



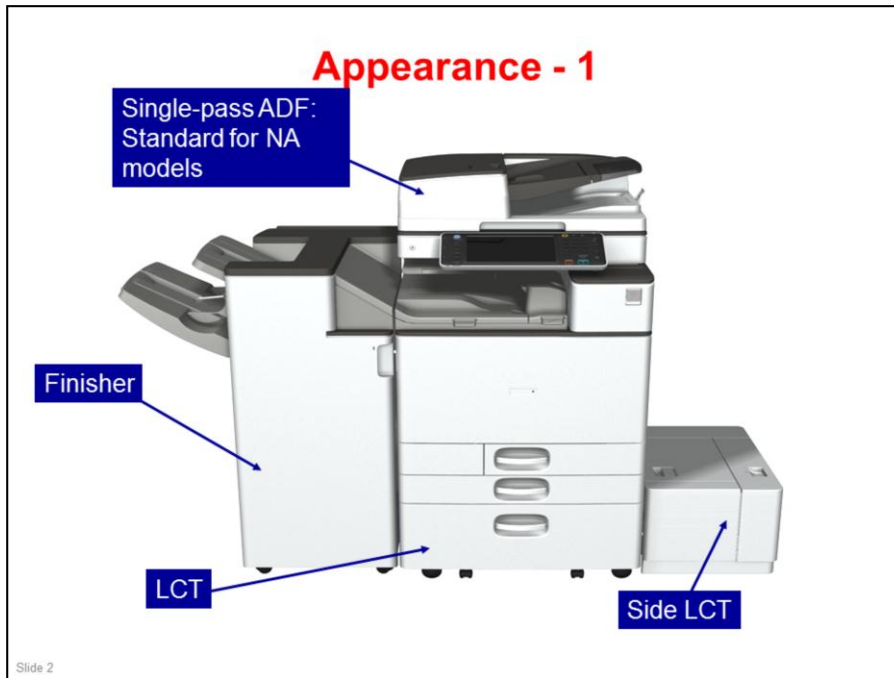
This course explains the new series of middle-range to high-end color copiers Met-C1.

These new models are successors to the At/Ap-series.

Version 1.2 - The following slides were changed or inserted (slide numbers are for the new TTP, not the old one)

- ☐ 13 modified
- ☐ 21 modified
- ☐ 26 inserted
- ☐ 29 inserted
- ☐ 59 modified
- ☐ 63 inserted
- ☐ 87 modified
- ☐ 103 modified
- ☐ 116 inserted
- ☐ 128, 129 modified
- ☐ 131 inserted
- ☐ 162 inserted
- ☐ 163 inserted
- ☐ 168 modified
- ☐ 192 modified
- ☐ 229 inserted
- ☐ 239 modified
- ☐ 242 inserted

- ☐ 246 modified
- ☐ 251 inserted
- ☐ 262 modified



- ❑ The ADF is an option in this series. It is the same as the ADF that is built into the Ch-C1.
- ❑ In NA models, the SPDF is standard.



No additional notes



- ❑ Instead of the single-pass ADF, customers can install a simple ADF. It is the same as the K-C4.

RICOH**D146/D147/D148/D149/D150
Service Training****Product Overview**

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This section provides an overview of the machine, and the options that can be installed.

What Models are there in the Series? Comparing Basic Specifications

	Met-C1a (D146)	Met-C1b (D147)	Met-C1c (D148)	Met-C1d (D149)	Met-C1e (D150)
CPM (BW/FC)	30/30	35/35	45/45	55/55	60/60
Recovery from Sleep (Full system)	5.6 sec		6.2 sec	US: 13.0 sec EU: 10.0 sec	US: 16.0 sec EU: 12.0 sec
Scanning Speed	70ipm (ARDF)		Simplex: 100 ipm Duplex: 180 ipm (SPDF)		
Max Print Resolution	1200 x 1200dpi, 2bit Print speed reduced to half		1200 x 1200dpi, 2bit		
Max Paper Weight Duplex	256 gsm				
Dimension (W x D x H)	587 mm x 677 mm x 760 mm (w/o DF) 23.1" x 26.7" x 30" (w/o DF)				

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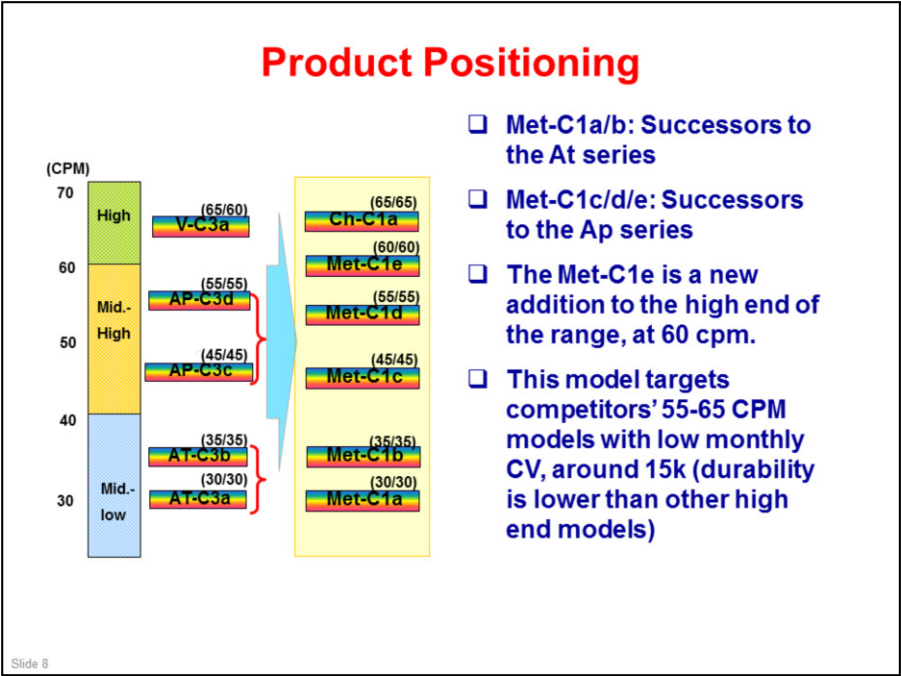
- ❑ Additionally, Met-C1 aims to reenter the SRA3/12.6" market and replace high CPM (but around 15k AMCV)
- ❑ Met-C1a/b does not have enough memory to process 1200 x 1200 dpi at full speed.

What Models are there in the Series?
Regional Variations in Standard Models

	RAC	RE	RA	RCN
C1a	1 model ARDF is standard; Smart Operation Panel is option	2 models 1) ARDF, normal operation panel 2) ARDF, Smart operation panel	1 model ARDF is standard; Smart Operation Panel is option	1 model ARDF is option; Smart Operation Panel is option
C1b	1 model ARDF is standard; Smart Operation Panel is option	2 models 1) ARDF, normal operation panel 2) ARDF, Smart operation panel	1 model ARDF is standard; Smart Operation Panel is option	1 model ARDF is option; Smart Operation Panel is option
C1c	1 model SPDF is standard; Smart Operation Panel is option	4 models 1) ARDF, normal operation panel 2) ARDF, Smart operation panel 3) SPDF, normal operation panel 4) SPDF, Smart operation panel	1 model ARDF is option; SPDF is option; Smart Operation Panel is option	1 model ARDF is option; SPDF is option; Smart Operation Panel is option
C1d	1 model SPDF is standard; Smart Operation Panel is option	4 models 1) ARDF, normal operation panel 2) ARDF, Smart operation panel 3) SPDF, normal operation panel 4) SPDF, Smart operation panel	1 model ARDF is option; SPDF is option; Smart Operation Panel is option	1 model ARDF is option; SPDF is option; Smart Operation Panel is option
C1e	1 model SPDF is standard; Smart Operation Panel is option	2 models 1) SPDF, normal operation panel 2) SPDF, Smart operation panel	1 model SPDF is standard; Smart Operation Panel is option	1 model SPDF is standard; Smart Operation Panel is option

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No additional notes



No additional notes

Comparing Specifications
Met-C1a/b - 1

	AT-C3		Met-C1	
	a	b	a	b
Size (WxDxH, mm)	670 x 682 x 760 , w/o ADF		587 x 677 x 760, w/o ADF	
Weight (kg)	110		81	
Print/Copy Speed (B/W, ppm)	30	35	30	35
Print/Copy Speed (FC, ppm)	30	35	30	35
1 st Copy Time (B/W, seconds)	4.9		4.6	
1 st Copy Time (FC, seconds)	7.4		7.3	
Warm-up Time (seconds)	20		19	
Recovery from Sleep Mode (Full System, seconds)	10		5.6	
Print resolution, dpi	1200 x 1200		1200 x 1200, 2-bit	
Scan Resolution, dpi	600 dpi		600 dpi	
Copy Resolution, dpi	600 dpi		600 dpi	
Max Output Size (Trays)	297 x 420 mm, 11" x 17"		320 x 457 mm, 12.6" x 18"	
Max Output Size (Bypass)	305 x 458 mm, 12" x 18"		320 x 457 mm, 12.6" x 18"	

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No additional notes

Comparing Specifications
Met-C1a/b - 2

	AT-C3		Met-C1	
	a	b	a	b
Paper Weight (Trays, gsm)	52 - 256		52 - 300	
Paper Weight (Bypass, gsm)	52 - 300		52 - 300	
Paper Weight (Duplex, gsm)	52 - 169		52 - 256	
Paper Feed Capacity (Standard)	550 x 2 + 100 = 1200		550 x 2 + 100 = 1200	
Paper Feed Capacity (Maximum)	1200 + 1000x2 (LCT) + 1200 (side LCT) = 4400		1200 + 1000x2 (LCT) + 1500 (side LCT) = 4700	
Hard Disk (GB)	250		250	
Memory (GB)	1.5		1.5 (Max 2.0)	
Scanning Speed (B/W, FC)	50 lpm (200 dpi)		70 lpm (200 dpi, 300 dpi)	
TEC Value (kWh)	US: 1.44 EU: 1.36	US: 1.63 EU: 1.55	1.06	1.44
Max Power Consumption (kW)	US: 1.584 EU: 1.7		US: 1.584 EU: 1.7	

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- ❑ Memory: To upgrade the memory to 2GB, the 1.5 GB memory is removed and a 2 GB option is installed.

Comparing Specifications
Met-C1c/d/e - 1

	AP-C3		Met-C1		
	c	d	c	d	e
Size (WxDxH, mm)	670 x 677 x 760 , w/o ADF		587 x 677 x 760, w/o ADF		
Weight (kg)	<133		<86		<86.5
Print/Copy Speed (B/W, ppm)	45	55	45	55	60
Print/Copy Speed (FC, ppm)	45	55	45	55	60
1 st Copy Time (B/W, seconds)	3.7	3.1	4.0	3.1	
1 st Copy Time (FC, seconds)	5.8	4.9	5.7	4.6	
Warm-up Time (seconds)	22.1	24.1	19	17	
Recovery from Sleep Mode (Full System, seconds)	15	20	6.2	US: 13 EU: 10	US: 16 EU: 12
Print resolution, dpi	1200 x 1200		1200 x 1200, 2-bit		
Scan Resolution, dpi	600 dpi		600 dpi		
Copy Resolution, dpi	600 dpi		600 dpi		
Max Output Size (Trays)	297 x 420 mm, 11" x 17"		320 x 457 mm, 12.6" x 18"		
Max Output Size (Bypass)	305 x 458 mm, 12" x 18"		320 x 457 mm, 12.6" x 18"		

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No additional notes

Comparing Specifications
Met-C1c/d/e - 2

	AP-C3		Met-C1		
	c	d	c	d	e
Paper Weight (Trays, gsm)	52 – 256, 14lb Bond-140lb Index		52 – 300, 14lb Bond-140lb Index		
Paper Weight (Tray 3, gsm)	52 - 256		52 - 300		
Paper Weight (Bypass, gsm)	52 – 300, 14lb Bond-110lb Cover		52 – 300, 14lb Bond-110lb Cover		
Paper Weight (Duplex, gsm)	52 - 169		52 - 256		
Paper Feed Capacity (Std)	550 x 2 + 100 = 1200		550 x 2 + 100 = 1200		
Paper Feed Capacity (Max)	1200 + 1000x2 (LCT) + 1200 (side LCT) = 4400		1200 + 1000x2 (LCT) + 1500 (side LCT) = 4700		
Hard Disk (GB)	250		250		
Memory (GB)	2		2 (max)		
Scanning Speed (B/W, FC)	ARDF: 67 lpm (200 dpi, 300 dpi) SPDF: 85/116 lpm (200 dpi, 300 dpi)		ARDF: 70 lpm (200 dpi, 300 dpi) SPDF: 100/180 lpm (200 dpi, 300 dpi)		
TEC Value (kWh)	US: 2.15 EU: 2.19	US: 2.72 EU: 2.77	1.81	2.51	2.91
Max Power Consumption (kW)	<1.584		NA: <1.584, EU: <1.850		

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No additional notes

Yield of Consumables

❑ Toner cartridges

- ♦ Met-C1a/b:
 - » K: 29.5k, Color: 18k
- ♦ Met-C1-c/d/e:
 - » K: 33k, Color: 22.5k

The cartridge for ab can be inserted in the cde model.

On the other hand, the cartridge for cde cannot be inserted in the ab model.

❑ Waste toner bottle: 100k

- ♦ This is replaced by the customer.
- ♦ With SP 5-073-001, this can be changed to replacement by technician.
- ♦ Never try to empty toner out of the waste toner bottle to use the same bottle again; always replace the bottle with a new one. This is because the coil inside the bottle may break.

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Yields are based on these conditions:

- ❑ A4 (LT) long-edge feed
- ❑ 5% image coverage ratio
- ❑ Color ratio: 30%
- ❑ 3 prints/job (Met-C1a/b), 4 prints/job (Met-C1c/d/e)

Targets

❑ Average Print Volume

- ◆ Met-C1a: 5 k/month
- ◆ Met-C1b: 7 k/month
- ◆ Met-C1c: 10 k/month
- ◆ Met-C1d: 12 k/month
- ◆ Met-C1e: 15 k/month

❑ Color ratio: 30%

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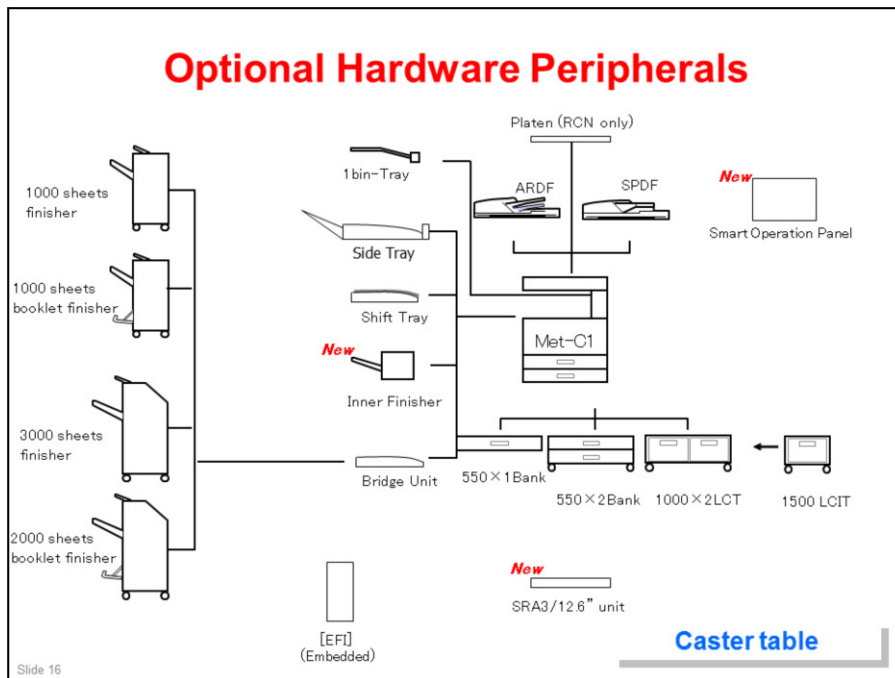
No additional notes

Reliability Information

- ❑ **PM Interval: 300k, 400k**
- ❑ **MPBF Target (Mainframe)**
 - ◆ Met-C1a: 106k
 - ◆ Met-C1b: 127k
 - ◆ Met-C1c: 161k
 - ◆ Met-C1d: 174k
 - ◆ Met-C1e: 202k
- ❑ **Call Ratio Target (Mainframe)**
 - ◆ Met-C1a: 0.072
 - ◆ Met-C1b: 0.090
 - ◆ Met-C1c: 0.112
 - ◆ Met-C1d: 0.129
 - ◆ Met-C1e: 0.149
- ❑ **Machine Life: 3,000k or 5 years whichever comes first**

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No additional notes



- ☐ If you install any of the finishers, you must also install either the 1000x2 LCT or the two-tray paper tray unit.
- ☐ Depending on the region, some options may not be available for all models.

Options: Original Feed

		Also used with these models:	Similar to:	Note
D683: SPDF DF3080	New			Same as the unit that is built into the Ch-C1
D779: ARDF DF3090	New		K-C4	
D700: Platen Cover PN2000		K-C4		
D593: ADF Handle Type C		Or-C1		

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No additional notes

Options: Paper Feed

		Also used with these models:	Similar to:	Note
D693: Paper Feed Unit PB3160	New		Ap/At-C3	2 trays
D694: Paper Feed Unit PB3150	New		Ap/At-C3	1 tray; only one of these can be installed
D695: LCIT PB3170	New		Ap/At-C3	Tandem Tray, 1000 sheets x 2
D696: LCIT RT3030	New		Ap/At-C3	Side LCT, 1500 sheets
D178: Caster Table Type M3				Requires PB3150

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No additional notes

Options: Finishing

		Also used with these models:	Similar to:	Note
D687: Finisher SR3140	New			1000-sheet
D686: Booklet Finisher SR3150	New		B793 booklet finisher	1000-sheet
D688: Booklet Finisher SR3170	New		CH-C1	2000-sheet
D689: Finisher SR3160	New		CH-C1	3000-sheet
D717: Punch Unit PU3050	New			For D686/D687
D706: Punch Unit PU3060	New	CH-C1		For D688/D689
D609: Internal Finisher SR3130	New		Or-C1	500-sheet
D716: Punch Unit PU3040		OR-C1		
D691: Internal Shift Tray SH3070	New		Ap/At-C3	
D685: Bridge Unit BU3070	New		Ap/At-C3	
D692: 1 Bin Tray BN3110	New		Ap/At-C3	
D725: Side Tray Type M3	New		Ap/At-C3	

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No additional notes

Options: Controller

		Also used with these models:	Similar to:	Note
D165: Postscript3 Unit Type M3	New		Similar to those used with other models	For Met-C1a/b
D165: Camera Direct Print Card Type M3	New			For Met-C1a/b
D165: Browser Unit Type M3	New			For Met-C1a/b Requires Memory Unit Type M3 2GB
D165: SD card for NetWare printing Type M3	New			For Met-C1a/b
D165: IPDS Unit Type M3	New			For Met-C1a/b
D166: Postscript3 Unit Type M4	New			For Met-C1c/d/e
D166: Camera Direct Print Card Type M4	New			For Met-C1c/d/e
D166: Browser Unit Type M4	New			For Met-C1c/d/e
D166: SD card for NetWare printing Type M4	New			For Met-C1c/d/e
D166: IPDS Unit Type M4	New			For Met-C1c/d/e

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No additional notes

Options: Controller

		Also used with these models:	Similar to:	Note
D164: IEEE 802.11a/g/n Interface Unit Type M2	New		Similar to those used with other models	
D164: Memory Unit Type M3 2GB	New			For Met-C1a/b only. Remove existing 1.5 GB memory and install this 2GB memory
D166: OCR Unit Type M2	New	Ch-C1		
D739: Smart Card Reader Built-in Unit Type M2	New	Ch-C1		Install in left USB port only
B679: IEEE 1284 Interface Board Type A		Used with many other models		
D566: Bluetooth Interface Unit Type D		Used with many other models		
D377: File Format Converter Type E		Used with many other models		
D640: Copy Data Security Unit Type G		Used with many other models		
D641: SD Card for Fonts Type D		Used with many other models		
B869: Unicode Font Package for SAP®		Used with many other models		
D377: Data Overwrite Security Unit Type H		Used with many other models		For CC certification

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“Smart card Reader Built-in Unit Type M2” is only available on the left USB port.

“Bluetooth Interface Unit Type D” is available on both the left and right USB ports.

Options: Fax

		Also used with these models:	Similar to:	Note
D163: Fax Option Type M3	New		Similar to those used with other models	For Met-C1a/b
D163: G3 Interface Unit Type M3	New			For Met-C1a/b
D165: Fax Connection Type M3	New			For Met-C1a/b
D167: Fax Option Type M4	New			For Met-C1c/d/e
D167: G3 Interface Unit Type M4	New			For Met-C1c/d/e
D166: Fax Connection Type M4	New			For Met-C1c/d/e
G578: Memory Unit Type B 32MB		In use with many models		
D739: Handset HS3020	New			
H903: Marker Type 30		In use with many models		

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No additional notes

Options: EFI Controller

		Also used with these models:	Similar to:	Note
D730: Color Controller E-22C	New			
D730: Connection Kit Type M3	New			For Met-C1a/b
D730: Connection Kit Type M4	New			For Met-C1c/d/e

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No additional notes

Options: Other

		Also used with these models:	Similar to:	Note
D739: Imageable Area Extension Unit Type M3	New			This is a longer paper transfer roller; it allows the machine to print on SRA3/12.6 inch paper
B870: Optional Counter Interface Unit Type A			Similar to those used with other models	
D739: Key Counter Bracket Type M3				
D593: Card Reader Bracket Type 3352				
D148: Smart Operation Panel Type M3	New			A new type of operation panel.
D739: External Keyboard Bracket Type M3	New			For the Smart Operation Panel Type M3

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No additional notes

Note about Controller and Fax Options

- ❑ The controller for the Met-C1a/b is different from the controller for the Met-C1c/d/e.
- ❑ Because of this, there are two versions of the following options. Be sure to install the correct ones.
 - ◆ Postscript3 Unit
 - ◆ Camera Direct Print Card
 - ◆ Browser Unit
 - ◆ SD card for NetWare printing
 - ◆ IPDS Unit
 - ◆ Fax Option
 - ◆ G3 Interface Unit
 - ◆ Fax Connection Unit
 - ◆ Connection Kit for Fiery Controller
 - » The Fiery controller itself is the same for all models.

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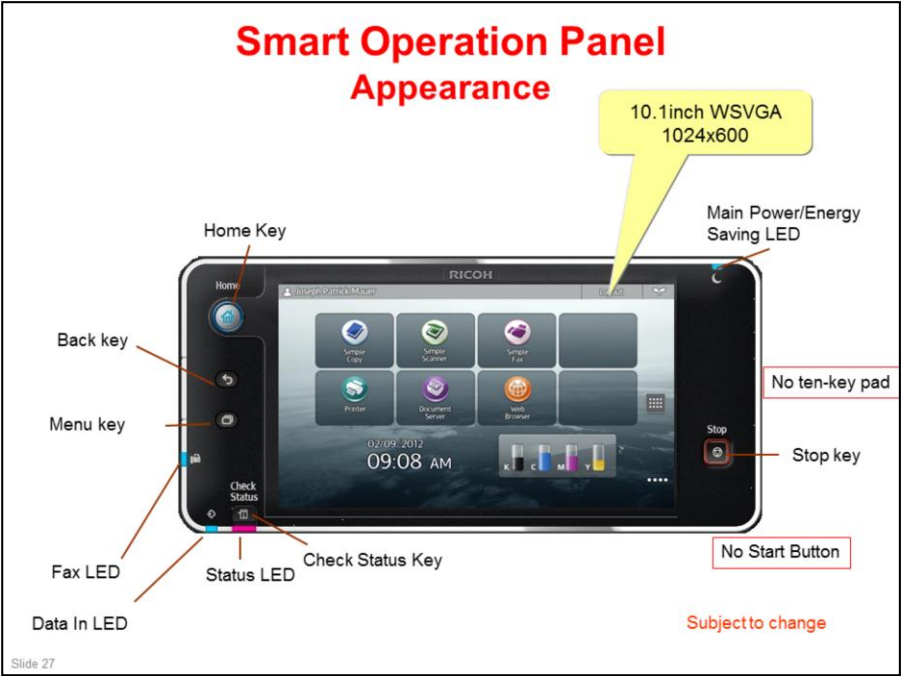
No additional notes

Memory Unit Type M3

- ❑ **Memory Unit Type M3 2GB is a sales option only for the ab models.**
 - ◆ For the cde models, 2GB memory is installed by default.
- ❑ **If a customer requires this option, replace the 1.5GB standard memory with the 2GB memory option**
- ❑ **When is this optional memory needed?**
 - ◆ It is required for the browser unit.
 - ◆ Also, it is required for using 3rd party's applications.
 - ◆ It is not required for all SDK applications provided by Ricoh (there are three types) .
 - » For applications, 32.7MB is available. So, if a customer wants to use applications more than the size, this optional memory must be installed.

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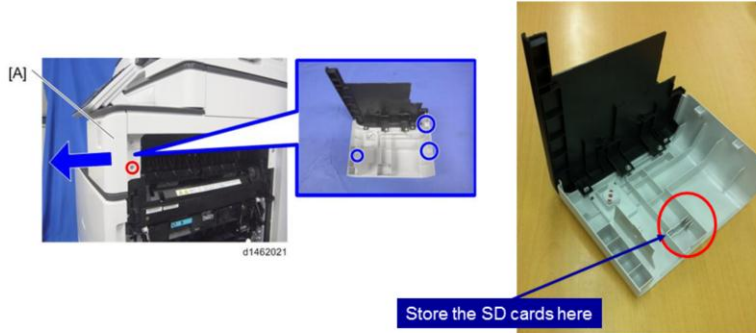
No additional notes



No additional notes

SD Cards

- ❑ Options on SD cards must be moved to the card in slot 1.
- ❑ Original SD cards must be stored inside the power supply cover [A] as shown below, as proof of purchase.

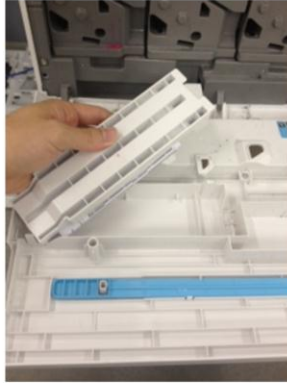


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No additional notes

SD Cards

- ❑ Also we can recommend to use the following space for SD cards by attaching with tape.



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No additional notes

RICOH

**D146/D147/D148/D149/D150
Service Training**

New and Improved Features

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No additional notes

Differences from Predecessors:
Summary of Important New Features

	Met-C1	Details
1	Smart operation panel	Android OS built in Simple UI for copy, scanner and fax Advanced operational feeling
2	Searchable PDF (SD card option)	Scanner function to add text information to the scanned file
3	Image area extension option (paper transfer roller)	Wider paper transfer roller Real time process control deactivation is required at installation.
4	Log trace function	Enhancement for controller and engine log collection

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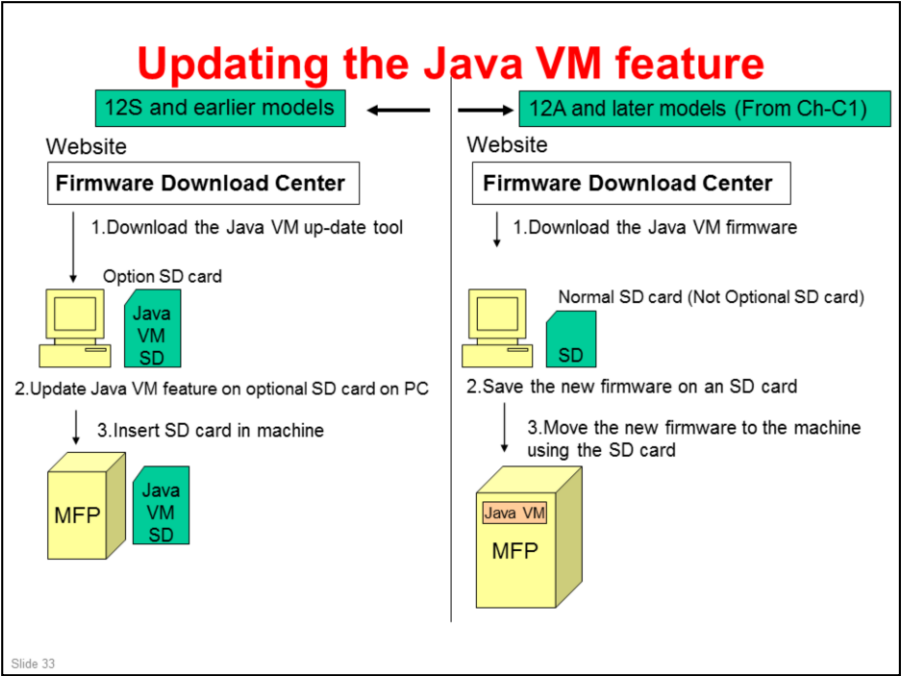
No additional notes

Java VM Feature

- ❑ Java VM was provided as an option on an SD card until now, but from 12A models such as Met-C1, this function is mounted on the controller board (NAND flash memory) as standard.

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- ❑ This change is to expand sales of ESA solution applications.
- ❑ As you know, up until 12S models, if the customer wants to use ESA solution applications, it is necessary to buy two options, one is the feature itself, and one is the Java VM feature to activate the feature.
- ❑ But from Ch-C1, the customer can use the ESA solution application by buying only the application.



