RICOH

ATHENA-C1 TRAINING

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.

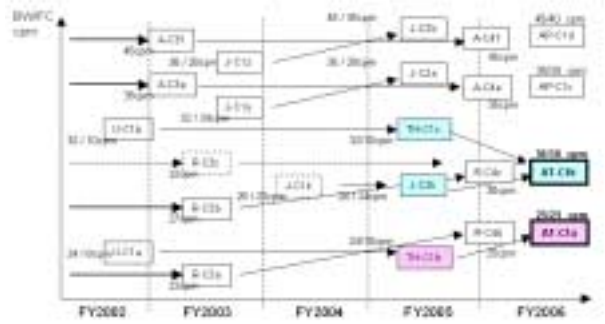
INTRODUCTION

- Here is a view of the machine with three optional peripherals installed.
- There are other options, as we will see later.

How many models?

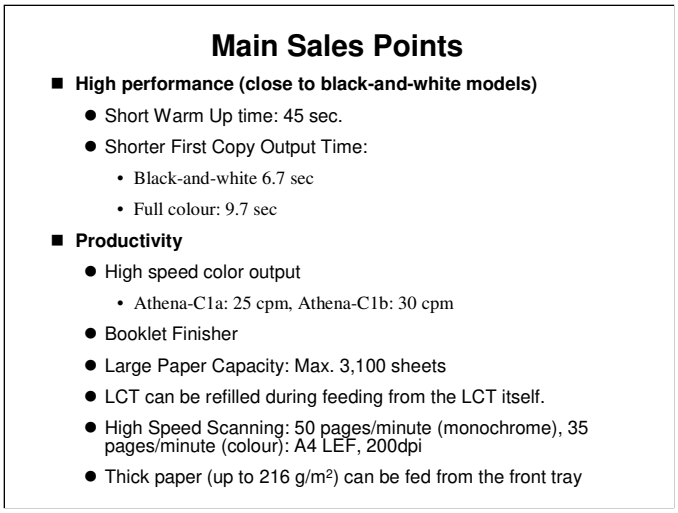
- **Two models:**
  - AT-C1a: 25 cpm
  - AT-C1b: 30 cpm
- **The speed is the only difference between the two models.**
  - Both models contain a printer/scanner kit as standard equipment.

Product Positioning

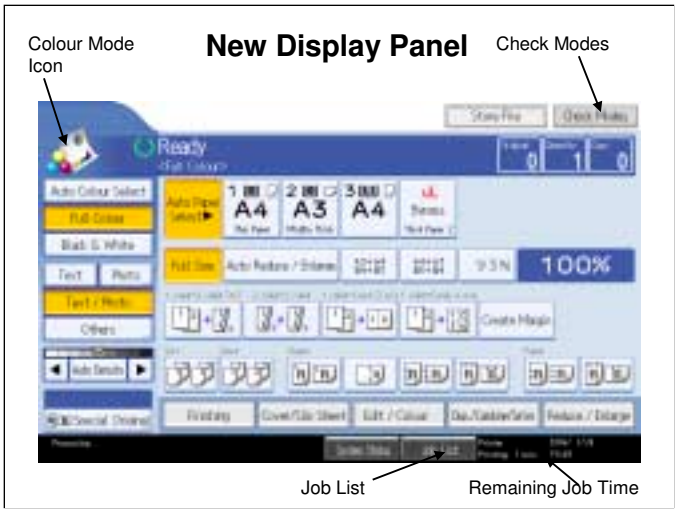


- This chart shows which machines the Athena-C1a/b could be used as alternatives or as replacements.
- The faster machine could be seen as a replacement for the slower models of the Jupiter-C1/C2 series. The Athena uses a four-PCU tandem colour copying system, like the Jupiter, so it is quite fast.

SALES POINTS

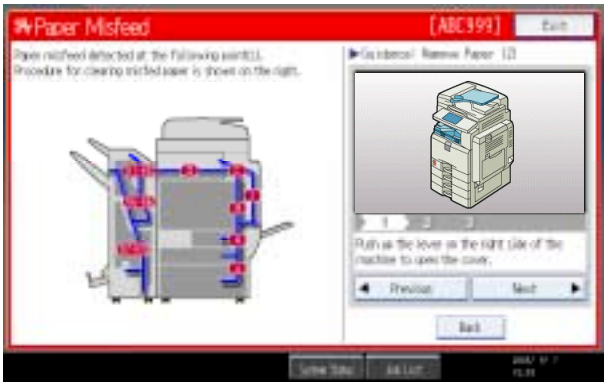


- There are also a lot of connectivity features, which we will not explain in this class. We will limit ourselves to the engine in this course.

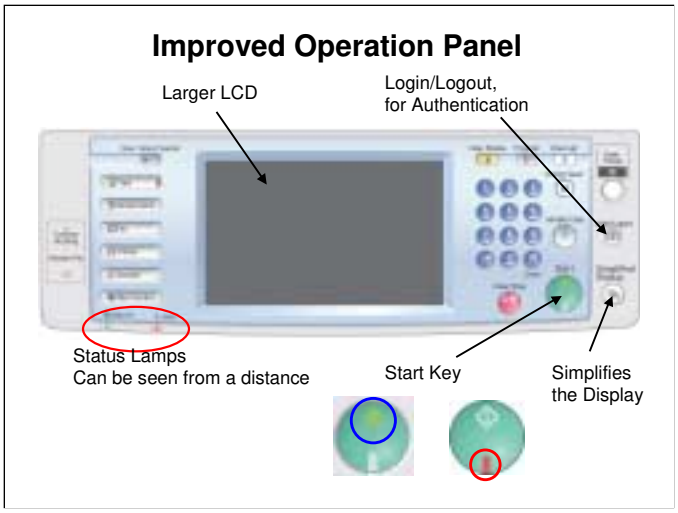


- The colour mode icon changes when you select Auto Colour Select, Full Colour, or Black and White. Ask the class to try it on the machine, if you have one set up already.
  - Other modes, such as two-colour mode, can also be shown as options on the display by adjusting machine settings.
- The Check 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



❒ For some functions, such as removing jams and replacing toner, an animated guidance appears on the screen.



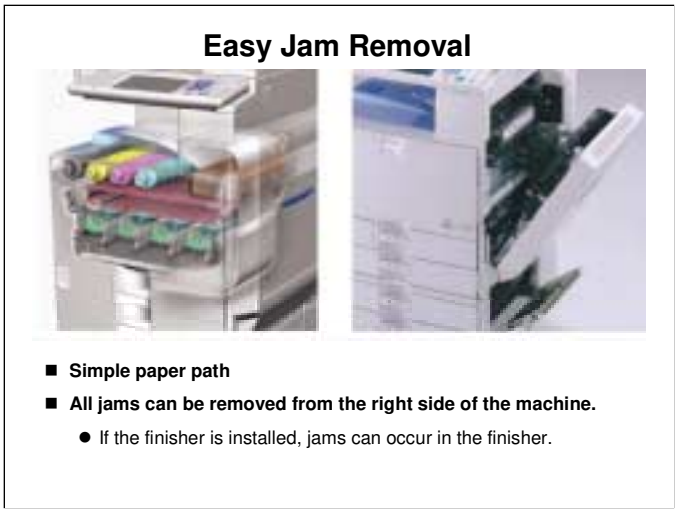
- The login/logout button makes authentication a bit easier.
- The 'simplified display' button reduces the amount of information on the LCD panel. Try it and see. The next slide gives an example.
- The red and green lamps on the Start key show clearly when the machine will or will not start.

Display

Normal Display

Simplified Display

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



❒ The photo on the left shows that the path through the machine is simple.

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.**

❒ The LED does not become lit during duplex operation.

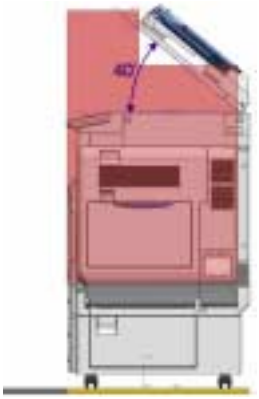
Paper Tray Handle

- **The handle can be pulled easily with an 'overhand' or 'underhand' grip.**

Replacing Toner is Easy

- **Toner cartridges can be changed with one hand, and with one movement.**

ARDF Accessibility - 1



- **To make the machine accessible to people in wheelchairs, the parts operated by users must be in the red area as shown in the diagram.**
  - USA regulations
- **Therefore, the ARDF lifting angle must be limited to within 40 degrees.**

❒ See the next slide for the next part of this story.

ARDF Accessibility - 2

- To limit the ADRF angle, these hinges will be available as service parts.

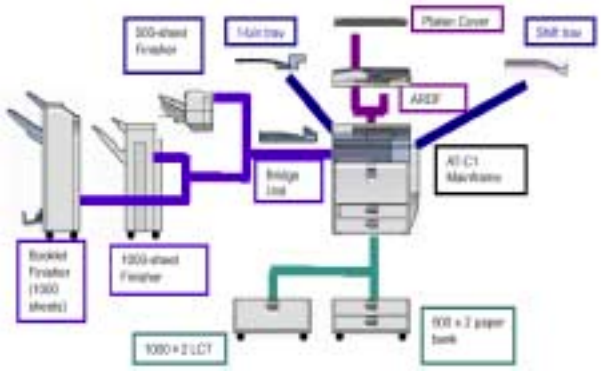
EQUIPMENT

Mainframe, with No Options

- **The machine has this equipment built in.**
  - Duplex
  - Bypass tray
  - 2x500-sheet trays
  - 500-sheet output tray
  - 8.5-inch W-VGA touch panel
  - Printer/Scanner, with USB and Ethernet
  - 1024MB Memory
  - 40GB HDD
  - PCL5c/6, RPCS
  - 10/100 BaseTX

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

Paper Handling Options



- You can install up the following:
  - The platen cover or the ARDF
  - Shift tray or one of the three finishers (a finisher requires the bridge unit)
    The 1000-sheet and booklet finishers also require the LCT or paper tray unit.
  - One-bin tray
  - The two-tray paper feed unit (also called a 'paper bank') or the LCT
- Except for the booklet finisher, all the above items are the same as those used with the TH-C1, but with a different colour for the cover.
- The booklet finisher is a new item. The booklet mechanism is the same as in the Euphrates booklet finisher for the V-C1.
- The punch unit can only be installed in the booklet finisher. The other two finishers do not have punch units.
- The platen cover is like the one that is used with J-P2+CFE, J-C1 , J-C2.
- The platen cover, two-tray feed unit, LCT, and bridge unit will also be used with the AP-C1.

Paper Handling Options

- **All the options are new, except for the 1000-sheet finisher.**
  - This is used with many other models (for example, A-C3, U-C1).
- **The shift tray cannot be installed in the same machine as a finisher.**
  - To install a finisher, the bridge unit must be installed, and this goes in the same place as a shift tray.
- **If the 1000-sheet or booklet finisher is installed, you must also install the LCT or paper feed unit.**
  - If not, the paper exit from the copier will not be at the correct height to go into the finisher.

Fax Options

- **Fax Option: New Item**
- **Optional G3 unit : New Item**
- **SAF memory (32MB): Same as J-C2/TH-C1**
- **Handset: Same as J-C2/TH-C1**
- **Fax Stamp Ink: Same as A-C3, J-C1**

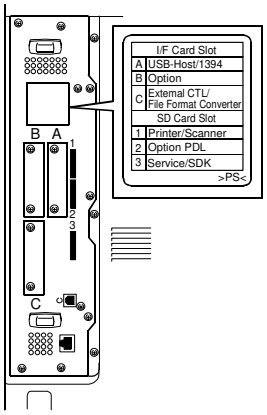
Printer/Scanner Options (1)

- **Printer/scanner is a standard part of the machine, not an option.**
  - USB and Ethernet are built in.
- **Wireless LAN (IEEE 802.11b): Same as J-C2, TH-C1**
- **IEEE 1284: Same as J-C2, TH-C1**
- **IEEE 1394: Same as J-C2, TH-C1**
- **Bluetooth: Same as K-C2.5, PG-C1, MT-C3, B-C3, AP-C1**
- **PostScript3 option: New Item**
  - Required to use the PDF Direct Print Function

Printer/Scanner Options (2)

- **USB Host: New, also used with PG-C1, MT-C3, B-C3**
  - Required to attach PictBridge
- **Media Link Board: New, also used with PG-C1, MT-C3, B-C3**
- **Video Link Board : New, also used with MT-C3, B-C3**
  - Required to attach the Fiery controller
- **PictBridge: New (enables direct printing from a digital camera)**

Printer/Scanner Options



- **In this model, the IEEE 1394 option goes in a different slot from the other printer interface options.**
  - IEEE1394 interface: Slot A
  - IEEE1284, IEEE802.11 (Wireless LAN), or Bluetooth: Slot B
- **Because of this, two of the printer interface options can be installed in this model.**
  - IEEE1394 and one other.

❒ This is different from previous models.

Security Options

- **HDD Data Overwrite Security Unit: Also used with J-C2, TH-C1**
- **Copy Data Security Unit: Also used with A-C4, R-C4**

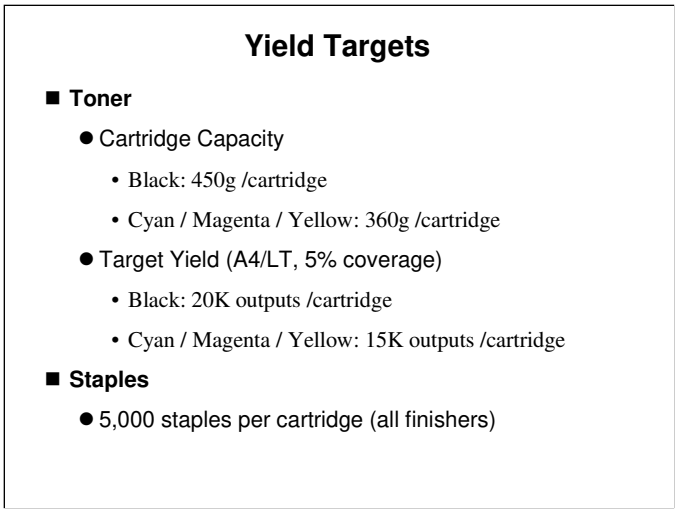
Other Options

- **Java VM Card: New Item, also used with MT-C3, B-C3**
- **Web Browser Option (SDK): New Item, also used with MT-C3, B-C3**
- **Optional counter Interface: New Item**
  - This is a 20-pin interface. It is required when you attach a key counter.
- **Key Counter Bracket: Also used with J-C2**
- **NRS interface: New item**

TARGETS

Reliability Targets

- **Unit life (2 prints per job): 1200K or 5 years**
- **Average Copy Volume per month (copy + fax + print):**
  - Athena-C1a: 5K
  - Athena-C1b: 8K
- **Max Copy Volume per month: 20K (Target Color Ratio: 30%)**
- **PM cycle: 80K (Target Color Ratio: 30%)**



- The toner bottles are not compatible with other products.
- The staple refill cartridges are compatible with those used in the U-C1, TH-C1, and J-C2.
- The set staple cartridges are also compatible for the above models, except for the booklet finisher. The cartridge for that finisher is not compatible.

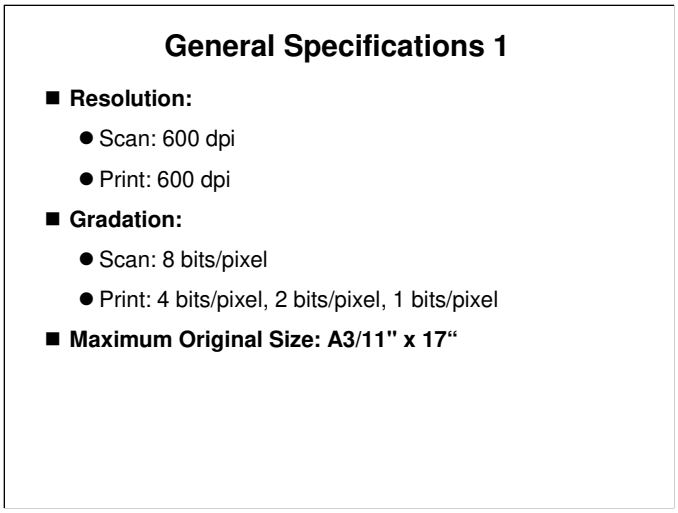
Replacement for PCU Components

	80 k	160 k	240 k	320 k
Drum unit	**Yes**	**Yes**	**Yes**	**Yes**
Developer		**Yes**		
Development unit				**Yes**
PCU				**(Yes)**

- **At 320 k, you can do either of the following (depending on your local service policy):**
  - Replace the PCU as a complete unit.
  - Replace the individual components (drum unit, development unit). The new development unit contains developer.

❒ At the moment, CMY development units are EM parts, not PM parts. It is not clear how this will be handled at this time.

❒ Go through the machine's specifications, using the slides. Emphasize the points listed below.



- 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:**
  - Tray 1: A4/8.5" x 11" (LEF)
  - Tray 2: Min A5 (LEF)/8.5" x 11“, Max A3/11" x 17"
  - By-pass: Min 90 x 148 mm, Max 305 x 600 mm/12" x 23.6"
  - Optional Tray: Min A5 (LEF)/8.5" x 11“, Max A3/11" x 17"
  - LCT: A4/8.5" x 11" (LEF)
- **Printing Paper Weight:**
  - Standard tray: 60 to 216 g/m^2 (16 to 57 lb.)
  - Optional paper tray: 60 to 216 g/m^2 (16 to 57 lb.)
  - By-pass tray: 60 to 253 g/m^2 (16 to 67 lb.)
  - Duplex unit: 64 to 169 g/m^2 (17 to 45 lb.)

Print Paper Size

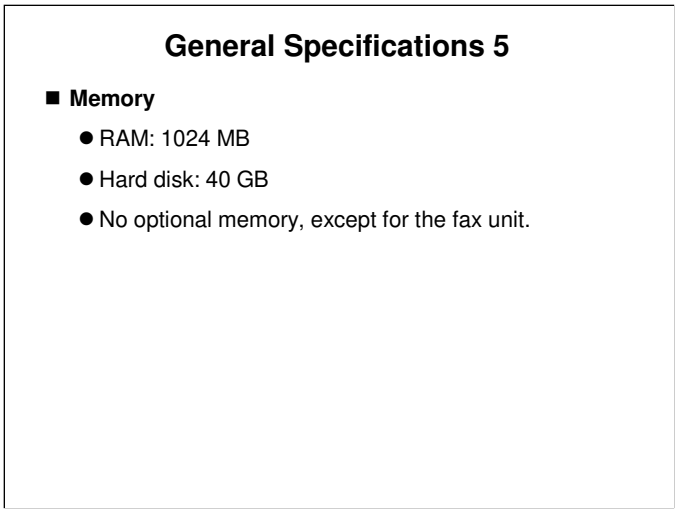
❒ For details, refer to “Supported Paper Sizes” in the service manual.

General Specifications 3

- **Print Paper Capacity (80 g/m^2, 20 lb):**
  - Standard tray: 500 sheets x 2
  - By-pass tray: 100 sheets
  - Optional paper feed tray: 500 sheets x 2
  - LCT: 2000 sheets
- **Output Paper Capacity:**
  - Standard exit tray: 500 sheets (face down)
  - Shift tray: 250 (80 g/m^2)/125 (B4/LG or more) sheets
  - 1-bin Tray: 125 (80 g/m^2)
  - 500-sheet finisher: 500 sheets (80 g/m^2)
  - 1000-sheet finisher 250 + 1000 sheets (80 g/m^2)
  - 1000-sheet booklet finisher: 100 + 1000 sheets (80 g/m^2)

General Specifications 4

- **Copy speed**
  - Normal (ADF 1 to 1, LT/A4 LEF):
    - C1a: 25 cpm (color or black & white
    - C1b: 30 cpm (color or black & white)
  - OHP/Thick
    - Both models: 16 cpm (color/black & white)
- **First copy (normal mode):**
  - Color: 9.7 seconds or less (A4/LT LEF)
  - Black & white: 6.7 seconds or less (A4/LT LEF)
- **Warm-up time: 45 seconds or less (23 °C, 50%)**



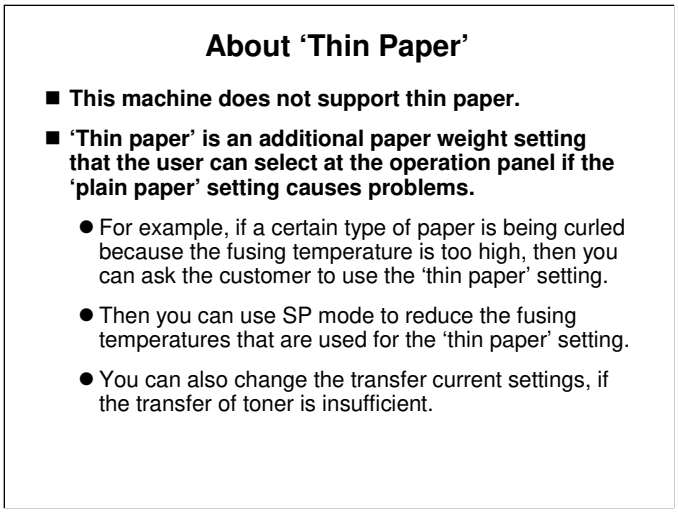
- The memory is standard. There is no optional additional memory for the copier.
- The fax option has an additional memory module. The purpose is explained in the Fax section of the course.

Thick Paper Productivity

Model	Mode	Paper Thickness (g/m^2)	BK CPM	FC CPM
AT-C1a	Thin Paper	60	25	25
	Plain Paper	60-81	25	25
	Middle Thick	-105	25	25
	Thick Paper 1	-169	16	16
	Thick Paper 2	-219	16	16
	Thick Paper 3	-253	16	16
AT-C1b	Thin Paper	60	30	30
	Plain Paper	60-81	30	30
	Middle Thick	-105	30	30
	Thick Paper 1	-169	16	16
	Thick Paper 2	-219	16	16
	Thick Paper 3	-253	16	16

Why is the paper weight for thin paper only 60 g/m2?

- ❒ This machine does not support thin paper.
- ❒ For details about how to use this setting, see the next slide.



❒ Copy quality is not guaranteed for thin paper, and wraparound jams can occur in the fusing unit.

Product Comparison

		AT-C1a/b	TH-C1b/c	J-C2k/a
Configuration		Desk Top	Desk Top	Desk Top
Dimension (W x D x H)		650 x 654x 740 mm	550 x 682 x 781mm	6 7 0 x 698 x 859mm
Weight		120kg	85kg	120kg
Scan Resolution		600x600dpi	600x600dpi	600dpi
Copy/Print Resolution (dpi)		Copy:600x600 Print:600x600 (4bit)	Copy:600x600 Print:600x600 (2bit)	Copy: 600x600 Print:1200x1200 600x600 (2bit)
Max Print Paper Size		12"x18"	12"x18"	12"x18"
Paper Weight		52-253g/m^2	64-163g/m^2 17-43 lbs	60-163g/m^2 16-43 lbs
Paper Feeding Capacity (80g/m^2)	Std	1100sheets	500sheets	1,100sheets
	Max.	3,100sheets	2,600sheets	3,100sheets

- Note that this model (AT-C1) can handle a wider range of paper weights than other colour models in the same market segment.

Product Comparison

		AT-C1a/b	TH-C1b/c	J-C2k/a
Copy Speed (A4/LT LEF)		BW: 25/30cpm FC: 25/30cpm	BW: 24/32cpm FC: 10cpm	BW: 28/35cpm FC : 24/28cpm
1st Copy Speed		BW 6.7sec. FC 9.7sec.	BW 7.8sec. FC18.0sec.	BW 8.0sec. FC10.0sec.
Warm-up Time		45sec.	99sec.	99sec.
Multiple Copy		1-999	1 – 100	1 – 999
Duplex		Standard	Option *2	Standard
HDD	Std.	40GB	40GB	80GB
	Max.	40GB	40GB	80GB
Memory	Std.	1,024MB	768MB	1,024MB
	Max.	1,024MB	768MB	1,024MB
Booklet Finisher		Yes	No	Yes

- ❒ The copy speed is faster for full colour copying.
- ❒ The 1st copy speed is faster.
- ❒ The warm-up time is shorter.

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ATHENA-C1 TRAINING

INSTALLATION

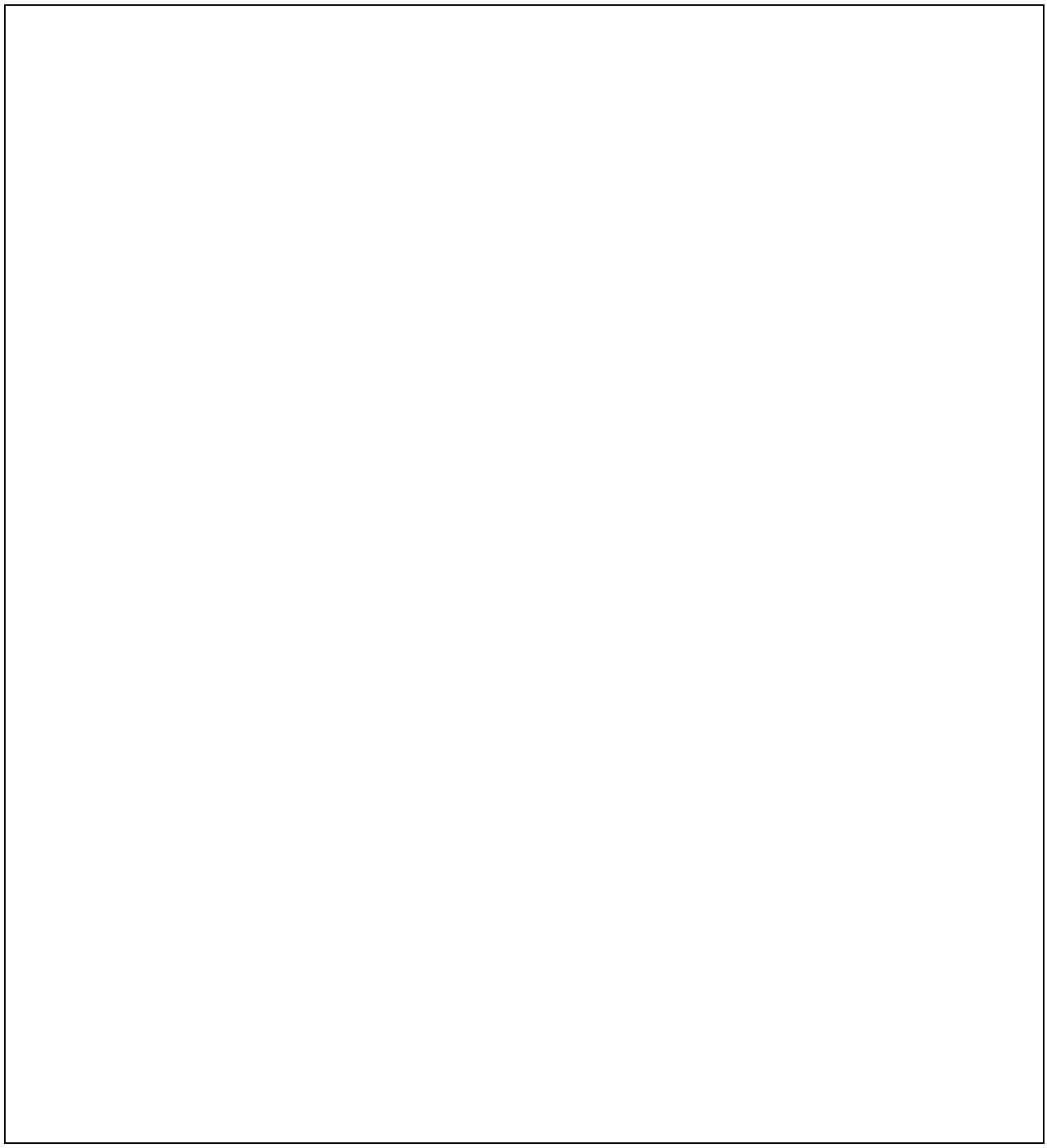
❒ In this section, get the trainees to install the machine and all the options.

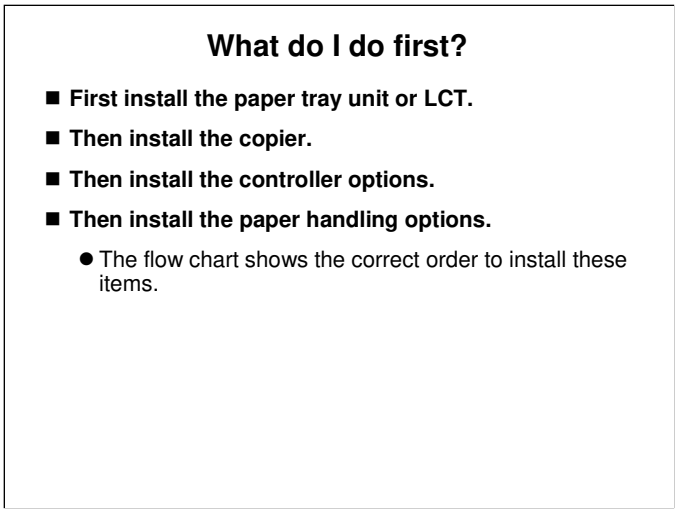
Service Manual section 1

❒ Install at least one machine with all options as a complete system.

❒ Make sure that the class follows all notes and cautions in the procedures.

OVERVIEW





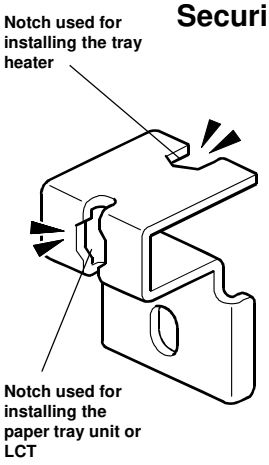
B230 Service Manual, Installation, Copier Installation, Installation Flow Chart

PAPER TRAY UNIT, LCT

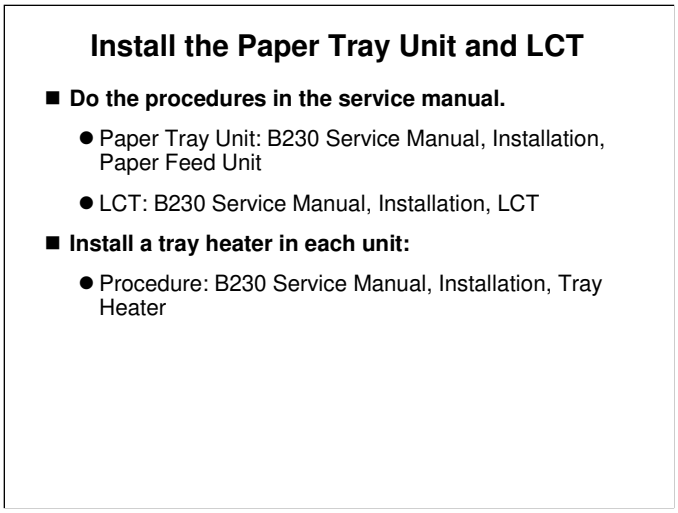
Important Notes

- **You must lift the copier and put it on top of the paper tray unit or LCT.**
  - 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 or LCT installed. You will damage the lifting handles.

Securing Brackets



- **The securing bracket contains two notches.**
  - One of these notches is used as a tool when you install the paper tray unit or LCT.
  - The other notch is used as a tool when you install the tray heater.
  - So, do not install the securing brackets until after you install the tray heater.



B230 Service Manual, Installation, LCT/Paper Feed Unit

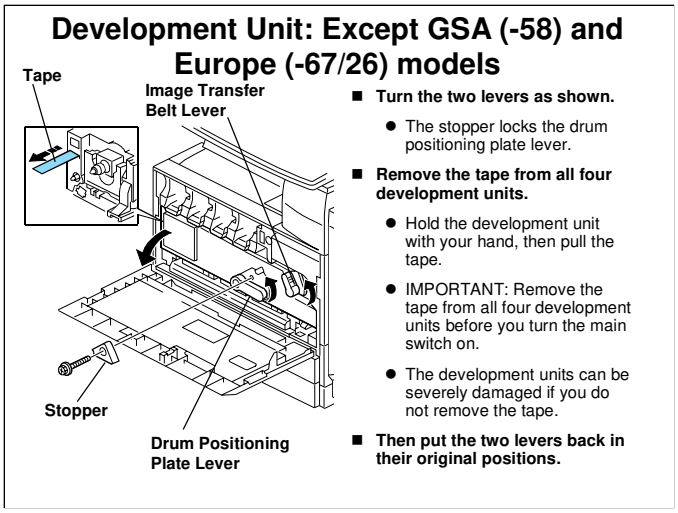
- ❒ Ask the class to install the Paper Tray Unit and the LCT.
- ❒ Only one can be installed on each machine at the same time, so install them on different machines in the classroom.
- ❒ Make sure that all students get a chance to install each unit.

B230 Service Manual, Installation, Tray Heater

- ❒ Install a tray heater in each unit, so that the class understands how to use the securing bracket (see the previous slide).
- ❒ If the location has a high humidity, it may be necessary to install tray heaters.
- ❒ Unlike the Bellini-c3, there is only one way to connect the heaters.

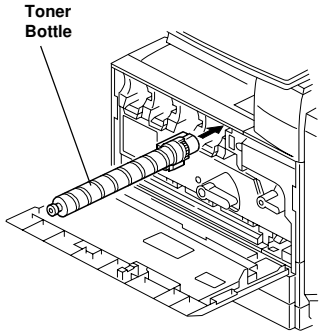
MAIN COPIER – IMPORTANT POINTS ABOUT INSTALLATION

- ❒ First, we will look at important points about installing the copier.
- ❒ Then you will install your copier and peripherals.



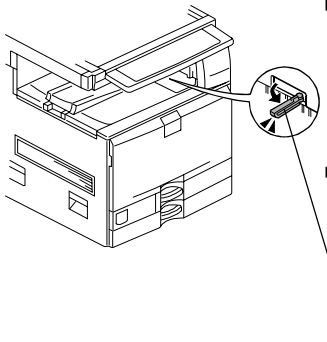
❒ In European and GSA (USA government) models, the tape is removed at the factory. So steps 2 to 7 of this part of the installation procedure are not needed.

Toner Bottles



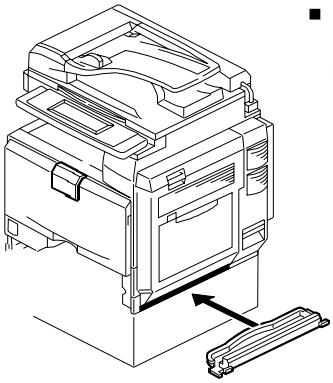
- **Shake each bottle 5 or 6 times before you install it.**

Paper Trays

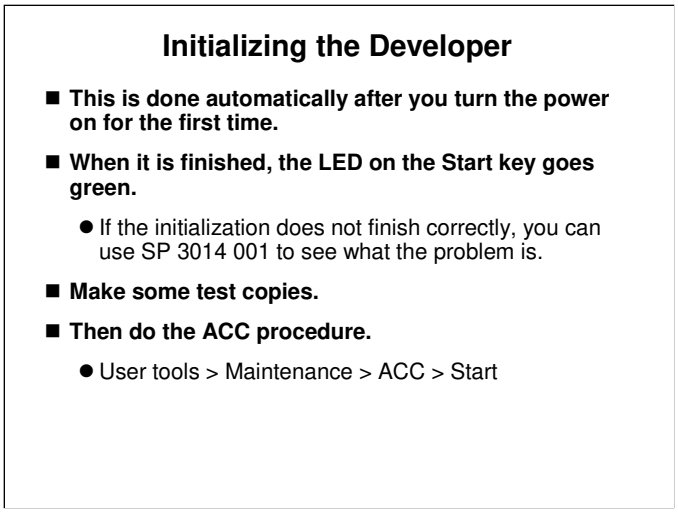


- **Make sure the guides are at the correct positions for the paper size used by the customer.**
  - The service manual explains how to adjust the guides.
- **Pull out the feeler for the output tray full detection mechanism.**

Fire Prevention Cover

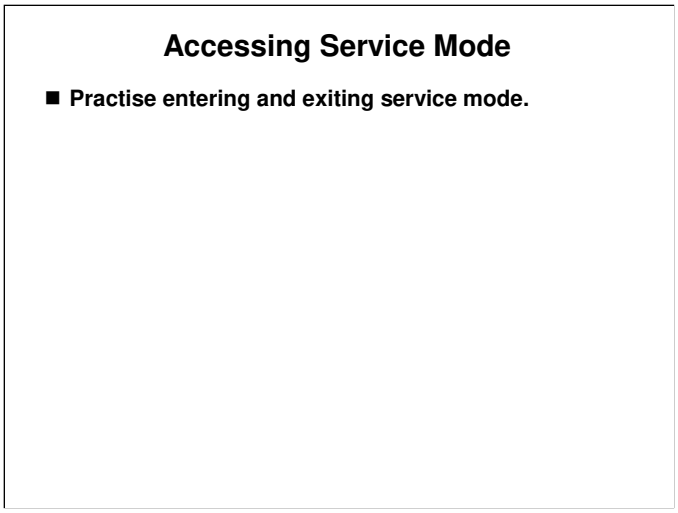


- When the copier is installed on the floor without the optional paper tray unit or a table, attach the cover at the right side of the copier.



