



## HOW TO USE THIS PRESENTATION

This TTP (Technical Training package) will help you train service technicians on the model Di-C1/C1L.

You can use this guide in three ways:

- ☐ As a check list to make sure you have covered all the important points
- ☐ As a set of ordered notes taken from the service manual, operation manual, and other sources. Sometimes, the ideas from other manuals have been reworded or reorganized for clarity.
- ☐ As a source of information that is not included in any of the other manuals. This may include technical details of the machine's hardware or software, or background knowledge of technologies used in the machine. This information can be taught to the trainees if you feel that they will benefit from it, but some of it may be too technical for routine field use. This information may also help you answer questions from the class.
- ☐ Caution: Do NOT give copies of this TTP to anyone other than trainees, technical training staff, technical support staff, and management personnel. In particular, do not reveal this information to competitors.

Date of change	Version History	Description
17-11-2008	1.1	Changed slides 30, 33, 41, 60, 83, 125, 127, 132, 173, 175, 178, 200, 201, 203, 204, 205, 206, 209, 214, 218, 228, 234, 235, 247, 348, 371, 373

**PREPARATION CHECK LIST**

Description	Quantity	Remarks
Field Service Manual	1 per trainee	Give copies to the trainees
Operation Manual	1 per trainee	Give copies to the trainees
Training Schedule	1 per trainee	Give copies to the trainees
Training machines	1 for every 3 trainees	Have the trainees completely install these during class.
Special Tools	1 set per machine	As necessary
Computer	1 per student	Used for testing the printing and document storage. The operating system should be one of the following: 2000/XP/Vista/2003/2008
Network	1	The computers must connect to the copier via a TCP/IP network, or a Wireless LAN network and Wireless LAN board.

- ☐ Provide the relevant manuals and any additional handouts you feel are necessary. Special tools are listed in the Replacement and Adjustment section of the service manual.

## **Objectives**

- ☐ **Install the machine and its peripherals in the field.**
- ☐ **Understand and perform routine maintenance.**
  - ♦ Understand the PM table.
  - ♦ Understand the important SP codes.
- ☐ **Troubleshoot and repair this product in the field.**

Slide 3

### **ORIENTATION**

**Provide the trainees with information about the training course procedures, facilities, objectives and rules.**

#### **Introduction of instructors**

- ☐ Introduce yourself to the class, and any other instructors who will be taking part. Tell them who to talk to if they have any problems.

#### **Introduction of trainees**

- ☐ Distribute a list of those attending the course.
- ☐ Try to generate a friendly and relaxed atmosphere, and encourage the class to get to know each other.
- ☐ If it will help, have the trainees introduce themselves (name, company, work experience).

#### **Explanation of curriculum**

- ☐ Pass out copies of the training schedule
- ☐ Impress the importance of getting to the class on time
- ☐ Go over the course objectives (key points listed on the slide).

#### **Explanation of training center rules**

- ☐ Explain the general rules of your training center (smoking, breaks, use of facilities, etc.)
- ☐ Explain the tools and equipment available at the facility.
- ☐ Impress on the trainees that they should not touch the machines until the instructor says so, and that they are responsible for replacing tools and keeping the classroom in order.

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****COURSE OVERVIEW**

Slide 4

- ☐ The course is broken up into several modules. This section outlines these modules.
- ☐ The course covers the copier and the optional peripherals. Connectivity is not covered in this course.

## Course Overview - 1

- ☐ Product Outline
- ☐ Specifications
- ☐ Installation
- ☐ Machine Overview
- ☐ Scanner
- ☐ Laser Exposure
- ☐ PCDU

Slide 5

### PRODUCT OUTLINE

- ☐ The model will be introduced to the class.
- ☐ The optional peripherals will be introduced to the class.
- ☐ The product concept, sales points, and targets will be presented.

### SPECIFICATIONS

- ☐ The main specifications will be outlined. Significant items will be stressed.

### INSTALLATION

- ☐ The class will install their machines and the peripherals.
- ☐ The class will learn how to access SP modes and user tools.
- ☐ The class will study how to upgrade the firmware.

### MACHINE OVERVIEW

- ☐ The components will be discussed.
- ☐ The paper feed path and copying process will be outlined.
- ☐ The machine's organization and overall PCB structure will also be covered.

### SCANNER

- ☐ The scanner mechanism will be discussed.

### LASER EXPOSURE

- ☐ The laser diode circuits and laser optics will be described.

### PCDU

- ☐ This section explains the components of the PCDU.
- ☐ All the image-creation processes around the drum, including development, are covered in this section.

## Course Overview - 2

- ☐ Process Control
- ☐ Toner Supply
- ☐ Transfer
- ☐ Paper Feed
- ☐ Fusing
- ☐ Paper Exit
- ☐ Duplex

Slide 6

### PROCESS CONTROL

- ☐ This section explains the basic points about how the machine controls the copy process to compensate for changes in operating conditions.
- ☐ Toner supply control, and toner near-end/end detection are covered in this section.

### TONER SUPPLY

- ☐ The toner supply mechanism will be described.
- ☐ Toner supply control, and near-end/end detection are covered in the process control section.

### TRANSFER

- ☐ Image transfer, paper transfer, and paper separation will be described.

### PAPER FEED

- ☐ The paper feed mechanism for the main body will be described. The optional tray units will be dealt with in later sections.

### FUSING

- ☐ Fusing will be described.

### PAPER EXIT

- ☐ The paper feed out mechanisms will be described.

### DUPLEX

- ☐ The duplex mechanisms will be described.
- ☐ The duplex unit is a standard component of this model.

## Course Overview - 3

### ☐ Options

- ◆ ARDF (standard equipment for the H model [Di-C1a/c])
- ◆ Paper Tray Units (1-tray, 2-tray)
- ◆ Shift Tray
- ◆ One-bin Tray
- ◆ Side Tray
- ◆ Internal finisher

### ☐ Maintenance

### ☐ Troubleshooting

### ☐ Fax Option

Slide 7

## OPTIONS

- ☐ The options listed above will be described in the indicated order.

## MAINTENANCE

- ☐ PM is described briefly.

## TROUBLESHOOTING

- ☐ Basic points concerning service codes, diagnostics, and other troubleshooting tools will be covered.

## FAX

- ☐ Basic information about the fax unit will be explained.

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****PRODUCT OUTLINE**

Slide 8

- ☐ The model will be introduced.
- ☐ The optional peripherals will be introduced.
- ☐ The product concept, sales points, and targets will be presented.



# INTRODUCTION

Slide 9

**No additional notes**

## How many models?

### ❑ Four models:

- ♦ Di-C1a, Di-C1La: 20 cpm
- ♦ Di-C1c, Di-C1Lc: 25 cpm

### ❑ Differences between the models:

- ♦ Di-C1a/c (also known as the 'H model'):
  - » WVGA display panel
  - » HDD built-in
- ♦ Di-C1La/Lc (also known as the 'L model'):
  - » 4-line LCD panel
  - » No HDD (no local storage, built-in or optional)
  - » No finisher or shift tray
  - » Fax option is different
    - No optional SAF memory
    - No IP Fax or Internet Fax
  - » TWAIN scanning only (no Scan-to e-mail or other connectivity features)
  - » Fewer printer features
  - » The USA model of the Di-C1La (20 cpm model) has a built-in fax unit.

Slide 10

❑ H model: High-end model

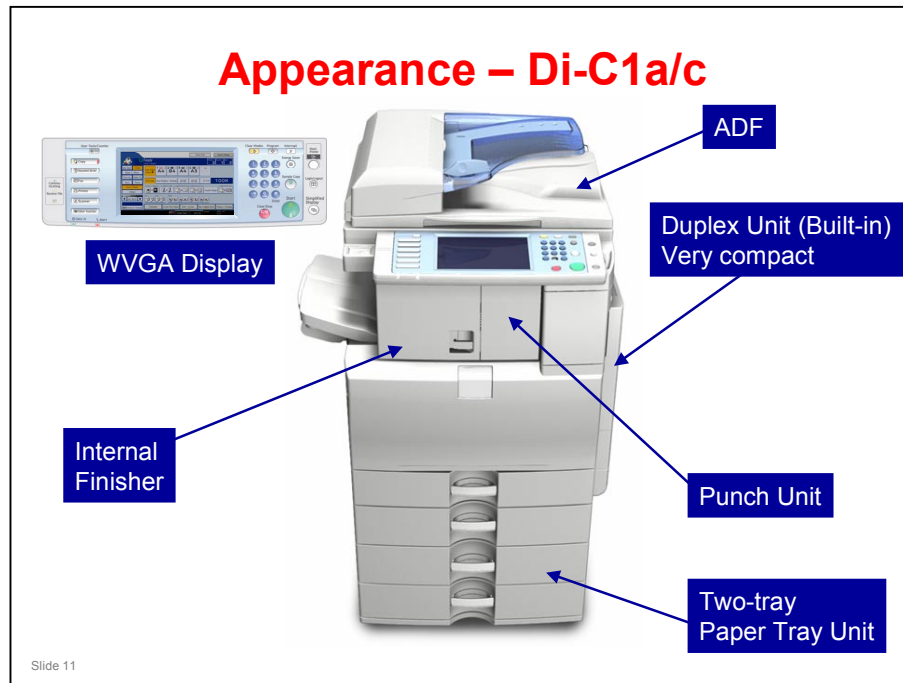
❑ L model: Light model

❑ The Di-C1La/c do not have the following printer features:

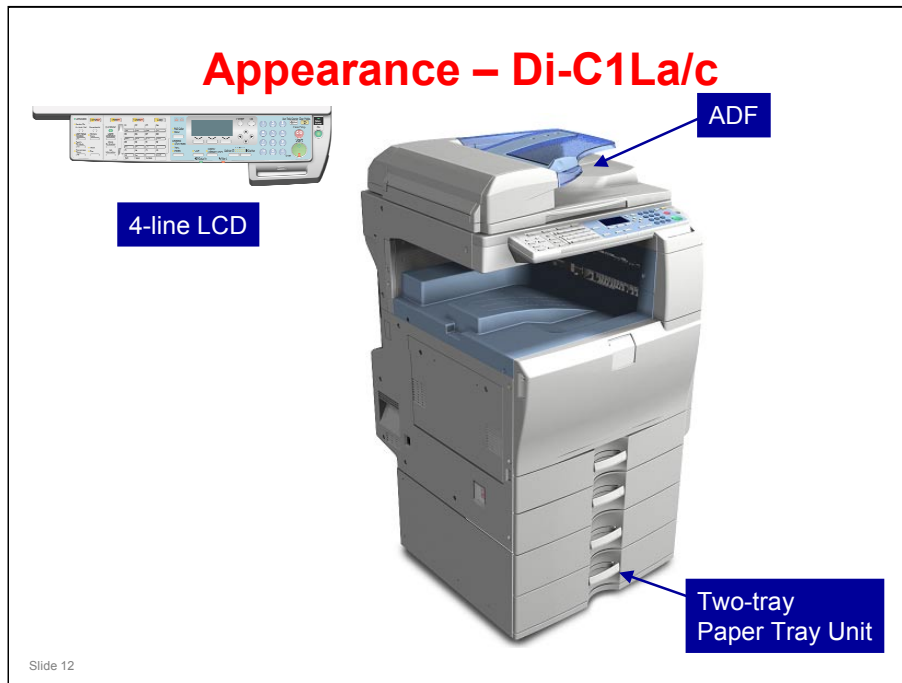
- Sample Print
- Locked Print
- Hold Print
- Stored Print
- Store and Print
- Mail to Print
- PDF Direct Print
- 1200 dpi Support
- Mobile Driver
- Bonjour (Rendezvous) Support
- Wireless LAN Interface Option

❑ Fax

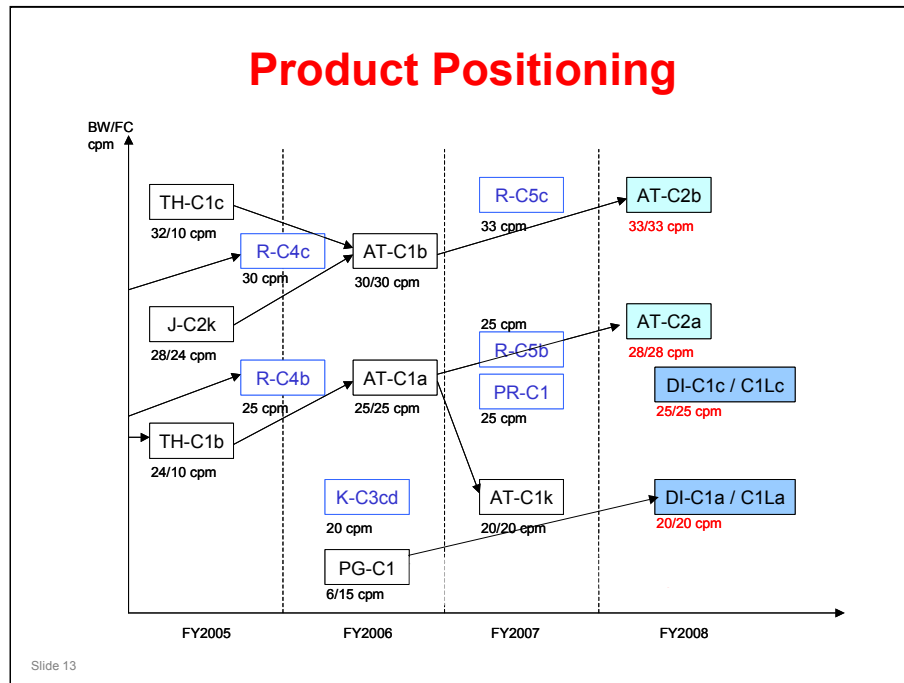
- The fax option for the Di-C1a/c is different from the fax option for the Di-C1La/c.
- The specifications are different. For details, see the Fax section of the course.



- ☐ Here is a view of the machine with some optional peripherals installed.
- ☐ There are other options, as we will see later.
- ☐ ADF is standard equipment



- ☐ The duplex unit is not visible in this photo.
- ☐ ADF is standard equipment for Europe and North America; option for Asia and China
- ☐ The display is similar to the K-C3. The K-C3 is a target model for B-to-C replacement.



- This chart shows the position of the Di-C1 in the product line-up.

## **SALES POINTS**

Slide 14

**No additional notes**

## Main Sales Points

### ❑ High performance (close to black-and-white models)

- ♦ Short Warm Up time: Less than 30 sec.
- ♦ Short First Copy Output Time:
  - » Black-and-white 6.5 sec
  - » Full colour: 9.5 sec

### ❑ Productivity

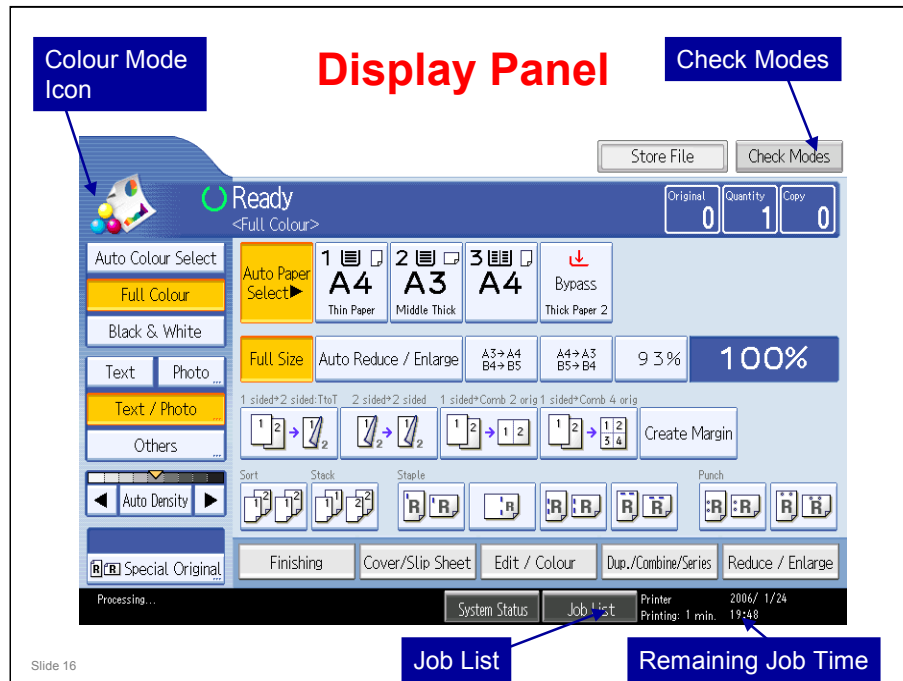
- ♦ High speed colour output
  - » Di-C1a/C1La: 20 cpm, Di-C1c/C1Lc: 25 cpm
- ♦ Internal 500-sheet finisher (Di-C1a/c only)
- ♦ High Speed Scanning (from ADF): 41 pages/minute (monochrome), 26 pages/minute (colour): A4 LEF, 200dpi
- ♦ Thick paper (up to 256 g/m<sup>2</sup>) can be fed from the first tray or bypass tray

### ❑ Small footprint

- ♦ 587 mm x 655 mm (w x d)
- ♦ Smallest in this range of the market

Slide 15

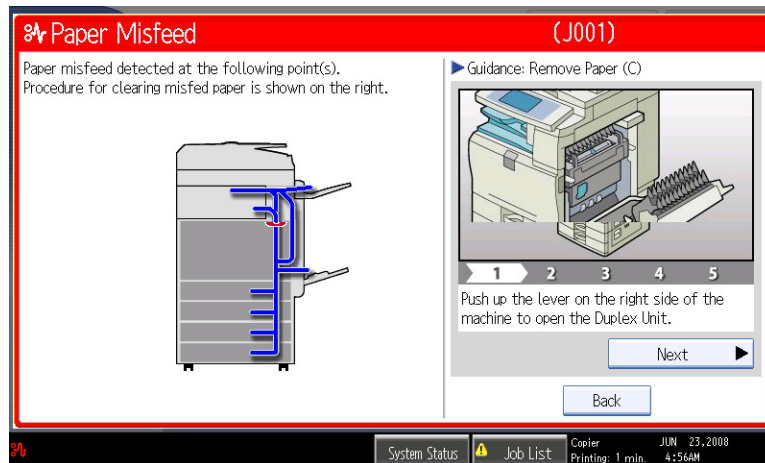
- ❑ There are also a lot of connectivity features, which we will not explain in this class. We will limit ourselves to the engine in this course.



- ☐ This is for the Di-C1a/c only.
- ☐ The colour mode icon changes when you select Auto Colour Select, Full Colour, or Black and White. Ask the class to try it on the machine, if you have one set up already.
  - Other modes, such as two-colour mode, can also be shown as options on the display by adjusting SP modes.
- ☐ The Check Modes button is part of the LCD display.
- ☐ The Job List button is a new feature.
- ☐ You can also see an estimate of the remaining time for the job, at the bottom of the screen. (Does not work for fax communication.)

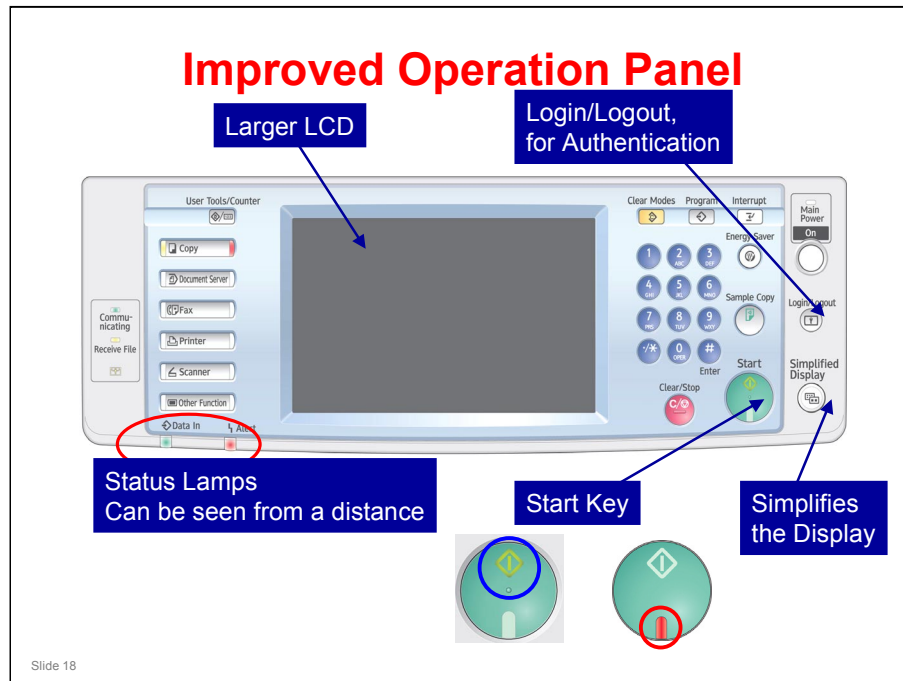


## Animated Guidance



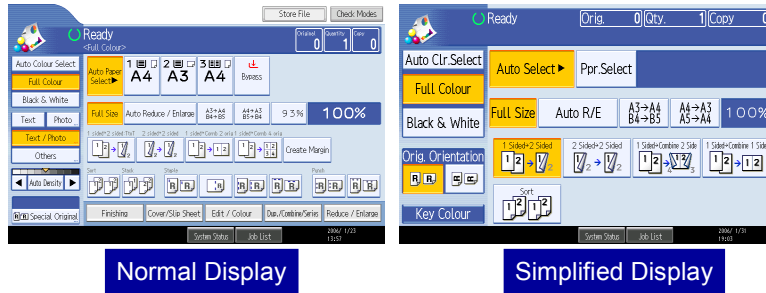
Slide 17

- ☐ This is for the Di-C1a/c only.
- ☐ For some functions, such as removing jams and replacing toner, an animated guidance appears on the screen.



- ☐ This is for the Di-C1a/c only.
- ☐ This type of operation panel has been used for higher-end models for some time now. But if you have not worked with this type of model, this panel may be new for you.
- ☐ The login/logout button makes authentication a bit easier.
- ☐ The 'simplified display' button reduces the amount of information on the LCD panel. Try it and see. The next slide gives an example.
- ☐ The red and green lamps on the Start key show clearly when the machine will or will not start.

## Display

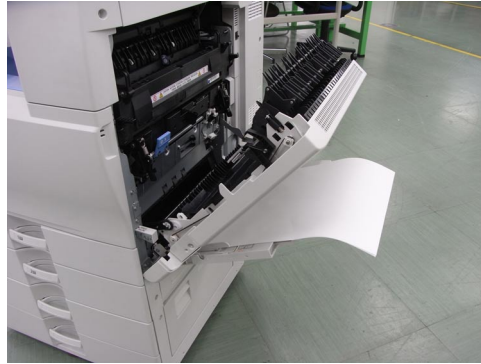


- ❑ The simplified display appears when you push the Simplified Display button.

Slide 19

- ❑ This is for the Di-C1a/c only.

## Easy Jam Removal



- ☐ Simple paper path
- ☐ The cover can be opened without paper falling off the bypass tray.
- ☐ All jams can be removed from the right side of the machine.

Slide 20

**No additional notes**

# **EQUIPMENT**

Slide 21

**No additional notes**

## Mainframe, with No Options

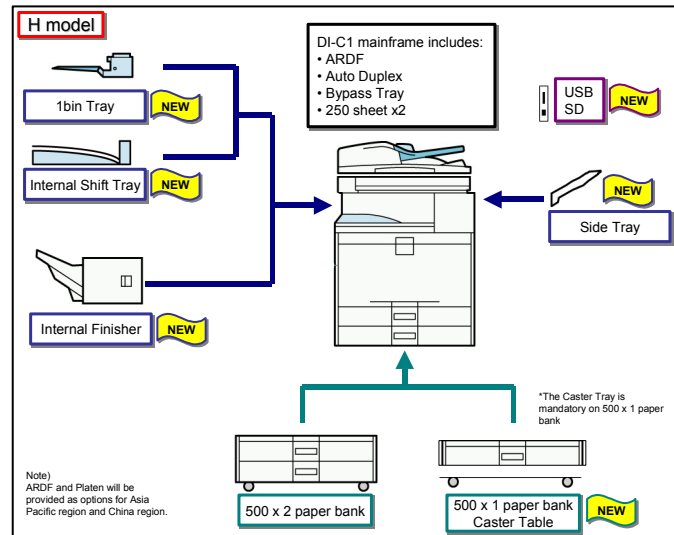
### ☐ The machine has this equipment built in.

- ◆ Duplex
- ◆ Bypass tray
- ◆ 2x250-sheet trays
- ◆ 500-sheet output tray
- ◆ 8.5-inch W-VGA touch panel (Di-C1a/c only)
- ◆ Printer/Scanner, with USB and Ethernet
- ◆ 768MB Memory (Di-C1a/c), 512 MB Memory (Di-C1La/c)
- ◆ USB Host Interface
- ◆ 60GB HDD (Di-C1a/c only)
- ◆ PCL5c/6 (Di-C1a/c only), RPCS
- ◆ 10Base-T/100BaseTX

Slide 22

- ☐ This slide shows what you get with the base machine.
- ☐ Note that the printer/scanner is standard equipment for this model.

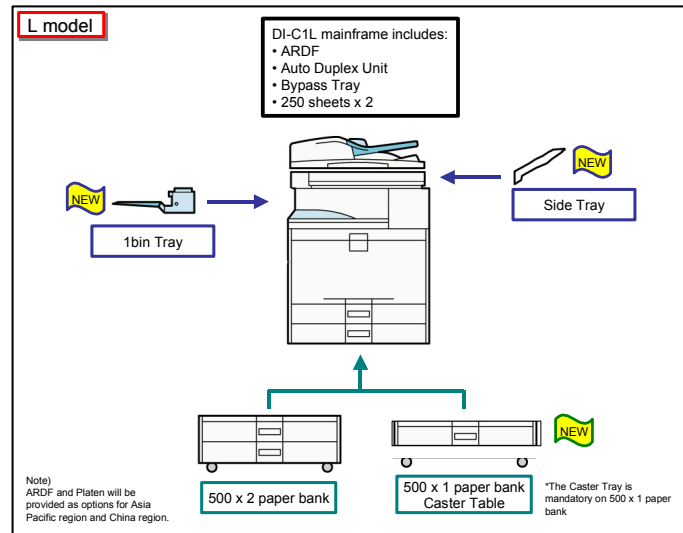
## Paper Handling Options – Di-C1a/c



Slide 23

- ❑ You can install one of the following paper feed options
  - One-tray paper feed unit (requires the caster table, or the machine cannot be moved around)
  - Two-tray paper feed unit
- ❑ You can install the following finishing/output options:
  - Shift tray and/or one-bin tray (you can install both of these if you wish)
  - Internal finisher
    - If you install the internal finisher, you cannot install the one-bin tray or shift tray.*
    - If you install the internal finisher, you can install the side tray to receive fax outputs, instead of the one-bin tray.*
  - The side tray can be installed with any of the other finishing options at the same time.
    - Paper feeds out to the side tray face down. First the paper goes out towards the standard tray, then it switches back to the right side of the machine and out to the side tray, face down.*

## Paper Handling Options – Di-C1La/c



Slide 24

- ☐ You can install one of the following paper feed options
  - One-tray paper feed unit (requires the caster table, or the machine cannot be moved around)
  - Two-tray paper feed unit
- ☐ You can install the following finishing/output options:
  - One-bin tray
  - Side tray
  - There is no shift tray or finisher.
  - The side tray can be installed with the one-bin tray at the same time.
- ☐ There is no USB/SD card option.



## Paper Handling Options

- ❑ **All the options are new, except:**
  - ♦ ARDF: Same as R-C5, AT-C2
  - ♦ Two-tray paper feed unit: Same as Pr-C1, R-C5
- ❑ **Di-C1a/c: The one-bin tray and shift tray cannot be installed in the same machine as the finisher.**
  - ♦ If you install the finisher, you can install the side tray to receive fax outputs, because you cannot install the shift tray or the one-bin tray.
- ❑ **The finisher and shift tray cannot be installed in the Di-C1La/c.**
- ❑ **If the one-tray paper feed unit is installed, you must also install the caster table. If not, you cannot move the machine around.**
  - ♦ If no optional paper feed unit is installed, you can also install the caster unit as an option.

Slide 25

**No additional notes**

## Fax Options

- ❑ Fax Option: New Item
  - ◆ There are two fax options. One is for Di-C1a/c, one is for Di-C1La/c
- ❑ Expansion memory (32 MB): Same as R-C5, AL-C1
- ❑ Handset: Same as AT/AP-C2, R-C5, AL-C1
- ❑ Fax Stamp Ink: Same as AT/AP-C2, R-C5, AL-C1
- ❑ There is no optional extra G3 Interface unit.

Slide 26

**No additional notes**

## Printer/Scanner Options

- ❑ **Printer/scanner is a standard part of the machine, not an option.**
  - ◆ USB and Ethernet are built in.
- ❑ **PictBridge: Same as G-P3 (enables direct printing from a digital camera)**
- ❑ **Di-C1a/c only:**
  - ◆ Wireless LAN (IEEE 802.11g, a/g): Same as AT-C2
  - ◆ IEEE 1284: Same as AT-C2
  - ◆ Bluetooth: Same as AT-C2
  - ◆ Gigabit Ethernet: Same as AL-C1, R-C5, G-P3
  - ◆ PostScript3 option: New Item
    - » Required to use the PDF Direct Print and Mail to Print functions
- ❑ **Di-C1La/c only:**
  - ◆ Printer Enhanced Option (PCL Module)

Slide 27

- ❑ **PCL Module option:** This is standard for the Di-C1a/c.

## Security Options

### □ Di-C1a/c only:

- ◆ Data Overwrite Security Unit: Also used with AL-C1, R-C5
- ◆ Copy Data Security Unit: Also used with AL-C1, R-C5
- ◆ HDD Encryption Unit: Also used with AL-C1, R-C5

Slide 28

**No additional notes**

## Other Options

- ❑ **Optional counter interface: Also used with AP/AT-C2**
  - ◆ This is a 20-pin interface. It is required when you attach a key counter.
- ❑ **Key Counter Bracket: Also used with AP/AT-C2**
- ❑ **Di-C1a/c only:**
  - ◆ File Format Converter: Also used with V-C2, AL-C1, R-C5
  - ◆ VM Card: Also used with AP/AT-C2
  - ◆ Web Browser Option: Also used with AP/AT-C2
  - ◆ USB2.0/SD Card Slot: Also used with AP/AT-C2

Slide 29

**No additional notes**

## Optional USB 2.0/SD card slot



- ❑ This optional unit allows use of the new Scan to USB and Scan to SD features.
- ❑ This allows users to scan documents and save them in electronic format on an SD card or USB memory device.
  - ♦ If the USB device or SD card is connected to a computer, the scanned files can then be viewed, printed, or processed.
- ❑ You cannot print or send files from this SD/USB slot with the operation panel. You must connect the USB device/SD card to a computer.
- ❑ This USB slot cannot be used as a printer interface, except for PictBridge.

Slide 30

- ❑ Files saved on a removable memory device will not appear in the list of stored files.
- ❑ Files saved on a removable memory device cannot be printed or sent using the machine's operation panel. To perform operations on files saved on a removable memory device, you must use an application on a client computer.
- ❑ You cannot specify where the data is saved. Files are saved in the root directory of the removable memory device.
- ❑ If the removable memory device is partitioned, files are saved on the first partition.

## Optional USB 2.0/SD card slot

- ❑ **Up to 2 GB of data can be saved.**
  - ◆ However, depending on the number of files already stored on the removable memory device, new files might not be saved, even if there appears to be sufficient free space.
- ❑ **This machine supports FAT16 format USB memory devices and SD cards. Other forms of removable memory device are not compatible.**
- ❑ **Saving might fail if the USB memory device has password protection or other security features.**
- ❑ **To save files on a removable memory device, you must attach the optional USB 2.0/SD card slot to the machine.**
- ❑ **File formats that can be used:**
  - ◆ Single page TIFF/JPEG/PDF (including high compression PDF)
  - ◆ Multipage TIFF/PDF (including high compression PDF)

Slide 31

**No additional notes**

**TARGETS**

Slide 32

**No additional notes**



## Reliability Targets

- ❑ **Unit life (2 prints per job): 600K or 5 years**
- ❑ **Average Copy Volume per month (copy + fax + print):**
  - ◆ Di-C1a/C1La: 3K
  - ◆ Di-C1c/C1Lc: 4K
- ❑ **Duty: 40K**
- ❑ **PM cycle:**
  - ◆ 60K (drum unit, PCDU toner collection bottle, transfer belt cleaning unit assembly [includes a waste toner bottle])
  - ◆ 150K (fusing rollers and fusing belt)
  - ◆ Target Colour Ratio: 15% (C1a/C1La), 20% (C1c/C1Lc)

Slide 33

- ❑ There are two waste toner bottles: drum unit, and image transfer belt. Replace both at the same time.

## Yield Targets

### ❑ Toner

- ◆ Target Yield (A4/LT, 5% coverage)
  - » Black: 10K outputs/cartridge
  - » Cyan / Magenta / Yellow: 5.5K outputs/cartridge

### ❑ Developer

- ◆ Pre-installed in the machine at the factory, and pre-installed in each development unit spare part.
  - » Europe, USA Di-C1a/c: The heat seal is also removed at the factory
- ◆ Under normal conditions, the life of the developer is the same as the machine, so it is not necessary to replace.
- ◆ No SP needed at installation. Initialization is done automatically after power is switched on for the first time.

### ❑ Staples

- ◆ 5,000 staples per cartridge

Slide 34

- ❑ The toner bottles are not compatible with other products.
  - The toner is the same as the AT-C2, but the shape of the cartridge is different.
- ❑ The staple refill cartridges are not compatible with other models.

**RICOH**

**Di-C1 TRAINING  
COPIER ENGINE**

**SPECIFICATIONS**

Slide 35

**No additional notes**

## General Specifications 1

### Resolution:

- ◆ Scan: 600 dpi
- ◆ Print:

		DI-C1L	DI-C1
Copy	Color	600 dpi 4bit	600 dpi 4bit
	B&W	600 dpi 1bit	600 dpi 4bit
Print		600 dpi 2bit/1bit	1200 dpi 1bit 600 dpi 2bit/1bit

### Maximum Original Size: A3/11" x 17"

Slide 36

- ❑ The next few slides show the basic engine specifications.
- ❑ For more detailed specifications (for example, scanner, printer, fax), see the service manual.

## General Specifications 2

### □ Print Paper Size:

- ◆ Trays 1 and 2: Min A5 (LEF)/8.5" x 5.5", Max A3/11" x 17"
- ◆ By-pass: Min 90 x 148 mm, Max 305 x 600 mm/12" x 23.62"
- ◆ Optional Tray: Min A5 (LEF)/8.5" x 5.5", Max A3/11" x 17"

### □ Printing Paper Weight:

- ◆ Tray 1: 60 to 256 g/m<sup>2</sup> (16 to 68 lb.)
- ◆ Tray 2: 60 to 169 g/m<sup>2</sup> (16 to 45 lb.)
- ◆ Optional paper tray: 60 to 105 g/m<sup>2</sup> (16 to 28 lb.)
- ◆ By-pass tray: 52 to 256 g/m<sup>2</sup> (14 to 68 lb.)
- ◆ Duplex unit: 60 to 105 g/m<sup>2</sup> (16 to 28 lb.)

Slide 37

### Print Paper Size

- For details, refer to "Supported Paper Sizes" in the service manual.

### Paper Weight

- From tray 1, DI-C1 supports thick paper (the same paper weight as AT-C2). Paper weight is a key spec for low segment colour MFP users.
- Why is there such a big difference between the trays for paper weight?
  - Tray 1 has a belt mechanism that assists feed for heavy paper.

## General Specifications 3

### ❑ Print Paper Capacity (80 g/m<sup>2</sup>, 20 lb):

- ◆ Standard tray: 250 sheets x 2
- ◆ By-pass tray: 100 sheets
- ◆ Optional paper feed tray: 500 sheets x 2

### ❑ Output Paper Capacity:

- ◆ Standard exit tray: 500 sheets (A4/LT, 80 g/m<sup>2</sup> face down)
- ◆ Side Tray: 50 (A4/LT, 80 g/m<sup>2</sup>)
- ◆ 1-bin Tray: 100 (A4/LT, 80 g/m<sup>2</sup>)
- ◆ Di-C1a/c only: Shift tray: 250 (80 g/m<sup>2</sup>)
- ◆ Di-C1a/c only: 500-sheet finisher: 500 sheets (80 g/m<sup>2</sup>)

Slide 38

- ❑ Standard exit tray: There is no tray full sensor.

## General Specifications 4

### ❑ Copy speed

- ◆ Normal (LT/A4 LEF):
  - » C1a/C1La: 20 cpm (colour or black & white)
  - » C1c/C1Lc: 25 cpm (colour or black & white)
- ◆ 1200 dpi, OHP/Thick paper
  - » Both models: 12.5 cpm (colour/black & white)

### ❑ First copy:

- ◆ Colour: 9.5 seconds or less (A4/LT LEF)
- ◆ Black & white: 6.5 seconds or less (A4/LT LEF)

### ❑ Warm-up time: Less than 30 seconds (20 °C, 50%)

Slide 39

- ❑ Warm-up time: The new toner melts at a lower temperature, so warm-up is quicker.
- ❑ Copy speed: Middle thick also 20/25 cpm.

## General Specifications 5

### □ Memory

- ◆ RAM
  - » Di-C1a/c: 768 MB, Di-C1La/c: 512 MB
- ◆ Hard disk: 60 GB (Di-C1a/c only)
- ◆ Optional memory: 512 MB (Di-C1a/c only)
  - » Up to 2 units can be installed (up to 1 GB)

Slide 40

- The fax option has an additional memory module. The purpose is explained in the Fax section of the course.



## Thick Paper Productivity

Mode	Paper Thickness (g/m <sup>2</sup> )	BK CPM C1a	FC CPM C1a	BK CPM C1c	FC CPM C1c
Thin Paper	52-59.9	20	20	25	25
Plain Paper 1	-74	20	20	25	25
Plain Paper 2	-90	20	20	25	25
Middle Thick	-105	20	20	25	25
Thick Paper 1	-169	12.5	12.5	12.5	12.5
Thick Paper 2	-210	12.5	12.5	12.5	12.5
Thick Paper 3	-256	12.5	12.5	12.5	12.5
OHP, 1200dpi printing	-	12.5	12.5	12.5	12.5

Slide 41

**No additional notes**

## Copier Specifications

	Model DI-C1L	Model DI-C1
ACS	X	O
Mixed Sizes Originals Mode	X	O
Advanced Reduce/Enlarge Copying	X	O
Advanced Copier Functions (Booklet/Magazine, Covers, Stamps, etc.)	X	O
Electrical Sort	O (Only B&W)	O
Staple/Punch	X	O (With Finisher)

Slide 42

- ☐ X: Not available
- ☐ O: Available
- ☐ ACS: This refers to the machine's ability to detect whether the original is b/w or colour (the L model cannot do this; the user must specify at the operation panel). It does not refer to the motion of the transfer belt away from the CMY drums for black-and-white pages.

## Scanner/Fax Specifications

	Model DI-C1L	Model DI-C1
Scan to functions	X	O
Document Server (Local Storage)	X	O
LAN FAX	O (No print function)	O
Internet FAX	X	O
IP FAX	X	O
FAX forwarding Solution	X	O

Slide 43

- ☐ X: Not available
- ☐ O: Available

## Printer Specifications (1)

	Model DI-C1L	Model DI-C1
Printing Module	Built in standard	Built in standard
Controller CPU	RM5231A-400MHz	RM7035C-533MHz
Print Speed (A4/LT LEF)	C1La: FC 20ppm/ BW 20ppm C1Lc: FC 25ppm/ BW 25ppm	C1a: FC 20ppm/ BW 20ppm C1c: FC 25ppm/ BW 25ppm
Memory Capacity	512MB (Standard and Max)	Max: 1GB (Standard: 756MB, Option: 512MB)
HDD	Not Available	Standard : 60GB
Supported Printer Language	Standard : RPCS Option : PCL5c, PCL6	Standard : RPCS, PCL5c, PCL6 Option : Adobe PostScript3
Standard I/F	Ethernet (100 base-TX/10 base-T) USB2.0 Host, USB2.0 Device	Ethernet (100 base-TX/10 base-T) USB2.0 Host, USB2.0 Device
Optional I/F	Not Available	IEEE1284/ECP IEEE802.11a/g g, WPA support Bluetooth Ethernet 1000 base-T

Slide 44

- ❑ Print speed is one-half of the above specification when 1200 x 1200 dpi is selected.
- ❑ Memory: Standard is 768MB (2 slots, 512MB + 256MB) and max is 1GB (2 slots, 512MB + 512MB) where optional 512MB replaces the standard 256MB.

## Printer Specifications (2)

	Model DI-C1L	Model DI-C1
Network Protocol	TCP/IP(IPv4, IPv6), IPX/SPX	TCP/IP(IPv4, IPv6) , IPX/SPX, <a href="#">AppleTalk</a>
Print Resolution	600 x 600 dpi / 1bit 600 x 600 dpi / 2bit	600 x 600 dpi / 1bit 600 x 600 dpi / 2bit <a href="#">1200 x 1200 dpi / 1bit</a>
Sample Print, Locked Print, Hold Print, Stored Print, Store and Print	<a href="#">Not Available</a>	<a href="#">Available</a>
Chaptering	<a href="#">No</a>	<a href="#">Yes</a>

Slide 45

**No additional notes**

## Product Comparison

	Di-C1	Di-C1L	AT-C2	K-C3cd
Dimensions (W x D x H, mm)	587 x 655 x 725		670 x 671 x 760	587 x 568 x 558
Weight (kg)	85		110	47
Scan Resolution (dpi)	600			
Max. Copy/Print Resolution (dpi)	1200	600	1200	600
Max. Print Paper Size (mm)	297 x 600			
Paper Weight (g/m <sup>2</sup> )	52 - 256		60 - 256	52 - 162
Paper Feed Capacity: Std (sheets)	600		1200	600
Paper Feed Capacity: Max (sheets)	1600		4400	1600

Slide 46

- ❑ Dimensions and weight are shown for the machine without options installed.

## Product Comparison

	<b>Di-C1</b>	<b>Di-C1L</b>	<b>AT-C2a/b</b>	<b>K-C3cd</b>
Copy Speed (A4/LT LEF, cpm)	C1a: 20/20 C1c: 25/25	C1La: 20/20 C1Lc: 25/25	BW: 28/33 FC: 28/33	BW: 20
1 <sup>st</sup> Copy Speed (seconds)	BW: 6.5 FC: 9.5		BW: 5 FC: 8	BW: 6.5
Warm-up Time (seconds)	Less than 30		45	26
Multiple Copying	1 - 999		1 - 999	1 - 99
Duplex	Standard			
Hard Disk Capacity (GB)	60	No HDD	80	No HDD
Memory (MB)	Std: 768 Max 1024	Std: 512 Max: 512	Std: 1024 Max 1024	Std: 384 Max 384
Optional Finisher	Yes	No	Yes	No

Slide 47

**No additional notes**

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****INSTALLATION**

Slide 48

- ☐ Install at least one machine with all options as a complete system.
- ☐ Follow all notes and cautions in the procedures.



# **COPIER**

## **Important Points**

Slide 49

**No additional notes**

## Shipping Retainer for Scanner

Remove  
this stay

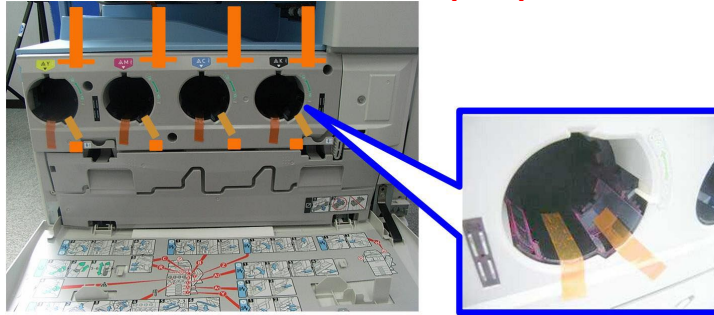


- ❑ Remove the scanner unit stay and keep it in the cutout in the inner tray.
  - ◆ Europe models: The scanner unit stay cannot be inserted in the cutout on the inner tray. You must bring it back to your depot.

Slide 50

**No additional notes**

## Development Unit: Except Europe (-27) and USA Di-C1a/c (-17) models

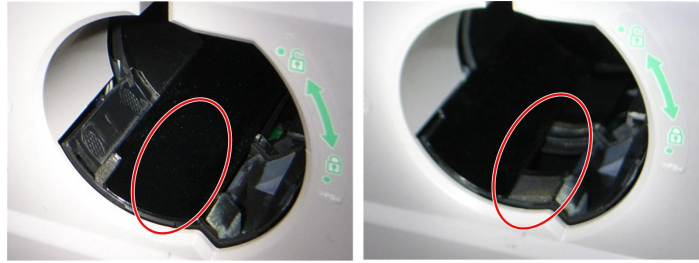


- ❑ **Remove the tape from all four development units and toner  
hoppers.**
  - ◆ **IMPORTANT:** Remove the tape from all four development  
units before you turn the main switch on.
  - ◆ The development units can be severely damaged if you do  
not remove the tape.

Slide 51

- ❑ In the following models, the tape is removed at the factory.
  - Europe: All models
  - USA: Di-C1 a/c

## Check the Toner Hopper Shutter

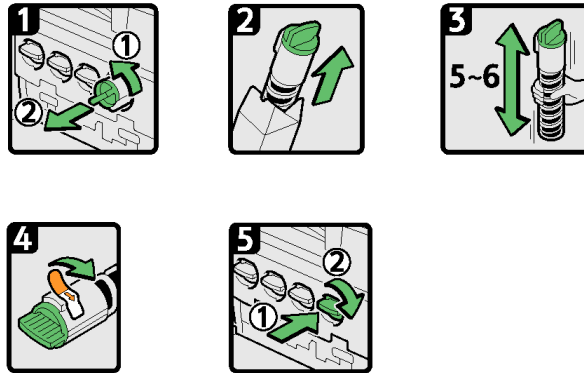


- ❑ The toner hopper shutter must be fully closed (as shown on the left).
- ❑ If the toner hopper shutter is not fully closed and the inlet of the toner hopper unit is visible (as shown on the right), the toner bottle cannot be installed properly.

Slide 52

**No additional notes**

## Toner Bottles



- ❑ Shake each bottle 5 or 6 times before you install it.
- ❑ When the toner bottle is installed, the bottle must be turned to the right (clockwise).
  - ◆ This opens the bottle, and toner can leave the bottle.
  - ◆ AT-C1/C2: It is not necessary to turn the bottle to the right.

Slide 53

**No additional notes**

## Initializing the Developer

- ❑ This is done automatically after you turn the power on for the first time.
- ❑ When it is finished, the LED on the Start key goes green.
  - ◆ If the initialization does not finish correctly, you can use SP 3014 001 to see what the problem is.
- ❑ Make some test copies.
- ❑ Then do the ACC procedure.
  - ◆ User tools > Maintenance > ACC > Start
  - ◆ There are 4 test patterns in this menu: one for copier mode and three for printer mode. Do all four of these tests.

Slide 54

- ❑ When you turn on the machine, it is not necessary to check if the cover is open or closed.

### *Appendix, Process Control Error Conditions*

- ❑ SP 3014 001: A code is displayed. See the above section of the service manual for details.

## SP Settings (1)

### ❑ Counting method: SP5-045-001

- ◆ Specifies whether the counting method used in meter charge mode is based on developments or prints.

» The default setting is 'developments'.

### ❑ A3/11" x 17" double counting: SP5-104-001

- ◆ The default setting is 'single counting'. When you have to change this setting, contact your supervisor.

### ❑ Supply names: SP 5-841

- ◆ Input the product name of the toner, staples, and fax stamp.
- ◆ These names appear on the screen when the user presses the Inquiry button in the user tools screen.

Slide 55

- ❑ SP5-045-001: You must select one of the counter methods (developments/prints) in accordance with the contract.

## SP Settings (2)

### ☐ Service Tel. No. Setting: SP5-812-001 through 004

- ◆ 001: Service station telephone number
- ◆ 002: Service station fax number. This number is printed on the counter list when meter charge mode is selected. This lets the user fax the counter data to the service station.
- ◆ 003: Supplier of consumables
- ◆ 004: Sales representative

### ☐ Hard disk: At installation, it is not necessary to format the hard disk or transfer the stamp data.

- ◆ After the hard disk is replaced, you must transfer the stamp data (SP 5853), but hard disk formatting is not necessary.

Slide 56

**No additional notes**



## **Fax Settings (D037-17)**

- ❑ The D037-17 model has a built-in fax unit.
- ❑ Fax settings must be made during the copier's installation procedure.
  - ◆ See the service manual for the fax option.

