direction until the vertical-centering sensor turns OFF. A timeout occurs at 12 mm here, and error message [T05-604] is displayed.

(3) The print-positioning pulse motor operates in the downward direction again, and then rotates 2.25 mm after the vertical-centering sensor turns ON, before stopping.
(If the paper feed cam is an old design type, the rotation amount is 0.1 mm instead of 2.25 mm).

[Horizontal-Print-Position Initialization]



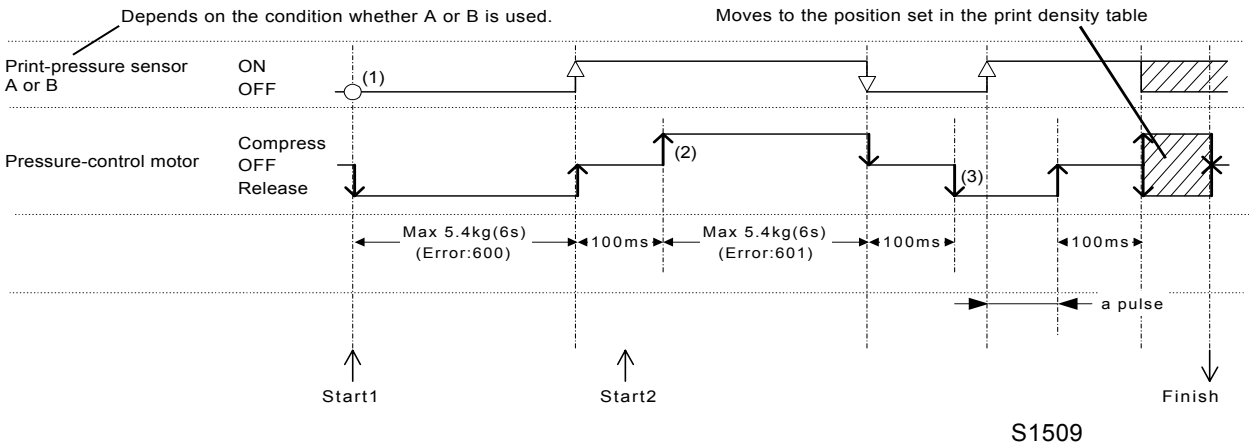
* When ON: Horizontal-centering sensor: Blocked

(1) The horizontal-centering sensor is checked at startup; operation starts from Start 1 if it is OFF, and from Start 2 if it is ON. At Start 1, the horizontal pulse motor operates in the rightward direction until the horizontal-centering sensor turns ON. A timeout occurs at 12 mm here, and error message [T05-605] is displayed.

(2) The horizontal pulse motor operates in the leftward direction until the horizontal-centering sensor turns OFF. A timeout occurs at 10 mm here, and error message [T05-606] is displayed.

(3) The horizontal pulse motor operates in the rightward direction again, and then rotates (0.1 + c) mm after the horizontal-centering sensor turns ON, before stopping
(c = value set in test mode No. 681 [default: 0 mm]).

[Print-Pressure Initialization]



* When ON: Print-pressure sensor A or B: Blocked

(1) The print-pressure sensor is checked at startup; 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 pressure-releasing direction until the print-pressure sensor turns ON. A timeout occurs at 6 s here, and error message [T11-600] is displayed.

(2) The pressure-control motor operates in the pressure-increase direction until the print-pressure sensor turns OFF. A timeout occurs at 6 s here, and error message [T11-601] is displayed.

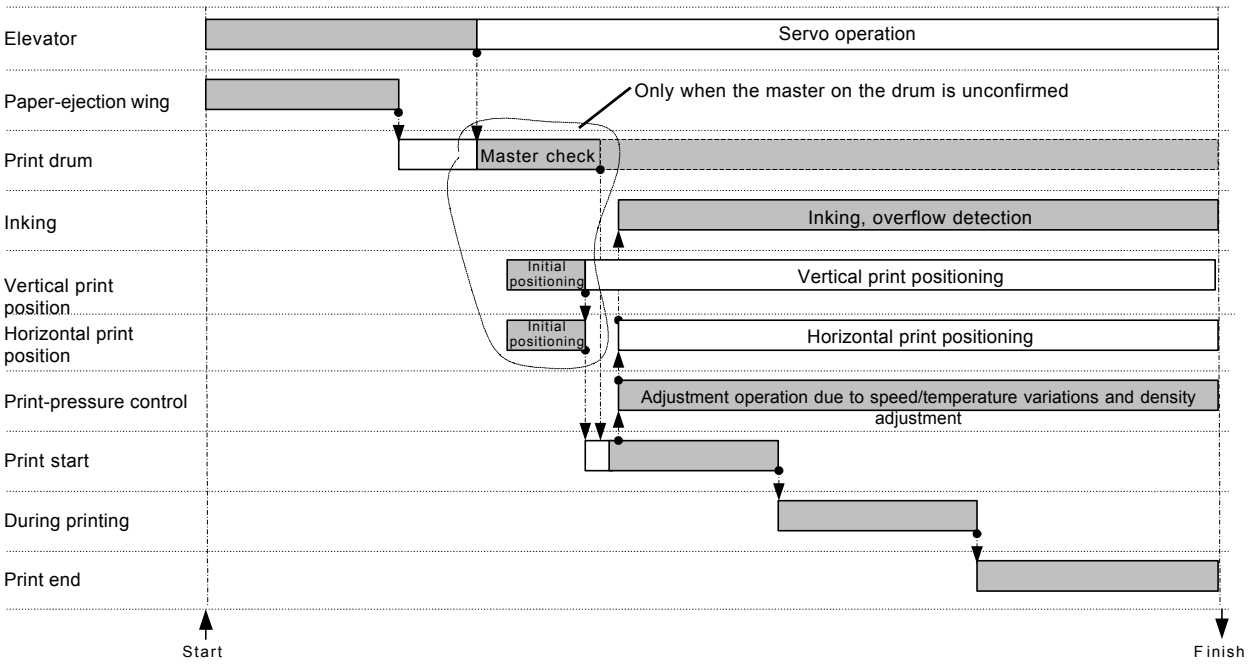
(3) The pressure-control motor operates in the pressure-releasing direction again, and then moves the equivalent of “a” pulses after the print-pressure sensor turns ON, before stopping
(a = value set in test mode No. 682 [default: 0 mm]).

(4) The pressure-control motor moves to the position set in the print density table.

Memo

Printing Operations

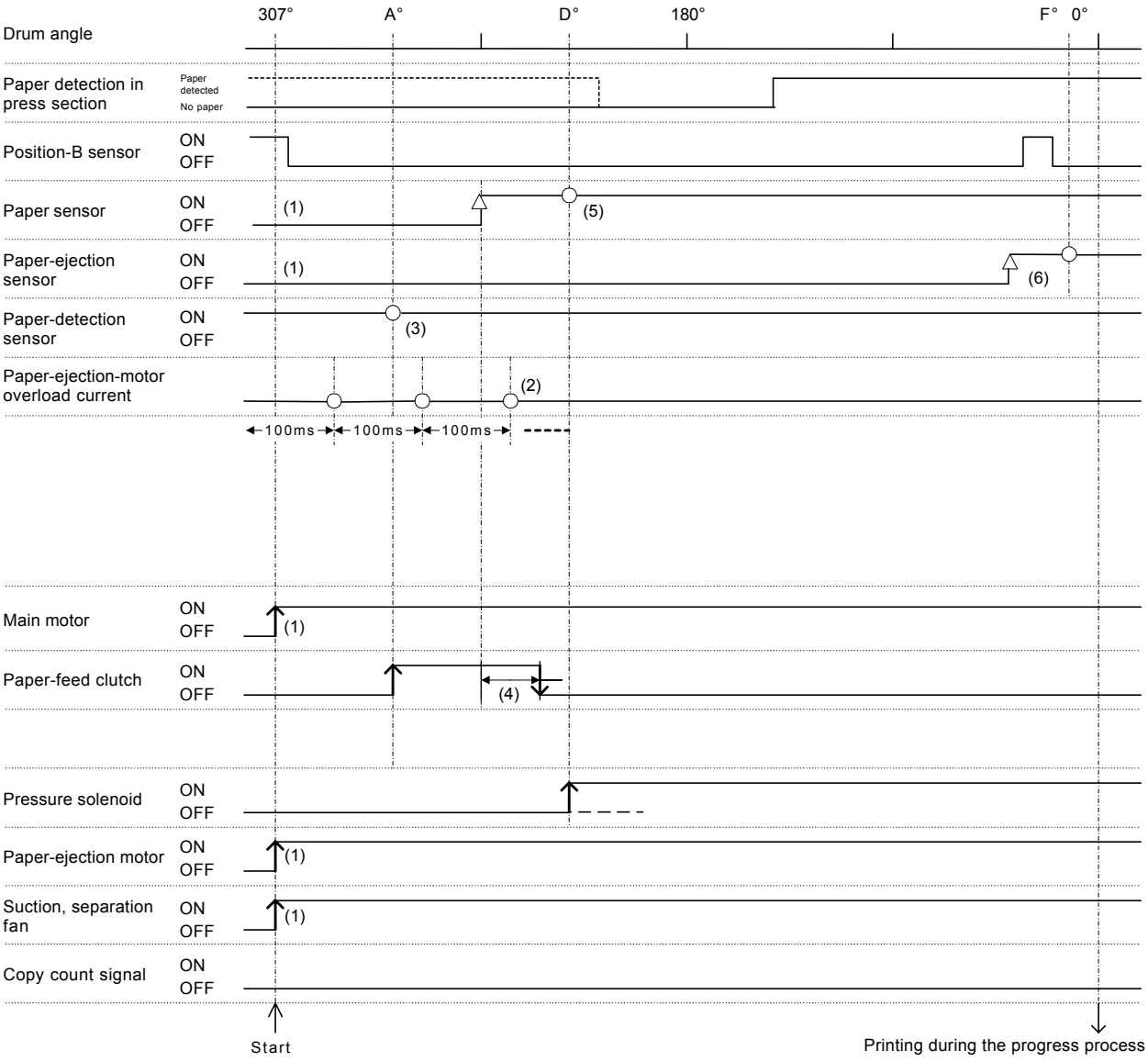
1. Overall Operation of Normal Printing



S1510

2. Individual Printing Operations

[Print Start Operation]



S1511

* When ON: Position-B sensor: Blocked; Paper sensor: Blocked; Paper-ejection sensor: Blocked; Paper-detection sensor: Open

(1) The paper-ejection sensor is checked during startup printing, and error message [A09-417] is displayed if paper is present. The paper sensor is also checked during startup printing, and error message [A09-418] is displayed if paper is present. At startup 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 increases by one speed level at a drum angle of 220° for each sheet printed.

(2) The paper-ejection-motor overload current is continually monitored at 100-ms intervals, and error message [T20-416] is displayed if it is activated three times in succession.

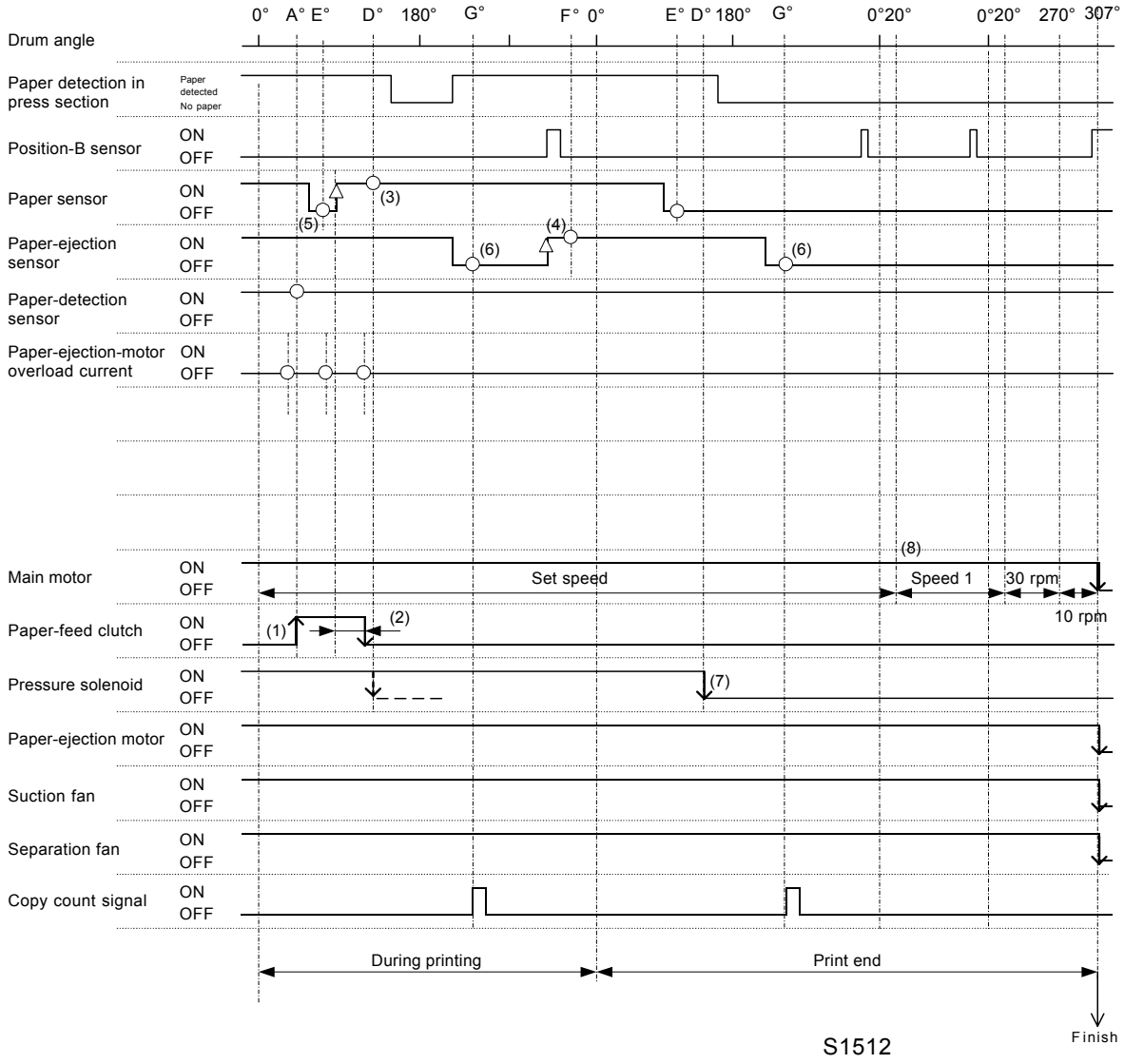
(3) The paper-detection sensor is checked at drum angle A°, and the paper-feed clutch is activated if paper is present. Error message [C04-402] is displayed if no paper is present
(A = 40° + value set in test mode No. 481 + vertical-print-position adjustment).

(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 = 30° + value set in test modes Nos. 482–485 + adjustment for print-drum speed).

(5) The paper sensor is checked at drum angle D°, and the pressure solenoid is activated if paper is present. If no paper is present, it determines that no paper has been picked up and moves to the paper pickup (three-cycle) operation without activating the pressure solenoid
(D = 150° + value set in test mode No. 486).

(6) If the paper-ejection sensor does not detect paper by the time the print drum has rotated to angle F°, 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 [A07-410] is displayed if no paper is present
(F = 350° + value set in test mode No. 487).

[During Printing – End Operation]



* When ON: Position B sensor: Blocked; Paper sensor: Blocked; Paper-ejection sensor: Blocked; Paper-detection sensor: Open

(1) The paper-detection sensor is checked at 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 = 40° + value set in test mode No. 481 + vertical-print-position adjustment).

(2) The paper is transported, and the paper-feed clutch is deactivated once the print drum has rotated B° from when the paper was detected by the paper sensor
(B = 30° + value set in test modes Nos. 482–485 + adjustment for print-drum speed).

(3) If the paper sensor does not detect the paper by the time the print drum has rotated to angle D°, it determines that no paper has been picked up and moves to the paper pickup (three-cycle) operation
(D = 150° + value set in test mode No. 486).

(4) If the paper-ejection sensor does not detect paper by the time the print drum has rotated to angle F°, 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 [A07-410] is displayed if no paper is present
(F = 350° + value set in test mode No. 487).

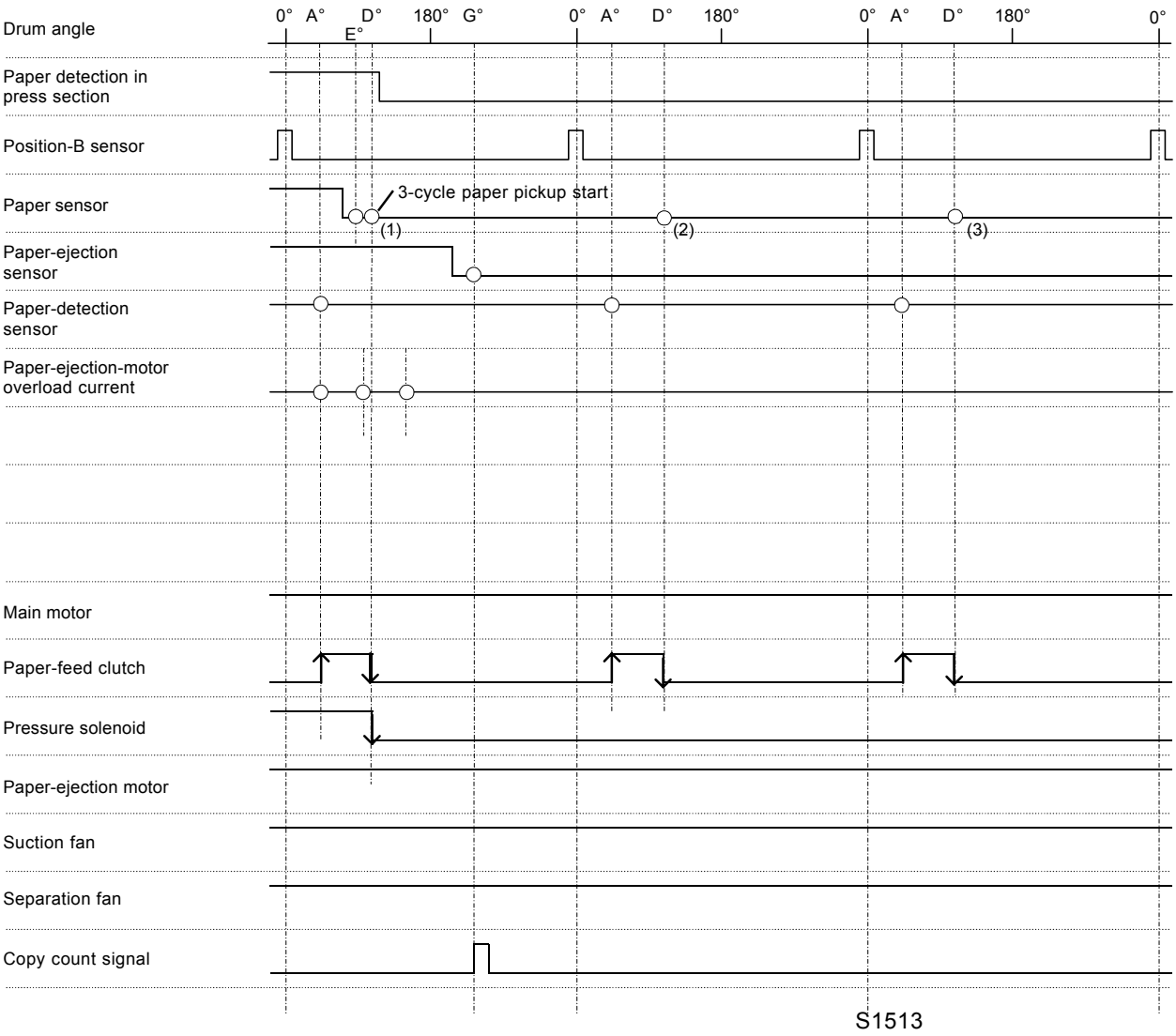
(5) If no paper passes the paper sensor by the time the print drum has rotated to angle E°, it determines that a paper jam has occurred and moves to the print end operation, and error message [F26-413] is displayed
(E = 98° + vertical-print-position adjustment).

(6) The paper-ejection sensor is checked at drum angle G°. If the paper is still present, it determines that a paper jam has occurred and moves to the print end operation, and error message [A09-411] is displayed. If normal, the copy count is incremented.
(G = 290°)

(7) Upon completion of printing, the pressure solenoid is deactivated when the print drum has rotated to angle D°.

(8) On the penultimate revolution, the drum rotates at speed 1 at 20°, reducing to 30 rpm at 20° on the final revolution, and to 10 rpm at 270°. The main motor, paper-receiving motor, suction fan, and separation fan stop once the print drum is detected at position B.

[Paper Pickup (Three-Cycle)]



* When ON: Position B sensor: Blocked; Paper sensor: Blocked, Paper-ejection sensor: Blocked; Paper-detection sensor: Open

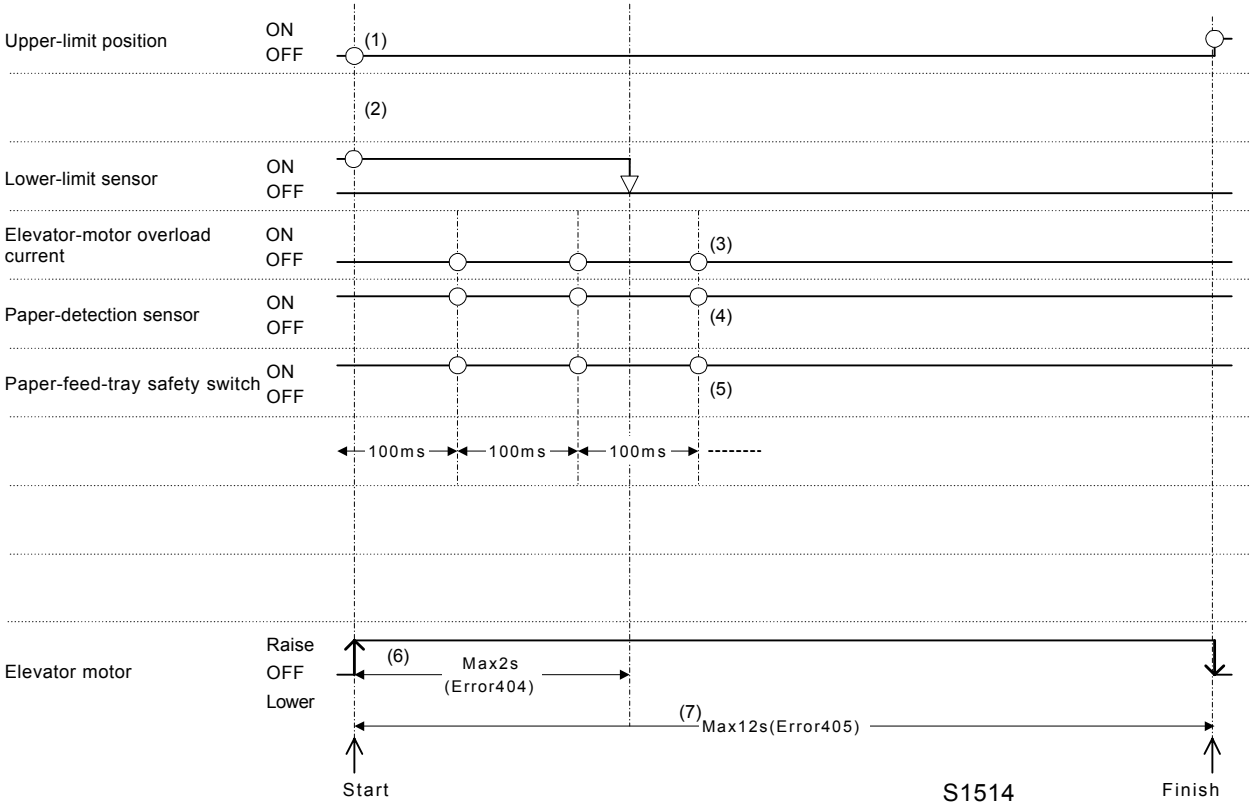
(1) If the paper sensor does not detect paper by the time the print drum has rotated to angle D°, it determines that no paper has been picked up and moves to the three-cycle paper pickup operation (D = 150° + value set in test mode No. 486).

(2) The paper-feed operation is performed a second time, and normal operation is resumed if the paper sensor detects paper by the time the print drum has rotated to angle D°.

(3) The paper-feed operation is performed a third time, and normal operation is resumed if the paper sensor detects paper by the time the print drum has rotated to angle D°. If no paper is detected, the print end operation is performed 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) Operation ends if the elevator is at upper-limit position from the start. If it is not at the upper-limit position, the elevator motor operates in the raise direction until the upper-limit position corresponding to the paper-feed pressure is reached.

(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 100-ms intervals while the elevator is operating, and error message [T02-401] is displayed if an overload current is detected three times in succession.

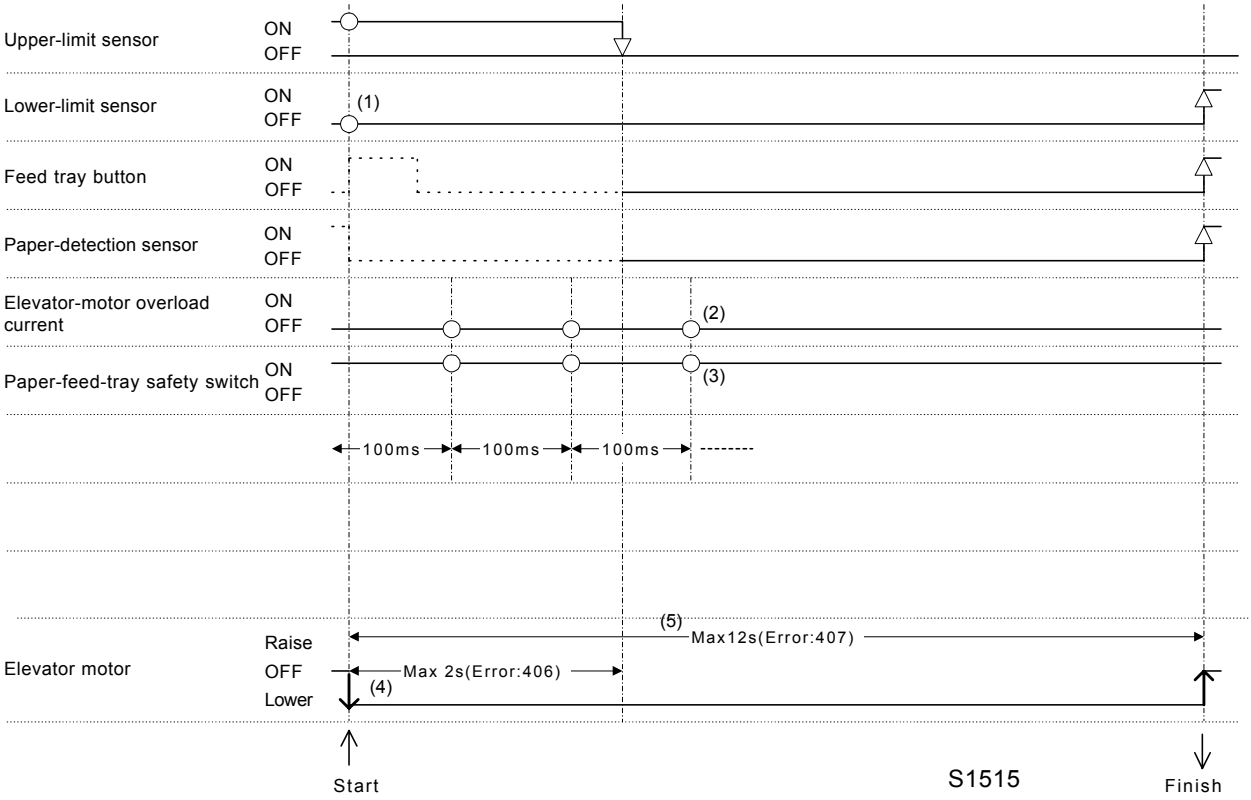
(4) The paper-detection sensor is continually monitored at 100-ms intervals while the elevator is operating, and error message [C04-402] is displayed if no paper is detected twice in succession.

(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 s to turn OFF after the elevator motor starts, a timeout occurs and error message [T02-404] is displayed.

(7) If more than 12 s are required for the elevator to reach the upper-limit position after the elevator motor starts, a timeout occurs and error message [T02-405] is displayed.

[Elevator Lower Operation]



* When ON: Upper-limit sensor: Blocked; Lower-limit sensor: Blocked; Paper-detection sensor: Open

(1) The operation ends if the lower-limit sensor is ON from the start. If the lower-limit sensor is OFF, the elevator motor operates in the lower direction until the lower-limit sensor turns ON.

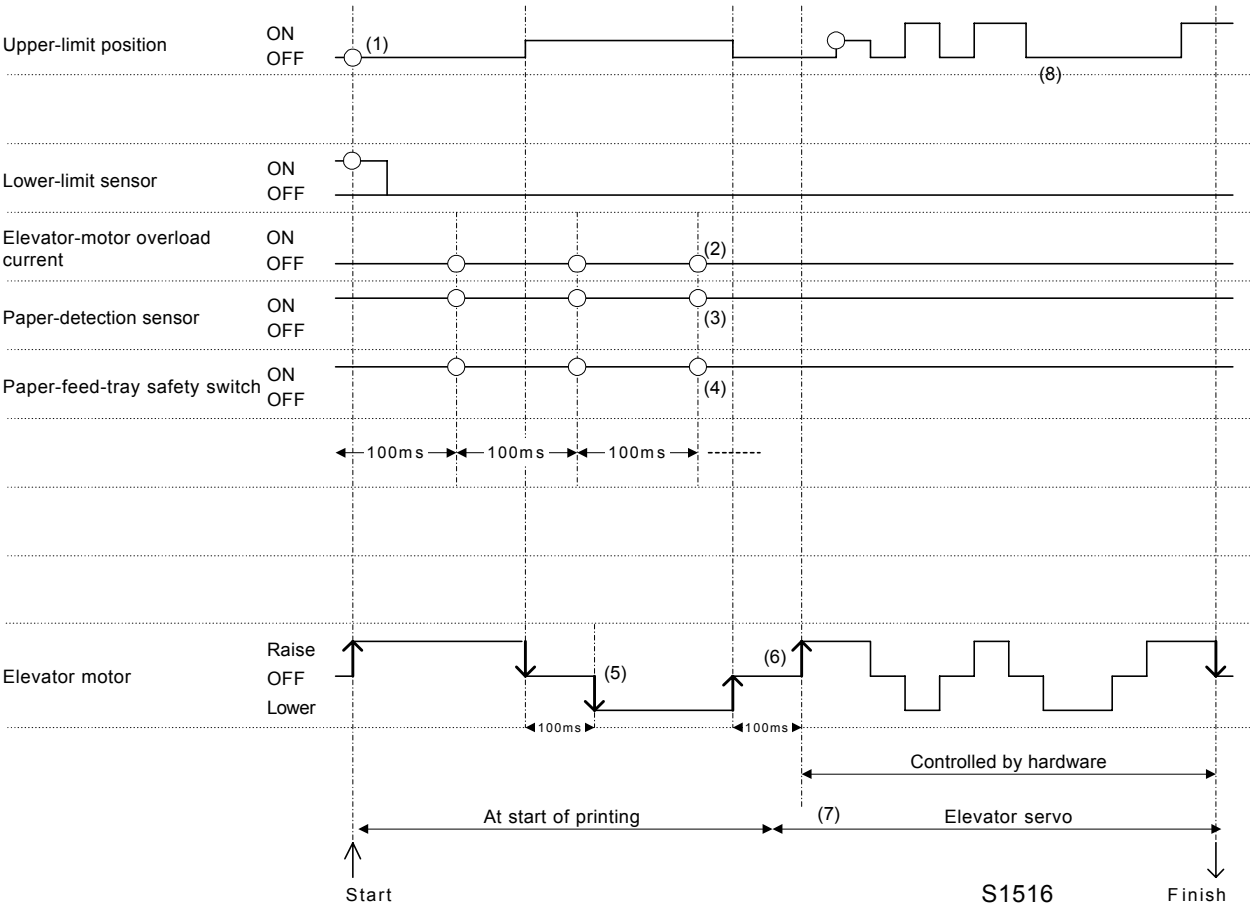
(2) The elevator-motor overload current is continually monitored at 100-ms intervals while the elevator is operating, and error message [T02-401] is displayed if an overload current is detected three times in succession.

(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 s to turn OFF after the elevator motor starts, a timeout occurs and error message [T02-406] is displayed.

(5) If the lower-limit sensor takes more than 12 s to turn ON after the elevator motor starts, a timeout 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

(1) The operation ends if the elevator is at the upper-limit position from the start. If it is not at the upper-limit position, the elevator motor operates in the raise direction until the upper-limit position corresponding to the paper-feed pressure is reached.

(2) The elevator-motor overload current is continually monitored at 100-ms intervals while the elevator is operating, and error message [T02-401] is displayed if an overload current is detected three 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 position is reached, the elevator descends briefly until the upper-limit sensor turns OFF.

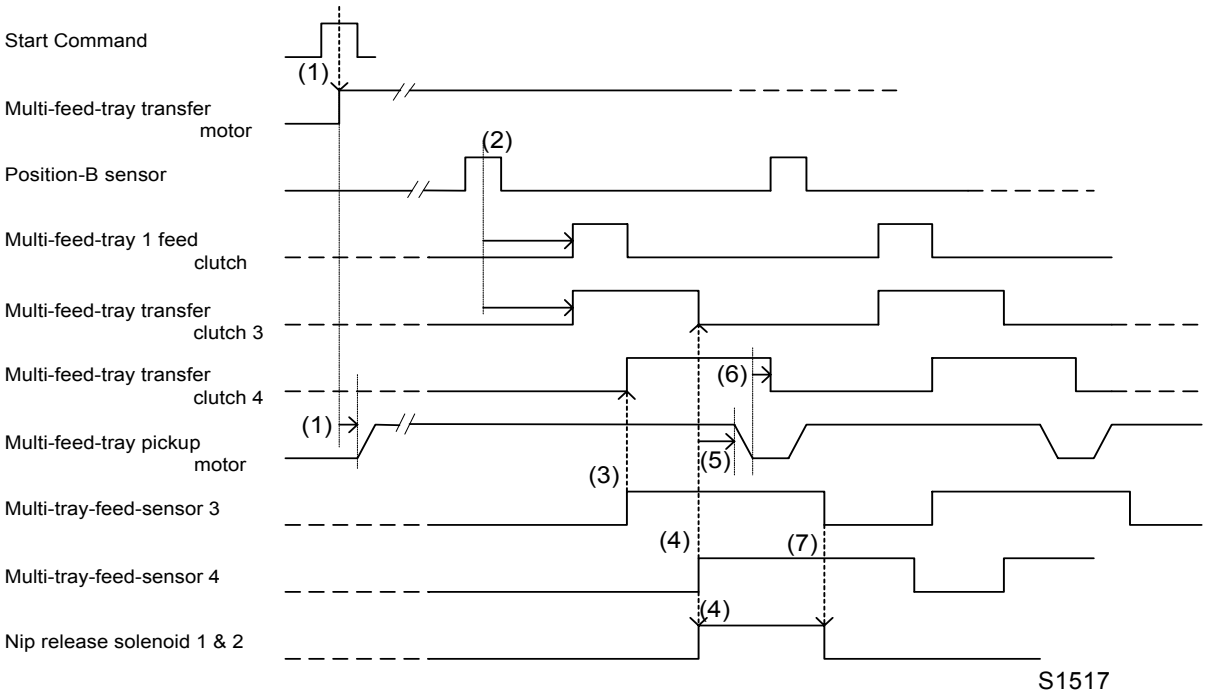
(6) The elevator then rises until the upper-limit position is reached again.

(7) The elevator servo operation is subsequently performed.

(8) If the upper-limit sensor remains OFF for more than 2 s during the elevator servo operation, error message [T02-408] is displayed.

4. Multi-feed Tray Operations

[Multi-feed tray 1 operation]



* When ON: Position-B sensor: Blocked; Multi-tray feed sensors 3 & 4: Open

(1) With the Start Command signal, the multi-feed-tray transfer motor activates. Then 100 ms later the multi-feed-tray pickup motor goes ON.

(2) With the paper feed clutch ON timing, both the multi-feed-tray 1 feed clutch and multi-feed-tray transfer clutch 3 activate.

(3) When the multi-tray feed sensor 3 goes ON, the multi-feed-tray transfer clutch 4 activates.

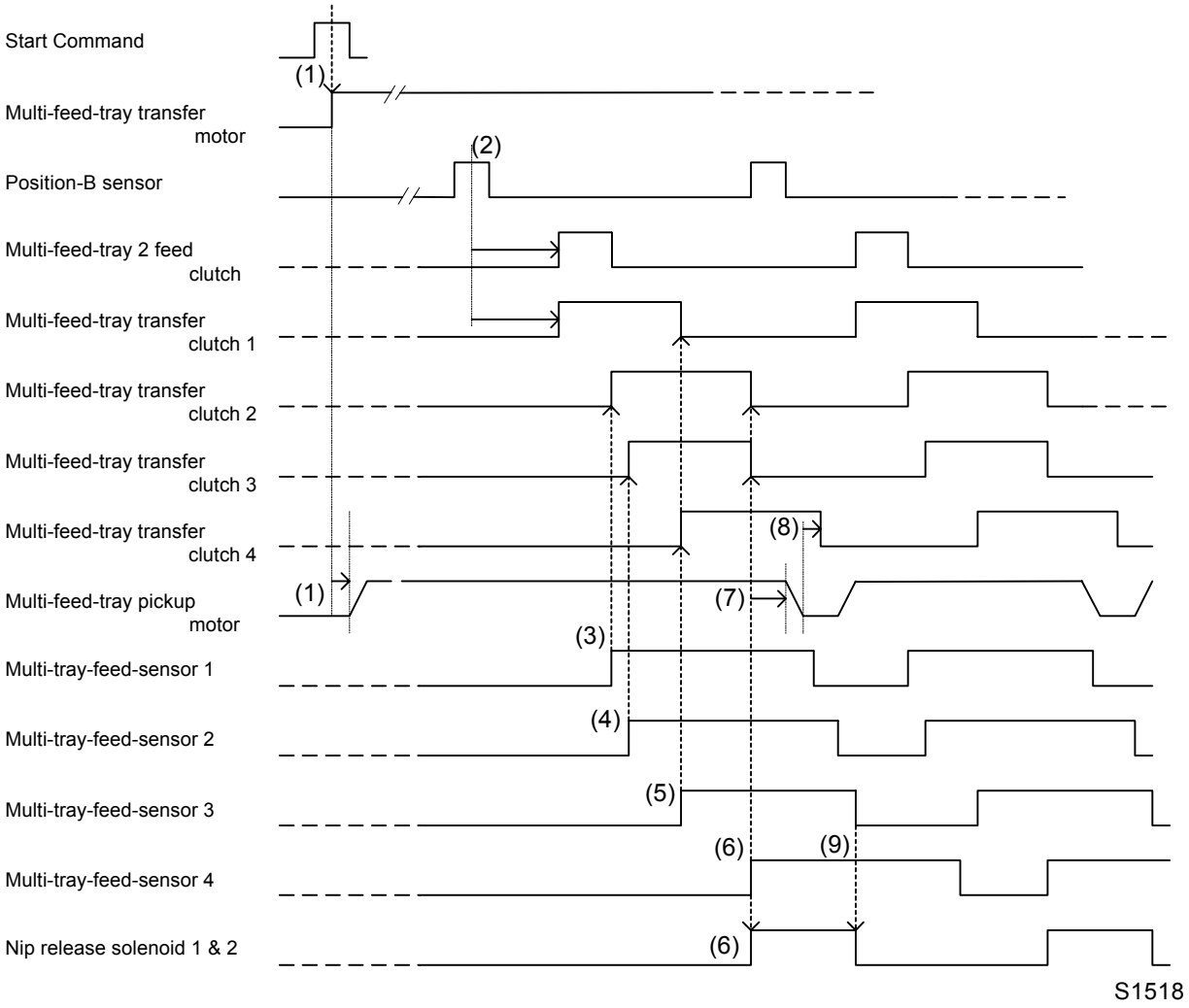
(4) When the multi-tray feed sensor 4 goes ON, the multi-feed-tray transfer clutch 3 goes OFF and both the nip release solenoids 1 & 2 goes activates.

(5) After the multi-feed-tray pickup motor rotates for 72 pulses with the ON timing of the multi-tray feed sensor 4, the motor starts to slow down and stops.

(6) 10 ms later, the multi-feed-tray transfer clutch 4 goes OFF.

(7) With the OFF timing of the multi-tray feed sensor 3, the nip release solenoids 1 & 2 goes OFF.

[Mult-feed tray 2 operation]



* When ON: Position-B sensor: Blocked; Multi-tray feed sensors 1, 2, 3 & 4: Open

(1) With the Start Command signal, the multi-feed-tray transfer motor activates. Then 100 ms later the multi-feed-tray pickup motor goes ON.

(2) With the paper feed clutch ON timing, both the multi-feed-tray 2 feed clutch and multi-feed-tray transfer clutch 1 activate.

(3) When the multi-tray feed sensor 1 goes ON, the multi-feed-tray transfer clutch 2 goes ON.

(4) When the multi-tray feed sensor 2 goes ON, the multi-feed-tray transfer clutch 3 goes ON.

(5) When the multi-tray feed sensor 3 goes ON, the multi-feed-tray transfer clutch 4 goes ON.

(6) When the multi-tray feed sensor 4 goes ON, the multi-feed-tray transfer clutch 3 goes OFF and both the nip release solenoids 1 & 2 goes ON.

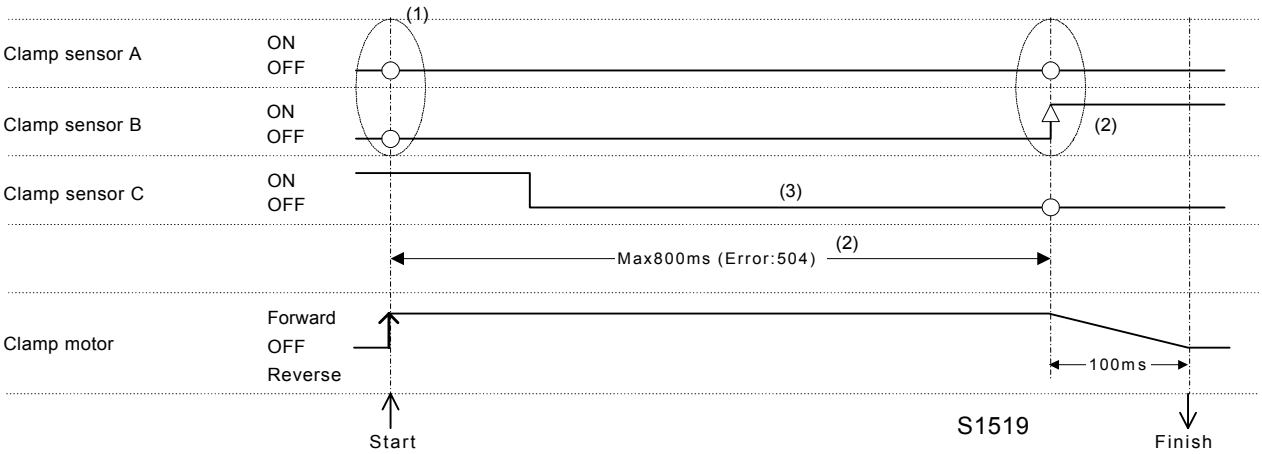
(7) fter the multi-feed-tray pickup motor rotates for 72 pulses with the ON timing of the multi-tray feed sensor 4, the motor starts to slow down and stops.

(8) 10 ms later, the multi-feed-tray transfer clutch 4 goes OFF.

(9) With the OFF timing of the multi-tray feed sensor 3, the nip release solenoids 1 & 2 goes OFF.

5. Print-Drum-Area Operations

[Clamp Release]



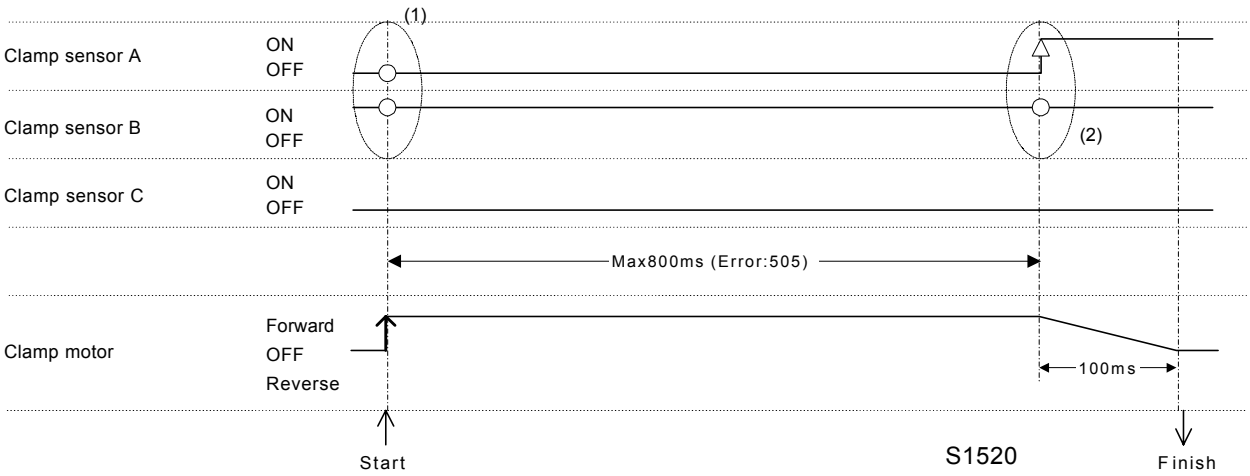
* When ON: Clamp sensor A: Blocked; Clamp sensor B: Blocked; Clamp sensor C: Blocked

(1) Error message [T03-507] is displayed at the start unless both clamp sensors A and B are OFF. If both sensors are OFF, the clamp motor operates in the forward direction.

(2) The clamp motor stops as soon as clamp sensor B turns ON. Error message [T03-508] is displayed here unless clamp sensor A is OFF and clamp sensor B is ON. Similarly, error message [T03-504] is displayed if the clamp motor does not stop within 800 ms.

(3) Error message [T03-503] is displayed if clamp sensor C does not turn OFF during the clamp operation from the standby position.

[Position-A Compensation]

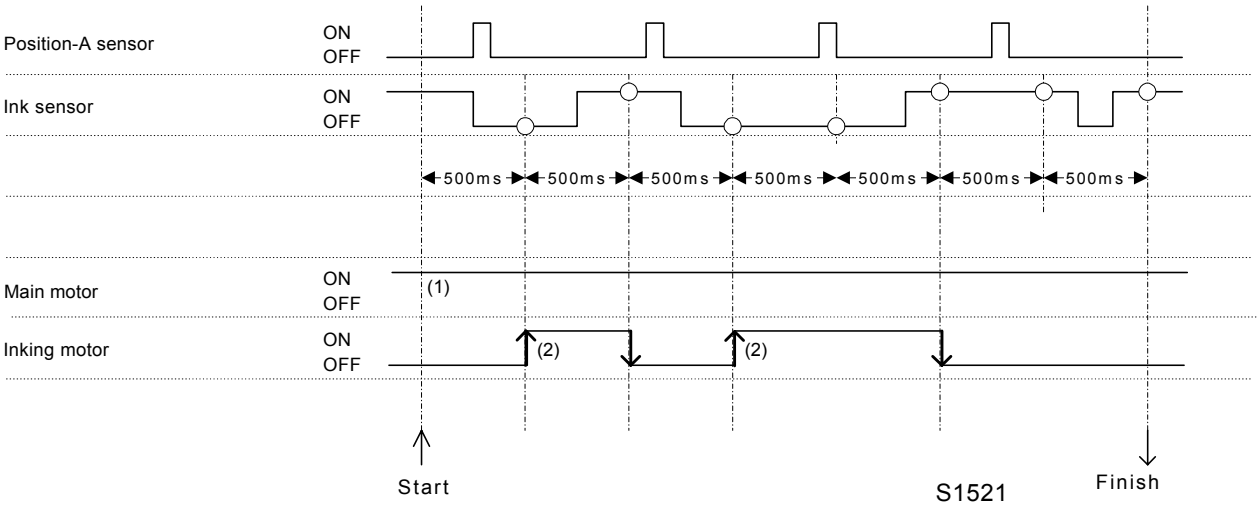


* When ON: Clamp sensor A: Blocked; Clamp sensor B: Blocked; Clamp sensor C: Blocked

(1) Error message [T03-507] is displayed at the start unless both clamp sensor A and B are OFF. If the sensors are correct in such a case, the clamp motor operates in the forward direction.

(2) The clamp motor stops as soon as clamp sensor A turns ON. Error message [T03-508] is displayed here unless clamp sensor B is ON while clamp sensor A is ON. Similarly, error message [T03-505] is displayed if the clamp motor does not stop within 800 ms.

