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V-C3 TECHNICAL TRAINING

BASED ON THE V-C2 SERIES

Slide 1

This course explains the differences between this new model and the V-C2 series.

Product Overview

Introduction

Slide 2

No additional notes

How Many Models?

- **D081: V-C3a SP**
- **D082: V-C3b SP**
- **The difference between these models is the output speed.**
  - V-C3a: FC: 60 cpm, B/W: 65 cpm
    - » V-C2a: FC: 55 cpm, B/W: 60 cpm
  - V-C3b: FC: 70cpm, B/W: 75cpm
    - » This is the same as the V-C2b.
- **Both models have a built-in scanner/printer unit.**
- **The VM card is inserted in the lower slot at the factory. The new App 2 Me feature is built into this VM card, but must be enabled at installation.**
- **Both models have a 320 GB hard disk and 2 GB of RAM.**
  - There is no optional extra memory.

Slide 3

- App 2 Me is a new feature that allows you to carry your preferred operation panel configuration from machine to machine. It is a connectivity feature, so it is not explained in this course in detail.

-17 Version: D081 vs D082

- **In the –17 version (North America), the power supply for D081 is different from D082.**
  - D081-17: 110-127 V, 20 A, 60 Hz
  - D082-17: 208-240 V, 12 A, 60 Hz – contains an automatic voltage detection function
- **Other versions: The power supply is 220-240 V, 12-10A, 50/60 Hz**
  - D081-19, -27, -29
  - D082-19, -21, -27, -29

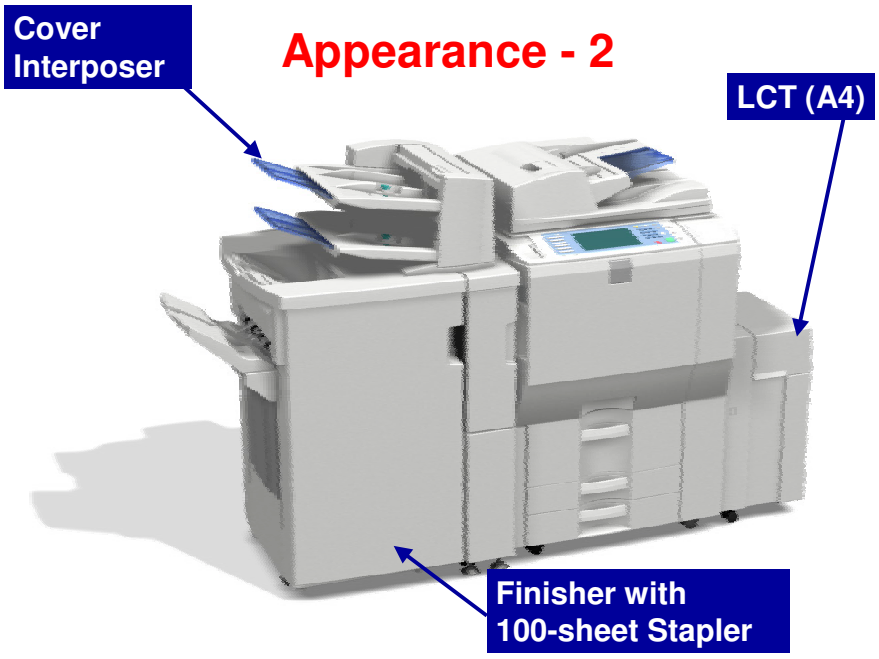
Slide 4

No additional notes

Appearance - 1

Slide 5

- Here is a view of the copier with some of the important options attached.
- The ADF is a standard part of the machine.
- The Booklet Finisher is an option.



❒ Here is a view with a different set of options installed.

Operation Panel

- The operation panel has also been re-designed.
- The recess to hold pins and paper clips on the right end of the D014/D015 has been replaced by a dummy panel on the D081/D082 which can be removed for installation of the USB/SD card slot option (D505).

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No additional notes

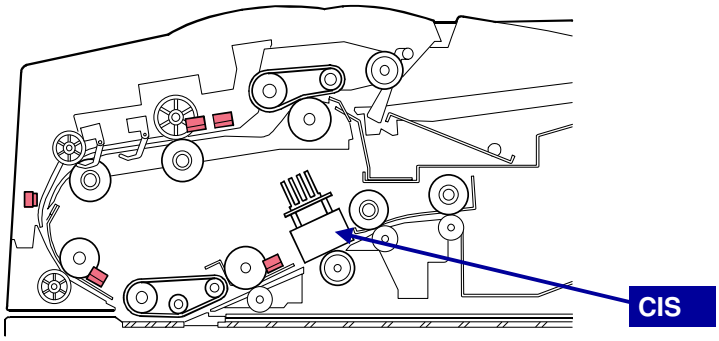
Product Overview

Major Improvements

Slide 8

No additional notes

High-speed Duplex Scanning

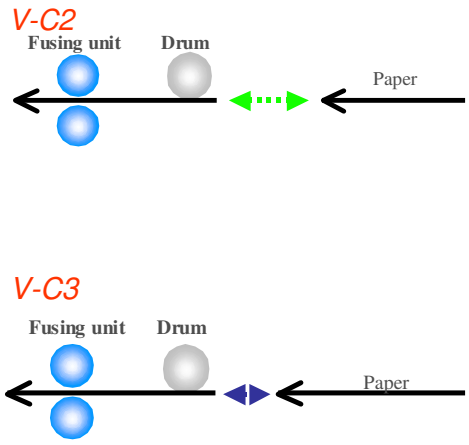


- **A CCD (inside the scanner unit, below the ADF) scans the front side, and a CIS (inside the ADF) scans the rear side.**
- **Scanning speed:**
  - Single-sided: Color 70 ppm, B/W 82 ppm (same as V-C2)
  - Duplex: Color 90 ppm, B/W 130 ppm (V-C2 was Color 53ppm, B/W 60ppm)

Slide 9

- This is the same idea as the MT-series black-and-white copiers.
- The ADF is the same as the MT-C4.
  - If you are not familiar with this ADF, there is a separate section towards the end of this TTP.

Faster Printing for V-C3a



- **The gap between sheets has been reduced.**
  - The line speed is the same as for V-C2a.
- **Printing speeds**
  - V-C2a
    - B/W: 60 ppm
    - Full color: 55 ppm
  - V-C3a
    - B/W: 65 ppm
    - Full color: 60 ppm
  - V-C2b/V-C3b
    - B/W: 75 ppm
    - Full color: 70 ppm

Slide 10

- This increase in productivity has been accomplished by adjusting paper feed timing to narrow the gap between sheets of paper in the paper path. The line speed for both models is not changed from the V-C2 series models.
  - This is only done for the V-C3a. For the V-C3b, the speed is the same as the V-C2b.
- The V-C3b (same speed as the V-C2b) could not be given a higher copy speed. It is already at a line speed of 352 mm/s, and it is not possible to reduce the gap between sheets any more.
- With either the V-C3a or V-C3b if production quality cannot be maintained, the machine will drop into the CPM down mode.

Paper Weights

Std Tray	52.3-216
	14lbs.Bond～90lbs.Index
Std Tray 3	52.3-256
	14lbs.Bond～90lbs.Index
Bypass	52.3-300
	14lbs.Bond～110lbs.Cover
Duplex Unit	60-216
	17lbs.Bond～90lbs. Index
A4/LT LCT	52-128
	14-34lbs
A3/DLT LCT	52.3-300
	14lbs.Bond～110lbs.Cover

Slide 11

- Note that tray 3 can handle heavier paper than the other two standard trays. This is explained after the next slide.

Copy Speed for each Paper Weight

Model	Mode	Paper Thickness		BK CPM	FC CPM
		gsm	lbs		
C3a	Thin Paper	52.3~65.9		**65**	60
	Plain Paper	66~99.9		**65**	60
	Middle Thick	100~127.4		**60**	**60**
	Thick Paper 1	127.5~163.9		37.5	37.5
	Thick Paper 2	164~249.9		**37.5**	**37.5**
	Thick Paper 3	250~300		30	30
	OHP, 1200dpi printing, High gloss paper※1			30 37.5 ※Depends on the thickness	30 37.5 ※Depends on the thickness
C3b	Thin Paper	52.3~65.9		**75**	**70**
	Plain Paper	66~99.9		**75**	**70**
	Middle Thick	100~127.4		**60**	**60**
	Thick Paper 1	127.5~163.9		37.5	37.5
	Thick Paper 2	164~249.9		**37.5**	**37.5**
	Thick Paper 3	250~300		30	30
	OHP, 1200dpi printing, High gloss paper※1			30 37.5 ※Depends on the thickness	30 37.5 ※Depends on the thickness

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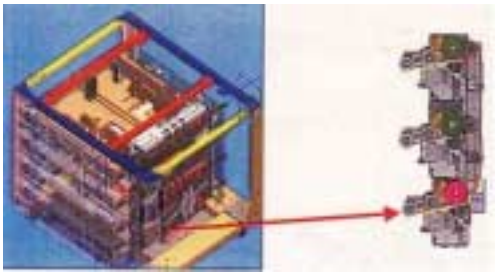
- gsm: grams per square meter

Improved Thick Paper Handling

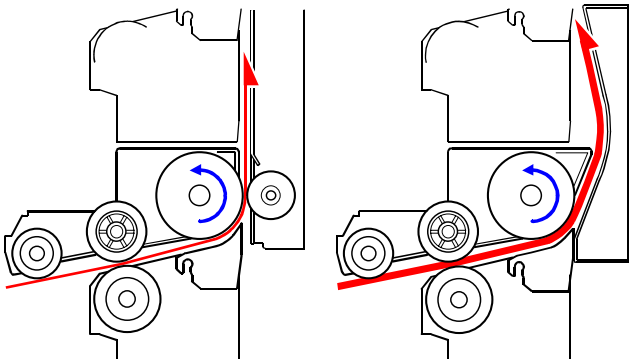


- **All of the trays can handle paper of weight up to 216 g/m² but Tray 3 can handle thicker paper up to 256 g/m².**
  - There is a wider gap where the right edge of Tray 3 opens at the bottom of the vertical paper feed path. Also, the curvature of the paper feed path is not as sharp (see the next slide).
  - This makes it easier for paper up to 256 g/m² thick to pass through the junction to the vertical paper feed path.
  - The gap has been widened for Tray 3 only, so thicker paper (up to 256 g/m²) should be loaded in Tray 3.

Slide 13

- This large junction point makes it easier for thick paper to feed into the vertical feed path and reduces the occurrence of paper jams. The large gap also makes it easier to remove jams if they do occur in the vertical feed path.

Improved Thick Paper Handling



V-C1, V-C2
V-C3: Trays 1 and 2

V-C3: Tray 3

- The bend at the exit from the tray is smoother in Tray 3.
  This allows the tray to feed thick paper 2 without problems.

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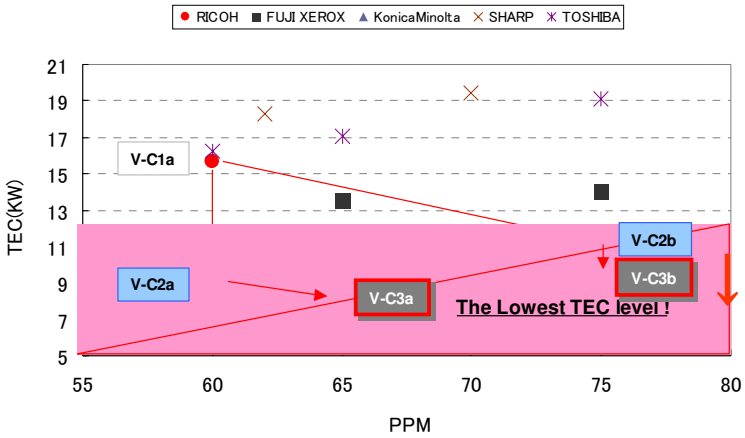
No additional notes

Lower Energy Consumption

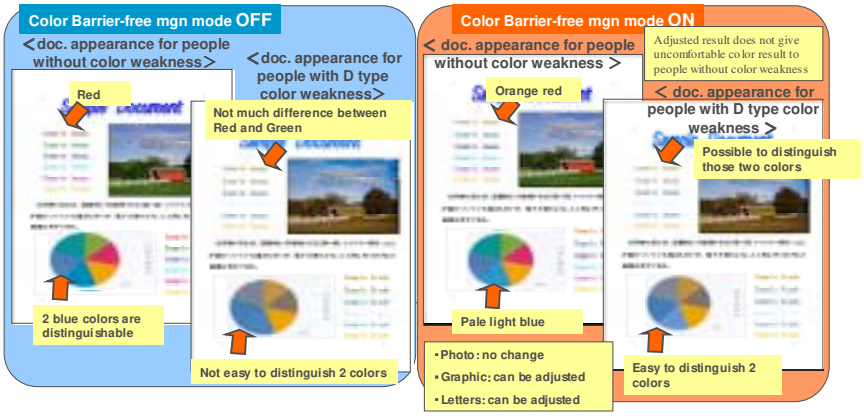


- **The typical electricity consumption (TEC) is lower than previous models in this series, and lower than competitors' models.**

Slide 15

- The maximum power consumption is not changed, but the warm-up time is less, and less energy is consumed in Sleep Mode.
  - North America: V-C3a: 8.72kWh/w, V-C3b: 9.66kWh/w
  - EU/Asia/TWN/China: V-C3a: 8.07kWh/w, V-C3b: 9.66kWh/w

Color Weakness Management Mode



❑ **This mode can be selected at the printer driver to help people with color weakness to distinguish between red and green.**

Slide 16

❒ Color weakness is also known as partial color blindness. For example, some people cannot distinguish red from green; both colors appear as a yellowish brown, as shown on the slide.

- ➢ It is said that between 5 and 10% of Caucasian males are red-green color blind.
- ➢ There is another form of color weakness, involving yellow and blue, but this is more rare.

❒ This feature is available with PCL6 or PS3, operating on MS Office 2007.

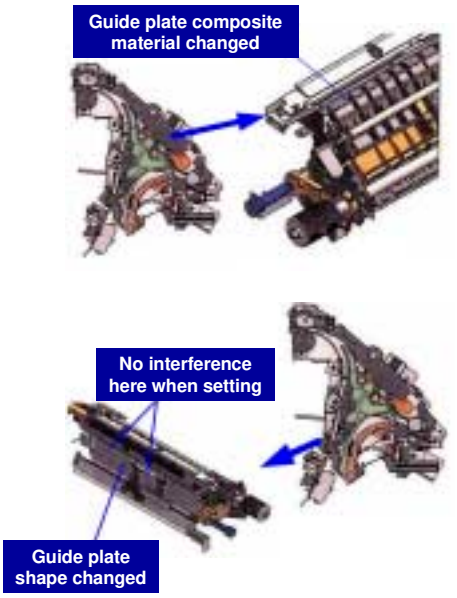
Product Overview

Modifications to the Engine

Slide 17

No additional notes

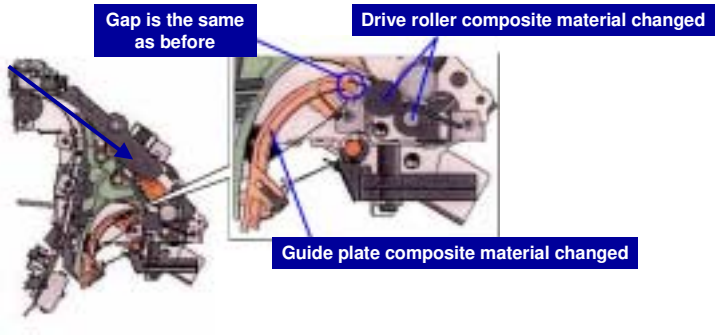
Guide Plate Modification



- In the V-C2, high temperature inside the machine warps the guide plate and causes it to hit the stay. This causes noise the guide plate opens and closes during paper feed.
- To solve this problem, a more heat resistant material is used to make the guide plate.
- The shape of the guide plate was also changed, to eliminate noise when the unit is removed and installed.

No additional notes

Inverter and Decurler Units



- **Inverter Guide Plate**
  - The shape of the inverter guide plate was modified and the spring fulcrum point was moved to improve operation during paper feed.
- **De-curl Drive Roller**
  - To prevent the de-curl drive roller from swelling due to moisture, the material has been changed.

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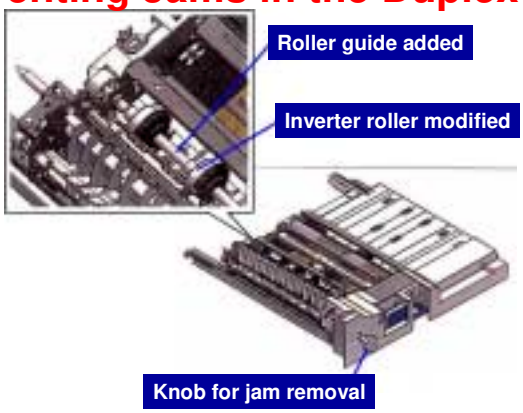
No additional notes

Preventing Jams in the Duplex Unit



- To prevent recurring jams, the diameter of the inverter roller at the inverter path entrance has been increased slightly and a roller guide was added to improve the feeding of curled paper, and at the same time reduce the amount of curl.
- Also, a jam removal knob has been added to the side of the duplex unit to make it easier to remove jams from the duplex tray.

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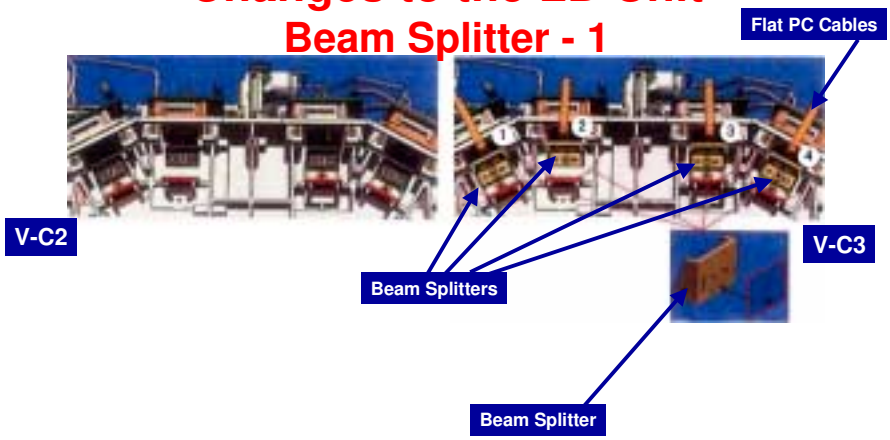
No additional notes

Changes to the LD Unit
Beam Splitter - 1



- Four LCD beam splitters have been added at the rear edge of the laser unit. Each one is connected by a flat PC (printed circuit) cable.

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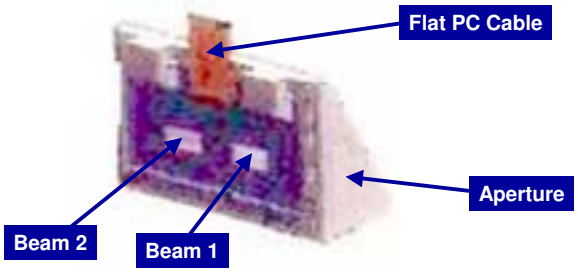
No additional notes

Changes to the LD Unit
Beam Splitter - 2



- **The diagram on the left shows a close-up view of one element.**
- **Each element performs beam switching for 1200-dpi.**
  - 1200 dpi is only available in printing mode. In other modes, printing is at 600 dpi.
- **The other parts of the image writing system (optical housing, polygon mirror, optics, synchronization detect sensor, etc.) are identical to those of the previous machine.**

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No additional notes

Changes to the Fusing Unit

Overview

- **The parts and configuration of the fusing unit are almost the same as those of the previous machine.**
- **However, there are some improvements:**
  - Warm-up time is shorter.
  - Longer service lives for some parts.
  - Some parts have been discarded.
- **The thickness of the metal core in the hot roller has been reduced from 1.5 mm to 1.0 mm. This allows the core the reach the ready temperature much faster.**
- **The rotational speed of the hot roller during warm-up has been increased from 141 mm/s to 282 mm/s. Also, the ready temperature (re-load temperature) has been raised from 20C to 40C.**

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- Warm-up time is shorter by 15 s (V-C3 EU, V-C3b all versions) or 20 s (V-C3a NA).

Changes to the Fusing Unit
Life of Service Parts

- **Hot roller:**
  - V-C2: 300 K, V-C3: 450 K
  - The hot roller is composed of a new, low cost material of greater durability.
- **Cleaning unit :**
  - V-C2: 300 K, V-C3: 450 K
  - The new cleaning unit uses more oil, supplies less oil, and has a new oil application roller.
- **Pressure bearing:**
  - V-C2: 600 K, V-C3: 1200 K
  - The curvature of the pressure bearing has been reduced and the new rubber seals keep out foreign matter.
- **These three parts are physically interchangeable with the V-C2 parts. But always use the correct parts for the machine (do not use V-C3 parts in a V-C2, for example).**
- **If you use the wrong parts, copy quality cannot be guaranteed.**

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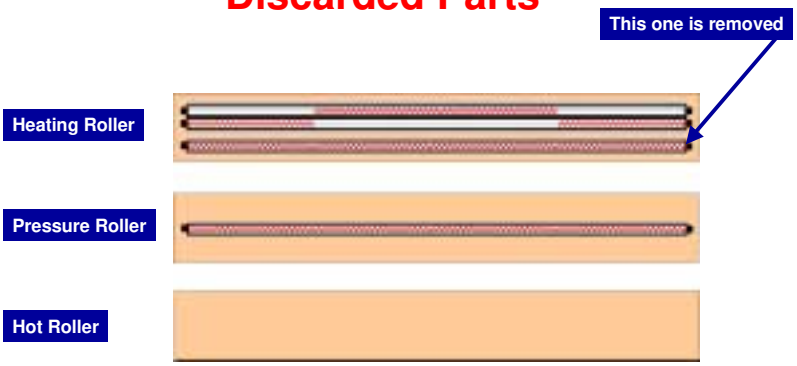
- We will see how to distinguish between the V-C3 and V-C2 parts later.