Slide 57

- ❑ D037-17 is the USA model of the Di-C1La (20 cpm model)

## **PAPER TRAY UNITS**

### **Important Points**

Slide 58

**No additional notes**

## Important Notes

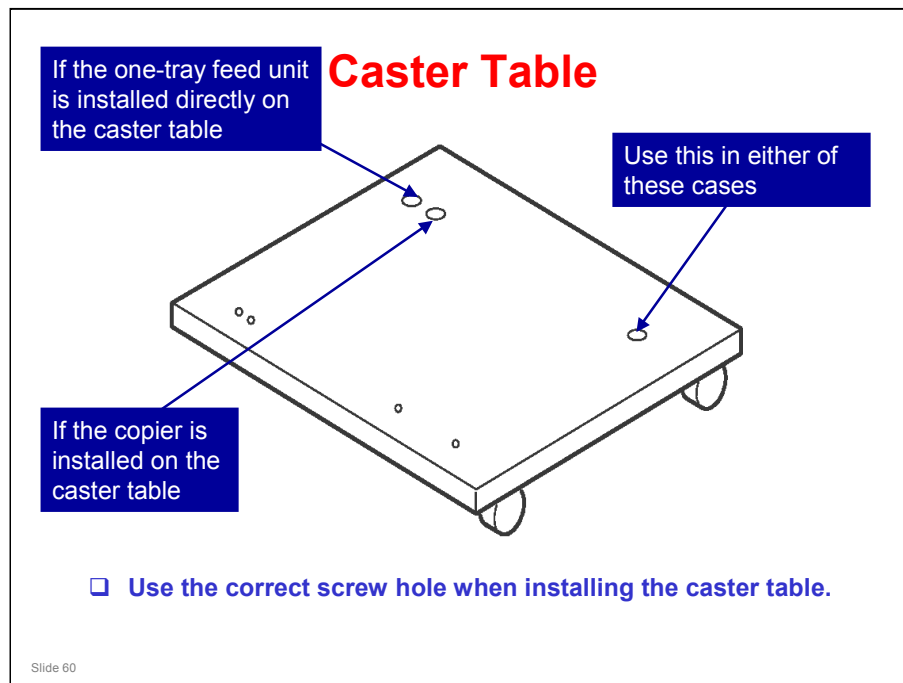
- ☐ The one-tray paper feed unit must be installed with the caster table.

Slide 59

### ALSO

**You must lift the copier and put it on top of the paper tray unit.**

- ☐ Always lift with two persons. The copier is too heavy for one person.
- ☐ Do not try to lift the copier with the paper tray unit installed. You will damage the lifting handles.



**No additional notes**

## **SHIFT TRAY, ONE-BIN TRAY**

### **Important Points**

Slide 61

**No additional notes**

## Install in This Order

- ❑ Install the shift tray unit first.
  - ◆ Installing the shift tray unit after the 1-bin tray unit may be difficult.

Slide 62

**No additional notes**

## **FINISHER AND PUNCH UNIT**

### **Important Points**

Slide 63

**No additional notes**

## Service Manual Procedures

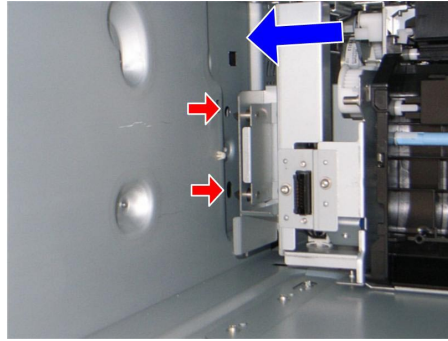
- ❑ Internal Finisher: This procedure explains how to install the internal finisher, without installing the punch unit at the same time.
- ❑ Punch Unit: There are procedures for
  - ◆ A) Installing the punch unit if the internal finisher has already been installed
  - ◆ B) Installing the punch unit if the internal finisher has not already been installed

Slide 64

**No additional notes**



## Inserting the Joint Pins



- ❑ Insert the two joint pins before attaching the front side of the inverter unit to the paper exit unit of the mainframe.
- ❑ Otherwise, paper jams may occur between the paper exit unit and inverter unit.

Slide 65

- ❑ Joint pins: Two red arrows

## **USB/SD CARD SLOT**

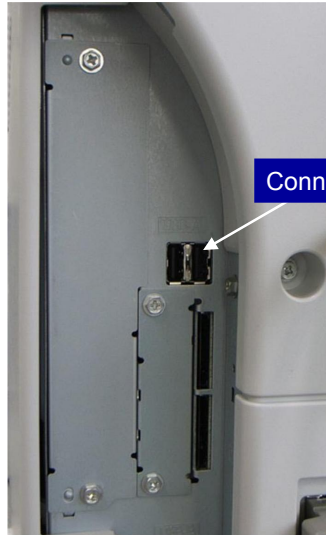
**Important Points**

**Di-C1a/c Only**

Slide 66

**No additional notes**

## Connect the Right-hand Slot



- ❑ If you connect the USB/SD option to the left-hand slot, the cable will prevent the user from connecting a camera to the other slot.

Slide 67

**No additional notes**

## USB/SD Slot

- ❑ After you install this unit, it must be enabled with an SP mode (see the installation procedure for details).
- ❑ Test the operation of this device after installation.
  - ◆ Try to scan a document and store it to the SD card or USB memory device.

Slide 68

### Procedure for storing a file on an SD card/USB device

- ❑ 1.Insert an SD card or USB memory device in the slot.
  - You can connect only one removable memory device at a time.
- ❑ 2.Close the media slot cover.
  - If you leave the cover open,static electricity conducted through an inserted SD card could cause the machine to malfunction.
- ❑ 3.Make sure that no previous settings remain.
  - If a previous setting remains,press the [Clear Modes] key.
- ❑ 4.Place originals.
- ❑ 5.Press [Store File].
- ❑ 6.Press [Store to Memory Device].
- ❑ 7.Press [OK].
- ❑ 8.Press the [Start] key.
  - When writing is complete,a confirmation message appears.
- ❑ 9.Press [Exit].
- ❑ 10.Remove the memory device from the media slot.
  - Do not remove the memory device while writing is in process.

## **CONTROLLER OPTIONS**

### **Important Points**

Slide 69

**No additional notes**

## Board and Card Slots (1)



- ❑ Fax Option: Install the fax option here.
- ❑ I/F Board slot (Di-C1a/c only): Install one of the following
  - ◆ IEEE1284
  - ◆ IEEE802.11a/g, g
  - ◆ Bluetooth
  - ◆ File Format Converter
  - ◆ Gigabit Ethernet

Slide 70

**No additional notes**

## Board and Card Slots (2)



### ❑ SD Card Slots (Di-C1a/c)

- ♦ Slot 1: Install one of the following
  - » PostScript 3; do not copy to another SD Card.
  - » Data Overwrite Security Unit
  - » PictBridge
- ♦ Slot 2: VM Kit, Service (installing the Browser Unit, installing the HDD Encryption Unit, updating the firmware).
  - » The VM card stays in slot 2. The Browser Unit and HDD Encryption Unit cards are removed after installation.
  - » After you install the browser unit, do not use the browser card on another machine.

Slide 71

- ❑ The browser unit SD card is linked to its machine (the machine serial number is registered on the SD card). So a card that has already been installed on one machine cannot be used on another.

## Board and Card Slots (3)



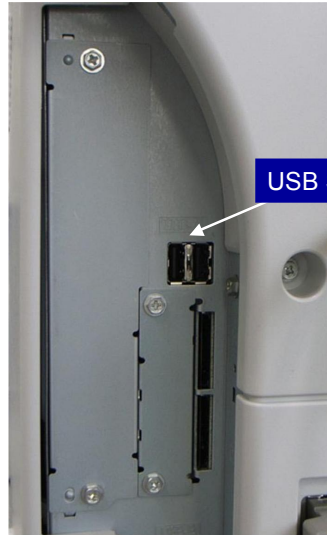
- ❑ **SD Card Slots (Di-C1La/c)**
  - ◆ Slot 1: Printer Enhanced Option (PCL option)
  - ◆ Slot 2: Service only (for example, updating the firmware).

Slide 72

**No additional notes**



## Board and Card Slots (4)



### ❑ USB Slots

- ♦ Di-C1a/c: Two slots
- ♦ Di-C1La/c: One slot

### ❑ The following can be connected to a USB slot

- ♦ USB2.0/SD option (Di-C1a/c only)
  - » Connects to the right-hand slot during installation.
- ♦ Digital camera (to copy photos, if the PictBridge option is already installed)

Slide 73

- ❑ The photograph shows the Di-C1a/c, with two slots. The slots are the same in function, but you should use the right-hand slot for the USB/SD option.
- ❑ If you connect the USB/SD option to the left-hand slot, the cable will prevent the user from connecting a camera to the other slot.

## SD Card Slots

### ❑ Slot 1 (Di-C1a/c)

- ♦ One of these can be installed.
  - » PostScript 3, Data Overwrite Security Unit, PictBridge
- ♦ To install more than one, you must merge the software onto one card.
  - » Procedure: We will study later in this section
- ♦ Do not copy the PostScript card onto another card. This violates Adobe's copyright.

### ❑ Slot 1 (Di-C1La/c)

- ♦ Printer Enhanced Option (PCL option)

Slide 74

**No additional notes**

## SD Card Slots

### □ Slot 2

- ◆ It is used for installing new firmware.
- ◆ Di-C1a/c: It is also used during the installation procedure for the browser unit, VM card, or HDD encryption unit.
  - » The machine copies firmware from the SD card to the hard disk during the procedure.
  - » You must remove the SD card from slot 2 after you install the browser unit or HDD encryption unit.
  - » After you install the VM unit, do not remove the SD card from slot 2.
  - » After you install the browser unit, do not use the browser card on another machine.

Slide 75

**No additional notes**

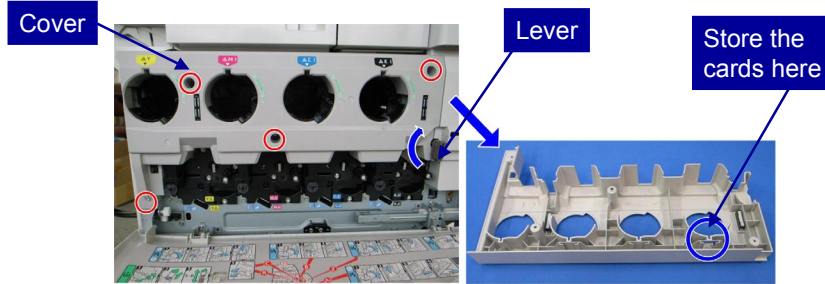
## Moving Applications

- ❑ If you want to use more than one of the 'slot 1 applications', you must move the application from the original card to another SD card.
- ❑ See the service manual for the detailed procedure.
- ❑ Basic points:
  - ◆ Put the source card in slot 2, and copy it to the card in slot 1.
  - ◆ Do not copy the PostScript application. This card must stay in slot 1.

Slide 76

**No additional notes**

## Storing the Original SD Cards after Merging

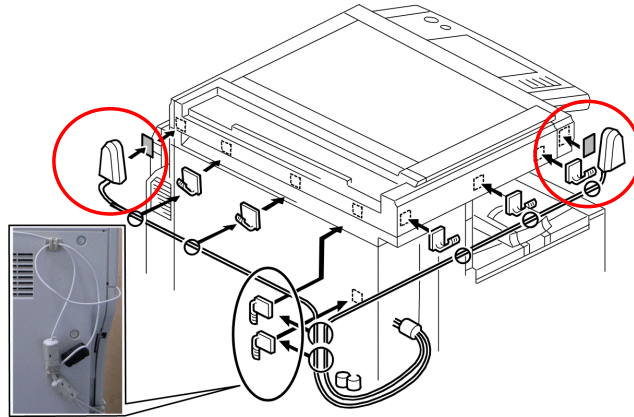


- ❑ **After you move an application, the original SD card is de-activated.**
  - ♦ It can be re-activated with the 'Undo Exec' procedure in the service manual.
    - » Put the original card in slot 2, and copy back from slot 1.
- ❑ **But the customer must keep it as a proof of purchase.**
- ❑ **The original cards can be stored in a secret compartment at the front of the machine.**
  - ♦ Hold down the lever and turn it in the arrow direction.
  - ♦ Remove the cover and store the SD cards as shown.

Slide 77

**No additional notes**

## IEEE802.11a/g, g Interface (1)



- ❑ Make sure to install the antennas correctly, as described in the manual.
- ❑ "ANT1" is a transmission/reception antenna and "ANT2" is a reception antenna. Do not attach them at the wrong places.

Slide 78

**No additional notes**

## IEEE802.11a/g, g Interface (2)



- ❑ Refer to the above picture when installing the USB2.0/SD slot.

Slide 79

**No additional notes**

## **TRANSPORTING THE MACHINE**

Slide 80

**No additional notes**



## Moving the Machine a Short Distance

- ❑ Remove all trays from the optional feed unit.

Slide 81

*Service manual, Installation, Copier Installation, Moving  
the Machine*

### **Moving the Machine a Long Distance (1)**

- ☐ **Move the scanner carriage from home position.**
  - ◆ Use SP 4806 001.
  - ◆ This prevents dust from getting into the scanner.
- ☐ **Remove the paper from the paper trays, and secure the bottom plates with tape.**
- ☐ **Attach shipping tape to the covers, or tightly wrap the machine with shrink-wrap.**

Slide 82

**No additional notes**

**After Moving the Machine a Long Distance**

- ❑ **Do the "Auto Colour Registration" as follows. This optimizes colour registration.**
  - ◆ First, do "Forced Line Position Adj. Mode c" (SP2-111-3).
  - ◆ Then, do "Forced Line Position Adj. Mode a" (SP2-111-1).
- ❑ **To check if SP 2-111-1 was successful, watch the screen during the process. A message is displayed at the end.**
  - ◆ Also, you can check the result with SP 2-194-007 (0: Completed successfully, 1: Failed).
- ❑ **Make sure that the side fences in the trays are correctly positioned.**

Slide 83

- ❑ SP 2111-1 and -3 are used at other occasions, after replacing certain parts. We will see this again.

*Service Manual, Appendix, Process Control Error Conditions*

*Service Manual, Appendix, Troubleshooting Guide*

- ❑ For SP 2194, see these sections of the service manual.

## **INSTALL THE MACHINE AND OPTIONS**

Slide 84

**No additional notes**

## Install the Following

- ❑ **Install the Following**
  - ♦ Copier
  - ♦ Paper Handling Options
    - » Paper feed units
    - » Caster table (for the one-tray paper feed unit)
    - » ARDF and/or platen cover
    - » Side tray
    - » One-bin tray
    - » Shift tray
    - » Internal finisher and punch unit
    - » Side tray
    - » USB2.0/SD card slot
  - ♦ Controller Options
- ❑ **Refer to the procedures in the service manual.**
- ❑ **Obey all warnings and cautions in the procedures.**

Slide 85

**No additional notes**

## Other Options

- ☐ **Mechanical counter (NA only)**
  - ◆ After you install the mechanical counter and enable it with SP 5987, then SC611 occurs if you try to remove it. This is to prevent falsification of the counter setting.
- ☐ **Key counter interface**
- ☐ **Scanner anti-condensation heater**
- ☐ **Tray heaters (main unit, optional paper tray unit)**

Slide 86

- ☐ If there is time, install these items.

## **UPDATING THE FIRMWARE**

Slide 87

- ☐ Install the latest firmware in the machine.

## Downloading New Software

- ❑ All firmware is on SD cards.
- ❑ The firmware SD card plugs into SD card slot 2.
- ❑ Update the firmware.
  - ◆ Verify the update was successful
- ❑ Update the operation panel firmware.
  - ◆ Controller firmware and operation panel firmware cannot be updated at the same time.
- ❑ The VM card firmware has a different procedure.  
See the installation procedure for the VM card.

Slide 88

*Service manual, System Maintenance Reference,  
Firmware Update*

- ❑ Reads the 'Before you Begin' section of the procedure in the service manual, which explains how to handle SD cards.
- ❑ The 'Updating Firmware' section has the main firmware download procedure. Try it on your machine.
  - If an error occurs, an error code appears. A table in the manual explains these codes ('Handling Firmware Update Errors' section).
  - If power fails during the update, insert the card once again and switch on the machine to continue the firmware download automatically from the card. The menu will not appear on the screen, because an error message will be displayed.



## Backing Up NVRAM Data

- ❑ Copy the data to an SD card.
- ❑ The SD card plugs into slot 2.
- ❑ Use SP5824 001
  - ◆ SP 5825 001 copies the data from the SD card to the machine.
- ❑ The data is copied to a folder in the SD card, into a file with the filename taken from the machine's serial number
  - ◆ Example, Serial Number "B2340017", filename is NVRAM\B2340017.NV
  - ◆ This ensures that data from a different machine is not copied back by accident.
  - ◆ An SD card can hold NVRAM data from more than one machine.
- ❑ Write the machine's serial number on the card for reference when you wish to copy the data back.

Slide 89

*Service manual, System Maintenance Reference,  
NVRAM Data Upload/Download*

- ❑ Write the serial number of the machine on the card, so that you will be able to copy the correct data back to the machine.
- ❑ Data cannot be copied back to the machine if the machine's serial number does not match the file name on the card.

## Backing Up the Address Book Data

- ❑ Copy the data to an SD card.
- ❑ The SD card plugs into slot 2.
- ❑ Use SP5846 051
  - ◆ SP 5846 052 copies the data from the SD card to the machine.

Slide 90

*Service manual, Service tables, Firmware Update,  
Address Book Upload/Download*

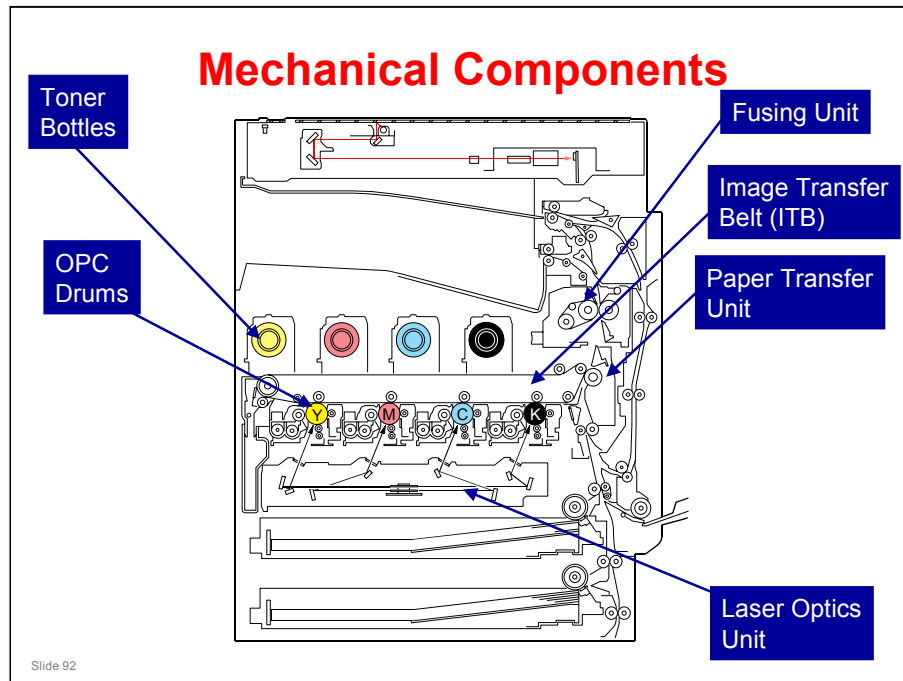
**RICOH**

**Di-C1 TRAINING  
COPIER ENGINE**

**MACHINE OVERVIEW**

Slide 91

**No additional notes**



- ☐ This is a view of the internal structure of the machine.
- ☐ There are 4 OPC drums.
- ☐ Laser beams write latent images on the drums. There is one laser beam for each drum.
- ☐ Four toner images are transferred from the OPC drums to the image transfer belt, on one rotation of the belt.
- ☐ At the paper transfer unit, the four toner images are pushed off the belt onto the paper.
- ☐ The paper feeds up to the fusing unit, and out of the machine.

**In the AT-C1 series, the order of drums from left to right is YCMK. In the Di-C1 it is YMCK. Why?**

- ☐ K is always at the right end, because it must always contact the transfer belt, which moves away from the colour drums for black-and-white pages.
- ☐ Y is always at the left end, and is the first to be deposited on the belt. The first toner to be deposited has more chance to move around on the belt. If yellow toner moves around on the belt, there is less of an image problem than with M or C, because it is less visible.
- ☐ The order of M and C depends on the designer's concept for the engine.

## Mechanical Component Overview (1)

### ❑ Laser optics unit

- ♦ There are four lasers, and four sets of optics. One for each toner colour (KYCM). Each polygon mirror reflects light from two laser diodes.

### ❑ PCDU (Photoconductor and Development Unit)

- ♦ There are four units, one for each toner colour. Each PCDU includes a drum unit and a development unit.

### ❑ Toner bottles

- ♦ Toner is supplied from the toner bottles to each development unit through a hopper
  - » The bottle rotates, and toner passes to the hopper.

Slide 93

**No additional notes**

## Mechanical Component Overview (2)

### ❑ Image transfer unit

- ♦ Bias rollers opposite the OPC drums transfer toner from the drums to the transfer belt. Four toner images are super-imposed onto the belt.

### ❑ Paper transfer roller unit

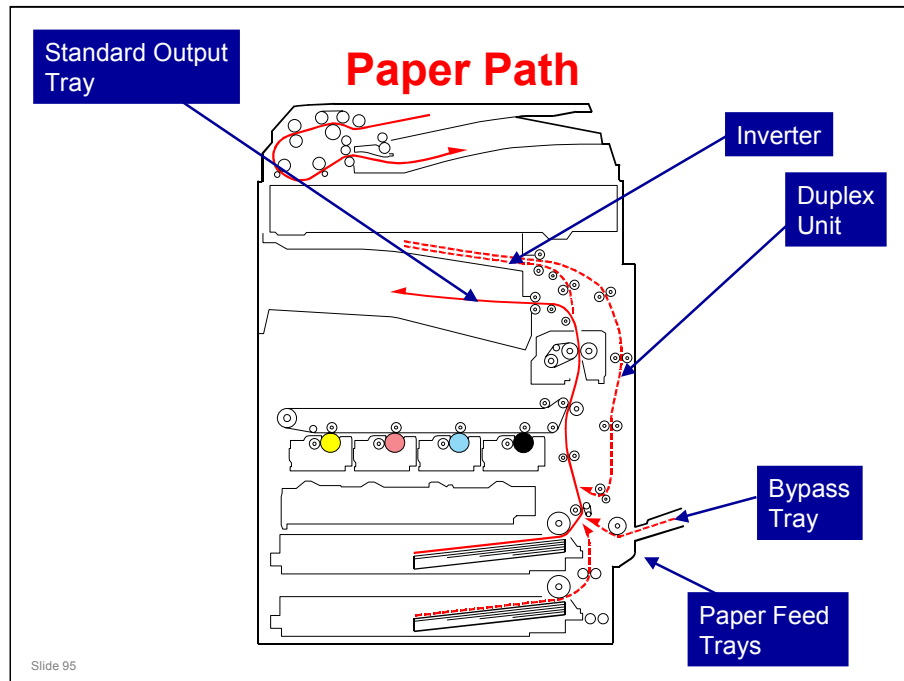
- ♦ The ITB drive roller pushes the toner from the transfer belt to the paper (the transfer roller is an idle roller).

### ❑ Fusing unit

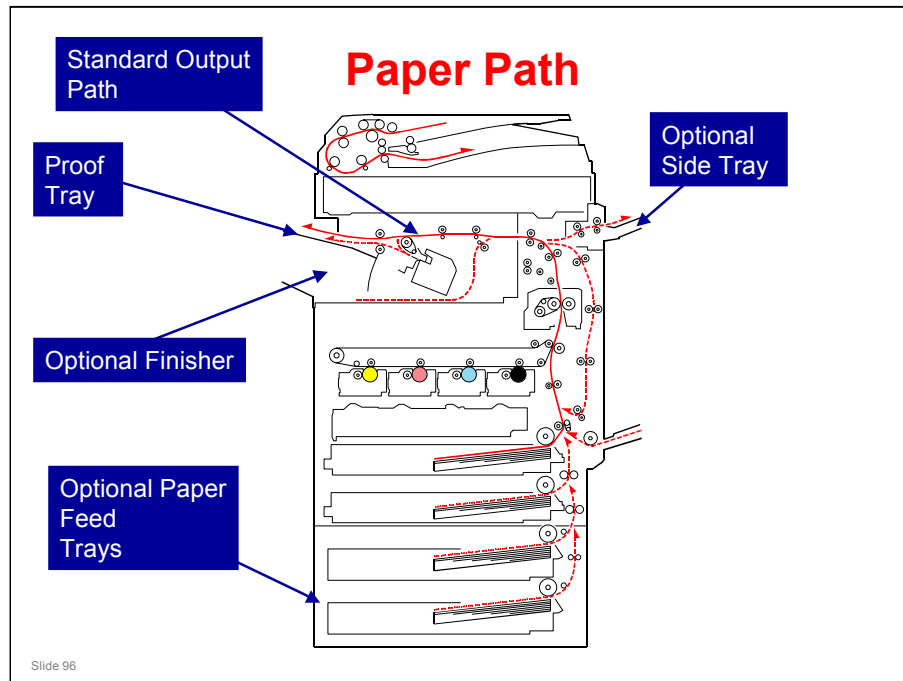
- ♦ This is a belt-type fusing unit. A heating roller, out of the paper feed path heats a belt. Then the belt heats the hot roller. This type of unit warms up the rollers more quickly than a conventional two-roller system.

Slide 94

**No additional notes**

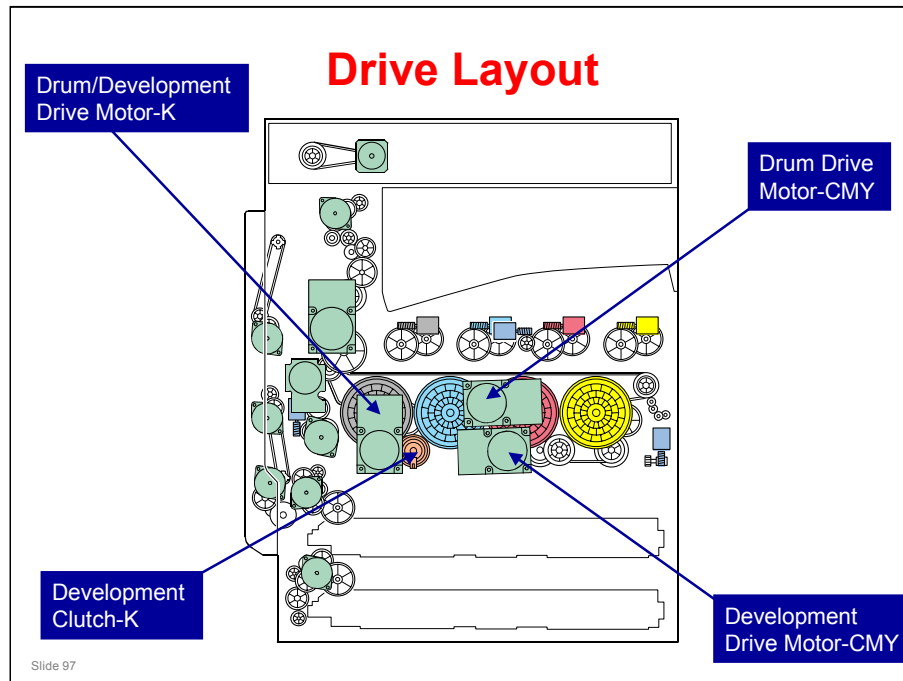


- ❑ This shows the path of paper through the machine, with no optional paper handling units installed.
- ❑ Demonstrate the following feed paths on the diagram.
  - Up from the paper feed trays
  - In from the bypass tray
  - Out at the top of the machine (to the standard output tray)
  - To the duplex unit, via the inverter



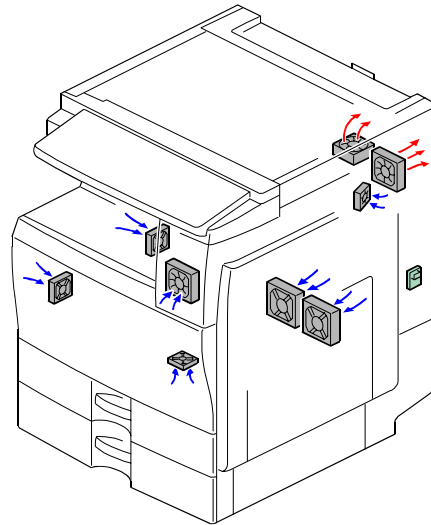
- ☐ This shows the path of paper through the machine, with the optional finisher, side tray, and paper feed unit (2-trays) installed.
- ☐ When the finisher is installed, paper feeds out through the top of the finisher to the proof tray, if finishing is not selected.
- ☐ If finishing is selected, paper follows the dotted line in the diagram, and feeds out to the proof tray also.
- ☐ If the finisher is installed, and duplex is selected, the paper goes below the finisher before it is fed to the duplex unit (see the dotted line below the finisher).





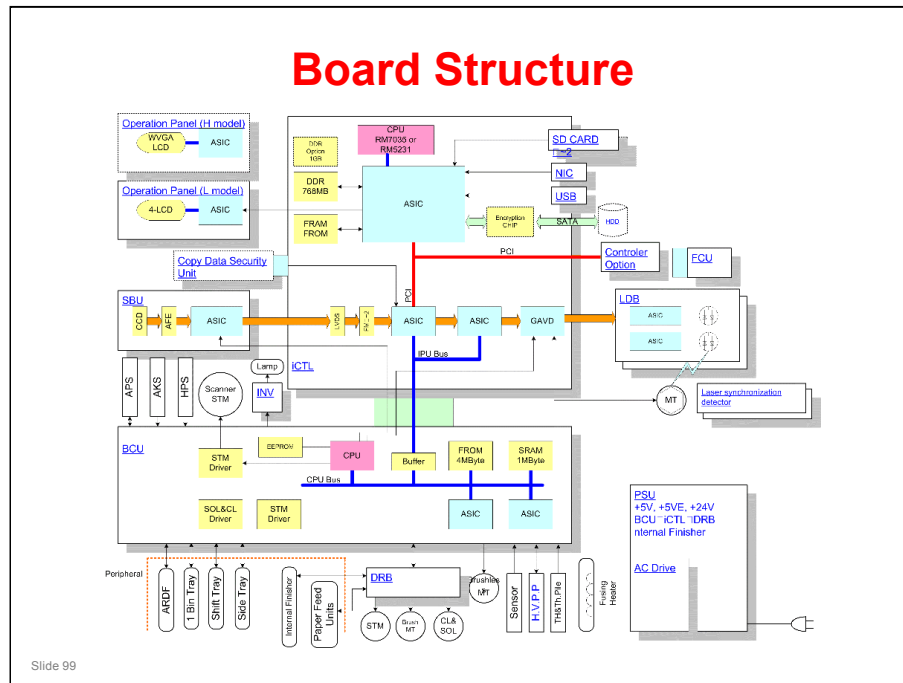
- ❑ This shows the main motors in the machine.
- ❑ Notes:
  - The PCDU for K has one motor to drive the drum and development unit. Because of this, there is a clutch to start/stop the development unit for K.
  - For CMY, the drum drive motor CMY drives the three drums, and the development drive motor CMY drives the three development units. There are no development clutches for the three colours.

## Ventilation and Cooling

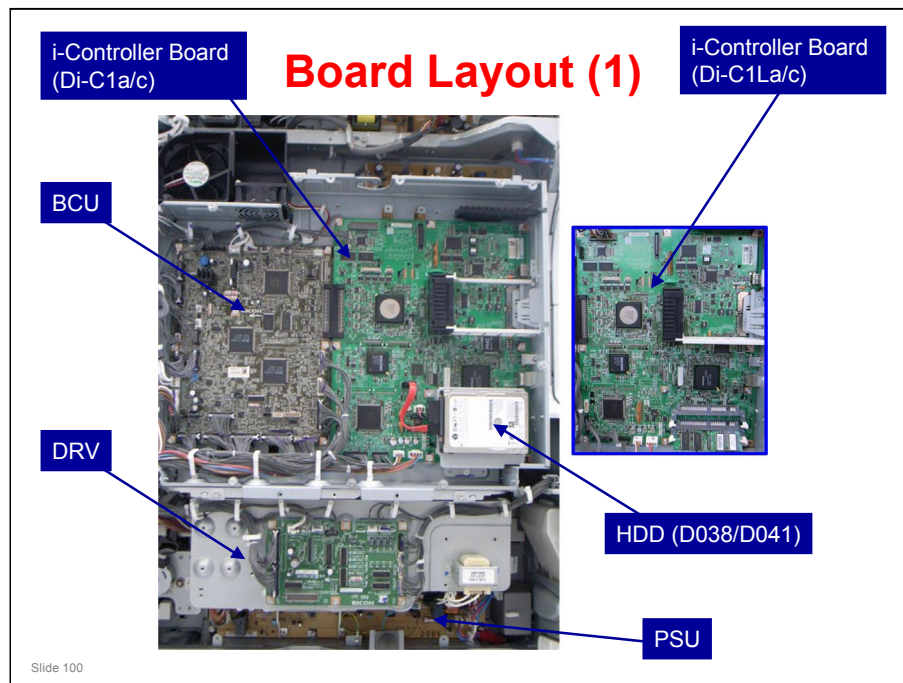


Slide 98

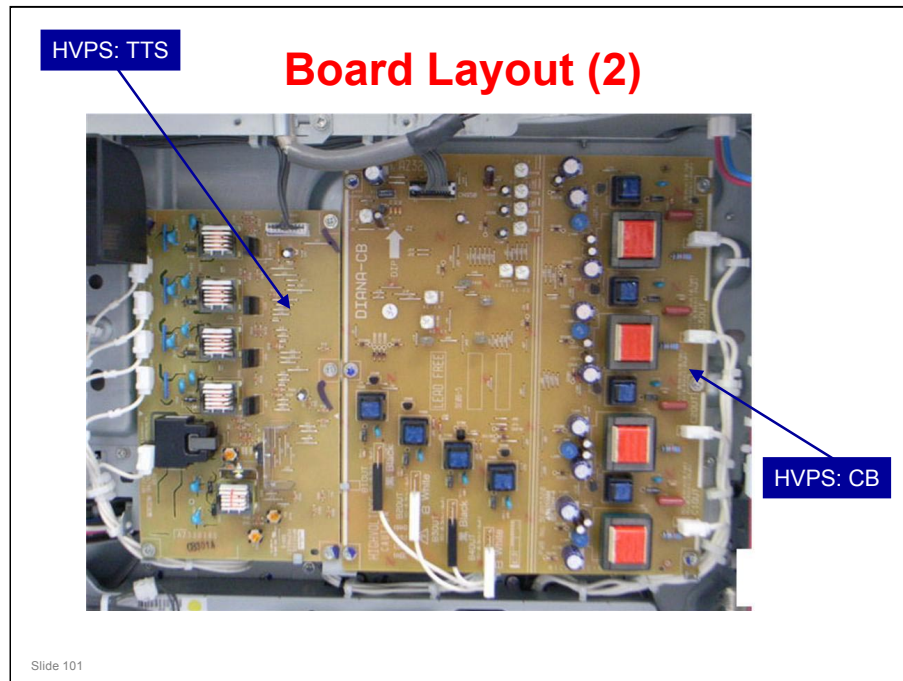
**No additional notes**



- ❑ This shows a schematic of the electrical layout of the machine.
- ❑ The orange line through the centre from the SBU to the LDB is the flow of image data through the machine.
  - The CCD (Charged Coupled Device) generates analog RGB signals.
  - The SBU (Sensor Board Unit) converts the analog RGB signals to digital signals. It sends these signals to the iCTL board.
  - The iCTL board processes the image. Then the CMYK image data goes to the laser diode drivers.



- ☐ Here, the controller box is closed.



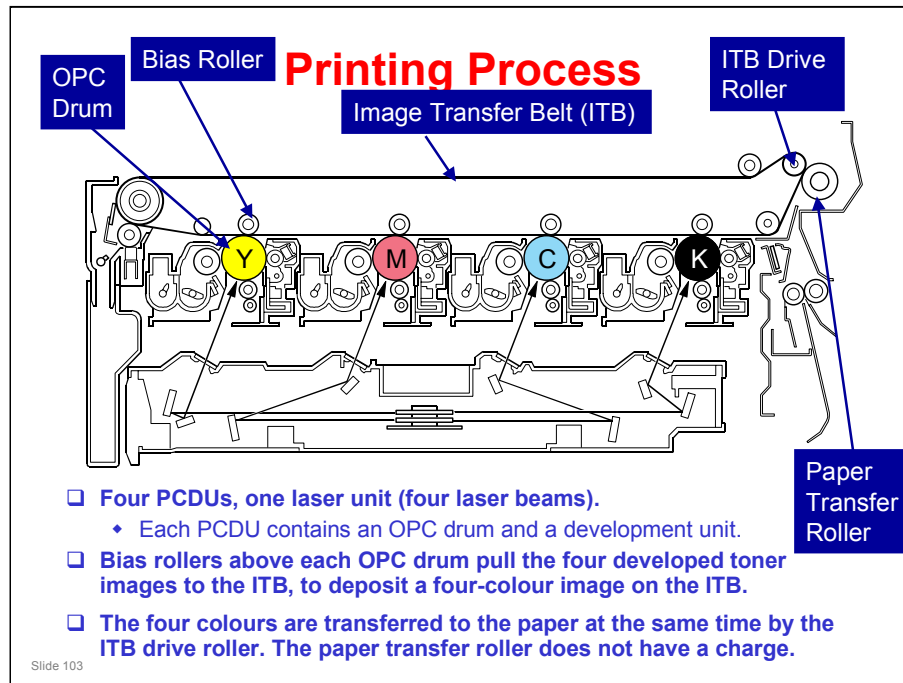
- ☐ Here, the controller box is open.
- ☐ HVPS: CB – Drum charge and development bias
- ☐ HVPS: TTS – Image transfer

## Main Boards

- ❑ The BCU controls the engine.
- ❑ The controller (called iCTL) handles the network and printer interfaces, and the operation panel. It also contains the image processing circuits.
- ❑ The SBU contains a CCD.
- ❑ The DRB contains driver circuits for motors.
- ❑ The FCU (fax controller unit) controls the fax option.

Slide 102

- ❑ iCTL: IPU + Controller



- ❑ Here is a close-up of the main print engine.
- ❑ The ITB drive roller pushes the toner from the ITB onto the paper. The paper transfer roller does not pull the toner.

## Process Speeds

- ❑ There are two process speeds, as follows:
  - ♦ Thin, Plain, or Middle Thick Paper: 120 mm/s
    - » Print speed (ppm): C1a: 20, C1c: 25
  - ♦ 1200 dpi, OHP/Thick Paper: 60 mm/s
    - » Print speed (ppm): 12.5

Slide 104

- ❑ The process speed is the feed speed from registration roller to the fusing unit.
- ❑ The process speed affects various machine parameters, as can be seen if you take a quick look through the SP tables.
- ❑ The process speeds for the two models are the same, but the print speeds at 120 mm/s are different for each model. This is because the gap between sheets is shorter for the faster model.
- ❑ What is 'middle thick paper'? 82 – 105 g/m<sup>2</sup> (22 – 28 lb.)



## New Unit Detection Mechanisms

### ❑ PCDU, Development Unit

- ◆ The development unit (as part of the PCDU, or as a separate development unit) contains an ID chip.
- ◆ The ID chip contains information that tells the machine that the unit is new.

### ❑ PCDU Toner Collection Bottle

- ◆ The machine uses the 'bottle full sensor' to determine if the bottle was replaced.
- ◆ This only works if the bottle is in a 'full' or 'near-full' condition.

Slide 105

- ❑ The ID chip in the development unit contains all the counters for the PCDU (drum unit counters, development unit counters).
- ❑ If we replace the development unit as a separate unit, the new ID chip does not contain the drum counters for the drum unit that is still in the machine.

## Replacement of Electrical Components

- ❑ Take care when replacing these parts. Follow the instructions in the manual.
  - ◆ BCU
  - ◆ iCTL board
  - ◆ Hard disk
  - ◆ NVRAM
- ❑ **Drum Motor: CMY**
  - ◆ Do not remove the PCDUs when you replace this motor.
- ❑ **Gear unit**
  - ◆ Do SP1902-001 (Drum Phase Adjustment) after you replace the gear unit.

Slide 106

- ❑ The next few slides will go over the important points.

## Replacing the iCTL

- ❑ Remove the NVRAM from the old iCTL and install it on the new one.
- ❑ Make sure that you install the correct board.
  - ◆ There are 4 models. The iCTL board is different for each one.
  - ◆ If you install the wrong board, the machine will not work.

Slide 107

**No additional notes**

## Replacing the BCU

- ❑ Remove the NVRAM from the old BCU and install it on the new one.
- ❑ Turn the machine on.
  - ♦ SC995-01 appears. This means that the serial number is not stored.
- ❑ Store the serial number with SP 5811-004.
- ❑ Cycle the main power off/on.
- ❑ There is only one type of BCU. You install the same board in each of the four models.

Slide 108

**No additional notes**

## Hard Disk Removal

- ❑ Remove the hard disk.
- ❑ After installing the new disk:
  - ◆ Copy the stamp data to the disks from the firmware: SP5853. Then switch the machine power off/on.
  - ◆ It is not necessary to format the hard disk.

Slide 109

**No additional notes**

## Hard Disk Removal (1)

- ❑ **Explain to the customer that the following information stored on the HDD is lost when the HDD is replaced:**
  - ◆ Document server documents
  - ◆ Custom-made stamps
  - ◆ Document server address book
- ❑ **The address book and document server documents (if needed) must be input again.**
  - ◆ If you previously backed up the address book to an SD card with SP5846 051, you can use SP 5846 052 to copy the data from the SD card to the hard disk.
- ❑ **Custom-made stamps must be re-made and stored again.**

Slide 110

**No additional notes**

## Hard Disk Removal (2)

- ❑ If the customer uses the DOS unit option, this option must be set up again after a new hard disk is installed.
- ❑ If the HDD encryption unit is installed, the user must copy the encryption key from the controller to the new hard disk.
  - ◆ This is not a service procedure, so it is not in the service manual.
- ❑ Any SDK applications must be installed again.
  - ◆ It is not necessary to install the VM card option again.
- ❑ If the customer is using the optional Browser Unit, this option must be installed again. You must use the same SD card as when the browser unit was installed first.

Slide 111

- ❑ The browser unit SD card is linked to its machine (the machine serial number is registered on the SD card). So a card that has already been installed on one machine cannot be used on another.

## Hard Disk Removal (3)

### ❑ Before you install a new unit:

- ◆ Do SP 5846 051 to copy the address book from the hard disk to an SD card (put the SD card in slot 1).

### ❑ After you install a new unit:

- ◆ Do SP5853 001 to download the fixed stamps from the ROM to the HDD.
- ◆ Switch the machine off and on to enable the fixed stamps for use.
- ◆ Do SP 5846 052 to download the address book from the SD card to the hard disk (put the SD card in slot 1).

Slide 112

**No additional notes**



## Disposal of HDD Units

- ❑ Never remove an HDD unit from the work site without the consent of the client.
- ❑ If the customer has any concerns about the security of any information on the HDD, the HDD must remain with the customer for disposal or safe keeping.
- ❑ The HDD may contain proprietary or classified (Confidential, Secret) information.
  - ◆ Specifically, the HDD contains document server documents and data stored in temporary files created automatically during copy job sorting and jam recovery.
  - ◆ Such data is stored on the HDD in a special format so it cannot normally be read but can be recovered with illegal methods.

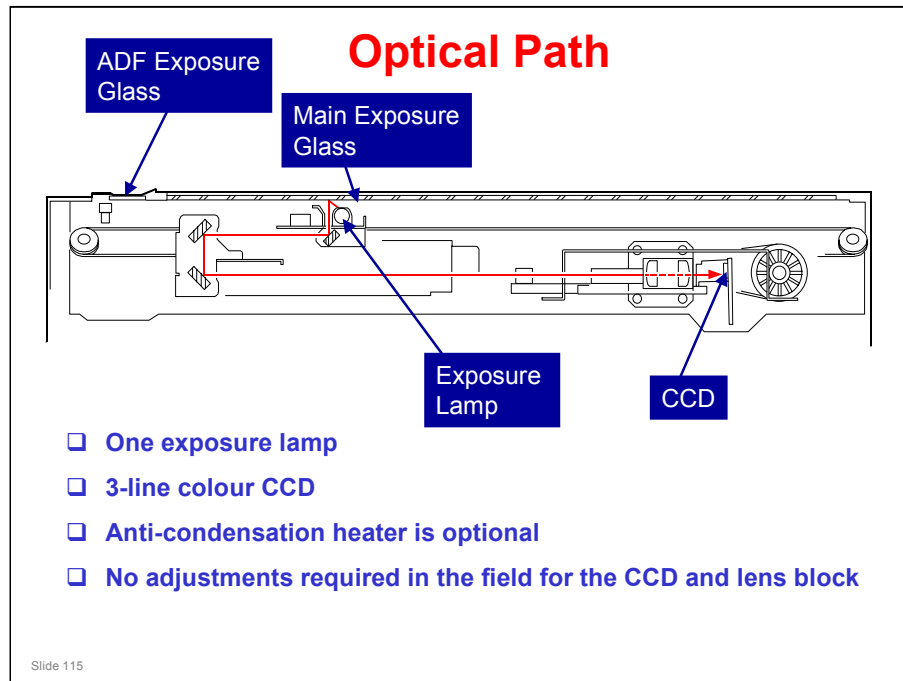
Slide 113

**No additional notes**

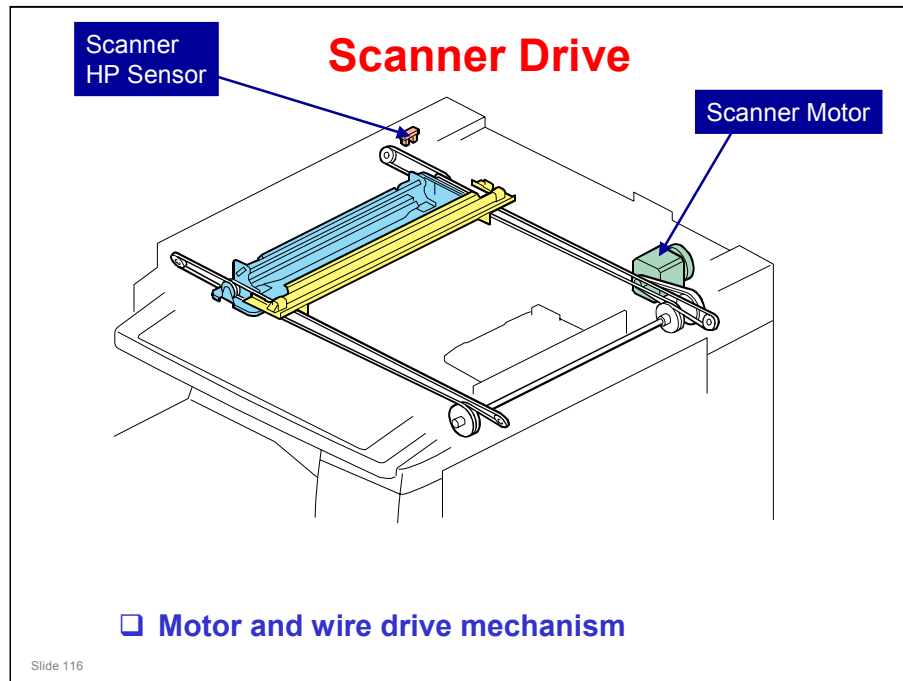
**RICOH****Di-C1 TRAINING  
COPIER ENGINE****SCANNER**

Slide 114

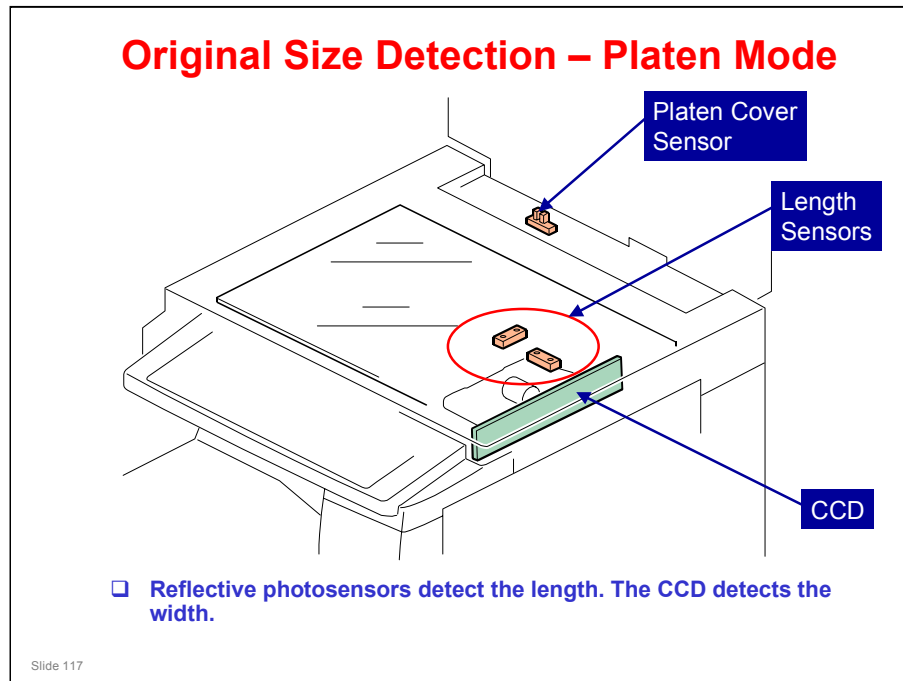
- ☐ In this section, the mechanical components of the scanner will be described.
- ☐ The optional ADF is described in a separate section.