[Inking Operation (No Ink Detection)]

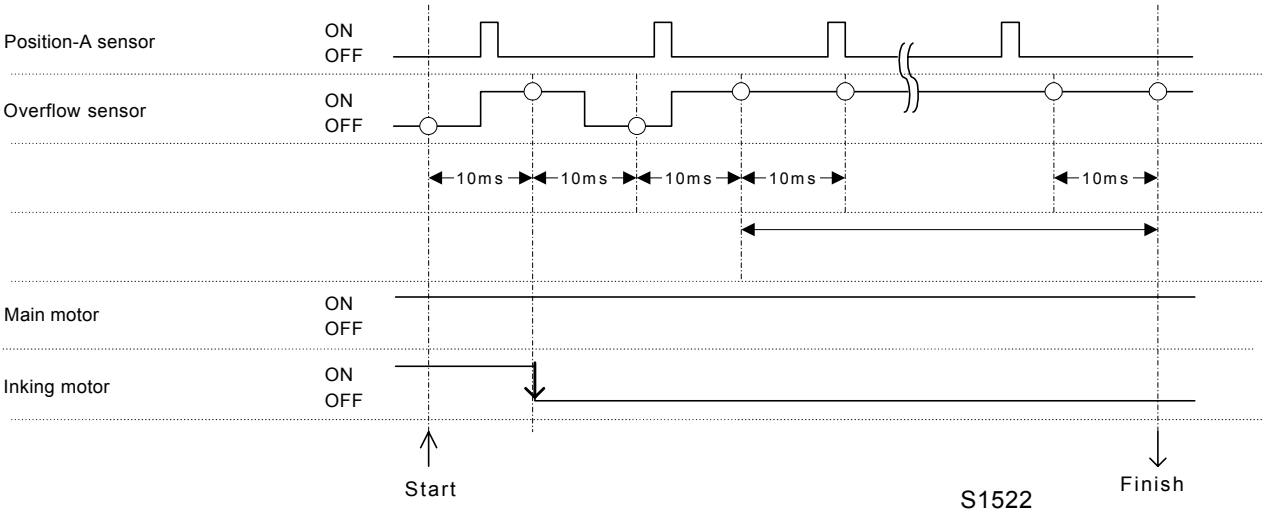


(1) Inking is performed with the main motor ON.

(2) The ink sensor is monitored at 500-ms intervals, and if it is determined to be OFF (majority OFF when checked for 50 cycles at 10-ms intervals), the inking motor is activated until the ink sensor turns ON. Timeout occurs at contiguous "A" second here, and the ink cartridge is determined to be empty. Error message [C01-512] is displayed.

Normally: ["A" = value set in test mode No. 583 (default: 15 s)]
Following ink replacement or after power ON: ["A" = value set in test mode No. 584 (default: 40 s)]

[Inking Operation (Overflow Detection)]

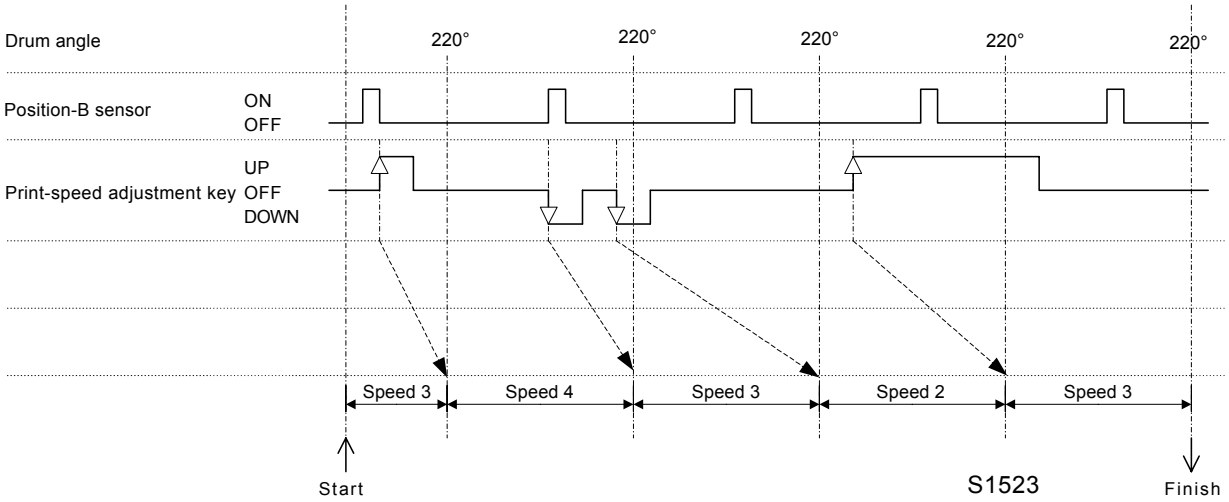


(1) The overflow sensor is monitored at 10-ms intervals, and the main motor stops if the overflow sensor is determined to be ON.

(2) If the overflow sensor is determined to be 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 (default: 50 times))

6. Print Adjustment Operations

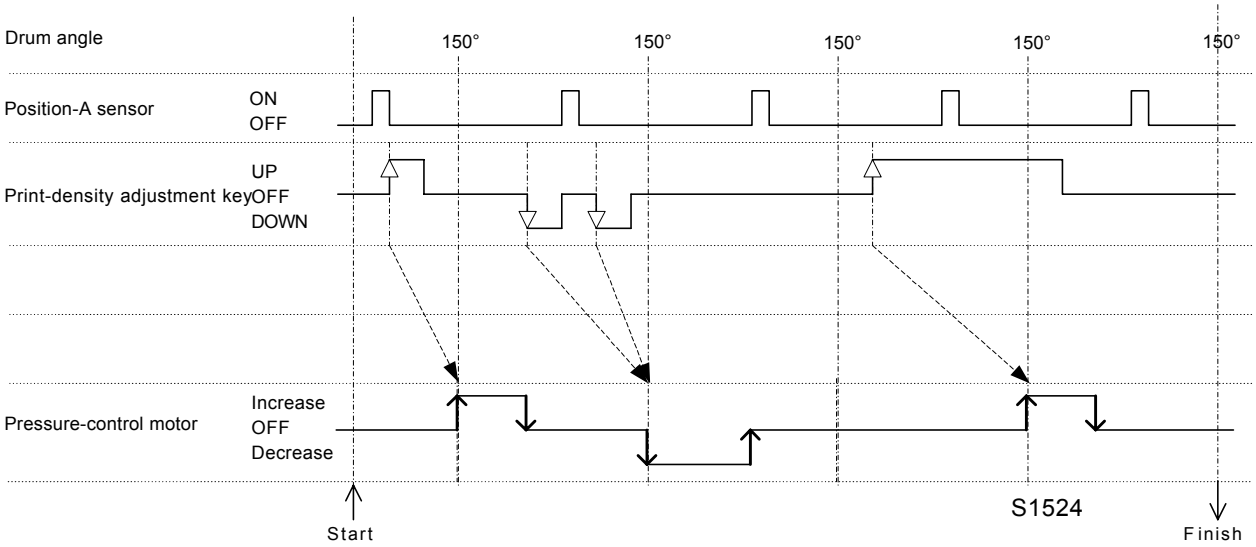
[Print Speed Control]



(1) When the print-speed adjustment key is pressed, the speed does not change immediately, but changes the next time the print drum reaches the 220° position.[Second next for front-feed machines]

(2) If the print-speed adjustment key is pressed twice, two revolutions are required to reach the specified speed, as the speed changes by one level per revolution.[One level per two revolution for front feed machines].

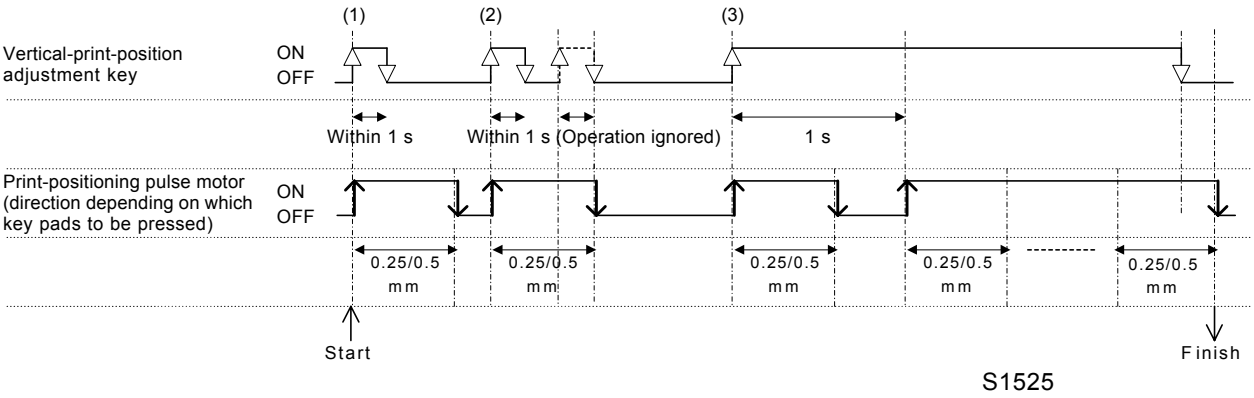
[Print Density Control]



(1) When the print-density adjustment key is pressed, the print density does not change immediately, but changes the next time the print drum reaches the 150° position.

(2) Likewise, when the print-density adjustment key is pressed twice, the density changes as specified the next time the print drum reaches the 150° position.

[Vertical-Print-Position Control]



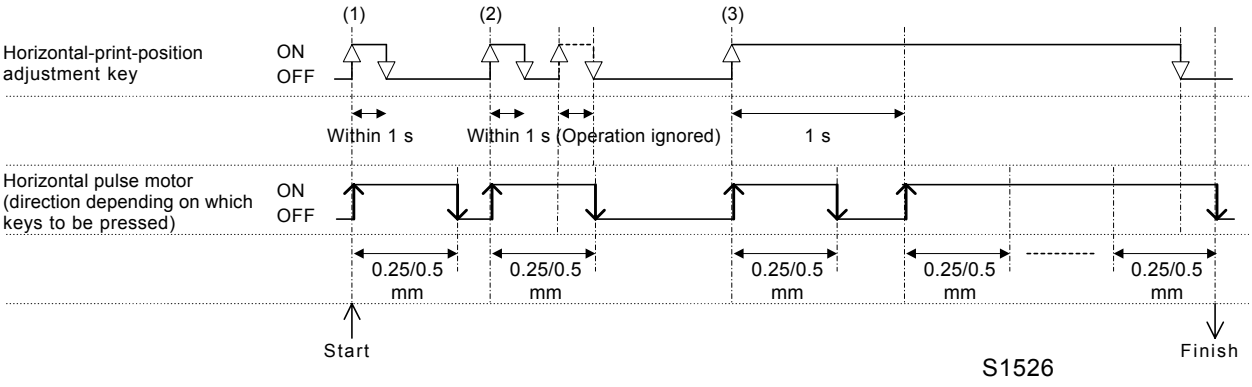
(1) If the vertical-print-position adjustment key is pressed once (within the 1-s duration), the position is immediately changed by 0.25/0.5 mm.

(2) When the vertical-print-position adjustment key is pressed twice (within 1 s), the second press is ignored if it occurs while the position is being changed for the first press.

(3) If the vertical-print-position adjustment key is pressed for more than 1 s, the position is changed by 0.25/0.5 mm for the first 1 s, and is then changed continuously in increments of 0.25/0.5 mm for as long as the key is held down (the motor stops at the limit position even if the key is not released).

* For the front-feed machines, the change is one step per one drum rotation.

[Horizontal-Print-Position Control]



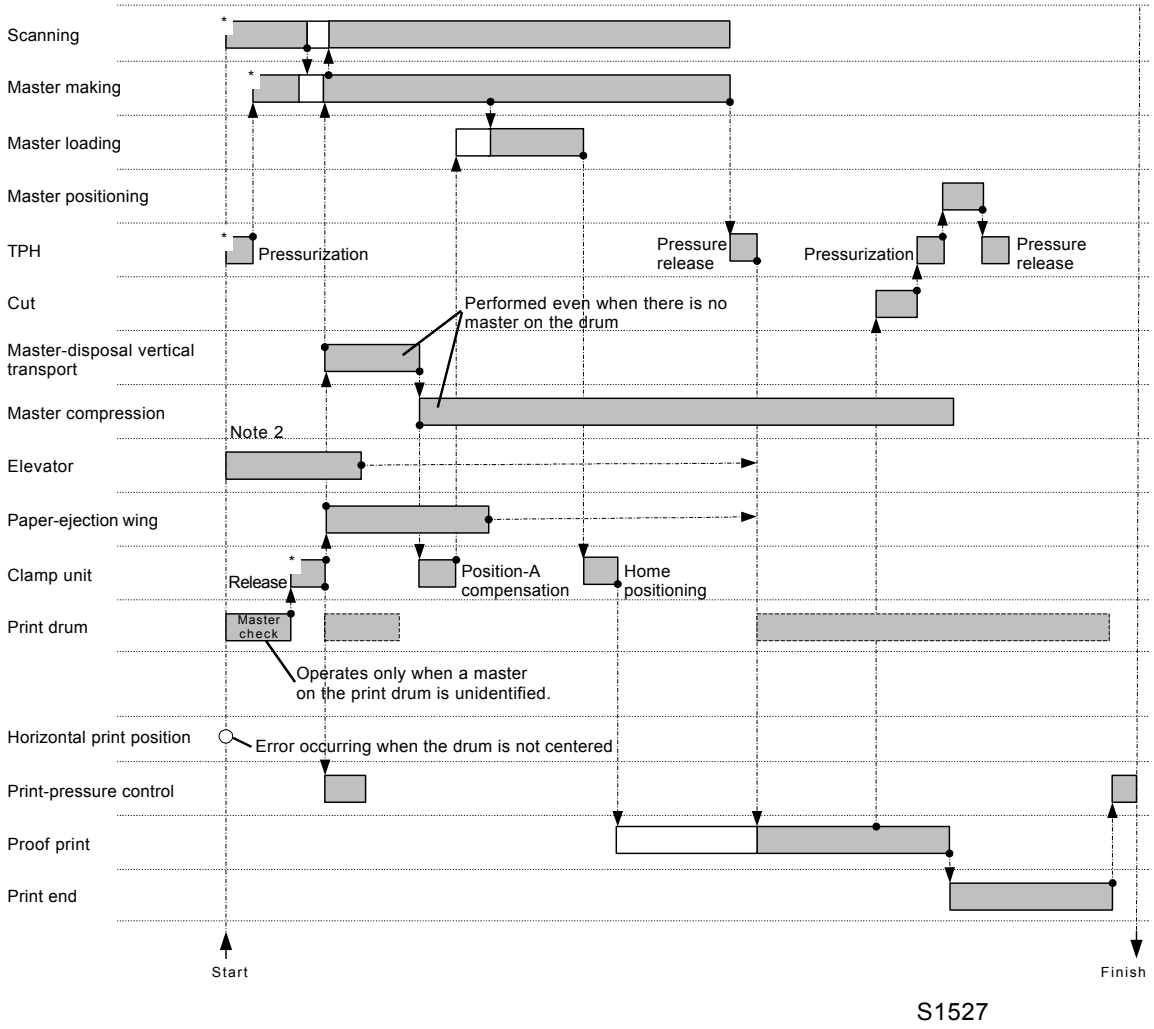
(1) If the horizontal-print-position adjustment key is pressed once (within 1 s), the position is immediately changed by 0.25/0.5 mm.

(2) When the horizontal-print-position adjustment key is pressed twice (within 1 s), the second press is ignored if it occurs while the position is being changed for the first press.

(3) If the horizontal-print-position adjustment key is pressed for more than 1 s, the position is changed by 0.25/0.5 mm for the first 1 s, and is then changed continuously in increments of 0.25/0.5 mm for as long as the key is held down (the motor stops at the limit position even if the key is not released).

Master Disposal Operations

1. Overall Timing of Master Making



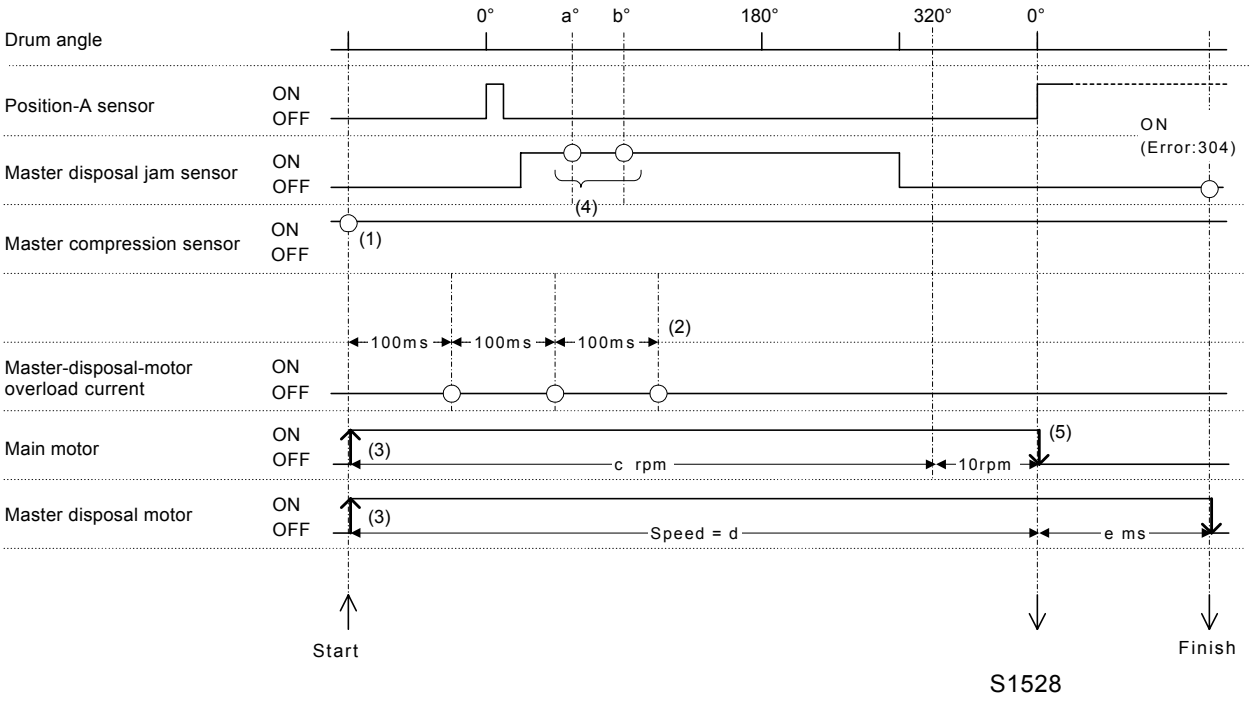
Note 1: If the presence of the master on the print drum is confirmed when the original is set (*), the operations specified below are performed during standby. If the START key is not pressed within a preset length of time, when the “Print-drum release” button or “Test print” key is pressed, the original status is restored.

- Scanner: Shading compensation, auto base control
- TPH: Pressurization
- Clamp unit: Release operation

Note 2: For a triple-tray source, the elevator starts at the upper-limit position.

2. Individual Master Disposal Operations

[Vertical Transport]



* When ON: Position-A sensor: Blocked; Master disposal jam sensor: Open;
Master compression sensor: Open

(1) The master compression sensor is checked at startup, and the master compression plate is initialized if it is OFF.

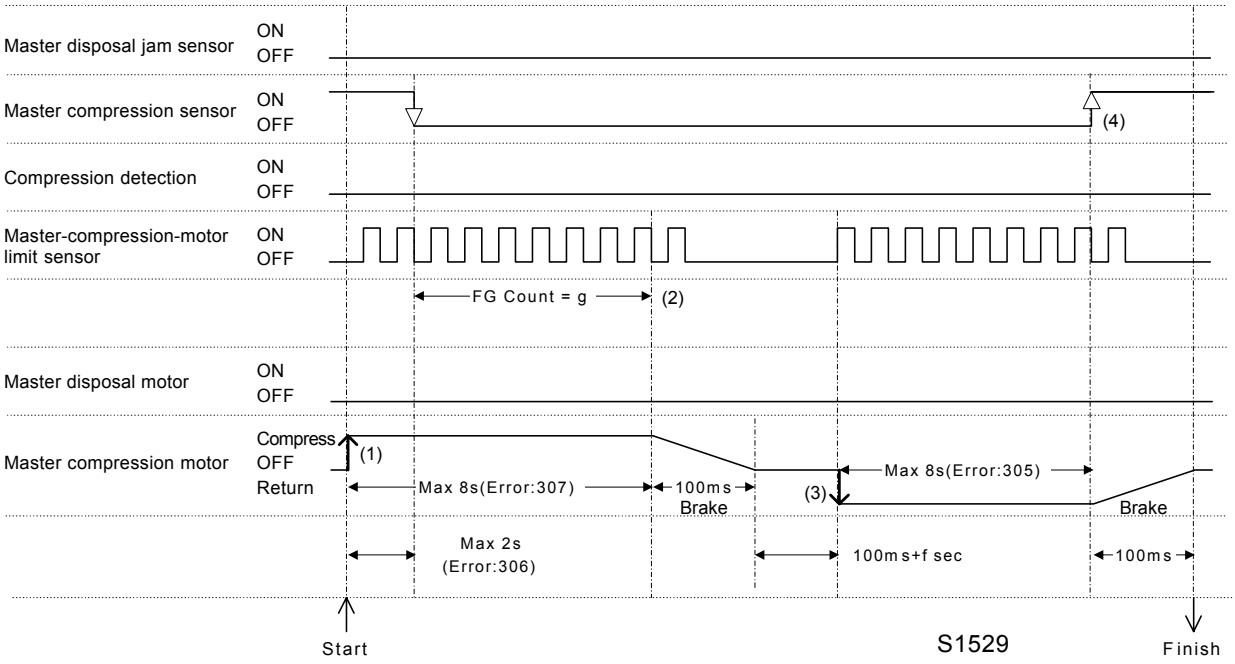
(2) The master-disposal-motor overload current is continually monitored at 100-ms intervals during the removed-master vertical-transport operation, and error message [T12-300] is displayed if an overload current is detected three times in succession.

(3) The main motor and master disposal motor are operated to vertically transport the removed master while rotating the print drum. The drum speed c here corresponds to the value set in test mode No. 387 (default: 30 rpm), and the relative speed d of the master disposal motor relative to the drum speed corresponds to the value set in test mode No. 388 (default: x1).

(4) The progress of the removed master is checked twice by the master disposal sensor at print drum angles “a°” and “b°”, and is judged to be normal if the sensor is ON at both points. If at either point, ON is detected, the movement is judged normal. If the sensor is OFF/OFF, error message [A04-303] is displayed.
(“a” = value set in Test mode No. 380 [default 120°])
(“b” = value set in Test mode No. 381 [default 180°])

(5) The print drum stops at position A, and the master disposal motor stops after “e” ms. The master disposal jam sensor is checked here, and error message [A04-304] is displayed if it is ON.
(“e” = value set in test mode No. 382 [default: 1000 ms])

[Master Compression (Few Masters in Disposal Box)]



* When ON: Master disposal jam sensor: Open; Master compression sensor: Open;
Master-compression-motor limit sensor: Blocked

The master compression operation starts after the master disposal vertical-transport operation ends.

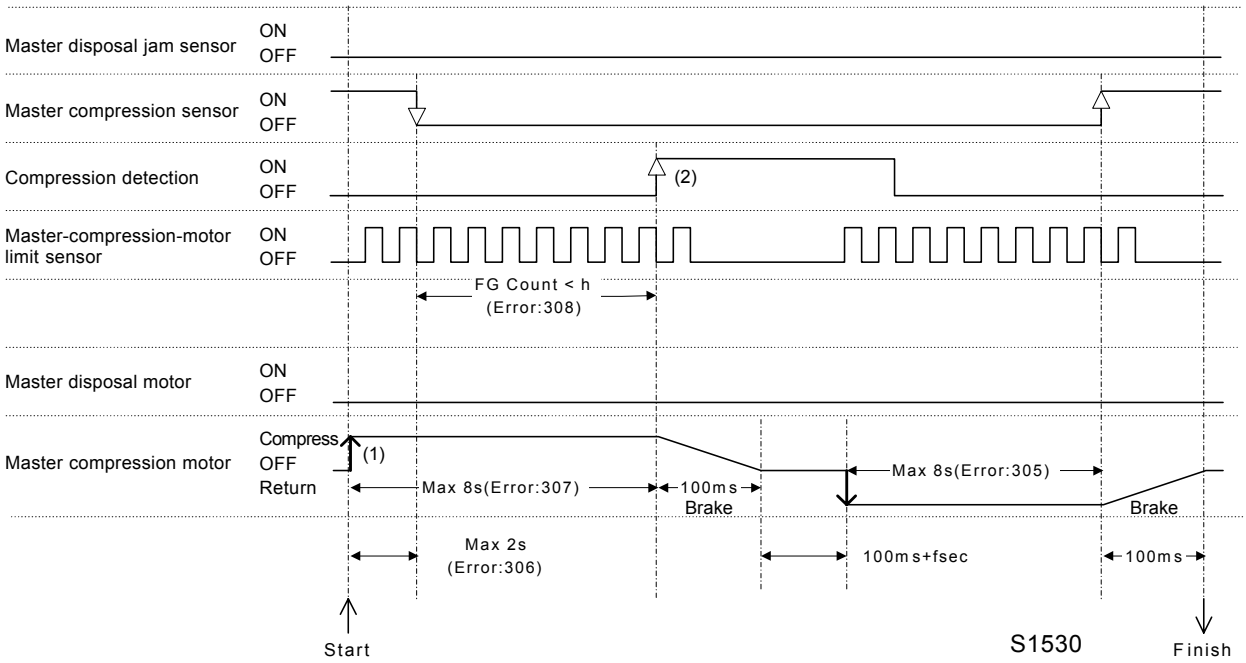
(1) The master compression motor operates in the compression direction. If the master compression sensor does not turn OFF within 2 s, error message [T12-306] is displayed.

(2) The master compression motor stops once the pulse count of the master-compression-motor limit-sensor reaches “g” pulses after the master-compression sensor turns OFF. Error [T12-307] is displayed if the compression detection does not turn ON within 6.5 s after the master compression motor operates in the compression direction, or the master-compression-motor limit-sensor pulse count (“g” pulses) cannot be counted
(g = value set in test mode No. 383 [default: 163 pulses]).

(3) The master compression motor operates in the return direction after stopping for 100 ms + “f” s
(f = value set in test mode No. 384 [default: 3 s]).

(4) The master compression motor stops when the master compression sensor turns ON.
Error [T12-305] is displayed if the compression detection does not turn OFF within 6.5 s after the master compression motor operates in the return direction.

[Master Compression (Many Masters in Disposal Box)]



* When ON: Master disposal jam sensor: Open; Master compression sensor: Open;
Master-compression-motor limit sensor: Blocked

The master compression operation starts after the master disposal vertical-transport operation ends.

(1) The master compression motor operates in the compression direction. If the master compression sensor does not turn OFF within 2 s, error message [T12-306] is displayed.

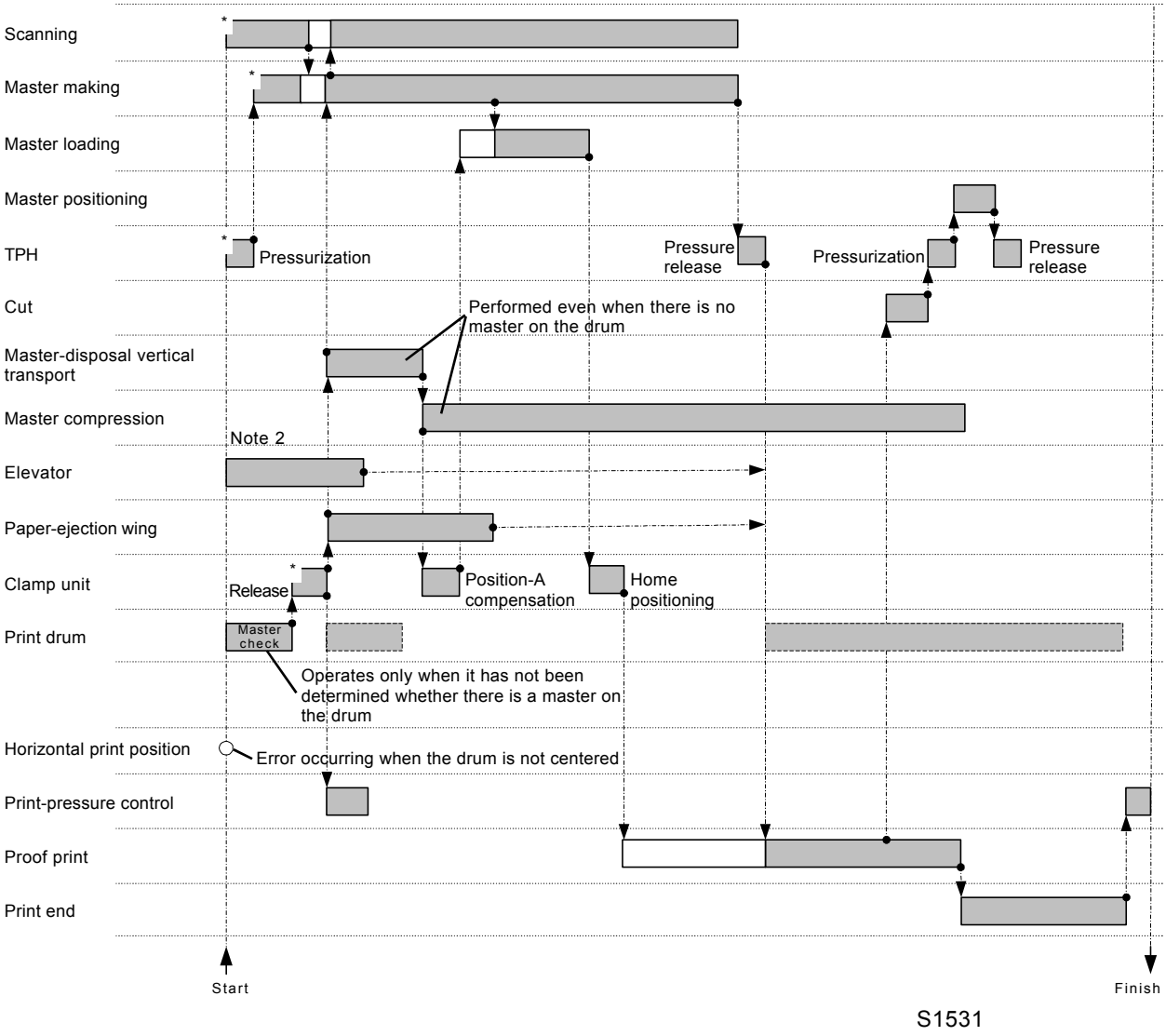
(2) Compression detection turns ON and the master compression motor stops if more than “x” ms is required for one pulse change to be received from the master-compression-motor limit sensor after compression starts
(x = value set in test mode No. 385 [default: 53 ms]).
Error message [C03-308] is displayed if the compression detection turns ON before the pulse count from the master-compression-motor limit sensor reaches “h” pulses after the master compression sensor turns OFF
(h = value set in test mode No. 386 [default: 122 pulses]).

(3) The master compression motor operates in the return direction after stopping for 100 ms + “f” s
(f = value set in test mode No. 384 [default: 3 s]).

(4) The master compression motor stops when the master compression sensor turns ON.

Master Making Operations

1. Overall Timing of Master Making



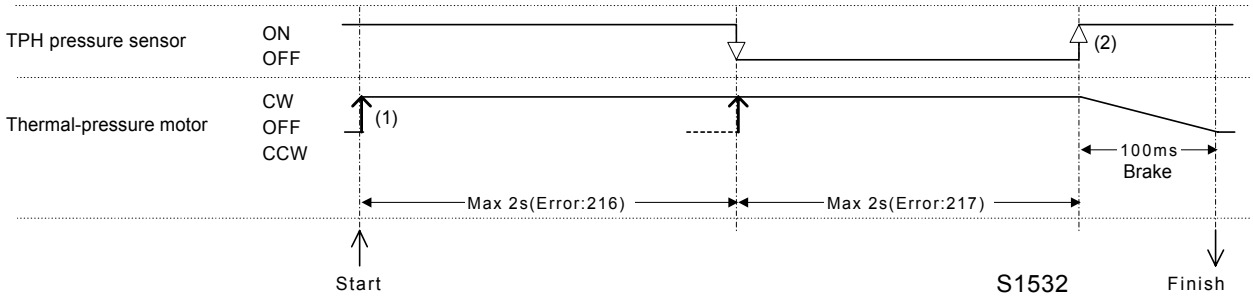
Note 1: If the presence of the master on the print drum is confirmed when the original is set (*), the operations specified below are performed during standby. If the START key is not pressed within a preset length of time, pressing the “Print-drum release” button or “Test print” key restores the original status.

- Scanner: Shading compensation, auto base control
- TPH: Pressurization
- Clamp unit: Release operation

Note 2: For a triple-tray source, the elevator starts at the upper-limit position.

2. Individual Master Making Operations

[TPH Pressurization]

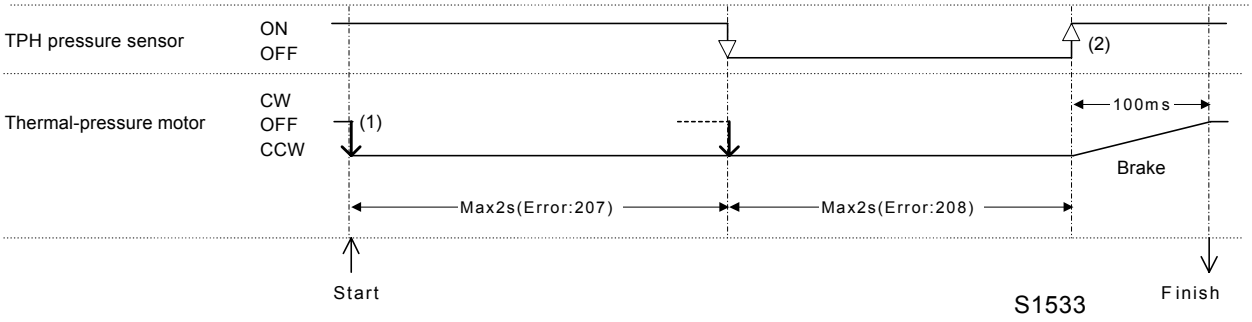


* When ON: TPH pressure sensor: Blocked

(1) The thermal-pressure motor operates in the pressurization direction.

(2) The TPH pressure sensor turns OFF briefly, and the thermal-pressure motor stops when the sensor turns ON again. Error message [T19-216] is displayed if the TPH pressure sensor does not turn OFF within 2 s after the thermal-pressure motor operates in the pressurization direction. Error message [T19-217] is displayed if the TPH pressure sensor does not turn ON within 2 s after it turns OFF.

[TPH Pressure Release]

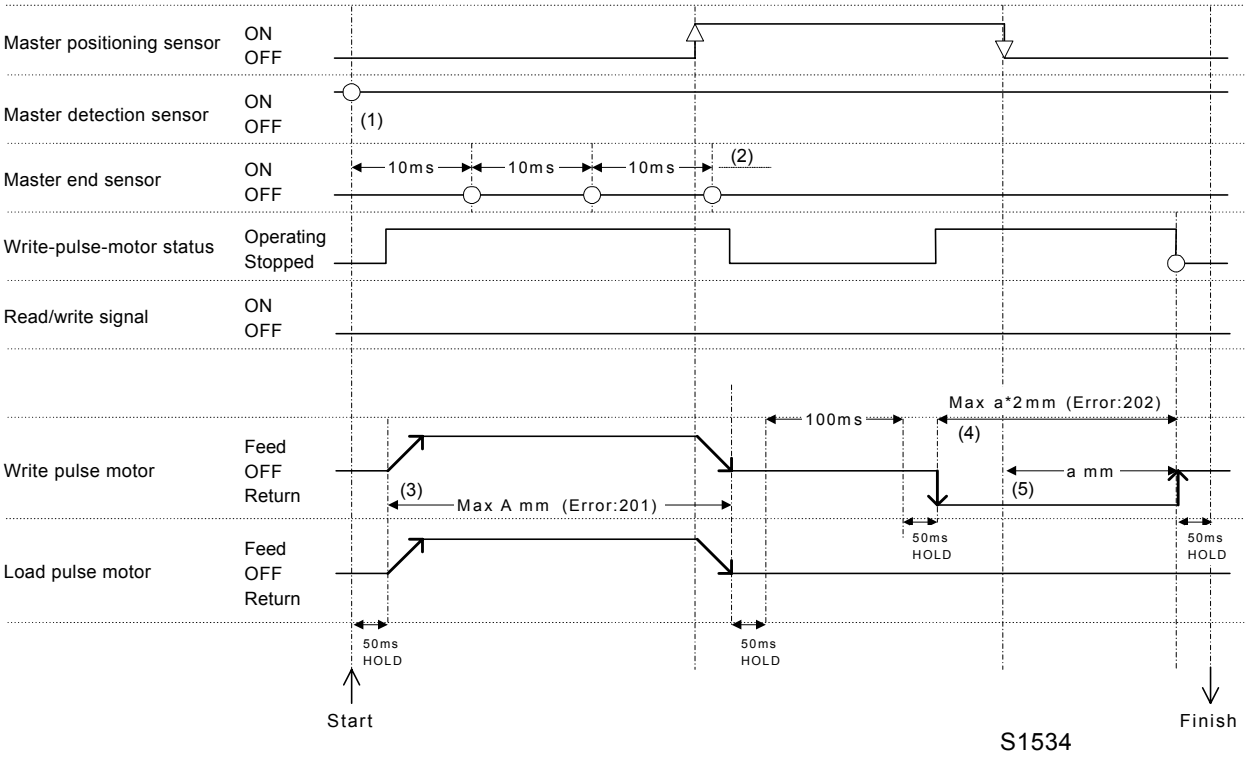


* When ON: TPH pressure sensor: Blocked

(1) The thermal-pressure motor operates in the pressure-release direction.

(2) The TPH pressure sensor turns OFF briefly, and the thermal-pressure motor stops when the sensor turns ON again. Error message [T19-207] is displayed if the TPH pressure sensor does not turn OFF within 2 s after the thermal-pressure motor operates in the pressure-release direction. Error message [T19-208] is displayed if the TPH pressure sensor does not turn ON within 2 s after it turns OFF.

[Master Positioning]



* When ON: Master positioning sensor: Open; Master detection sensor: Open; Master end sensor: Blocked

The master positioning operation starts after the setting of the master making unit or completion of master cutting during master making.

(1) The master detection sensor detects whether a master is present at startup. If the master detection sensor is OFF, error message [D05-210] is displayed.

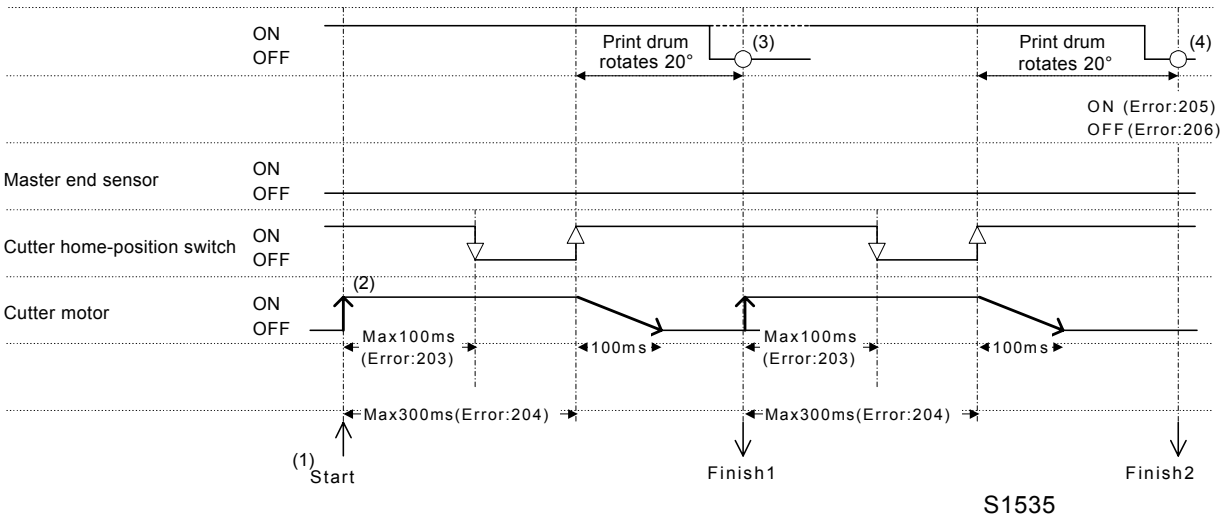
(2) The master end sensor is checked at 10-ms intervals during master positioning, and if an end mark is detected twice in succession, error message [C02-200] is displayed.

(3) The write pulse motor and load pulse motor operate in the feed direction until the master-positioning sensor turns ON. A timeout occurs here when it has fed 40 mm during setting of the master loading unit and 30 mm during inching after cutting, and error message [A01-201] is displayed.

(4) The write-pulse motor operates in the return direction until the master-positioning sensor turns OFF. Timeout occurs here when it has fed (a x 2) mm, and error message [A01-202] is displayed.

(5) The master is moved a further “a” mm in the return direction after the master positioning sensor turns OFF, and then the motor stops, ending the master positioning operation
(a = value set in test mode No. 280 (default: 5 mm)).

[Master Cutting]



* 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 OFF.

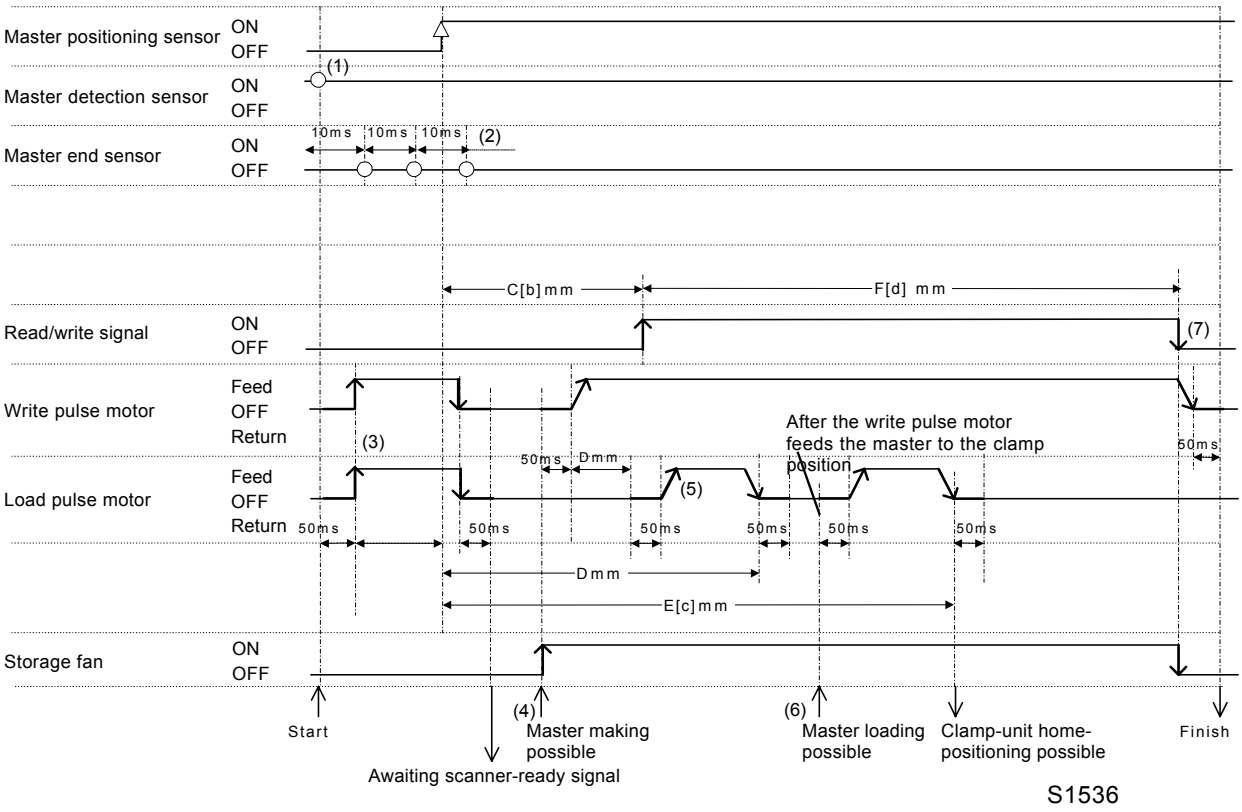
(1) The master cutting operation starts after the print drum stops at angle “H°” during master loading (H = 265.4° [A3] + value set in test mode No. 284).

(2) The cutter motor operates and stops after the cutter home-position switch turns OFF and then back ON again. Timeout occurs at 100 ms before the switch turns OFF, and error message [T13-203] is displayed. Likewise, a timeout occurs at 300 ms before the switch turns ON again, and error message [T13-204] is displayed.

(3) The print drum rotates through 20°, and the master-positioning sensor is checked. 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.

(4) The print drum rotates through 20°, and the master-positioning sensor is rechecked. 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]



* When ON: Master positioning sensor: Open; Master detection sensor: Open; Master end sensor: Blocked

The master loading and master making operations start upon completion of the TPH compression operation.

(1) The master detection sensor checks for the presence of a master at startup.

(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 turns ON. Timeout occurs here when the master is fed (a x 2) mm, and error message [A01-201] is displayed
(a = value set in test mode No. 280 [default: 5 mm]).

(4) The write pulse motor operates once the clamp release operation ends for master disposal, and master making starts after a master has been transported to the master-making start position.
(C = 3.0 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 standby position.
(D = 31 mm)

(6) Upon completion of master-disposal vertical transport and print-drum position-A compensation, the load pulse motor operates to transport the leading edge of the master to the clamp position.
(E = 71.3 mm + value set in test mode No. 283)

(7) The master making operation ends once master making is complete for the effective printing area.
(F = master-making length + value set in test mode No. 282)

Memo

CHAPTER 16: MISCELLANEOUS PRECAUTIONS

Contents

1. Software Downloading Procedure

(1) Switch off the power.

(2) Remove the left-hand (viewed from the front) card-slot cover by removing one screw (M3 x 6) from the rear cover.

(3) Remove the DM-32 card if inserted.

(4) Insert the two downloading cards [ROSE software] & [MCTL software] containing the new program.

(5) When the power is switched on again, the green LED flashes on the rear of the main PCB (loading). Loading is complete once the two green LEDs illuminate continuously (not flashing).

If red colored LED lights up, the downloading was unsuccessful (Error Status), and needs to repeat the downloading procedure from the beginning.

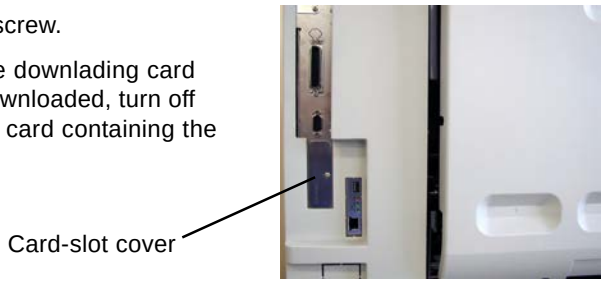
(6) Switch off the power, and remove the two cards.

(7) Run test mode No. 80 (Clear Error-Status Data) and switdch off the power.

(8) Reinsert the original card if present.

(9) Return the card-slot cover in place with one screw.

Note: For the models with only one slot, insert the downlading card containing the ROSA program first. After downloaded, turn off the power, and then insert the downloading card containing the MCTL program.



P1601

2. Battery Replacement

Replace the battery on the main PCB with the power to the machine switched ON.

* Data will be lost if the power to the machine is switched OFF when replacing the battery.

3. Main PCB (SH-PCB) Replacement : Refer to the photograph on next page.

(1) When the main PCB is replaced, the details set in the test mode must be reset. Note the following items prior to replacement.

- Details of test mode No. 070 (System-Parameter Adjust Record)
- Details set in Sub-Stage Selections, Job list, Program, and Catalog

(2) Switch off the power, remove the DIMM, EEPROM (IC4) and battery, and then replace the main PCB.

(3) Turn all the dipswitches (SW4) on the new main PCB OFF. Set the slide switch (SW2) to “FL.”

(4) Install the previously removed DIMM, EEPROM and the battery onto the new main PCB, and then install the PCB.

(5) Download the software (see this chapter).

(6) Start test mode.

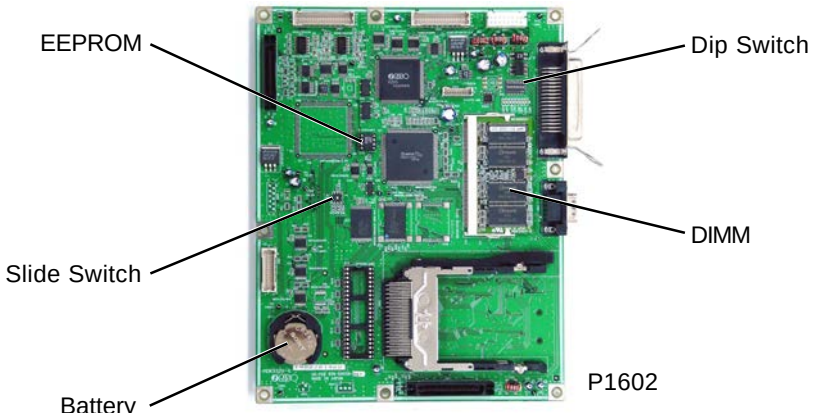
(7) Run test modes Nos. 80 (Clear Error-Status Data), 81 (Memory Clear), 82 (Clear Test-Mode Data Setup).

