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D127/D128
Service Training

Product Overview

S-C5

Slide 1

Draft started: 12 January 2012

First draft completed: 23 January 2012

Release: 30 January 2012

Machine Appearance

Slide 2

No additional notes.

Operation Panel - 1

- **Includes a 4.3" color touch panel.**
- **The home button returns to the home screen from anywhere.**
- **Three function keys are available. They can be assigned designated functions.**
- **An SD/USB slot is built-into the right side of the panel as standard equipment (not an optional unit).**

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- SP5074 can be used to customize the application that appears when the Home button is pressed.
- Function keys:
  - Nothing is assigned when the machine leaves the factory.
  - If the browser unit is installed, a URL can be assigned to a function key.

Operation Panel - 2

- **Status key: When the error lamp lights, press this key. The machine displays a list that shows the status of all jobs**
- **Energy saver key: There is no operation panel power button, only this energy saver button. Press this once, and the machine goes to the energy saver mode.**
  - To cut the power, turn off the main switch; the machine goes into the safe shutdown process.
  - Energy saver lamp: Blinks slowly when the machine is in energy saver mode. Stays off when the machine is in normal operation mode (full power).
- **Stop key: For the GW+ controller, this button can be used to stop all types of jobs, including printer, fax, etc.**
  - With the old GW controller, this button can only be used to stop copy jobs.

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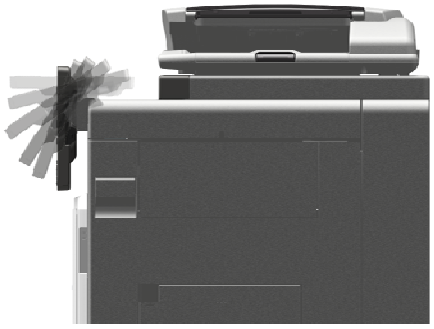
No additional notes

Operation Panel - 3



- The angle of the operation panel can be changed.

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No additional notes

What's new at a glance

	S-C4.5 (D115/D116)	S-C5 (D127/D128)
		
Speed:	20 cpm	30 cpm
Panel:	4 line panel	4.3 inch Color Touch
Size (mm): (w x D x H)	485 x 450 x 481	476 x 450 x 451

- The S-C5 also has a new ARDF (same as used on the D117/D118) and the front cover appearance has changed.

Slide 6

No additional notes

Names and Codes

Design name	Product code	Product names
Stella-C5 SP (Model S-C5 SP)	D127	Ricoh Aficio MP 301SP Gestetner MP 301SP nashuatec MP 301SP Rex-Rotary MP 301SP infotec MP 301SP Lanier MP 301SP Savin MP 301SP
Stella-C5 SPF (Model S-C5 SPF)	D128	Ricoh Aficio MP 301SPF Gestetner MP 301SPF nashuatec MP 301SPF Rex-Rotary MP 301SPF infotec MP 301SPF Lanier MP 301SPF Savin MP 301SPF

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No additional notes.

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Who Will Use This Model

- **Small office users (3-10 people) or individuals (as a personal business machine).**
- **Mid to large sized offices (10-50 people) as a work group division printer/scanner.**
- **Mid to large sized offices as a business personal machine.**
- **This machine has these benefits:**
  - Compact size
  - Quick warm up time
  - Color scan to E-mail feature
  - Standard duplex printing (both scan and print)
  - Copier/printer/color scanner

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No additional notes

Machine Configuration

- ARDF (D606) is standard except for EU. (Option for D127 in EU.)
- Platen (D607) is standard for D127 in EU.
- Paper bank (D661) is optional. Up to 2 can be added.
- Handset (D645) for NA only

(See next slide for internal system components/options.)

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No additional notes

System Components & Options

[A]: Controller box (standard)

[B]: SD cards for slot 1 (x3)

- Printer/scanner unit (D468, standard)
- FAX connection unit (D660, option for D127)
- Browser unit (D569, standard)

[C]: SD cards for slot 2 (x2)

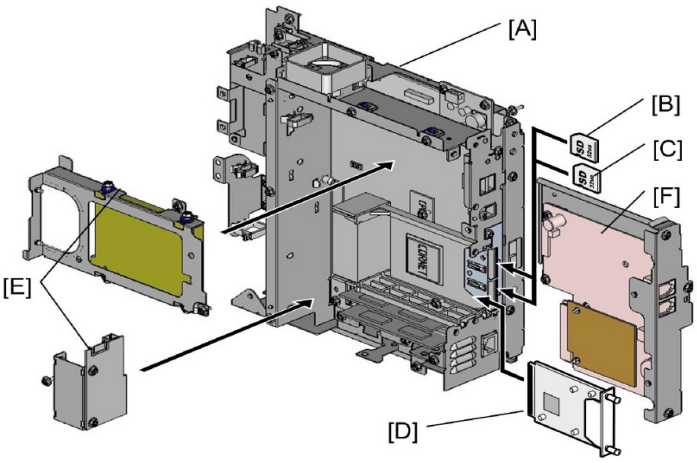
- VM card (D640, standard)
- Netware (D659, option)

[D]: One of the following options

- Gigabit Ethernet board (G874)
- IEEE 1284 (B679)
- IEEE 802.11a/g (B377)

[E]: HDD (D659, option)

[F]: FAX (D655, option for D127)



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No additional notes.

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No additional notes.

General Specifications

- **Configuration: Desktop**
- **Copy Process: Laser scanning & electrophotographic printing**
- **Copy speed: 30 ppm**
  - A4 / 8½" x 11"; 100% (Both when printing from memory and by ARDF.)
- **Warm up:**
  - 10 seconds from Off Mode or Sleep Mode
  - 30 seconds from power on
- **First copy time: 6 seconds or less**
- **Copy paper capacity:**
  - Paper tray: 250 sheets
  - Optional paper feed unit: 500 sheets (up to 2)
  - Bypass: 100 sheets
- **Toner Yield: 7,000 copies per toner bottle**

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No additional notes.

More Specifications

- **For a more detailed description of machine's specifications, refer to specifications section of FSM (Field Service Manual), noting in particular the following:**
  - Copy paper size
  - Copy paper weight
  - Power consumption and machine dimensions
  - Copy paper capacity
  - Original paper size
  - Paper feed

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No additional notes.

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No additional notes.

Before You Start

- **Read the installation chapter of FSM before installing machine, noting:**
  - Environment (ventilation, temperature range, etc.)
  - Space and power requirements.
  - Accessory check (for model you will install).
- **Before installing optional units, be sure to:**
  - **Switch the machine off and the remove power cord and network cable.**
- **Keep the system parameter report. You will need it for any future troubleshooting of the machine.**

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No additional notes.

Installation

- **Install the machine. See the "Installation" section of the FSM.**
- **Install the optional paper tray unit and the optional paper tray unit heater.**
- **Be sure to keep in mind the following when you install the machine and paper tray unit:**
  - You do not need to pull toner bottle holder completely out of machine.
  - Do not remove inner cap of toner bottle.
  - Do not use force to turn toner bottle after you have set it in toner bottle holder. Machine will turn bottle.
  - Remove all tape from machine.

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No additional notes.

Service Program Mode

- **Standard maintenance work requires utilization of SP modes. There are two kinds of SP modes for this machine:**
  - SP Mode (Service Program mode)
  - SSP Mode (Special Service Program mode)
    - » SP & SSP modes are for service technician only. Do not let users access SP & SSP modes.
- **Read the Service Program section of FSM. Then try entering some of the SP and SSP modes (after you have finished installing the machine).**

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- Contact your service manager for the procedures for entering the SP Mode and the SSP Mode.

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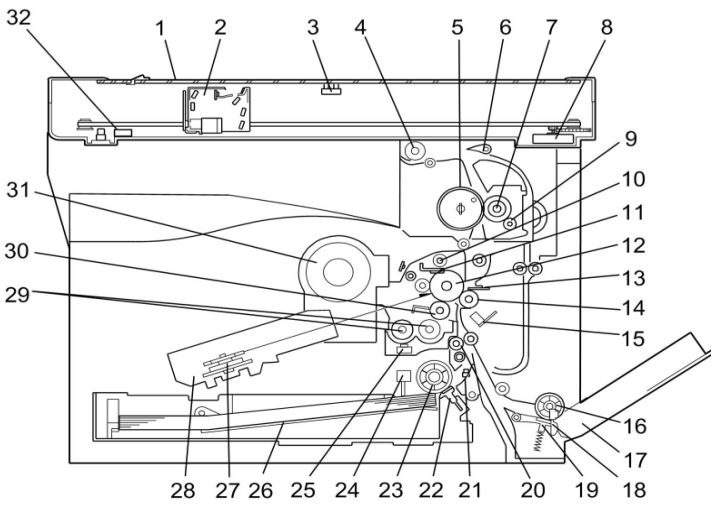
No additional notes.

Component Layout

1. Exposure glass
2. Scanner carriage
3. Platen cover sensor
4. Exit rollers
5. Hot roller
6. Paper path sensor
7. Pressure roller
8. Scanner motor
9. Cleaning web roller
10. Toner collection coil
11. Cleaning blade
12. OPC drum
13. Discharge plate
14. Transfer roller
15. ID sensor
16. By-pass paper feed roller
17. By-pass tray
18. By-pass paper end sensor
19. By-pass friction pad
20. Registration rollers
21. Registration sensor
22. Paper tray friction pad
23. Paper feed roller
24. Paper end sensor
25. TD sensor
26. Bottom plate
27. Polygon mirror motor
28. Laser unit
29. Mixing augers
30. Development roller
31. Tonner bottle
32. Scanner HP sensor



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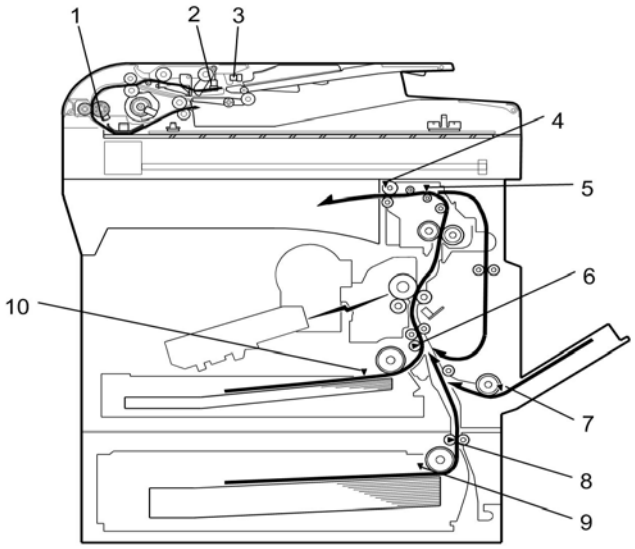
- The layout of the components of the main print engine is basically the same the previous product (S-C4.5). However, the scanner is new.

Paper Paths

1. Original registration sensor
2. Original set sensor
3. Upper cover sensor
4. Exit sensor
5. Paper path sensor
6. Registration sensor
7. By-pass paper end sensor
8. Paper feed sensor (PFU)
9. Paper end sensor (PFU)
10. Paper end sensor (Tray)



- The illustration shows the routes that paper and documents follow through the machine
- The various paper sensors are identified.

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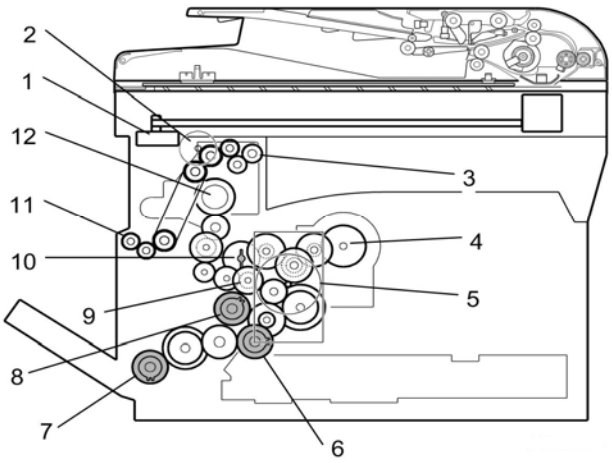
No additional notes.

Drive Layout – Main Machine

1. Scanner motor
2. Duplex motor
3. Exit rollers
4. Toner supply motor
5. Main motor
6. Paper feed clutch
7. By-pass feed clutch
8. Registration clutch
9. Development drive gear
10. Drum drive gear
11. Duplex one-way clutch
12. Fusing drive gear



Note: The duplex motor and the toner supply motor are both new with this model. Clutches were used in the previous models in the series.

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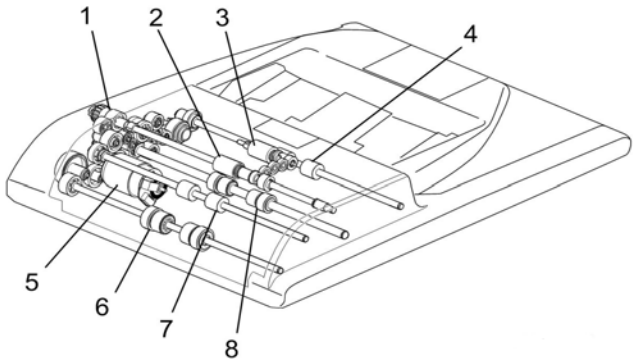
No additional notes.

Drive Layout – ARDF

1. Feed clutch
2. Feed roller
3. Pick-up roller
4. Inverter roller
5. Feed motor
6. Registration roller
7. Pull-out roller
8. Exit roller



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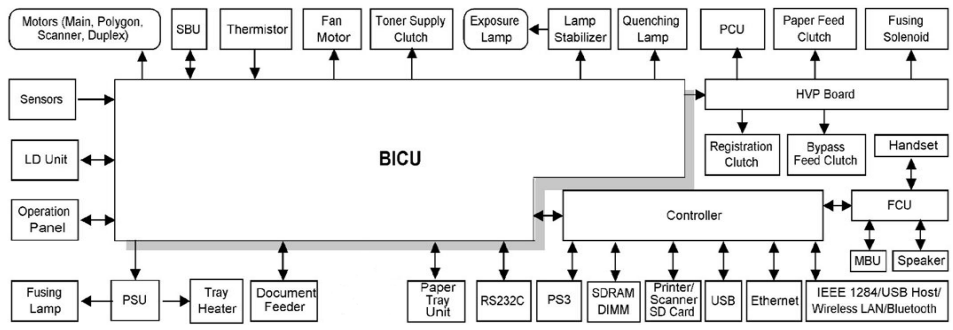
- The slide shows some of the drive components of the ARDF.
- The ARDF feed motor drives all the ARDF components.

Block Diagram



- This product uses the GW+ controller.