Changes to the Fusing Unit
Discarded Parts



- One fusing lamp has been discarded from the heating roller of the V-C3a (NA version).

Slide 25

No additional notes

Changes to the Fusing Unit
Discarded Parts

- **The belt ride-up control roller has been discarded in all the machines.**

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- This roller in the V-C2 series has been removed.

Changes to the Fusing Unit

Changed Components

- **The following parts for the D014/D015 and D081/D082 fusing units are not the same; they cannot be substituted for one another when servicing these machines:**
  - Hot roller
  - Pressure roller
  - Pressure roller bearing
  - Oil supply roller
- **These three parts are physically interchangeable with the V-C2 parts. But always use the correct parts for the machine (do not use V-C3 parts in a V-C2, for example).**
- **If you use the wrong parts, copy quality cannot be guaranteed.**

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Details follow on the next few slides.

Changes to the Fusing Unit
Changed Components

- The following table shows the reasons for the changes.
- Please refer to the parts catalogs for the part numbers.

Part Name	Reason for Change
Hot Roller (ϕ52)	To extend service life by 150K (300K to 450K)
Pressure Roller (ϕ50)	Lighter roller core to shorten warm-up time to first copy/print.
Pressure Roller Bearing ϕ20x ϕ32x7	To double service life (600K to 1200K)
Oil Supply Roller (ϕ16)	To extend service life 150 K (300K to 450K)

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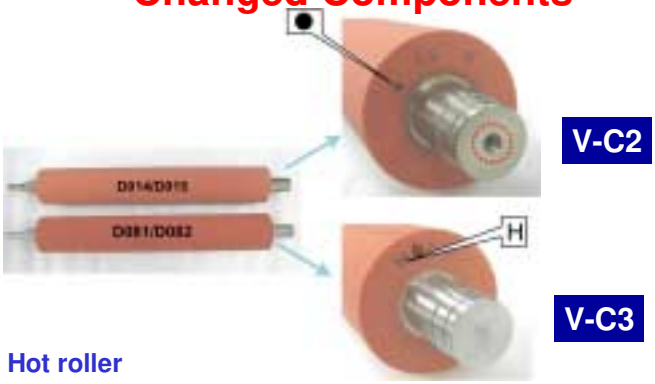
No additional notes

Changes to the Fusing Unit
Changed Components



- **Hot roller**
  - The marks on the ends of the two rollers are different.
  - The shaft of the V-C2 roller has a hole in the end

Slide 29

- The next few slides show how to tell the difference between the old and new components.

Changes to the Fusing Unit

Changed Components

- **Pressure roller**
  - The shapes of the ends of the shafts are different.
    - » V-C2: One step, V-C3: Two steps

Slide 30

No additional notes

Changes to the Fusing Unit
Changed Components

- **Pressure roller bearing**
  - The V-C3 bearing is blue.

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No additional notes

Changes to the Fusing Unit
Changed Components

- **Oil supply roller**
  - The numbers printed on the rollers are different.
    - » V-C2: The last two digits are "42" or "90".
    - » V-C3: The last two digits are "15".

Slide 32

No additional notes

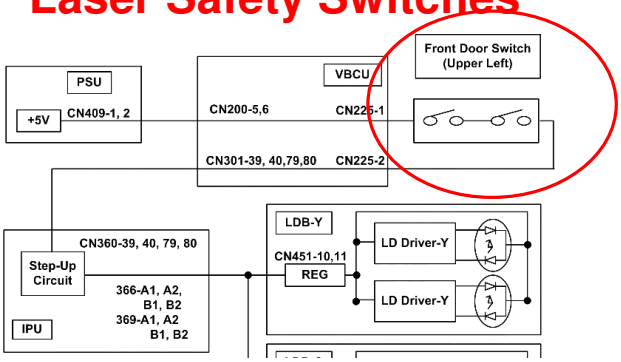
Scanner Unit Harnesses

- **The routing and connection of the harnesses on the left side of the scanner unit have changed.**
  - In the D014/D015, the lower harnesses at the front (1) and rear (2) of the LDB have ferrite cores.
  - In the D081/D082, the lower harnesses at the front (1) and rear (2) of the LDB are bundled tighter and have no bulky ferrite cores.

Slide 33

No additional notes

Laser Safety Switches



- When the front cover is open, the 5V line to the laser diodes is disconnected.
- The circuit is basically the same as the V-C2. The only difference is that the connector numbers on the LDB boards are different.

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No additional notes

Product Overview

Specifications

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No additional notes

Comparison with V-C2

	V-C3	V-C2
Copy speed (BW/FC) CPM	V-C3a: 65/60 V-C3b:75/70	V-C2a: 60/55 V-C2b:75/70
Warm up time	V-C3a: 70 s (NA), 60 s (EU) V-C3b: 60 s	V-C2a: 90 s (NA), 75 s (EU) V-C2b:75 s
First copy time (BW)	V-C2a: 5.7 s V-C2b: 4.9 s	V-C2a: 5.7 s V-C2b: 4.9 s
First copy time (FC)	V-C2a: 7.5 s V-C2b: 6.4 s	V-C2a: 7.5 s V-C2b: 6.4 s

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- The fusing unit was modified, as explained earlier. This is the reason for the changed specifications for warm-up time.
- The copy speed for V-C3a is faster than for V-C2a. This is done by reducing the gap between sheets of paper. The line speed is the same as V-C2a.
- The copy speed for V-C3b is the same as for V-C2b. The line speed is the same as the V-C2b.

ADF Specs – Changes from V-C2

- **V-C3 scans to sides at the same time. V-C2 cannot do this.**
- **Stack capacity**
  - V-C2: 100
  - V-C3: 250 sheets (69 g/m^2)
    - » 150 sheets: 80g/m^2, 20 lb. Bond

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Product Overview

Equipment

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No additional notes

Standard Equipment

- ADF (one pass duplex scan)
- Printer / Scanner
- USB host
- 10Base-T / 100Base-TX
- VM
  - The VM card is included with the machine, in the lower SD card slot, when shipped from the factory.
- App 2 Me

Slide 39

No additional notes

Options for Paper Feed

- **A3/DLT Large Capacity Tray RT4000: Used in V-C2**
- **A4/LT Large Capacity Tray RT43: Used in V-C2, Mt-C4**
  - Requires LCT Adapter Type B: Same as V-C2
- **A3/11"x17" Tray Type 2105: Used in V-C2**
- **Tab Sheet Holder Type 3260: Used with V-C2**
- **8.5”x14” Paper Size Tray Type 1075 (LG Unit for A4/LT LCT): Used with V-C2**

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No additional notes

Options for Finishing

- **Finishers SR4030/SR4040: New finishers (successor models for SR4010/4020)**
  - SR4040 (D373): 2000-sheet tray, booklet finishing
  - SR4030 (D374): 3000-sheet tray, no booklet finishing
- **Finisher SR5000: Used with V-C2**
  - Requires Finisher Adapter Type C: Same as V-C2
- **Copy Tray Type 2075: Used with V-C2, Mt-C4**
- **Cover Interposer CI5000: Used with V-C2**
- **Cover Interposer Tray Type 3260: Used with V-C2, Mt-C4**
- **Multi folding unit: Used with Mt-C4 and Katana-C2**
- **Ring Binder: Used with V-C2 (was introduced after product launch)**
- **Mail Box CS391: Used with V-C2, Mt-C4**

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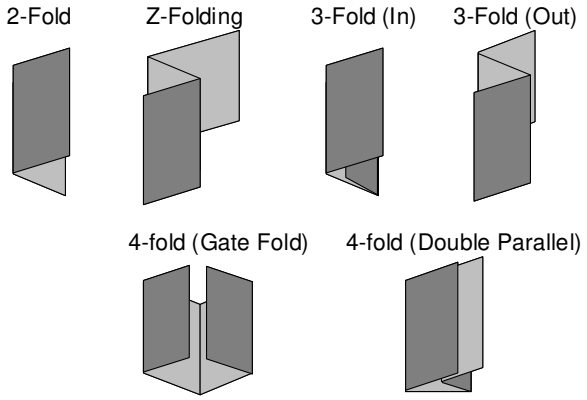
- The multi-folding unit replaces the old z-folder. However, the z-folder is still used with the model in the field in Japan.
- Ring binder: Requires Finisher SR5000 (B830) and cannot be used with either the SR4040 (D373) or SR4030 (D374).
- Multi-folding unit: Can be used with either the SR4040 (D373) or SR5000 (B830). Cannot be used with the SR4030 (D374).

Multi-folding Unit FD5000 (D454)



- This replaces the z-folding unit from previous models.
- The unit can make a wide range of folds in the output.

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No additional notes

Ring Binder RB5000 (D392) - 1

- **This option punches holes and inserts a binder automatically.**
- **The Ring Binder can be installed only with the Finisher B830 (SR5000).**
  - It cannot be installed with either the Finisher D473 (SR4040) or Finisher D474 (SR4030).

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No additional notes

Ring Binder RB5000 (D392) - 2

- **Binders for 50 or 100 sheets are available.**
- **The binders are in a cartridge, so it is very easy to refill the machine with new binders.**
  - Up to 75 sets of the rings can be loaded in a cartridge.
  - Black and white colored rings are available.

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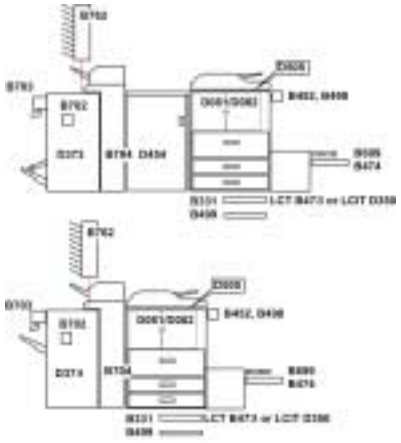
No additional notes

Configuration with D373 or D374 Finishers



- The D454 Multi Folder can be used with the D373 Finisher (and the B830 Finisher) but not with the D374 Finisher.
- The Mailbox (B762) and the Cover Interposer (B704; one tray) cannot both be installed on the same machine.

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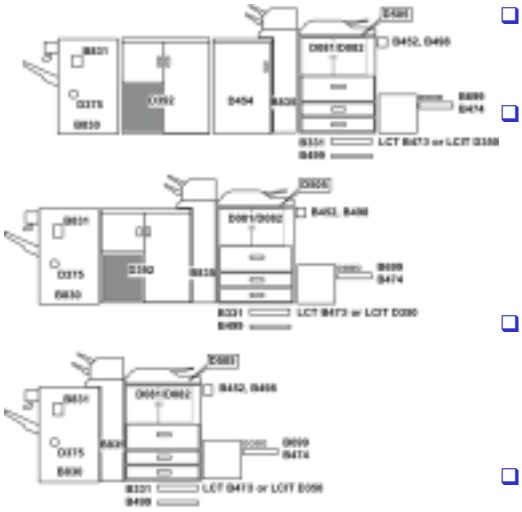
This configuration features either the D373 Finisher (SR4040 with saddle-stitching) or D374 Finisher (SR4030 no saddle-stitching).

Configuration with B830 Finisher



- **The Ring Binder (D392) can be used with or without the Multi Folder (D454).**
- **The Ring Binder can be installed only with the Finisher B830 (SR5000).**
  - It cannot be installed with either the Finisher D373 (SR4040) or Finisher D374 (SR4030).
- **In all three configurations, the Cover Interposer (B835; two trays) must be installed on the left side of the main machine.**
- **The mailbox cannot be installed.**

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This configuration features the SR5000 Finisher.

Controller Options

- **Same as V-C2, except for the following changes**
  - Browser Unit is Type E
  - VM card option: Included with the machine
  - PostScript3 Unit is Type C7501

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No additional notes

Other Options

- Fax unit: New option
- Front SD/USB slot: New option
- EFI controller: New option

Slide 48

No additional notes

Optional USB/SD Card Slot

- USB 2.0/SD Slot Type D (D505) can be installed on the right end of the operation panel.
- This device enables easier access to USB and SD card slots at the front of the main machine.
- This option can be installed for the SD card only, or for both SD cards and USB.

Slide 49

No additional notes

Optional USB 2.0/SD card slot

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

Slide 50

- Files saved on a removable memory device will not appear in the list of stored files.
- Files saved on a removable memory device cannot be printed or sent using the machine's operation panel.To perform operations on files saved on a removable memory device, you must use an application on a client computer.
- Files saved on a removable memory device will not appear in the list of stored files.
- Files saved on a removable memory device cannot be printed or sent using the machine's operation panel.To perform operations on files saved on a removable memory device, you must use an application on a client computer.
- You cannot specify where the data is saved. Files are saved in the root directory of the removable memory device.
- Up to 2 GB of data can be saved. However,depending on the number of files already stored on the removable memory device, new files might not be saved,even if there appears to be sufficient free space.
- If the removable memory device is partitioned,files are saved on the first partition.

Optional USB 2.0/SD card slot

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

Slide 51

No additional notes

Optional USB 2.0/SD card slot

- **After you install this option, you must enable it with Scanner SP Mode 1013.**
  - Change the SP setting from 0 to 1.

Slide 52

App 2 Me

- **App 2 Me is included on the VM card.**
- **However, it must be enabled at installation.**
  - The procedure is in the field service manual for the main machine.
    - » At the end of the section for installing the main machine, see the ‘Enabling App2 Me on VM/Calypso SD Card’ section.

Slide 53

No additional notes

SD Card Slots – Upper Slot

- **Empty when shipped**
- **Use for the following options (keep the card in the slot after installation)**
  - Data Overwrite Security Unit
  - PostScript
    - » If you want to install more than one of these, copy them onto one SD card.
    - » You cannot copy the PostScript card. However, you can copy the other SD cards to the PostScript card.
- **Also use this slot to install the following SD card options (remove the card from the slot after installation).**
  - HDD encryption unit
  - Browser unit
    - » During the installation procedure, the HDD encryption or browser software is copied to the hard disk inside the machine.

Slide 54

No additional notes

SD Card Slots – Lower Slot

- Contains the VM card (with App 2 Me) when shipped.
- Use this slot for service procedures, such as firmware update and NVRAM backup.
- When doing the above, remove the VM card, do the procedure (see the service manual), then put the VM card back in.

Slide 55

No additional notes

Lower Slot – Important Note (1)

- **VM card applications such as App 2 Me must be halted if you need to remove the VM card.**
  - Normally, you need to remove the VM card at these times:
    - » To update the firmware
    - » To back up the NVRAM
    - » To install the browser unit or the HDD encryption unit.
    - » To update the App 2 Me application firmware
- **To halt the VM card applications, do the following steps:**
  - 1. Push the “User/Tools” key.
    - » If an administrator setting is registered for the machine, step 2 and 3 are required. Otherwise, skip to step 4.
  - 2.Push the “Login/Logout” key.
  - 3.Login with the administrator user name and password.
  - 4.Touch “Extended Feature Settings” twice on the LCD.
  - 5. Touch each application until the status changes to “Stop”.
    - » It is necessary to stop each application that is running before you remove the VM card.
  - 6. Turn off the machine. And then remove the VM Card.

Slide 56

- You have to remove the VM card to execute a service procedure, such as those listed on the slide.
- After the firmware update, or whatever, then you have to enable App 2 Me and the other extended features again. To do this, see the next slide:

Lower Slot – Important Note (2)

- **After the firmware update, NVRAM backup, etc, then you have to enable App 2 Me and the other extended features again. To do this:**
  - 1. Put the VM card in its slot.
  - 2. Turn the main power on.
  - 3. Press the "User Tools“ key on the operation panel.
    - » If an administrator setting is registered for the machine, steps 4 and 5 are required. Otherwise, skip to step 6.
  - 4. Push the “Login/Logout” key.
  - 5. Login with the administrator user name and password.
  - 6. Touch the "Extended Feature Settings“ button twice.
  - 7. Touch the each application that you use. The status will change to ‘On’.
  - 8. Touch the "Exit“ button.
  - 9. Exit the "User Tools/Counter“ settings.

Slide 57

No additional notes

Installation

Slide 58

There are only a few changes from the V-C2. However, the procedure is not easy and mistakes are often made in the field. So, please study this again; some new information has been added.

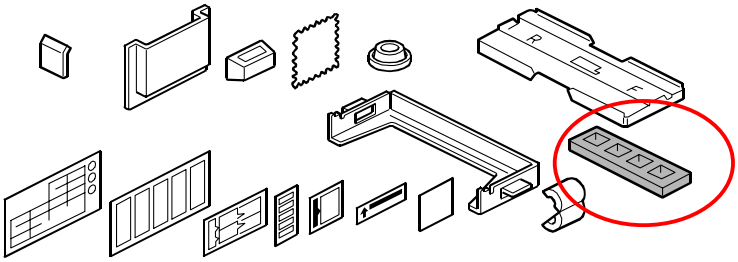
Main Copier
Important Points

Packing Materials and Retainers

Slide 59

- These slides show the most important points of the installation procedure. They are not the full procedure. To do the full procedure, you must use the manual.
- First, study these important points. Then install your machines.
- If you do not study these important points first, you could damage the machines, and could get hurt.

Accessories Kit

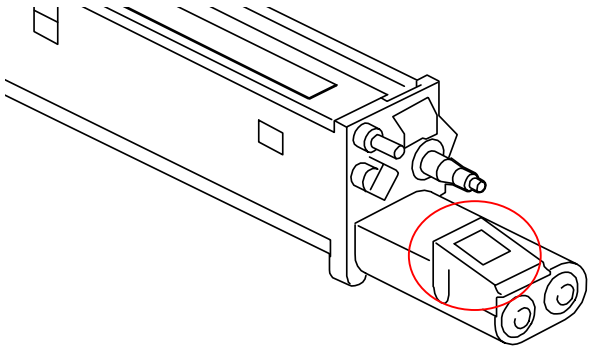


- If you send PCUs to the factory or warehouse, use these caps to prevent toner from spilling out.
  - They are not used during installation.
- There is one cap for each PCU. It goes over the toner supply port (see the next slide).
- These caps are needed when you replace developer. They plug the toner supply ports when you take the PCU out of the machine. This prevents toner from spilling out.

Slide 60

No additional notes

Toner Supply Port



- The toner supply port is here (in the red circle).

Slide 61

No additional notes

Toner and Developer

- The toner for this machine is clearly marked D081/D082.
- The developer for this machine is clearly marked D081.
- Do not use any other types of toner or developer with this machine.
- Please instruct the customer to use only toner cartridges that are produced for this machine.

Slide 62

No additional notes

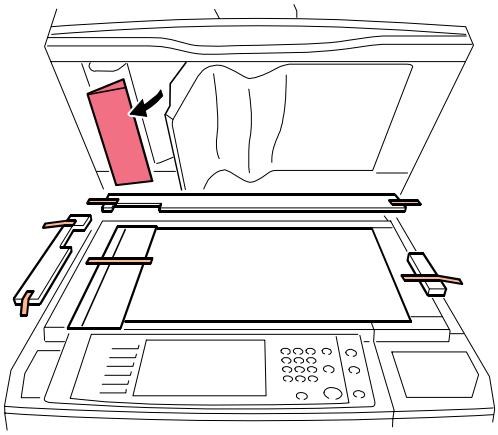
SP Mode Factory Setting List

- This list is under the ADF cover. Remove it.
- Keep it safely for future reference. Do not throw it away.

Slide 63

No additional notes

Remove the Red Paper

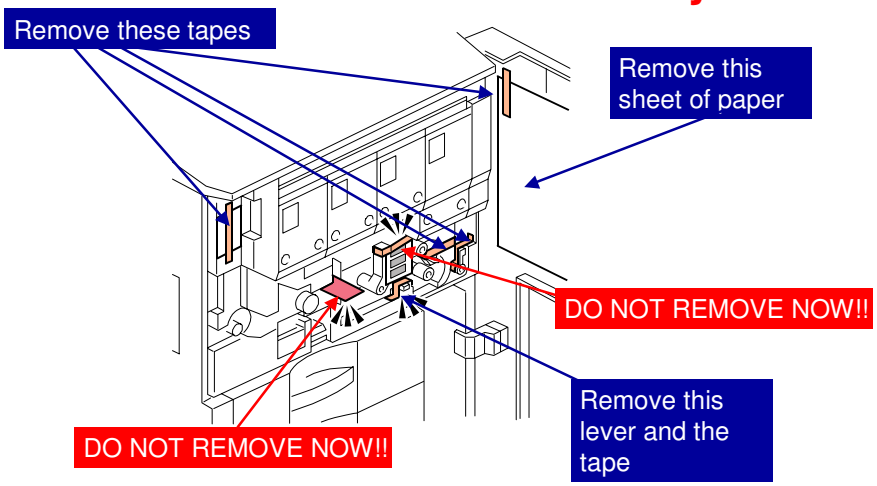


- Pull away the white plate and remove the red paper.

Slide 64

- This is a new step.

Remove These Items Only!!