B230 Service Manual, Troubleshooting, Process Control Error Conditions

- ❒ When you turn on the machine, it is not necessary to check if the cover is open or closed.
- ❒ SP 3014 001: A code is displayed. See the above section of the service manual for details.



B230 Service Manual, Service Tables, Service Program Mode

❒ Make sure that everybody knows how to access SP mode.

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'.
  - NOTE: You can set this one time only.
- **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 other supplies.
  - These names appear on the screen when the user presses the Inquiry button in the user tools screen.

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

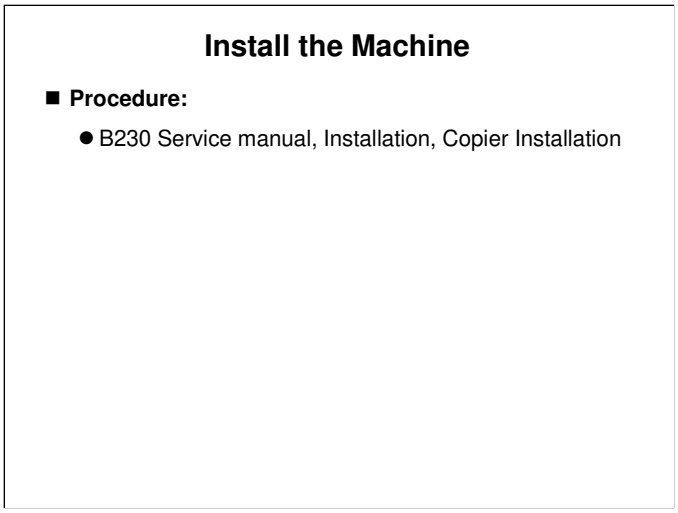
SP Settings (2)

- **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 formatting is not necessary.

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

INSTALL THE COPIER

❒ The class will now install their machines.



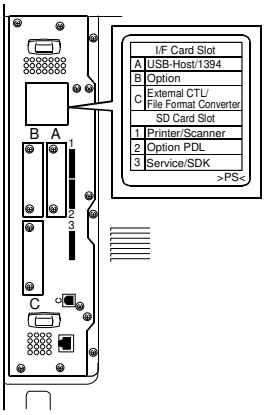
- First, have the trainees install their machines.
- Make sure that the class follows all notes and cautions in the procedures.
- Why is there no circuit breaker in this machine? Other colour copiers have them.
  - This machine was designed so that electrical leaks do not occur, and so a circuit breaker is not necessary. In the other models, a circuit breaker is installed because there is a chance that leaks may occur. The B230 series has extra safety measures built in.

INSTALLING THE CONTROLLER OPTIONS

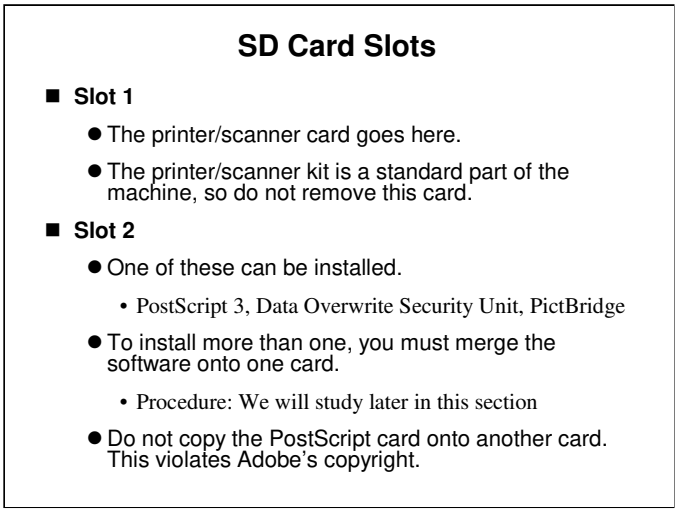
Why do we Install These Now?

- **If you install some of the paper handling options first, it will be necessary to remove them before you can install the controller options.**
  - In particular, if you install a finisher, some of the slots for controller options will be impossible to access, and you must remove the finisher to install the controller options.

Controller Options - Purpose of the Slots



- **3 slots for boards**
  - A: USB Host interface, or IEEE1394 interface
  - B: IEEE1284, IEEE802.11 (Wireless LAN), or Bluetooth
  - C: File format converter
- **3 slots for SD cards**
  - Slot 1: Used for the standard printer/scanner application only.
  - Slot 2: Used for one of the optional applications:
    - PostScript 3, Data Overwrite Security Unit, PictBridge
  - Slot 3: Used for installing the Browser Unit, or for service only (for example, updating the firmware).

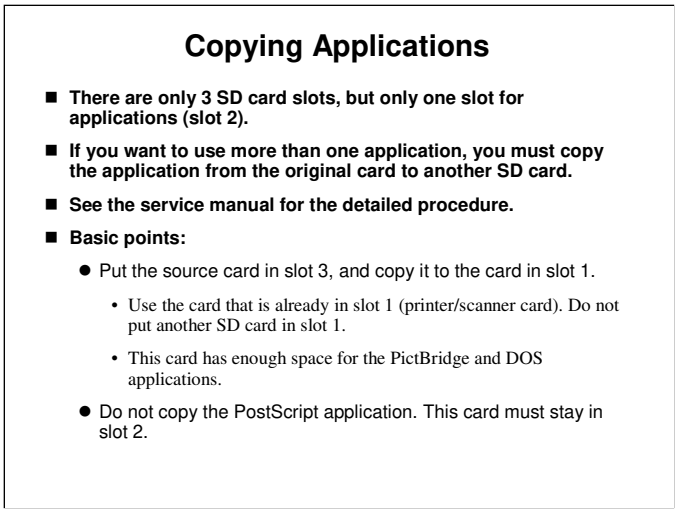


- ❒ Slot 2 is the only SD card slot available for applications.
- ❒ You can copy applications from slot 3 to a card in slot 1 or slot 2. If you use slot 1, you can only copy to the printer/scanner card that is already in slot 1. Do not put another SD card in slot 1.

SD Card Slots

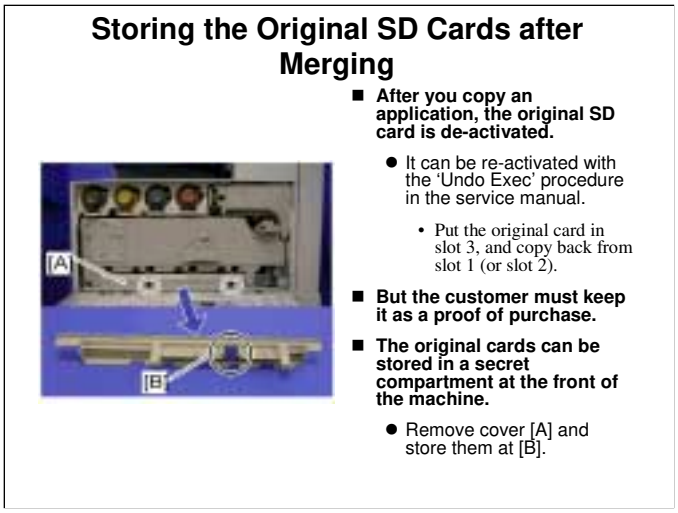
- **Slot 3**
  - It is used for installing new firmware.
  - It is also used during the installation procedure for the browser unit.
    - The machine copies firmware from the SD card to the hard disk during the procedure.
    - You must remove the SD card from slot C3 after you install the browser unit.

❒ Slot 2 is the only SD card slot available for applications.



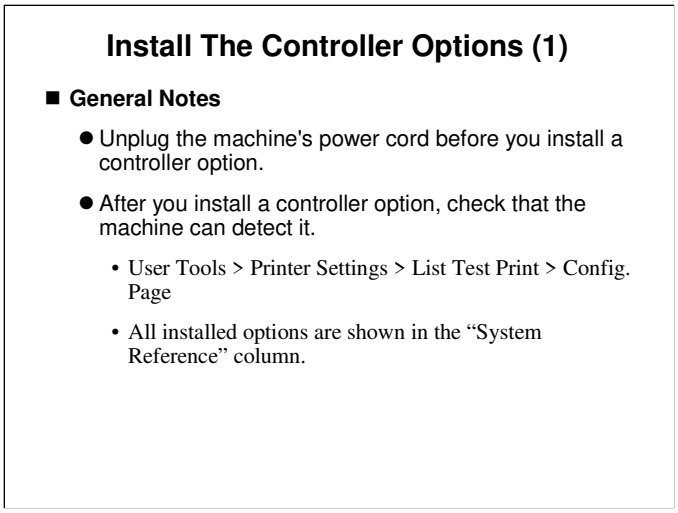
Procedure: B230 Service Manual, Installation, Controller, SD Card Appli Move

- For this model, the printer/scanner card in slot 1 has enough space for the PictBridge and the DOS applications. Use the card that is already in slot 1 (printer/scanner card). Do not remove the printer/scanner card from slot 1.
- If you want to use slot 2, you must first turn the machine power off, remove the SD card from slot 1, and turn the power on again. You can then do the procedure, and the application will go to the card in slot 2.
- The procedures in the manual assume that you use slot 1.



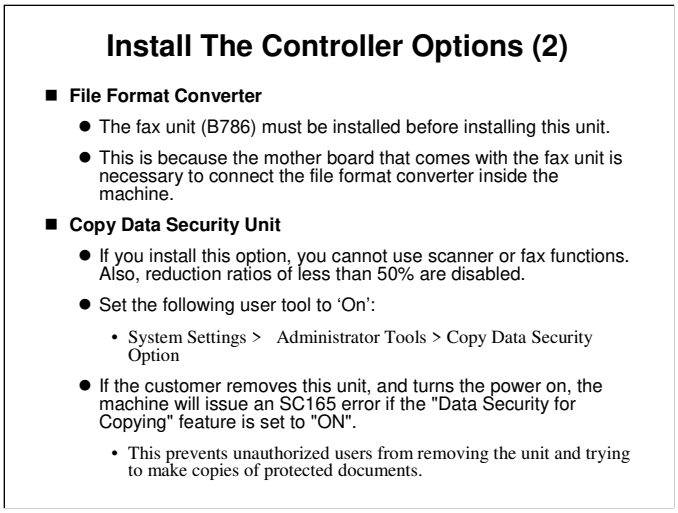
B230 service manual, Installation, Controller Options, SD Card Appli Move

❒ If you want to use slot 2, you must first turn the machine power off, remove the SD card from slot 1, and turn the power on again. You can then do the procedure, and the application will be copied froms the card in slot 2.



B230 service manual, Installation, Controller Options

❒ Have the class install these options. They should study the installation procedures, and do as many of them as possible.

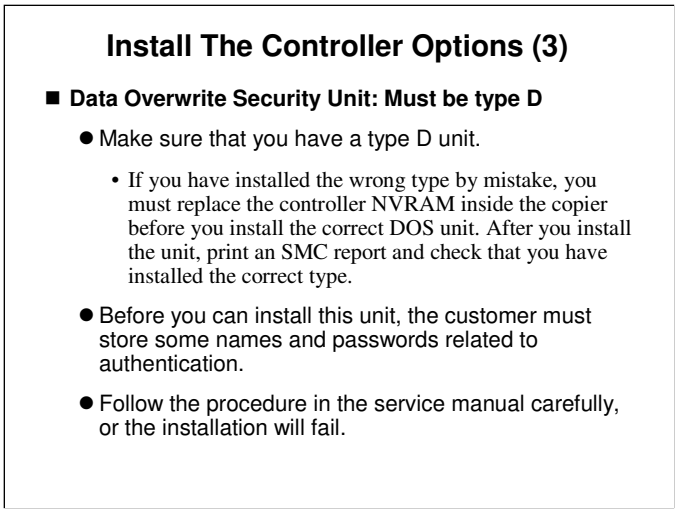


B230 service manual, Installation, Controller Options

❒ Have the class install these options. They should study the installation procedures, and do as many of them as possible.

What does the Copy Data Security Unit do?

❒ The machine makes gray-out output and sounds the buzzer when making copies of prints that are printed with the RPCS driver with “Unauthorized Copy Prevention”.



B230 service manual, Installation, Controller Options

❒ Have the class install these options. They should study the installation procedures, and do as many of them as possible.

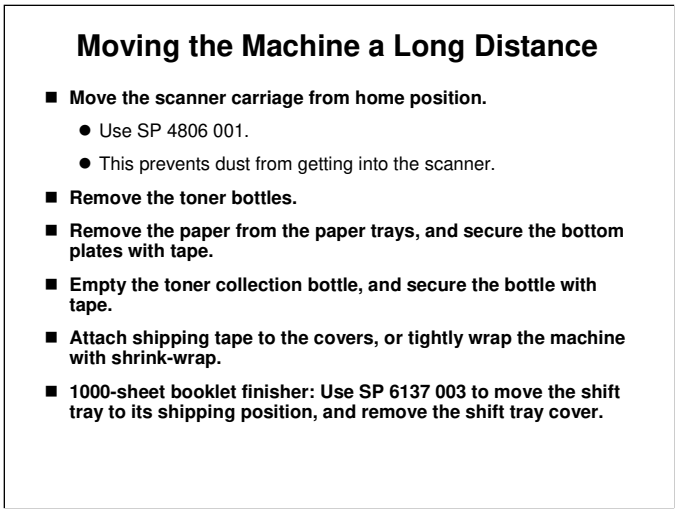
TRANSPORTING THE MACHINE

B230 Service manual, Installation, Copier Installation

Moving the Machine a Short Distance

- **Remove all trays from the optional feed unit or LCT.**

B230 Service manual, Installation, Copier Installation, Moving the Machine



B230 Service manual, Installation, Copier Installation, Transporting the Machine

- To move the shift tray to the shipping position, you can also use dip switches, as explained in the service manual for the booklet finisher.
- There are no SP or dip switch settings for the other finishers.

After Moving the Machine a Long Distance

- **Do the "Auto Color Registration" as follows. This optimizes color 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 2-194-10 to -12.
- **Make sure that the side fences in the trays are correctly positioned, to prevent color registration errors.**

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

B230 Service Manual, Troubleshooting, Process Control Error Conditions
B230 Service Manual, Troubleshooting, Troubleshooting Guide

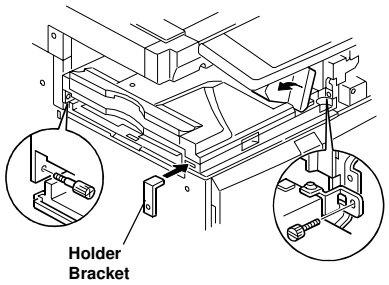
❒ For SP 2194, see these sections of the service manual.

**PAPER HANDLING OPTIONS –
IMPORTANT POINTS**

What Order do I Install These In?

- **The best order is as follows:**
  - One-bin tray
  - Shift tray
  - Bridge unit
    - Must be installed if you will install a finisher, or the paper cannot be fed to the finisher.
  - Finisher (and Punch Unit if applicable)
    - The punch unit can only be installed in the 1000-sheet booklet finisher.
  - ARDF or Platen cover

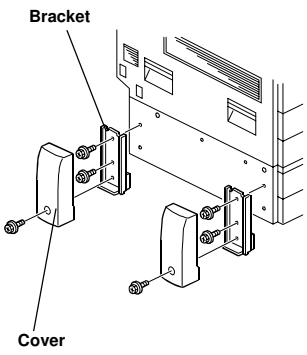
Installing the Bridge Unit



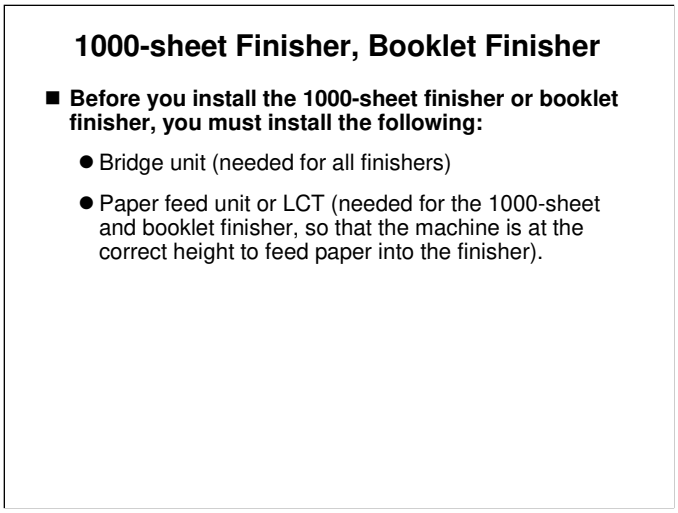
- If you cannot install the finisher immediately, install the holder bracket as shown.
- If you do not do this, then the user could damage the bridge unit if they pull up the bridge unit tray.
- When you install the finisher, you will need this bracket during the installation procedure.

❒ The holder bracket is item 4 in the accessories. This is used in the finisher installation. But, we should install this bracket when we install the bridge unit, if we do not install a finisher immediately. If not, the users could break the bridge unit if they push the machine using the bridge unit as a pushing place.

Support Brackets for the 500-sheet Finisher

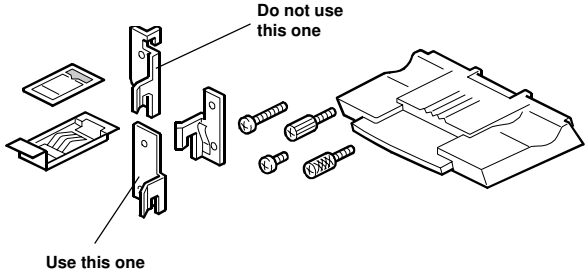


- Install the support brackets and coverts if the optional LCT or paper tray unit is installed.
- These support brackets can prevent the machine from falling to the left side.



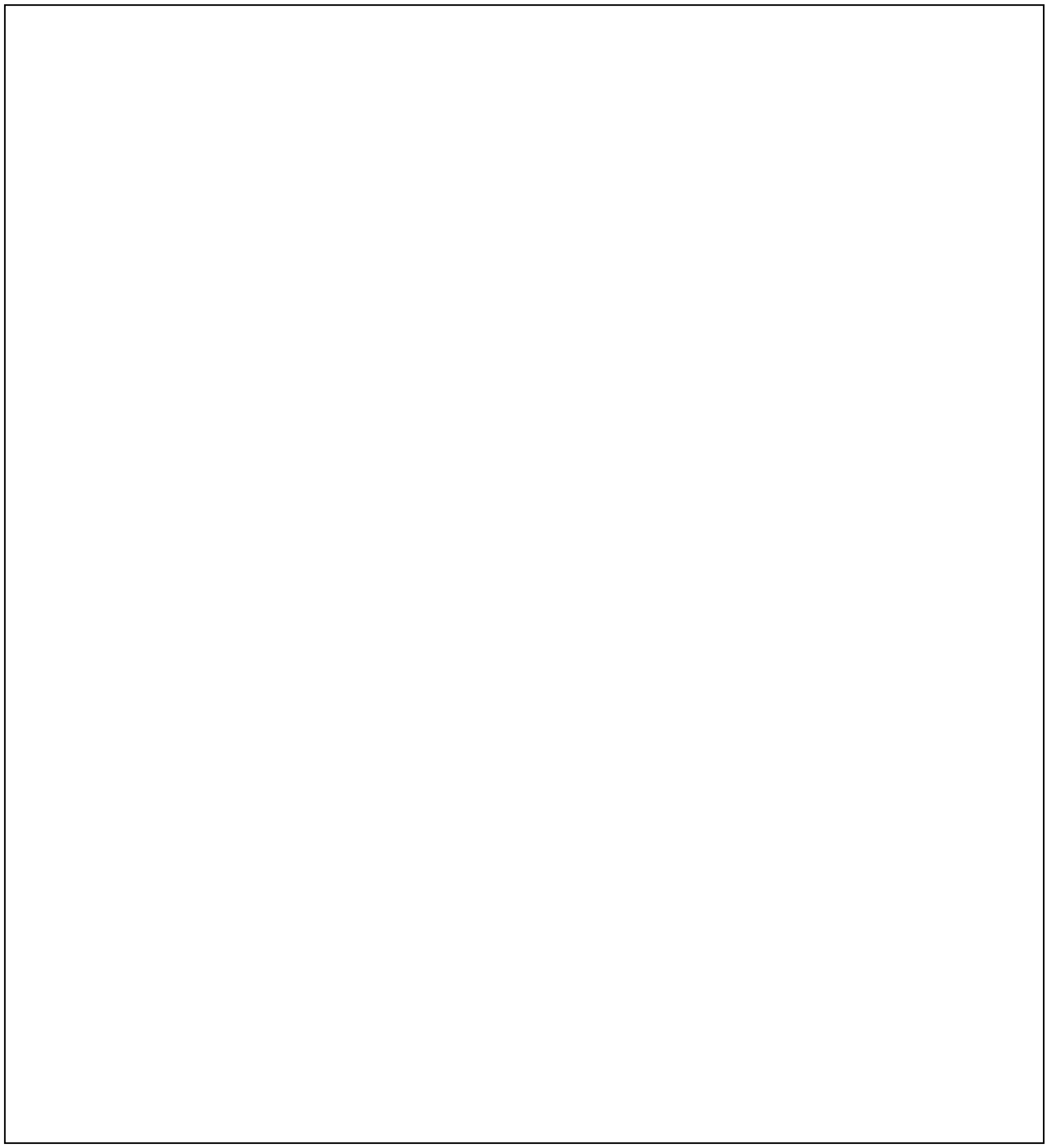
- ❒ All finishers require the bridge unit.
- ❒ The 500-sheet finisher does not require the paper feed unit or LCT.
- ❒ If the 1000-sheet and booklet finishers do not have the paper feed unit or LCT, the paper exit from the copier main body is not at the correct height to feed paper into the finisher.

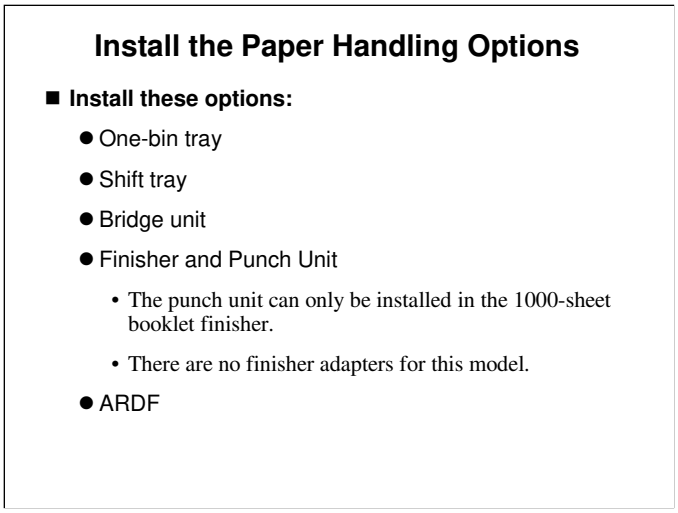
1000-sheet Finisher: Rear Joint Bracket



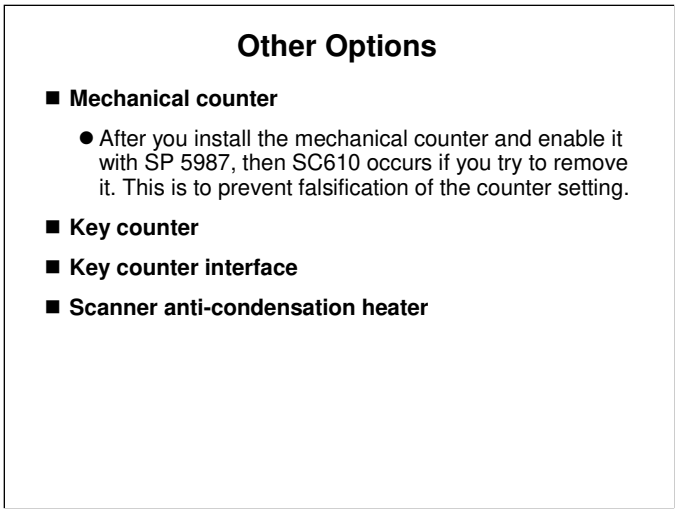
- Use the correct 'rear joint bracket'.
- The other one is for use with another copier model.

INSTALL THE PAPER HANDLING OPTIONS





- ❒ Now, have the trainees install the options, in the order given on the slide.
- ❒ Ensure that all members of the class practice installing each option.
- ❒ Make sure that the class follows all notes and cautions in the procedures.



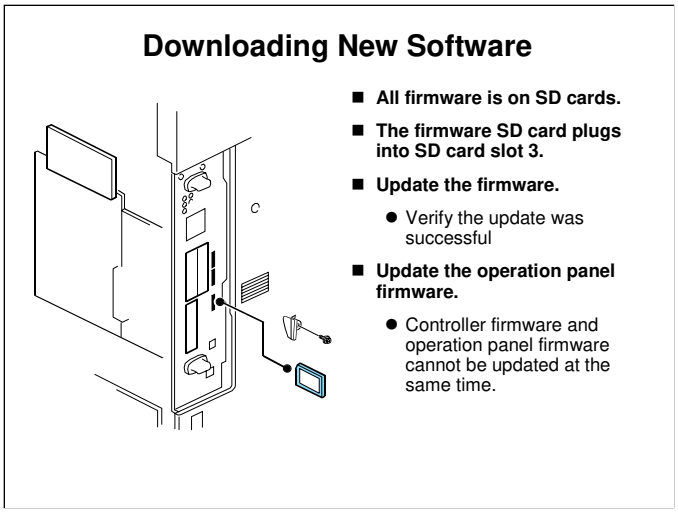
❒ If there is time, ask the class to install these items.

UPDATING THE FIRMWARE

UPGATING THE FIRMWARE

B230 service manual, service tables, Firmware Update

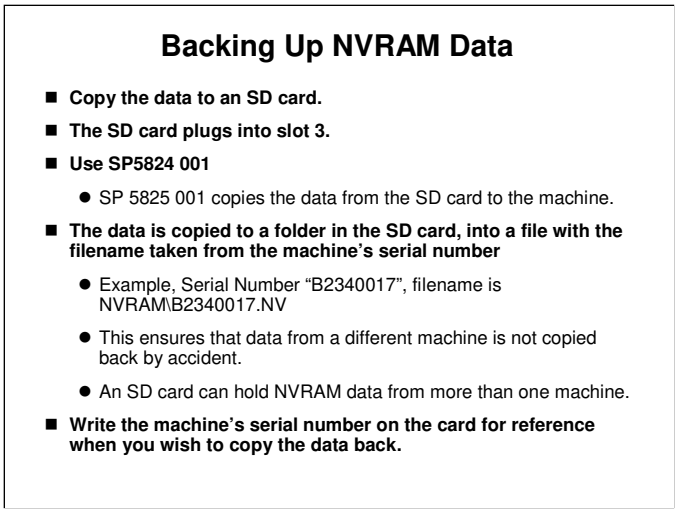
❒ The class will now install the latest firmware in the machine.



- ❒ Make sure that the class reads the 'Before you Begin' section, which explains how to handle SD cards.
- ❒ The 'Updating Firmware' section has the main firmware download procedure. Have the class try it on their machines.
  - ➢ 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.

Notes

- ❒ The Engine module contains firmware for the line position adjustment process.
- ❒ The finisher module is for the booklet finisher only.



B230 service manual, service tables, Firmware Update, 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

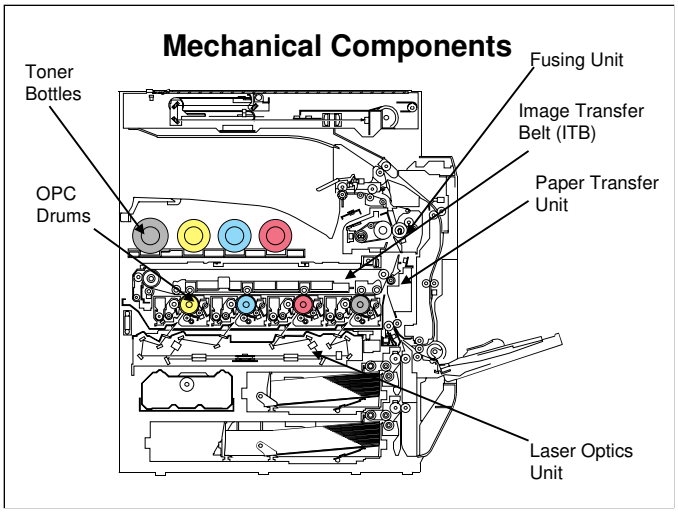
- **Copy the data to an SD card.**
- **The SD card plugs into slot 3.**
- **Use SP5846 051**
  - SP 5846 052 copies the data from the SD card to the machine.

B230 service manual, service tables, Firmware Update, Address Book Upload/Download

RICOH

ATHENA-C1 TRAINING

MACHINE OVERVIEW



B230 service manual, Detailed Section Descriptions, Overview

- ❒ 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.

This looks weird - Why are the toner bottles in a different order, from left to right, than the OPC drums?

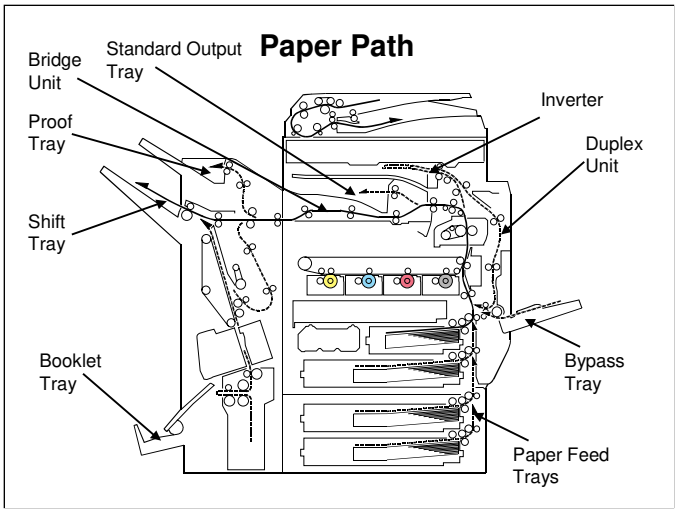
- ❒ The black toner bottle is bigger, so it cannot be put at the right hand end of the toner bottle rack (the bottle is too big), so it is at the left end.

Mechanical Component Overview (1)

- **Laser optics unit**
  - There are four lasers, and four sets of optics. One for each toner color (KYCM). Each polygon mirror reflects light from two LD units.
- **PCU**
  - There are four units, one for each toner color. Each PCU includes a drum unit and a development unit.
- **Toner bottles**
  - Toner is supplied from the toner bottles to the development units by toner supply pumps (one for each colour).

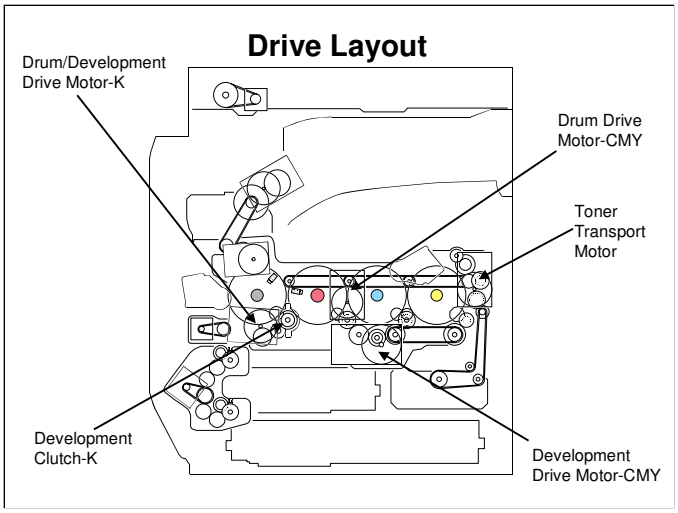
Mechanical Component Overview (2)

- **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.



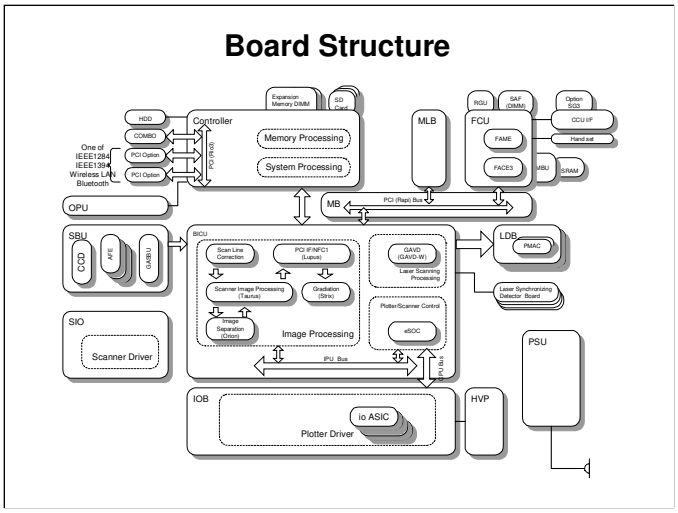
B230 service manual, Detailed Section Descriptions, Overview, Paper Path

- This shows the path of paper through the machine, with an optional booklet finisher 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
  - To the finisher, via the bridge unit.
  - Out through the finisher's proof tray, shift tray, and booklet tray.



B230 service manual, Detailed Section Descriptions, Overview, Drive Layout

- This shows the main motors in the machine.
- The service manual describes the functions of each of these motors, and other components not shown on this slide. Also, we shall see each mechanism in detail during the training course.
- Notes:
  - The PCU 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.
  - The toner transport motor does a lot of things. It drives the toner attraction pumps and the toner collection coils from the PCUs, from the transfer belt unit, and inside the toner collection bottle. Also rotates the toner bottles.

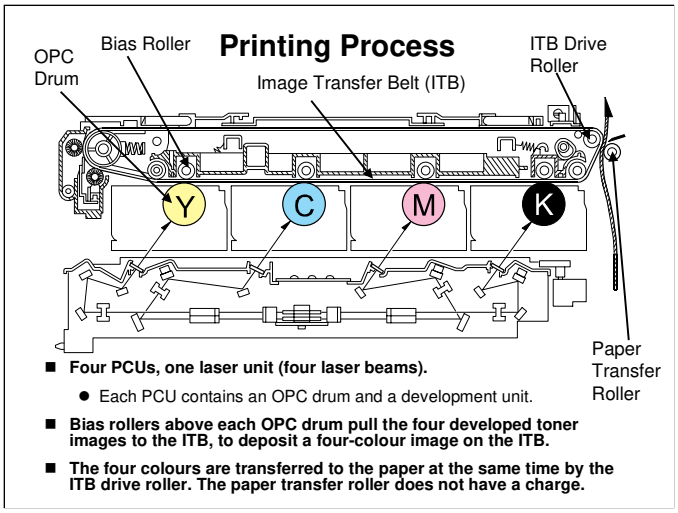


B230 service manual, Detailed Section Descriptions, Overview, Board Structure

- This shows a schematic of the electrical layout of the machine.
- The service manual has details about what the components do, and what the acronyms mean (such as BICU). The main points are on the next slide.

Main Boards

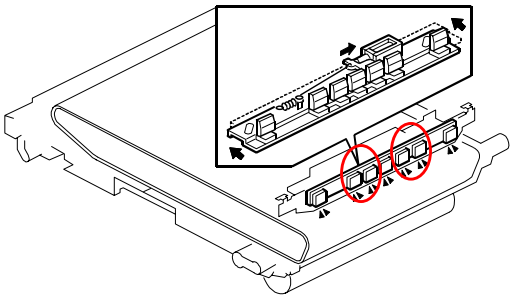
- The BICU is the main board. It contains 6 CPUs to control the machine.
- The controller handles the network and printer interfaces, and the operation panel.
- The SBU contains a CCD.
- The IOB contains driver circuits for motors.
- The motherboard connects the FCU board to the BICU. The mother board is supplied with the optional fax unit.
- The FCU (fax controller unit) controls the fax option.



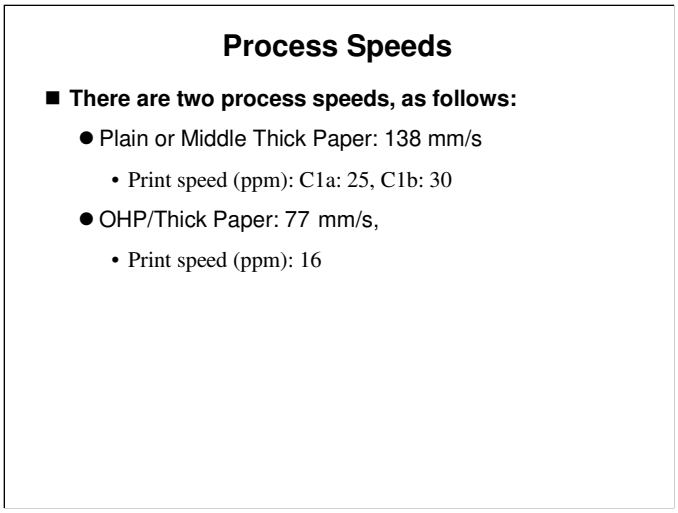
B230 service manual, Detailed Section Descriptions, Overview, Printing Process

- ❒ Here is a close-up of the main print engine.
- ❒ More details of the printing process are in this section of the manual.
- ❒ The ITB drive roller pushes the toner from the ITB onto the paper. The paper transfer roller does not pull the toner.