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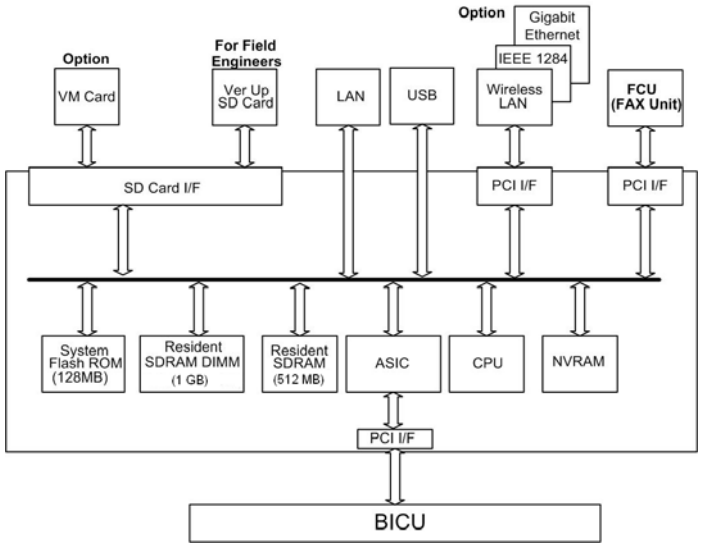
No additional notes.

Block Diagram for GW+ Controller



❑ **Details are in the notes section below.**

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This machine uses the GW architecture. To enable printer features, install the printer option SD Card in the controller.

- ❑ Main components:
  - ➢ CPU:
  - ➢ ASIC: It controls all the functions of the controller board.
  - ➢ Flash ROM: 128 MB Flash ROM for the system program
  - ➢ NOR Flash ROM: 4MB
  - ➢ SDRAM: 1.5 GB (1GB + 512MB)
  - ➢ NVRAM: Stores the controller settings
  - ➢ LAN interface
  - ➢ USB 2.0 interface
  - ➢ SD Card: Printer/Scanner program
- ❑ Optional components:
  - ➢ PostScript3
  - ➢ Wireless LAN interface
  - ➢ IEEE1284 interface
  - ➢ Bluetooth V2 + EDR
  - ➢ PCL
  - ➢ RPCS
  - ➢ Unauthorized copy guard
  - ➢ HDD Encryption Unit
  - ➢ FAX Connection
  - ➢ NetWare
  - ➢ JAVA VM
  - ➢ Data Overwrite Security Unit
  - ➢ VM Card
  - ➢ HDD

NVRAM Upload/Download

- **There are two different procedures.**
  - NVRAM Upload – From the BICU to a flash memory card (use SP 5824-1)
  - NVRAM Download – From a flash memory card to the BICU (use SP 5825-1)
- **The detailed procedures are in the FSM.**
  - FSM → System Maintenance Reference → Using SP Mode → NVRAM Data Upload/Download

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- NVRAM data from more than one machine can be uploaded (saved) to the same SD card.
- In order for the NVRAM data to download successfully, the serial number of the file on the SD card must match the serial number of the machine. If the serial numbers do not match, the download will fail.

Adjusting Copy Image

- **Adjust copy image area at these times:**
  - After clearing engine data (SP-5801-1, SP-5801-2).
  - After replacing the polygon mirror motor or paper tray.
- **Do adjustments as outlined in the FSM.**
  - FSM → Replacement and Adjustment → Adjusting Copy Image Area

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No additional notes.

Operating Instructions

- **While these are user operations, service technicians should also be generally familiar with them.**
- **Read these if you're not already familiar with them:**
  - User Tools: General settings
  - Placing originals and copying

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No additional notes.

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Scanner

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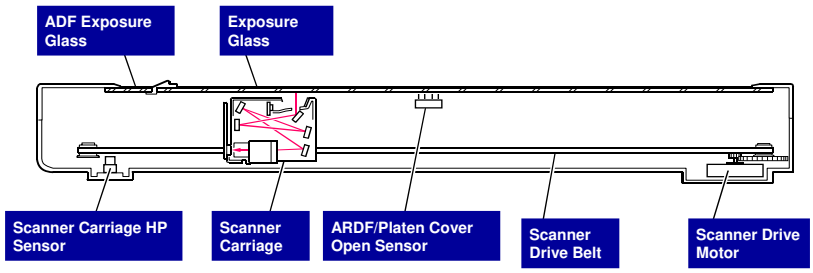
No additional notes

Overview



- The scanner unit is simplified compared to the previous model (S-C4.5).
- All scanner optics are included inside one carriage.
- When you wish to move the carriage, use the drive belt. Do not pull the carriage directly.

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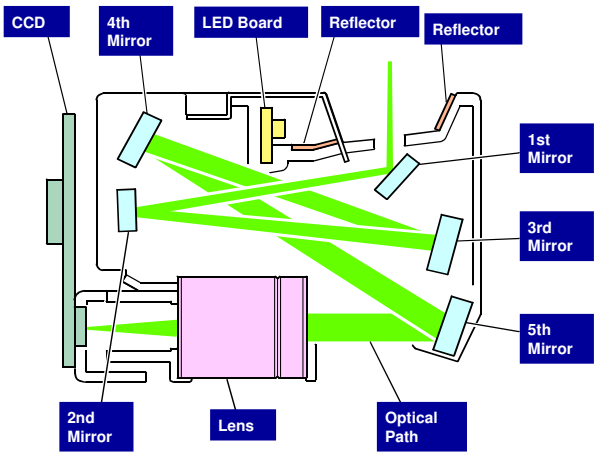
In the replacement procedure in the FSM, the carriage is called the "LED Unit".

Inside the Carriage

- The light source is an LED array. Light from the LED board goes to the original via the two reflectors. Then from the original, the light follows the light path to the CCD.
- The elements in the array are more densely spaced at the ends than at the center, to make sure that enough light reaches the left and right edges of the original.
- The green lines show how the light reflected from the original goes to the CCD.



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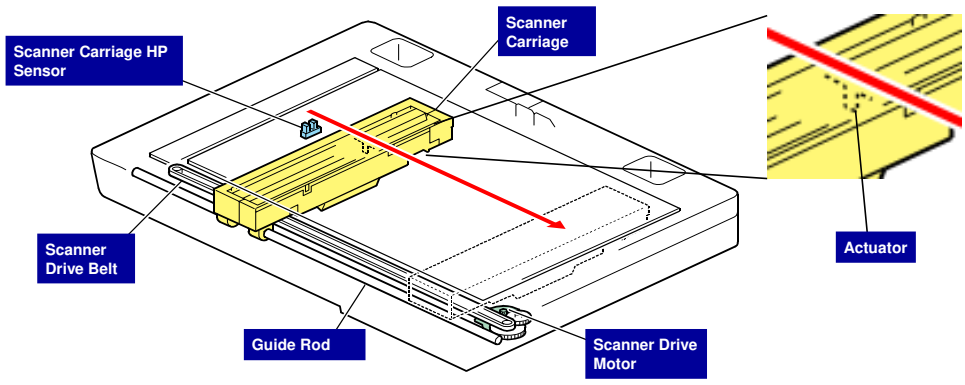
No additional notes.

Scanner Drive



- The drive belt moves the carriage along the guide rod.
- Scanning starts with the carriage at the HP sensor.
- After scanning, the carriage returns to the HP sensor.
- The actuator for the HP sensor is on the underside of the carriage.

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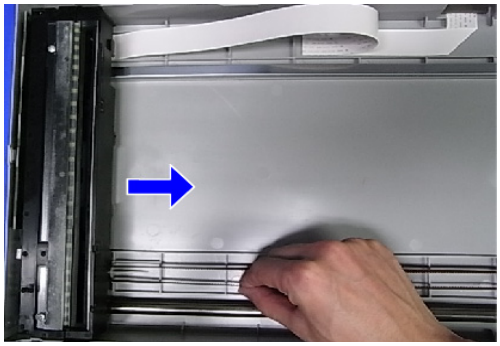
No additional notes

Moving the Carriage by Hand



- When you wish to move the carriage, move the belt, as shown above.
- Do not pull the carriage directly.

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No additional notes

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Image Processing

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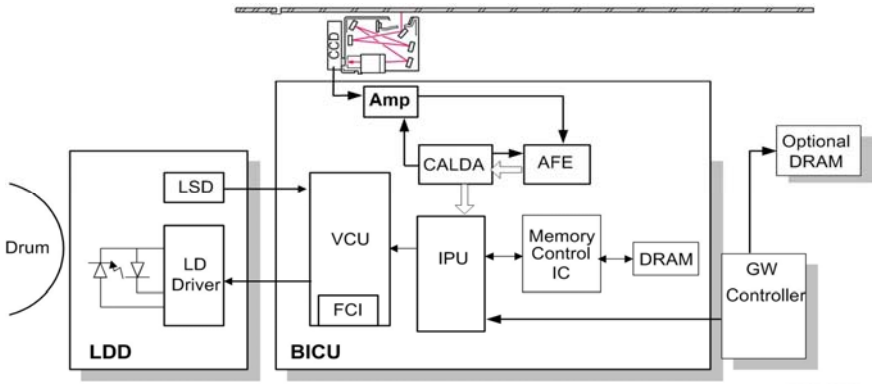
No additional notes.

Image Processing – Overview 1



- Details are on the next slide.

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No additional notes.

Image Processing – Overview 2

- **The scanned image is processed by the following modules.**
- **In the SBU**
  - CCD: Converts the reflected light from the image into an analog signal. Driven by the CALDA.
  - Amp: Amplifies the analog signal and sends it to the AFE on the BICU.
- **In the BICU**
  - IPU: Auto shading, filtering, magnification, scanner gamma correction, ID gamma correction
  - VCU: Printer gamma correction, LD print timing control and laser power PWM control
  - FCI (inside the VCU): Smoothing
  - The data then moves to the LD drive board in accordance with timing controlled by the BICU.
  - CALDA: CCD drive, AFE drive, Data conversion, Offset correction
  - AFE: Analog digital converter, Gain adjustment, Offset adjustment (Analog Front End)

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No additional notes.

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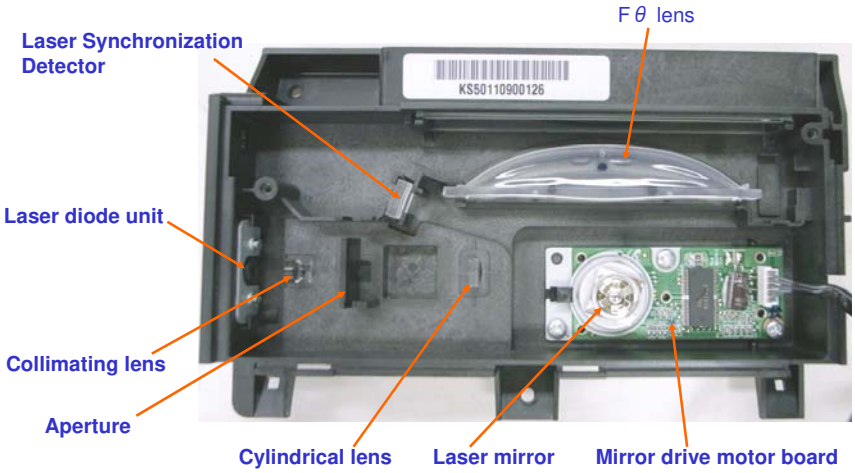
No additional notes.

Laser Unit – 1



- Here is a view of the interior of the laser unit.
- A 4-sided mirror is used. (rather than 6-sided)
- Laser light passes from the laser diode unit through the collimating lens, the aperture, and cylindrical lens to the rotating mirror. The mirror sends the beam through the F θ lens to the photoconductor drum.
- The F θ lens also acts as a focusing lens.

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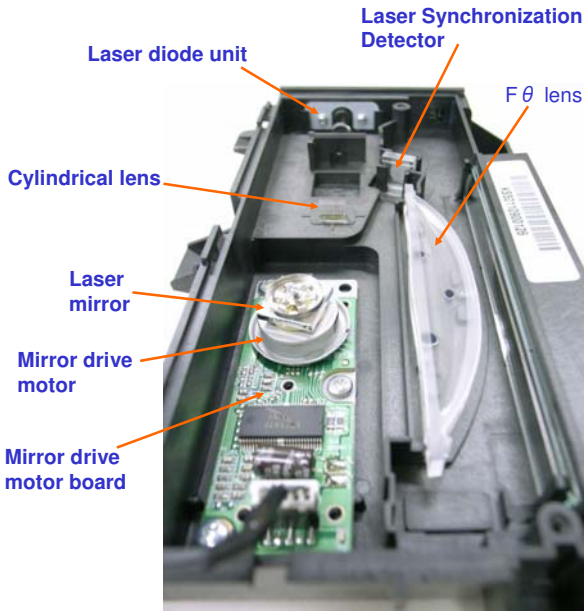
- See the core technology manual for a general discussion of laser imaging processes.

Laser Unit – 2

- Here is another view of the interior of the laser unit.
- This is a dual beam laser unit.
- Exposure of the photoconductor by the laser beam creates a latent image. The rotating 4-sided mirror moves the laser beam across the photoconductor to make the main scan while photoconductor rotation controls the sub-scan.



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- See the core technology manual for a general discussion of laser imaging processes.
- Generally the laser unit should be replaced as a unit.
  - The only internal component that can be replaced is the mirror motor drive assembly (mirror drive motor board + mirror drive motor + mirror).
  - Unlike previous machines in this series, the laser diode unit cannot be replaced.