No additional notes

Re-install this feature if you replace the controller board

- ❑ When replacing a controller board, you need to confirm which ESA applications are installed, and re-install them.
 - ◆ To check, look at the most recent list of optional features installed in this machine. It was printed with SP5-990-024 (SDK/J Summary) or SP5-990-025 (SDK/J Application Info.)
 - ◆ For reinstalling, please keep the original SD card in the machine (the SD card Holder is in the power supply cover)



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No additional notes

Embedded OCR (Searchable PDF) Overview



- ❑ This function lets users add transparent text information on scanned documents.
- ❑ Searchable PDF is composed of two layers; Image-Layer and Text Layer.
- ❑ User can search specific words by using electronic search functions.
- ❑ Also this function allows Copy & Paste functions like other Office documents.
- ❑ Language support:
 - 1.English 2.German 3.French 4.Italian 5.Spanish 6.Dutch 7.Portuguese 8.Polish 9.Swedish 10.Finnish 11.Hungarian 12.Norwegian 13.Danish 14.Japanese
- ❑ Requires the OCR option (this is a new type of option).
- ❑ The OCR option cannot be copied from one SD card to another.

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- ❑ From 12A models such as Ch-C1, we provide the new optional feature “Searchable PDF”
- ❑ This feature is provided as a SD card option.
- ❑ The OCR button is displayed after you install it from the SD card.
- ❑ It is not necessary to install any application on the customer’s PC. Just install the OCR kit on the machine.
- ❑ After scanning the originals, the machine starts the OCR processing on the scanned data in the HDD.
- ❑ And then, when the OCR processing has finished , the machine sends the scanned data which includes OCR data.
- ❑ While OCR processing, you can use other functions, such as printing or scanning.

Embedded OCR (Searchable PDF)

Notes about this Feature

- ❑ OCR can recognize texts even when there are multiple languages (easy words) in the scanned documents.
- ❑ When users choose Searchable PDF, invisible texts will be embedded in scanned images after scanning all input documents. Then, the machine sends a Searchable PDF file to the designated destinations.
- ❑ Files can be encrypted and be set with passwords in the same way as normal PDF files.
- ❑ File names can automatically be set from the OCR text.
Example: “yyyymmdd + sequence number + words in document + .pdf”
- ❑ If documents are upside down, the machine will detect and modify automatically.
- ❑ The OCR system can detect white pages in the documents and take them out of the file. Users can enable this function from the operation panel or Web Image Monitor.

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No additional notes

Embedded OCR (Searchable PDF) How it Works



User Operations

- Users' basic operation does not differ from other scanner settings.
- This function supports the following file types: PDF, High Compression PDF, and PDF/A.

Send Searchable PDF to email

- When there are email size limitations and the scanned file size exceeds it, the file will be automatically divided so that its size will become within the limit.
- The file will be divided by pages.
- Please note that users cannot cancel the job once Searchable PDF job has started, unlike other file formats.

Benefits for the Customer

- Users can search specific words by using electronic search functions. Also this function lets you use Copy & Paste functions like other Office documents. Therefore, users can reduce time to look for documents.
- This function requires only the OCR option. Users don't have to provide additional servers or software for using this function.
- Some models requires OCR option plus HDD option.

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No additional notes

Embedded OCR (Searchable PDF)

Remarks - 1

- ☐ This function is provided as an option.
- ☐ Some models require a HDD option.
- ☐ Searchable PDF files cannot be stored in the Document Server.
- ☐ Preview cannot be used for Searchable PDF files.
- ☐ When texts have kerning letters, accuracy may become lower.
- ☐ OCR can process texts up to 40,000 characters/page.
- ☐ When it is impossible to create a Searchable PDF file, a normal PDF will be created.
- ☐ OCR will start after all originals are scanned and then a searchable PDF will be sent to the specified destination. So users need to wait until OCR is completed when SD/USB is selected as a destination.
- ☐ Other Scan to SD/USB jobs will not start while a Searchable PDF job is in progress, until the files have been sent to SD/USB.
- ☐ When SD/USB is selected as a destination for searchable PDF, the function automatically naming the scanned file is not available.

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No additional notes

Embedded OCR (Searchable PDF)

Remarks - 2

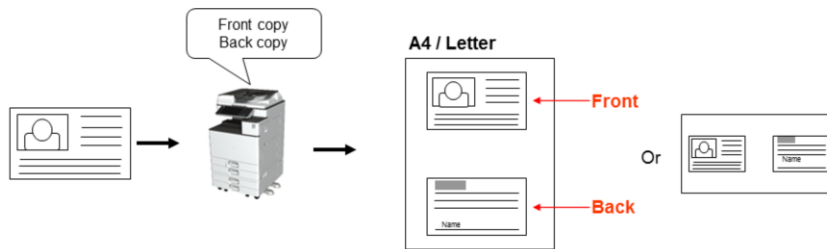
- ❑ When the scan resolution is set below 200dpi, OCR quality may not be good enough to create a Searchable PDF. As a result, Searchable PDF cannot be used. Therefore, Searchable PDF cannot be used when the resolution is set less than 200dpi.
- ❑ Actual scanning resolution will become less than 200dpi when the size of the image is reduced. In this case, users can use Searchable PDF, though OCR quality deteriorates.
- ❑ When there are email size limitations and the scanned file size exceeds it, the whole file will be automatically divided to multiple files. In this case, the system ignores the limitation of file quantities.
- ❑ If the receiver PC doesn't support a specific language, the file name will be corrupted when the file name is set automatically,
- ❑ Users cannot use these functions at the same time:
 - ◆ Searchable PDF + Encryption + PDF/A + Signature
 - ◆ Searchable PDF + High compression PDF + PDF/A
- ❑ Processing time will be depend on the following items. Therefore, some cases takes a long time to create a Searchable PDF.
 - ◆ Controller spec / The number of characters / Resolution / Paper size

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No additional notes

ID Card Copy - 1

- ❑ This function lets you copy the front and back sides of an ID card, or other small original, onto one side of a sheet of paper.
 - ◆ This function reduces paper cost.
- ❑ Before this model, users had to print at least 2 pages when taking copies of an ID card, or had to print as duplex.



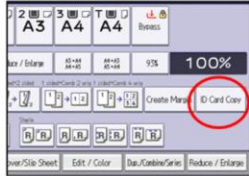
Slide 40

No additional notes

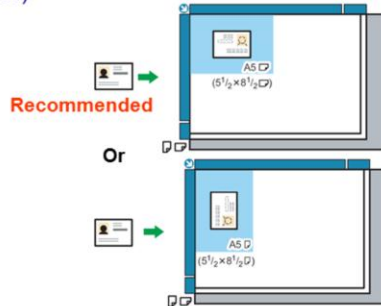
ID Card Copy - 2

❏ Operation

1. Press [ID Card Copy].
2. Select the paper tray (A4/LT is recommended).
3. Place the original front side down on the exposure glass.
4. Press the original back side down on the exposure glass, and then press the [Start] key again.
 - » * The user has to place the original in the center of an area that is half of the printout paper size.
 - » (For example: if printout paper size=A4, put the ID card in a space the same as A5.)



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No additional notes

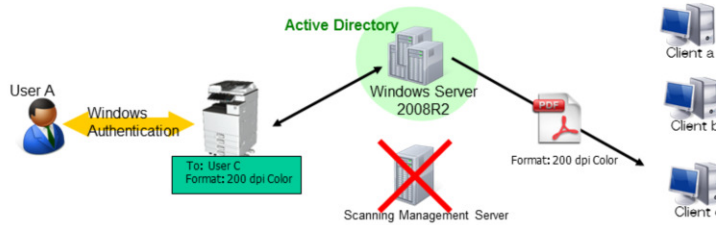
ID Card Copy - 3

- ❑ Before using this function, assign [ID Card Copy] to one of the Customizable Function keys in [Customize Function: Copier] in User Tools.
- ❑ For using this function, we recommend A4 or letter size. If using another paper size, users have to set the original (ID card) on platen at the center of the paper's half-size (long-edge).
- ❑ When users select this function, the reduce/enlarge level will be set to 100%. However, after selecting this function, users can change the reduce/enlarge ratio at the operation panel.
- ❑ These functions are not available with ID card copy.
 - ◆ Centering / Separation line / Rotate
 - ◆ Auto paper select (if ID card copy will be selected, "auto paper select" will be canceled.)
 - ◆ Combine / Series
 - ◆ Auto Reduce/Enlarge / Create margin
 - ◆ Duplex / Booklet / Magazine
 - ◆ Front cover sheet / Slip sheet / Separating Chapters
 - ◆ Erase center / Erase border / Erase inside / Erase outside / Double copy / Image repeat
- ❑ When the user pushes “#” before setting the 2nd original, the machine will print only the 1st scanned page.

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No additional notes

Distributed Scan Management (DSM) - 1



□ **What is "Distributed Scan Management (DSM)"?**

- ◆ DSM is supported as a standard function of WindowsServer2008R2 or later. DSM combines user data and scanning conditions in Windows Active Directory. It enables user to scan documents without detailed scan settings. An administrator can control scan settings and destinations.

□ **What benefit will it bring to customers?**

- ◆ A user who already has WindowsServer2008R2 or later doesn't have to purchase an additional server for scanning management. Without a scanning management server, the IT manager sets scanning conditions and destinations for users in advance. Therefore, the preset scan settings will be automatically set when the user chooses a destination.

For a detailed description of DSM, see this website:

<http://msdn.microsoft.com/en-us/library/ff540612.aspx>

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No additional notes

Distributed Scan Management (DSM) - 2

Administrator Operations

To activate this function, the administrator sets destination information and scan settings in Windows Server for individual users.

1. Add [Print and Document Service] from windows server manager.
2. Select the [Distributed Scan Server] check box, and set DSM information for individual users.

*Administrator can preset send to address, color type, file format and resolution.

User Operations

When users are logged into the machine through windows authentication, they can select the DSM function at the operation panel.

When using DSM, users can change their preset settings at the operation panel, unless prohibited by the administrator.

Preset items

Document type / File type / Resolution / Scan size / Density / Orientation of original / Simplex or Duplex / Batch scan / SADP / Preview / Erase center / Erase border

* Availability of these functions depends on the machine specs.



No additional notes

Distributed Scan Management (DSM) - 3

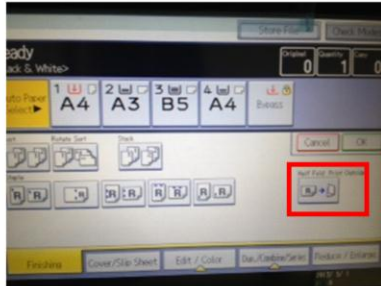
- ❑ Before using this function, select [DSM] in [Use WSD or DSM]. DSM and WSD cannot be used at the same time.
- ❑ Windows authentication is required to use this function.
- ❑ DSM is supported under the following Windows operating systems for servers: Windows Server 2008 R2 or later.
- ❑ Stored function is not available in DSM.
- ❑ DSM cannot be registered as a program setting.
- ❑ Users cannot add send to address from the operation panel when using DSM.
- ❑ The machine can read DSM information up to 100.
- ❑ For non-HDD models, only 1 waiting job can be stored. If the machine has a HDD, up to 100 waiting jobs can be stored.
 - ◆ The maximum number depends on memory capacity at that time.
- ❑ When DSM data is updated, network reboot will be required.
- ❑ DSM is not available in Simplified Display mode.
- ❑ Administrators can register up to 3 filters for each PSP.
- ❑ If administrators set too many characters in the following settings, this information will not be shown on operational panel.
 - ◆ 1, Folder-path for network, e-mail address and URL for Share-Point. (We recommend under 1,024 bytes.)
 - ◆ 2, Prefixed document name. (We recommend under 85 characters.)

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No additional notes

Folding Without Stapling - 1

- ❑ Until now, only the folder option can fold the output without stapling. But from this model, users can do this with a finisher.
- ❑ This function is available only for copying, output from document server, and printing.

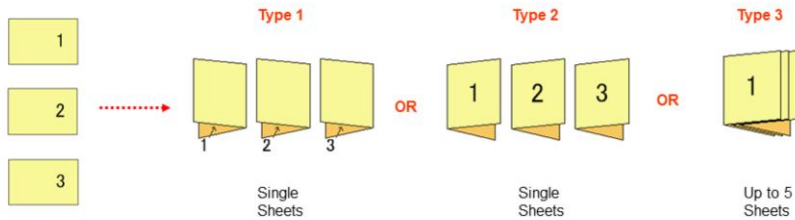


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No additional notes

Folding Without Stapling - 2

- ❑ There are three types of folding (see the diagrams below).
- ❑ Available with the following finishers for Met-C1:
 - ◆ Type 1: Not available for Met-C1
 - ◆ Type 2: Available with both booklet finishers
 - ◆ Type 3: Only available with SR3170 booklet finisher



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No additional notes

Folding Without Stapling - 3

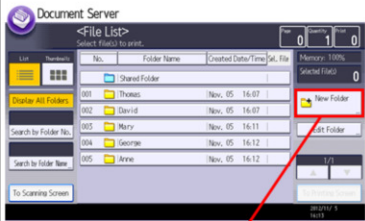
- ☐ **When using this function, users cannot use these functions.**
 - ◆ Booklet, Magazine, Bypass, Slip sheets, Staple, Punch, Multi folding, Mixed size
- ☐ **When using this function, the machine will disable the following functions:**
 - ◆ Shift collate, Rotating collate
- ☐ **Some paper types/sizes cannot use this function.**
- ☐ **This function is not available on the simplified operation panel.**

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No additional notes

Folder Management in Document Server - 1

- This function improves the management of stored documents.



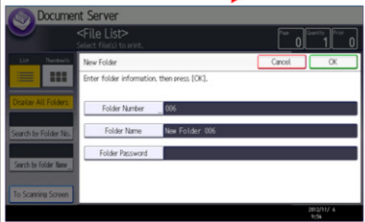
Shared folder and personal folders are displayed on the top screen of the Document Server function. At factory default, only the shared folder is displayed.

When printing/sending images stored in the Document Server, or when downloading images from WIM, users need to specify a folder before selecting the images.

Users can register up to 200 personal folders from the operation panel or WIM. Users can set a pass code for personal folders.

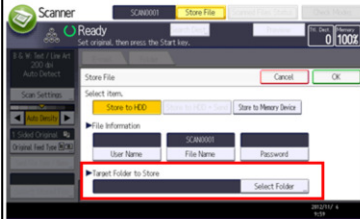
Users need to input the correct pass code to open folders protected by a pass code. If they fail to input the correct one after 10 tries, the folder will be locked. Users who have File Administrator rights can cancel the lock.

Folder name and pass code can be changed from the operation panel or WIM.



No additional notes

Folder Management in Document Server - 2



When storing images to the Document Server, users need to specify the target folder.

Users can set the shared folder as a default target folder and also can register a program in which a personal folder is set as a target folder.

- ☐ Folders cannot be made within the shared folder or a personal folder.
- ☐ When storing received faxes, they will be stored in a dedicated fax folder. Users can access the folder from the fax application or WIM.
- ☐ When storing sent faxes, they will be stored in the shared folder.
- ☐ Moving the stored documents to another folder is not supported.
- ☐ The folder number cannot be changed after it is fixed.
- ☐ The folder name must be within 64 bytes, and must be different from names of existing folders.

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No additional notes

Capturing the Debug Logs - 1

- ❑ **Debug logs for the controller, engine, and operation panel (or optional Smart Operation Panel) can be transferred to an SD card in the SD slot on the operation panel.**
 - ◆ The controller debug is updated continuously during operation, but the engine debug log is only changed if an SC or jam occurs.
 - ◆ These logs can help solve problems caused by the software.
 - ◆ They are not effective for identifying defective parts or problems caused by hardware.
- ❑ **In older models, a technician enabled the logging tool after a problem occurred. After that, when the problem had been reproduced, the technician was able to retrieve the debug log.**
- ❑ **However, this new feature saves the debug logs at the time that problems occur. Then you can copy the logs to an SD card.**

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No additional notes

Capturing the Debug Logs - 2



- ❑ **Insert the SD card into the slot on the side of the operation panel.**
- ❑ **Set the start date of the log with SP5-857-101**
 - ♦ e.g.: March 28, 2013: input 20130328 (yyyymmdd)
 - ♦ Set the date three days earlier than the occurrence of the problems.
- ❑ **Set the end date of the log with SP5-857-102**
 - ♦ e.g.: March 30, 2013: input 20130330 (yyyymmdd)
- ❑ **Execute SP5-857-103 to write the debug log to the SD card.**
 - ♦ The approximate time it takes to transfer the debug log is as follows.
Transfer time may be affected by the type or format of the SD card.
 - » Controller debug log (GW debug log): 2 - 20 minutes
 - » Engine debug log: 2 minutes
 - » Operation panel debug log: 2 - 20 minutes

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- ❑ See the 'Retreiving the Debug Logs' section in the service manual for details of the procedures.

Capturing the Debug Logs - 3

❑ **The debug logs are saved with the following file names and paths.**

- ♦ Controller debug log (GW debug log):
/LogTrace/machine number/watching/
yyyymmdd_hhmmss_unique identification
number.gz
- ♦ Engine debug log:
/LogTrace/machine number/engine/
yyyymmdd_hhmmss.gz
- ♦ Operation panel debug log:
/LogTrace/machine number/oepanel/
yyyymmdd_hhmmss.tar.gz

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No additional notes

RICOH**D146/D147/D148/D149/D150
Service Training****Installation**

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This section explains the main points about installation. For full details, see the Field Service Manual.

Installing the Copier

- ❑ **Basically, this is very simple.**
 - ◆ Remove packing materials.
 - ◆ Remove the seals from the PCDUs.
 - ◆ Connect the PCDU harnesses.
 - ◆ Rotate two levers on the ITB clockwise until they point down.
 - ◆ Install the toner bottles.
 - » When the machine is switched on for the first time, toner is sent to the hopper automatically. It takes about 5 minutes.
- ❑ **Developer is pre-installed in the machine before shipping.**
 - ◆ Also, developer is also pre-installed in the service parts for the PCDU and development unit.
 - ◆ This means that there are no procedures for removing old developer and installing new developer.
- ❑ **If you install an optional paper tray unit or optional LCT at the same time, put the machine on the paper tray unit or the LCT first. Then install the machine and other options**

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No additional notes

Lifting the Machine



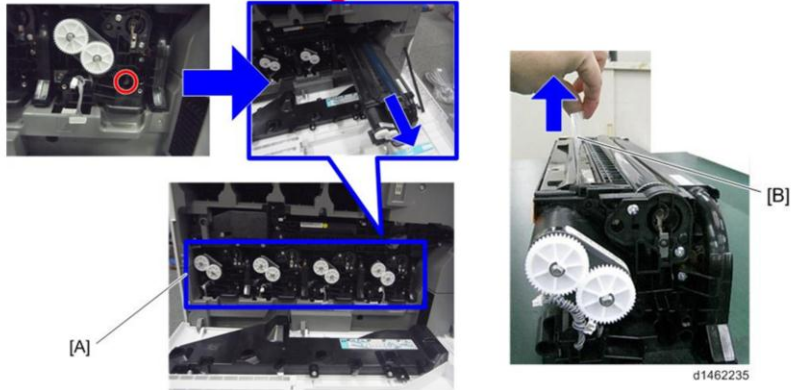
d1462211

- ☐ Always lift the machine with the handles at the bottom.
- ☐ Do not lift by holding the right cover, scanner unit, operation panel, or other components that might be sticking out, because this will damage the machine.
- ☐ When shipped from the factory, these handles are obscured by packing materials. So, remove the packing materials before you attempt to lift the machine.

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No additional notes

Removing the PCDU Seals



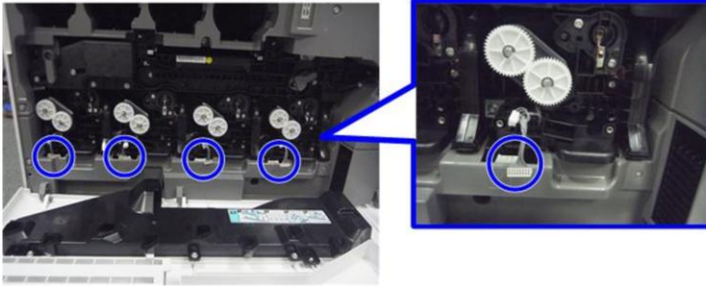
- ☐ Each PCDU [A] has a seal [B] that must be removed during installation.
- ☐ Do this before you turn the main switch on, or the development units can be severely damaged.
- ☐ Before you remove the seal, remove all orange tapes and the red tag as shown in the service manual. [met-c1_sm_d146_fsm_2nd_00116421_eng](#)

[How to remove preset seal](#)

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No additional notes

PCDU Harness



d1462219

- ☐ There is no drawer connector at the back of the PCDUs.
- ☐ You must connect a harness for each PCDU to the machine during the installation procedure.

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- ☐ This is a cost reduction measure.

ITB Levers

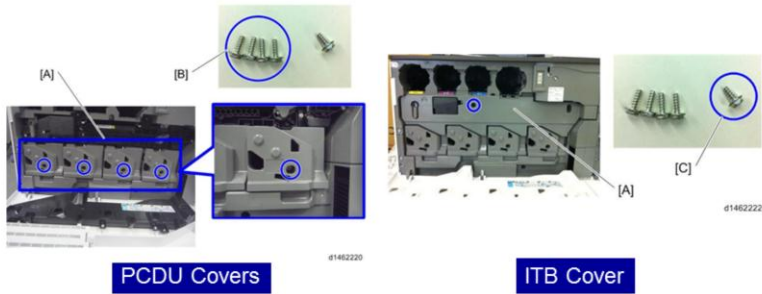


- Two levers must be adjusted during installation. Move them down for normal operation. Move them up when you want to pull out or push in the ITB unit.
 - ♦ [A]: Waste toner bottle contact lever
 - » In this machine, the ITB cleaning unit is above the ITB, so waste toner transport is different from other models.
 - » The lever must be moved so that the waste toner path from the ITB connects to the waste toner bottle.
 - » The ITB cleaning unit is moved slightly to the left when it is in the up position.
 - ♦ [B]: ITB contact lever; this is the same as in other models, except that the ITB moves down to contact the drums. Move this lever up also before you replace a PCDU.

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No additional notes

Front Covers for PCDUs and ITB Unit



- ☐ These are not installed on the machine when it is shipped.
- ☐ This is because you have to remove a seal from each PCDU and change the positions of 2 levers on the ITB unit during installation.
- ☐ After doing that, attach the covers.

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No additional notes

Installing the Toner Bottles

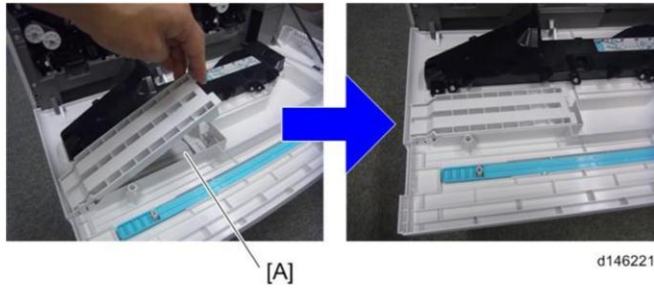


- ❑ The shape of the bottles is different from previous models
- ❑ You must remove a cap from the bottle before installing it in the machine

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No additional notes

Factory Setting Sheet



- ❑ The factory setting sheet is stored on the reverse side of the front cover, in the location [A] where you store the scanner support plate.

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No additional notes

Security Screen When the Power is First Turned On



- ❑ In order to increase the security of the machine, and to ensure that the customer sets the administrator password, an administrator set/change prompt display is shown up at the first power-up.
- ❑ Follow the procedure at the start of the installation procedure in the service manual to input the passwords.
- ❑ Alternatively, SP5-755-002 allows you to skip this screen temporarily and continue the installation procedure without setting an administrator password.
 - ◆ However, the Program/Change Administrator screen appears every time you turn the power OFF/ON, if the password is not set.
- ❑ The passwords for Supervisor or Administrator 1 to 4 can be set via "System Settings". But the Program/Change Administrator screen appears every time the power switch is turned ON if the passwords are input this way. So we recommend the customers to set the passwords via network or the Program/Change Administrator screen.

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Options

Single-pass Document Feeder


- ☐ In the accessories, you will find an IPU and a BCU.
- ☐ During the installation procedure, you must install the additional IPU board (after installation, there will be two IPU boards in the machine).
- ☐ Also, you must take out the BCU board that is in the machine and install the BCU board from the accessories.
- ☐ Make sure that you remove the EEPROM from the old BCU and put it on the new one.
- ☐ After installation, you must do the following:
 - ◆ Input values from a sheet of paper into SP mode (these are correction values for the CIS)
 - ◆ Check and adjust the registration and skew.

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No additional notes


Options

Paper Tray Units, Tandem LCT



Front

d1462453



Rear

d1462454

- ☐ These units are installed below the copier.
- ☐ Always join the copier to the tray unit with one screw. Use one of the connecting brackets as a screwdriver. Do this immediately after you put the copier on top of the tray unit.
 - ♦ At the front of the machine, pull out the copier's 2nd tray and attach the bracket.
 - ♦ At the rear of the machine, at two locations.
- ☐ Then lock the casters of the paper feed unit/LCT.
- ☐ Finally, check the registration with SP mode as explained in the installation procedure.
- ☐ Paper size is set as shown below when the machine is shipped from the factory.
 - ♦ NA: LT LEF
 - ♦ EU, AA, CHN: A4 LEF
- ☐ The paper size can be changed to A4 or LT. First, adjust the side fences, then change SP5-181-007
 - ♦ 0: A4, 1: LT

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- ☐ There is no space to use a normal screwdriver, so we must use one of the connecting brackets to attach the screw.

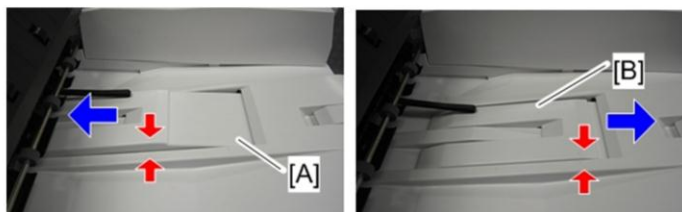
Options Side LCT

- ❑ This cannot be installed unless you have already installed the optional two-tray paper feed unit or the tandem LCT.
- ❑ Paper size is set as shown below when the machine is shipped from the factory.
 - ◆ NA: LT LEF
 - ◆ EU, AA, CHN: A4 LEF
- ❑ The paper size can be changed to A4, LT, or B5 (all LEF). First, adjust the side fences, then change SP5-181-017
 - ◆ 0: A4, 1: LT, 2: B5

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No additional notes

Options ARDF DF3090



d1585055

- ☐ When feeding thin paper, adjust the sliding tray to the point shown above [A].
- ☐ When feeding normal paper, adjust the sliding tray to the point shown above [B].
- ☐ If not, you may get the following problems:
 - ◆ Original jam
 - ◆ Originals cannot be stacked neatly

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No additional notes

Options

One-bin Tray, Bridge Unit, Side Tray

- ☐ If the bridge unit or the side tray will be used, install the one-bin tray first.

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No additional notes

Options Finisher

- ❑ **Install the following before you install a finisher:**
 - ◆ Bridge unit
 - ◆ Tandem LCT or two-tray paper feed unit

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No additional notes

Options

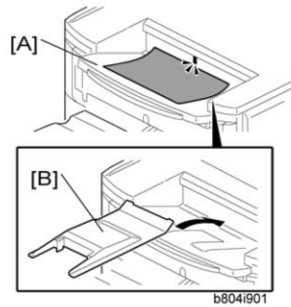
D687 Finisher

- ❑ **Only for D687: Two stabilizers are included as accessories.**
 - ◆ They must be attached to the finisher just after it is taken out of the shipping box.

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No additional notes

D688 and D689 Finishers Proof Support Tray



- ❑ The user must install the proof support tray [B] on the proof tray [A] when using thin paper (if thin paper curls, it can block the sensor, and this support tray prevents this).

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- ❑ The trailing edges of excessively curled paper can activate the tray full sensors before the tray is actually full.
- ❑ Once the "Exit Tray Full" message displays, the job cannot continue until some sheets are removed from the tray which is only partially full. The trays are designed to prevent this problem.
- ❑ The auxiliary tray for the shift tray and proof tray should be installed for Z-folding jobs.

Options

Internal Finisher

- ❑ **If the punch unit for this finisher will be installed, installed the punch unit before you install this finisher.**
- ❑ **If you will install the one-bin tray also, install that option part of the way through the procedure for installing the internal finisher.**
 - ◆ See the installation procedure for the internal finisher in the service manual for details.
- ❑ **Attach stabilizers to the base of the machine as explained in the installation procedure, to prevent the machine from falling over.**
 - ◆ These stabilizers are shipped with the internal finisher as accessories.

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No additional notes

Options

Imageable Area Extension Unit - 1

- ❑ **This is a transfer roller that allows full bleed printing on 315mm width paper.**
 - ◆ The standard transfer roller allows image widths of up to 305 mm.
- ❑ **Do not touch the surface of this roller during installation. The material is very soft and breaks easily.**
- ❑ **Before you change the roller, check the Engine firmware version.**
 - ◆ If the version is earlier than 1.22, then you must input all the SPs in the table in the installation procedure.
 - ◆ If the version is 1.22 or later, then you only need to do SP2-400-001.
- ❑ **Then change some SP settings, as shown in the installation procedure. Then turn the power off.**
 - ◆ These SPs are related to process control.
 - ◆ Real time process control is disabled if the extension unit is installed. This is because real time process control uses areas at the extreme edges of the ITB, which are outside the image area if the normal PTR is used, but not if the extension unit is installed.
- ❑ **Install the new roller.**

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No additional notes

Options

Imageable Area Extension Unit - 2

- ❑ **When you forget to change the SP, the following problems occur.**
 - ◆ If the SP setting is the normal setting (SRA3 paper not supported), but the optional longer paper transfer roller is installed
 - » Images at the edges of SRA3 paper will not be transferred.
 - » MUSIC/program control pattern adheres to the ends of the paper transfer roller (outside the A3 area), and this can transfer to the underside of printouts.
 - » Real-time process control cannot be performed correctly, and because of this, an abnormal image and SC285-00 (MUSIC error) may occur.
 - ◆ If the SP setting is for SRA3, but the paper transfer roller is the normal one (SRA3 paper not supported)
 - » Images at the edges of SRA3 paper will not be transferred.
 - Real-time process control is not performed, and the time between process controls will be shorter (productivity will decrease)
 - » The waiting time for fusing temperature rise is longer than intended.