(8) Set the details noted in step (1).

(9) Switch off the power and then switch it on again.

(10) Confirm that the machine starts up correctly.

(11) Set the clock in “Properties” to complete the procedure.



Main PCB (SH-PCB)

4. MCTL PCB Replacement

(1) Switch off the power, and remove the old MCTL PCB.
(2) Install the new MCTL PCB.
(3) Download the software (see this chapter).
(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.

5. Drum-Control PCB Replacement

*** Before the replacement of the PCB, start up test mode No.70 and copy down the test mode setting on the print drum test modes.**

(1) Pull out the print drum, and replace the PCB with a new PCB.
(2) Install the print drum back in the machine.
(3) Run test mode No. 588 (Print Drum Code Settings) and input the correct setting for the print drum.

Code No.	Model	Print Drum Size	Type
17	RP35/31 series	A3	Black
18	RP35/31 series	Ledger	Black
26	RP35/31 series	A4W (Letter-R)	Black
33	RP37/35/31 series	A3	Color
34	RP37/35/31 series	Ledger	Color
42	RP37/35/31 series	A4W (Letter-R)	Color
49	RP37 series	A3	Black
50	RP37 series	Ledger	Black
58	RP37 sereis	A4W (Letter-R)	Black

T1603

(4) Change the print drum test modes as referred to by test mode No.70 before the PCB replacement.
(5) Run test mode No. 587 (Ink Color Setting) and input the correct setting.
(6) Switch off the power and then switch it on again.
(7) The procedure is complete if the machine operates correctly.

6. Filter PCB Precautions

Never touch the unused primary power-supply connectors or other conducting parts on the filter PCB. The power-supply voltage is supplied to these components (risk of electric shock).

7. Print Image Position Adjustment Procedure

The adjustment should be made in the order given below. The result will not be good if the adjsutment is not done in the correct order.

Also, the 1st and 2nd paper feed area on the machine must be correctly adjusted before trying to make the following adjustments.

1. Horizontal writing position of TPH. (Chapter 14)
2. Master-clamp range adjustment. (Chapter 14)
3. Master-making elongation and shrinkage adjustment. (Chapter 14)
4. Write start position adjustment. (Chapter 14)
5. Master-making length adjustment. (Chapter 14)
6. FB Read pulse-motor speed adjustment. (Chapter 12)
7. FB Scan start-position Adjustment. (Chapter 12)
8. FB Horizontal-scan position adjustment. (Chapter 12)
   - This adjustment is in relation to Vertical-print-position adjustment (Chapter 6)

CHAPTER 17: PANEL MESSAGES

Contents

PANEL MESSAGES

1. Explanation of Panel Messages

Overview of 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

2) Error type

The order of error priority is as specified below.

Error type	Error details
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	Paper-jam error
L	Link-mode error

3) Error point

The error-point classifications are as specified below. If the power was turned off, during an error that would be backed up had been displayed, “999” will be displayed as an error point when the machine is turned on.

Error point	Error details
0XX	System (hardware, software, communication), panel
1XX	Scanning section (scanner, AF), image processing
2XX	Master making section
3XX	Master-disposal section
4XX	Paper-feed/ejection section
5XX	Print-drum area
6XX	Printing adjustment section (vertical, horizontal, density)
7XX	Accessories 1
8XX	Accessories 2

2. List of Panel Messages

Error type	details
T01	Main motor lock
T02	Elevator motor lock
T03	Clamp motor lock
T04	Overflow
T05	Print-positioning pulse-motor lock
T06	Horizontal pulse-motor lock
T07	Digitizer error
T08	Computer interface error
T09	Option error (paper eject)
T10	Option error (paper feed)
T11	Pressure-control motor
T12	Master-disposal-section motor lock
T13	Cutter motor lock
T14	Flatbed error
T15	AF error
T17	Solenoid counter not connected
T19	Thermal-pressure motor lock
T20	Paper-ejection-section motor lock
T22	Drum-lock error
T23	Scanner lock not released
T24	Inking motor lock
T25	No battery
T93	NET-C hardware error
T94	TPH connection error
T95	MCTL PCB backup error
T96	Drum hardware error
T98	Hardware error

Error type	details
A01	Master feed error
A02	Master loading error
A03	Cutting error
A04	Master-disposal error
A05	Master present in the master-disposal section
A06	Check paper-feed tray
A07	Paper-feed error
A08	Paper jam on print drum
A09	Paper-ejection error
A10	AF original feed error
A16	Awaiting master removal
A17	Cutter error
A18	Print-drum unlocked

Error type	details
B01	Keycard counter: No card
B02	Sorter: Error command 1
B03	Sorter: Error command 2
B04	Sorter: Error command 3
B05	Sorter: Error command 4
B06	Multi-tray: Main-unit error
B07	Multi-tray: Main-unit error
B08	Multi-tray: Main-unit error
B09	Multi-tray: Main-unit error
B10	Multi-tray: Tray-1 error
B11	Multi-tray: Tray-1 error
B13	Multi-tray: Tray-1 error
B14	Multi-tray: Tray-1 error
B16	Multi-tray: Tray-2 error
B17	Multi-tray: Tray-2 error
B19	Multi-tray: Tray-2 error
B20	Multi-tray: Tray-2 error
B21	Data storage: Read/write error
B22	Job separator: Power off
B23	Job separator: No tape
B24	Job separator: Tape jam
B25	Sorter: Error command 5
B26	Sorter: Error command 6
B27	Sorter: Error command 7
B28	Sorter: Error command 8
B31	Linked printer data communication error
B33	IP address set up error

Error type	details
C01	Replace ink cartridge
C02	Replace master roll
C03	Master-disposal box full

Error type	details
D01	Print drum not set
D02	Incorrect print drum
D03	Ink cartridge not set
D04	Incorrect ink cartridge
D05	Master not set
D07	Master-disposal box not set
D08	Master-disposal unit not set
D09	Master making unit not set
D10	Scanner table not set
D11	Front cover not set
D12	Feed-joint pass. Cover not set.

Error type	details
E01	Replace battery
E02	Maintenance call

Error type	details
F01	No master on drum
F02	Master image larger than paper size: 1
F04	Original not set
F05	Print quantity under “minimum print quantity”
F07	Drum-position error
F08	Paper size / Original size: Mismatch
F10	Master image larger than paper size: 2
F11	Master image larger than paper size: 3
F12	Original size irregular: Triple-Tray Source selection invalid
F16	AF cannot be used for QT-4
F17	Drum size does not match
F18	Incorrect zoom rate
F19	Master image larger than paper size: 4
F20	Master image larger than paper size: 5
F21	AF multi-up: Original not set
F22	FB multi-up: Original not set
F23	Communication error: D to P
F24	Auto-reproduction size selection: Unable
F25	Incorrect image resolution
F26	Incorrect paper size: Long-paper mode
F30	Multiple paper feed
F31	Auto-stack tray error
F32	Data storage area full
F33	Master image size / Drum size: Mismatch
F37	AF cannot be used in book mode
F40	No paper in paper-feed tray: Triple-Tray Source
F41	No paper in tray 1: Triple-Tray Source
F42	No paper in tray 2: Triple-Tray Source
F43	D to P Original size / Paper size: Mismatch
F44	Auto reproduction size selection: Unable
F49	Printer-Auto-Selection to linked printer disabled: Job setting error
F50	Printer-Auto-Selection to linked printer disabled: Linked printer error
F51	No Original on Scanner Table: Duplex Scanning Mode
F52	Printing from Linked Printer Disabled: Configuration Data being acquired
F53	More than 999 copies at one time not possible from linked printer
F54	Printer-Auto-Selection to linked printer disabled: Selected paper not in linked printer
F55	Printer-Auto-Selection to linked printer disabled: Receiving print data from PC
F56	Printer-Auto-Selection to linked printer disabled: Config. Data being acquired
F57	Printing from Linked Printer Disabled: Processing print data from PC
F58	Printing from Linked Printer Disabled: Initializing NET-C
F59	Printer-Auto-Selection to linked printer disabled: Initializing NIC
F60	Printer-Auto-Selection to linked printer disabled: Print quantity selected is Zero
F61	Linked Printer paper size and original size do not match

Error type	details
L01	Error while in obtaining Management Information Base (MIB)

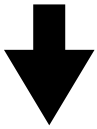
Paper-jam error (Gxxx Errors)

The paper-jam error number is determined by combining the errors for the paper jams involved. There are nine different jam errors, as specified in the table below. Each error is assigned a bit, and the jam-error number (Gxxx) is the sum of the corresponding values. The detailed error codes can be displayed by pressing the "*" key.

Bit	Corresponding value	Error type	Description
Bit 0	1	A10	AF original feed error
Bit 1	2	B03	Sorter: Error command 2
Bit 2	4	B07	Multi-tray: Main-unit error
Bit 3	8	B09	Multi-tray: Main-unit error
Bit 4	16	B11	Multi-tray: Tray-1 error
Bit 5	32	B17	Multi-tray: Tray-2 error
Bit 6	64	A07	Paper-feed error
Bit 7	128	A08	Paper jam on print drum
Bit 8	256	A09	Paper-ejection error

Example:

If A08 and B03 occur, the Error No. will be G130.



G130

Error type	Panel display
Panel display	Gxxx Paper Jam Remove Paper in Indicated Areas and Press [OK] Button.

3. Details on Panel Messages

Serviceman-call errors

Error type	T01 [Main-motor lock]
Panel display	T01-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset
Error point	Error conditions
520	The main motor limit sensor does not go ON/OFF for more than 16 pulses while the main motor is operating, even after the elapse of 100 ms.
521	The position-A sensor does not go ON/OFF, between two detections of position-B, while the main motor is operating.
522	The position-B sensor does not go ON/OFF while the motor is operating, even when 3033 pulses are received at the Main FG.
524	The clamp unit is not at the home position while the print drum is operating (Clamp sensor C: OFF, except during master disposal).
536	The drum failed to stop at position A. (over-run)
537	The drum failed to stop at position B. (over-run)
538	The print drum is not locked during operation. (Print-drum lock position sensor: OFF)

Error type	T02 [Elevator motor lock]
Panel display	T02-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch on power again
Error point	Error conditions
400	Both the upper and lower limit sensors were ON.
401	An overload current was detected in the elevator motor.
404	The lower-limit sensor does not go OFF within 2 s after the elevator motor operates in the raising direction from the lower-limit position.
405	The upper-limit sensor does not go ON within 12 s after the elevator motor operates in the raising direction.
406	The upper-limit sensor does not go OFF within 2 s after the elevator motor operates in the lower direction from the upper-limit position.
407	The lower-limit sensor does not go ON within 12 s after the elevator motor operates in the lowering direction.
408	The upper-limit sensor is OFF continuously for at least 2 s 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
Reset method	Jam reset or switch on power again
Error point	Error conditions
500	Clamp sensor C turns OFF following clamp unit initialization.
501	Clamp sensors A and B do not change within 800 ms when the clamp motor operates in reverse during clamp unit initialization (clamp sensor A starts at OFF).
502	Clamp sensors A and B do not change within 800 ms when the clamp motor operates in the forward direction during clamp unit initialization (clamp sensor A starts at ON).
503	Clamp sensor C does not go OFF within 800 ms when the clamp moves from the home position.
504	The clamp does not move from the home position to the open position within 800 ms during the operation of the clamp.
505	The clamp does not move from the open position to the position-A compensation position within 800 ms during the operation of the clamp.
506	The clamp does not move from the position-A compensation position to the clamp close position within 800 ms during the clamp operation.
507	The command does not coincide with the current position when clamp operation is started.
508	The command does not coincide with the stop position when clamp operation is stopped.

Error type	T-04 [Overflow]
Panel display	T04-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch on power again
Error point	Error conditions
513	The overflow sensor was ON for a set number of times in succession during the 10-ms-interval overflow-sensor check.

Error type	T05 [Print-positioning pulse-motor lock]
Panel display	T05-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch on power again
Error point	Error conditions
603	The vertical-centering sensor does not switch OFF → ON even when the vertical-positioning pulse motor is moved 12 mm in the ON direction.
604	The vertical-centering sensor does not switch ON → OFF even when the vertical-positioning pulse motor is moved 12 mm in the OFF direction.
610	Timeout error during the vertical-print-position return operation
614	Vertical-print-position returning time out error
616	The one-step-positioning key was pressed with vertical-print-position information undefined.

Error type	T06 [Horizontal pulse-motor lock]
Panel display	T06-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch on power again
Error point	Error conditions
605	The horizontal-centering sensor does not switch OFF → ON even when the horizontal pulse motor is moved 12 mm in the ON direction.
606	The horizontal-centering sensor does not switch ON → OFF even when the horizontal pulse motor is moved 10 mm in the OFF direction.
611	Timeout error during horizontal-print-position return operation
615	Horizontal-print-position returning time out error
617	The one-step-positioning key was pressed with the horizontal-print-position information undefined.

Error type	T07 [Digitizer error]
Panel display	T07-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch 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
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
Reset method	Switch power on again
Error point	Error conditions
003	Communication error with the sorter
700	Sorter communication: CTS does not switch to L within 3000 ms after the power is switched ON.
701	Sorter communication: The 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	T10 [Option error (paper feed)]
Panel display	T10-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch power on again
Error point	Error conditions
801	The type status was not returned from the multi-tray unit when the power was switched ON.
802	The Standby OK command was not returned when printing started.
803	The status was not returned from the multi-tray unit.
840	An undefined multi-tray-unit command was received.
841	CAN controller initialization failed.

Error type	T11 [Pressure-control motor lock]
Panel display	T11-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch on power again
Error point	Error conditions
600	Timeout error for reducing pressure (OFF → ON) during print-pressure home positioning.
601	Timeout error for increasing pressure (ON → OFF) during print-pressure home positioning.
602	The print-pressure limit sensor does not change during print-pressure operation.
620	Print-pressure operation was called with the print-pressure motor locked.
621	Incorrect print-pressure operation timing (print-pressure operation command was received when the print-pressure should not change).
622	Sensor A is ON and sensor B is OFF during movement from area A to area D.
623	Either sensor A or sensor B is ON during movement from area D to area A.
624	The current area data is undefined.
625	The target area data is undefined.
626	Timeout during relative print-pressure movement.

Error type	T12 [Master-disposal-section motor lock]
Panel display	T12-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch on power again
Error point	Error conditions
305	The master compression sensor does not go ON within 8 s after the master compression motor operates in the return direction.
306	Master compression sensor does not go OFF within 2 s after the master compression motor operates in the compress direction.
307	The master compression sensor does not go ON within 8 s after the master compression motor operates in the compress direction, and the master-compression-motor limit sensor cannot count up until the compression-limit position.
309	The master-compression-motor limit sensor does not change within 200 ms during compression operation.

Error type	T13 [Cutter motor lock]
Panel display	T13-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch on power again
Error point	Error conditions
203	Cutter HP SW does not go OFF within 100 ms after the cutter motor is activated.
204	Cutter HP SW does not go OFF → ON within 300 ms after the cutter motor is activated.
205	The master-positioning sensor is ON when the print drum rotates through the preset angle following cutting, and the master-positioning sensor is still ON when the print drum rotates through the preset angle following repeat cutting.

Error type	T14 [Flatbed error]
Panel display	T14-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch power on again
Error point	Error conditions
112	The FB/AF HP sensor does not go OFF within the set time.
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 error for waiting black shading compensation
117	Timeout error for waiting white shading compensation
118	Scanner operation command was received when it should not move. (400/300 dpi)
123	Offset adjustment not completed within set time (new type 300 dpi scanner unit).
124	Gain adjustment not completed within set time (new type 300 dpi scanner unit).
125	Offset adjustment not completed (new type 300 dpi scanner unit).
126	Gain adjustment not completed (new type 300 dpi scanner unit).
140	Communication error from the scanner unit (NAK twice, undefined error, etc.)
141	Communication timeout error from the scanner unit (Receive timeout)
142	The scanner unit detects a sequence error from the Risograph.
150	Timeout error for receiving the Risograph scanner command
151	The Risograph received an undefined command from the scanner.
152	The Risograph detected a communication sequence error from the scanner.
153	Risograph scanner communication error (ACK, NAK, or received-channel error)
154	The Risograph could not send data to the scanner within the set time.
160	Scanner connection error

Error type	T15 [AF error]
Panel display	T15-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch power on again
Error point	Error conditions
004	Communication error with the AF/CPU units
100	Original IN sensor adjustment error
101	AF-EEPROM error
108	AF guide potentiometer error
110	AF operation not completed within the set time
120	Communication error from the AF unit (NAK twice, undefined error, etc.)
121	Communication timeout error from the AF unit (Receive timeout)
122	The AF unit detects a sequence error from the Risograph.
130	Timeout error for receiving the Risograph AF command
131	The Risograph received an undefined command from the AF unit.
132	The Risograph detected a communication sequence error from the AF unit.
133	Risograph AF communication error (ACK, NAK, or received-channel error)
134	The 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
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
Reset method	Jam reset or switch power on again
Error point	Error conditions
207	The TPH pressure sensor does not go OFF within 2 s after the thermal-pressure motor activates in the counterclockwise direction.
208	The TPH pressure sensor does not go ON within 2 s after the thermal-pressure motor activates in the counterclockwise direction.
216	The TPH pressure sensor does not go OFF within 2 s after the thermal-pressure motor activates in the clockwise direction.
217	The TPH pressure sensor does not go ON within 2 s after the thermal-pressure motor activates in the clockwise direction.

Error type	T20 [Paper-ejection-section motor lock]
Panel display	T20-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset
Error point	Error conditions
414	The paper-ejection-wing home sensor does not go ON within the set time after the paper-ejection-wing motor activates in the clockwise direction during paper-ejection wing home positioning.
415	The paper-ejection-wing home sensor does not go OFF within 250 ms after the paper ejection wing motor activates in the counterclockwise direction from home position during paper ejection wing positioning.
416	An overload current was detected in the paper-ejection motor.
424	The paper-ejection limit sensor gives fewer than 20 pulses within 100 ms.

Error type	T22 [Drum lock error]
Panel display	T22-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch power on again
Error point	Error conditions
514	Failed to stop at position B during print-drum locking
516	The print-drum lock position sensor does not go OFF within 500 ms after the print-drum locking motor activates.
517	The print-drum lock cam sensor does not go ON within 1 s after the print-drum locking motor activates.
518	The print-drum lock position sensor does not go ON within 500 ms after the print-drum locking motor activates.
519	The print-drum lock cam sensor does not go OFF within 1 s after the print-drum locking motor activates.
529	The print-drum lock-position sensor and print-drum lock cam sensor are both ON.
530	The print-drum lock cam sensor does not go ON within 2 s after the print-drum locking motor activates during drum lock initialization.
531	The print-drum lock position sensor does not go ON within 2 s after the print-drum locking motor activates during drum lock initialization.
549	The print-drum lock-position sensor does not go ON during locking of the print-drum lock unit.
556	The print-drum lock-position sensor is OFF while the print drum is not set.

Error type	T23 [Scanner lock not released]
Panel display	T23-*** Image Scanner is Locked!! Unlock it
Reset method	Release the scanner lock in test mode
Error point	Error conditions
111	In scanner lock mode

Error type	T24 [Inking motor lock]
Panel display	T24-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
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!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch power on again
Error point	Error conditions
026	The residual battery voltage is below 2.3 V when the power is ON.

Error type	T93 [NET-C hardware error]
Panel display	T93-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch power on again
Error point	Error conditions
932	No reply from NET-C. NET-C does not recognize hardware reset of NET-C, or does not detect initialization command from RP, etc.
933	No response from NET-C for 90 seconds during NET-C initialization.

Error type	T94 [TPH not connected]
Panel display	T94-*** !!System Error!! Press Reset Key If Recovery has Failed, Call Service
Reset method	Jam reset or switch on power again
Error point	Error conditions
225	TPH not connected.

Error type	T95 [MCTL PCB backup error]
Panel display	T95-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch power on again
Error point	Error conditions
036	Backup data size does not match with that of NVRAM rated data size.
056	NVRAM check-sum error in the MCTL PCB
059	Serial-number data sent from SH-PCB does not match the MCTL PCB serial-number data.

Error type	T96 [Drum hardware error]
Panel display	T96-*** !!System Error!! Pull Out Print Drum and Replace it If Recovery has Failed, Call Service
Reset method	Pull out the print drum or switch the power on again
Error point	Error conditions
552	Print-drum data backup error

Error type	T98 [Hardware error]
Panel display	T98-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch power on again
Error point	Error conditions
005	Type-code error
029	Straight paper feed (multi-tray unit) paper width VR setting is not made.
030	Tray 1 (multi-tray unit) paper width VR setting is not made.
031	Tray 2 (multi-tray unit) paper width VR setting is not made.
046	The DIMM capacity does not match.
051	Touch-panel communication error
052	EEPROM read error
053	Memory settings (program, mode, user paper), failed to read the save data
054	Memory settings (program, mode, user paper), failed to write save data
055	The machine type code from SH-PCB does not match the type data from the MCTL PCB.
057	SRAM backup error in the SH-PCB
058	SH-PCB serial-number data is all set to zero.
063	The test-mode setting data stored was set outside the adjustment range.
064	An undefined command was sent in communication between SH-PCB and MCTL PCB.
065	Communication error 01 between SH-PCB and MCTL PCB (MCTL PCB side)
068	Communication error 04 between SH-PCB and MCTL PCB (MCTL PCB side)
069	Communication error 05 between SH-PCB and MCTL PCB (MCTL PCB side)
070	Communication error 06 between SH-PCB and MCTL PCB (MCTL PCB side)
071	Communication error 07 between SH-PCB and MCTL PCB (MCTL PCB side)
072	Communication error 08 between SH-PCB and MCTL PCB (SH-PCB side)
073	Communication error 09 between SH-PCB and MCTL PCB (SH-PCB side)
074	Communication error 10 between SH-PCB and MCTL PCB (SH-PCB side)
075	Communication error 11 between SH-PCB and MCTL PCB (SH-PCB side)
076	Communication error 12 between SH-PCB and MCTL PCB (SH-PCB side)
077	Communication error 12 between SH-PCB and MCTL PCB (SH-PCB side)
078	Communication error 14 between SH-PCB and MCTL PCB (SH-PCB side)
079	Communication error 15 between SH-PCB and MCTL PCB (SH-PCB side)
080	Communication error 16 between SH-PCB and MCTL PCB (SH-PCB side)
081	Communication error 17 between SH-PCB and MCTL PCB (SH-PCB side)
082	Communication error 18 between SH-PCB and MCTL PCB (SH-PCB side)
083	Communication error 19 between SH-PCB and MCTL PCB (SH-PCB side)
084	Communication error 20 between SH-PCB and MCTL PCB (SH-PCB side)

Error type	T98 [Hardware error]
Panel display	T98-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch power on again
Error point	Error conditions
085	User settings (properties, test-mode adjustment values), failed to read save data
086	User settings (properties, test-mode adjustment values), failed to write save data
087	Memory settings (program, mode, user paper), no save data set
088	User settings (properties, test-mode adjustment values), no save data set
089	No.1 of the Dip switches on SH-PCB is set to ON.
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.
094	Communication sequence error between SH-PCB and MCTL PCB (MCTL side)
095	Check sum of user settings (properties, test-mode adjustment values), does not match during stand-by.
096	Check sum of memory settings (program, mode, user paper), does not match, during stand-by.
097	Test mode adjustments memorized in the drum is outside the adjustment range.
099	ROSE: Error in data processing
219	The TPH size code does not match the machine-type code data.
220	The TPH resolution code does not match the machine-type code data.
422	The transmitter adjustment DA setting reached the upper limit during text-mode No. 457 Auto Multi-Paper-Feed Det. Adj.
423	The transmitter adjustment DA setting reached the lower limit during text-mode No. 457 Auto Multi-Paper-Feed Det. Adj.
526	Drum set safety switch is ON, but drum connection signal is OFF.
540	Print-drum communication: Gate-array timeout
541	Print-drum communication: ROM-writing-complete timeout
614	Print-pressure jig: Outside the adjustment range
922	ROSE: System lock (Image communication error)
998	MCTL: System lock (System overload)

Jam errors

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: OFF → ON, then master-positioning sensor OFF (or switch the 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 during the master-positioning operation.
202	The master-positioning sensor does not go OFF even when the write pulse motor is reversed during the master-positioning operation.
211	The master-positioning sensor was ON during standby.
214	The master-positioning sensor was ON at the start of master making.
215	Faulty gate-array control for the write pulse motor or load pulse motor (motor does not stop within set time)
222	Master feed error (error occurred during error recovery movement)

Error type	A02 [Master loading error]
Panel display	A02-*** Master Misfeed Rewind Master Roll and Reset Master in Place
Reset method	Master-manufacturing unit sensor: OFF → ON
Error point	Error conditions
509	The master-loading sensor was OFF when the master was checked at a specified drum angle during the master-loading operation.
555	Master loading error (error occurred during error recovery movement)

Error type	A03 [Cutting error]
Panel display	A03-*** Master Was Not Loaded on Print Drum Correctly Pull Out Print Drum and Remove Master
Reset method	Print-drum set sensor: OFF → ON
Error point	Error conditions
206	Master cut was successful after master cut retry.
223	Master cutting error (error occurred during error recovery movement)

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: OFF → ON
Error point	Error conditions
303	Master-disposal jam sensor was OFF at both 120 and 180 degrees drum angle.
304	The master-disposal jam sensor was ON at completion of master-disposal operation.
315	Master-disposal error (error occurred during recovery movement).
316	Master-disposal jam sensor was ON during recovery movement.

Error type	A05 [Master present in the master-disposal section]
Panel display	A05-*** Master Jammed in Disposal Unit Open Scanner Table and Disposal Top Cover, then Remove Master
Reset method	Master-disposal-unit set sensor: OFF → ON, and master-disposal jam sensor: OFF. (Or switch the power on again.)
Error point	Error conditions
312	The master-disposal jam sensor was ON at the start of master making operation.

Error type	A06 [Check paper-feed tray]
Panel display	A06-*** Check Standard Feed Tray
Reset method	The paper-feed-tray lower/upper safety switch goes ON. (Or switch the power on again.)
Error point	Error conditions
403	The paper-feed-tray upper or lower safety switch was OFF.
433	The paper-feed-tray upper or lower safety switch became OFF while tray in motion.

Error type	A07 [Paper-feed error]
Panel display	
Reset method	Turn the paper sensor OFF and reset the jam (or switch the power on again).
Error point	Error conditions
409	The paper-ejection sensor was OFF when the paper should have arrived, and the paper sensor was ON at 180°, just before stopping.
412	The paper sensor was OFF three times in succession when a paper misfeed was detected (paper misfeed).
418	The paper sensor was ON at the start of operation.
429	Paper feed error (error occurred during recovery movement)

Error type	A08 [Paper jam on print drum]
Panel display	
Reset method	Print-drum set sensor: OFF → ON (Or switch the power on again.)
Error point	Error conditions
410	The paper-ejection sensor was OFF when paper should have arrived, and the paper sensor was OFF at 180° just before stopping.
421	The paper sensor was ON when the paper should have left the paper sensor during feeding of long paper in long-length paper mode (paper longer than 555 mm).
430	Paper jam on print drum (error occurred during recovery movement).
829	Error command (Main unit: Jam error) received from the multi-tray unit. During machine idling, Multi-tray feed sensor 4 is ON and Paper sensor is also ON.

Error type	A09 [Paper-ejection error]
Panel display	
Reset method	Turn the paper-ejection sensor OFF and reset the jam, or switch the power on again.
Error point	Error conditions
411	The paper-ejection sensor was ON when the paper should have left the paper-ejection sensor.
417	The paper-ejection sensor was ON at the start of operation.
431	Paper-ejection error (error occurred during recovery movement)

Error type	A10 [AF original feed error]
Panel display	
Reset method	Turn the AF original detection sensor OFF, and reset the jam.
Error point	Error conditions
102	Original-registration-sensor remaining jam
103	Original-IN-sensor remaining jam
104	Original-OUT-sensor remaining jam
105	Original-registration-sensor non-arrival jam
106	Original-IN-sensor non-arrival jam
107	Original-OUT-sensor non-arrival jam
109	An original feed error occurred, due to opening the AF.
162	No original in AF during AF master making.

Error type	A16 [Awaiting master removal]
Panel display	A16-*** Master Remains on Print Drum Pull Out Print Drum and Remove Master
Reset method	Print-drum set sensor: OFF → ON
Error point	Error conditions
525	Awaiting master removal.
554	Remove master (master is detected on drum while in recovery movement).

Error type	A17 [Cutter error]
Panel display	A17-*** !!System Error!! Rewind Master Roll and Close Scanner Table
Reset method	Master-loading set unit: OFF → ON; master-detection sensor: OFF.
Error point	Error conditions
209	The cutter home-position switch was OFF during master setting at the start of master making.
221	Cutter error (error occurred during recovery movement).

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	Print-drum safety switch: OFF → ON
Error point	Error conditions
528	The print-drum lock position sensor is OFF and the print-drum lock cam sensor is ON, while the print-drum sensor safety switch is ON.

Option errors

Error type	B01 [Keycard counter: No card]
Panel display	B01-*** Insert Card into Key/Card Counter
Reset method	Insert Card
Error point	Error conditions
730	Keycard counter: No card

Error type	B02 [Sorter: Error command 1]
Panel display	B02-*** Check Sorter Panel Display
Reset method	Check Sorter
Error point	Error conditions
702	An error command was received (Serviceman-call error) from the sorter.

Error type	B03 [Sorter: Error command 2]
Panel display	
Reset method	Remove jammed paper
Error point	Error conditions
703	An error command was received (Jam error) from the sorter.

Error type	B04 [Sorter: Error command 3]
Panel display	B04-*** Close Sorter Cover
Reset method	Close the cover
Error point	Error conditions
707	An error command was received (Open error) from the sorter.

Error type	B05 [Sorter: Error command 4]
Panel display	B05-*** Check Sorter Panel Display
Reset method	Check the sorter
Error point	Error conditions
709	An error command was received (others) from the sorter.

Error type	B06 [Multi-tray: Main-unit error (Serviceman-call error)]
Panel display	B06-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Jam reset or switch power on again
Error point	Error conditions
804	An error command was received (Main unit: Serviceman-call error) from the multi-tray unit. Even after 100 ms after the multi-tray transfer motor was turned ON, multi-tray feed limit sensor did not count any pulses.

Error type	B07 [Multi-tray: Main-unit error (Jam-Feed joint pass)]
Panel display	
Reset method	Sensor on paper-feed path → OFF, jam reset, or switch the power on again
Error point	Error conditions
825	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 3 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the multi-tray feed sensor 4 did not turn ON (Multi-tray feed sensor 1&2=OFF, 3=ON), or multi-tray feed sensor 3 is ON when the power is turned ON.
826	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 4 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the paper sensor did not turn ON (Multi-tray feed sensors 1&2=OFF and 3&4=ON), or multi-tray feed sensors 3&4 are ON when power is turned ON.
827	Error command received (Main unit: Jam error) from the multi-tray unit. When the machine is in idle, the multi-tray feed sensors 3&4 are ON and paper sensor is ON.
828	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 4 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the paper sensor did not turn ON (Multi-tray feed sensors 1 to 3=OFF and 4=ON), or multi-tray feed sensor is ON when the power is turned ON.

Error type	B08 [Multi-tray: Main-unit error (Multi-tray transfer unit open)]
Panel display	B08-*** Close Multi-Tray Transfer Unit
Reset method	Jam reset or switch power on again
Error point	Error conditions
805	Error command received (Main unit: Open error) from the multi-tray unit. Multi-tray transfer unit was opened.

Error type	B09 [Multi-tray: Main-unit error (Jam-Multi tray transfer)]
Panel display	
Reset method	Sensor on paper-feed path → OFF, jam reset, or switch the power on again
Error point	Error conditions
816	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 1 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the multi-tray feed sensor 2 did not turn ON (Multi-tray feed sensor 1 stayed ON), or multi-tray feed sensor 1 is ON when the power is turned ON.
817	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 2 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the multi-tray feed sensor 3 did not turn ON (Multi-tray feed sensor 1,2 stayed ON), or multi-tray feed sensors 1&2 are ON when the power is turned ON.
818	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 3 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the multi-tray feed sensor 4 did not turn ON (Multi-tray feed sensors 1 to 3 stayed ON), or multi-tray feed sensors 1 to 3 are ON when the power is turned ON.
819	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 4 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the paper sensor did not turn ON (Multi-tray feed sensors 1 to 4 stayed ON), or multi-tray feed sensors 1 to 4 are ON when the power is turned ON.
820	Error command received (Main unit: Jam error) from the multi-tray unit. During the machine idling, the multi-tray feed sensors 1 to 4 are ON and the paper sensor is ON.
821	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 2 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the multi-tray feed sensor 3 did not turn ON (Multi-tray feed sensor 1=OFF, 2=ON), or multi-tray feed sensor 2 is ON when the power is turned ON.
822	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 3 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the multi-tray feed sensor 4 did not turn ON. (Multi-tray feed sensor 1=OFF, 2&3=ON), or multi-tray feed sensors 2&3 are ON when the power is turned ON.
823	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 4 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the paper sensor did not turn ON (Multi-tray feed sensor 1=OFF, 2 to 4=ON), or multi-tray feed sensors 2 to 4 are ON when the power is turned ON.
824	Error command received (Main unit: Jam error) from the multi-tray unit. During the machine idling, the multi-tray feed sensors 2 to 4 are ON and the paper sensor is ON.
825	Error command received (Main unit: Jam error) from the multi-tray unit. After multi-tray feed sensor 3 turns ON, and multi-tray transfer motor rotates a certain amount of pulses, the multi-tray feed sensor 4 did not turn ON (Multi-tray feed sensors 1&2=OFF, 3=ON), or multi-tray feed sensor 3 is ON when power is turned ON.

Error type	B10 [Multi-tray: Tray-1 error (Serviceman call)]
Panel display	B10-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Jam reset or switch power on again
Error point	Error conditions
806	Error command received (Tray 1: Serviceman-call error) from the multi-tray unit. Even after 7 sec after multi-tray 1 elevator motor turned ON, the upper limit sensor does not turn ON.

Error type	B11 [Multi-tray: Tray-1 error (Jam: Upper)]
Panel display	
Reset method	Reset tray
Error point	Error conditions
807	Error command received (Tray 1: Jam error) from the multi-tray unit. Paper misfeed from tray 1. (Multi-tray feed sensor 3 is OFF)
842	In feeding from tray 1, paper sensor stayed OFF even though the paper should have reached the paper sensor.

Error type	B13 [Multi-tray: Tray-1 error (Multi-tray unit open)]
Panel display	B13-*** Set Feed Tray 1 in Place
Reset method	Set tray
Error point	Error conditions
809	Error command received (Tray 1: Open error) from the multi-tray unit.

Error type	B14 [Multi-tray: Tray-1 error (Check tray)]
Panel display	B14-*** Check Feed Tray 1
Reset method	Jam reset or switch power on again
Error point	Error conditions
810	Error command received (Tray 1: Check-tray error) from the multi-tray unit. Multi-tray 1 limit switch is ON.

Error type	B16 [Multi-tray: Tray-2 error (Serviceman call)]
Panel display	B16-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Jam reset or switch power on again
Error point	Error conditions
811	Error command received (Tray 2: Serviceman-call error) from the multi-tray unit. Even after 7 sec after multi-tray 2 elevator motor turned ON, the upper limit sensor did not change to ON.

Error type	B17 [Multi-tray: Tray-2 error (Jam)]
Panel display	
Reset method	Reset tray
Error point	Error conditions
812	Error command received (Tray 2: Jam error) from the multi-tray unit. Paper misfeed from tray 2. (Multi-tray feed sensor 1 is OFF)
843	Misfeed when paper is fed from tray 2

Error type	B19 [Multi-tray: Tray-2 error (Tray-2 open)]
Panel display	B19-*** Set Feed Tray 2 in Place
Reset method	Set tray
Error point	Error conditions
814	Error command received (Tray 2: Open error) from the multi-tray unit.

Error type	B20 [Multi-tray: Tray-2 error (Check tray)]
Panel display	B20-*** Check Feed Tray 2
Reset method	Jam reset or switch power on again
Error point	Error conditions
815	Error command received (Tray 2: Check-tray error) from the multi-tray unit. Multi-feed tray 2 limit SW is ON.

Error type	B21 [Data storage: Read/Write error]
Panel display	B21-*** !!System Error!! Turn Main-Power SW OFF Then ON If Recovery has Failed, Call Service
Reset method	Switch 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 [Job separator: Power off]
Panel display	B22-*** !!Job Separator Has No Power!! Turn ON Power Switch of it
Reset method	Check and switch ON the power of job separator.
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" more than 4 sec.

Error type	B23 [Job separator: No tape]
Panel display	B23-*** No Paper Tape in Job Separator Replace Tape Roll
Reset method	Check and set paper tape in job separator.
Error point	Error conditions
722	With the “Tape separation” function set ON, no tape detected when the start key is pressed.
723	No tape remains upon completion of the tape-ejection operation.

Error type	B24 [Job separator: Tape jam]
Panel display	B24-*** Paper-Tape Jam in Job Separator Remove Paper Tape
Reset method	Check and remove the jammed paper from job separator.
Error point	Error conditions
724	Tape remains when the start key is pressed with the “Tape separation” function set to ON.
725	The tape-jam detection signal is “H” within 500 ms 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 5 sec. at “L”) after the cluster-A signal goes ON (tape misfeed).

Error type	B25 [Sorter: Error command 5 (Full error)]
Panel display	B25-*** Check Sorter Panel Display
Reset method	Remove the paper from sorter.
Error point	Error conditions
704	Error command (Full error) received from the sorter

Error type	B26 [Sorter: Error command 6 (Print on bin error)]
Panel display	B26-*** Check Sorter Panel Display
Reset method	Remove the paper from sorter.
Error point	Error conditions
705	Error command (Paper on bin error) received from the sorter

Error type	B27 [Sorter: Error command 7 (Staple error)]
Panel display	B27-*** Check Sorter Panel Display
Reset method	Clear the stapler jam.
Error point	Error conditions
706	Error command (Staple error) received from the sorter

Error type	B28 [Sorter: Error command 8 (Size error)]
Panel display	B28-*** Check Sorter Panel Display
Reset method	Remove paper from sorter.
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
Reset method	Check Network and Linked Printer Panel Message
Error point	Error conditions
920	Error detected by NET-C. (No signal from linked printer, connection interrupted, NET-C TCP/IP is not activating, interruption from RP, etc.)

Error type	B33 [IP address set up error]
Panel display	B33-*** No IP Address Assigned to This Printer Contact Network Administrator
Reset method	Assign correct IP address
Error point	Error conditions
931	IP address is not assigned to RP. With no IP address assigned, the link is enabled on the linked printer.

Consumable error

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: OFF → ON and Master detection sensor: OFF → ON
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 sec and then ON.
Error point	Error conditions
308	The compression detection position was reached before the master-compression-motor limit-sensor count reached the specified level, after the master compression motor turned ON in the compression direction.

Set check error

Error type	D01 [Print drum not set]
Panel display	D01-*** Set Print Drum in Place
Reset method	Print-drum safety switch to ON and Print-drum set signal to ON
Error point	Error conditions
527	Both the print-drum safety switch and print drum set signal is OFF.
547	The print-drum set signal is ON, but the print-drum safety switch is OFF.

Error type	D02 [Incorrect print drum]
Panel display	D02-*** Wrong-Type Print Drum Installed
Reset method	Replace with correct print drum.
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
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).
223	Master not set (Error occurred in error recovery movement)

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	D08 [Master disposal unit not set]
Panel display	D08-*** Close Disposal Top Cover
Reset method	Disposal-top-cover sensor: ON
Error point	Error conditions
311	The disposal-top-cover sensor is OFF (sensor light path is free).

Error type	D09 [Master-making unit not set]
Panel display	D09-*** Close Master-Making Unit
Reset method	Master-making-unit sensor: ON
Error point	Error conditions
212	The master-making-unit sensor is OFF (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.

Error type	D12 [Feed-joint pass. Cover not set.]
Panel display	D12-*** Close Feed-Joint Passage Cover
Reset method	Feed-joint pass. Cover safety switch: ON.
Error point	Error conditions
551	Feed-joint pass. The cover safety switch is OFF.

Warning (Serviceman call)

Error type	E01 [Replace battery]
Panel display	!! Battery Replacement !! Call Service
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).

Error type	E02 [Maintenance call]
Panel display	!! Maintenance !! Call Service
Reset method	Jam reset
Error point	Error conditions
011	The master counter reached the value set in test mode when the power was ON, the unit was reset, or operation ended.
012	The copy counter reached the value set in test mode when the power was 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 ON, the unit was reset, or operation ended.

Warning (other)

Error type	F01 [No master on drum]
Panel display	No Master on Print Drum Make a New Master
Reset method	Close, reset, or change mode.
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)
Reset method	Stop, reset, or start.
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 Start Key To Cancel, Press Stop Key
Reset method	Set original.
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	Enter Print Quantity Over ** Programmed Minimum Value
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	F07 [Drum-position error]
Panel display	!! Print Drum is Not in Neutral Position !! Press Print-Position Centering Key to Shift Back Print Drum
Reset method	Press centering key.
Error point	Error conditions
014	The print drum is not centered at the start of master making.

Error type	F08 [Paper size / original size: mismatch]
Panel display	!! The Current Paper Size is not Correct !! Change Paper Size
Reset method	Change the paper size or original size.
Error point	Error conditions
017	Paper size corresponding to the original size is not set for Triple-Tray Source selection.

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)
Reset method	Stop, reset, or start test printing.
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	F11 [Master image larger than paper size: 3]
Panel display	!! Another Size of Paper has been Loaded on the Standard Feed Tray !! Change Paper Data
Reset method	Select the paper size on the paper-feed tray (master making size).
Error point	Error conditions
023	At the start of the master making or when the paper on the paper-feed-tray was changed, the paper size does not match the image size.

Error type	F12 [Original size irregular: Triple-Tray Source selection invalid]
Panel display	!! No Auto Paper Size Selection with Irregular Size Original !! Select Paper Size
Reset method	Close or reset.
Error point	Error conditions
024	A non-standard-size original was set at the start of operation with the Triple-Tray Source selected.

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
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	F17 [Drum size does not match]
Panel display	!! The Print Drum Type has been Changed !! Select the Current Print Drum Type
Reset method	Select the print-drum size.
Error point	Error conditions
027	Different size print drum from the previous is set.

Error type	F18 [Incorrect zoom rate]
Panel display	!! Images may not fit in Frame of paper with this Reproduction Size !! Check Current Selection (Continue → START Key)
Reset method	Change reproduction size, or start master-making operation.
Error point	Error conditions
043	The paper size does not match the original size reproduction size when the master-making operation is started with the manual tray selected.

Error type	F19 [Master image larger than paper size: 4]
Panel display	!! Another Size of Paper has been Loaded on Feed Tray 1 !! Change Paper Data
Reset method	Select the paper size for tray 1.
Error point	Error conditions
040	The paper size selected does not match that of the actual paper loaded when the paper in tray 1 was replaced.

Error type	F20 [Master image larger than paper size: 5]
Panel display	!! Another Size of Paper has been Loaded on Feed Tray 2 !! Change Paper Data
Reset method	Select the paper size for tray 2.
Error point	Error conditions
041	The paper size selected does not match that of the actual paper loaded when the paper in tray 2 was replaced.

Error type	F21 [AF multi-up: Original not set]
Panel display	Place Another Original To Cancel, Press Stop Key
Reset method	Set original on the AF, or cancel the operation.
Error point	Error conditions
032	The next original is not in placed on AF for multi-up operation.

Error type	F22 [FB multi-up: Original not set]
Panel display	Place Another Original and Press Start Key To Cancel, Press Stop Key
Reset method	Place original on the flatbed, or stop the FB multi-up operation.
Error point	Error conditions
033	The next original is not placed on flatbed for multi-up operation.

Error type	F23 [Communication error: D to P]
Panel display	Communication Error Check Communication Devices and Cables
Reset method	Jam reset
Error point	Error conditions
044	Communication error in remote mode (D to P mode)

Error type	F24 [Auto reproduction-size selection: Unable]
Panel display	!! No Auto Reproduction Size Selection with This Combination of Original and Printing Paper !! Select Size Manually.
Reset method	Set the reproduction size manually. Press OK or RESET key to clear the message.
Error point	Error conditions
038	The reproduction size is not consistent with the operable range when operation was started with the auto reproduction size.

Error type	F25 [Incorrect image resolution]
Panel display	!! The Image Resolution of the Current Data has Just been Converted !! (Continue → START Key)
Reset method	Jam reset or start key
Error point	Error conditions
045	Data is received with a inconsistent image resolution (D to P mode).

Error type	F26 [Incorrect paper size: Long-paper mode]
Panel display	!! Paper-Size Selection is Not Correct !! Change Selection
Reset method	Check the paper size. Press "OK" or "RESET" to clear the message.
Error point	Error conditions
413	With the long-length paper mode not selected, the paper sensor is still ON when the paper should have left the paper sensor (the paper was a long-length paper).
419	With the long-length paper mode selected, the paper left the paper sensor too soon (the paper was not a long-length paper).

Error type	F30 [Multiple paper feed]
Panel display	!! Possible Multiple Paper Feed !! Check Printed Copies
Reset method	Check the printed copies. Press "OK" or "RESET" to clear the message.
Error point	Error conditions
420	Multiple paper feed is detected during operation (when no paper-ejection jam error exists).
425	Paper conforming to data obtained in the light-transmission check is fed in multiple.
426	Paper is fed in multiple during the light-transmission check.
427	Paper conforming to data obtained in the paper-sensor OFF check is fed in multiple.
428	Paper is fed in multiple during the paper-sensor OFF check.

Error type	F31 [Auto stack-tray error]
Panel display	Check Paper Receiving Tray
Reset method	Check the paper guides or press the start key. Press "OK" or "RESET" to clear the message.
Error point	Error conditions
836	The HP sensor does not go ON during paper-guide home positioning.
837	The HP sensor does not go OFF when the paper guides are moved.
838	The HP sensor does not go ON during paper-stopper home positioning.
839	The HP sensor does not go OFF when the paper stopper is moved.

Error type	F32 [Data storage area full]
Panel display	!! Data-Storage Area has Become Full !! Clear Old Storage Data
Reset method	Check the available storage area. Press "OK" or "RESET" to clear the message.
Error point	Error conditions
713	Insufficient memory available when data is being written on the data-storage card.

Error type	F33 [Master image size / Drum size: mismatch]
Panel display	!! Unmatched Size -- Print Drum and Image Area !! Check Print Drum (Continue → START Key)
Reset method	Check the print drum size, or start making master by pressing the start key.
Error point	Error conditions
047	The master making size did not match the drum size when P-to-P master making is started.
048	The master making size did not match the drum size when D-to-P master making is started.

Error type	F37 [AF cannot be used in book mode]
Panel display	!! Book Shadow Editor is Not Available with AF !! Place Original on Stage Glass
Reset method	Set the original on the flatbed, or cancel book mode. Press "OK" or "RESET" to clear the message.
Error point	Error conditions
050	The original was set on the AF with book mode set when master making is started.

Error type	F40 [No paper in paper-feed tray: Triple-Tray Source]
Panel display	Load Paper in Standard Feed Tray
Reset method	Load paper.
Error point	Error conditions
060	Paper ran out during proof printing with the standard (straight) feed tray selected from the Triple-Tray Source.
907	Paper ran out during printing with the standard (straight) feed tray selected from the Triple-Tray Source.

Error type	F41 [No paper in tray 1: Triple-Tray Source]
Panel display	Load Paper in Feed Tray 1
Reset method	Load paper.
Error point	Error conditions
061	Paper ran out during proof printing with Tray 1 selected from the Triple-Tray Source.
908	Paper ran out during printing with Tray 1 selected from the Triple-Tray Source.

Error type	F42 [No paper in tray 2: Triple-Tray Source]
Panel display	Load Paper in Feed Tray 2
Reset method	Load paper.
Error point	Error conditions
062	Paper ran out during proof printing with Tray 2 selected from the Triple-Tray Source.
909	Paper ran out during printing with Tray 2 selected from the Triple-Tray Source.

Error type	F43 [D to P Original Size / Paper Size: Mismatch]
Panel display	!! Unmatched Size -- Current Page and Printing Paper !! Check Paper Size (Continue ->START Key)
Reset method	Check paper size, or press START Key to continue.
Error point	Error conditions
900	Original size and paper size do not match at start of D to P master making.

Error type	F44 [Auto Reproduction Size Selection: Unable]
Panel display	!! No Auto Reproduction Size Selection w ith This Combination of Original and Printing Paper !! Select Size Manually
Reset method	Manually select the reproduction size.
Error point	Error conditions
901	Original size could not be detected (original size out of detectable parameter).

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)
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RP.
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)
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RP.
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 / Simplex → STOP
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
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)
Reset method	Change the mode, or START Key to start (print out from RP).
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)
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RP.
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)
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RP.
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)
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RP.
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
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
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)
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RP.
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)
Reset method	Close, RESET or STOP to cancel, or press START Key to make prints from RP.
Error point	Error conditions
929	Auto-printer-selection is disabled with print quantity selected as Zero.

Error type	F61 [Linked Printer paper size and original size do not match]
Panel display	!! Paper of the Specified Size is Not Prepared in Linked Printer !!
	Prepare it there
Reset method	Close, RESET or STOP.
Error point	Error conditions
930	Linked printer paper size and original size mismatch.