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Photoconductor Unit (PCU)

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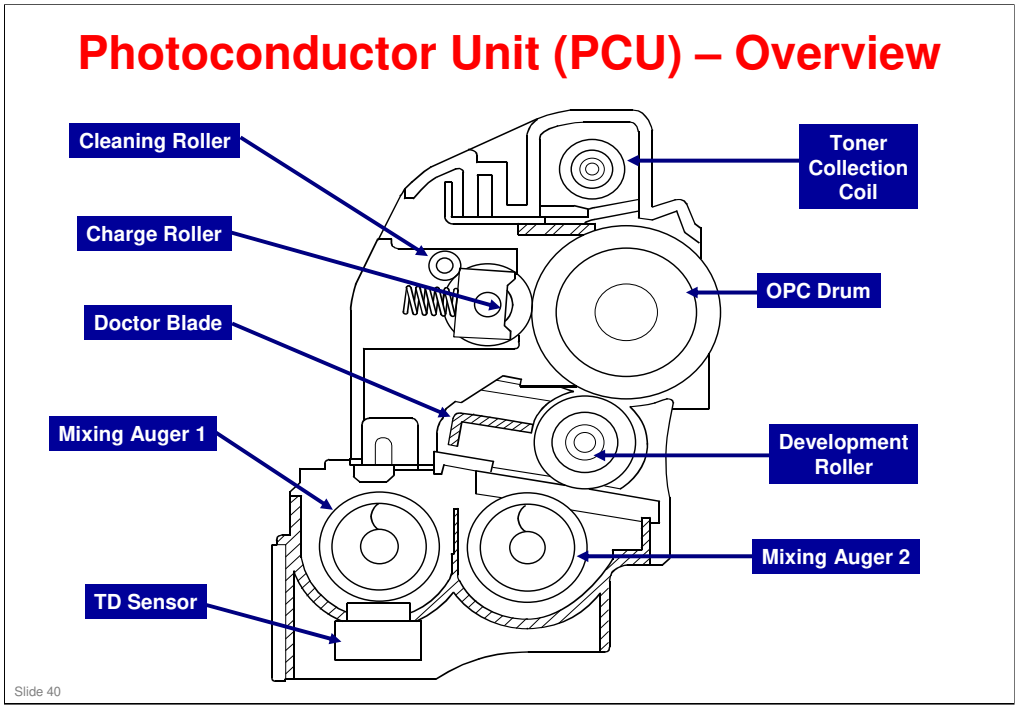
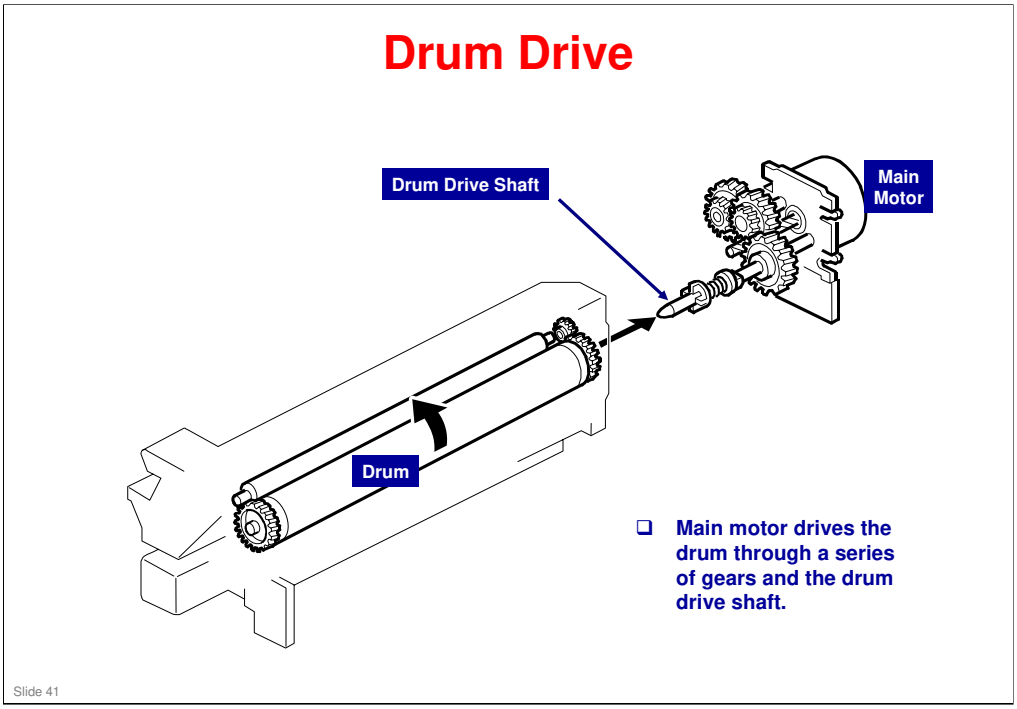
No additional notes.

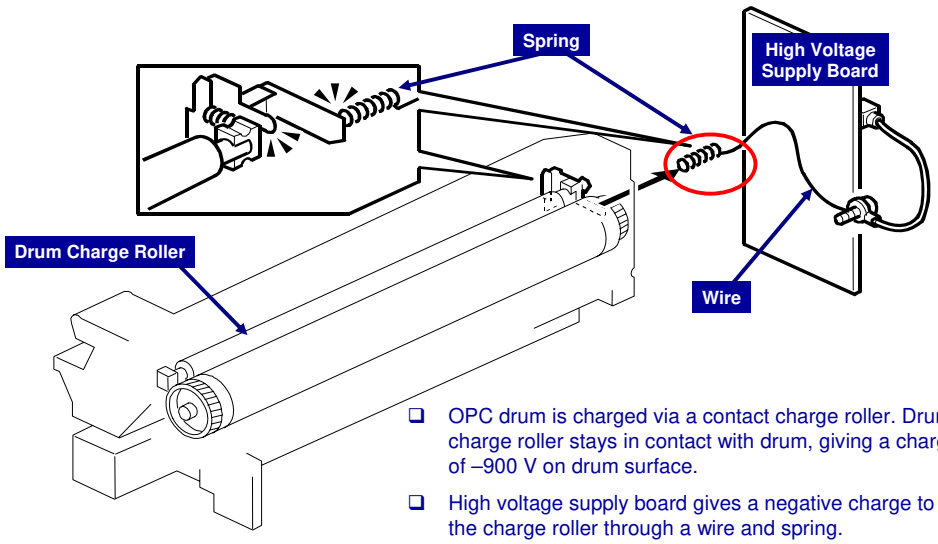


No additional notes.



No additional notes.

Drum Charge



- OPC drum is charged via a contact charge roller. Drum charge roller stays in contact with drum, giving a charge of –900 V on drum surface.
- High voltage supply board gives a negative charge to the charge roller through a wire and spring.
- Default base charge is –1700 V. This can be adjusted with SP 2001 1.

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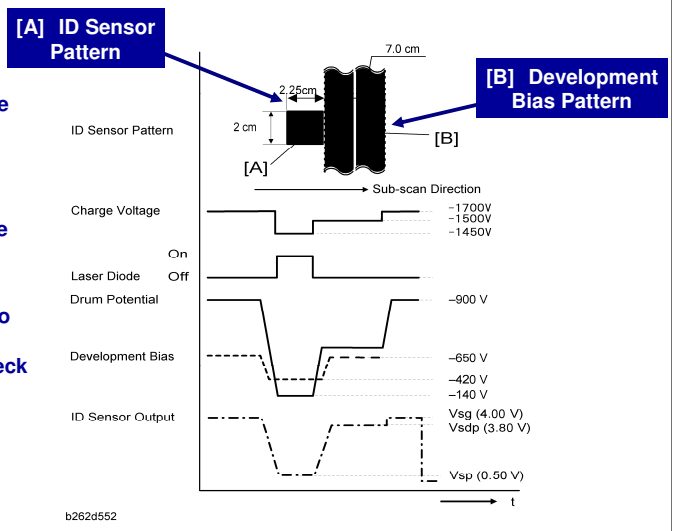
No additional notes.

Charge Roller Voltage Correction

- Voltage transfer from charge roller to drum decreases as ambient temperature and humidity increase. Machine checks charge transfer, and adjusts charge roller voltage when required.
- Checks are done on initial warm-up. If machine is set to low-power or auto-off mode for more than 4 hours, a check will be done when machine wakes up.



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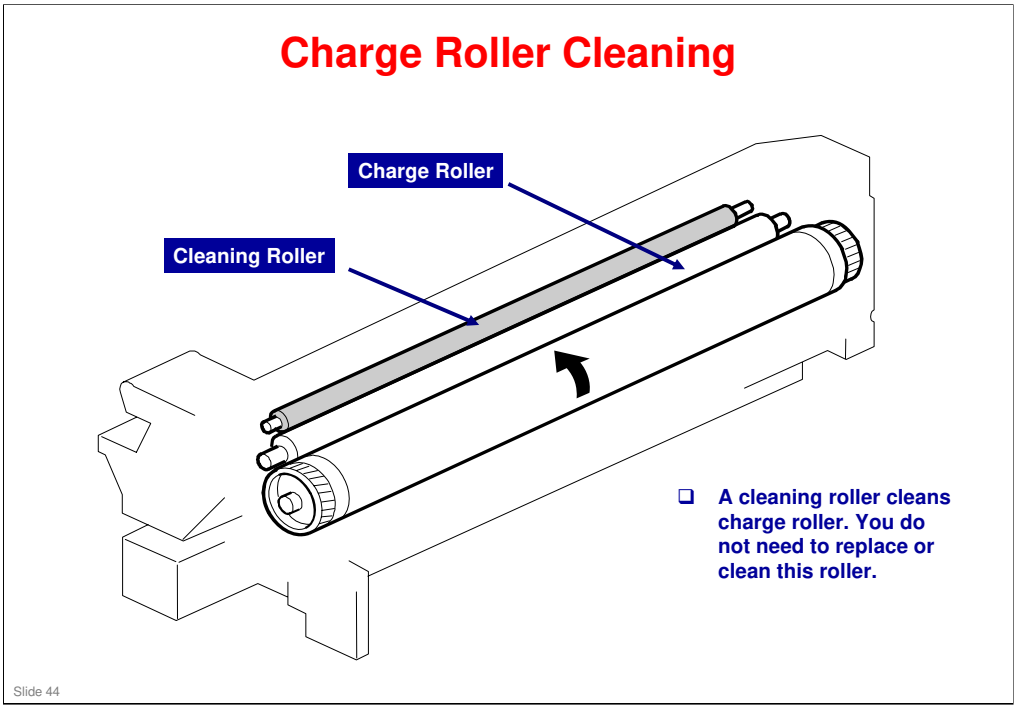
Procedure:

- Right after the machine creates the ID sensor pattern for toner density control, the development bias pattern is created. The development bias changes to –650 V.
- The ID sensor measures the development bias pattern's density (Vsdp) and the bare drum's voltage (Vsg).
- The FCU compares the results and adjusts the roller voltage accordingly.
  - Vdsp/Vsg > 0.95: Decreases the negative charge on the charge roller by +50 V.
  - Vdsp/Vsg < 0.90: Increases the negative charge on the charge roller by –50 V.
- Use SP 2221 to see the current ID sensor values.



No additional notes.

New PCU Initialization

- **The PCU is a PM item. Replace it at 45 K.**
- **You must initialize a new PCU using SP 2801-1:**
  - At copier installation
  - When a replacement PCU is installed
- **If the machine is not used for a long period:**
  - If the machine sets idle for a long period, the developer condition may change and dirty background may result.
  - In this case, do "Developer Mixing" with SP 2802. (This reconditions the developer without initializing the TD sensor and resetting the PCU counter.)

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Note: Unlike earlier machines in this series, it is not necessary to initialize the TD sensor nor the PCU counter. These are done automatically by SP 2801-1.

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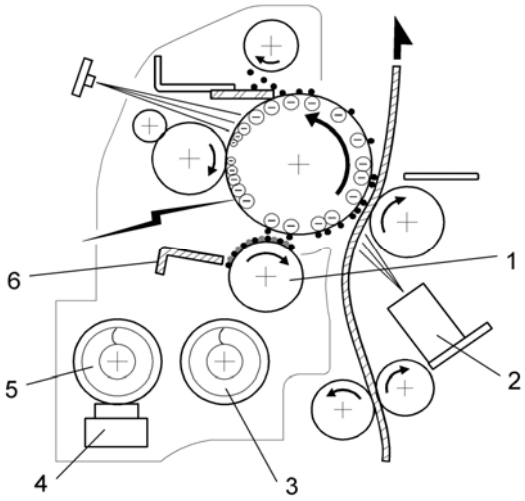
No additional notes.

Development Overview

1. Development roller
2. ID sensor
3. Mixing auger 2
4. TD sensor
5. Mixing auger 1
6. Doctor blade

- The two mixing augers mix the developer (carrier/toner mix).
- TD (toner density) sensor and the ID (image density) sensor are used to control copy image density.



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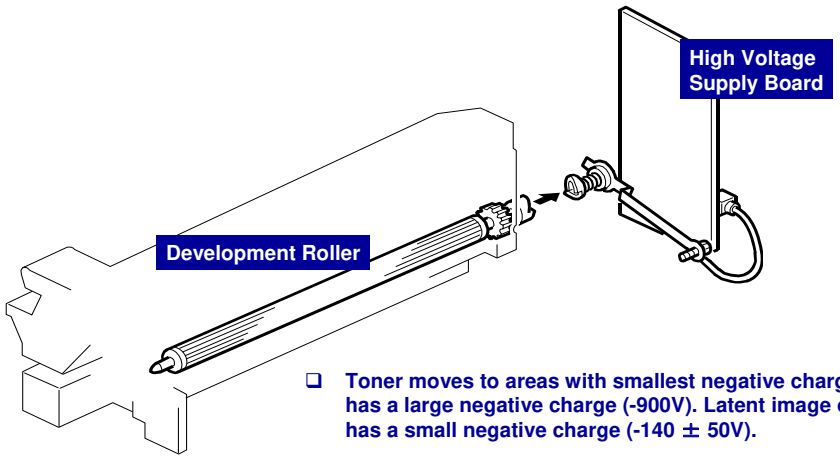
No additional notes.

Development Bias



- Toner moves to areas with smallest negative charge. Drum has a large negative charge (-900V). Latent image on drum has a small negative charge (-140 ± 50V).
- High voltage supply board gives a –650 V bias to development roller. This sends toner from development roller to latent image.
- Development bias can be adjusted with SP 2201 1

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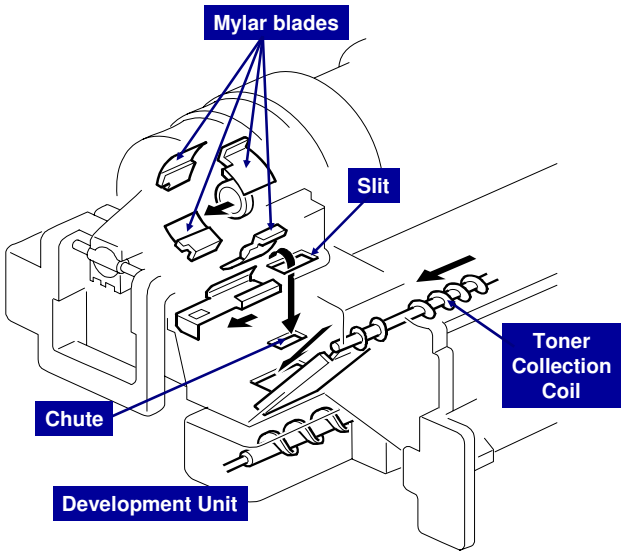
No additional notes.

Toner Supply

- Toner path is same for all models. There are two sources of toner: new toner and recycled toner.
- A shutter is pushed open by PCU body when a toner bottle is set in machine. Toner bottle cap is held with a chuck. Cap comes off when lever is pushed.
- Spiral grooves move toner out of bottle. Mylar blades move toner through a slit into development unit. This happens when clutch turns toner bottle.
- Toner collection coil recycles toner it gets from OPC drum. Recycled toner moves down chute and goes into development unit through a slit.