- ☐ In platen mode, the original is put on the main exposure glass, and the scanner moves down the original during scanning.
- ☐ In ADF mode, the scanner stays at the home position, and the original is fed past the ADF exposure glass.
- ☐ The optics anti-condensation heater is an option. It prevents condensation on the mirrors, which will cause image problems.



- ❑ The same motor drives the first and second scanners.
  - The first scanner contains the exposure lamp, reflectors, the 1st mirror, and the lamp regulator. The second scanner contains the 2nd and 3rd mirrors.
  - The regulator is mounted on the scanner to reduce the wiring between the lamp and the regulator.
  - The second scanner moves at half the speed of the first scanner. This is to maintain the focal distance between lens and original.
- ❑ In this machine, wires are used instead of timing belts. These are more difficult to replace, but copy quality is better (less jitter).
- ❑ Note that the operation in ADF mode is different from platen mode (as shown on the previous page).
  - In ADF mode, the scanner goes to home position (detected by the home position sensor), and stays there during scanning.
- ❑ The scanner motor speed and image processing control the magnification.



- ❑ When the ADF is opened, the scanner carriage moves 30 mm from the home position.
- ❑ Then, when the ADF is closed, the exposure lamp turns on and the CCD detects the paper width.
  - The lamp turns on when the platen cover sensor detects that the cover is being closed.
  - If the cover stays open during copying, the CPU checks the original size when the Start key is pressed.
- ❑ When feeding with the ADF, the width and length sensors in the ADF detect the original size.

## Replacement and Adjustment

### ☐ Service Manual, Replacement and Adjustment, Image Adjustments

- ◆ Do these adjustments after you replace one of these parts: Original Length Sensors, Lens Block, Scanner Motor, Scanner Wires

### ☐ Main Exposure Glass

- ◆ Position the marker at the front-left corner.

### ☐ ADF Exposure Glass

- ◆ Position the white marker at the rear-left corner.

### ☐ Exposure Lamps

- ◆ Do not touch the new lamp directly by hand. Grease spots will cause poor scanning quality.

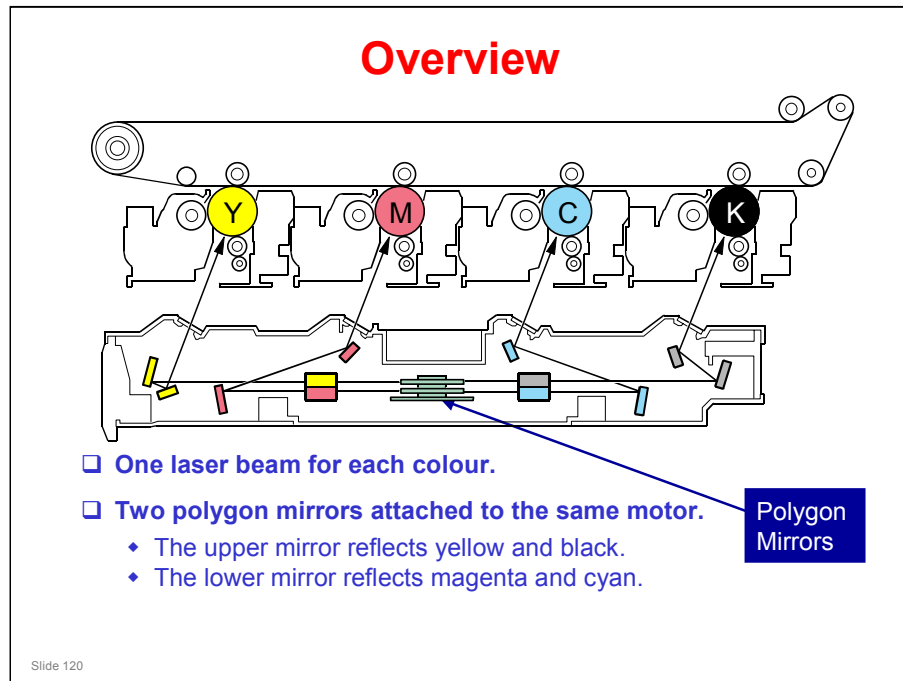
Slide 118

**No additional notes**

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****LASER EXPOSURE**

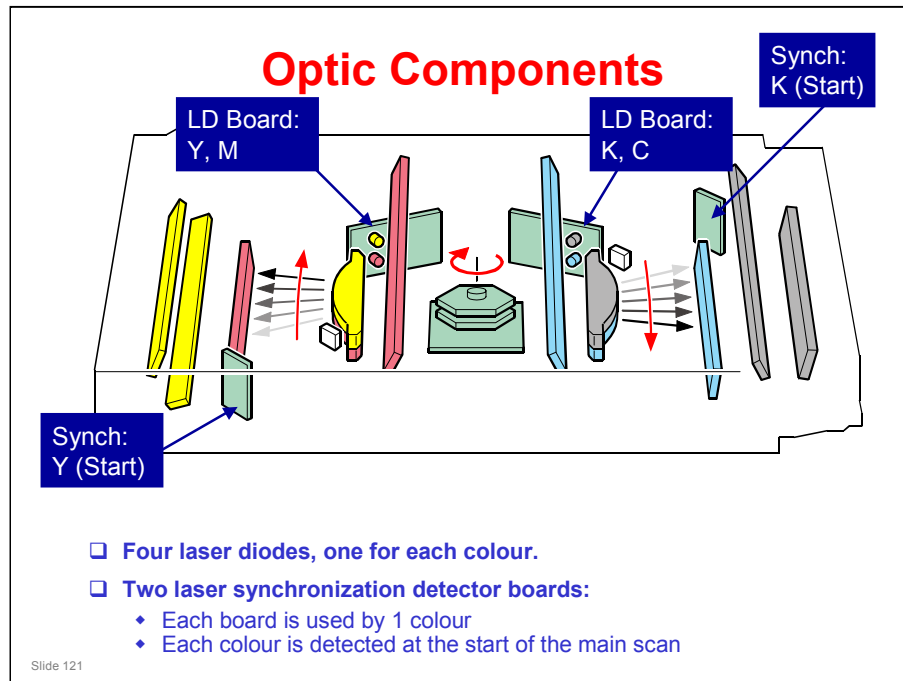
Slide 119

- ❑ The optics and electronics in the laser unit will be described in this section.



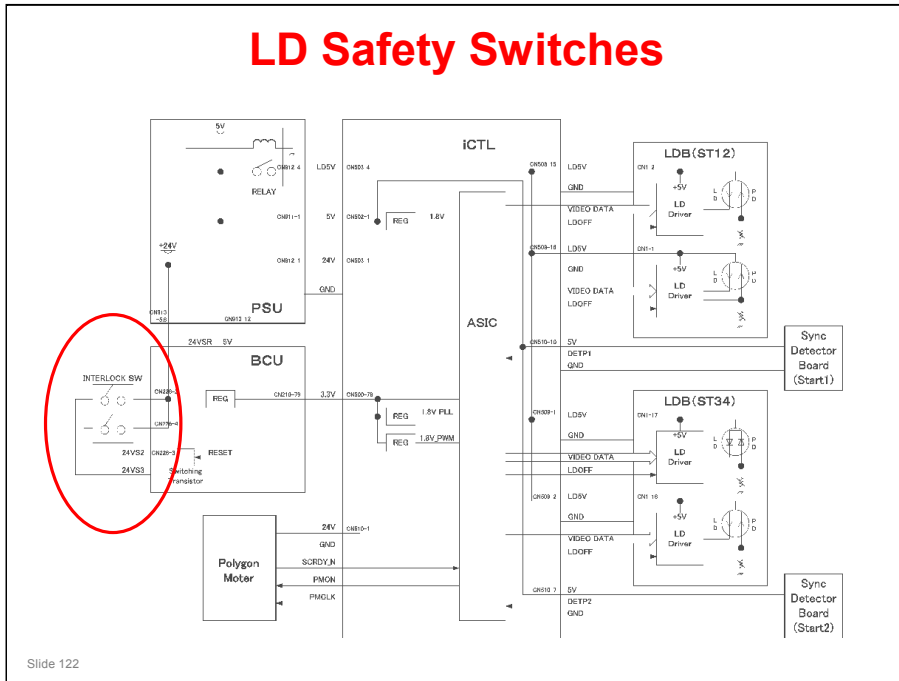
- ❑ Black also has one beam only.
- ❑ This diagram does not show the LD units. A more complete diagram of the optics is on the next slide.





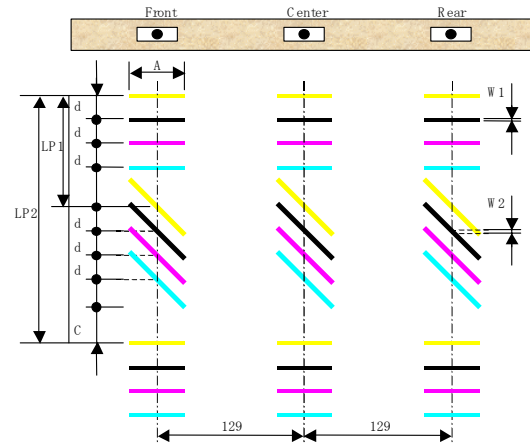
- ❑ Main scan synchronization for cyan is calculated by the CPU, based on the reading for K (black).
- ❑ Main scan synchronization for magenta is calculated by the CPU, based on the reading for yellow.

## LD Safety Switches



- ❑ Make sure that you understand how the cover switches cut the laser power.
- ❑ The switches used are the front and duplex unit.

## Automatic Line Position Adjustment



- During automatic line position adjustment, the line patterns above are created on the transfer belt.

Slide 123

- The spaces between the lines are measured by the front, center, and rear ID sensors. The controller takes the average of the spaces. Then it adjusts the following positions and magnification.
  - Sub scan line position for CMY
  - Main scan line position for CMY
  - Magnification ratio for CMY
  - Skew for CMY
- The transfer belt-cleaning unit cleans the transfer belt after the patterns are measured. SC 285 shows if an error is detected three times consecutively.

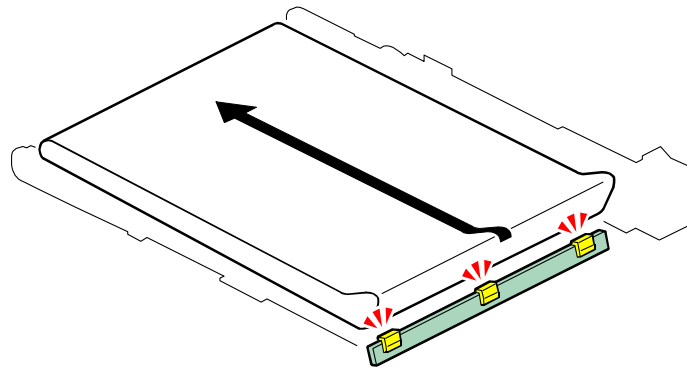
## Automatic Line Position Adjustment

- ❑ The spaces between the lines are measured by the front, center, and rear ID sensors. The controller takes the average of the spaces. Then it adjusts the following positions and magnification.
  - ◆ Sub scan line position for CMY
  - ◆ Main scan line position for CMY
  - ◆ Magnification ratio for CMY
  - ◆ Skew for CMY
- ❑ This process prevents:
  - ◆ Colour registration errors
  - ◆ Skew

Slide 124

- ❑ Colour registration errors: These are when the four colour toner images (CMYK) are not written exactly on top of each other
  - Sometimes, this type of error is called 'colour shift'. This is not the correct term. Colour shift is a change in the actual colour.
  - In this model, the improved mechanisms have reduced colour registration errors a lot. This means that the default setting for 'black overprint' is changed to 'off'.
  - When black overprint is on, if there is black superimposed on a colour image, the black toner is superimposed on the colour toner image. This means that a lot of toner is deposited on the paper and scattering can occur.
  - When black overprint is off, if there is black superimposed on a colour image, colour toner is not deposited on the places where black toner will be. This reduces the quantity of toner. But, if colour registration is not good, a white gap could appear at the border between the colour toner area and the black toner area.
- ❑ Skew: The main scans of the four laser beams across the OPCs must be parallel. If not, the four colour toner images will be skewed in relation to each other.

## ID Sensors



- ❑ Three ID sensors, on the ID sensor board:
  - ◆ All three are used for line position adjustment
  - ◆ The one in the center is also used for process control
- ❑ Do not wipe the sensors with a dry cloth. Use a cloth moistened with alcohol.

Slide 125

**No additional notes**

## More about the Adjustments

### ❑ Sub scan line position for CMY

- ♦ The adjustment of the sub-scan line position for CMY is based on the line position for K (colour registration).
  - » The machine measures the gaps between the lines of each colour in the pattern on the transfer belt.
  - » If the gaps for a colour are not correct, the machine moves the image of the colour up or down the sub scan axis.
  - » To do this, it changes the laser write timing for that colour.

### ❑ Main scan line position for CMY

- ♦ If the machine detects that the image is out of position in the main scan direction, it changes the laser write start timing for each scan line.

### ❑ Magnification adjustment for CMY

- ♦ If the machine detects that magnification adjustment is necessary, it changes the LD clock frequency for the required colour.

### ❑ Skew for CMY

- ♦ The adjustment of the skew for CMY is based on the line position for K.

Slide 126

**No additional notes**

## Adjustment Conditions (1)

### □ Initial:

- ◆ Immediately after the power is turned on, if one of the following conditions are met.
  - » Time after drum motor stops (SP3522-002)
  - » Temperature change since the previous line position adjustment (SP2193-008/011)
  - » Number of prints (SP2193-016) since the previous line position adjustment
- ◆ When the machine recovers from the energy saver mode, if one of the following conditions are met.
  - » Time after drum motor stops or main power on (SP3522-002)
  - » Temperature change since the previous line position adjustment (SP2193-008/011)
  - » Number of prints (SP2193-016) since the previous line position adjustment
- ◆ Done either once or twice (or not done), depending on temperature change since the previous line position adjustment.
- ◆ The machine checks the above conditions at power on/recovery. Then, line position adjustment is done if one of the conditions occurs.

Slide 127

**No additional notes**

## Adjustment Conditions (2)

### □ During a job:

- ♦ The job is interrupted and the adjustment is done once, depending on:
  - » Time since the previous line position adjustment
  - » Temperature change since the previous line position adjustment
  - » Number of prints since the previous line position adjustment
- ♦ The machine checks the above conditions every 5 pages (SP 3512 001). Then, line position adjustment is done if one of the conditions occurs.

Slide 128

**No additional notes**



## Adjustment Conditions (3)

### □ At the end of a job:

- ♦ The adjustment is done once, depending on:
  - » Time since the previous line position adjustment
  - » Temperature change since the previous line position adjustment
  - » Number of prints since the previous line position adjustment
- ♦ The machine checks the above conditions at the end of each job. Then, line position adjustment is done if one of the conditions occurs.

Slide 129

**No additional notes**

## Adjustment Conditions (4)

### □ When the front door is opened and closed:

- ♦ The adjustment is done once (or twice), depending on:
  - » Time since the previous line position adjustment
  - » Temperature change since the previous line position adjustment
- ♦ The machine checks the above conditions after the front door is opened/closed. Then, line position adjustment is done if one of the conditions occurs.

Slide 130

**No additional notes**

## Adjustment Conditions (5)

### ❑ In standby mode (but not in energy saver mode):

- ◆ The adjustment is done once, depending on:
  - » Time since the previous line position adjustment
  - » Temperature change since the previous line position adjustment
  - » Number of prints since the previous line position adjustment
- ◆ The machine checks the above conditions in standby mode every 10 minutes (SP 3512 002). Then, line position adjustment is done if two of the conditions occurs.
  - » Time and number of prints, or temperature and number of prints

### ❑ New PCDU

- ◆ When the machine detects a new PCDU, line position adjustment is automatically done twice.

Slide 131

**No additional notes**

## Adjustment Conditions (6)

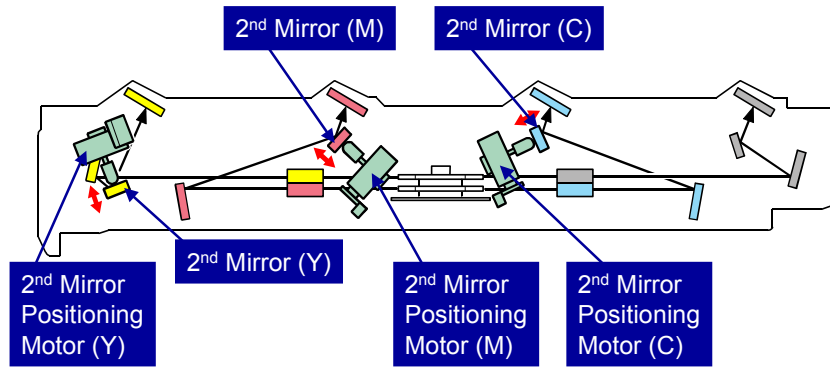
### ❑ Forced line position adjustment:

- ◆ You can do this at any time with SP 2111.
  - » It must be done after installing a new laser optics unit or polygon mirror, or after moving the machine.
- ◆ There are three adjustments.
  - » 2111 001: Fine adjustment, twice
  - » 2111 002: Fine adjustment, once
  - » 2111 003: Rough adjustment, once
- ◆ Normally, do SP 2111 003 first. Then do SP 2111 001.
  - » The screen displays the results of SP 2111 001. Also, you can see SP 2194 007 (0: Completed successfully, 1: Failed).
  - » If you do the rough adjustment, then you must follow immediately with the fine adjustment.

Slide 132

- ❑ If the error is more than 1.4 mm, the fine adjustment cannot correct it. The rough adjustment must be done, followed by the fine adjustment.

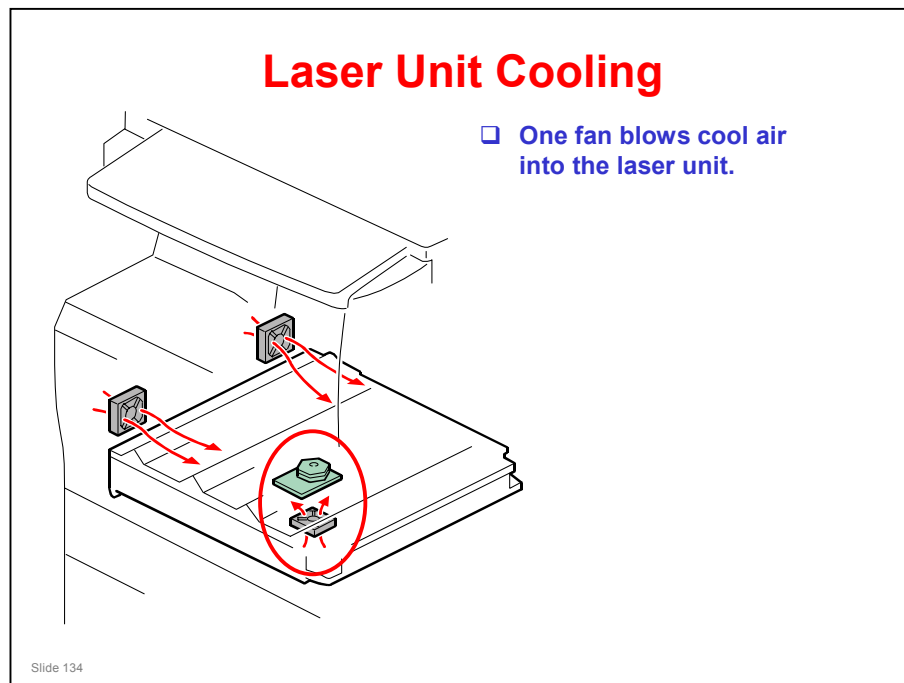
## MUSIC - Main Scan Skew Correction



- ❑ The 2nd mirrors for C, M, and Y each have a motor.
  - ◆ The angle of each 2nd mirror can be adjusted by these motors.
  - ◆ The angle of the 2nd mirror for black is not changed.
- ❑ AT-C1: The angle of the WTL lens is adjusted, not the 2nd mirror

Slide 133

- ❑ The 2nd mirror positioning motors for magenta, cyan, and yellow adjust the angle of the 2nd mirror for these three colours, based on the 2nd mirror position for black.



- ❑ The other two fans in this diagram are for the development unit.

## Service Remarks

- ☐ SWITCH THE POWER OFF AND UNPLUG THE POWER CORD BEFORE STARTING WORK ON THE LASER UNIT
- ☐ Do not loosen the LD board securing screws.
- ☐ Do not adjust any of the VRs.
- ☐ Do not open the optical housing unit except when absolutely necessary for servicing.
- ☐ Do not touch the surfaces of the polygon mirrors.
- ☐ To avoid damage to the polygon motor, switch the machine off and wait 3 minutes to allow the motor to stop rotating before removing it.

Slide 135

**No additional notes**

## Laser Optics Housing Unit Replacement (1)

- ❑ First, prepare the new laser optics housing unit.
- ❑ Then, before you switch the machine off, you must make some SP adjustments.
  - ♦ These adjustments move the 2nd mirror positioning motors back to home position.
  - ♦ If this is not done, the motors in the new unit will be at the home position, but the SP setting could be different. This could cause errors in skew correction.
  - ♦ After you install the new unit, you will do the forced line position adjustment, and this will set up the motors and SPs correctly.
- ❑ Note: If you forget to do these SP adjustments, there is a recovery procedure in the manual.
- ❑ Then you can remove the old unit and install a new one.
- ❑ After you install the new unit, do the SP adjustments, and the line position adjustment, as explained in the manual.

Slide 136

*Service Manual, Replacement and Adjustment, Laser Optics*

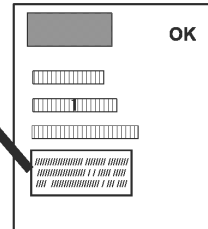
- ❑ This is a bit tricky, so make sure that you understand the points on this slide before you start the procedures.



## Laser Optics Housing Unit Replacement (2)

### Input data for SP modes

Color Regist Adjust Bk:Main Scan:Dot SP 2-101-001:xxx  
Color Regist Adjust C:Main Scan:Dot SP 2-101-002:xxx



- ☐ The sheet that is packed with the new laser optics housing unit clearly shows which numbers to store in the SP modes.
- ☐ If that is not enough, look at the replacement procedure in the service manual for a full explanation.

Slide 137

**No additional notes**

## Polygon Mirror Motor

- ❑ After you install a new unit, you must do the forced line position adjustment (SP 2111 003, then 2111 001).

Slide 138

**No additional notes**

## Image Adjustments

- **Service Manual, Replacement and Adjustment, Image Adjustments**
  - ◆ These image adjustments must be done after replacing the laser optics housing unit or the polygon mirror motor.

Slide 139

**No additional notes**

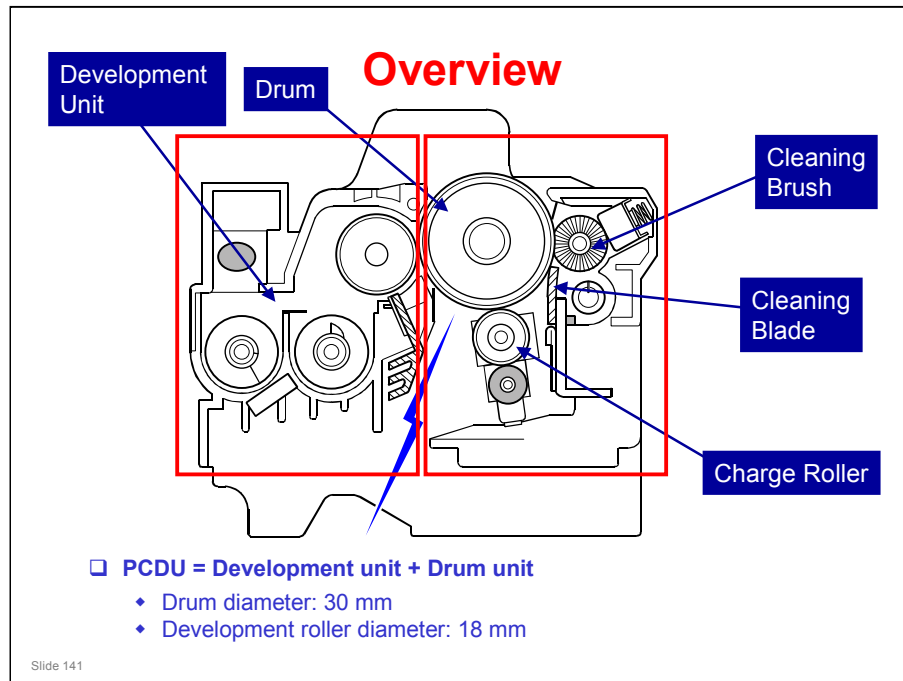
**RICOH**

**Di-C1 TRAINING  
COPIER ENGINE**

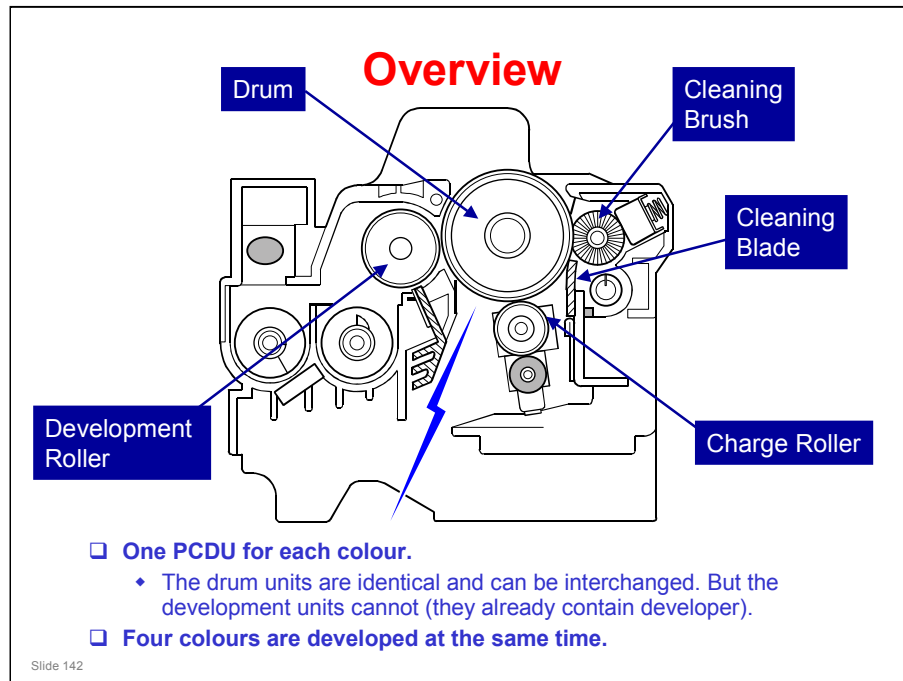
**PCDU**

Slide 140

**No additional notes**

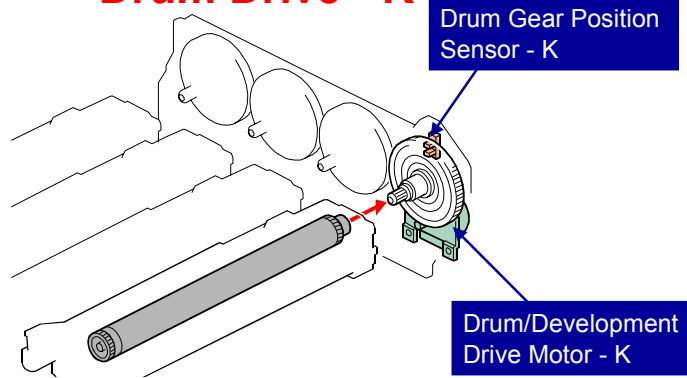


- ❑ The PCDU is divided into two parts, as shown by the red boxes on this slide. These two parts are the development unit (on the left) and the drum unit (on the right).
- ❑ The drum units are the same for each colour. However, the development units already contain developer, so these are not interchangeable.



- ❑ This shows the most important components of the PCDU.
- ❑ The image transfer roller (not shown here) pulls the toner off the drum and onto the transfer belt.

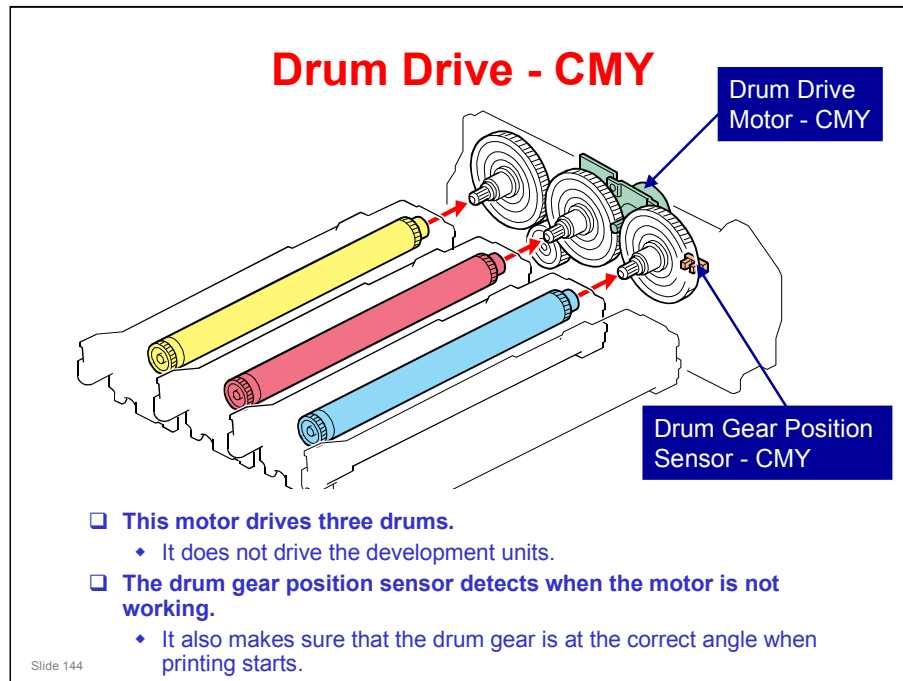
## Drum Drive - K



- ❑ The same motor drives the development unit for K.
- ❑ The drum gear position sensor detects when the motor is not working.
  - ♦ It also makes sure that the drum gear is at the correct angle when printing starts.
  - ♦ This prevents variations in print quality caused by incorrect gear meshing at the start of the job.

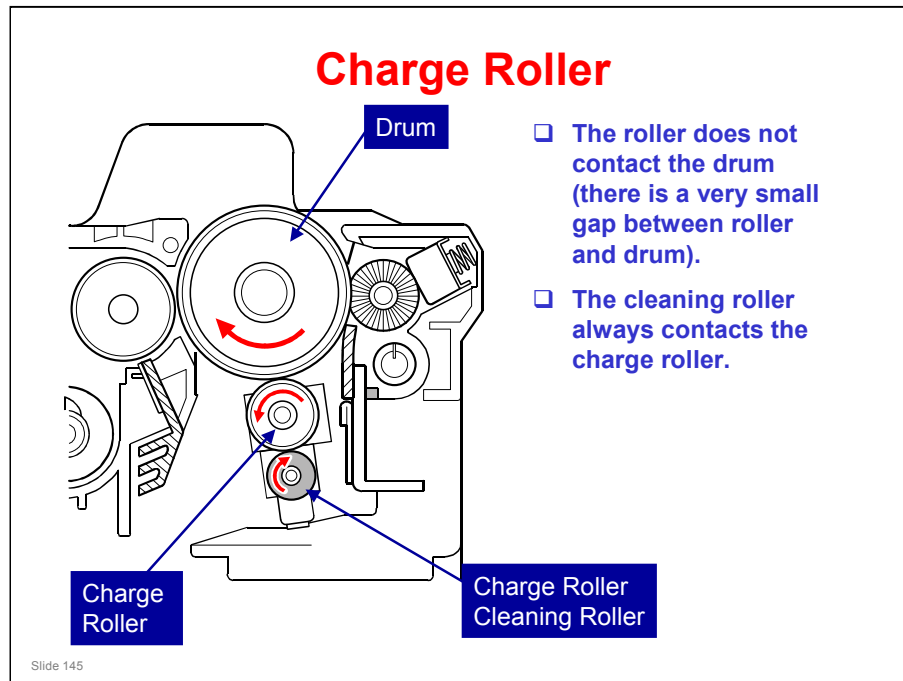
Slide 143

- ❑ SC380 occurs if the sensors detect that the drums are not turning.



- ❑ The function of the gear position sensor is similar to the sensor for black.
- ❑ The motor drives all three colour drums. This reduces colour alignment errors.
- ❑ The two gear position sensors (K, CMY) work together. Both gears must be at home position at the start of the job. If there is an error, the position of the black gear is corrected to match the position of the CMY gear.
  - The mechanism is initialized after every 30 jobs.





**No additional notes**

## Charge Roller Voltage

- ❑ The charge roller gives the drum surface a negative charge.
- ❑ An ac voltage is also applied to the charge roller, at a constant current.
  - ◆ The ac voltage helps to ensure that the charge given to the drum is as uniform as possible.
- ❑ The high voltage supply board - C.B, at the rear of the machine, supplies the ac and dc to the charge roller.
- ❑ The machine automatically controls the charge roller voltage if automatic process control is enabled.

Slide 146

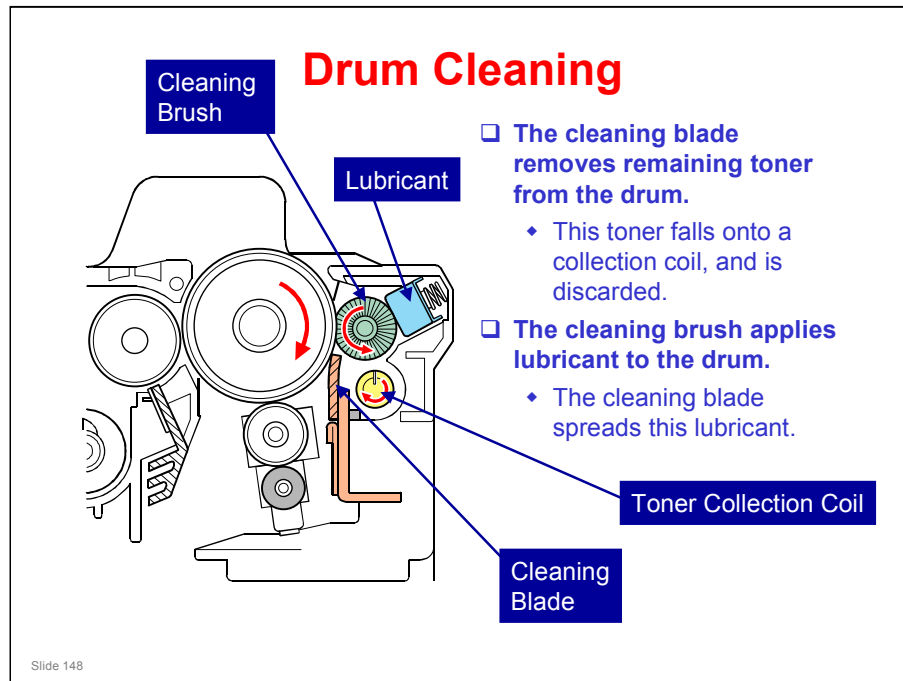
**No additional notes**

## Quenching

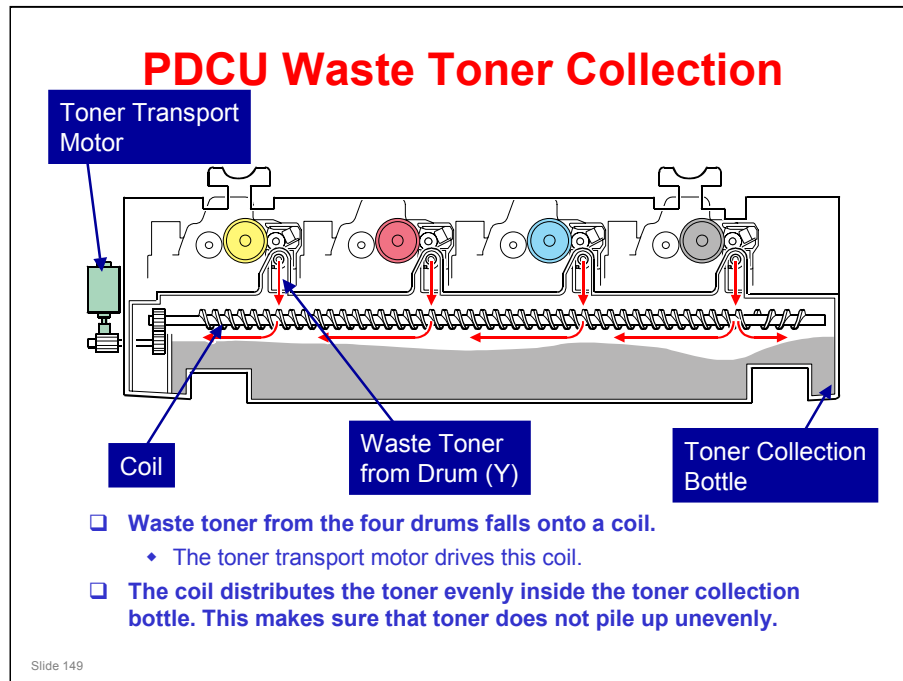
- ☐ The laser exposes all areas of the drum at the end of each job.
- ☐ This removes any charges remaining on the drum.

Slide 147

**No additional notes**

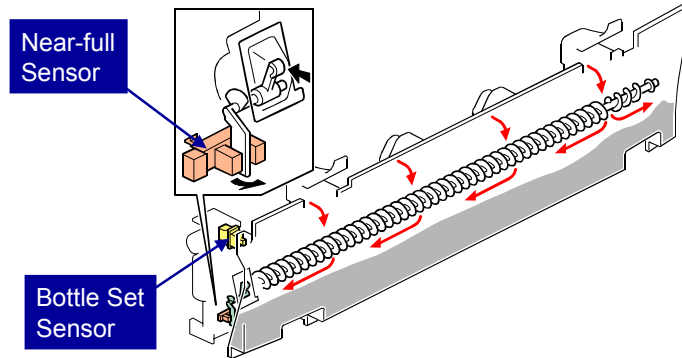


- ❑ The waste toner collection mechanism from the drum is on the next slide.
- ❑ The waste toner from the transfer belt goes to a different bottle.



- ☐ The gears at the end of the drum drive the toner collection coil inside each drum unit.
- ☐ The image transfer unit has a separate bottle for collecting waste toner.
- ☐ The mechanism is similar to the G-P3.
  - In the AT-C1, toner from all four drums is collected in one coil before it goes to the bottle. In the G-P3/Di-C1, there are four openings in the bottle, and toner goes directly from the drum into the bottle, and is distributed by coils inside the bottle.

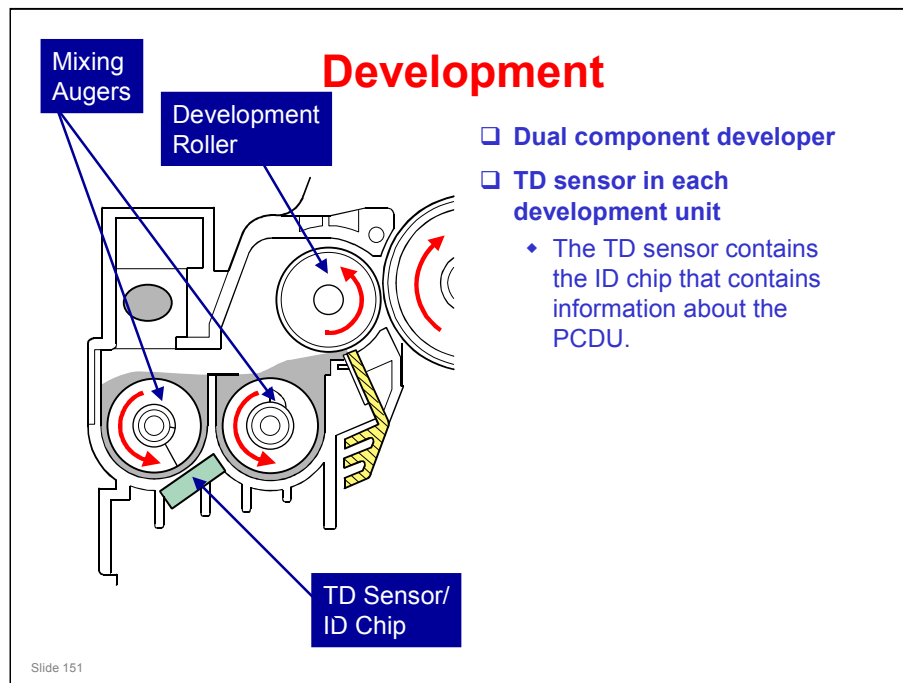
## Toner Bottle Detection/Full Detection



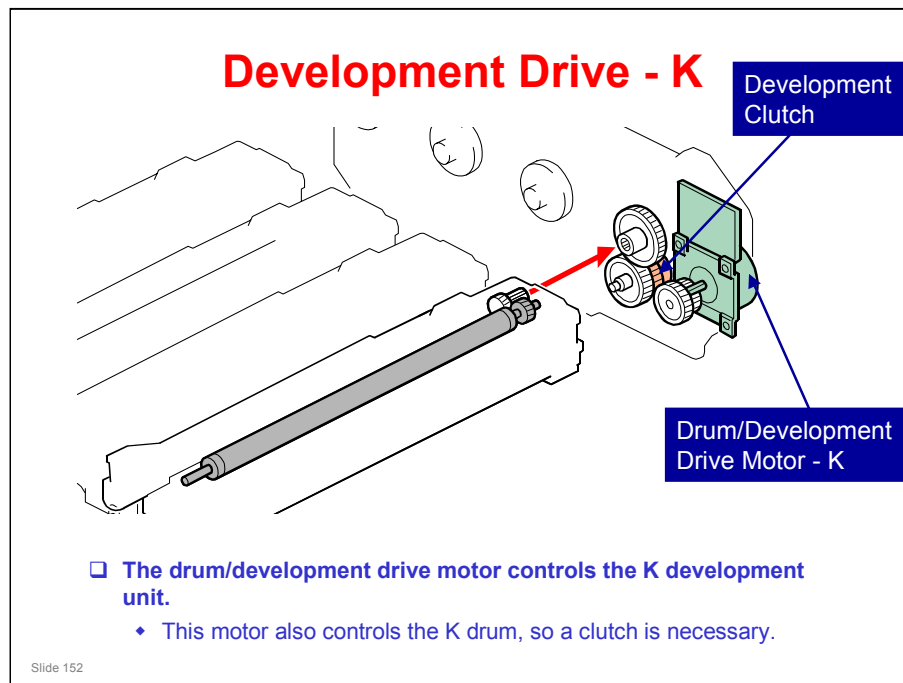
- ❑ When the waste toner sensor detects the actuator, the 'near-full' condition occurs.
- ❑ The machine can make about 2000 more copies (2 P/J, 20% colour ratio, 5% coverage). Then the 'full' condition occurs and the machine stops.

Slide 150

- ❑ Bottle full is detected by estimating toner coverage since near-full was detected. It does not count 2000 sheets.



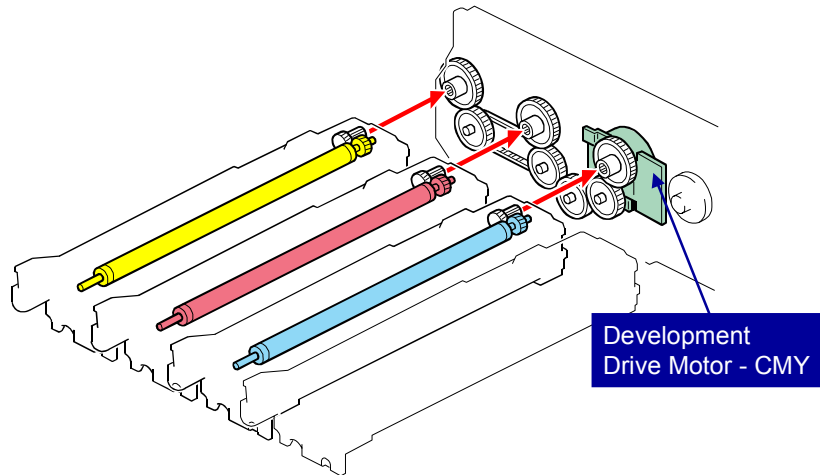
**No additional notes**



**No additional notes**



## Development Drive - CMY

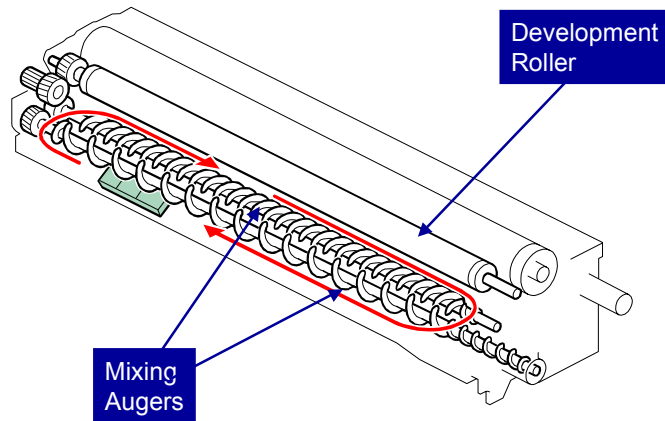


- ❑ This motor drives the C, M, and Y development units.

Slide 153

- ❑ This motor does not control the drums, so no clutch is necessary.

## Developer Agitation



- ❑ Two augers circulate the toner in the development unit during development, during toner supply, and during process control self checks.

Slide 154

- ❑ This diagram shows how the augers move the toner around inside the development unit.

## Development Unit Storage

- ❑ If the development unit was stored at more than 40 °C, the developer can become solid.
- ❑ If this occurs, you will get a developer initialization error at installation.
- ❑ At this time, you must do the following procedure:
  - ◆ You should also do this procedure when you install a new development unit.
- ❑ 1. Remove the (old) development unit.
- ❑ 2. Keep the (new) development unit level and shake it several times from side to side.
- ❑ 3. Install it in the machine.

Slide 155

**No additional notes**

## Refresh Mode

- ❑ While making prints with low coverage, the developer is agitated with less toner consumption and the toner carrier attraction tends to increase. This may cause low image density or poor transfer (white dots).
- ❑ To prevent this, the coagulated toner or overcharged toner must be consumed. To do this, 'refresh mode' is done when the total number of prints with low coverage gets to a certain level.
- ❑ In 'refresh mode', the machine makes a band for each colour to consume some of the toner in the development unit and add fresh toner from the cartridge.

Slide 156

- ❑ SP 3516 controls this feature. Do not adjust.

## New Unit Detection (1)

- ❑ The TD sensor assembly contains the ID chip. This chip tells the machine if the PCDU or development unit is new or not.
- ❑ When the machine detects a new PCDU or development unit, the machine automatically does the following:
  - ◆ PM counter clear for items related to the PCDU
  - ◆ Developer initialization
  - ◆ Charge roller voltage control
  - ◆ Process control
  - ◆ Line position adjustment

Slide 157

- ❑ SP 3901: Turns new PCDU detection off

## New Unit Detection (2)

- ❑ If you install a new drum unit only, the machine does not detect it automatically.
  - ◆ Then, you must reset the PM counter for the drum unit.
  - ◆ To do this, set SP 3902 009 (K), 010 (C), 011 (M), or 012 (Y) to 1 before you start to work on the machine.
- ❑ If you install a new development unit only, the machine detects it automatically and resets the PM counter. But, the ID chip in the new development unit will also reset the PM counter for the drum if you do not do the following:
  - ◆ Set SP 3902 001 (K), 002 (C), 003 (M), or 004 (Y) to 1 before you start to work on the machine.
- ❑ If you install a new PCDU, the machine detects it automatically. Do not change SP 3902.

Slide 158

### Summary

- ❑ If you replace the PCDU, do not change SP 3902
- ❑ If you change only the drum unit, set SP 3902 009 (K), 010 (C), 011 (M), or 012 (Y) to 1 before you start to work on the machine.
- ❑ If you change only the development unit, set SP 3902 001 (K), 002 (C), 003 (M), or 004 (Y) to 1 before you start to work on the machine.