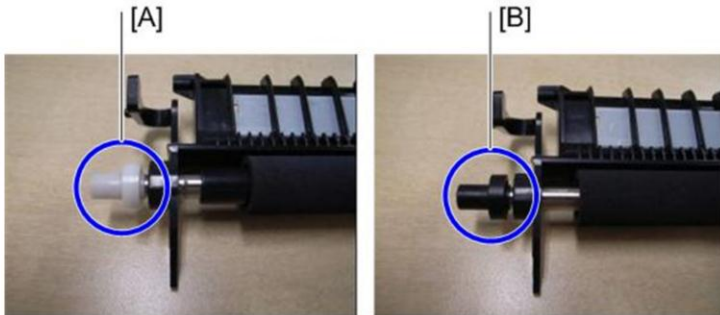
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No additional notes

Options

Imageable Area Extension Unit - 3

- ❑ When you replace the roller at PM, make sure to install the correct type of transfer roller.
 - ◆ [A]: Standard transfer roller
 - ◆ [B]: Imageable Area Extension Unit



d1463070

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No additional notes

Options

Smart Operation Panel

- ☐ **Before installation, do the following SP adjustments.**
 - ◆ Set SP5-748-201 bit 0 to 1 (default: 0).
 - ◆ Set SP5-748-101 to 1 (default: 0).
- ☐ **Switch power OFF/ON.**
- ☐ **After switching the power ON, if the default setting icon is displayed and the default screen is displayed, the operation panel is connected normally.**

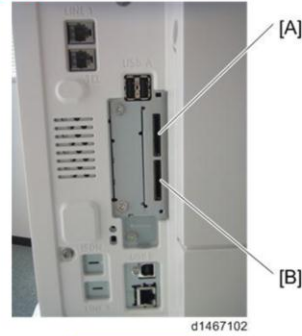
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No additional notes

Options SD Card Slots



D148/D149/D150



D146/D147

- ☐ [A]: SD card slot 1 (option slot)
- ☐ [B]: SD card slot 2 (service slot)

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- ☐ The OCR card does not need to be kept in the slot after installation. So the legal aspects about merging the OCR software are not a problem, because there is no need to merge the OCR software.

Options

SD Card Options

- ❑ **In former models (such as Ap/At-C3), there are some SD card options that can't be merged.**
- ❑ **In Met-C1, there are no restrictions.**
 - ◆ For example, the part of the Postscript software that requires licensing is now built into the controller, so the portion on the SD card can be moved to another SD card.
- ❑ **You can insert SD card options in any slot on controller board.**
 - ◆ We recommend that you insert SD card options in slot 1, because slot 2 is also used as the service slot.

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No additional notes

Embedded OCR (Searchable PDF) Installation - 1

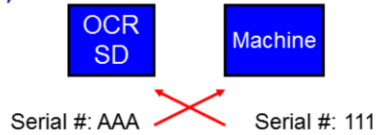
- ☐ Insert the OCR SD card in slot 1 or 2
- ☐ Turn the main switch on.
- ☐ Execute SP 5-878-004 (Option setup: OCR dictionary)
- ☐ Turn the switch off and on.
- ☐ Execute SP 5-878-004 again (Option setup: OCR dictionary)
- ☐ Turn the switch off.
- ☐ Remove the SD card from the SD slot.
- ☐ Save the SD card in the storage space under the switch cover.

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No additional notes

Embedded OCR (Searchable PDF) Installation - 2

- ❑ The machine's serial number is saved on the OCR SD card during the first execution of SP5-878-004. At the same time, the OCR option's serial number is saved in the machine's NVRAM (on the controller board).



- ❑ Dictionary text information in the SD card is copied to the HDD during the second execution of SP5-878-004.
- ❑ Even after the dictionary data is copied to the HDD, the information is still stored in the SD card.

Note: The OCR option has a license, like the PS option. Each SD card is available for only one machine. Therefore, once an OCR SD card is used on a certain machine, the machine writes the serial number on the SD card to prevent it from being used on other machines.

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No additional notes

Embedded OCR (Searchable PDF) Troubleshooting

1. HDD broken

- ♦ Replace the HDD and copy the dictionary text information to the new HDD by using the original SD card again.

2. NVRAM broken/replaced

- ♦ If upload/download of NVRAM is not possible, order the OCR SD card as a service part and do the installation procedure again.

3. Please make sure to keep the original SD card in the storage location inside machine.

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No additional notes

After Installing the Machine and All Options

- ❑ After you have finished installing the machine, it might be a good idea to back up the NVRAM to an SD card.
 - ◆ Also, it might be a good idea to do this after every service visit.

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No additional notes

RICOH

RICOH

**D146/D147/D148/D149/D150
Service Training**

Maintenance

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No additional notes

Important Notes

- ❑ With previous models, when the DC power was turned off, the supply of power from the AC control board to machine internal systems was stopped.
- ❑ With this model, even after the main switch/DC power has been turned off, a voltage of 5V still flows through the machine to detect when the switch is pushed to turn the power on.
- ❑ Therefore, before performing any kind of machine maintenance, you must physically remove the power cord from the outlet and wait several minutes (approx. equivalent to the time it takes to remove the rear cover).

Slide 84

No additional notes

PM Parts

- ❑ **PCDU**
 - ◆ PCU-K: 400k
 - ◆ PCU-CMY: 270k
 - ◆ Development Unit – K: 600k
- ❑ **Transfer**
 - ◆ ITB Unit: 600k
 - ◆ ITB Cleaning Unit: 300K
 - ◆ PTR Unit: 400k
- ❑ **Fusing**
 - ◆ Pressure Roller: 400k
 - ◆ Heating Sleeve Unit: 400k
 - ◆ Ball Bearing: 400k
- ❑ **Other**
 - ◆ Waste Toner Bottle: 100k (this is replaced by the customer, but can be changed to technician PM replacement by SP adjustment)
 - ◆ Exhaust Filters: 300k
- ❑ **When the fusing sleeve unit is used past its target yield (430k), the heating sleeve may break, causing a service call. Therefore, the machine displays a warning on the operation panel at 415k pages and stops at 430k pages. Please make sure to replace the heating sleeve unit before the unit's PM counter reaches 430k pages.**

Slide 85

No additional notes

Yield Parts

- ❑ Development Unit – CMY: 600k
- ❑ ARDF Feed Belt, Pick-up Roller, Reverse Roller:
120k originals

Slide 86

- ❑ The above listed parts are treated as “Yield Parts”, which means that they are not expected to require replacement during the entire lifecycle of the machine, assuming the machine is used at the target ACV, coverage ratio, and color ratio. This is why these parts are listed separately from PM parts

Procedure for Replacing a PM Part

1. **Execute the SP for forced detection of a new part.**
 - ♦ See the next slide for a list of SP modes for each part.
 2. **Turn the power off**
 - ♦ Do not turn on again until after replacing the part. If you have to turn the power on again before replacing the part, go back to step 1 to execute the SP before replacing the part.
 3. **Replace the part.**
 4. **Turn the power on.**
 5. **The machine automatically resets the counter, replacement day, remaining number of days, and executes the necessary automatic adjustments for the new part.**
- ☐ **Do not use the PM counter clear SP mode.**

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- ☐ See 'Preventative Maintenance – PM Parts Settings' in the service manual for full details of how to replace a PM part and check the machine after replacement.

SP Modes Before PM Part Replacement

- | | |
|---|---|
| <input type="checkbox"/> SP3-701-002 PCU Bk | <input type="checkbox"/> SP3-701-118 Pressure Roller |
| <input type="checkbox"/> SP3-701-003 Dev Bk | <input type="checkbox"/> SP3-701-131 Ozone filter |
| <input type="checkbox"/> SP3-701-025 PCU C | <input type="checkbox"/> SP3-701-132 Exhaust filter |
| <input type="checkbox"/> SP3-701-026 Dev C | <input type="checkbox"/> SP3-701-206 ADF pick up roller |
| <input type="checkbox"/> SP3-701-048 PCU M | <input type="checkbox"/> SP3-701-207 ADF feed |
| <input type="checkbox"/> SP3-701-049 Dev M | <input type="checkbox"/> SP3-701-208 ADF reverse |
| <input type="checkbox"/> SP3-701-071 PCU Y | |
| <input type="checkbox"/> SP3-701-072 Dev Y | |
| <input type="checkbox"/> SP3-701-093 ITB Unit | |
| <input type="checkbox"/> SP3-701-102 ITB Cleaning | |
| <input type="checkbox"/> SP3-701-109 PTR | |

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- ☐ The following are reset automatically after replacement, so we don't need to reset these SPs.
 - SP3-701-142: Waste Toner Bottle
 - SP3-701-115: Fusing Unit
 - SP3-701-116: Fusing Sleeve Belt Unit

PM Counter Display

- ❑ The PM Counter main menu and sub menu allows you to review the PM counts for both units and individual components.



d1353049

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No additional notes

PM Counter Display



1. **All PM parts list:** Displays all PM items
 2. **Parts list for PM yield indicator:** Displays the items with their PM yield indicator settings set to "Yes".
 3. **Clear all PM settings:** Reset all PM counter settings to "0" at the same time. PM items can be reset one by one with the [Clear] button in the All PM Parts List.
 4. **Counter list print out:** Prints the PM counter.
 5. **Estimated Usage Rate/Estimated Remain Days:** Displays the estimated usage ratio and remaining days for PM parts.
 6. **Commissioning Status Report Print:** Prints a system report.
- ☐ The other items are not available (greyed out).
 - ☐ 1 to 4 are used in the MT and V series. 5 and 6 are new features from this model.

Slide 90

No additional notes

PM Parts Screen: Main Menu

- “All PM Parts list” displays all PM units and individual items. This list shows all PM items, regardless of their “PM yield indicator settings”.

SP Mode (PM Parts)					Prev Menu	Exit
All PM Parts List		Select Parts				
No.	Description	PM Yield	Current	Target		
xxx	#Fusing Unit	NO	00000000	00150000	Clear	01/09 ▲ Prev ▼ Next
xxx	Gear: Hot Roller	NO	00000000	00200000	Clear	
xxx	Hot Roller	NO	00000000	00200000	Clear	
xxx	Fusing Belt	NO	00000000	00200000	Clear	
xxx	Pressure Roller	NO	00000000	00450000	Clear	
xxx	Pressure Roller Sep. Pawl	NO	00000000	00300000	Clear	
xxx	Oil Supply Unit	NO	00000000	00150000	Clear	
xxx	Fusing Belt Stripper Unit	NO	00000000	00150000	Clear	

[A]

[B]

[C]

[D]

[E]

[F]

- [A]: Number buttons. Pressing a number button opens a submenu.
- [B]: Descriptions. The # mark denotes a "unit" (not an individual item).
- [C]: PM yield buttons. Function is the same as the "PM yield indicator settings" button.
- [D]: Current PM counter value.
- [E]: Target PM interval. This can be changed by pressing a number button [A].
- [F]: PM counter clear button. Function is the same as the [Clear current counter] button.

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- The Clear button [F] in CH-C1 does more things. It is the same as new unit detection (resets the number of remaining days, replacement date, starts the automatic adjustments, PM counter clear). In the Met-C1, it just clears the PM counter.

PM Parts Screen: Sub Menu

- ❑ Press any number button (001 – xxx) to open the submenu for a PM part.

xxx #Fusing Unit

Current counter	0010892	[A]	Clear current counter
Target yield	0300K	[B]	Change Target Yield
Latest1	0014846	[D]	[C] PM yield indicator settings <div>No Yes</div>
Latest2	0000000		
Latest3	0000000		

Exit

▲Prev ▼Next

d074p904

- ❑ [A]: Clear current counter. Press to reset the selected PM counter to “0”. You can also clear the settings by pressing the [Clear] button on the right side of the PM Counter Main Menu.
- ❑ [B]: Change target yield. Press the change the target PM yield.
- ❑ [C]: PM yield indicator settings. [Yes] is the default. Press [No] to remove the current item from the Parts list for PM yield indicator.
- ❑ [D]: PM counter history. This is a summary of the most recent counts.

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No additional notes

Parts list for PM yield indicator

- ❑ The list shows the PM Parts Main Menu with only items set to “ Yes” displayed.

JAN 23, 2002 11:03PM

SP Mode(PM Parts)

Prev. Menu

Exit

Parts list for PM yield indicator

Select parts

No	Description	Exceed	Current	Target	
001	#K:PCU	[A]	0010092	0300K	Clear
017	#M:PCU		0005570	0300K	Clear
033	#C:PCU		0005223	0300K	Clear
049	#Y:PCU		0005514	0300K	Clear
065	ITB		0025738	0600K	Clear
066	#ITB Cleaning Unit		0025738	0300K	Clear
070	#PTR Unit		0025738	0600K	Clear

01/02

▲Prev

▼Next

d074p905

- ❑ The # mark denotes a unit.
- ❑ Items without the # (for example, 065 ITB) denote individual components.
- ❑ [A]: An asterisk * will appear in the Exceed column [A] to show items that have exceeded their target PM yields.

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No additional notes

Estimated Value Display

SP Mode (PM Parts)

Prev MenuExit

Estimated UsageRate/RemainDays

Select parts

No	Description	Exceed Usage Rate	Remain Days	
001	#PCDU:K	000	255	Clear
003	#Development Unit:K	000	255	Clear
008	#Cleaning Unit:K	000	255	Clear
012	#Charge Roller Unit:K	000	255	Clear
021	#Photo Conductor:K	000	255	Clear
024	#PCDU:C	000	255	Clear
026	#Development Unit:C	000	255	Clear
031	#Cleaning Unit:C	000	255	Clear

01/05

▲ Prev

▼ Next

[A]

[B]

[C]

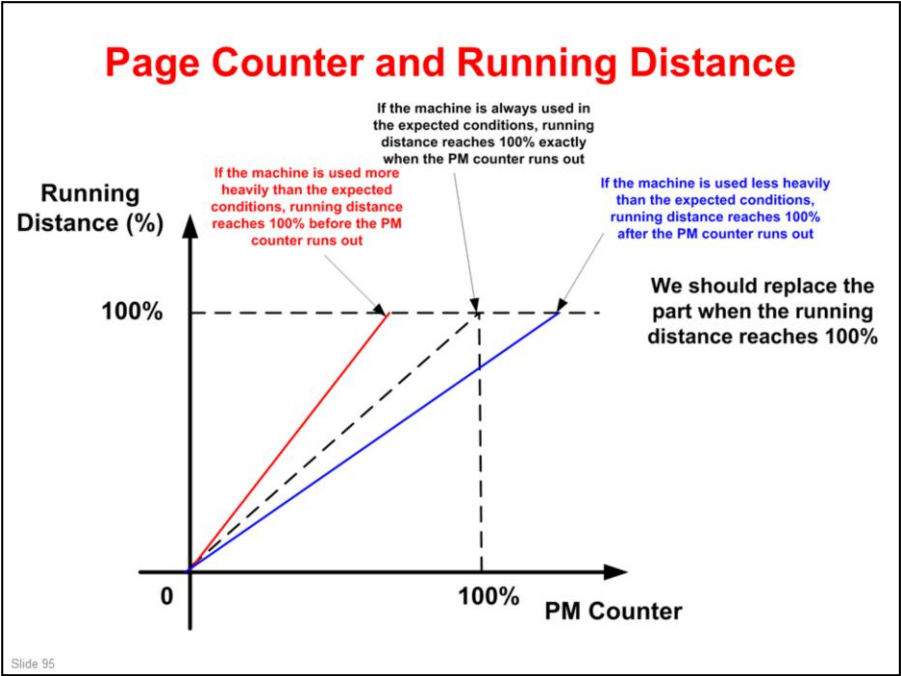
[D]

[E]

- [A]: Number buttons. Pressing a number button opens a submenu.
- [B]: Descriptions. The # mark denotes a “unit” (not individual items).
- [C]: Displays the estimated usage rate (0~100%)
- [D]: Displays the estimated remaining days (255~0 days)
- [E]: Clear button: Just clears the PM counter (Not the same as Ch-C1)

Slide 94

No additional notes



No additional notes

Page Counter and Running Distance

- ❑ PM parts yield is based on the page counter (K) when the customer prints using the target conditions.
- ❑ But, for most PM parts, the yield depends on running distance
 - ◆ See the formula below for how this is calculated.
- ❑ So, a function was added to display the estimated PM yield, in which the running distance is included.

Running Distance (m) (SP7-944-001~127)
= Motor rotation time (s) × Paper speed (mm/s)/1000

Slide 96

- ❑ Motor rotation time: This is the accumulated time that the motor that drives the PM part has been rotating.
- ❑ The machine applies the running distance calculation to display the usage rate and remaining days of parts.
- ❑ With this system, PM can be scheduled with more accuracy according to machine usage conditions unique to every user.
- ❑ Please refer to the usage rate and remaining days when scheduling PM.

Note: Running Distance Data

- ❑ Since the PM parts yield is determined by given conditions (e.g., A4LEF, 26P/J, FC70%, etc), if a machine is used in an unexpected manner, parts could reach their life before the prescribed yield (EM), or on the contrary, could exceed the prescribed yield.
- ❑ However, if a machine refers to the running distance of the parts (which is a calculation based on the total number of revolutions made by the parts), PM can be carried out at more precise timing because the running distance reflects the actual status of the machine.

Estimated Usage Rate Display

- ❑ Displays the larger of these two values: Page counter (SP7-954-xxx), and running distance (SP7-942-xxx).
- ❑ Note that parts such as rollers are displayed using the page counter value since running distance is not measured.

Estimated usage rate % by page counter = $A/B \times 100$

A: Current page counter value (SP7-621-xxx)

B: Standard page end value (SP7-623-xxx)

Estimated usage rate % by running distance = $A/B \times 100$

A: Current distance value (SP7-944-xxx)

B: Standard distance end value (SP7-940-xxx)

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No additional notes

Estimated Remaining Days Display

- ❑ Displays the smaller of these two values: Page counter (SP7-951-XXX), and running distance (SP7-952-XXX).
- ❑ Note that parts such as rollers are displayed using the page counter value since running distance is not measured.

Remaining days by page counter (SP7-951-XXX) = $(A - B) / C$

A: Standard end value by pages (SP7623-xxx)

B: PM page counter (SP7621-xxx)

C: Average PM page counter per day = PM page counter (SP7621-xxx)/Number of days since last replacement

Remaining days by running distance (SP7-952-XXX) = $(A - B) / C$

A: Standard end value by distance (SP7940-xxx)

B: PM distance counter (SP7944-xxx)

C: Average distance per day = PM distance counter (SP7944-xxx)/Number of days since last replacement

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No additional notes

Commissioning Status Report

☐ You can print the Status Report to check the machine status.

- | | |
|--------------------|----------------------------|
| 1. SP7403-001~010 | SC History |
| 2. SP7507-001~010 | Printer Engine Jam History |
| 3. SP7508-001~010 | Original Jam History |
| 4. SP7910-001, 002 | ROM No |
| 5. SP7911-001, 002 | Firmware version |
| 6. SP8581-001 | T: Counter |
| 7. SP8591-001 | O: Counter |

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- ☐ T: Counter – This is the total counter for all applications
- ☐ O: Counter – This is the counter for network and SDK applications

RICOH

**D146/D147/D148/D149/D150
Service Training**

**Detailed Section Descriptions
Machine Overview**

Slide 100

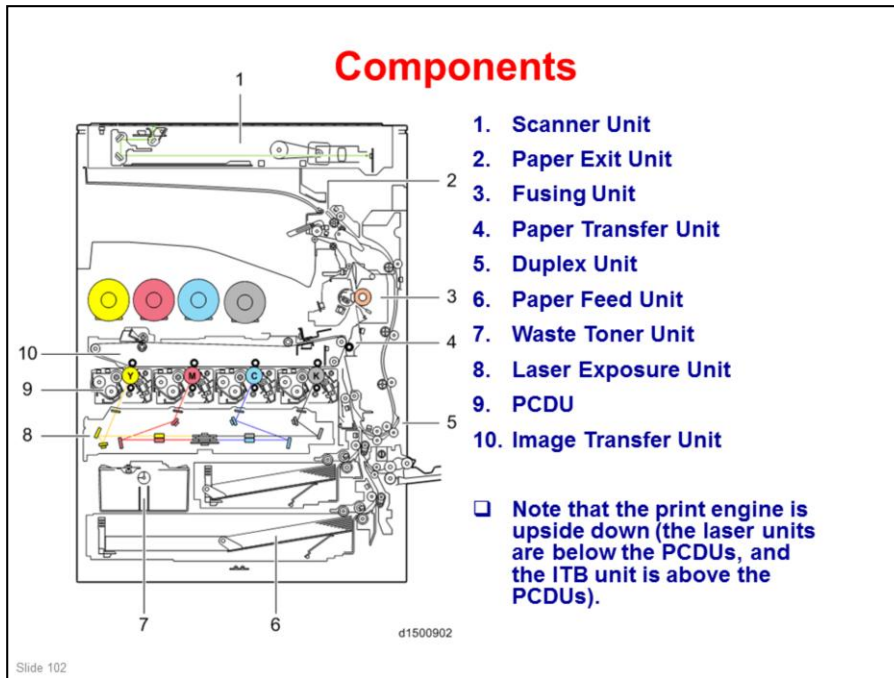
No additional notes

Differences between the Models

	Met-C1a/b	Met-C1c/d/e
Laser diode unit	LD 1 beam	LD 4 beams
Air flow	8 fans	11 fans
Double feed detection	No	Only Met-C1e
Bypass	-	Side fence contact sensor mechanism (Met-C1e only)
Electrical Boards	IPU is not compatible with SPDF	IPU is compatible with SPDF, but an additional board (IPU sub board) is mounted on SPDF models, and must be installed when an optional SPDF is installed.

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No additional notes



No additional notes

Drive Components

The diagram shows the internal drive mechanism of a Ricoh printer. It features a grid with numbers 1 through 22 pointing to various motors and components. The components are arranged in a complex layout, with some labeled with letters K, C, M, and Y. The diagram is a technical illustration showing the mechanical parts and their relative positions within the printer's chassis.

1. Paper feed motor
2. By-pass feed/duplex motor
3. Transport motor
4. Registration motor
5. Image transfer motor
6. Fusing motor
7. Paper eject/pressure release motor
8. Duplex entrance motor
9. Inverter motor
10. Scanner motor
11. Toner bottle drive motor (Bk)
12. Toner bottle drive motor (C)
13. Toner bottle drive motor (M)
14. Toner bottle drive motor (Y)
15. Toner transport motor (Y)
16. Toner transport motor (M)
17. Toner transport motor (C)
18. Toner transport motor (Bk)
19. Color development motor
20. Color PCU motor
21. Black development motor (D148/D149/D150 only)
22. Black PCU/image transfer motor

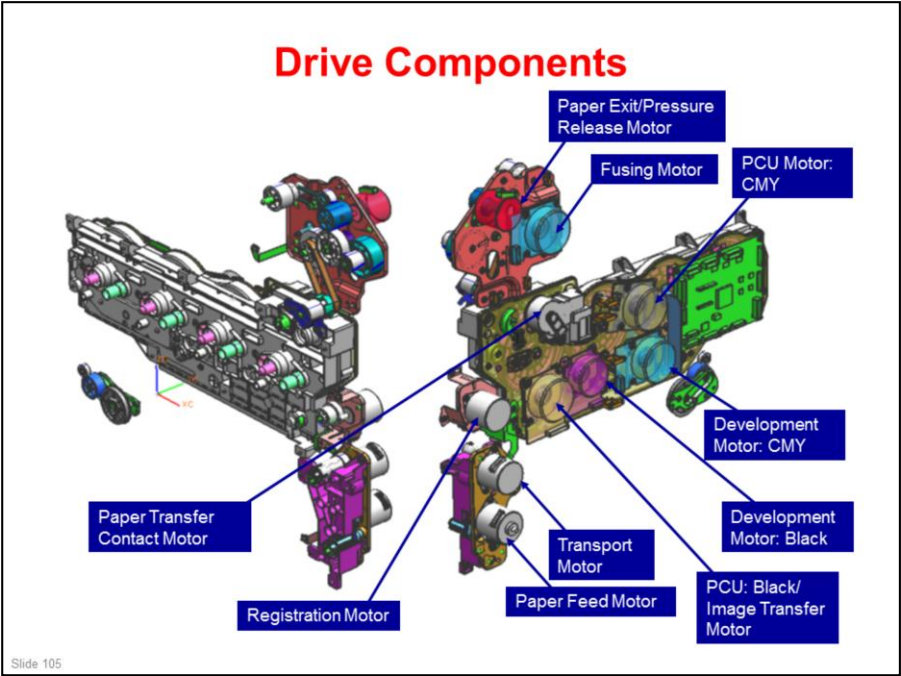
No additional notes

Differences from Predecessors: Drive

	Met-C1	Predecessor	Purpose
1	Individual motors for paper feed and transport (DC motors)	One motor for paper feed and transport (stepper motor), with clutch	Energy saving and higher productivity

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No additional notes



No additional notes

Drive Components - 1

- ❑ **PCU: Black / Image Transfer Motor**
 - ◆ Drives the black PCU, ITB, PTR, and waste toner bottle
- ❑ **Development Motor: Black**
 - ◆ Drives the black development unit
- ❑ **PCU Motor: CMY**
 - ◆ Drives the C, M, and Y PCUs
- ❑ **Development Motor: CMY**
 - ◆ Drives the C, M, and Y development units
- ❑ **Toner Bottle Drive Motor**
 - ◆ Drives the toner bottles; one for each color
- ❑ **Toner Transport Motor**
 - ◆ Drives the sub-hoppers between the toner bottles and the development units; one for each color
- ❑ **Paper Transfer Contact Motor**
 - ◆ Drives the PTR contact mechanism

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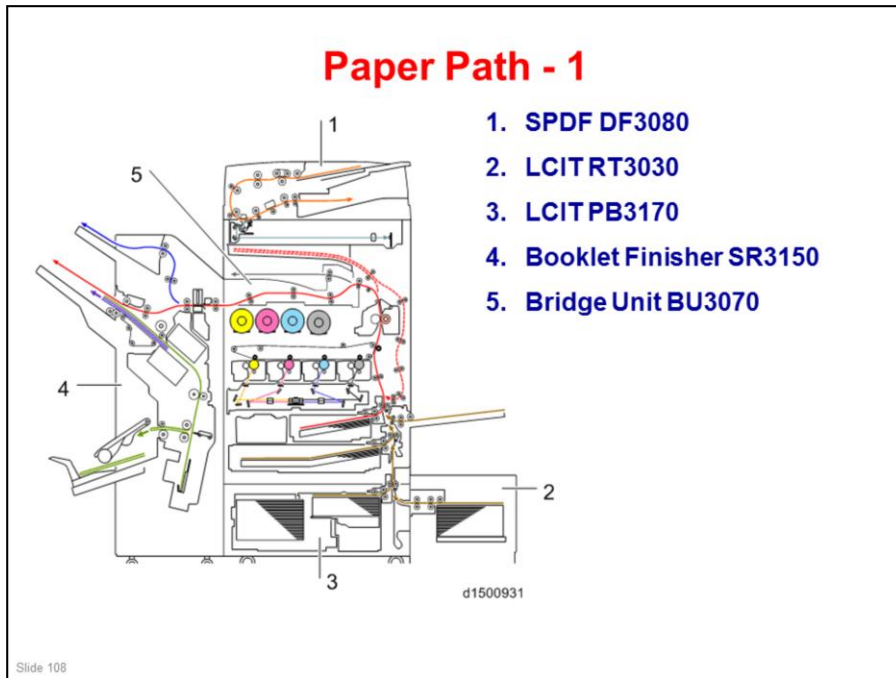
No additional notes

Drive Components - 2

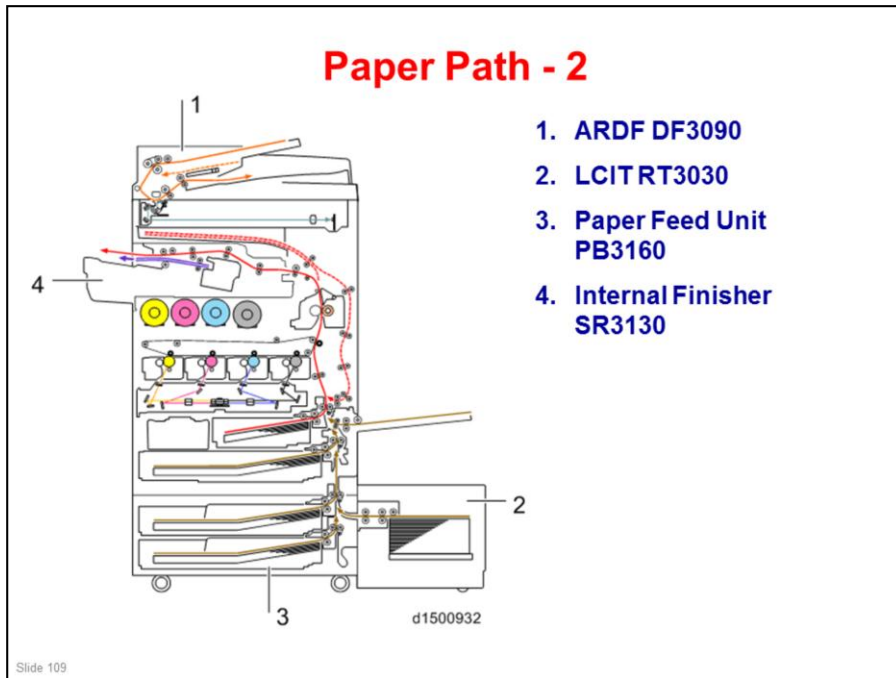
- ❑ **Paper Feed Motor**
 - ◆ Drives the pick-up and feed rollers
 - ◆ For tray 1, drives clockwise (as seen from the output shaft side)
 - ◆ For tray 2, drives counter-clockwise
- ❑ **Transport Motor**
 - ◆ Drives the transport rollers
 - ◆ For tray 1, drives clockwise (as seen from the output shaft side)
 - ◆ For tray 2, drives counter-clockwise
- ❑ **Registration Motor**
 - ◆ Drives the registration rollers
- ❑ **Fusing Motor**
 - ◆ Drives the fusing unit
- ❑ **Paper Exit / Pressure Release Motor**
 - ◆ Clockwise (as seen from the output shaft side): Fusing pressure release
 - ◆ Counter-clockwise: Paper exit rollers