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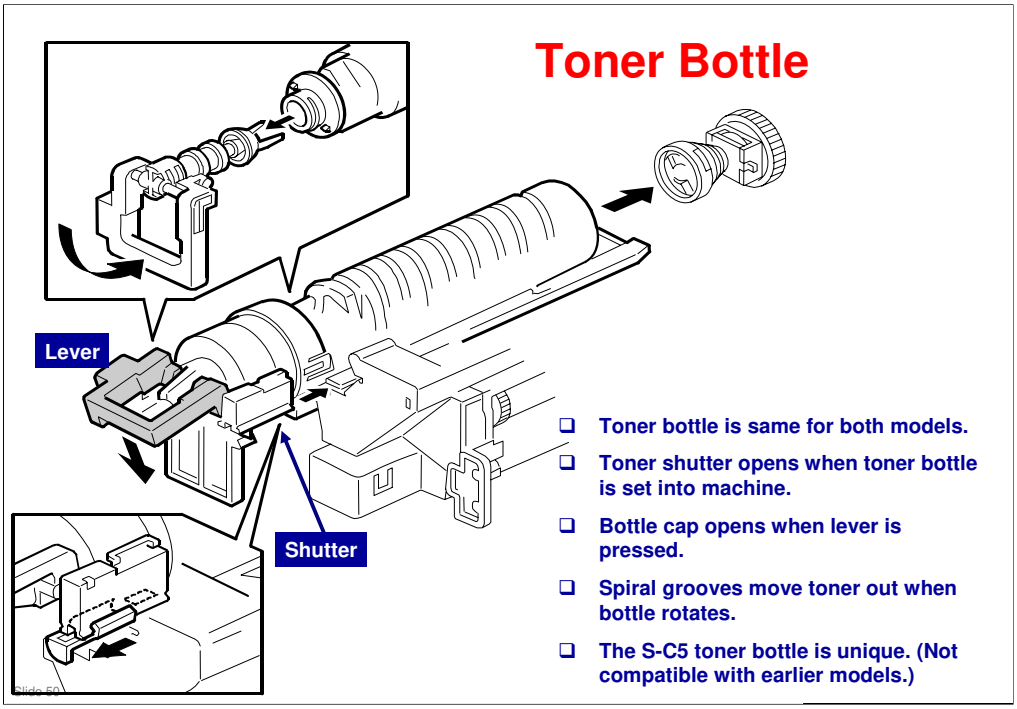
No additional notes.



No additional notes.

Toner Density Control

- **Toner concentration in developer is controlled with these values:**
  - Vts: TD sensor initial set of 2.4V. (Used as reference voltage when Vref is not available).
  - Vref: Toner supply reference voltage (calculated value; periodically updated).
  - Vt: Actual output from TD sensor.
  - Vsg/Vsp: Values from ID sensor, where Vsp is voltage of a test pattern ("ID sensor pattern"), and Vsg is voltage of bare drum.
- **Toner is given to development unit if Vt is more than reference voltage**

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Toner Density Control

Reference Voltage

- Vts is used as the reference if the PCU has just been installed, or if ID sensor correction is set “off” with SP 2927. Vref is used as the reference at all other times.

Toner Density Sensor Initial Setting

- The Vts for this machine is 1.25 V. The machine adjusts the sensor so that it reads out 1.25V for TD sensor initialization when a new PCU is installed.

Toner Concentration Measurement

- The machine checks concentration every copy cycle, comparing Vt against the reference voltage to do this.

Vsp/Vsg Detection

- An ID sensor pattern is made on the drum by the charge roller and laser diode. The ID sensor detects the pattern density (Vsp) and the density of the bare drum (Vsg). Detection is done at the same time as (and immediately before) charge-roller voltage detection.
- You can set ID sensor control “off” with SP 2927.

Calculation of Vref

- Vref is calculated based on the ID sensor output (Vsp/Vsg) and the present reference voltage (Vref or Vts) – Vt.

Toner Supply Determination

- The machine gives toner if Vt gets to more than the reference voltage. You can see current Vt and reference voltage values with SP 2220.

Toner Errors

- **Sensor errors occur at these times:**
- **ID Sensor:**
  - Vsg ≤ 2.50 (when Vsg is read)
  - Vsg < 4.00 (at maximum power)
  - Vsp ≥ 2.50
- **You can see current ID sensor readings with SP 2220**
- **TD Sensor**
  - TD < 0.20 V
  - TD > 4.0 V
- **If machine gets TD sensor error readings 10 times in succession, SC 389 will be shown.**

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No additional notes.

Toner Near End/End Detection

- **Machine will show toner near end at these times:**
  - Vt is at Level-6 five times in succession.
- **Machine will show toner end at these times:**
  - VT is >= Level-6 n times in a row. (Default n = 50)
  - VT is at Level-7 three times in a row

  (Levels in table below)

Toner Motor ON Time

Level	Decision	On time (t)
1	RV < Vt ≤ RV + S/16	t
2	RV + S/16 < Vt ≤ RV + S/8	2t
3	RV + S/8 < Vt ≤ RV + S/4	4t
4	RV + S/4 < Vt ≤ RV + S/2	8t
5	RV + S/2 < Vt ≤ RV + 4S/5	16t
6	RV + S > Vt ≥ RV + 4S/5	30sec.
7	Vt ≥ RV + S	30sec.

- Reference voltage RV (= Vref or Vts)
- S (TD sensor's sensitivity coefficient)
- The default value for "t" is 0.5. The value can be changed using SP 2922.

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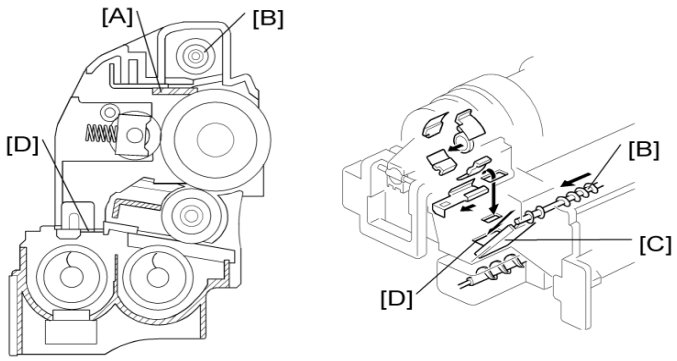
Toner Near End/End Detection

•n is the number of sheets that can be printed before toner near end gets to toner end. n is set to 50 by default.

•You can change the value of n to 20 with SP 2213.

Drum Cleaning & Toner Recycling



- The cleaning blade [A] scrapes remaining toner from the drum after image transfer. Toner piles up on the blade.
- Toner collect coil [B] transports toner from pile and drops it onto chute [C], where it slides down into the development unit through a slit located at [D].
- At the end of each copy job, the drum turns about 3 mm in reverse to help clear toner and other debris from the edge of the cleaner blade.

Slide 54

No additional notes.

Some Related SP Modes

- SP 2801: Developer initialization
- SP 2802: Forced developer mixing
- SP 2908: Forced toner supply
- SP 2921: Toner supply mode
- SP 2923: Toner recovery time
- SP 2926: Standard Vt
- SP 2928: Toner end clear

See the FSM for the full list of related SP modes.

Slide 55

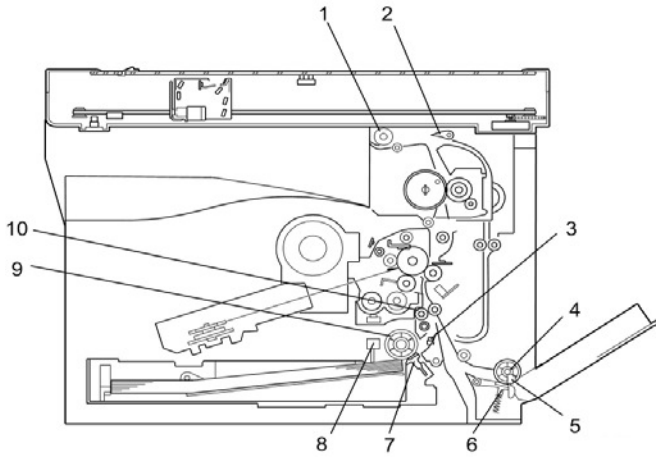
No additional notes.

RICOH

No additional notes.

Paper Feed - Overview

1. Exit roller
2. Paper path sensor
3. Registration sensor
4. By-pass feed roller
5. By-pass paper end sensor
6. By-pass friction pad
7. Tray friction pad
8. Tray paper end sensor
9. Paper feed roller
10. Registration rollers

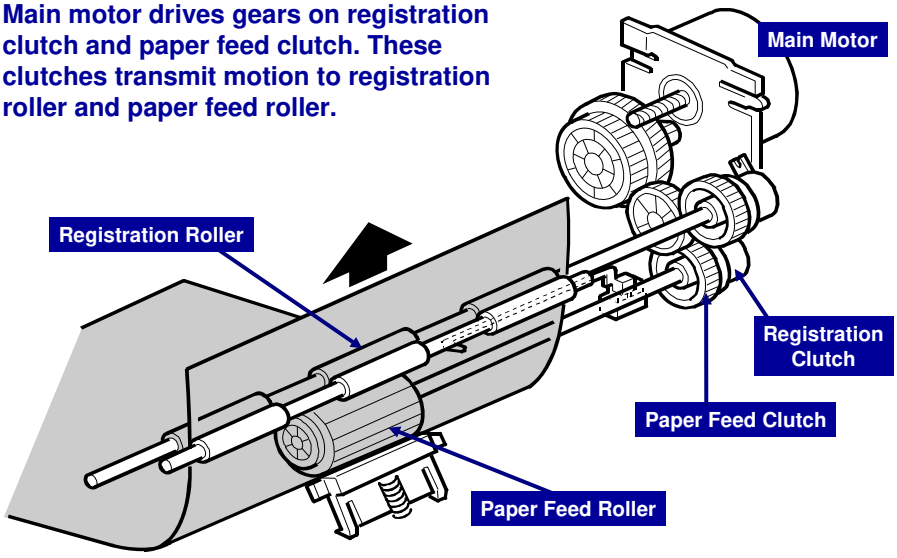


Slide 57

No additional notes.

Drive Mechanism - From Paper Tray

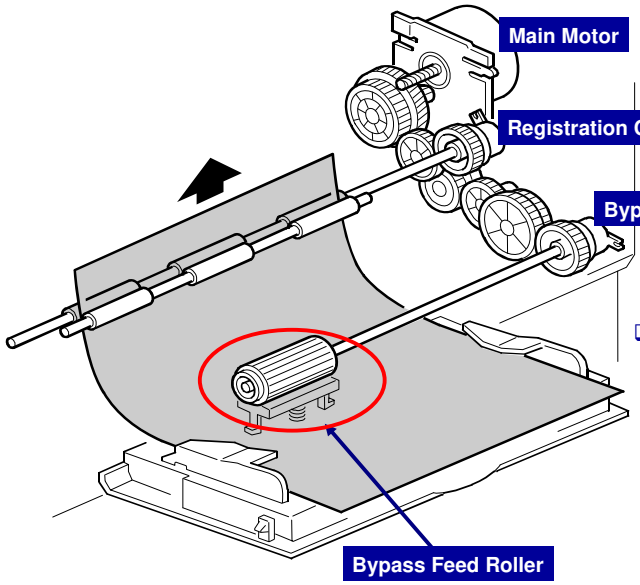
- Main motor drives gears on registration clutch and paper feed clutch. These clutches transmit motion to registration roller and paper feed roller.



Slide 58

No additional notes.

Drive Mechanism - Bypass Tray



- Main motor drives gears of registration clutch and bypass feed clutch. Bypass feed clutch moves bypass feed roller.

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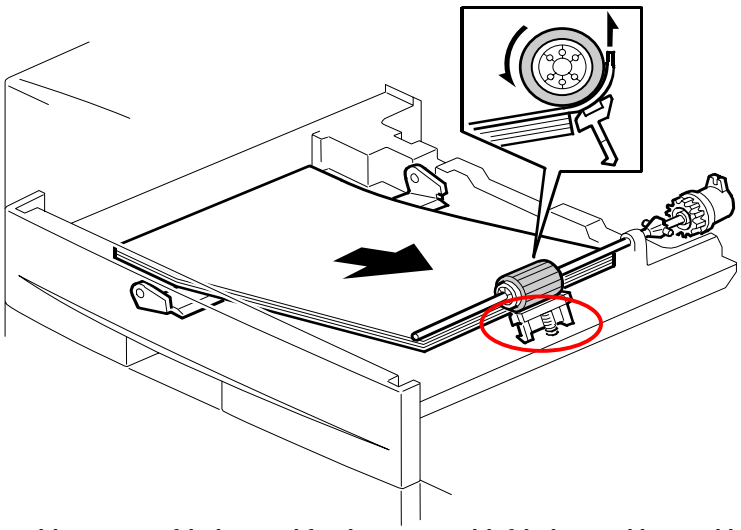
Paper Feed And Separation

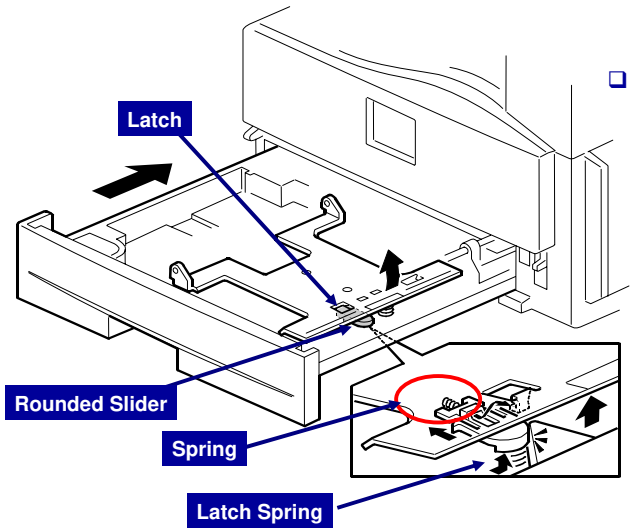


- This machine uses a friction-pad feed system, with friction pad located inside paper tray.

Slide 60

No additional notes.