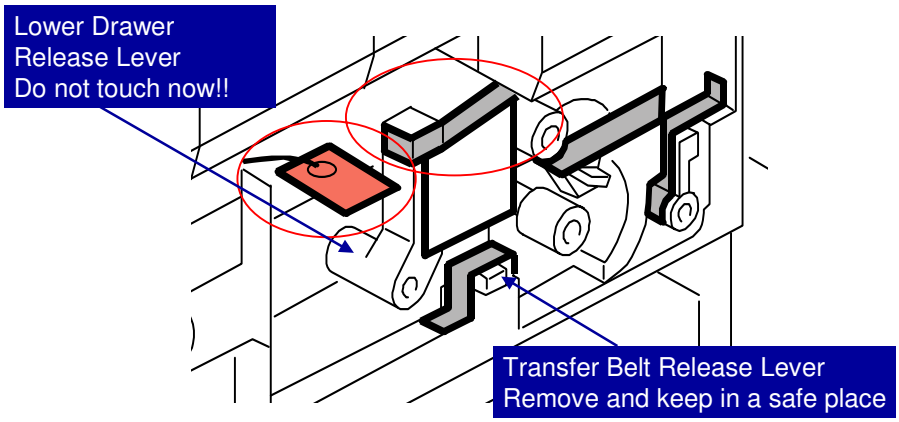


- **Do not remove anything else at this time!**
  - See the next slide for details.

Slide 65

No additional notes

Do Not Remove These Items Now!!



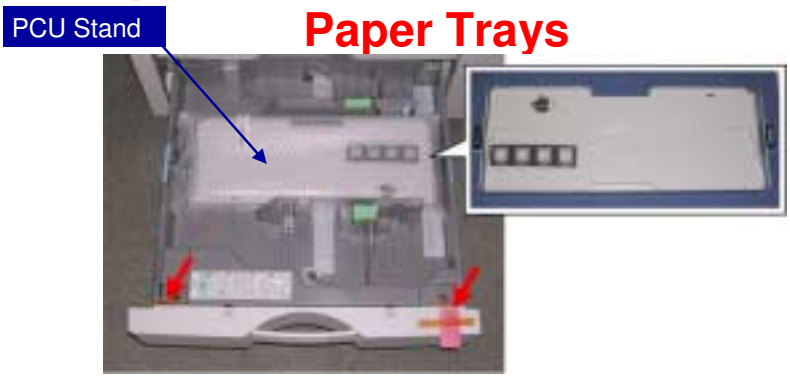
- **At this time, do not remove the two retainers shown in red circles, and do not try to pull out the drawer unit.**
- **Remove the tape that holds the transfer belt release lever, and remove the lever. We will use this later during installation.**

Slide 66

V-C3 field service manual, Installation, Copier, Installation, Internal Tapes and Packing Material

- This is what you see when you open the front cover.
- The transfer belt release lever is taped in a temporary shipping location, as shown here. We remove it now and put it in the correct position later.
- The other lever in the diagram is the lower drawer release lever.
- Normally during installation, you tear out all the retainers. But do not do this for this machine.
- If you pull out the two retainers that are shown above, you will damage the image transfer belt. This is because, at this time, the belt is not under tension, and if you pull the drawer unit out, you will damage the belt.
- We remove these retainers after we remove the faceplate.

Unpack the Accessories from the Paper Trays

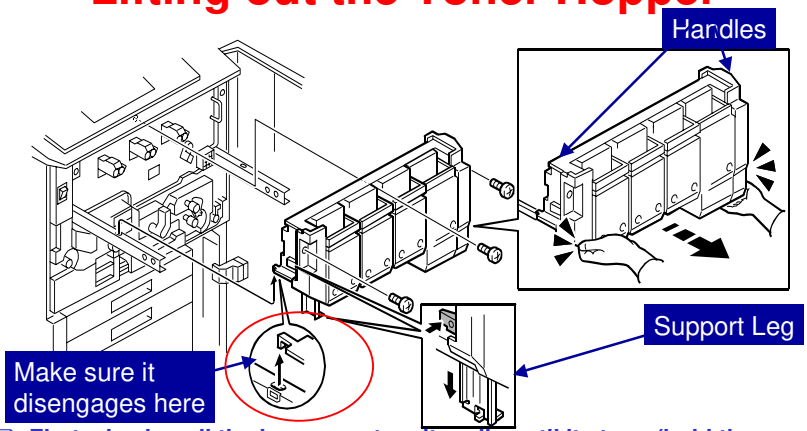


- **The PCU stand is in Tray 2.**
  - This is the same as the PCU stand for the V-C2.
  - The correct storage location for this is explained later in the course.
- **Tray 3 also contains accessories. Unpack them as shown in the manual.**

Slide 67

- The V-C3 PCU stand is the same as the V-C2 PCU stand. You can use a V-C2 PCU stand if the V-C3 stand is not available. But do not use a V-C1 PCU stand.

Lifting out the Toner Hopper



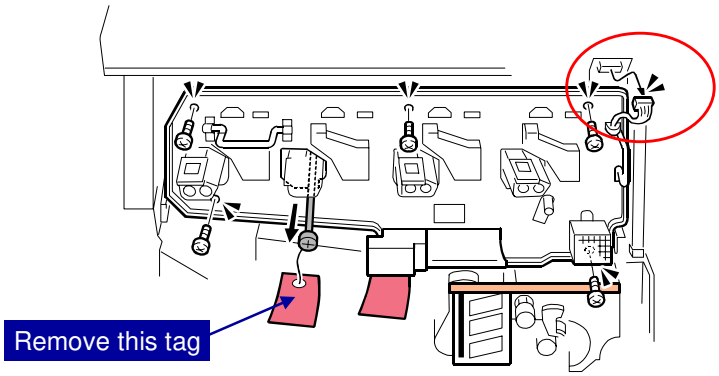
- **First, slowly pull the hopper out on its rails until it stops (hold the bottom front corners of the hopper as shown).**
  - Note: When you pull the hopper out, it can easily slip off the rails.
- **Pull down and lock the support leg.**
- **Lift the hopper off the rail. Use the handles at the top. The hopper is heavy, so make sure that it disengages fully (see the red circle).**

Slide 68

V-C3 field service manual, Installation, Copier, Installation, Shipping Retainer Removal

- Do not use the handles at the top until the final step. If you pull the hopper out of the machine at the start with the handles, the hopper can come off the machine and fall on your feet.
- After this, we remove the faceplate. The manual explains how to do this.

Removing the Faceplate



- Remove the indicated tag. Then disconnect a connector and remove the faceplate.

Slide 69

No additional notes

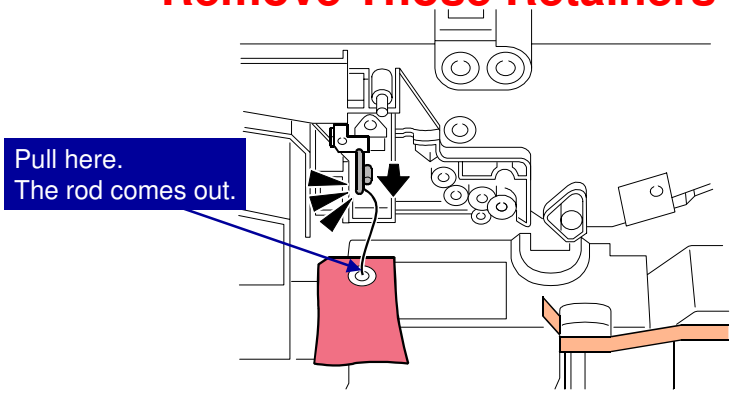
Do not Remove the PCUs

- For this model, we do not need to remove the PCUs during installation.
- Developer is installed without removing the PCUs as we shall see later.

Slide 70

No additional notes

After Removing the Faceplate – Remove Those Retainers



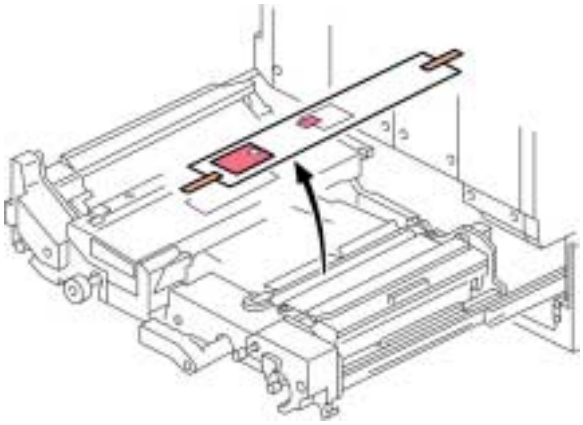
- Do not pull the drawer unit out until after you remove the stabilizing rod (attached to the red tag).
- Pull the tag by the reinforced ring part. If not, you could pull the wire off.

Slide 71

V-C3 field service manual, Installation, Copier, Installation, Shipping Retainer Removal

- The rod releases the cleaning blade for the transfer belt. It also protects the ITB and PTR during shipping.

Drawer Unit



- **Now you can open the drawer unit, and remove the protective sheet of paper from the drawer.**
  - Do this exactly as described in the service manual.

Slide 72

V-C3 field service manual, Installation, Copier, Installation, Remove Remaining Retainers and Packing Material

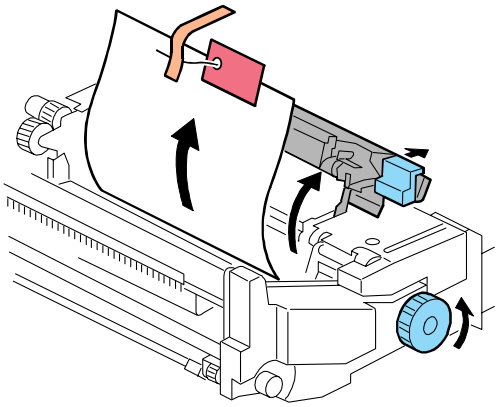
Instruction Sheet

- This sheet protects the PTR during shipping.
- It also reminds you that the stabilizing rod should have been removed already, If not, do it now, before you remove this sheet.
- Do not slide the drawer back in until after you have removed the rod, or the ITB and PTR will be damaged.

Slide 73

No additional notes

Fusing Unit

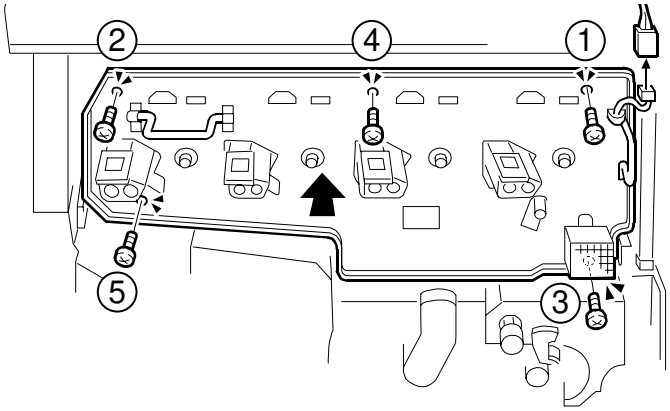


- **Now remove the protective sheet of paper from the fusing unit.**

Slide 74

V-C3 field service manual, Installation, Copier, Installation, Remove Remaining Retainers and Packing Material

Re-attach the Faceplate



- **Attach the screws in the correct sequence. Do not tighten them strongly.**

Slide 75

V-C3 field service manual, Installation, Copier, Installation, Reattach the Faceplate

Main Copier
Important Points

Developer

Slide 76

- These slides show the most important points of the installation procedure. They are not the full procedure. To do the full procedure, you must use the manual.
- First, study these important points. Then install your machines.
- If you do not study these important points first, you could damage the machines, and could get hurt.

Installing Developer

Overview

- **We do not remove the PCU from the machine, so we do not need the PCU stand.**
- **First, we install each developer bottle on a port at the front of each PCU.**
- **Then we remove the seals from each bottle, and make sure that the developer can flow freely from each bottle.**
- **Then, we use SP mode to transfer the developer from the bottles to the PCUs.**
  - The SP installs all 4 developers at once.
  - There are SPs to install individual colours also, but at installation, we can do them all at once.
- **Then we check that the developer was installed correctly.**
  - There is an SP to check for errors.
  - Also, we check visually to see if developer remains in the bottle.

Slide 77

- This slide shows the steps in outline. The next few slides explain these steps in more detail.

Installing Developer

Notes

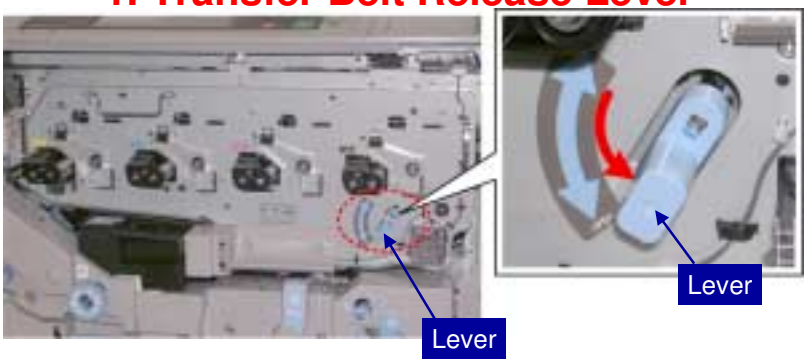
- Do the procedure in the order described in the service manual.
- Do not turn the machine on or off, or open or close the front door, until you are instructed to do so in the installation procedure.
- The toner hopper unit must be off the machine (already done, if you followed the procedure correctly).

Slide 78

No additional notes

Installing Developer

1. Transfer Belt Release Lever



- Attach the lever to the tip of the shaft.
- Rotate the lever down.
- This separates the transfer belt from the surfaces of the PCU drums.

Slide 79

V-C3 field service manual, Installation, Copier, Installation, Filling the PCU Units with Developer

- We removed this lever earlier, with all the retainers.

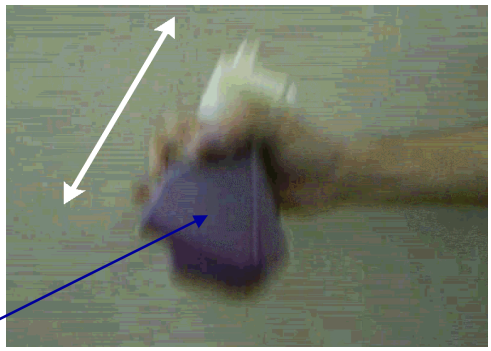
Installing Developer
2. Find the Y Developer Bottle

- **Make sure that it is marked D081 as shown.**
  - There are two models in the V-C3 series: D081, and D082. For both models, the developer is marked D081.

Slide 80

No additional notes

Installing Developer
3. Loosen the Developer



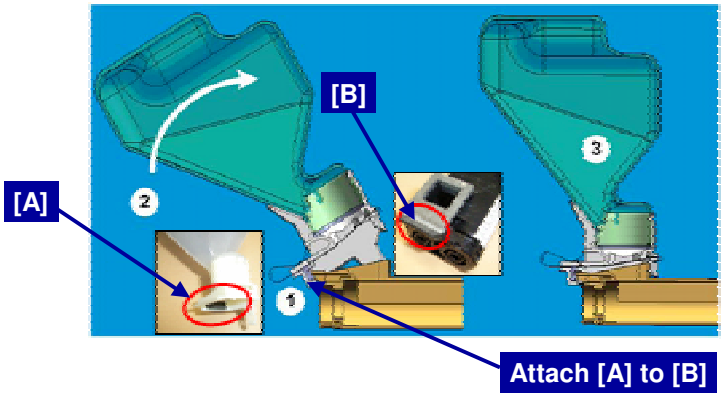
- **Hold the bottle upside down as shown.**
- **Shake the bottle up and down 10 to 15 times.**
  - The opening must point up when you do this.

Slide 81

- This is necessary because the developer settles and solidifies during transportation and storage.

Installing Developer

4. Mounting the Developer Bottle on the PCU



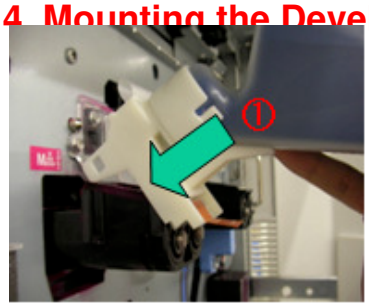
- **Set the opening of the bottle as shown (1).**
  - Make sure that you attach [A] firmly to [B].
- **Swing the bottle up (2) until it snaps into place (3).**
- **The order from left to right is Y C M K**

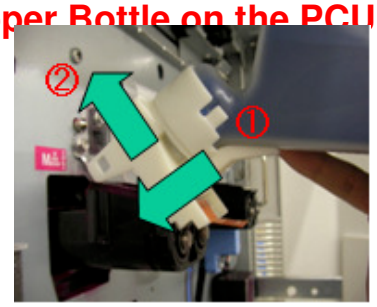
Slide 82

❒ The next two slides show this procedure in detail.

Installing Developer

4. Mounting the Developer Bottle on the PCU





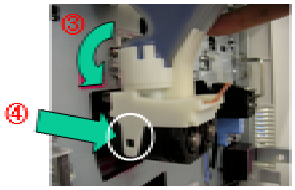
- Rest the neck of the developer bottle on the PCU, as shown in the photo on the left.
- While keeping the contact between the neck of the developer bottle and the PCU, slide the neck upward in the direction of the arrow marked “2”.

Slide 83

No additional notes

Installing Developer

4. Mounting the Developer Bottle on the PCU



Tab

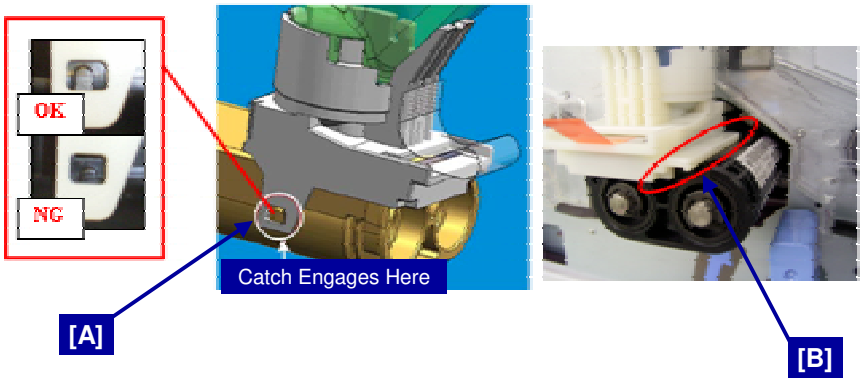
- Rotate the developer bottle up in the direction of the arrow marked “3”, and lock the neck of the bottle into the PCU.
- Check the tab and make sure the bottle is locked in place. If it is not locked in place, push the neck of the bottle in the direction of the arrow marked “4” until it locks.

Slide 84

No additional notes

Installing Developer

4. Mounting the Developer Bottle on the PCU



- **[A] Make sure that the neck of each bottle has snapped into place.**
  - If it is out of place, developer will spill out after the seal is removed.
- **[B] Make sure there is no gap between the developer and the PCU.**

Slide 85

❒ Then, install the M, C, K bottles in the same way as described on the previous few slides.

Installing Developer

5. Remove the Seals

- Pull out all four seals.
- Hold the bottle with one hand and slowly pull out the seal with the other.
- Tap the side of each bottle to make sure that developer flows freely.

Slide 86

No additional notes

Installing Developer

6. Make sure that the Lever is Down

- The lever must be down before you start the SP modes.
- If the lever is up, SP3814 (fill the PCUs with developer from the bottles) will fail.

Slide 87

No additional notes

Installing Developer
7. SP Mode

- **CLOSE THE FRONT DOOR, THEN TURN THE MACHINE POWER ON.**
- **Wait for the machine to beep twice.**
  - This indicates that the fusing unit is ready.
  - If you do not wait for the beeps, SP3814 (fill the PCUs with developer from the bottles) will fail.
- **Do SP 3814-1.**
  - This moves the developer from the bottles to the development units.
  - It takes about 3 minutes.
  - When “Completed” appears on the display, press “Exit”.
- **Do SP3815.**
  - This checks that SP 3814-1 was executed correctly.
  - If all is correct, you should see “1111” on the display.
  - If another number is shown, see the service manual.
    - » For example, if “1191” is displayed, this could mean that the tape was not removed from the C bottle.

Slide 88

CLOSE THE DOOR BEFORE YOU TURN THE POWER ON.

- This is required by the software.
- In other color products, we keep the door open to prevent initial process control.
- However, for this machine, it is different. How does the machine detect that it is not time to start process control? At this time, the toner hopper has been removed. The machine detects the absence of the electrical connection to the toner hopper, and when it detects this, it does not start the initial process control.

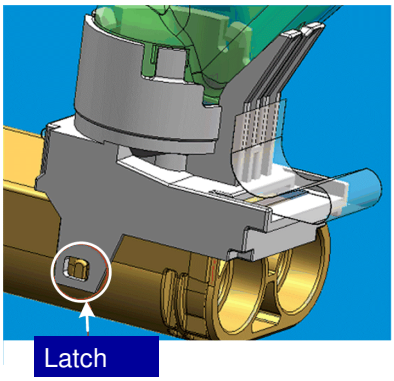
Installing Developer
8. Check Each Bottle

- **Even if SP 3815 shows no errors, there may be developer remaining in the bottle.**
- **Touch Exit twice, then open the front door.**
- **Shine a light through the neck of the bottle to make sure that the bottle is empty.**
  - Try this with a full bottle and an empty bottle, and make sure that you can understand the difference between them.
- **If developer remains in the bottle, do SP 3814 for that color again.**
  - See after the next slide for more details.

Slide 89

- What to do if a bottle is not empty?
  - See after the next slide.

Installing Developer
8. Check Each Bottle



- **If all bottles are empty, turn the machine power off and disconnect the power cord.**
- **Remove the empty developer bottles.**
  - It may be necessary to use a small screwdriver to disconnect the bottle at the latch.

Slide 90

- What to do if a bottle is not empty?
  - See the next slide.