## ID Chip

- ❑ The ID chip is part of the TD sensor assembly.
- ❑ The ID chip contains counters and other data about the PCDU, drum unit, and development unit.

Slide 159

**No additional notes**

## Replacement and Adjustment

### □ Development Unit

- ◆ Do the ACC procedure after the developer initialization is finished.
  - » User tools > Maintenance > ACC > Start

Slide 160

- Under normal conditions, the life of the developer is the same as the machine, so it is not necessary to replace.
- Do the ACC procedure after developer initialization. This ensures that the machine's colour characteristics are maintained.

### *Appendix, Process Control Error Conditions*

- An explanation of the codes displayed by SP3014 001 is in this section of the service manual.



## Replacement and Adjustment

### □ PCDU Toner Collection Bottle

- ◆ If you replace the bottle after the machine detects that it is full or near-full, the machine automatically resets the PM counter for the bottle after replacement.
- ◆ But, if you replace a bottle that is not full or near-full, then you must reset the PM counter for this unit. To do this, set SP 3902 019 to 1 before you start to work on the machine.

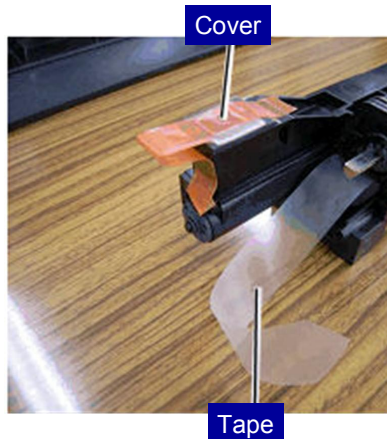
Slide 161

**No additional notes**

## Replacement and Adjustment

### □ When installing a new PCDU

- ◆ Remove the cover on the toner inlet and pull out the tape from the new development unit before installing a new PCDU in the machine.



Slide 162

**No additional notes**

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****PROCESS CONTROL**

Slide 163

- ☐ Process control will be described briefly in this section.

## Overview

Slide 164

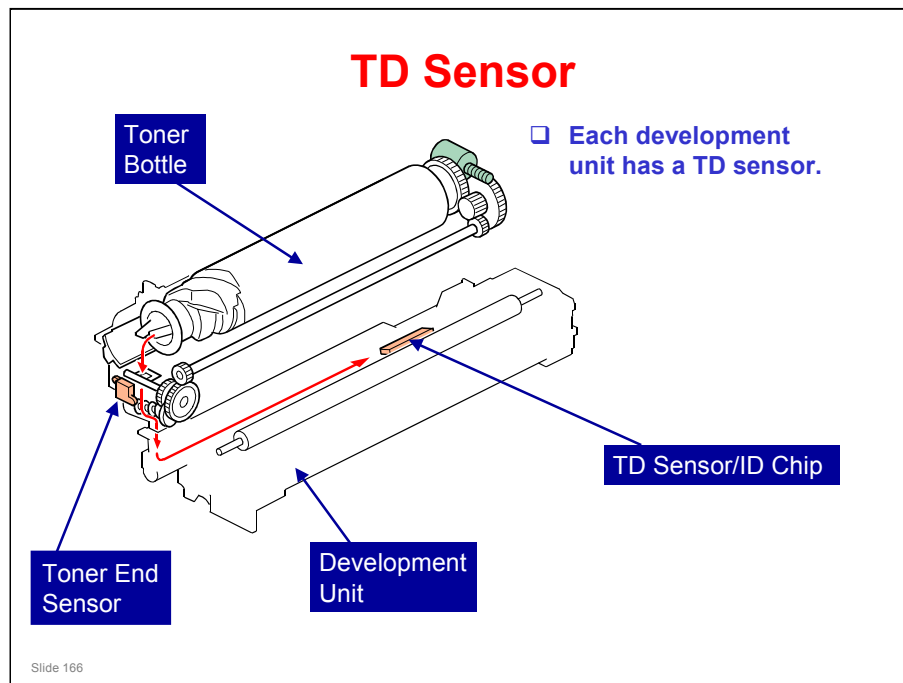
**No additional notes**

## What is Done?

- ❑ This machine has two forms of process control.
  - ◆ Potential control
  - ◆ Toner supply control
- ❑ Process control uses these components:
  - ◆ The central ID sensor
    - » There are three ID sensors. Only one is used for process control
  - ◆ Toner density sensor

Slide 165

- ❑ Line position adjustment: This process prevents colour registration errors and skew. It is described in the Laser Exposure section.



**No additional notes**

## Potential Control

Slide 167

**No additional notes**

## Overview

- The machine determines the best possible  $V_D$ ,  $V_B$ , and  $V_L$ , based on current machine conditions.
  - ◆  $V_D$ : Drum potential without exposure – to adjust this, the machine adjusts the charge roller voltage.
  - ◆  $V_B$ : Development bias
  - ◆  $V_L$ : Drum potential at the strongest exposure – to adjust this, the machine adjusts the laser power
- At the same time, the machine also determines  $V_{TREF}$ : Reference TD sensor output, used for toner supply control.

Slide 168

No additional notes



## When is it Done? (1)

### ❑ Initial:

- ♦ Immediately after the power is turned on, or when the machine recovers from the energy saver mode.
  - ♦ Done if one of these conditions occurs:
    - » Temperature has changed by more than a certain amount after the drum motor stopped.
    - » Humidity has changed by more than a certain amount after the drum motor stopped.
    - » 250 b/w or 100 full colour prints were made since the previous adjustment (SP 3511 005/006).
- And  
The machine was not used for more than 6 hours (SP 3522 002).

Slide 169

- ❑ The threshold levels are set by SP modes.
- ❑ No process control before or after ACC.

## When is it Done? (2)

### ❑ At the end of a job:

- ♦ Done if 250 b/w or 100 full colour prints were made since the previous adjustment (SP 3515 001/002).

### ❑ During a job:

- ♦ Done if 500 b/w or 200 full colour prints were made since the previous adjustment (SP 3515 003/004).
  - » The machine checks the above condition every 5 pages (SP 3512 001). Then, potential control is done if the condition occurs.
- ♦ Done every 20 pages (A4) or every 10 pages (A3) if the following two conditions both occur:
  - » Temperature is higher than 30 °C (SP 3-520-010) or lower than 15 °C (SP 3-520-011)
  - » Pixel coverage is more than 20% for any one colour (SP 3-224-017 [high temperature]/018 [low temperature])
- ♦ Done every 10 pages (A4) or every 5 pages (A3) if the following two conditions both occur:
  - » 60 mm/s mode (1200 dpi, OHP/Thick Paper)
  - » Pixel coverage is more than 10% for any one colour (SP 3-224-022)

Slide 170

- ❑ During a job: This process control is longer than other process controls; it takes 40 seconds

- At 14 pages, a flag is set. This flag is checked every 5 pages. Then, if a condition occurs that requires process control, and the flag happens to be set, process control is done.

*If the flag is checked every 5 pages, why is the first check at 20 pages and not 15 pages? The machine does not have time to prepare for process control between page 14 and page 15. So process control is done at the next 5-page interval (page 20).*

- AT-C1: The flag is checked every 30 sheets.

- ❑ You cannot adjust the intervals with SP 3515 001 to 004. These SPs only show the current settings. To change the current settings, you must adjust SP 3511 001 to 004 (base value) and SP 3511 022 to 029 (coefficients)

## When is it Done? (3)

- ❑ **After replacing the development unit:**
  - ◆ Process control occurs automatically
- ❑ **After replacing the following units, process control must be done manually with SP 3-902 (PM counters are reset then process control is done)**
  - ◆ ITB unit
  - ◆ ITB cleaning unit (if the waste toner bottle is not detected as full or near-full)
  - ◆ Drum unit
- ❑ **Forced (manual execution):**
  - ◆ Use SP 3011 001
  - ◆ Process control counters (SP 3510-003/004) are not reset after a forced execution

Slide 171

**No additional notes**

## **Toner Density Adjustment Mode Overview**

- ❑ Process control adjusts the toner density so that the density of each colour in the image is correct.
- ❑ But, sometimes, process control adjusts the toner density too slowly, and the first few copies after process control have incorrect toner densities.
- ❑ Toner density adjustment mode brings toner concentrations to the correct values much more quickly.

Slide 172

**No additional notes**

## **Toner Density Adjustment Mode**

### **What is Done?**

- ❑ The machine makes sensor patterns and checks the current development gamma.
- ❑ Development gamma too low: If the following condition occurs, the machine increases the toner density. To do this, it supplies toner to the development unit.
  - ♦  $\text{Current gamma} < \text{Target gamma} - 0.15$  (SP3-239-012)
- ❑ Development gamma too high: If the following condition occurs, the machine decreases the toner density. To do this, it consumes some of the toner in the development unit.
  - ♦  $\text{Current gamma} \geq \text{Target gamma} + 0.15$  (SP3-239-009)

Slide 173

- ❑ These two methods of toner density adjustment are called 'toner supply mode' (confusing!), and toner consumption mode.

## **Toner Density Adjustment Mode**

### **When is it Done?**

- ☐ **After power-on (toner supply mode only, no consumption)**
- ☐ **Before ACC**
  - ♦ In this way, the customer can execute the toner density adjustment mode, if they think that colour balance is not good. It becomes part of the ACC process.
- ☐ **At end of job (toner supply mode only, no consumption)**
- ☐ **The machine has a forced toner density adjustment mode (SP 3011 002).**

Slide 174

- ☐ SP 3043 can be adjusted to control when toner density adjustment mode is done, or disable the feature at each of the times listed on the slide.
- ☐ In addition to the times stated on the slide, it is possible to do toner density adjustment in standby mode (3043 003).

## Time Required for Process Control

- ❑ The customer may ask why the machine stops for a significant time.
  - ◆ Initial start-up
    - » Process control: approx. 30 seconds
  - ◆ During a job
    - » Process control: approx 30 seconds
  - ◆ At the end of a job
    - » Full colour Job end Process control: approx. 11 seconds
    - » B&W Job end Process control: approx. 6 seconds

Slide 175

- ❑ For 1200 dpi/OHP/Thick paper mode, it is always approx 30 seconds.
- ❑ Toner adjustment mode can add anything up to an extra minute, depending on the conditions.

### Comparison with AT-C1:

- ❑ For process control that is done just after a print job, note that the time is reduced to 11 seconds (for full colour) or 6 seconds (for black-and-white jobs). For the AT-C1 it was always 20 seconds.
- ❑ Why is it quicker? The sensor pattern is made while the last page of the job is still feeding out of the machine. In the AT-C1, the machine waits until the paper is completely fed out before the patterns are made. Also, for black and white, the Di-C1 only makes the black sensor pattern.

## **Toner Supply Control**

Slide 176

**No additional notes**



## Overview

- ❑ **Uses these components:**
  - ◆ TD sensor: Detects how much toner there is in the developer
  - ◆ ID sensor: Measures the density of standard sensor patterns during process control.
  - ◆ Pixel counter: Counts pixels to determine how much toner for each colour is used on the page
- ❑ **The result of toner supply control determines how long the toner supply motor turns on for.**
  - ◆ This determines the amount of toner supplied.
- ❑ **This is done before every development for each colour.**

Slide 177

**No additional notes**

## Toner Supply Control Modes

- ❑ This machine uses 5 toner supply modes. The mode used depends on SP3-044-001 to -004.
- ❑ These are the five modes:
  - ◆ PID control mode
  - ◆ PID control mode with fixed VTREF
  - ◆ Fixed supply mode
  - ◆ MBD control mode: This is the default mode.
  - ◆ MBD control mode with fixed VTREF
- ❑ You can select a different mode for each colour, if necessary.
  - ◆ Use SP 3-044 if the TD sensor and/or ID sensor breaks and no spare part is available.
  - ◆ After replacing the part, return the SP setting to the default.
  - ◆ See the next slide for details.

Slide 178

- ❑ MBD control mode is a new one. It was not used in Athena-C1/C2. For more, see the next slide.

## Toner Supply Control

- ❑ **PID control mode**
  - Uses the TD sensor, ID sensor, and pixel count.
  - VTREF is adjusted by process control.
- ❑ **PID control mode with fixed VTREF**
  - Change to this mode if the ID sensor breaks.
  - This mode uses only the TD sensor.
  - VTREF is fixed at the value stored in SP3-222-001 to -004.
- ❑ **Fixed supply mode**
  - Change to this mode if the TD sensor breaks.
  - The amount of toner supplied depends on SP3-401-001 to -004.
  - The default is 70% of normal supply, to prevent excessive supply of toner.
- ❑ **MBD control mode: This is the default mode.**
  - Uses the TD sensor, ID sensor, and pixel count.
  - VTREF is adjusted by process control.
- ❑ **MBD control mode with fixed VTREF**
  - Change to this mode if the ID sensor breaks.
  - This mode uses only the TD sensor.
  - VTREF is fixed at the value stored in SP3-222-001 to -004.

Slide 179

- ❑ Use SP 3-044 if the TD sensor and/or ID sensor breaks and no spare part is available.
- ❑ After replacing the part, return the SP setting to the default.
- ❑ MBD (Model Based Differential) is similar to PID mode, except the formula is different, and tuned for each model. PID uses the same formula for each model, so MBD is more accurate in theory.

## Other SP Modes

Slide 180

- ❑ A lot of SPs were already discussed. Here are other SPs related to process control.

## Potential Control – Others

### ❑ Enable/disable

- ◆ 3041 001: Potential control, enable/disable
- ◆ 3041 002: LD power control, enable/disable
- ◆ 3041 004: What type of process control is done before ACC (default: TD adjustment only)

### ❑ Forced process control

- ◆ 3011 001: Normal process control, manual execution
- ◆ 3011 002: Toner density adjustment mode, manual execution
- ◆ 3321: ID sensor initialization

### ❑ Results

- ◆ 3012: Process control results (YMCK)
- ◆ 3014: Developer initialization results (4 digits, YMCK)
- ◆ 3325: ID sensor initialization result (Front, Center, Rear)

Slide 181

- ❑ In this machine, the TD sensor is not initialized, except during developer initialization. This is because the sensor is in a place where it does not get dust/toner on it.

## What Values are used if Potential Control is Disabled?

- ❑ If potential control is disabled (SP3-041-001 is set to 0),  $V_D$  and  $V_B$  are fixed by SP mode settings.
  - ♦ SP2-005 for  $V_D$  , SP2-229 for  $V_B$
- ❑ If LD power control is disabled (SP3-041-002 is set to 0), the LD power is fixed by an SP mode setting.
  - ♦ SP2-221 for  $V_L$

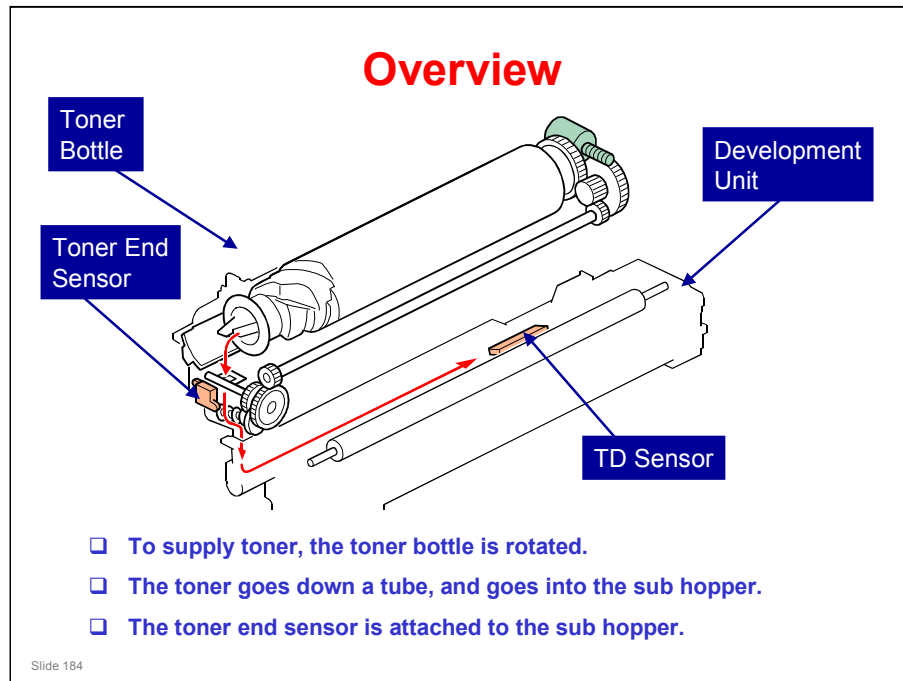
Slide 182

No additional notes

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****TONER SUPPLY**

Slide 183

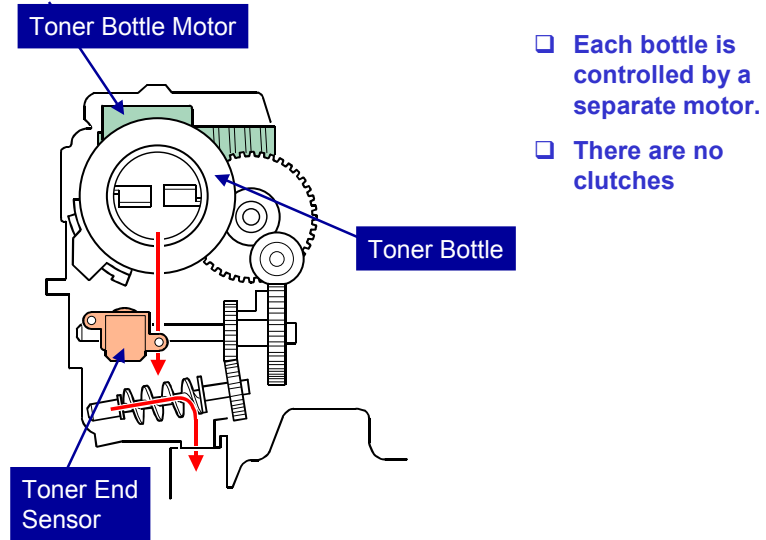
- ☐ In this section, the mechanical components of the toner supply system will be described.
- ☐ Toner supply control was explained in the Process Control section of the course.



- ☐ This mechanism is the same for each of the four toner bottles in the machine.
- ☐ The TD sensor contains an ID chip that contains information about the PCDU, development unit, and drum unit, such as counters.
  - We discussed this in the PCDU section.
- ☐ The RFID chip in the toner bottle contains data on the amount of toner consumed from the bottle, and is used for toner bottle detection (the machine uses it to detect if the bottle installed or not).

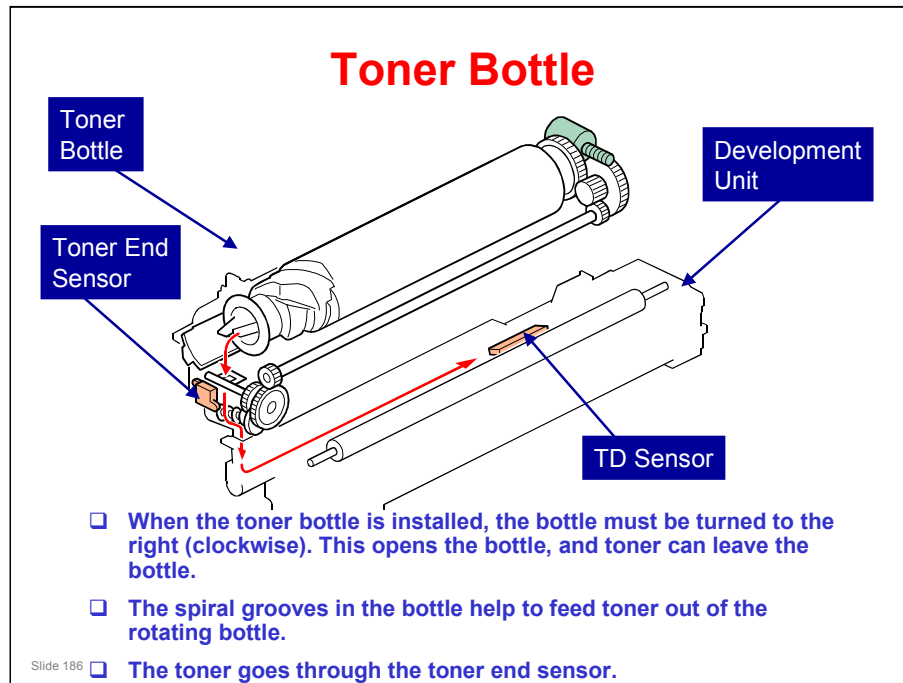


## Toner Bottle Rotation



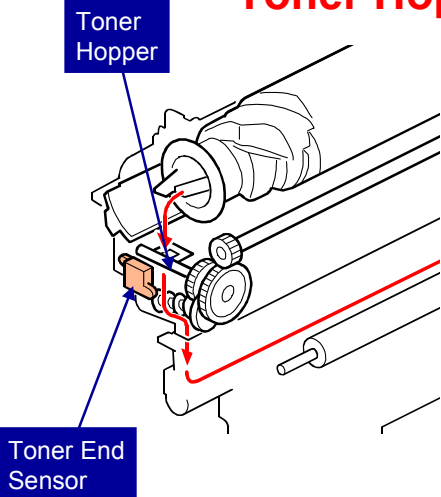
Slide 185

**No additional notes**



- ❑ This slide shows how toner is supplied from the toner bottle.

## Toner Hopper Unit



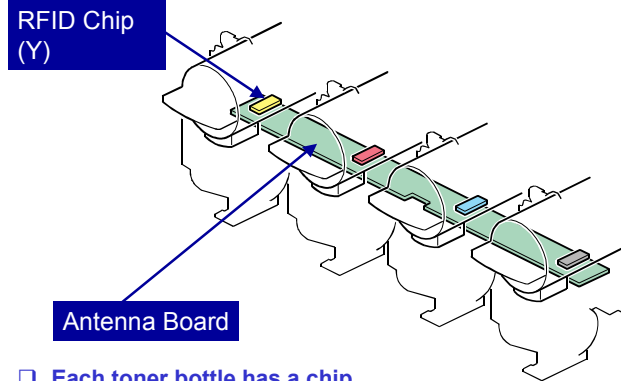
The diagram illustrates the internal components of a toner hopper unit. A blue box labeled 'Toner Hopper' points to the main container. A red arrow shows the path of toner from the hopper, through a series of rollers and gears, towards a 'Toner End Sensor' located at the bottom of the unit. The sensor is represented by a small orange rectangle. The entire unit is shown in a cross-sectional view, revealing the mechanical components that manage the flow of toner.

- ❑ The toner hopper contains a small amount of carrier.
- ❑ This prevents large amounts of toner from entering the development unit during a long job with high image coverage.
- ❑ If a lot of toner is allowed to enter, toner scattering may occur.
- ❑ The carrier is held in the hopper by magnets.
- ❑ If the toner hopper unit is replaced, carrier must be added to the new hopper unit.
- ❑ Carrier is provided with each spare toner hopper unit in a small bottle.

Slide 187

**No additional notes**

## Radio Frequency ID Chip



- ❑ Each toner bottle has a chip.
  - ◆ This chip contains data on the amount of toner consumed from the bottle, and is used for toner bottle detection (the machine uses it to detect if the bottle is installed or not).
- ❑ It sends its data to the RFID antenna board.
- ❑ There is no electrical contact. The data is sent by wireless communication.

Slide 188

**No additional notes**

## Toner Near-end Detection

- ❑ To detect toner near-end, the machine uses the following data:
  - ◆ Toner supply motor rotation counter
  - ◆ Pixel counter
  - ◆ Toner end sensor
- ❑ If one (or both) of the counters detect that the remaining toner amount is less than a set value (see below), the machine enters the near-end condition.
  - ◆ K: 13 g (600 sheets at 5% coverage)
  - ◆ CMY: 3 g (120 sheets at 5% coverage)
- ❑ The toner end sensor detects the near-end condition when there are only 100 sheets left.
  - ◆ This occurs when the bottle is empty, but a small amount of toner remains in the sub hopper.

Slide 189

- ❑ The two counter values on the slide are stored in the RFID chip on the toner cartridge, and copied to the NVRAM on the BCU.
- ❑ The toner end sensor is a fail-safe in case the two counters do not detect near-end correctly. However, 100 sheets is not much time before the toner runs out.

## Toner Near-end Detection Method

### ❑ 3045 002

- ◆ 0: Pixel counter, motor rotation counter, and toner end sensor
- ◆ 1: Toner end sensor only

Slide 190

- ❑ If set to 1, there is no toner in the toner cartridge at the near end condition. The customer can change the bottle immediately.
- ❑ If the setting is 0, there may still be toner in the bottle when near-end occurs. Some toner is wasted if the customer changes the bottle immediately. However, the customer has some time to get a new toner cartridge.

## Toner End Detection

- ❑ To detect toner end, the machine uses the TD sensor (there is one below each toner bottle).
  - ◆ Toner end is detected if both of these conditions occur:
    - »  $VT - VTREF \geq 0.5$
    - »  $SUM(VT - VTREF) \geq 10$
- ❑ The toner end sensor continues to check for toner in the hopper, and if it detects toner, the toner end condition is cancelled.

Slide 191

**No additional notes**

## What Happens if Toner End is Detected?

- If toner end is detected for black, the toner bottle must be replaced or the machine cannot print.
- If toner end is detected for C, M, or Y, the machine can print in black and white only. Colour print jobs cannot be started.
  - ◆ If C, M, or Y toner ends during a colour-printing job, the job is suspended until toner is supplied.
  - ◆ If new colour toner is not installed, the user can print black-and-white jobs only.

Slide 192

**No additional notes**



## Toner End Recovery

- ❑ The machine assumes that the toner cartridge was replaced if either of the following occurs when the near-end or end status exists:
  - ◆ The front door is opened and closed.
  - ◆ The main switch is turned off and on.
- ❑ Then the machine starts to supply toner to the development unit.
- ❑ Then, the machine clears the toner near-end or end status if the toner end sensor detects that toner was supplied.
- ❑ The machine tries to supply toner for a maximum of 50 times. If the sensor still does not detect toner, there is no recovery from toner end.

Slide 193

No additional notes

## Replacement

### ❑ Toner hopper unit

- ◆ During reassembly, pour some carrier (8g) into the hopper.
  - » A small bottle of carrier is provided with the new toner hopper spare part as an accessory. It contains 8g of carrier.
  - » Follow the procedure in the manual carefully. The shutter comes off easily after the inner cover has been removed.

### ❑ Toner end sensor

- ◆ Do not replace this in the field. Replace the toner hopper unit.

Slide 194

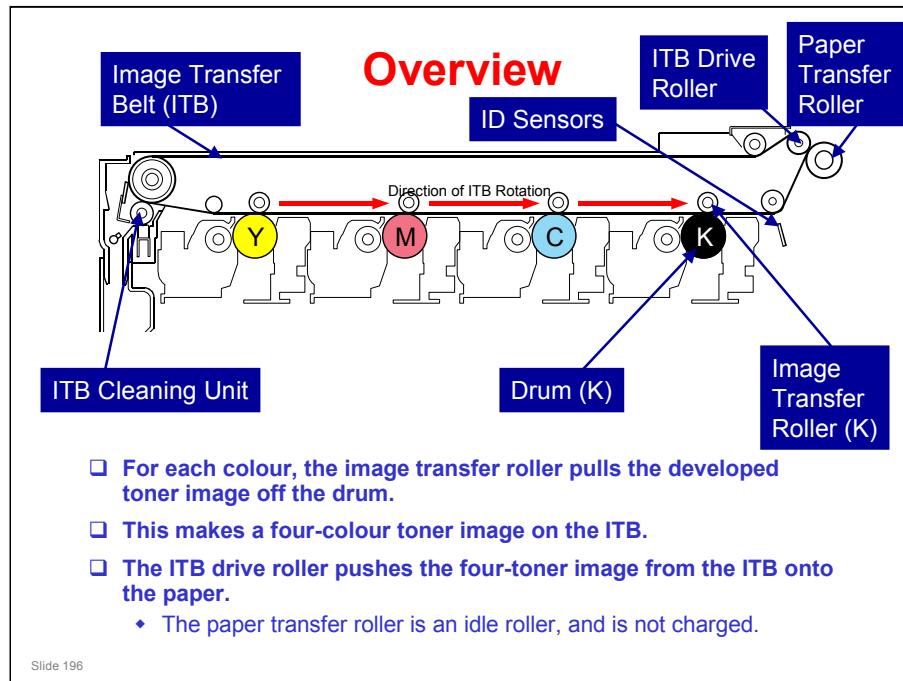
### ❑ Do not replace the toner end sensor in the field.

- This sensor is part of the toner hopper unit. Replace the complete toner hopper unit instead. Otherwise, carrier will spill out onto the floor, and will not be present in the hopper after reassembly.
- The sensor is not supplied as a spare part anyway.

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****TRANSFER**

Slide 195

- ❑ In this section, the image transfer, paper transfer, and paper separation mechanisms will be described.



- ☐ All four colour toners are pulled onto the ITB on the same rotation of the ITB.
- ☐ The paper transfer roller does not pull the toner off the ITB. In this machine, the ITB drive roller pushes the toner off the ITB and onto the paper.
- ☐ Used toner collected by the ITB cleaning unit goes to the used toner collection bottle in the ITB unit. This is separate from the bottle that is used for the drums.

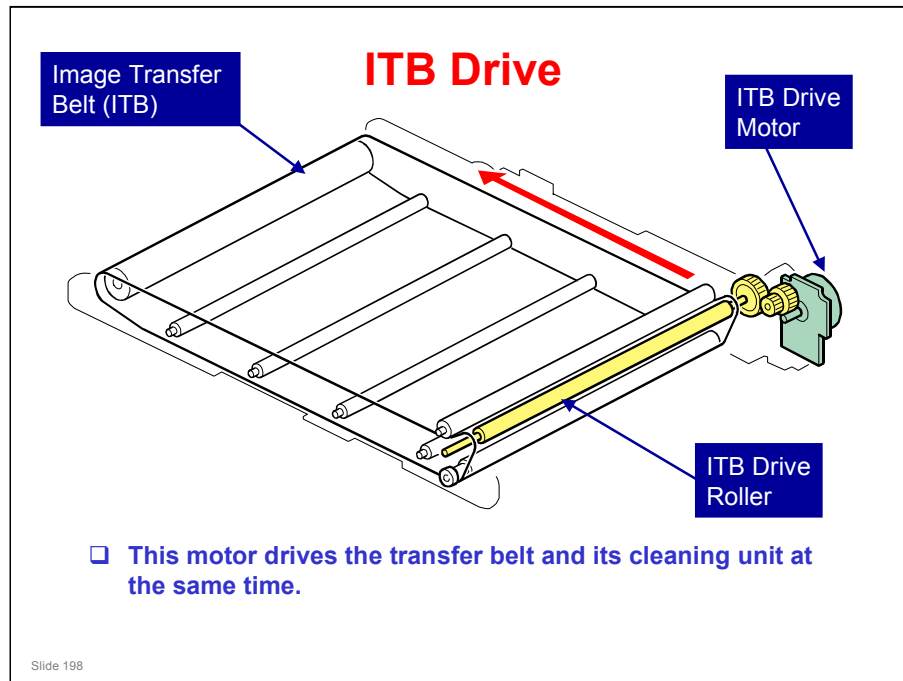
## ITB Lock Lever



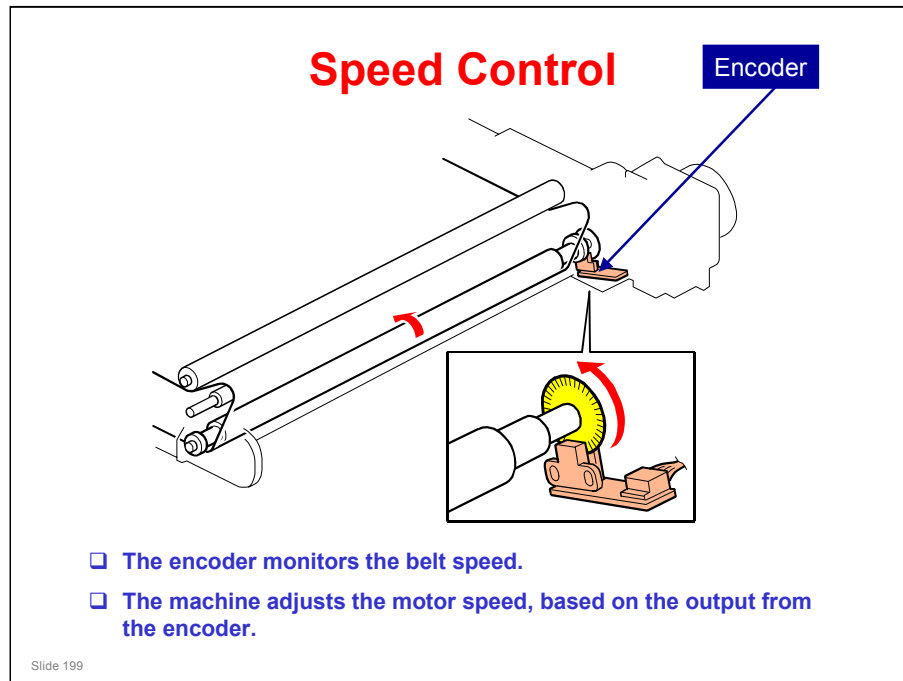
- ❑ To release the ITB from the K drum, you must turn the image transfer belt unit lock lever clockwise before you remove the unit. If you do not do this, you will damage the K drum.

Slide 197

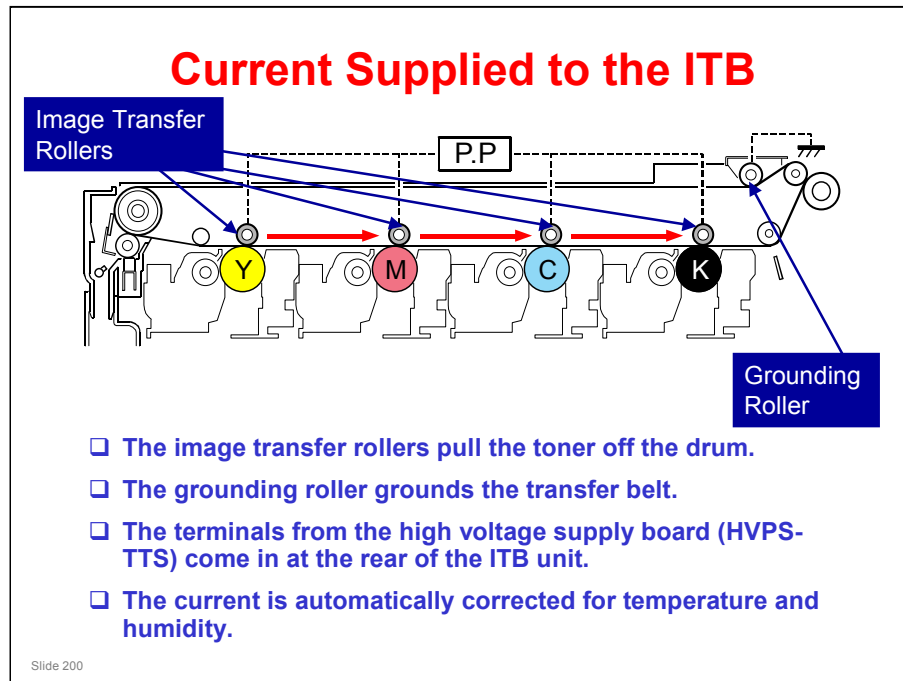
**No additional notes**



- Drive for the transfer belt cleaning unit is shown in more detail later in this section.

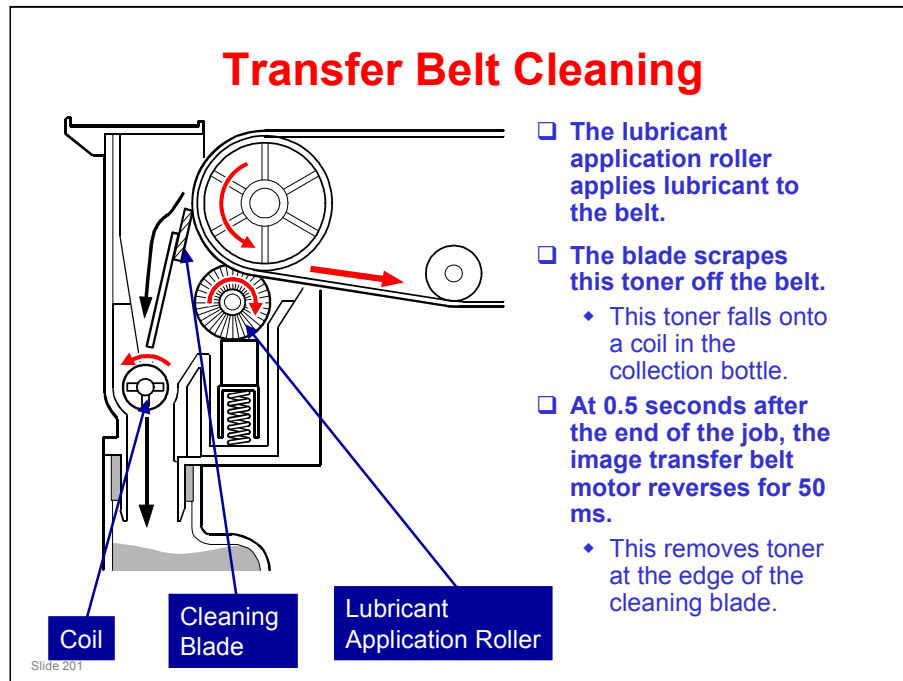


- ☐ The speed of the belt depends on the process speed (see 'Process Speeds' in the Machine Overview section of the course).
- ☐ The machine ignores unusually high or low readings from the encoder that exist only for a short time.



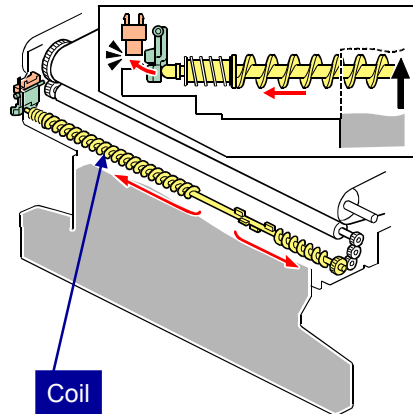
- ❑ The temperature/humidity sensor is at the rear lower right side of the machine.
- ❑ The grounding roller is also called the 'press roller'.





- ❑ The waste toner collection bottle in the ITB unit is separate from the bottle for the drums.
- ❑ The reverse rotation at the end of the job is also done for the OPCs at the same time, for the same purpose.

## Waste Toner Collection From the Image Transfer Belt

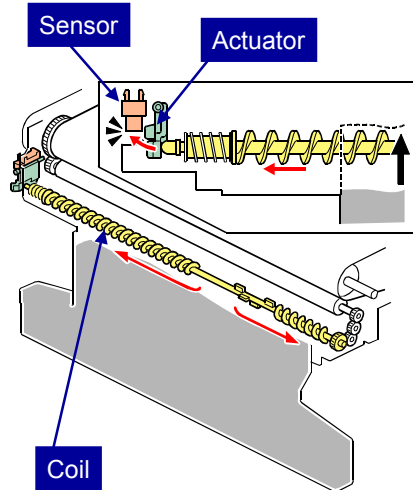


- ❑ Waste toner from the transfer belt falls into a coil.
  - ♦ The ITB drive motor drives this coil through some gears at the front of the ITB unit.
- ❑ This coil moves the waste toner to the toner collection bottle.
- ❑ This is a separate bottle from the one that collects waste toner from the drums.

Slide 202

No additional notes

## Waste Toner Bottle Near-Full

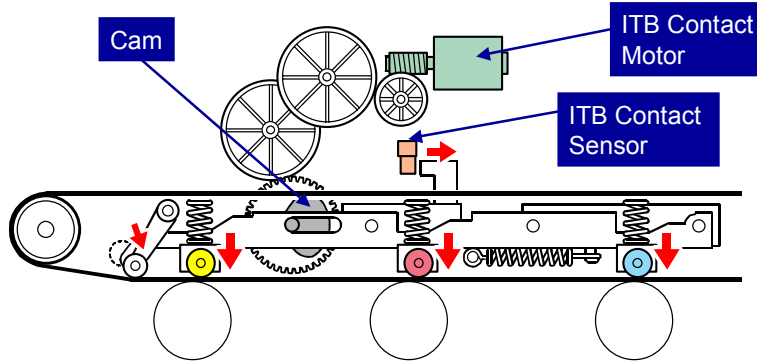


- ❑ When the bottle is almost full, the screw pushes against the toner while it turns, and this causes the end of the coil to push the actuator into the sensor.
- ❑ At this time, the machine detects 'near-full'.
- ❑ Then after about 2k prints (for 5% coverage), the machine stops and the bottle must be emptied.

Slide 203

No additional notes

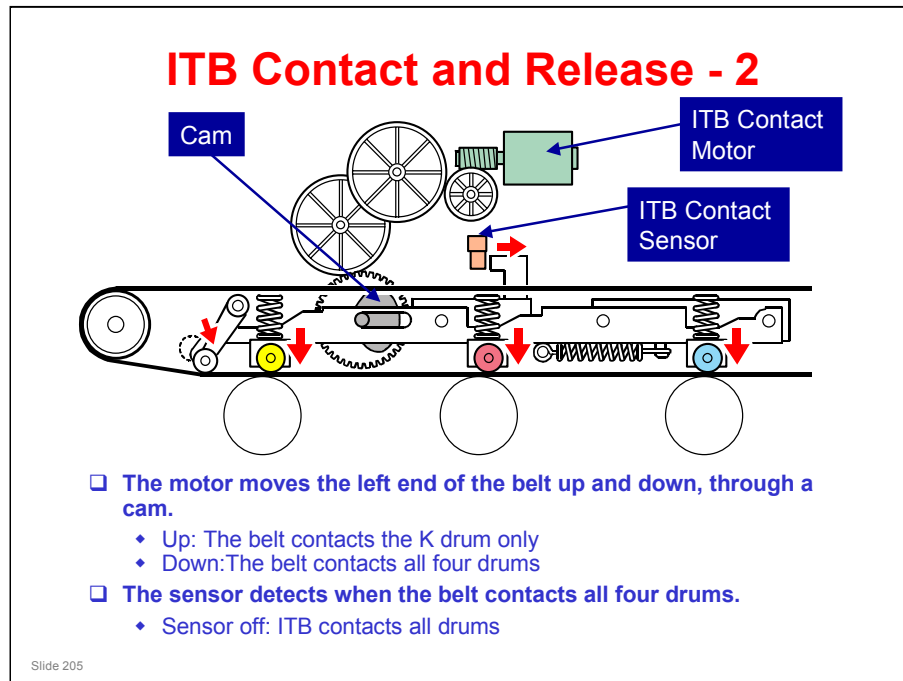
## ITB Contact and Release - 1



- ❑ **The belt always contacts the K drum.**
  - ♦ To move the belt away from the K drum, turn the release lever clockwise. Do this to remove the transfer belt unit, or you will damage the K drum.
- ❑ **The belt contacts the CMY drums for colour printing only.**
  - ♦ If a black-and-white page comes in the middle of a colour job, the belt does not move away from the CMY drums.

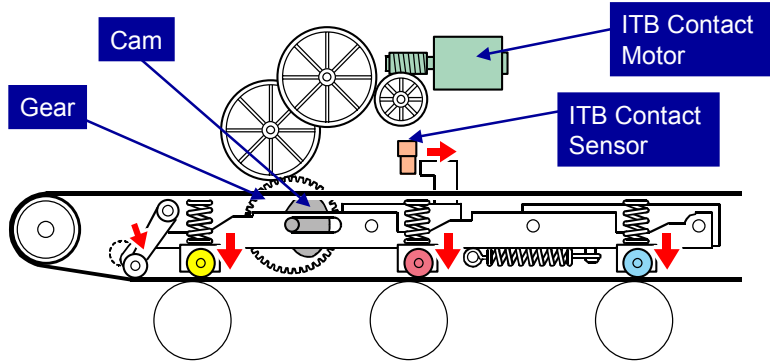
Slide 204

- ❑ This mechanism makes the drums and transfer belt life longer.
- ❑ If a black-and-white page comes in the middle of a colour job, the belt does not move away from the CMY drums.
  - This keeps the printing speed at the maximum, because it takes time for the motor to move the belt up and down.
- ❑ If a colour page appears in the same job after black-and-white pages, the machine waits until the previous page has left the transfer unit. Then it moves the belt up against all four drums.
- ❑ The ITB contact sensor detects the status of the ITB (contacting K only, or contacting all four drums).



- ❑ The following explains how the sensor and motor operate to initialize the machine, and during different types of printing.
  - The ITB contact sensor operates as a detection sensor during machine initialization, and as a position sensor during machine operations.
  - Before machine initialization, the left side of the image transfer belt is in the home position. When initialization starts, the ITB contact motor lowers the left side until the actuator has passed the sensor. Then ITB contact motor lifts up the left side to its home position. This action actuates the sensor in a certain pattern.
  - The sensor actuation patterns are as follows.
    - Initialization: On - Off - On - Off - On*
    - Operation - Standby (Default): On*
    - Operation - B/W printing: On*
    - Operation - Colour Printing: Off*
    - On: The actuator is out of the sensor.*
    - Off: The actuator is interrupting the sensor.*

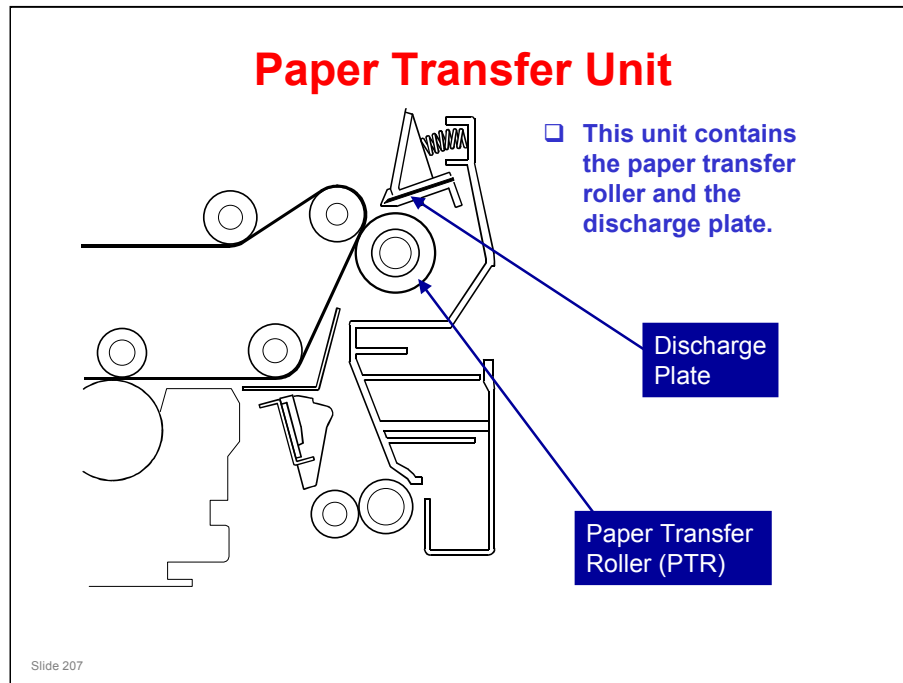
## ITB Contact and Release - 3



- ☐ If a power failure occurs with the belt touching all 4 drums, the belt stays in this position, and you cannot remove the ITB.
- ☐ Open the exit tray cover, then turn the gear or cam of the transfer belt unit until the belt is fully raised.

Slide 206

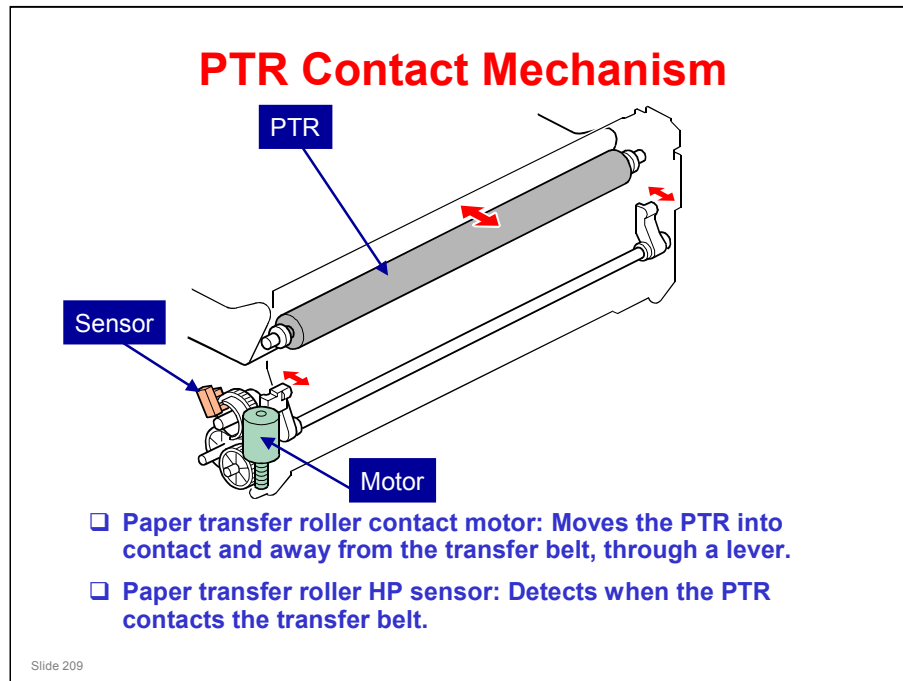
**No additional notes**



- The discharge plate removes charges from the paper, and this makes it easier to separate from the transfer belt.