Paper Lift Mechanism

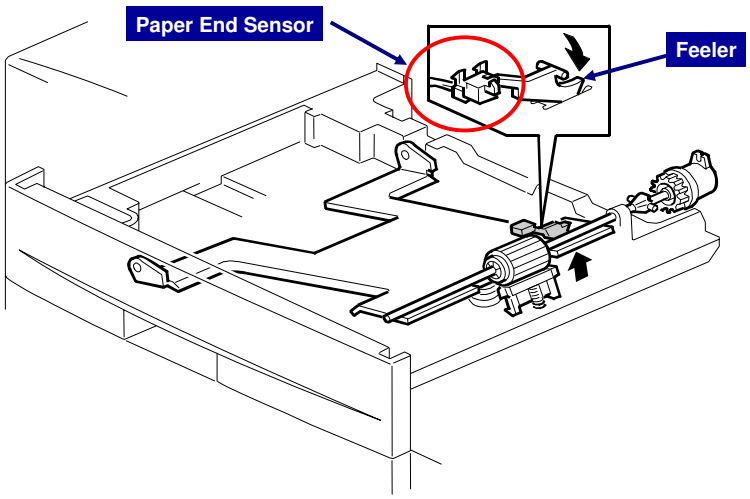


- A protrusion on frame pushes the rounded slider in against spring when tray is closed (by sliding it into machine). This retracts the latch, allowing the spring to push the plate up.

Slide 61

No additional notes.

Paper End Detection-Main Tray

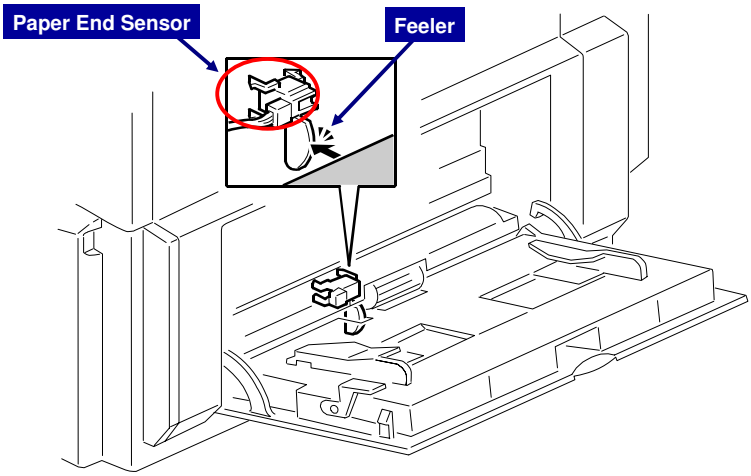


- The feeler goes into the cutout when paper runs out, activating the paper end sensor.

Slide 62

No additional notes.

Paper End Detection - Bypass Tray

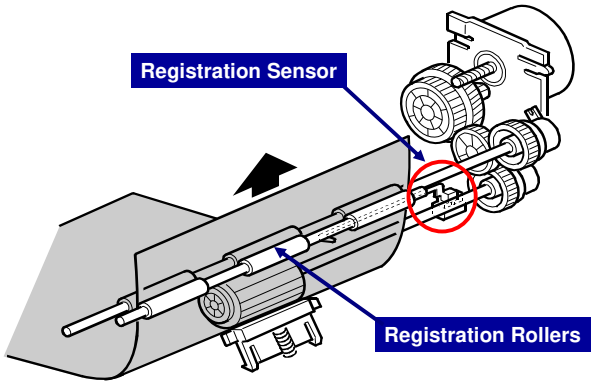


- The feeler goes into the cutout when paper runs out, activating the paper end sensor.

Slide 63

No additional notes.

Paper Registration



- The BICU uses input from registration sensor to control clutch timing and detect misfeeds. Registration clutch timing is controlled to eliminate skew (by stopping the paper briefly as it reaches the roller, so that it buckles). The amount of buckle can be adjusted with SP 1003

Slide 64

No additional notes.

RICOH

RICOH

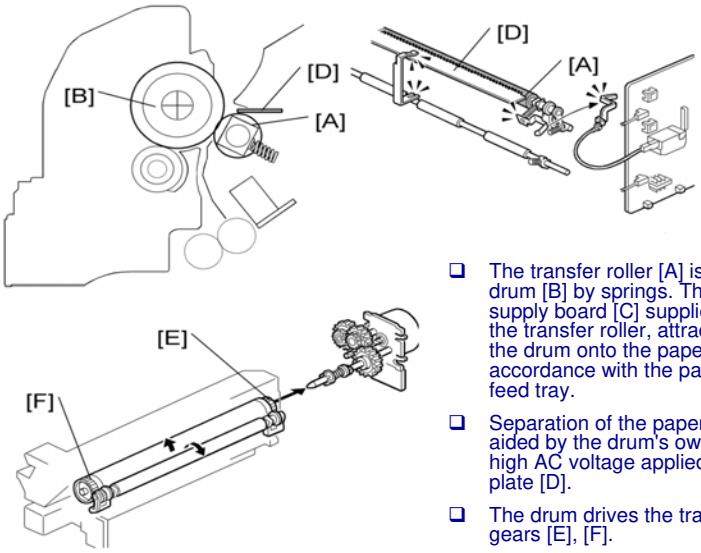
D127/D128
Service Training

Image Transfer And Paper Separation

Slide 65

No additional notes.

T/S Overview



- The transfer roller [A] is held against the OPC drum [B] by springs. The high-voltage power supply board [C] supplies a positive current to the transfer roller, attracting the toner from the drum onto the paper. The current is set in accordance with the paper's type, size, and feed tray.
- Separation of the paper from the drum is aided by the drum's own curvature and by a high AC voltage applied to the discharge plate [D].
- The drum drives the transfer roller directly by gears [E], [F].

Slide 66

No additional notes.

Transfer Current Timing

- **Machine has two transfer current levels: Low and High.**
  - Low level: High voltage supply board supplies +10µA to transfer roller before image transfer starts. This prevents transfer roller from getting positively charged toner on drum surface.
  - High level: High voltage supply board supplies high level of current to transfer roller at time of image transfer. This allows transfer roller to move toner to paper.
  - When the trailing edge of the paper has passed the transfer roller, the high voltage supply board stops supplying the high transfer current. The transfer current goes back to the low level if printing more pages.
- **Transfer Current Timing**
  - Transfer current level can be adjusted with SP 2301.
  - When increasing a transfer current level, use caution:
    - » Increasing a transfer current level may produce ghost images–some part of image near the leading edge reappears in other part of the page.
    - » Increasing a transfer current level might damage the OPC drum.

Slide 67

No additional notes.

Transfer Roller Cleaning

- **Toner may transfer to the roller surface following a paper jam or if the paper is smaller than the image. Periodic cleaning of the roller is required to prevent this toner from migrating back to the rear of new printouts.**
- **The machine cleans the roller at the following times:**
  - After initial power on.
  - After clearing of a copy jam
  - At the end of a job, if at least 10 sheets have been printed since the last cleaning
- **The high voltage supply unit first supplies a negative cleaning current (about –10 μA) to the transfer roller, causing negatively charged toner on the roller to move back to the drum. It then applies a positive cleaning current (+10 μA) to the roller, causing any positively charged toner to migrate back to the drum.**
- **The cleaning current can be adjusted using SP 2303.**

Slide 68

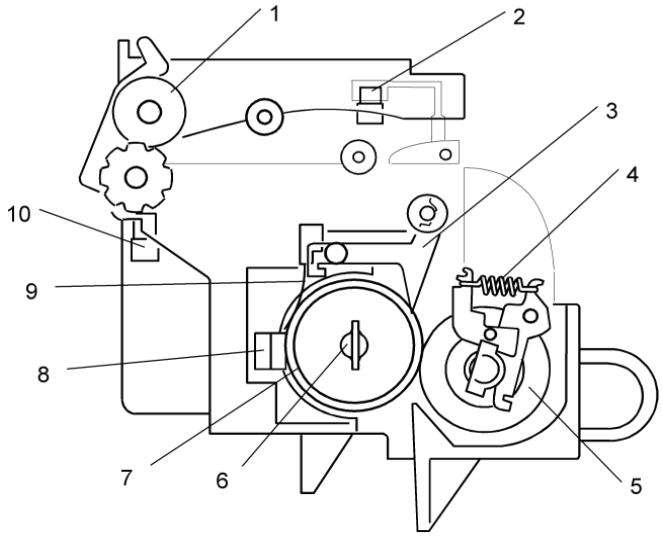
No additional notes.

RICOH

No additional notes.

Fusing Overview

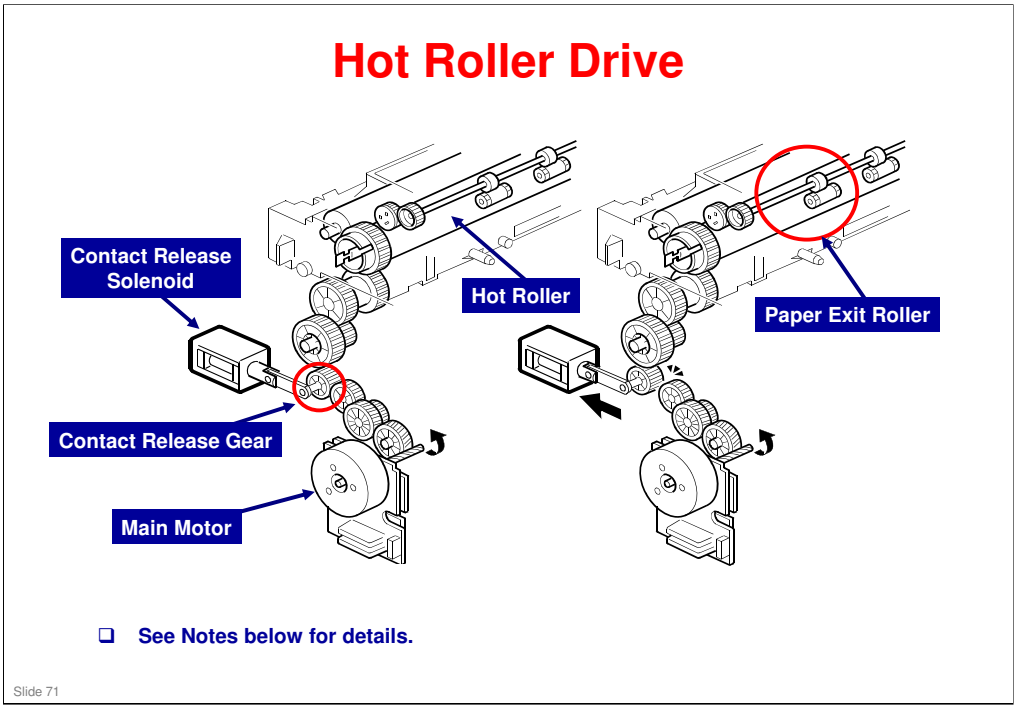
1. Exit roller
2. Paper path sensor
3. Hot roller strippers
4. Pressure spring
5. Pressure roller
6. Fusing lamp
7. Hot roller
8. Thermostat
9. Thermistor
10. Exit sensor



❑ **This slide shows the main components of the fusing unit.**

Slide 70

No additional notes.

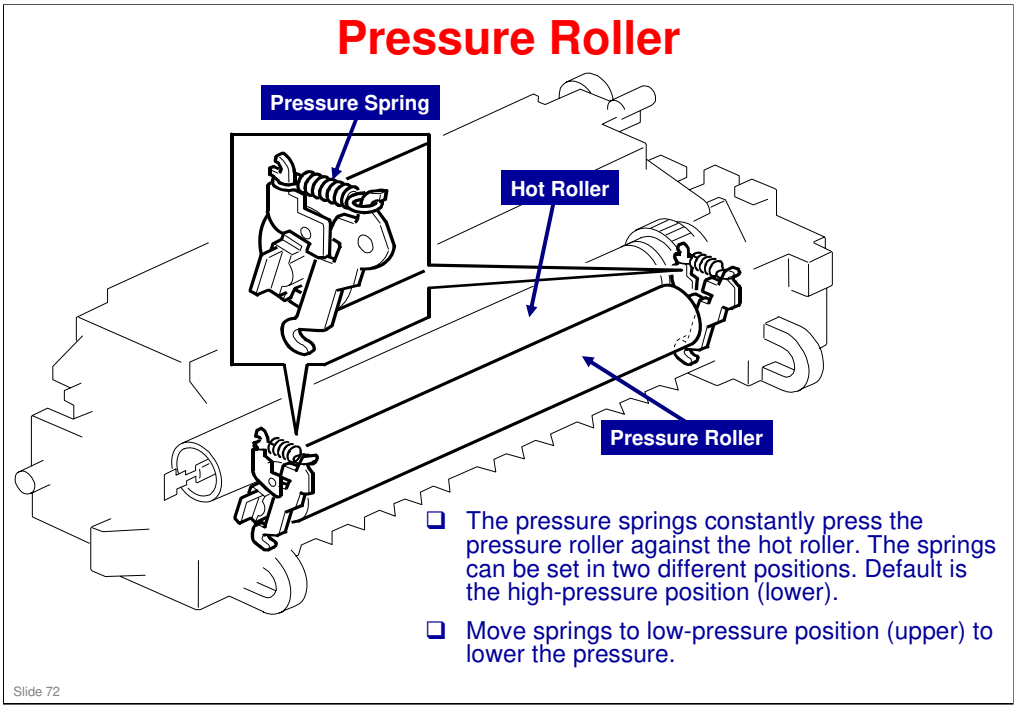


Hot Roller Drive Mechanism

- The main motor drives the hot roller through a gear train. One of the gears in the gear train is the contact-release gear. This gear is linked to the contact-release solenoid. When the contact-release solenoid is activated, it separates the contact-release gear from another gear in the gear train.
- Drive power of the main motor is not transmitted to the hot roller.
- Drive power of the main motor is not transmitted to the paper exit roller. This roller is driven by the exit motor.

Contact/Release Control

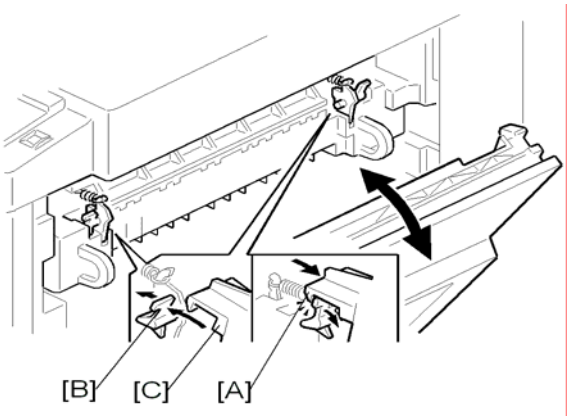
- The contact-release solenoid comes on at these times:
  - When the copier warms the hot roller.
  - When the hot roller temperature is 16° C or higher.
  - Fusing idling (SP 1103-1) is set to "No."
- Control is based on these:
  - The copier takes a shorter time to heat the hot roller when the roller isn't turning.
  - The temperature of the hot roller surface may get uneven when the hot roller temperature is low and the roller does not turn.



No additional notes.