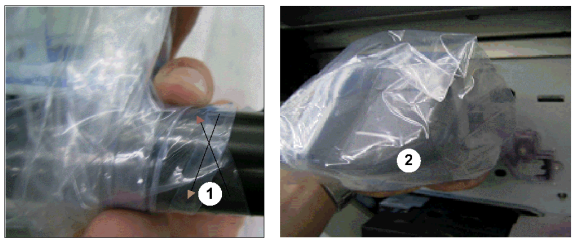
If the Bottles are not Empty - 1

- **Use SP3814 again.**
  - Do SP3814-1 to 6 for the color of whichever PCU is to be filled with developer.
    - » These SP codes fill the PCUs with developer from the developer bottle.
  - Hold the bottle to prevent it from coming off, then tap the bottle gently a few times.
  - Open the front door, then turn on the main power switch.
  - When you see the door open message on the screen, close the door.
  - Wait about 40 sec. until the SC code appears on the screen, then turn off the power switch.
  - Repeat this procedure until the bottle becomes empty.
  - After 10 attempts if the bottle is still not empty, do the procedure on the next slide.

Slide 91

V-C3 field service manual, Removal and Adjustment, PCU, Developer Replacement, Handling Problems with Developer Filling

If the Bottles are not Empty - 2



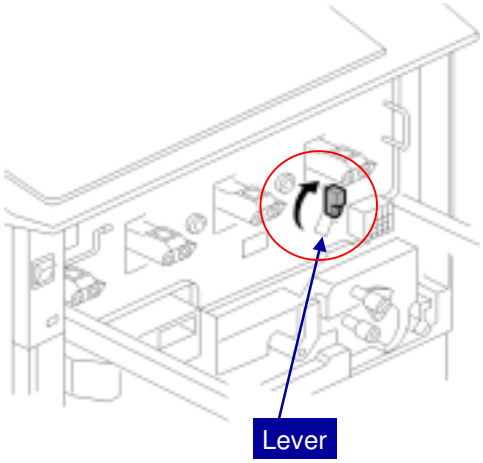
temp_devbotoff

- **The developer has probably clogged inside the bottle, so you must remove the developer bottle and the PCU.**
  - Cover the toner bottle with a plastic bag and seal the mouth of the bag with your hand (1).
  - Remove the bottle (2).
  - Remove the faceplate and remove the PCU from the machine.
  - Open the top of the development unit
  - Pour remaining developer from the bottle into the development unit.

Slide 92

- No additional notes

Transfer Belt Release Lever



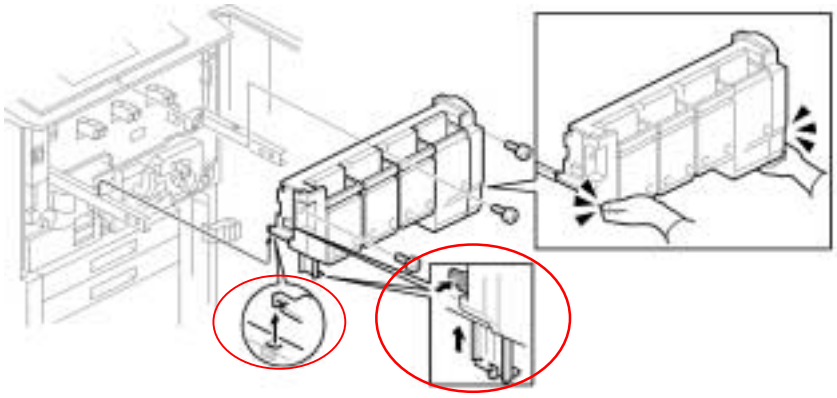
- **Then turn the transfer belt release lever to the vertical position until it locks.**
  - DO NOT FORGET THIS, OR YOU WILL GET AN SC CODE!!

Slide 93

V-C3 field service manual, Installation, Copier, Installation, Reinstall the Toner Hopper

- If you forget to turn it to the vertical position, you will get an SC code, as shown in the service manual.

Install the Toner Hopper



- Make sure that the support leg is up and locked before you push the toner hopper into the machine.
- Never press in on the top of the toner hopper.

Slide 94

V-C3 field service manual, Installation, Copier, Installation, Reinstall the Toner Hopper

Install the Toner Hopper

- The transfer belt release lever must be turned up and locked before you install the toner hopper.
- If the transfer belt release lever is down, the toner hopper cannot be closed completely against the faceplate.
- If the transfer belt release lever [A] is not attached, this will cause an image transfer roller position error (SC447).

Slide 95

No additional notes

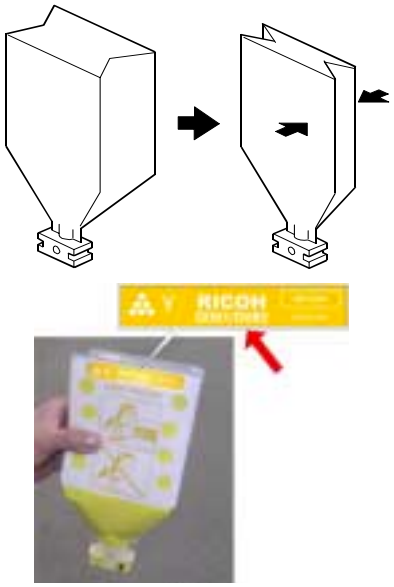
Main Copier
Important Points

Toner

Slide 96

- These slides show the most important points of the installation procedure. They are not the full procedure. To do the full procedure, you must use the manual.
- First, study these important points. Then install your machines.
- If you do not study these important points first, you could damage the machines, and could get hurt.

Toner Cartridges



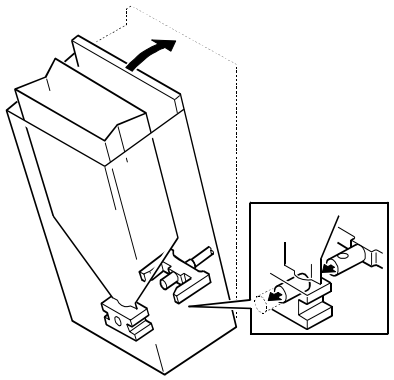
- This type of cartridge is called an STC (Soft Toner Cartridge).
- The cartridge walls collapse slowly when toner is used.
- Make sure that the cartridge is marked D081/D082. Do not use another type of toner.

Slide 97

No additional notes

Toner Cartridge

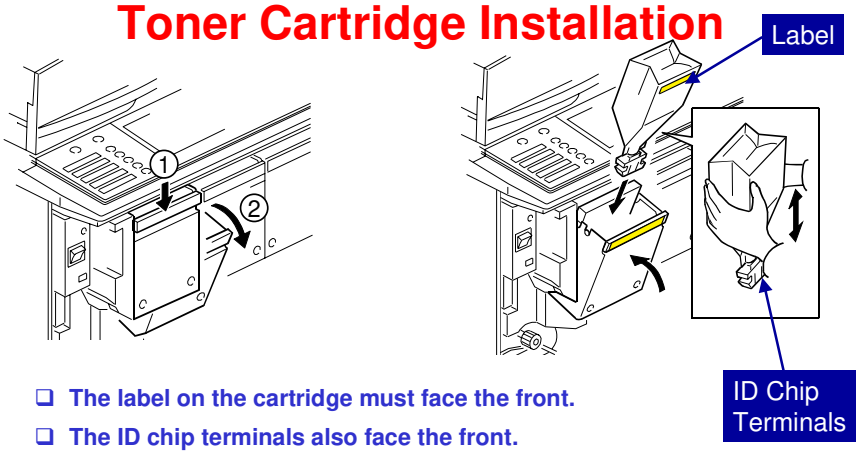
- **When you put a cartridge in the hopper and close the cover, a plug opens a port in the bottom of the cartridge, and toner can go out through the bottom.**



Slide 98

- At elevations 1,000 meters (3,280 ft.) above sea level, the toner cartridge packs may expand, and prevent you from installing them in their bins.
- After approximately 24 hours, the cartridges should shrink to normal size.
- But if you cannot wait, there is a service part to bleed off the pressure inside the cartridge before you install it.

Toner Cartridge Installation



- **The label on the cartridge must face the front.**
- **The ID chip terminals also face the front.**
- **Shake the cartridge up and down (not side to side) 10 times.**
  - Do not squeeze. This will form clumps in the toner.
  - Do not hold the cartridge upside down.
- **Make sure that you install the cartridges in the correct bins.**
  - There are decals on each bin.

Slide 99

V-C3 field service manual, Installation, Copier, Installation,
STC (Soft Toner Cartridge) Installation

Main Copier
Important Points

Initializing Developer and Toner

Slide 100

- These slides show the most important points of the installation procedure. They are not the full procedure. To do the full procedure, you must use the manual.
- First, study these important points. Then install your machines.
- If you do not study these important points first, you could damage the machines, and could get hurt.

Important Note about Initialization

- When installing this machine, we use SP 3811 to initialize the TD sensor after adding developer.
- SP3811 does a number of things, including initialization of the TD sensor.
- You must not initialize the TD sensor again.
- Do SP3811-1 only once.
- SP 3801 also initializes the TD sensor. Never do SP3801-1 (Init TD Sensor) after doing SP3811. If the TD sensor is initialized twice this will cause a fatal error in toner supply control.

Slide 101

No additional notes

Comparing SPs 3801 and 3811

- SP 3801 initializes the TD sensor for the new developer.
- SP 3811 does the same, but it also sends toner to the sub hopper of the PCU, covers the drum with a layer of toner (to prevent the cleaning blades from flipping, or damaging the drums), and does process control. It takes about 4.5 minutes.
- During installation, and after replacing the drum or PCU, we use SP 3811.
- After replacing developer only, we use SP 3801.
- After using SP 3801 or 3811, do not use them again until the next time you replace the developer. Otherwise, you will cause toner scattering inside the machine. To cure this, you must replace the developer.
- Only use the SP modes for initializing the TD sensor at the times stated in the service manual.

Slide 102

No additional notes

Initializing Developer and Toner

Overview

- **The procedure must be done exactly as stated in the manual.**
- **You must open the front door before you turn the power on.**
  - This prevents initial process control from starting automatically.
  - If you forget, then you must change all the developers.
- **Turn the power on. Then, 'Open Cover' will be shown on the display. Then, you can close the front door.**
- **After you close the front door, you can do SP 3811 001.**
- **This adds toner, initializes the TD sensor, and does process control.**
  - Do not use SP 3801 or 3811 again, to initialize the TD sensors again, until the next time you replace the developer. Otherwise, you will cause toner scattering inside the machine. To cure this, you must replace the developer.
  - Only use the SP modes for initializing developer at the times stated in the service manual.

Slide 103

V-C3 field service manual, Installation, Copier, Installation, Initializing Developer and Toner

❒ This slide shows the important points about initializing the machine.

Initializing Developer and Toner
1. Open the Front Door

❑ **Open the front door, then turn the power on.**
- Then, the machine will not start the initial process control self-check.
- If the front door is not open, the drums will turn with no toner in the PCUs.
- If the drums turn with no toner in the PCUs, this can cause the cleaning blades to catch on a dry drum and cause damage to the drum surfaces.

❑ **Then, 'Open Cover' will be shown on the display. Then, you can close the front door.**
- You can hear a motor before you close the cover. This is the fusing unit. The PCUs do not turn at this time.

Slide 104

❒ You have to open the door this time.

Initializing Developer and Toner

2. Wait 2 Minutes

- **Wait for the machine to warm up.**
  - This should be about 2 minutes.

Slide 105

- Wait until the normal machine ready display appears.

Initializing Developer and Toner
3. SP Modes

- **Do SP 3811 001.**
  - This sends toner to the sub hopper of the PCU, covers the drum with a layer of toner (to prevent the cleaning blades from flipping, or damaging the drums), initializes the TD sensor, and does process control. It takes about 4.5 minutes.
  - If 'Failed' appears immediately after you start, the machine is not warmed up. Wait 2 minutes then do SP 3811 001 again.
- **Then check that the initialization was done correctly. To do this, use SP 3812.**
  - If the display is not '1111', see 'Special Procedures' in the Troubleshooting section of the manual.
- **Then check that the initial process control was done correctly. To do this, use SP 3821 001.**
  - If the display is not '10101010', see 'Special Procedures' in the Troubleshooting section of the manual.

Slide 106

- Forced MUSIC is done later with a user tool.

SPs 3801 and 3811 - Very Important!!!!

- **Only initialize the TD sensor at these times:**
  - At installation, exactly as explained in the procedure.
  - After you replace developer (only initialize the TD sensor for the colour that you replaced)
  - As instructed in specific troubleshooting procedures.
- **Only initialize the sensor one time. Do not do it more than one time.**
- **Never do SP 3801 after doing SP 3811. If the TD sensor is initialized twice for the same batch of developer, a fatal error will occur with toner supply control.**
- **If you do not obey the above instructions, you will get toner scattering inside the machine.**
  - It is possible that many instances in the field of toner scattering are caused by initializing the TD sensor more than one time.
- **To repair the machine, you must replace the developer (after you clean the machine!).**

Slide 107

- If a technician initializes the sensor more than one time, the developer must be replaced. But it is not easy to know that a mistake was made until toner scattering occurs inside the machine. Then it is too late.
- A common source of error is to replace one developer (for example, black), but then do the TD sensor initialization for all colours. Then you have to replace the C, M, and Y developers.

Why should we not initialize the TD sensor more than once?

- See “Handout 1 - Do not Initialize the TD Sensor More than One Time!”

Problems Related to Developer Installation

- **The following symptoms are related to developer installation:**
  - 1. Image density is too light
  - 2. The toner end alert does not turn off after one or more brand-new toner cartridges are installed
  - 3. Toner scattering inside the machine
- **If you face these symptoms, please check that you did the developer installation correctly, and refer to Special Procedures in the Troubleshooting section of the service manual.**

Slide 108

No additional notes

Main Copier
Important Points

Completing the Installation

Slide 109

- These slides show the most important points of the installation procedure. They are not the full procedure. To do the full procedure, you must use the manual.
- First, study these important points. Then install your machines.
- If you do not study these important points first, you could damage the machines, and could get hurt.

Add Paper to Trays 1-3

- **Tray 1: Tandem Tray**
  - The default is set for each region (for example, A4 for Europe/Asia).
- **Trays 2 and 3: These are universal trays. They can detect a lot of standard paper sizes, but you must put the side and end fences in the correct positions.**
- **To use a non-standard or custom size, you must input the required size with a user tool.**
  - The default setting of this user tool is 'Auto Detect'. This uses the input from the sensor.
  - We will see this again in the Paper Feed section of the course. At this time, please use a standard paper size and move the fences to the correct positions.
  - Put A3 or DLT paper in one of the trays. We need it for the next step.

Slide 110

V-C3 field service manual, Installation, Copier, Installation, Load the Paper Trays

Notes concerning Trays 2 and 3

- **If the user does not put the fences at the correct position, a jam can occur.**
- **To use a paper size that is not in this table, select the size with this user tool: System Settings> Tray Paper Settings >Tray Paper Size.**
  - If the paper size is not the same as the setting, a jam can occur.
- **Note that SP 5112 must be set to 'enabled' or non-standard sizes cannot be selected for trays 2 and 3.**

Slide 111

No additional notes

Make a Test Color Print

- **Make a color copy of a C-4 color chart.**
  - It must be on A3 paper, and you should use a sample of the paper that the customer will normally use for color copies.
- **If the color is not good, do the ACC procedure.**
  - This is described in the installation procedure.

Slide 112

V-C3 field service manual, Installation, Copier, Installation, Make a Test Color Print

Color Registration (MUSIC)

- **Do a forced MUSIC adjustment with the following user tool.**
  - User Tools > Maintenance > Color Registration
  - Touch ‘OK’ to do the procedure.
- **If the adjustment is successful, "Color Registration is completed." is displayed. If it does not appear, try again.**

Slide 113

- This is now a user tool.

Set the Counter Type

- **SP5045 001 can change the counter type for the display. If you want to change this, change it before you make the SMC report.**
  - The default for the counter is ‘developments’.
- **Then you can print an SMC report. Keep it in a safe location.**

Slide 114

V-C3 series service manual, Installation, Copier, Installation, Counter Display Setting

- In the V-C2, you cannot change this setting back to ‘developments’ if you change it to ‘pages’, unless you use an SSP mode.
- For the V-C3, you can change it again at any time.

SP Settings (1)

- **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
- **For machines with built-in hard disks (color scanner models): At installation, it is not necessary to format the hard disk or transfer the stamp data.**
  - However, if the hard disk is replaced, you must transfer the stamp data (SP 5853), format the hard disk (SP 5832 001), and copy the address book from the backup on an SD card (SP SP5846-052).
    - » Normally, it is a good idea to make a backup of the address book on an SD card with SP 5846 051 whenever you visit the customer.

Slide 115

- Some of these do not appear in the service manual.
- The note for the hard disk only applies to models with a color scanner. The monochrome scanner model does not have a hard disk.

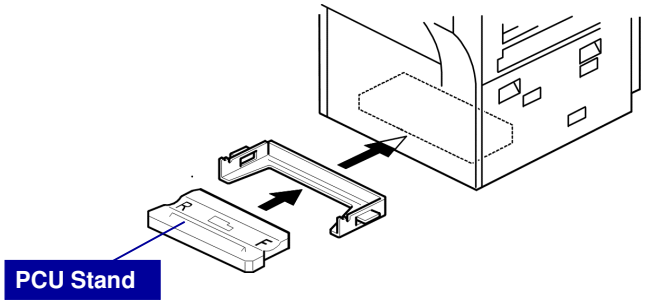
SP Settings (2)

- You must enable USB with SP 5985-2.

Slide 116

No additional notes

Others

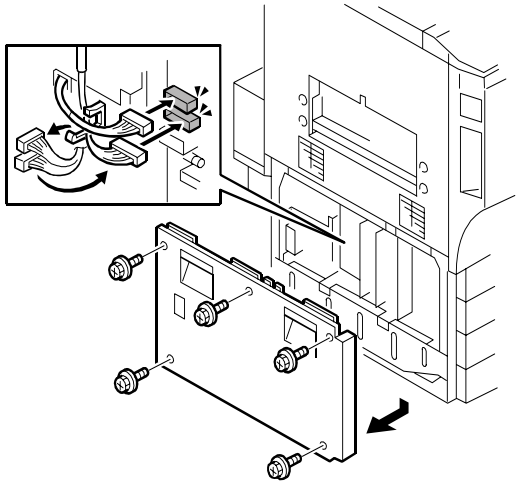


- **Make the machine level.**
- **Store the PCU stand inside the machine.**
  - Make sure that the special tool is there.
- **Print an SMC report and keep it with the machine.**
  - Keep it with the SP Mode factory Setting sheet you removed earlier.

Slide 117

No additional notes

Connect the Tray Heaters

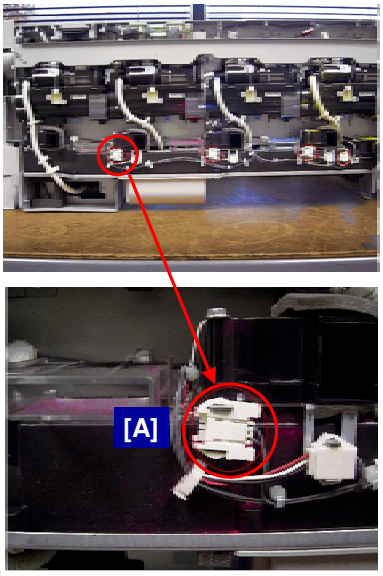


- If the location has high humidity, you should connect these heaters.
- Ask the customer first. The customer may not want the extra energy expenses.

Slide 118

V-C3 series service manual, Installation, Copier, Installation, Connect the Upper and Lower Tray Heaters

Connecting the Tray Heaters



- Do not connect the connector [A] for the Black PCU Fan Motor.
- This connector is disconnected on purpose, for the following reason:
- A certain amount of toner scatters inside the machine, which is normal. However, sometimes, the black PCU cooling fan blows some of this toner onto the ID sensor.
- This can generate an SC error.
- This does not happen with the PCU fan motors for the other colors, because these fans are located far from the ID sensor.

Slide 119

This is new for the V-C3

Inkjet Paper Caution Decals

- **Do not use inkjet paper in this machine.**
- **To remind the user, attach the decals to each paper tray (and for the optional LCTs) as shown in the manual.**
- **The example above shows where to attach the decal for tray 1 (tandem tray).**

Slide 120

- This is new for the V-C3.
- An English decal is already attached to the tray. If you wish to attach a decal for another language, just put the new decal on top of it.
- Do not try to remove the English decal.

Installing the Options

Other Changes and Corrections to the Installation Procedures

Slide 121

No additional notes

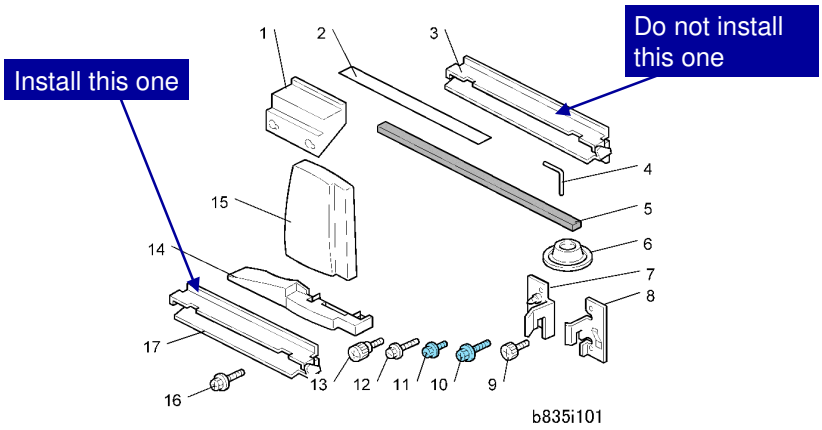
Tray Heaters for the D350 LCT

- **There are two types.**
  - 120V Model: Both connector harnesses are WHITE.
  - 208V-240V Model: Both connector harnesses are RED.
- **Make sure to install the correct heater**
  - Note for –17 copier models: D081 is 120V, D082 is 240 V

Slide 122

No additional notes

Paper Guides



- Many of the peripherals have two entrance guide plates packed with the accessories.
- For the V-C3 series, always use the short one.