**No additional notes**

## PTR Contact Mechanism

- ❑ The PTR contacts the transfer belt at all times, except
  - ♦ During line position adjustment (MUSIC)
  - ♦ During process control
  - ♦ Sleep mode
    - » In standby mode, the PTR still contacts the transfer belt.
  - ♦ When the power switch on the operation panel is off
    - » NOTE: Always turn off the power with the operation panel switch first.
    - » If you turn off the power with the main switch, the PTR and transfer belt are still in contact.
    - » If they stay like this for a long time, the belt will have a dent in it, and this will cause insufficient transfer at that point, causing a white line on outputs.

Slide 210

- ❑ When the machine is not being used, the PTR moves away from the transfer belt. If this is not done, the belt becomes damaged (bent, stretched, warped) where the PTR contacts it. This causes copy quality problems, such as horizontal white lines.
- ❑ During line position adjustment and process control, patterns are developed on the transfer belt. The PTR is moved away from the belt at this time, or the PTR will remove the patterns before they get to the ID sensors. This also means that the PTR will get dirty.

## Replacement – Image Transfer Unit (1)

### □ Image Transfer Belt Unit

- ♦ The ITB is in contact with the K drum before you turn the switch off. Take care not to damage the K drum.
  - » To release the ITB from the K drum, you must turn the image transfer belt unit lock lever clockwise before you remove the unit. If you do not do this, you will damage the K drum.
- ♦ If the power failed in the middle of a colour job, with the ITB in contact with all four drums, then the belt touches all 4 drums, and you cannot remove the ITB.
  - » Remove the exit tray, then turn the gear until the belt is fully raised. After that, the ITB contacts the K drum only.
- ♦ Remove the ITB unit motor from the old ITB unit and install it in the new one. The new ITB unit does not have an ITB unit motor.

Slide 211

**No additional notes**

## Replacement – Image Transfer Unit (2)

### ❑ Image Transfer Belt Unit, Image Transfer Belt

- ♦ If you will install a new ITB unit, set SP 3902-013 to 1 before you turn off the power switch.
  - » If you do this, then the machine will reset the PM counter for the unit automatically, after you turn the power on again.
  - » The machine cannot automatically detect that a new ITB unit has been installed.

### ❑ Image Transfer Belt Cleaning Unit

- ♦ If you replace the cleaning unit after the machine detects that it is full or near-full, the machine automatically resets the PM counter for the bottle after replacement.
- ♦ But, if you replace a cleaning unit that is not full or near-full, then you must reset the PM counter for this unit. To do this, set SPs 3902-017 and -020 to 1 before you turn off the power switch.
  - » If you do this, then the machine will reset the PM counter for the units automatically, after you turn the power on again.
  - » SP 3902-017 is for the cleaning unit and SP 3902-020 is for the waste toner collection bottle.

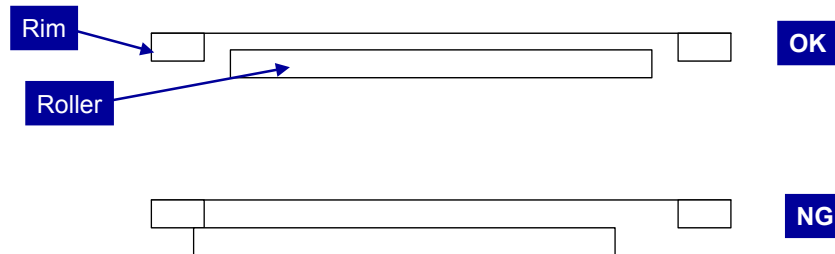
Slide 212

- ❑ Normally, the waste toner collection bottle is replaced at the same time as the ITB cleaning unit. But a separate SP has been provided.

## Replacement – Image Transfer Unit (3)

### ❑ Image Transfer Belt

- ♦ The belt has a rim at the front and a rim at the rear. All the rollers in the ITB unit must be between these two rims. The rims must not be riding on the rollers.



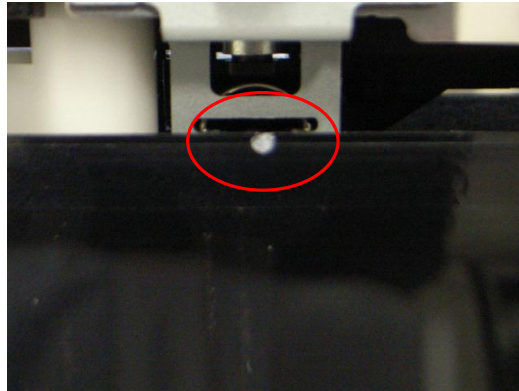
Slide 213

- ❑ The diagram gives you a general idea – it isn't particularly accurate.

## Replacement – Image Transfer Unit (4)

### ❑ Image Transfer Belt (continued)

- ♦ The white mark on the belt must be at the rear side.



Slide 214

**No additional notes**

## Replacement – Paper Transfer Unit

### ❑ Paper Transfer Roller Unit or Paper Transfer Unit

- ◆ If you will install a new unit, set SP 3902-018 to 1 before you turn off the power switch.
  - » If you do this, then the machine will reset the PM counter for the unit automatically, after you turn the power on again.

### ❑ ID Sensor Board

- ◆ If you install a new board, input the values from the decal into SP mode as shown in the service manual.
- ◆ Clean the ID sensor every EM. Use a cloth moistened with alcohol.
  - » Do not use a dry cloth. Otherwise, the ID sensors may get more dirty due to static electricity.

Slide 215

- ❑ It is not necessary initialize the ID sensor with SP 3321 after a new ID sensor is installed.

## SP Modes – Paper Transfer Current for OHP

### □ SP2603-001

- ♦ OHP current for black-and white
- ♦ Default settings: -15  $\mu$  A (USA), -13  $\mu$  A (other regions)

### □ SP2608-001

- ♦ OHP current for full colour
- ♦ Default settings: -24  $\mu$  A (USA), -20  $\mu$  A (other regions)

Slide 216

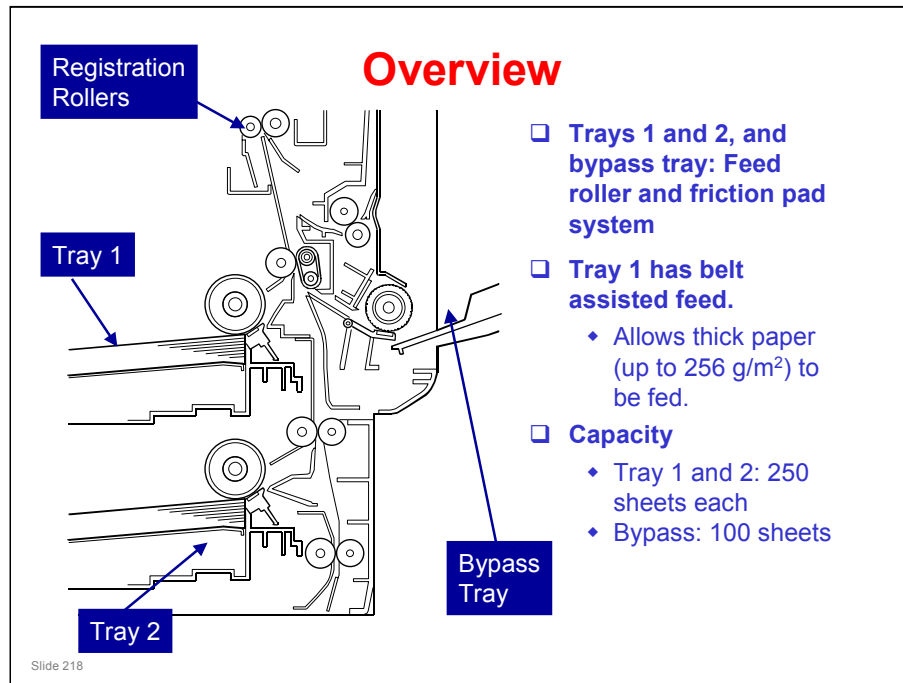
**No additional notes**



**RICOH****Di-C1 TRAINING  
COPIER ENGINE****PAPER FEED**

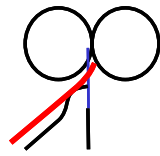
Slide 217

- ☐ In this section, the paper feed mechanisms in the copier will be described.
- ☐ The optional paper feed units will be described in separate sections.

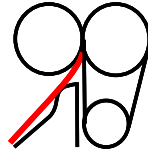


- ❑ Belt assisted feed: See the next slide.

## Belt-Assisted Feed for Thick Paper



Previous design

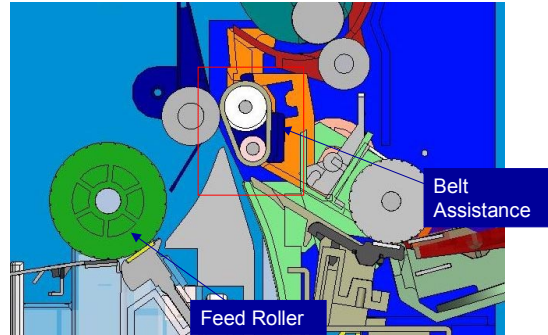


Belt Assistance

Belt-assisted feed enables paper to feed through the sharp bend in the paper path.

Previous design: Without belt assistance, the edge of the paper hits the roller and creates a paper jam.

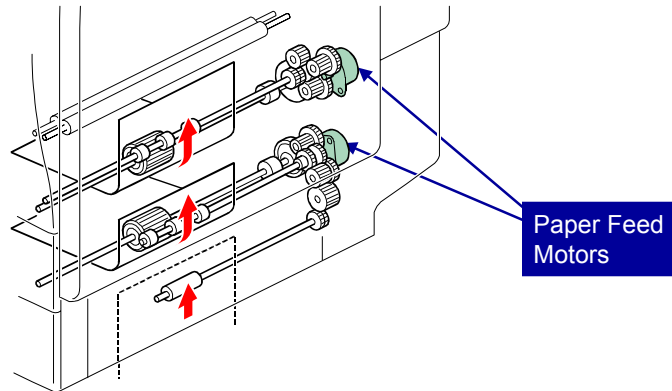
With belt assistance: The belt guides the paper to the rollers to take the paper smoothly.



Slide 219

No additional notes

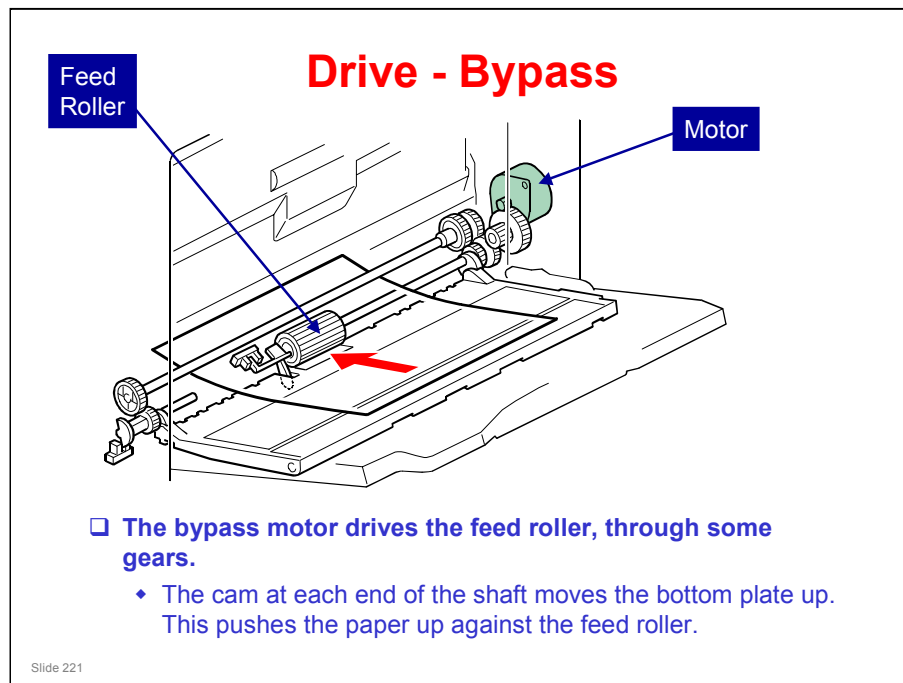
## Drive – Trays 1 and 2



- ❑ Each tray has a motor. There are no paper feed clutches.
- ❑ If the tray is in the machine, the feed roller always touches the top sheet of paper.

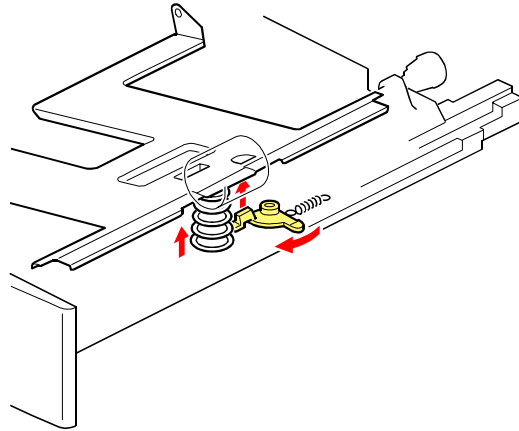
Slide 220

**No additional notes**



**No additional notes**

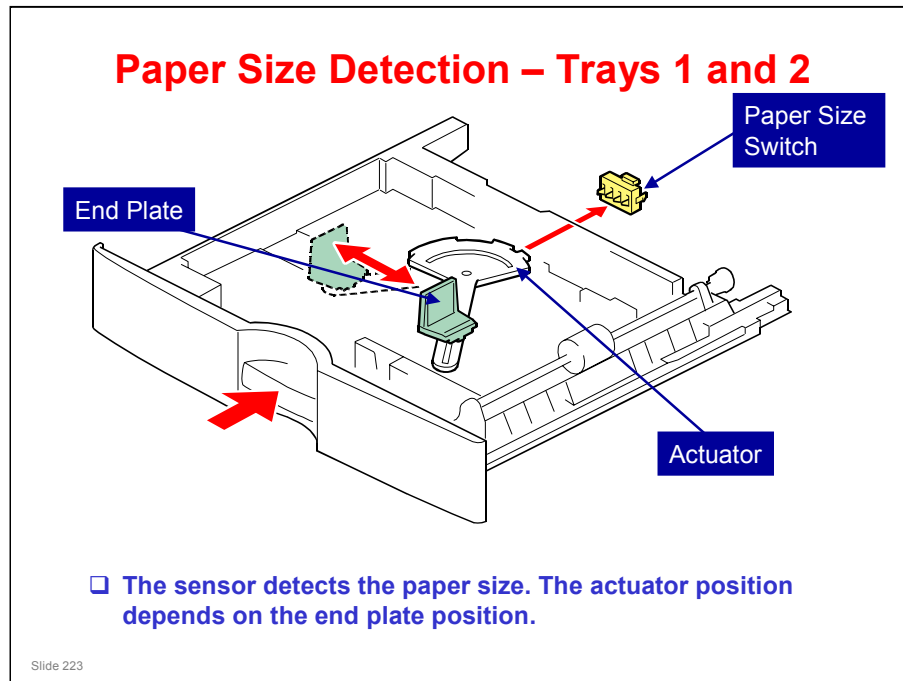
## Tray Lift – Trays 1 and 2



- A spring pushes up the tray bottom plate.

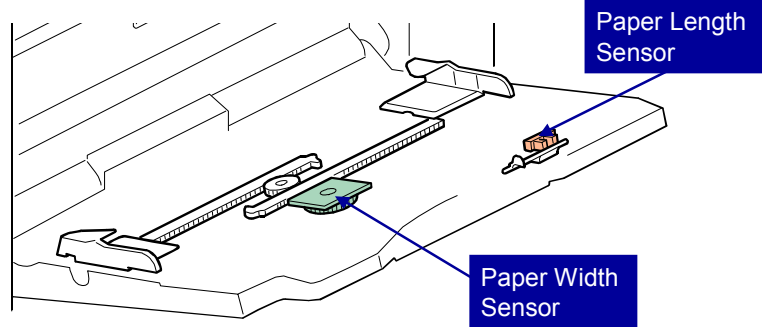
Slide 222

**No additional notes**



- ❑ The sensor functions as a tray set switch and a size detector.
  - The three switches on the left detect paper size. The switch on the right is a tray set sensor.
- ❑ Only the length is detected directly.
- ❑ The actuator has patterns of studs on the rear.
- ❑ These studs turn the paper size switches on/off.
  - This also tells the cpu that the tray is in the machine.
  - The settings of SP 5-181 determine how the machine interprets the sensor readings for paper sizes that are almost the same.
  - If other paper sizes are used, they must be selected with a user tool: System Settings - Tray Paper Settings - Tray Paper Size (Tray 2).
- ❑ If the fence is moved, a different set of studs moves to the switches, and the machine detects a different paper size.

## Paper Size Detection – Bypass Tray



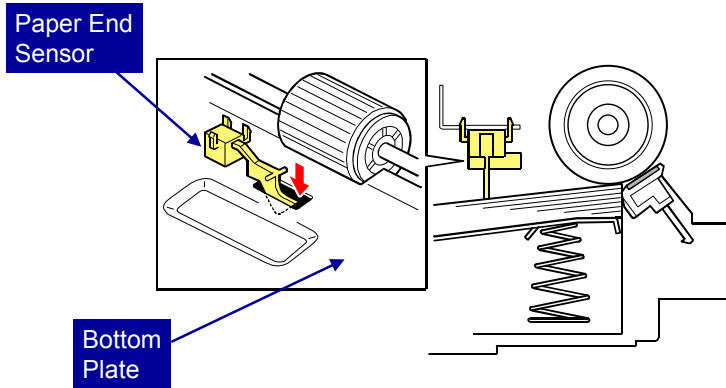
- ❑ A length sensor is added.
- ❑ This helps the machine to distinguish between these pairs of paper sizes, which have the same width
  - ♦ A4 SEF and A5 LEF
  - ♦ A3 SEF and A4 LEF
- ❑ The sensor cannot distinguish between LT and LG SEF.
  - ♦ This must be pre-set with SP 1007-1

Slide 224

**No additional notes**



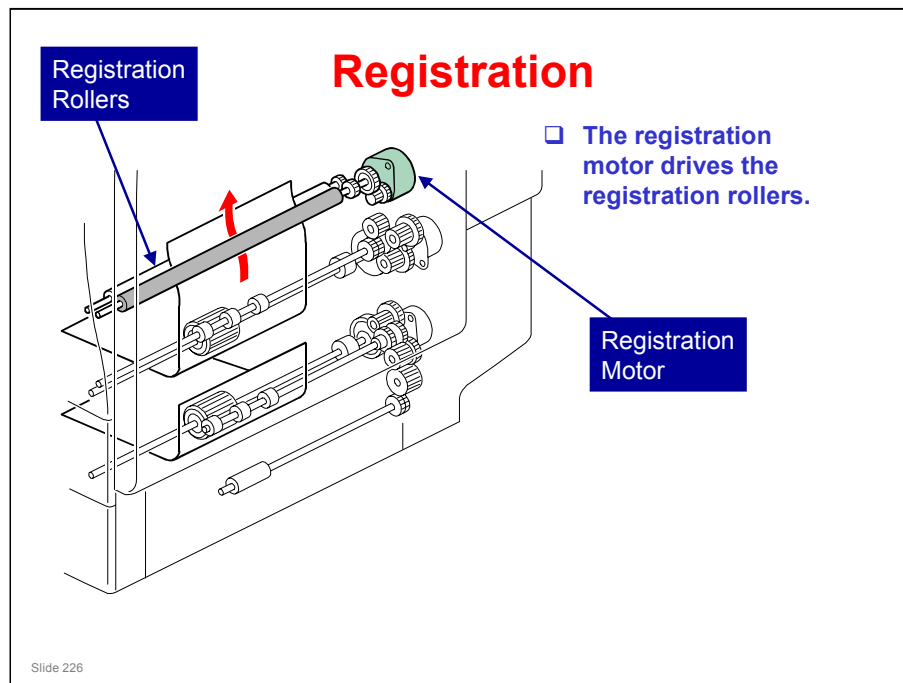
## Paper End Detection – Trays 1 and 2



- When there is no paper, the feeler drops into the slot in the bottom plate. Then the actuator enters the paper end sensor.

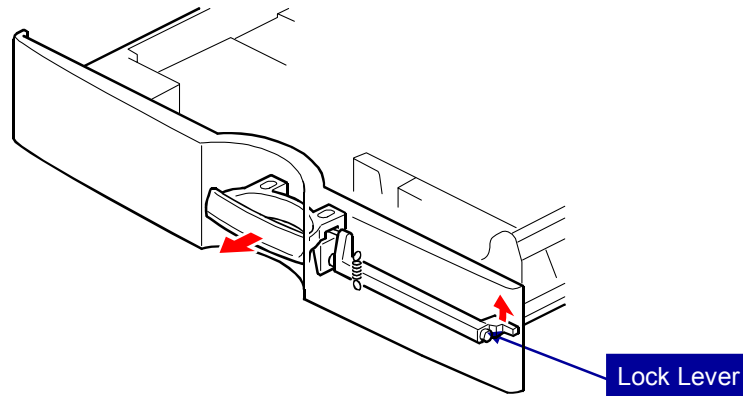
Slide 225

**No additional notes**



**No additional notes**

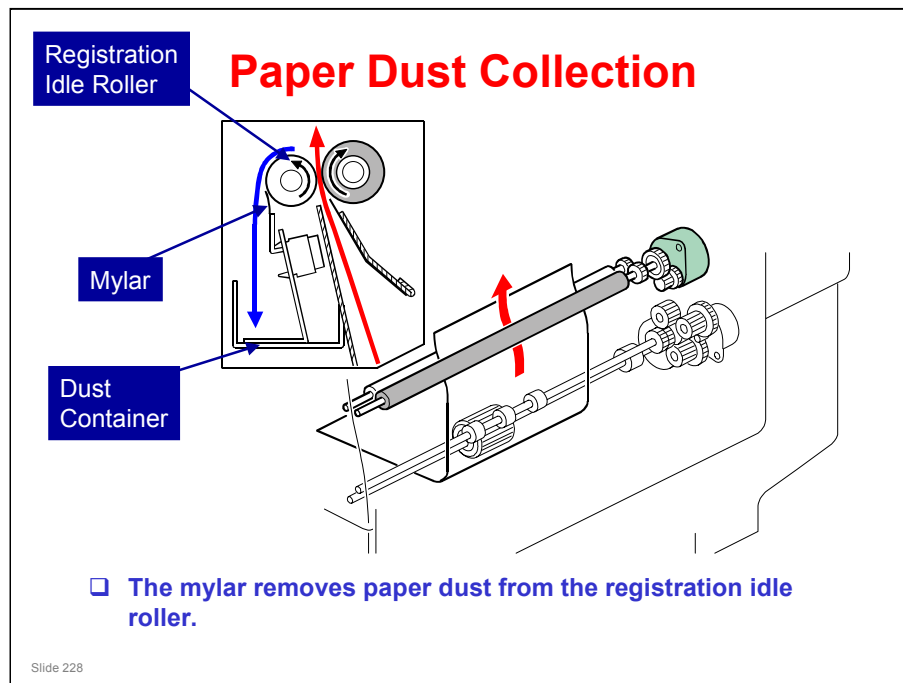
## Tray Lock - Front



- ❑ This lock prevents the tray from coming out during shipping.
- ❑ Pull the handle to release the lock.
  - ♦ The lock lever is lifted when you pull the handle.

Slide 227

**No additional notes**



No additional notes

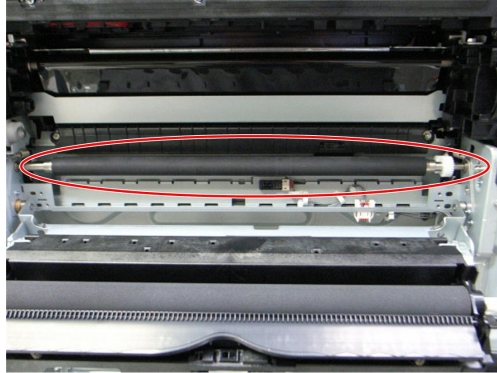
## Replacement

- ❑ Bypass paper width switch: Take care to install the switch correctly. After installation, test that the switch was installed correctly. There is a procedure in the manual.
- ❑ Friction pad: Make sure that the mylar does not go under the friction pad when reinstalling the friction pad.

Slide 229

**No additional notes**

## Cleaning the Registration Roller



- ☐ Clean the registration roller and registration idle roller with a damp cloth every 60 K.
- ☐ Never use alcohol to clean the registration roller.

Slide 230

**No additional notes**

## Size Detection – SP Modes

### □ SP 5181

- ♦ Some paper sizes are almost the same and cannot be distinguished by the sensors.
- ♦ To select which size is detected, use SP 5181.

### □ SP 5112

- ♦ Tray 2: If the user cannot select a non-standard paper size with the user tool, set this SP to 1.
- ♦ Auto paper size detection is disabled if the user selects a non-standard paper size.

### □ SP 1007-1

- ♦ Bypass paper size detected (USA)
- ♦ 0: LT SEF, 1: LG

Slide 231

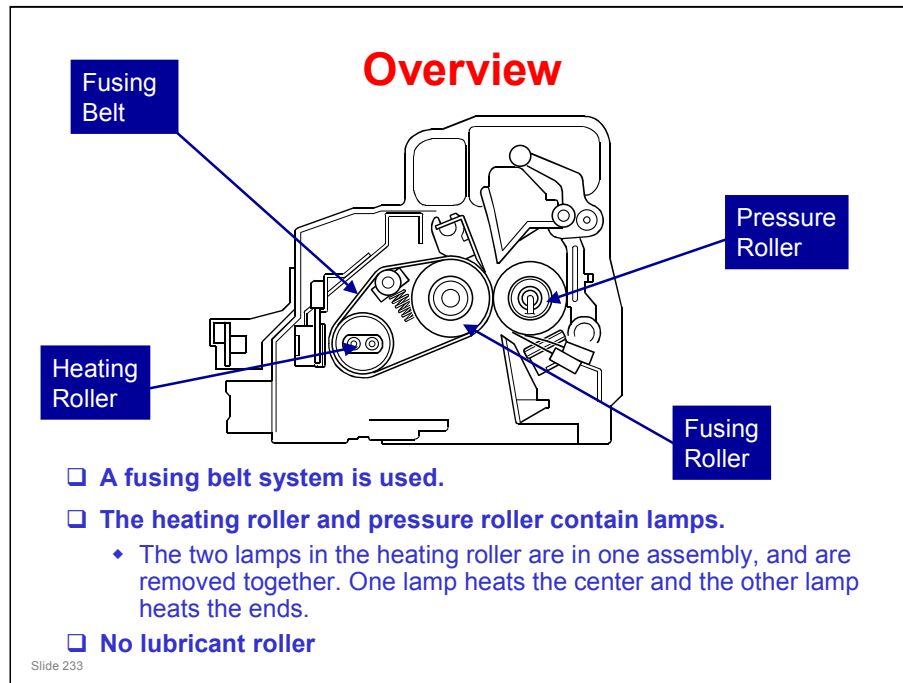
**No additional notes**

**RICOH****DI-C1 TRAINING  
COPIER ENGINE****FUSING**

Slide 232

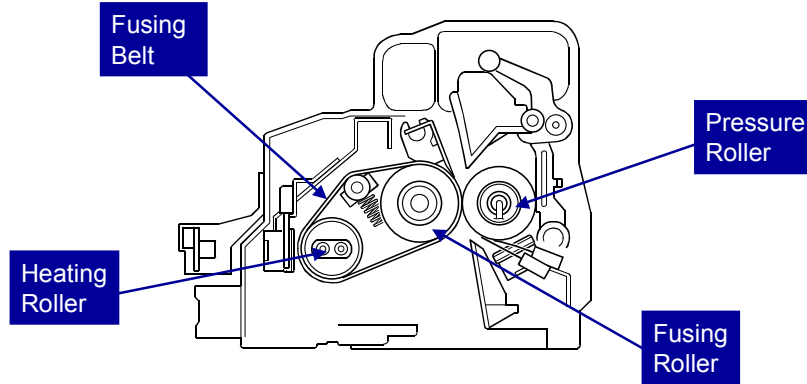
- ❑ In this section, the fusing unit will be described.





- ☐ The two lamps in the heating roller are in one assembly, and are removed together.
  - In the heating roller, one lamp heats the center and the other lamp heats the ends.

## Temperature Control Components

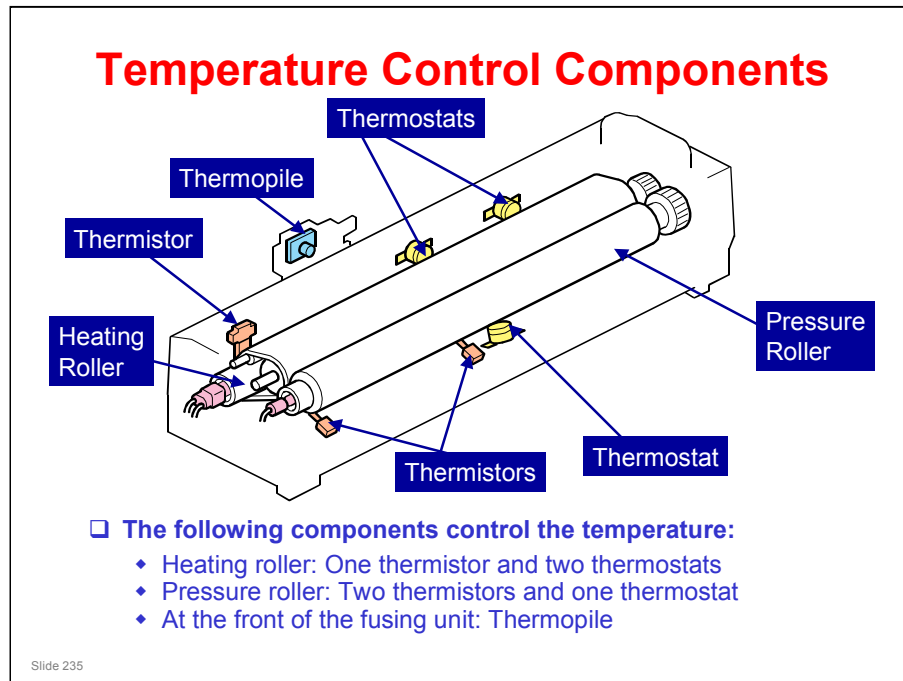


❑ The following components control the temperature:

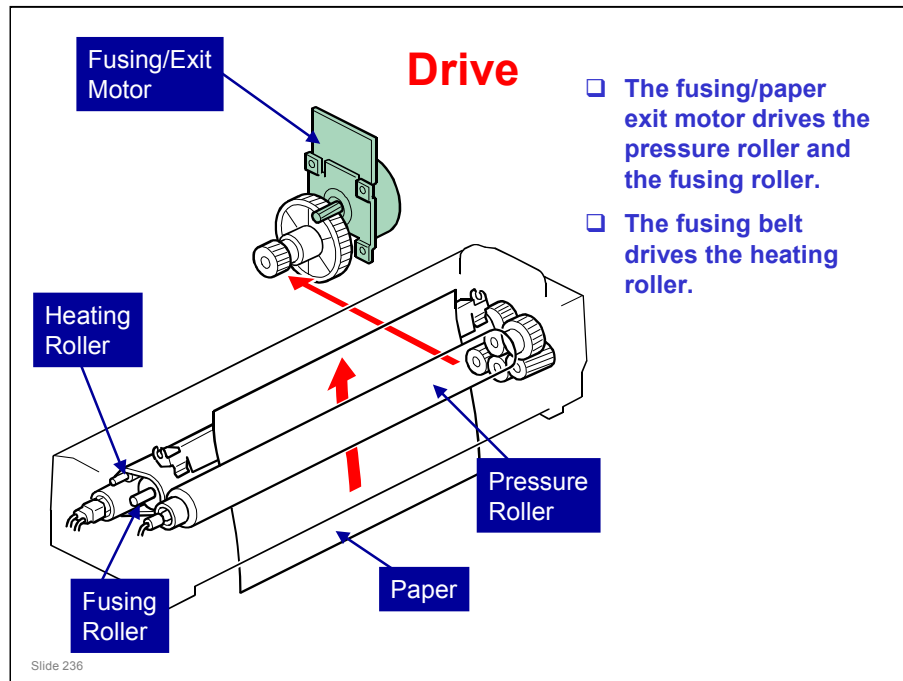
- ♦ Heating roller: One thermistor and two thermostats
- ♦ Pressure roller: Two thermistors and one thermostat
- ♦ At the front of the fusing unit: Thermopile

Slide 234

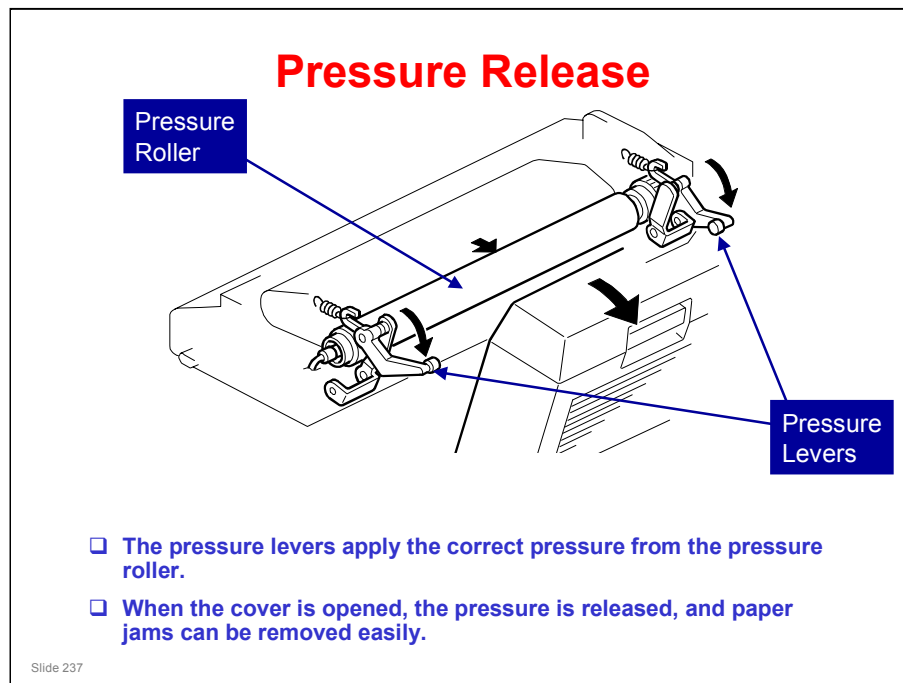
- ❑ The thermopile detects the temperature at the center of the fusing unit, and the thermistor detects the temperature at the end.



- ❑ Here is a three-dimensional drawing of the fusing unit.
- ❑ The thermopile detects the temperature at the center of the fusing unit, and the thermistor detects the temperature at the end.



- Paper passes vertically through the right side of the fusing unit, as shown in the diagram.



**No additional notes**

## Fusing Temperature Control

- The fusing temperatures for each paper type and operating mode are set with SP 1105.

Slide 238

**No additional notes**

## Fusing Temperature Corrections

### □ Corrections for ambient temperature (SP 1112)

- ◆ If the room temperature is below 17 ° C, the heating roller temperature is increased by 5 ° C.
- ◆ If the room temperature is above 30 ° C, the heating roller temperature is decreased by 5 ° C.

Slide 239

**No additional notes**

## Overheat Protection

- ❑ Power to the fusing lamp is cut if the machine detects that the temperature at the heating roller or pressure roller is 250 °C or more.
  - ◆ SC 544, 554, 564, or 574 will occur.
- ❑ SC codes related to overheat protection
  - ◆ SC 54x: Thermopile (heating roller: center)
  - ◆ SC 55x: Thermistor (heating roller: side)
  - ◆ SC 56x: Thermistor (pressure roller: center)
  - ◆ SC 57x: Thermistor (pressure roller: side)

Slide 240

**No additional notes**



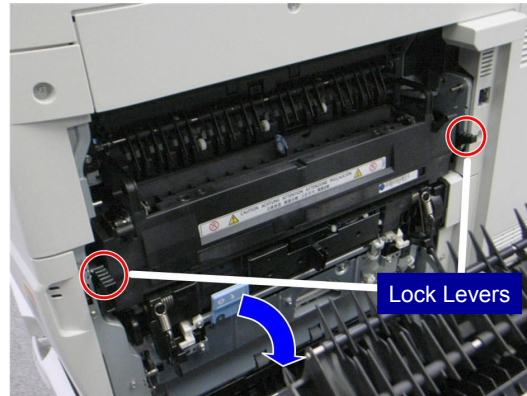
## Fusing Unit Replacement (1)

- ❑ If you will install a new fusing unit, set SP 3902-014 to 1 before you turn off the power switch.
  - ◆ If you do this, then the machine will reset the PM counter for the unit automatically, after you turn the power on again.
  - ◆ The machine cannot automatically detect that a new fusing unit has been installed.
- ❑ If you change the following parts, and not the complete fusing unit, you must set the following SPs to 1 before you turn the machine power off.
  - ◆ Fusing Roller: 3902-015
  - ◆ Fusing Belt: 3902-016

Slide 241

**No additional notes**

## Fusing Unit Replacement (2)



□ When installing the fusing unit:

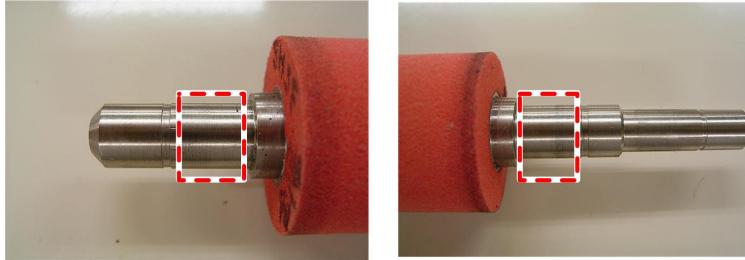
- ♦ Make sure that the both lock levers are locked before closing the duplex unit. Otherwise, these lock levers can be broken.

Slide 242

**No additional notes**

## Lubrication

- ❑ When reassembling the fusing unit
  - ◆ When replacing the fusing roller, you have to apply Barrierta S552R to the following places.



Slide 243

**No additional notes**

## Replacement

- ❑ Turn off the main switch and wait until the fusing unit cools down before beginning any of the procedures in this section of the machine. The fusing unit can cause serious burns.
- ❑ When cleaning the thermopile, wait until the fusing unit has completely cooled down. Otherwise, you may get a serious burn.

Slide 244

- ❑ The fusing lamps are designed so that it is very difficult to install them incorrectly.
  - The lengths of the wires from the two lamps are different. It is difficult to connect them to the incorrect terminals.

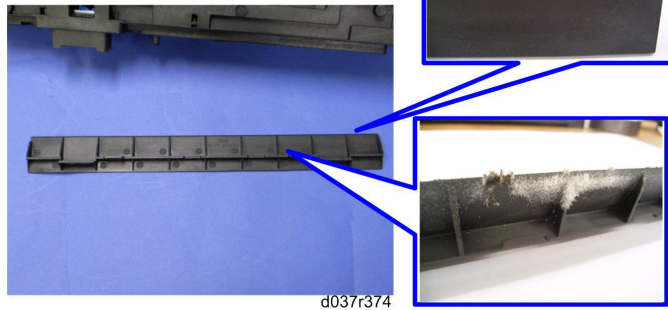
## Cleaning at 60k

- ❑ The following must be cleaned every 60k.
  - ◆ Entrance guide plate (cloth moistened with alcohol)
  - ◆ Stripper plate (cloth moistened with alcohol)
  - ◆ Exit guide plate (cloth moistened with alcohol)
  - ◆ Pressure roller (cloth moistened with alcohol)
  - ◆ Heating roller thermistor (dry cloth)
  - ◆ Pressure roller thermistors (dry cloth)

Slide 245

**No additional notes**

## Cleaning the Entrance Guide Plate



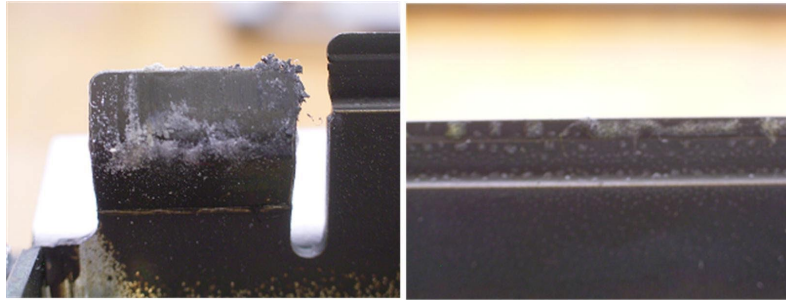
d037r374

□ Clean at these locations.

Slide 246

**No additional notes**

## Cleaning the Stripper Plate

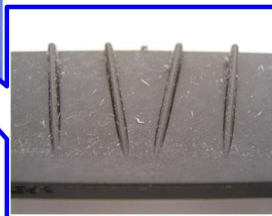
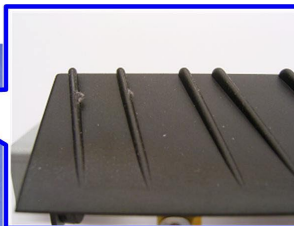
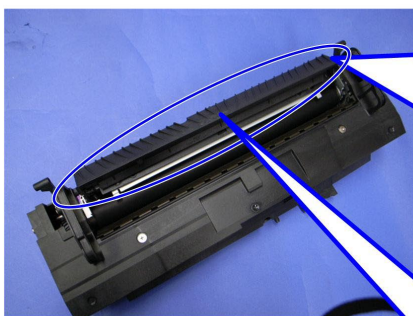


- ❑ Paper dust attaches to the stripper plate, as shown above.

Slide 247

**No additional notes**

## Cleaning the Exit Guide Plate



□ Clean at these locations.

Slide 248

**No additional notes**



## SP Modes

- ❑ **1106: Displays the temperatures inside the fusing unit**
- ❑ **1801-007: Fusing motor speed adjustment**
  - ◆ Fusing motor speed can be adjusted in 0.01% steps.
  - ◆ Normally, it is at -0.4%.
  - ◆ The fusing motor normally turns slower than the transfer roller, so there is some slack between the fusing unit and the PTR.
  - ◆ If the paper is too slack, when the trailing edge leaves the transfer roller, the sudden release of the trailing edge causes the paper to spring outwards. Then, toner particles will move around, causing the image at the trailing edge to be fuzzy.
  - ◆ If this problem occurs, increase the speed of the fusing motor (the designers suggest a setting of -0.25%, but it depends on paper thickness; stiff paper will vibrate more, causing more movement of toner).

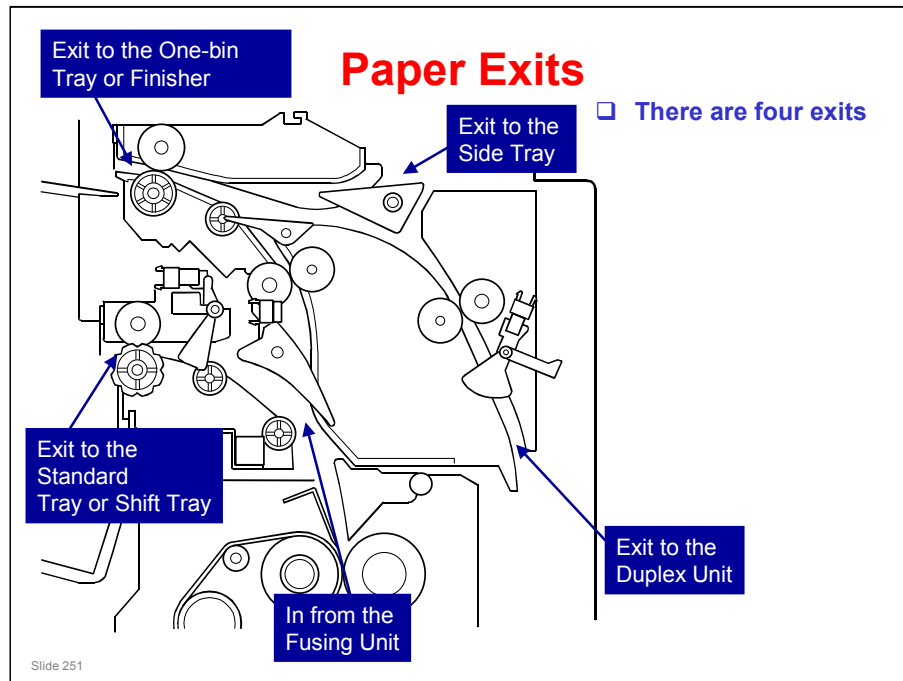
Slide 249

- ❑ It is recommended that a setting lower than -0.25% should not be used. Otherwise, some types of thin paper could become creased, and there are no separate settings for different paper types.

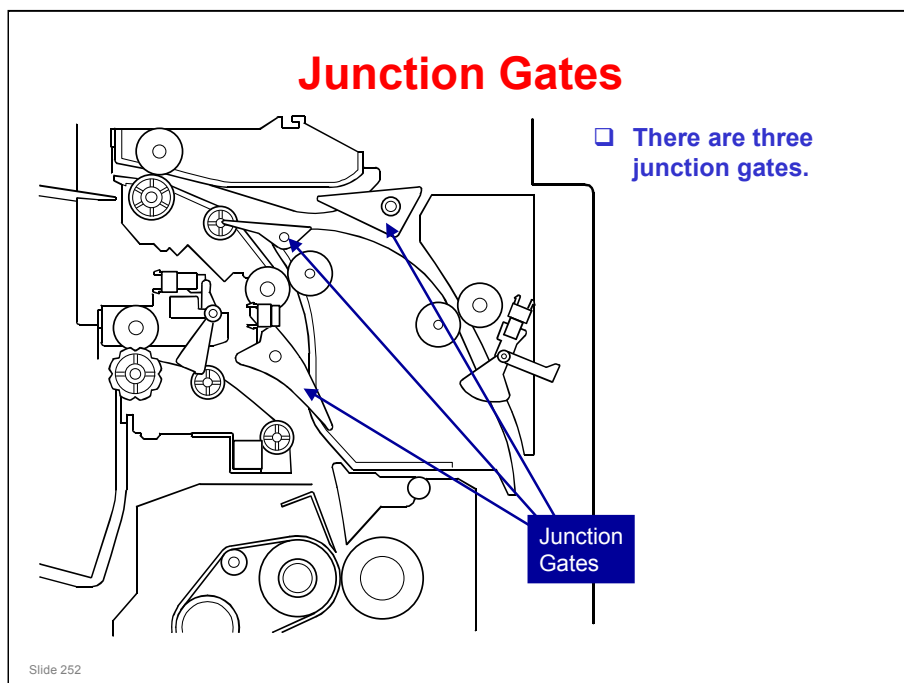
**RICOH****Di-C1 TRAINING  
COPIER ENGINE****PAPER EXIT**

Slide 250

- ❑ In this section, the paper exit mechanism will be described.

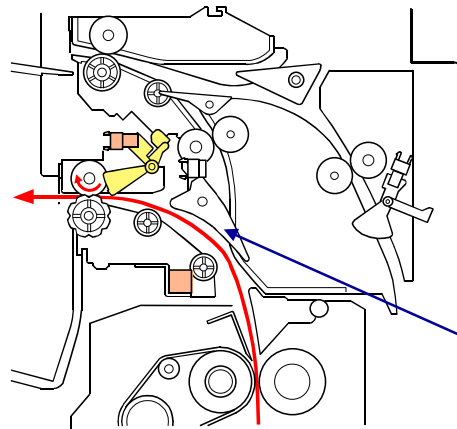


- We will discuss the inverter in the Duplex section of the course.



**No additional notes**

## Junction Gate – To the Standard Tray



- ❑ To feed paper to the standard tray, the solenoid for junction gate 1 is off.

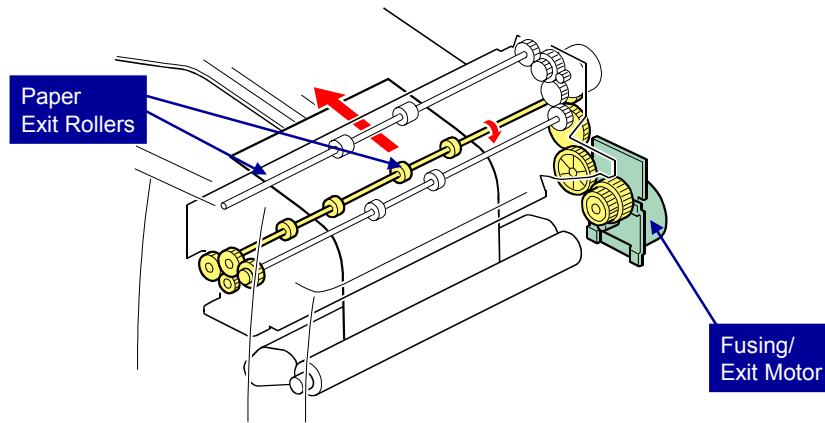
- ♦ This is the default position.