MIB (Management Information Base) error

Error type	L01 [Error while in obtaining Management Information Base (MIB)]
Panel display	!! No Linked Printer Detected !! Check Cable Connection and Power Supply for Linked Printers
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 RP, 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)

4. Backed-up Errors

The errors listed below are backed up and are not cleared even when the machine power is switched off.

Error type	Details
T01	Main motor lock
T03	Clamp motor lock
T13	Cutter motor lock
A03	Cutting error
A04	Master disposal error
A16	Awaiting master removal
A17	Cutter error
C01	Replace ink cartridge
C02	Replace master roll
C03	Master disposal box full

MEMO

CHAPTER 18: TEST MODE

Contents

1. Procedures

1) Start-up Procedure

Switch on power while simultaneously pressing the ◁ and ▷ print positioning keys on the panel. This initiates test mode in standby mode.

2) Operating Procedure

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

a) Key entry procedure

(1) In standby mode, enter the number of the test mode to be run using the numeric keys. If you make a mistake during entry, you can perform entry once again by pressing the “C” key.

(2) Press the “Start” key to initiate Test mode operations.

(3) Press the “Stop” or “Start” key to end Test mode and return to standby or operation standby modes.

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

b) Menu selection method

(1) While in standby mode, select the unit containing the test item to be run from the Test mode menu.

- Press the unit name on the LCD screen. (Unit name is highlighted.)
- The Test mode sub-menu appears.

(2) Select the test item to be run from the Test mode sub-menu.

- Press the test item on the LCD screen. (Test item is highlighted.)

(3) Press the “Start” key to initiate Test mode operations.

(4) Press the “Stop” or “Start” key to end the Test mode operation and return to standby mode or operation standby mode.

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

3) Ending Procedure

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

2. Individual Test Procedures

1) Checking sensors and switches

Indicates the sensor and switch status with audible beeps.

- Detected: Buzzer sounds at 0.1 second intervals (short beeps).
- Not detected: Buzzer sounds at 0.5 second intervals (long beeps).

2) Checking motors and solenoids

Switch on by pressing the “Start” key, then press the “Start” or “Stop” key to switch off.

* Error checking is not performed during the operation. Note that moving parts may lock if at their limit positions.

3) Checking unit operations

(1) Switch on by pressing the “Start” key, then initiate unit operation. Error checking is performed in basically the same way as for normal operation. Some operations will halt when the sequence is complete, while other operations will continue until you press a key (“Stop” or “Start”).

(2) A continuous audible tone is emitted to indicate an error. To cancel errors, press the “Reset” key.

4) Data check

Press the “Start” key to display data.

* Data check only displays the various settings. These settings cannot be changed here.

5) Data setting

(1) Press the “Start” key to display and change the data currently set.

(2) Change data using the numeric keys. Use the “*” key to change the “±” display.

(3) Once settings have been changed, press the “Start” key to confirm the data and return to standby mode. Press the “Stop” key to cancel the settings and return to standby mode.

* The settings will be set to their default values if values beyond the specified setting ranges are entered. The settings are also set to their default values if values are entered in units other than the units specified.

3. System/Control Panel Test Mode

No.	Sensors, switches	Detection status
001	Wakeup Key Check	Key pressed
No.	Motors, solenoids	Remarks
030	Beep Sound Check 1	0.1-second intervals
031	Beep Sound Check 2	0.5-second intervals
032	Wakeup LED ON	Illuminates
No.	Unit checks	
050	Test Print A Creates a master for test pattern 1 (checkered)	
051	Test Print B (Check) Creates a master for test pattern 2 (cross stripes)	
052	Test Print C (Dot1) Creates a master for test pattern 3 (dots 1)	
053	Test Print D (Dot2) Creates a master for test pattern 4 (dots 2)	
054	Test Print E (Dot1 + Check) Creates a master for test pattern 5 (dots 1 + cross stripes)	
055	Test Print F (Dot2 + Check) 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. * Detects overload current. * Operates regardless of whether the print drum has been inserted.	
057	Low-Speed Printing Operation Prints continuously at 15 rpm. * Detects overload current. * Operates regardless of whether the print drum has been inserted.	
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.	
059	Auto Power-OFF Signal Output Switches off the power.	
060	Panel Key Test Displays the key number for the key pressed.	
061	Panel LCD Test Runs the test display.	
062	Panel LED Test Illuminates the panel LEDs in sequence.	
063	Unit Initialization Resets the mechanical sections to their home positions (TPH, master compression plate, paper ejection wings, drum lock, clamps, vertical/horizontal positioning, print pressure).	
064	System Configuration Data Output Creates a master for the CI system data.	
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 three 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 check	Display details
070	System-Parameter Adjust Record	Lists the test-mode No. and setting for non-default items during data setting.
071	SW Action Record	Displays the error code (D**) for the set switch that caused operation to stop (8 most recent items).
072	Error Record	Lists the error recodes of which occurred recently in normal mode by the error codes (max. 64 codes).
073	Maintenance Count	Displays all maintenance counter values.
074	Current Battery Volume	Displays the current residual battery digital value and voltage. Digital value: 0–255 (full at 255) Voltage: 0–3.3 V (displays x10 values)
075	Loader Version Display	Displays the program loader version for both SH-PCB and MCTL-PCB.
078	Optional Configuration Check	Displays whether any peripheral options are currently connected. Displays the version if the peripheral unit if the unit contains ROM. 0 = No option connected. 1 = Option connected.

No.	Data settings	
080	Clear Error Status Data	
	Description	Forcibly clears jam. Consumable errors cannot be cleared.
	Setting	None
081	Clear User Memory	
	Description	Clears data in user memory (resets to default values). *** Always save data before resetting.**
	Setting	None
082	Clear Test-Mode Data Setup	
	Description	Resets all settings set in test modes to the default values. *** Always save data 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	
	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
085	Maintenance-Drum Meter Entry	
	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	
	Description	Sets the effective range for the black-priority process in shrinkage printing (effective for the reduction of cyclic patterns). **Effective only on 300 dpi machine with new-type scanner unit.**
	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 settings				
087	Maintenance-Master Count Clear				
	Description	Clears the master count (within the software) for displaying the maintenance-call message.			
	Setting	None			
088	Maintenance-Copy Count Clear				
	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	Setting of print quantity display after previous printing finishes. * Disabled: Displays "0" quantity. * Enabled: Displays [previous set print quantity].			
	Setting	Setting:		With "AUTO-GO" ON	With "AUTO-GO" OFF
			0 :	Enabled	Enabled
			1 :	Enabled	Disabled
			2 :	Disabled	Enabled
			3 :	Disabled	Disabled
		Default:	0 :	Enabled	Enabled
091	Panel Black/White Reversal				
	Description	Reverses the black/white mode of the touch-panel display			
	Setting	Setting:	1 (Reversed), 0 (Normal)		
		Default:	0 (Normal)		
094	Min. Print Quantity Control				
	Description	Sets the minimum print number set in user mode to Enabled/Disabled.			
	Setting	Setting:	1 (Enabled), 0 (Disabled)		
		Default:	1 (Enabled)		
095	Counter Action Control				
	Description	Sets the counters (solenoid counter, software counter) to Enabled/Disabled. Counters remain disabled until the power is switched off.			
	Setting	Setting:	1 (Enabled), 0 (Disabled)		
		Default:	1 (Enabled)		
098	Counter Action Control 2				
	Description	Sets the counters (solenoid counter, software counter) to Enabled/Disabled. This setting is stored even when the power is switched off.			
	Setting	Setting:	1 (Enabled), 0 (Disabled)		
		Default:	1 (Enabled)		
		* Cannot be selected from the main menu * The test mode is activated only after activating test mode No. 960 in advance just prior to activating this test mode No.098. * Enter either 0 or 1 and press the “Start” key to set.			
099	Warning Display Control				
	Description	Selection of whether to display the warning messages [F02], [F10], [F33] and [F18] at the start of the master-making or printing. * Enabled = YES * Disabled = NO.			
	Setting	Range:	1 (Enabled), 0 (Disabled)		
		Default:	1 (Enabled)		

4. Process/Scanning Test Mode

No.	Sensors, switches	Detection status
100	Image-Scanner AF Shading Sensor	Carriage at home position
101	Flatbed Original Det. Sensor	Detecting (original present)
102	Flatbed Original Size Sensor 1	Detecting (original present)
103	Flatbed Original Size Sensor 2	Detecting (original present)
104	Flatbed Original Size Sensor 3	Detecting (original present)
105	Flatbed Original Size Sensor 4	Detecting (original present)
106	Flatbed Original Size Sensor 5	Detecting (original present)
107	Flatbed Original Size Sensor 6	Detecting (original present)
108	Flatbed Original Size Sensor 7	Detecting (original present)
110	Stage Cover Sensor	Stage cover closed
No.	Motors, solenoids	Remarks
130	Image-Scanner Lamps ON	Original scanning light source
No.	Unit checks	
150	Shading Operation Runs the Shading Operation.	
151	Scanner Home Action Returns the scanner to the home position.	
152	Scanner Cycle Action Performs one scanner operation cycle (A3 scanning only). * Adjusts the speed in accordance with the reproduction size set in test-mode No. 187.	
153	Scanner AF Action Moves the Scanner to the AF Scanning Position.	
154	Scanner Lock Action Moves the scanner to the lock position for transport. * Error message displayed.	
155	Scanner Release Action Cancels the error status set in test-mode No. 154.	
156	Scanner Cycle Continuous Action [effective on 300 dpi machines with new-type scanner unit] Repeats the motion of Test Mode No. 152	
157	Lamp Carriage Action [effective on 300 dpi machines with new-type scanner unit] Lamp carriage moves to home position → Lamp carriage transfers in scanning direction → 1 second halt 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. * Pressing the Start or Stop button will escape from this test mode.	
158	Scanner Lamp Replace Positioining [effective on 300 dpi machines with new-type scanner unit] Moves the scanner to lamp replacing position.	

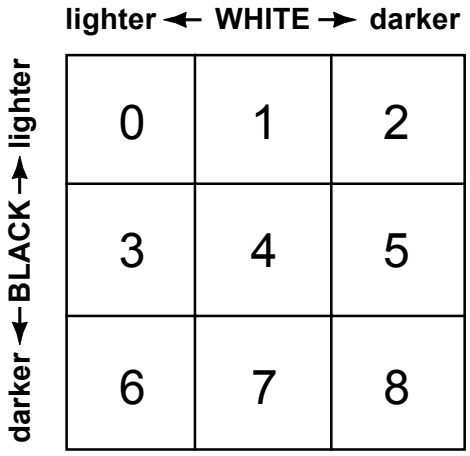
No.	Data check	Display details		
170	FB Original Size Code Data * Following two steps must be made before this test mode is activated. 1) Active test mode No. 151. 2) Place original on the scanner table and keep the stage cover opened.	00: no paper	01: A3	02: B4
		03: A4	04: A4-R	05: B5
		06: B5-R	07: - - - -	08: - - - -
		09: - - - -	10: - - - -	11: - - - -
		12: - - - -	13: Ledger	14: Legal
		15: Letter	16: Letter-R	17: Statement
		18: Statement-R	19: Foolscap	50: non standard

No.	Data settings			
180	FB Horizontal Scan Position Adjust			
	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) relative to datum * (+ is to left)	
		Unit:	5 (0.5 mm)	
		Default:	0 mm	
181	FB Scan Start Position Adjust			
	Description	Adjusts the original scanning start position on the flatbed		
	Setting	Range:	-60 to +60 (-6.0 mm to +6.0 mm) relative to datum * (+ is downward)	
		Unit:	1 (0.1 mm)	
		Default:	0 mm	
182	FB Scanning Speed Adjustment			
	Description	Adjusts the original scanning speed on the flatbed		
	Setting	Range:	-100 to +100 (-10.0% to +10.0%) relative to datum * (+ shrinks)	
		Unit:	1 (0.1%)	
		Default:	0%	
183	Line-Copy Slice Level Adjustment			
	Description	Sets the slice level for line mode. Lighter for larger values.		
	Setting		(300 dpi, 400 dpi, 600 dpi)	(300 dpi with new-type scanner unit)
		Range:	-16 to +16	-32 to +32
		Unit:	1	1
		Default:	2 (1 for 300 dpi)	-10
184	Base Tone Slice Level Adjustment			
	Description	Sets the slice level for ABC (auto base control). Lighter for larger values.		
	Setting		(300 dpi, 400 dpi, 600 dpi)	(300 dpi with new-type scanner unit)
		Range:	-16 to +16	-32 to +32
		Unit:	1	1
		Default:	-1 (0 for 300 dpi)	8
185	Stray White Dot Erasure			
	Description	The image processing function compensates if stray white dots of specified size exist.		
	Setting		(300 dpi, 400 dpi, 600 dpi)	(300 dpi with new-type scanner unit)
		Settings:	0: OFF 1: Erase 1 x 1 dots 2: Erase 2 x 2 dots 3: Erase 2 x 3 dots	No adjustment
		Default:	3 (600 dpi) 2 (400 dpi) 2 (300 dpi)	
186	Stray Black Dot Erasure			
	Description	The image-processing function compensates if stray black dots of specified size exist.		
	Setting		(300 dpi, 400 dpi, 600 dpi)	(300 dpi with new-type scanner unit)
		Settings:	0: OFF 1: Erase 1 x 1 dots 2: Erase 2 x 2 dots 3: Erase 2 x 3 dots	No adjustment
		Default:	3 (600 dpi) 2 (400 dpi) 2 (300 dpi)	

No.	Data settings		
187	Cycle Test Scanning Speed Adjust		
	Description	Sets the scanning speed (reproduction rate) of test mode No. 152.	
	Setting	Range: 50 to 200 (50% to 200%) Unit: 1 (1%) Default: 100%	
188	Line Edge Stress Level Adjust		
	Description	The larger the number, the edge is stressed stronger.	
	Setting	(300 dpi, 400 dpi, 600 dpi) Range: 0 to 15 Unit: 1 Default: 8 (11 for 300 dpi)	(300 dpi with new-type scanner unit) No adjustment
189	Halftone Curve Selection (Photo)		
	Description	Selects the matrix forming the halftone-curve base for photo mode.	
	Setting	Range: 0 to 8 Unit: 1 Default: 4	
190	Halftone Curve Selection (Dot)		
	Description	Selects the matrix forming the halftone-curve base for dot mode.	
	Setting	Range: 0 to 8 Unit: 1 Default: 4	
191	Halftone Curve Selection (Duo)		
	Description	Selects the matrix forming the halftone-curve base for duo mode.	
	Setting	Range: 0 to 8 Unit: 1 Default: 4	
192	Halftone Curve Selection (DtDuo)		
	Description	Selects the matrix forming the halftone-curve base for DtDuo mode.	
	Setting	Range: 0 to 8 Unit: 1 Default: 4	

[Reference Data]

Halftone-Curve Matrix for above test modes 189 through 192.



No.	Data settings			
193	Trimming Slice Level Adjustment			
	Description	Sets the slice level for trimming. Larger values make trimming more difficult.		
	Setting	Range: Unit: Default:	-16 to +16 1 -2	
194	Edge Stress Level (Line)			
	Description	Adjusts the edge stress (Line).		
	Setting	Range: Unit: Default:	(300 dpe, 400 dpi, 600 dpi) No adjustment	(300 dpi with new-type scanner unit) 0 to 31 (weak ⟷ strong) 1 11
195	Edge Stress Baseline (Line)			
	Description	Adjusts the edge stress slice level (Line).		
	Setting	Range: Unit: Default:	(300 dpe, 400 dpi, 600 dpi) No adjustment	(300 dpi with new-type scanner unit) 0 to 255 1 60
196	Edge Stress Level (Duo)			
	Description	Adjusts the edge stress (Duo).		
	Setting	Range: Unit: Default:	(300 dpe, 400 dpi, 600 dpi) No adjustment	(300 dpi with new-type scanner unit) 0 to 31 (weak ⟷ strong) 1 0
197	Edge Stress Baseline (Duo)			
	Description	Adjusts the edge stress slice level (Duo).		
	Setting	Range: Unit: Default:	(300 dpe, 400 dpi, 600 dpi) No adjustment	(300 dpi with new-type scanner unit) 0 to 255 1 11
198	Dot Photo Signal Smoothing Level			
	Description	Adds smoothing effect on photographs with dot screen (effective against moire)		
	Setting	Range: Unit: Default:	(300 dpe, 400 dpi, 600 dpi) No adjustment	(300 dpi with new-type scanner unit) 0 to 15 1 7
199	Auto Multi-Up Recovery			
	Description	Selects if the Multi-up stays active or becomes inactive after one Multi-up operation.		
	Setting	Setting: Default:	0 (Change to Inactive) 1 (Stays Active) 1 (Stays Active)	

5. Master Making Test Mode

No.	Sensors, switches	Detection status
200	Master-positioning sensor	Master present
201	Master end sensor	Master end label detected
202	Master detection sensor	Master present
203	Cutter home-position switch	Switch OFF (cutter at home position)
204	TPH pressure switch	Blocked (detection plate present)
205	Master-making-unit switch	Blocked (master-making unit/cover set)
206	Flatbed set switch	Switch ON (flatbed set)
207	Master-volume det. sensor A	Blocked (detection plate present)
208	Master-volume det. sensor B	Blocked (detection plate present)
No.	Motors, solenoids	Remarks
230	Thermal-pressure motor (CW)	
231	Thermal-pressure motor (CCW)	
232	Write pulse motor CW (feed)	
233	Write pulse motor CCW (reverse)	
234	Load pulse motor CW (feed)	
235	Load pulse motor CCW (reverse)	
236	Storage fan	
237	Cutter motor	
238	Thermal-power control	
No.	Unit checks	
250	Cutter-motor cycle action Performs cutting.	
251	Thermal press. Motor action (+). Moves the TPH in the compressive direction.	
252	Thermal press. Motor action (-). Moves the TPH in the release direction.	
253	Write & load pulse motors Simultaneously rotates the write and load pulse motors in the feed direction.	
No.	Data check	Display details
270	TPH thermistor A/D data	Displays the AD values for the TPH thermistor.
271	TPH thermistor temperature data	Displays the TPH-thermistor AD values as temperatures. (degrees Celsius)
272	Write roller temp. A/D data.	Displays the AD values for the write-roller ambient temperature.
273	Write roller temp. Scale data.	Displays the AD values as temperatures for the write-roller ambient temperature. (degrees Celsius)
274	TPH power voltage	Displays the voltage applied to the TPH when the TPH is switched on. * Displayed as voltage x 100

No.	Data settings		
280	Master Front-End Position Adjust		
	Description	Adjusts the small amount of return movement after the master-positioning sensor goes ON to perform inching operation during master setting or following master cutting. * Switches off the master-positioning sensor in standby mode.	
	Setting	Range: Unit: Default:	0 to +100 (0 to +10.0 mm) 1 (0.1 mm) +5.0 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: Unit: Default:	-50 to +50 (-5.0 mm to +5.0 mm) (+ is downward) 1 (0.1 mm) 0 mm
282	Master-making length adjustment		
	Description	Adjusts the master-making area (scanning length).	
	Setting	Range: Unit: Default:	-100 to +100 (-10.0 mm to +10.0 mm) relative to datum. * (+ increases length) 1 (0.1 mm) 0 mm
283	Master-clamp-range adjustment		
	Description	Adjusts the master-clamp range during loading of the master.	
	Setting	Range: Unit: Default:	-100 to +100 (-10.0 mm to +10.0 mm) relative to datum * (+ increases clamp amount) 1 (0.1 mm) 0 mm
284	Master cut-position adjustment		
	Description	Adjusts the length of one master (cutting timing).	
	Setting	Range: Unit: Default:	-100 to +100 (-10.0° to +10.0°) relative to datum * (+ increases the master length) 2 (0.2°) 0°
285	Master-image front-margin adjust		
	Description	Adjusts the master margin (mask amount in image processing) at the right (front) of the copy.	
	Setting	Range: Unit: Default:	-30 to +30 (-3.0 mm to +3.0 mm) relative to datum * (+ increases margin) 5 (0.5 mm) 0 mm
286	Master-image rear-margin adjust		
	Description	Adjusts the master margin (mask amount in image processing) at the left (rear) of the copy.	
	Setting	Range: Unit: Default:	-30 to +30 (-3.0 mm to +3.0 mm) relative to datum * (+ increases margin) 5 (0.5 mm) 0 mm
287	Master-making speed adjustment		
	Description	Adjusts the speed of the write pulse motor.	
	Setting	Range: Unit: Default:	-100 to +100 (-10.0% to +10.0%) relative to datum * (+ elongates) 1 (0.1%) 0%

No.	Data settings		
288	TPH resistance-value entry		
	Description	Sets the TPH resistance value.	
	Setting	Range:	1200 to 5300 (1200 Ω–5300 Ω) 600 dpi 1200 to 2600 (1200 Ω–2600 Ω) 400 dpi 1200 to 2400 (1200 Ω–2400 Ω) 300 dpi
		Unit:	1 (1 Ω)
		Default:	1200 Ω
290	W-Roller Temp. Reference Control		
	Description	Sets whether automatic image-size control is enabled or disabled for expansion and contraction of the write roller due to temperature variations.	
	Setting	Settings:	0: Disabled 1: Enabled
		Default:	1 (Enabled)
294	TPH Print Position Adjustment		
	Description	Adjusts the horizontal printing position of the TPH (set only during shipment or when replacing TPH).	
	Setting	Range:	-30 to +30 (-3.0 mm to +3.0 mm) relative to datum. * (+ moves to left)
		Unit:	1 (0.1 mm)
		Default:	0 mm

6. Master Disposal Test Mode

No.	Sensors, switches	Detection status
300	Master-Disposal Jam Sensor	Open (master present)
301	Master Compression Sensor	Open (master compression plate at HP)
303	Disposal-Box Safety Switch	Switch ON (master disposal box set)
304	Disposal Top-Cover Sensor	Blocked (master disposal unit closed)
305	Mstr-Compress-Motor Limit Sensor	Blocked (detection plate present)
306	Mstr-Disposal-Motor Limit Sensor	Blocked (detection plate present)
No.	Motors, solenoids	Remarks
330	Master Disposal Motor	One direction only (feed direction)
No.	Unit checks	
350	Compression-plate home action. Returns the compression plate to the home position.	
351	Master compression-cycle action. Performs one compression cycle.	
No.	Data check	Display details
370	Compression-Range Count Display	Count of the Encoder sensor up to the stop position of the compression operation. Displays after activating test mode No.351.
371	Master-Disposal Count Display	Displays the count stored.
No.	Data settings	
380	Master-Disposal-Jam Det. Angle 1	
	Description	Sets the first print-drum angle for checking for disposal jams.
	Setting	Range: 0 to 3600 (0°to 360°) Unit: 2 (0.2°) Default: 120°
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: 2 (0.2°) Default: 180°
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 s to 2 s) Unit: 10 (0.01 s) Default: 0.8 s
383	Compression-Limit Position Count	
	Description	Sets the count for the compression-limit position.
	Setting	Range: 122 pulses to 179 pulses Unit: 1 pulse Default: 163 pulses
384	Compression Action Duration	
	Description	Sets holding duration of compression plate at the operative position. Plate starts its sequence to returning position when holding time is expired.
	Setting	Range: 0 to 100 (0 s to 10 s) Unit: 1 (0.1 s) Default: 3 s

No.	Data settings		
385	Compress. load application time		
	Description	Sets the stop time after performing one compression-detection.	
	Setting	Range:	5 to 70 (5 ms to 70 ms)
		Unit:	1 (1 ms)
		Default:	53 ms
386	Full box compression count		
	Description	Sets the count for the full master-disposal-box position.	
	Setting	Range:	73 pulses to 147 pulses
		Unit:	1 pulse
		Default:	122 pulses
387	Disposal-drum rotation speed		
	Description	Sets the print-drum speed for master removal.	
	Setting	Range:	10 rpm to 60 rpm
		Unit:	5 rpm
		Default:	30 rpm
388	Disposal-motor speed selection		
	Description	Selects the master-disposal-motor speed relative to the master removal drum speed.	
	Setting	Settings	0 : x 0.7 relative speed
			1 : x 0.8 relative speed
			2 : x 0.9 relative speed
			3 : x 1.0 relative speed
			4 : x 1.1 relative speed
			5 : x 1.2 relative speed
		Default:	3 : x 1.0 relative speed
389	Clears master disposal count		
	Description	Clears the removed master count memory.	
	Setting	None	

7. Paper Feed/Eject Test Mode

No.	Sensors, switches	Detection status
400	Paper detection sensor	Open (paper present)
401	Paper-size detection sensor	Open (paper present)
402	Elevator upper-limit sensor A	Blocked (detection plate present)
403	Elevator upper-limit sensor B	(Upper-limit position from combination of A and B)
404	Elevator lower-limit sensor	Blocked (paper-feed tray at lower limit)
405	Paper-feed sensor (Paper sensor)	Blocked (paper present)
406	Paper-ejection sensor	Blocked (paper present)
407	Paper-feed-tray upper safety SW	Switch ON (pressed)
408	Paper-feed-tray lower safety SW	Switch ON (pressed)
409	Feed-tray button (Elevator button)	Switch ON (pressed)
410	Paper-volume det. sensor A	Blocked (detection plate present)
411	Paper-volume det. sensor B	(Paper volume from combination of A and B)
412	Paper-ejection-limit sensor	Blocked (detection plate present)
413	Paper-ejection-wing home sensor	Blocked (ejection wings at home position)
414	Paper-feed pressure sensor - High	Blocked (pressure-adjust lever at card position)
No.	Motors, solenoids	Remarks
430	Paper-ejection motor	One direction only (ejection direction)
431	Suction fan & separation fan	
433	Paper-ejection-wing motor (CW)	
434	Paper-ejection-wing motor (CCW)	
435	Elevator SW LED ON	Illuminates
436	Paper-feed clutch action	
No.	Unit checks	
450	Paper-size VR adjust (182 mm) Sets a VR value of 182 mm (B5) (Adjustment of paper width potentiometer).	
451	Paper-size VR adjust (297 mm) Sets a VR value of 297 mm (A3) (Adjustment of paper width potentiometer).	
452	Elevator-motor action Raises and lowers the paper-feed tray repeatedly * Starts by raising, except when at the upper limit * Stops when the “Stop” key is pressed * Stops for 1 s at the upper and lower limits	
453	Elevator-motor servo action Performs servo operation * Stops when the “Stop” key is pressed	
454	Paper ejection & suction action Activates the paper ejection motor, suction fan, and separation fan simultaneously.	
455	Paper-ejection-wing home action Moves the ejection wings to the home position.	
456	Paper-ejection-wing target shift Moves to the position set in test-mode No. 490.	
457	Auto multi-paper-feed det. adj. Illuminates the illumination level D/A at 127 (8 bits). Check the receiving-side A/D value. If the A/D value is not 100 ± 12, the D/A value is checked at -1 if over and at +1 if under. Finally, calculate the D/A required to give an A/D value of 100 ± 12, and store the D/A value. * Perform the above with one sheet of 50-g paper set at multi-feed sensor position.	

No.	Data check	Display details
470	Paper-width A/D data	Displays 10-bit data following A/D conversion.
471	Paper-width metric data	Displays the paper width (mm) following adjustment.
472	Multi-paper-feed det. A/D data	Multi-paper-feed det. A/D values.

No.	Data settings		
480	Elevator upper-limit selection		
	Description	Selects the paper-feed-tray stop position (paper-feed position). Tray position will be interlocked with the pressure-adjust lever when this test mode is set to Auto. Settings 1, 2 and 3 will be at fixed position.	
	Setting	Settings	0: Auto 1: Standard 2: Card 3: Custom
		Default:	0 (Auto)
481	Paper-feed-clutch ON angle		
	Description	Adjusts the angle timing for activating the paper-feed clutch.	
	Setting	Range:	-150 to +150 (-15.0° to +15.0°) relative to datum * (+ delays ON timing)
		Unit:	2 (0.2°)
		Default:	+5°
482 483 484 485	Paper-feed-clutch OFF angle/stnd Paper-feed-clutch OFF angle/card Paper-feed-clutch OFF angle/lght Paper-feed-clutch OFF angle/cstm		
	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°) relative to datum * (+ 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 (-20.0° to +20.0°) relative to datum * (+ 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:	-200 to +200 (-20.0° to +20.0°) relative to datum * (+ 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:	-200 to +200 (-20.0° to +20.0°) relative to datum * (+ delays detection)
		Unit:	2 (0.2°)
		Default:	0°
489	Paper-ejection-wing position adj.		
	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 pulses

No.	Data settings		
490	Paper-ejection Wing Target Position		
	Description	Sets the ejection-wing movement amount for custom paper setting (function setting).	
	Setting	Range:	0 to 1920 (0 pulses to 1920 pulses)
		Unit:	1 (1 pulse)
		Default:	1450 pulses
491	Card (name card) Feed Clutch ON Angle (OPTION item)		
	Description	Adjusts the angle timing for activating the card-feed-clutch.	
	Setting	Range:	-100 to +100 (-10.0° to +10.0°) relative to datum. (+ delays ON timing)
		Unit:	2 (0.2°)
		Default:	0°
492	Card (name card) Feed Clutch OFF Angle (OPTION item)		
	Description	Adjusts the angle timing for deactivating the card-feed-clutch.	
	Setting	Range:	-300 to +100 (-30.0° to +10.0°) relative to datum. (+ delays OFF timing)
		Unit:	2 (0.2°)
		Default:	0°
493	1st Print Feed Clutch ON Angle		
	Description	Adjusts the angle timing for activating the paper-feed-clutch at proof print.	
	Setting	Range:	-150 to +150 (-15.0° to +15.0°) relative to datum. (+ delays ON timing)
		Unit:	2 (0.2°)
		Default:	0°
494	Paper Misfeed Det. Angle / OUT		
	Description	Adjusts the angle timing for detecting paper jam during paper feed OUT.	
	Setting	Range:	-100 to +100 (-10.0° to +10.0°) relative to datum. (+ delays detection timing)
		Unit:	2 (0.2°)
		Default:	0°
499	Special Paper Feed Mode		
	Description	Activates or deactivates short size and long size paper feeding.	
	Setting		Short Paper / Normal Paper / Long Paper
		Range:	128mm to ------- 140 to 420/432mm (140 to 454mm) ----------up to 555mm (455 to 470 excluded)
		Setting:	0 : Disable / Enable / Disable
			1 : Disable / Enable / Enable
			2 : Enable / Enable / Disable
			3 : Enable / Enable / Enable
		Default:	1 : Disable / Enable / Enable
		Note:	* When long size paper is enabled, the standard size paper is enabled up to 454mm.
			* Optional service part (adopter) is required to run the short size papers.

8. Print Drum Test Mode

No.	Sensors, switches	Detection status
500	Position-A sensor	Blocked (detection plate present)
501	Position-B sensor	Blocked (detection plate present)
502	Main-motor limit sensor	Blocked (detection plate present)
503	Clamp sensor A	Blocked (detection plate present)
504	Clamp sensor B	Blocked (detection plate present)
505	Clamp sensor C	Blocked (detection plate present)
506	Master loading sensor	Open (master present)
507	Print-drum lock-position sensor	Blocked (drum lock lever in lock position)
508	Print-drum lock-cam sensor	Blocked (lock cam in release position)
509	Ink sensor	In contact with ink
510	Overflow sensor	In contact with ink
511	Ink-cartridge set SW1	Pressed
512	Ink-cartridge set SW2	Pressed
513	Ink-cartridge set SW3	Pressed
514	Ink-cartridge set SW4	Pressed
515	Ink-cartridge set SW5	Pressed
516	Free drum rotation SW	Pressed
517	Front-cover switch	Steel tab detected (front cover closed)
518	Print-drum lever switch (Drum release button)	Pressed
519	Print-drum connection signal	Connected
520	Print-drum safety switch	Switch ON (drum set)
521	Ink-volume det. sensor 1	Blocked (ink present)
522	Ink-volume det. sensor 2	Blocked (ink present)
523	Ink-volume det. sensor 3	Blocked (ink present)
524	Feed-joint pass cover safety SW.	Pressed (Feed-joint pass cover is closed.)
No.	Motors, solenoids	Remarks
530	Main-motor action (15 rpm)	
531	Main-motor action (30 rpm)	
532	Clamp-motor action (Open)	Counterclockwise direction
533	Clamp-motor action (Close)	Clockwise direction
534	Print-drum locking motor	One direction only
535	Print-drum release SW (button) / LED ON	Illuminates

No.	Unit checks
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.
551	Print drum on position A Stops the print drum at position A. * Position including adjustment values.
552	Print drum on position B Stops the print drum at position B. * Position including adjustment values.
553	Clamp home action Resets the clamp 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 HP → clamp open Cycle 2: Clamp open → position-A Cycle 3: Position-A → Clamp closed (clamp HP)
555	Print-drum locking action Enables the print drum to be locked.
556	Print-drum release action Unlocks the print drum. * Caution: Note that this operates irrespective of the drum position.
557	Inking action Performs the following operations in sequence: (1) Applies ink while rotating the drum without pressure (until the ink sensor goes ON). (2) Makes a confidential master. (3) Rotates the print drum for 10 revolutions with pressure applied after the ink sensor goes ON. (4) Stops at position B.
558	Print-drum ink drainage Performs the following operations in sequence: (1) Performs print test C. (2) Performs the paper-feed test without inking. (3) Ignores inking errors. (4) Stops at position B when the "Stop" key is pressed.

No.	Data check	Display details
570	Print-drum limit count (position count)	Displays the position count
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		
580	Master-det. print-drum angle		
	Description	Adjusts the angle used to detect master loading.	
	Setting	Range:	-200 to +100 (-20.0° to +10.0°) relative to datum * (+ delays detection)
		Unit:	2 (0.2°)
		Default:	0°
581	Print-drum position-A adjustment		
	Description	Adjusts the print-drum position-A stop position.	
	Setting	Range:	-38 to +40 (-3.8° to +4.0°) relative to datum angle of 0°. * (+ rotates towards the overrun direction)
		Unit:	2 (0.2°)
		Default:	-3.0°

No.	Data settings		
582	Print-drum position-B adjustment		
	Description	Adjusts the print-drum position-B stop position.	
	Setting	Range:	-50 to +50 (-5.0° to +5.0°) relative to datum angle of 307°. * (+ causes overrun)
		Unit:	2 (0.2°)
		Default:	0°
583	Inking time (regular)		
	Description	Sets the time for continuously detecting that the ink sensor is OFF (no ink detected) in normal operation. This data is stored in the print-drum memory.	
	Setting	Range:	1 to 60 (1 to 60 s)
		Unit:	1 (1 s)
		Default:	15 s
584	Inking time (replacement)		
	Description	Sets the time for continuously detecting that the ink sensor is OFF (no ink detected) immediately after the ink cartridge is replaced. This data is stored in the print-drum memory.	
	Setting	Range:	1 to 60 (1 to 60 s)
		Unit:	1 (1 s)
		Default:	40 s
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 times
587	Ink color code		
	Description	Sets the ink color set in the inking drum.	
	Setting	Settings:	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: Lightgray 54: Lightgray 2, 55: Orange, 56: Orange 2 60: Silver 2, 61: Pink, 62: Pink 2 63: Custom
		Default:	33 (Black)
588	Print drum type code		
	Description	Sets the size and type of print drum on the Drum PCB.	
	Setting	Settings:	17: RP35/31 A3 Black 18: RP35/31 Ledger Black 26: RP35/31 A4W (Letter-R) Black 33: RP37/35/31 A3 Color 34: RP37/35/31 Ledger Color 42: RP37/35/31 A4W (Letter-R) Color 49: RP37 A3 Black 50: RP37 Ledger Black 58: RP37 A4 (Letter-R) Black

No.	Data settings		
589	1st print speed (black drum)		
	Description	Speed table for determining the speed of proofread printing (black drum).	
	Setting	Settings:	-1: Slowest 0: Slow +1: Normal +2: Fast
		Default:	+1 Normal
590	1st print speed (color drum)		
	Description	Speed table for determining the speed of proofread printing (color drum).	
	Setting	Settings:	-1: Slowest 0: Slow +1: Normal +2: Fast
		Default:	+1 Normal
593	Drum loading rotation start adj.		
	Description	Timing for the master loading on the drum (drum rotation) to start after master making is finished.	
	Setting	Settings:	0 to 500 (0 seconds to 5 seconds)
		Unit:	1 (10 ms)
		Default:	0 (0 second)

9. Printing Test Mode

No.	Sensors, switches	Detection status
601	Vertical-Centering Sensor	Blocked (detection plate present)
602	Horizontal-Centering Sensor	Blocked (detection plate present)
603	Print-Pressure Limit Sensor	Blocked (detection plate present)
604	Print-Pressure Sensor A	Blocked (detection plate present)
605	Print-Pressure Sensor B	Blocked (detection plate present)
No.	Unit checks	
650	Vertical-centering action Resets the vertical position to the home position.	
651	Vertical cycle action Performs the following operations: (1) Vertical home positioning. (2) Moves upward to the vertical MAX position (+10 mm) and stops for 1 s. (3) Vertical home positioning. (4) Moves downward to the vertical MAX position (-10 mm) and stops for 1 s. (5) Vertical home positioning.	
652	Horizontal-centering action Resets the horizontal position to the home position.	
653	Horizontal cycle action Performs the following operations: (1) Horizontal home positioning. (2) Moves left to the horizontal MAX position (+10 mm) and stops for 1 s. (3) Horizontal home positioning. (4) Moves right to the horizontal MAX position (-10 mm) and stops for 1 s. (5) Horizontal home positioning.	
654	Print-pressure home action Resets the print pressure to the center (home position).	
655	Print-pressure cycle action Performs the following operations: (1) Print-pressure home positioning. (2) Moves to the release-direction MAX position (-260 pulses) and stops for 1 s. (3) Print-pressure home positioning. (4) Moves to the compression-direction MAX position (+260 pulses) and stops for 1 s. (5) Print-pressure home positioning.	
656	Paper-feed test Performs continuous printing. * Speed keys can be used. * Overload current detection is performed. * Print adjustments apply (vertical, horizontal, pressure).	
657	Low-speed printing test Performs continuous printing at 15 rpm. * Overload-current detection is performed. * Print adjustments apply (vertical, horizontal, pressure).	
658	Print spring tension release Rotates the pressure-control motor to the pressure-spring release position (-260 pulses).	

No.	Data settings		
681	Horizontal-Home Position Adj.		
	Description	Sets the offset for the horizontal print home position.	
	Setting	Range: Unit: Default:	-200 to +200 (-2.0 mm to +2.0 mm) * (+ is left) 25 (0.25 mm) 0 mm
682	Print-Pressure Adjustment		
	Description	Sets the offset for the print-pressure position.	
	Setting	Range: Unit: Default:	-46 to +46 (-46 to +46 pulses) * (+ is compresses) 1 pulse 0 pulses
683	Vertical Center Level Selection.		
	Description	*** Not for use**** (Do not change setting)	
	Setting	Setting: Default:	0: Old design CAM. 1: New design CAM. 1 (New design CAM) -- Keep to the default setting of 1.
684	Paper Data Default Selection		
	Description	Selects if the paper data stays active or become inactive after power is turned off or Rest button is pressed.	
	Setting	Setting: Note:	0: Both the paper size and paper type information on previous operation is kept. 1: Paper size returns to default. Paper type is kept to the previous operation. 2: Paper type returns to default. Paper size is kept to the previous operation. 3: Both the paper size and paper type information returns to default. Paper size default is AUTO. Paper type default is STANDARD.
688	Maximum Print Quantity Setting		
	Description	Able or disable the maximum print quantity setting, and also sets the maximum quantity.	
	Setting	Setting: Range: Unit: Default:	0: Inactive 1 to 9999: Active 1 to 9999: (1 copy to 9999 copies) 1 (1 copy) 0: Inactive
689	Print Position Auto-Return		
	Description	In master-making (or in Renew Page), the selection in relation to test mode No. 690 is made if the previous printing is made with printing position not at the center position.	
	Setting	Setting: Default:	0: No auto-return to the selected print position (Initializes to center position). 1: Auto-return to the selected print position in Renew Page only. 2: Auto-return to the selected print position in Master-Making and Renew Page. *** Note: The second proof-print copy will advance the copy-count.** 0: No auto-return to the selected print position (Initializes to center position).

No.	Data settings	
690	Auto-Return Position Range	
	Description	This test mode becomes active if the setting by test mode No. 689 is selected to 1 or 2.
	Setting	Setting: 0: Master is made with the print drum returned to the center position. Then after the first proof-print copy, the second proof-print copy is printed after about 15 seconds later with the print drum returned to the previous off-center position. 1: Master is made with the print drum returned to the horizontal center position, while the vertical print position is at the previous offset print position. The first proof-print copy comes out with only the vertical position offset. The second proof-print copy is printed after about 15 seconds later with the print drum returned to the previous off-center position in horizontal and vertical position. *Note: 1. The second proof-print copy will advance the copy count.* *2. If [AUTO-GO] is selected, the printing will proceed automatically after the first proof-print copy is printed. No second proof-print copy is made.* *3. The master-making sequence is until the print drum returns to the offset position.* *By pressing the STOP button during the master-making the machine stops just before the second proof-print copy printing.* *4. The mechanical movement stops in between the master-making and second proof-print copy printing.* *5. In confidential master-making, the horizontal print position stays at the center position.* *6. With the auto-return activated, the [Recall] button is not highlighted.* *7. When the master-making is made from PC or when keycard-counter data-output print is made, the second proof-print copy is not printed even when the auto-return is activated.* Default: 0: Master is made with the print drum returned to the center position. Then after the first proof-print copy, the second proof-print copy is printed after about 15 seconds later with the print drum returned to the previous off-center position.
694 695 696 697 698 699	1st Print Ejection Speed Adjust : (for proof-print printing) Paper Ejection Speed 1 Adjust : (for printing speed No.1) Paper Ejection Speed 2 Adjust : (for printing speed No.2) Paper Ejection Speed 3 Adjust : (for printing speed No.3) Paper Ejection Speed 4 Adjust : (for printing speed No.4) Paper Ejection Speed 5 Adjust : (for printing speed No.5)	
	Description	Paper ejection motor speed adjustment for each printing speed.
	Setting	Range: -2 to +2 Setting: -2 : 94% of the normal speed. -1 : 97% of the normal speed. 0 : Normal speed +1 : 103% of the normal speed. +2 : 106% of the normal speed. Default: 0 : Normal speed

10. Accessories 1 Test Mode

No.	Sensors, switches	Detection status
700	Original registration sensor	Blocked (original present)
701	Original IN sensor	Blocked (original present)
702	Original OUT sensor	Blocked (original present)
703	AF original detection sensor	Open (original present)
704	AF original size sensor 1	Blocked (original present)
705	AF original size sensor 2	Blocked (original present)
707	AF-unit cover switch	Stage cover (AF) set
708	AF-unit joint signal check	AF connected
709	Job separator tape jam sensor	Tape is detected
710	Job separator tape det. Sensor	Tape is detected
711	Job separator power switch	Power is supplied to Job separator
No.	Motors, solenoids	Remarks
730	AF read pulse-motor CW	Feed direction

No.	Unit checks
750	AF cycle action Performs one AF scanning cycle Feed in original → Reset scanner to HP → Shading → Move scanner to scanning position → AF scanning and ejection → Reset scanner to HP * AF scanning speed set by test mode No. 785 applies.
751	AF feed action Performs AF feed operation Feed in original → AF scanning (original feed) * AF scanning speed set by test mode No. 785 applies.
752	Orig. IN sensor sensitivity adj. Adjusts the sensitivity of the origin IN sensor. (run without paper).
753	AF-guide min.-width VR value Sets the VR value with the paper guides closed to the minimum-width position.
754	AF-guide max.-width VR value Sets the VR value with the paper guides opened to the maximum width position.
755	AF base-tone adj. cycle action Start: Shading → Moves to AF-ABC position (lamp ON at AF-ABC position). Stop: Lamp goes OFF, returns to home position.
756	Editing board initialization. Resets the digitizer internal data to the default values. Test mode No. 787 also resets to the defaults.
757	Storage-memory initialization Resets the storage memory if data is to be erased or if a storage-memory error prevents resetting.
758	Storage-memory check Checks the capacity, used memory, and available space in the storage memory.
759	Job Separator Tape Feed & Stamp Stamps twice and feeds the tape out.

No.	Data check	Display details
770	AF-guide width A/D data	10-bit data following A/D conversion (raw data).
771	AF original size code data	00: no paper 01: A3 02: B4 03: A4 04: A4-R 05: B5 06: B5-R 13: Ledger 14: Legal 15: Letter 16. Letter-R 17: Statement 18: Statement-R 19: Foolscap 50: non-standard
772	Storage-memory card data	Displays the storage-memory card data.
773	Storage-memory properties	Displays the capacity, used memory, available space, and volume label of the storage memory.