Pressure Release

- When the right door is opened, part [A] (on each side) pulls open catch [B] (on each side), releasing pressure on the pressure roller, so that it can turn freely to allow removal of jams.
- When the right door is closed, part [C] pushes catch [B] closed, restoring normal pressure.



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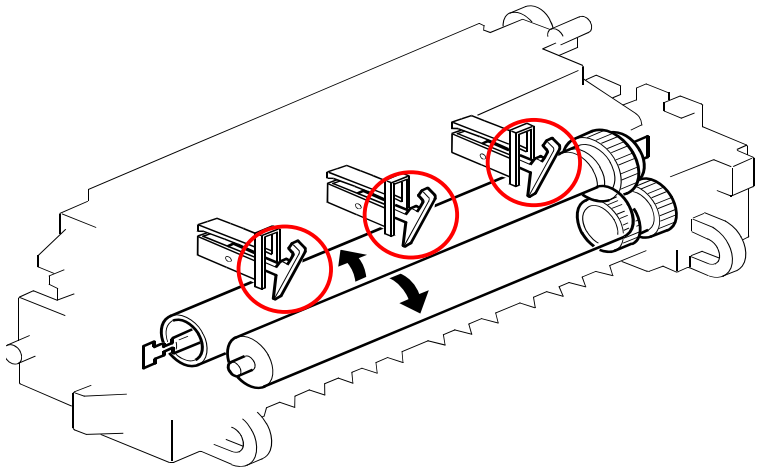
No additional notes.

Separation



- The three hot roller stripper pawls prevent paper from sticking to the hot roller.

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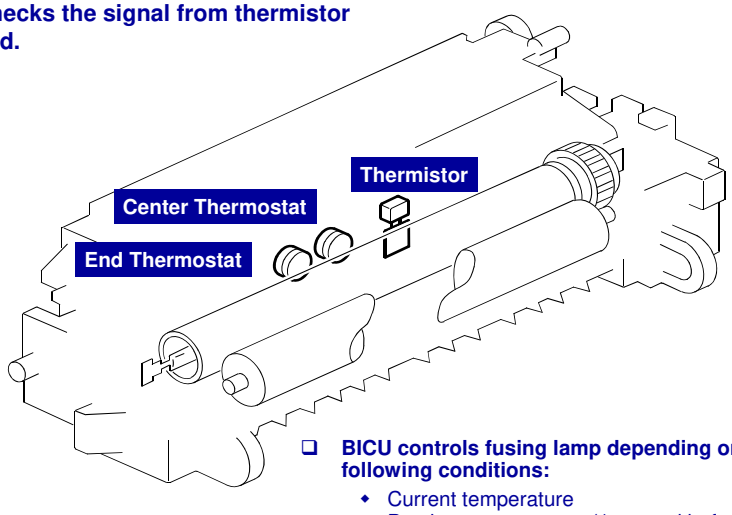
No additional notes.

Fusing Temperature Control

- The BICU checks the signal from thermistor every second.



- BICU controls fusing lamp depending on following conditions:
  - Current temperature
  - Previous temperature (1 second before)
  - Target fusing temperature

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No additional notes.

Overheat Protection

- **The BICU checks the fusing temperature through the thermistor. The machine has four features to safeguard from overheating.**

- **Feature 1**
  - BICU switches fusing lamp off when fusing temperature gets too high.
- **Feature 2**
  - BICU (Base engine & Image Control Unit) stops the machine when the thermistor detects an abnormal condition. Then the machine will show SC 543, SC 544, or SC 545.
- **Feature 3**
  - The BICU stops the machine if the thermistor does not work correctly and then shows SC 541
- **Feature 4**
  - The thermostat near the center cuts power to the fusing lamp at 160°C. the thermostat near the end cuts power to the fusing lamp at 170°C. These thermostats are on the same circuit as the fusing lamp.

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No additional notes.

Replacement and Adjustments

- **Do these removal procedures: (Reference fusing unit in FSM)**
  - Fusing unit.
  - Exit sensor.
  - Hot roller stripper pawls.
  - Hot roller and fusing lamp.
  - Thermoswitch and thermistor.
  - Pressure roller.
  - Nip band adjustment.
- **Most fusing unit PM parts should be replaced or cleaned at PM 90 K.**
- **The pressure roller life has been extended (compared to earlier models). Yield is 120 K or more. Replace as required.**

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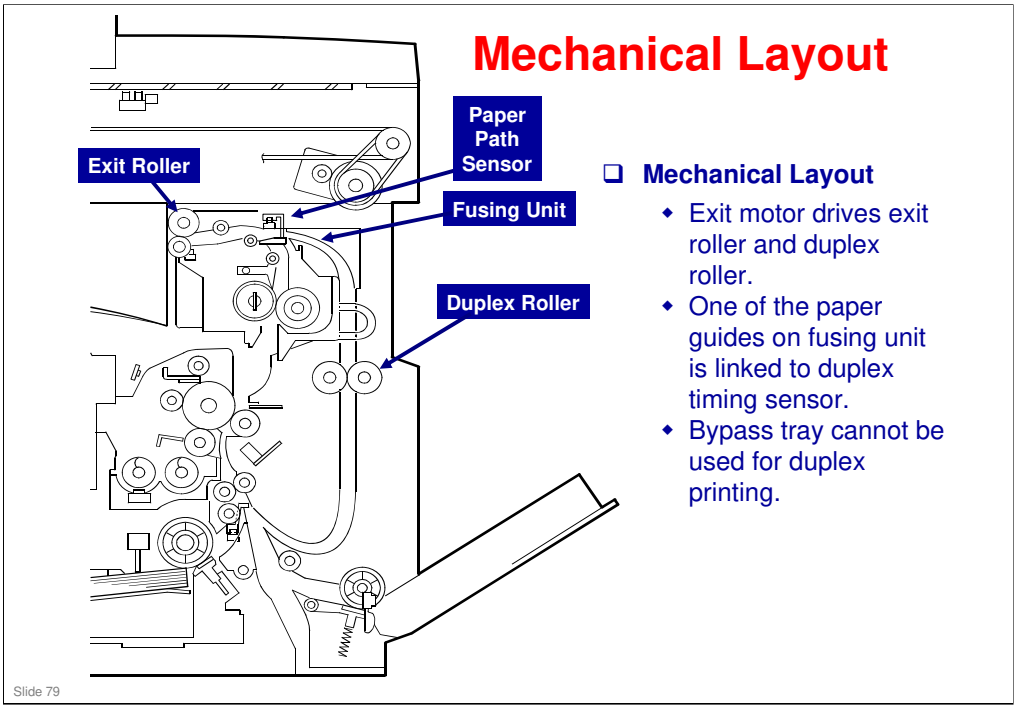
No additional notes.

RICOH

No additional notes.

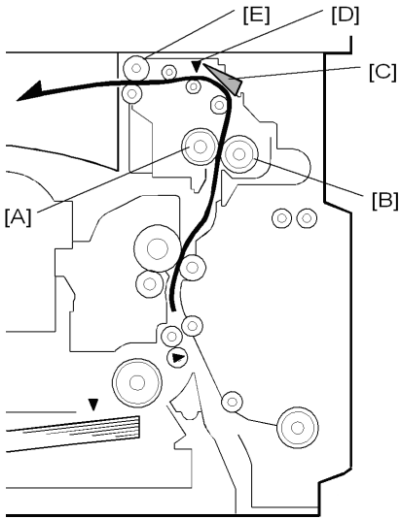


No additional notes.

Duplex Printing Process – 1

The main steps of the duplex printing process are as follows:

1. The controller starts to operate the main motor and duplex motor.
2. The hot roller [A] and pressure roller [B] transport the paper to the paper guide [C].
3. The leading edge of the paper pushes the paper guide; the paper guide activates the paper path sensor [D].
4. When the leading edge of the paper reaches the exit rollers [E], the exit rollers transport the paper.



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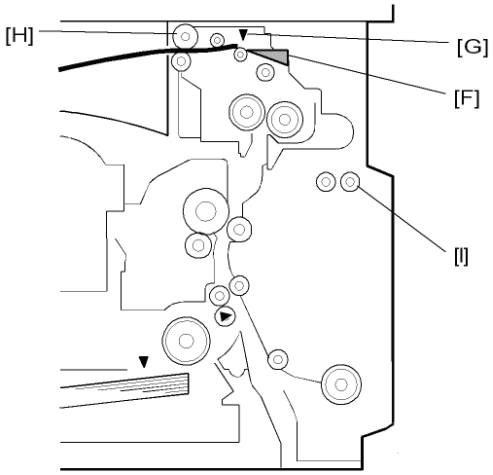
No additional notes.

Duplex Printing Process – 2

5. When the trailing edge of the paper passes the paper guide, the paper guide drops to the original position [F] and turns the paper path sensor [G] off.
6. The controller starts to operate the duplex motor in reverse; the exit rollers [H] turn in reverse, transporting the paper to the duplex rollers.
7. The paper goes over the paper guide and reaches the duplex rollers [I].
8. The duplex rollers transport the paper into the duplex unit. The paper goes through the unit.



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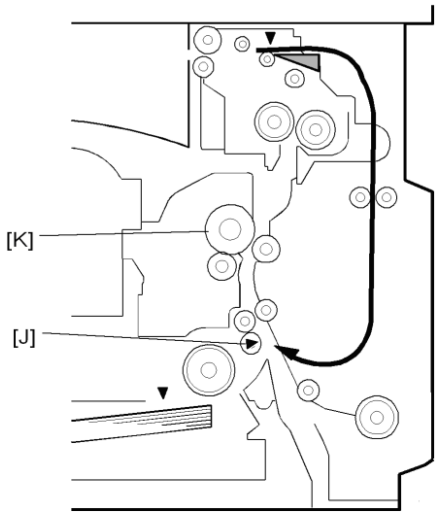
No additional notes.

Duplex Printing Process – 3

9. When the leading edge of the paper reaches the registration sensor [J], the controller stops the duplex motor. The duplex rollers hold the paper in the duplex unit.
10. When the OPC drum [K] gets ready for printing, the controller restarts the duplex motor. The duplex rollers transport the paper.
11. The duplex rollers keep transporting the paper until the paper reaches the fusing unit.
12. The hot and pressure rollers transport the paper to the paper guide.



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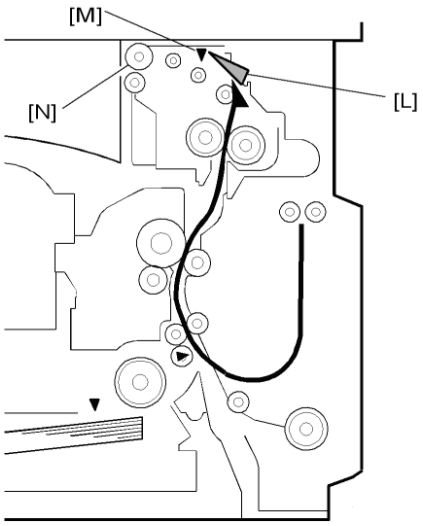
No additional notes.

Duplex Printing Process – 4

13. The leading edge of the paper pushes the paper guide [L], and the paper guide turns the paper path sensor [M] on.
14. The controller changes the direction of the duplex motor. The exit roller [N] changes the direction of its rotation, transporting the paper to the copy tray.



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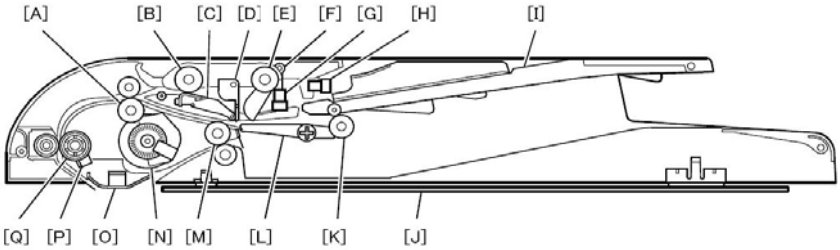
No additional notes.

RICOH

No additional notes.

Component Layout



[A]: ADF entrance roller
[B]: Feed roller
[C]: Friction pad
[D]: Stopper
[E]: Pick-up roller
[F]: Original set sensor actuator
[G]: Original set sensor
[H]: Upper cover open/close sensor
[I]: Original tray
[J]: Platen
[K]: Reverse roller
[L]: Junction gate
[M]: Exit roller
[N]: ARDF motor
[O]: Scanning guide plate
[P]: Transport sensor
[Q]: Pre-scanning roller