Junction Gate

Slide 253

- ❑ This diagram shows the junction gate configuration when paper goes to the standard tray.

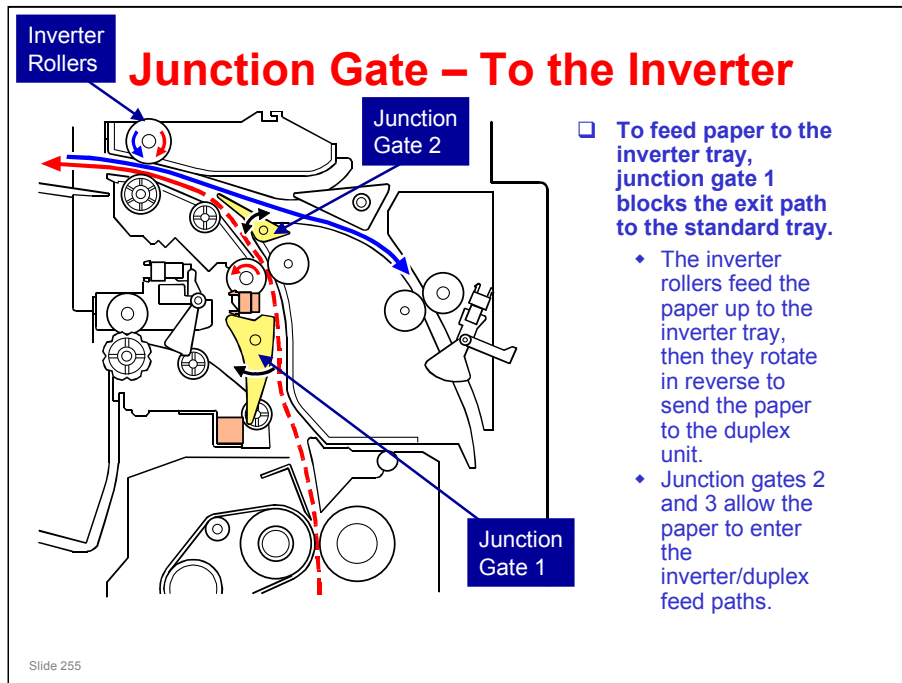
## Junction Gate – To the Standard Tray



- ❑ The fusing/exit motor drives the paper exit rollers.
- ❑ There is no tray full sensor for the standard exit tray.

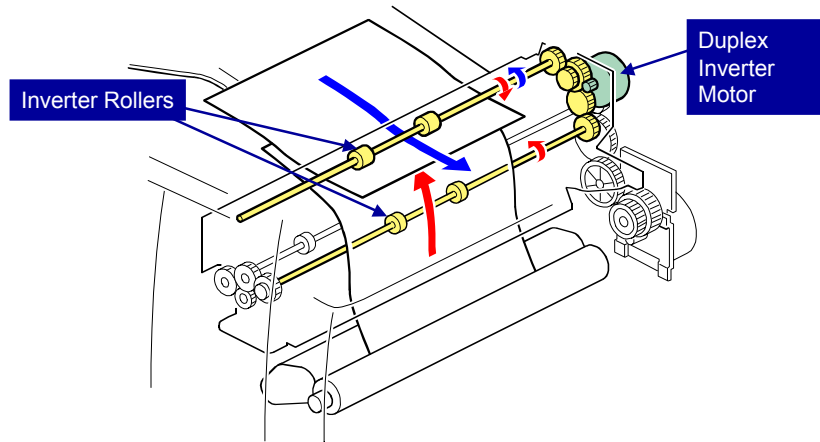
Slide 254

- ❑ Here is a three-dimensional view of the mechanism.



- ❑ Junction gate 2 does not have a solenoid.
- ❑ Normally, it is held closed by a spring.

## Junction Gate – To the Inverter



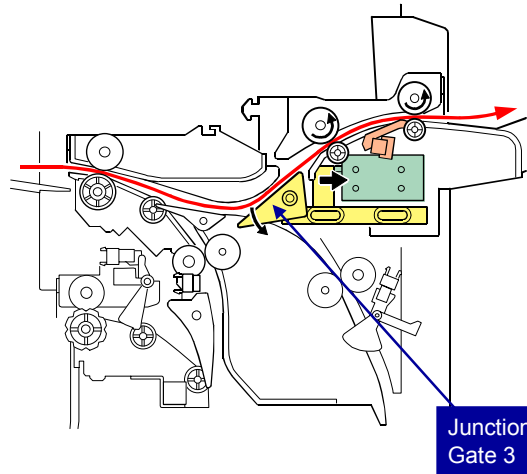
- ❑ The inverter motor drives the inverter rollers.

Slide 256

- ❑ Here is a three-dimensional view of the mechanism.



## Junction Gate – To the Side Tray



- ❑ To feed paper to the side tray, junction gate 1 blocks the exit path to the standard tray.
- ❑ The paper goes to the inverter tray, in the same way as for duplex mode.
- ❑ But, junction gate 3 blocks the exit to the duplex unit, so the paper goes out to the side tray.

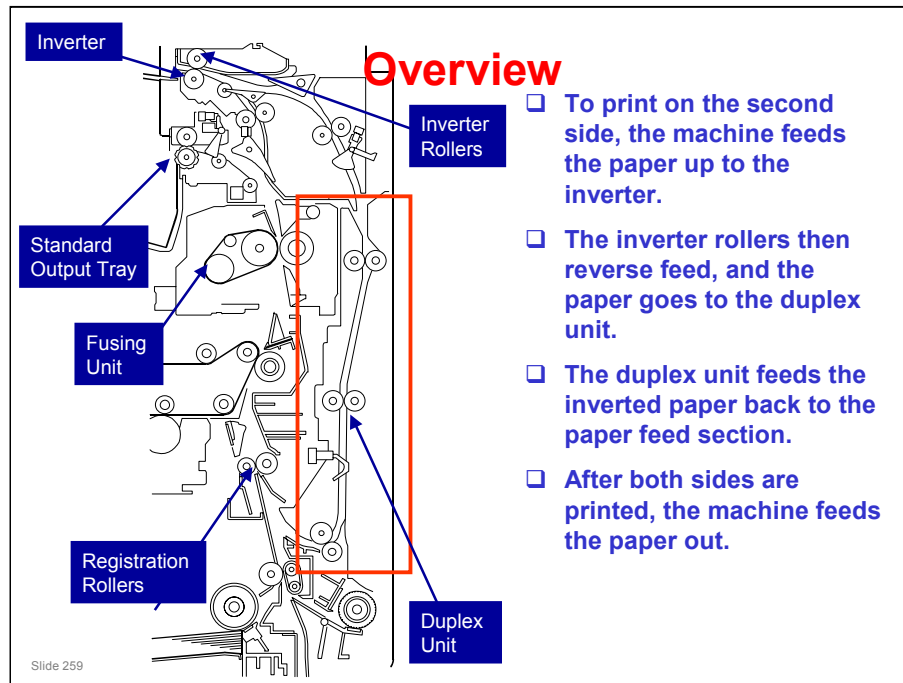
Slide 257

- ❑ Junction gate 3 is controlled by a solenoid in the optional side tray unit.

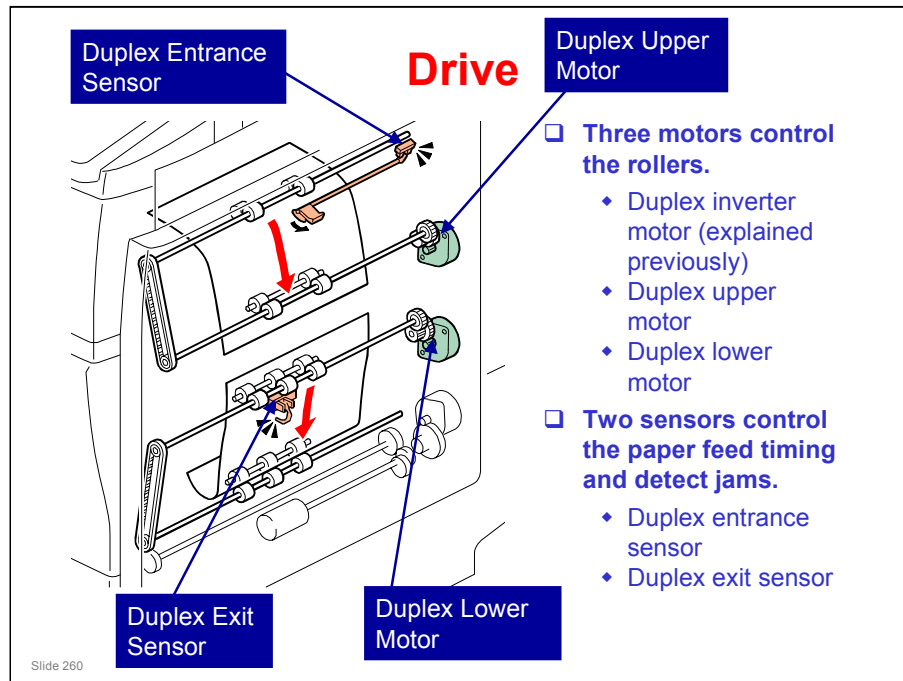
**RICOH****Di-C1 TRAINING  
COPIER ENGINE****DUPLEX**

Slide 258

- ❑ In this section, the duplex mechanism will be described.



- ❑ The duplex unit is shown in a red box in the above diagram.



- ❑ With interleaving, there can be two sheets of paper in the machine at the same time.

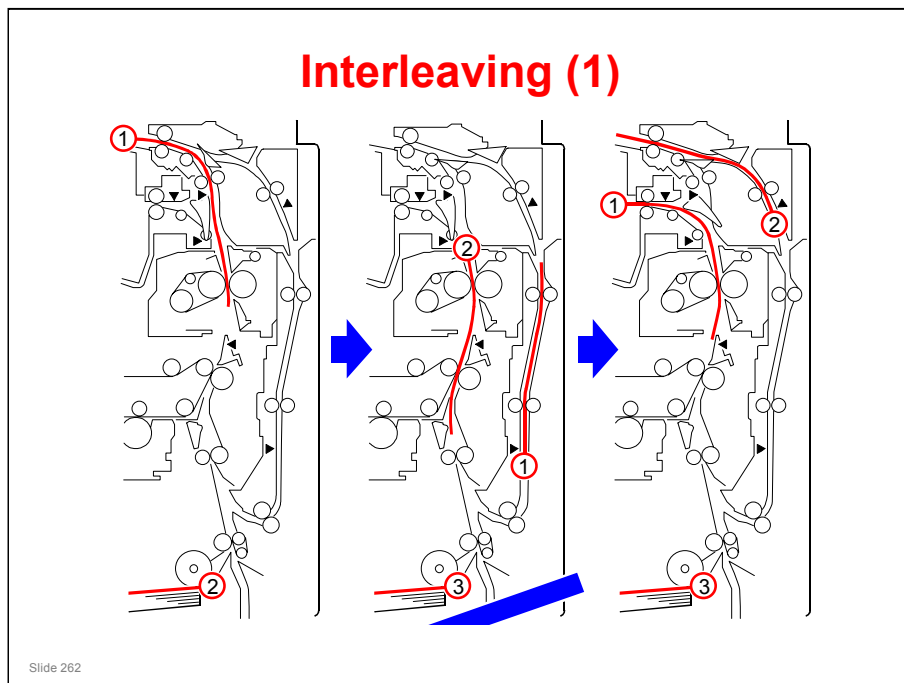
## Duplex Specifications

- ❑ Paper weight range: 60 – 105 g/m<sup>2</sup>
- ❑ Paper size range: A3/DLT – A5 LEF
- ❑ Duplex speed: 25 cpm (A4/LT LEF, BW/FC)
  - ◆ For the 20 cpm models, duplex speed is also 25 cpm
- ❑ Cannot make duplex outputs from the bypass tray.
- ❑ Cannot make duplex outputs on thick paper.
- ❑ Two sheets can be interleaved (A4/LT).

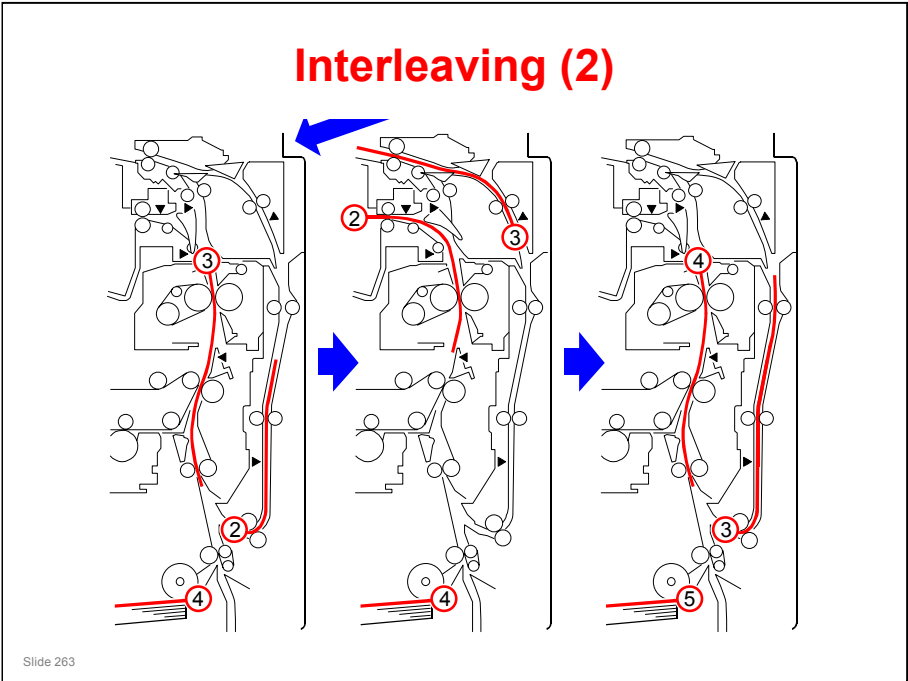
Slide 261

### How can the 20cpm model achieve 25 cpm in duplex mode?

- ❑ The paper feed speed after leaving the fusing unit increases to about double during switchback and inverting.



- ❑ The next two slides show how interleaving works in this machine.



No additional notes

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****OPTIONAL AUTOMATIC DOCUMENT  
FEEDER (D366)**

Slide 264

**PURPOSE OF THIS SECTION**

- ☐ This optional unit will be described. It is similar to the ADF used with the D023 series copiers.



## Overview

- ❑ **It feeds originals above the main copier's DF exposure glass during scanning.**
  - ◆ The DF exposure glass is a narrow glass to the left side of the exposure glass. The ADF does not use the main exposure glass. The main glass is only used when the user selects book mode, and puts the originals on the glass.
- ❑ **The inverter unit lets the user make copies of two-sided originals. It stacks the originals in the correct order after scanning.**
- ❑ **There is a stamp for use with the Di-C1 fax unit (all models), or for scanning (Di-C1a/c only).**
  - ◆ This stamp is built-in, not optional.

Slide 265

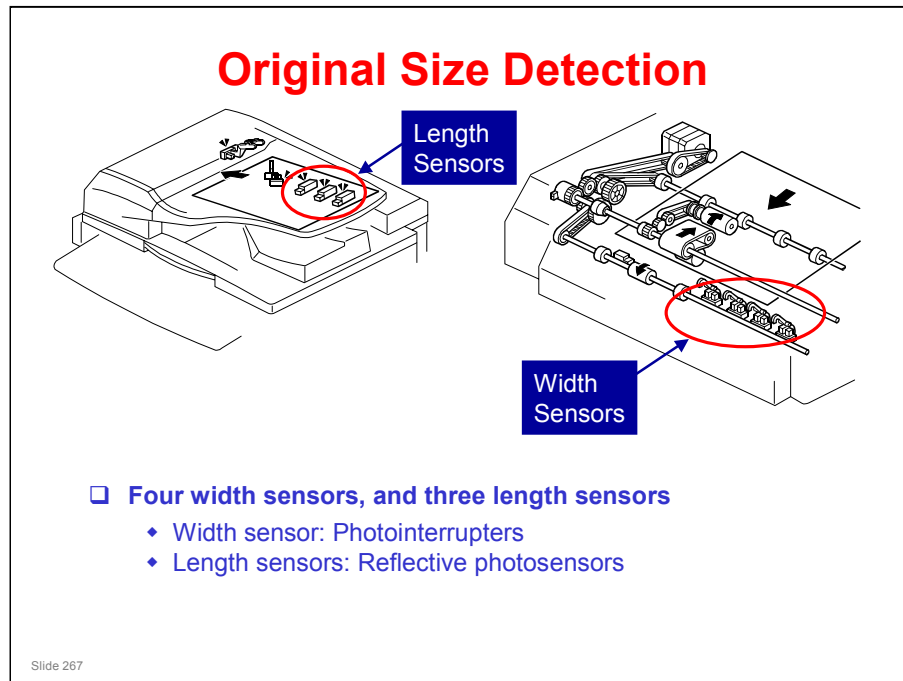
**No additional notes**

## Components

- ❑ Study the component layout diagrams.

Slide 266

- ❑ Note the functions of the following components:
  - Original sensor: During one-to-one copying, copy paper is fed to the registration roller before scanning, to increase the copy speed. The sensor monitors the stack of originals in the feeder, and detects when the trailing edge of the last page is fed in. This stops paper feed before the next sheet is fed.
  - Original width sensor: Uses an electrode plate, with terminals attached to the document guides. The sensor output changes when the user moves the guides to align with the document width. Because of this, the incorrect width is detected if the user does not put the guides in the correct position.
  - The DF position sensor only detects when the DF is opened. The platen cover sensor triggers the APS sensors.



*D366 Service Manual, Detailed Section Descriptions,  
Basic Operation, Original Set and Size Detection*

- ❑ The table in the service manual shows the sizes that the machine detects for each output. There is also some more information about how the sensors operate.
- ❑ The machine cannot detect more than one original width in the same job. But there is a mixed original-length mode, as explained later in this presentation.

## Original Size Detection – SP Modes

- ❑ 5126: Determines which F size is detected
- ❑ 6016: Determines how the machine interprets width/length sensor output for paper sizes that are almost the same.

Slide 268

- ❑ Make sure that the class is familiar with the table of sensor output vs original size.

### SP 5126

- ❑ Use SP 5126 to control the size that is detected for the 'F' sizes, which are very similar (8½" x 13", 8¼" x 13", 8" x 13"), and cannot be distinguished by the sensors.

### SP 6016

- ❑ There are 7 bits. Each bit represents two paper sizes that are almost the same. Select 0 or 1 to decide which paper size the machine detects from that pair.

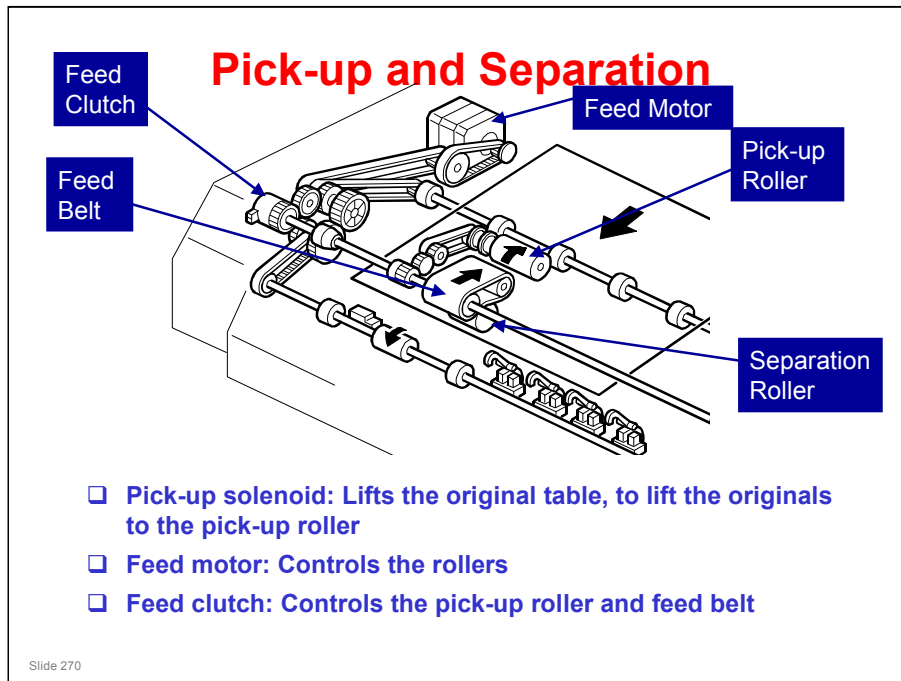
## Mixed Original-Length Mode

- ❑ Width detection: Same as for normal mode
- ❑ Length detection: Done for each sheet
  - ◆ As a result, scanning is slower if the user selects mixed size mode
- ❑ To detect length, the machine counts transport motor pulses from registration-sensor-on until registration-sensor-off

Slide 269

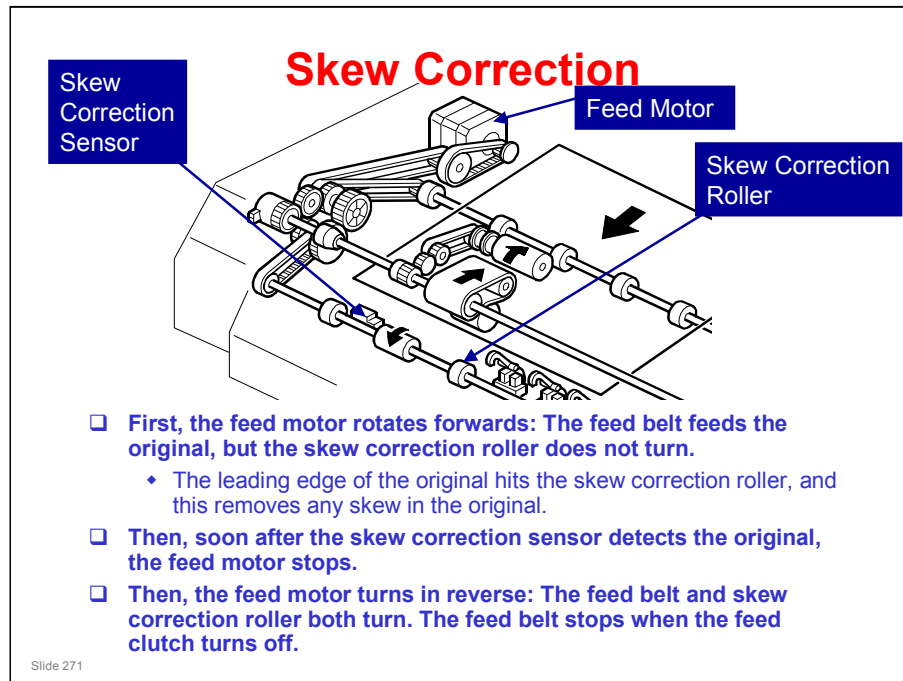
### *D366 Service Manual, Detailed Section Descriptions, Basic Operation, Mixed Original Size Mode*

- ❑ This explains what occurs if the user selects mixed original-length mode.
- ❑ Normally, in mixed original-length mode, original length is detected as shown below:
  - The width is detected with the same procedure that is used when all originals are the same size.
  - The machine keeps an area in memory that is sufficient for an original of the detected width and 432 mm length.
  - Printing is done after length detection, and only the part of the memory that contains data up to the detected original length is printed.
- ❑ But, if some functions are selected (for example, Auto Reduce/Enlarge), the length must be detected before image scanning starts. Because of this, the machine must measure the length before scanning.
  - It must also make sure that the originals are in the correct sequence before scanning. Because of this, the 3 steps in the manual are done.
  - If the original is duplex, the original is inverted again after scanning the first side. Then the second side is scanned, and the paper is fed out.
- ❑ Why must the machine measure length first when we use Auto Reduce/Enlarge, Centering, and other functions?
  - With these functions, the machine must know the length of the original accurately.
  - For example, with centering, the image is centered on the copy paper. This cannot be done if the machine does not know the length of the original accurately.
  - Also, with Auto Reduce/Enlarge, the size of the original's image is decreased to fit on the copy paper. This cannot be done if the machine does not know the length of the original accurately.



*D366 Service Manual, Detailed Section Descriptions,  
Basic Operation, Pick-up and Separation*

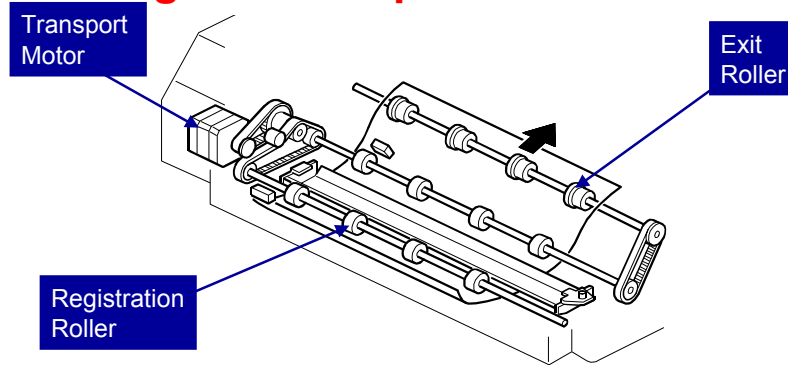
- ❑ Main points about the mechanism
  - The feed motor has two speeds. It feeds the first original to the glass quickly, but is slower for scanning (the speed during scanning is set by the reproduction ratio).
  - The original sensor detects the trailing edge of the last original, before the original set sensor does.
- ❑ The original set sensor detects if an original is in the feeder. Why not use that sensor? Why is one more sensor necessary?
  - In this machine, the copier feeds copy paper into the machine first, to increase the copy speed. The original sensor tells the copier that there are no more pages to be scanned. The copier can then stop paper feed.
  - Look at the component diagram. The original set sensor is near the scan line, to tell the cpu that an original is in the feeder and is ready to be scanned. This is too far into the machine to tell the cpu sufficiently early to stop the next sheet of copy paper.
  - The original sensor is much nearer to the trailing edge of the stack. This gives sufficient warning to the cpu when the last page of the original is fed in.



*D366 Service Manual, Detailed Section Descriptions,  
Basic Operation, Skew Correction*

- ❑ The one-way clutches in the ADF mechanism allow the feed motor to have different effects when rotating forwards and in reverse.

## Original Transport and Feed-out

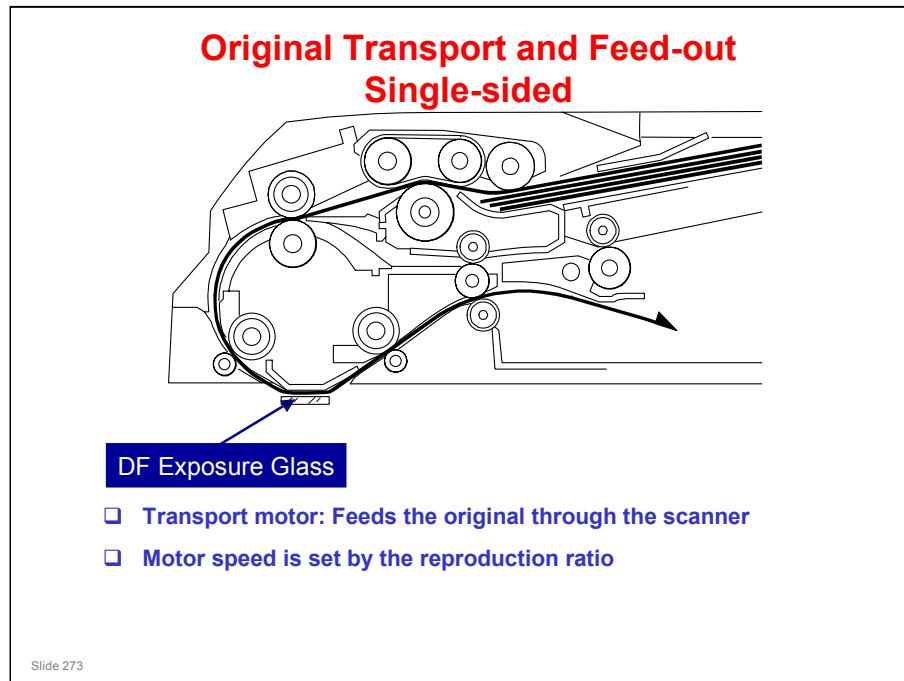


- ❑ The transport motor drives the registration and exit rollers.

Slide 272

**No additional notes**

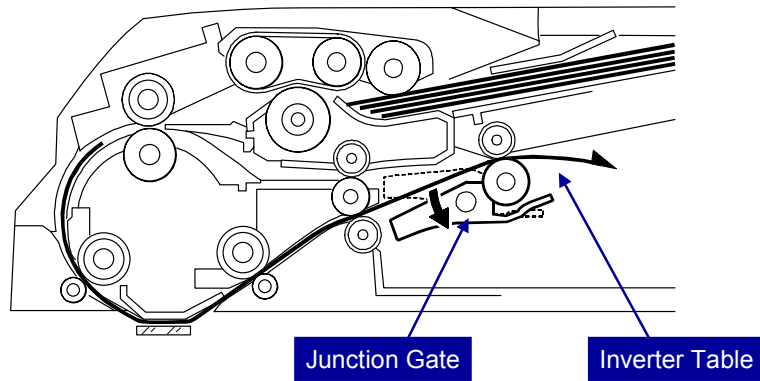




*D366 Service Manual, Detailed Section Descriptions,  
Basic Operation, Original Transport and Exit*

- ❑ The machine scans the original through the DF exposure glass.
- ❑ The original stops at the registration sensor. But, there is no skew correction at this time (this is because the feed motor in the ADF stops). The original stops here for timing, to feed the original at the correct time to synchronize with the remaining part of the copy process.

## Original Transport and Feed-out Double-sided 1

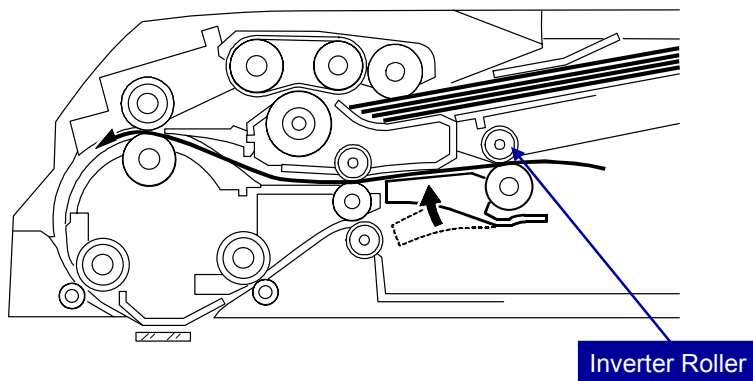


- ❑ When the original exit sensor detects the leading edge, the junction gate opens and the original goes to the inverter table.

Slide 274

- ❑ The main points are on the next 4 slides.

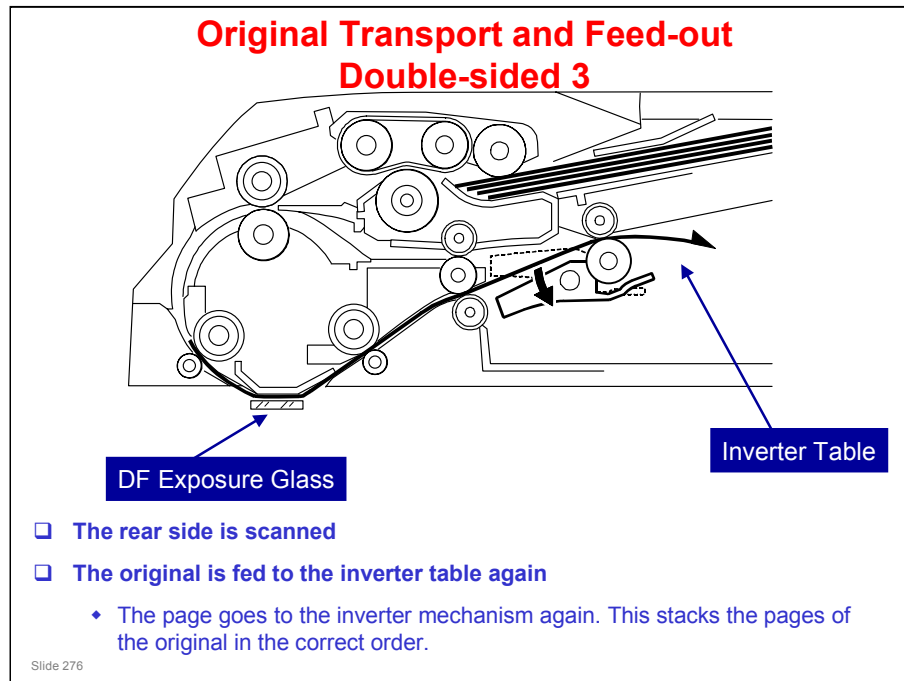
## Original Transport and Feed-out Double-sided 2



- When the paper is in the inverter table, the feed motor changes direction and the inverter roller feeds the original into the ARDF again.

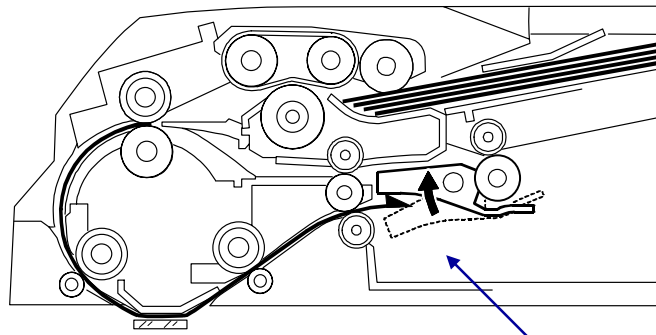
Slide 275

No additional notes



**No additional notes**

### Original Transport and Feed-out Double-sided 4



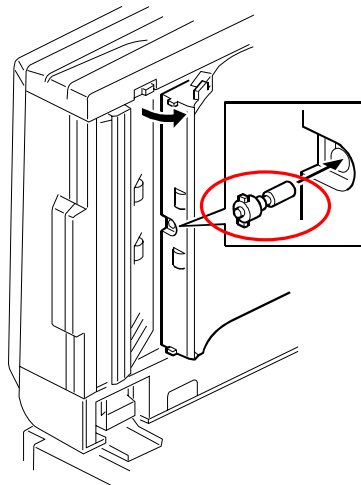
Exit Tray

- The page is fed in from the inverter table and out to the exit tray.

Slide 277

No additional notes

## Stamp (Fax and Scanner)



Slide 278

- ❑ This is used in fax mode or in scanner mode.
- ❑ The original is stamped if the original was sent.
  - ◆ For memory transmission and scanning, the original is stamped if it is stored successfully.
- ❑ SP 6-010: This setting adjusts the stamping position. To do this, it detects when the transport motor stops.

No additional notes

## Dust Detection (SP 4020)

- ❑ This function checks the ADF exposure glass for dust that can cause black lines in copies.
- ❑ If dust is detected, a message is shown on the operation panel, but the machine does not stop.
- ❑ SP 4020 001: Enable/disable (default – disabled)
- ❑ SP 4020 002: Sensitivity adjustment
- ❑ SP 4020 003: Adjusts image processing parameters to remove thin vertical lines that are caused by dust (default – disabled)
  - ◆ A piece of dust on the ADF exposure glass causes a thin vertical line on the scanned image. This is because the ADF feeds the paper above the exposure glass during scanning. Dust on the glass is shown on each line of the scanned image, and the result is a thin vertical line.
- ❑ SP 7852: Shows the number of times that the machine detected dust on the ADF.

Slide 279

**No additional notes**

## SP Modes

- ❑ **4-020: Dust check**
  - ◆ SP 7-852: Shows the number of times that the machine detected dust on the ADF.
- ❑ **6-006: Registration**
- ❑ **6-009: ADF free run**
- ❑ **6-010: Stamp position adjustment (in the sub-scan direction only)**

Slide 280

- ❑ **4-020:** This function checks the narrow scanning glass of the ADF for dust that can cause black lines on copies. If dust is detected, a message is displayed, but scanning does not stop.



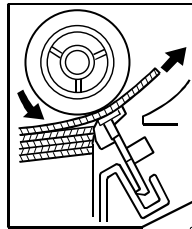
**RICOH****Di-C1 TRAINING  
COPIER ENGINE****ONE-TRAY PAPER TRAY UNIT (D425)**

Slide 281

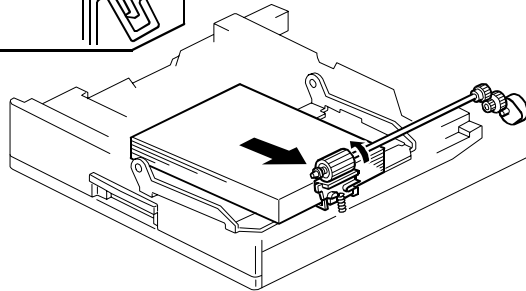
**PURPOSE OF THIS SECTION**

- ☐ The mechanisms in the optional one-tray paper feed unit will be described.
- ☐ It is similar to the paper tray unit used with the Kir-C3 series.

## Paper Feed and Separation



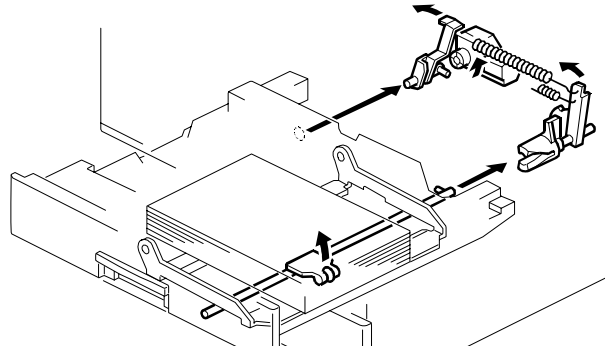
- ❑ Feed roller and friction pad
- ❑ Paper feed motor:  
Drives the feed roller.  
There is no clutch.



Slide 282

- ❑ There are two motors, one to lift the bottom plate and one to drive the rollers.
- ❑ There are no clutches.
- ❑ The feed roller is part of the tray.
  - When the user pulls out the tray, paper caught between the feed roller and friction pad does not remain jammed inside the machine.

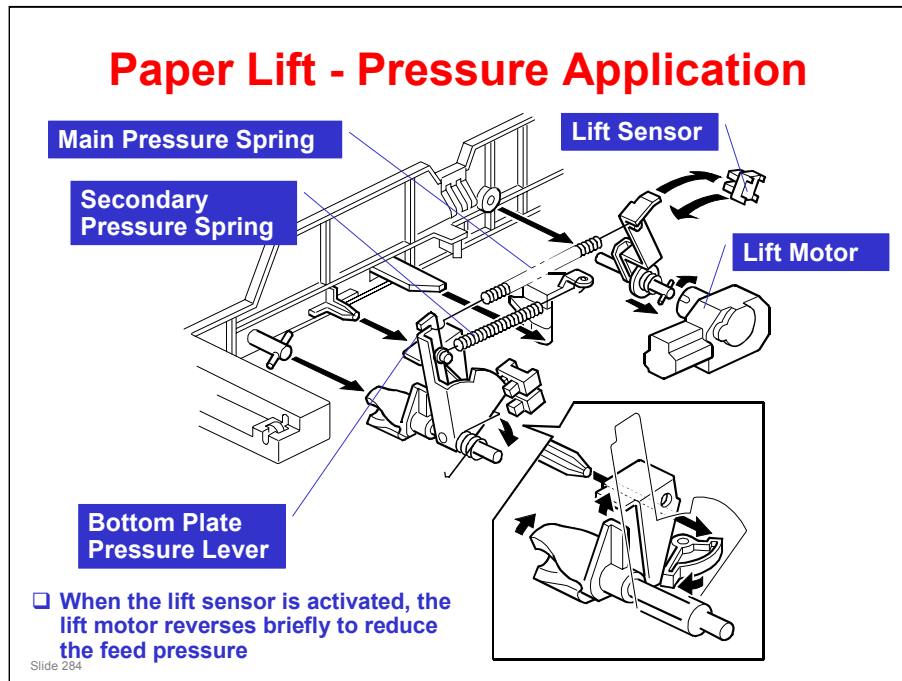
## Paper Lift - Engaging the Shafts



- ❑ The two shafts engage when the tray is pushed into the machine.
  - ◆ One shaft lifts the stack
  - ◆ The other shaft controls the paper feed pressure

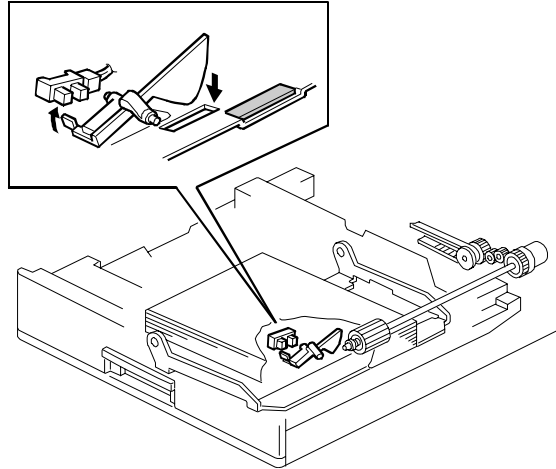
Slide 283

- ❑ This mechanism has two purposes:
  - To lift the stack to the paper feed height.
  - To apply a suitable paper feed pressure.
- ❑ This slide shows how the shafts engage when the tray is pushed into the machine.



- This slide shows how the tray is lifted.
- The lift motor turns on, and turns clockwise as viewed on the diagram.
  - The main pressure spring pulls the bottom plate pressure lever, and this lifts the tray bottom plate.
- When the top of the stack touches the feed roller, the motor cannot pull up the plate any more, so it pulls the actuator into the lift sensor.
  - The pressure of the feed roller on the paper is now too high, so the lift motor now reverses to reduce this pressure. It reverses for 200 ms or 600 ms, depending on the paper size. For smaller paper, it reverses the larger amount (600 ms) to reduce the pressure more.
  - For A4-LEF, A3-SEF, and B4-SEF paper, a projection on the side fence engages the secondary pressure spring, to ensure that extra pressure is applied to wider paper.
- Finally, when the tray is pulled out, the lift motor reverses for 1.7 ms. This makes it easier to put the tray back.

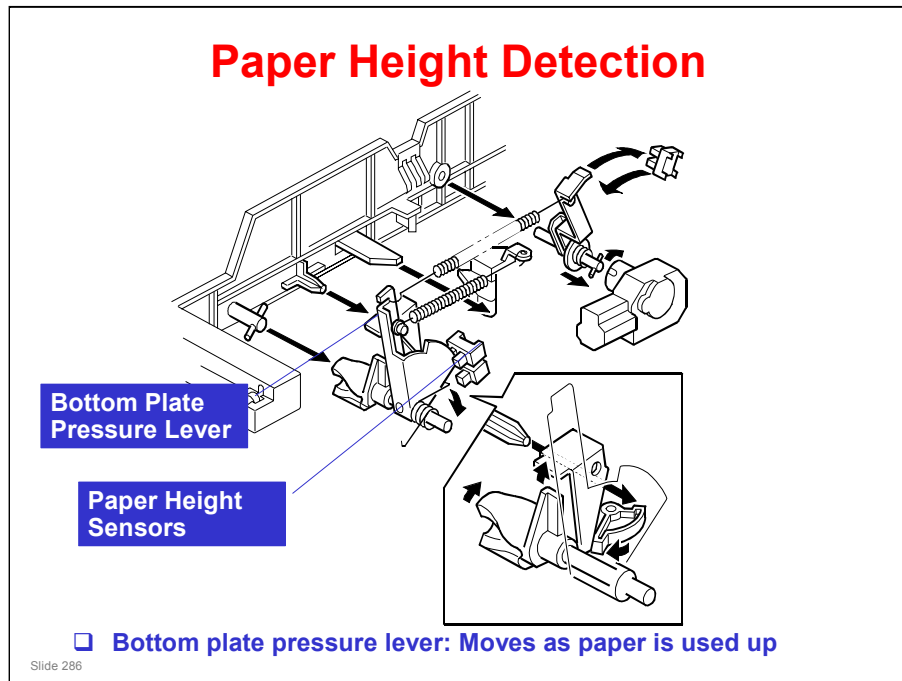
## Paper End Detection



- ❑ Paper end sensor feeler: Falls through a slot in the bottom plate when there is no paper.

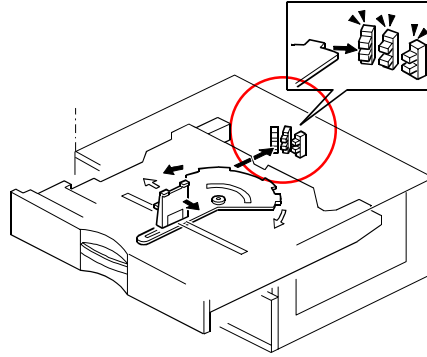
Slide 285

No additional notes



- ❑ Note that these sensors are not used unless the optional printer controller has been installed. Then the current status can be viewed from the driver. Note that this feature is only available for the optional paper tray units.
- ❑ The two paper height sensors detect the amount of paper in the tray.
- ❑ The actuator is attached to the bottom plate pressure lever.
- ❑ The lift motor rotates to increase the feed pressure when the remaining paper falls below a certain amount.
  - When the tray contains paper of a small width, the paper feed pressure may become too low when the thickness of the remaining stack of paper has decreased. To counteract this, the lift motor rotates forward for a short while after the remaining paper falls below a certain level. This increases paper feed pressure, simulating the pressure generated by a full tray.

## Paper Size Detection

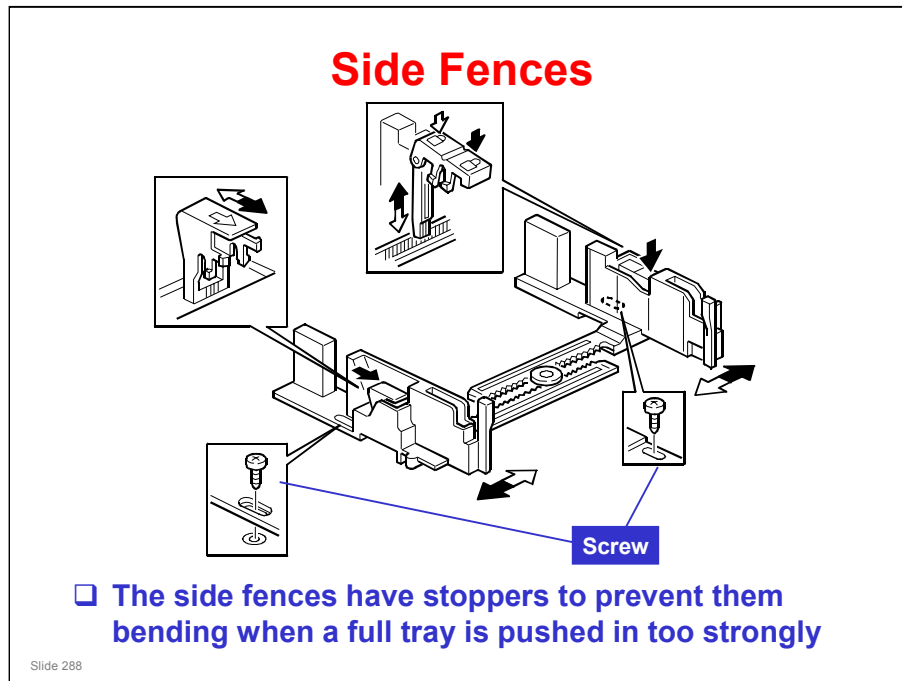


- ❑ The tray is a universal tray.
- ❑ Paper size sensors: Detect the paper length
  - ◆ The position of the sensor actuator is controlled by the position of the end fence

Slide 287

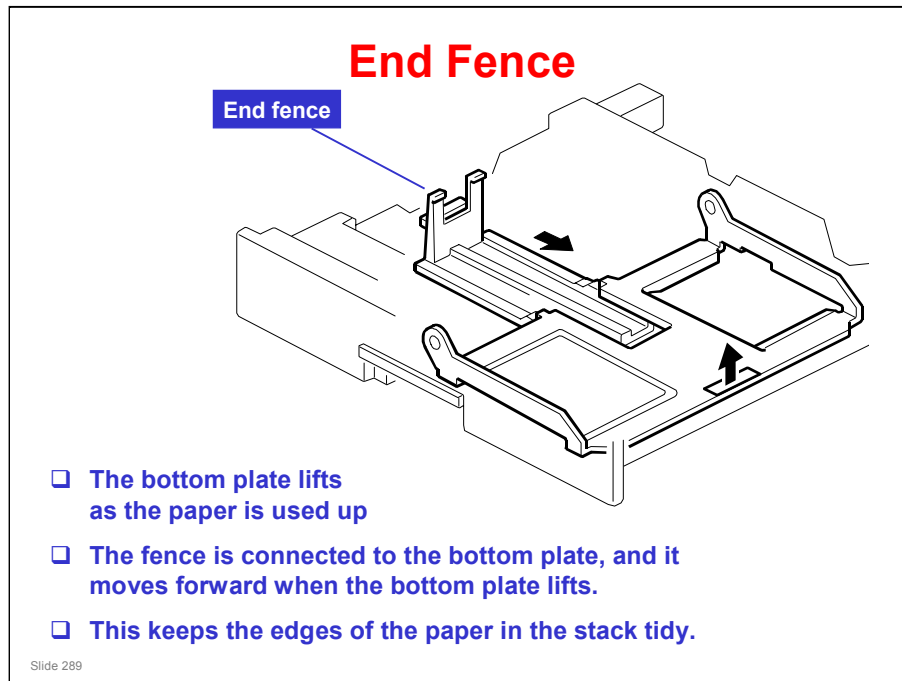
- ❑ Only the length is detected directly.
- ❑ The actuator has patterns of studs on the rear.
- ❑ These studs turn the paper size sensors on/off.
  - This also tells the cpu that the tray is in the machine.
  - For a paper size detection table, see the D331 service manual.