No.	Data settings		
780	AF scan mirror-position adjustment		
	Description	Adjusts the stop position of the mirror (carriage) during AF scanning.	
	Setting	Range:	Range: -20 to +20 (-2.0 mm to +2.0 mm) relative to datum * (+ is downward)
		Unit:	1 (0.1 mm)
		Default:	0 (0 mm)
781	AF-base mirror-position adjust		
	Description	Adjusts the stop position of the mirror (carriage) during AF-ABC.	
	Setting	Range:	0 to +30 (0 mm to +3.0 mm) relative to datum * (+ is upward)
		Unit:	1 (0.1 mm)
		Default:	0 (0 mm)
782	AF horizontal-scan position adj.		
	Description	Adjusts the horizontal position when the original is scanned by using the AF. Set separately from the flatbed.	
	Setting	Range:	-30 to +30 (-3.0 mm to +3.0 mm) relative to datum * (+ is left)
		Unit:	5 (0.5 mm)
		Default:	0 (0 mm)
783	AF scan start-position adjust		
	Description	Adjusts the scan start position when the original is scanned by using the AF.	
	Setting	Range:	-60 to +60 (-6.0 mm to +6.0 mm) relative to datum * (+ is downward)
		Unit:	1 (0.1 mm)
		Default:	0 (0 mm)
784	AF scanning-speed adjustment		
	Description	Adjusts the scanning speed when the original is scanned by using the AF (adjusts the AF read pulse motor speed).	
	Setting	Range:	-50 to +50 (-5.0% to +5.0%) relative to datum * (+ shrinks)
		Unit:	1 (0.1%)
		Default:	0 (0%)
785	AF cycle-action speed adjust		
	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 by using the AF.	
	Setting	Range:	-63 to +63 (-6.3 mm to +6.3 mm) relative to datum * (+ is downward)
		Unit:	1 (0.1 mm)
		Default:	0 (0 mm)
787	Editor data skip range adjust		
	Description	Sets the scanning start distance after the digitizer receives digitizer VSYNC (ignores noise in the initial section).	
	Setting	Range:	-0 to +255 (-0.0 mm to +25.5 mm) relative to datum
		Unit:	1 (0.1 mm)
		Default:	0 (0 mm)

No.	Data settings		
788	Coin Box Usage		
	Description	If [1:connected] is selected and coin box is attached, panel messages regarding the coin box becomes active.	
	Setting	Setting:	0 : Not connected 1 : Connected **Note: Coin Box is not available.** **The setting for this test mode should be selected to [0].**
		Default:	0 : Not connected
790	Link printer print position adj. (L/R)		
	Description	Adjusts the printing position of the linked printer (affects all linked printers).	
	Setting	Range:	Range: -50 to +50 (-5.0 mm to +5.0 mm) relative to datum (+ is downward)
		Unit:	1 (0.1 mm)
		Default:	0 (0 mm)
791	Link printer print position adj. (up/dwn)		
	Description	Adjusts the printing position of the linked printer (affects all linked printers).	
	Setting	Range:	Range: -50 to +50 (-5.0 mm to +5.0 mm) relative to datum (+ is to the left)
		Unit:	1 (0.1 mm)
		Default:	0 (0 mm)
792	Auto Router Skip Warning Display		
	Description	With printer-auto-selection selected, when print data sent from a PC commands print quantity of zero, the master making will proceed, but whether or not to indicate warning message No. F60 can be selected.	
	Setting	Setting:	0 : No display of warning message F60. 1 : Warning message F60 displayed.
		Default:	0 : No display of warning message F60.
793	AF link data storage printout		
	Description	Selects whether or not to hold the image or not before printing out from the linked printer when sorter, stacker or electrical sorter on the linked printer is used.	
	Setting	Setting:	0 : Not hold 1 : Hold
		Default:	1 : Hold
794	Link Duplex Mode Auto Recovery		
	Description	Selects if the duplex printing stays active or become inactive after one duplex operation.	
	Setting	Setting:	0 : Change to inactive 1 : Stays active
		Default:	1 : Stays active

No.	Data settings	
795	ACCESSORIES 1 → [Resolution-Conversion Processing Pattern (Duo)]	
	Description	For linked printer output in the Duo mode of the 400 dpi 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. *** Cannot be selected from the menu screen.**
	Setting	Range: 0 : Random interpolation 1 : Normal interpolation Default: 0 : Random interpolation
796	ACCESSORIES 1 → [Resolution-Conversion Processing Pattern (Duo with Dot)]	
	Description	For linked printer output in the Duo mode with Dot mode of the 400 dpi machine, the 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. *** Cannot be selected from the menu screen.**
	Setting	Range: 0 : Normal interpolation 1 : Random interpolation Default: 0 : Normal interpolation
797	ACCESSORIES 1 → [Resolution-Conversion Processing Pattern (Photo)]	
	Description	For linked printer output in the Photo mode of the 400 dpi 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. *** Cannot be selected from the menu screen.**
	Setting	Range: 0 : Random interpolation 1 : Normal interpolation Default: 0 : Random interpolation
798	ACCESSORIES 1 → [Resolution-Conversion Processing Pattern (Photo with Dot)]	
	Description	For linked printer output in the Photo mode with Dot mode of the link-mode machine, the 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. *** Cannot be selected from the menu screen.**
	Setting	Range: 0 : Normal interpolation 1 : Random interpolation Default: 0 : Normal interpolation

11. Accessories 2 Test Mode

No.	Sensors, switches	Detection status
800	Auto-stacking-guide home sensor	Blocked (Paper guides at home position)
801	Auto-stack.-guide limit sensor	Blocked (Paper guides at limit position)
802	Auto-stack.-stopper limit sensor	Blocked (Paper stopper at limit position)
803	Auto-stack.-stopper home sensor	Blocked (Paper stopper at home position)
804	Auto-stack.-paper release button	Pressed
805	Auto-stacking paper-det. sensor	Open
806	Multi-tray feed sensor 1	Open (Paper present)
807	Multi-tray feed sensor 2	Open (Paper present)
808	Multi-tray feed sensor 3	Open (Paper present)
809	Multi-tray feed sensor 4	Open (Paper present)
810	Joint paper separation sensor	Open (Paper present)
811	Multi-tray feed limit sensor	Blocked (Blocked by encoder disk)
812	Multi-tray transfer safety SW	Pressed (Multi-tray transfer unit closed)
813	Multi-feed tray 1 top sensor (upper limit sensor)	Blocked (Blocked by detection plate)
814	Multi-feed tray 1 paper sensor	Open (Tray 1 is set and paper is present)
815	Multi-feed tray 1 size sensor	Open (Tray 1 is set and paper is present)
816	Multi-feed tray 1 volume sensor 1	Blocked (Blocked by detection plate)
817	Multi-feed tray 1 volume sensor 2	
818	Multi-feed tray 1 safety SW	Pressed (Tray 1 is set)
819	Multi-feed tray 1 limit SW	Pressed
820	Multi-feed tray 2 top sensor (upper limit sensor)	Blocked (Blocked by detection plate)
821	Multi-feed tray 2 paper sensor	Open (Tray 2 is set and paper is present)
822	Multi-feed tray 2 size sensor	Open (Tray 2 is set and paper is present)
823	Multi-feed tray 2 volume sensor 1	Blocked (Blocked by detection plate)
824	Multi-feed tray 2 volume sensor 2	
825	Multi-feed tray 2 safety SW	Pressed (Tray 2 is set)
826	Multi-feed tray 2 limit SW	Pressed
827	Feed joint passage cover SW	Pressed (Feed-joint-pass.-cover is closed)
No.	Motors, solenoids	Remarks
830	Multi-feed tray transfer motor	One direction (feed direction)
831	Multi-feed tray pickup motor	One direction (feed direction)
832	Multi-feed tray 1 feed clutch	
833	Multi-feed tray 2 feed clutch	
834	Multi-feed tray transfer clutch 1	
835	Multi-feed tray transfer clutch 2	
836	Multi-feed tray transfer clutch 3	
837	Multi-feed tray transfer clutch 4	

No.	Unit checks
850	Auto-stacking-guide home action Resets the paper guides on the auto-stacking guide to the home position.
851	Auto-stacking-stopper home action Resets the paper stopper on the auto-stacking guide to the home position.
852	Auto-stacking-tray cycle action Performs the following operations: (1) Resets the paper side guides to the home position. (2) Resets the paper back stopper to the home position. (3) Slides paper side guides inwards, stops for 1 sec., and slides to home position. (4) Slides paper back stopper inwards, stops for 1 sec., and slides to home position.
853	Multi-feed tray 1 elevator UP Raises multi-feed tray 1 to the paper-feed position.
854	Multi-feed tray 2 elevator UP Raises multi-feed tray 2 to the paper-feed position.
855	Multi-feed tray 1 feed test Feeds one sheet of paper from multi-feed tray 1 to the second paper feed position.
856	Multi-feed tray 2 feed test Feeds one sheet of paper from multi-feed tray 2 to the second paper feed position.
857	Multi-feed tray 1 VR adj. (182 mm) Sets the VR value for multi-feed tray 1 to 182 mm (B5 paper size width). * Perform with the paper guides moved to the 182 mm position.
858	Multi-feed 1 size VR adj. (297 mm) Sets the VR value for multi-feed tray 1 to 297 mm (A3 paper size width). * Perform with the paper guides moved to the 297 mm position.
859	Multi-feed 2 size VR adj. (182 mm) Sets the VR value for multi-feed tray 2 to 182 mm (B5 paper size width). * Perform with the paper guides moved to the 182 mm position.
860	Multi-feed 2 size VR adj. (297 mm) Sets the VR value for multi-feed tray 2 to 297 mm (A3 paper size width). * Perform with the paper guides moved to the 297 mm position.

No.	Data check	Display details
870	Feed-tray 1 paper-width A/D data	Feed-tray 1 10-bit data after A/D conversion (raw data).
871	Feed-tray 2 paper-width A/D data	Feed-tray 2 10-bit data after A/D conversion (raw data).
872	Feed-tray 1 paper-width data (mm)	Feed-tray 1 paper width after adjustment (mm x 10)
873	Feed-tray 2 paper-width data (mm)	Feed-tray 2 paper width after adjustment (mm x 10)

No.	Data settings		
880	Auto-stacking-guide home adjust		
	Description	Sets the offset for the auto-stacking paper-guide home position.	
	Setting	Range:	-5 to +5 (-5.0 mm to +5.0 mm) relative to datum position. * (+ increases width)
		Unit:	1 (1 mm)
		Default:	0 (0 mm)
881	Auto-stacking stopper home adj.		
	Description	Sets the offset for home position of the auto-stacking-paper-stopper.	
	Setting	Range:	-5 to +5 (-5.0 mm to +5.0 mm) relative to datum position. * (+ increases width)
		Unit:	1 (1 mm)
		Default:	0 (0 mm)
882 883 884 885	Auto-stacking pattern (Card) Auto-stacking pattern (Standard) Auto-stacking pattern (Light) Auto-stacking pattern (Custom)		
	Description	Sets the offset for the paper-guide positions for feeding different paper types in the auto-stacking operation.	
	Setting	Range:	-20 to +20 (-20 mm to +20 mm) relative to datum position. * (+ increases width)
		Unit:	1 (1 mm)
		Default:	0 (0 mm)
886 887 888 889	Multi-tray feed ON (Card) Multi-tray feed ON (Standard) Multi-tray feed ON (Light) Multi-tray feed ON (Custom)		
	Description	Adjusts the feed start timing from multi-feed tray for each paper type. *This setting must be adjusted for each paper tray. Choose [1] or [2] on the upper right corner of the display to select the tray.	
	Setting	Range:	-20 to +20 (-20° to +20°) relative to datum angle. * (+ delays OFF)
		Unit:	1 (1°)
		Default:	0 (0°)
890 891 892 893	Multi-feed tray feed range (Card) Multi-feed tray feed range (Standard) Multi-feed tray feed range (Light) Multi-feed tray feed range (Custom)		
	Description	Adjusts the buckle amount (feed stop timing) from multi-feed tray for each paper type. *This setting must be adjusted for each paper tray. Choose [1] or [2] on the upper right corner of the display to select tray.	
	Setting	Range:	-10 to +10 (-10 mm to +10 mm) relative to datum amount. * (+ increases feed amount = increases buckle amount)
		Unit:	1 (1mm)
		Default:	0 (0mm)

No.	Data settings		
894	Multi-tray lead selection		
	Description	Select whether to use assist control for each print speed. (Proof print, 1, 2, 3, 4 & 5).	
	Setting	Range:	0 to 63 Proof print ON 1 Speed 1 ON 2 Speed 2 ON 4 Speed 3 ON 8 Speed 4 ON 16 Speed 5 ON 32
		Unit:	1 * Enter the sum of the above.
		Default:	30 (speed 1 to 4: ON)
895	Multi-tray release solenoid ON		
	Description	Adjusts the timing to switch on the nip-release solenoid. (nip release of feed roller 4).	
	Setting	Range:	-30 to +30 (-30° to +30°) relative to datum angle. * (+ delays ON timing)
		Unit:	1 (1°)
		Default:	0 (0°)
896	Multi-tray release solenoid OFF		
	Description	Adjusts the timing to switch off the nip-release solenoid. (nip of feed roller 4).	
	Setting	Range:	-30 to +30 (-30° to +30°) relative to datum angle. * (+ delays OFF timing)
		Unit:	1 (1°)
		Default:	0 (0°)
897	MFT (multi-feed tray) transfer clutch 4 OFF angle		
	Description	Adjusts the drum angle to switch OFF the multi-feed-tray transfer clutch 4 after the paper reaches the timing roller.	
	Setting	Range:	-35 to +50 (-35° to +50°) relative to datum angle. * (+ delays OFF timing)
		Unit:	1 (1°)
		Default:	0 (0°)
898	Multi-feed tray selection		
	Description	Selects the tray for feeding paper during test-mode master making and printing.	
	Setting	Settings:	0: Straight 1: Tray 1 2: Tray 2
		Default:	0: Straight
899	Paper feed mode multi-selection		
	Description	Selects the paper type for feeding paper during test-mode master making and printing.	
	Setting	Settings:	0: Standard 1: Card 2: Thin/Light 3: Custom
		Default:	0: Standard

12. Factory Check Mode (Development Use)

Following test modes are available for required adjustments when necessary.

Since these are special test modes, the display message for each will only display as, “Factory Check Mode”, and for that reason caution must be paid when activating these test mode numbers.

Test modes from 1400 to 1414 relates to Multi-Feed Tray.

Test modes 1415 and 1416 are for Auto-Stacking Tray.

No.	Data settings		
1400	Multi-feed-tray vertical print position adjustment selection.		
	Description	Select whether to use auto compensation by the multi-tray unit, or manual compensation by the settings of test mode 1403 to 1414.	
	Setting	Setting:	0: Auto compensation 1: Manual compensation
		Default:	0: Auto compensation
1401 1402	Multi-feed-tray 1 Vertical print position offset Multi-feed-tray 2 Vertical print position offset		
	Description	Further adjustments (by the main unit) of the print position from the auto compensation by the multi-tray-unit. (Test mode No.1400 must be selected to **0** (auto) for this test mode to be active.	
	Setting	Range:	-10 to +10 (-1.0 mm to +1.0 mm) * (- downward)
		Unit:	5 (0.5 mm)
		Default:	0 (0 mm)
1403 1404 1405 1406 1407 1408	Multi-feed-tray 1 Vertical print position Manual adj. (Proof print) Multi-feed-tray 1 Vertical print position Manual adj. (Speed 1) Multi-feed-tray 1 Vertical print position Manual adj. (Speed 2) Multi-feed-tray 1 Vertical print position Manual adj. (Speed 3) Multi-feed-tray 1 Vertical print position Manual adj. (Speed 4) Multi-feed-tray 1 Vertical print position Manual adj. (Speed 5)		
	Description	Adjusts the vertical print position offset, caused by different speed for tray 1. Effective only when test mode 1400 is set to **1** (Manual).	
	Setting	Range:	-60 to +20 (-6.0 mm to +2.0 mm) * (- downward)
		Unit:	5 (0.5 mm)
		Default:	0 (0 mm)
1409 1410 1411 1412 1413 1414	Multi-feed-tray 2 Vertical print position Manual adj. (Proof print) Multi-feed-tray 2 Vertical print position Manual adj. (Speed 1) Multi-feed-tray 2 Vertical print position Manual adj. (Speed 2) Multi-feed-tray 2 Vertical print position Manual adj. (Speed 3) Multi-feed-tray 2 Vertical print position Manual adj. (Speed 4) Multi-feed-tray 2 Vertical print position Manual adj. (Speed 5)		
	Description	Adjusts the vertical print position offset, caused by different speed for tray 2. Effective only when test mode 1400 is set to **1** (Manual).	
	Setting	Range:	-60 to +20 (-6.0 mm to +2.0 mm) * (- downward)
		Unit:	5 (0.5 mm)
		Default:	0 (0 mm)

No.	Data settings		
1415	Auto stacking tray fence open selection		
	Description	Selects which fence to slide out when Auto stack paper release button is pressed to retrieve the paper from the tray.	
	Setting	Setting:	0 : Only the end fence slides out. 1: Only the side guides slides out. 2: Slide both the end fence and side guides out.
		Default:	0 : Only the end fence slides out.
1416	Auto stacking tray end fence position selection		
	Description	Selects Auto stacking tray end fence position, whether by auto paper size detection or by registered paper size data.	
	Setting	Setting:	0 : by auto paper size detection 1 : by registered paper size Note: * When selected to registered paper size, the end fence will slide to the registered paper size position, but the side guides will slide to the width of the paper detected on the feed tray. * When the side guides stops at width of 160mm or less, the end fence will stop at either of the following two positions to prevent the side guides and end fence from hitting with each other. 1) If the registered paper size length is between 175mm and 320mm, the end fence stops at 320mm. 2) If the registered paper size length is less than 175mm, the end fence stops at 175mm.
		Default:	0 : by auto paper size detection

MEMO

CHAPTER 19: INITIAL SETTINGS

Contents

1. Configurable Items

The functions for which the initial settings can be changed are as follows.

Some items will not be displayed depending on the printer model and the configuration of optional devices.

ITEMS	Selections
Copy-Md-Selections	
Image Processing	Line , Duo, Photo
Scanning Contrast	Auto , Manual (Level 1, 2, 3, 4, 5)
Reproduction Size	1-to-1 , Auto
Halftone Curve Type	Highlight: 1 (lighter), 2 (standard) , 3 (darker) Shadow: 1 (lighter), 2 (standard) , 3 (darker)
Margin-Plus Rate	90 to 99%, default: 95%
[MULTIUP] Display	ON , OFF
Data-Md-Selections	
Controller Link	ON , OFF
Auto Process Mode	ON , OFF
Display Priority	Copy Mode , Data Mode
Print Speed	1 (60) , 2 (80) , 3 (100) , 4 (110) , 5 (120)
Print Density	1 , 2 , 3 , 4 , 5
Reservation Period	Standard: 1 to 99 seconds Extension: 1 to 99 minutes
Double Feed Check	ON , OFF
[D-CHECK] Display	ON , OFF
[Renew Pg] Display	ON , OFF
Fine Adjust Mode	ON , OFF
Custom Paper Entry	
Energy Saving Mode	Energy saving mode: Auto-Sleep , Auto Power Off, OFF Waiting Time: 1 to 60 minutes
Power-OFF schedule	Power-off Schedule: ON, OFF Power-off Time

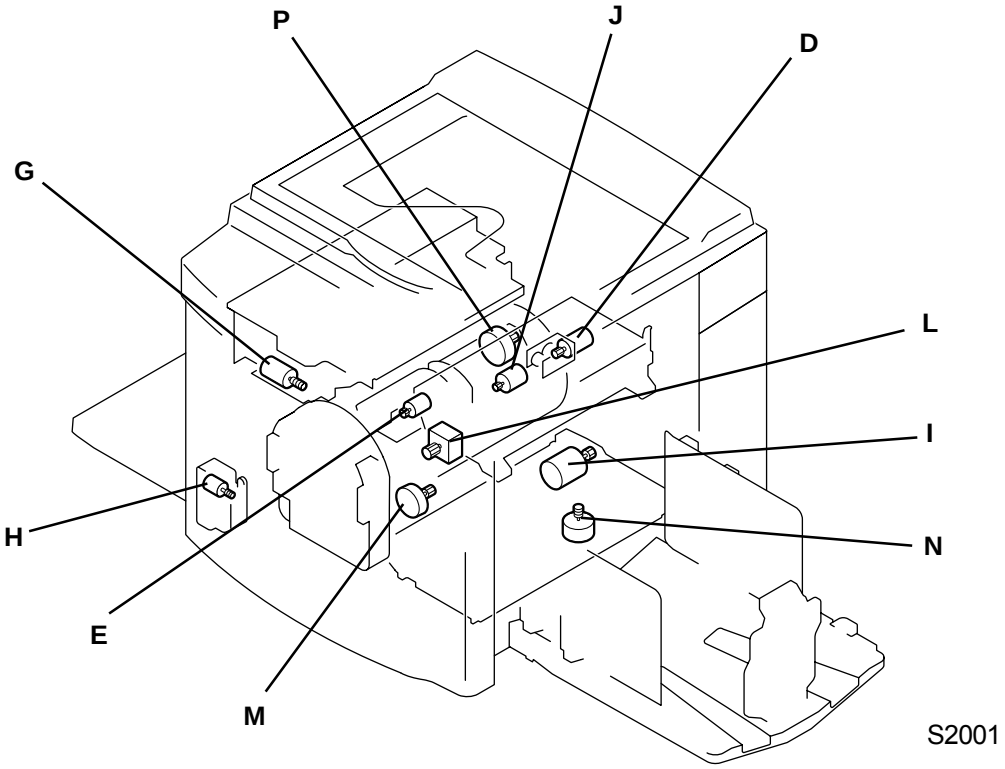
ITEMS	Options
Auto Idling Action	Auto Idling: ON , OFF Interval: 1 to 12 hours Rotation: One time to three times
Volume Alarm Cue	Earlier, Standard , Later
Minimum Print Qíty	1 to 99 (copies)
Feed Tray Relay	ON, OFF
Triple-Tray Source	ON, OFF
Beep Sound	ON , OFF
Clock/Calender	
Basic Displayed Language	
Communication Mode	Local , Remote
Owner Name Entry	

Memo

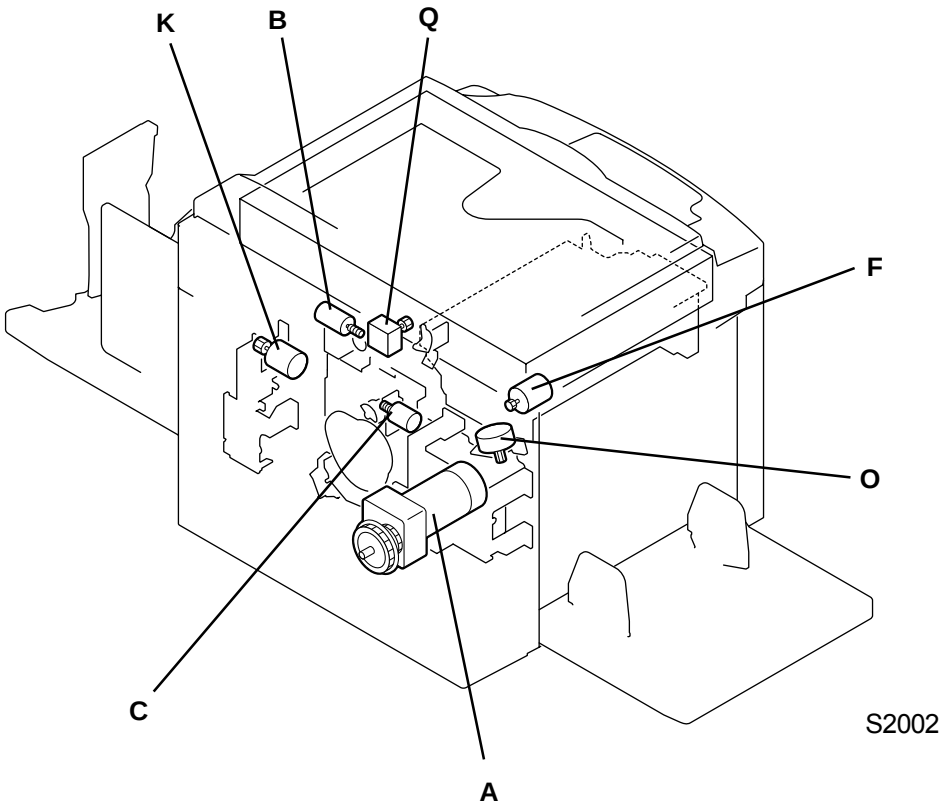
CHAPTER 20: ELECTRICAL COMPONENTS

Contents

1. Motors



S2001

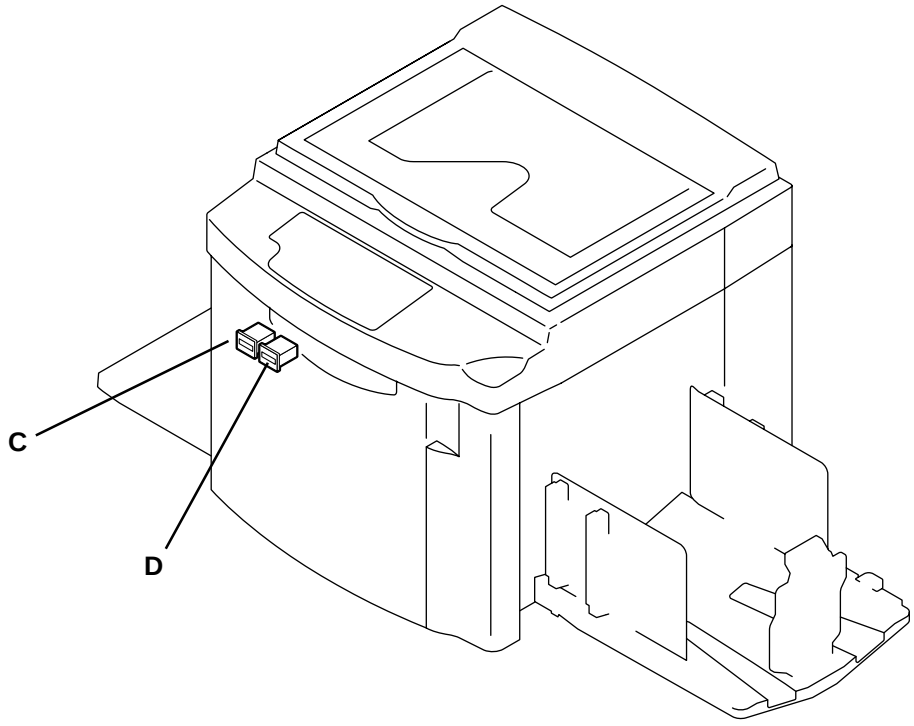


S2002

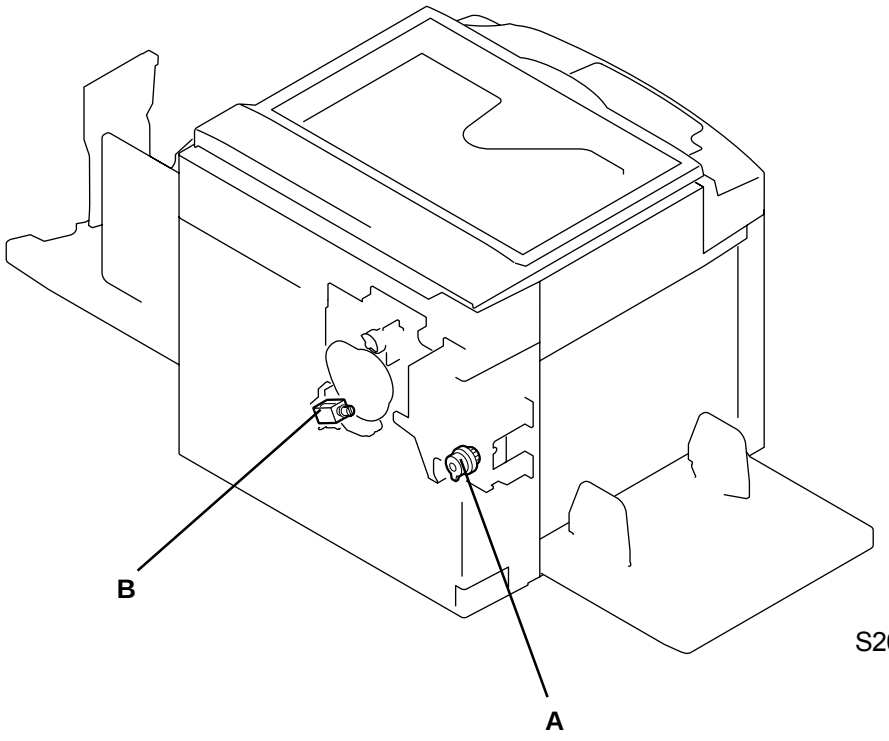
Sym.	Name	Test mode No.
A	Main motor	530, 531
B	Clamp motor	532, 533
C	Print drum locking motor	534
D	Thermal pressure motor	230, 231
E	Cutter motor	237
F	Master disposal motor	330
G	Master compression motor	
H	Elevator motor	
I	Paper ejection motor	430
J	Inking motor	
K	Print pressure motor	
L	Write pulse motor	232, 233
M	Load pulse motor	234, 235
N	Paper ejection wing motor	433, 434
O	Vertical position pulse motor	
P	Horizontal position pulse motor	
Q	FB read pulse motor	

T2003

2. Solenoids and Clutches



S2003

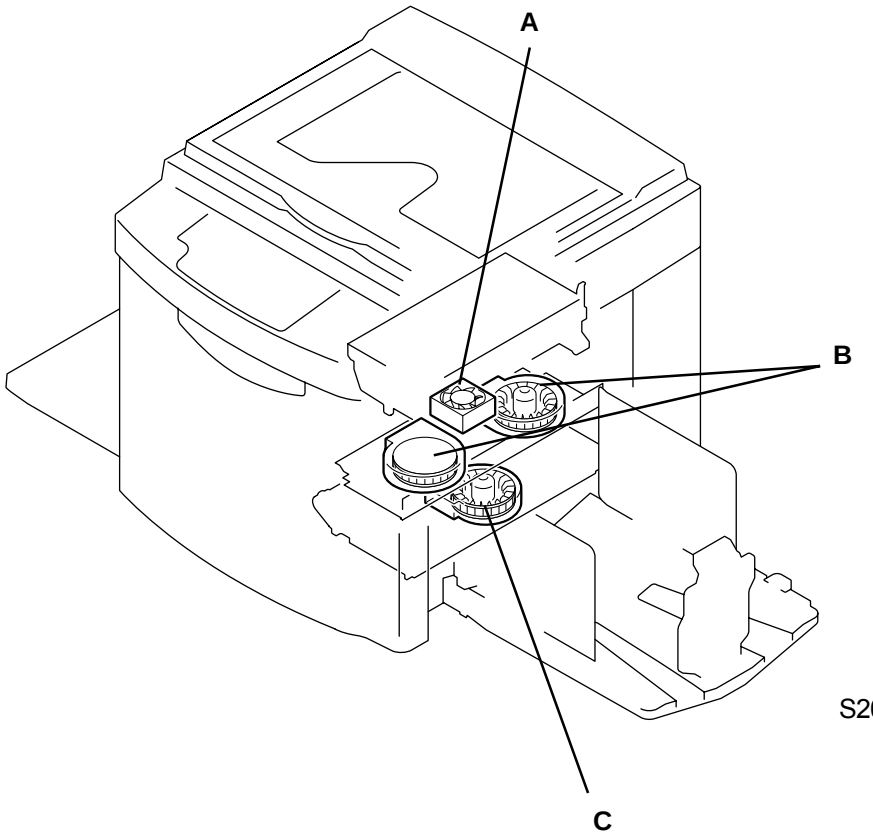


S2004

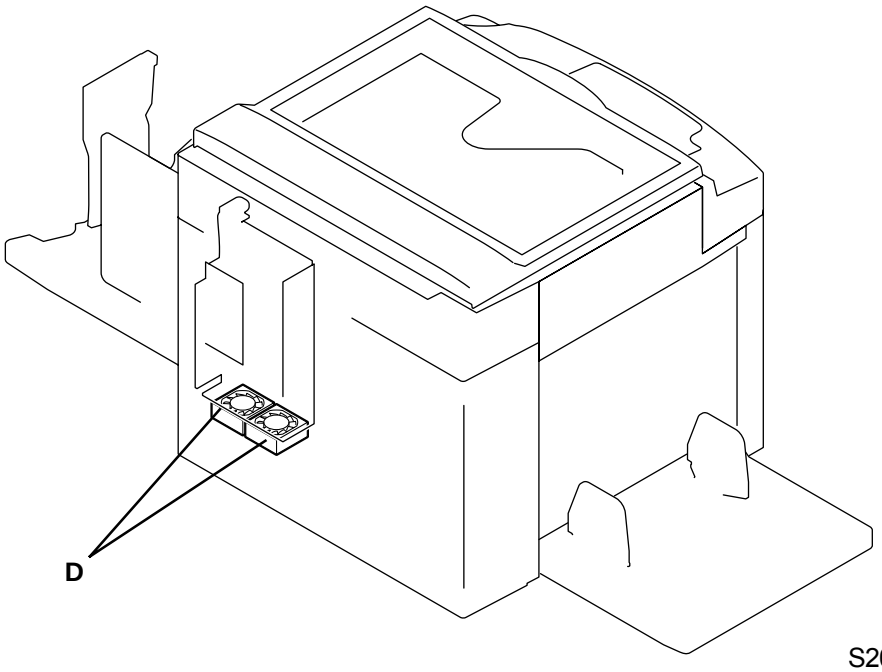
Sym.	Name	Test mode No.
A	Paper-feed clutch	436
B	Pressure solenoid	
C	Copy counter	
D	Master counter	

T2005

3. Fan



S2005

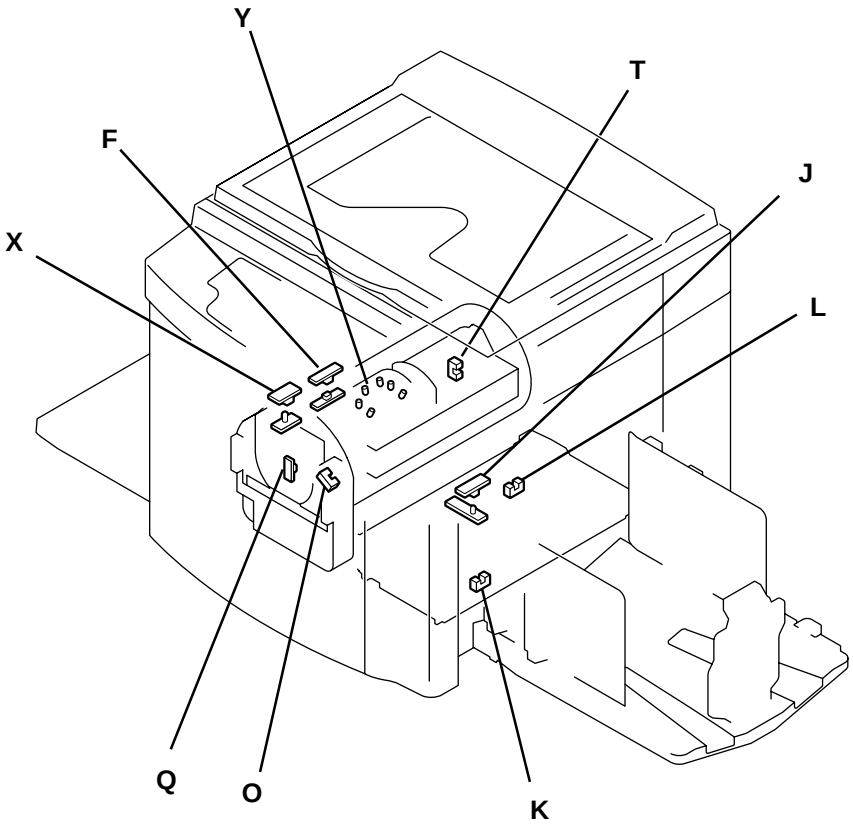


S2006

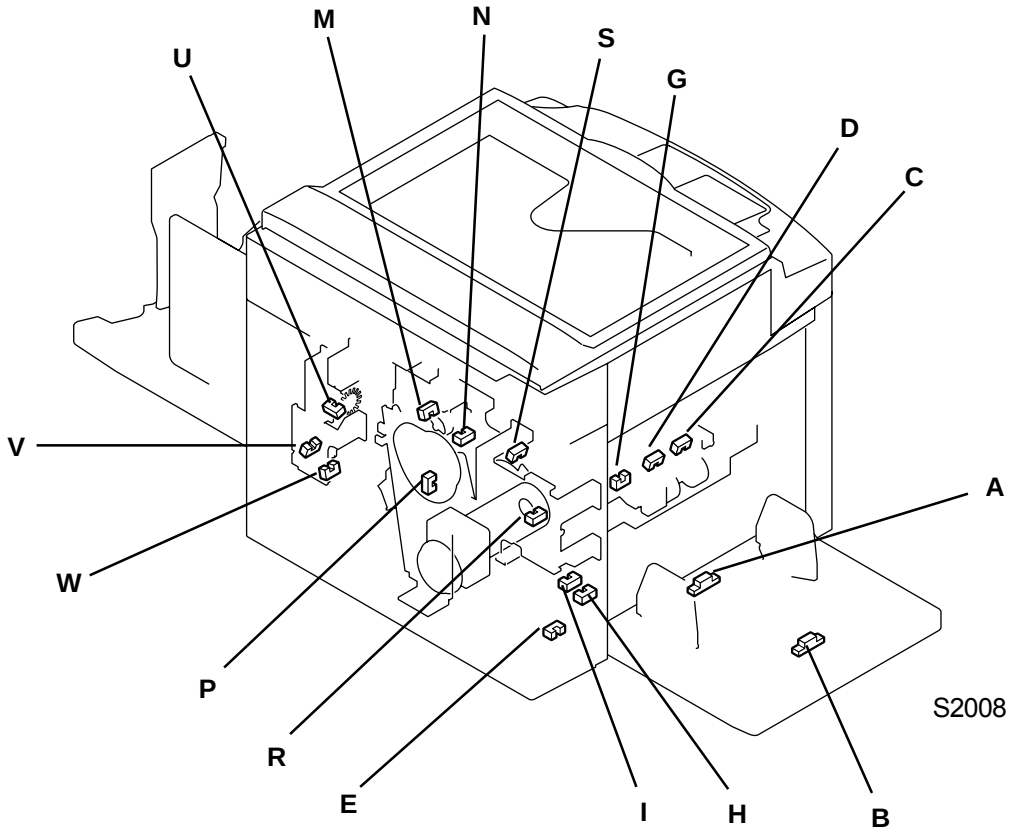
Sym.	Name	Test mode No.
A	Storage fan	436
B	Separation fan	431
C	Suction fan	
D	Power supply cooling fan	

T2007

4. Sensors 1 [Paper-feed/ejection, Print drum]



S2007

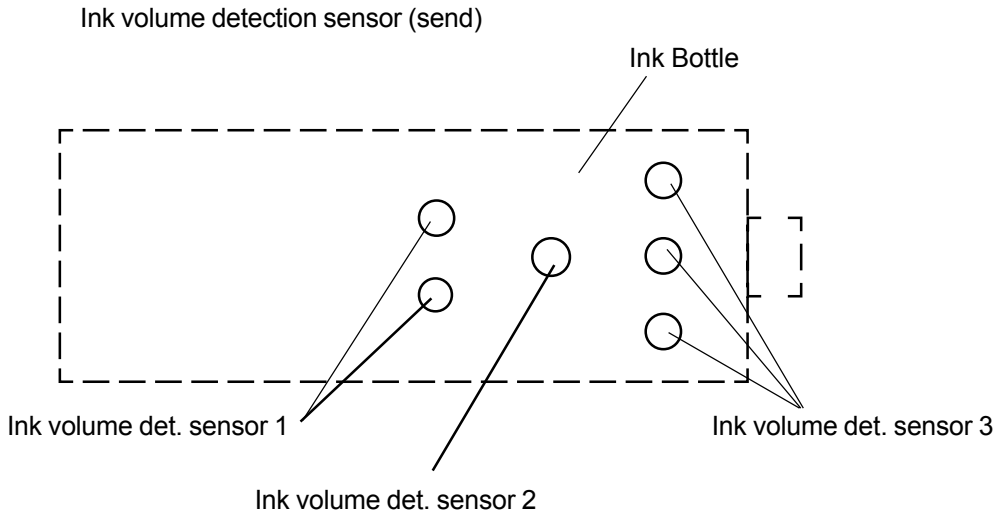


S2008

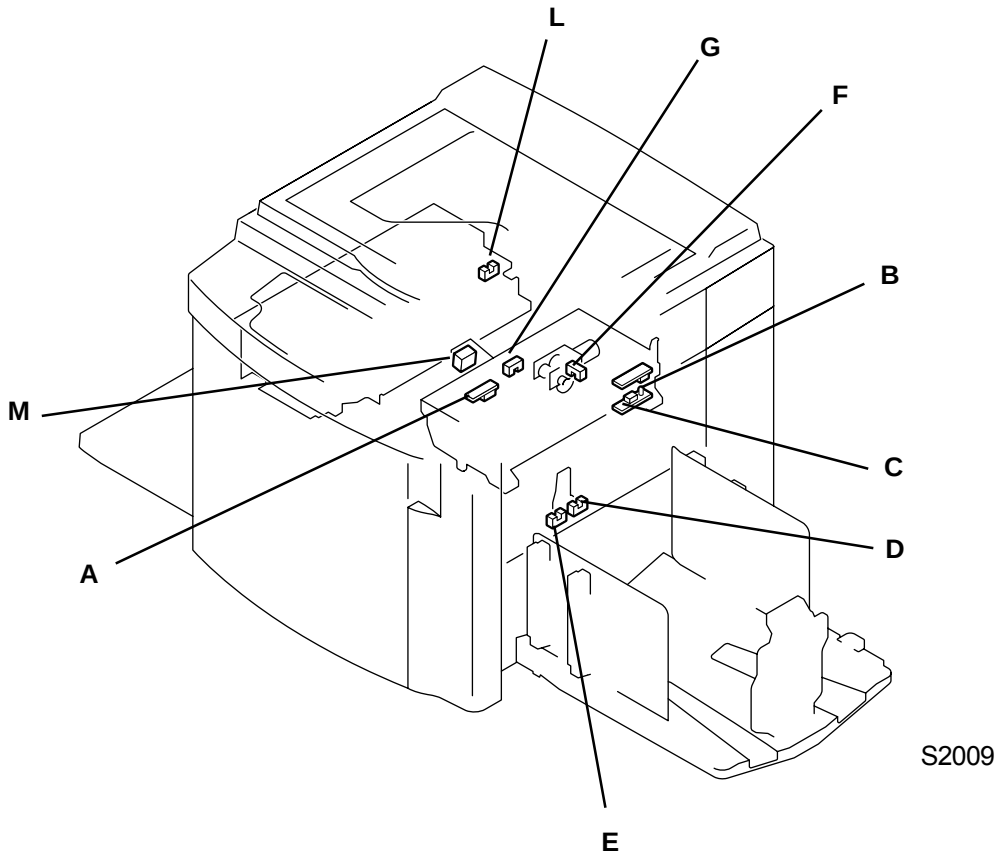
Sym.	Name	Sensor type	Test mode No.
A	Paper detection sensor	Reflective	400
B	Paper size detection sensor	Reflective	401
C	Elevator upper limit sensorA	Interrupt	402
D	Elevator upper limit sensorB	Interrupt	403
E	Elevator lower limit sensor	Interrupt	404
F	Paper sensor	Transmittive	405
G	Paper feed pressure sensor -High	Interrupt	414
H*	Paper volume det. sensor A	Interrupt	410
I*	Paper volume det. sensor B	Interrupt	411
J	Paper ejection sensor	Transmittive	406
K	Paper ejection wing home sensor	Interrupt	413
L	Paper ejection limit sensor	Interrupt	412
M	Print drum lock position sensor	Interrupt	508
N	Print drum lock cam sensor	Interrupt	507
O	Position A sensor	Interrupt	500
P	Position B sensor	Interrupt	501
Q*	Ink volume det. sensor (receive)	Transmittive	521, 522, 523
R	Main motor limit sensor	Interrupt	502
S	Vertical centering sensor	Interrupt	601
T	Horizontal centering sensor	Interrupt	602
U	Print pressure limit sensor	Interrupt	603
V	Print pressure sensor A	Interrupt	604
W	Print pressure sensor B	Interrupt	605
X*	Multi-paper feed det. sensor	Transmittive	
Y*	Ink volume det. sensor (send)		

T2009

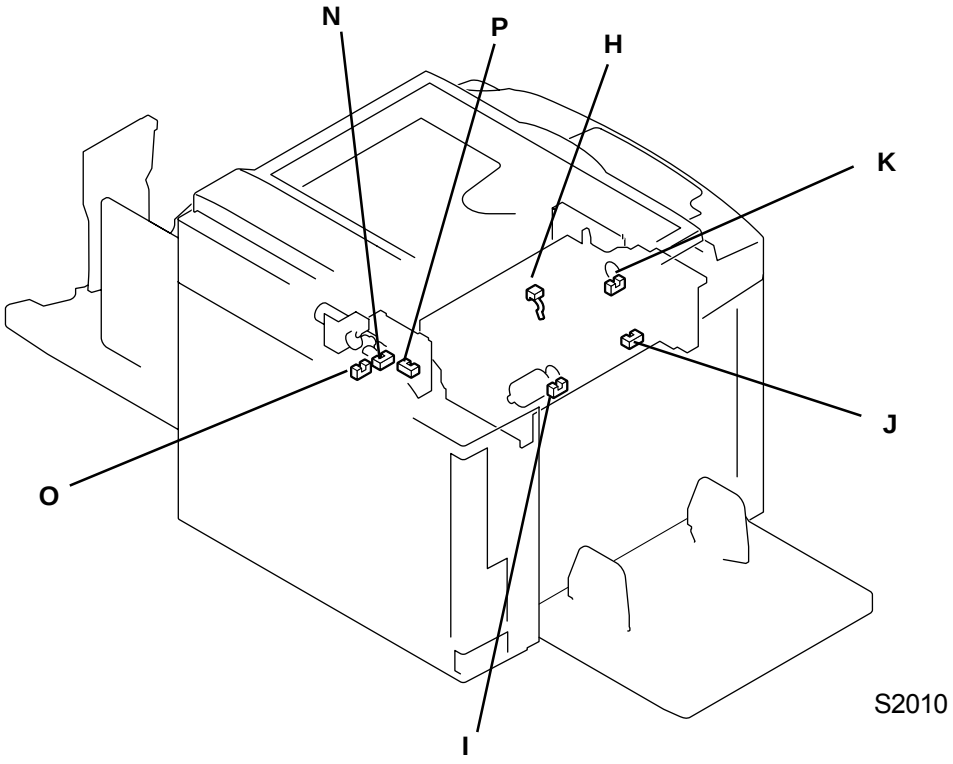
* mark = Not used on 300 DPI machines.



5. Sensors 2 [Master-making and disposal]



S2009



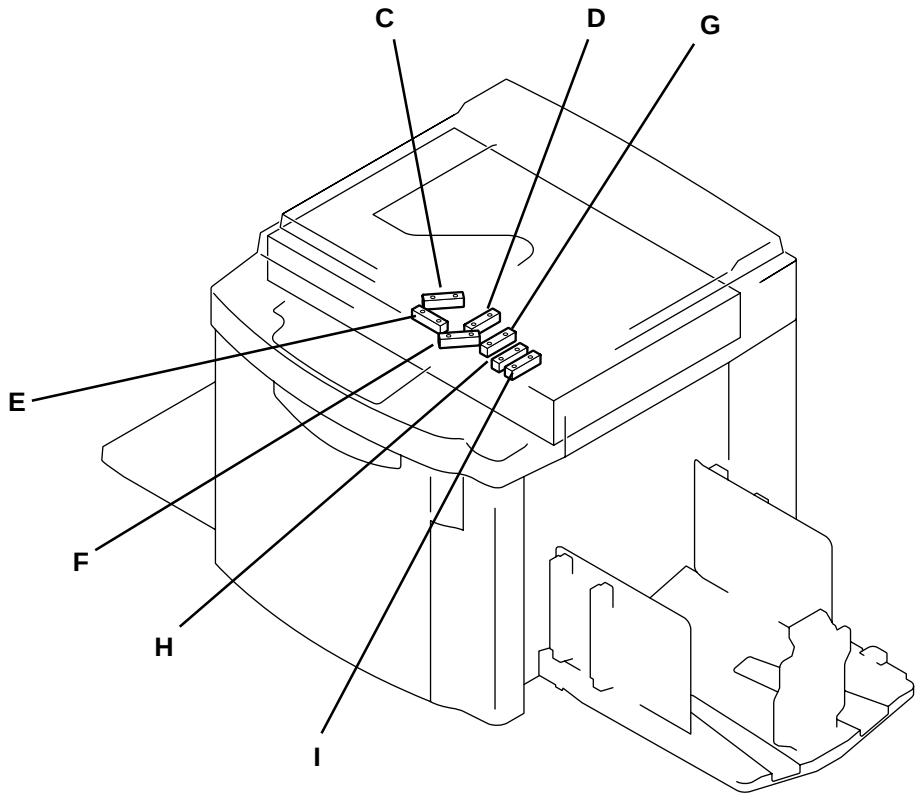
S2010

Sym.	Name	Sensor type	Test mode No.
A	Master positioning sensor	Reflective	200
B	Master end sensor	Transmittive	201
C	Master detection sensor	Reflective	202
D*	Master volume det. sensor A	Interrupt	207
E*	Master volume det. sensor B	Interrupt	208
F	TPH pressure sensor	Transmittive	204
G	Master making unit sensor	Interrupt	205
H	Master disposal jam sensor	Actuator	300
I	Mstr disposal motor limit sensor	Interrupt	306
J	Master compression sensor	Interrupt	301
K	Mstr compress motor limit sensor	Interrupt	305
L	Disposal top cover sensor	Interrupt	304
M	Master loading sensor	Reflective	506
N	Clamp sensor A	Interrupt	503
O	Clamp sensor B	Interrupt	504
P	Clamp sensor C	Interrupt	505

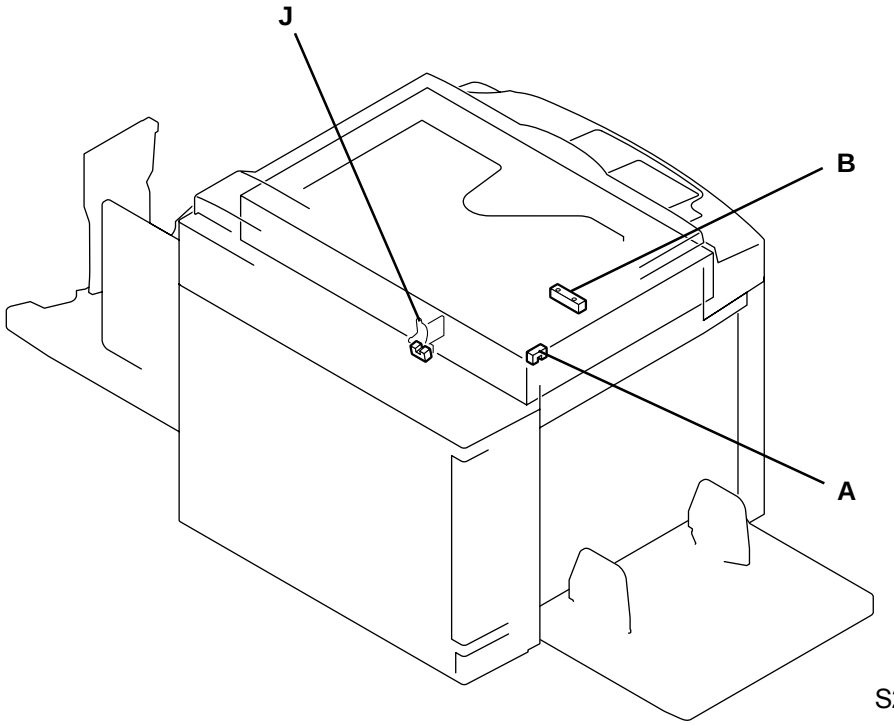
T2011

* mark = Not used on 300 DPI machines.