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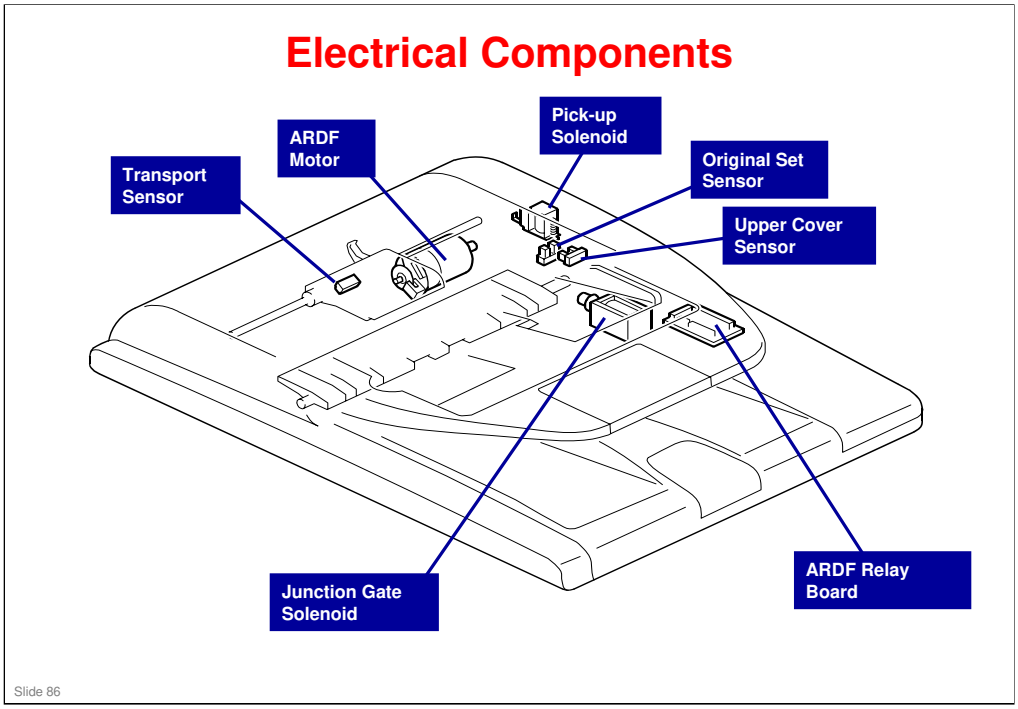
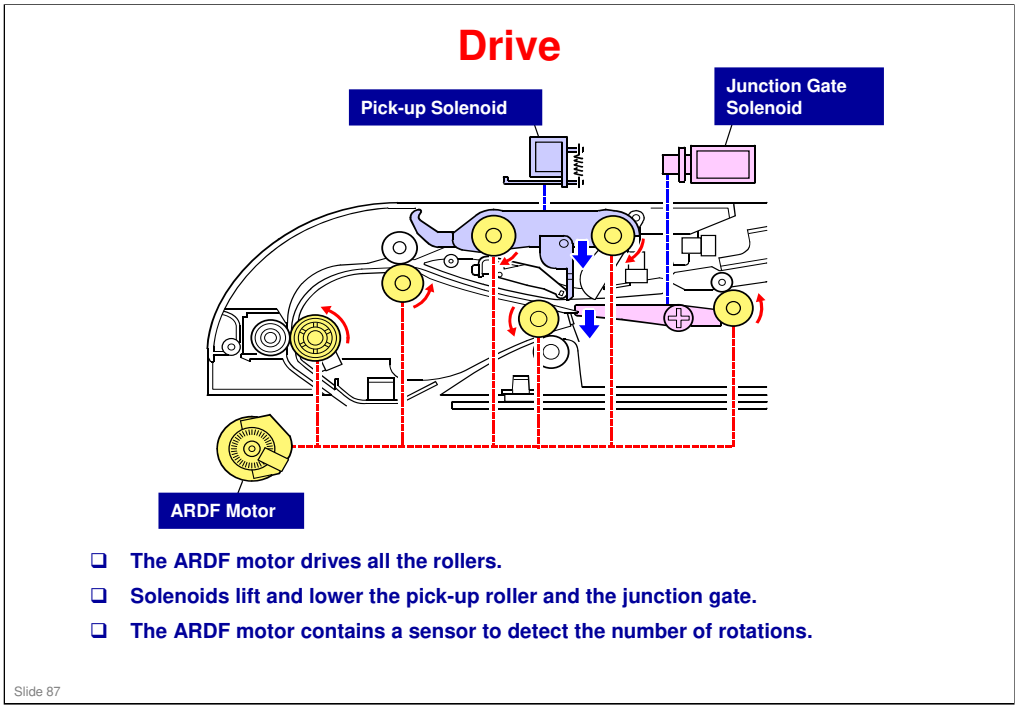
- There is only one motor ([N]).

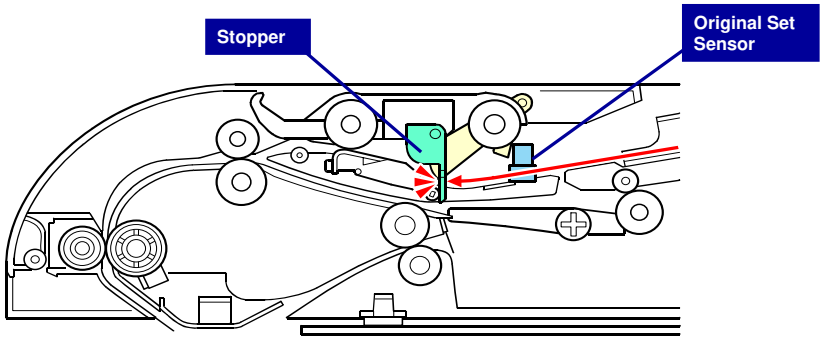


No additional notes



No additional notes

Original Detection

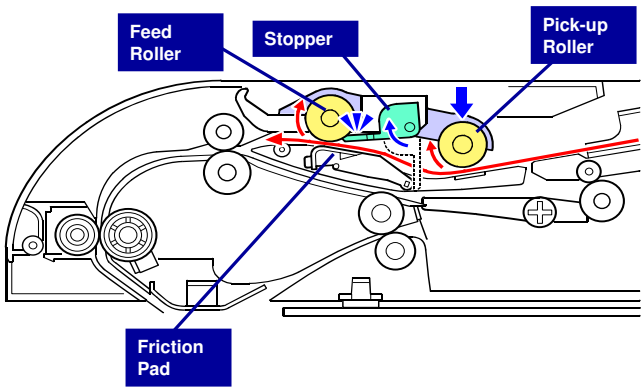


- The stopper prevents the user from placing originals too far into the feeder.
- Original feed control starts when the original set sensor detects originals.

Slide 88

No additional notes

Pick-up



- The pick-up solenoid drops the pick-up roller onto the top original of the stack.
- This moves the stopper out of the way, and the original can be fed to the feed roller.
- The friction pad ensures that only one sheet of the original enters the feeder at a time.

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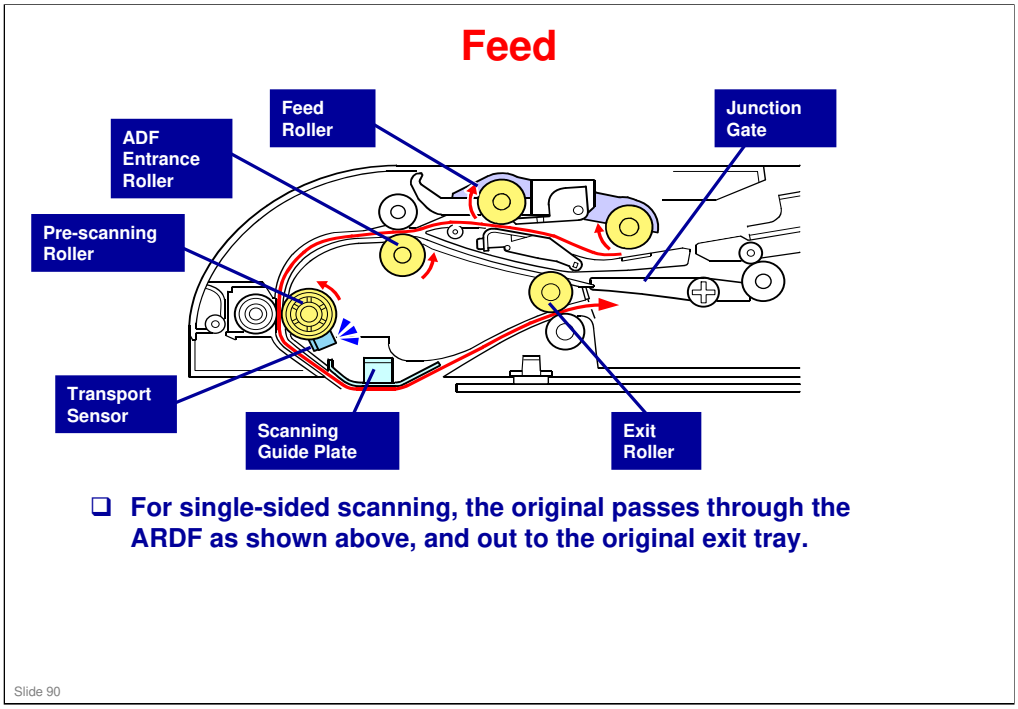
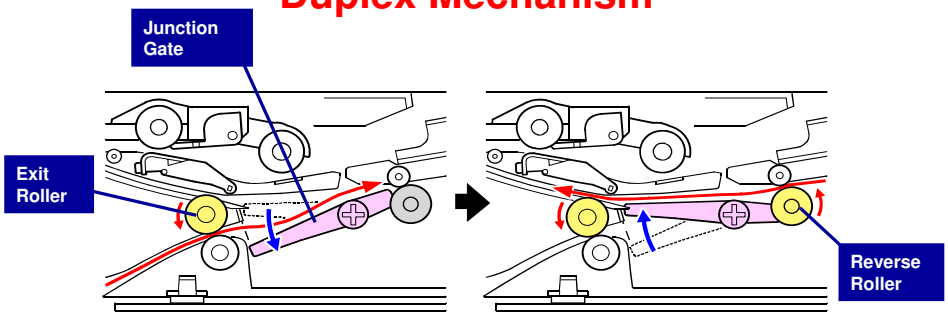
No additional notes



No additional notes

Duplex Mechanism



- The junction gate solenoid drops the junction gate, and the original feeds up towards the reverse roller, instead of down into the exit tray.
  - At this time, the reverse roller is idle.
- When the trailing edge of the original has passed the exit roller, the junction gate solenoid turns off, and the reverse roller feeds the original back into the ARDF.
- The second side is scanned.
- After scanning the second side, the machine inverts the original again, so that it is stacked correctly in the exit tray.

Slide 91

No additional notes

RICOH

RICOH

D127/D128
Service Training

Paper Feed Unit (D661)

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- The paper feed unit is also referred to as the "Paper Tray Unit" in some documents, but the official name is "Paper Feed Unit PB 1040".

Overview

- **Paper feed unit is an option for this machine.**
- **Paper feed unit uses standard mechanisms for these:**
  - Paper feed (friction pad method)
  - Paper lift (springs)
  - Paper end detection (feeler method)
- **Paper feed unit does not have any mechanism to detect paper size. If you want to change paper size, you must set new paper size in machine memory with a user tool. This will prevent timing jams. (Please refer to the operating instructions for details.)**

Slide 93

No additional notes.

Specifications

- **Paper sizes:**
  - A4 SEF
  - 8½" x 11" SEF
  - 8½" x 13" SEF
  - 8½" x 14" SEF
- **Paper weight: 60-90 g/m² (16-24 lb)**
- **Tray Capacity: 500 sheets**
- **Paper feed system: Feed roller and friction pad**

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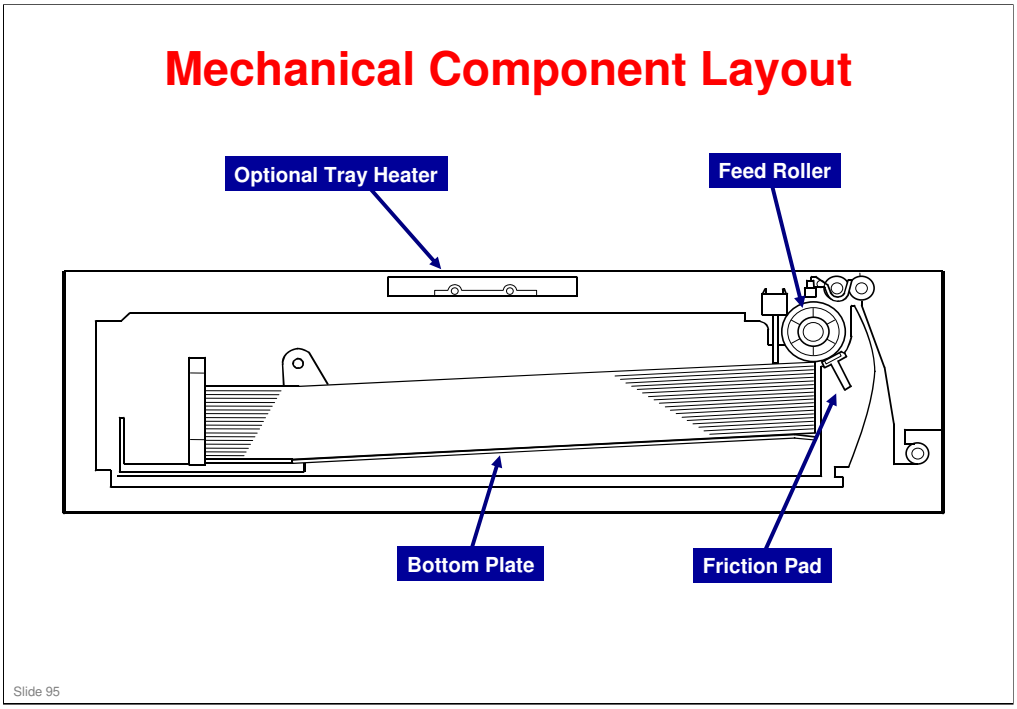
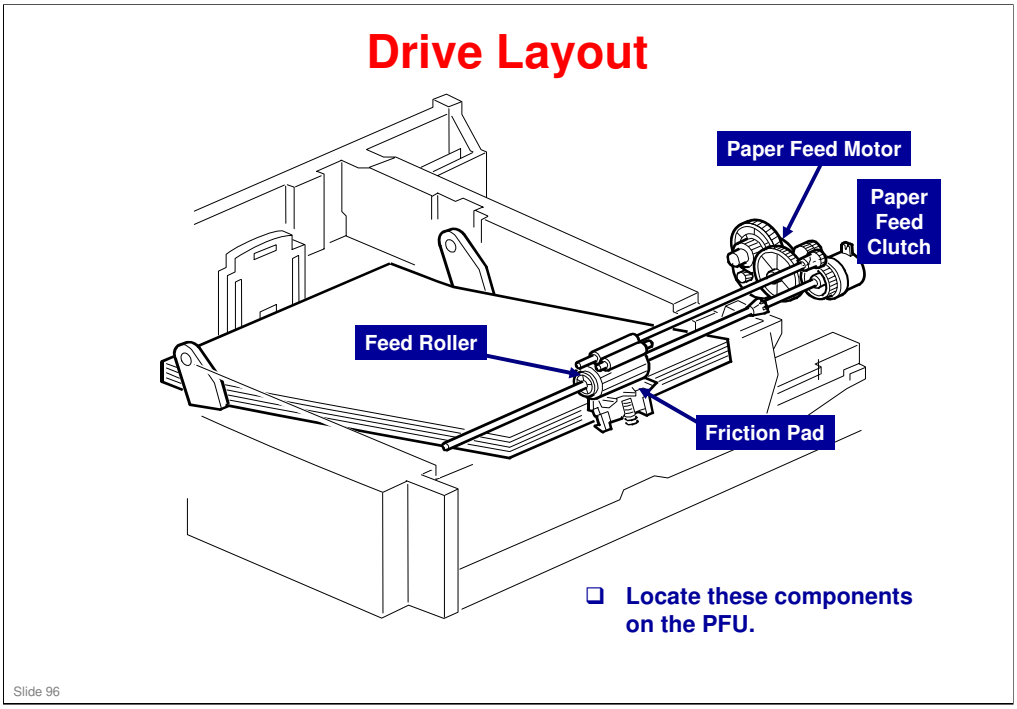
No additional notes.