*If other paper sizes are used, they must be selected with a user tool:  
System Settings - Tray Paper Settings - Tray Paper Size (Tray 3,  
Tray 4).*



- ❑ If the tray is full of paper and it is pushed in strongly, the fences may deform or bend. This may cause the paper to skew or the side-to-side registration to be incorrect.
- ❑ Each side fence can be secured with a screw, for customers who do not want to change the paper size.





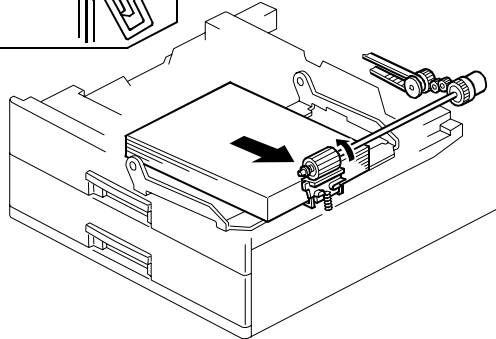
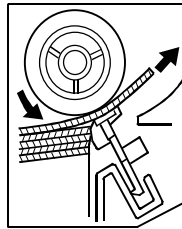
**No additional notes**

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****TWO-TRAY PAPER TRAY UNIT (D331)**

Slide 290

- ☐ In this section, you will study the mechanisms of the optional paper feed unit.
- ☐ This is the same as the paper tray unit that is used with the Pr-C1.

## Paper Feed and Separation

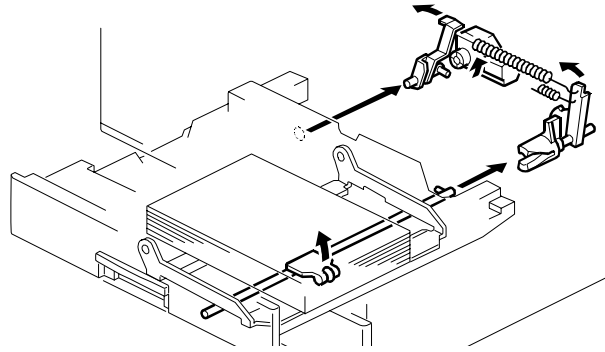


- ❑ Feed roller and friction pad
- ❑ Paper feed motor:  
Drives the feed roller
  - ◆ The appropriate paper feed clutch turns on to transfer drive from the motor to the rollers in the required tray.
  - ◆ The relay clutch drives the relay roller, which feeds paper up from the lower tray.

Slide 291

No additional notes

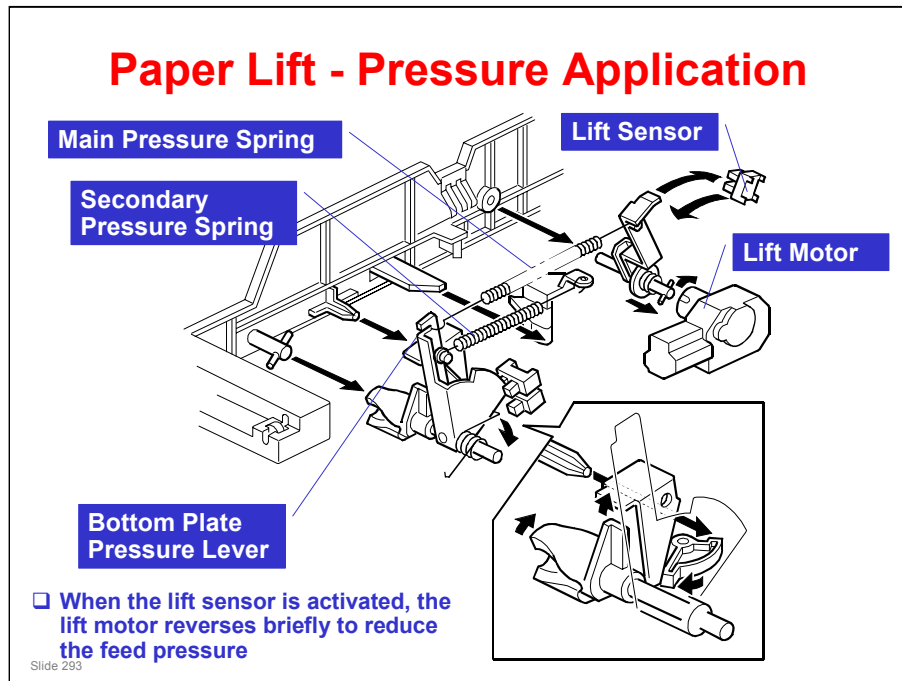
## Paper Lift - Engaging the Shafts



- ❑ The two shafts engage when the tray is pushed into the machine.
  - ◆ One shaft lifts the stack
  - ◆ The other shaft controls the paper feed pressure

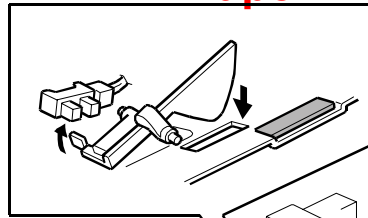
Slide 292

- ❑ This mechanism has two purposes:
  - To lift the stack to the paper feed height.
  - To apply a suitable paper feed pressure.
- ❑ This slide shows how the shafts engage when the tray is pushed into the machine.

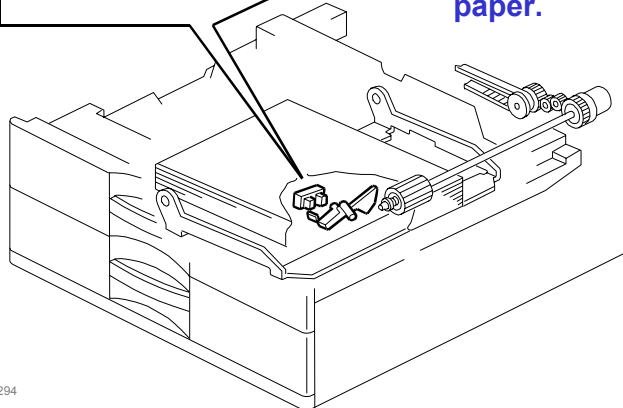


- This slide shows how the tray is lifted.
- The lift motor turns on, and turns clockwise as viewed on the diagram.
  - The main pressure spring pulls the bottom plate pressure lever, and this lifts the tray bottom plate.
- When the top of the stack touches the feed roller, the motor cannot pull up the plate any more, so it pulls the actuator into the lift sensor.
  - The pressure of the feed roller on the paper is now too high, so the lift motor now reverses to reduce this pressure. It reverses for 200 ms or 600 ms, depending on the paper size. For smaller paper, it reverses the larger amount (600 ms) to reduce the pressure more.
  - For A4-LEF, A3-SEF, and B4-SEF paper, a projection on the side fence engages the secondary pressure spring, to ensure that extra pressure is applied to wider paper.
- Finally, when the tray is pulled out, the lift motor reverses for 1.7 ms. This makes it easier to put the tray back.

## Paper End Detection

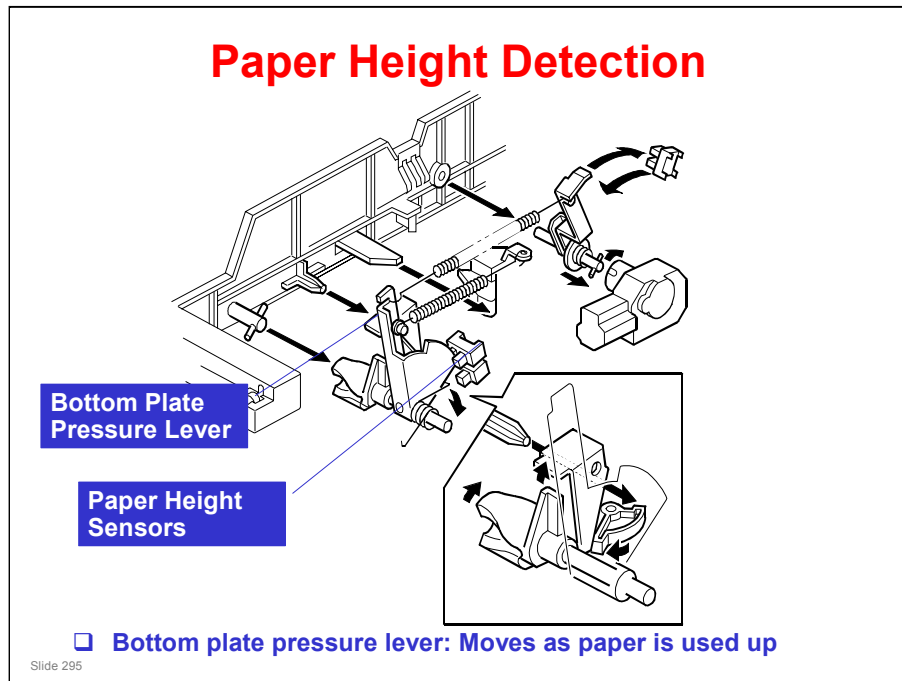


- Paper end sensor feeler: Falls through a slot in the bottom plate when there is no paper.



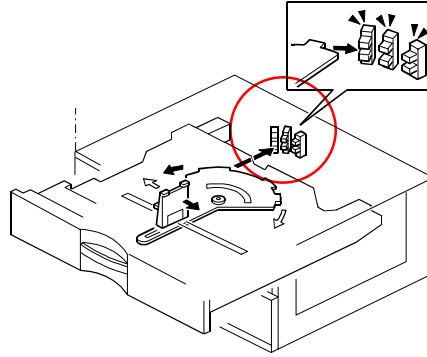
Slide 294

No additional notes



- ❑ Note that these sensors are not used unless the optional printer controller has been installed. Then the current status can be viewed from the driver. Note that this feature is only available for the optional paper tray units.
- ❑ The two paper height sensors detect the amount of paper in the tray.
- ❑ The actuator is attached to the bottom plate pressure lever.
- ❑ The lift motor rotates to increase the feed pressure when the remaining paper falls below a certain amount.
  - When the tray contains paper of a small width, the paper feed pressure may become too low when the thickness of the remaining stack of paper has decreased. To counteract this, the lift motor rotates forward for a short while after the remaining paper falls below a certain level. This increases paper feed pressure, simulating the pressure generated by a full tray.

## Paper Size Detection



- ❑ Both the trays are universal trays.
- ❑ Paper size sensors: Detect the paper length
  - ◆ The position of the sensor actuator is controlled by the position of the end fence

Slide 296

- ❑ Only the length is detected directly.
- ❑ The actuator has patterns of studs on the rear.
- ❑ These studs turn the paper size sensors on/off.
  - This also tells the cpu that the tray is in the machine.
  - For a paper size detection table, see the service manual.

*If other paper sizes are used, they must be selected with a user tool:  
System Settings - Tray Paper Settings - Tray Paper Size (Tray 3,  
Tray 4).*



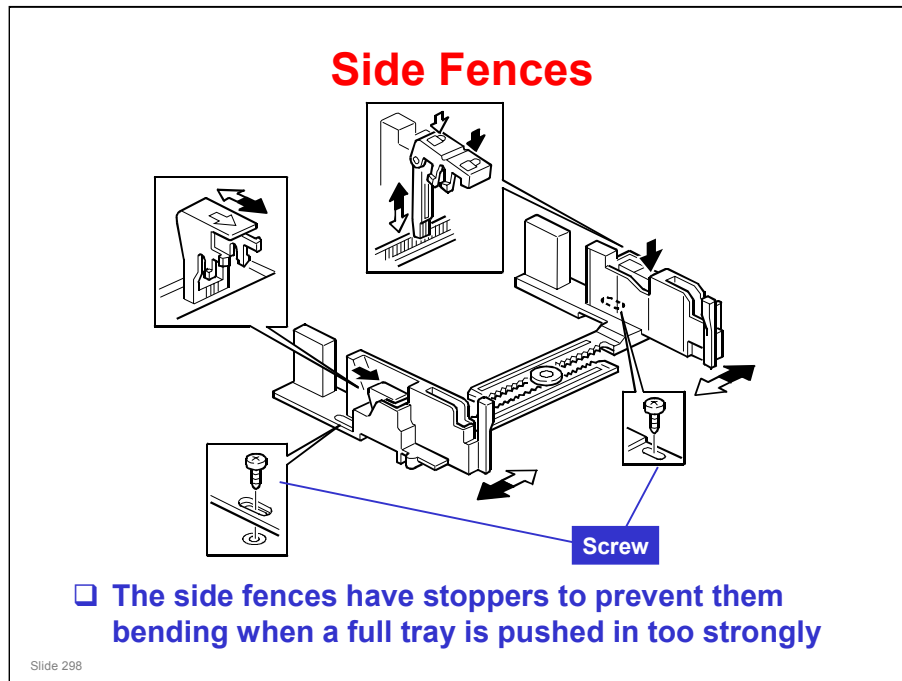
## Size Detection – SP Modes

### □ SP 5181

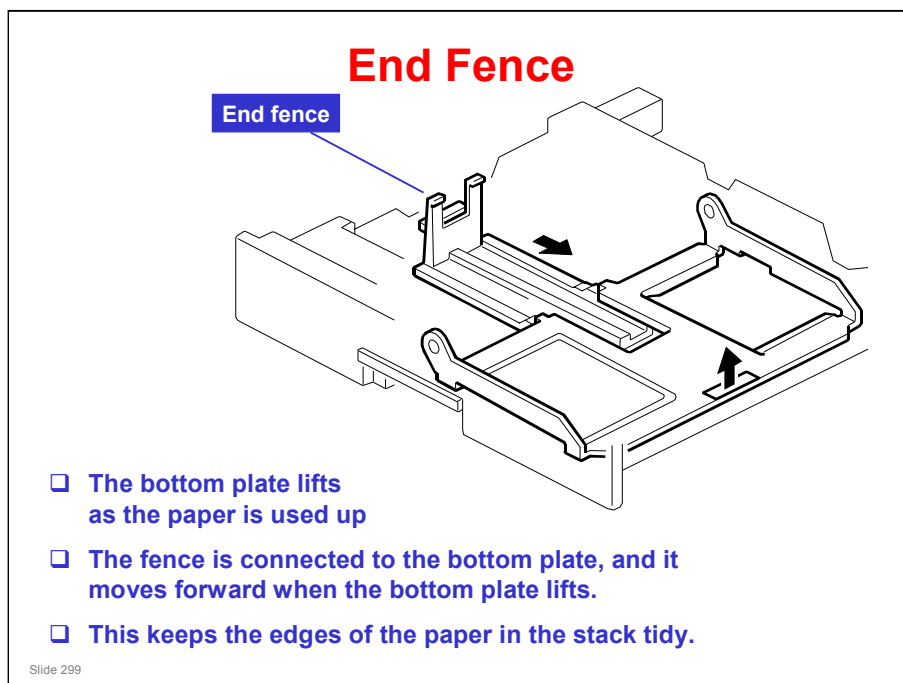
- ♦ Some paper sizes are almost the same and cannot be distinguished by the sensors.
- ♦ To select which size is detected, use SP 5181.
  - » Tray 3: SP 5181 009 to 012
  - » Tray 4: SP 5181 013 to 016

Slide 297

**No additional notes**



- ❑ If the tray is full of paper and it is pushed in strongly, the fences may deform or bend. This may cause the paper to skew or the side-to-side registration to be incorrect.
- ❑ Each side fence can be secured with a screw, for customers who do not want to change the paper size.



**No additional notes**

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****SHIFT TRAY (D428)**

Slide 300

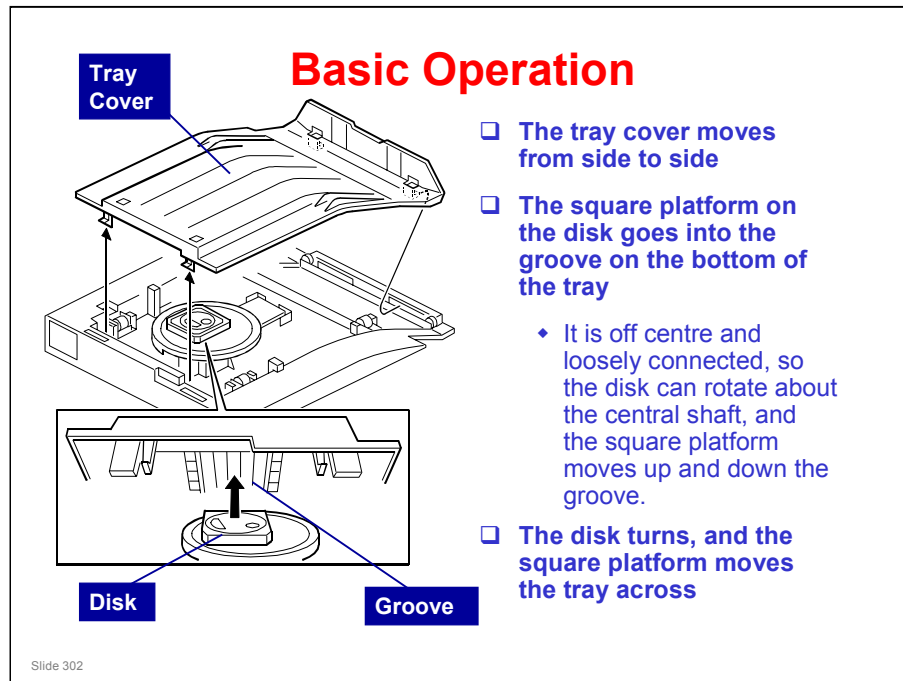
- ☐ In this section, you will study the mechanisms of the optional shift tray.
- ☐ This unit is similar to the unit that is used in the Athena-C1/C2.

## Overview

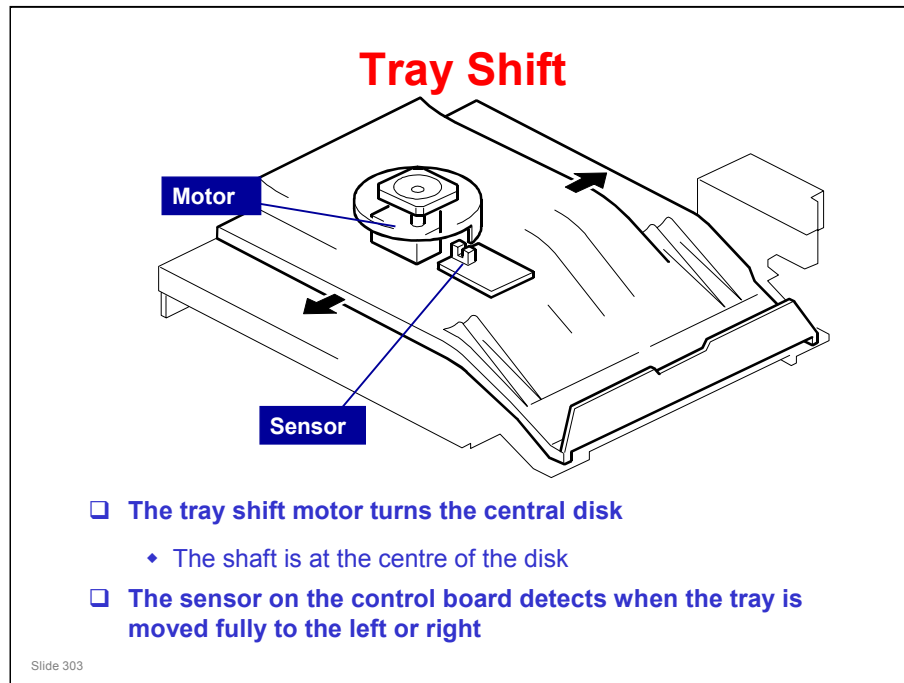
- ❑ The shift tray is similar to an output tray, but it sorts outputs into different stacks
- ❑ To do this, it moves the tray from side to side. This is called 'shift sorting' and it is faster than rotation sorting.
  - ♦ For rotation sorting, the image must be rotated in memory, and this is slow.
  - ♦ For shift sorting, the shift tray moves from side to side, to sort the sets of copies into different stacks.

Slide 301

**No additional notes**



No additional notes



- ❑ The tray motor moves the tray from side to side.
- ❑ The half turn sensor detects when the tray was fully moved to the left or to the right.

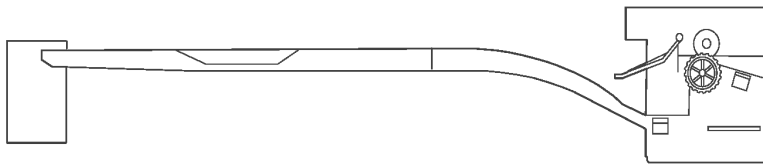
**RICOH****Di-C1 TRAINING  
COPIER ENGINE****ONE-BIN TRAY (D426)**

Slide 304

- ☐ In this section, you will study the mechanisms of the optional one-bin tray.
- ☐ This unit is similar to the unit that is used in the Athena-C1/C2.



## Overview

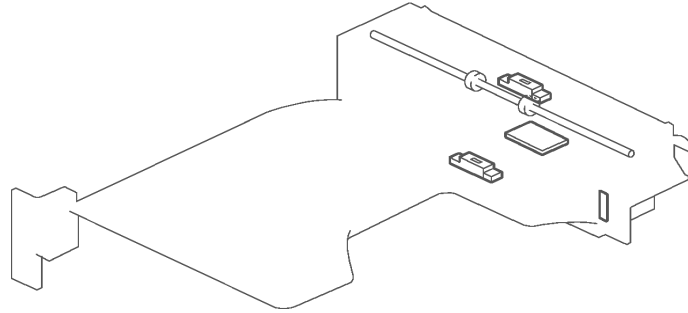


- ❑ This unit adds an output tray. It does not replace the tray that is supplied with the machine.
- ❑ It is not a sorter, because the tray and/or the rollers do not move from side to side.
- ❑ With more than one output tray, the user can (for example) send copy-mode outputs to the standard output tray, and fax-mode outputs to the 1-bin tray.

Slide 305

- ❑ To send output to a different output tray for each mode, the user adjusts this user tool: User Tools - System Settings - General Features - Output: Copier, Output: Facsimile, etc
  - The one-bin tray is called 'Internal Tray 2'.

## Components



- ❑ The main motor in the copier operates the tray. There is no motor in the tray.
- ❑ The junction gate solenoid in the paper exit mechanism of the main copier sends paper to this tray.
- ❑ The paper sensor in the one-bin tray checks if there is paper in the tray. Then, if there is paper, the LED on the side of the tray lights.

Slide 306

**No additional notes**

## LED on the One-bin Tray



- ❑ This LED lights when an output arrives on the one-bin tray.
  - ♦ The one-bin tray is an optional device.
- ❑ If the one-bin tray is set up to receive fax messages, then the LED tells the customer when a fax message has been printed.

Slide 307

**No additional notes**

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****SIDE TRAY (D427)**

Slide 308

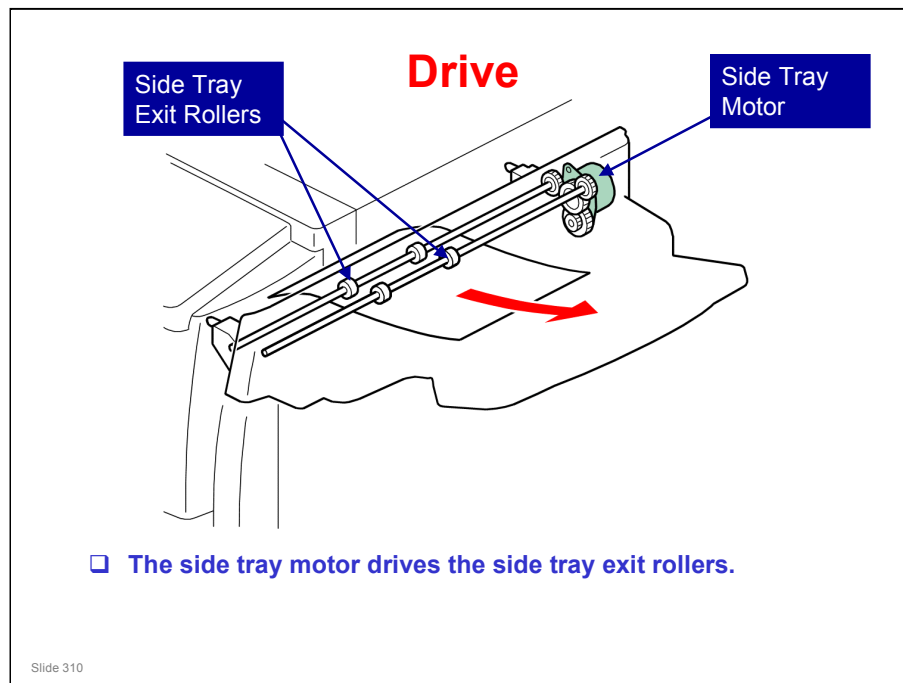
- ☐ In this section, you will study the mechanisms of the optional side tray.
- ☐ This unit is new.

## Overview

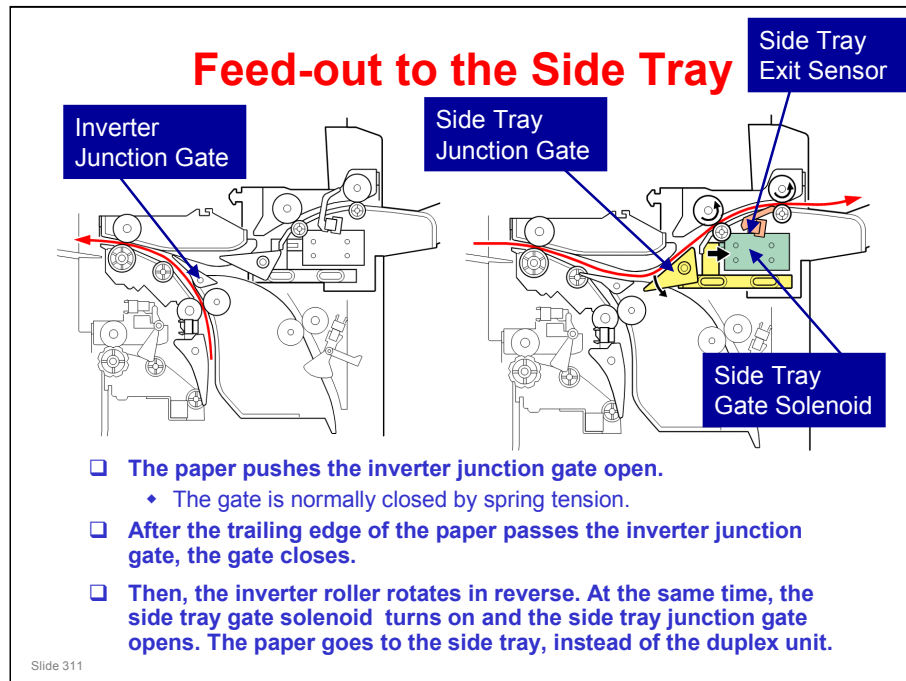
- ❑ The side tray is an additional output tray.
- ❑ This can be installed when the 500-sheet finisher is installed, so that the user can (for example) send copy-mode outputs to the finisher tray, and fax-mode outputs to the side tray.
- ❑ This is because, when the finisher is installed, the one-bin tray cannot be installed.

Slide 309

**No additional notes**



No additional notes



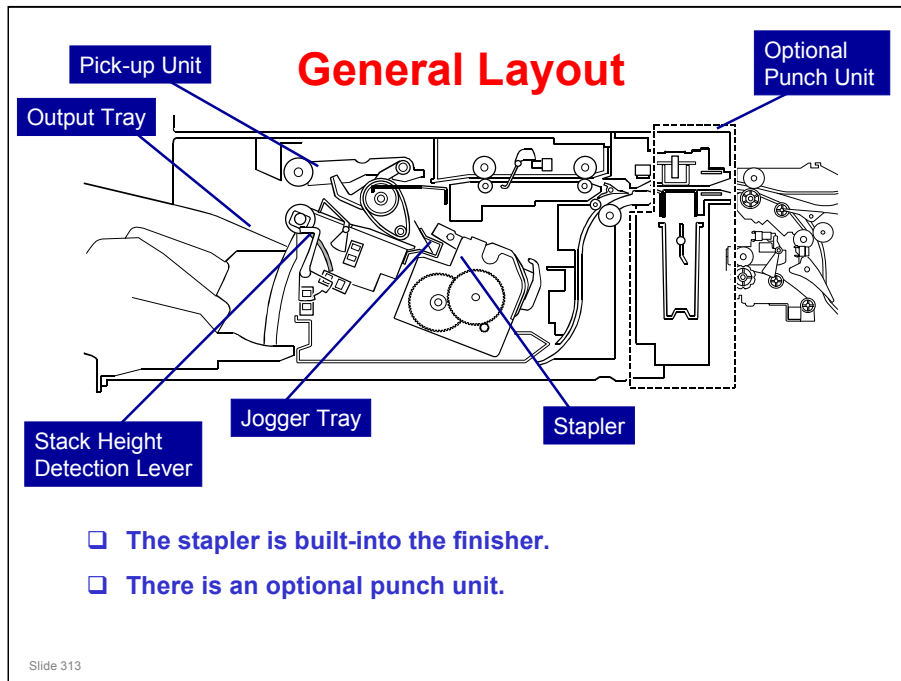
- ❑ The solenoid is at the rear of the tray, near the motor.
- ❑ When the side tray exit sensor detects the trailing edge of the paper, the side tray gate solenoid turns off and closes the path to the side tray. This sensor also detects paper jams.

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****INTERNAL FINISHER (D429)**

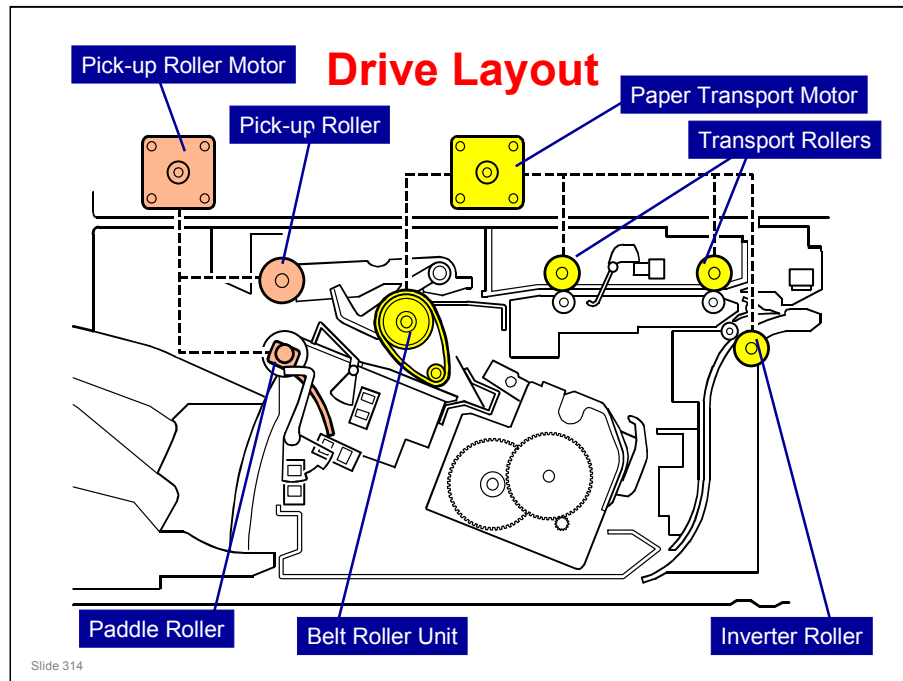
Slide 312

- ☐ In this section, you will study the mechanisms of the optional 500-sheet finisher.
- ☐ This finisher has some similarities with the finisher for the AT-C1, but a punch unit is added.





- ❑ The output tray moves down when the stack gets thicker.
  - The output tray does not move from side to side to sort the copies. Because of this, it should not be called a shift tray.
- ❑ The jogger tray moves even-numbered sets to one side before it feeds them to the output tray. That is how shift sorting is done with this finisher.
  - The jogger tray is also used for stapling. The stapler is attached to one side of the jogger tray. It is not shown in this diagram.
- ❑ The stack height detection lever turns on sensors that tell the machine to lift or lower the output tray.
- ❑ The pick-up unit moves up and down, controlled by the selected mode and the part of the job.
  - This is described later.



- ❑ The pick-up roller motor can turn forward or in reverse. This is necessary because the pick-up roller feeds paper back into the jogger tray, and forward to the output tray.

## Finisher Modes

### ☐ Straight feed-out

- ♦ Paper goes directly to the output tray without sorting or stapling

### ☐ Shift sorting

- ♦ Odd-numbered sets (set 1, 3, 5, etc): The front fence jogs the output, and the printout moves to the rear.
- ♦ Even-numbered sets (set 2, 4, 6, etc): The rear fence jogs the output, and the printout moves to the front.

### ☐ Stapling

- ♦ Each set is stapled in the jogger tray before it is fed to the output tray.

Slide 315

**Straight feed-out (automatically selected if the paper type is outside the specified weight range for the finisher)**

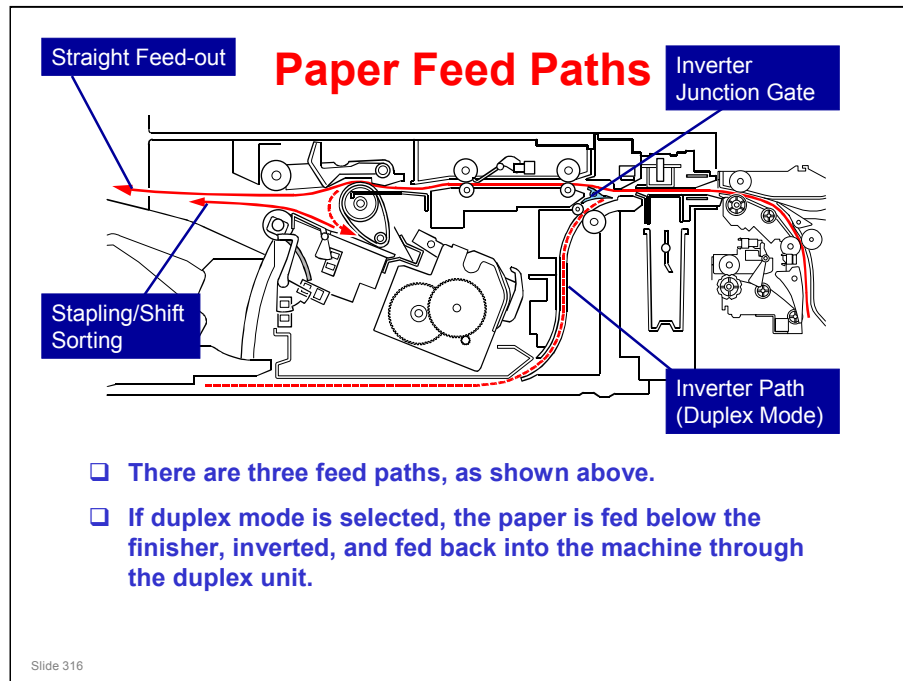
- ☐ Each page is fed out immediately after it comes from the copier.

**Shift sorting (if selected with the operation panel or printer driver)**

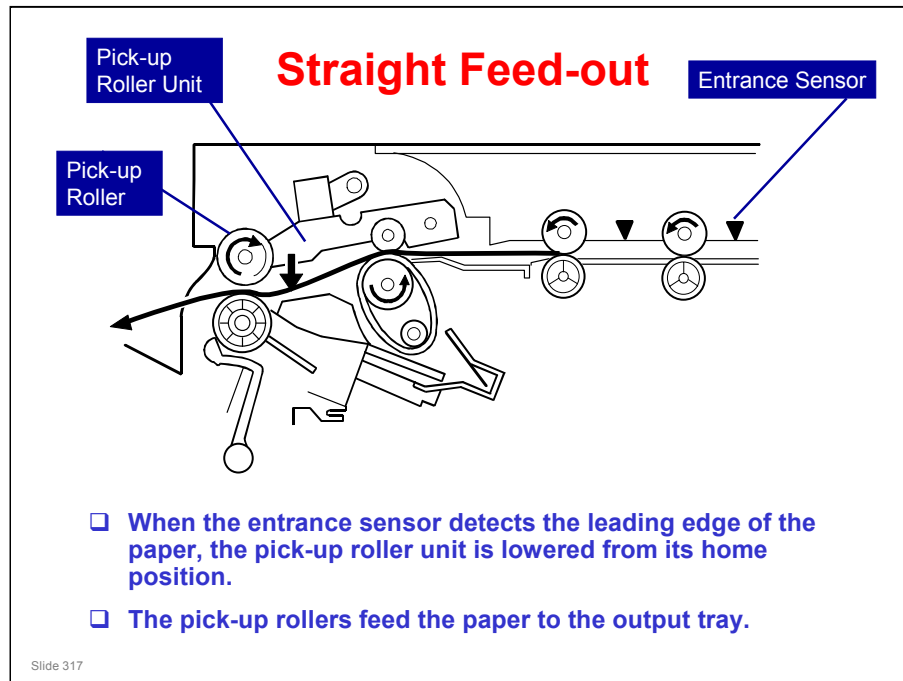
- ☐ This lets the user separate the sets easily.

**Stapling (if selected with the operation panel or printer driver)**

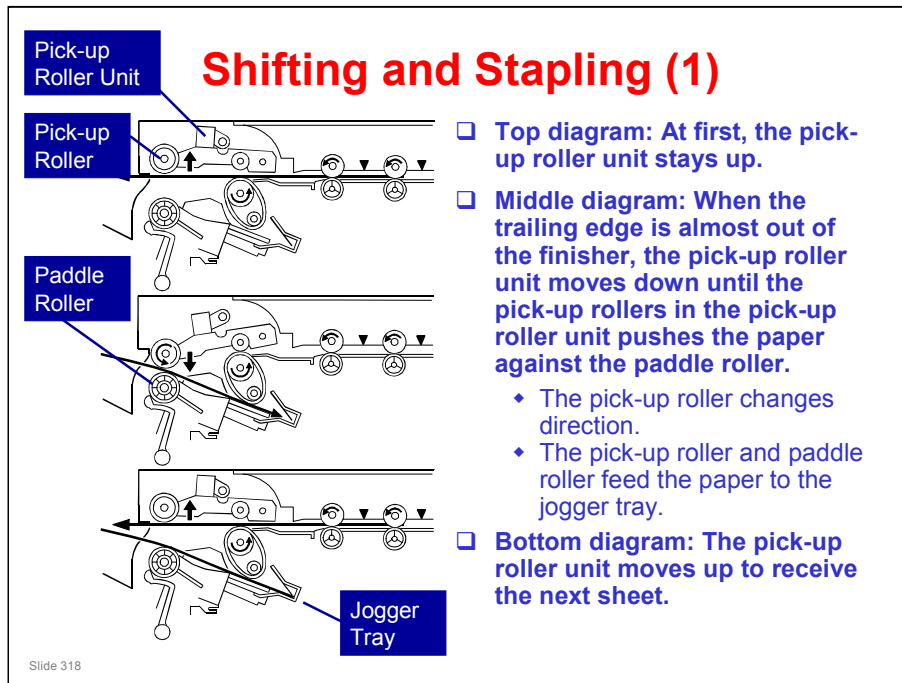
- ☐ Each set is fed the same as even-numbered sets in shift sorting mode.
- ☐ But, the set is stapled in the jogger tray before it is fed to the output tray.
- ☐ All sets are moved to one side.



**No additional notes**

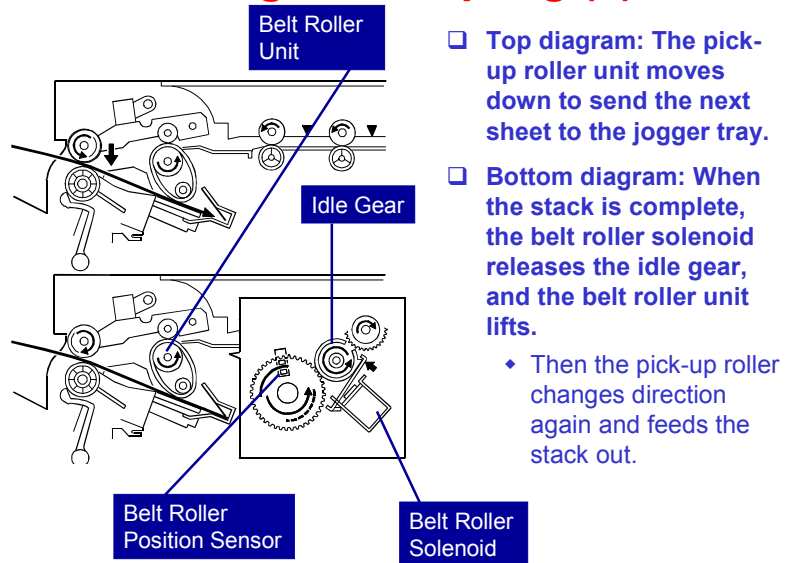


- ❑ The pick-up roller contact motor moves the pick-up roller unit up and down.
- ❑ The pick-up roller motor turns the pick-up rollers.



**No additional notes**

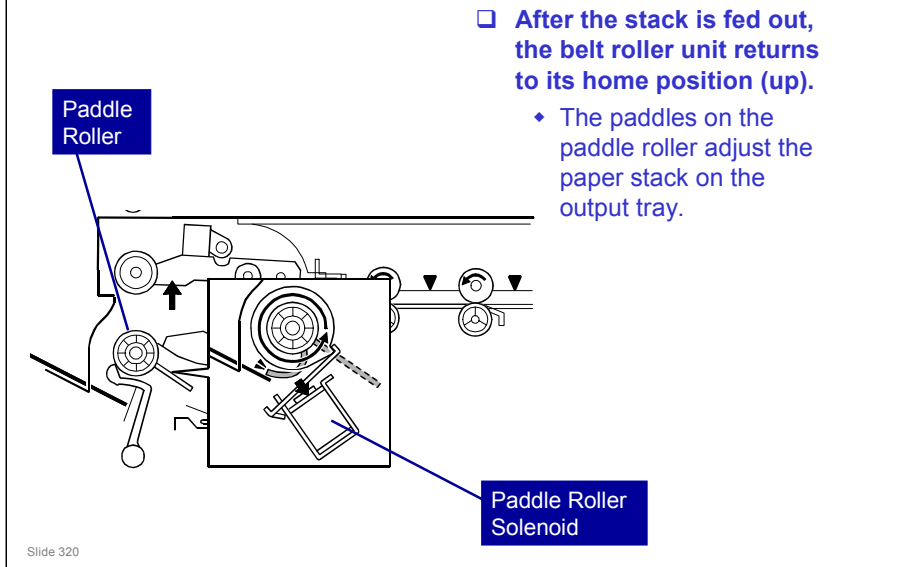
## Shifting and Stapling (2)



Slide 319

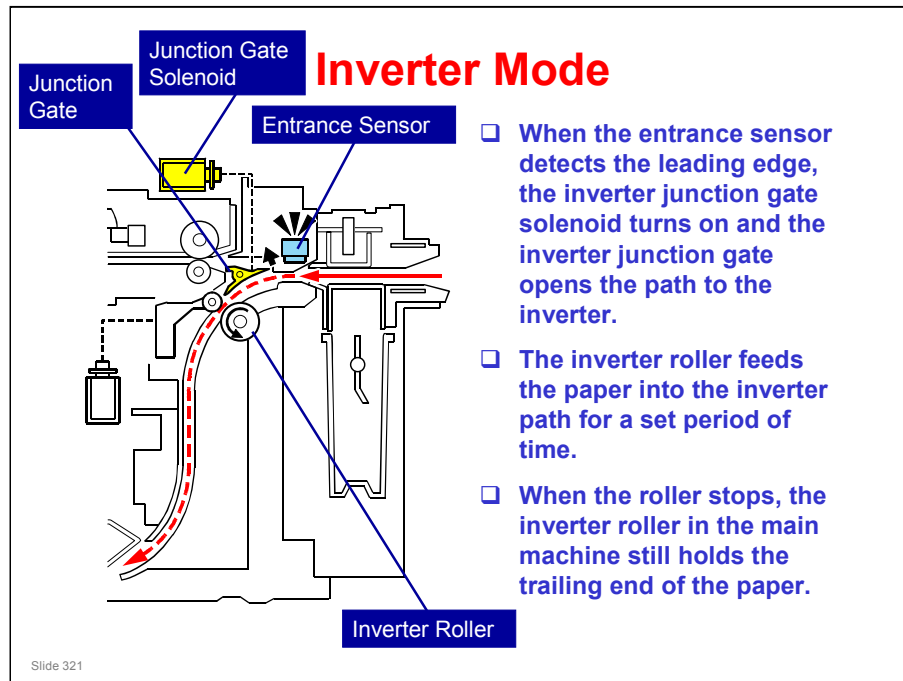
- ❑ The belt roller position sensor detects the position of the belt roller unit.
- ❑ When the belt roller solenoid releases the idle gear, the gear to the right turns. This has a cam and shaft attached to it, and this lifts the belt roller unit.

## Shifting and Stapling (3)

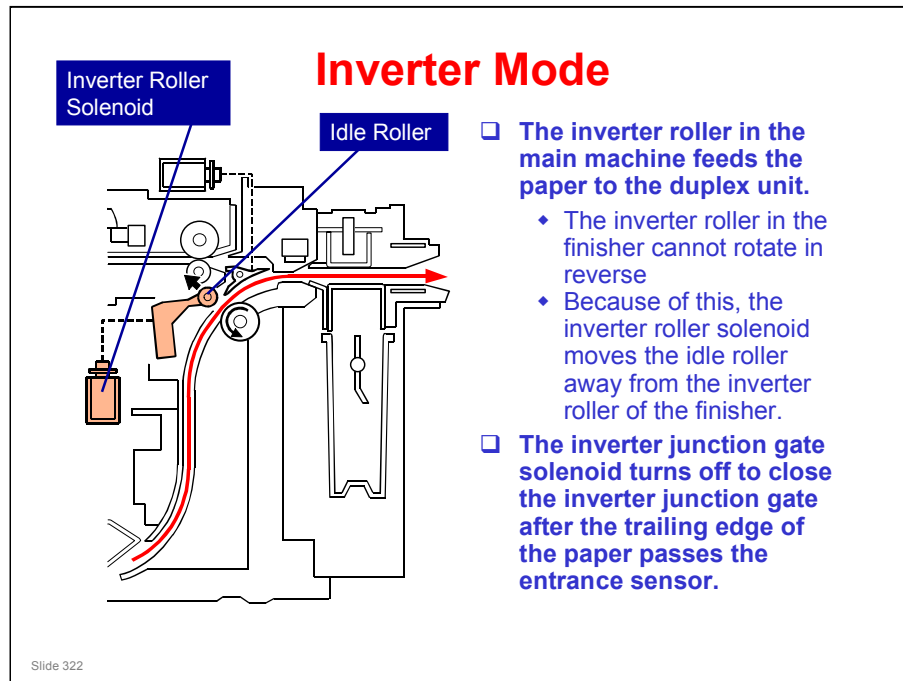


- ❑ The paddle roller solenoid controls the paddle roller.
- ❑ The pick-up roller turns forward or in reverse. The other rollers do not change direction, and are controlled by the paper transport motor.