6. Sensors 3 [Scanner Table]



S2011



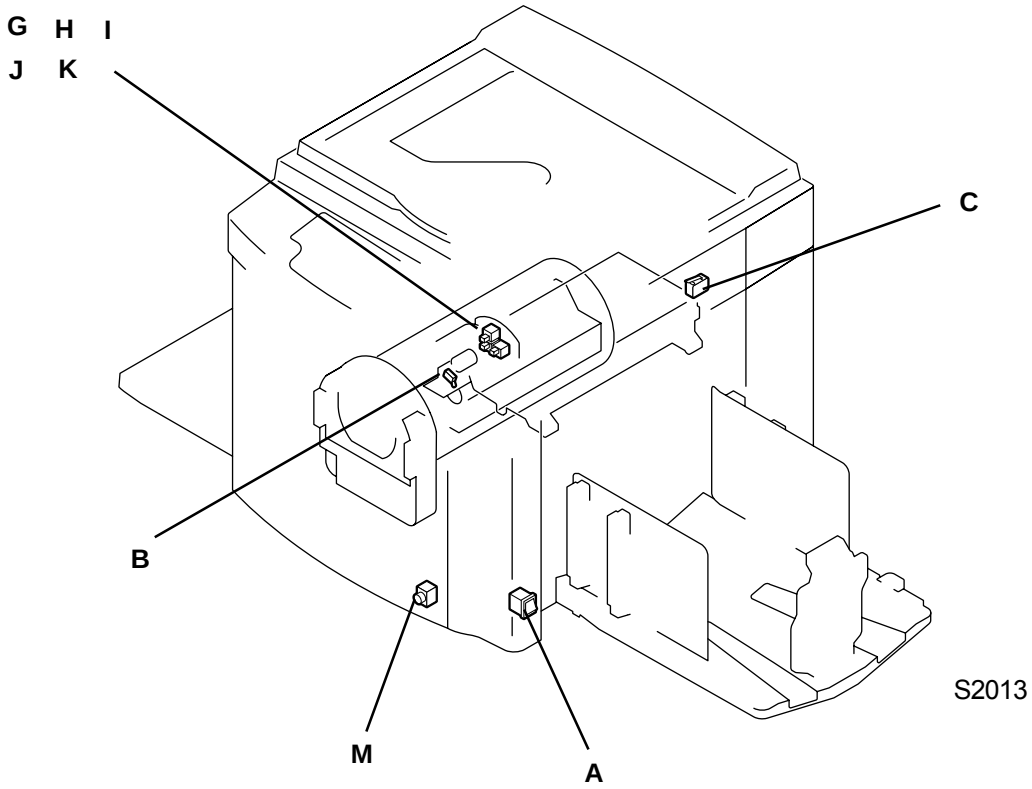
S2012

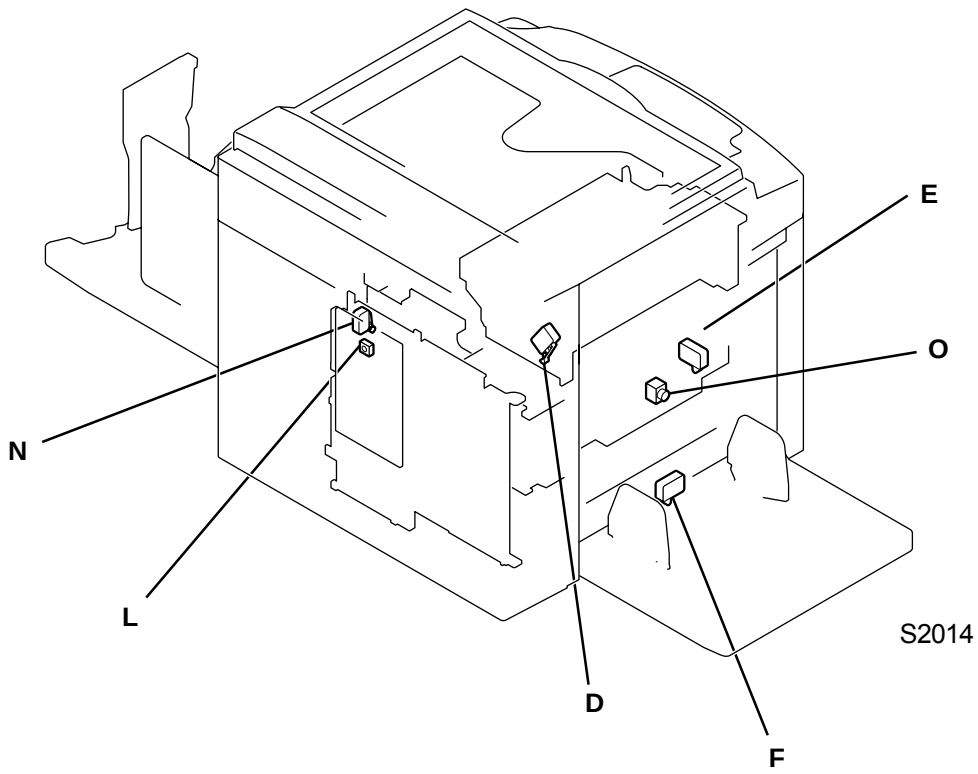
Sym.	Name	Sensor type	Test mode No.
A	Image scanner AF shading sensor	Interrupt	100
B	Flat bed original det. sensor	Reflective	101
C*	Flat bed original size sensor 1	Reflective	102
D*	Flat bed original size sensor 2	Reflective	103
E*	Flat bed original size sensor 3	Reflective	104
F*	Flat bed original size sensor 4	Reflective	105
G*	Flat bed original size sensor 5	Reflective	106
H*	Flat bed original size sensor 6	Reflective	107
I*	Flat bed original size sensor 7	Reflective	108
J	Stage cover sensor	Interrupt	110

T2013

* mark = Not used on 300 DPI machines.

7. Switches and Buttons

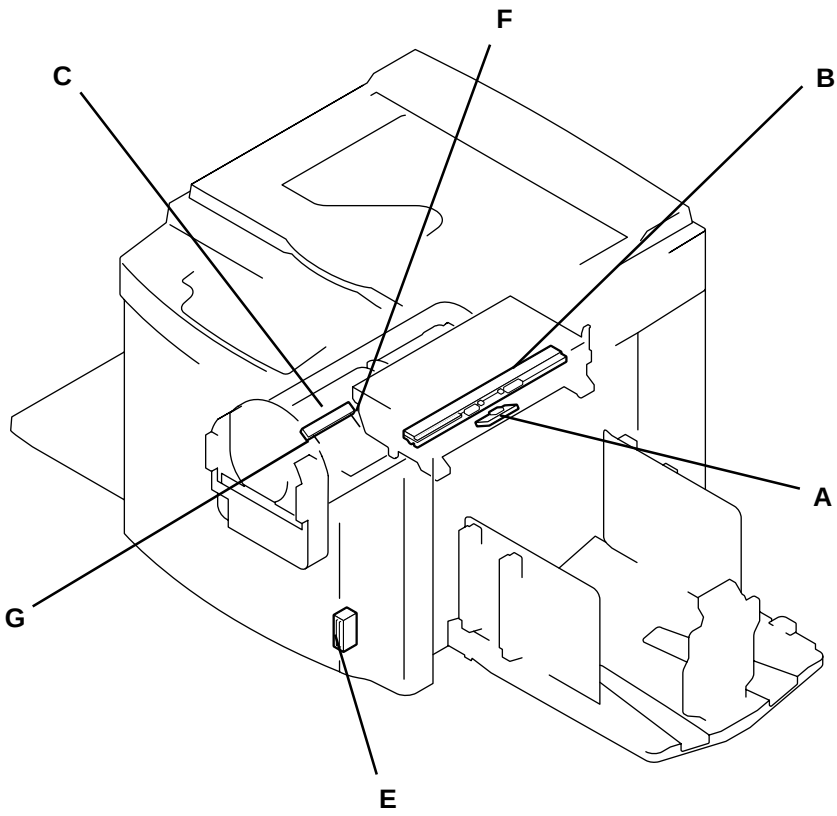




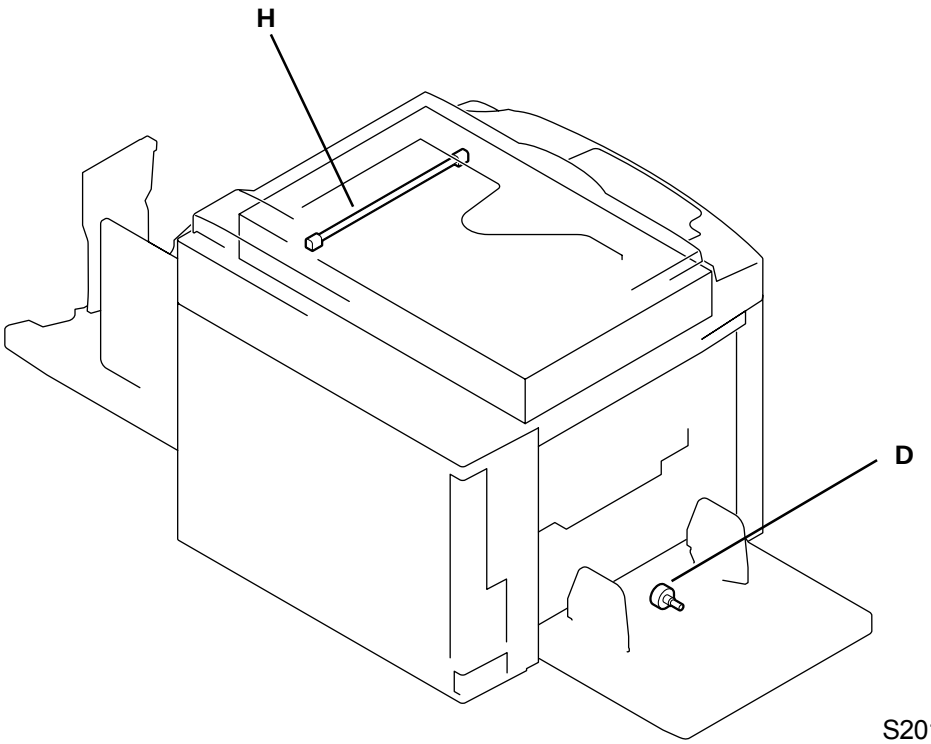
Sym.	Name	Test mode No.
A	Main SW	
B	Cutter home position switch	203
C	Flat bed set switch	206
D	Disposal box safety switch	303
E	Paper feed tray upper safety SW	407
F	Paper feed tray lower safety SW	408
G	Ink cartridge set SW 1	511
H	Ink cartridge set SW 2	512
I	Ink cartridge set SW 3	513
J	Ink cartridge set SW 4	514
K	Ink cartridge set SW 5	515
L	Main motor 15 rpm SW	516
M	Print drum release button	518
N	Print drum safety SW	520
O	Elevator button	409

T2015

8. Others



S2015

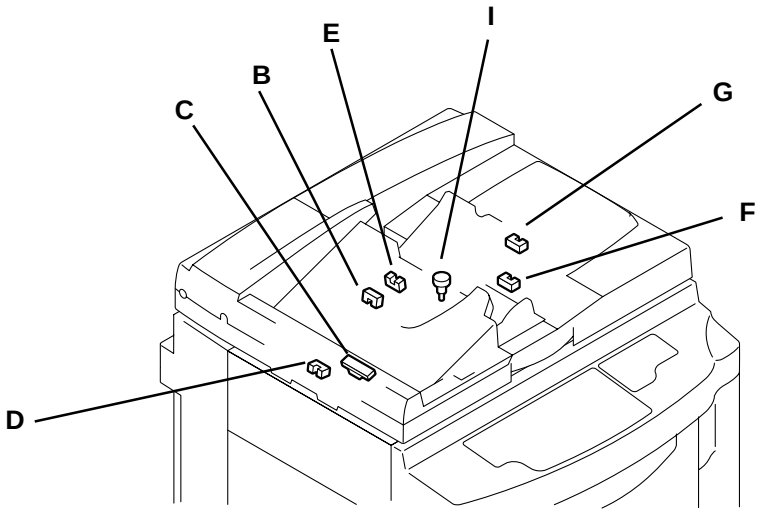


S2016

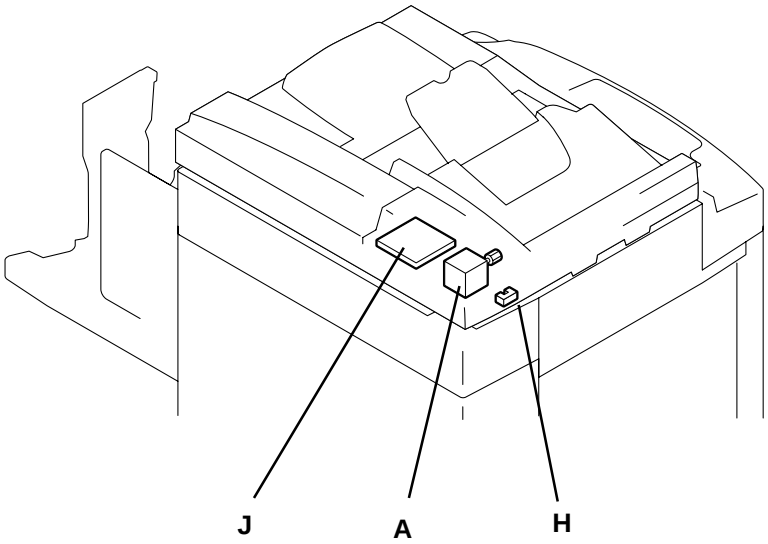
Sym.	Name	Test mode No.
A	Write roller temperature sensor	272, 273
B	TPH temperature sensor	270, 271
C	Print drum temperature sensor	572, 573
D	Paper width potentiometer	470, 471
E	Front cover SW	517
F	Ink sensor	509
G	Overflow sensor	510
H	CCD lamp	130

T2017

9. AF Unit



S2017



S2018

(1) Motor

Sym.	Name	Test mode No.
A	AF read pulse motor	730

T2019a

(2) Sensors

Sym.	Name	Test mode No.
B	Original registration sensor	700
C	Original IN sensor	701
D	Original OUT sensor	702
E	AF original detection sensor	703
F	AF original size sensor 1	704
G	AF original size sensor 2	705
H	AF unit cover set sensor	707

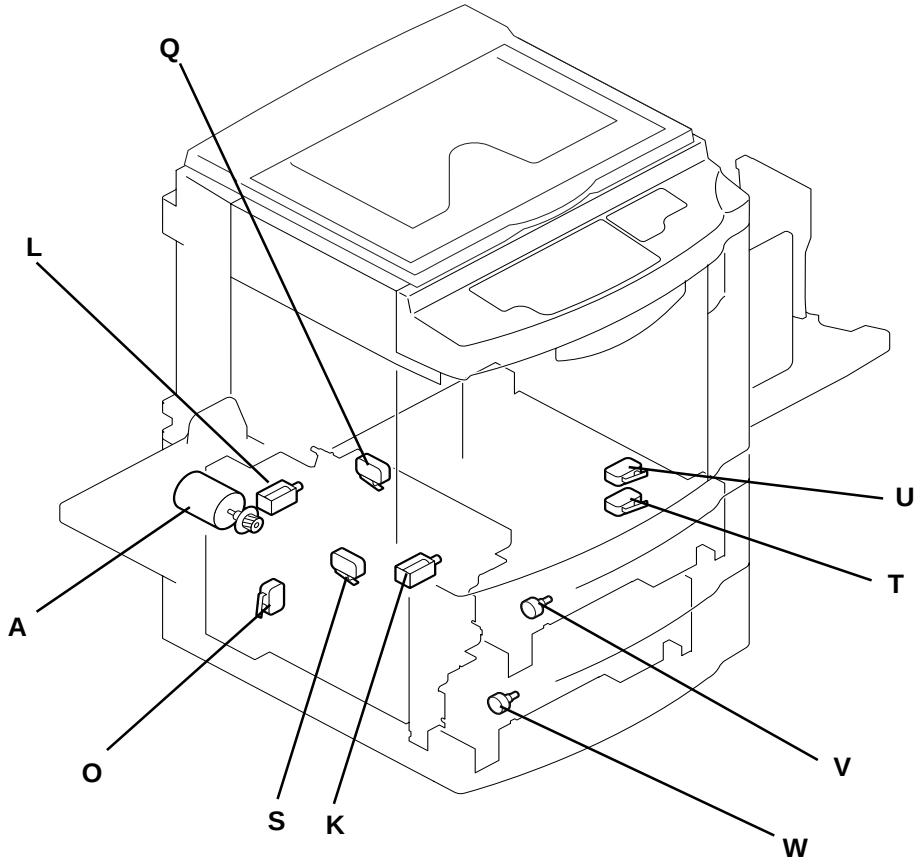
T2019b

(3) Others

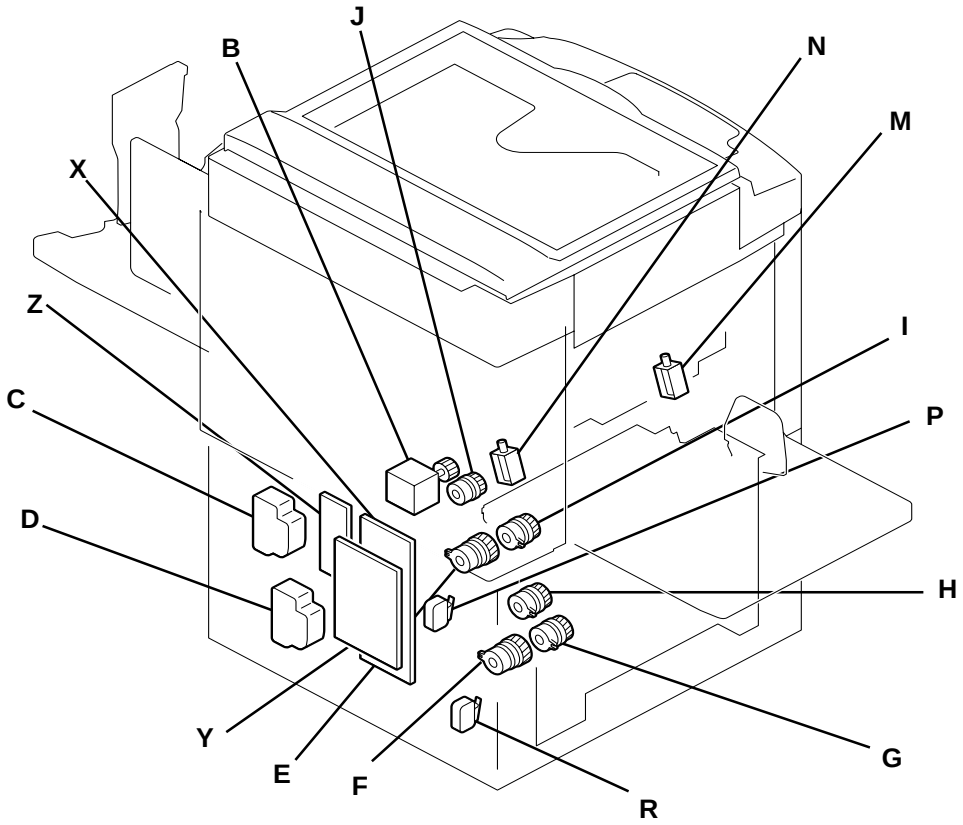
Sym.	Name	Test mode No.
I	AF guide potentiometer	753, 754
J	AF unit control PCB	

T2019c

10. Multi-tray-paper-feeder



S2019



S2020

(1) Motor, Clutch, Solenoid

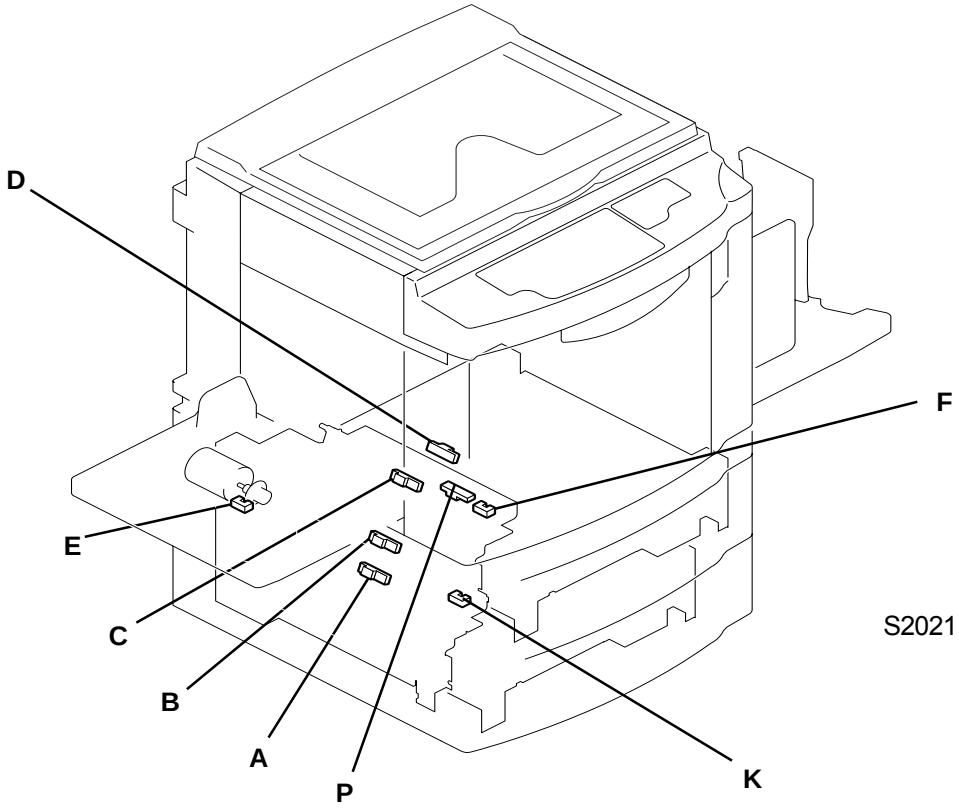
Sym.	Name	Test mode No.
A	Multi-feed tray transfer motor	830
B	Multi-feed tray pickup motor	831
C	Multi-feed tray elevator motor 1	
D	Multi-feed tray elevator motor 2	
E	Multi-feed tray 1 feed clutch	832
F	Multi-feed tray 2 feed clutch	833
G	Multi-feed tray transfer clutch 1	834
H	Multi-feed tray transfer clutch 2	835
I	Multi-feed tray transfer clutch 3	836
J	Multi-feed tray transfer clutch 4 (on main unit)	837
K	Nip release solenoid 1	
L	Nip release solenoid 2	
M	Nip release solenoid 3	
N	Nip release solenoid 4	

T2021a

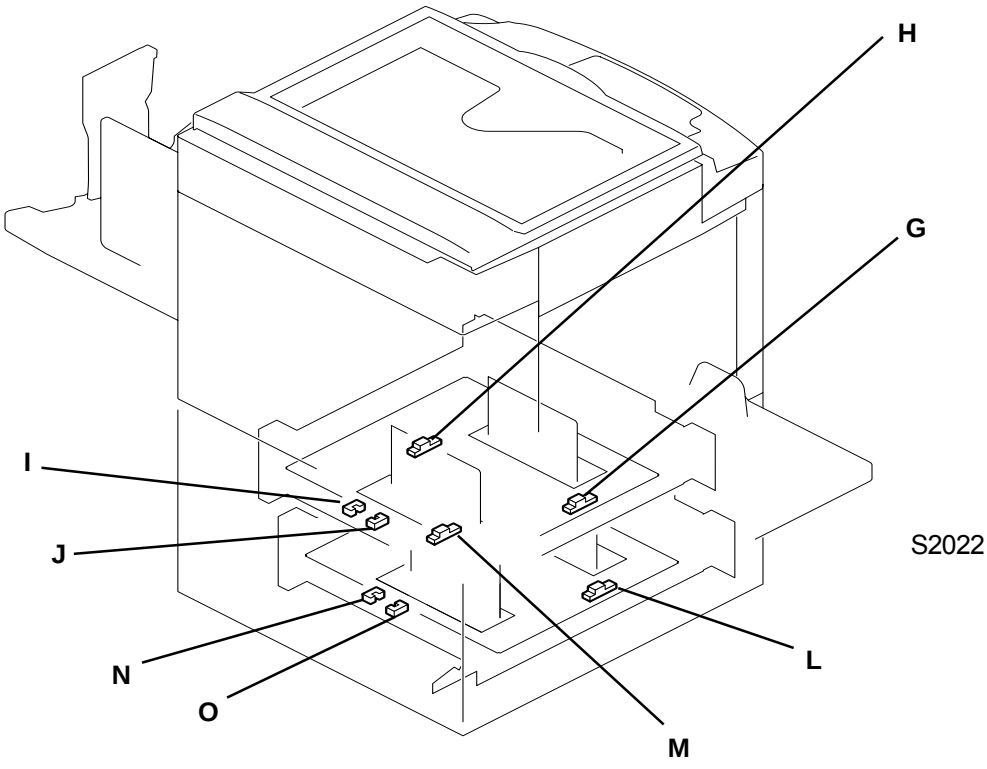
(2) Switches and others

Sym.	Name	Test mode No.
O	Multi-Tray Transfer Safety Sw	812
P	Multi-Feed Tray 1 Safety Sw	818
Q	Multi-Feed Tray 1 Limit Sw	819
R	Multi-Feed Tray 2 Safety Sw	825
S	Multi-Feed Tray 2 Limit Sw	826
T	Feed Joint Pass. Cover Safety SwMT	827
U	Feed Joint Pass. Cover Safety Sw	524
V	Multi-Tray 1 Paper width potentiometer	857, 858, 870, 872
W	Multi-Tray 2 Paper width potentiometer	859, 860, 871, 873
X	Multi-Feed Tray power supply PCB	
Y	Multi-Feed Tray Main PCB	
Z	Multi-Feed Tray Drive PCB	

T2021b



S2021



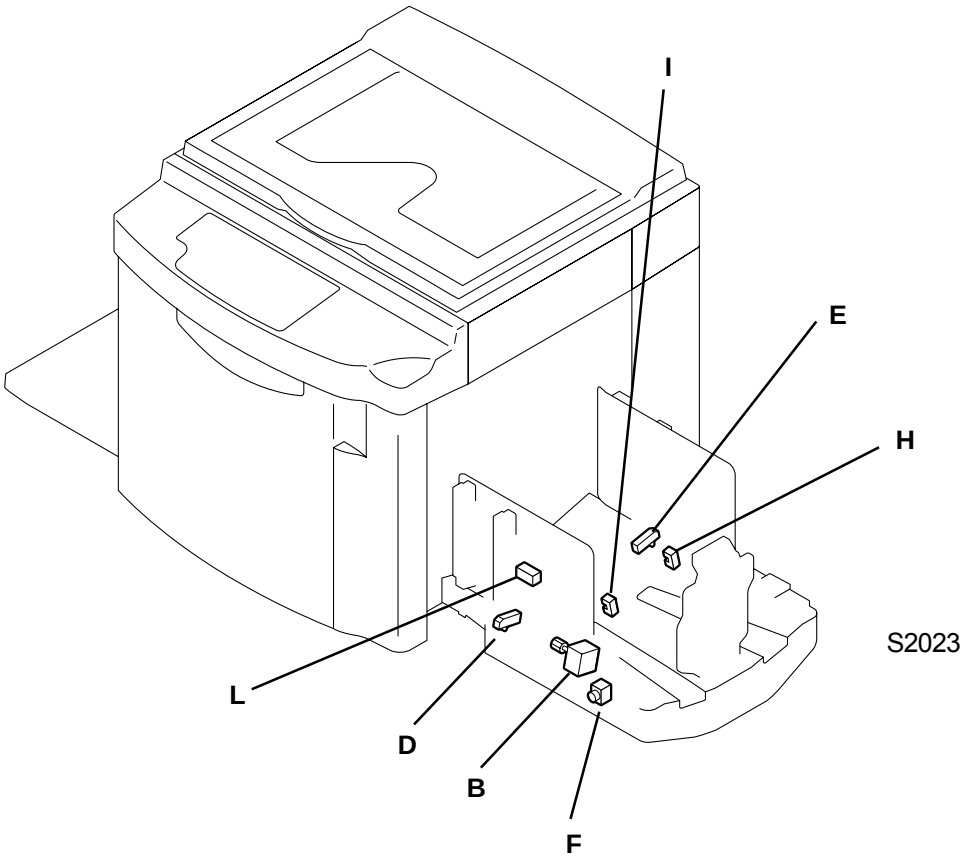
S2022

(3) Sensors

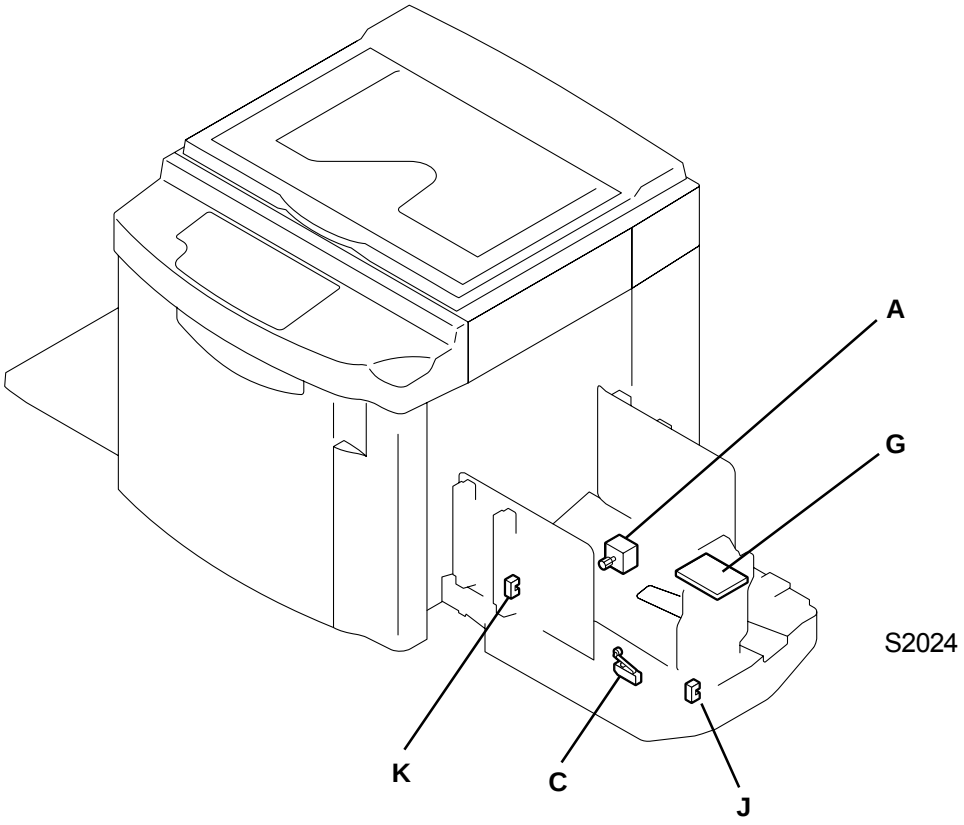
Sym.	Name	Test mode No.
A	Multi-tray feed sensor 1	806
B	Multi-tray feed sensor 2	807
C	Multi-tray feed sensor 3	808
D	Multi-tray feed sensor 4	809
E	Multi-tray feed limit sensor	811
F	Multi-feed tray 1 upper limit sensor	813
G	Multi-feed tray 1 paper det. sensor	814
H	Multi-feed tray 1 size sensor	815
I	Multi-feed tray 1 volume sensor1	816
J	Multi-feed tray 1 volume sensor2	817
K	Multi-feed tray 2 upper limit sensor	820
L	Multi-feed tray 2 paper det. sensor	821
M	Multi-feed tray 2 size sensor	822
N	Multi-feed tray 2 volume sensor1	823
O	Multi-feed tray 2 volume sensor2	824
P	Multi-tray 1 pickup sensor	810

T2023

11. Auto-Control-Stacking-Tray



S2023



S2024

(1) Motors

Sym.	Name	Test mode No.
A	Paper stopper motor	
B	Paper guide motor	

T2025a

(2) Swithes, buttons, others

Sym.	Name	Test mode No.
C	Paper stopper base SW	
D	Paper guide base SW (Right)	
E	Paper guide base SW (Left)	
F	Paper stopper HP button	804
G	Auto tray control PCB	

T2025b

(3) Sensors

Sym.	Name	Test mode No.
H	Paper guide HP sensor	800
I	Paper guide limit sensor	801
J	Paper stopper HP sensor	803
K	Paper stopper limit sensor	802
L	Auto stacking paper det. sensor	805

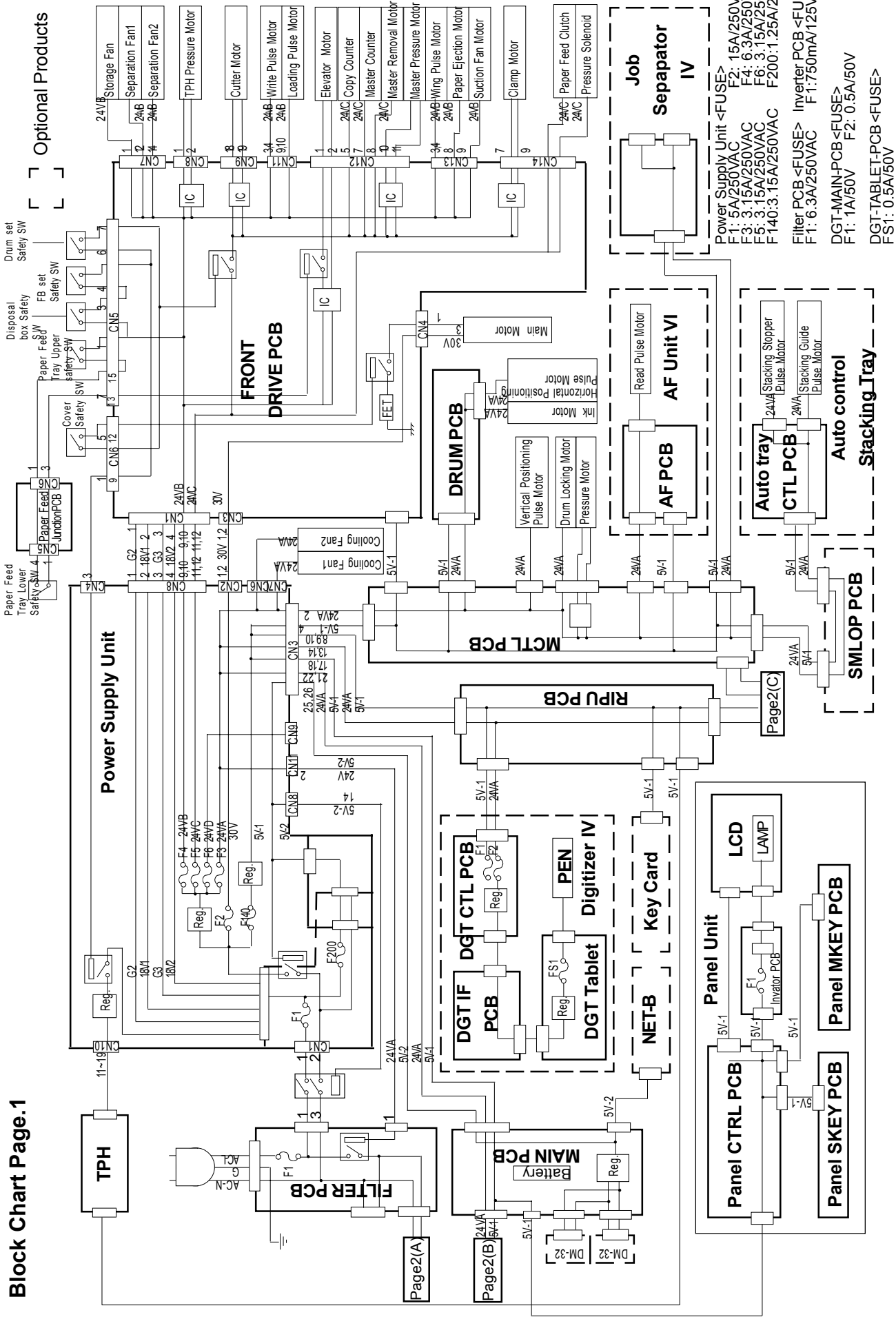
T2025c

Memo

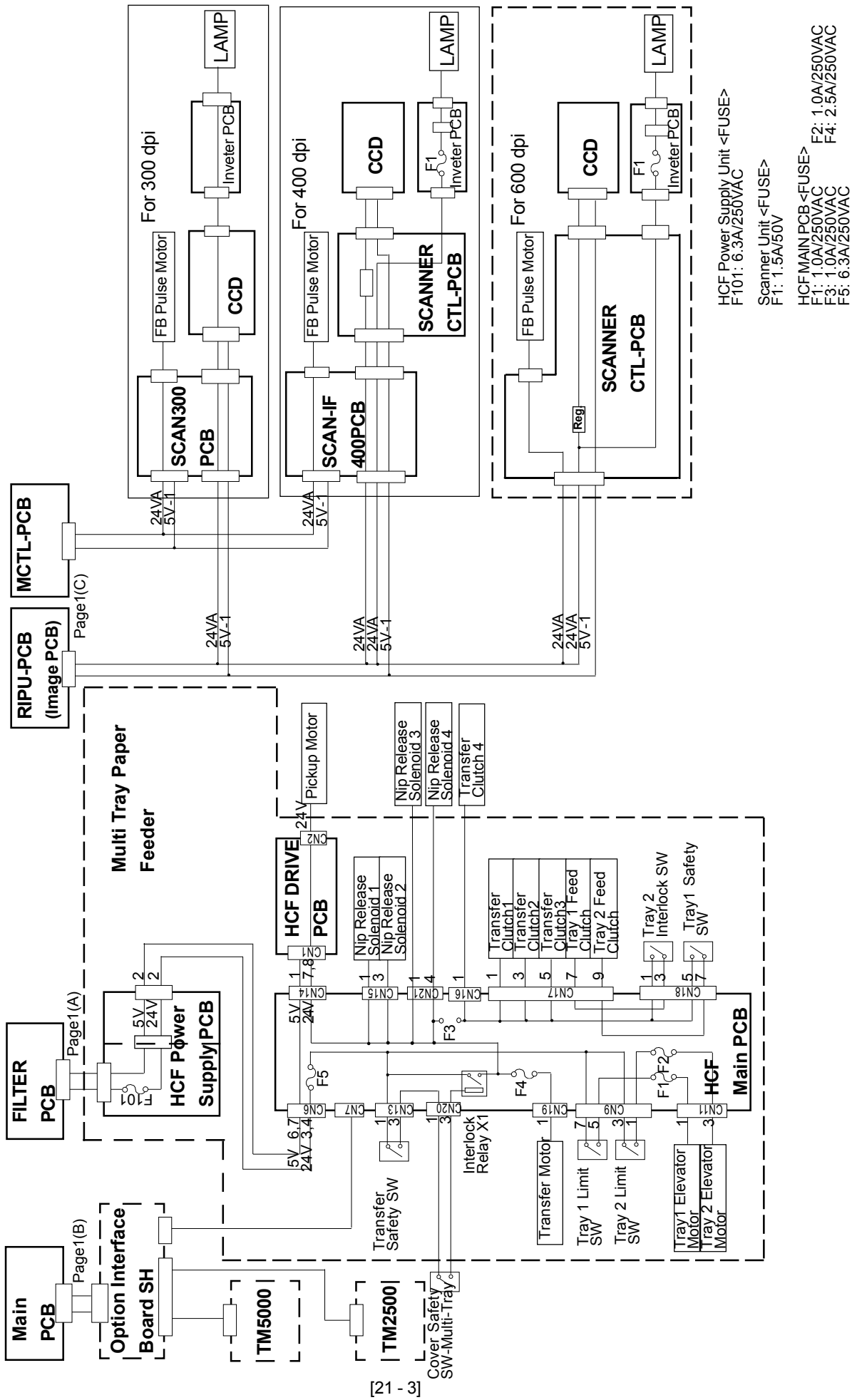
CHAPTER 21. DESCRIPTION OF PCBs

Contents

1. BLOCK CHART

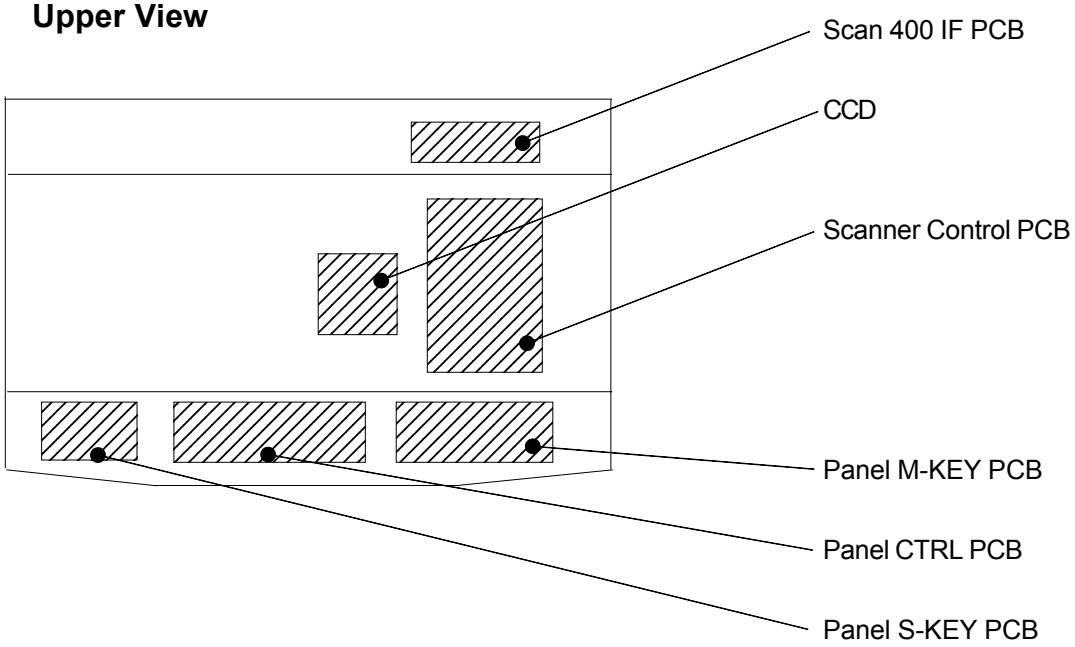


Block Chart Page.2

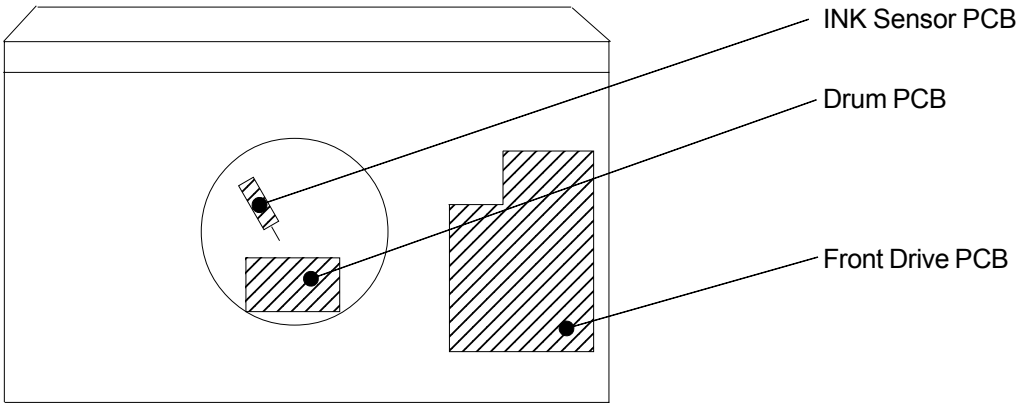


2. LOCATION OF PCBs

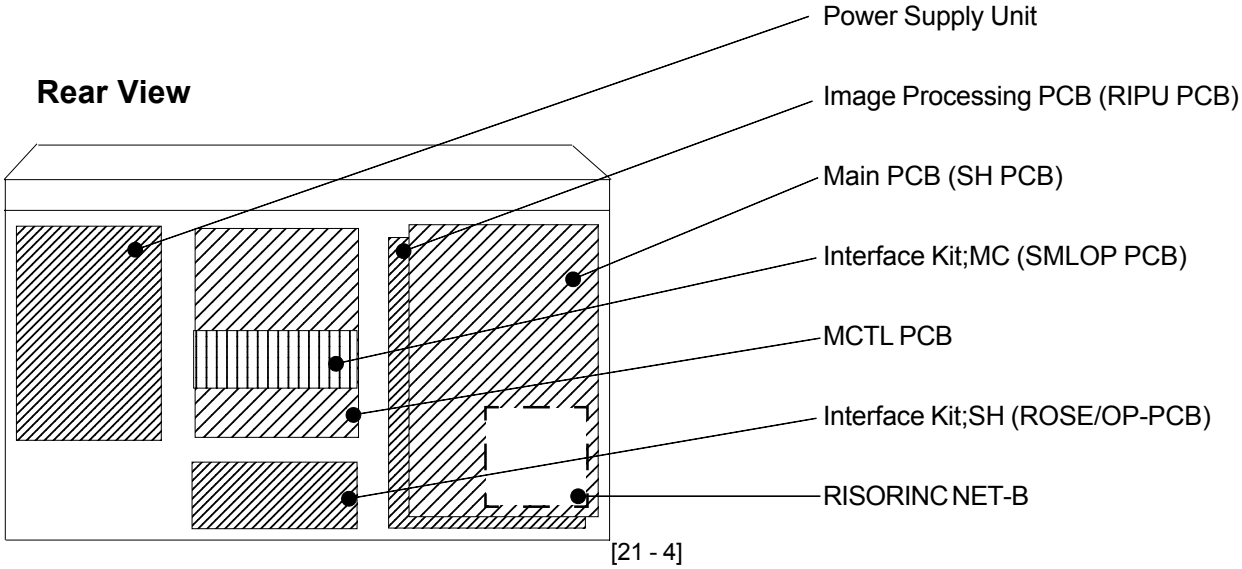
Upper View



Front View



Rear View



Compatibility

Risograph / Name	RP 3700	RP 3790	RP 3500	RP 3590	RP 3100
Main PCB (SH PCB)	○	○	○	○	○
MCTL PCB	○	○	○	○	○
Front Drive PCB	○	○	○	○	○
RIPU PCB	○	○			
RIPM PCB			○	○	○
PanelCTRL PCB	○	○	○	○	○
Panel MKEY PCB	○	○	○	○	○
Panel SKEY PCB	○	○	○	○	○
Drum Control PCB	○	○	○	○	○
Power Supply PCB	○	○	○	○	○
Sub Control PCB	○	○	○	○	○
Scanner Control PCB	○	○	●	●	⊗
SCAN400IF PCB			○	○	
SCAN300IF PCB					○
AF Control PCB	▲	▲	▲	▲	▲
SMLOP PCB	△	○	△	○	△
ROSE/OP PCB	△	○	△	○	△
RISORINC NET-B	△	○	△	△	△
HCF Main PCB		○		○	
HCF Drive PCB		○		○	
HCF Power Supply PCB		○		○	

● For 400DPI machines only

⊗ For 300DPI machines only

▲ Inside of AF Unit (Option)

△ Option

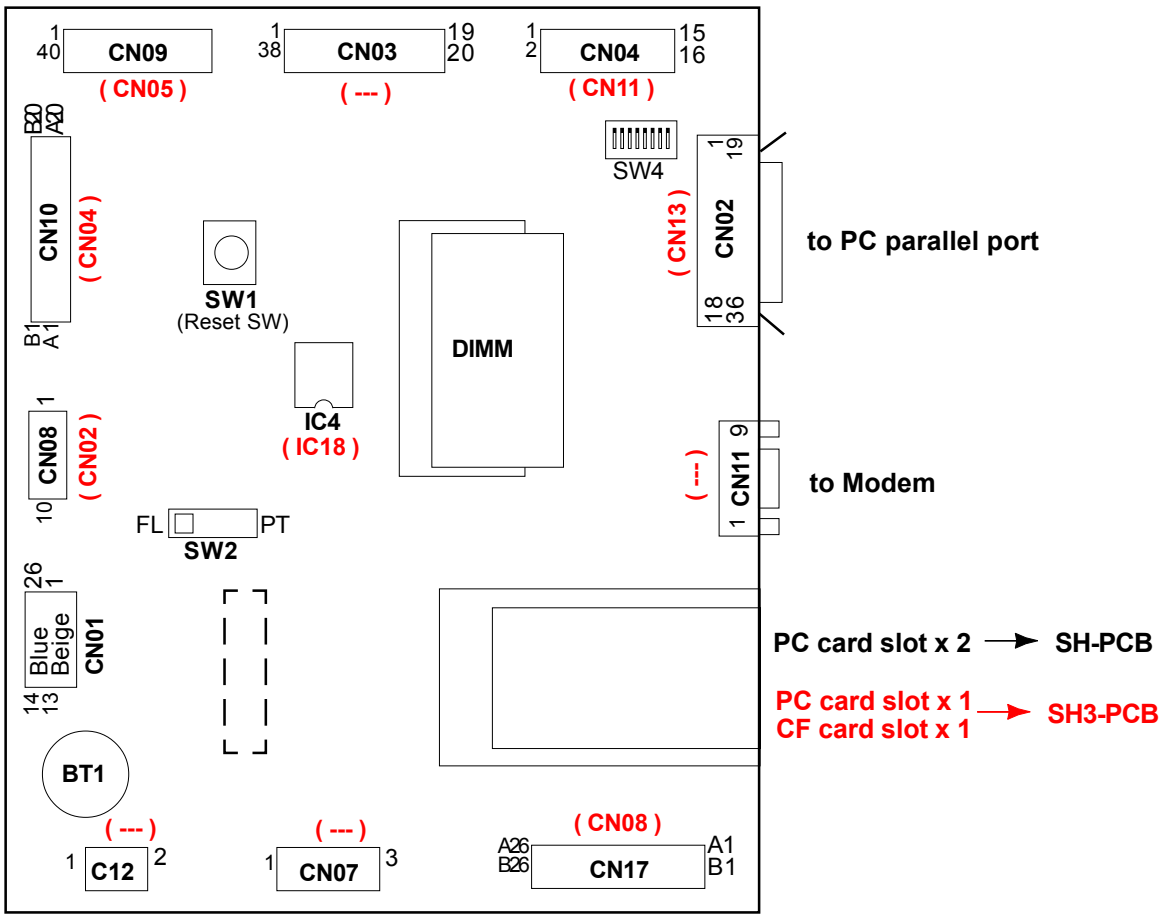
3. PCB Function

PCB Name	Function
Main PCB (SH PCB)	Overall Control, Computor Interface
MCTL PCB	Drive control of components
Front Drive PCB	Drive control of components
RIPU PCB	Processing Image Data
RIPM PCB	Processing Image Data
PanelCTRL PCB	Control of Display and Touch Panel
Panel M-KEY PCB	Enter Main function key, Numeral Display
Panel S-KEY PCB	Enter Sub function key
Drum Control PCB	Control of the inside of Drum
Power Supply PCB	Supply all voltages
Sub Control PCB	Supply voltage to TPH
Scanner Control PCB	FB Scanning control
SCAN400IF PCB	Convert Scanner resolution
AF Control PCB	AF control
SMLOP PCB	Junction of Auto control stacking tray
ROSE/OP PCB	Junction of Multi tray paper feed, TM2500, TM5000.
RISORINC NET-B	Network connection
HCF Main PCB	Control of Multi Feed Tray unit
HCF Drive PCB	Drive control of Multi Feed Tray unit
HCF Power Supply PCB	Supply voltage to Multi Feed Tray unit

MEMO

4. Description

4-1. Main PCB (SH PCB)



The connector socket numbers in ( ) are those for the new SH3-PCB.