Slide 123

- The example shown here is the B835 cover interposer.

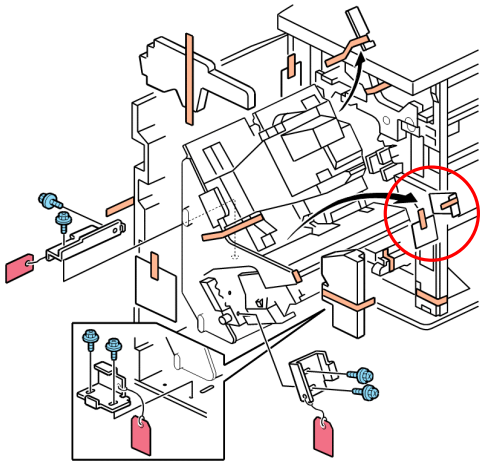
Multi-folding Unit (D454)

- **After you install this unit, do the following:**
  - Make sure that the unit is level and at the correct height.
  - Test the breaker switch in this unit.
  - Check for skew and side-to-side registration errors.

Slide 124

No additional notes

Installing the B830 Finisher

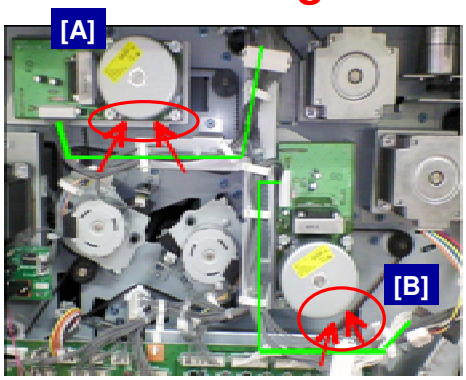


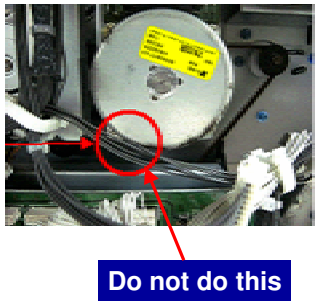
❑ **Remove these two sheets of paper (in the red circle).**

Slide 125

❒ This is a new step in the installation procedure for this finisher.

Installing the B830 Finisher





- When installing the D375 finisher adapter, route the harnesses along the green lines in the diagram.
- The harnesses must not touch the motors at [A] and [B]. This will damage the harness,

Slide 126

No additional notes

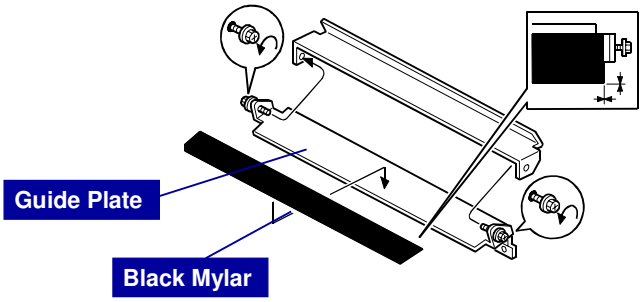
Installing the Punch Unit (B831)

- **The procedure in the original service manual was replaced.**
  - The new procedure is the same as the one for the B234 series (Katana-C1)

Slide 127

No additional notes

Installing the B835 Cover Interposer



- Attach the black Mylar (included with the cover interposer to the guide plate of the peripheral to the left of the cover interposer.

Slide 128

No additional notes

Installing Finishing Options

Skew and Registration Adjustment

Slide 129

Service manual, Installation, Common Adjustments, Skew and Side-to-Side Registration

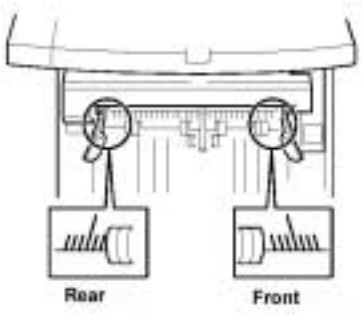
Skew and Registration Adjustment

- The paper feed path is extremely long when all the finishing options are installed.
- In such a long path, the cumulative effect of paper skew and deviation in side-to-side registration may require adjustment.

Slide 130

No additional notes

Where Skew and Side-to-Side Registration Are Measured



- At the exit of the copier and some peripherals, you can measure the skew and registration at two locations, as shown above.
- At both locations, use the two scales to measure the amount of skew or deviation in side-to-side registration.
- Important! There are two scales. The one at the rear is for DLT paper, and the one at the front is for A3 paper. Use the correct scale.

Slide 131

❒ To get access to the measurement point in the booklet finisher, you must remove the upper cover of the booklet finisher.

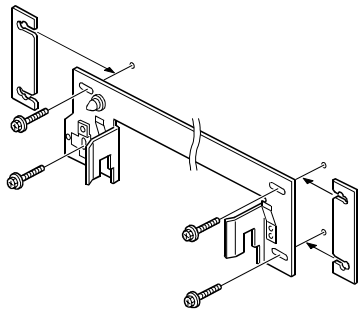
Where Skew and Side-to-Side Registration Are Adjusted

- **Both skew and side-to-side registration adjustment are possible at the outputs of these units:**
  - Cover interposer (two trays; B835)
  - Multi-folder unit
  - Ring binder

Slide 132

No additional notes

Adjustment Bracket



- There is a bracket like this at the locations mentioned on the previous slides.
- To adjust skew, we can insert spacers under one end of the bracket.
- To adjust registration, we can move the bracket from side to side.

Slide 133

- The class will get a chance to try the adjustment later.

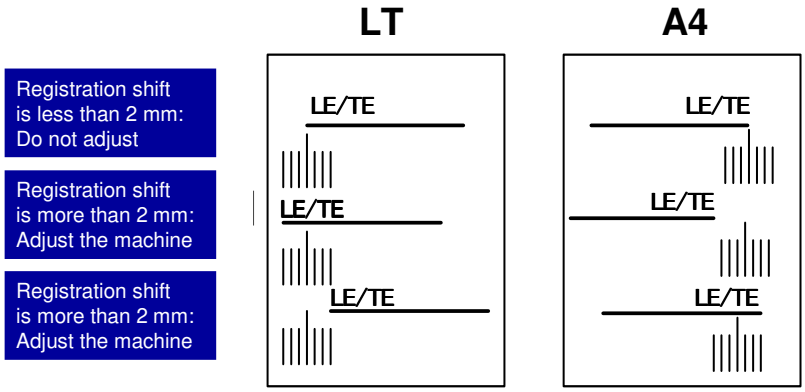
General Rules

- Skew and side-to-side correction can be done only where the unit is docked to the upstream unit with the adjustment bracket (see the previous slide).
- After installing each peripheral device, do some test prints. Check for skew, and check that side-to-side registration is correct.
- If you detect a problem with skew or side-to-side registration, do the adjustment on the adjustment bracket attached to the peripheral unit upstream of the unit where the problem occurred.

Slide 134

- Upstream: Towards the copier exit

When Registration Should Be Adjusted



- If the error is more than ±2 mm, you should adjust the machine.
- The order is not important, but if possible, adjust for registration shift first, then for skew.

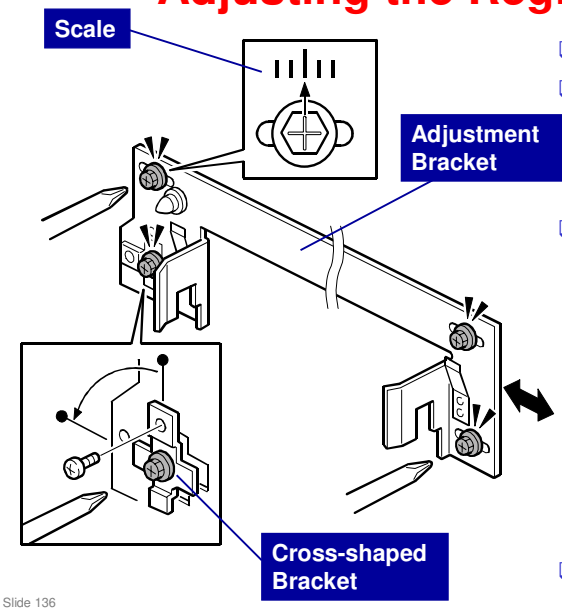
Slide 135

- LE: Leading edge
- TE: Trailing edge

To check for registration shift

- Look at the scale when the leading edge comes by and when the trailing edge comes by. Check where the side edge of the paper is on the scale.
- If the side of the paper is within 2 mm of the central line on the scale, there is no registration shift.
- If the side of the paper is more than 2 mm from the central line on the scale, you should adjust the machine.

Adjusting the Registration

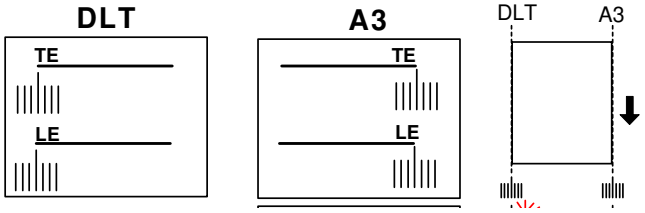


- Loosen the screws.
- Remove the 'cross-shaped' bracket, turn it by 90 degrees, then tighten the screw to secure this bracket.
- Move the adjustment bracket by the same amount as the registration shift.
  - Use the scale to make sure that you move the bracket by the correct amount.
  - If the registration shift was toward the front of the machine, slide the adjustment bracket to the front.
- Then secure the adjustment bracket

Service manual, section 1.13.2

❒ If you move the adjustment bracket, you cannot turn the small cross-shaped bracket back 90 degrees at the end of the procedure, so do not try it.

When Skew Should Be Adjusted - 1



- **Look at the scale when the leading edge comes by and when the trailing edge comes by.**
- **Check where the side edge of the paper is on the scale.**
  - If the side of the paper comes past at the same place on the scale, there is no skew.
  - The above diagram shows an example where no adjustment is necessary.
- **If the error is more than ±2 mm, you should adjust the machine.**
- **Adjust for skew first, then for registration shift.**

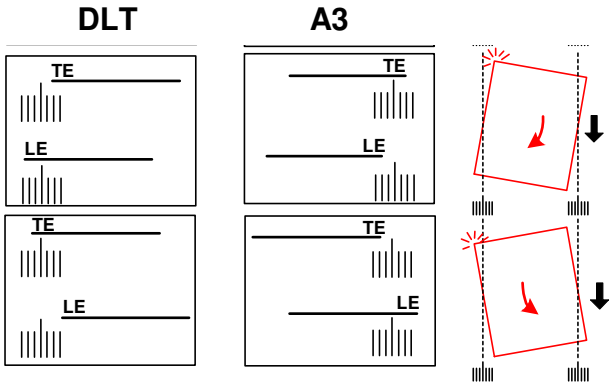
Slide 137

- LE: Leading edge
- TE: Trailing edge

To check for skew

- Look at the scale when the leading edge comes by and when the trailing edge comes by. Check where the side edge of the paper is on the scale.
- If the side of the paper comes past at the same place on the scale, there is no skew.
- If the difference is more than 2 mm, you should adjust the machine.

When Skew Should Be Adjusted - 2



- **In these examples, skew is present. The machine must be adjusted.**
  - The red diagram on the right shows the type of skew.
  - The diagram in the middle shows how this type of skew appears on the A3 scale.
  - The diagram in the middle shows how this type of skew appears on the DLT scale.

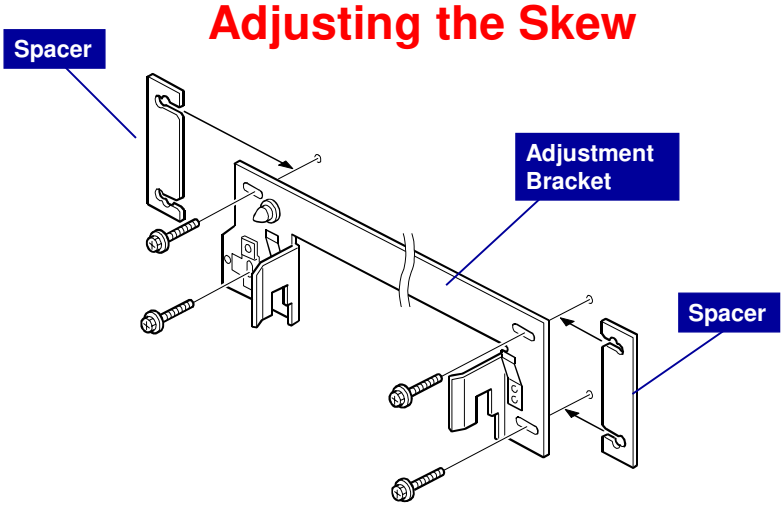
Slide 138

- LE: Leading edge
- TE: Trailing edge

To check for skew

- Look at the scale when the leading edge comes by and when the trailing edge comes by. Check where the side edge of the paper is on the scale.
- If the side of the paper comes past at the same place on the scale, there is no skew.
- If the difference is more than 2 mm, you should adjust the machine.

Adjusting the Skew



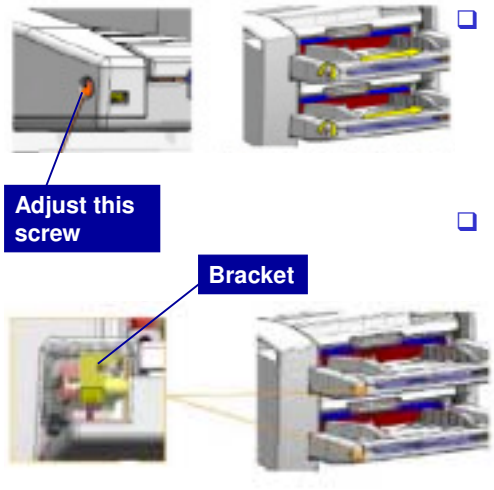
- **Insert spacers below the adjustment bracket.**
  - The service manual shows you where to find the spacers inside the machine.

Slide 139

Service manual, section 1.13.2

❒ If the trailing edge skews towards the rear, insert the spacer at the rear side of the machine.

Adjusting Registration at the Entrance of the B835

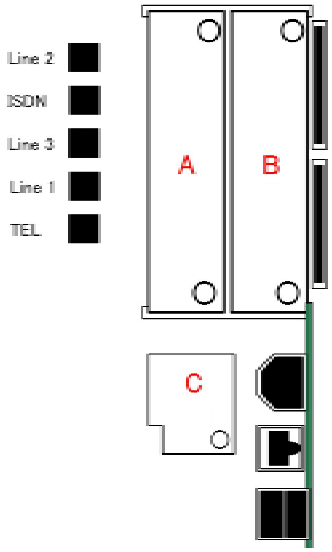


- **Adjust the screw at the side of the tray**
  - Turn clockwise: The tray moves to the front
  - Turn anti-clockwise: The tray moves to the rear
- **The tray can be moved a maximum of 2 mm in either direction.**
  - To see the current setting, remove the tray cover and look at the scale on the bracket.

Slide 140

- This slide shows how side-to-side registration can be adjusted at the entrance of the cover interposer.
  - The adjustment is made on the trays, not on the bracket between the peripherals.
- There is no skew adjustment here. Skew can only be adjusted at the exit from the cover interposer (see the previous slide)

Fax Unit Slots



Slide 141

Line 1: Line out for the Fax Option

Line 2: Line out for an optional G3 Interface Unit

Line 3: Line out for another optional G3 Interface Unit

TEL: Telephone connection

ISDN: ISDN connection (Japan only)

No additional notes

Maintenance

Changes since the V-C2 was launched

Slide 142

No additional notes

Changes to the PM Table

- **Main copier**
  - Development unit: Lubricate with KS660B grease every 150k
  - Drum lubricant brush roller: Change every 300k for YCM, and every 400k for black. Apply G104 Yellow Toner and Zinc Stearate after replacement
  - Fusing Unit Components: Replacement intervals changed
    - Hot roller changed from 300 to 450k
    - Pressure Roller Cleaning Roller changed from 300 to 450k
    - Oil Supply Roller changed from 300 to 450k
    - Pressure Roller Shaft Bearings changed from 600 to 1200k
- **ADF**
  - This is the same as the MT-C4
- **New peripherals**
  - Multi-folder
  - Ring binder

Slide 143

- Details of the lubrication procedures follow on the next few slides.
- Part numbers of lubricants are listed in the maintenance section of the manual.

Lubrication - Copier

- **Always use Lubricant Powder (B1329700) (composed of Zinc Stearate).**
  - One exception: After replacing the lubricant brush roller in the PCU, use G104 Yellow Toner (D0159500) and Zinc Stearate D0159501 to lubricate the new roller.
    - » Zinc Stearate D0159501 was introduced after the V-C2 was launched.
- **Never use the old Setting Powder (54429101) in any service procedure for the V-C3.**
- **Never use V-C2 or V-C3 yellow toner as a lubricant.**
  - The yellow toner for these models contains carrier, and this will damage the drum and other components.
  - The yellow toner for the V-C1 models is required for the maintenance of this model, when the lubricant brush roller in the PCU is replaced.

Slide 144

- V-C1 series yellow toner is needed when you replace the lubricant brush roller in the PCU. The V-C1 series was not sold in some areas, but the toner is available as a service part (see below).
- Part numbers of required lubricants
  - G104 YELLOW TONER (D0159500) – this is the V-C1 yellow toner (Note – nothing to do with a model code G104!)
  - ZINC STEARATE (D0159501) – this is for the PCU lubricant brush rollers
  - ZINC STEARATE (B1329700) – this is for the other procedures that require zinc stearate.

Lubricant Brush Roller (PCU) - 1

- **After installing a new roller, lubricate as follows:**
  - 1. Place a sheet of clean paper on a flat surface.
  - 2. Pour a small amount of G104 Yellow Toner (D0159500) from its bottle onto the paper.
    - » This is V-C1 series yellow toner.
    - » Do not use V-C2 or V-C3 yellow toner; this contains developer
  - 3. Pour the same amount of Zinc Stearate (D0159501) from its bottle onto the paper.

Slide 145

- G104 yellow toner – this is just the name. It has nothing to do with a model code G104!
- The ratio of the two powders in the mixture should be 1:1.

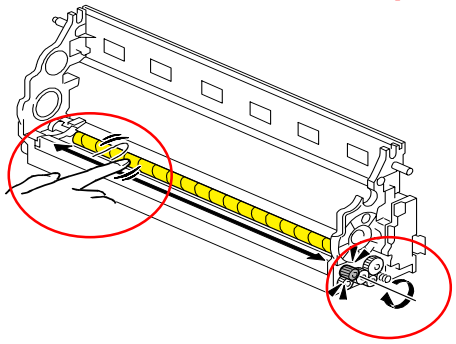
Lubricant Brush Roller (PCU) - 2

- 4. Mix the G104 Yellow Toner and Zinc Stearate together evenly.

Slide 146

No additional notes

Lubricant Brush Roller (PCU) - 3



- 5. Apply the mixture of powders as shown by the arrow.
- 6. At the same time, turn the gear as shown, so that lubricant is applied to the whole surface of the roller.

❑ **IMPORTANT:**

- 1. Use a brush to apply the powder if one is available. If a brush is not available, use your finger.
- 2. Only use this mixed powder for the PCU lubricant brush roller of the V-C2 or V-C3. Never apply this powder to another part or another model.

Slide 147

V-C3 field service manual, Removal and Adjustment, PCU, PCU Blades and Rollers, After Replacement

❒ The slide shows how to apply the mixture of powders to the lubricant brush roller. See the service manual for detailed instructions.

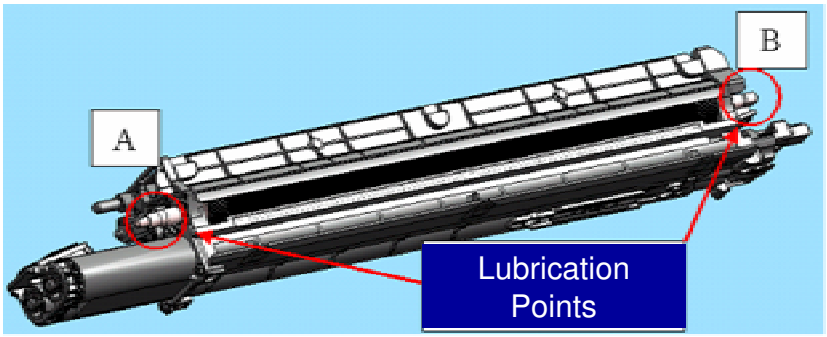
Development Unit Sleeve Shaft - 1

- **Use the following grease when you lubricate the development unit sleeve shaft:**
  - Grease-KS660B, P/N: D0149800
- **This new grease is conductive, and is completely different from any of the existing types (e.g. Grease-KS660, Silicone Grease 501, Grease Barierta-S552R).**
  - The existing types are not conductive.
- **This new grease, Grease-KS660B, was specially designed for use on the V-C2, and is also compatible with the V-C3.**
- **NEVER use this new grease on the V-C1 series.**

Slide 148

No additional notes

Development Unit Sleeve Shaft - 2

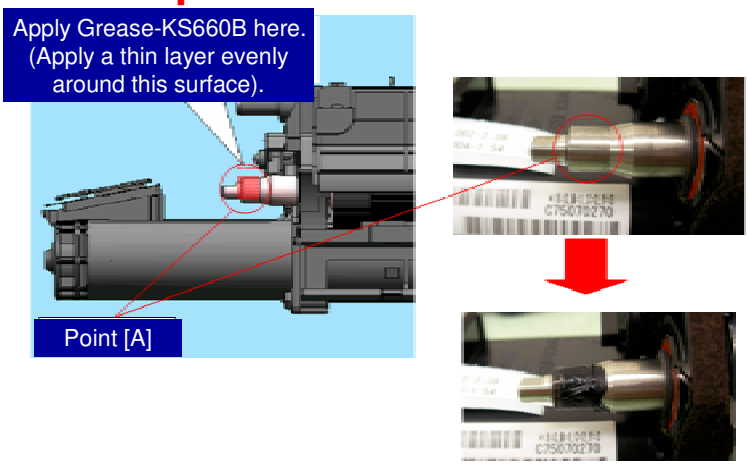


- This shows where to apply this new grease.
- The next two slides show close-ups of these lubrication points.