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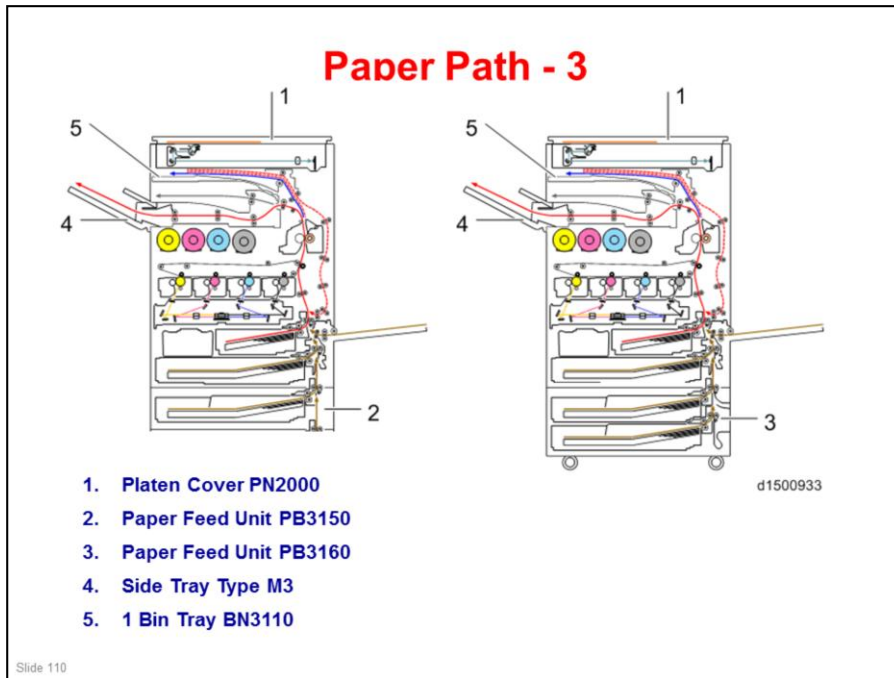
No additional notes



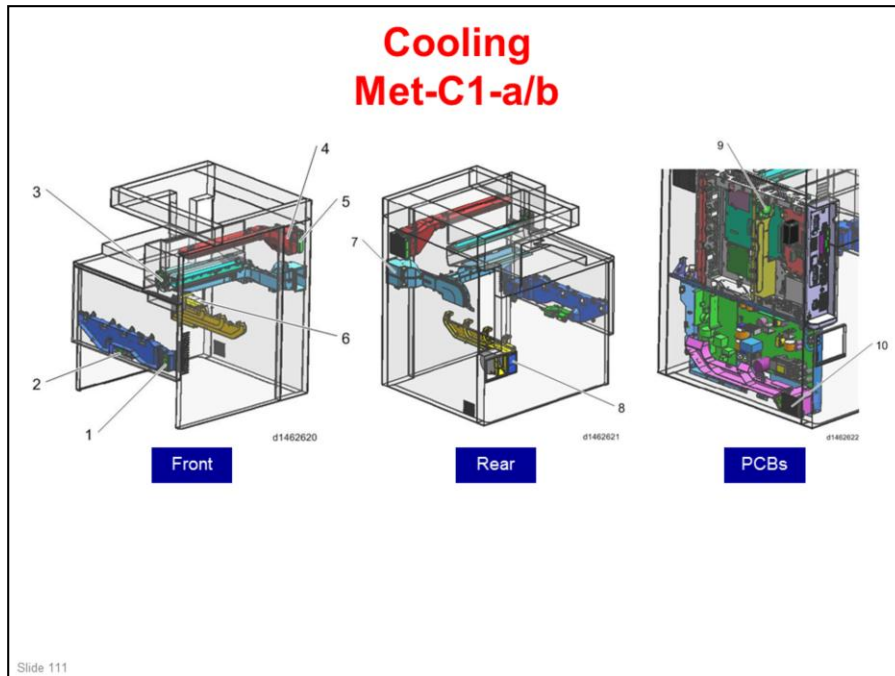
No additional notes



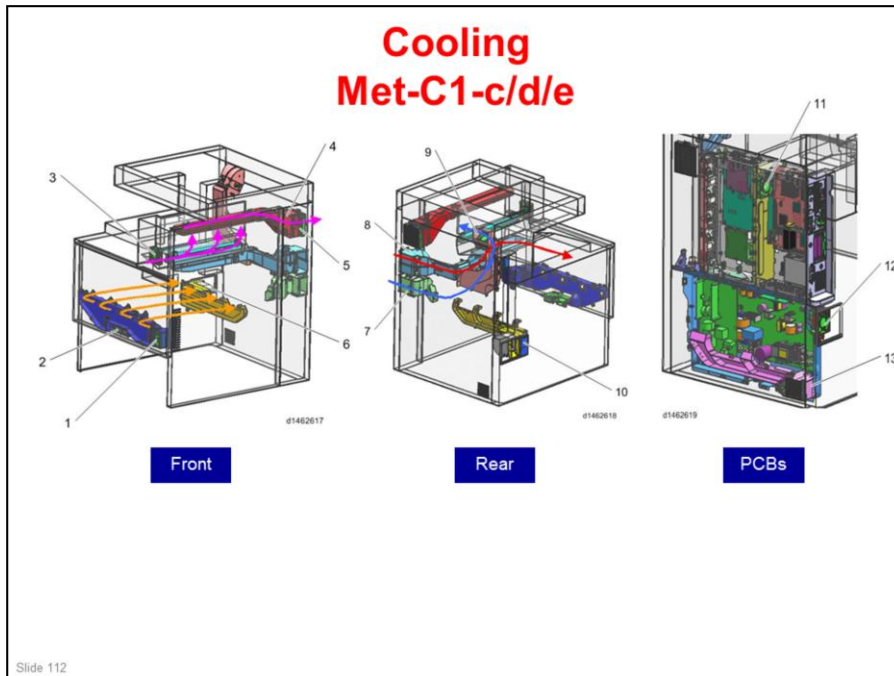
No additional notes



No additional notes



1. Development air intake fan / right
2. Development air intake fan / left
3. Paper discharge cooling fan
4. Fusing heat discharge fan
5. Odor filter
6. Ozone exhaust fan
7. Toner supply cooling fan
8. Ozone filter/Dust filter
9. Electric box cooling fan
10. PSU cooling fan



1. Development air intake fan / right
2. Development air intake fan / left
3. Paper discharge cooling fan
4. Fusing heat discharge fan
5. Odor filter
6. Ozone exhaust fan
7. Drive cooling fan (Met-C1c/d/e only)
8. Toner supply cooling fan
9. Main body exhaust fan (Met-C1c/d/e only)
10. Ozone filter/Dust filter
11. Electric box cooling fan
12. PSU heat discharge fan (Met-C1c/d/e only)
13. PSU cooling fan

Cooling
Functions of the Fans

Call-out	Fan	Intake/Exhaust	Model
1	Development air intake fan / right	Intake	ab, cde
2	Development air intake fan / left	Intake	ab, cde
3	Paper discharge cooling fan	Exhaust	ab, cde
4	Fusing heat discharge fan	Exhaust	ab, cde
5	Odor filter	Exhaust	ab, cde
6	Ozone exhaust fan	Exhaust	ab, cde
7	Drive cooling fan	Intake	cde
8	Toner supply cooling fan	Intake	ab, cde
9	Main body exhaust fan	Exhaust	cde
10	Ozone filter/Dust filter	Exhaust	ab, cde
11	Electric box cooling fan	Intake/Exhaust	ab, cde
12	PSU heat discharge fan	Exhaust	cde
13	PSU cooling fan	Intake	ab, cde

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No additional notes

Cooling Notes - 1

- ❑ PSU heat discharge fan: Met-C1c/d/e only
- ❑ Toner supply cooling duct: The shape of the duct for Met-C1c/d/e is different from Met-C1a/b.
- ❑ Paper is cooled immediately after fusing, to reduce the temperature of the stack, and to reduce curling. Also reduces condensation in the paper exit area.
- ❑ During output, the operation of fans depends on the machine's internal temperature (see the next slide).
 - ◆ This temperature is measured by a temperature/humidity sensor at the rear of the PCUDs.
- ❑ After output, the fans stay on until the machine cools enough.

Slide 114

- ❑ Cooling is increased over the Ap/At series, because the Met series uses all motors and a few clutches, and the Met is more compact.

Cooling
Notes - 2

Imaging Area Temperature	<34	34	35	36	37	38	40 *1
Fusing heat discharge fan	On	On	On	On	On	On	On
Ozone exhaust fan	20%	20%	30%	30%	40%	40%	40%
Toner supply cooling fan	On	On	On	On	On	On	On
Development air intake fan / left	On	On	On	On	On	On	On
Development air intake fan / right				On	On	On	On
Drive cooling fan				On	On	On	On
Main body exhaust fan				On	On	On	On
Paper discharge cooling fan *2	On	On	On	On	On	On	On
PSU fan *2	On	On	On	On	On	On	On
PSU heat discharge fan *2	On	On	On	On	On	On	On
Electric box cooling fan *2	On	On	On	On	On	On	On

- *1 If the imaging temperature reaches 39° C (D148/D149/D150), 42° C (D146/D147) each fan will continue operating until the temperature falls by 2° C.
- *2 These fans turn on in these conditions:
 - ◆ When the time since the previous job is less than 10 minutes.
 - ◆ Or, when the time since the previous job is more than 10 minutes, and 5 minutes have elapsed since the machine started.

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No additional notes

Cooling Notes - 3



- ❑ This thermistor [A] inside the machine controls the cooling fans.

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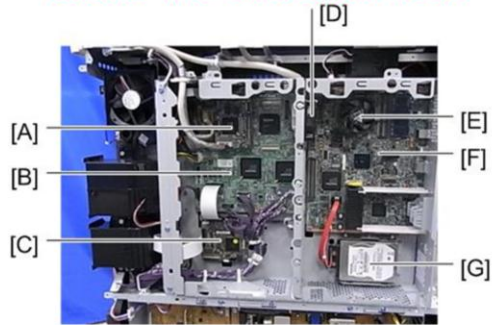
No additional notes

Differences from Predecessors: Electrical Components			
	Met-C1	Predecessor	Purpose
LCD	Two types of LCD (not compatible with each other)	One type of LCD	
IOB	Two IOBs for image creation and paper transfer	One IOB	Optimized layout
NVRAM	Two EEPROMs	One	
FFC	1. FFC used for main signal line 2. 2 piece connection	1. Wire harness 2. Only flat cable	1. Weight reduction 2. Easier to handle
Main switch	1. DC SW 2. Press and hold = forced power off	1. Rocker SW 2. The plug must be pulled out to force power off.	
Fax	Bracket added to the replacement FCU part	No bracket for the FCU	Easier to handle

Slide 117

No additional notes

Locations of PCBs Inside the Controller Box

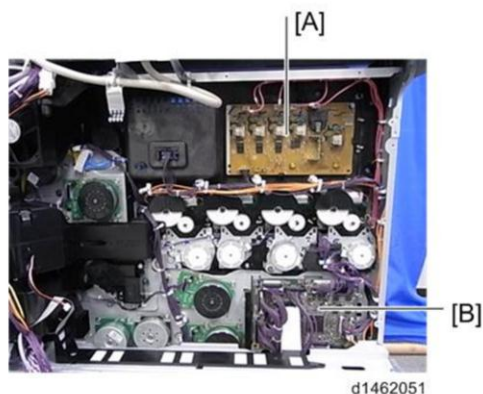


- A) IPU Sub (only if an SPDF is present)
- B) IPU
- C) BCU
- D) Controller Box Cooling Fan
- E) CPU Cooling Fan
- F) Controller Board
- G) HDD

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No additional notes

Locations of PCBs Behind the Controller Box



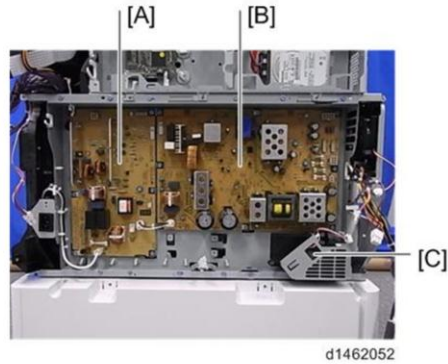
A) HVP_TTS

B) Imaging IOB

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- ❑ Note that there are two IOB boards. One is the Imaging IOB (for the printer engine), and the other is the paper transport IOB (for the paper feed components).

Locations of PCBs Inside the Power Box

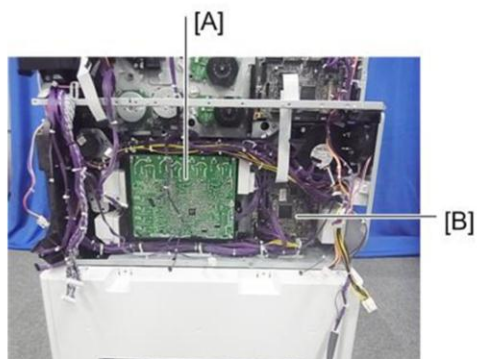


- A) PSU (AC controller board)
- B) PSU (DC Power)
- C) PSU Cooling Fan

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No additional notes

Locations of PCBs Behind the Power Box



d1462053

A) HVP_CB

B) Paper Transport IOB

Slide 121

No additional notes

Differences from Predecessors:
Notes Concerning Servicing

	Met-C1	Predecessor
Procedure at electrical board replacement	Must always hold the main switch down before starting a procedure for electrical board replacement (in order to remove residual charge)	No procedure
Grease used in the fusing unit	Grease for use with metal (Fluotraibo) on pressure roller and bushing.	Traditional grease (Barierta)
Release for Fusing high temperature detection	Fusing unit replacement is required <u>only</u> for SC544/554.	Fusing unit replacement is required for SC544/554/564/574.
Imageable area extension option	SP setting is required at the installation (25 Sps now, will be changed to 1 SP). The PM yield is the same as the normal PTR. Regular PM replacement is required.	—
VM function on the controller board	VM is built into the controller board. Accordingly, the procedure to update VM firmware is changed.	VM function is provided as an SD card option.

Slide 122

No additional notes

Caution Before Removing Components



- ❑ **Even if you turn the power switch off, +5V is still supplied. So do the following before you start work.**
 1. Push the power switch [A] on the machine.
 2. Wait 3 minutes to shut down.
 3. Take out the power cord.
 4. Push the power switch [A] again to remove the residual charge.

Slide 123

No additional notes

Starting the Machine Again

- ❑ To start the machine, press the main power switch.
- ❑ If you press the main power switch between the beginning and the end of a shutdown, the machine will not start.

Slide 124

No additional notes

Forced Shutdown

- ❑ In case normal shutdown does not complete for some reason, the machine has a forced shutdown function.
- ❑ To make a forced shutdown, press and hold the main power switch for 6 seconds.
- ❑ In general, do not use the forced shutdown. Forced shutdown may damage the hard disk and memory, and can cause damage to the machine. Use a forced shutdown only if it is unavoidable.

Slide 125

No additional notes

Replacement of Parts

General Notes

- ❑ **Some of the covers have tabs on them which break easily.**
 - ◆ The procedures in the service manual have diagrams to show where the tabs are. Take care not to break them when handling the covers.

Slide 126

No additional notes

Replacement of Parts Order for Removing Covers

❑ Remove covers in the following order.



1. Paper exit tray
2. Controller cover
3. Ozone filter/Dust-shield filter box
4. Front cover
5. Upper left cover
6. Left rear cover
7. 2nd paper feed tray
8. Left cover

Slide 127

No additional notes

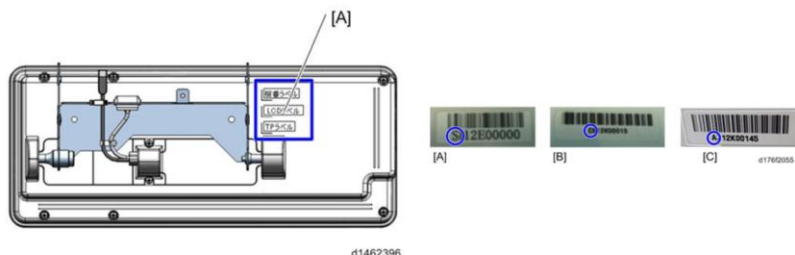
LCD Panels - 1

- ❑ LCD panels from three different vendors are used.
- ❑ Depending on which type is used in the machine, the bracket for attaching these has a different shape. Also, the exterior cover on the machine has a different shape.
- ❑ So, if you replace the LCD panel, make sure that you install the correct type.

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No additional notes

LCD Panels - 2



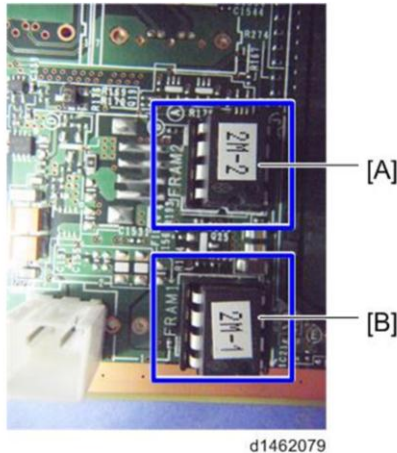
- ❑ How to determine the correct type to install?
- ❑ There are three labels on the rear of the operation panel. The center label [A] shows the LCD model number.
- ❑ The first letter is either an S or a C or an A, to indicate the different vendors.
- ❑ Panels from vendor S and vendor A are interchangeable.
- ❑ If your machine has a label starting with S, you can replace the LCD with another one that has a label starting with S or A.
- ❑ If your machine has a label starting with A, you can replace the LCD with another one that has a label starting with S or A.
- ❑ If your machine has a label starting with C, you can only replace the LCD with another one that has a label starting with C.

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Replacement and Adjustment > Controller Unit > LCD

- ❑ See the above section of the service manual for more details on replacing the two types of LCD panel.

Replacing NVRAMs on the Controller Board - 1



d1462079

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- ❑ **Make sure that the NVRAMs are installed in the correct sockets.**
 - ♦ The chip with 2M-1 on it must be in the socket with FRAM1 next to it.
 - ♦ The chip with 2M-2 on it must be in the socket with FRAM2 next to it.
- ❑ **Make sure that the NVRAMs are installed in the correct orientation.**
 - ♦ The notches in the NVRAMs must point down as shown in the photo.
 - ♦ Note that you are not prevented mechanically from installing these the wrong way round, so be careful.
 - ♦ If you install them the wrong way round, the NVRAMs and the controller board may be damaged.

No additional notes

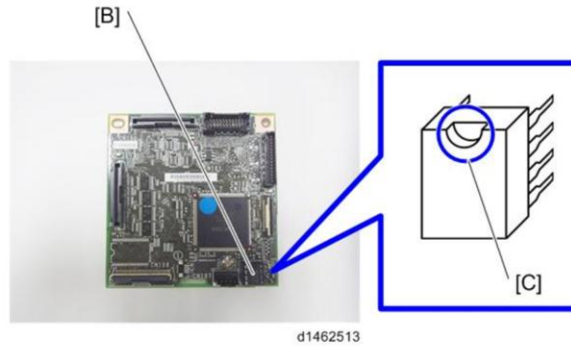
Replacing NVRAMs on the Controller Board - 2

- ❑ **When a brand-new NV-RAM is installed in a machine that has a smart operation panel, some SPs will be reset to the initial values and a SC will occur. In that case, follow the instructions in the service manual and reset the SC.**
 - ♦ See the procedure 'NVRAMs on the controller board'.
 - ♦ The procedure is long and complicated, so follow it carefully.
 - ♦ Note that you must have a backup of the address book before you start to replace the NVRAMs.
 - » It is best to use the customer's own backup, because if you take a backup just before replacing a defective NVRAM, the data may be corrupted.

Slide 131

No additional notes

Replacing the EEPROM on the BCU Board



- ❑ Install the EEPROM [B] the correct way around.
 - ◆ The indentation [C] must point upwards.

Slide 132

No additional notes

RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions
Scanner**

Slide 133

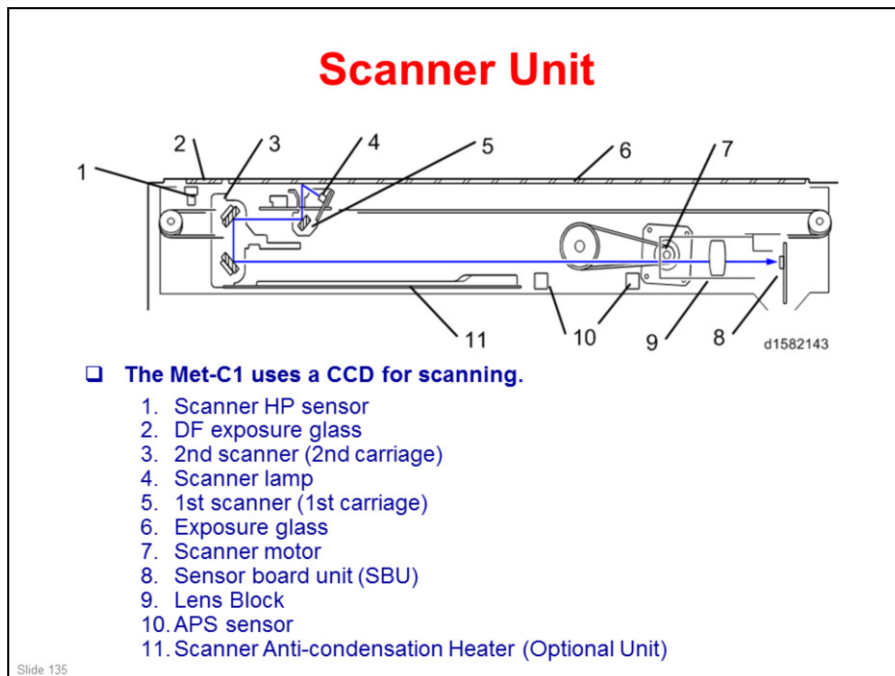
This section describes the scanner.

Differences from Predecessors: Scanner unit

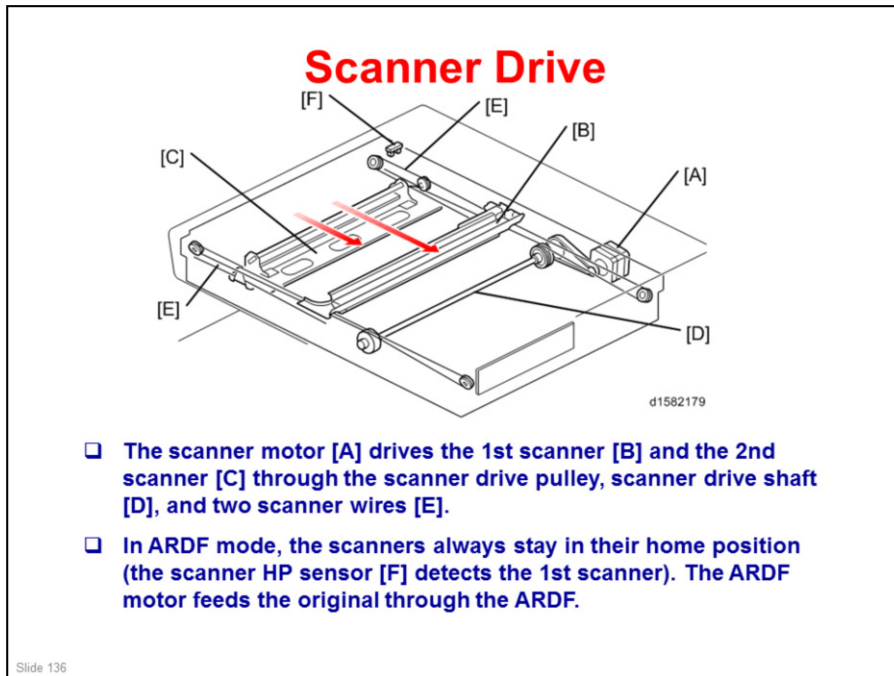
	Met-C1	Predecessor	Purpose
1	LED Scanning on all models	45/55 CPM halogen scan	Energy saving
2	Non contact sheet-through scan (DF use)	Contact sheet-through scan	Reduction of black line occurrence

Slide 134

No additional notes



- ❑ The original on the exposure glass or ARDF exposure glass reflects the light emitted from the scanner lamp. The reflected light goes to the CCD on the sensor board by way of the 1st and 2nd scanners. The sensor board converts the CCD analog signals into digital signals.
- ❑ When the original is manually placed on the exposure glass, the scanner motor pulls the 1st and 2nd scanners via mechanical linkage. The original is scanned from left to right.
- ❑ When the original is fed from the optional ARDF, it is automatically fed over the ARDF exposure glass, and to the original exit. The 1st and 2nd scanners stay at their home positions below the ARDF exposure glass.
- ❑ The anti-condensation heater is available as an optional unit. It prevents condensation on the mirrors. Condensation can occur when the scanner unit is, for example, moved from a cold room to a warm room. Condensation can cause abnormal images.



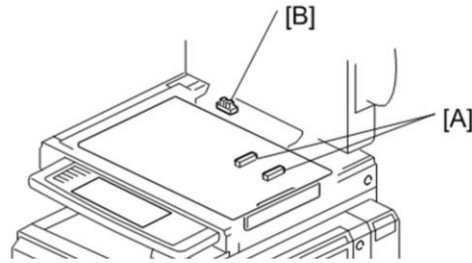
Book mode

- ❑ The SBU board controls the scanner drive motor. The 2nd scanner speed is half that of the 1st scanner.
- ❑ In reduction or enlargement mode, the scanning speed depends on the magnification ratio. The returning speed is always the same, whether in full size or magnification mode. The image length change in the sub scan direction is done by changing the scanner motor speed. In the main scan direction it is done by image processing on the BCU board.
- ❑ You can adjust the magnification in the sub-scan direction by changing the scanner motor speed with SP4-008.

ARDF mode

- ❑ The scanners always stay in their home position (the scanner HP sensor [F] detects the 1st scanner) to scan the original. The ARDF motor feeds the original through the ARDF. In reduction/enlargement mode, the image length change in the sub-scan direction is done by changing the ARDF motor speed. Magnification in the main scan direction is done in the BCU board. This is the same as for book mode.
- ❑ You can adjust magnification in the sub-scan direction by changing the ARDF motor speed with SP6-017.

Original Size Detection – Platen Mode



- ❑ There are no original width sensors in the scanner unit.
- ❑ The CCD detects the original width. The APS length sensors [A] detect the original length.
- ❑ The BCU board checks the sensors when the platen cover sensor [B] is activated as it is closed.
 - ◆ If the copy is made with the platen cover open, the CPU determines the original size from the sensor outputs after the Start key is pressed.

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No additional notes

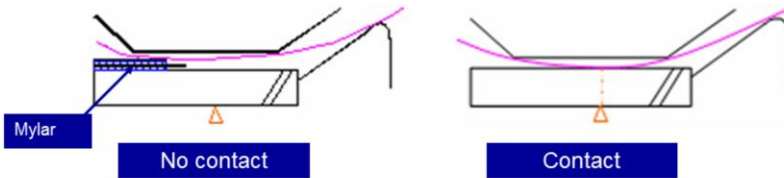
Original Size Detection – Notes

- ❑ By changing SP4-305-001, you can change between A4 size/letter size and Chinese paper size (8 × 16).
- ❑ If the user specifies that the pre-scan lamp is too bright, the brightness for the pre-scan can be reduced by decreasing the value of SP4-309-004. However, if the lamp brightness is reduced, size detection may be less accurate for a document with a large number of solid images.

Slide 138

No additional notes

ADF Exposure Glass: No contact vs Contact



- ☐ Originals that have sticky substances on the surface may cause streaks on the exposure glass.
- ☐ To prevent these streaks, the ADF exposure glass has a mylar, which guides the original over the glass so that it does not contact the glass.
- ☐ This method has one demerit: any dust that attached to the exposure glass will stay there and will not be swept away by originals passing through.
- ☐ However, the dust detection feature described on the next few slides can help with this.
- ☐ Met-C1 uses the no contact type, but it can be converted to a contact type.

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- ☐ To convert between contact and no contact type scanning:
 - Replacement and Adjustment > Scanner Unit > Modifying the Scanner (contact/contactless) when using ARDF
 - Replacement and Adjustment > Scanner Unit > Modifying the Scanner (contact/contactless) when using SPDF

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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- ❑ This function is the same as V-C3.

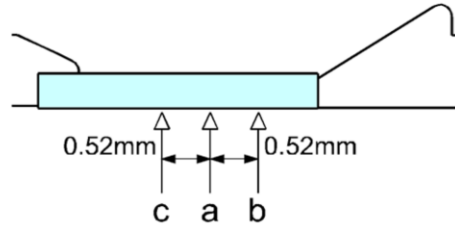
Dust Detection - SP 4020

- ☐ SP 4020 001: Enable/disable (default – disabled)
- ☐ SP 4020 002: Sensitivity adjustment
- ☐ SP 4020 003: Do not adjust in the field
- ☐ SP 7852: Counts how many times the machine detected dust on the ADF.