CN1

MCTL PCB
CN11

CN10 (CN4)

Panel CTRL-PCB
CN1

CN9 (CN5)

External Interface

CN3 (---)

NET-B

CN4 (CN11)

GND	1
GND	
5V	
5V	
PGND	
PGND	
24V	
24V	
GND	
GND	
15V	
15V	
STANDBY	
POFF(IN)	
NC	
NMI	16

Power Supply PCB
CN3

4-1. Main PCB (SH PCB) - continued -

CN2 (CN13)

STB-B	1
PBD0	
PBD1	
PBD2	
PBD3	
PBD4	
PBD5	
PBD6	
PBD7	
ACK-B	
BSY-B	
PE-B	
SLCT-B	
ATFD-B	
NC	
GND	
GND	
GND	
GND	
GND	
GND	
GND	
GND	
GND	
GND	
GND	
GND	
GND	
INIT-B	
FLT-B	
NC	
NC	
NC	
SLCTIN-B	36

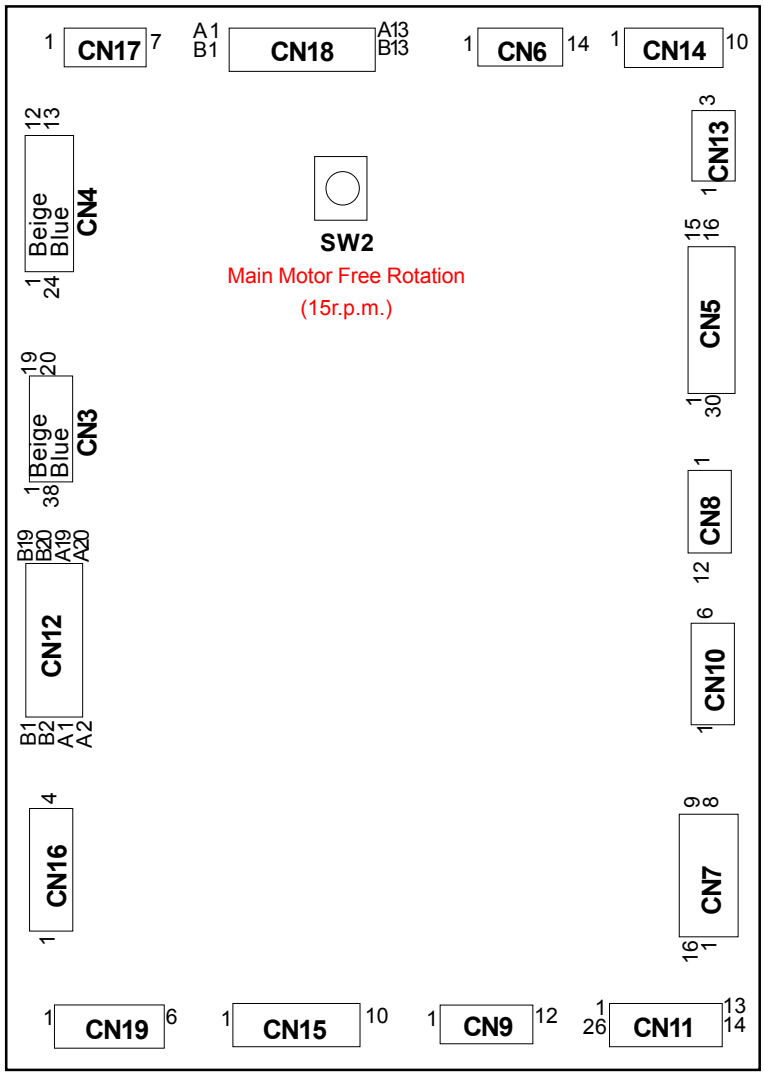
CN11 (---)

DCD	1
RXD	
TXD	
DTR	
GND	
DSR	
/RTS	
/CTS	
RI	9

CN17 (CN8)

Interface board SH

4-2. MCTL PCB



CN19

Drum lock motor	1	purple → Drum lock motor
+24V		
Pressurize (+24V)		→ Print pressure motor
Depressurize (+24V)		
EL LED+		→ Elevator SW LED
EL LED-	6	

CN15

	1	purple
/B		→ Print-positioning pulse motor
/A		
+24VA		
+24VA		
B		
A		
	8	

CN16

GND	→ Power Supply Unit CN3
+24V	
GND	
+5V	

CN12 → Interface board MC CN1

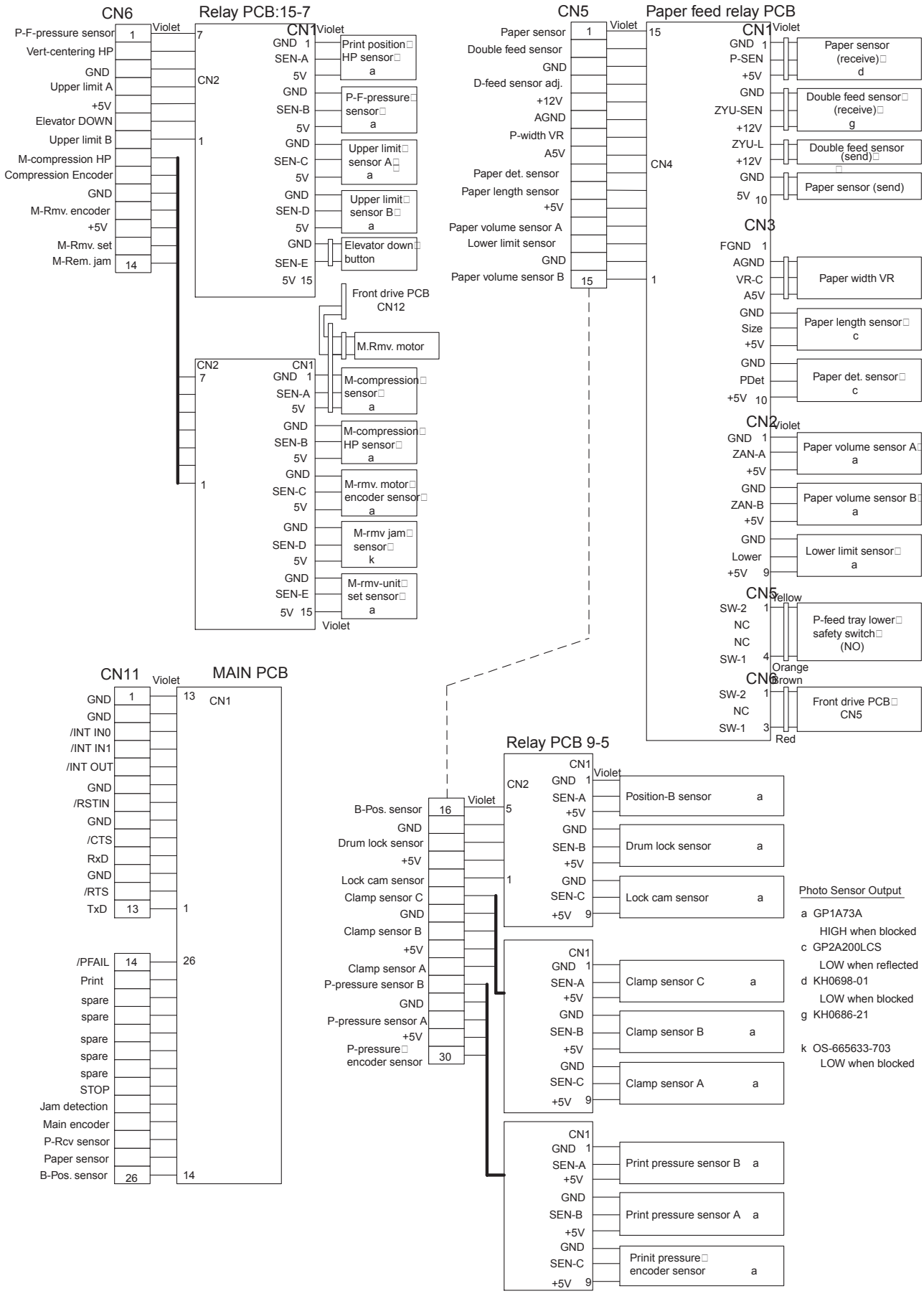
CN4 → DrumPCB CN1

CN17

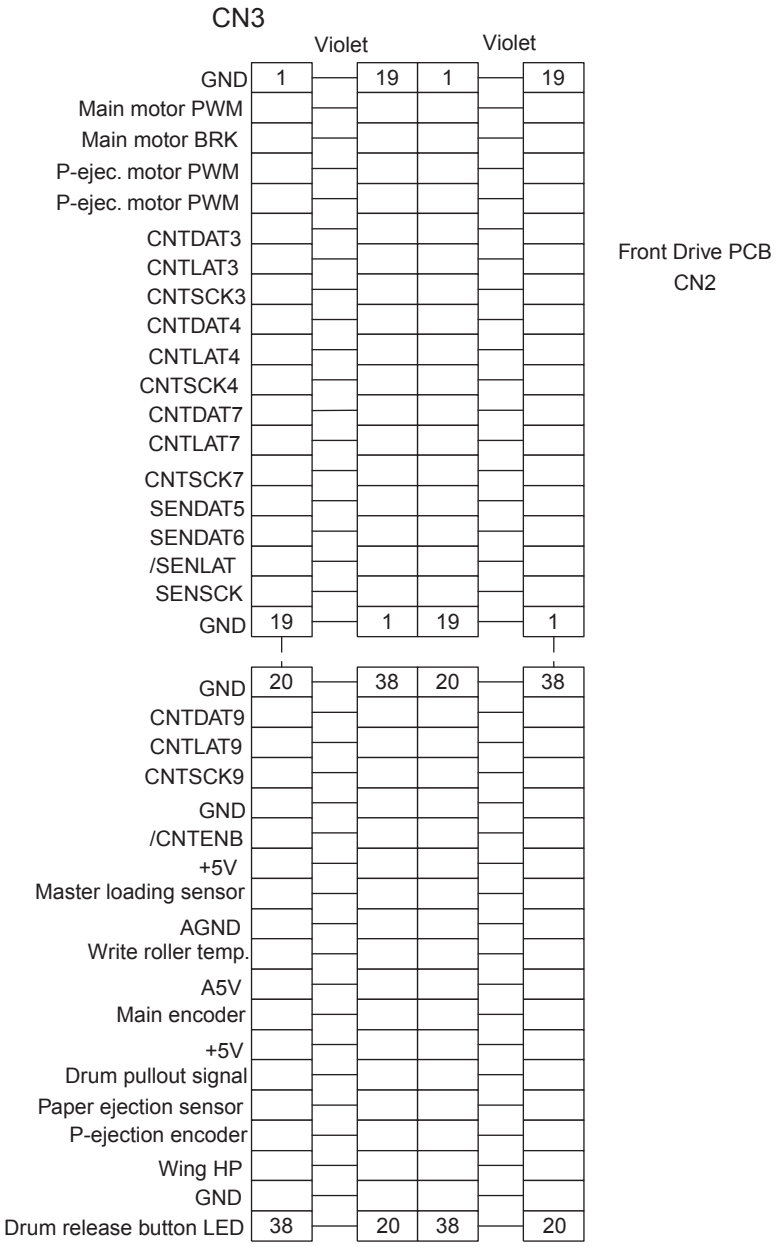
GND	→ Power Supply Unit CN12
/DALAT	
DACLK	
DATAT	
/TPHCTL	
NC	
POWERFAIL	

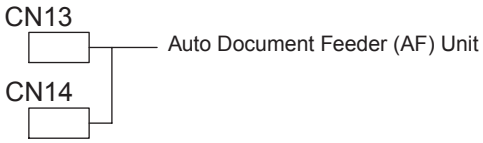
CN18 → LED Unit (JIG)

4-2. MCTL PCB - continued -

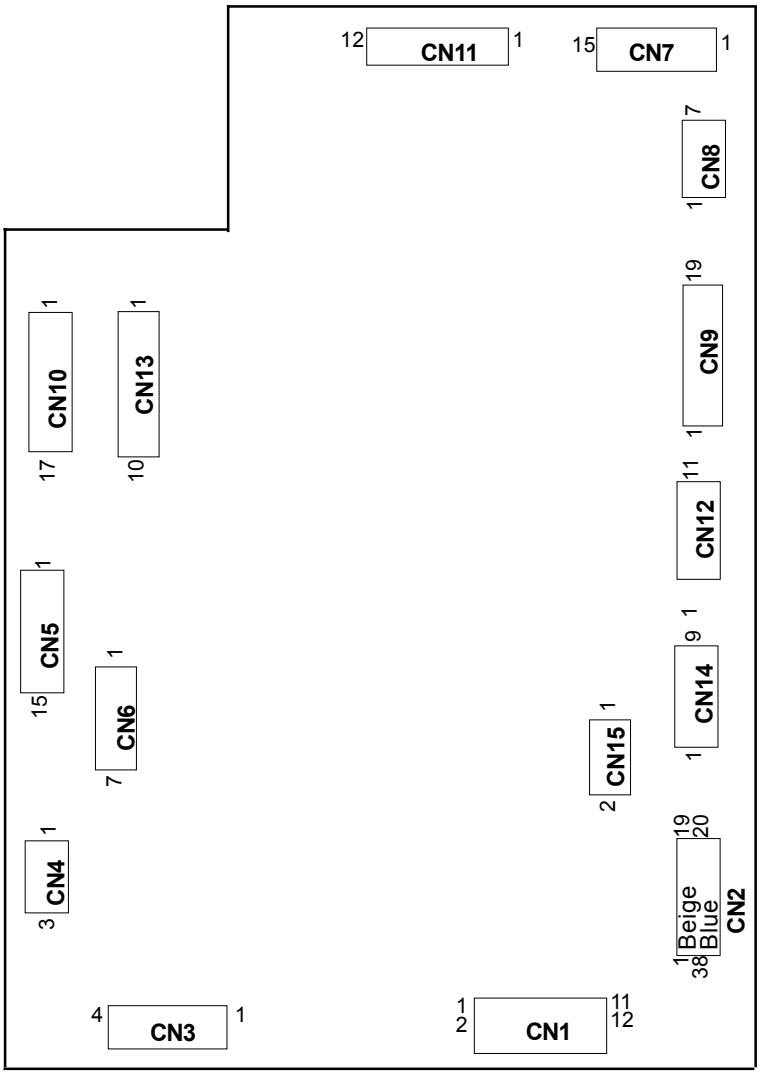


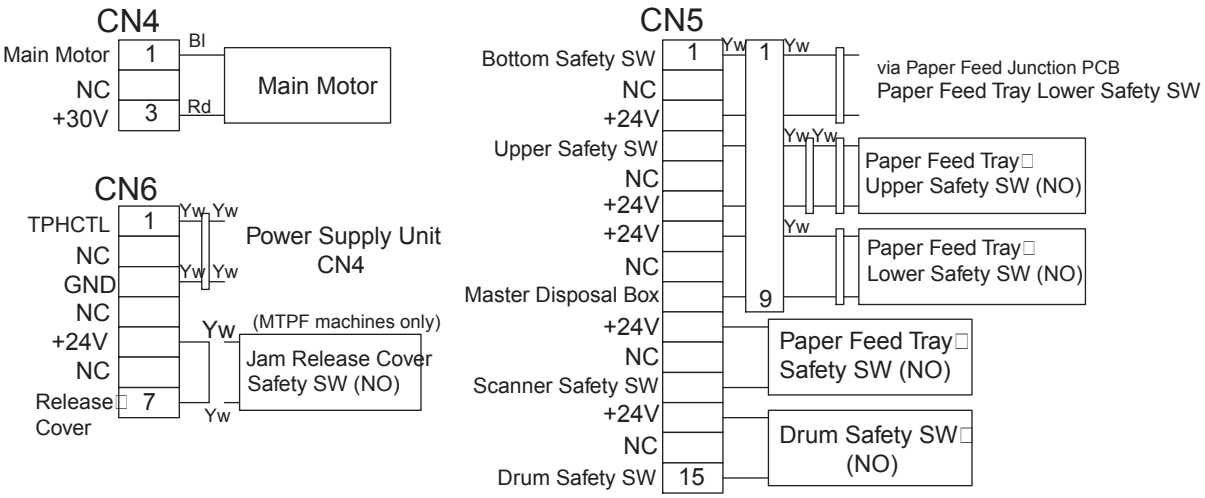
4-2. MCTL PCB - continued -



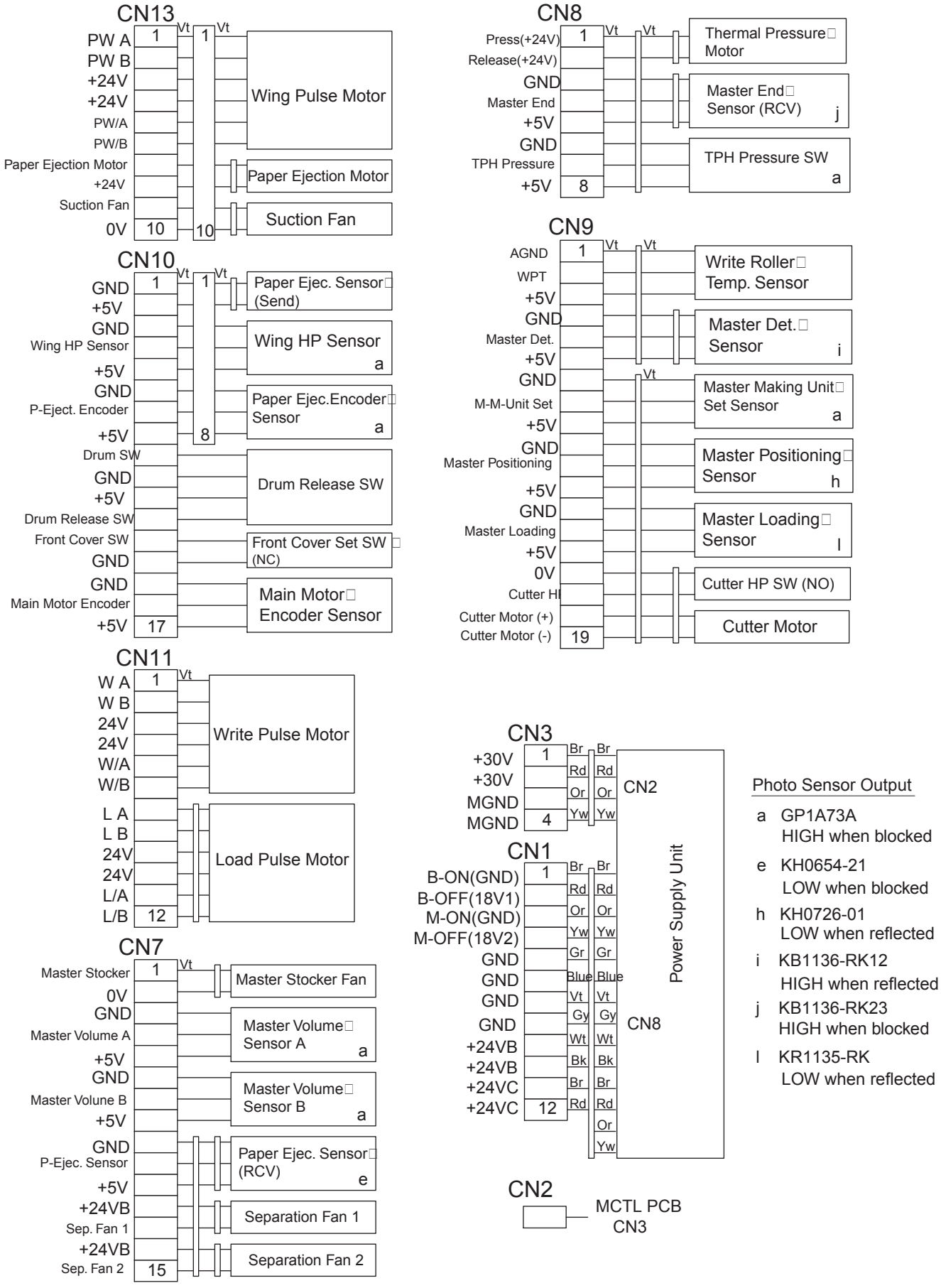


4-3. Front Drive PCB

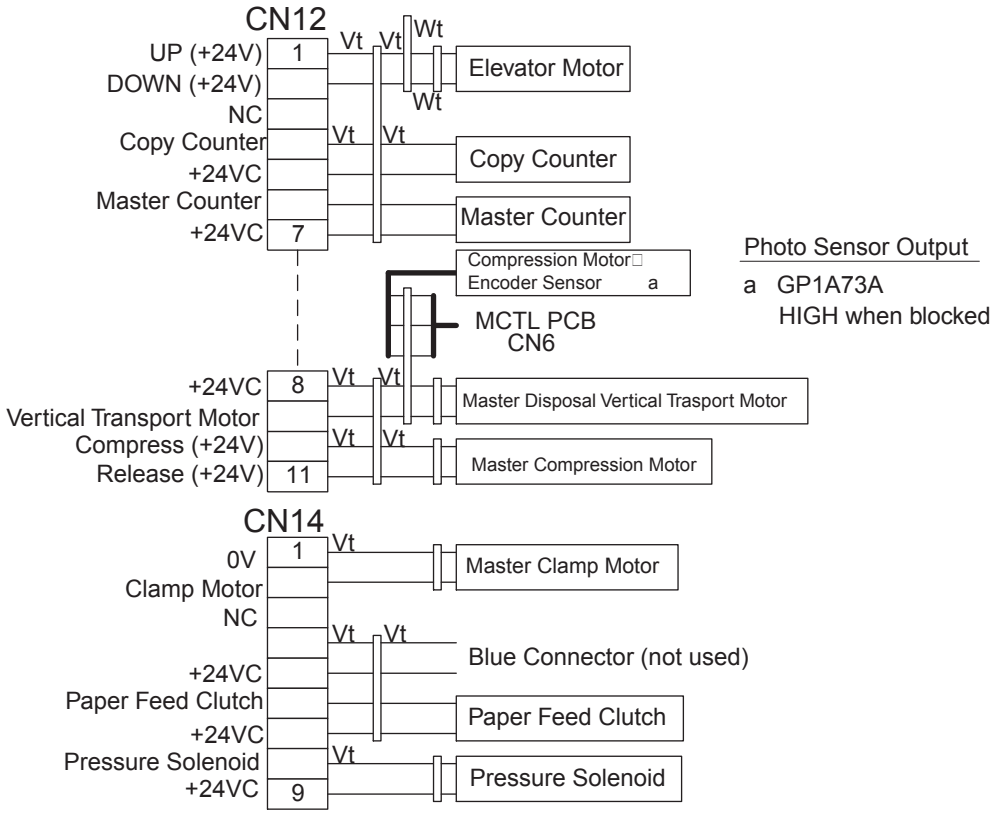




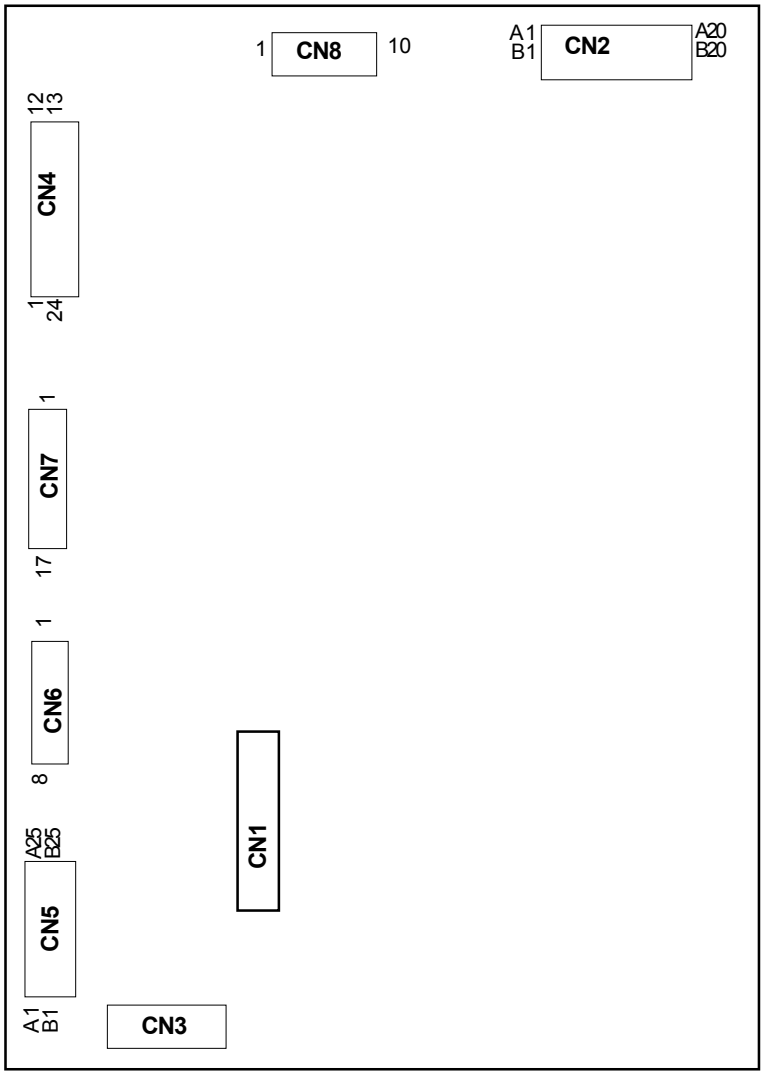
4-3. Front Drive PCB - continued -



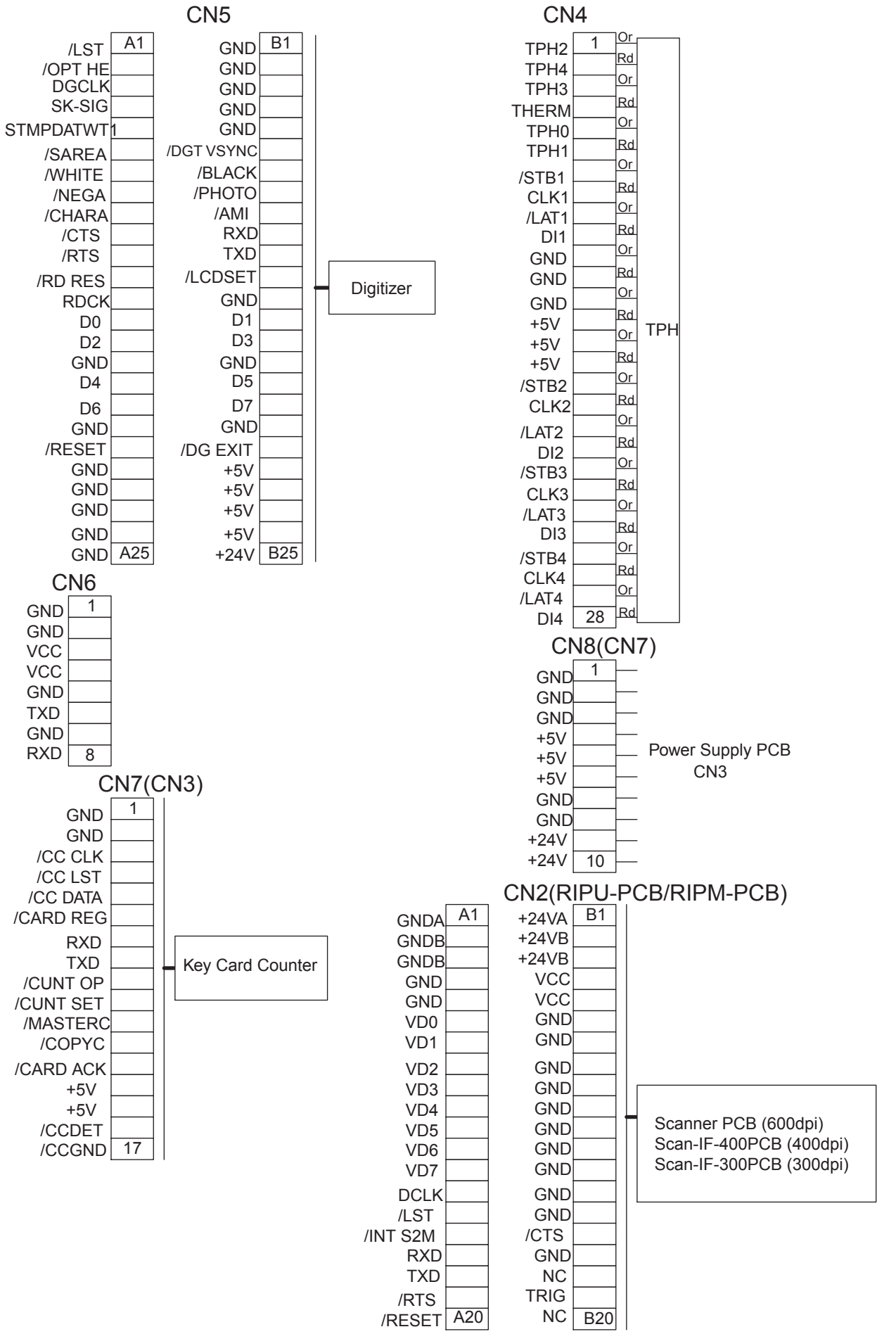
4-3. Front Drive PCB - continued -



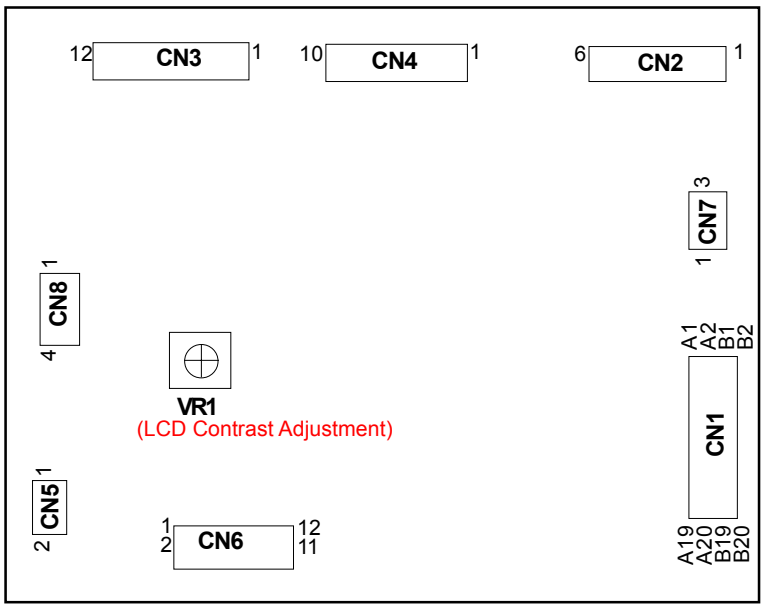
4-4. Image Processing PCB (RIPU / RIPM)

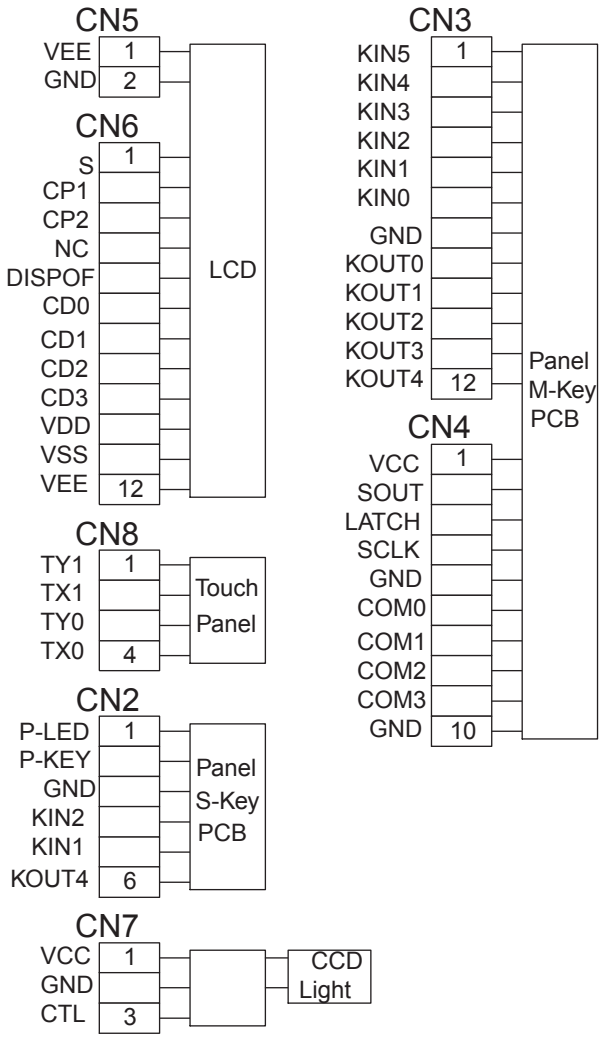


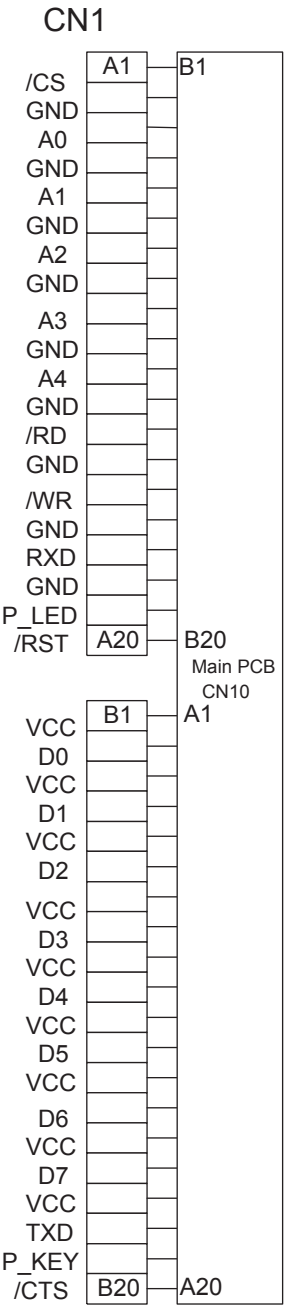
4-4. Image Processing PCB (RIPU / RIPM) - continued -