Slide 149

No additional notes

Development Unit Sleeve Shaft - 3

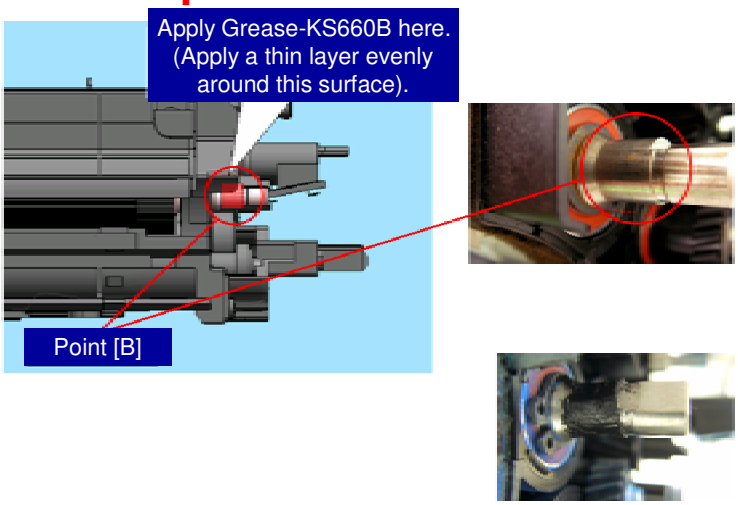


- This shows lubrication point [A].

Slide 150

No additional notes

Development Unit Sleeve Shaft - 4



- This shows lubrication point [B].

Slide 151

No additional notes

Charge Corona Unit (K)

- **From V-C3, the K corona wire assembly is listed as individual parts in the PM table.**
  - For V-C2, you cannot replace the K corona wire as an individual part, because the grid cannot be removed and replaced.
- **These can be replaced separately or as a unit, but the individual spare parts is cheaper than the complete unit.**

Slide 152

No additional notes

Used Toner Bottle

- We recommend that you give customers a spare used toner bottle, so that they can replace the bottle when it becomes full.
- The service technician can collect the full bottle at the next scheduled service call.
- This eliminates EM visits in response to SC484 (Used Toner Bottle Full) errors.

Slide 153

No additional notes

Replacement Procedures

Changes since the V-C2

Slide 154

- There are many small changes to procedures throughout the manual. This section of the course explains the most important changes and additions.

ADF

- The ADF is different (same as MT-C4), so the replacement procedures are different from the V-C2.

Slide 155

No additional notes

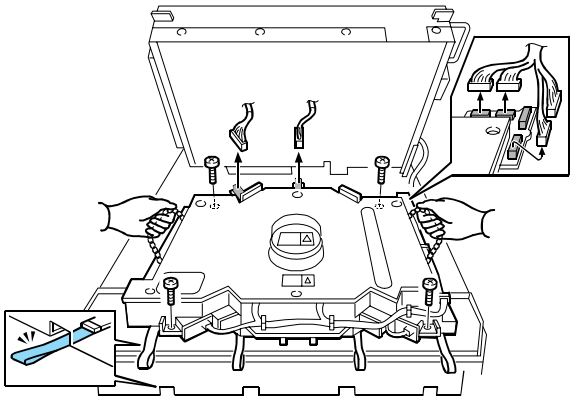
Scanner Lens Block Replacement

- The SP numbers have changed. Refer to the service manual for details of the procedure.

Slide 156

No additional notes

Lifting out the Laser Unit



- Hold the chains when you lift the laser unit out of the machine.

Slide 157

No additional notes

Installing a New Laser Unit

- There are four tapes at the front of the laser unit. When you install them, make sure that you do not tuck them under the laser unit.
- Be sure to reconnect the ground wire at the right rear corner of the machine.

Slide 158

No additional notes

Laser Unit Replacement – SP Modes

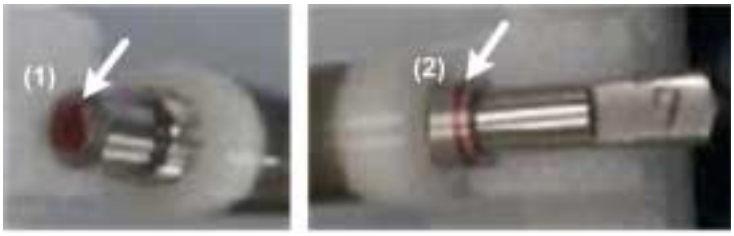
- The SP modes after replacing the laser unit are different from the V-C2.
- Refer to the replacement procedure in the service manual for details.

Slide 159

No additional notes

Charge Roller Replacement

- **The charge rollers are marked on the tip of one end with a red stamp (1) and with a red ring around the sleeve on the other end (2).**
  - These markings distinguish the D081/D082 YMC PCU units from PCU units of previous machines.
  - Always replace a PCU unit with a unit that has these markings. Do not use a PCU unit for a previous machine.



Slide 160

No additional notes

K PCU Charge Unit Replacement

- **This procedure has changed completely.**
- **The main points to remember are as follows.**
  - The corona wires are thin and break easily. If a wire breaks, remove all the pieces from the machine.
  - Do not use alcohol to clean the charge corona unit.
  - Do not touch the surface of the new grid mesh.

Slide 161

- As in the V-C2, the K PCU uses a corona wire. The other PCUs use a charge roller.
- However, in the V-C2, it was not necessary to replace the wire in the field. The charge corona unit was replaced as an assembly.

Laser Synchronization Detectors

- **These cannot be replaced in the field.**
  - This is because factory adjustment is needed after installation of new sensors. This cannot be done in the field.
- **If these sensors are defective, you must replace the laser unit.**

Slide 162

No additional notes

PCU Components

SP Modes

- **Do the SP modes exactly as explained in the manual.**
- **If you replace the developer, initialize the TD sensor only for that colour which you replaced.**
  - Use SP 3801 to initialize the sensor.
    - » SP 3811 also initializes the TD sensor, but it does other things also.
- **SP 3801 and SP 3811 both initialize the TD sensor. If the TD sensor is initialized twice for the same batch of developer, a fatal error will occur with toner supply control.**
  - Also, if you initialize a TD sensor more than once, this will cause toner scattering.
- **After replacing any component of the PCU, you must do SP 2111 (forced MUSIC adjustment).**
  - See the service manual for the correct procedure for each component.

Slide 163

- SP 3811 sends toner to the sub hopper of the PCU, covers the drum with a layer of toner (to prevent the cleaning blades from flipping, or damaging the drums), initializes the TD sensor, and does process control. It takes about 4.5 minutes.

PCU Components

SP Modes

- **After replacement, do only these SP modes, in this order.**
  - Complete PCU: 3811, 2111-1
  - Drum only: 3820-2, 2111-1
  - Developer only: 3801, 2111-1
  - Drum and developer: 3801, 3802, 2111-1
  - Drum and cleaning blade: 3820-2, 2111-1
  - Drum, developer, and cleaning blade: 3811, 3812, 2111-1
  - Developer and cleaning blade: 3811, 3812, 2111-1
  - Drum lubricant bar and/or drum lubricant blade (without replacing drum or developer): 2111-1
  - Cleaning blade and/or lubricant brush roller (without replacing drum or developer): 3810, 2111-1

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The aim of SP3810 is to send toner to the PCU to coat the drum with toner. This prevents the cleaning blades from bending and scouring the drums. Therefore, SP3810 should be performed after replacing the drum cleaning roller or drum cleaning blade.

SP3810 does the same as SP3811 except for the developer set up function.

SP3811 does the following:

- Checks and confirm each PCU is installed and filled with developer.
- Switches on toner supply and sends toner to the sub hopper of each PCU.
- Sends toner to the PCU to coat the drum with toner. This prevents the cleaning blades from bending and scouring the drums.
- Initialize the TD sensors.
- Starts the process control self check to set the target for development gamma and adjusts toner density.
- Starts the MUSIC sequence to check and correct color image offset.

SP3810 does the following:

- Checks and confirm each PCU is installed and filled with developer.
- Switches on toner supply and sends toner to the sub hopper of each PCU.
- Sends toner to the PCU to coat the drum with toner. This prevents the cleaning blades from bending and scouring the drums.

VBCU Replacement DIP Switches

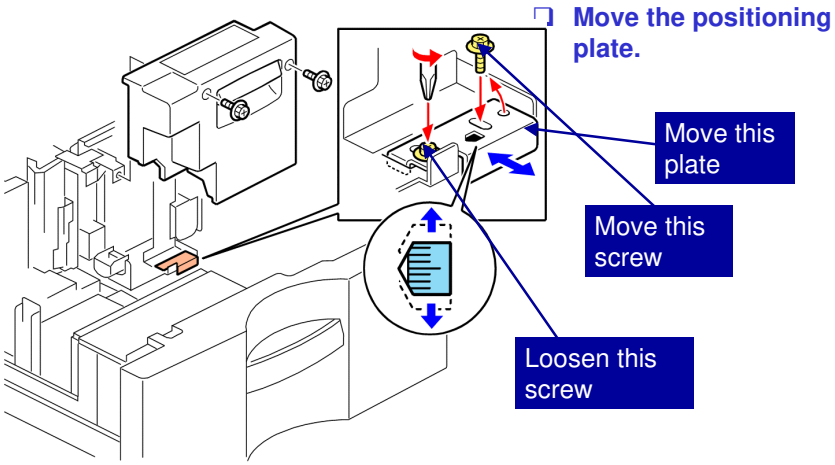
- Make sure that the dip switch settings on the new board are correct, as shown above.

Slide 165

No additional notes

Tandem Feed Tray

Side-to-side Registration



Slide 166

This procedure has changed slightly.

- ❒ 1. Open the tandem tray.
- ❒ 2. Remove the front cover of the right tray.
- ❒ 3. Loosen one screw.
- ❒ 4. Remove the other screw from the round hole and move it to the oval hole.
- ❒ 5. Look at the scale through the cut-out.
- ❒ 6. Shift the plate forward or back, check the position on the scale, and then tighten both screws to set the plate at the new position.

Troubleshooting

Changes since the V-C2

Slide 167

No additional notes

Developer

- **If the image density is too light, if toner scattering occurs, or if the machine fails to release the "Toner End" alert, this can be caused by one of the following problems:**
  - Developer Filling (SP3814) was not successful.
  - Developer Setup (SP3811) or TD sensor initialization (SP3801) was not done or was not done correctly after Developer Filling (SP3814).
  - Developer Setup (SP3811) or TD sensor initialization (SP3801) was done more than once.
- **Please refer to "Special Procedures" in the Troubleshooting section.**

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V-C3 service manual, Troubleshooting, Handling Errors, Special Procedures

Halo Effect

- **Images printed with the GW controller may show a "halo" effect when printing in 2-bit mode (1800x600dpi) and in 4-bit mode (9600x600dpi).**
  - This problem is most visible when text is overlaid onto halftone areas. The greater the difference in image density between text and halftone areas, the more noticeable the halo effect.
  - This problem is also evident when the mode is changed to 2-bit mode. (The default dithering pattern for 2-bit mode is designed to improve gradation, but this can also make the halo effect more visible.)

With the default dither matrix | With the 'low halo effect' dither matrix

Slide 169

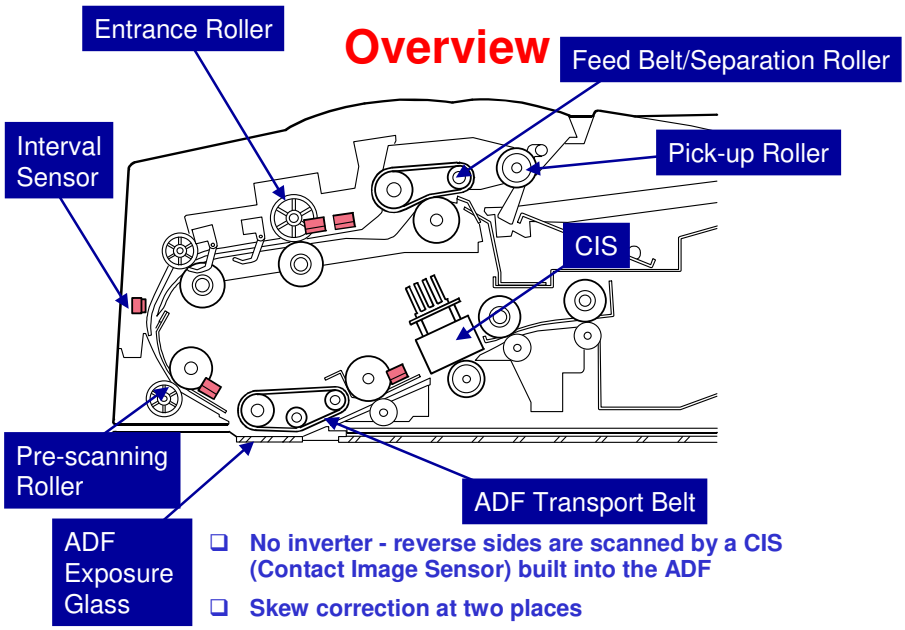
V-C3 service manual, Troubleshooting, Handling Errors, Special Procedures

- Please refer to "Special Procedures" in the Troubleshooting section for troubleshooting procedures.

Document Feeder

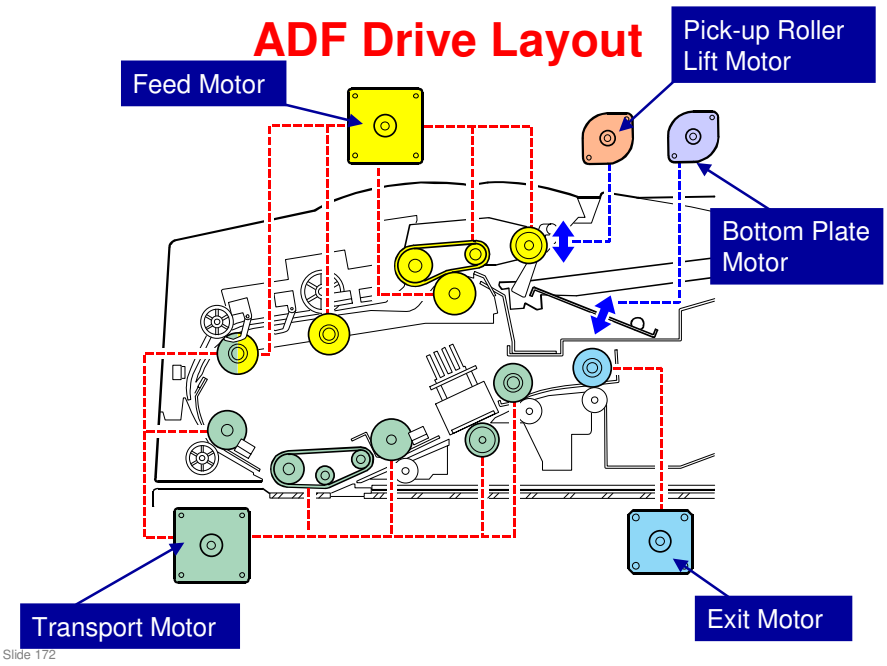
Slide 170

- The ADF is a standard component of the machine. It is based on the ADF of the MT-C4 series copiers.
- This section of the course will explain the ADF's mechanisms.
- If you are familiar with the MT-C4, you can skip this section.



- The most important points are on the slide.
  - The entrance roller is also known as the grip roller. Late name change from designers – no time to check all documents.
- Here is a brief overview of how the ADF works.
  - The pick-up roller feeds the original to the feed belt and separation roller. Skew is corrected at the entrance roller, but only for small original sizes (B6, A5, HLT), or for duplex scanning (any size).

    For sizes larger than A5, the pre-scanning roller slows, which buckles the paper and corrects skew (the entrance roller is still turning at the original speed, which is now faster than the pre-scanning roller, so the paper buckles and skew is corrected).
  - When the skew correction sensor detects the leading edge of the original, the pre-scanning roller starts. Skew is also corrected at the pre-scanning roller.
  - The CCD is below the ADF exposure glass, where the original is scanned.
  - For two-sided original scanning, the CIS scans the reverse side while the original leaves the ADF.



Pick-up roller lift motor: Drives the pick-up roller lift mechanism.

Feed motor: Drives the following:

- ❒ Pick-up roller and feed belt drive gear
- ❒ Entrance roller and 1st transport roller

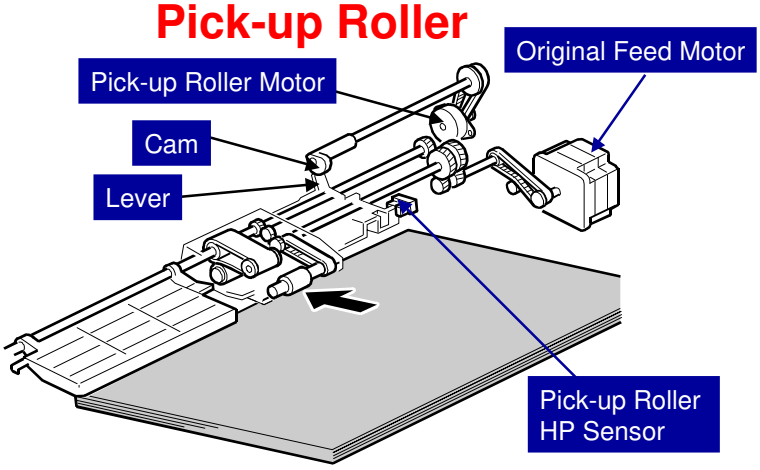
Bottom plate motor: Drives the bottom plate lift mechanism.

Transport motor: Drives the following:

- ❒ Pre-scanning roller
- ❒ Scanning roller
- ❒ 2nd transport roller
- ❒ White platen roller
- ❒ 3rd transport roller

Exit motor: Drives the exit roller.

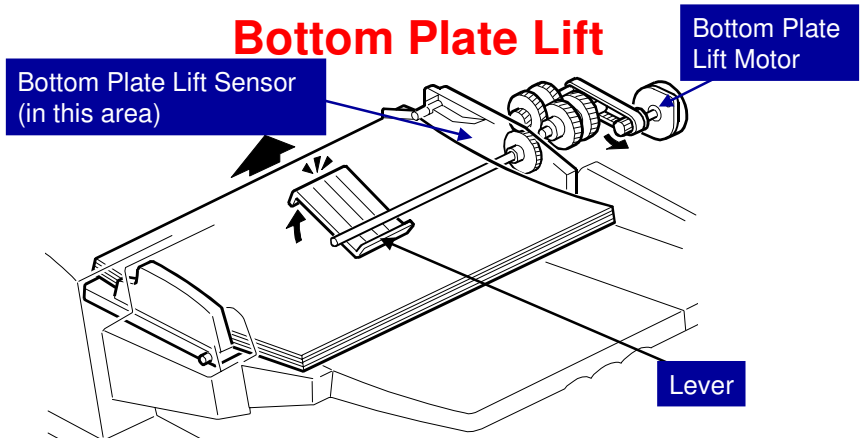
Pick-up Roller



- **Pick-up roller motor: Drops the pick-up roller onto the stack of originals**
- **Feed motor: Rotates the pick-up roller**

Slide 173

- Just after the original set sensor detects an original, the pick-up roller motor switches on, to drop the pick-up roller onto the original stack.
- When the leading edge of the original reaches the skew correction sensor, the pick-up roller motor switches on again, to lift the pick-up roller away from the original stack.
  - Home position is detected by the pick-up roller HP sensor.
- When the trailing edge of the original passes the skew correction sensor, and there are still some originals on the tray, the pick-up roller is again dropped onto the stack of originals.
- Details of the mechanism are as follows:
  - When there are no originals: The pick-up roller remains up (this is the home position).
  - When an original is placed on the tray: The original set sensor switches on, and this switches the motor on. The cam releases a lever. The lever rises and the pick-up roller drops onto the stack of paper. Then the pick-up roller feeds the paper to the feed belt and separation roller.
  - When the leading edge of the original reaches the skew correction sensor: The motor switches on again. The cam pushes the lever down until the actuator enters the sensor and switches off the motor. This stops the pick-up roller at the home position.
  - When the trailing edge of the paper passes the skew correction sensor with originals still waiting for scanning: The motor switches on to feed in the next sheet.