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No additional notes

Dust Detection – Action Taken



- ❑ When dust detection determines that dust exists, the scan point shifts in order to avoid the dust.
- ❑ There are three scanning points.
 - ♦ a: Home position
 - ♦ b: The first time that dust is detected, the scanner moves here.
 - ♦ c: The next time that dust is detected, the scanner moves here.
 - ♦ If dust is detected again, the scanner moves back to a. Then with consecutive dust detections, the scanning position cycles a > b > c > a > b > c, etc

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No additional notes

RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions****Laser Unit**

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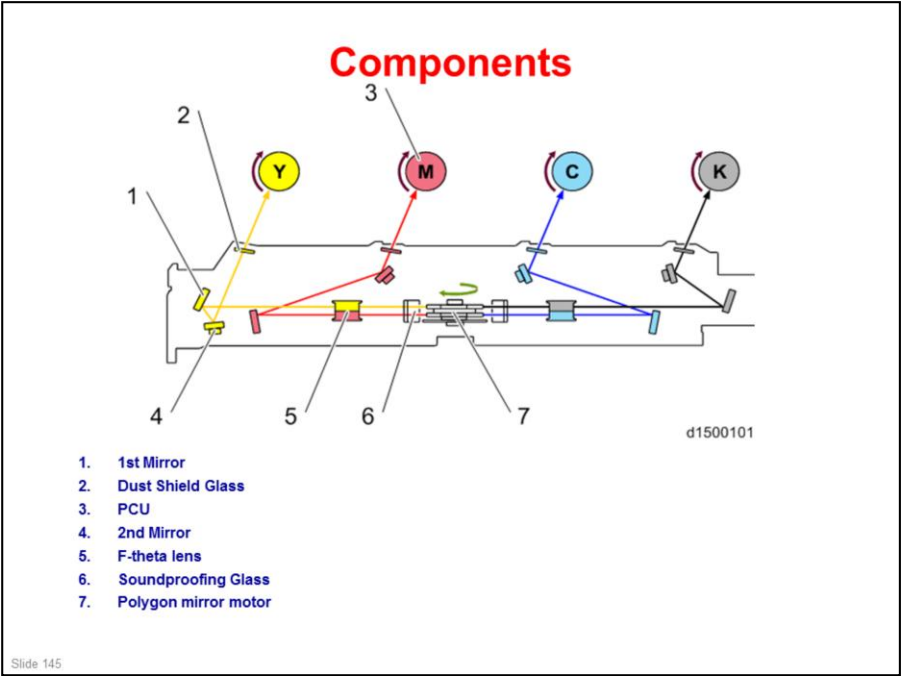
This section describes the laser unit.

Differences from Predecessors: Laser unit

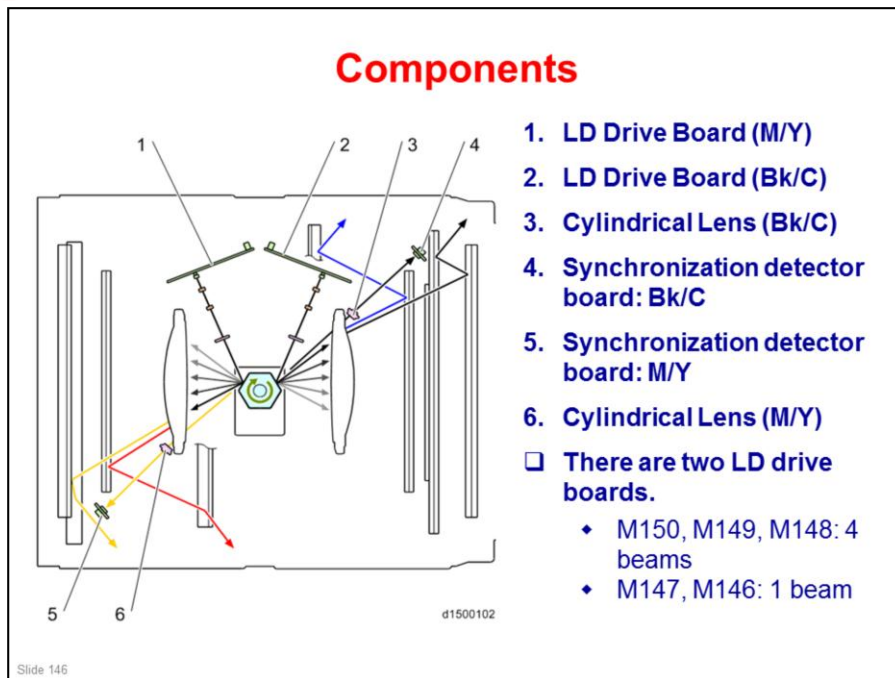
	Met-C1	Predecessor	Purpose
1	<div>Adjustment after replacing the laser unit replacement</div> <div><input type="checkbox"/>Download the SP values from the unit</div> <div><input type="checkbox"/>One SP for coarse and fine MUSIC adjustment</div>	<div>Adjustment after replacing the laser unit replacement</div> <div><input type="checkbox"/>Input values into SP mode by hand by referring to a sheet included with the unit.</div> <div><input type="checkbox"/>Two SPs for coarse and fine MUSIC adjustment</div>	Easier to service

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No additional notes



No additional notes



No additional notes

LD Safety Switch

- ❑ To prevent the laser beam from turning on when the front cover or duplex unit is open, the 5V supply to the LD Drive Board is interrupted when the interlock switch is open.

Slide 147

No additional notes

Skew Adjustment

- ❑ The 2nd mirrors for C, M, and Y have a motor to adjust the angle of the mirror to align the scan lines with black.

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No additional notes

Replacing the Laser Unit

- ☐ Execute SP modes as explained in the service manual to download the correction values from the new laser unit.
- ☐ Don't connect the skew correction motor harness until after you have done the SP modes.
- ☐ It is not necessary to execute color registration after replacing the laser unit.

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No additional notes

RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions****PCDU**

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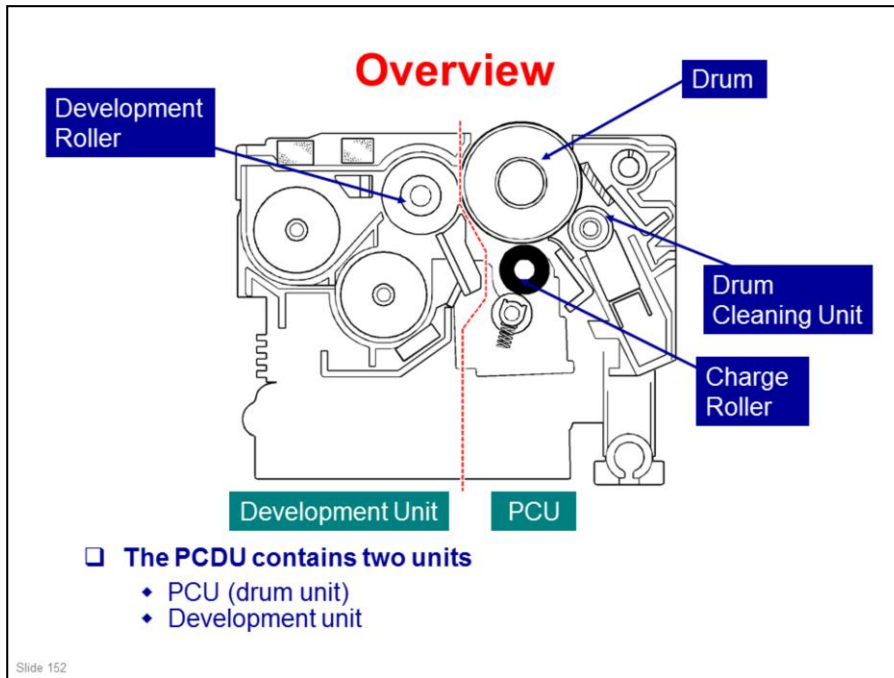
This section describes the processes around the drum.

Differences from Predecessors: PCDU

	Met-C1	Predecessor	Purpose
1	Spring release procedure needed at unit replacement for some models	No spring release procedure	Optimization of PM yield and compatible units for each model
2	Harness connection at machine installation	Drawer connection	Simplified the unit layout
3	Heat seal removal needed at machine installation and unit replacement	Heat seal removal needed only at unit replacement	

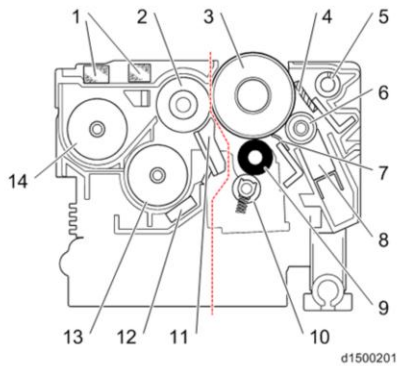
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No additional notes



No additional notes

Layout



1. Inner pressure adjustment filter
2. Development roller
3. OPC drum
4. Cleaning blade
5. Toner collection auger
6. Lubricant roller
7. Lubricant blade
8. Lubricant bar
9. Charge roller (non-contact)
10. Cleaning roller (charge roller)
11. Doctor blade
12. TD sensor
13. Developer supply coil
14. Developer collection coil

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No additional notes

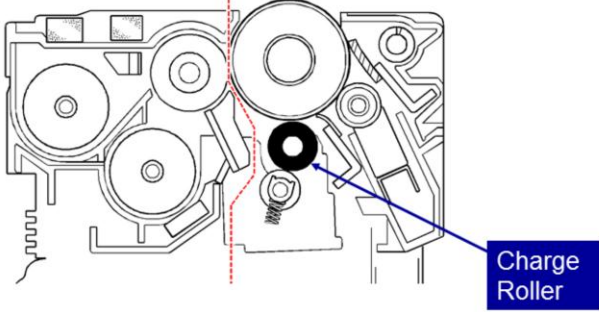
Differences from Predecessors: PCU

	Met-C1	Predecessor	Purpose
1	PCU diameter 30mm	PCU diameter 40mm	Machine size reduction
2	Distance between drum and charge roller: 50μm	Distance between drum and charge roller: 18μm	Reduction of charge roller dirt
3	Attachment of lubricant blade is in the forward direction	Attachment of lubricant blade is in the backward direction	Machine size reduction

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No additional notes

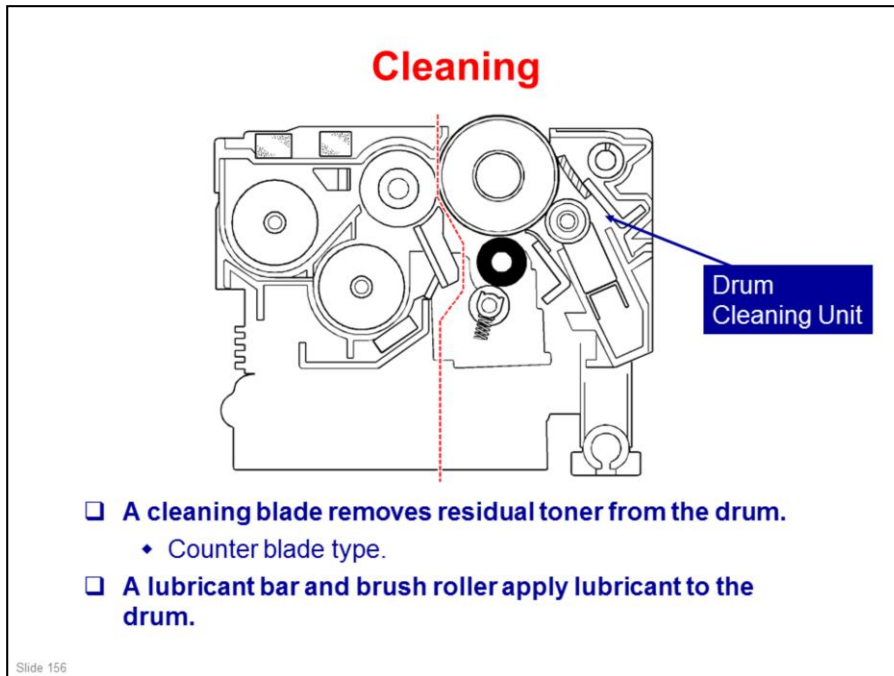
Charge



- ❑ A charge roller is used for each drum.
- ❑ The charge roller rotates with the drum.
- ❑ The life of the drum is extended by separating the charge roller from the drum by about 50 μ .
- ❑ When the charge roller is dirty, an uneven charge is generated, so a cleaning roller always contacts the charge roller.

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No additional notes

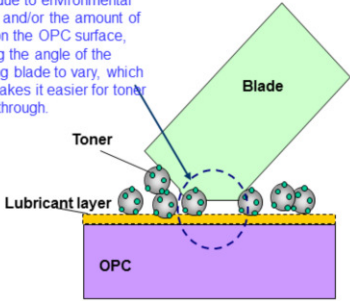


No additional notes

New Drum Lubricant

◆ Previous lubricant system

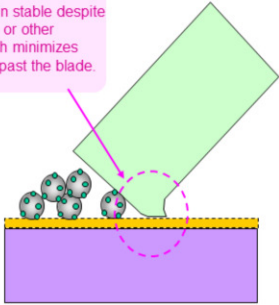
The lubricant's performance/effectiveness drops due to environmental factors and/or the amount of toner on the OPC surface, causing the angle of the cleaning blade to vary, which then makes it easier for toner to slip through.



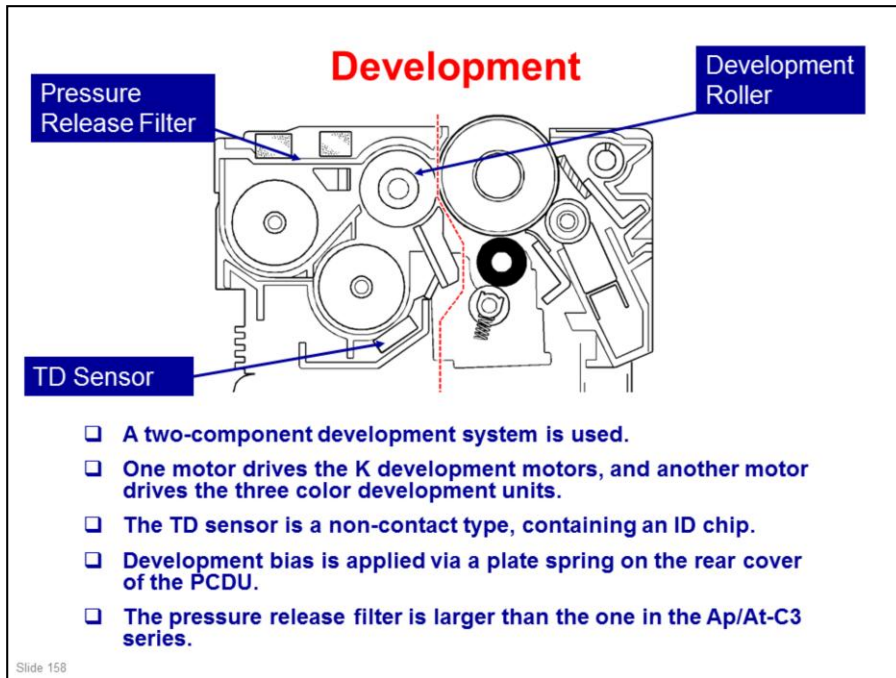
Labels: Blade, Toner, Lubricant layer, OPC

◆ New lubricant system

Improvements in the function of the lubricant allow the blade to remain stable despite environmental or other changes, which minimizes toner slipping past the blade.



No additional notes



In the ID chip, the following data is stored.

- ❑ Model series ID
- ❑ New PCDU information
- ❑ Color information
- ❑ Developer replacement information
- ❑ PCU replacement information
- ❑ Sensor serial no., date of manufacture
- ❑ Date of unit installation
- ❑ Unit total counter at installation (no. of sheets, travel distance)
- ❑ Date of unit operation
- ❑ Unit total counter during operation (no. of sheets, travel distance)
- ❑ Unit parts information
- ❑ Total counter
- ❑ Total color counter

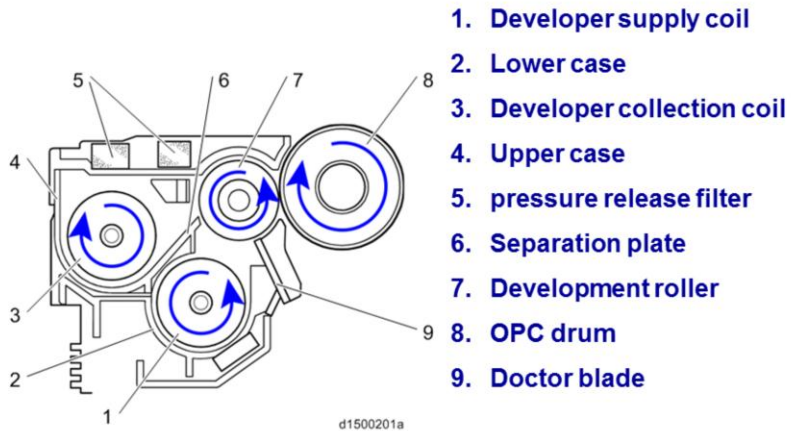
Differences from Predecessors: Development

	Met-C1	Predecessor	Purpose
1	Developer moves through the unit along one path	Developer moves through the unit along more than one path	Stabilization of image density along to main direction
2	New carrier (HS carrier)	-	High image quality High productivity
3	Development roller diameter: 20mm Mixing coil diameter: 22mm	Development roller diameter: 18 mm Mixing coil diameter: 14 mm	More developer
4	Pressure release filter is larger	-	Prevention of toner scattering

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No additional notes

Development Unit Components

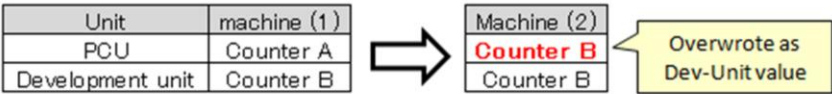


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No additional notes

Replacing Note for PCDU or PCU

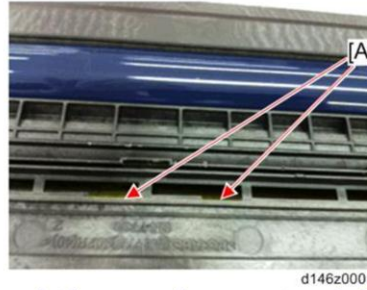
- ❑ Before replacing a PCDU or PCU, set SP3-701 to "1" for the PCU that you will replace, and again (if you are replacing a PCDU) for the development unit that you will replace. Then switch the power OFF.
- ❑ If you forget this procedure, the counter of the PCU will be overwritten with the development unit value.
- ❑ DO NOT exchange a PCDU or PCU unit between field machines. (The counters will be overwritten.)



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- ❑ SP3-701-002 PCU Bk
- ❑ SP3-701-003 Dev Bk
- ❑ SP3-701-025 PCU C
- ❑ SP3-701-026 Dev C
- ❑ SP3-701-048 PCU M
- ❑ SP3-701-049 Dev M
- ❑ SP3-701-071 PCU Y
- ❑ SP3-701-072 Dev Y

Removing the Preset Seal on a New PCDU

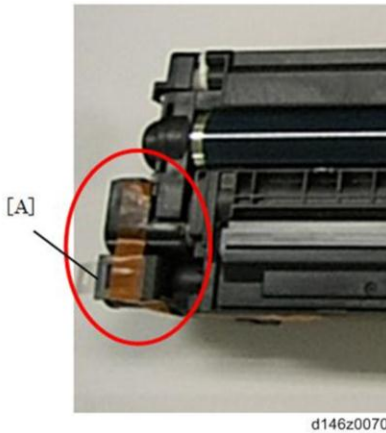


- ❑ **Make sure to completely remove the orange tapes before removing the preset seal on a new PCDU. Otherwise, the ribs [A] inside the unit may be broken and fall into the development unit. This causes white lines to appear on outputs.**
 - ◆ D149/D150: These machines also have a component that prevents compatibility of the PCDU with D149/D150.. This must also be removed before installation. It is explained briefly on the slides 'Replacing the PCDU or PCU on a D149 or D150'. See the service manual for full details of the procedure.
- ❑ **The service manual shows how to remove the orange tapes and the seal correctly for each model.**

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Replacement and Adjustment > PCDU > Notes when removing a PCDU

Removing the Toner Supply Cap on a New PCDU



d146z0070

- ❑ Make sure that the cap [A] of the toner supply opening is removed before installing a new PCDU in the machine. Otherwise, toner may be scattered inside the machine.

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Replacement and Adjustment > PCDU > Notes when removing a PCDU

Replacement - 1

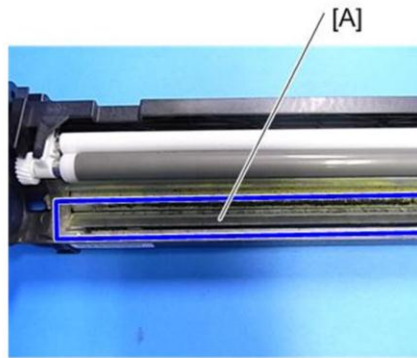


- ☐ Take care not to damage the part of the rear end block shown by the blue circle.
- ☐ Otherwise, electrical contact may become poor, and this may cause poor image quality.

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No additional notes

Replacement - 2



d1462169

- ❑ If you join the drum unit and development unit while pressing the charge roller, the cleaning blade [A] may turn over in the opposite direction to the original. If this happens, toner lines may appear on prints.

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No additional notes

Replacement - 3



- ❑ Turn the drum in the direction of the arrows before attaching to the main body, and check that toner lines do not appear.
- ❑ When you install a new development unit or PCDU, the counter is not reset automatically.
 - Before replacing the unit, set SP3-701 for the unit you will replace to "1" and switch the power OFF. If you replace a complete PCDU, you need to set one SP for the PCU (which is the drum unit), and another for the development unit.
 - Then replace the unit and switch the power ON.
 - The counter will be reset

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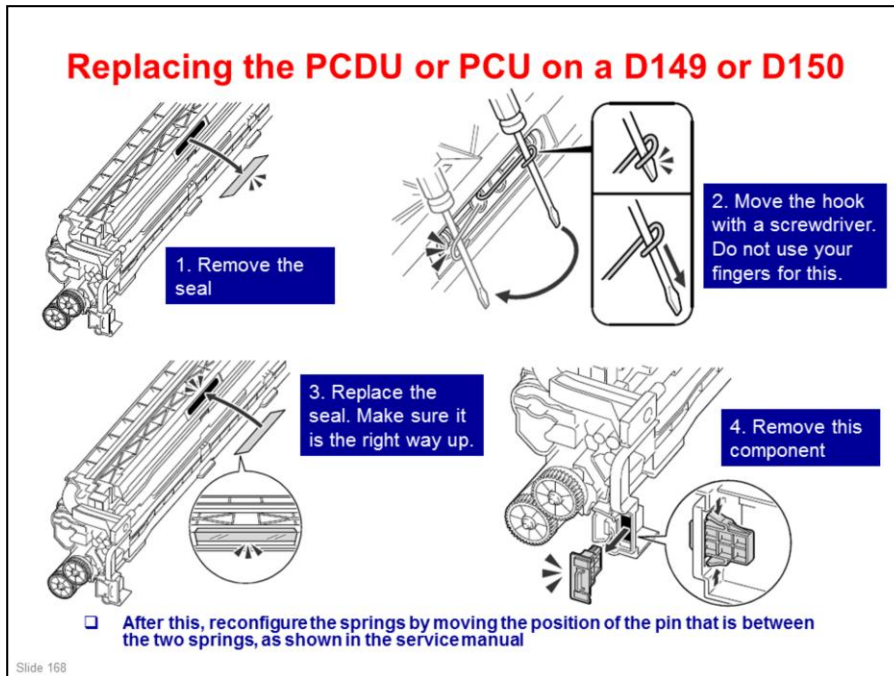
No additional notes

Replacing the PCDU or PCU on a D149 or D150

- ❑ An additional procedure is required when replacing the PCDU or PCU (drum unit) on the D149 and D150.
 - ◆ This is not necessary for the D146, D147, or D148.
- ❑ During this procedure, spring pressure is adjusted. If this is not done, the lubricant bar is consumed more quickly, and the life of the PCDU will be reduced by 90%.
- ❑ The procedure is printed on a sheet that comes with the PCDU.
- ❑ The main points are shown on the next slide.

Slide 167

No additional notes



Replacement and Adjustment > PCDU > Notes when removing a PCDU > D149/D150 > Configuring the Springs

- ❑ Step 4. This component prevents compatibility with D149/D150.

RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions
Toner Supply**

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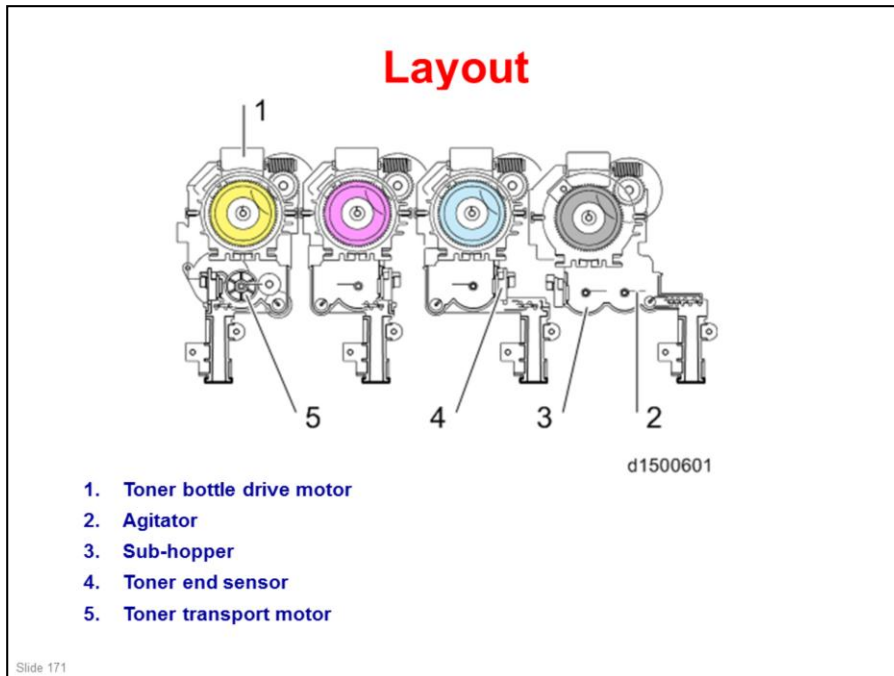
This section describes the toner supply mechanism.

Differences from Predecessors: Toner Supply

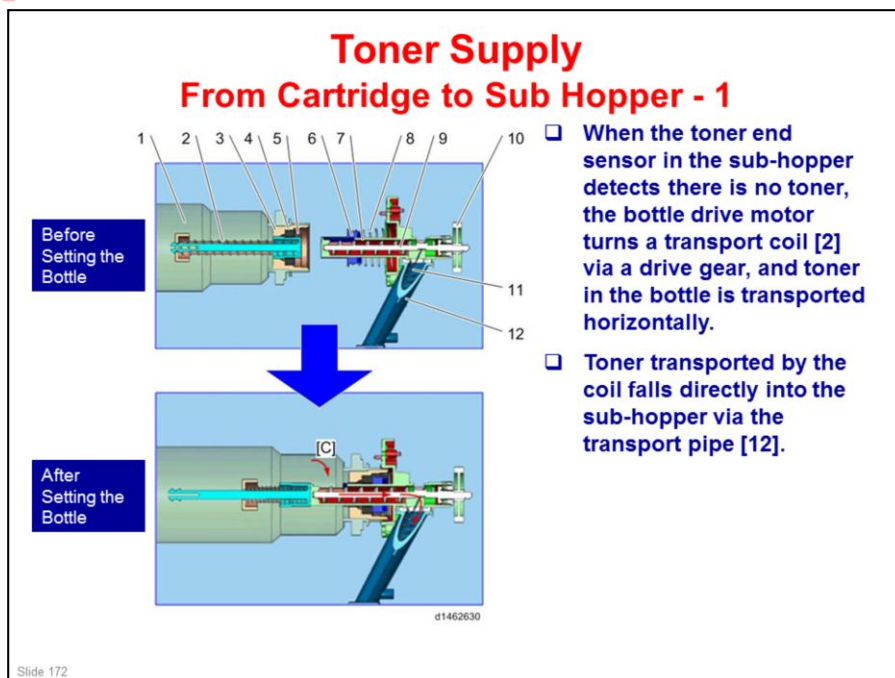
	Met-C1	Predecessor	Purpose
1	HI-ACT system Sub hoppertoner supply system HI-ACT: High Accuracy and Clean Toner Cartridge	Rotary toner bottle + toner pump	Less machine down time for toner bottle replacement
2	Two types of toner near end (estimated near end and definite near end)	One type of toner near end	

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No additional notes



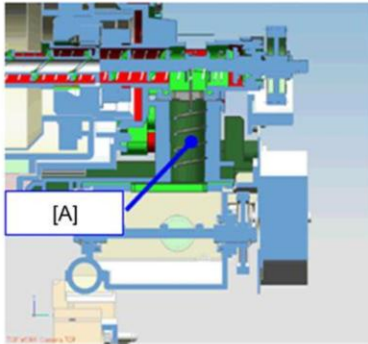
- ☐ The toner cartridge and sub hopper are driven by separate motors.
- ☐ There are no toner pumps.
- ☐ The cartridge has an ID chip which stores data on residual toner and various toner counters, toner end history, and model serial number.



1. Toner bottle (new type of bottle, called a Hi-ACT cartridge [High accuracy and Clean Toner Cartridge])
2. Coil
3. Shutter holder
4. Seal
5. Shutter
6. Shutter
7. Transport nozzle
8. Coil
9. Toner transport coil
10. Drive gear
11. Spring
12. Transport pipe

Toner Supply From Cartridge to Sub Hopper - 2

- To prevent toner from remaining, a spring [A] in the transport pipe moves up and down together with the coil.