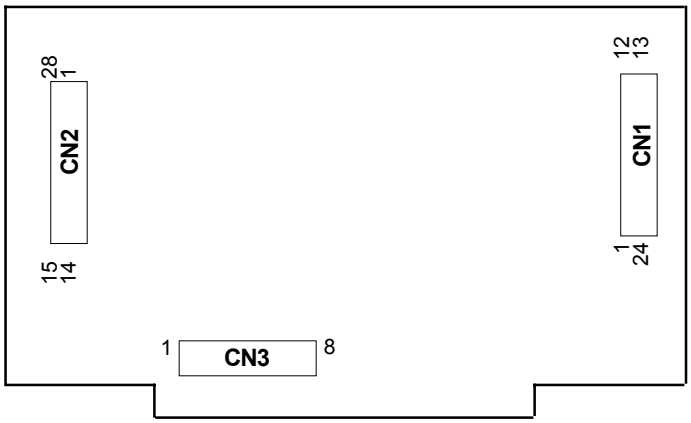
4-5. Panel CTRL PCB







4-6. Drum Control PCB



Abbreviation

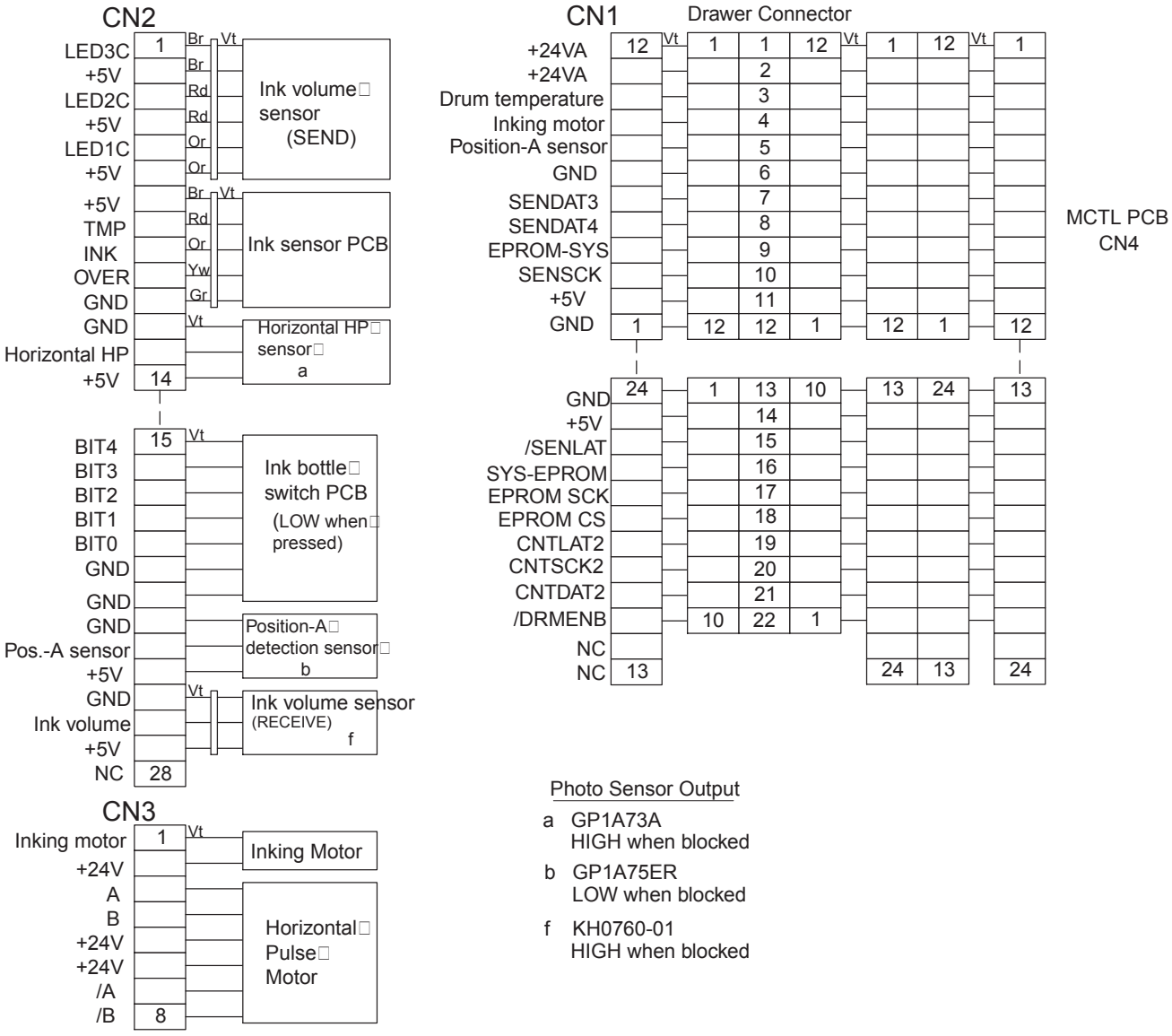


Photo Sensor Output

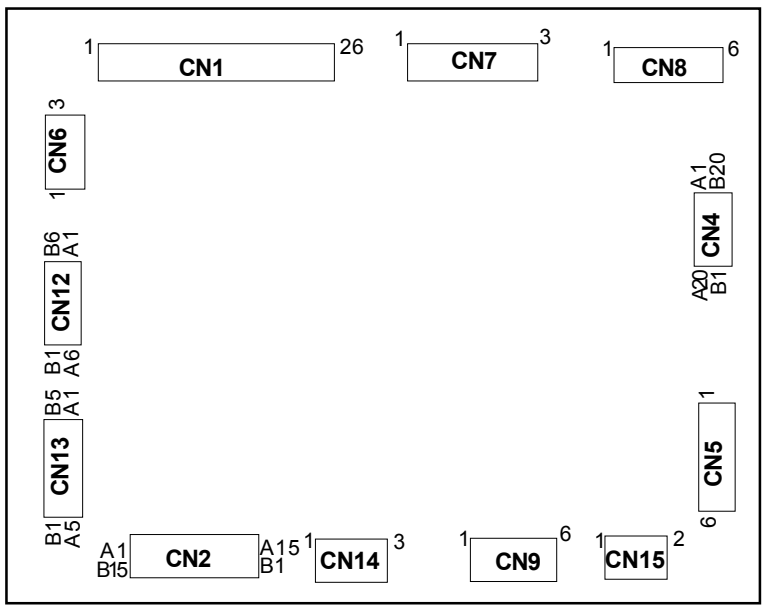
a GP1A73A
HIGH when blocked

b GP1A75ER
LOW when blocked

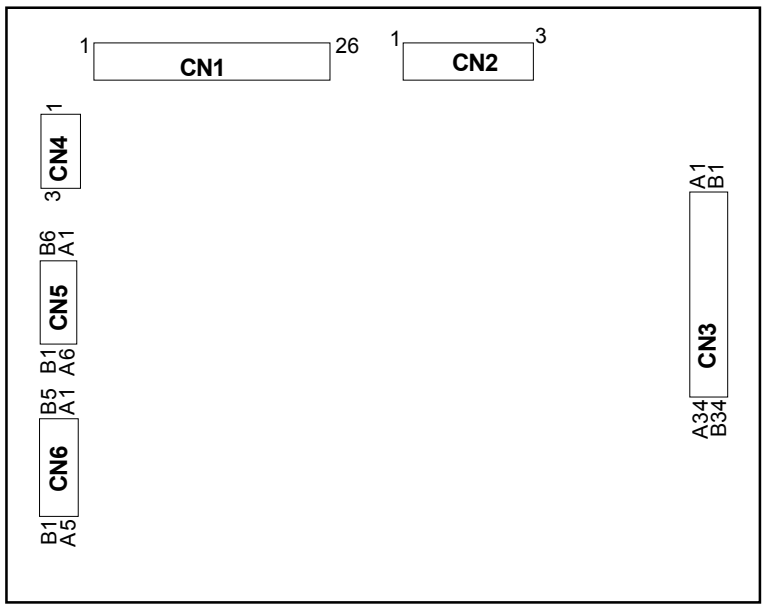
f KH0760-01
HIGH when blocked

4-7. Scanner Control PCB

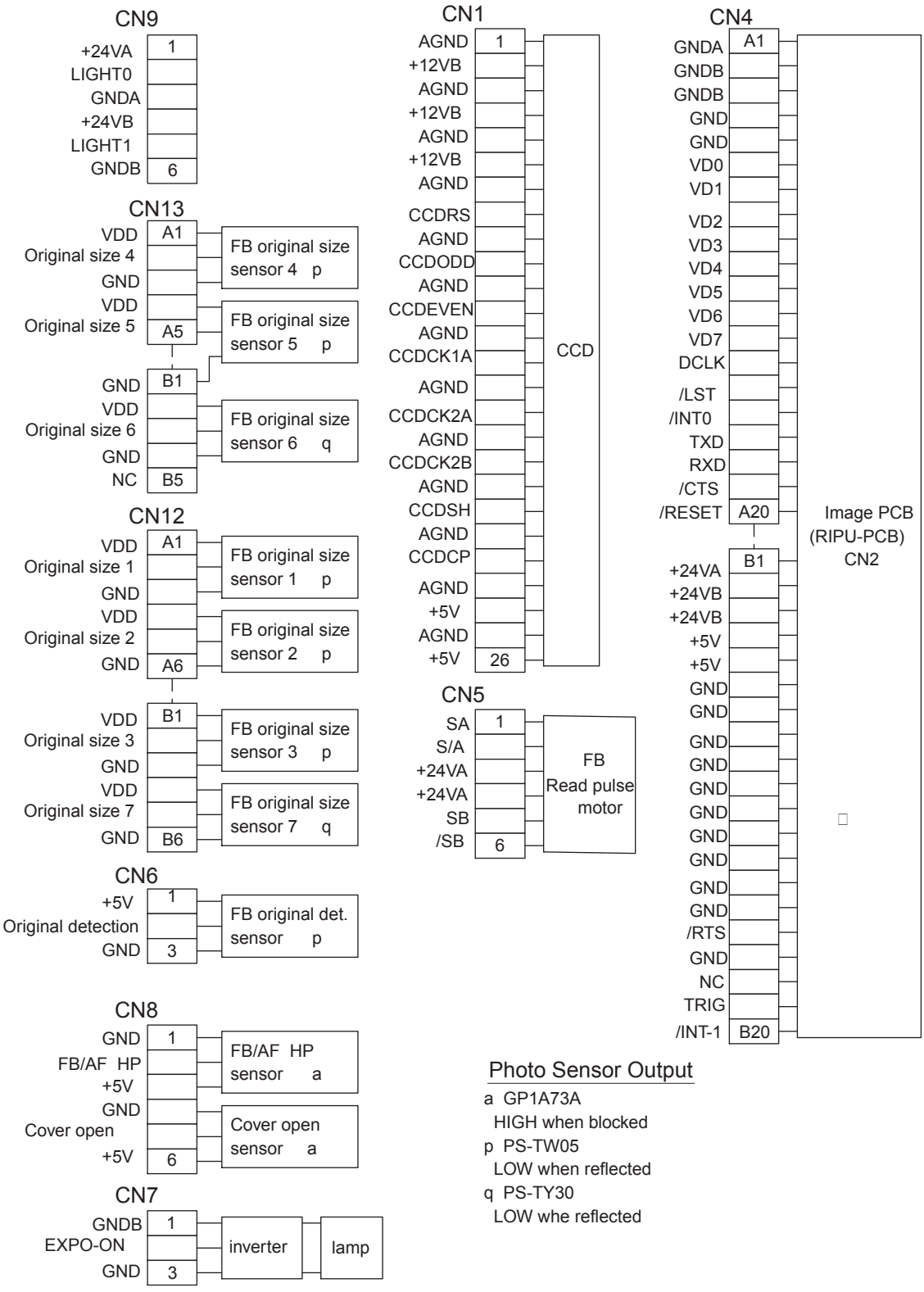
4-7-1. Scanner Control PCB for 600 dpi



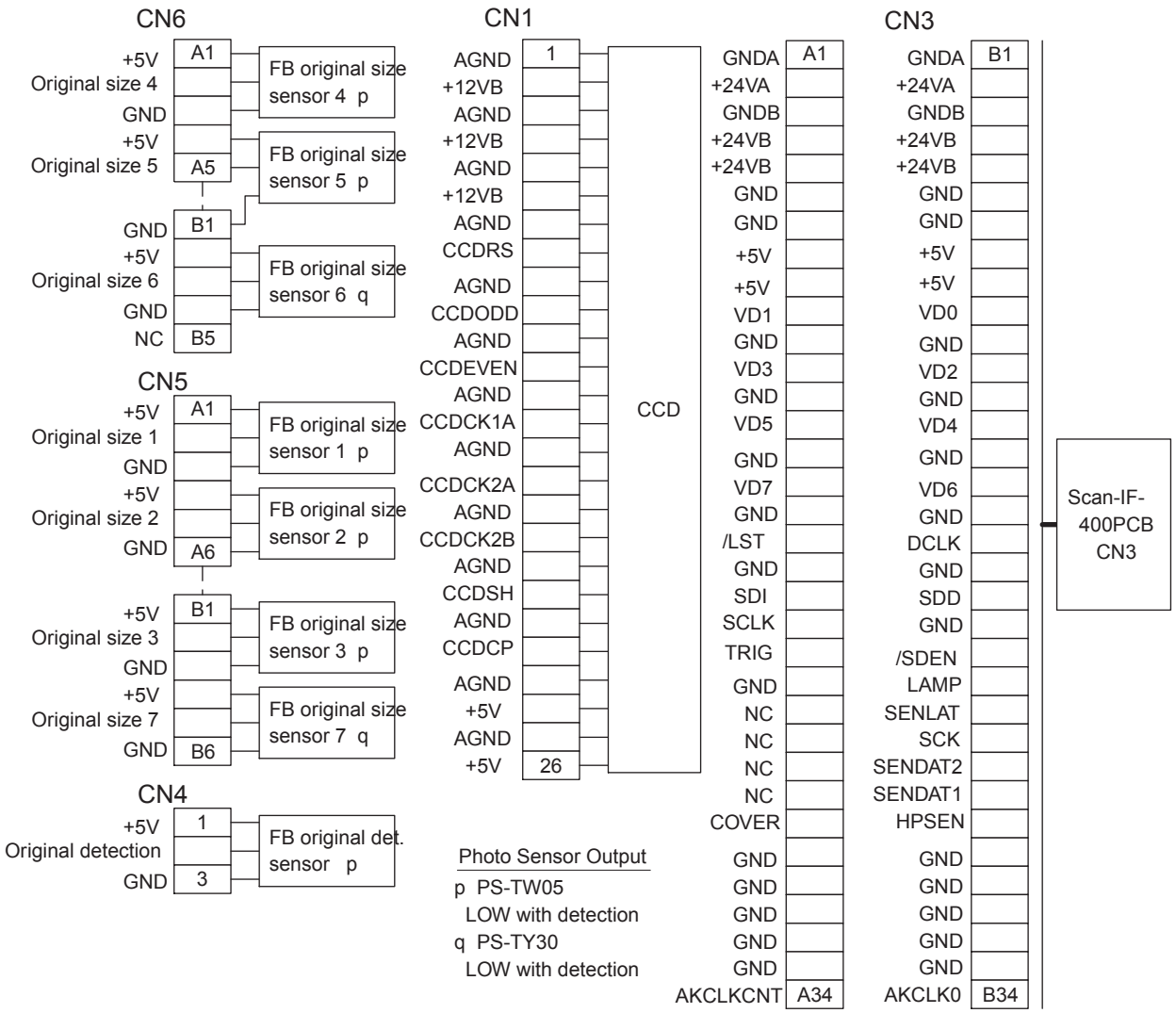
4-7-2. Scanner Control PCB for 400dpi

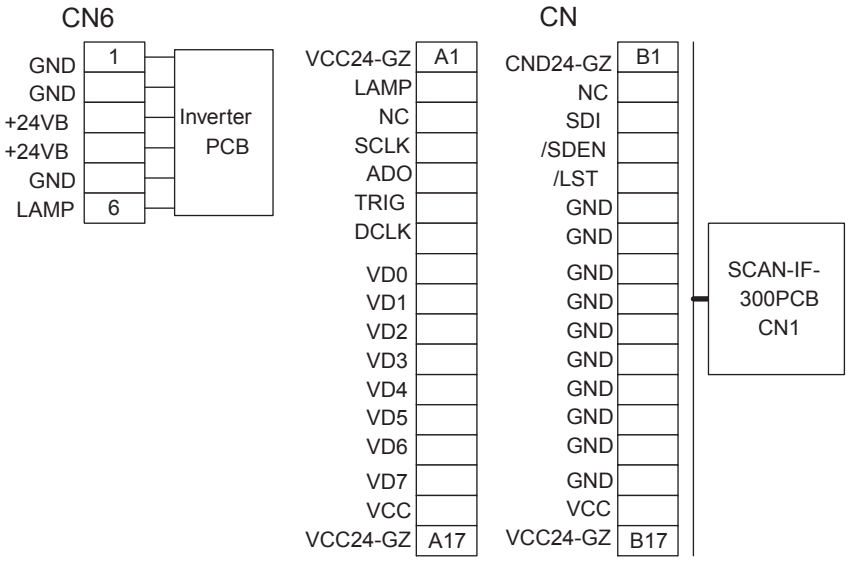


4-7-1. Scanner Control PCB for 600 dpi - continued -

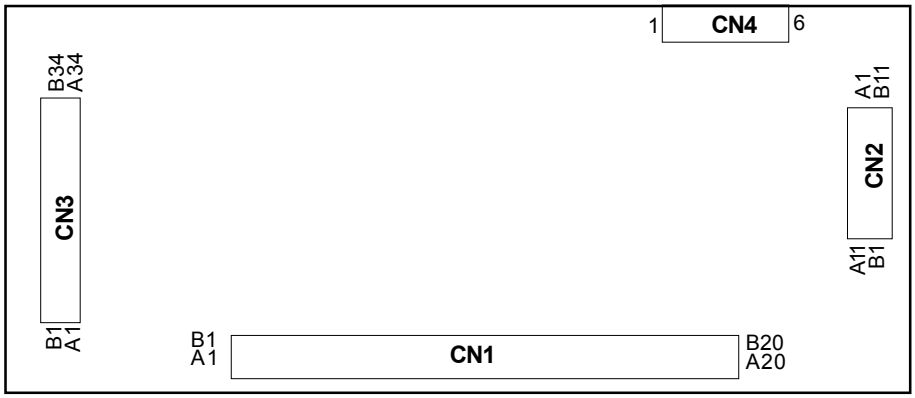


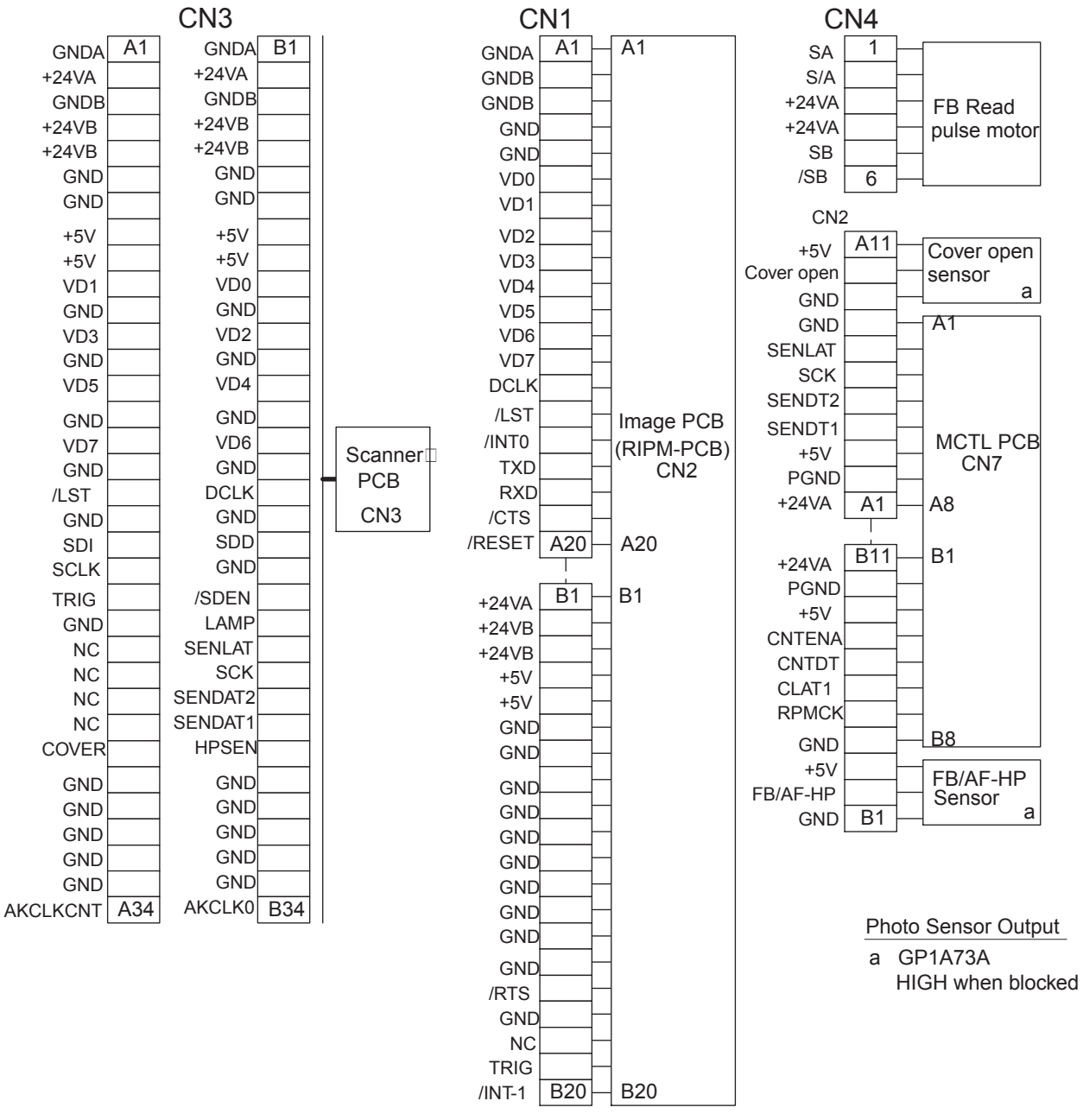
4-7-2. Scanner Control PCB for 400dpi - continued -



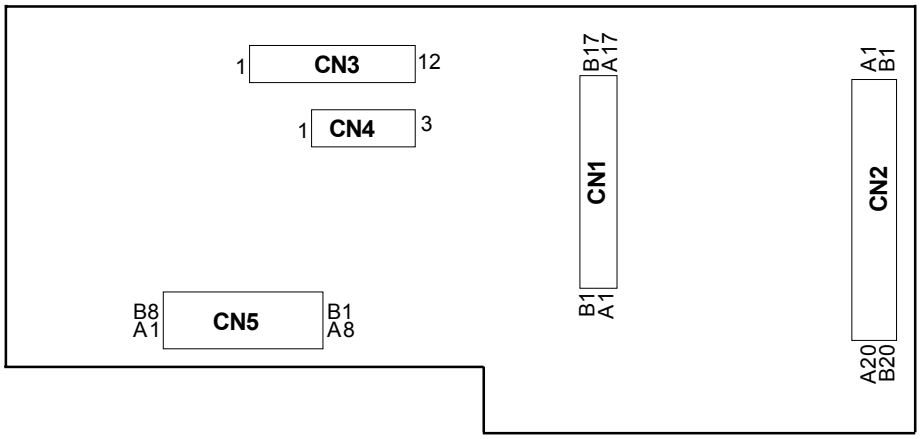


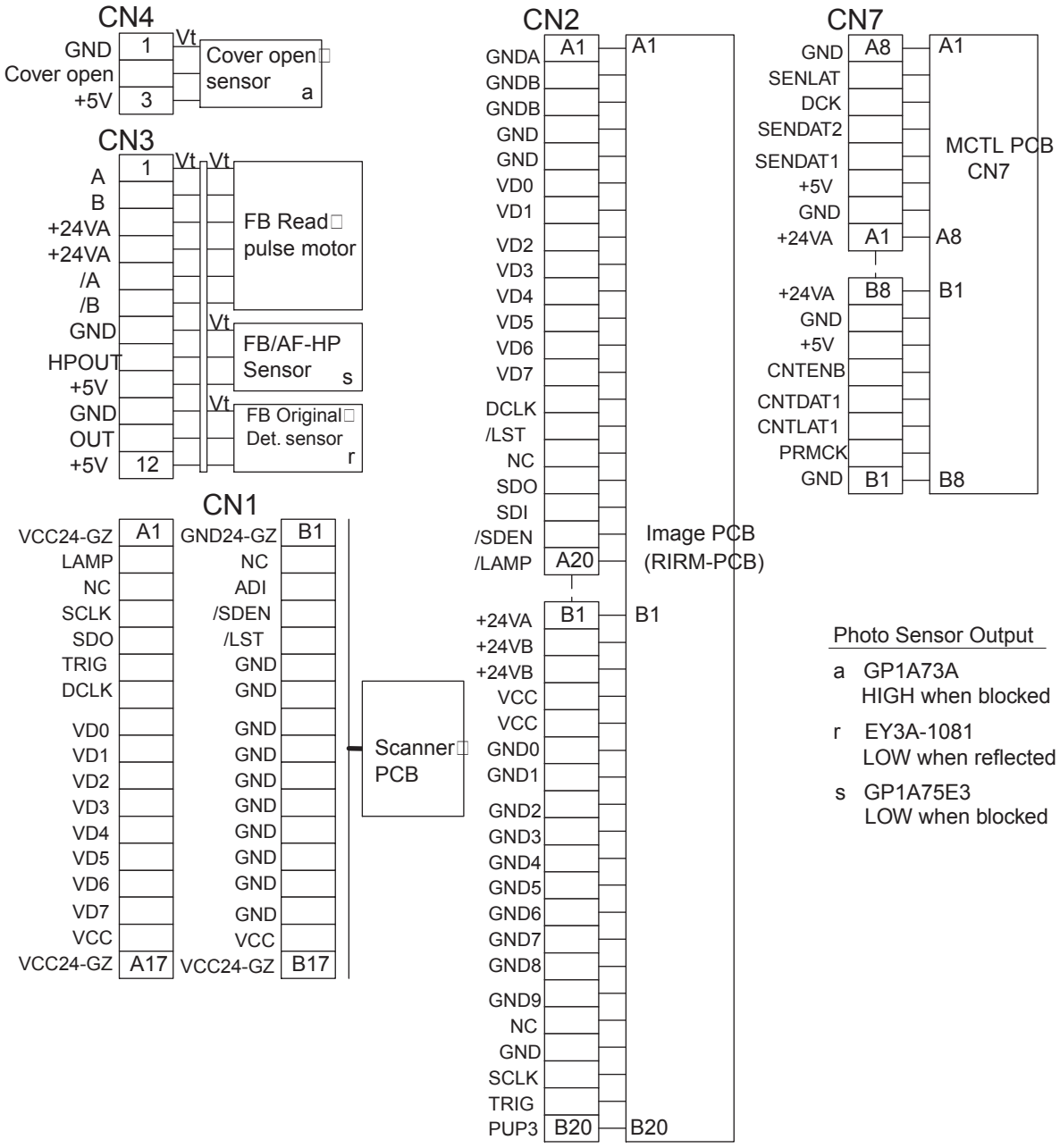
4-7-3. Scan 400 IF PCB



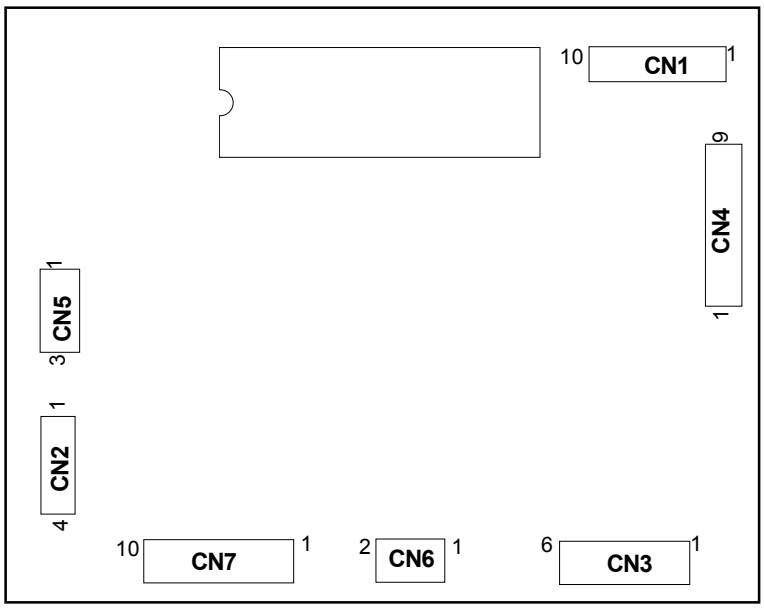


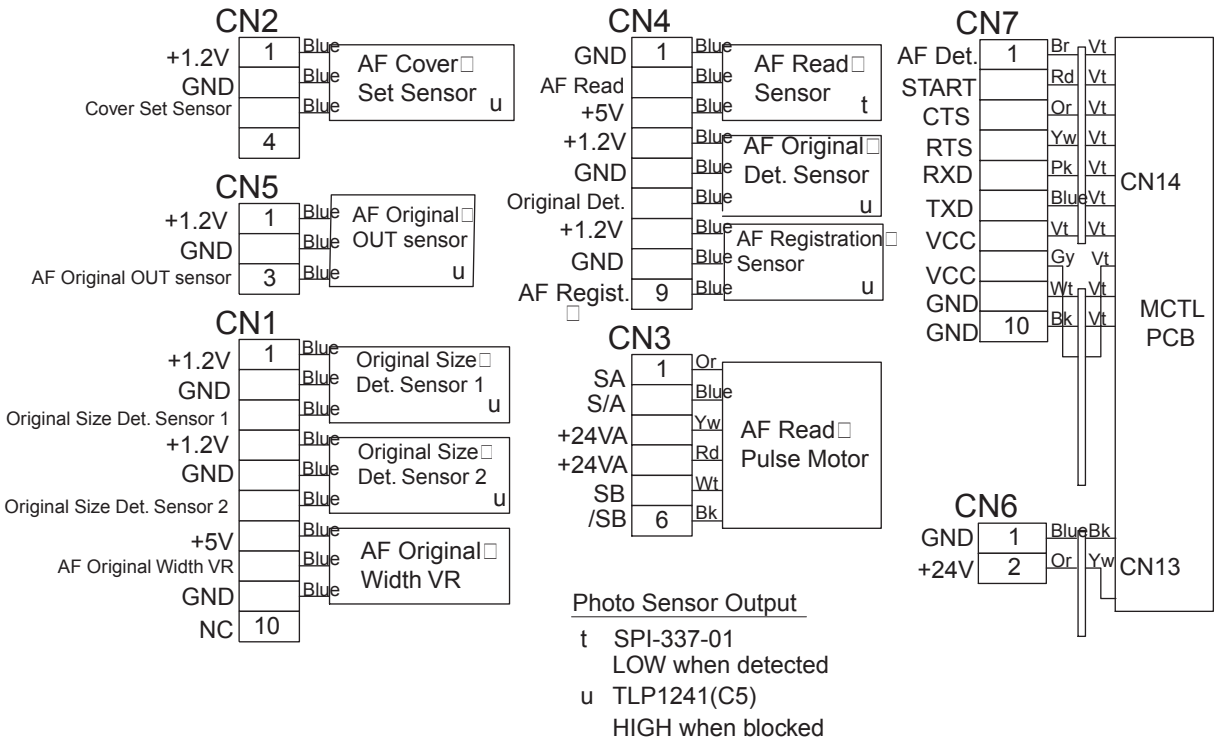
4-7-5. Scan 300 IF PCB



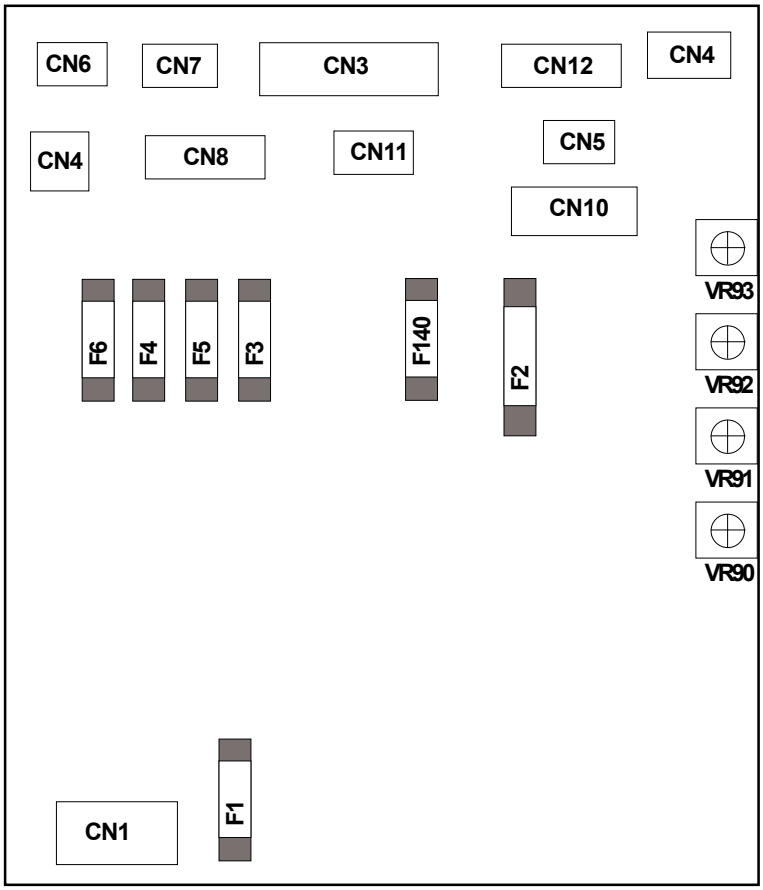


4-8. AF Control PCB





4-9. Power Supply PCB

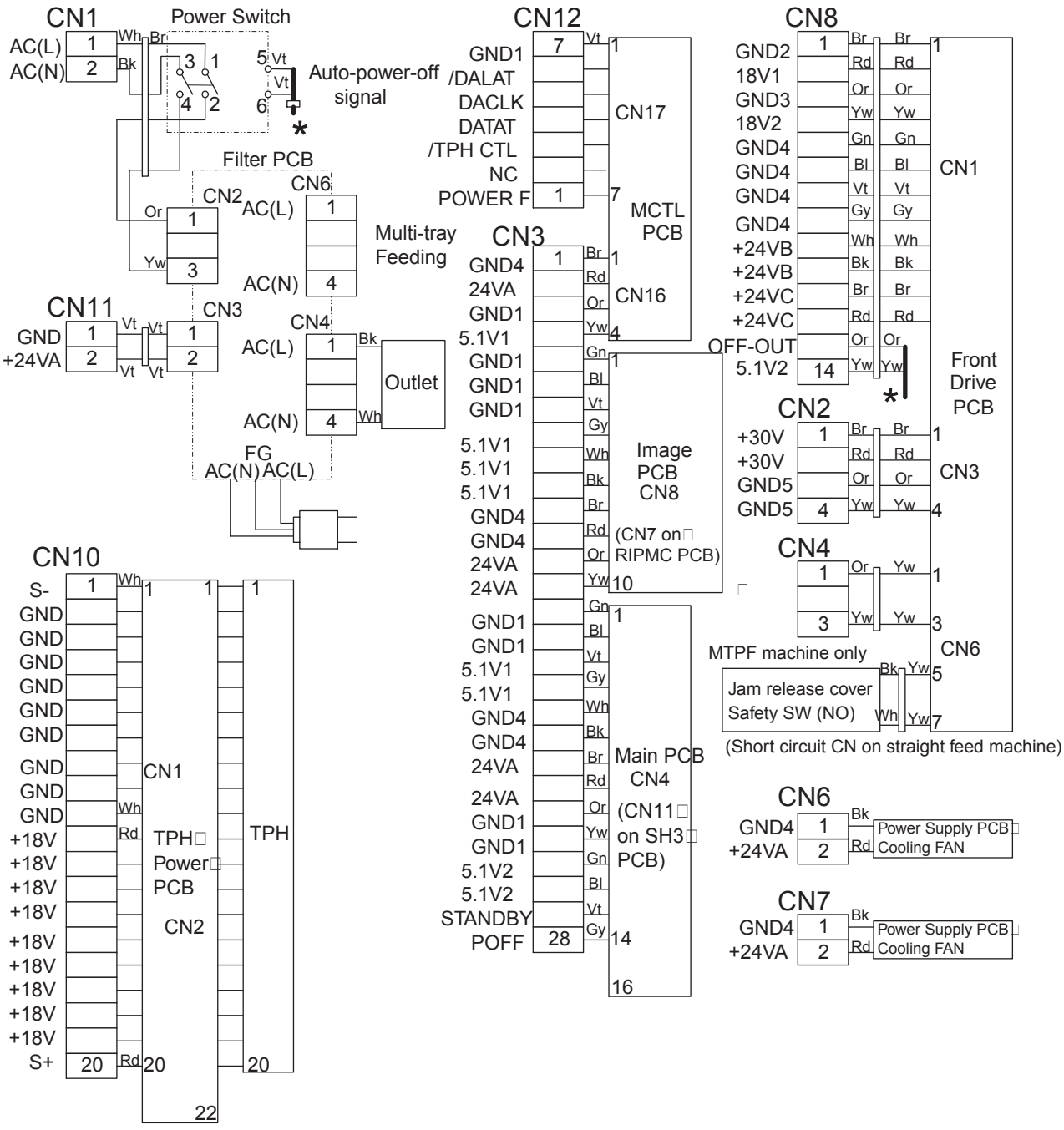


FUSE	100V Machine	200V Machine
F1	125V 10A	250V 5A
F2	125V 15A	250V 15A
F3	125V 3.15A	250V 3.15A
F4	125V 6.3A	250V 6.3A
F5	125V 3.15A	250V 3.15A
F6	125V 3.15A	250V 3.15A
F140	125V 3.15A	250V 3.15A

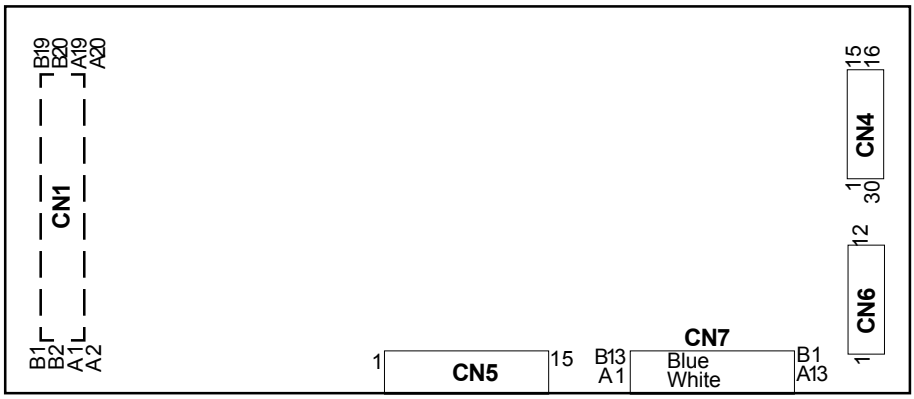
Fuse System

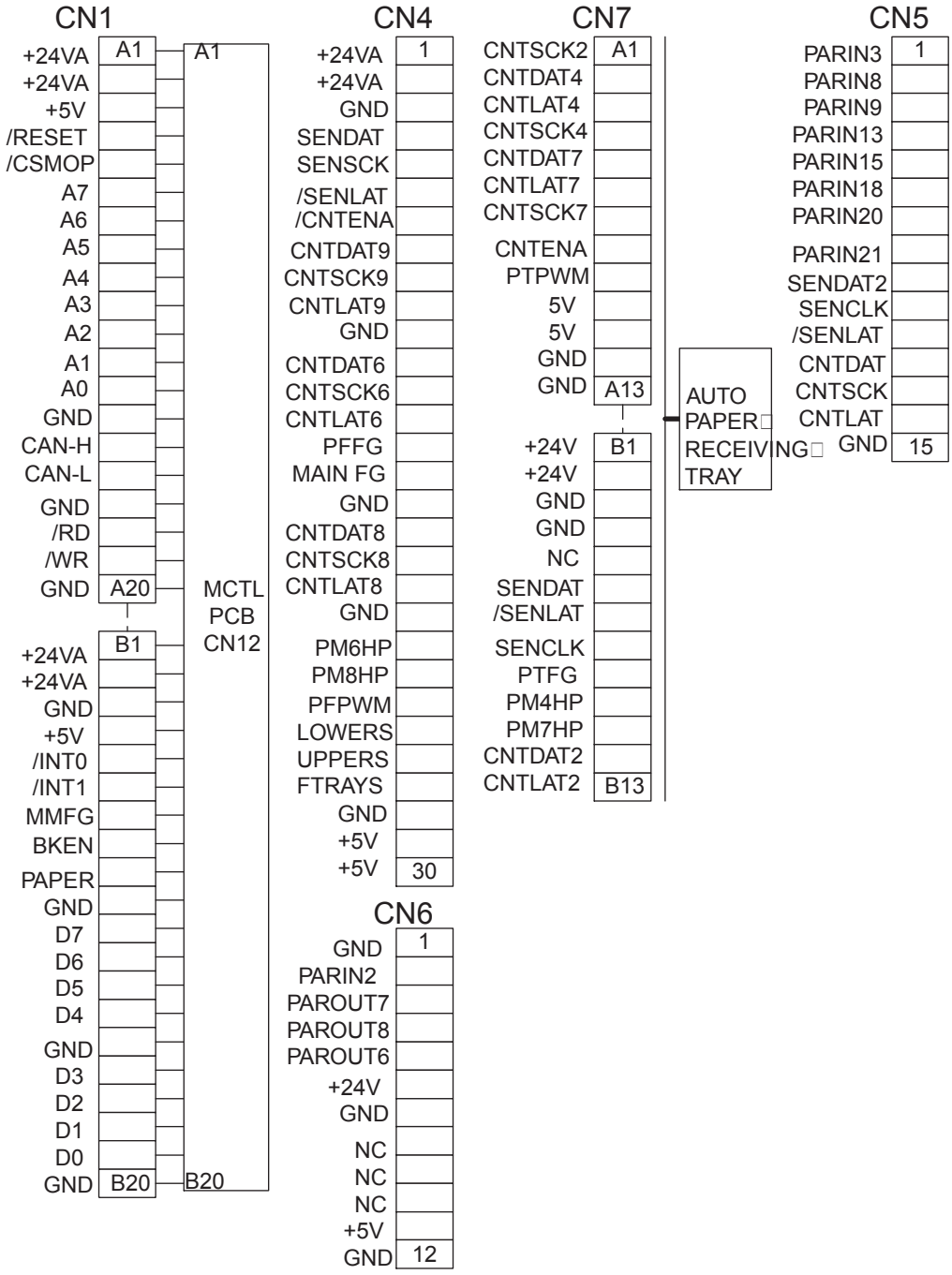
Fuse No.	**100V** machine	**200V** machine	System	Components
F1	125V 10A	250V 5A	Main	All components
F2	125V 15A	250V 15A	30V	Main Motor
F3	125V 3.15A	250V 3.15A	24VA	AF Read Pulse Motor FB Read Pulse Motor Print Drum Locking Motor Print Pressure Motor Vertical Position Pulse Motor Horizontal Position Pulse Motor Multi Tray Feeder Inking Motor
F4	125V 6.3A	250V 6.3A	24VB	Elevator Motor Load Pulse Motor Paper Ejection Motor Paper Ejection Wing Motor Separation Fan Storage Fan Suction Fan Thermal Pressure Motor Write Pulse Motor
F5	125V 3.15A	250V 3.15A	24VC	Clamp Motor Cutter Motor Master Compress Motor Master Disposal Motor Paper feed clutch Pressure Solenoid
F6	125V 3.15A	250V 3.15A	24VD	N.C.
F140	125V 3.15A	250V 3.15A	5V	Sensors

4-9. Power Supply PCB - continued -

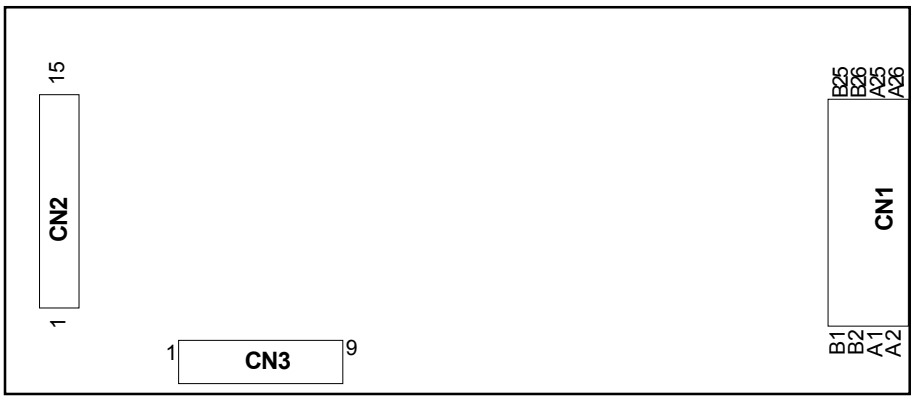


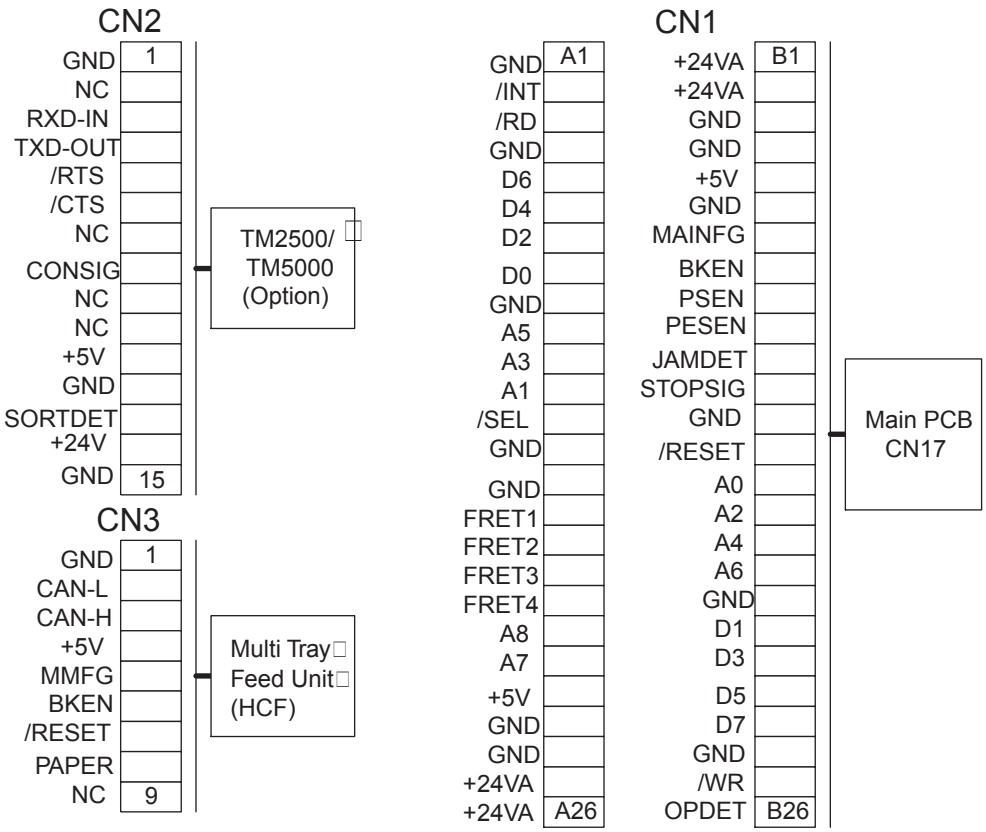
4-10. SMLOP PCB (MC Option Control Board)



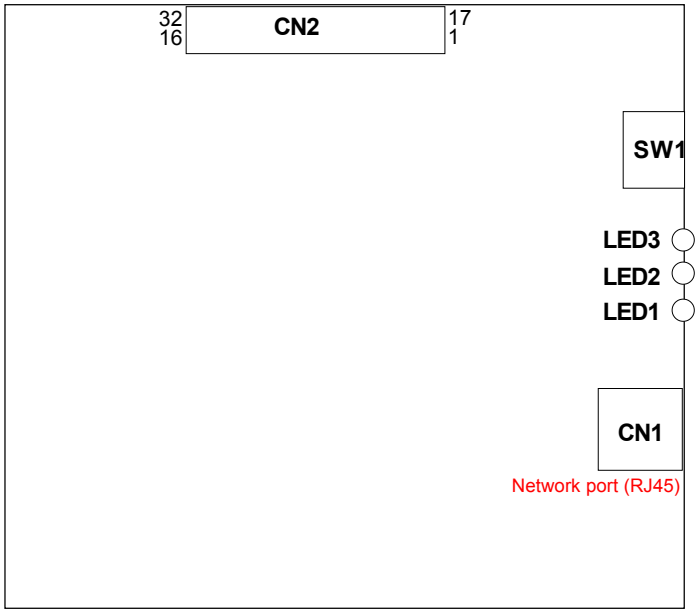


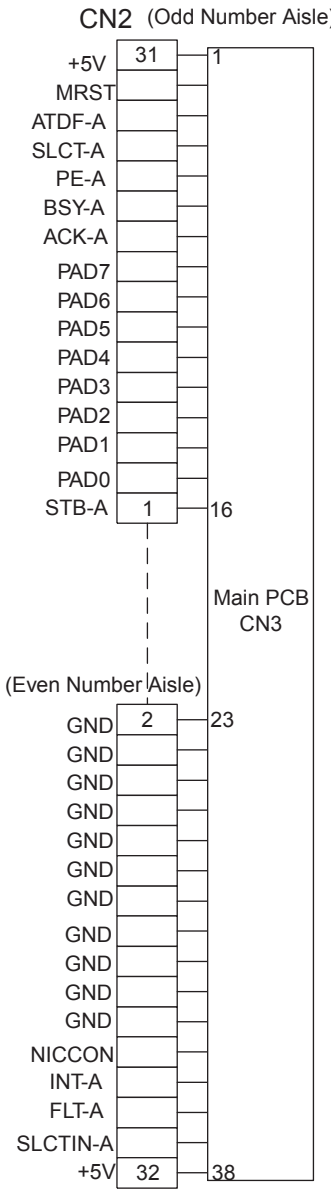
4-11. ROSE/OP PCB (SH Option Control Board)



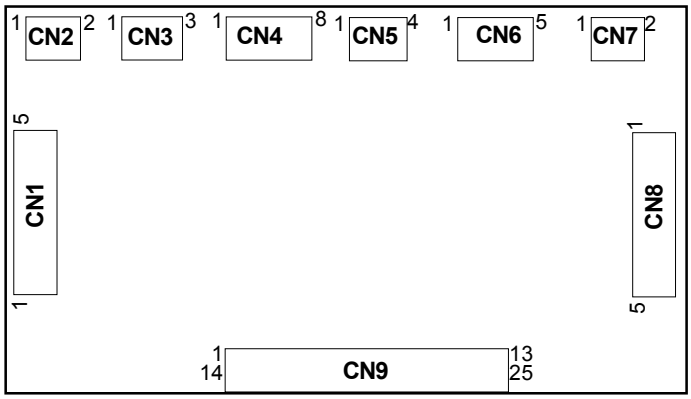


4-12. RISORINC NET-B





4-13. Auto Tray CTL PCB



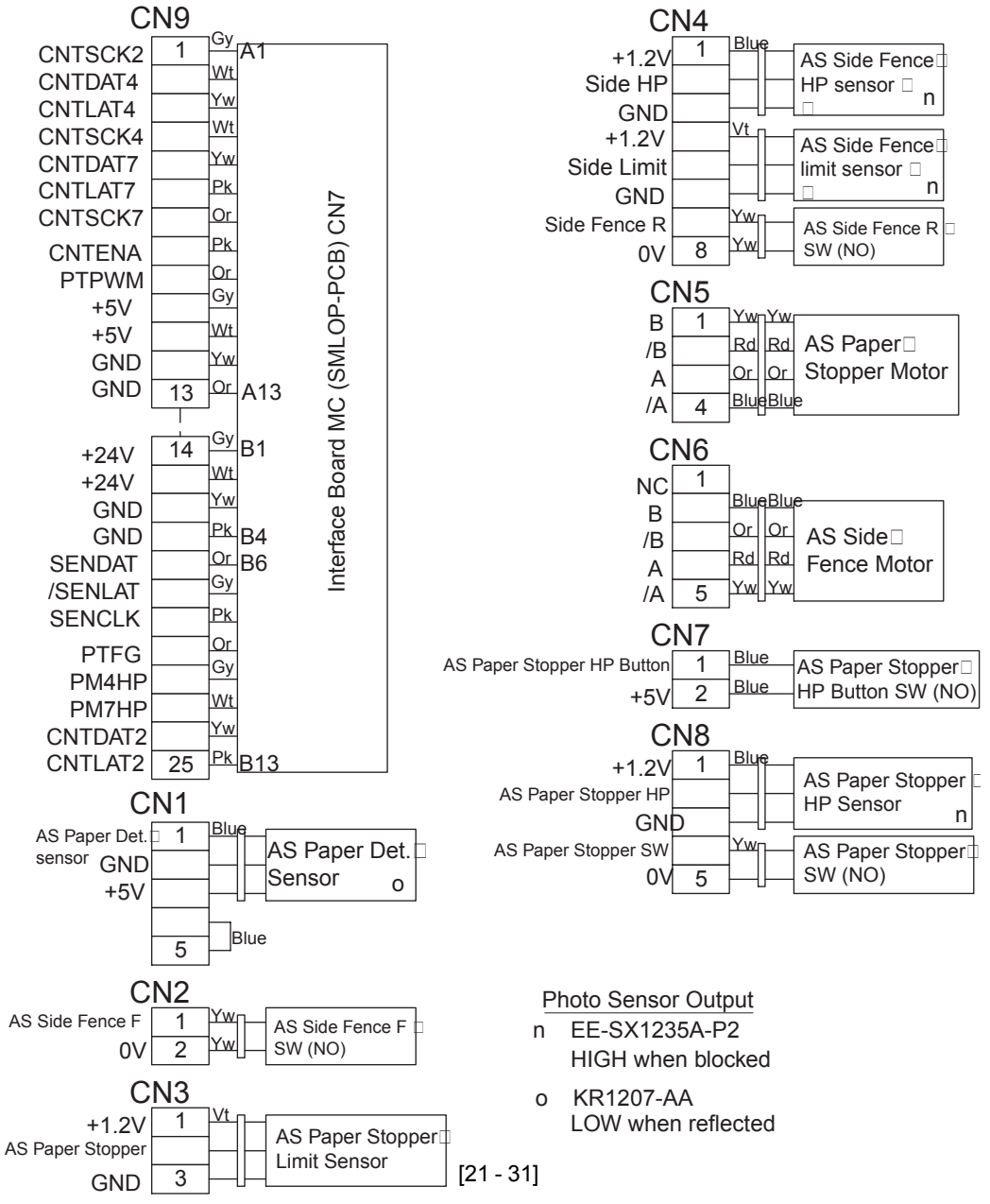


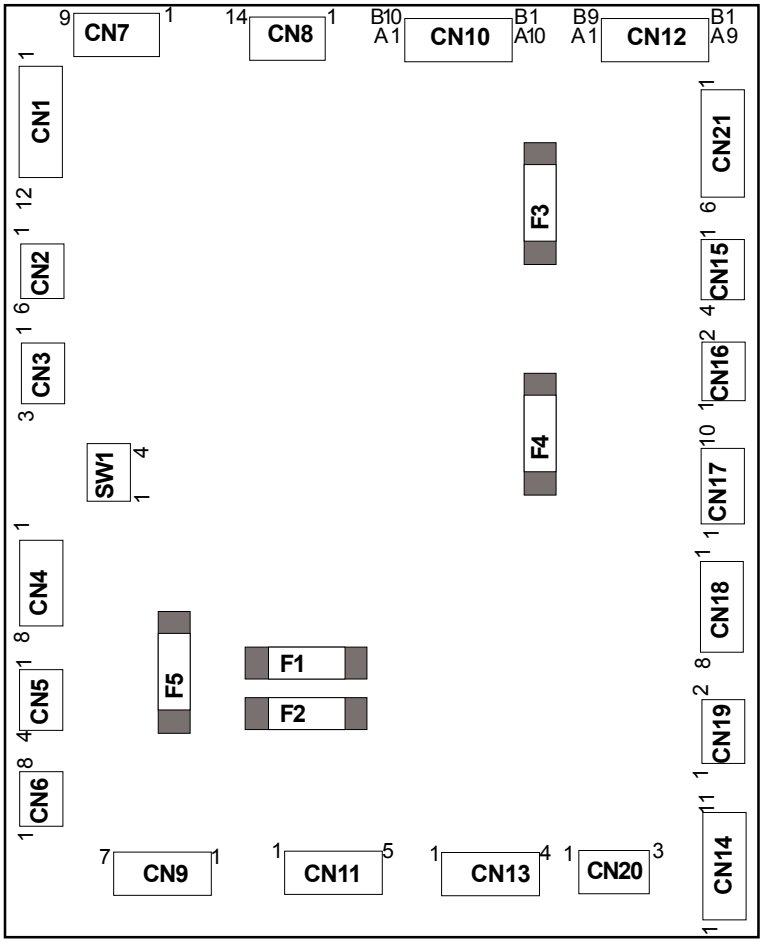
Photo Sensor Output

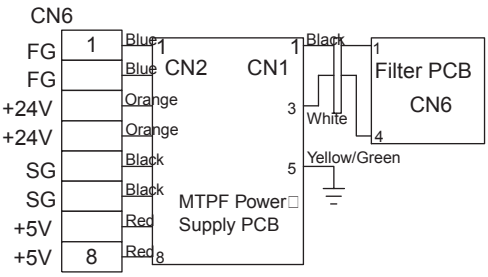
n EE-SX1235A-P2
HIGH when blocked

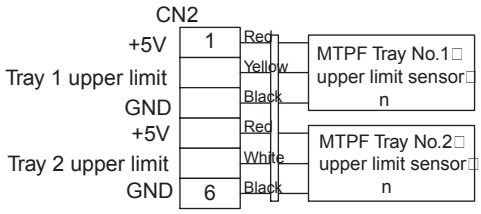
o KR1207-AA
LOW when reflected

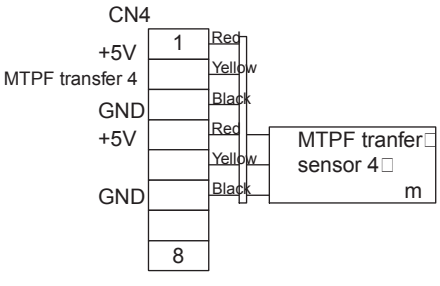
4-14. HCF CTL PCB

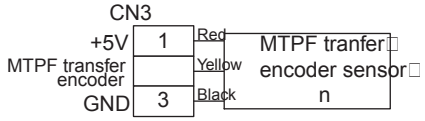
F1:250V 1.0A
F2:250V 1.0A
F3:250V 1.0A
F4:250V 2.5A
F5:250V 6.3A











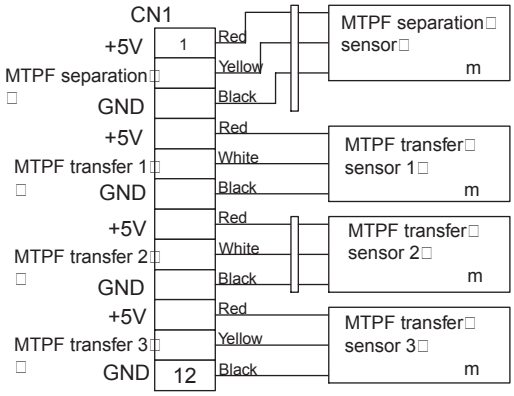


Photo Sensor Output

m GP2A25
LOW when reflected.
n EE-SX1235A-P2
HIGH when blocked.

4-14. HCF CTL PCB - continued -

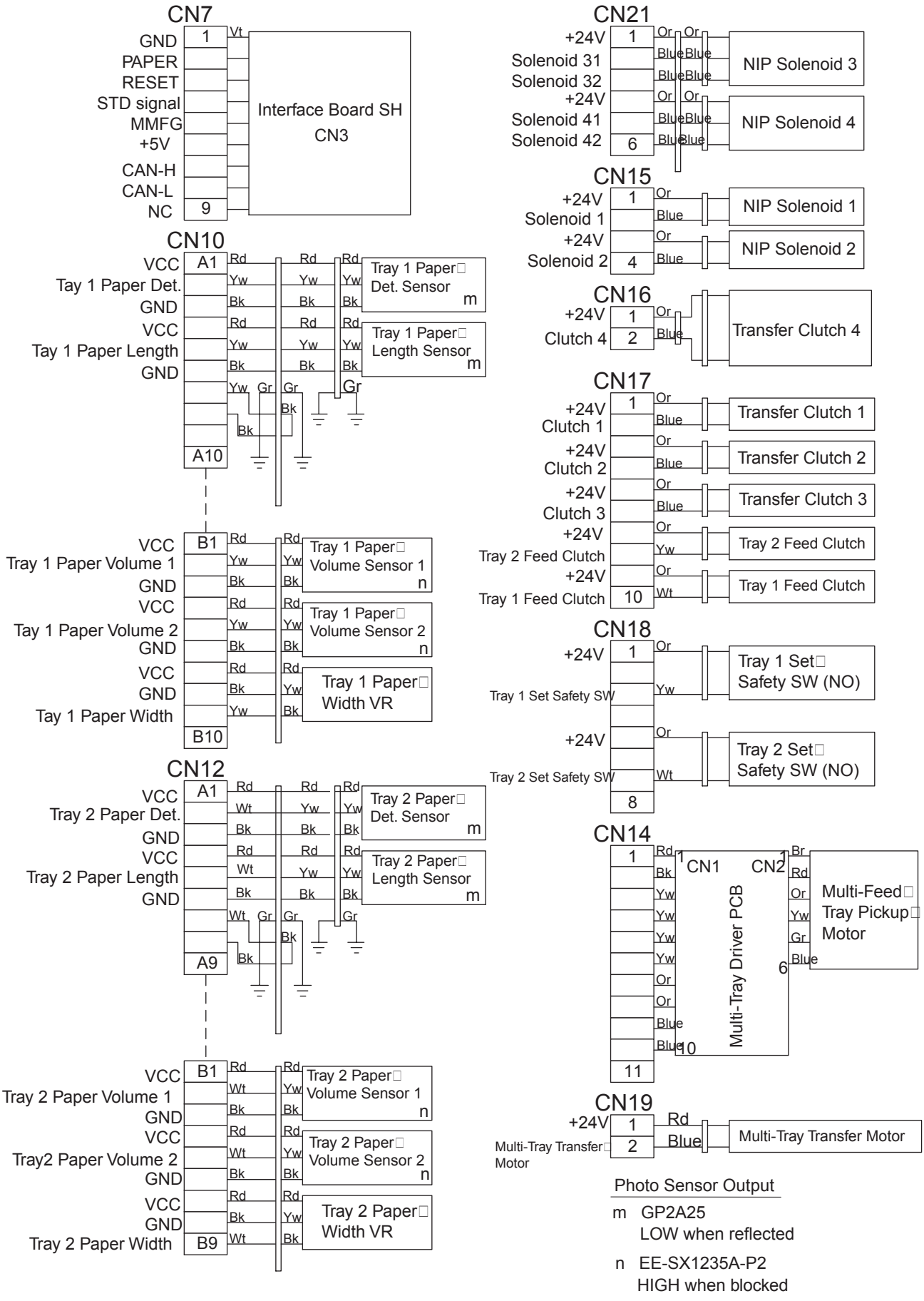


Photo Sensor Output

m GP2A25
LOW when reflected

n EE-SX1235A-P2
HIGH when blocked

4-14. HCF CTL PCB - continued -