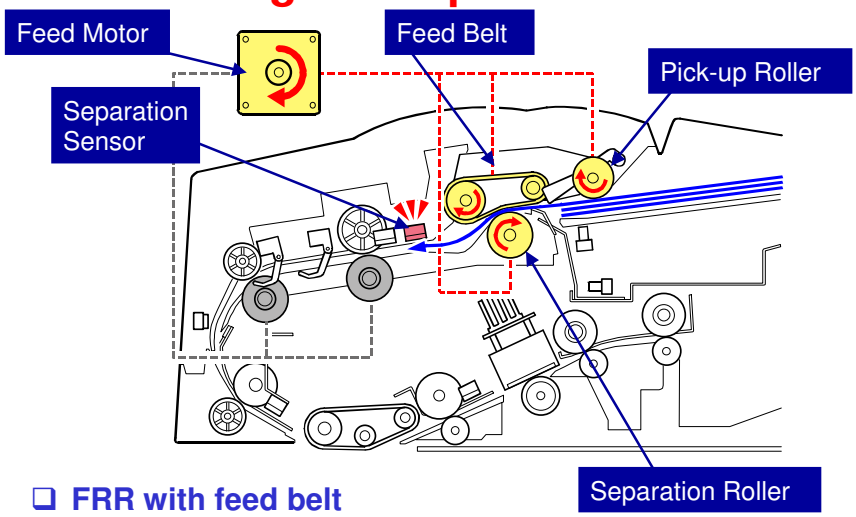


- **The bottom plate lift motor lifts the bottom plate at the following times:**
  - Just after the original set sensor detects an original
  - When some originals have been fed, and the top of the stack needs lifting

Slide 174

- The timing for the bottom plate motor to lift the bottom plate can be changed with SP 6900. The default is when an original is detected (as shown on the slide). However, this can be changed to after the Start key is pressed.
- The bottom plate sensor determines whether the plate needs lifting.
  - When an original is placed on the original tray: The original set sensor switches on, the pick-up roller drops, and the sensor (on the pick-up roller assembly) switches off. Then, the motor lifts the lever, raising the bottom plate.
  - When the bottom plate reaches the correct feed position: The sensor switches off and the motor stops.
  - During the job, when the top of the stack becomes too low: When the pick-up roller drops low enough to switch the sensor on again, the motor switches on again to raise the stack to the correct feed position.

Original Separation

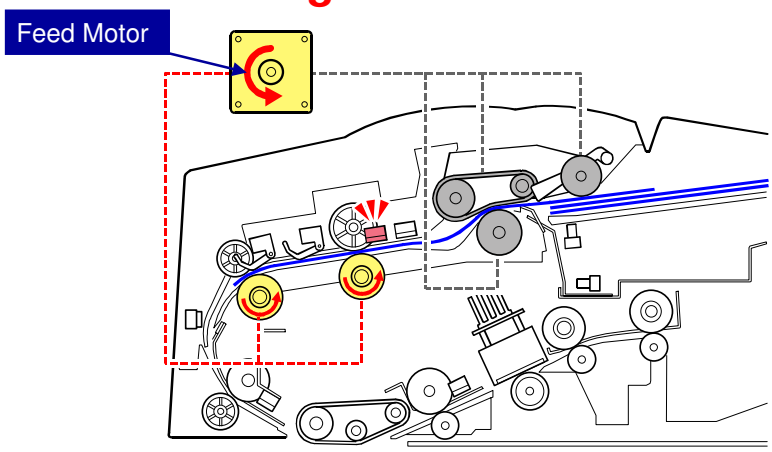


- FRR with feed belt
- Simplified feed path (no inverter mechanism)

Slide 175

- This mechanism prevents feeding more than one sheet at a time.

Original Feed-in



- **The feed motor turns in the other direction to drive these rollers.**

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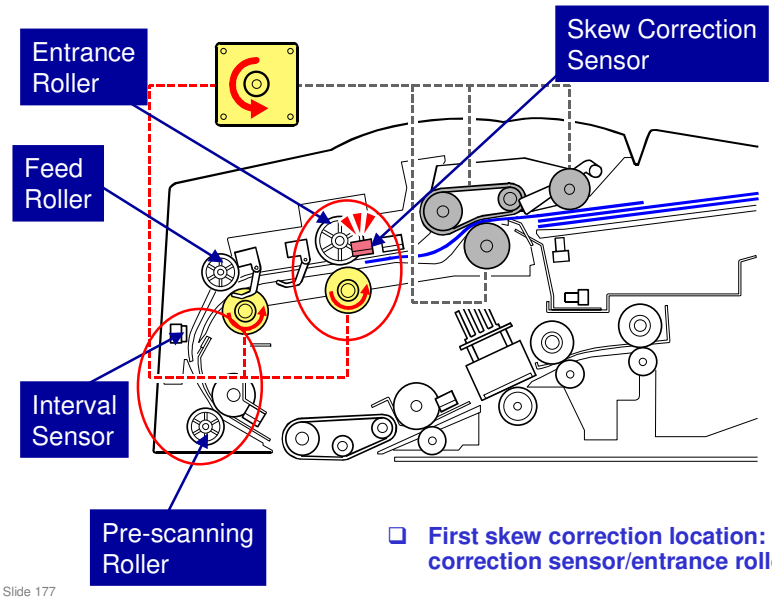
- Remember that there is no inverter. The second side is scanned by the CIS, which is near the exit roller.

Skew Correction - 1

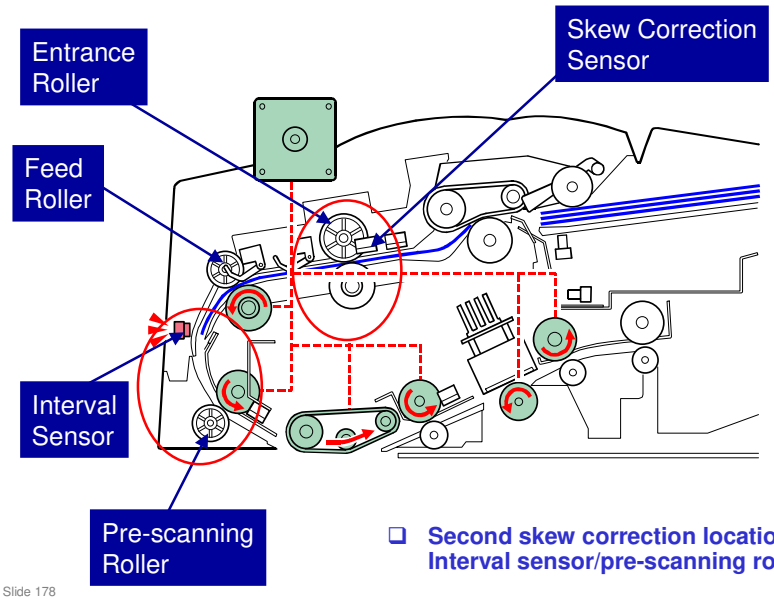


- Skew correction is done at the two circled locations.
  - Skew correction sensor/entrance roller: When the sensor detects the leading edge of the original, the roller stops for a certain period. This buckles the original and corrects the skew.
  - Interval sensor/pre-scanning roller: The actual method depends on the paper size, and whether both sides will be scanned.

    For single-sided scans larger than A5, after the entrance roller starts rotating, the feed motor increases the speed of the feed roller to reduce the interval between the original just fed and the original ahead being scanned. When the interval sensor detects the leading edge of the original approaching the pre-scanning roller, the pre-scanning roller slows down slightly. The feed roller is still feeding the paper faster than the pre-scanning roller, and this slows the original at the leading edge and corrects skew. If SP6020 is changed from the default, the roller will stop (like for other job types), for more precise skew correction.

    For other types of job, the pre-scanning roller stops. All duplex scans are stopped at this roller, for the best possible skew correction. This is because both sides are scanned at the same time, by sensors on opposite sides of the paper. Any skew in the ADF would therefore be noticeable on the copy.
- The rollers are driven by different motors, which makes it possible for one roller to stop or be slower while the other one is still going.
  - Entrance roller, Feed roller (1st transport roller): : Driven by the feed motor
  - Pre-scanning roller: Driven by the transport motor
- The amount of buckle at each location can be adjusted with SP 6006.
  - 6006 005: Corrects the amount of buckle at the entrance roller
  - 6006 006: Corrects the amount of buckle at the pre-scanning roller

Skew Correction - 2



- Second skew correction location: Interval sensor/pre-scanning roller

Here is a summary of the skew correction methods.

1. Skew correction sensor/entrance roller

	B6, A5, HLT	Larger Than A5
Duplex Scanning	Yes	Yes
Simplex Scanning	Yes	Yes

Note

Skew is always corrected with method **1** for every job, regardless of the paper size and mode.

2. Interval sensor/pre-scanning roller stop correction

	B6, A5, HLT	Larger Than A5
Duplex Scanning	Yes	Yes
Simplex Scanning	Yes	No

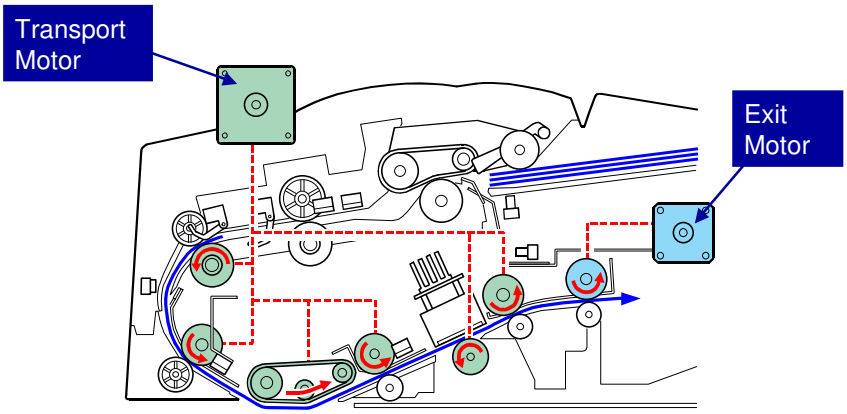
Note

Use SP6020 (ADF Contact Mode In/Out) to enable skew correction method **2** for all jobs to ensure accurate original feeding. However, switching this feature on slows original feed slightly.

3. Interval sensor/pre-scanning roller slow-down correction

	B6, A5, HLT	Larger Than A5
Duplex Scanning	No	No
Simplex Scanning	No	Yes

Original Transport and Exit



- The transport and exit motors control paper feed through this part of the ADF.

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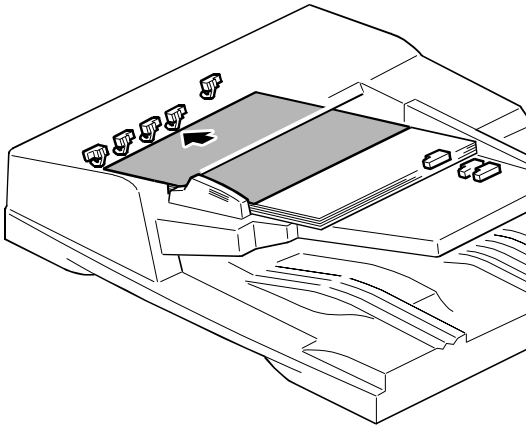
No additional notes

Original Size Detection



❑ **Original length and width are read when the original passes the separation sensor**

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- The original width sensors cannot detect the width until the original has passed the entrance roller.
- Some small sizes cannot be detected by the sensors (A5SEF, B6SEF, B6LEF), because the sensor outputs for these sizes are identical (all sensors are off). In this case, the length is detected using the separation sensor and clock pulse counts from leading edge to trailing edge.
- The machine cannot tell the difference between certain original sizes, such as DLT (11 x 17") and 11 x 15". The machine assumes such originals are 11 x 17. To change this, use SP 6016 and SP 5126.
  - North America: There are two sets of four sizes. To switch from the default set to the other, input 120. The other set of four sizes will then be detected. To change back again, input 0.
  - Europe: There are two sets of three sizes. To switch from the default set to the other, input 7. The other set of three sizes will then be detected. To change back again, input 0.
  - It is not possible to change just one of the settings. All three (or all four in the case of N. America) must be changed at the same time.

    Test this, using the paper sizes that you will encounter in your market. The description in the manual could be incorrect. Perhaps you have to enter a decimal number equivalent to the 0/1 settings of an 8-bit register. Look at the accompanying file 'SP6016-alternativemethod.doc' for what may actually happen.
- The maximum length of an original in the ADF is 440 mm (17"). This can be changed to 1260 mm (49.5") with the Special Original function at the operation panel.
- In the scanner below the exposure glass, there are also some sensors, as in previous models.
- There are some differences between the Europe and North America versions
  - EU: Length sensor x 1, NA: Length sensor x 2

Original Size Detection

- **The machine cannot tell the difference between certain original sizes, such as DLT (11” x 17”) and 11” x 15”. The machine assumes such originals are 11” x 17.**
- **To change this, use SP 6016 and SP 5126.**

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❒

Changing the Default Selection with SP6016 and SP5126

Here is a list of paper sizes that can be set for the default to enable detection. The bold sizes are the default settings, and the italic sizes are the alternate settings.

North America			Europe/Asia		
Bit 6	DLT SEF	11" x 15"	Bit 2	8 K	DLT SEF
Bit 5	LT LEF	Exec LEF	Bit 1	16 K SEF	LT SEF
Bit 4	LT SEF	8" x 10" SEF	Bit 0	16 K LEF	LT LEF
Bit 3	LG SEF	Set by SP 5126			

To change the default settings:

1. Enter the SP mode.
2. Select SP6016.

On the screen you will see an 8-digit binary setting bar: 00000000
The default settings are all "0".
In North America, the size recognition is changed with Bits 6 to 3 (other bits are ignored):

	Bit6	Bit5	Bit4	Bit3
0	DLT SEF	LT LEF	LT SEF	LG SEF
1	11" x 15" SEF	EXE LEF	8" x 10" SEF	SP 5126 (default = F4 SEF)

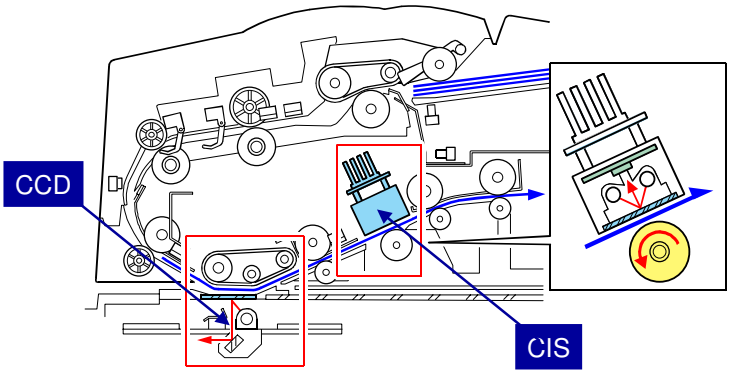
In Europe, the size recognition is changed with Bits 2 to 0 (other bits are ignored):

	Bit2	Bit1	Bit0
0	DLT SEF	LT SEF	LT LEF
1	8 Kai SEF	16 Kai SEF	16 Kai LEF

SP 5126

This SP controls the alternative paper sizes that are detected for LG SEF (USA) or 8.5 x 13" (Europe/Asia).

CIS



- **The CIS scans the reverse side of the original, if two-sided scanning has been selected.**
  - This means that for two-sided scanning, the original feeds though the scanner one time only.
- **The resolution is 600 dpi, the same as the CCD.**
- **The white roller below CIS is used as a white reference point**

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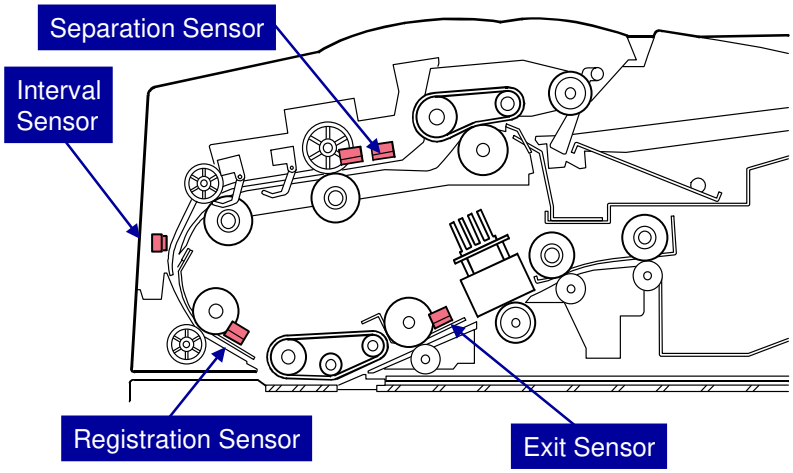
- The CIS can scan a line 306 mm (12") wide at 600 dpi. To increase the scanning speed, the sensors are divided into 13 parallel blocks.

Feed Timing and Jam Detection



- Feed timing controlled by the separation and registration sensors
- Jam detection at the skew correction, separation, interval, registration, and exit sensors

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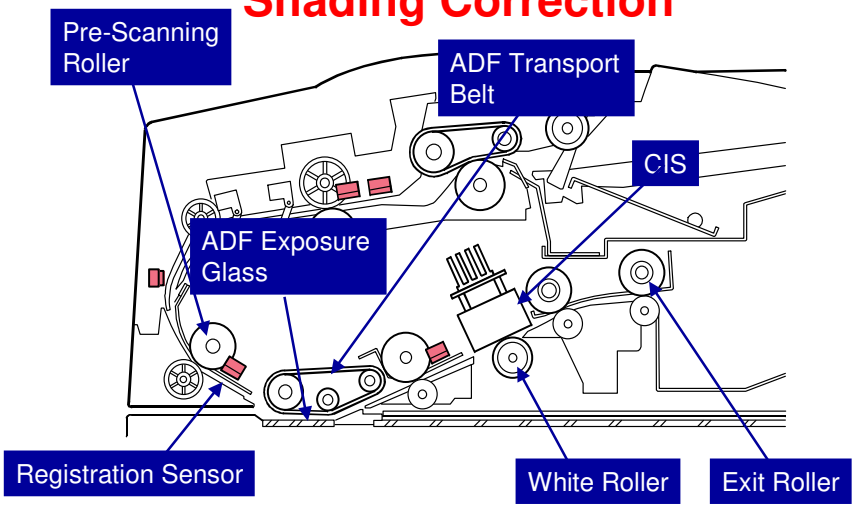
❒

Jam Type		Cause
Separation sensor	Check in failure	Remains off after enough time for the original to feed twice the distance from the original setting position to the separation sensor.
Skew correction sensor	Check in failure	Remains off after enough time for the original to feed twice the distance from the separation sensor to the skew correction sensor.
Interval sensor	Check in failure	Remains off after enough time for the original to feed twice the distance from roller [F] to the interval sensor.
Registration sensor	Check in failure	Remains off after enough time for the original to feed twice the distance from the skew correction sensor to the registration sensor.
Exit sensor	Check in failure	Remains off after enough time for the original to feed twice the distance from the registration sensor to the exit sensor.
Separation sensor	Check out failure	Remains on after enough time for a 610 mm (24") original to feed (except when the user is feeding custom-sized originals, which can be up to 1260 mm).
Skew correction sensor	Check out failure	Remains on after enough time for the original to feed twice the distance from the separation sensor to the skew correction sensor.
Interval sensor	Check out failure	Remains on after enough time for the original to feed twice the distance from the interval sensor to the skew correction sensor.
Registration sensor	Check out failure	Remains on after enough time for the original to feed twice the distance from the skew correction sensor to the registration sensor.
Exit sensor	Check out failure	Remains on after enough time for the original to feed twice the distance from the registration sensor to the exit sensor.

Note

If a problem occurs in the ADF, either SC700 or SC701 will be issued.

Shading Correction



- CCD scanning: Uses the white plate above the ADF exposure glass
- CIS scanning: Uses the white roller below the CIS.

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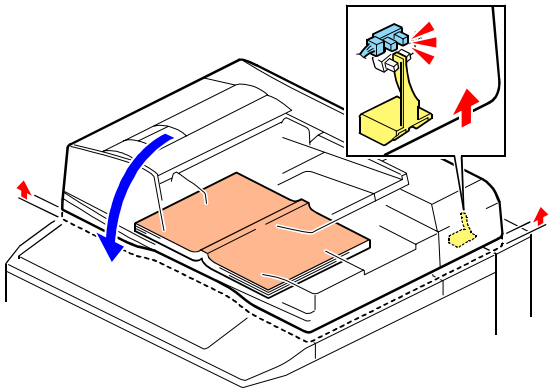
- Shading correction, which attempts to compensate for slight distortions caused by the differences in brightness of the light elements due to wear, temperature variation, or distortion by the lenses, is done for the first sheet:
  - The original is fed for a few clock pulses after the registration sensor detects the leading edge of the original.
  - The original is then delayed slightly at the ADF exposure glass while the CPU uses the white plate (above the ADF exposure glass when the ADF is closed) to determine the white peak level for the job.
  - The pre-scanning roller, ADF transport belt, and transport rollers feed the original over the ADF exposure glass and under the CIS, until it reaches the exit roller.
  - If the reverse side of the original is to be scanned, the CPU uses the surface of the white platen roller to determine the white peak level for the job.

ADF Lift Detection



- When you set a thick original, such as a book, the ADF lifts, the actuator leaves the sensor, and the sensor turns off.
- When the sensor is off, the ADF cannot feed any originals.