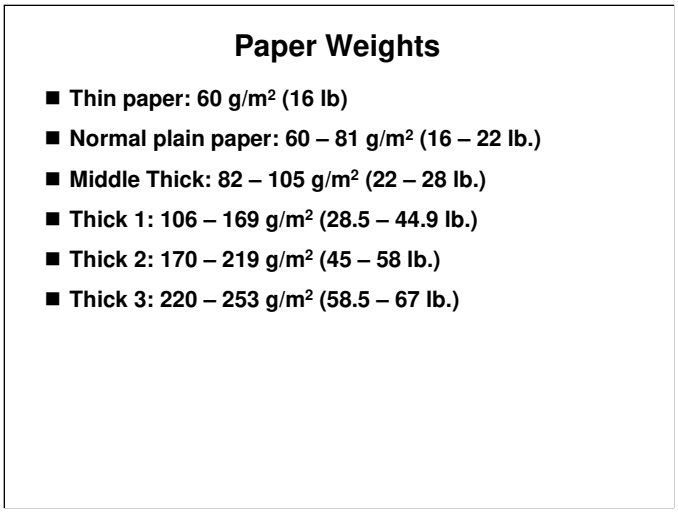
ID Sensors



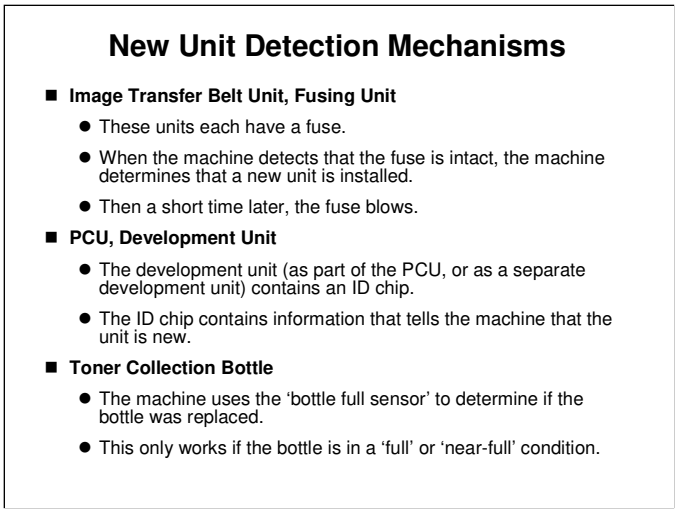
- **Seven ID sensors, on the ID sensor board:**
  - Three for line position adjustment: Left end, middle, right end
  - Four for process control: In the red circles as shown above
- **When the sensors are not used, the solenoid moves the shutter to cover the sensors. This prevents dust on the sensors.**



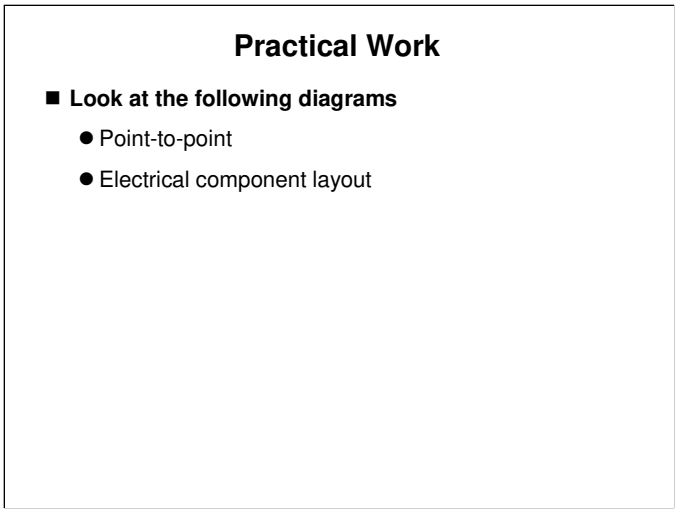
- The process speed is the feed speed from registration roller to the fusing unit.
- The process speed affects various machine parameters, as can be seen if you take a quick look through the SP tables.
- What is 'middle thick paper'? See the next slide.
- Some SP modes also have adjustments for 'FINE'. This is not used in the AT-C1.



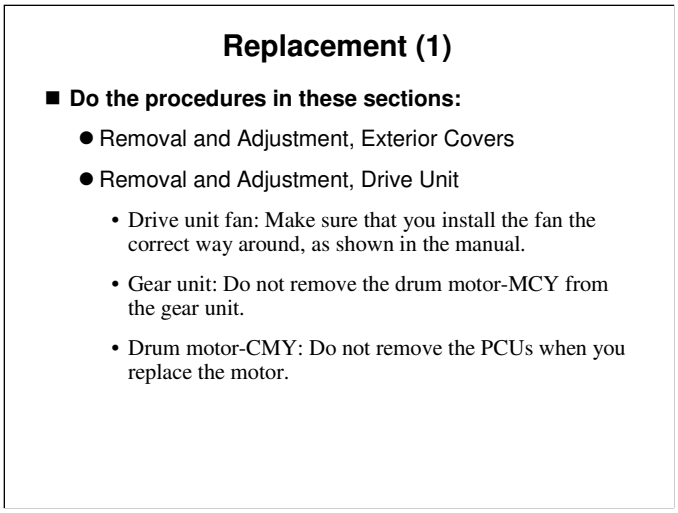
- This machine does not support thin paper.
- 'Thin paper' is an additional paper weight setting that the user can select at the operation panel if the 'plain paper' setting causes problems.



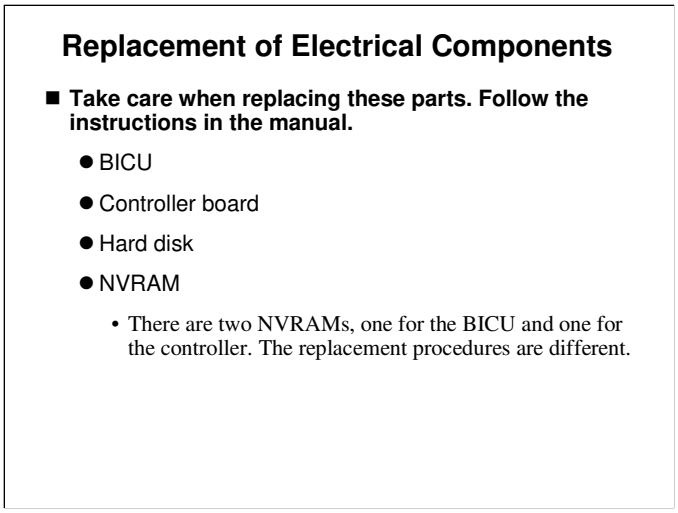
- The ID chip in the development unit contains all the counters for the PCU (drum unit counters, development unit counters).
- If we replace the development unit as a separate unit, the new ID chip does not contain the drum counters for the drum unit that is still in the machine. (You can see them as 'previous unit counters', stored in SP7906, but these will not be updated when the new drum is used).
- Normally, the development unit is replaced at 320k, and the drum unit is replaced at 80k. So this should normally not be a problem, unless the development unit breaks. This counter storage method may be changed for future models.



- ❒ Introduce the point-to-point and electrical component layout diagrams.
- ❒ Have the trainees locate the electrical components on the machines and on the p-to-p diagram.
  - ➢ We will discuss all the major components in the relevant sections of the course. There is no need to study this in detail now.
- ❒ Have the trainees remove the covers and locate the major components of the copier main body.
- ❒ Point out as many of the components on the list as you think necessary.



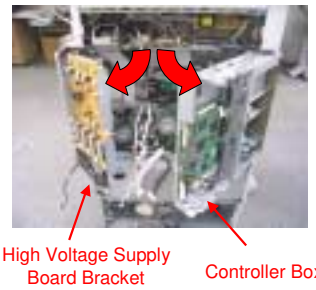
❒ Have the trainees remove and replace the parts in these sections of the manual.
❒ Remind them to follow all notes and cautions in the manual.



❒ The next few slides will go over the important points. Then the class will remove the parts.

Controller Box & High Voltage Supply Board Bracket

- **Even if the controller box and the high voltage supply board bracket are not removed, it is possible to check the parts behind the controller box and the high voltage supply board bracket.**

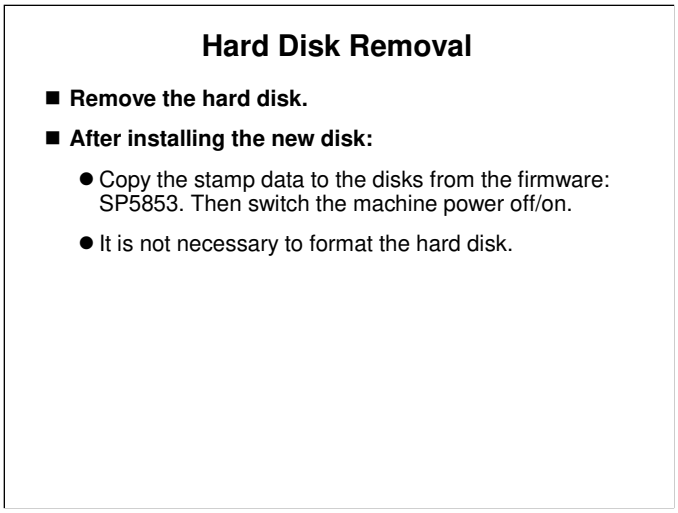


Replacing an NVRAM (1)

- **Before you replace an NVRAM, try to do the following:**
  - Print the SMC report
  - Copy the contents of the NVRAM to an SD Card (SP 5824 001)
  - For the controller NVRAM, make a backup copy of the address book data.
- **If you cannot do this, then after installing the new NVRAM, you can use a backup that you made on a previous visit.**
  - But you cannot get back settings that were made after that visit.
  - If you do not have a backup copy on an SD card, then the memory reset (SP 5801 001) resets the memory to the defaults. Then you can input the necessary changes to the defaults.

Replacing an NVRAM (2)

- **To copy data back from the SD card to NVRAM, you must use SP 5825 001.**
  - There are two NVRAMs in this model, but the same SPs are used to make backups of each NVRAM.
  - You can store data from both NVRAMs on the same card. The machine understands which is the correct data when you restore the data to the NVRAM from the SD card.
- **IMPORTANT: If you replace the NVRAM on the controller board, the Data Overwrite Security Unit will not work. The user must buy a new one.**



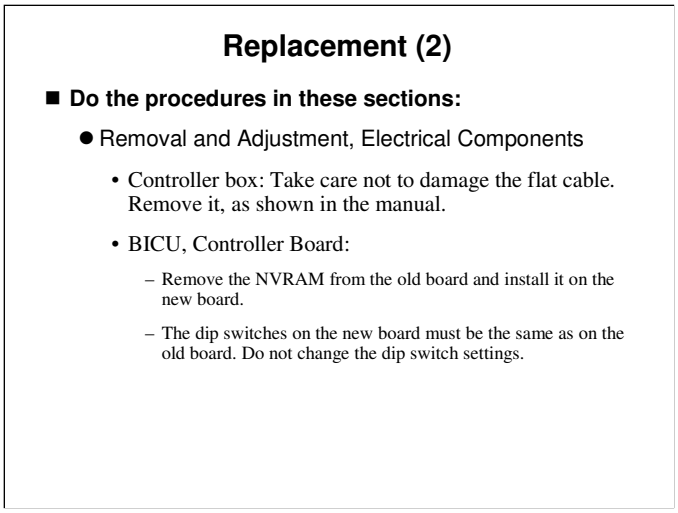
❒ Have the class remove and replace the hard disk.
❒ The stamp data is copied directly from the firmware, not from SD or flash cards.

Hard Disk Removal

- **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. Custom-made stamps must be re-made and stored 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.
- **If the customer is using the Data Overwrite Security feature, the DOS function must be set up again.**
- **If the customer is using the optional Browser Unit, this option must be installed again.**

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.



❒ Have the trainees remove and replace the parts in these sections of the manual.
❒ Remind them to follow all notes and cautions in the manual.

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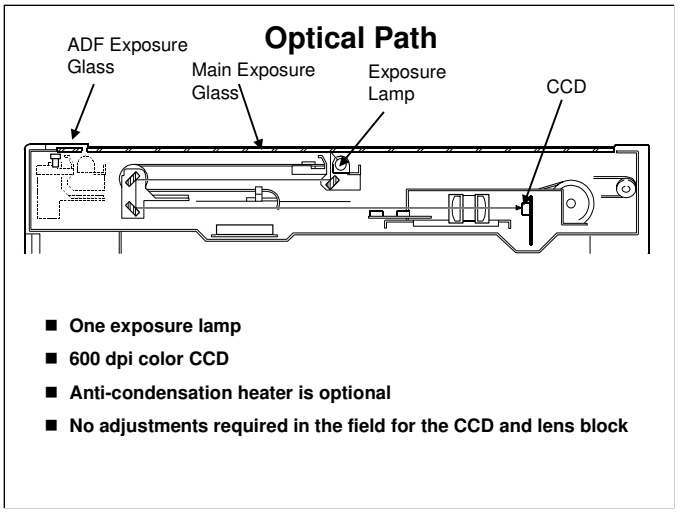
ATHENA-C1 TRAINING

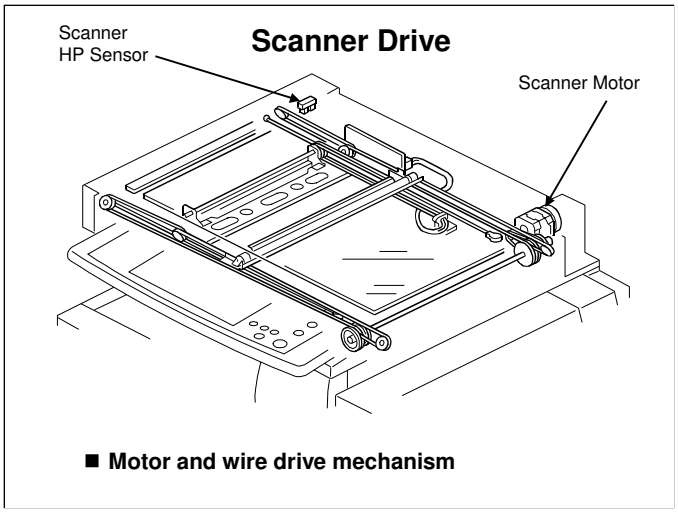
SCANNER

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



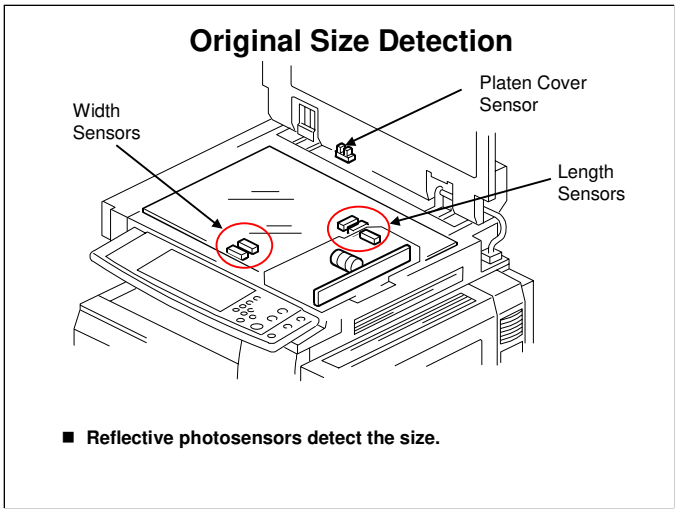
B230 Service Manual, Detailed Section Descriptions, Scanning, Overview

- ❒ Outline the optical path.
- ❒ The service manual shows the important components of the scanner.
- ❒ In platen mode, the original is fed to 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.



B230 Service Manual, Detailed Section Descriptions, Scanning, Scanner Drive

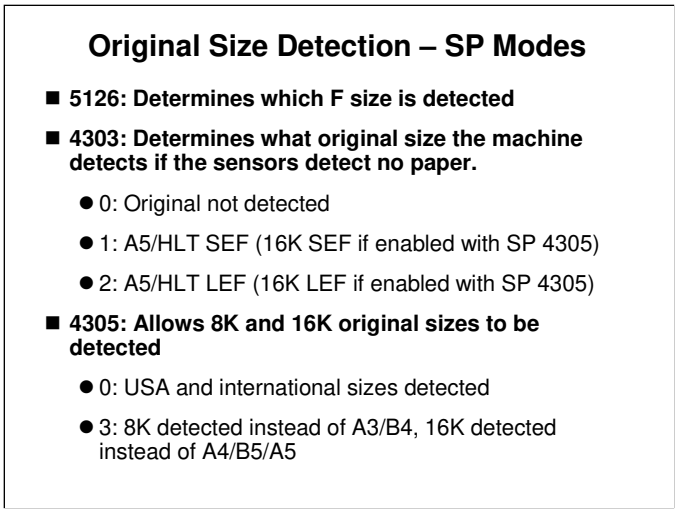
- ❒ Describe the mechanism. Point out the following:
- ❒ The same motor drives the first and second scanners.
  - ➢ The first scanner contains the exposure lamp, reflectors, the 1st mirror, and the lamp regulator. The second scanner contains the 2nd and 3rd mirrors.
  - ➢ The regulator is mounted on 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 service manual explains how the scanner motor speed and image processing control the magnification.



B230 Service Manual, Detailed Section Descriptions, Scanning, Original Size Detection

❒ Describe the APS sensors.

- There are two width sensors and three length sensors. The service manual shows where these sensors are located.
- The CPU checks the sensors when the platen cover sensor detects that the cover is being closed.
- If the cover stays open during copying, the CPU checks the sensors when the Start key is pressed.



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

SP 5126

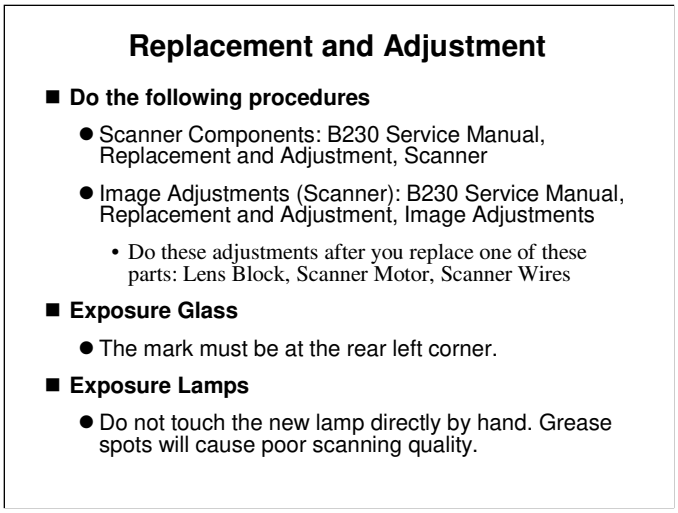
- Use SP 5126 to control the size that is detected for the 'F' sizes, which are very similar (8½ x" 13", 8¼" x 13", 8" x 13"), and cannot be distinguished by the sensors.

SP 4303

- This SP determines what happens when all sensors are off (such as when A5 sideways is set - too small for the sensors to detect).

SP 4305

- Ask the class to look at the SP table. Settings 1 and 2 are a bit strange. They let the machine detect A4 if the original is SEF, and LT if it is LEF (or the other way around).



B230 Service Manual, Replacement and Adjustment, Scanner

Replacement

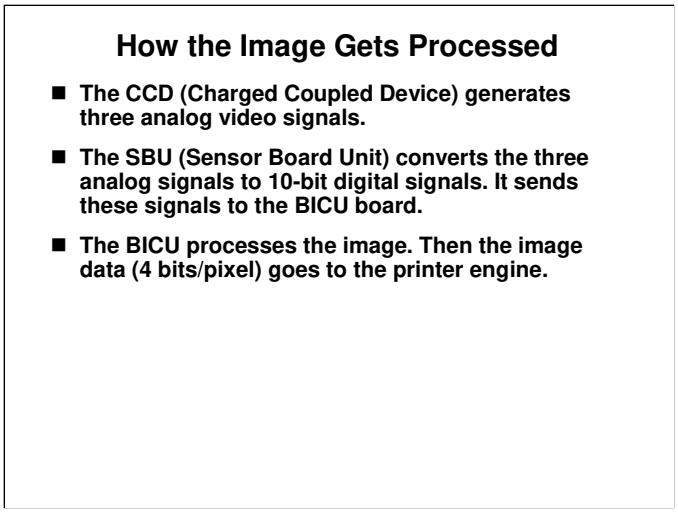
- ❒ Have the trainees remove and replace the parts in this section of the manual.
- ❒ Remind them to follow all notes and cautions in the manual.
- ❒ Note that the copy adjustments must be done after replacing the lens block, APS sensors, scanner motor or scanner wires. There is no need to do these in the class, unless the trainees need some practise.

Replacement and Adjustment

■ **SBU**

- Adjust the following SP modes after you replace the sensor board unit:
  - SP4–008 (Sub Scan Mag): See "Image Adjustment: Scanning".
  - SP4–010 (Sub Mag Reg.): See "Image Adjustment: Scanning".
  - SP4–011 (Main Scan Reg): See "Image Adjustment: Scanning".
  - SP4–688 (DF: Density Adjustment): Use this to adjust the density level if the ID of outputs made in the DF and Platen mode is different.

❒ The image processing functions will be explained briefly.



B230 service manual, Detailed Section Descriptions, Image Processing

- ❒ Ask the class to read the service manual if they want more. There isn't much there anyway, and there are not a lot of adjustments. Because of this, we do not discuss image processing in great detail.
- ❒ The BCU and IPU of previous models are now combined in the BICU board.

SP Modes

- **1001: Leading edge registration (printer): Changes the registration clutch timing**
- **1002: Side-to-side registration (printer): Changes the laser main scan start timing**
- **2103: Erase margin adjustment: Erases data from the image**
- **4008: Sub scan magnification (scanner motor speed)**
- **4010: Leading edge registration (scanner): Changes the scanner motor timing**
- **4011: Side-to-side registration (scanner): Changes the CCD main scan start timing**

SP Modes

- **4400: Scanner erase margin for book scanning**
- **4688: ADF density adjustment: Adjust if the density in ADF mode is different from book mode**
- **4994: Text/photo detection method for scanning to PDF**
- **5610: Recalls or overwrites the factory settings for ACC**
- **5611: Determines the proportions of CMY toner in two-color mode for red, green and blue**

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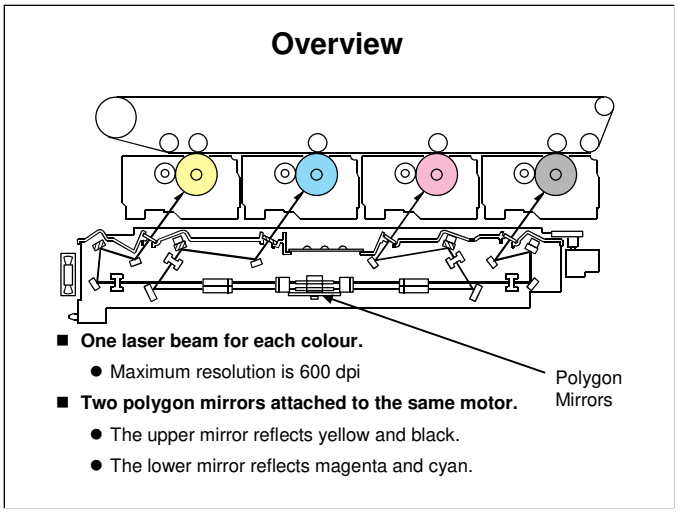
ATHENA-C1 TRAINING

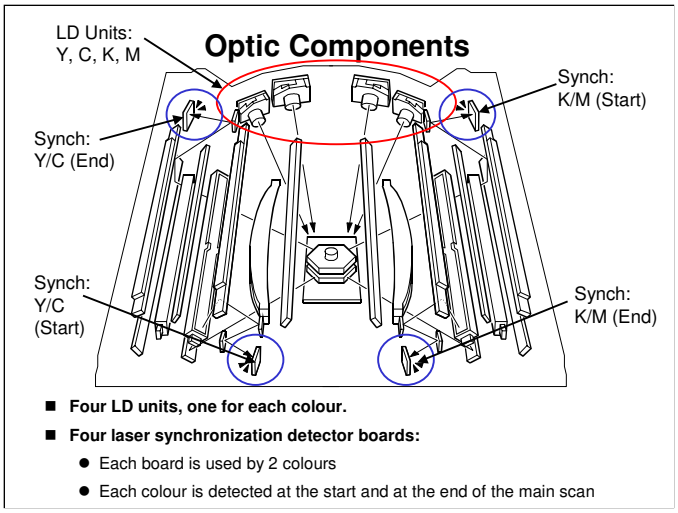
LASER EXPOSURE

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



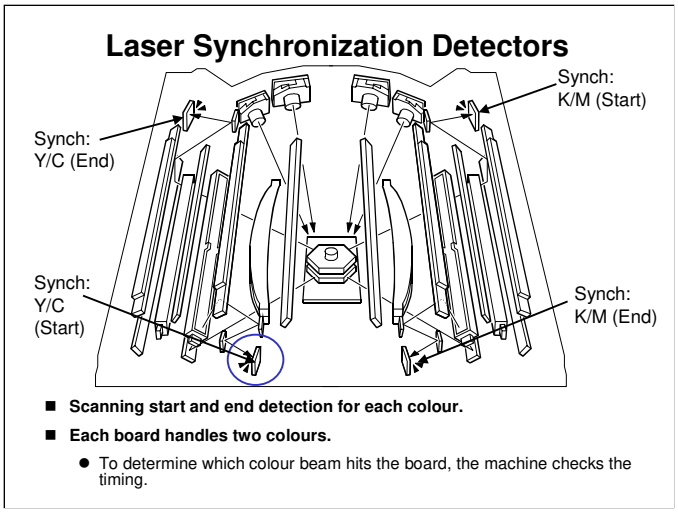
B230 service manual, Detailed Section Descriptions, Laser Exposure, Overview/Optical Path

- ❒ Have the class look at the diagram in the manual. The optical components should be familiar to those who have worked on recent models.
- ❒ 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.
- ❒ Resolutions of 1200, 1800, and 2400 dpi are also mentioned in the documentation. These are not really 1200, 1800, and 2400 dpi. For example, 600 dpi at 4 bits per pixel is called 2400 dpi.



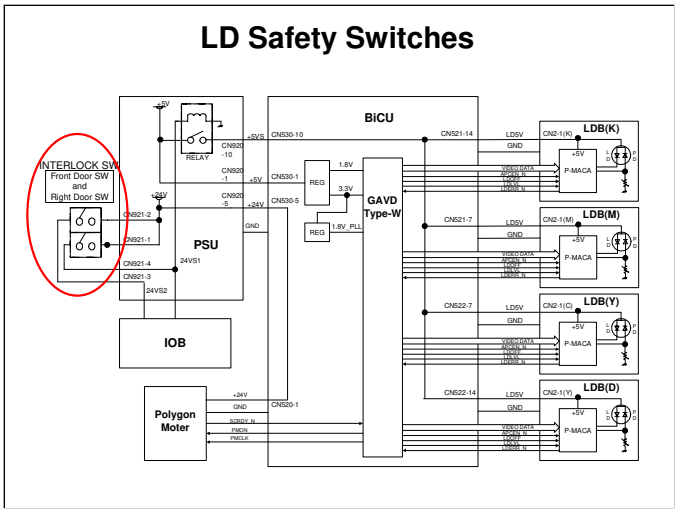
B230 service manual, Detailed Section Descriptions, Laser Exposure, Overview/Optical Path

- The LD units (shown in the red circle) are Y, C, K, M from left to right in the diagram.
- The lasers go immediately to the polygon mirrors.
  - Laser exposure for black and magenta starts from the rear side of the drum. But for yellow and cyan it starts from the front side of the drum. This is because the LD units for black and magenta are on the other side of the polygon mirror from the units for yellow and cyan.
- The four laser synch detector boards (shown in blue circles) will be explained in more detail on the next slide.



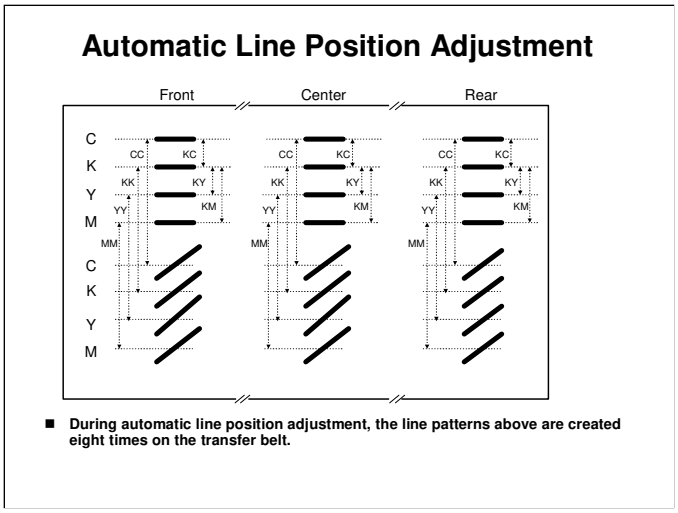
B230 service manual, Detailed Section Descriptions, Laser Exposure, Laser Synchronization Detectors

- ❒ For magenta and black, the LSD at the rear detects the start of the main scan.
- ❒ For yellow and cyan, the LSD at the front detects the start of the main scan.
- ❒ With a detector at the start and at the end, it is possible to make sure that the number of pulses for each colour is the same. This reduces colour registration errors in the main scan direction.
- ❒ To do this, the machine measures the number of clock pulses between start and end detection.
- ❒ If the number is not correct, the LD clock frequency is adjusted automatically.
  - ➢ If the board at the end position is defective, you must disable the detection feature with SP2-186-1, until you can replace the defective part.



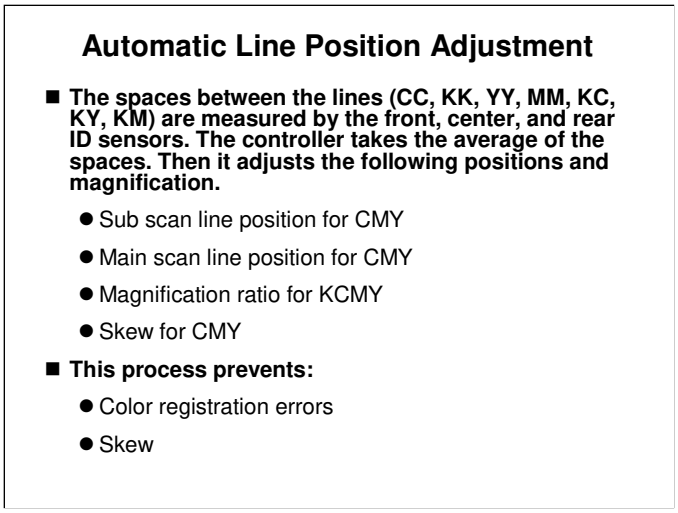
B230 service manual, Detailed Section Descriptions, Laser Exposure, LD Safety Switches

- ❒ Make sure that the class understands how the cover switches cut the laser power.
- ❒ The switches used are the front and right front door.
- ❒ Have the class follow the circuit on the diagram.



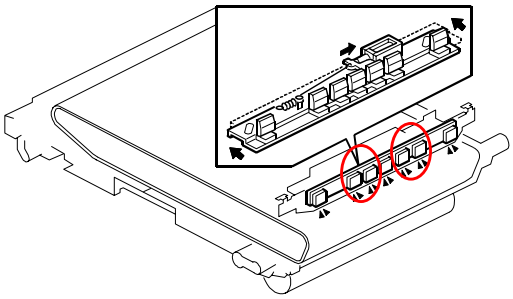
B230 service manual, Detailed Section Descriptions, Laser Exposure, Automatic Line Position Adjustment

- The spaces between the lines (CC, KK, YY, MM, KC, KY, KM) 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 KCMY
  - 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.



- Color 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 'color shift'. This is not the correct term. Color shift is a change in the actual colour.
  - In this model, the improved mechanisms have reduced color 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 color 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 color image, colour toner is not deposited on the places where black toner will be. This reduces the quantity of toner. But, if color 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 color toner images will be skewed in relation to each other.

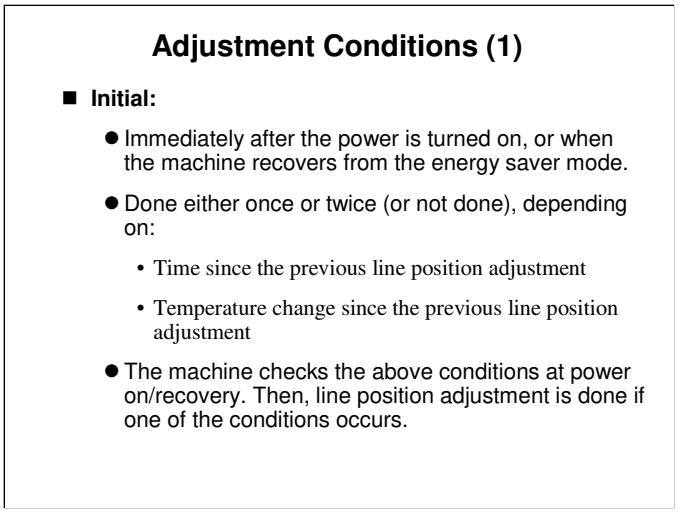
ID Sensors



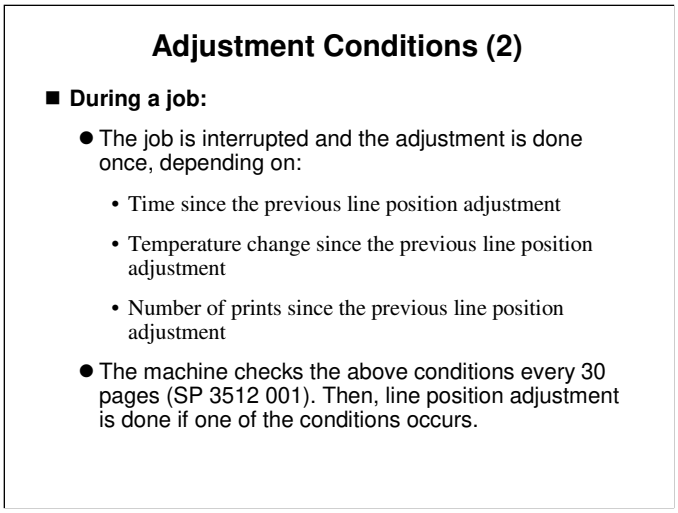
- **Seven ID sensors:**
  - Three for line position adjustment: Left end, middle, right end
  - Four for process control: In the red circles as shown above
- **When the sensors are not used, the solenoid moves the shutter to cover the sensors. This prevents dust on the sensors.**

More about the Adjustments

- **Sub scan line position for CMY**
  - The adjustment of the sub-scan line position for YCM is based on the line position for K (color registration).
    - The machine measures the gaps between the lines of each color in the pattern on the transfer belt.
    - If the gaps for a color are not correct, the machine moves the image of the color up or down the sub scan axis.
    - To do this, it changes the laser write timing for that color.
- **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 KCMY**
  - If the machine detects that magnification adjustment is necessary, it changes the LD clock frequency for the required color.
- **Skew for CMY**
  - The adjustment of the skew for YCM is based on the line position for K.



❒ The service manual explains the SP settings that can be used to adjust the behaviour of the machine.