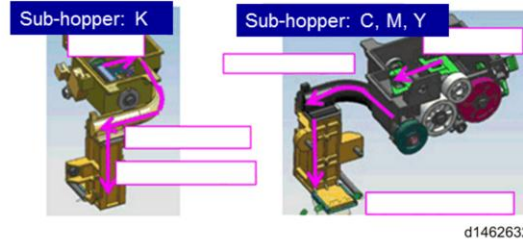


d1462631

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No additional notes

Toner Supply From Sub Hopper to Development Unit



- ☐ The sub-hopper can hold 24.7 cc for Bk (equivalent to 221 sheets of 5% chart), or 19.3 cc for color (equivalent to 225 sheets of 5% chart).
- ☐ Toner which has fallen into the sub-hopper is homogenized by an agitator (Mylar: 2 for BK, 1 for each color).
- ☐ After being horizontally transported by the coil, toner in the sub-hopper falls directly into the development unit.

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No additional notes

Toner Near-end Detection

Overview

- ❑ **The machine estimates the amount of toner remaining in the cartridge using two methods, and takes the smaller result of the two.**
 - ◆ Toner supply motor drive time (SP3-102-001 to 004)
 - ◆ Pixel count (SP3-102-011 to 014)
 - ◆ The smaller of the two values is the amount of remaining toner, and is stored in SP3-102-021 to 024.
- ❑ **Based on these measurements, the machine detects toner near-end in two stages.**
 - ◆ Estimated toner near-end
 - ◆ Definite toner near-end

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- ❑ Definite toner end uses the TD sensor in addition to the above two methods.
- ❑ Definite toner near end – toner only remains in the sub hopper.
 - The sub-hopper can hold 24.7 cc for Bk (equivalent to 221 sheets of 5% chart), or 19.3 cc for color (equivalent to 225 sheets of 5% chart).

Toner Near-end Detection

'Estimated Toner Near-end'

- ❑ If the amount of remaining toner falls below a certain limit (SP3-110-001 to 004; default 70g), the machine enters the 'estimated toner near-end' state.

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No additional notes

Toner Near-end Detection

'Definite Toner Near-end' - 1

- ❑ If the amount of remaining toner falls below a certain limit (SP3-120-001 to 004; default 50g), the machine then starts to look for the 'definite toner near-end' condition, as explained on the next slide.

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No additional notes

Toner Near-end Detection

'Definite Toner Near-end' - 2

- ❑ The machine checks the toner end sensor every 200 ms while the development motor is on.
- ❑ The result is stored in the “no toner counter” (SP3-121-001 to 004).
 - ◆ If toner is detected, the counter is cleared.
- ❑ If the no toner counter exceeds a threshold value (SP3-122-001 to 004), the machine rotates the toner bottle for a certain time (SP3-163-001), to make sure the bottle is empty. Then, the machine checks if toner is present or not using the toner end sensor.
- ❑ If no toner is detected, the machine signals definite toner near-end.

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No additional notes

Toner End Detection

- ❑ **After toner near-end is detected, the machine signals toner end if one of the following occurs.**
 - ◆ Sheet count after near-end exceeds a certain threshold
 - » Black: 221 pages
 - » Color: 225 pages
 - ◆ Sheet count and pixel count after near-end both exceed a certain threshold
 - ◆ The output of the toner density sensor has deviated from the target by more than a certain threshold

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Using the TD sensor to detect toner end

- ❑ The difference between the output of the TD sensor (V_t : SP3-210-001 ~ 004) and the target value of the TD sensor (V_{tref} : SP3-230-001 ~ 004) is computed as ΔV_t , and values of ΔV_t larger than the threshold value (SP3-131-001) are integrated as $\Sigma \Delta V_t$ (SP3-132-001 ~ 004).
- ❑ If the integration value $\Sigma \Delta V_t$ is larger than the threshold value (SP3-132-002), it is determined to be toner end.

TD sensor thresholds before toner near end is determined

- ❑ The computation is done in the same way, but different values for the ΔV_t threshold value and $\Sigma \Delta V_t$ threshold value are used.
 - ΔV_t threshold value before NE: SP3-131-011
 - $\Sigma \Delta V_t$ threshold value before NE: SP3-131-012

RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions
Paper Feed**

Slide 180

This section describes the image transfer belt unit and paper transfer roller.

Differences from Predecessors: Paper Feed

	Met-C1	Predecessor	Purpose
1	Can use up to SRA3 compatible (if optional PTR is installed)	Up to A3	Wider range of paper sizes
2	Paper weight: 52 to 300g/m2	Paper weight: 52 to 256g/m	Wider range of paper weights
3	Small sizes and envelopes can be fed from the standard tray (tray 2 only) in addition to the optional 1-tray and 2-tray feed units	Small sizes and envelopes can only be fed from the optional 1-tray and 2-tray feed units	Spec improvement
4	RF system	FRR system	Simplified layout
5	Paper tray detection: Dedicated sensor	Paper tray detection: Paper size sensor	Improvement
6	Can feel a click at positions for regular paper sizes	No click	Useability improvement
7	Paper dust case removable by technician	Paper dust case removable by user	Spec improvement
8	Tray pull-in mechanism	Locked tray	Useability improvement
9	Double-feed detection (D150 only)	Nothing	Useability improvement

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No additional notes

Differences from Predecessors: By-pass

	Met-C1	Predecessor	Purpose
1	Side fence contact sensor function (D150 only)	No side fence contact sensor function	Improved useability

Slide 182

No additional notes

Differences from Predecessors: Optional PFU

	Met-C1	Predecessor	Purpose
1	RF system	FRR system	Simplified layout
2	Paper weight: 52 – 300g/m2	Paper weight: 52 – 256g/m2	
3	Tray pull-in system	Locked tray	Improved useability
4	Paper size: up to SRA3 (315mm) with optional PTR	Up to A3	
5	Tray detection switch: separate sensor	Tray detection switch: detected by paper size sensor	
6	Two motors for paper feed and transport (DC motor)	One motor and clutch for paper feed and transport	Basic spec up
7	Stabilizer without projection	Stabilizer with projection	-

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No additional notes

Differences from Predecessors: Tandem LCT

	Met-C1	Predecessor	Purpose
1	One sensor to detect remaining paper	Three sensors to detect remaining paper	Simplified layout
2	One motor to transfer the left tray	Feed motor and clutch to transfer the left tray	Energy saving
3	Only paper detection ON or OFF on left tray	Detection for remaining paper volume on the left tray	Simplified layout
4	Reflective photosensor to detect Side fence HP	Photointerrupter to detect side fence HP	

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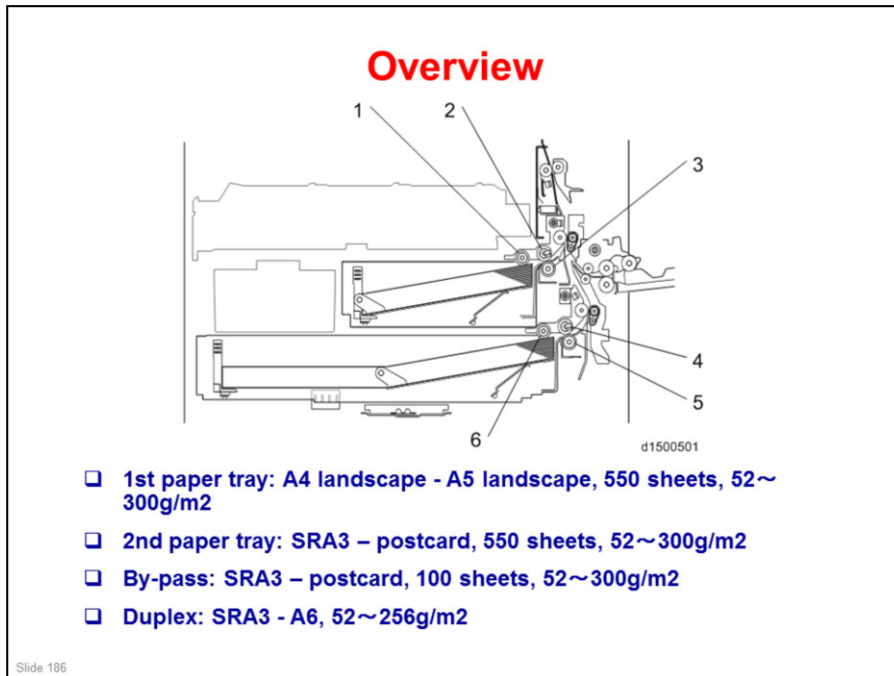
No additional notes

Differences from Predecessors: Side LCT

	Met-C1	Predecessor	Purpose
1	No switch to detect the lower limit position of the tray	There is a switch	Simplified layout
2	One sensor to detect remaining paper volume	Three sensors to detect remaining paper volume	Simplified layout

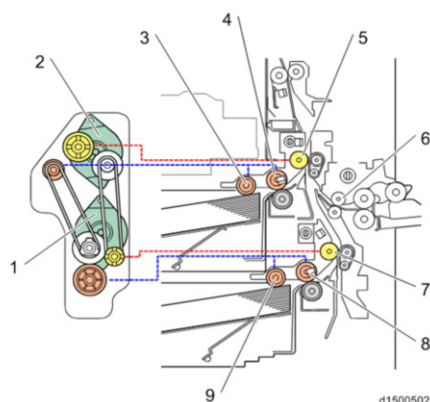
Slide 185

No additional notes



1. Pick-up roller (1st paper tray)
2. Feed roller (1st paper tray)
3. Separation roller (1st paper tray)
4. Feed roller (2nd paper tray)
5. Separation roller (2nd paper tray)
6. Pick-up roller (2nd paper tray)

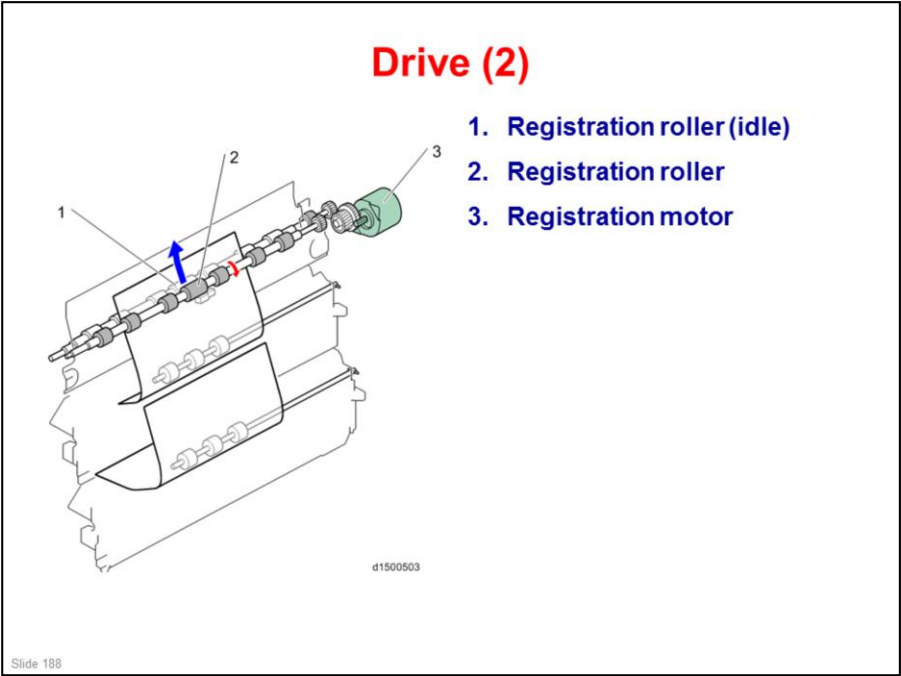
Drive (1)



- ❑ The paper feed motor drives the pick-up and feed rollers in both trays.
- ❑ The transport motor drives the transport rollers in both trays.
 - ♦ For tray 1, the paper feed and transport motors drive clockwise (as seen from the output shaft side)
 - ♦ For tray 2, the motors drive counter-clockwise
- ❑ The separation roller has no drive. It contains a torque limiter which prevents more than one sheet from feeding.
- ❑ The by-pass duplex motor drives the rollers in the bypass and duplex mechanisms.

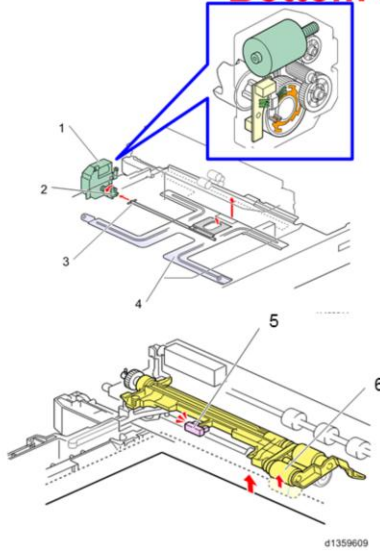
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1. Paper feed motor
2. Transport motor
3. Pick-up roller (First tray)
4. Paper feed roller (First tray)
5. Transport roller (First tray)
6. By-pass transport roller
7. Transport roller (Second tray)
8. Paper feed roller (Second tray)
9. Pick-up roller (Second tray)



No additional notes

Bottom Plate Lift

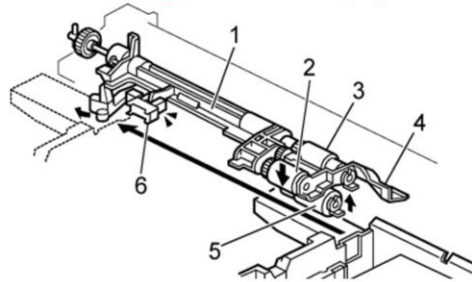


- ❑ When the tray is set in the machine, the set switch at the rear of the tray switches on.
- ❑ The lift motor [1] engages the coupling [2] on the shaft [3] at the rear of the tray, the motor rotates, and the tray base plate [4] is lifted.
- ❑ The tray base plate lifts until the paper surface pushes the pick-up roller [6] up, and the upper limit sensor [5] switches off (interrupted), and the machine enters paper feed standby mode.
- ❑ When the tray is removed, the coupling is released, and the base plate moves down. The lift motor then rotates until the coupling returns to the home position.

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No additional notes

Paper Feed (1)

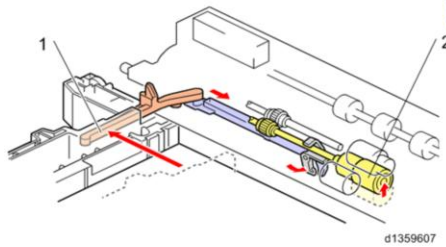


- ❑ When the paper feed tray is set, the pick-up arm [1] is pressed, the separation roller [5] comes into contact with the feed roller [3], and the pick-up roller [2] contacts the top of the paper.
 - ♦ See the next slide for details.
- ❑ The machine is ready to feed paper when the tray bottom plate has moved up. When the paper feed motor turns on, the rollers rotate and paper is fed.
- ❑ The torque limiter on the separation roller prevents more than one sheet from feeding (the separation roller is not rotated by a motor).

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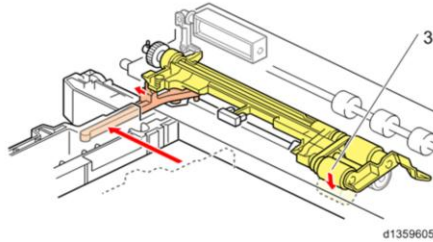
1. Pickup arm
2. Pick-up roller
3. Feed roller
4. Feed guide
5. Separation roller
6. Upper limit sensor

Paper Feed (2)



- When the paper feed tray is set, the pick-up arm [1] is pressed, the separation roller [2] comes into contact with the feed roller, and the pick-up roller [3] contacts the top of the paper.

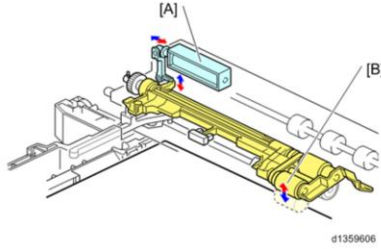
- ♦ To prevent paper remaining between the rollers, when the paper feed tray is withdrawn, the arm returns and contact with the rollers is released.



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No additional notes

Paper Feed (3)



- ❑ To maintain a constant gap between sheets, the paper feed sensor near the paper feed roller monitors paper feed.
- ❑ The paper feed motor switches off just before the rear edge of the first sheet completely passes the paper feed roller.
- ❑ When the rear edge of the first sheet has passed the paper feed roller, the solenoid [A] switches OFF and the pick-up roller [B] contacts the surface of the paper .
- ❑ When the first sheet has been fed a set distance by the transport roller, the paper feed motor turns on to feed the second sheet of paper.

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- ❑ Note that the action of the solenoid is different from the bypass tray.
 - Trays 1 and 2: When the solenoid turns on, the pick-up solenoid moves up away from the top sheet of paper.
 - Bypass tray: When the solenoid turns on, the pick-up roller moves down onto the top sheet of paper.

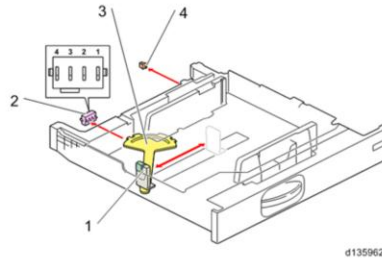
Paper Size Detection – Tray 1

- ❑ There are no sensors. The size must be set at the operation panel by the customer.
 - ◆ A4 LEF (default), LT LEF, B5 LEF, or A5 LEF

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No additional notes

Paper Size Detection – Tray 2



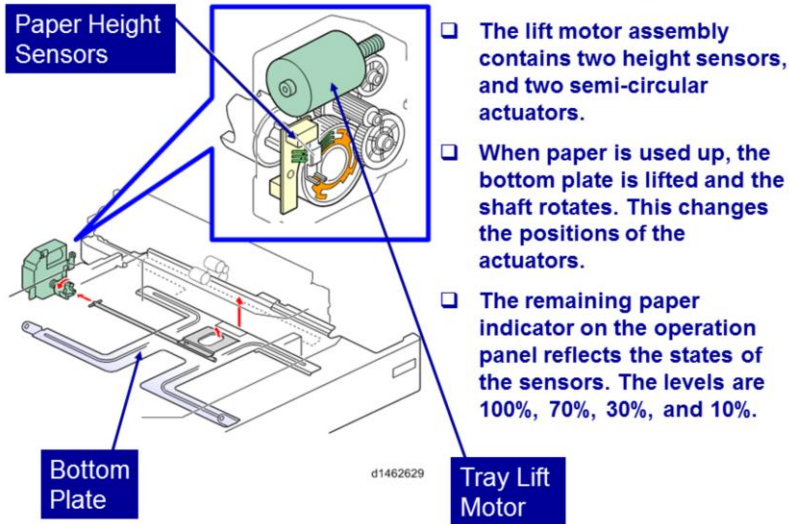
d1359620

- ❑ An actuator [3] attached to the side fence [1] pushes the microswitches on the paper size sensor [2]. The pattern of switches pushed informs the machine of the paper size.
 - ♦ The following sizes can be detected: SRA3, A3, B4, A4 SEF, LT SEF, B5 SEF, A4 LEF, B5 LEF, and A5 LEF
 - ♦ SRA3, A3, B4, A4 LEF, and B5 LEF can be changed to 12 x 18", DLT, LG, LT LEF, and Exe LEF with SP5-181-002~6
- ❑ If the user inputs a paper size at the operation panel, the sensor readings are ignored.
- ❑ Switch [4] is the tray set switch.

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No additional notes

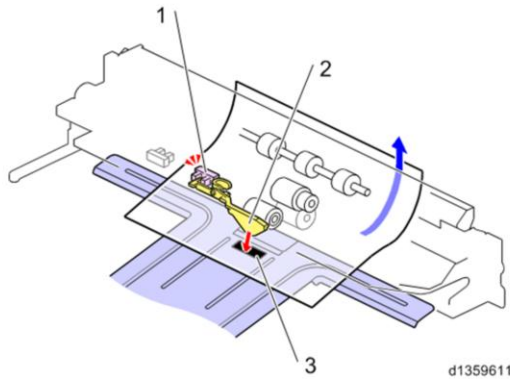
Remaining Paper Detection – Trays 1 and 2



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No additional notes

Paper End Detection

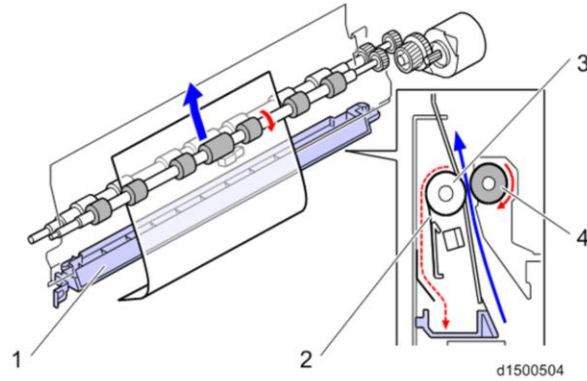


- When there is no more paper in the tray, a feeler [2] falls through a slot [3] in the bottom plate, and the end sensor [1] detects that paper has run out.

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No additional notes

Paper Dust Removal

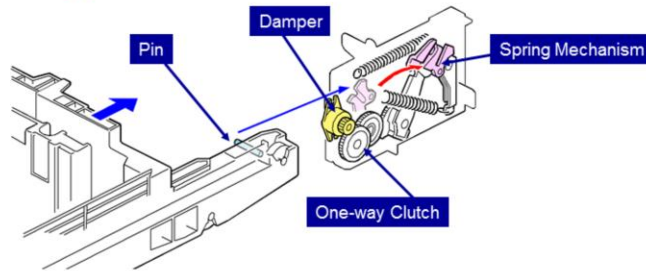


- ❑ A mylar sheet [2] contacts the registration roller [3], and sends paper dust to the dust tray [1].

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- ❑ 4 is an idle roller.

Tray Pull-in Mechanism

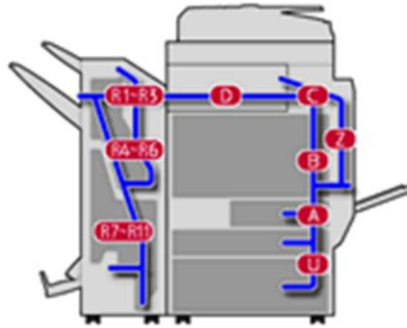


- ❑ The tray is pulled in by a one-way clutch and spring mechanism in the pull-in unit. The pull-in unit catches a pin on the tray to pull the tray in.
- ❑ When the user pulls the tray out, a damper controls the release of the tray.

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No additional notes

Paper Jam Animation



- ❑ A real-time paper jam animation is displayed on the operation panel.
- ❑ If there is paper jammed in the machine at more than one location, after the first one is removed, the animation automatically changes to show how to remove the next one.
 - ◆ In older models, a button has to be pressed to go to the next animation.

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- ❑ Ch-C1 also has this function.

Paper Jam LED (Met-C1c/d/e only)



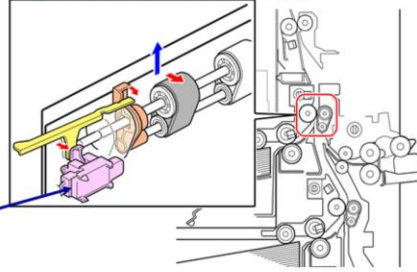
- ❑ When a Z jam or a B jam occurs, the remaining paper position is displayed by an LED next to the Z or B decal.

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No additional notes

Paper Thickness and Double-feed Detection (Met-C1e only)

Paper Thickness
Sensor

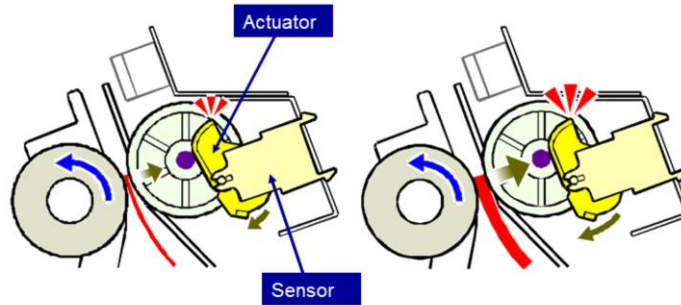


- ❑ If the wrong paper weight setting is used, there may be a jam, insufficient fusing, or even damage to the machine.
- ❑ In the D150 (Met-C1e), if the paper being fed does not match the selected paper type, paper feed is stopped.
- ❑ The same mechanism also detects multi-feeds. If the paper suddenly is heavier than the previous sheets in a job, the machine does not stop printing, but records the error (the error frequency is stored in SP1-311-001 to 006).

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- ❑ The sensor reading is reset if one of the following occurs.
 - Just after the power switch is turned on (the sensor is reset for all paper feed trays)
 - When a tray is set (reset for the removed and reset paper tray only)
 - When the bypass paper end sensor has changed from “No Paper” to “Paper Detected” (bypass tray only)
 - At first printing after the paper type/paper thickness setting has changed (only for the tray where the paper type/paper thickness setting has changed)
 - When double feed has occurred (only for the tray where double feed has occurred)
 - Return from energy saver mode.

Paper Thickness and Double-feed Detection Operation Examples

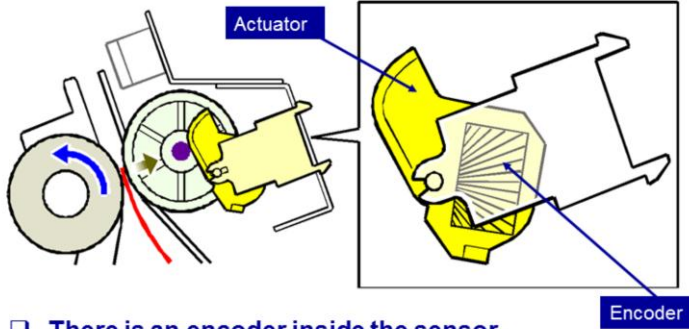


- ☐ On the left, normal paper is being fed through the sensor.
- ☐ On the right, thick paper is being fed through the sensor.
- ☐ The thickness of the paper affects the angle of the actuator that is attached to the relay roller.

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- ☐ The sensors are attached to idle rollers, not drive rollers.

Paper Thickness and Double-feed Detection Inside the Sensor



- ☐ There is an encoder inside the sensor.
- ☐ The sensor uses this encoder to measure the angle of the actuator.
- ☐ The machine uses this angle to calculate the thickness of the paper.

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- ☐ This type of sensor is more accurate for measuring thickness than a photointerrupter.

Double-feed Detection

- ❑ The machine compares the thickness of the current sheet with the previous sheet.
- ❑ If the difference between the two is over a certain threshold (SP1304-001 to 003), double feed is detected, feed stops, and JAM099 is displayed.
- ❑ The double feed detection setting can be enabled/disabled for each tray (SP1-302-001 to 006).
 - ◆ Default is 'enabled'.
- ❑ Even if double feed detection is disabled, the number of double feed detections is stored (SP1-309-001 to 006).

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No additional notes

Paper Thickness Detection
Sensor Tolerance

- ❑ For each paper weight setting that is applied to a tray, there is a range of paper weights that the machine thinks is acceptable. Outside these ranges, an error will be logged but the machine will continue.

Setting	Acceptable range
Thin	Thin – Middle thick
Plain 1	Thin – Thick 1
Plain 2	Thin – Thick 2
Middle Thick	Thin – Thick 3
Thick 1	Plain 1 – Thick 4
Thick 2	Plain 2 – Thick 4
Thick 3	Middle thick – Thick 4
Thick 4	Thick 1 – Thick 4

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No additional notes

Paper Thickness Detection

Other Points

❑ Sensor error detection

- ♦ The paper thickness sensor output value is measured at power-on/return from energy saver mode/right cover opened and closed. At these times, there should be no paper, so the thickness should be zero.
- ♦ If a fault is detected, SC511-00 occurs.

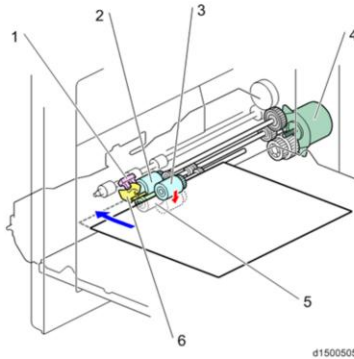
❑ The following paper types may be incorrectly detected.

- ♦ Paper with holes
- ♦ Recycled paper
- ♦ Backing paper
- ♦ Paper of mixed types

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No additional notes

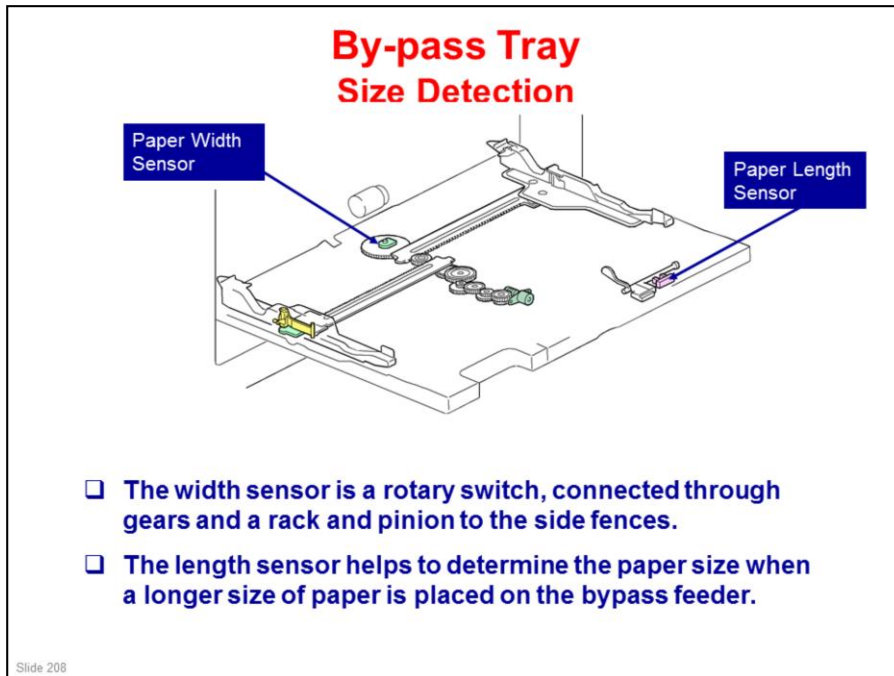
By-pass Tray Components



1. **By-pass paper end sensor**
2. **By-pass paper feed roller**
3. **By-pass pick-up roller**
 - ♦ Unlike the paper tray, this roller does not contact the paper stack in standby mode.
4. **By-pass/duplex motor**
 - ♦ Clockwise rotation: Duplex feed
 - ♦ Counter-clockwise rotation: Bypass feed
 - ♦ Do not use the bypass tray for duplex mode.
5. **By-pass separation roller**
6. **Paper end sensor feeler and actuator**
 - ♦ The feeler falls through a slot in the by-pass tray when paper has run out.