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No additional notes

Dust Detection – Overview

- **This function checks the ADF exposure glass for dust that can cause black lines in copies.**
- **The dust check is done before the first original is scanned.**
  - This is done only once at the beginning of a job. The check is not done for originals added during a long scanning job.
- **If dust is detected, a message is displayed on the operation panel, but the machine does not stop.**

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No additional notes

Dust Detection (SP 4020)

- **SP 4020 001: Enable/disable (default – disabled)**
- **SP 4020 002: Sensitivity adjustment**
- **SP 4020 003: Adjusts image processing parameters to remove thin vertical lines caused by dust**
  - A speck of dust on the ADF exposure glass causes a thin vertical line on the scanned image. This is because the ADF feeds the paper over the exposure glass during scanning. Dust on the glass appears on each line of the scanned image.
- **SP 7852: Counts how many times the machine detected dust on the ADF.**

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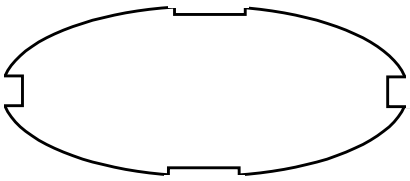
No additional notes

Dust Detection – Method



- **To detect dust on the ADF exposure glass, the ADF feed belt turns and the CCD scans this belt.**
  - No paper is present. The CCD scans the belt.
- **The ADF feed belt has four grooves cut across it in the main scan direction.**
- **These grooves are not easily contaminated with dust. Because of this, they are used as reference points during dust detection.**

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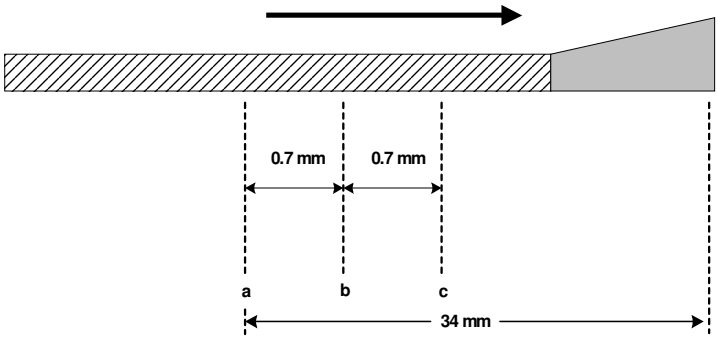
No additional notes

Dust Detection – Action Taken



- If dust is detected, the scanner carriage position for ADF scanning is moved by 0.7 mm, in the direction of the left scale.
- The next time that dust is detected, the scanning position is moved again by 0.7 mm, in the direction of the left scale.
- The third time that dust is detected, the scanning position is not moved. An alert message is displayed but the job does not stop.

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- If dust is detected after the scanner has been moved two times, an alert is displayed, but the job does not stop.
- Then, at the start of the next job, the scanner stays at the same position as the end of the previous job. But if dust is detected there, the scanner goes back to home position and the dust detection process starts again.

Replacement

- **The ADF is heavy. Remove it carefully.**

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- The V-C2 has a special tool to adjust the belt tension when you install an ADF transport belt. However, the V-C3 does not have this special tool.

RICOH

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Environmental Conservation

Technology for Environmental Conservation

Energy Saving

Paper Saving

Slide 191

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

Technology for Environmental Conservation

◎: New or modified function
○: Has this function
Blank: Does not have this function

Environmental Technology/Feature	Description	New model V-C3	Previous model V-C2
1. QSU	- Reduction of warm-up time (Energy saving) - Reduction of CO2 emissions	◎	○
2. Hybrid QSU	- Reduction of warm-up time (Energy saving) - Reduction of CO2 emissions		
3. IH QSU	- Reduction of warm-up time (Energy saving) - Reduction of CO2 emissions		
4. Paper-saving features	Allows documentation to be managed digitally, cutting down on paper consumption. Improves machine productivity when printing out duplex (double-sided) images.	○	○
5. High-speed duplex copying	Improves machine productivity when printing out duplex (double-sided) images.	◎	○
6. Ozone reduction design	- Low ozone emissions	○	○
7. PxP (polymerized) toner	- Energy saving - Conservation of materials/resources (reduced toner consumption)	○	○
8. Noise reduction design	- Low noise	○	○
9. Minimization of harmful substances	- Minimization of harmful substances	○	○
10. Environmentally-friendly toner bottle	- Conservation of materials/resources	○	○
11. Toner recycling	- Conservation of materials/resources		
12. Recycle-friendly design	- Conservation of materials/resources	○	○

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❒ This slide explains what technologies are used for conserving the environment in this product.

Brief Descriptions of the Technologies

- **1. QSU (Quick Start-up)**
  - This technology reduces both the amount of energy consumed while in Standby mode (the Ready condition) is reduced, as well as the time it takes for the machine to warm up to the Read condition.
  - This is made possible through the utilization of dual fusing lamp heating, low fusing point toner, a pressure roller with a "sponge" surface layer, and a thin surface layer hot roller.
- **2. Hybrid QSU**
  - This technology adds a capacitor to conventional QSU Technology, which allows the benefits of reduced energy consumption and reduced warm-up time described above to be extended to high-speed machines.

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No additional notes

Brief Descriptions of the Technologies

- **3. IH QSU**
  - This technology incorporates IH (Inductance Heating) technology into conventional QSU technology, which allows the benefits of reduced energy consumption and reduced warm-up time to be extended to color machines.
- **4. Paper-saving features**
  - 1) The duplex (double-sided) and Combine features reduce paper consumption.
    2) The Document Server and other electronic document management features reduce paper consumption by offering an electronic method for storing and managing important documents.

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No additional notes

Brief Descriptions of the Technologies

- **5. High-speed duplex copying**
  - 1) Enables high-speed duplex printing through the utilization of the Duplex Interleaf and high-speed Inverter Transport features.
  - 2) Enables quick printing of duplex jobs through the use of Duplex Scanning.
- **6. Ozone reduction design**
  - Greatly reduces the machine's ozone emissions to near-zero levels by utilizing:
    1) A charge roller/belt instead of a corona wire
    2) An image transfer roller/belt instead of a corona wire-based transfer system

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No additional notes

Brief Descriptions of the Technologies

7. PxP (polymerized) toner

- "PxP toner" is a fine-particle, polyester resin based toner, manufactured using a Ricoh-original polymerization method instead of the conventional pulverization method.
- This allows the toner to fuse at a lower temperature, which reduces the impact on the environment and contributes to achieving even higher image quality than before.
- PxP toner also has other benefits, including a reduction in the amount of toner needed to develop the image, as well as an approximate 35% reduction in CO_2 emissions during the toner manufacturing process.

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No additional notes

Brief Descriptions of the Technologies

- **8. Noise reduction design**
  - 1) The machine and its components are designed to minimize the overall noise generated by the machine. As a result, all noise levels conform to the local laws and regulations as well as user requirements in each market in which the products are sold.
  - 2) Reduces the noise generated by the polygon mirror motor.
- **9. Minimization of harmful substances**
  - 1) Products sold in the EU conform to the RoHS Directive.
  - 2) Products sold in China conform to China's version of the RoHS Directive.
  - 3) In addition, Ricoh imposes strict internal standards for limiting the presence of harmful substances.

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No additional notes

Brief Descriptions of the Technologies

- **10. Environmentally-friendly toner bottle**
  - A changeover from PS/PP/HDP to PET plastics allows approximately 40 percent by weight of the toner bottle to be recycled, and also reduces CO_2 emissions that occur during the toner bottle manufacturing process.
- **11. Toner recycling**
  - Enables effective use of resources by recycling (reusing) the toner left over on the drum surface after image transfer.
- **12. Recycle-friendly design**
  - To maximize the recycling ratio of machine and component materials, as well as the ease of performing the recycling in the field, machine sections and components are designed so that the recyclable parts can be separated out easily.
  - In addition, components are designed so that they can be reused for as long as possible after the machine has reached its operational lifetime.

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No additional notes

Quick Start-up

- **QSU reduces the operating temperature, because of these improvements in fusing unit technology**
  - The thickness of the metal core in the hot roller has been reduced from 1.5 mm to 1.0 mm. This allows the core to reach the ready temperature much faster.
- **This also means that the warm-up time is reduced.**
  - Warm-up time
    (V-C3a:90sec=>70sec, V-C3b:75sec=>60sec)

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- Through major reductions in warm-up time and recovery time from energy saver modes (Low power, Off/Sleep), QSU (Quick Start Up) Technology has eliminated the traditional trade-off between energy saving and convenience of speed.

High-speed duplex copying

- **New Duplex Scan feature has been adapted.**
  - A CCD (inside the scanner unit, below the ADF) scans the front side, and a CIS (inside the ADF) scans the rear side.
- **This also means that the duplex scan speed is improved.**
  - Duplex: Color 90 ppm, B/W 130 ppm (V-C2 was Color 53ppm, B/W 60ppm)

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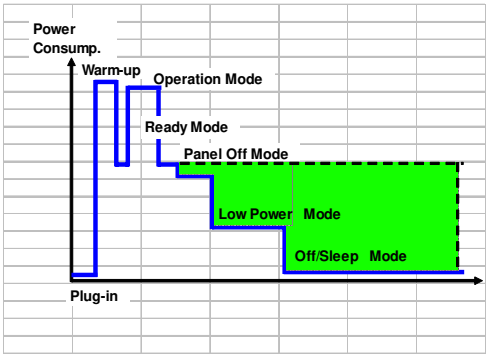
- Through major reductions in warm-up time and recovery time from energy saver modes (Low power, Off/Sleep), QSU (Quick Start Up) Technology has eliminated the traditional trade-off between energy saving and convenience of speed.

2. Energy Saving

2.1 Overview – 1



Energy Saver Modes	Description
Energy Saver Mode (Panel Off)	The machine is still in the Copy Ready condition. Level 1: Panel off only Level 2: Panel off and lower the fusing temperature.
Low Power Mode	The fusing temperature is lowered to the prescribed temperature (below ready temperature).
Sleep Mode	When a printer/scanner or fax unit is installed: No power is supplied to the printing engine, and almost none to the controller.

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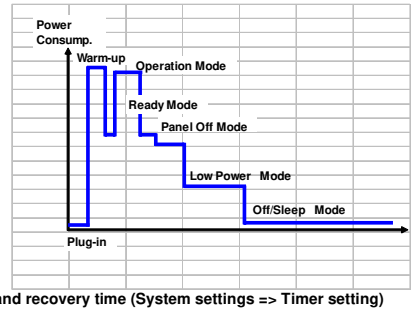
- When the machine is not being used, the machine enters energy saver mode to reduce the power consumption by turning off the LCD of the operation panel and lowering the fusing temperature.
- The area shaded green in this diagram represents the amount of energy that is saved when the timers are at the default settings. If the timers are changed, then the energy saved will be different. For example, if the timers are all set to 240 minutes, the green area will disappear, and no energy is saved before 240 minutes expires.

2. Energy Saving
2.2 Overview – 2 (System Settings)



1) Timer settings and recovery time (System settings => Timer setting)

Mode	Timer	Defult	Setting range	Recovery time
Panel off Mode	Panel Off Timer	60 sec.	10 sec to 240 min.	3 sec.
Low Power Mode	Energy Saver Timer	15 min.	1 to 240 min.	45 sec.
Off/Sleep Mode	Auto Off Timer	30 min.	1 to 240 min.	a:90, b:75 sec

Specified values for timers	Panel Off	Low Power	Auto Off
Panel Off > Energy Saver > Auto Off	Can start	Can start	Can start
Panel Off = Energy Saver = Auto Off	Cannot start	Cannot start	Can start
Panel Off < Energy Saver < Auto Off	Cannot start	Cannot start	Can start

2) Energy saver level setting (System setting => Administrator Tools => Energy saver level)

Level 1	Panel off only
Level 2	Panel off and lower the fusing temperature to recovery time within 10sec.

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- ・Energy Saver Level
- The user can set these timers with User Tools
  MFP/ Priport: User Tools > System settings > Timer Setting
  Printer : User Tools > System settings > Energy Saver Timer
- Normally, Panel Off timer < Energy Saver timer < Auto Off timer.
- But, for example, if Auto Off timer < or = Panel Off timer and Energy Saver timer, the machine goes immediately to Off mode when the Auto Off timer expires. It skips the Panel Off and Energy Saver modes.
- Example
  - Panel off: 1 minute
  - Low power: 15 minutes
  - Auto Off: 1 minute
  - The machine goes to Off mode after 1 minute. Panel Off and Low Power modes are not used.
- We recommend that the default settings should be kept.
  - If the customer requests that these settings should be changed, please explain that their energy costs could increase, and that they should consider the effects on the environment of extra energy use.
  - If it is necessary to change the settings, please try to make sure that the Auto Off timer is not too long. Try with a shorter setting first, such as 30 minutes, then go to a longer one (such as 60 minutes) if the customer is not satisfied.
  - If the timers are all set to the maximum value, the machine will not begin saving energy until 240 minutes has expired after the last job. This means that after the customer has finished using the machine for the day, energy will be consumed that could otherwise be saved.
  - If you change the settings, the energy consumed can be measured using SP8941, as explained later in this presentation.

2. Energy Saving
2.2 Energy Saver Mode: Condition of LEDs

❑ Condition of LEDs on the operation panel

Mode	Operation Switch LED	Energy Saver LED	Main Power LED
Panel off Mode	On	On	On
Low Power Mode	Off	On	On
Off/Sleep Mode	Off	Off	On

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No additional notes

2. Energy Saving
2.2 Energy Saver Mode: Panel Off Mode – 1

- **The machine enters panel off mode when one of the following is done.**
  - The panel off timer runs out after the last job.
    - » The panel off timer is controlled by User Tools: Timer settings.
  - The Energy Saver key is held down for a second.
- **The machine is still in the stand-by (ready) condition, but turns off the LCD of the operation panel.**
- **The machine recovers to the ready condition if one of the following occurs:**
  - The Energy Saver key is pressed
  - An original is placed in the ADF
  - The ADF is lifted
  - The user touches the operation panel
  - The front door is opened or closed

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- In some MFP models, when it takes 1 minute to return from Off/Sleep mode, there may be no Panel Off Mode
- Also, there is no Panel Off Mode in printers.

2. Energy Saving
2.2 Energy Saver Mode: Panel Off Mode – 2

❑ **Important**

There are two levels of Panel Off Mode:

- **Level 1:**
  Panel off only (No recovery time)
- **Level 2:**
  Panel off and lower the fusing temperature.
  Recovery time should be within 10 seconds

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❒ Level 2 was created so that it is possible for the machine to recover within 10 seconds.

2. Energy Saving
2.2 Energy Saver Mode: Low Power Mode

- **The machine enters low power mode when the energy saver timer runs out after the last job.**
- **When the machine enters low power mode, the fusing temperature is lowered to the prescribed temperature (below the machine ready temperature).**
- **The machine recovers to the ready condition if one of the following occurs:**
  - The Energy Saver key is pressed
  - An original is placed in the ADF
  - The ADF is lifted
  - The user touches the operation panel
  - The front door is opened or closed
- **The recovery time depends on the model and the region.**
  - Model V-C3a: 45 seconds
  - Model V-C3b: 45 seconds

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No additional notes

2. Energy Saving

2.2 Energy Saver Mode: Sleep Mode – 1

- **Sleep mode is used instead of auto off mode when a printer/scanner or fax unit is installed.**
- **The machine enters sleep mode when one of the following is done.**
  - The auto off timer runs out after the last job.
  - The operation switch is pressed to turn the power off.
- **When the machine enters sleep mode, no power is supplied to the printing engine, and almost none to the controller.**
- **Recovery time**
  - Model V-C3a: Less than 90 seconds
  - Model V-C3b: Less than 75 seconds

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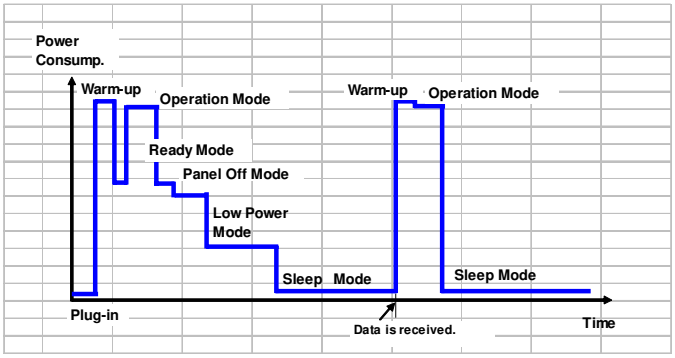
No additional notes

2. Energy Saving

2.2 Energy Saver Mode: Sleep Mode – 2

- **The machine recovers to the ready condition:**
  - **If data is received**
    - » After warm-up, the job starts, but the operation panel stays dark.
    - » Then, after the job is completed, the machine returns to sleep mode immediately. Panel Off and Low Power modes are skipped.



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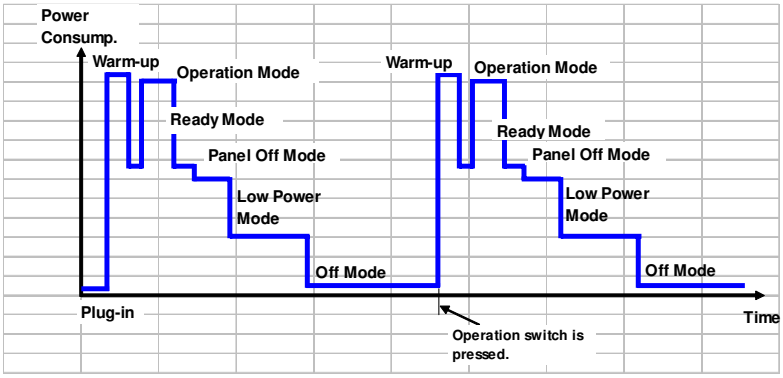
No additional notes

2. Energy Saving
2.2 Energy Saver Mode: Sleep Mode – 3

- **The machine recovers to the ready condition:**
  - **If the operation switch is pressed**
    - » The operation panel lights. When warm-up is finished, the machine goes to the ready condition.
    - » Then, after the job is completed, the machine returns to sleep mode when the auto off timer runs out or the operation switch is pressed.



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❒ This timing chart shows what happens if the data is received while the machine in sleep mode.

2. Energy Saving

2.3 Energy Save Effectiveness – 1

- **With the data from SP 8941:Machine Status, and the power consumption values from the specifications, we can estimate the amount of energy that is used by the machine.**
  - 8941-001: Operating mode
  - 8941-002: Standby mode
  - 8941-003: Panel off mode
  - 8941-004: Low power mode
  - 8941-005: Off/sleep mode
- **This should only be used as a reference value, because the power consumption specifications are measured in a controlled environment with a constant power supply.**
- **To get an exact measurement at the customers site, a watt meter must be used to measure the actual energy consumed.**

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No additional notes

2. Energy Saving

2.3 Energy Save Effectiveness – 2

(1) At the start of the measurement period, read the values of SP 8941:001-005 (Machine Status).

(2) At the end of the measurement period,read the values of SP 8941:001-005 (Machine Status).

(3) Find the amount of time spent in each mode.
(Subtract the earlier measurement from the later measurement and convert the result to hour.)

(4) Power consumption figures for each model are acquired from “Publication System of MSDS_&_PEI (PRODUCT ENVIRONMENT INFORMATION)” database.
Example:

Mode/condition	Power consumption:
Operating mode	1081.8W
Ready mode / Energy Save	214W
Low power mode	146W
Off/Sleep mode	7W

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No additional notes

2. Energy Saving

2.3 Energy Save Effectiveness – 3

(5) Multiply this by the power consumption spec for each mode and convert the result to kWh (kilowatt hours)

(6) This is a simulated value for power consumed.

Example calculations:

Mode /condition	SP8941: Machine Status	Time at Start (min.) ①	Time at End (min) ②	Running time (hour) (②−①)/60=③	Power Consumption Spec.(W) ④	Power consumption .(KWH) (③x④)/1000=⑤
Operating	001: Operating Time	21089	21386	5.0	1081.8	5.35
Stand by (Ready)	002: Standby Time	306163	308046	31.4	214.0	6.72
Energy save	003 Energy Save Time	71386	75111	62.1	214.0	13.29
Low power	004: Low power Time	154084	156340	37.6	146.0	5.49
Off/Sleep	005: Off mode Time	508776	520377	193.4	7.0	1.35
Total⑥						32.20

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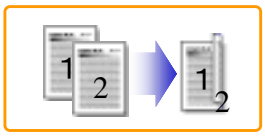
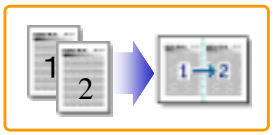
No additional notes

3. Paper Saving
3.1 Measuring the Paper Consumed – 1

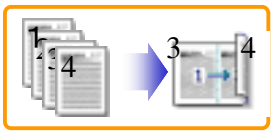
1. Duplex: Reduce paper volume in half!



2. Combine: Reduce paper volume in half!



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



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No additional notes

3. Paper Saving
3.1 Measuring the Paper Consumed – 2

- **To check the paper consumption, look at the total counter and the duplex counter.**
  - Total counter : SP 8581 001
  - Single-sided with duplex mode : SP 8421 001
  - Double-sided with duplex mode : SP 8421 002
  - Book with with duplex mode : SP 8421 003
  - Single-sided with combine mode : SP 8421 004
  - Duplex with combine mode : SP 8421 005
- **The total counter counts all pages printed.**
- **The duplex and combine counter counts all pages printed with duplex and combine mode.**

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No additional notes

3. Paper Saving

3.1 Measuring the Paper Consumed – 3

- **How to calculate the paper reduction ratio, when compared with Single-sided copying, with no 2-in-1 combine mode**
- **Paper reduction ratio (%) = Number of sheets reduced: A/Number of printed original images: B x 100**
  - Number of sheets reduced: A
    ＝Output pages in duplex mode/2＋ Number of pages in Single-sided with combine mode + Number of pages in Duplex with combine mode x 3/2
    A = (②+③+④)/2 + ⑤+⑥ x 3/2
  - Number of printed original images: B
    ＝Total counter＋ Number of pages in Single-sided with combine mode ＋ Number of pages in Duplex with combine mode
    B = ①+⑤+⑥

① **Total counter**	**: SP 8581 001 (pages)**
② **Single-sided with duplex mode**	**: SP 8421 001 (pages)**
③ **Double-sided with duplex mode**	**: SP 8421 002 (pages)**
④ **Book with with duplex mode**	**: SP 8421 003 (pages)**
⑤ **Single-sided with combine mode**	**: SP 8421 004 (pages)**
⑥ **Duplex with combine mode**	**: SP 8421 005 (pages)**

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In the above formula:

- Sheet: A sheet of paper
- Page: A side of a sheet of paper. In duplex mode, one sheet is two pages
  - Output page: One side of a sheet of output paper
- Original Image: An image of one original page (or, an image of one side of a two-sided original)
  - For one sheet of output paper in two-in-one copying, four original pages are copied onto two output pages.