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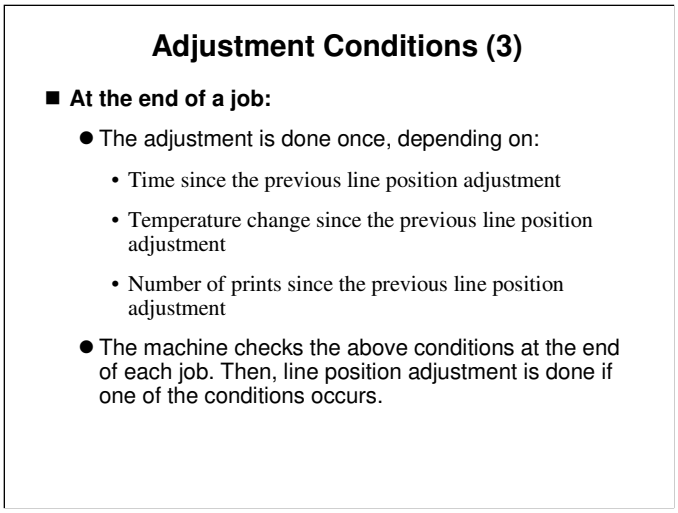
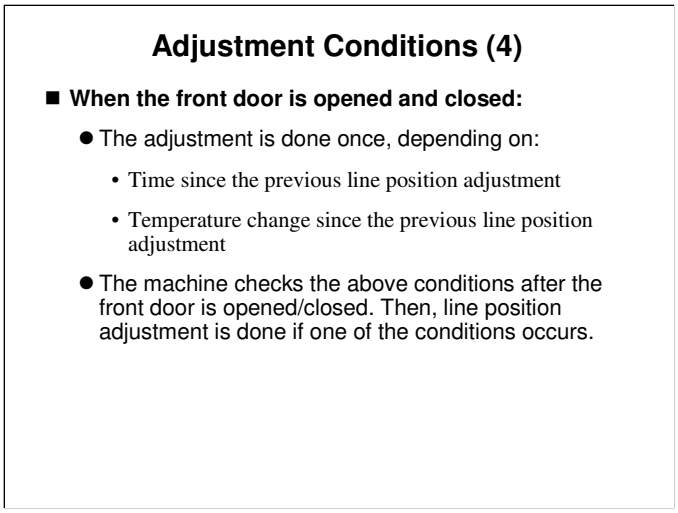


❒ The service manual explains the SP settings that can be used to adjust the behaviour of the machine.



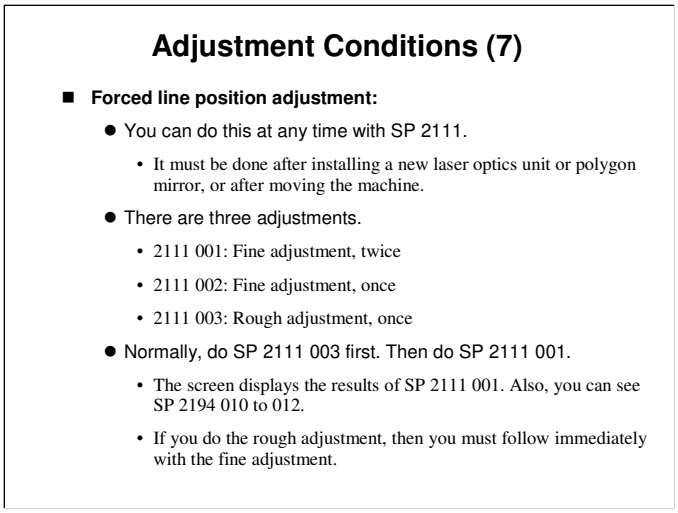
❒ The service manual explains the SP settings that can be used to adjust the behaviour of the machine.

Adjustment Conditions (5)

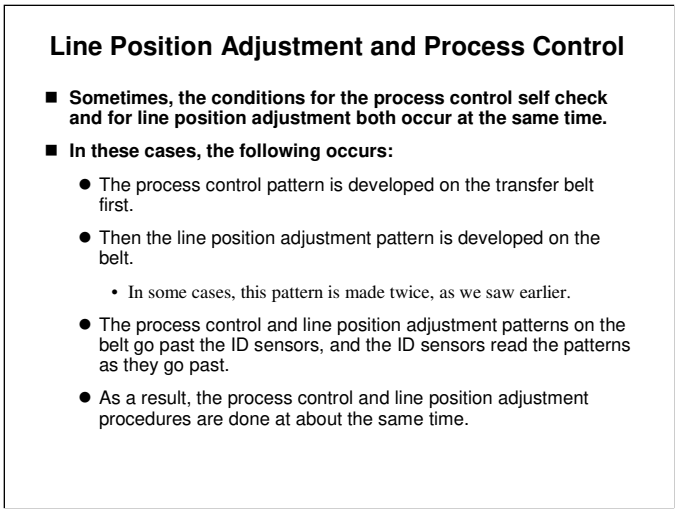
- **In standby mode (but not in energy saver mode):**
  - The adjustment is done once, depending on:
    - Time since the previous line position adjustment
    - Temperature change since the previous line position adjustment
    - Number of prints since the previous line position adjustment
  - The machine 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

Adjustment Conditions (6)

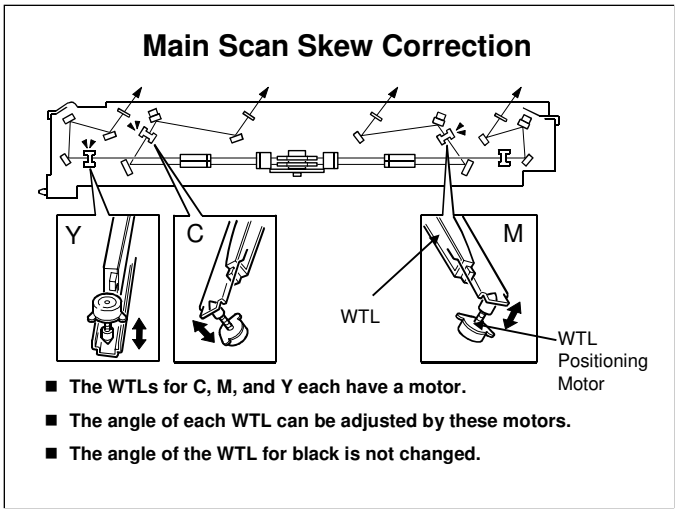
- **New PCU or transfer belt unit**
  - When the machine detects a new PCU or Image Transfer Belt Unit, line position adjustment is automatically done twice.
- **If the main scan magnification changes**
  - This is detected by the main scan synchronization detectors at each end of the scan line for each color.
  - If the magnification changes by more than 1% (SP2-193-010), line position adjustment is done.



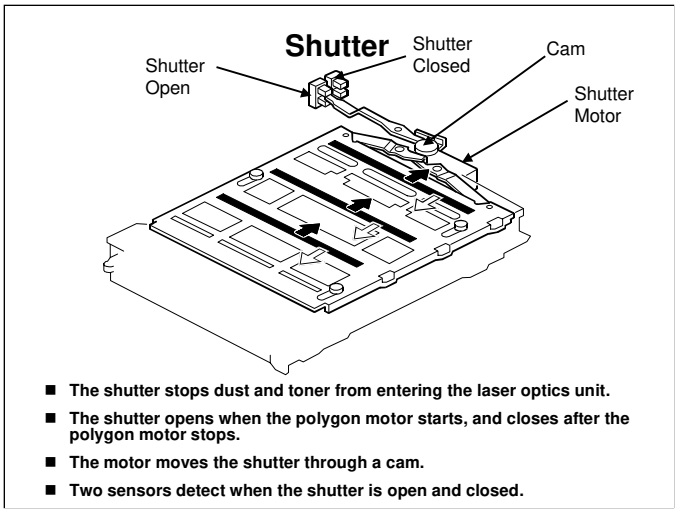
❒ If the error is more than 1.4 mm, the fine adjustment cannot correct it. The rough adjustment must be done, followed by the fine adjustment.



- The line position adjustment pattern is made twice in some cases, as we saw earlier (see the Adjustment Conditions slides 1 and 6).
- In theory, the two processes can be done at the same time:
  - The ID sensors used for process control are different from the sensors used for line position adjustment
  - Because of this, the sensor patterns for both processes can both be put on the transfer belt at the same time. (the patterns do not overlap)
- But, the laser cannot adjust its strength quickly enough across the main scan to put the patterns on the belt at the required image densities.



❒ The WTL positioning motors for magenta, cyan, and yellow adjust the angle of the WTLs for these three colours, based on the WTL position for black.

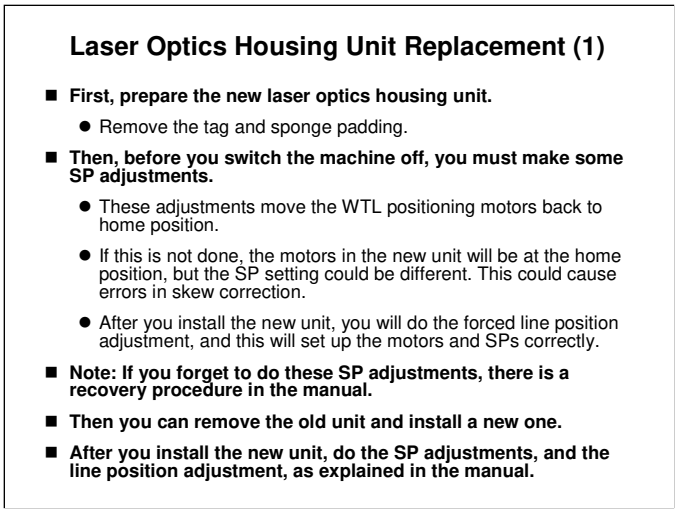


B230 service manual, Detailed Section Descriptions, Laser Exposure, Shutter Mechanism

❒ This mechanism makes sure that the shutter is only open when the laser is writing. At all other times, the shutter is closed, to stop dust and toner getting in.

Service Remarks

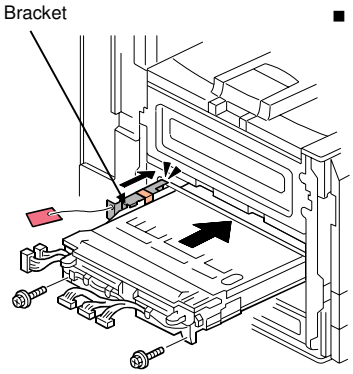
- **SWITCH THE POWER OFF AND UNPLUG THE POWER CORD BEFORE STARTING WORK ON THE LASER UNIT**
- **Do not loosen the LD board securing screws.**
- **Do not adjust any of the VRs.**
- **Do not open the optical housing unit except when absolutely necessary for servicing.**
- **Do not touch the faces of the 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.**



B230 Service Manual, Replacement and Adjustment, Laser Optics

❒ This is a bit tricky, so go over the main points with the class, on this slide, before they start the procedures.

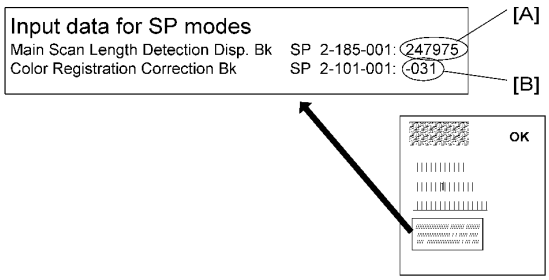
Laser Optics Housing Unit Replacement (2)



■ **When you install the new unit, do not remove the bracket until near the end of the installation procedure (the correct time is stated in the manual).**

- This bracket protects a capacitor on the unit. If the bracket is removed too early, you can break the capacitor on the corner of the main frame when you install the new unit.

Laser Optics Housing Unit Replacement (3)



- **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.**

Replacement (1)

- **Do the following procedures**
  - Laser Unit Components: B230 Service Manual, Replacement and Adjustment, Laser Optics
  - Image Adjustments (Printer): B230 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.

❒ Have the trainees remove and replace the parts in this section of the manual.
❒ Remind them to follow all notes and cautions in the manual.
❒ See the next slide for more notes.

Replacement (2)

- **Laser Optics Housing Unit**
  - When you install the new unit, do not remove the bracket until near the end of the installation procedure (the correct time is stated in the manual).
  - After you install a new unit, you must input values from a decal and make test prints, as explained in the manual.
  - Then you must do the forced line position adjustment (SP 2111 003, then 2111 001).
- **Polygon Mirror Motor**
  - After you install a new unit, you must do the forced line position adjustment (SP 2111 003, then 2111 001).

❒ Have the trainees remove and replace the parts in this section of the manual.
❒ Remind them to follow all notes and cautions in the manual.

SP Modes

- **2193: Conditions for line position adjustment**
- **2194: Displays the results for automatic line position adjustment**

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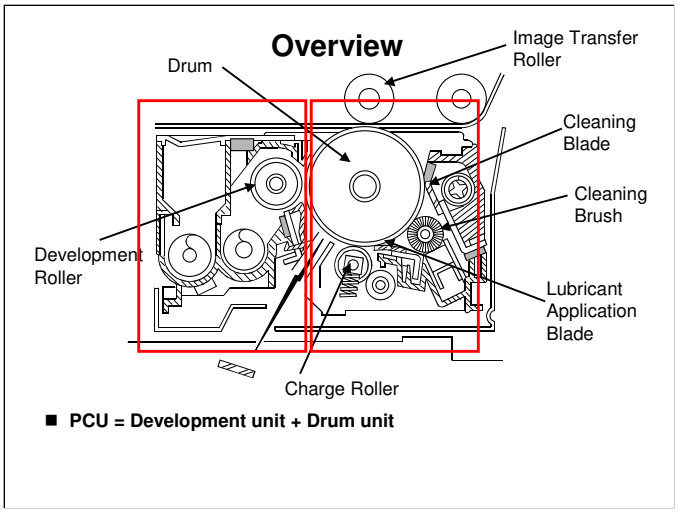
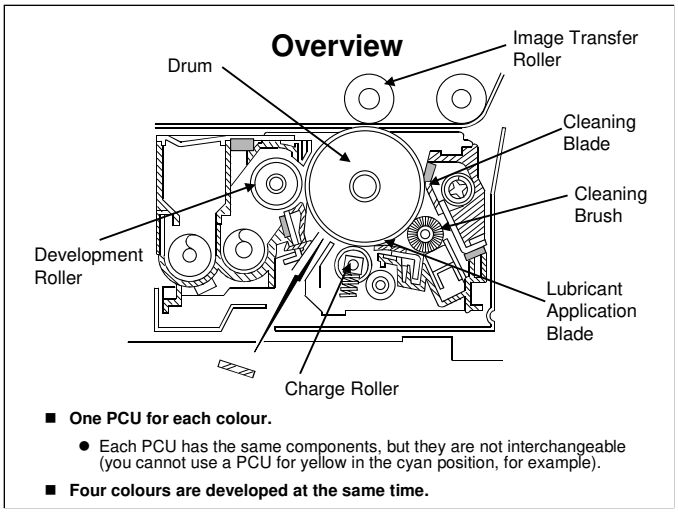
ATHENA-C1 TRAINING

PCU

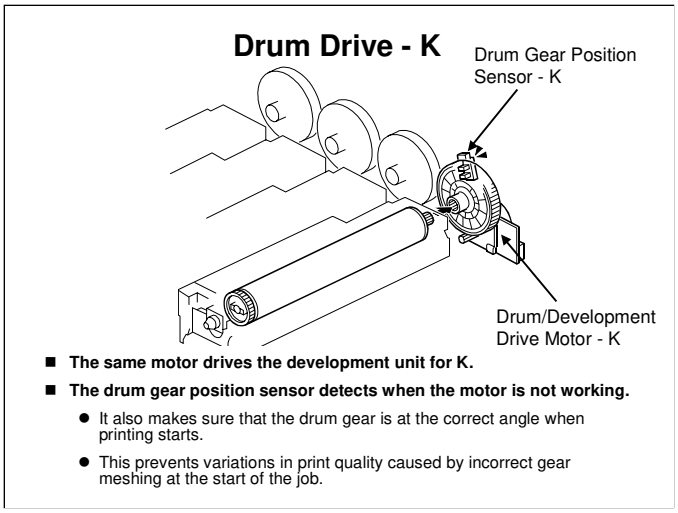


❒ The PCU is divided into two parts, as shown by the red boxes on this slide. These two parts are the development unit (on the left) and the drum unit (on the right).



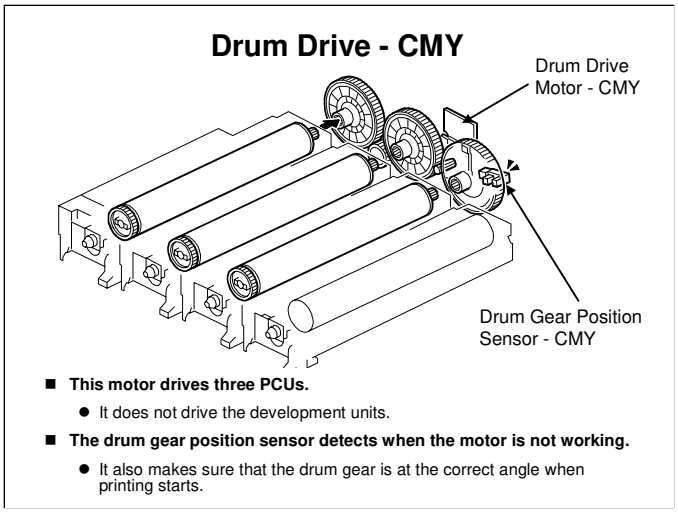
B230 Service Manual, Detailed Section Descriptions, PCU, Overview

- ❒ This shows the most important components of the PCU.
- ❒ The image transfer roller pulls the toner off the PCU and onto the transfer belt.
- ❒ Interchangeability of units: The drum units for Y, C, and M are the same (except for the labels on the front), but the front panel for the K drum unit is different.



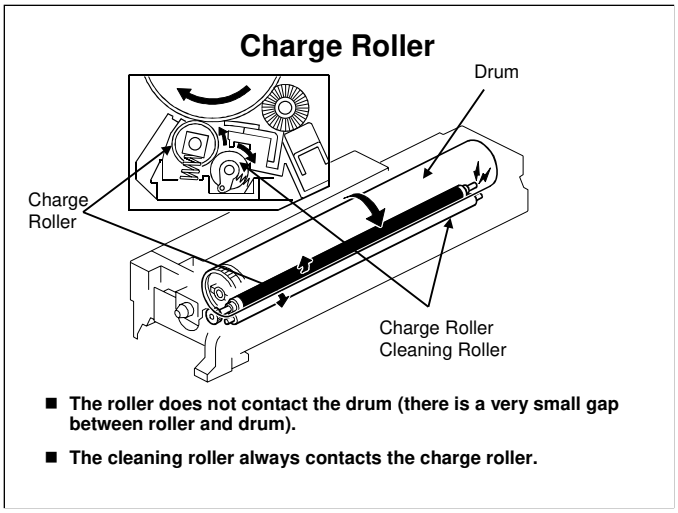
B230 Service Manual, Detailed Section Descriptions, PCU, Around the Drum, Drum Drive

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



B230 Service Manual, Detailed Section Descriptions, PCU, Around the Drum, Drum Drive

- The function of the gear position sensor is similar to the sensor for black.
- The motor drives all three colour drums. This reduces color 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.
- The drum units are not interchangeable. We do not recommend that you install a C drum in the location for M, for example.

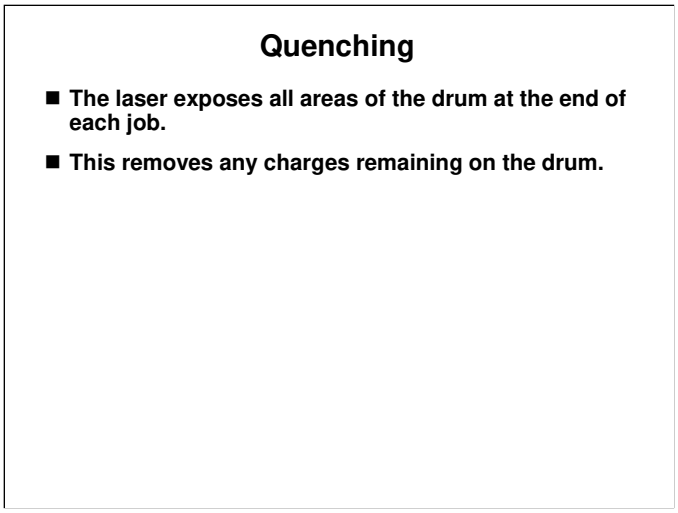


B230 Service Manual, Detailed Section Descriptions, PCU, Around the Drum, Drum Charge and Quenching

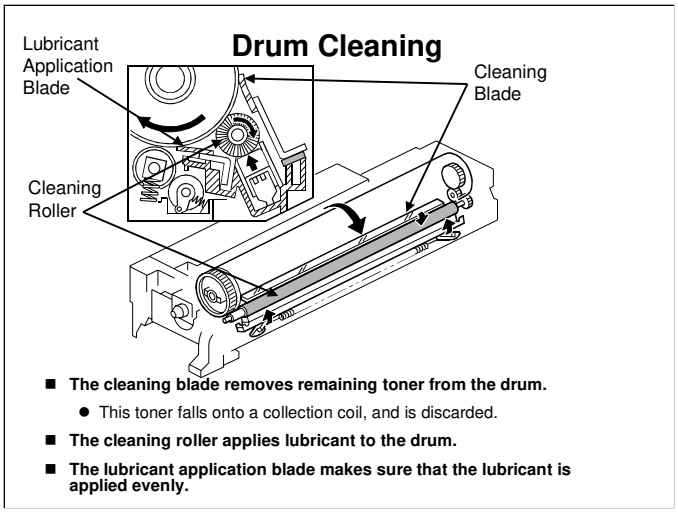
Charge Roller Voltage

- **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 (this occurs if SP3-041-1 is set to "CONTROL").**
- **However, if process control is switched off, (this occurs if SP3-041-1 is set to "FIXED"), the dc voltage is the value stored in SP2-005-1 to -12 (do not adjust in the field unless advised to do so).**

B230 Service Manual, Detailed Section Descriptions, PCU, Around the Drum, Drum Charge and Quenching

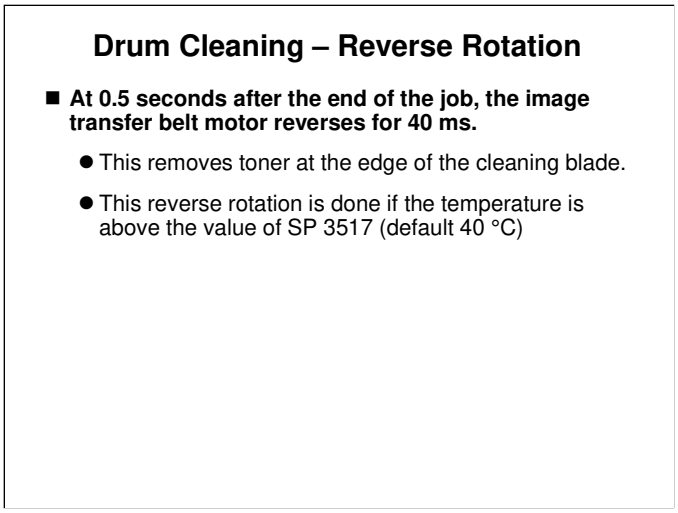


B230 Service Manual, Detailed Section Descriptions, PCU, Around the Drum, Drum Charge and Quenching

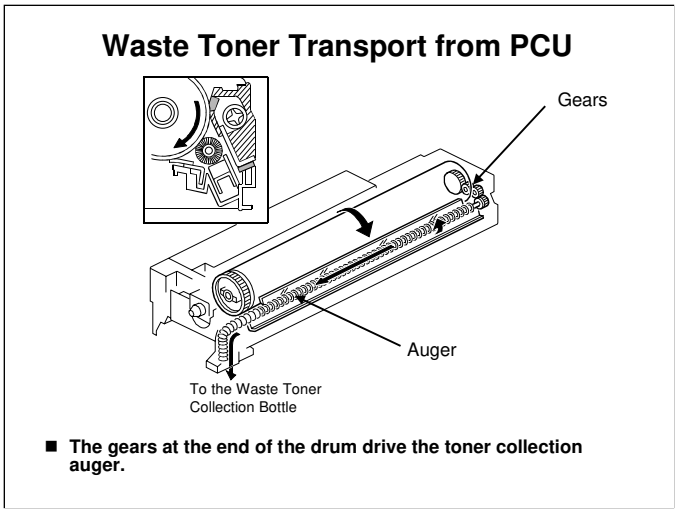


B230 Service Manual, Detailed Section Descriptions, PCU, Around the Drum, Drum Cleaning

❒ The toner collection mechanism from the PCU is on the next slide.

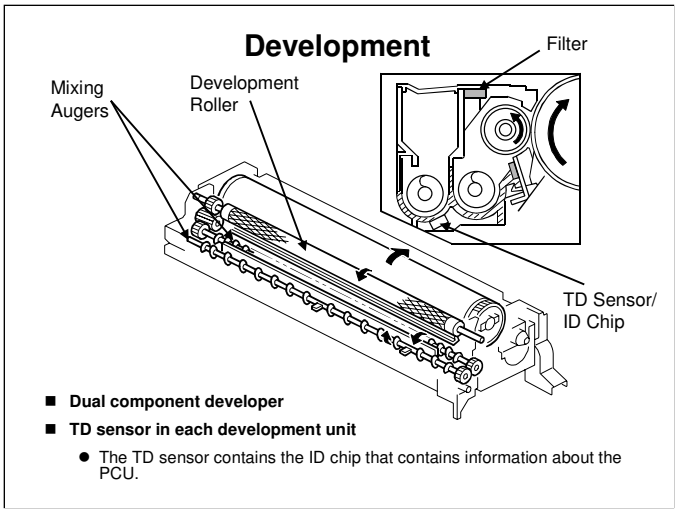


- The reverse rotation at the end of the job is controlled by SP2901 and 2902 (do not adjust, DFU).
  - It is also done for the image transfer belt at the same time, for the same purpose.



B230 Service Manual, Detailed Section Descriptions, PCU, Around the Drum, Drum Cleaning

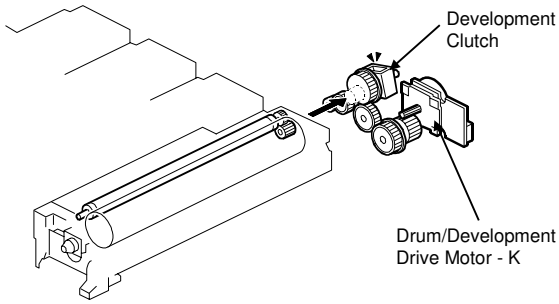
❒ The waste toner collection bottle and collection mechanism is described in a later section.



B230 Service Manual, Detailed Section Descriptions, PCU, Development, Development Operation

❒ The filter makes sure that pressure does not build up inside the development unit.

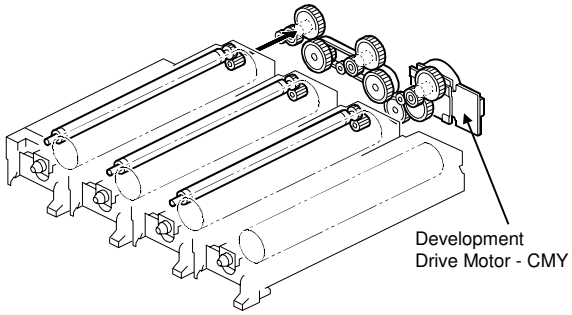
Development Drive - K



- **The drum/development drive motor controls the K development unit.**
  - This motor also controls the K drum, so a clutch is necessary.

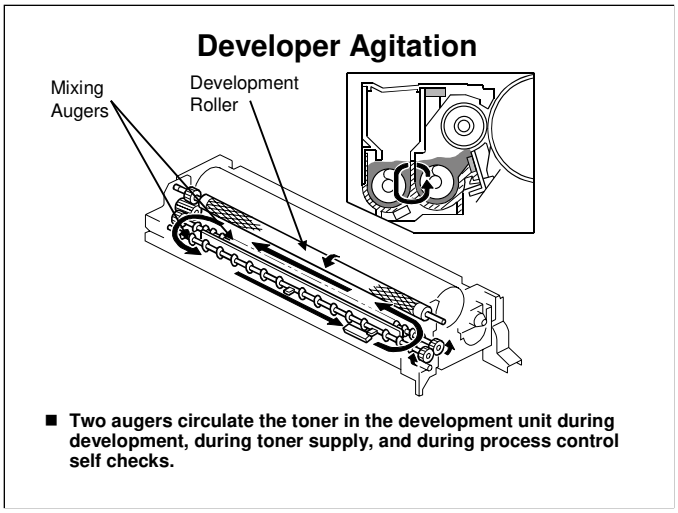
B230 Service Manual, Detailed Section Descriptions, PCU, Development, Drive

Development Drive - CMY



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

B230 Service Manual, Detailed Section Descriptions, PCU, Development, Drive

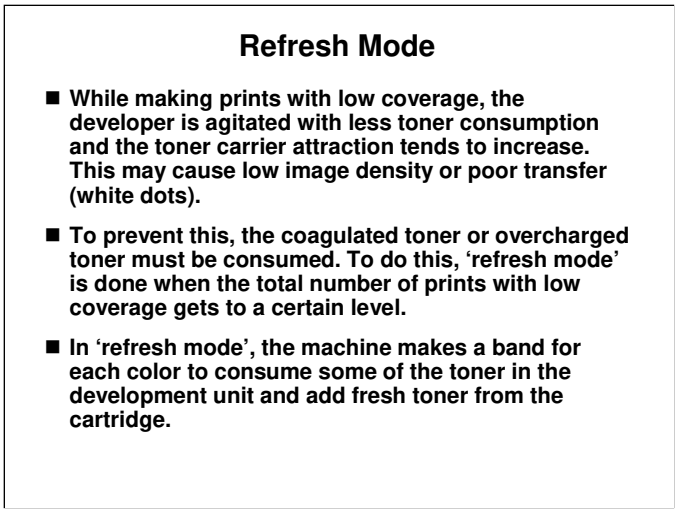


B230 Service Manual, Detailed Section Descriptions, PCU, Development, Developer Agitation

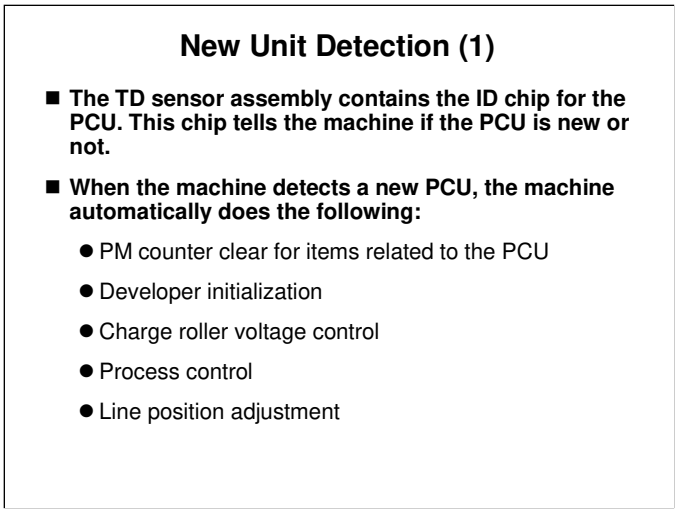
❒ This diagram shows how the augers move the toner around inside the development unit.

Developer Damage during Storage

- **If the developer was stored at more than 50 °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.**

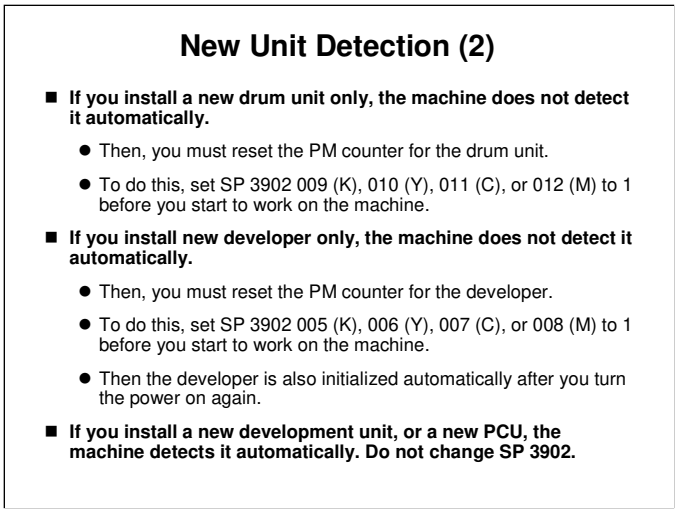


❒ SP 3516 controls this feature. Do not adjust.



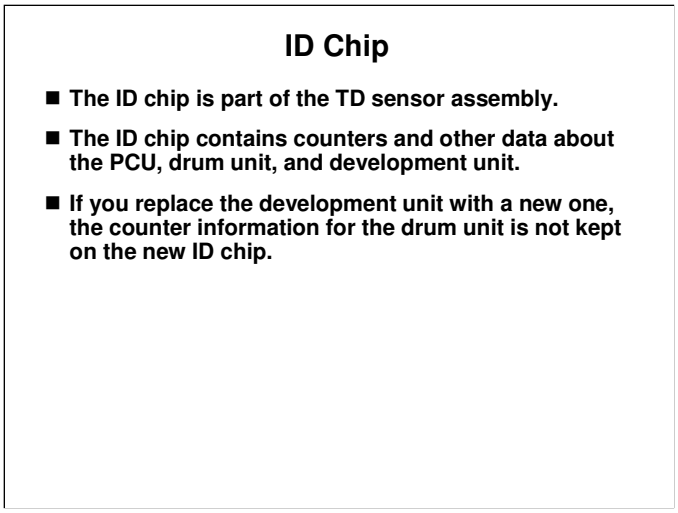
B230 Service Manual, Detailed Section Descriptions, PCU, Development, New Unit Detection

❒ SP 3901: Turns new PCU detection off

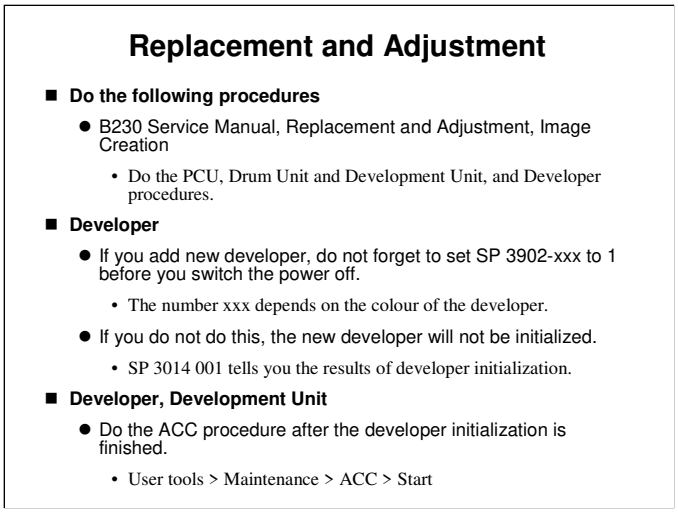


B230 Service Manual, Detailed Section Descriptions, PCU, Development, New Unit Detection

❒ During developer initialization, the developer is agitated for 30 seconds (SP 3021: do not adjust)



❒ This is a machine limitation. It may change in the future.



Replacement

- ❒ Have the trainees remove and replace the parts in this section of the manual.
- ❒ Remind them to follow all notes and cautions in the manual.

- ❒ Developer is only supplied in bags. The plastic developer container component of the PCU is not supplied as a consumable part. This is a cost reduction measure; the plastic containers are expensive.
- ❒ Do the ACC procedure after developer initialization. This ensures that the machine's color characteristics are maintained.

  Troubleshooting, Process Control Error Conditions
- ❒ An explanation of the codes displayed by SP3014 001 is in this section of the service manual.