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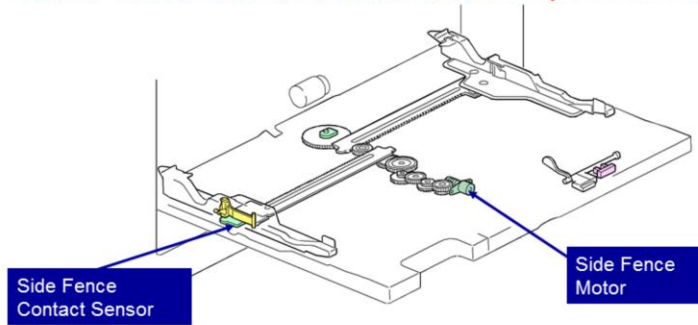
- ❑ The gear on the feed roller shaft colored grey in the diagram is a one-way gear.



No additional notes

By-pass Tray

Side Fence Contact Mechanism (D150 only) - 1



- This mechanism adjusts the positions of the side fences so that they contact the left and right edges of the paper properly.

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No additional notes

By-pass Tray

Side Fence Contact Mechanism (D150 only) - 2

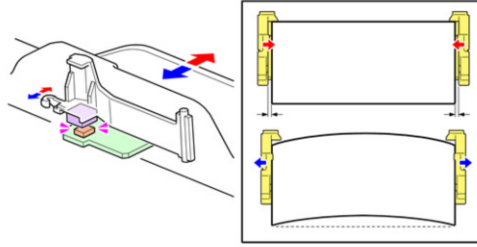
□ Purpose

- ◆ In the past, many jams occurred on the bypass tray compared with other locations.
- ◆ One cause of this is that the customer doesn't set the side fences accurately.
- ◆ To improve this situation, we included this side fence contact mechanism.
- ◆ It is important to note that this function does not automatically set the side fences to the set width. It moves the side fences a small distance and uses a sensor to detect when the side fence touches the edge of the paper.

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No additional notes

By-pass Tray Side Fence Contact Mechanism (D150 only) - 3



- ❑ A sensor is attached below the side fence. It converts a magnetic field to a voltage.
- ❑ When the motor moves the side fence, the edge of the paper nudges the side fence (or moves away from it), and the voltage from the sensor changes.
- ❑ The motor can only move the fence a short distance, so the user has to set the side fences as close as possible to the correct location.
- ❑ When the voltage is at a certain value (set with SP mode), the machine determines that the side fence is in the correct position and stops the motor.

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- ❑ The sensor is a Hall effect sensor.
- ❑ SP1-008-007 and 1-008-009 are the SPs that contain the voltage values used by the machine to control this mechanism.

By-pass Tray

Side Fence Contact Mechanism (D150 only) - 4

□ Procedure

- ♦ If the side fence contact sensor detects paper at the same time that the paper end sensor detects paper, fence adjustment starts in 1 second.
- ♦ When the paper end sensor is on and the user moves the fence, fence adjustment will start in 3 seconds.
 - » For the above two cases, after the machine determines the paper width, the copy button will be lit green.
- ♦ When the paper end sensor is on and no-one moves the fence, the machine determines the paper width in 3 seconds. Then the copy button will be lit green.

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No additional notes

By-pass Tray

Side Fence Contact Mechanism (D150 only) - 5

- ❑ **This feature can be disabled with SP 1-008-1.**
 - ◆ The default is 1 (enabled). However, the mechanism takes a little time, so for faster preparation for printing with the bypass tray, disable this feature.

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No additional notes

By-pass Tray**Side Fence Contact Mechanism (D150 only) - 6**

- ☐ If you replace the side fence and/or sensor, make sure that you do the procedure as explained in the service manual.
 - ◆ Replacement and Adjustment > By-pass Tray Unit > By-pass Tray Side Fence (D150 only)
- ☐ This procedure calibrates the side fence contact mechanism.

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No additional notes

Replacement Paper Feed Units

- ❑ The 1st paper feed unit can be removed without removing the duplex unit (just open the duplex unit), and you can remove the paper feed unit after pulling out the paper tray.
 - ◆ For ATAP-series, the duplex unit must be removed with.
- ❑ Note that the 1st paper feed unit and 2nd paper feed unit are not interchangeable.
 - ◆ The service parts have different part numbers.

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No additional notes

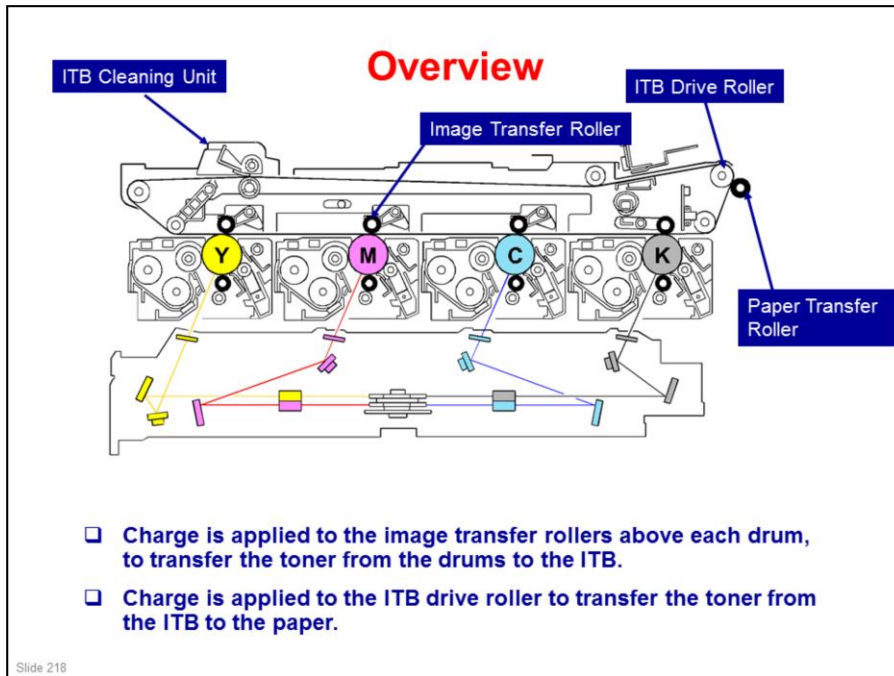
RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions
Image Transfer**

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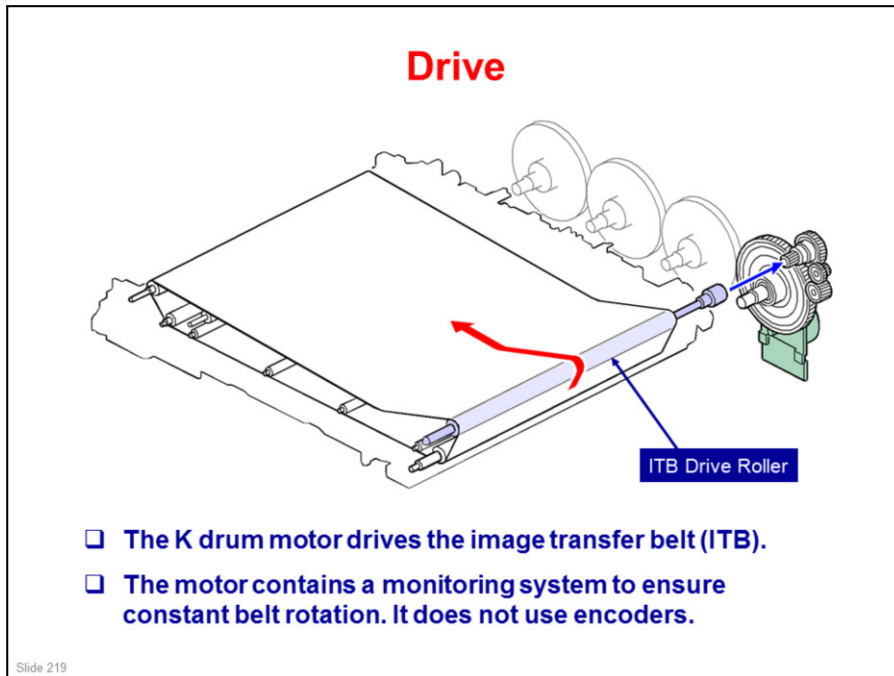
This section describes the image transfer belt unit and paper transfer roller.

Differences from Predecessors: Image Transfer			
	Met-C1	Predecessor	Purpose
1	Location of ITB cleaning unit above ITB	Location of ITB cleaning unit to the right of the ITB	Make the machine more compact
2	No lubricant in the ITB cleaning unit	Lubricant in the ITB cleaning unit	Improved cleaning because of new type of lubricant in the PCDU
3	No bias voltage on the PTR	Bias voltage on the PTR	
4	No encoder to control the ITB	Uses an encoder to control the ITB	
5	Adjustment values for the new ID sensor are provided on a sheet <u>attached to</u> the ID sensor	Adjustment values for the new ID sensor are provided on a sheet <u>included with</u> the ID sensor	
6	Real time process control (if the image area extension option is NOT installed)	Normal process control	Image quality stabilization and reduction of time between process control

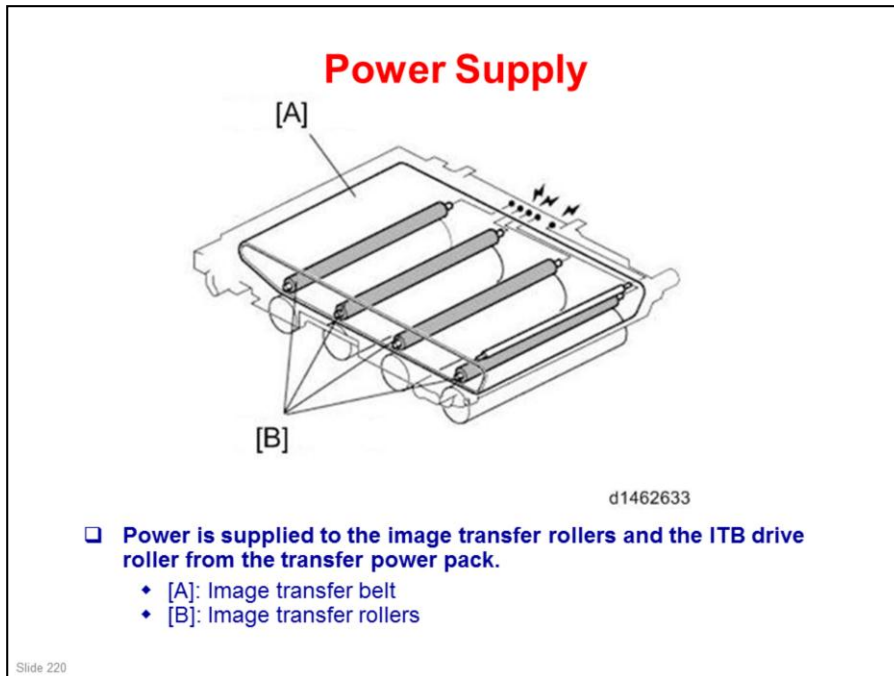
No additional notes



No additional notes

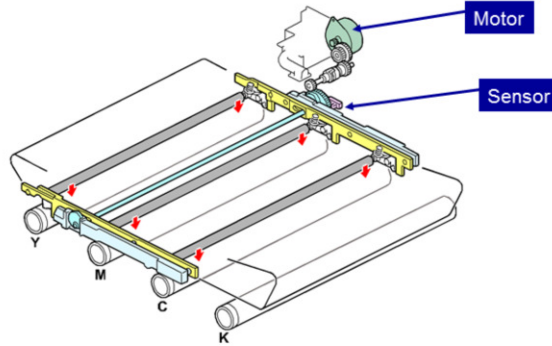


No additional notes



No additional notes

ITB Contact and Release

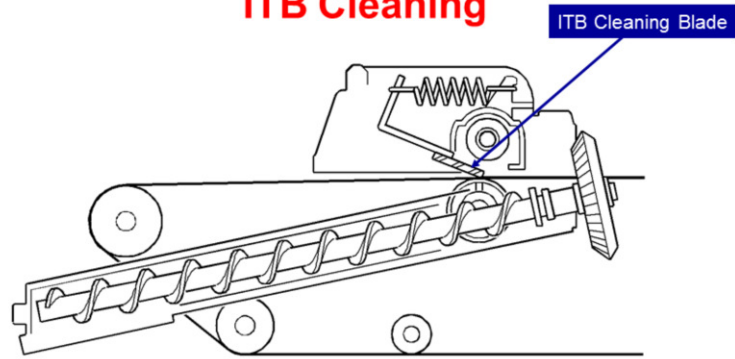


- ❑ This mechanism moves the ITB down into contact with the color drums when color printing is done.
 - The motor is also the toner supply motor for magenta. The direction of rotation of the motor determines whether the ITB contact mechanism moves or the magenta toner supply unit operates.
- ❑ A sensor detects an actuator on the cam to detect whether the ITB contacts the color drums.
- ❑ If a job is mixed (black-and-white and color pages in the same job), the mechanism will switch between modes when different types of pages are output.
 - SP 2907-001 determines whether the ITB moves away from the CMY drums for b/w pages in a color job.
 - » 0: Stays in contact even if b/w pages appear

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No additional notes

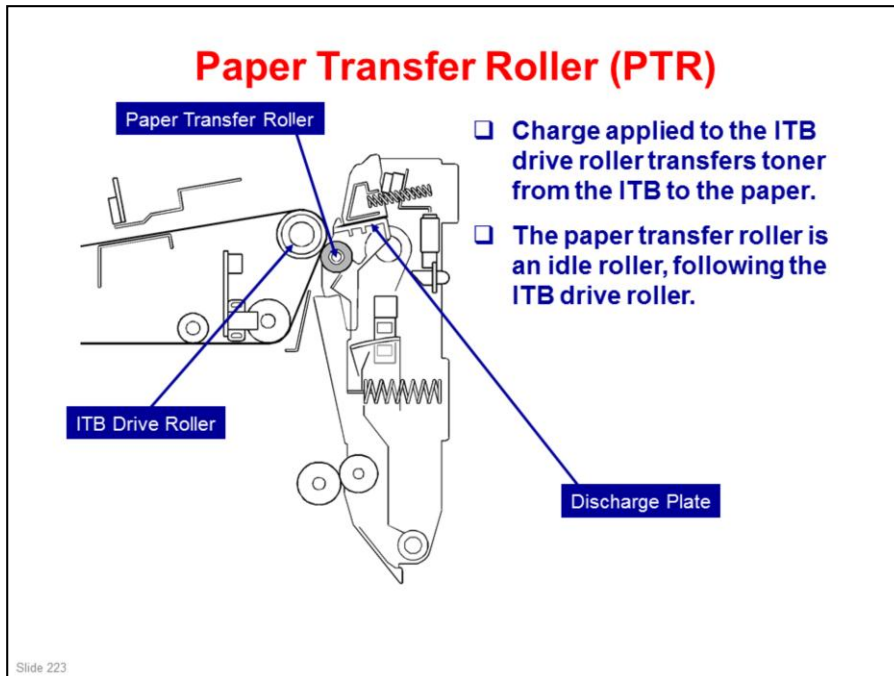
ITB Cleaning



- ☐ The cleaning unit is on top of the ITB unit.
- ☐ A counter blade is used for the ITB cleaning blade.
- ☐ There is no lubricant bar or brush roller.

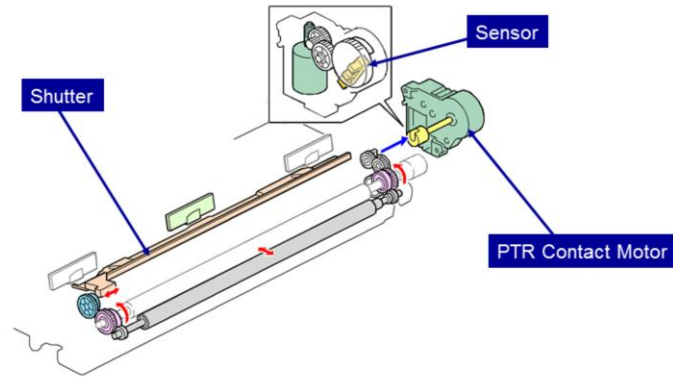
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No additional notes



No additional notes

PTR Contact and Release

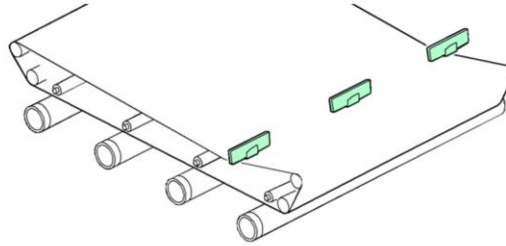


- ❑ If the PTR is permanently in contact with the ITB, toner on the ITB moves to the roller and gets on the reverse side of the paper. So, the PTR is separated from the ITB during Process Control or MUSIC.
- ❑ The motor contains a sensor to detect whether the PTR is in contact or away from the ITB.
- ❑ This motor also opens and closes a shutter to protect the ID/MUSIC sensors from toner.

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No additional notes

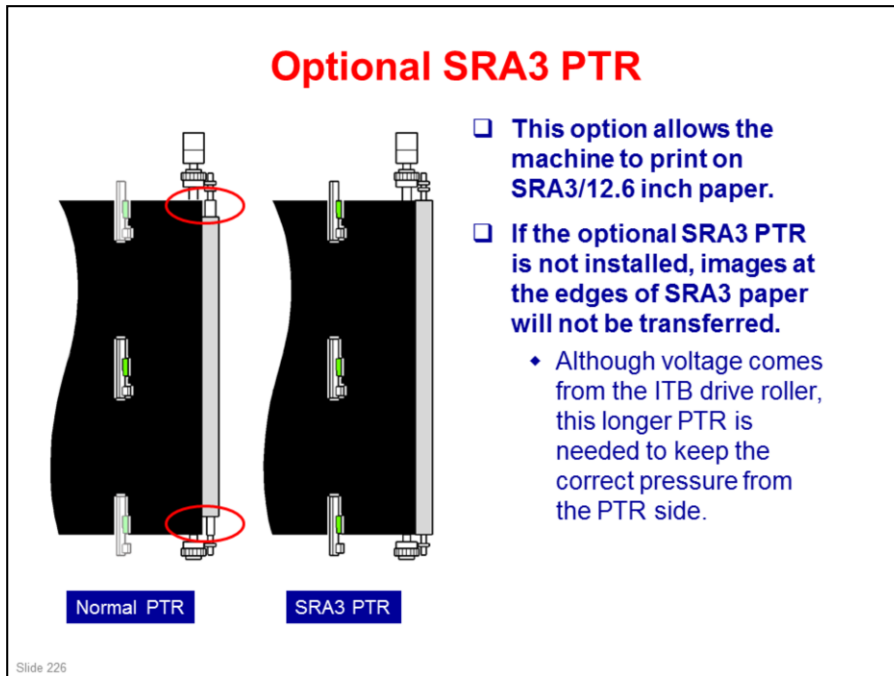
ID Sensors



- ❑ In this machine, all three of the sensors above the ITB act as ID sensors for process control.
- ❑ The central one is used for the normal process control (at the end of the job and so on).
- ❑ In this machine, there is a new feature called 'real-time process control'. Sensor patches are made on the extreme edges of the ITB during printing, and the ID sensors at left and right monitor these patches. As a result, process control is not needed in the middle of a job.
- ❑ Note that for printing on SRA3/12.6 inch paper, real-time process control cannot be done, because printing on this paper uses the full width of the ITB.

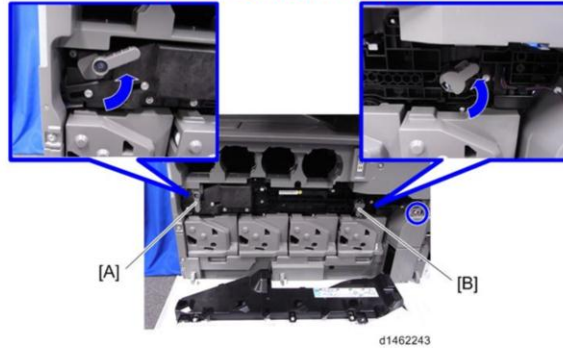
Slide 225

No additional notes



- ❑ The red circles show how the optional PTR is wider than the normal one.

Replacement ITB Lever Position

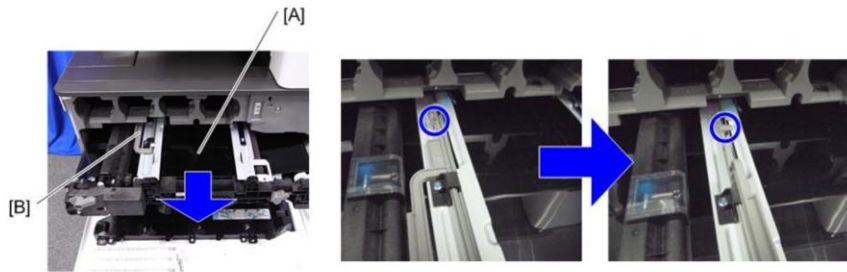


- ❑ **Before you remove or attach the image transfer belt unit:**
- ◆ Remove the duplex unit and open the paper transfer unit.
 - ◆ The waste toner bottle contact lever [A] and ITB contact lever [B] must be up before you try to pull out or push in the ITB unit.

Slide 227

No additional notes

Replacement Taking out the ITB Unit - 1

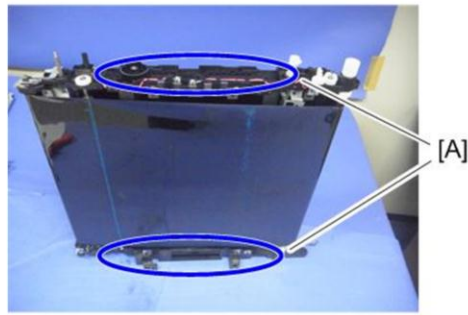


- ☐ To prevent the image transfer belt unit from falling out, there is a lock mechanism.
- ☐ After pulling out the image transfer belt unit fully, lift the handle [B] to release the lock, and remove it.
- ☐ The photos on the right show how this lock is working.

Slide 228

No additional notes

Replacement Taking out the ITB Unit - 2



d1464005

- ☐ When you lift the ITB unit, do not hold the rollers. Hold the black resin frame [A].
- ☐ If you touch the rollers, image quality will be affected.

Slide 229

No additional notes

Replacement ITB Cleaning Unit

- ❑ **When removing the ITB cleaning unit, to prevent toner from coming out, remove it so that the ITB cleaning unit is under the ITB unit (i.e., turn the ITB unit upside down).**
- ❑ **After installing a new cleaning unit, apply some toner to the ITB as shown in the manual.**
 - ◆ Then turn the image transfer belt about 10mm in the reverse direction, then turn it forward one complete turn.

Slide 230

No additional notes

Replacement ITB



d1462254

- ❑ After replacing the image transfer belt, to prevent twisting of the belt, pass the belt round once in the direction of the arrow.

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No additional notes

Replacement ID Sensors

- ❑ Before you replacing the ID sensor, you must input the values 1-6 on the decal for each of the new sensors into SP mode, or process control/MUSIC will not be done correctly after power is switched on (it will use the values for the old sensor).
 - ◆ Make sure that you input the values into the correct SP modes.
 - » SP3-333-001 to 3-333-006: front
 - » SP3-334-001 to 3-334-006: center
 - » SP3-335-001 to 3-335-006: rear
- ❑ After you replace the sensor, do SP3-011-004 (full MUSIC)

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- ❑ The procedure is similar to the Ti-P1.

RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions****Fusing**

Slide 233

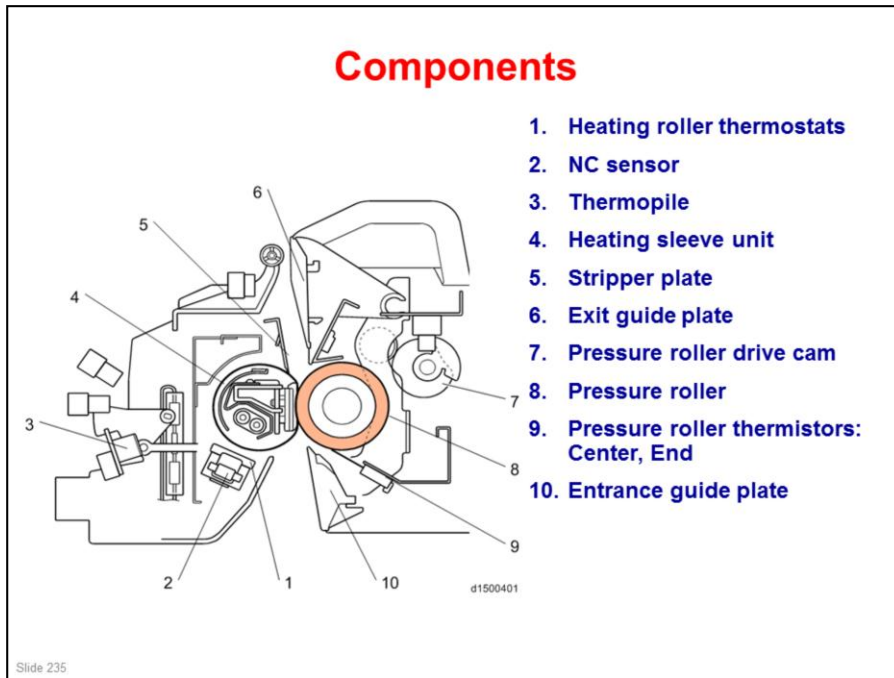
This section describes the fusing unit.

Differences from Predecessors: Fusing

	Met-C1	Predecessor	Purpose
1	Fusing sleeve material change (Ni+Cu)	Fusing sleeve material (SUS: stainless)	Stronger material
2	Two heaters + Shield	Three heaters (one is for postcards)	AC-TEC reduction
3	Fusing unit replacement required only at SC544-02/554-02 occurrence	Fusing unit replacement required at SC544-00/554-00/ 564-00/ 574-00 occurrence	To optimize the replacement timing of the fusing unit
4	Grease for use with metal (Fluotraibo) is used on the pressure roller and the bushing (this can be also used for the predecessors)	Grease for use with plastic is used on the pressure roller and the bushing (Barierta)	Improved lubrication
5	Pressure release motor turns only one way	Pressure release motor turn both ways	Machine layout change

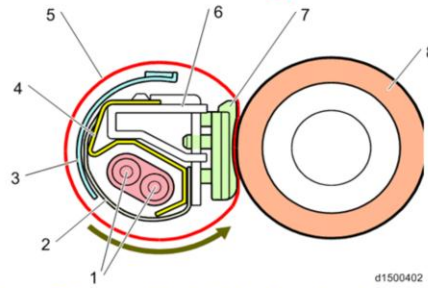
Slide 234

No additional notes



No additional notes

QSU-DH Fusing Method



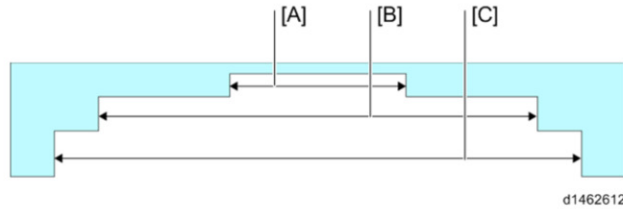
d1500402

- ☐ The heating sleeve [5] rotates freely. It is driven by the pressure roller [8].
- ☐ The nip pad [7] has a low friction cover, and this allows the heating sleeve to turn easily.
- ☐ The pressure roller presses against the nip pad [7] to form the nip zone, where the image is fused to the paper by heat and pressure.
- ☐ The stay [6] holds the nip pad in place.
- ☐ The stay has a mirrored surface facing the fusing lamps [1] to concentrate the energy from the lamps directly on the inner surface of the heating sleeve .
- ☐ The shield [3] makes sure that the heating sleeve is not heated excessively when narrow paper sizes are fed.

Slide 236

1. Fusing lamps (Center: 774W, Edge: 437W)
2. Edge shield (at both ends)
3. Shield
4. Reflector
5. Heating sleeve
6. Stay
7. Nip pad
8. Pressure roller

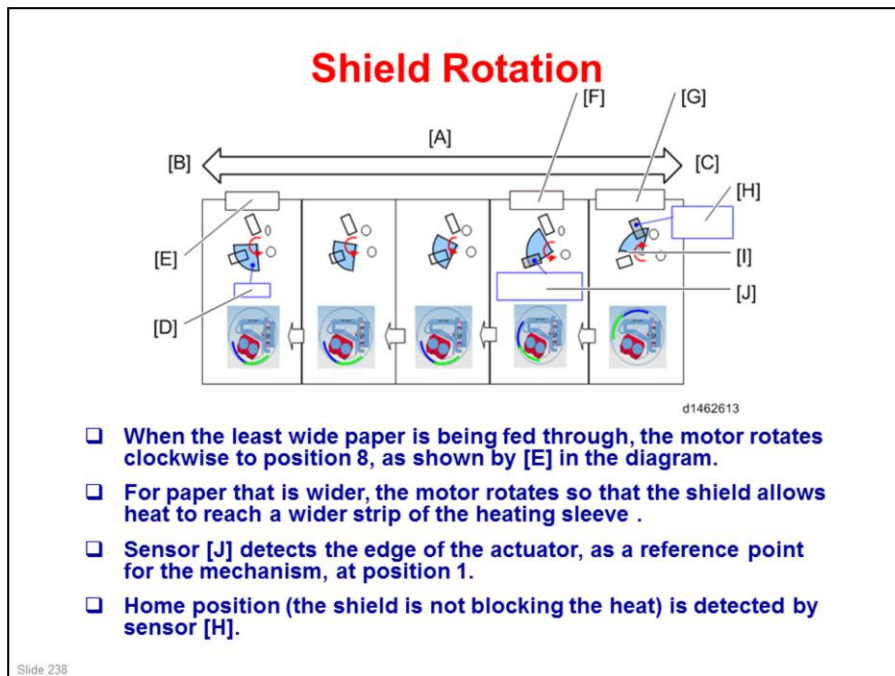
Shield



- ❑ To prevent the temperature at the edges of the heating sleeve from getting too high when the paper width is small, the shield rotates to block some of the heat from the fusing lamps.
- ❑ The shield is rotated by an independent motor. There are 9 positions, including the home position (HP: no shielding, for the widest paper).
 - ◆ The diagram only shows three, for simplification purposes.