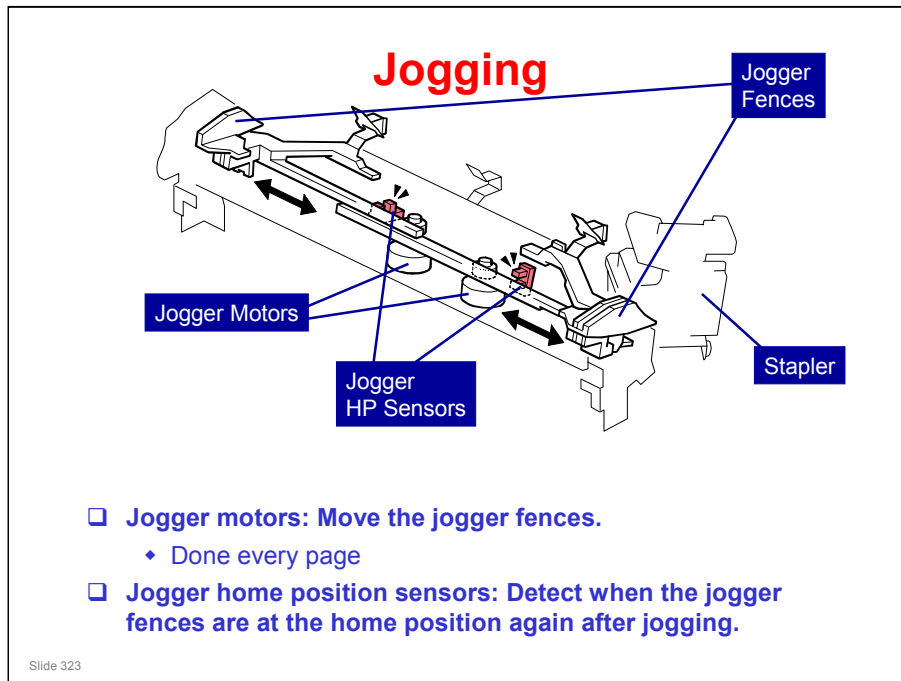




- ❑ This shows what happens when duplex is selected, if the finisher is installed.



- This shows how the paper is fed back into the duplex unit of the machine.

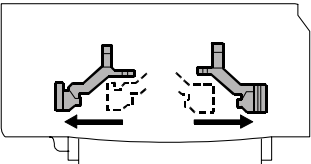


**No additional notes**

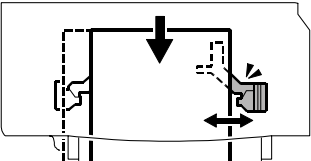
## Jogging

**Rear**
**Front**

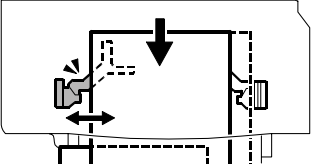
**Standby**



**Sets 1, 3, 5**



**Sets 2, 4, 6**

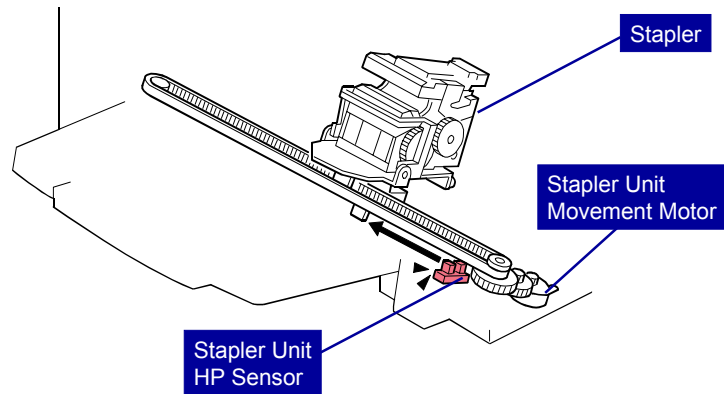


- ❑ In standby mode, the jogger fences move away from the center.
- ❑ In sort mode, the sets are separated as follows:
  - ◆ Odd-numbered sets (set 1, 3, 5, etc): The front fence jogs the output.
  - ◆ Even-numbered sets (set 2, 4, 6, etc): The rear fence jogs the output.
- ❑ In staple mode, only the front jogger fence moves.

Slide 324

**No additional notes**

## Stapler Unit Movement

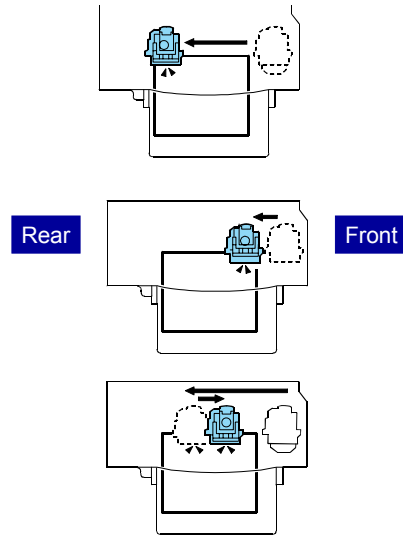


- The stapler unit movement motor moves the stapler to the correct position for stapling.

Slide 325

No additional notes

## Stapling Positions

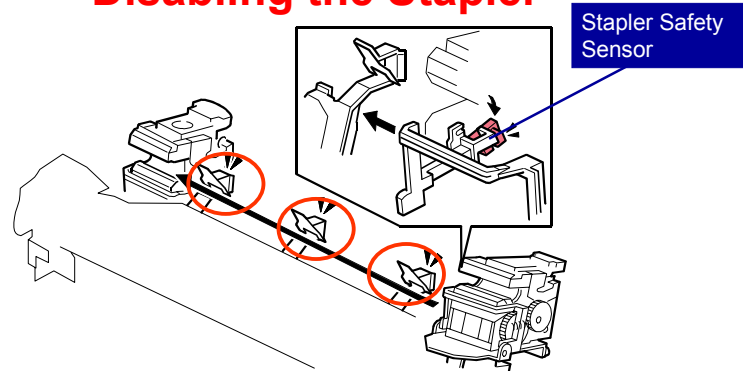


- There are three stapling positions.
  - ◆ One staple at the trailing edge (rear only)
  - ◆ One staple at the trailing edge (front only)
  - ◆ Two staples at the trailing edge (front and rear)

Slide 326

No additional notes

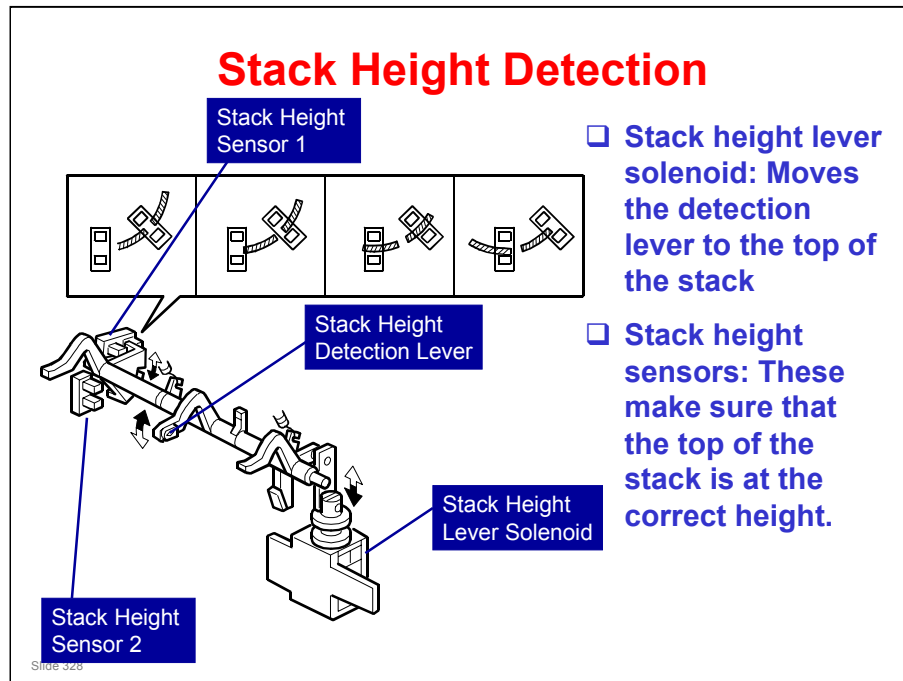
## Disabling the Stapler



- ❑ There are three fences in the stapler path. The stapler must not staple these fences.
- ❑ To disable the stapler, an actuator in the stapler is pushed into the stapler safety sensor when the stapler is at one of these fences.
- ❑ When the machine detects this actuator, the stapler will not operate.

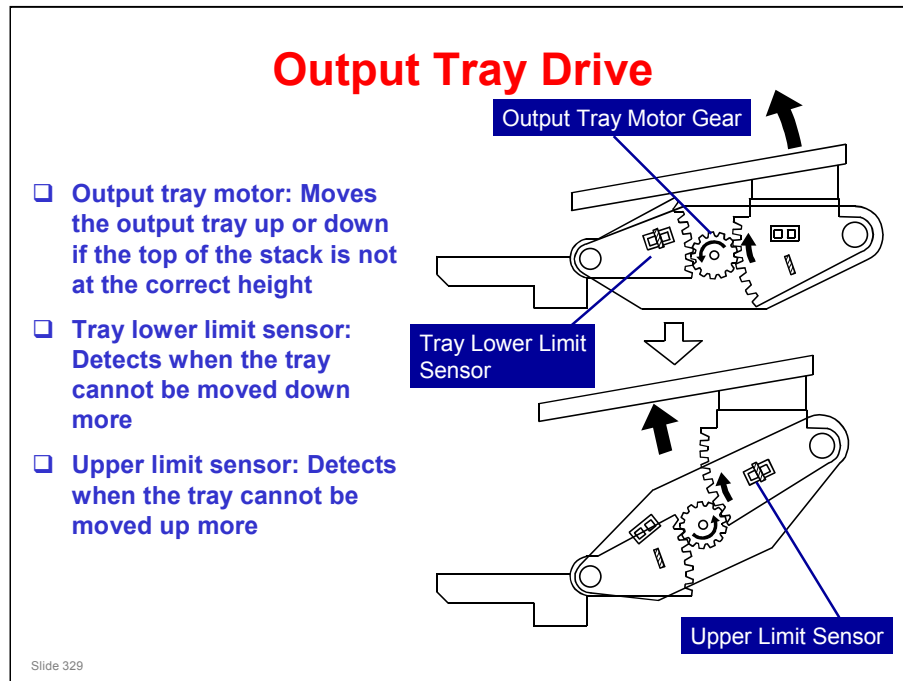
Slide 327

- ❑ The three fences are shown in red circles in the diagram.



- ☐ This shows how the stack height is detected. If the stack height is above a set level, the output tray must move down.
- ☐ The outputs from the two sensors tell the machine what to do.
  - Sensor 1 and 2 both off: The stack height is below the target. The output tray is then lifted to the target position.
  - Sensor 1 on, sensor 2 off: Target stack height position
  - Sensor 1 and 2 both on: The stack height is above the target. The output tray is then lowered to the target position.
  - Sensor 1 off, sensor 2 on: The stack height detection lever is at home position.
  - 'Off' means 'Actuator not in sensor'
- ☐ At the start of a print job, the solenoid turns on. The stack height detection lever comes down, to detect the current stack level.
- ☐ When a sheet of paper is being fed out, the solenoid turns off and the lever goes back up to home position (inside the unit).
- ☐ After paper has been fed out, the solenoid turns on again, and the lever detects the level of the stack.





### Overview

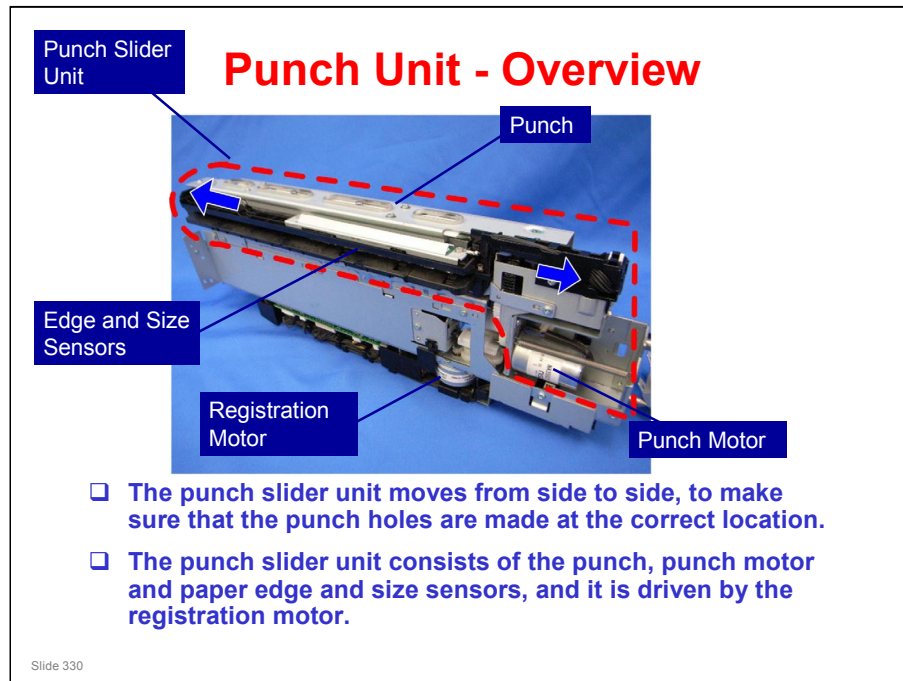
- ❑ The output tray motor gear lifts/lowers the tray if the stack height is not at the target position.
- ❑ The output tray motor turns the two sector gears. These gears keep the tray at the same angle during up/down movement.

### Output Tray Downward Movement

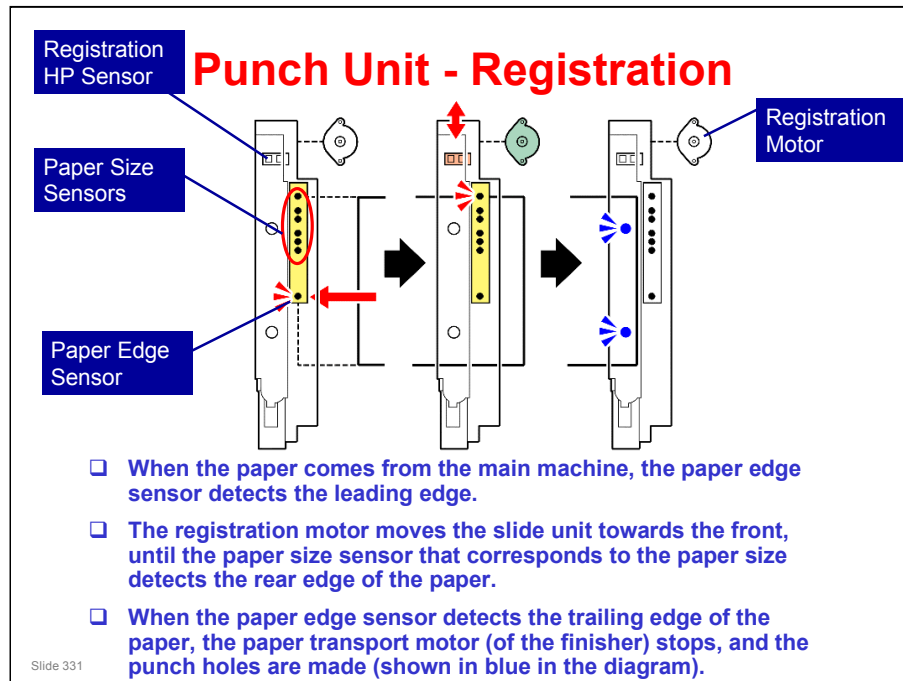
- ❑ The top of the paper stack is checked after every page (or set of pages) has been fed out. If the top of the stack is higher than the target level, the output tray motor moves the tray down.
- ❑ When the tray lower limit sensor detects the actuator on the sector gear (the gear on the left in the diagram), a stack near-limit signal is transferred to the main frame. The tray cannot move any lower. The next time the top of the stack height is above the target level, printing stops.

### Output Tray Upward Movement

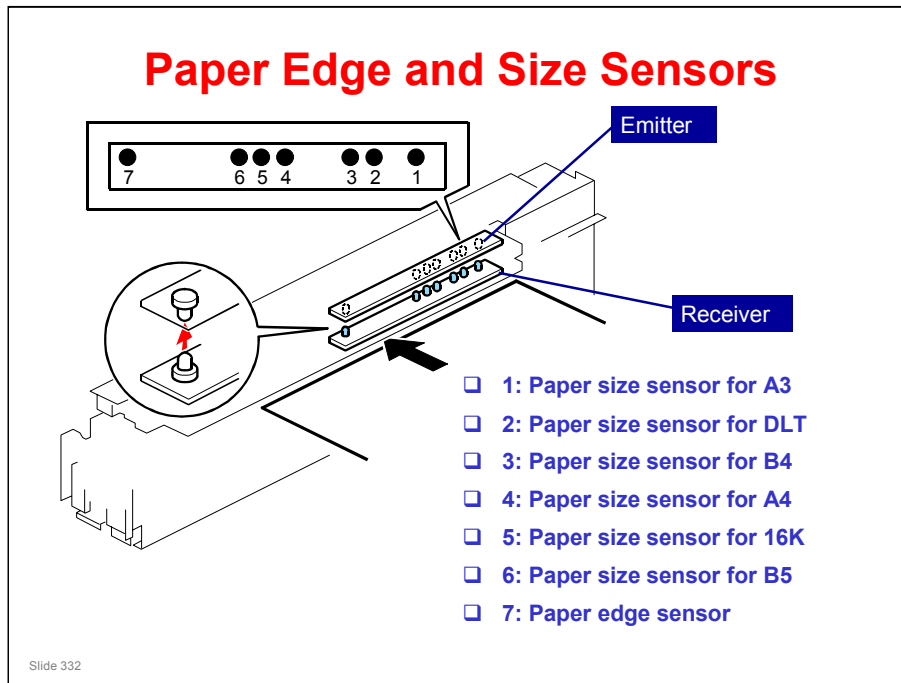
- ❑ If paper is removed from the stack, the top of the stack will be lower than the target level, and the output tray motor moves the tray up.
- ❑ When the tray upper limit sensor detects the actuator on the other sector gear, the tray cannot be moved up any more, so the motor stops.



- ❑ The punch slider unit is surrounded by the red dotted line in the photo.



- ☐ The registration home position sensor detects when the slide unit is at home position (in other words, when the paper edge sensors are at home position).



- ☐ The paper sizes shown above are for short-edge feed (SEF).

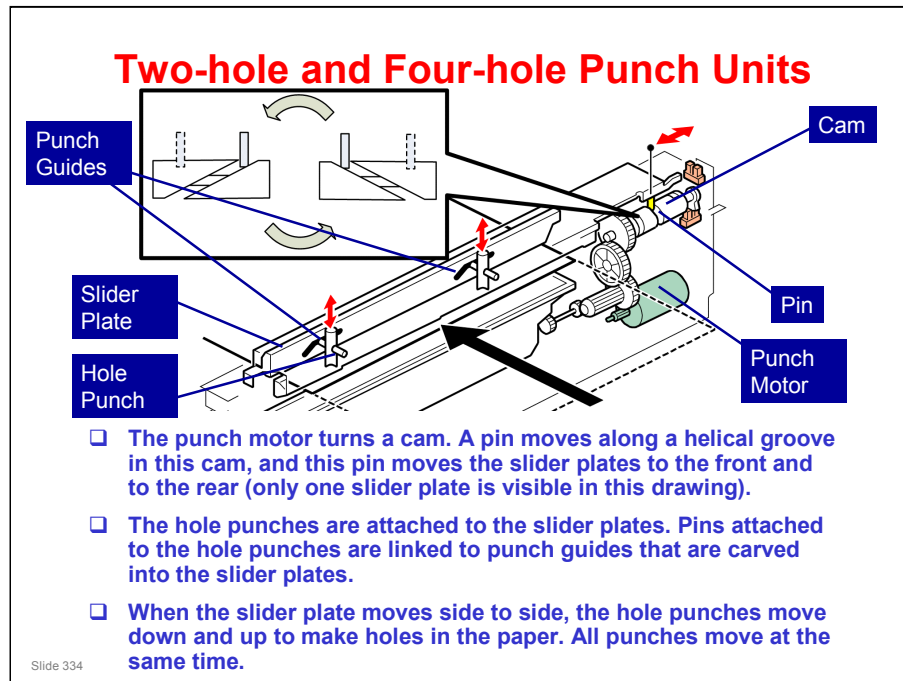
## Punch Units

### □ There are four types:

- ◆ 2 holes
- ◆ 2 or 3 holes
  - » The user can select 2-hole punching or 3-hole punching from the operation panel or the printer driver.
- ◆ 4 holes
  - » There are two 4-hole types: for North Europe, and for other areas.

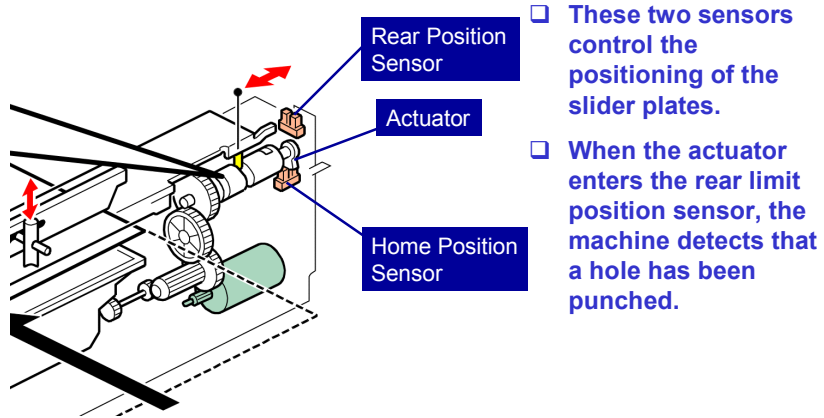
Slide 333

**No additional notes**



- ☐ The two-hole punch unit and the four-hole punch unit have the same mechanism.
- ☐ The two-hole punch unit is described here.

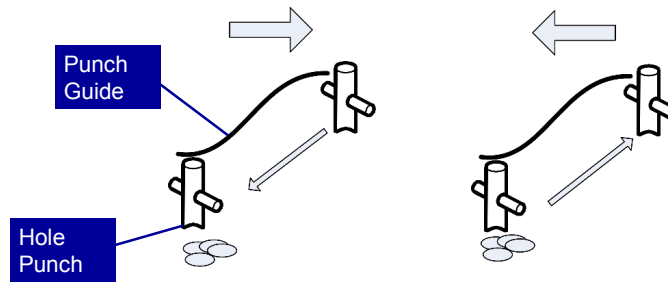
## Two-hole and Four-hole Punch Units



Slide 335

No additional notes

## Two-hole and Four-hole Punch Units



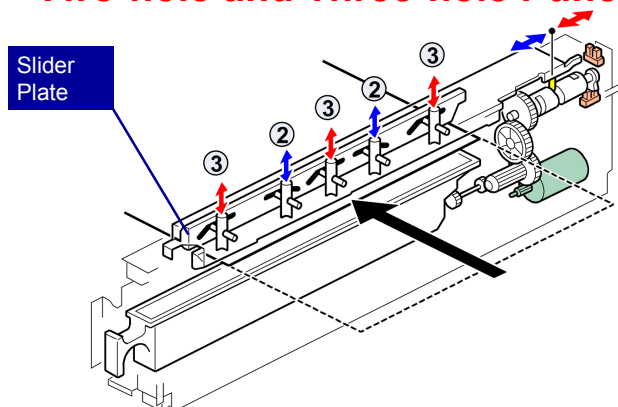
- ❑ For the first sheet of paper, the punch motor moves the slider plate to the rear.
- ❑ The punch guide forces the hole punch to move down, to punch a hole in the paper.
- ❑ The punch motor continues to rotate in the same direction, until home position is detected again.
- ❑ The punch motor then changes direction to punch the holes in the next sheet of paper. The slider plates move to the rear again, to punch the holes in the paper.

Slide 336

- ❑ The punch motor alternately turns forward and in reverse for alternate sheets of paper. But the slider plate always moves to the rear to punch the paper, because of the shape of the groove in the cam.
- ❑ Why does the punch unit change direction between sheets? This is so that the actuator of the punch waste detection mechanism can move back across the punch waste hopper. It is driven by the same motor, and if the motor turns in the same direction for a long time (during a long job), punch waste can build up without being detected.



## Two-hole and Three-hole Punch Unit

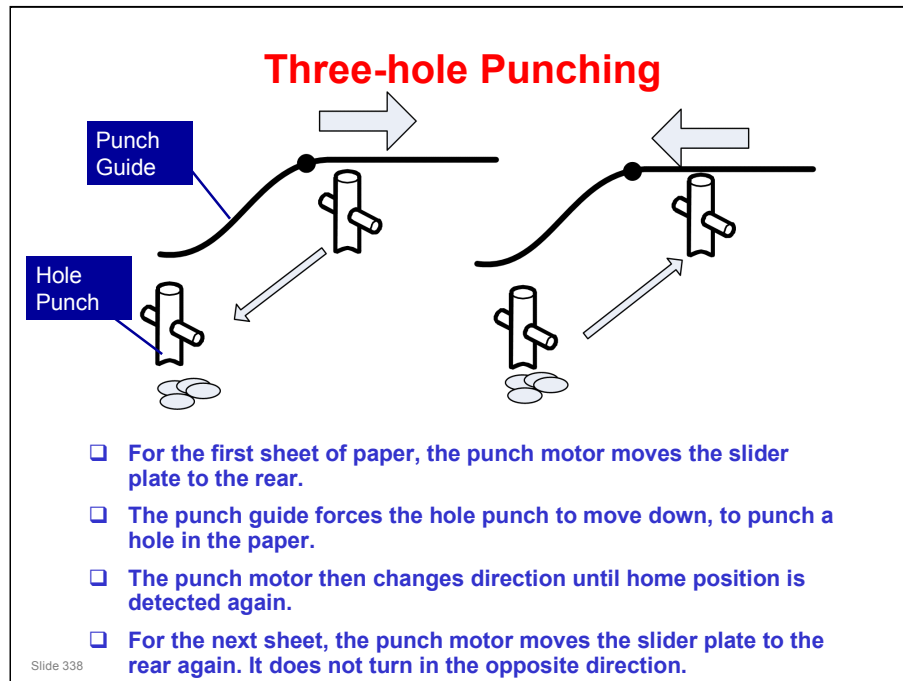


□ Similar to the two-hole and four-hole punch units, except:

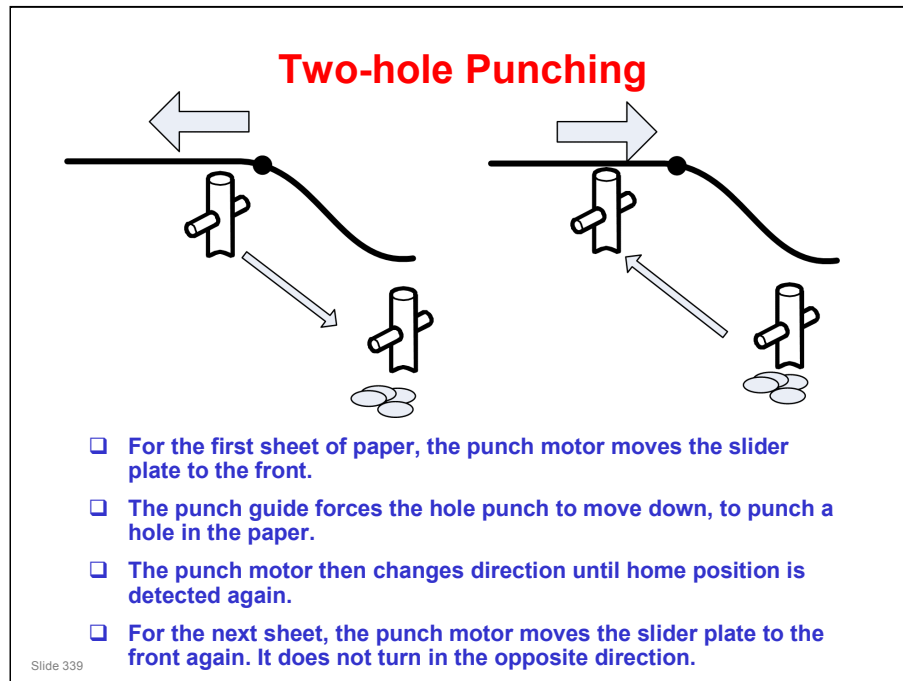
- ♦ To punch two holes, the slider plate moves to the front
- ♦ To punch three holes, the slider plate moves to the rear.

Slide 337

**No additional notes**

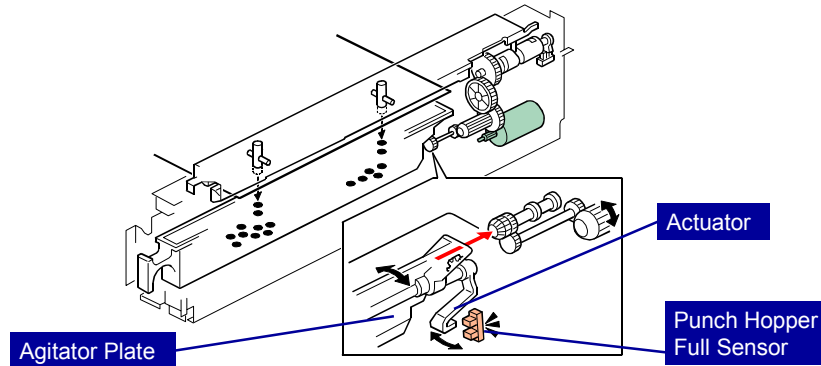


- ❑ If the slider plate is moved to the front from home position, the three-hole punches do not move down to the paper. However, the two-hole punches do move down, as we shall see on the next slide.



- ❑ If the slider plate is moved to the rear from home position, the two-hole punches do not move down to the paper. However, the three-hole punches do move down, as we saw on the previous slide.

## Punch Waste Hopper Full Detection



- ❑ An actuator is attached to the rear edge of the agitator plate. This plate keeps the punch waste in the hopper level.
- ❑ When the punch motor rotates forward and in reverse to punch the paper, the agitator plate is also moved from right to left.
- ❑ If the punch full sensor does not detect the movement of the actuator for a set time, the machine decides that the punch hopper is full.

Slide 340

- ❑ The punch hopper full sensor checks the actuator at initialization and while the punch unit is active.
- ❑ If the punch hopper is not set in the punch unit and the punch full sensor does not detect the actuator after a set time at power on, the machine also decides that the punch hopper is full.
  - There is no punch hopper set sensor. If the waste hopper is not in the machine when you turn the power on, the machine will not detect the actuator, and will display 'punch waste hopper full'.
- ❑ Two/four hole punch unit: The punch motor changes direction between sheets. This is so that the actuator can move back across the punch waste hopper. It is driven by the same motor, and if the motor turns in the same direction for a long time (during a long job), punch waste can build up without being detected.

## Replacement

- ❑ Before you remove the covers from the finisher, you must remove the finisher from the machine.

Slide 341

**No additional notes**

## SP Modes Related to this Finisher

- ☐ SP6101: Stapling position
- ☐ SP6102: Punch position (sub scan)
- ☐ SP6104: Punch position (main scan)

Slide 342

**No additional notes**

**RICOH**

**Di-C1 TRAINING  
COPIER ENGINE**

**MAINTENANCE**

Slide 343

**No additional notes**

## PM

### □ PM cycle: 60K and 150 K

- ♦ 60k: Drum unit, PCDU toner collection bottle, transfer belt cleaning unit assembly (includes a waste toner bottle)
  - » At the same time, clean the area around the entrance sheet of the development unit. Also, in the fusing unit, clean the entrance and exit guides, the stripper plate, and the pressure roller.
- ♦ 150K: Fusing rollers and fusing belt

### □ Peripherals: At EM only

Slide 344

*Service manual, Appendix, Maintenance Tables*



## New Unit Detection

- ❑ For the following units, there is a new unit detection mechanism. It is not necessary to reset PM counters.
  - ◆ PCDU
  - ◆ Development unit only (not the complete PCDU)
  - ◆ PCDU Toner Collection Bottles (if full or near-full)
  - ◆ ITB Cleaning Unit with ITB Waste Toner Bottle (if full or near-full)

Slide 345

### PCDU

- ❑ This contains the drum unit and the development unit.
- ❑ The development unit contains the new unit detection mechanism for the PCDU.
  - It uses the ID chip.
- ❑ So, if you replace the PCDU, or the development unit only, the machine detects the new unit automatically and resets the counters.
  - If you replace the development unit only, set 3902 001 (K), 002 (C), 003 (M), or 004 (Y) to 1 before you switch off the machine. If you forget this, then the drum counters will be reset when you turn the machine on again.
- ❑ But if you replace the drum unit only, then you must reset the counters (see the next slide).

### Toner Collection Bottles

- ❑ If the bottle is full or near-full, the counters are reset when the bottle is replaced or emptied.
  - The counters are reset after the cover is closed.
- ❑ But the counters are not reset if you replace a bottle that is not full or near-full. You must reset the counters manually (see the next slide).

## PCDU, PCDU Toner Collection Bottle

### □ PCDU

- ♦ This contains the drum unit and the development unit.
- ♦ The development unit contains the new unit detection mechanism for the PCDU.
- ♦ So, if you replace the PCDU, or the development unit only, the machine detects the new unit automatically and resets the counters.
  - » If you replace the development unit only, set 3902 001 (K), 002 (C), 003 (M), or 004 (Y) to 1 before you switch off the machine. If you forget this, then the drum counters will be reset when you turn the machine on again.
- ♦ But if you replace the drum unit only, then you must reset the counters (see the next slide).

### □ Toner Collection Bottles

- ♦ If the bottle is full or near-full, the counters are reset when the bottle is replaced or emptied.
- ♦ But the counters are not reset if you replace a bottle that is not full or near-full. You must reset the counters manually (see the next slide).

Slide 346

**No additional notes**

## PM Counter Reset

- ❑ **If you change the following parts, you must set the following SPs to 1 before you turn the machine power off.**
  - ◆ Development Unit only: 3902-001 (K), -002 (C), -003 (M), -004 (Y)
  - ◆ Drum Unit only: 3902-009 (K), -010 (C), -011 (M), -012 (Y)
  - ◆ Fusing Unit: 3902-014
  - ◆ Fusing Roller: 3902-015
  - ◆ Fusing Belt: 3902-016
  - ◆ Image Transfer Belt: 3902-013
  - ◆ Image Transfer Belt Cleaning Unit: 3902-017
  - ◆ Paper Transfer Roller: 3902-018
  - ◆ PCDU Toner Collection Bottle (if not full or near-full): 3902-019
  - ◆ Image Transfer Belt Toner Collection Bottle (if not full or near-full): 3902-020
- ❑ **Then, after you replace the parts, the PM counters will be reset automatically when you turn the main power switch on again.**
- ❑ **Check that the PM counters were reset correctly (SP 7-803).**
  - ◆ If a PM counter was not reset, you can reset it manually (SP 7-804).

Slide 347

### *Service manual, Preventive Maintenance, PM Parts Settings*

- ❑ Study the 'Before removing the old PM parts' and 'After installing the new PM parts' procedures in this section of the manual.

## After PM

### ☐ Do the ACC procedure.

- ◆ User Tools > Maintenance > ACC > Copier > Start
- ◆ User Tools > Maintenance > ACC > Printer > Start > Test Patterns 1, 2, and 3

### ☐ Do the forced line position adjustment

- ◆ First do SP2-111-3 (Mode c).
- ◆ Then do SP2-111-1 (Mode a).
- ◆ To check if SP 2-111-1 was successful, watch the screen during the process. A message is displayed at the end.
  - » Also, you can check the result with SP 2-194-007 (0: Completed successfully, 1: Failed).

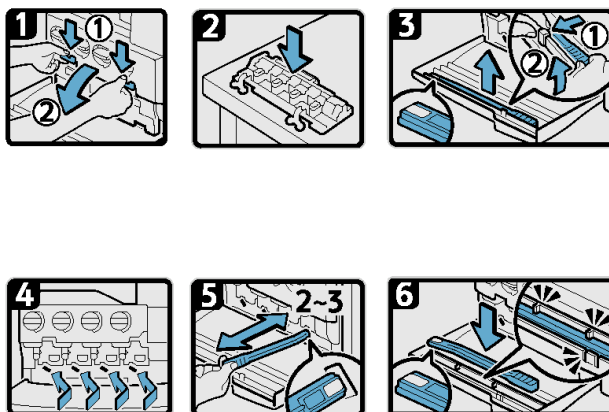
Slide 348

*Service manual, Preventive Maintenance, PM Parts Settings*

- ☐ Ask the class to study the 'Preparation before operation check' procedure in this section of the manual.

## Service Maintenance - Cleaning

- ❑ The service manual shows which parts of the machine and optional equipment must be cleaned when you visit the machine.
- ❑ The cleaning tool for the dust shield glass is stored in the front cover, as shown below.



Slide 349

No additional notes

## **Important Notes to Remember for PM**

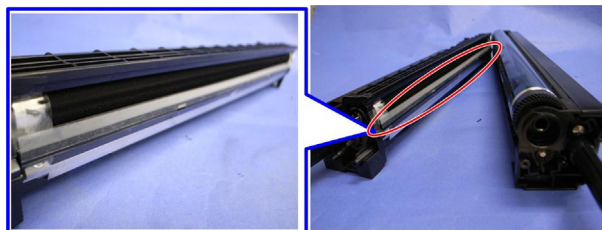
Slide 350

**No additional notes**

## Drum Unit

When installing the new drum unit :

- Clean around the entrance sheet of the development unit



New unit set & PM counter reset

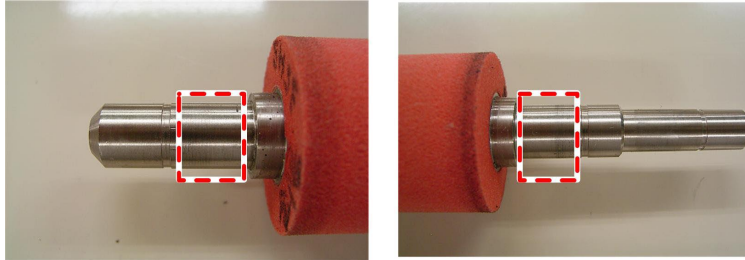
item	SP
Drum Unit K,C,M,Y	SP3-902-009 to -012

Slide 351

**No additional notes**

## Fusing Unit

- ❑ When reassembling the fusing unit
  - ◆ When replacing the hot roller, you have to apply Barrierta S552R to the following places.



Slide 352

**No additional notes**



**RICOH****Di-C1 TRAINING  
COPIER ENGINE****TROUBLESHOOTING**

Slide 353

- ❑ This section goes over the troubleshooting tools built into the machine.
- ❑ Explain that the troubleshooting section does not cover all possible problems. In the field, technicians will have to think for themselves and draw on their own experiences. However, the procedures in the manual will give some ideas for where to start to look when a particular problem occurs.

## Process Control Results

- ❑ ID sensor test: SP 3-325  
000 = Front, Center, Rear  
e.g. 111 → Successfully completed
- ❑ Process Control Self-Check Result: SP3-012  
YY CC MM KK: 11 11 11 11 ~ 99 99 99 99  
e.g. 11 → Successfully completed
- ❑ Line Position Adjustment Result: 2-194-10~12

Slide 354

*Service manual, Troubleshooting, Process Control Error Conditions*

- ❑ Each of these SPs gives a result code.
- ❑ For the meanings of each code, and how to proceed, see the above section of the service manual.

*Service manual, Troubleshooting, Troubleshooting Guide*

- ❑ This section gives more details on how to solve problems that occur with line position adjustment.
- ❑ Some steps ask you to use SPs. See the SP tables for details on each SP.
- ❑ Some of the SP adjustment have 'dot' and 'subdot' settings. These let you adjust the position of the lines. Adjust the 'dot' setting first, for a rough adjustment. Then, adjust the 'subdot' setting for a fine adjustment.

## Image Defects at Regular Intervals

□ If a defect occurs in the image at one of these intervals, the related component may be defective.

- ◆ Drum: 94.2 mm
- ◆ Fusing belt: 157.1 mm
- ◆ Development roller: 32 mm
- ◆ Paper transfer roller: 75 mm

Slide 355

**No additional notes**

## Reset Procedures

### ❑ Software Reset

- ◆ Either
  - » Operation panel power switch off/on
  - » Hold the # and . keys for 10 seconds

### ❑ User Tool Settings Reset

- ◆ Press 'User Tools'.
- ◆ To reset the system settings user tools: Hold # and press 'System Settings', then press 'Yes'.
- ◆ To reset the copy/doc server feature user tools: Hold # and press 'Copy/Document Server', then press 'Yes'.

Slide 356

*Service manual, System Maintenance Reference,  
Reboot/System Setting Reset*

- ❑ Note the two ways to reset the machine if the software hangs up.
- ❑ Point out the procedures to reset the user tool settings to their defaults.

## Paper Jam History

- ❑ SP 7504 shows details on jams that occur in each section of the machine.
- ❑ SP 7507 can be used to show details on the 10 most recent jams.

Slide 357

*Service manual, Troubleshooting, Jam Detection*

## Service Mode Lock

- ❑ If the customer uses the security functions on the machine, the technician has two problems:
  - ◆ The technician cannot get into SP mode
  - ◆ If the technician turns the machine power off and on frequently during servicing, a user name and password must be input each time.
- ❑ To make it easy to do work on the machine, you must ask the administrator to switch Service Mode Lock to Off.
  - ◆ You must ask the Machine Administrator to do this.
  - ◆ User Tools > System Settings > Administrator Tools > Service Mode Lock
  - ◆ The administrator will change it back to On after you finish.

Slide 358

**No additional notes**

## Error Codes

### ❑ SC Codes

- ◆ 4 levels of SC condition.
- ◆ Use SP 5810-1 to clear level A service call codes, then turn the main power off/on.

### ❑ Level D SC codes

- ◆ The machine can be set with SP 5875 to reboot automatically after 30 seconds if a level B SC code occurs.
  - » If the same SC occurs again, the machine does not reboot.

Slide 359

*Service manual, Troubleshooting, Service Call Conditions*

## Card Save (1)

- ❑ **This feature allows you to send print data files to an SD card in the service slot (slot 2 in this machine).**
  - ♦ The data is not printed.
- ❑ **Card Save mode must be turned on with printer bit switch 1, bit 4.**
  - ♦ Card Save will remain enabled until the SD card becomes full, or until all file names have been used.
- ❑ **Files are stored on the SD card in the folder /prt/cardsave.**
  - ♦ File names are assigned sequentially from PRT00000.prn to PRT99999.prn.
  - ♦ An additional file PRT.CTL will be created. This file contains a list of all files created on the card by the card save function.
- ❑ **Card Save cannot be used with PjL Status Readback commands.**

Slide 360

**No additional notes**



## Card Save (2)

- ❑ Previously stored files on the SD card can be overwritten or left intact.
- ❑ After you enable this function with the printer bit switch, the following two user tools are added to the List/Test Print tab of the Printer Features user tools menu.
  - ◆ Card Save (Add):
    - » Appends files to the SD Card.
    - » Does not overwrite existing files.
    - » If the card becomes full or if all file names are used, an error will be displayed on the operation panel. Subsequent jobs will not be stored.
  - ◆ Card Save (New)
    - » Overwrite files in the card's /prt/cardsave directory.

Slide 361

- ❑ Study the procedure in the service manual.

*Service Manual - System Maintenance Reference - Card  
Save Function*

- ❑ Note that there is no message on the screen to indicate that a file was copied to the SD card successfully. But there are some error messages that appear if things go wrong.
- ❑ If an error occurs, press “OK”. The device will discard the job and return to the ready state.

## SP Modes - Tests

- ☐ 2-109: Test pattern printing
- ☐ 4-301: APS sensor output test
- ☐ 5-803: Input tests
- ☐ 5-804: Output tests
- ☐ 6-007: ADF input tests
- ☐ 6-008: ADF output tests
- ☐ 6-120: Finisher input tests
- ☐ 6-121: Finisher output tests

Slide 362

**No additional notes**

## SP Modes - Counters

- ❑ 7-401: SC counter
- ❑ 7-403: SC history
- ❑ 7-502 to 7-506: Jam counters
- ❑ 7-507: Printer engine jam history
- ❑ 7-508: Original jam history
- ❑ 7-807: SC/jam counter reset

Slide 363

**No additional notes**

## SP Modes - Others

- ❑ 5-990: Parameter lists (SMC list printing)
- ❑ 7-801: ROM version display

Slide 364

**No additional notes**

**RICOH****Di-C1 TRAINING  
COPIER ENGINE****D432: Fax Option Type C2550 (for Di-C1-a/c)****D433: Fax Option Type C2530 (for Di-C1L-a/c)**

Slide 365

**No additional notes**

# General Specifications

Resolution:	G3: Standard: 8 x 3.85 lines/mm, 200 x 100 dpi Detail: 8 x 7.7 lines/mm, 200 x 200 dpi Fine: 8 x 15.4 lines/mm Super Fine (Di-C1a/c only): 16 x15.4 lines/mm, 400 x 400 dpi  Super Fine: Optional Expansion Memory required
-------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Slide 366

- ❑ There is no optional G3 interface unit.

## General Specifications

Data Compression:	MH, MR, MMR, JBIG
Protocol:	Group 3 with ECM
Modulation:	V.34, V.17 (TCM), V.29 (QAM), V.27ter (PHM), V.21, V.8 (FSK)
Data Rate:	G3: 33600/31200/28800/26400/24000/21600/ 19200/16800/14400/12000/9600/7200/4800/ 2400 bps Automatic fallback
I/O Rate:	With ECM: 0 ms/line Without ECM: 5, 10, 20, or 40 ms/line

Slide 367

**No additional notes**

General Specifications

Memory Capacity:	ECM: 128 KB SAF: Standard: 4 MB With optional Expansion Memory: 28 MB (Di-C1a/c only)  Page Memory: Standard: 4 MB x 2 With optional Expansion Memory: 8 MB x 2 (Di-C1a/c only)
------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Slide 368

No additional notes



## Preventing Transmission to the Wrong Destination

- ❑ If you want to prevent documents being sent to the wrong destination, you can configure the machine to do the following:
  - ◆ Prompt users more than once for the destination
    - » How many times will the user have to input the destination: User parameter switch 22, bits 7 to 4 (1 to 15 times)
    - » To disable this feature, set all 4 bits to 0.
    - » Cannot be used from the Simplified Display
  - ◆ Display the entered destination prior to transmission
    - » Enable/disable: User parameter switch 17, bit 4
    - » Does not work with manual dial or on-hook dial
    - » Cannot be used from the Simplified Display
- ❑ To avoid accidentally specifying multiple destinations, you can disable broadcasting.
  - ◆ You cannot specify group destinations if you disable broadcasting. You can specify only one address at a time.
    - » Enable/disable: User parameter switch 17, bit 1

Slide 369

- ❑ New features have been added to help the user prevent transmission to the wrong destination.

## Replacement and Adjustment

### □ FCU

- ◆ When you replace the FCU board, remove the MBU board from the old FCU board and install it on the new FCU board.
- ◆ Set the correct date and time with the User Tools:  
User Tools> System Settings> Timer Setting> Set Date/Time

### □ NOTE:

- ◆ Do not turn off the battery switch (SW1).
- ◆ Do SP6101 (Fax SP) to print the system parameters, and check the settings.

Slide 370

**No additional notes**

## FCU

### □ FACE3 (Fax Application Control Engine)

- ◆ CPU
- ◆ Data compression and reconstruction (DCR)
- ◆ DMA control
- ◆ Clock generation
- ◆ DRAM backup control

### □ Ricoh Modem and NCU Circuit

- ◆ V.34, V.17, V.29, V.27ter, V.21, and V.8
- ◆ Data transfer
- ◆ Line control
- ◆ Ringing signal/tone detection

Slide 371

**No additional notes**

## FCU

### □ DRAM

- ◆ The 16 MB of DRAM is shared as follows.
  - » SAF memory: 4 MB
  - » Page memory: 4 MB for scanning, 4 MB for printing
  - » Work area, cache: 4 MB

### □ Memory back-up

- ◆ A rechargeable battery backs up the SAF memory (DRAM) for 1 hour.

Slide 372

**No additional notes**

## MBU

- ❑ On this board, the flash ROM contains the FCU firmware, and the SRAM contains the system data and user parameters. Even if the FCU is changed, the system data and user parameters are kept on the MBU board.
- ❑ ROM
  - ◆ 3MB flash ROMs for system software storage
  - ◆ 2MB (16bit x 1MB) + 1MB (16bit x 512K)
- ❑ SRAM
  - ◆ The SRAM for system and user parameter storage is backed up by a lithium battery (battery life: 5 years).
    - » Di-C1: 256 KB
    - » Di-C1L: 128 KB

Slide 373

**No additional notes**

## MBU

### ❑ Memory back-up

- ♦ A lithium battery backs up the system parameters and programmed items in the SRAM, in case the base copier's main switch is turned off.

### ❑ Switch

- ♦ CN1: Switches the SRAM backup battery on/off.

Slide 374

**No additional notes**

## Stamp

- ☐ **SP 6010:** Adjusts the position of the stamp on the original in the sub scan direction.

Slide 375

**No additional notes**