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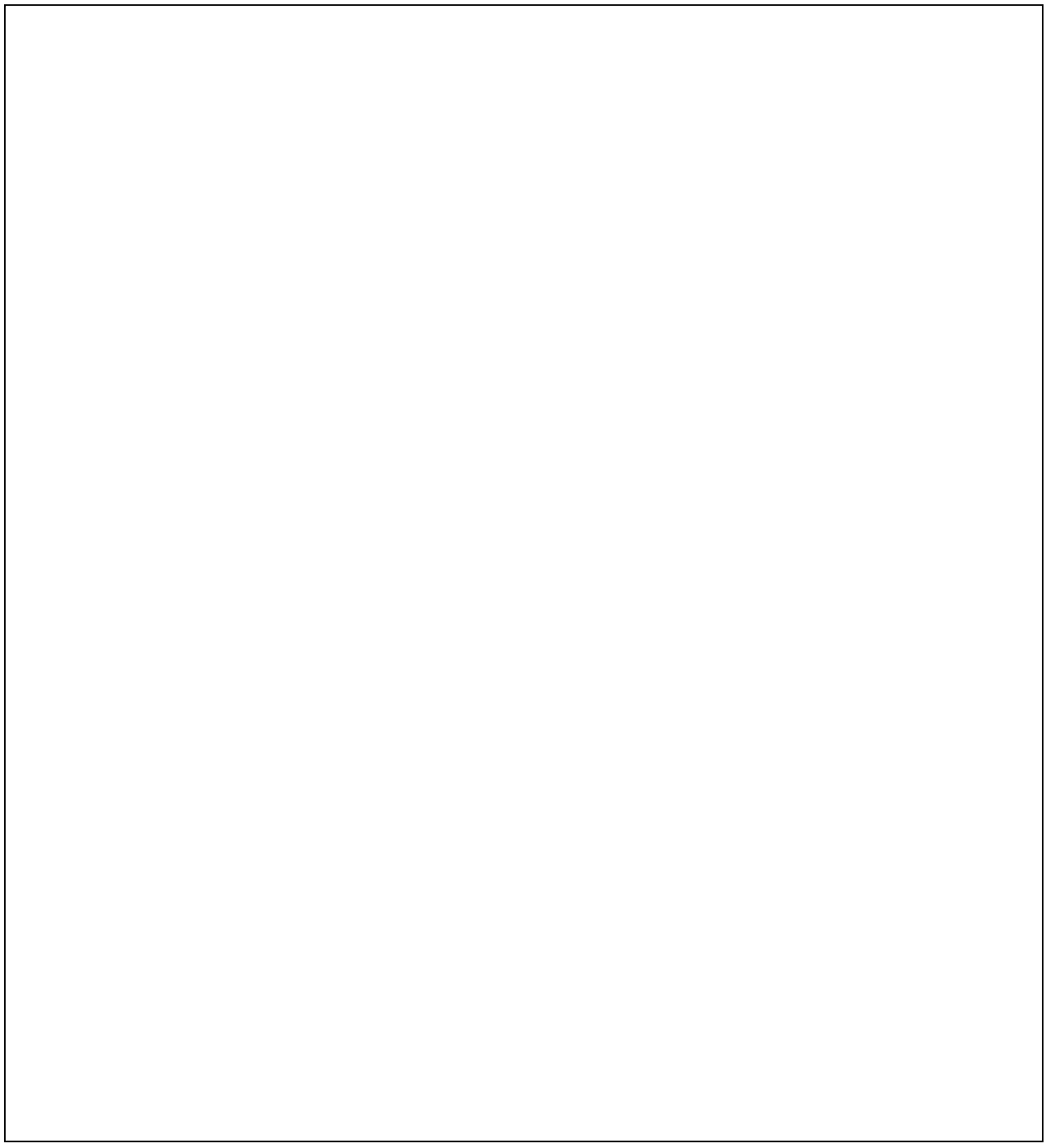
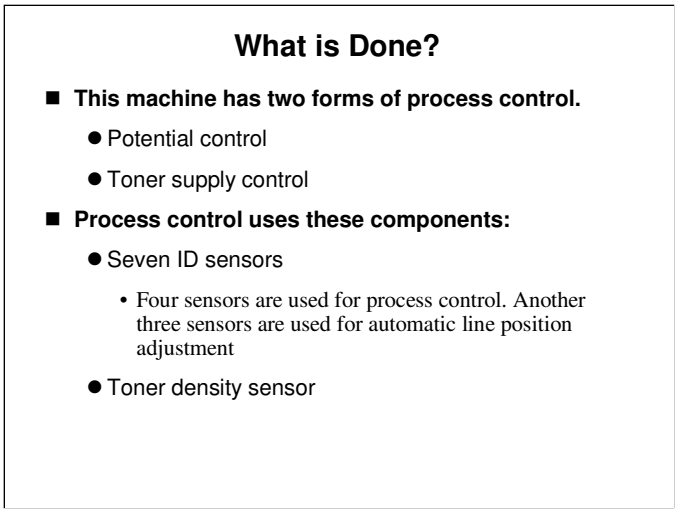
AT-C1 TRAINING

PROCESS CONTROL

❒ Process control will be described briefly in this section.

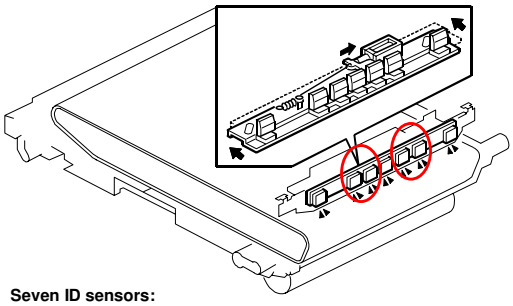
Overview



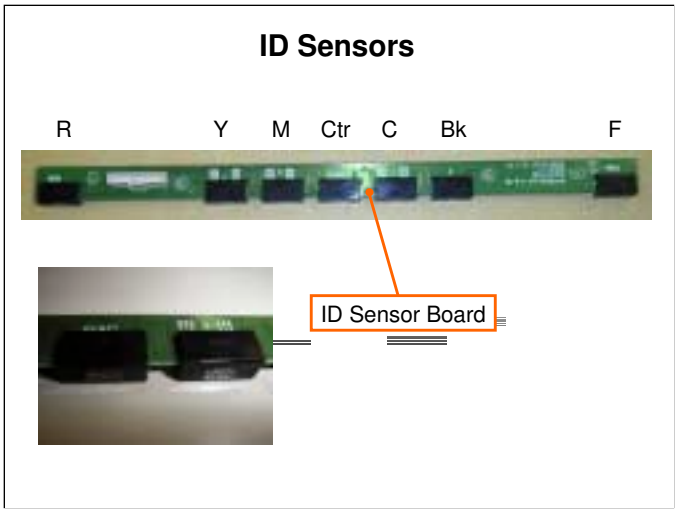


❒ Line position adjustment: This process prevents color registration errors and skew. It is described in the Laser Exposure section.

ID Sensors

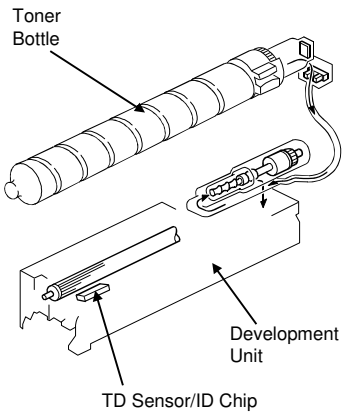


- **Seven ID sensors:**
  - Three for line position adjustment: Left end, middle, right end
  - Four for process control (one for each colour toner): In the red circles as shown above
- **When the sensors are not used, the solenoid moves the shutter to cover the sensors. This prevents dust on the sensors.**



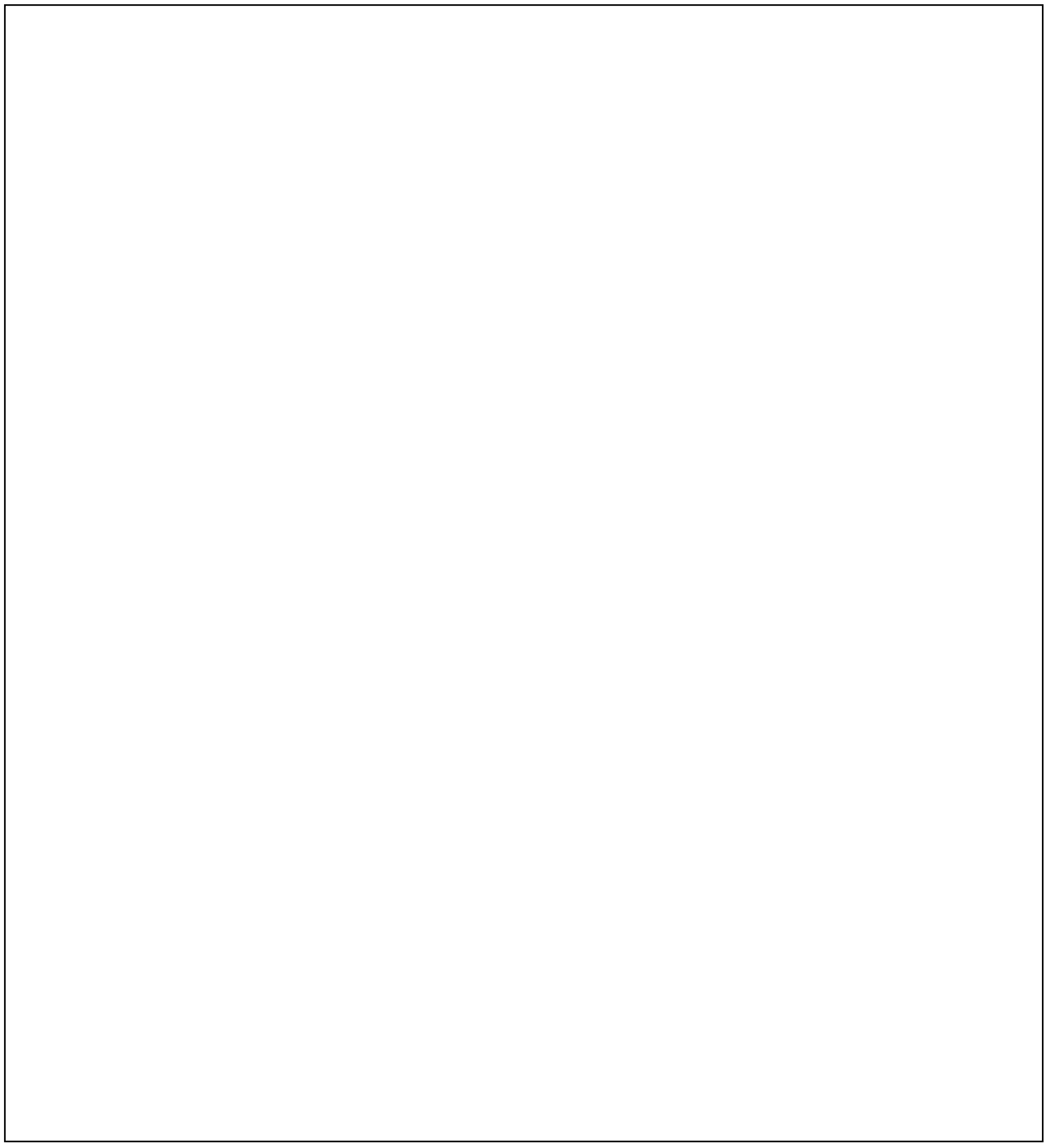
❒ R: Rear, F: Front

TD Sensor



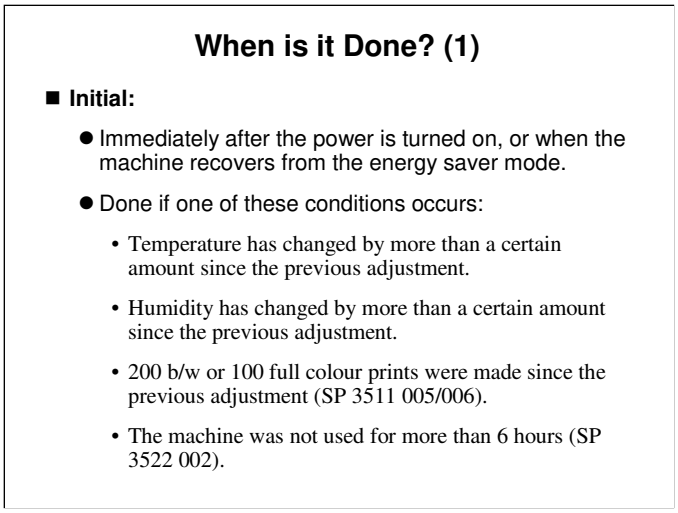
- **Each development unit has a TD sensor.**

Potential Control

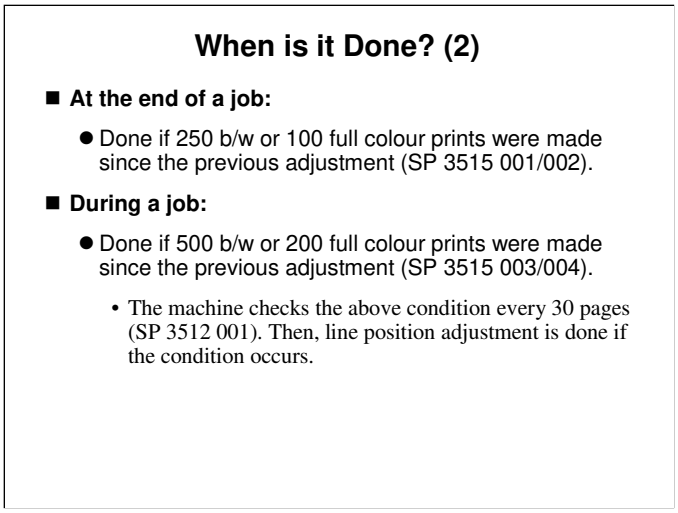


Overview

- **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.**



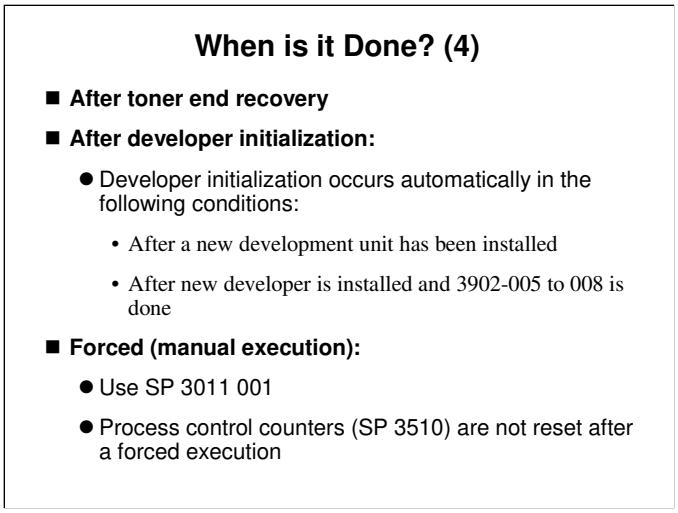
❒ The threshold levels are set by SP modes, as explained in the service manual.
❒ No process control before or after ACC.



- The intervals are set by SP modes, as explained in the service manual.
- 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)

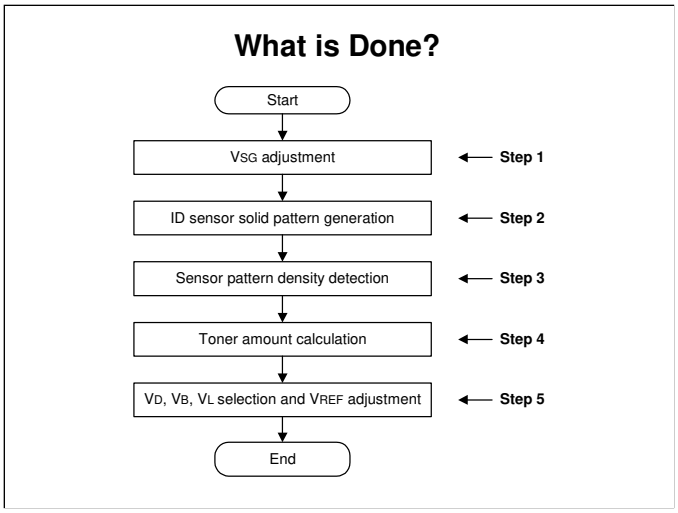
- **In standby mode (but not in energy saver mode):**
  - Done if one of these conditions occurs:
    - Temperature has changed by more than a certain amount since the previous adjustment.
    - Humidity has changed by more than a certain amount since the previous adjustment.
    - 200 b/w or 100 full colour prints were made since the previous adjustment (SP 3511 005/006).
    - The machine was not used for more than 6 hours (SP 3531 001).
  - The machine checks the above conditions in standby mode every 10 minutes (SP 3512 002). Then, process control is done if one of the conditions occurs.

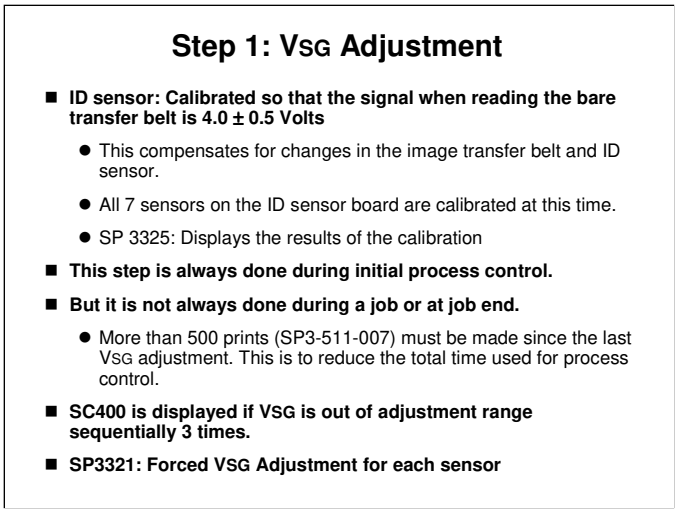


❒ Details of how to install developer were covered in the PCU section of the course.

What Values are used if Potential Control is Disabled?

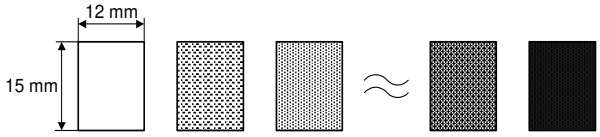
- **If potential control is disabled (SP3-041-001 is set to 0), V_D and V_B are fixed by SP mode settings.**
  - SP2-005 for V_D , SP2-229 for V_B
  - For toner supply: Fixed supply mode is used (V_{TREF} is not used)
- **If LD power control is disabled (SP3-041-002 is set to 0), the LD power is fixed by an SP mode setting.**
  - SP2-221 for V_L


What is Done?
Start
VSG adjustment
Step 1
ID sensor solid pattern generation
Step 2
Sensor pattern density detection
Step 3
Toner amount calculation
Step 4
VD, VB, VL selection and VREF adjustment
Step 5
End



❒ SP 2140 to 2145 are for designer use only. They cannot be used in the field to troubleshoot problems with the ID sensor.

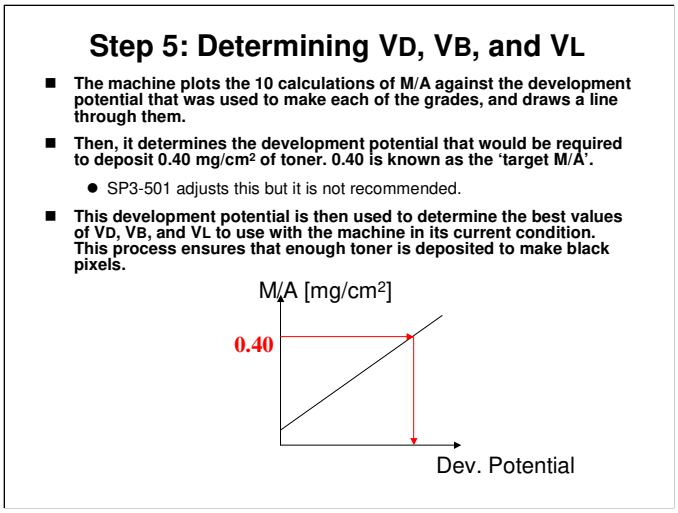
Steps 2 to 4: Toner Amount for Each Grade



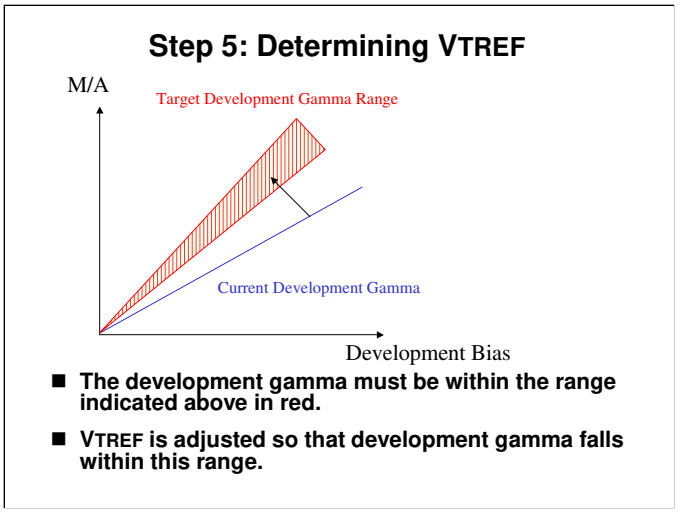
- **10 solid grades between white and 100% C, M, Y, or K**
- **Each grade is made by changing the development bias and charge roller voltage.**
  - The difference between development bias and charge roller voltage is always the same. But the development potential changes for each grade.
- **ID sensor: Measures the light reflected from each grade**
- **The machine calculates the amount of toner per unit area required to make each grade.**

More On Steps 2-4

- **The machine makes a 10-grade pattern on the image transfer belt.**
- **The development potential changes for each grade.**
  - The development potential is the difference between the development bias and the charge remaining on the drum where the laser writes a black area.
  - The development bias changes for each grade, so the development potential also changes.
- **The ID sensor measures the light reflected from each pattern.**
  - From this, the machine can calculate how much toner is deposited on the transfer belt for each of the 10 grades.
  - This is expressed as M/A (mass per unit area), in mg/cm^2.



- SP 3241: These settings determine how the machine sets the charge roller voltage, based on the development bias
  - Default: Charge roller voltage = Dev bias + 140 V
- SP 3242: These settings determine how the machine sets the LD power, based on the charge voltage. These SPs set the coefficients that are used in the calculation. There is no further information on this.



- The slope of the line is the development gamma, which is equivalent to the development potential.
- If the slope is too steep, the development potential will be too high, and the applied development bias will cause the mass of toner per area to be too high.
- If the slope is too shallow, the development potential will be too low, and not enough toner will be attracted to the latent image with the standard development bias.

VTREF Correction

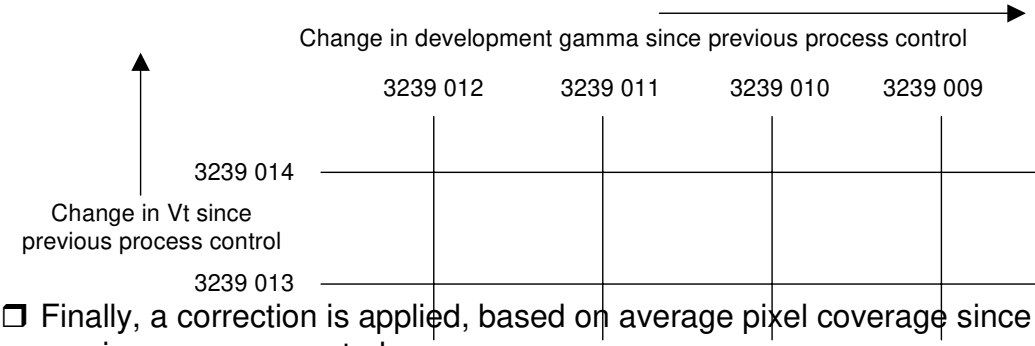
- **In this model, VT_{REF} compensation is not done by generating the pattern during a print job.**
- **In this model, VT_{REF} is corrected for pixel coverage.**
  - The correction is done during process control.
  - It is based on these three factors:
    - Average coverage since the previous process control
    - Change in development gamma since the previous process control
    - Change in VT since the previous process control

Details about Vtref correction

- ❒ At the process control self check, Vtref is corrected as follows.
- ❒ New Vtref = Vtref at developer initialization + Vtref correction.
  - ➢ SP 3222 001 to 004 displays new Vtref
  - ➢ SP 3222 005 to 008 displays Vtref at developer initialization
  - ➢ SP 3222 009 to 012 displays the Vtref correction.
- ❒ To get the new Vtref, the Vtref correction is always applied to the 'Vtref at developer initialization'. It is not applied to the current Vtref (the Vtref that was determined at the previous process control).

How is the Vtref correction calculated?

- ❒ At process control, the machine determines the changes in development gamma and in Vt since the previous process control.
- ❒ The ranges of these two factors are divided up by threshold levels (two for Vt, and four for gamma) as shown below. The result can be thought of as an aray of squares. As shown below
- ❒ Then, in each of the 'squares' in the diagram below, there is a different correction to apply to Vtref.



- ❒ Finally, a correction is applied, based on average pixel coverage since the previous process control.
  - ➢ The correction is a multiplication coefficient. It depends on the settings of SP 3224.
  - ➢ Low coverage: SP 3224 005 to 008
  - ➢ Medium coverage: No correction
  - ➢ High coverage: SP 3224 001 to 004

Toner Density Adjustment Mode

Overview

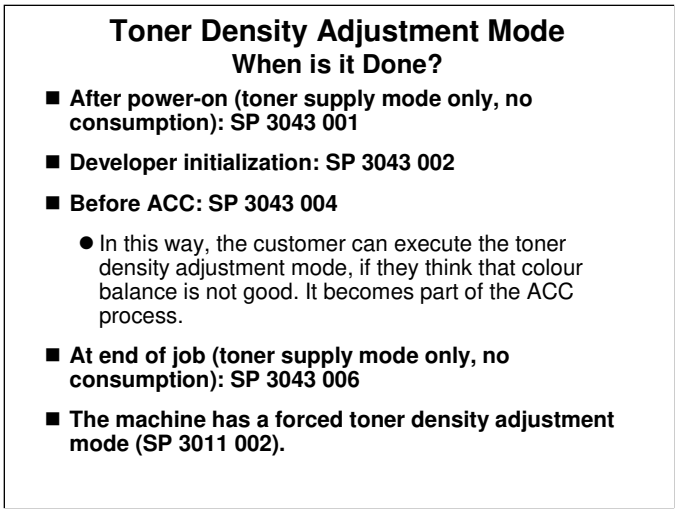
- Process control adjusts the toner density so that the density of each color in the image is correct.
- But, sometimes, process control adjusts the toner density too slowly, and the first few copies after process control have incorrect toner densities.
- Users of older models have complained about this.
- In this new model, a new process was included to take care of this. It is called 'toner density adjustment mode'.
- It brings toner concentrations to the correct values much more quickly.

Toner Density Adjustment Mode

What is Done?

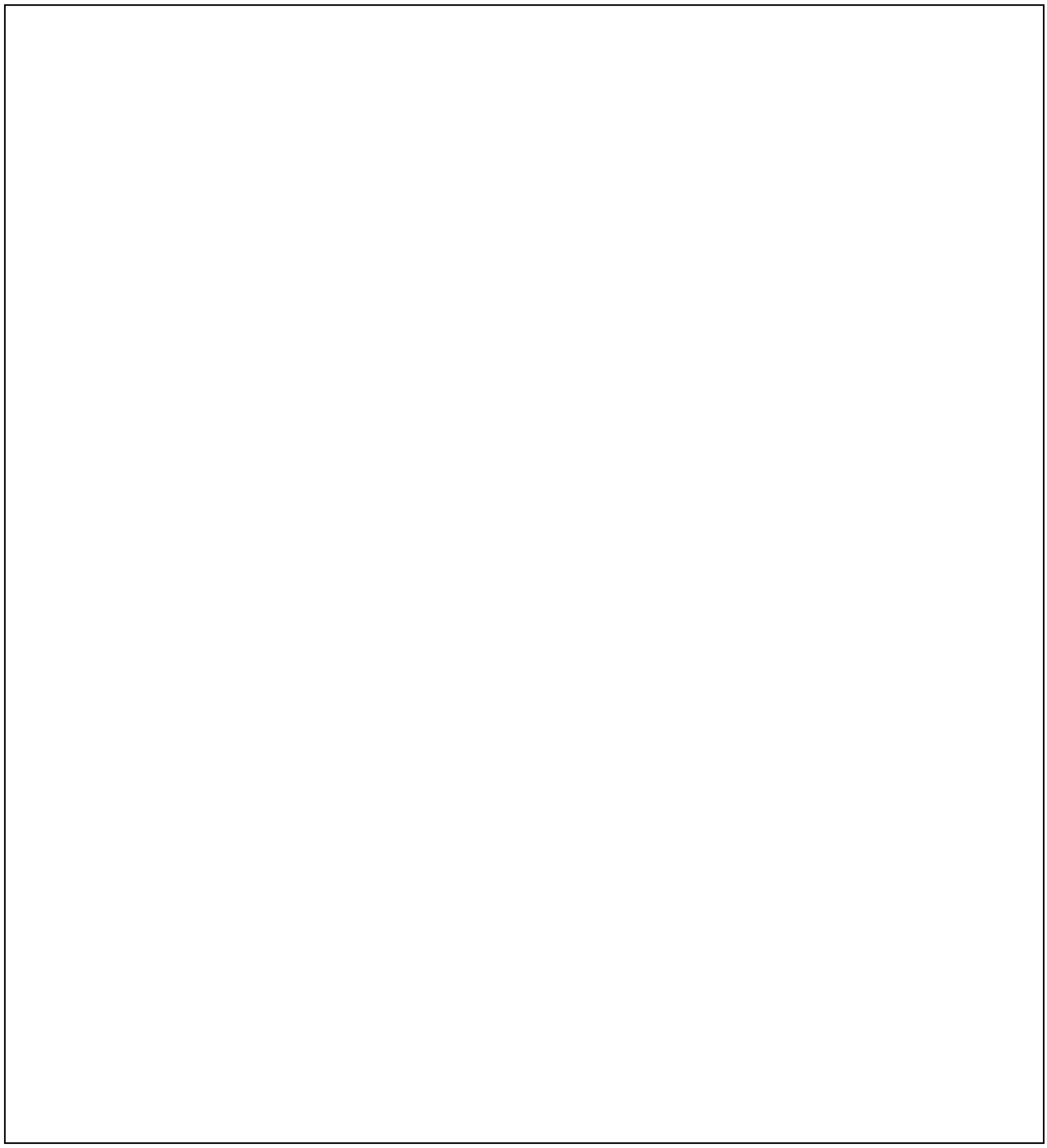
- **The machine makes sensor patterns and checks the current development gamma.**
- **Development gamma too low: If the following condition occurs, the machine increases the toner density. To do this, it supplies toner to the development unit.**
  - Current gamma < Target gamma - 0.2 (SP3-239-012)
- **Development gamma too low: If the following condition occurs, the machine decreases the toner density. To do this, it consumes some of the toner in the development unit.**
  - Current gamma ≥ Target gamma + 0.2 (SP3-239-009)

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



- 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).

Toner Supply Control

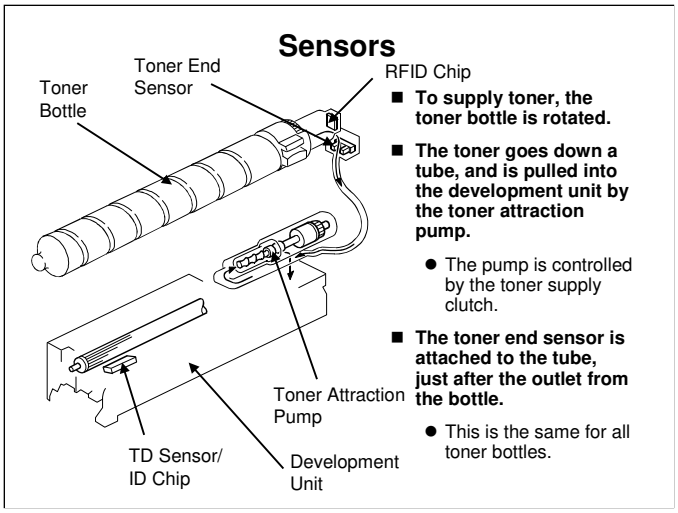


Overview

- **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 clutch turns on for.**
  - This determines the amount of toner supplied.
- **This is done before every development for each color.**

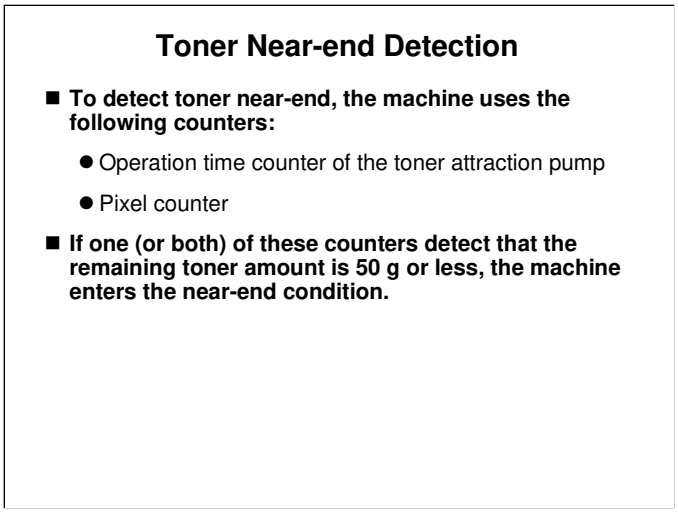
Toner Supply Control Modes

- **This machine uses 3 toner supply modes. The mode used depends on SP3-044-001 to –004.**
  - You can select a different mode for each colour, if necessary.
- **PID control mode: This is the default mode.**
  - Uses the TD sensor, ID sensor, and pixel count.
  - VTREF is adjusted by process control.
- **PID control mode with fixed VTREF**
  - The machine changes to this mode if the ID sensor breaks.
  - Uses only the TD sensor.
  - VTREF is fixed at the value stored in SP3-222-001 to –004.
- **Fixed supply mode**
  - The machine changes to this mode if the TD sensor breaks.
  - The amount of toner supply depends on SP3-401-001 to –004.
    - The default is 70% of normal supply, to prevent excessive supply of toner.



B230 service manual, Detailed Section Descriptions, Toner Supply, Overview

- 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 PCU, development unit, and drum unit, such as counters.
  - We discuss this in the PCU 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).



- The two counter values on the slide are stored in the RFID chip on the toner cartridge, and copied to the NVRAM on the BICU.
- The toner attraction pump is part of the toner supply mechanism. It pulls toner down from the toner bottle and into the development unit. We will see the mechanism in more detail in the 'Toner Supply' section of the course.

Toner End Detection

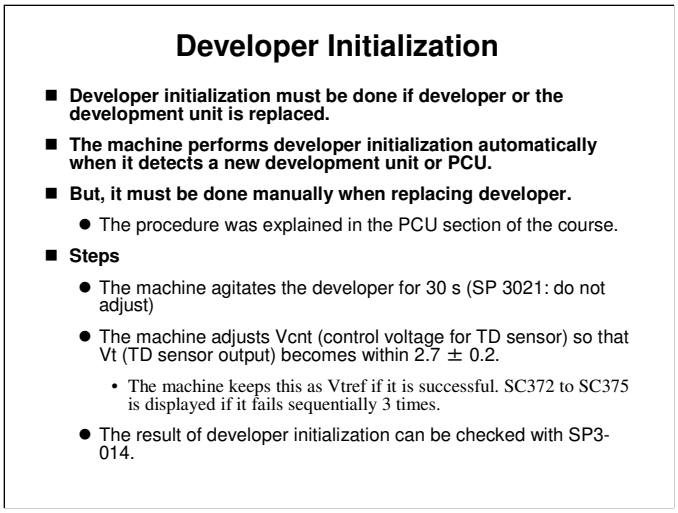
- **To detect toner end, the machine uses the TD sensor (there is one below each toner bottle).**
  - Toner end is detected if both of these conditions occur:
    - $V_T - V_{TREF} \geq 0.5$ (SP3-101-021)
    - $SUM(V_T - V_{TREF}) \geq 10$ (SP3-101-026)
- **The machine must be in a toner near-end condition. If it is not, then the machine does not check for toner end.**

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. Color print jobs cannot be started.**
  - If C, M, or Y toner ends during a color-printing job, the job is suspended until toner is supplied.
  - If new color toner is not installed, the user can print black-and-white jobs only.

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 5 times (SP 3-102). If the sensor still does not detect toner, there is no recovery from toner end.**



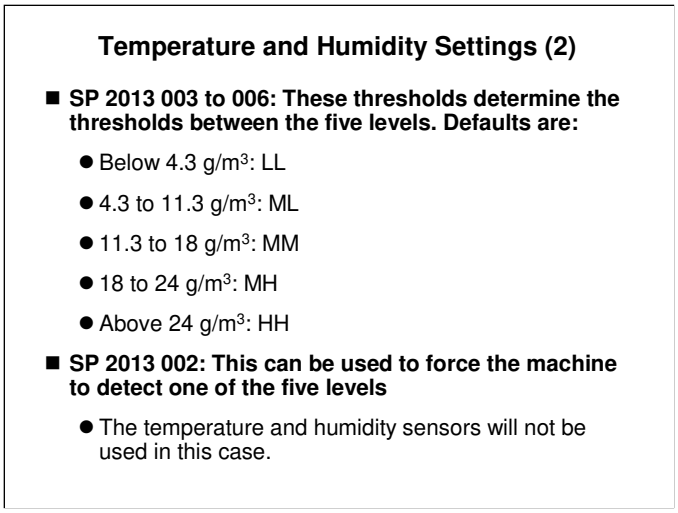
❒ During developer initialization, the machine forcibly supplies toner because there is no toner inside the toner transport tube at installation. Then the machine does the process control self check.

SP Modes

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

Temperature and Humidity Settings (1)

- **SP 2013 007, 008, 009: Displays the current temperature and relative humidity, and the absolute humidity**
  - This absolute humidity is now being used by the machine to correct the charge roller current.
  - The machine uses a scale of 5 levels of absolute humidity, and applies the corrections that are set for that level.
    - The corrections can be adjusted with SP mode.
  - These levels are called LL, ML, MM, MH, and HH.
  - The current level is displayed with SP 2013 001.



❒ Transfer current uses different SPs to set the thresholds, as explained in the Transfer section of the course.