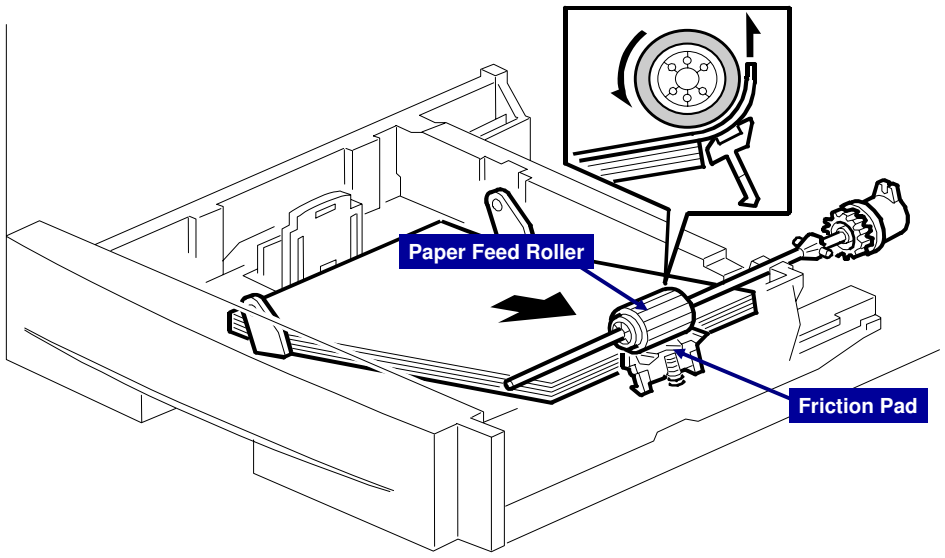


No additional notes.



No additional notes.

Paper Feed and Separation



- This is a standard friction pad paper feed system.

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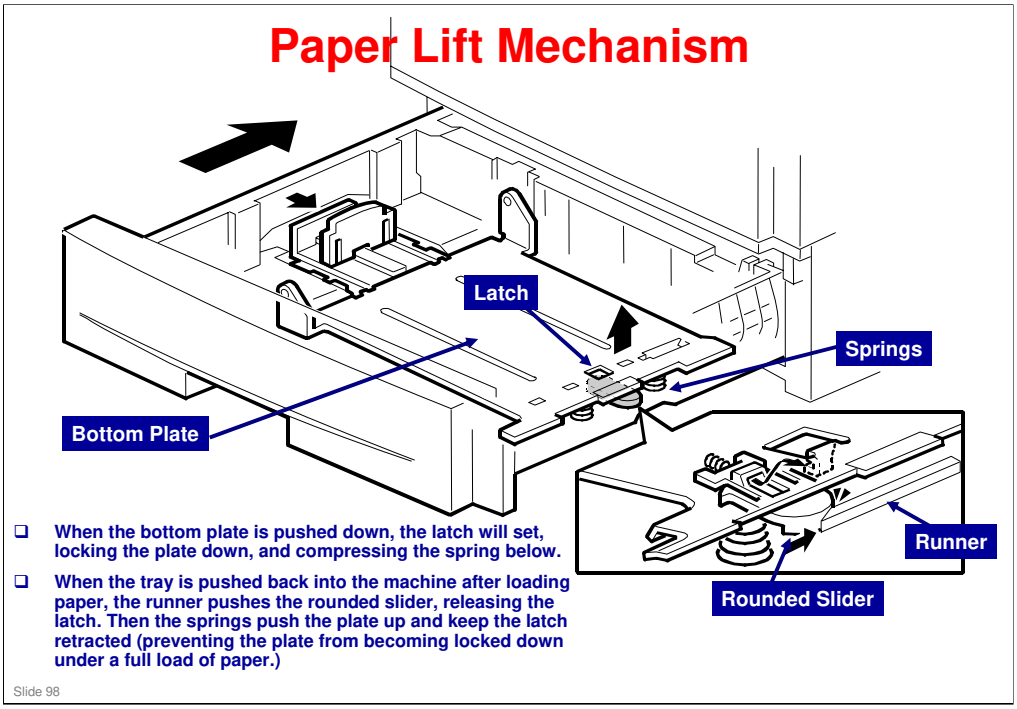
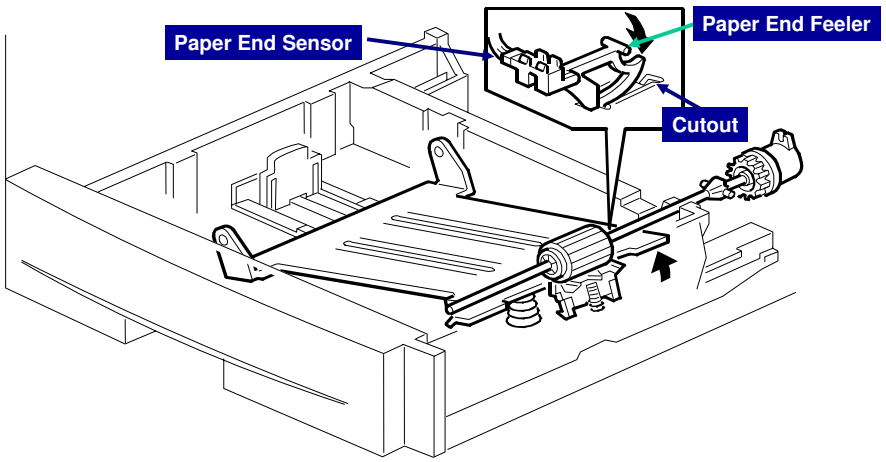
No additional notes.



No additional notes.

Paper End Detection



- If there is paper in the tray, the feeler will be pushed up into the paper end sensor. If there is no paper in the tray, the feeler drops into the cutout and activates the sensor.
- The feeler is rounded so it does not get caught when the tray is pushed in or pulled out.

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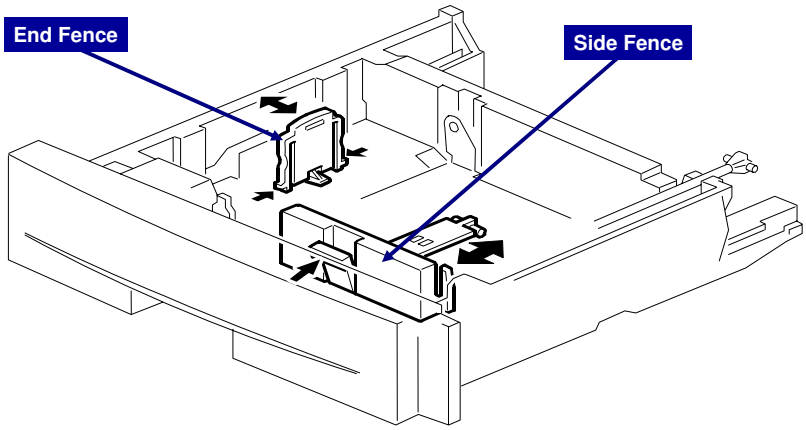
No additional notes.

Side and End Fences



- Side Fence: Set width to A4, 8¼", or 8½".
- End fence: Set from 11" to 13", with standard settings at 11", A4, and 13". To feed 14" paper, end fence must be removed (and stored in an internal storage compartment).
- You can secure both fences with screws at standard positions.

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No additional notes.

RICOH

No additional notes.

PM Procedures

- **Make sure you understand all warnings and precautions before you service machine.**
- **45 K PM**
  - Clean the exposure glass, platen cover, tray bottom plates, and registration roller.
  - Replace the PCU.
- **90 K PM**
  - Clean the fusing unit's inlet guide, outlet guide, hot roller bearings, and stripper pawls.
  - Replace the transfer roller, discharge plate, paper feed rollers, friction pads, and hot roller.
- **120 K PM**
  - Clean the pressure roller bearings.
  - Inspect the pressure roller and replace if necessary.
- **As Needed**
  - Inspect and clean critical parts. (Refer to the PM Table in the FSM for which parts to inspect.)
  - Replace the hot roller bearings and pressure roller bearings.
- **Clear the PM counter with SP 7804 after doing a 45 K or 90 K PM.**

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No additional notes.

Copy Image Adjustments

- **Copy image adjustments need to be done after doing the following:**
  - After clearing engine data (SP 5801-1 or SP 5801-2).
  - Replacement of the carriage (LED unit)
  - Replacement of the scanner motor
  - Replacement of the laser unit or polygon mirror motor assembly.
  - Replacement of the paper tray
- **There are separate adjustment procedures for the printing mechanism, the scanning mechanism, and the ARDF.**
  - Adjustment order: Printing → Scanning → ARDF.
- **Refer to the FSM for all adjustment procedures**
  - FSM → Replacement and Adjustment → Adjusting Copy Image Area

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No additional notes.

RICOH

No additional notes.

Overview

- SC codes refer to hardware or firmware malfunctions of copy/print engine. SC codes are shown on LCD screen of operation panel.
- This machine has four levels of service call conditions. Make sure you note which codes can be cleared by user and which codes cannot be cleared by user.
- If the problem is with circuit boards, disconnect and then reconnect all connectors before you replace a circuit board.

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No additional notes.

RICOH

SC Tables

- **Familiarize yourself with the service call conditions in the service call tables.**
  - FSM → Troubleshooting → SC Tables
- **These tables give symptoms and probable causes for the SC codes.**
- **The FSM has two sections of SC codes. The first is labeled "Engine SC Code Descriptions". The second, which is labeled "SC Code Descriptions", is for controller related SC codes.**

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No additional notes.

Sensor/Switch Open Errors

- **Familiarize yourself with the sensor/switch defect table.**
  - FSM → Troubleshooting → Electrical Component Defects → Sensor/Switch
- **This table gives the machine's indication or condition when sensors or switches fail. The related connector numbers are also listed.**
- **Simulate some open sensor/switch conditions. Use caution not to damage any connectors.**

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No additional notes.

Blown Fuse Conditions

Fuse	Rating		At main switch on
	100 ~ 127 V	250 V	
FU1	15 A, 250 V	8 A, 250 V	No response
FU2	8 A, 250 V	4 A, 250 V	No response

- The machine has two fuses on the power supply unit. If either opens the machine will not operate.

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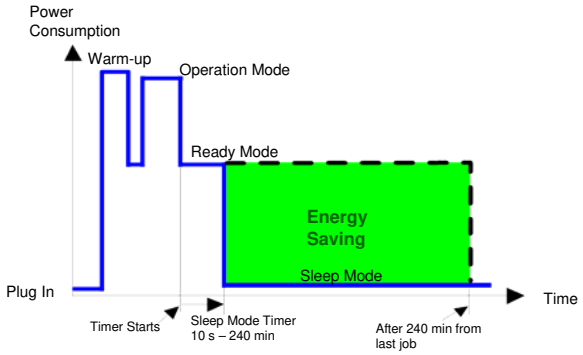
No additional notes.

- This section explains the technology used in this machine for environmental conservation, and the default settings of related functions.

Energy Saving



- **The area shaded green in this diagram represents the amount of energy that is saved when the sleep mode timer is at the default setting. If the timer is changed, then the energy saved will be different. For example, if the timer is set to 240 minutes, the green area will disappear, and no energy will be saved before 240 minutes expires.**

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No additional notes.

Changing the Sleep Mode Timer

- **You can specify this setting only if [Sleep Mode] is set to [Enable] in [Administrator Tools] in [System Settings].**
- **Default: [1 minute]**
- **The time can be set from 10 seconds to 240 minutes, using the number keys.**
- **Sleep Mode Timer may not work when error messages appear.**
- **We recommend that the default settings should be kept.**
  - If the customer requests that these settings should be changed, please explain that their energy costs could increase, and that they should consider the effects on the environment of extra energy use.
  - If it is necessary to change the settings, please try a shorter setting first, such as 30 minutes, then go to a longer one if the customer is not satisfied.
  - If the timer is set to the maximum value, the machine will not begin saving energy until 240 minutes has expired after the last job. This means that after the customer has finished using the machine for the day, energy will be consumed that could otherwise be saved.
- **The energy consumed and saved can be calculated using SP8941. The procedure is explained in the FSM.**
  FSM → Energy Saving → Energy Save Effectiveness

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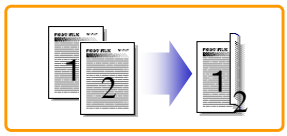
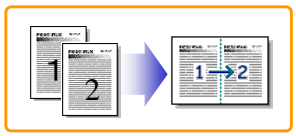
No additional notes.

Paper Saving

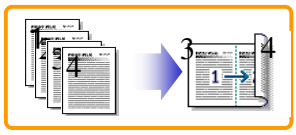
1. Duplex: Reduce paper volume by half!



2. Combine: Reduce paper volume by half!



3. Duplex + Combine: Using both features together can reduce paper volume by 3/4!



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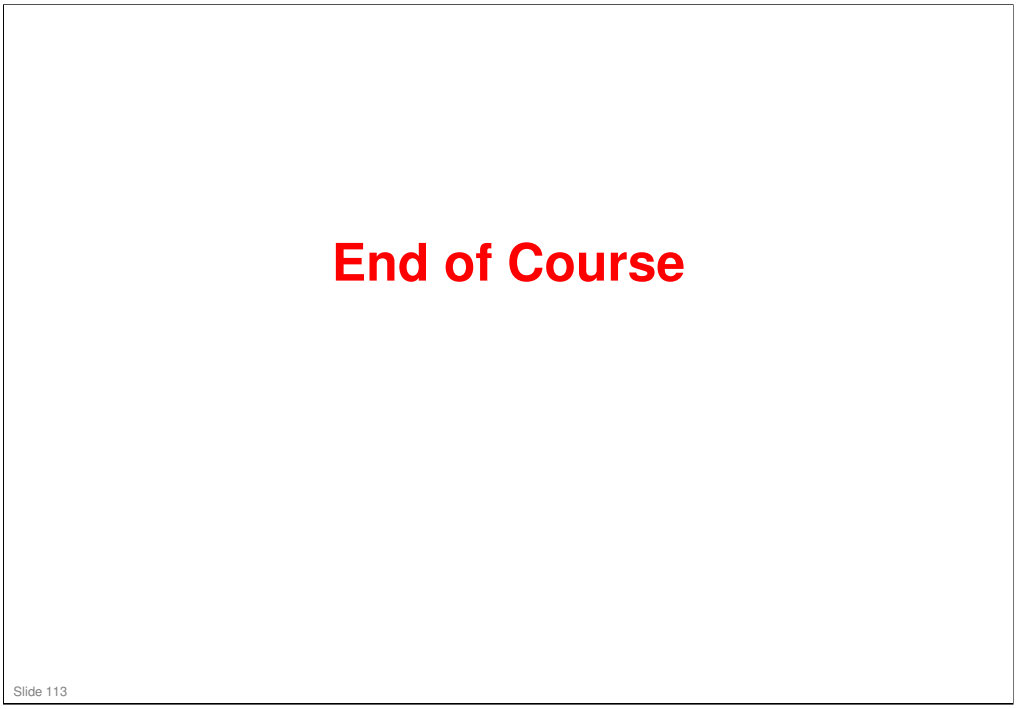
No additional notes



No additional notes.