Potential Control – Charge Roller

- **2005: Charge roller dc voltage if potential control is disabled with SP 3041 001**
  - 3631: Displays the current dc voltage
- **2006: Charge roller ac voltage, if SP 2012 is set to 1. Otherwise, this is decided by process control.**
  - 3641: Displays the current ac voltage
- **2007 to 2011: Charge ac current adjustment for environmental conditions**
  - Environmental conditions are detected with the temperature and humidity sensors, and determined by the settings of SP 2013.
- **3241: These settings determine how the machine sets the charge roller voltage, based on the development bias**
  - Default: Charge roller voltage = Dev bias + 140 V

Potential Control – Laser Power

- **2221: Adjusts the laser power, if LD power control is disabled with SP 3041 002**
  - 3651: Displays the current laser power
- **3242: These settings determine how the machine sets the LD power, based on the charge voltage**

Potential Control – Development Bias

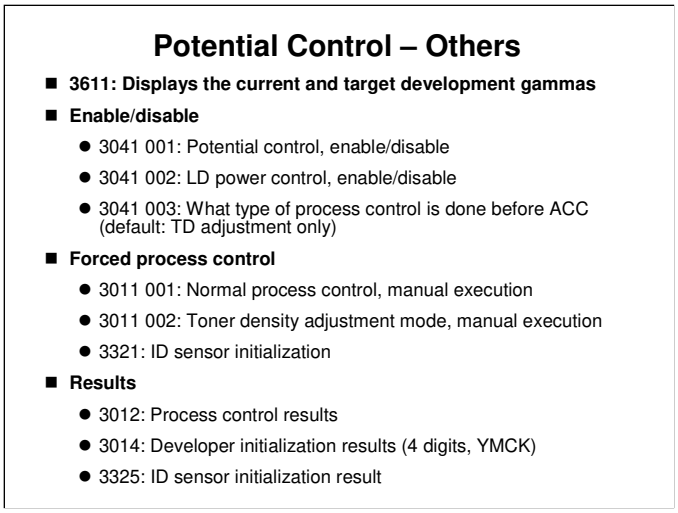
- **2229: Development bias if potential control is disabled with SP 3041 001**
  - 3621: Displays the current bias

Potential Control – TD Adjustment

- **3043: Controls toner density adjustment**
  - Already discussed

Potential Control – Execution Timing

- **3511, 3512, 3522, 3531: Execution intervals and thresholds**
  - Explained already
- **3513, 3514, 3515: Displays the intervals and conditions currently used to determine when to do the next process control**



- 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.
- If the machine cannot bring the development gamma within the target range, nothing happens (no SC code), because the machine cannot detect the current gamma after adjusting Vtref.

Toner Supply

- **3044: Toner supply method (one setting for each colour)**
- **3401: Toner supply rate for fixed supply mode**
- **3411: Displays the current toner supply rate**

Toner Supply

- **Forced toner supply**
  - 3015: Execution, supplies toner to the development unit
  - 3016: Duration of forced toner supply
- **3201: Displays Vt (SP 3238: Vt target)**
- **3221: Displays Vtcnt**
- **3222: Displays Vtref**

Toner Near-end/End

- **3045: Disables the toner end alert on the display panel.**
- **3101 013 to 016: Toner near-end threshold (near-end detected if remaining toner falls below this amount: default 50 g)**
- **Consumed/remaining toner**
  - 3101 005 to 008: Displays the consumed amount of each color toner, calculated by toner pump activation
  - 3101 009 to 012: Displays the remaining amount of each color toner, calculated by toner pump activation
  - 3101 028 to 031: Displays the consumed amount of each color toner, calculated by pixel count
  - 3101 032 to 035: Displays the remaining amount of each color toner, calculated by pixel count
  - 3101 040 to 043: Pixel mass per unit area, used to calculate toner consumption by pixel count

Toner Near-end/End

- **Near-end detection thresholds**
  - 3101 021: Vt – Vtref threshold for near-end detection
  - 3101 026: Delta Vt sum threshold for near-end detection
- **3102: Number of attempts to supply toner for toner end recovery**
- **3131: Number of times toner end was detected for each colour**

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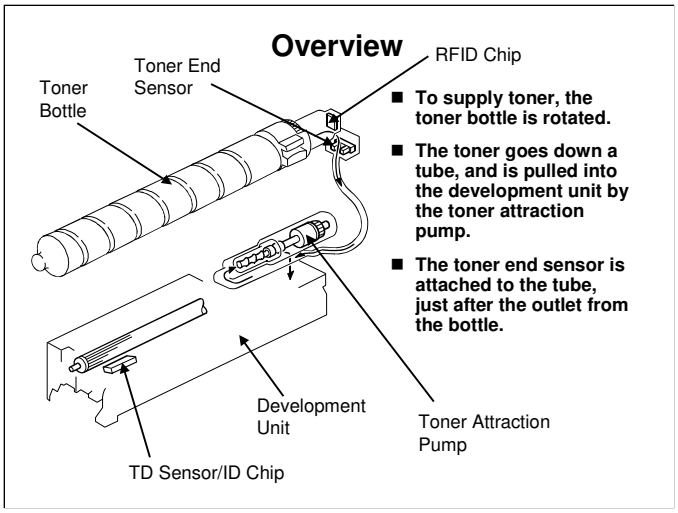
ATHENA-C1 TRAINING

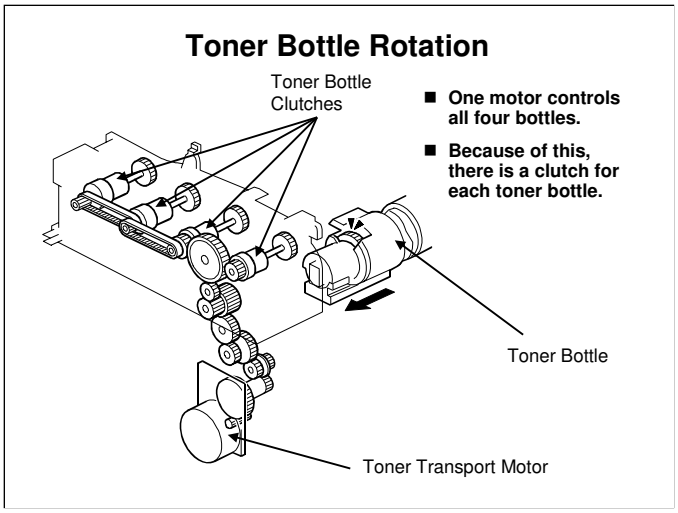
TONER SUPPLY

- 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.



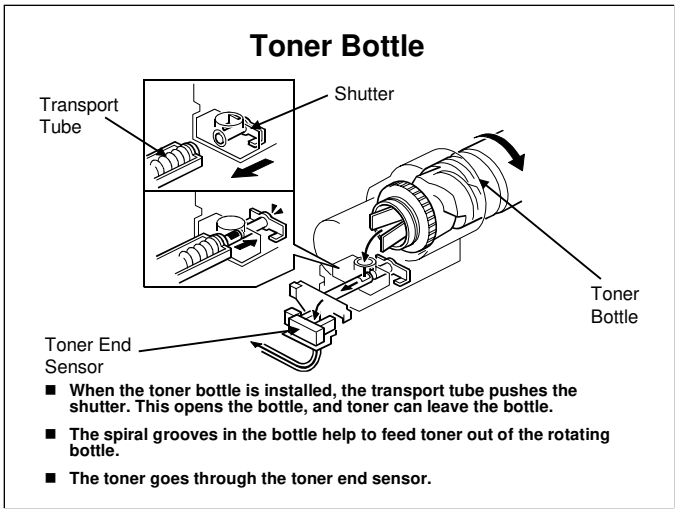
B230 service manual, Detailed Section Descriptions, Toner Supply, Overview

- 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 PCU, development unit, and drum unit, such as counters.
  - We discussed this in the PCU 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).



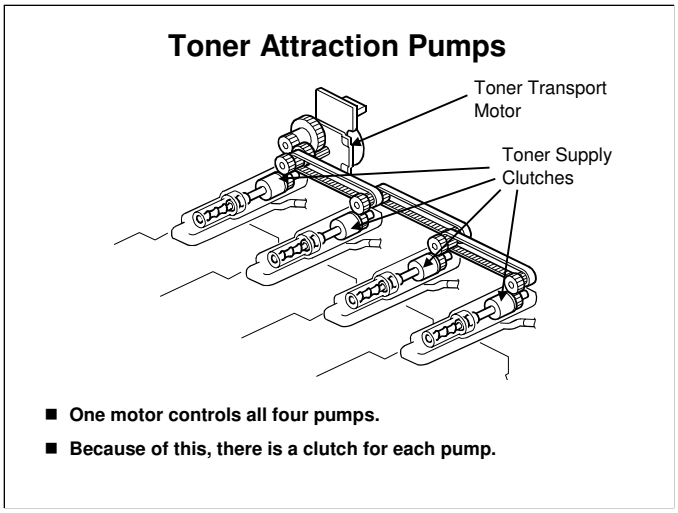
B230 service manual, Detailed Section Descriptions, Toner Supply, Toner Supply Mechanism

❒ The name of the clutch is the 'toner bottle clutch'. The toner supply clutches control the toner attraction pumps, as we shall see later.



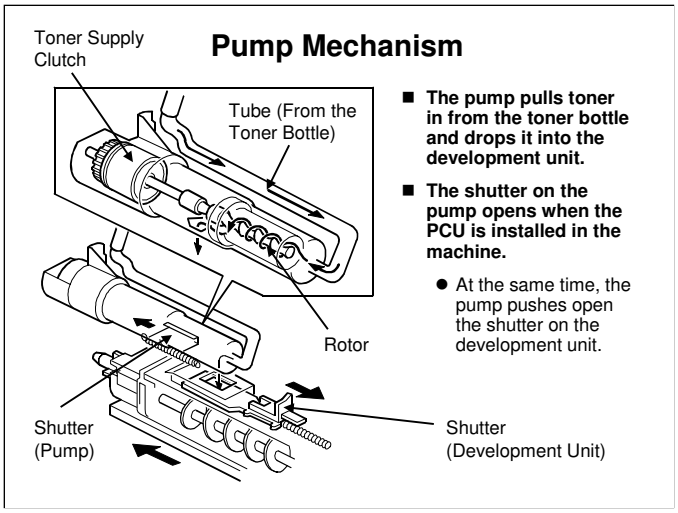
B230 service manual, Detailed Section Descriptions, Toner Supply, Toner Supply Mechanism

- This slide shows how toner is supplied from the toner bottle.
- Toner near-end and end detection were discussed in the Process Control section of the course.



B230 service manual, Detailed Section Descriptions, Toner Supply, Toner Supply Mechanism

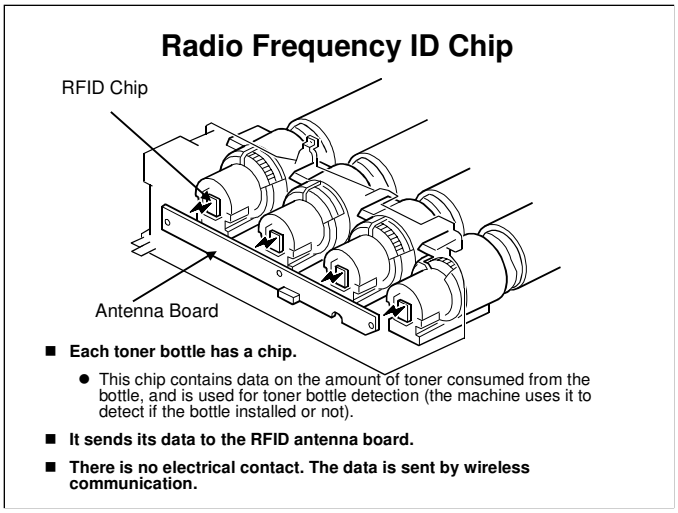
❒ This is the same motor that rotates the toner bottles.



B230 service manual, Detailed Section Descriptions, Toner Supply, Toner Supply Mechanism

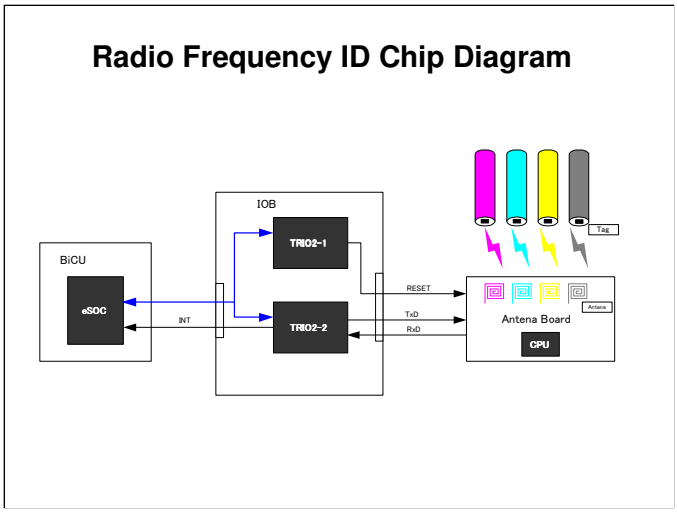
❒ The four pumps are the same.

❒ Springs close the two shutters when the PCU is pulled out of the machine.



B230 service manual, Detailed Section Descriptions, Toner Supply, Toner Cartridge

- ❒ The chip stores the time for the toner supply clutch, not the toner bottle clutch.
- ❒ The toner supply clutch controls the amount of toner that is transferred. The toner bottle clutch only rotates the bottle.



❒ Here is a schematic diagram of the RFID circuit.

Replacement

- **Do the following procedures**
  - B230 Service Manual, Replacement and Adjustment, Image Creation
    - Do the Toner Supply Tube Fan, Toner Pump Unit, and Toner End Sensor procedures.
- **Toner Supply Tube Fan**
  - When you install the new fan, make sure that the decal faces the rear of the machine.
- **Toner Pump Unit**
  - Use a sheet of paper as described in the manual.
    - This sheet of paper prevents toner and screws from falling into the laser optics housing unit through cutouts in the frames.
  - There are many notes and cautions in this procedure. Follow them carefully.

SP Modes

- **3045: Disables the toner end alert on the display panel.**
- **3101 005 to 008: Displays the consumed amount of each color toner, calculated by toner pump activation**
- **3101 009 to 012: Displays the remaining amount of each color toner, calculated by toner pump activation**
- **3101 028 to 031: Displays the consumed amount of each color toner, calculated by pixel count**
- **3101 032 to 035: Displays the remaining amount of each color toner, calculated by pixel count**

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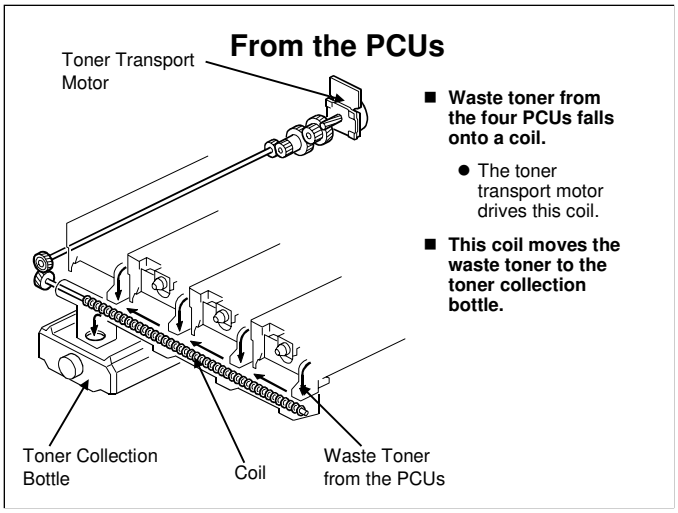
ATHENA-C1 TRAINING

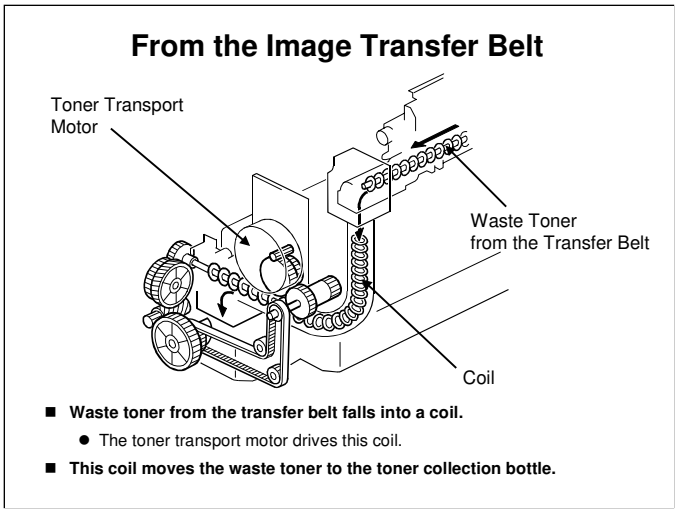
WASTE TONER COLLECTION

- 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.



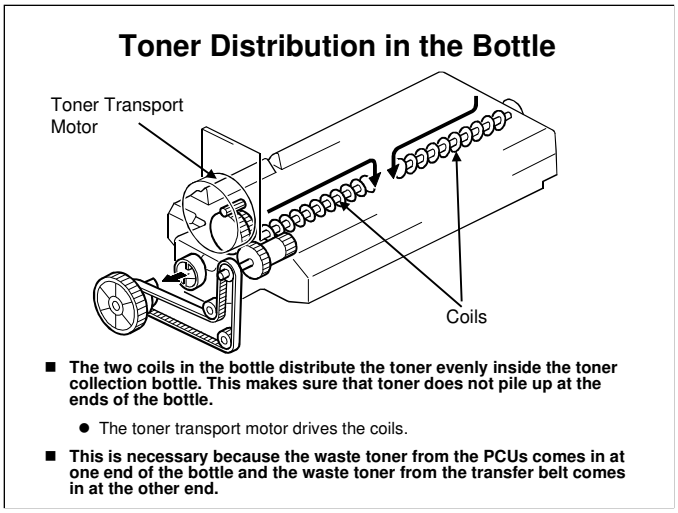
B230 service manual, Detailed Section Descriptions, Waste Toner Collection, Toner Collection Path and Drive

- ❒ For details on how waste toner is collected inside the PCUs, see the PCU section of the course.
- ❒ The PCUs are from left to right: Y, C. M, K



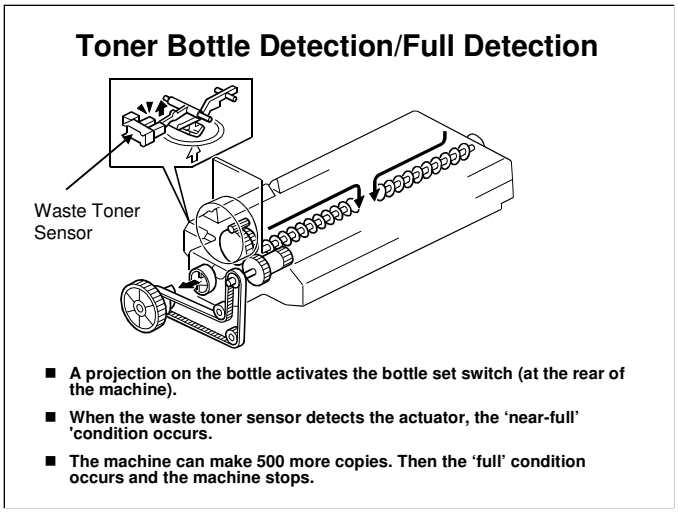
B230 service manual, Detailed Section Descriptions, Waste Toner Collection, Toner Collection Path and Drive

❒ For details on how waste toner is collected inside the transfer unit, see the Transfer section of the course.



B230 service manual, Detailed Section Descriptions, Waste Toner Collection, Toner Collection Path and Drive

- ❒ The coils pull the toner in from the ends of the bottle and move it to the center.
- ❒ This makes sure that toner does not pile up at the ends of the bottle.
- ❒ The toner transport motor is a very busy motor.



B230 service manual, Detailed Section Descriptions, Waste Toner Collection, Toner Bottle Detection/Full Detection

- The bottle set switch mechanism is not shown. It is at the rear of the machine (same as the waste toner sensor).
  - Show the projection on the bottle to the class. Also, go to the machine and show them the sensor, inside the machine at the rear.

Replacement

■ **Do the following procedures**

- B230 Service Manual, Replacement and Adjustment, Image Creation
  - Do the Toner Collection Bottle procedure.

■ **Notes**

- 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 017 to 1 before you start to work on the machine.

SP Modes

- **3800: Displays some data concerning the toner collection bottle**
- **3900: Disables bottle-full detection for the toner collection bottle**

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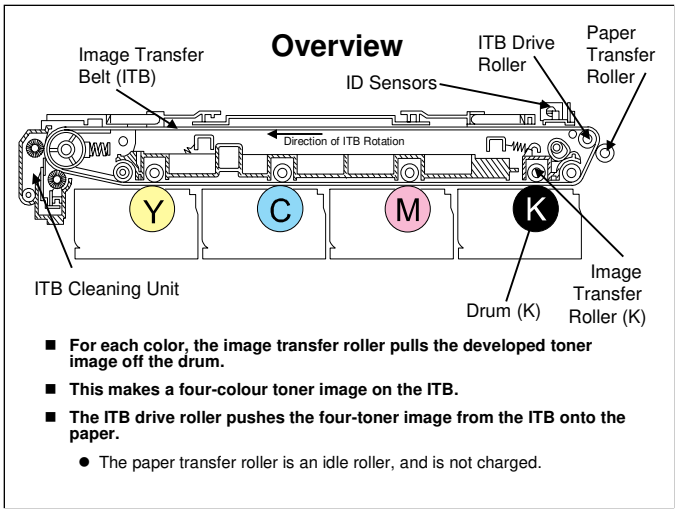
ATHENA-C1 TRAINING

TRANSFER

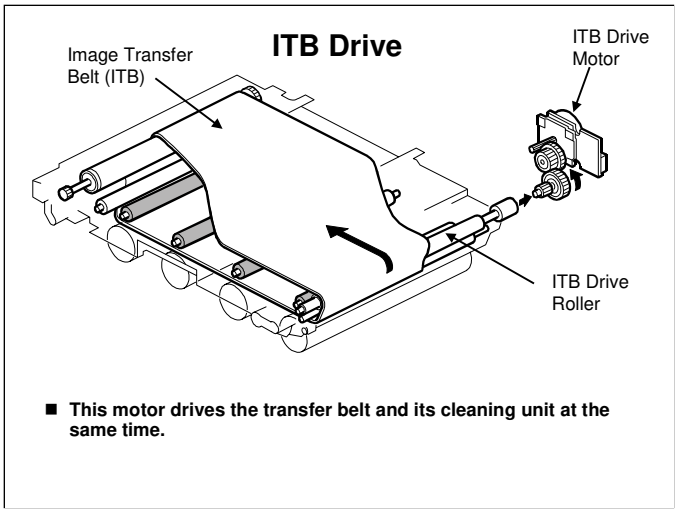
- In this section, the image transfer, paper transfer, and paper separation mechanisms will be described.

Date of change	Version History	Description
09-sep-2006	1.1	slide 4, notes page, no te



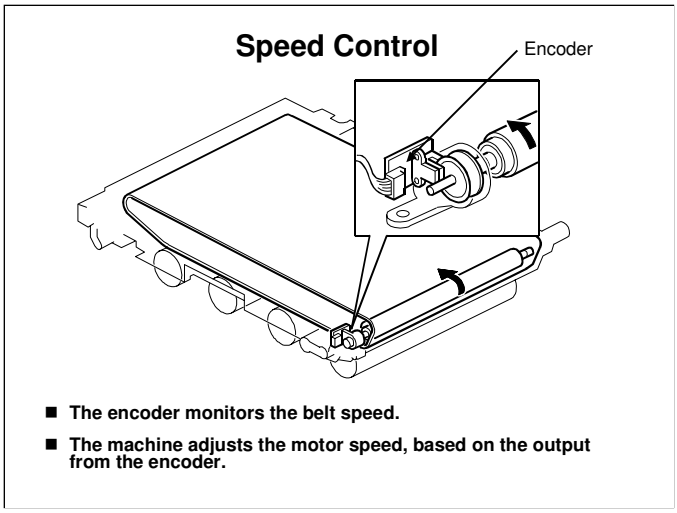
B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Image Transfer, Overview

- ❒ 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.



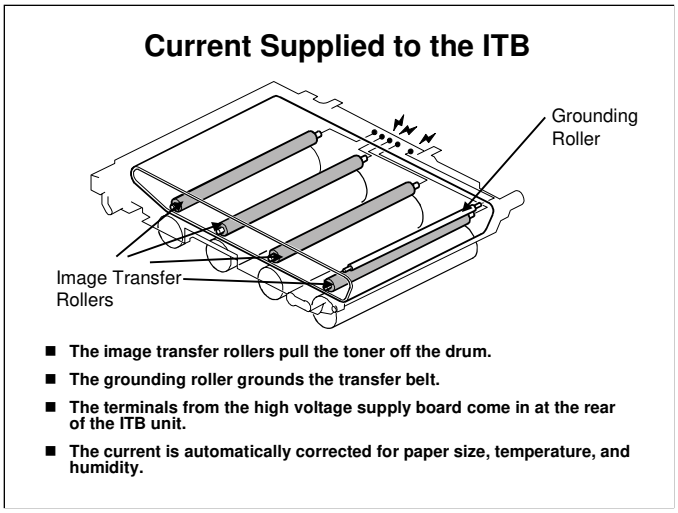
B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Image Transfer, ITB Drive

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



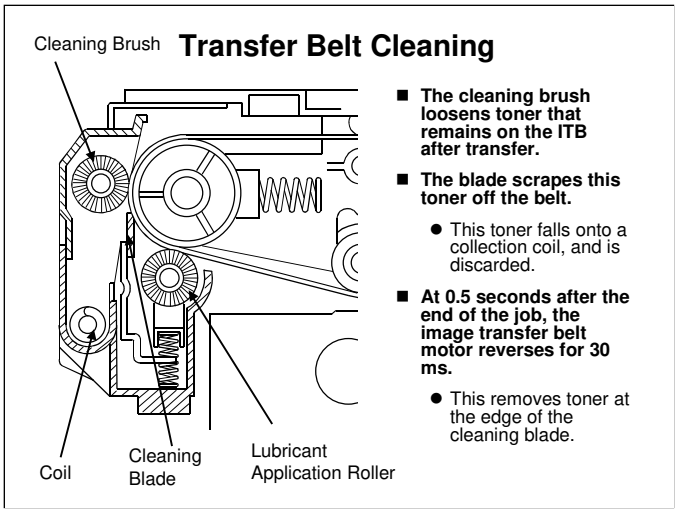
B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Image Transfer, ITB Drive

- 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 service manual shows this in more detail.



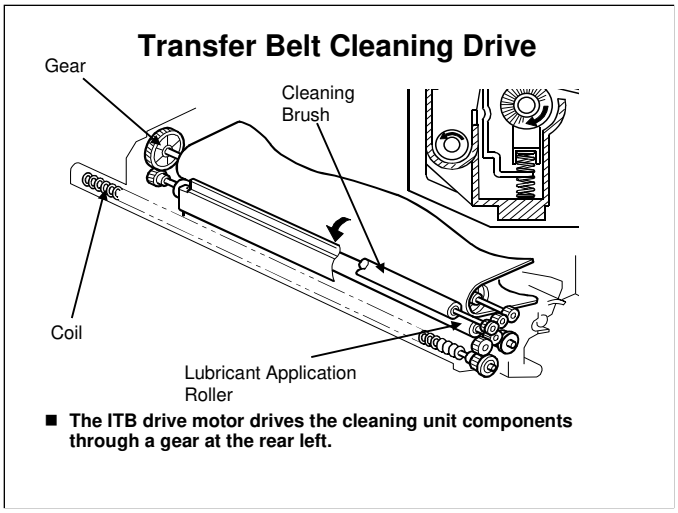
B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Image Transfer, ITB Current

- ❒ The temperature/humidity sensor is at the rear lower right side of the machine. See the component layout diagrams.
- ❒ We will look at the supply to the ITB drive roller again later in this section.



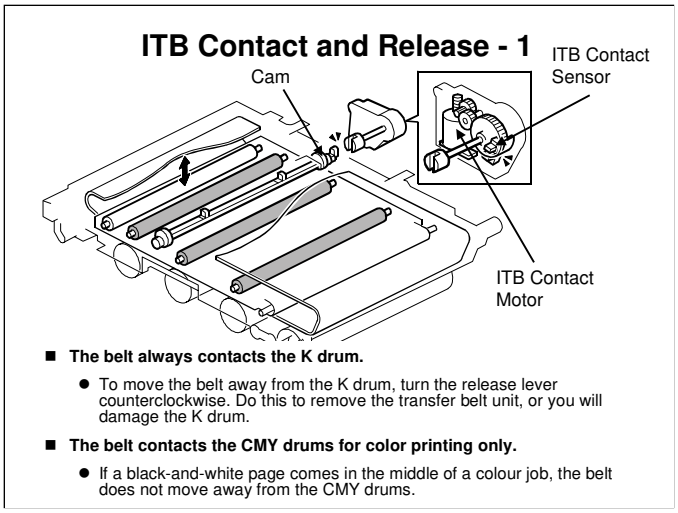
B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Image Transfer, Transfer Belt Cleaning

- The waste toner collection bottle and collection mechanism were described in an earlier section.
- The reverse rotation at the end of the job is controlled by SP2903 and 2904 (do not adjust, DFU).
  - It is also done for the OPCs at the same time, for the same purpose.



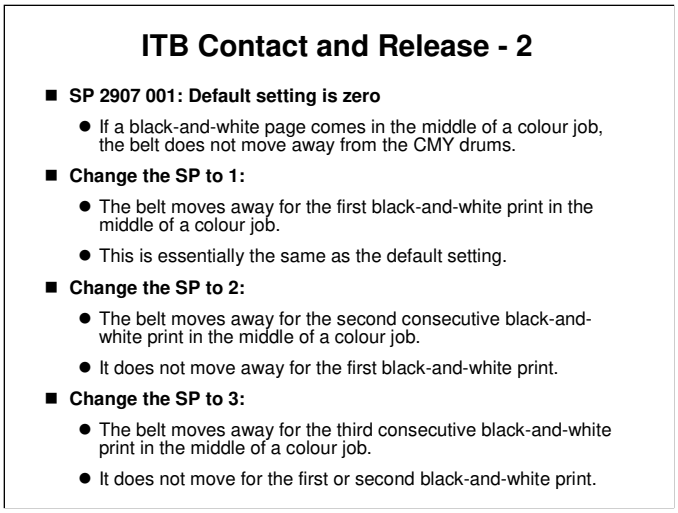
B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Image Transfer, Transfer Belt Cleaning

❒ This shows how the gear at the rear left of the transfer belt drives the cleaning unit..



B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Image Transfer, ITB Contact

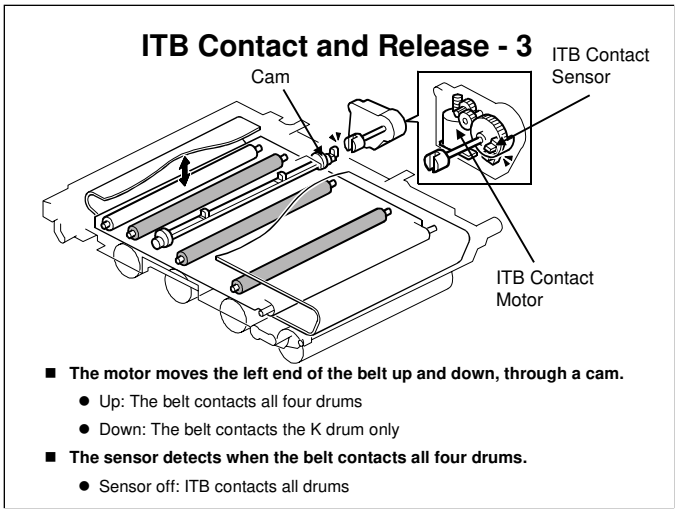
- This mechanism makes the drums and transfer belt life longer.
- If a black-and-white page comes in the middle of a colour job, the belt does not move away from the CMY drums.
  - This keeps the printing speed at the maximum, because it takes time for the motor to move the belt up and down.
  - This operation can be changed by adjusting SP 2907 001, as shown on the next slide.
- If a color 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).



This shows how the machine can be set up for different operations when black-and-white prints come in the middle of a set of color pages.

- ❒ If you change the SP to a higher value, the machine will operate faster, but there will be more wear and tear on the color drums.
  - ➢ It takes about 2 seconds to move the ITB away from the colour drums, and about 5 seconds to move the ITB into contact with the colour drums.

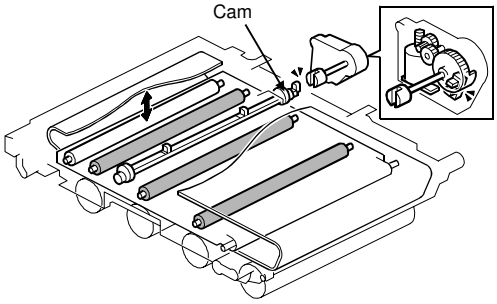
For colour pages, the ITB always contacts all drums. If one colour page comes in the middle of a black-and-white job, the ITB immediately moves into contact with the color drums. SP 2907 has no effect in this case.



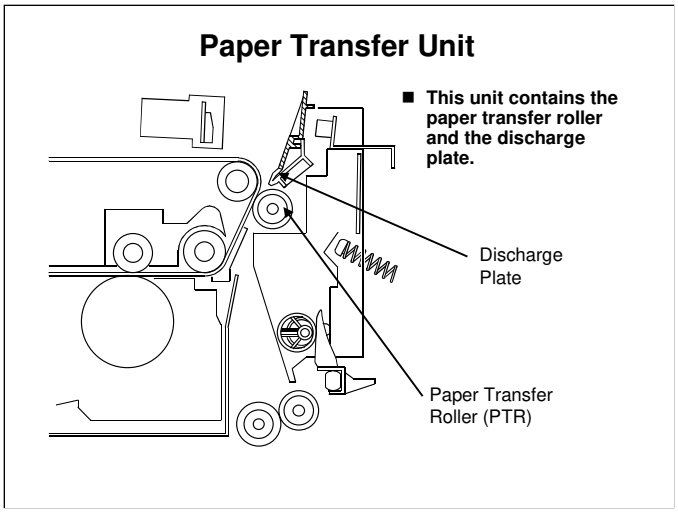
❒ The service manual explains how the sensor and motor operate to initialize the machine, and during different types of printing.

➢ See the ‘Transfer Belt Sensor’ section.

ITB Contact and Release - 4

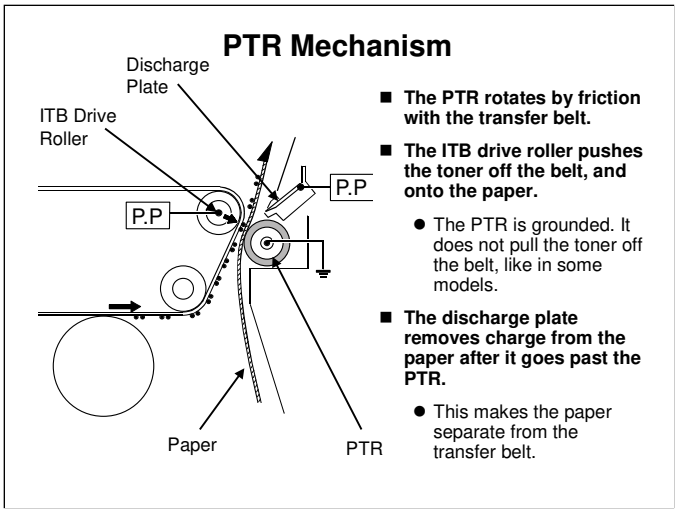


- **If a power failure occurs with the belt touching all 4 drums, the belt stays in this position, and you cannot remove the ITB.**
- **Open out the controller box, then turn the cam until the belt is fully lowered.**



B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Paper Transfer and Separation, Overview

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



B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Paper Transfer and Separation, PTR Drive

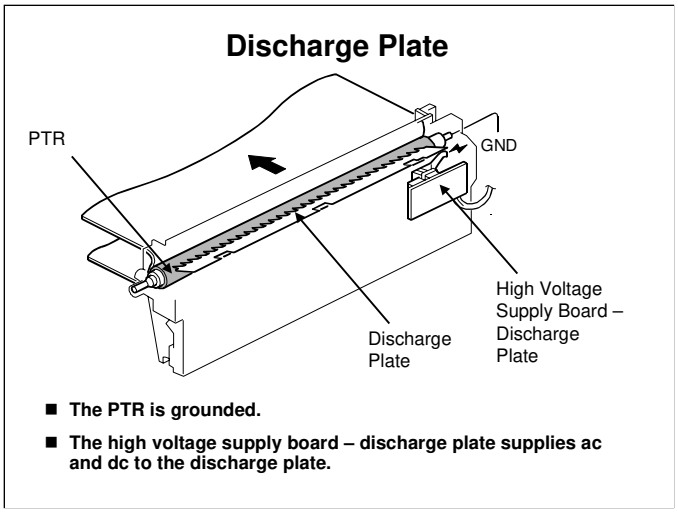
❒ Note that there are two power packs (P.P. in the diagram).

- The high voltage supply board supplies the ITB drive roller. It also supplies the image transfer rollers above each drum.

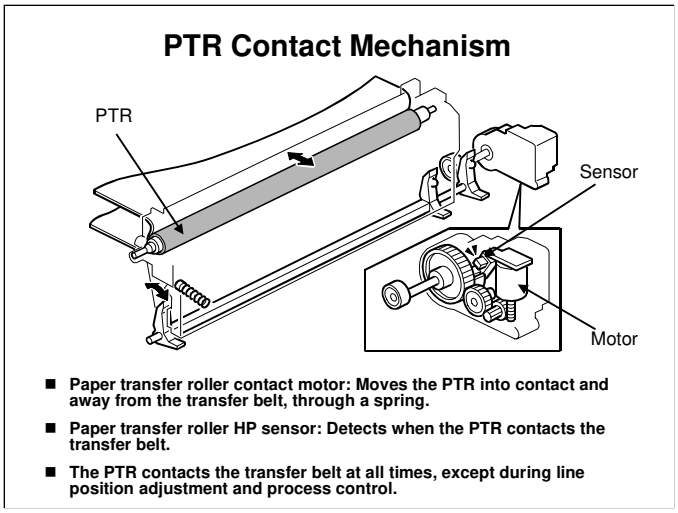
  Image transfer rollers - positive charge

  ITB drive roller – negative charge

- The high voltage supply board – discharge plate supplies the discharge plate with ac and dc voltage.



B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Paper Transfer and Separation, PTR Drive

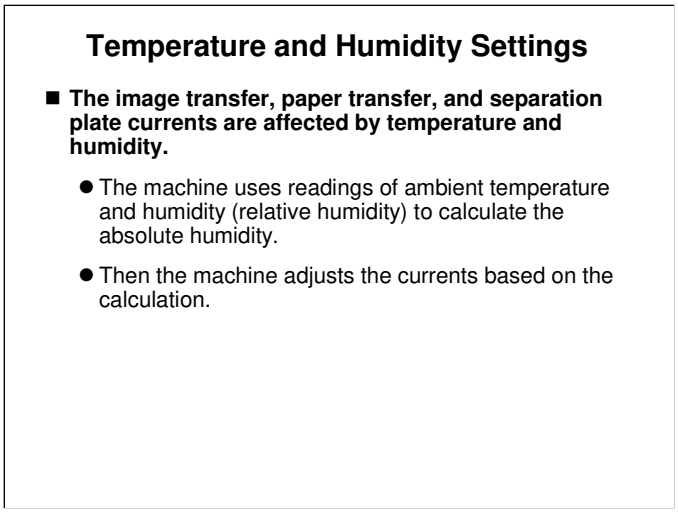


B230 service manual, Detailed Section Descriptions, Image Transfer and Paper Separation, Paper Transfer and Separation, PTR Contact and Separation

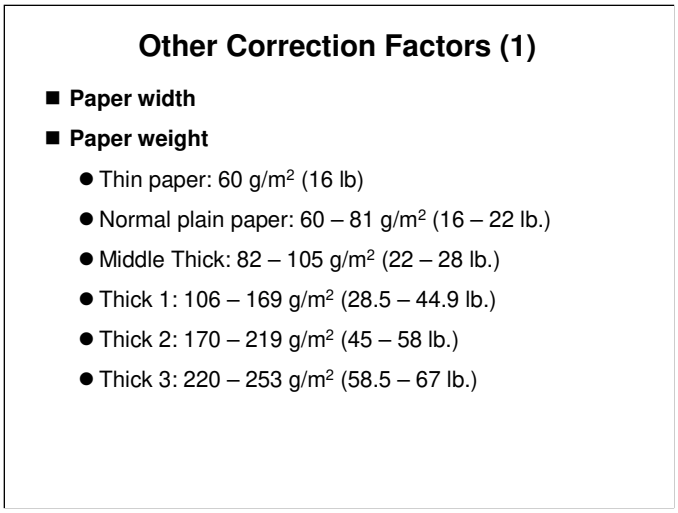
❒ During line position adjustment and process control, patterns are developed on the transfer belt. The PTR is moved away from the belt at this time, or the PTR will remove the patterns before they get to the ID sensors.

New Unit Detection

- **The new unit contains a fuse, that blows a short time after the new unit is installed.**
  - If the machine detects an intact fuse, followed shortly by a blown fuse, the machine automatically detects the new unit and resets the counters.
  - This is necessary because in Japan, the transport company staff may replace the unit, depending on the service contract.
- **If individual components of the ITB unit are replaced, and not a complete unit, the machine does not detect them automatically.**
  - If you replace the cleaning unit, you must reset the PM counter for this unit. To do this, set SP 3902 015 to 1 before you start to work on the machine.



❒ These temperature and humidity readings are also used by process control, as described in the Process Control section of the course.



- Some of these corrections can be adjusted. The adjustments will be explained at the end of this section, in the SP mode slides.

Thin paper

- This machine does not support thin paper.
- 'Thin paper' is an additional paper weight setting that the user can select at the operation panel if the 'plain paper' setting causes problems.
  - For example, if a certain type of paper is being curled because the fusing temperature is too high, then you can ask the customer to use the 'thin paper' setting.
  - Then you can use SP mode to reduce the fusing temperatures that are used for the 'thin paper' setting.
  - You can also change the transfer current settings, if the transfer of toner is insufficient.

Other Correction Factors (2)

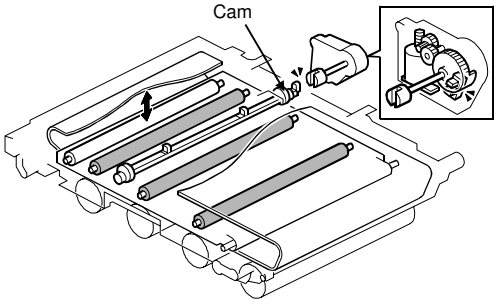
- **Print type (black-and-white, full colour)**
  - For the image transfer, different currents are applied for each toner colour.
  - Higher currents are applied for C and Y, because these two are applied last.
  - K and M toner already on the paper mean that more current is needed to transfer the C and Y toners correctly.
- **Leading and trailing edges**
  - These may require a different current that the image area, to ensure that paper separates correctly.
- **Side 1, Side 2 (duplex)**

❒ Some of these can be adjusted. The adjustments will be explained at the end of this section, in the SP mode slides.

Replacement – Image Transfer Unit (1)

- **Do the following procedures**
  - B230 Service Manual, Replacement and Adjustment, Image Transfer
- **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 counterclockwise 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.
    - Open out the controller box, then turn the cam until the belt is fully lowered. (see the next slide). After that, the ITB contacts the K drum only.

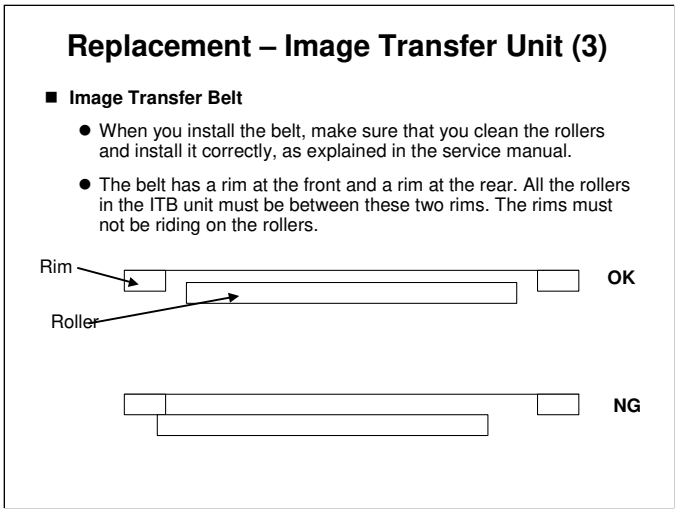
Cam for the Image Transfer Belt Unit



- **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 out the controller box, then turn the cam until the belt is fully lowered.**

Replacement – Image Transfer Unit (2)

- **Image Transfer Belt Cleaning Unit**
  - If you will install a new belt cleaning unit, set SP 3902-015 to 1 before you turn off the power switch.
    - If you do this, then the machine will reset the PM counter for the belt cleaning unit automatically, after you turn the power on again.
    - Do not use SP3902 if you replace the complete ITB unit. This is because the new ITB unit has a new unit detection mechanism.



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

Replacement – Image Transfer Unit (4)

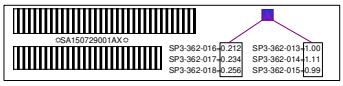
- **Image Transfer Belt (continued)**
  - The painted number on the belt must be at the rear side.

Replacement – Image Transfer Unit (5)

- **Image Transfer Belt (continued)**
  - Put "Lubricant Powder" (B132 9700) on the surface of the image transfer belt [A], while you turn the drive gear [B] at a constant speed, as shown.
    - The straight arrow in the picture shows belt movement direction.
    - Lubricant powder prevents the image transfer cleaning blade from turning up.

Replacement – Paper Transfer Unit

- **Do the following procedures**
  - B230 Service Manual, Replacement and Adjustment, Paper Transfer
- **Paper Transfer Roller Unit or Paper Transfer Unit**
  - If you will install a new unit, set SP 3902-016 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**
  - Note the cleaning procedure (every 320k).
  - If you install a new board, input the values from the decal into SP 3362 as shown in the service manual.



SP Modes – Temperature and Humidity Settings (1)

- **SP 2241: Displays the current temperature and relative humidity, and the absolute humidity**
  - This absolute humidity is now being used by the machine to correct the image and paper transfer currents.
  - The machine uses a scale of 5 levels of absolute humidity, and applies the corrections that are set for that level.
    - The corrections can be adjusted with SP mode.
  - These levels are called LL, ML, MM, MH, and HH.

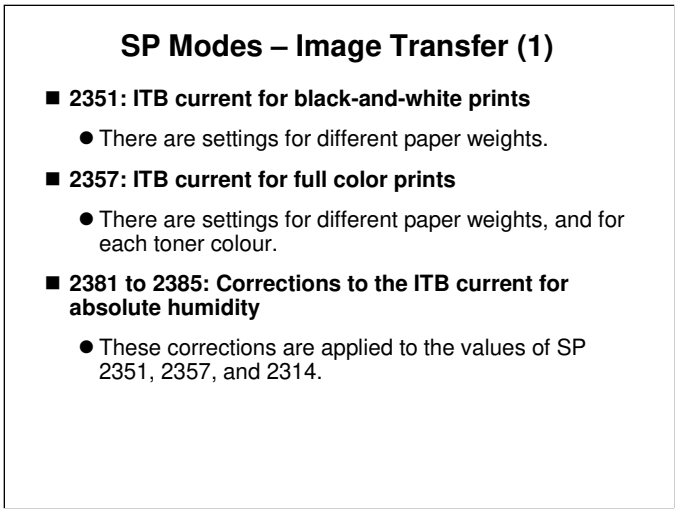
SP Modes – Temperature and Humidity Settings (2)

- **SP 2302 003 to 006: These thresholds determine the thresholds between the five levels. Defaults are:**
  - Below 4.3 g/m^3: LL
  - 4.3 to 11.3 g/m^3: ML
  - 11.3 to 18 g/m^3: MM
  - 18 to 24 g/m^3: MH
  - Above 24 g/m^3: HH
- **SP 2302 002: This can be used to force the machine to detect one of the five levels**
  - The temperature and humidity sensors will not be used in this case.

❒ Process control uses different SPs to set the thresholds, as explained in the Process Control section of the course.

SP Modes – Paper Width Thresholds

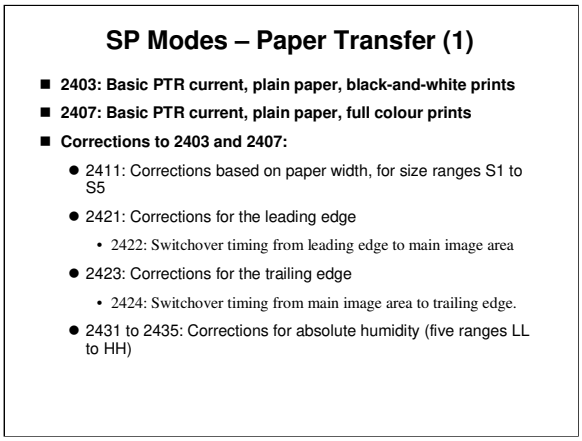
- **The machine corrects the paper transfer current for paper width.**
- **There are five ranges for paper width. A different correction can be applied for each width.**
  - S1: 297 mm or more
  - S2: From 257 to 297 mm
  - S3: from 210 to 257 mm
  - S4: From 148 to 210 mm
  - S5: 148 mm or less
- **SP 2308: Controls the thresholds between the five paper width ranges.**



❒ ITB: Image transfer belt

SP Modes – Image Transfer (2)

- **2311 001: Correction for ITB current for non image areas (applied between pages)**
- **2314: ITB current used for making ID sensor patterns**
- **2316 001: Current applied to the ITB immediately after power on or the cover open/closed**

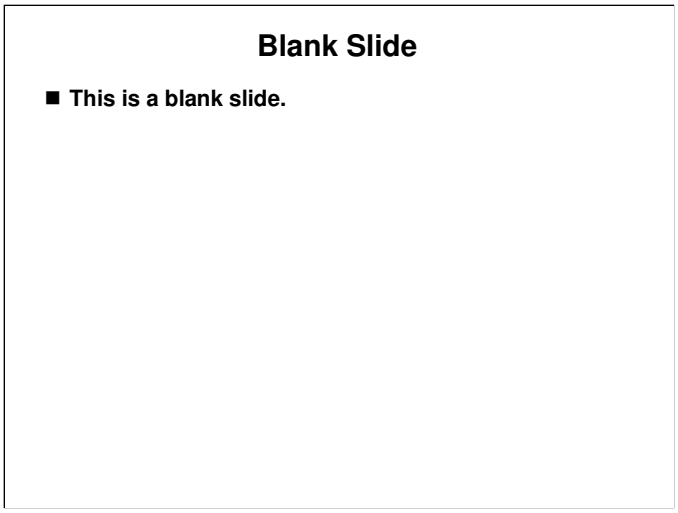


- PTR: Paper transfer roller
- S1 to S5: Five paper width ranges, described earlier in this section.
- LL, ML, MM, MH, HH: Five humidity ranges, described earlier in this section.

Adjustments for other paper weights

- Thin paper
  - Basic PTR current: 2453 (black-and-white), 2457 (colour)
  - Paper width correction: 2461
  - Leading edge correction: 2471 (switchover timing: 2472)
  - Trailing edge correction: 2473 (switchover timing: 2474)
  - Absolute humidity correction: 2481 to 2485
- Thick 1 paper
  - Basic PTR current: 2502 (black-and-white), 2507 (colour)
  - Paper width correction: 2511
  - Leading edge correction: 2521 (switchover timing: 2522)
  - Trailing edge correction: 2523 (switchover timing: 2524)
  - Absolute humidity correction: 2531 to 2535
- Thick 2 paper
  - Basic PTR current: 2553 (black-and-white), 2558 (colour)
  - Paper width correction: 2561
  - Leading edge correction: 2571 (switchover timing: 2572)
  - Trailing edge correction: 2573 (switchover timing: 2574)
  - Absolute humidity correction: 2581 to 2585
- OHP
  - Basic PTR current: 2603 (black-and-white), 2608 (colour)
  - Paper width correction: 2611
  - Leading edge correction: 2621 (switchover timing: 2622)
  - Trailing edge correction: 2623 (switchover timing: 2624)
  - Absolute humidity correction: 2631 to 2635
  - No corrections for side 2 duplex – most people don't make duplex copies on OHPs

Continued on the notes page for the next slide (Blank slide)



- Thick 3 paper
  - Basic PTR current: 2651 (black-and-white), 2652 (colour)
  - Paper width correction: 2653
  - Leading edge correction: 2654 (switchover timing: 2655)
  - Trailing edge correction: 2656 (switchover timing: 2657)
  - Absolute humidity correction: 2658 to 2662
- Special 1 paper
  - Basic PTR current: 2753 (black-and-white), 2757 (colour)
  - Paper width correction: 2761
  - Leading edge correction: 2771 (switchover timing: 2772)
  - Trailing edge correction: 2773 (switchover timing: 2774)
  - Absolute humidity correction: 2781 to 2785
- Special 2 paper
  - Basic PTR current: 2803 (black-and-white), 2807 (colour)
  - Paper width correction: 2811
  - Leading edge correction: 2821 (switchover timing: 2822)
  - Trailing edge correction: 2823 (switchover timing: 2824)
  - Absolute humidity correction: 2831 to 2835
- Special 3 paper
  - Basic PTR current: 2852 (black-and-white), 2857 (colour)
  - Paper width correction: 2861
  - Leading edge correction: 2871 (switchover timing: 2872)
  - Trailing edge correction: 2873 (switchover timing: 2874)
  - Absolute humidity correction: 2881 to 2885

SP Modes – Paper Transfer (2)

- **2311 002: Correction for PTR current for non image areas (applied between pages)**
- **2326: Current applied for cleaning the PTR**
  - This is done at the end of each job.
- **2930 to 2939: These control the upper limit voltages for the PTR**
  - 2930: Threshold between high and low resistance at the PTR.
    - This is measured at the start of each job.
      - The paper transfer current used to measure this can be adjusted with SP 2311 003.
    - It affects the upper limit voltage for the PTR.
  - 2931 to 2939: Upper limit voltages for the PTR, for each paper weight, and for high and low resistance.

SP Modes – Discharge Plate

- **2401: Separation DC voltage for plain paper**
- **Corrections to 2401:**
  - 2421: Corrections for the leading edge
    - 2422: Switchover timing from leading edge to main image area
  - 2431 to 2435: Corrections for absolute humidity

Adjustments for other paper weights

- Thin paper
  - Basic DC voltage: 2451
  - Leading edge correction: 2471 (switchover timing: 2472)
  - Absolute humidity correction: 2481 to 2485
- Thick 1 paper
  - Basic DC voltage: 2501
  - Leading edge correction: 2521 (switchover timing: 2522)
  - Absolute humidity correction: 2531 to 2535
- Thick 2 paper
  - Basic DC voltage: 2551
  - Leading edge correction: 2571 (switchover timing: 2572)
  - Absolute humidity correction: 2581 to 2585
- OHP
  - Basic DC voltage: 2601
  - Leading edge correction: 2621 (switchover timing: 2622)
  - Absolute humidity correction: 2631 to 2635
- Thick 3
  - Basic DC voltage: 2650
  - Leading edge correction: 2654 (switchover timing: 2655)
  - Absolute humidity correction: 2658 to 2662
- Special 1 paper
  - Basic DC voltage: 2751
  - Leading edge correction: 2771 (switchover timing: 2772)
  - Absolute humidity correction: 2781 to 2785
- Special 2 paper
  - Basic DC voltage: 2801
  - Leading edge correction: 2821 (switchover timing: 2822)
  - Absolute humidity correction: 2831 to 2835
- Special 3 paper
  - Basic DC voltage: 2851
  - Leading edge correction: 2871 (switchover timing: 2872)
  - Absolute humidity correction: 2881 to 2885

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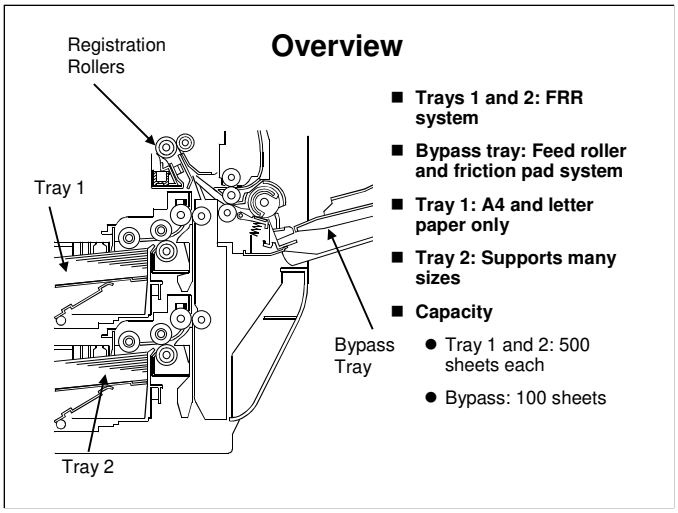
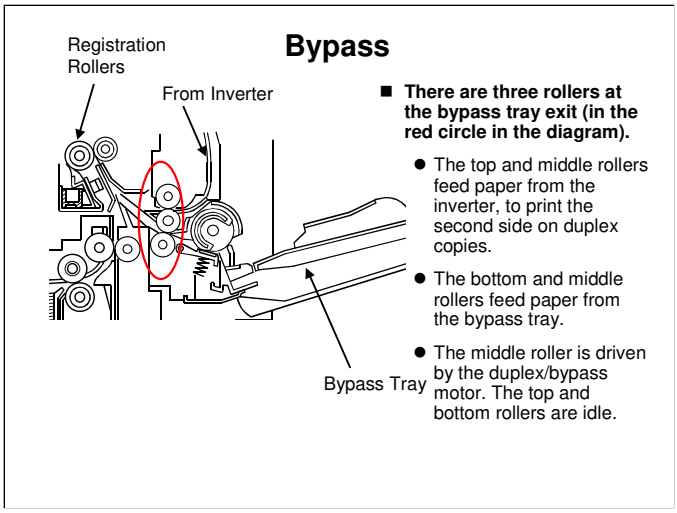
ATHENA-C1 TRAINING

PAPER FEED

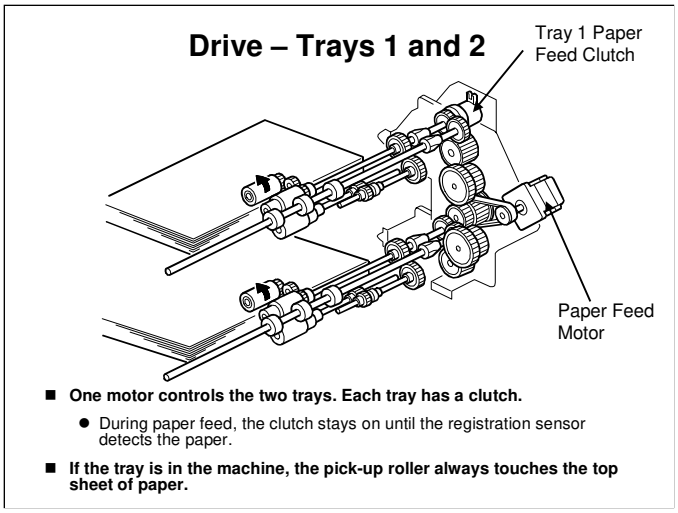
- In this section, the paper feed mechanisms in the copier will be described.
- The optional paper feed units will be described in separate sections.



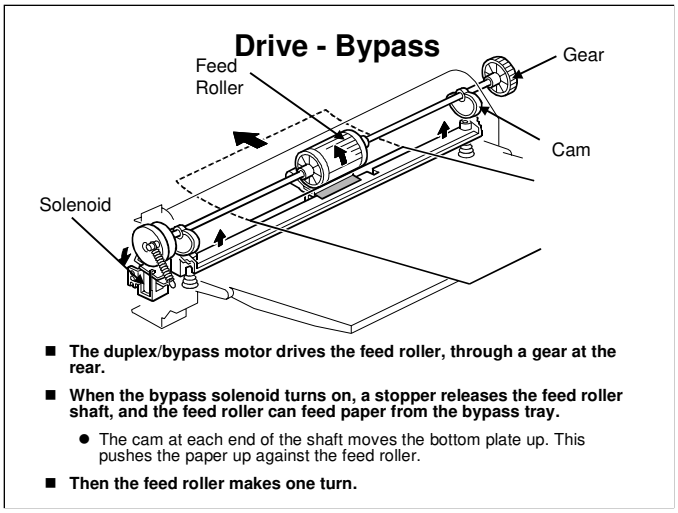
B230 service manual, Detailed Section Descriptions, Paper Feed, Overview



❒ This is a close-up view of the bypass tray exit.

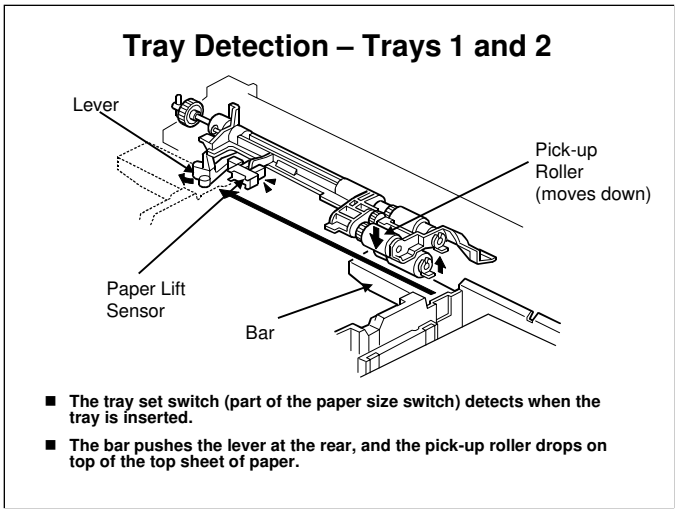


B230 service manual, Detailed Section Descriptions, Paper Feed, Drive



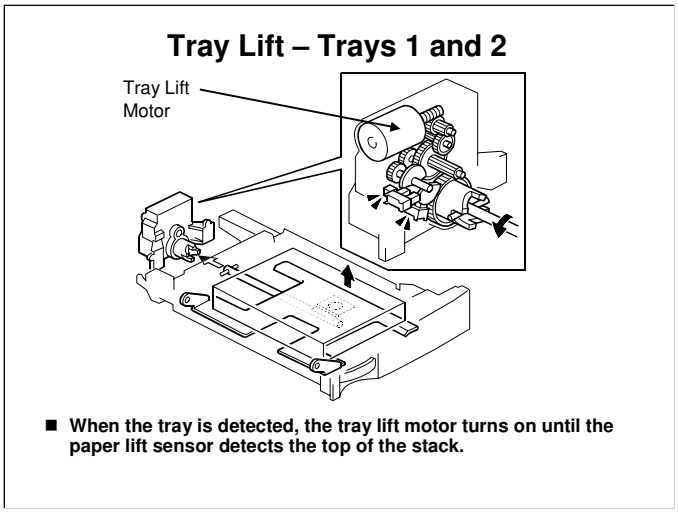
B230 service manual, Detailed Section Descriptions, Paper Feed, Drive

❒ The duplex/bypass motor mechanism is shown in more detail in the Duplex section of the course.



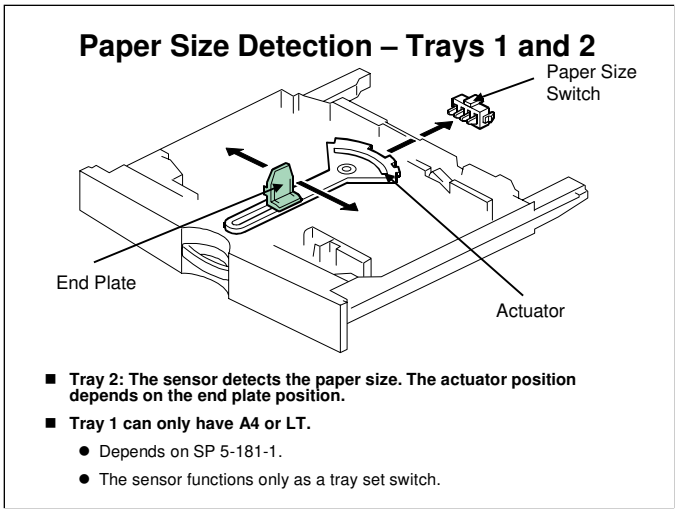
B230 service manual, Detailed Section Descriptions, Paper Feed, Paper Lift

❒ The tray set switch is in the center of the tray at the rear. It is shown on the slide for the Paper Size Detection mechanism.



B230 service manual, Detailed Section Descriptions, Paper Feed, Paper Lift

❒ The paper lift sensor is on the previous slide.



Paper Size Detection – Trays 1 and 2

- **Tray 2: The sensor detects the paper size. The actuator position depends on the end plate position.**
- **Tray 1 can only have A4 or LT.**
  - Depends on SP 5-181-1.
  - The sensor functions only as a tray set switch.

B230 service manual, Detailed Section Descriptions, Paper Feed, Paper Size Detection (Trays 1 and 2)

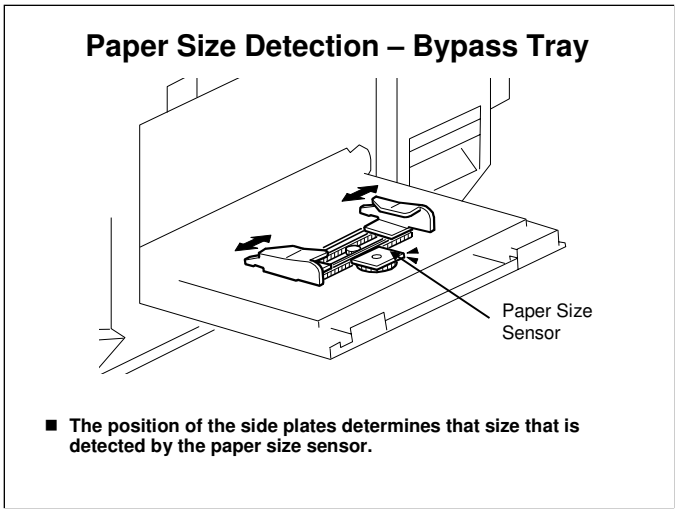
- The sensor functions as a tray set switch and a size detector in tray 2.
  - The three switches on the left detect paper size. The switch on the right is a tray set sensor.
- Only the length is detected directly.
- The actuator has patterns of studs on the rear.
- These studs turn the paper size switches 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. See the table in the service manual for details.

    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.

Size Detection – SP Modes

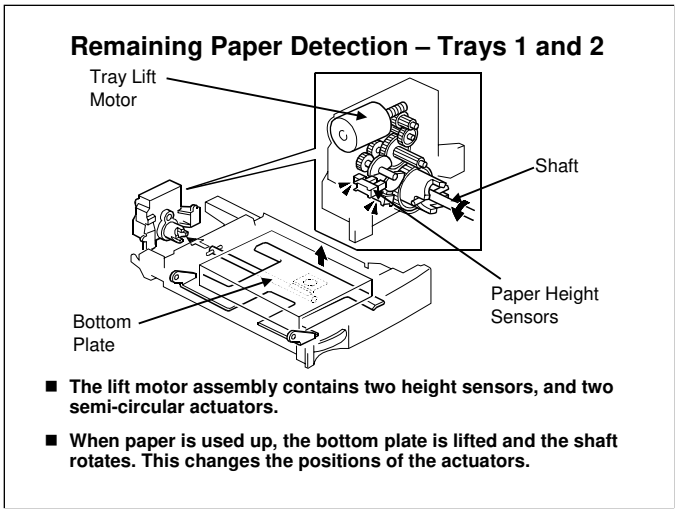
- **SP 5181**
  - Some paper sizes are almost the same and cannot be distinguished by the sensors.
  - To select which size is detected, use SP 5181.
    - Tray 3: SP 5181 006 to 009
    - Tray 4: SP 5181 010 to 013
- **SP 5112 (for trays 2, 3, and 4)**
  - If the user cannot select a non-standard paper 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 5112: Trays 3 and 4 are the optional two-tray paper feed unit.



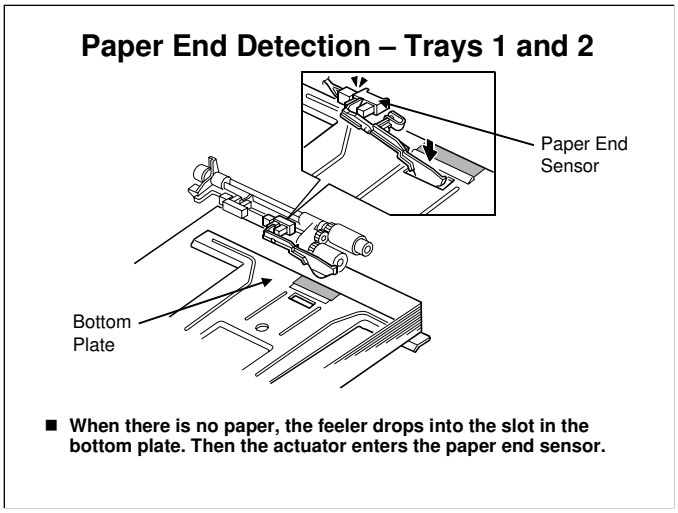
B230 service manual, Detailed Section Descriptions, Paper Feed, By Pass Paper Size Detection

- If the detected size is less than 8.5 inches in width, the sensors cannot detect the size.
- SP 1007 tells the machine what size to detect in this case (either Letter or Legal SEF).

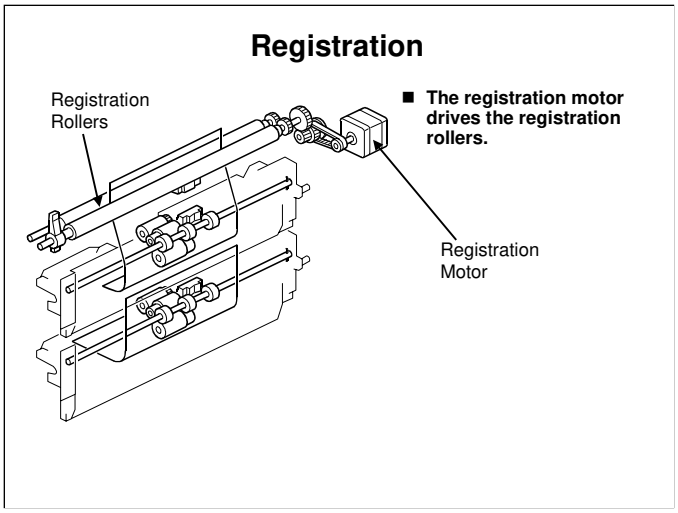


B230 service manual, Detailed Section Descriptions, Paper Feed, Paper Height Detection

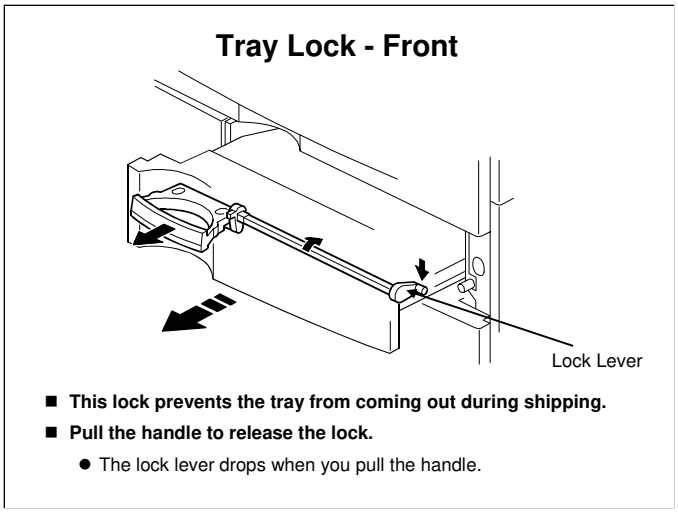
❒ The manual shows how the machine interprets the readings from the height sensors.



B230 service manual, Detailed Section Descriptions, Paper Feed, Paper End Detection

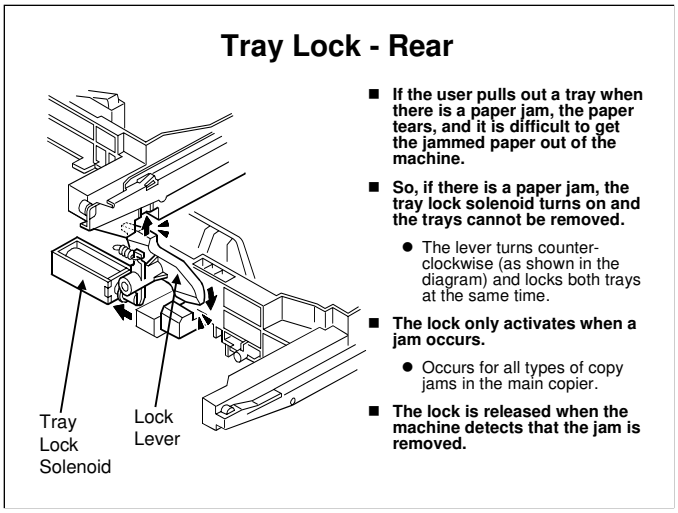


B230 service manual, Detailed Section Descriptions, Paper Feed, Registration

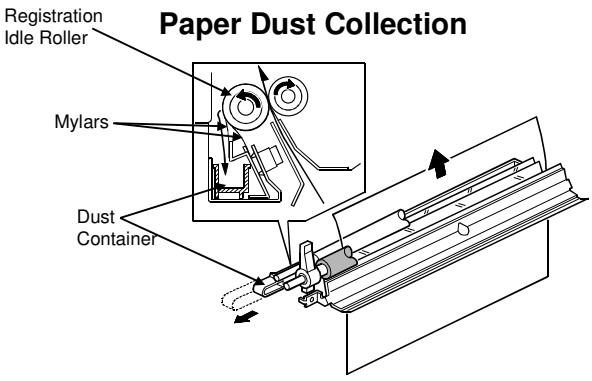


B230 service manual, Detailed Section Descriptions, Paper Feed, Tray Lock Mechanism

❒ Demonstrate this on the machine.

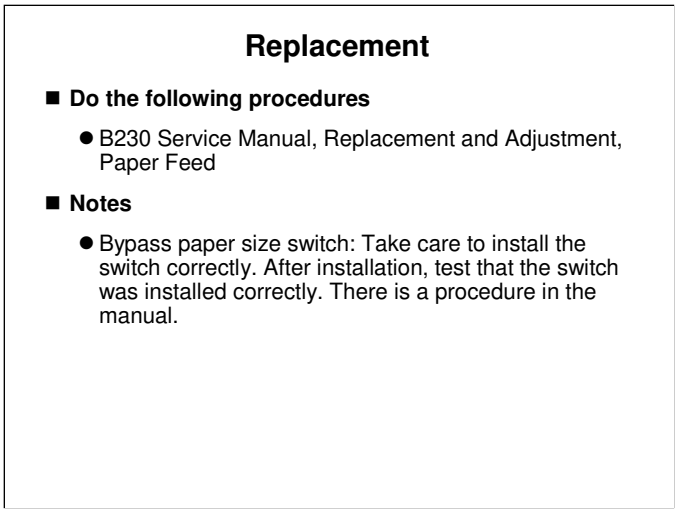


B230 service manual, Detailed Section Descriptions, Paper Feed, Tray Lock Mechanism



■ **The mylars remove paper dust from the registration idle roller.**

B230 service manual, Detailed Section Descriptions, Paper Feed, Paper Dust Collection



❒ Have the trainees remove and replace the parts in this section of the manual.
❒ Remind them to follow all notes and cautions in the manual.

SP Modes

- **1003: Paper buckle at the registration roller**
- **5150: Increases the maximum possible paper length that can be fed from the bypass tray.**
- **5179: Paper size error message for the by-pass tray, on/off**
  - If this is changed to 'on', a paper size error message is displayed when a paper jam occurs because the user put the paper in the bypass tray the wrong way around (LEF instead of SEF, for example)

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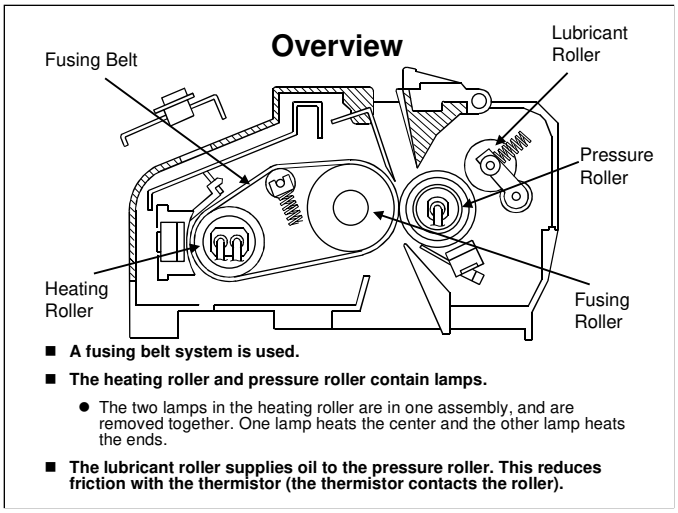
ATHENA-C1 TRAINING

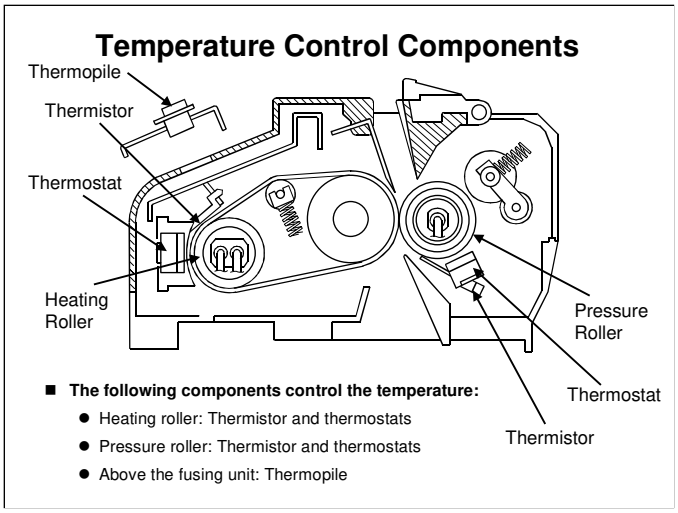
FUSING

❒ In this section, the fusing unit will be described.



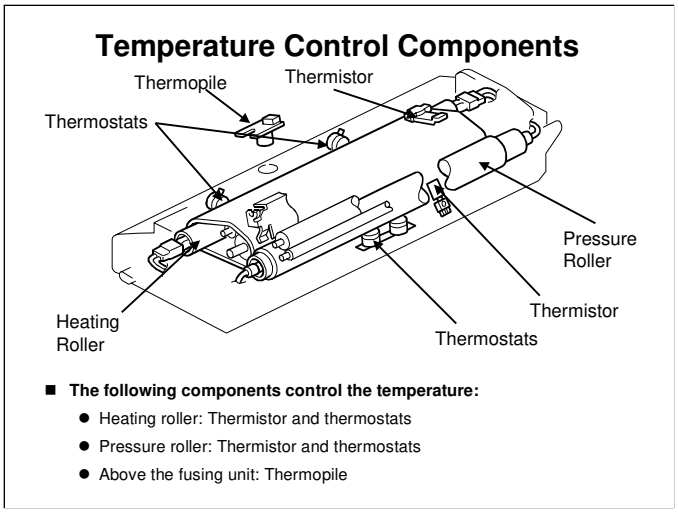
B230 service manual, Detailed Section Descriptions, Fusing, Overview

- ❒ The lubricant roller has a cleaning roller, to remove toner.
- ❒ 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.
  - ➢ The pressure roller thermistor contacts the pressure roller, so lubrication is necessary to reduce friction.
  - ➢ The other thermistor is near the heating roller/fusing belt, but does not contact.



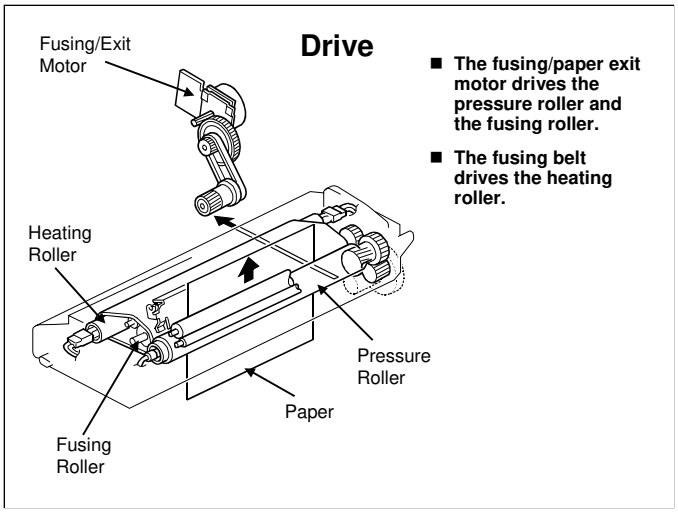
B230 service manual, Detailed Section Descriptions, Fusing, Overview

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



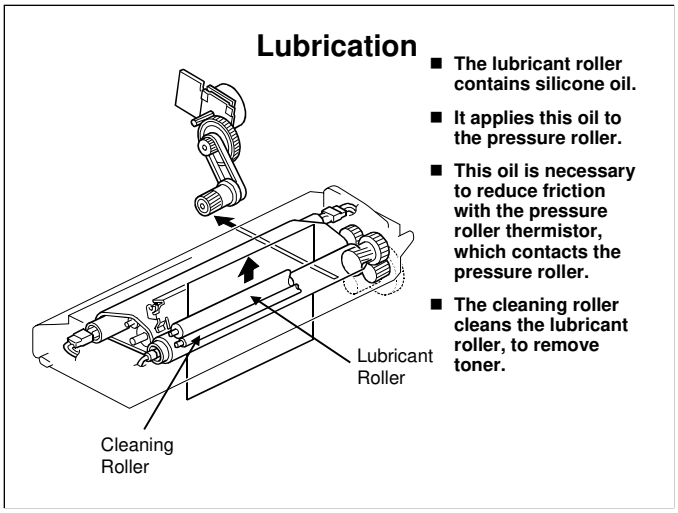
B230 service manual, Detailed Section Descriptions, Fusing, Fusing Temperature Control

- ❒ 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.

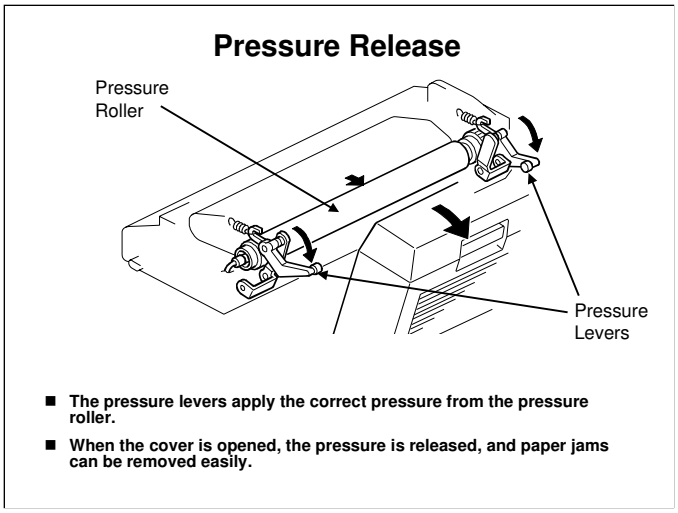


B230 service manual, Detailed Section Descriptions, Fusing, Fusing Unit Drive

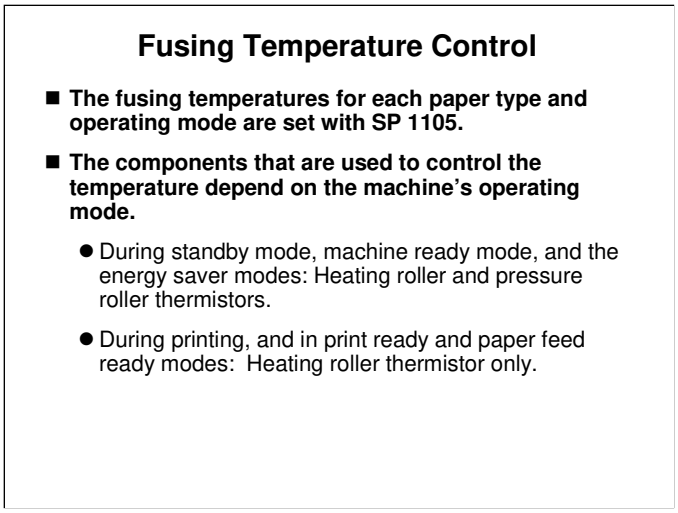
❒ Paper passes vertically through the right side of the fusing unit, as shown in the diagram.



B230 service manual, Detailed Section Descriptions, Fusing, Fusing Unit Drive

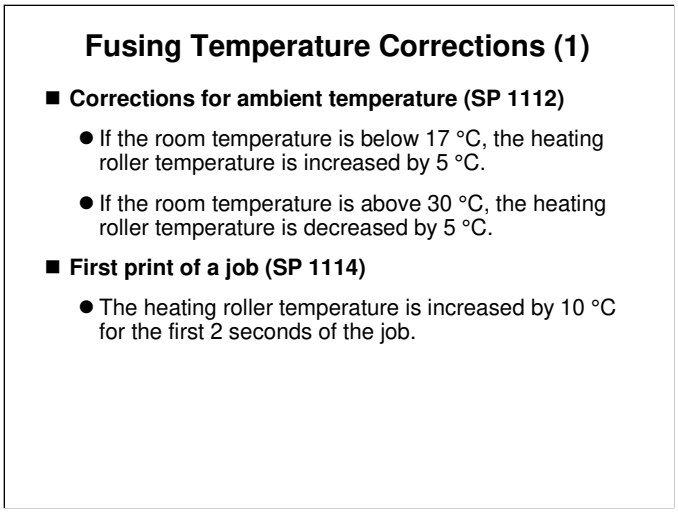


B230 service manual, Detailed Section Descriptions, Fusing, Pressure Release Mechanism



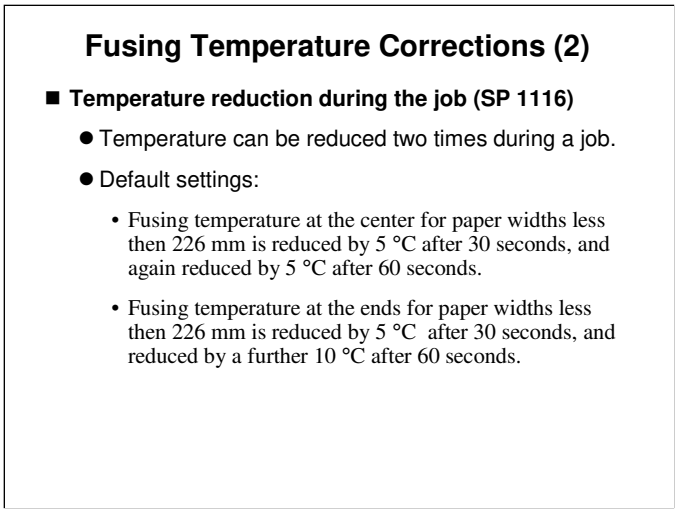
B230 service manual, Detailed Section Descriptions, Fusing, Fusing Temperature Control

- ❒ The service manual has a table that shows the default fusing control temperatures for different paper types and operating modes.
- ❒ Machine ready: After the power switch is turned on, the machine warms up. When the machine ready temperatures are detected, jobs can start.
- ❒ Paper feed ready: The machine can feed paper (for example, after recovery from energy saver mode).
- ❒ Print ready: A job can start (for example, after recovery from energy saver mode).
- ❒ Standby mode: This is between jobs, before energy saver mode starts.



B230 service manual, Detailed Section Descriptions, Fusing, Fusing Temperature Control

- The slide shows the SPs that can be used to adjust each correction.
- The slide shows the machine defaults. If the class want to know more, ask them to study the SP tables.



B230 service manual, Detailed Section Descriptions, Fusing, Fusing Temperature Control

- The slide shows more SPs that can be used to adjust each correction.
- The slide shows the machine defaults. If the class want to know more, ask them to study the SP tables.
  - In particular, SP 1116 has a number of adjustments. There are adjustments for the temperature at the center and at the ends. There are also adjustments for paper wider than 226 mm, and less than 226 mm.

    If the paper width is 226 mm or more, after SP 1116 018 sec, the temperature at the center is reduced by SP 1116 010 and the temperature at the ends is reduced by SP 1116 011.

    If the paper width is 226 mm or more, after SP 1116 019 sec, the temperature at the center is reduced by SP 1116 012 and the temperature at the ends is reduced by SP 1116 013.

    If the paper width is less than 226 mm, after SP 1116 020 sec, the temperature at the center is reduced by SP 1116 014 and the temperature at the ends is reduced by SP 1116 015.

    If the paper width is less than 226 mm, after SP 1116 021 sec, the temperature at the center is reduced by SP 1116 016 and the temperature at the ends is reduced by SP 1116 017.

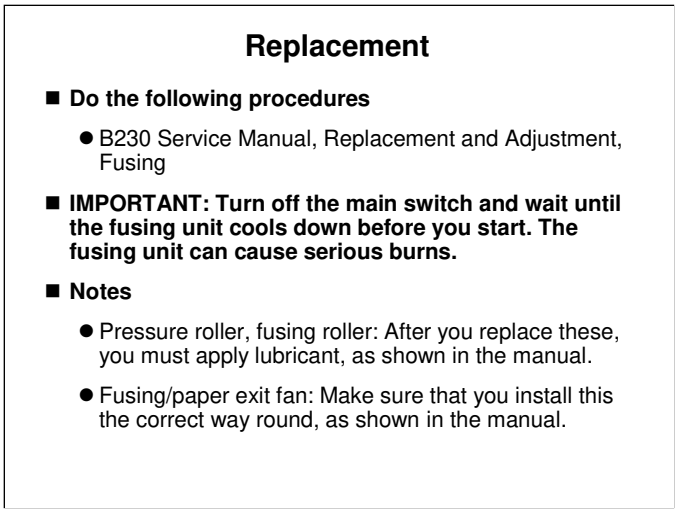
    1116 022 to 027 control this feature for side 2 of duplex copies (default: no changes)

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, or 564 will occur.
- **If the thermistors/thermopile fail, then the thermostats and thermofuse are additional safety measures.**
  - See the service manual for temperature cut-off information.

New Unit Detection

- **The new unit contains a fuse, that blows a short time after the new unit is installed.**
  - If the machine detects an intact fuse, followed shortly by a blown fuse, the machine automatically detects the new unit and resets the counters.
  - This is necessary because in Japan, the transport company staff may replace the fusing unit, depending on the service contract.
- **If individual components of the fusing unit are replaced, and not a complete unit, the machine does not detect them automatically.**
  - Then, you must reset the PM counters for the fusing unit.
  - To do this, set SP 3902 014 to 1 before you start to work on the fusing unit.



❒ Have the trainees remove and replace the parts in this section of the manual.
❒ Remind them to follow all notes and cautions in the manual.

❒ Turn off the main switch and wait until the fusing unit cools down before beginning any of the procedures in this section. The fusing unit can cause serious burns.

❒ 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.
  - ➢ The shape of the assembly means that it is not possible to install the assembly the wrong way around.

SP Modes - 1

- **Fusing Idling**
  - 1103 011: Idling start temperature (default 100 °C)
  - 1103 014: Minimum idling time (default 2 seconds)
  - 1103 015: Minimum idling time when recovering from energy saver mode (default 0)
  - 1103 016 to 018: Additional idling times for different room temperature conditions (defaults are all 0 seconds)
  - 1115 001: Interval between idling when in standby mode (default 60 minutes)
    - This prevents hot roller deformation
  - 1115 002: Duration of idling in standby mode (default 2 seconds)
  - 1117 002: Idling duration after end of job (default 4 seconds)
    - This prevents the heating roller from overheating at the end of the job, when no paper goes through the unit to cool it down.

SP Modes - 2

- **1106: Displays the temperatures inside the fusing unit**
- **1109: Nip band test**
  - If the nip band width is not correct, replace the pressure roller or add a new fusing unit. There is no nip band width adjustment.
- **1113: Interval before the machine goes to standby mode after getting to ready mode or after recovering from energy saver mode**
  - Default: After 10 seconds if no job starts

Fusing Unit Jams

- **Normally, the user will remove fusing unit jams.**
- **But, if SP 1159 is changed to 'on', the machine stops if a jam occurs in the fusing unit for three consecutive paper feeds. Then, SC559 appears. The technician must remove the jam.**

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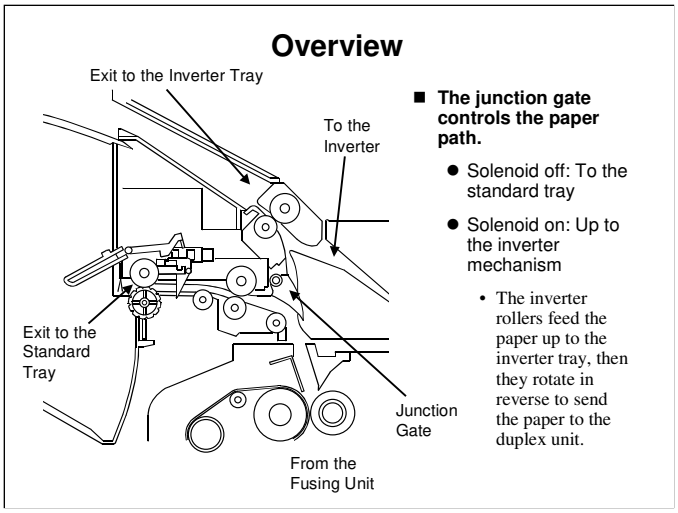
ATHENA-C1 TRAINING

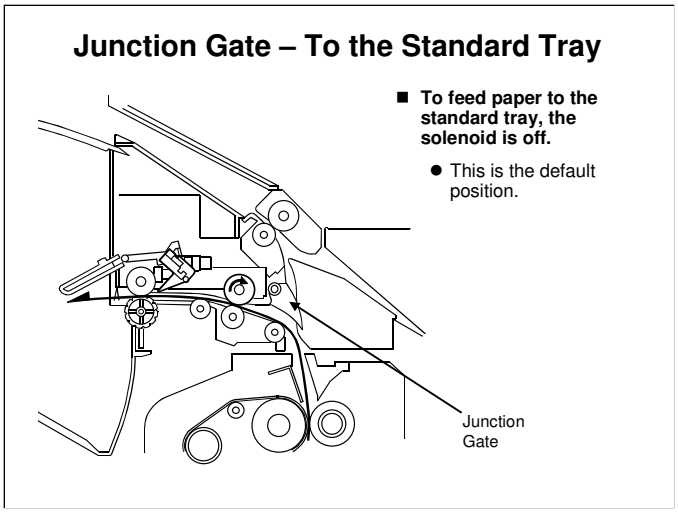
PAPER EXIT

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



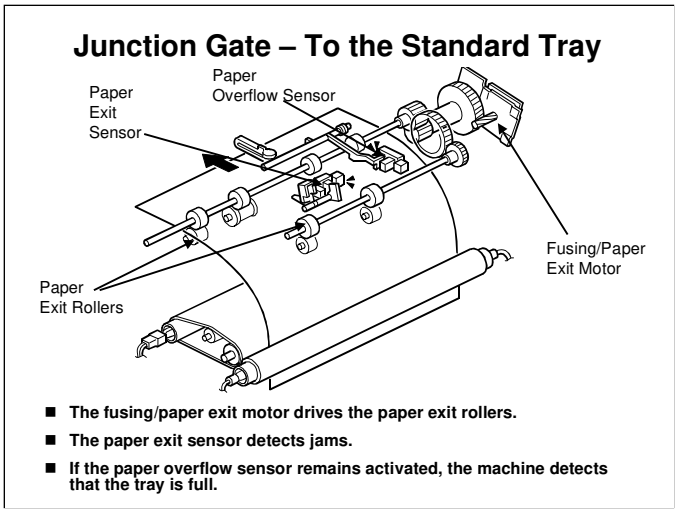
B230 service manual, Detailed Section Descriptions, Paper Exit, Overview

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



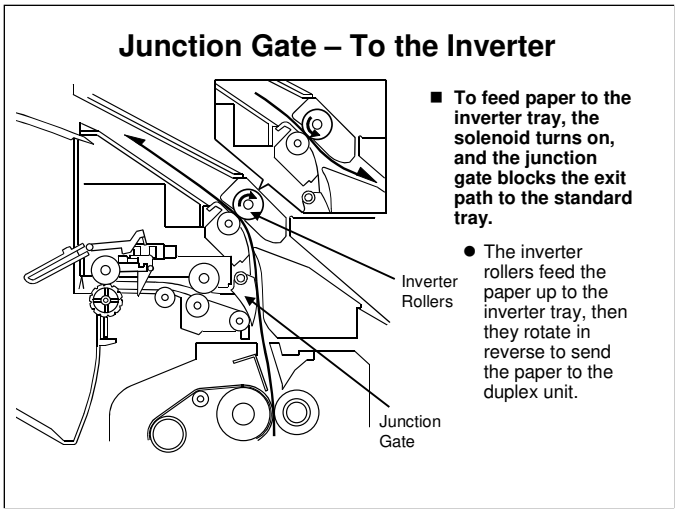
B230 service manual, Detailed Section Descriptions, Paper Exit, Junction Gate Mechanism

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

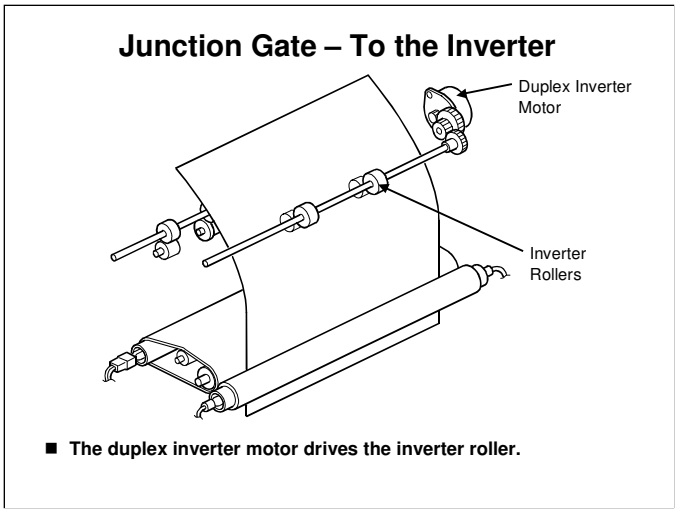


B230 service manual, Detailed Section Descriptions, Paper Exit, Junction Gate Mechanism

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



B230 service manual, Detailed Section Descriptions, Paper Exit, Junction Gate Mechanism



B230 service manual, Detailed Section Descriptions, Paper Exit, Junction Gate Mechanism

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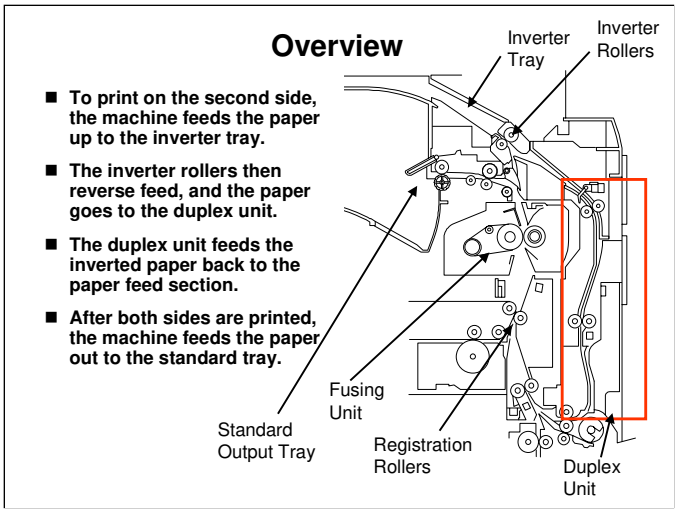
ATHENA-C1 TRAINING

DUPLEX

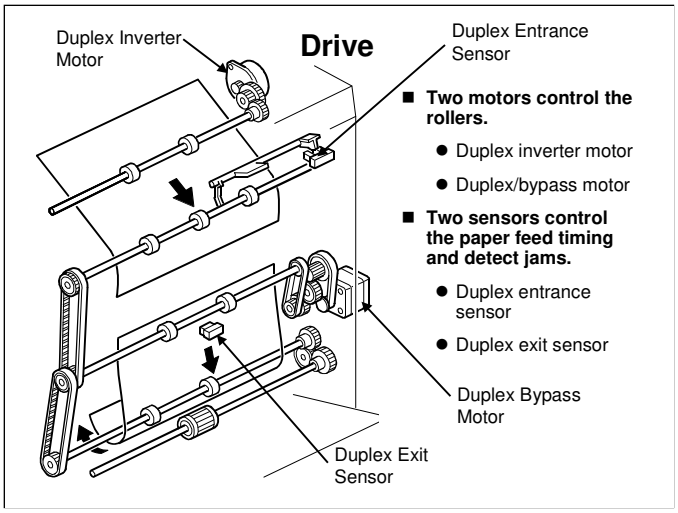
❒ In this section, the duplex mechanism will be described.



B230 service manual, Detailed Section Descriptions, Duplex Unit, Overview

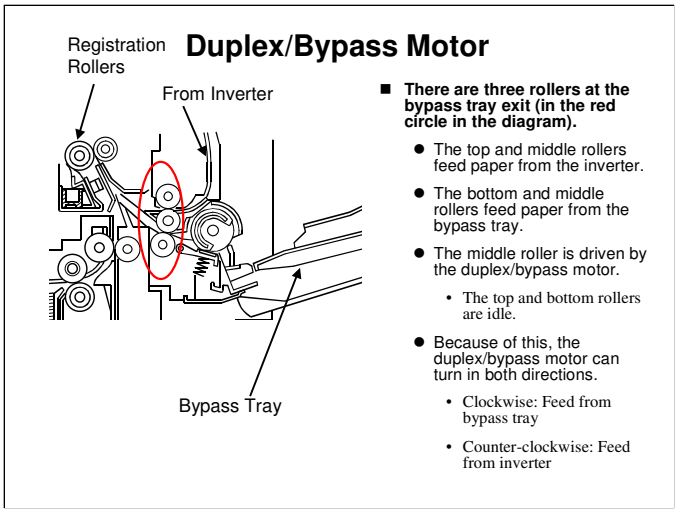
❒ The duplex unit is shown in a red box in the above diagram.

❒ The optional one-bin tray is installed to the left of the inverter tray.

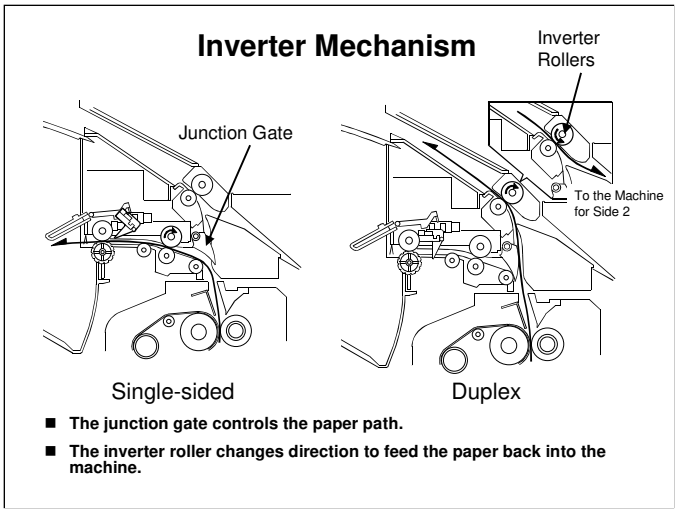


B230 service manual, Detailed Section Descriptions, Duplex Unit, Duplex Drive

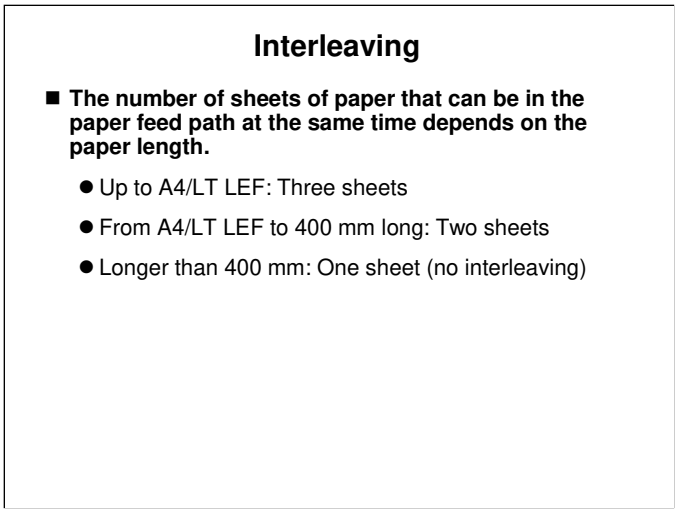
❒ With interleaving, there can be three sheets of paper in the machine at the same time.



❒ This is a close-up view of the bypass tray exit.

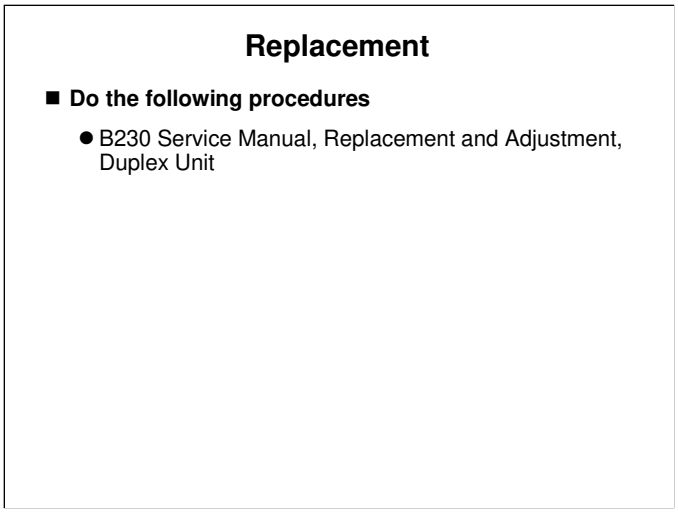


❒ This slide shows the paper feed paths for single-sided and duplex printing.



B230 service manual, Detailed Section Descriptions, Duplex Unit, Duplex Operation

❒ The service manual shows details of how interleaving is done in this model.



❒ Have the trainees remove and replace the parts in this section of the manual.
❒ Remind them to follow all notes and cautions in the manual.

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ATHENA-C1 TRAINING

SHIFT TRAY (B791)

- 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 Themis-C1.

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.

Components

■ **Study the component layout diagrams.**

❒ Ask the class members to study the component layout diagrams in the service manual.

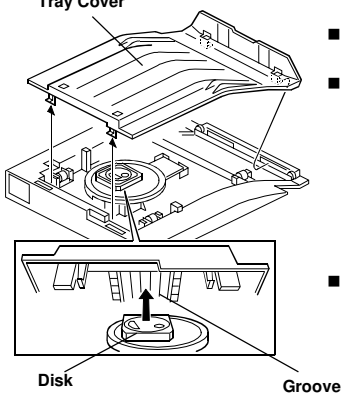
B791 Service Manual, Detailed Section Descriptions, Mechanical Component Layout

B791 Service Manual, Detailed Section Descriptions, Electrical Component Description

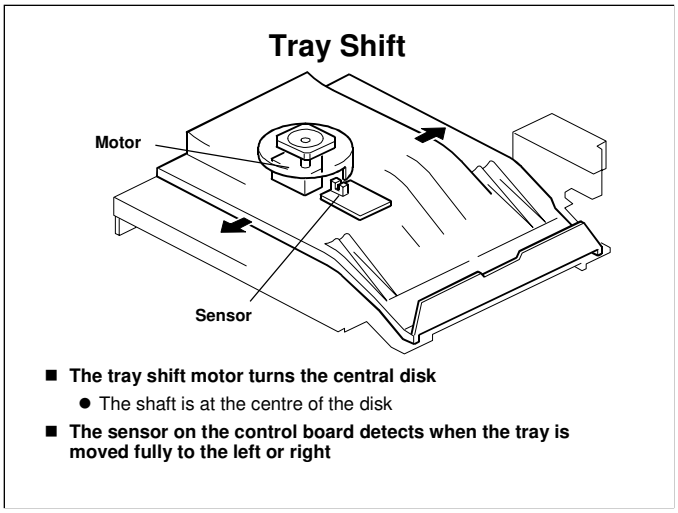
❒ The tray motor moves the tray from side to side.

❒ The half turn sensor detects when the tray was fully moved to the left or to the right.

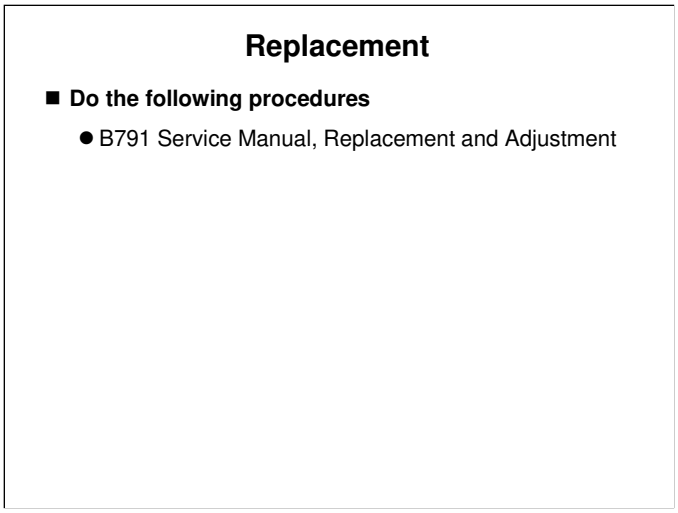
Basic Operation



- **The tray cover moves from side to side**
- **The square platform on the disk goes into the groove on the bottom of the tray**
  - It is off centre and loosely connected, so the disk can rotate about the central shaft, and the square platform moves up and down the groove.
- **The disk turns, and the square platform moves the tray across**



- ❒ Ask the class members to study the component layout diagrams in the service manual.
- ❒ 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.



❒ Have the trainees remove and replace the parts in this section of the manual.
❒ Remind them to follow all notes and cautions in the manual.