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No additional notes



[A]: Rotation from fully blocked to fully open

[B]: Shield width (large), motor cw

[C]: No shield, motor ccw

[D]: Actuator

[E]: Position 8

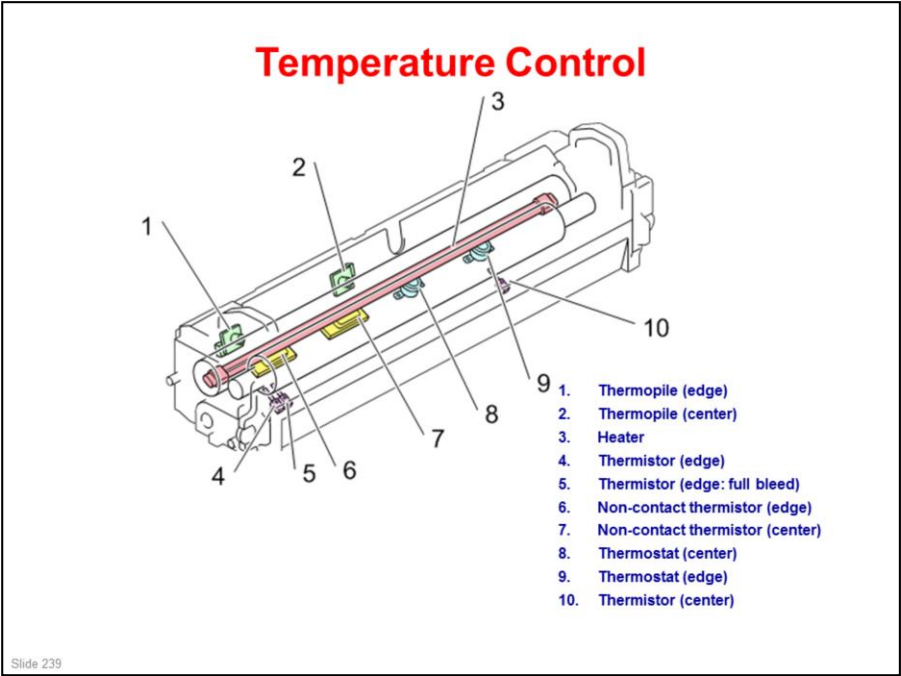
[F]: Position 1

[G]: Home position

[H]: Shield sensor 1 (to detect HP)

[I]: Reference edge

[J]: Shield sensor 2 (to detect reference edge)



❑ NC sensor: Non-contact thermistor

CPM Down Control

Handling Low Temperatures

- ❑ The central thermopile is checked at regular intervals, and if the temperature is too low, the CPM is reduced in three stages.
 - ◆ 100% > 80% > 65% > 50%

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- ❑ This is the same as the Ap-C3.

CPM Down Control

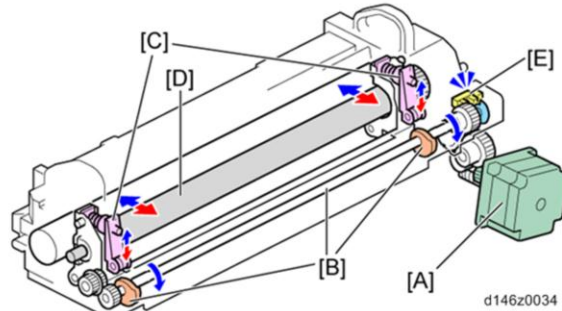
Handling High Temperatures

- ❑ To shorten warm-up time and reduce the TEC value, the fusing unit has a low heat capacity.
- ❑ Because of this, the temperature of those parts of the heating sleeve outside the paper width easily increases, and may get extremely hot. So, CPM down is implemented in the following 3 levels depending on the detected temperature, or the paper passage time.
 - ◆ 100% > 80% > 50% > 30% (for normal paper, A3/DLT/LT/A4)
 - ◆ There may be some differences depending on paper size/paper thickness.
- ❑ **Temperature detection**
 - ◆ The temperature is checked at regular intervals. If the temperature is above a certain value, the CPM is decreased by 1 level.
 - ◆ Since the points at which temperature tends to increase depend on the paper size, the sensor used is changed depending on the paper size.
 - » A3/DLT/B4: Thermistor (pressure roller end)
 - » LT/A4: Thermopile (end)
 - » B5/A5/B6/A6: Thermistor (pressure roller center)
- ❑ **Paper passage time**
 - ◆ Depending on the paper size, it may not be possible to use a sensor to monitor the points on the heating sleeve which tend to get hotter.
 - ◆ Therefore, time conditions are also used to determine CPM down, and if continuous paper passage time is above a threshold value, CPM is decreased by 1 level.

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- ❑ This is the same as the Ap-C3.

Pressure Release Mechanism

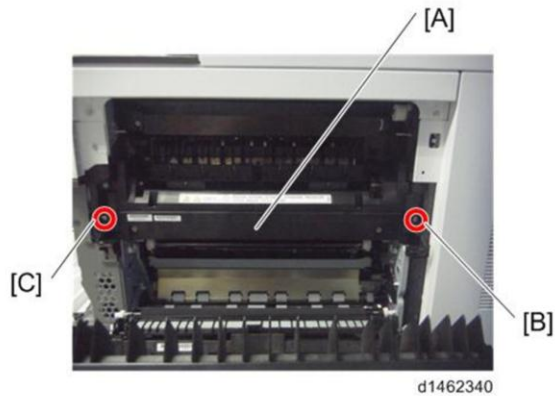


- ❑ This mechanism allows you to easily remove paper if there is a jam in the fusing unit.
- ❑ Paper exit/pressure release motor [A] releases the pressure lever [C], and the pressure roller [D] separates from the fusing belt.
- ❑ The pressure roller HP sensor [E] detects the encoder [B], and determines the position of the pressure roller.
 - ◆ After replacing the pressure roller, if the sensor does not detect the encoder 3 times continuously after a job is completed, SC569-00 is generated.

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- ❑ The shape of the motor differs in some machines.

Replacement Fusing Unit



- ❑ When putting the fusing unit [A] back in the machine, fasten the screw at the rear [B] first, then the screw at the front [C].

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No additional notes

Replacement Pressure Roller - 1



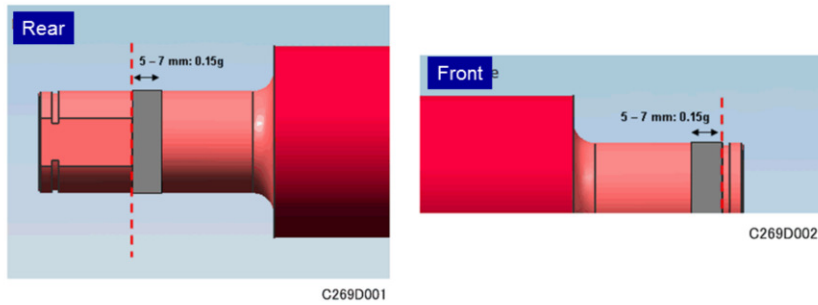
d1462364

- ❑ Do not remove or adjust the pressure adjusting screws when replacing the pressure roller.
- ❑ This screw is adjusted in the factory for the correct nip width, to match the hardness characteristics of each roller.
- ❑ Because of this, do not move the pressure roller to another fusing unit, or the nip will not be correct.

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No additional notes

Replacement Pressure Roller - 2



❑ Use the FLUOTRIBO MG GREASE(VSSG9002) for the pressure roller gear.

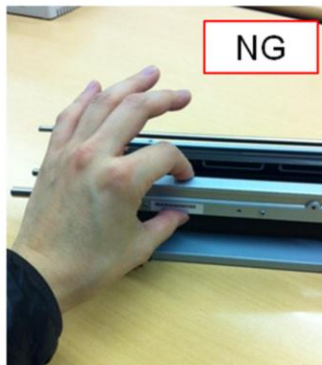
◆ This lubricant is used in Taurus-C1 and CH-C1

Slide 245

No additional notes

Replacement Fusing Sleeve Belt Unit

- ❑ The surface of the fusing sleeve is very sensitive. Do NOT touch the surface of the fusing sleeve belt. (It may cause a kink if you touch it.)
- ❑ Take care when you remove the fusing sleeve unit. Also be careful when replacing components around this unit, such as thermostats.



Slide 246

No additional notes

Output Tests for Fusing Unit Fusing Shield Motor

- 1. Remove the fusing unit.**
 - ♦ Also you cannot see the motor rotation if the fusing unit is in the machine.
- 2. Remove the waste toner bottle.**
 - ♦ This is necessary as an extra safety measure in case the technician did not remove the fusing unit.
 - ♦ When the waste toner bottle is removed, the fusing unit is disabled, but the output tests for the motors can be executed.
 - ♦ If the fusing lamp comes on while these SPs are executed, this could damage the sleeve because the shield is not protecting the sleeve properly.
- 3. Do SP 5-804-235 or -236 (clockwise or counterclockwise rotation).**

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No additional notes

Output Tests for Fusing Unit Fusing Drive Motor

- 1. Remove the fusing unit.**
- 2. Remove the waste toner bottle.**
- 3. Do these SPs for the output tests:**
 - ☐ SP5-804-092: High speed
 - ☐ SP5-804-093: Medium speed
 - ☐ SP5-804-094: Low speed
 - ☐ SP5-804-095: Very low speed
- 4. Turn the machine off.**
- 5. Put the fusing unit and waste toner bottle back.**
 - ☐ Turn the machine off before doing this, or the heating sleeve could be damaged.
- 6. Turn the machine on.**

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This procedure will be changed. Details will be released in an RTB.

Hardware Detection SC Codes - 1

- ❑ For the SCs in red in the following table, a new fusing unit or heating sleeve unit must be installed before you can reset the machine.
- ❑ If one of these SCs occurs, the sleeve is damaged, as an invisibly tiny kink which grows bigger and deeper into a tear, which may hurt the customer's fingers.
- ❑ To prevent this, the machine requires a new fusing unit or heating sleeve unit to reset.

Sensors	Ap/At-C3	MET-C1
Thermopile (Center)	SC544-00	SC544-01
Thermopile (Edge)	SC554-00	SC554-01
Thermistor (Center)	SC564-00	SC564-01
Thermistor (Edge)	SC574-00	SC574-01
NC sensor (Center)	Detected as SC544/554/564/574	SC544-02
NC sensor (Edge)	Detected as SC544/554/564/574	SC554-02

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- ❑ The target SC has changed from Ap/At-C3

Hardware Detection SC Codes - 2

□ The reasons that these SCs require a new fusing unit are as follows.

- ♦ Ap/At-C3
 - » There is no dedicated circuit for the NC sensor, and the machine does not record its temperature. So, there is no SC for the NC sensor.
 - » When the circuit for a sensor (including the NC sensor) breaks, the sensor with the highest temperature at the time is set as the SC.
- ♦ Met-C1
 - » There is a dedicated circuit for the NC sensor, so the machine can detect SCs for the NC sensor.

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Go back to slide 184

No additional notes

Hardware Detection SC Codes - 3

- ❑ To cancel SC544-02/554-02, it is necessary to replace the fusing unit or install the old one with an intact new unit detection fuse (a spare fuse is packed with the heating sleeve belt unit).
- ❑ If you cancel the SC by replacing the fusing unit, do the following.
 1. Install the new fusing unit (Do not install a previously installed unit because the machine will check it is a new part or not with the new unit detection fuse).
 2. Execute SP5-810-002 (SC Reset: Hard High Temp. Detection).
 3. Execute SP3-701-115 (Manual New Unit Set: #Fusing unit).
- ❑ If you cancel the SC by installing a new unit detection fuse, do the following.
 1. Install the new fuse. (see 'How to cancel SC544-02/SC554-02 with a new unit detection fuse' at the end of the Heating Sleeve Belt Unit replacement procedure)
 2. Execute SP5-810-002 [SC Reset: Hard High Temp. Detection].
 3. Execute SP3-701-116 [Manual New Unit Set: #Fusing Belt].
- ❑ If you are replacing the heating sleeve belt unit for PM or any reason other than canceling these SCs, you can discard the fuse that is packed with the new heating sleeve unit.

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No additional notes

RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions
Paper Exit, Duplex**

Slide 252

No additional notes

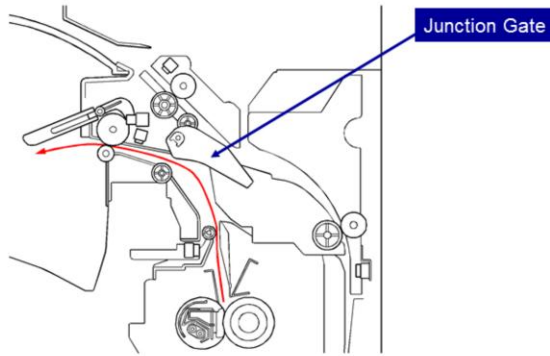
Differences from Predecessors: Duplex

	Met-C1	Predecessor	Purpose
1	Duplex: 256g/m2	Duplex: 169g/m2	Wider range of paper weights
2	Internal tray reverse switch back system	Internal reverse system	More compact
3	Jam detection LED (D148/D149/D150 only)	No jam detection LED	Improved useability
4	Real time jam animation	No real time jam animation	Improved useability

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No additional notes

Paper Exit

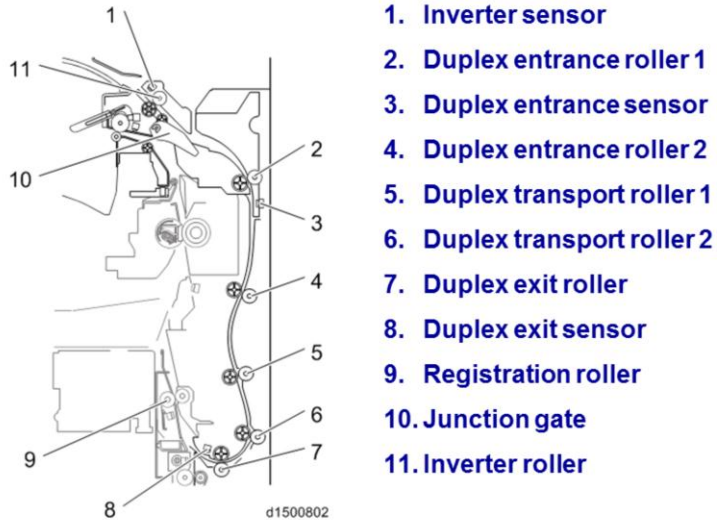


- ❑ To feed the paper to the standard exit, without duplexing, the junction gate stays up and the paper feeds out of the machine.
- ❑ Paper feeds this way also if there is a bridge unit/finisher installed.

Slide 254

No additional notes

Components of the Duplex Feed Path



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The rollers are driven by the following motors:

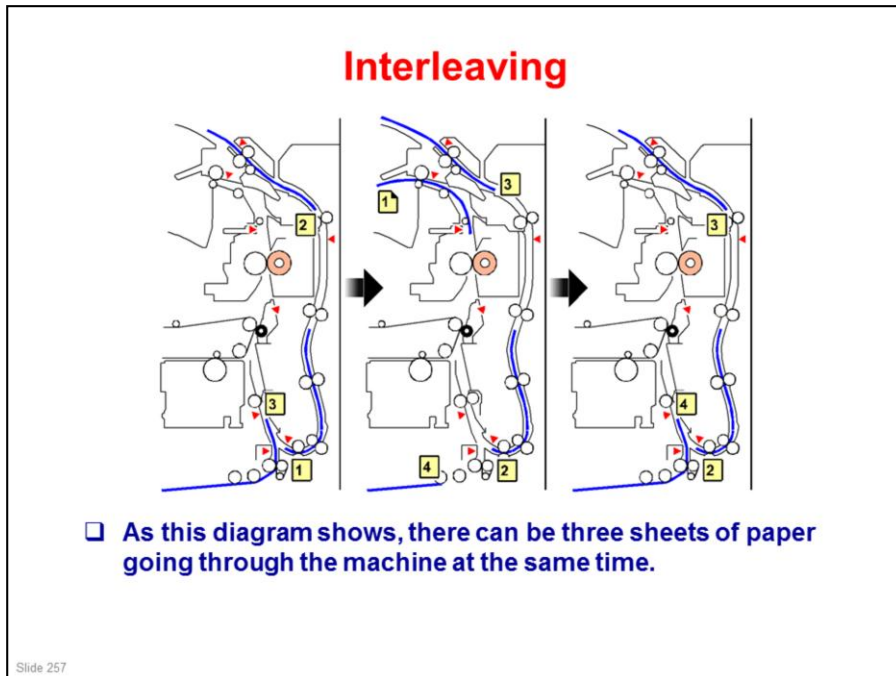
- ☐ Inverter roller: Inverter motor
- ☐ Duplex entrance roller 1: Duplex entrance motor
- ☐ Duplex entrance roller 2: Duplex entrance motor
- ☐ Duplex transport roller 1: By-pass feed/duplex motor
- ☐ Duplex transport roller 2: By-pass feed/duplex motor
- ☐ Duplex exit roller: By-pass feed/duplex motor

Duplex Feed

- ❑ For duplex feed, a solenoid moves the junction gate down so that it blocks the exit to the standard tray, and the paper feeds to the inverter mechanism.
 - ◆ This also happens when feeding out to the optional one-bin tray.
- ❑ After the trailing edge passes the exit sensor, the junction gate goes back to the normal position, and the rollers reverse-feed the paper into the duplex feed path.

Slide 256

No additional notes



Interleaving

- ☐ Paper length less than 216mm: 3
- ☐ 216-432 mm: 2
- ☐ 432-457.2 mm: 1

When feeding to the one-bin tray

- ☐ Paper length less than 216mm: 2
- ☐ 216-432 mm: 1

RICOH**D146/D147/D148/D149/D150
Service Training****Detailed Section Descriptions
Waste Toner Collection**

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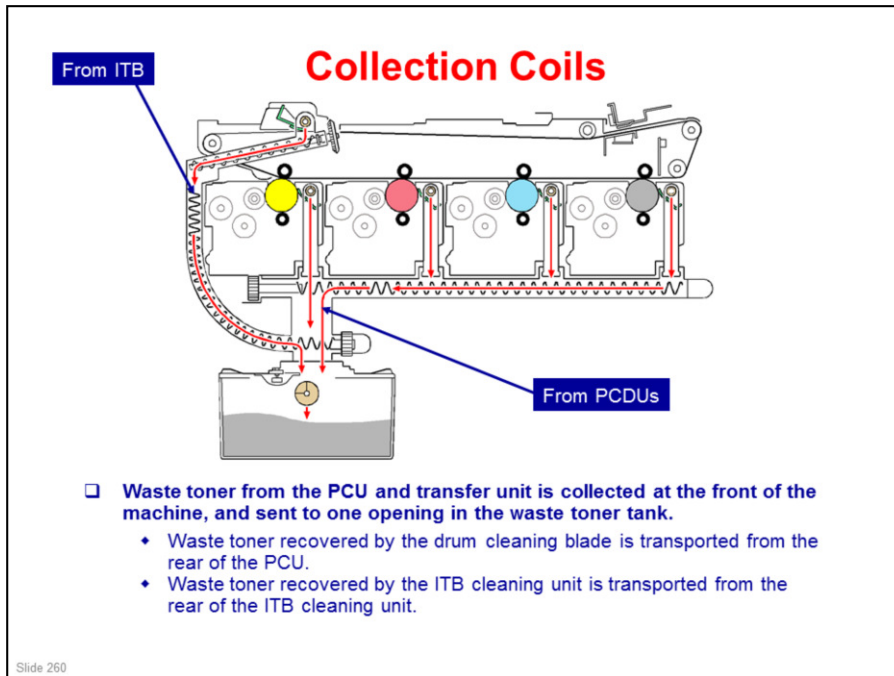
This section describes the waste toner collection mechanism.

Differences from Predecessors: Waste Toner

	Met-C1	Predecessor	Purpose
1	Coils driven by Bk PCU/ITB unit motor	Coils driven by dedicated motor	Layout optimization

Slide 259

No additional notes



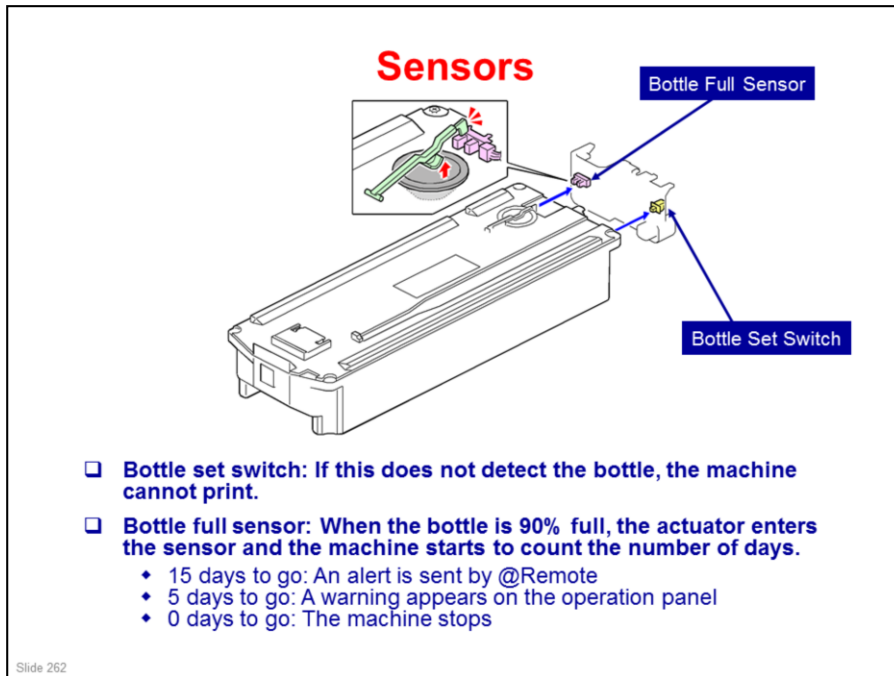
No additional notes

Drive

- ❑ The black PCU motor drives the coils in the waste toner bottle.

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No additional notes



- ❑ The bottle capacity is 100k. So, 90% is 10k remaining. The machine estimates when it is 15 days to go based on the average print volume.

RICOH**RICOH****OPTIONAL PERIPHERALS****Optional Finishers
(D686/D687)**

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No additional notes

Overview

Slide 264

No additional notes

What are the D686 and D687 Finishers?

❑ 1000-sheet Booklet Finisher D686

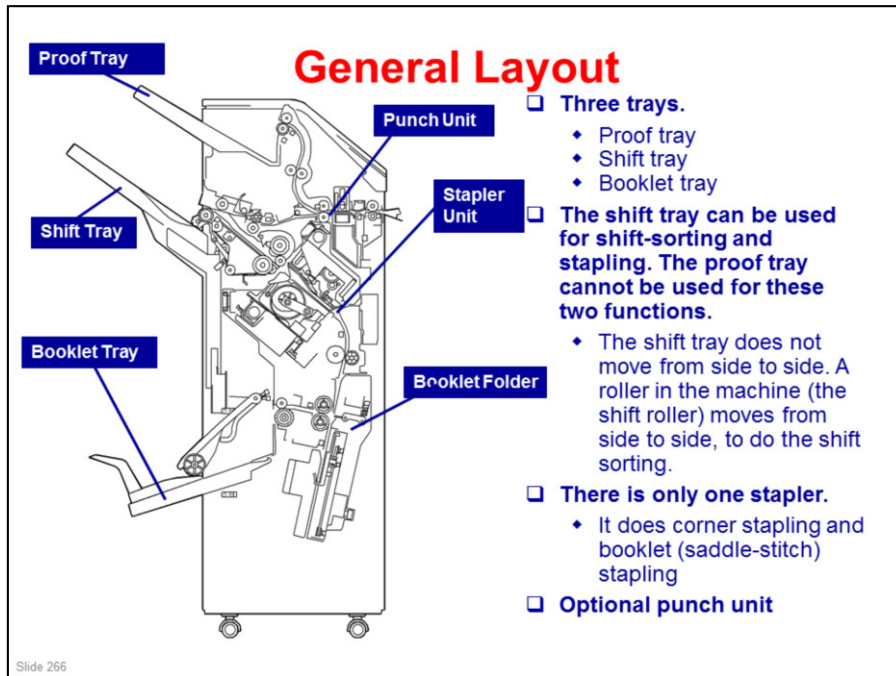
- ♦ This finisher has three trays: a proof tray on top of the finisher, an upper (shift) tray, and a lower tray for booklets.
- ♦ This is a replacement for the B793 finisher.
 - » The mechanisms are very similar to the B793 finisher.

❑ 1000-sheet Finisher D687

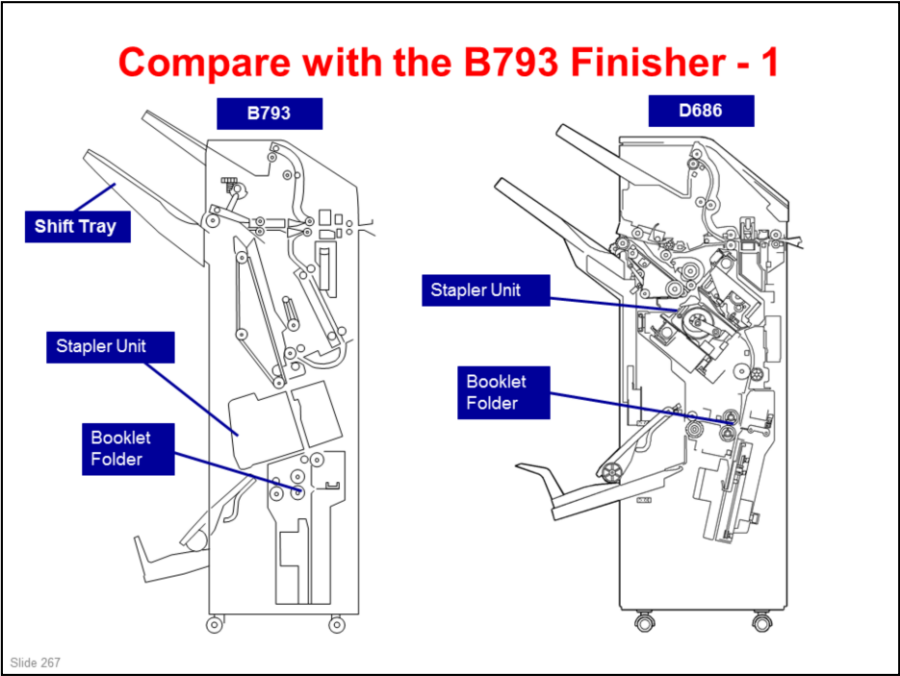
- ♦ This finisher has two trays: a proof tray on top of the finisher and the upper (shift) tray.
- ♦ This finisher does corner stapling only. It does not have a lower tray for stapled and folded booklets.

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No additional notes



No additional notes



No additional notes

Compare with the B793 Finisher - 2

❑ Better for thick paper

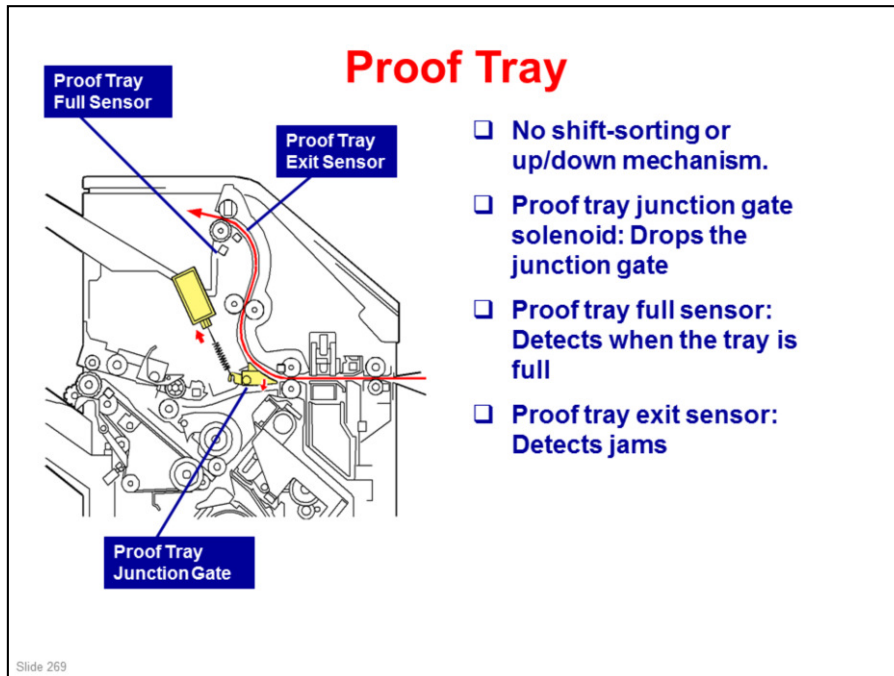
- ♦ D686/D687 has a less severe bend going back to the stapler tray from the shift tray. So, heavier paper can be stapled than in the B793.

❑ Better for thin paper

- ♦ In the B793, the stapler tray is almost vertical, so thin paper bends while in the staple tray. In D686/D687, the stapler tray is at a smaller angle, so thin paper can be stapled better.

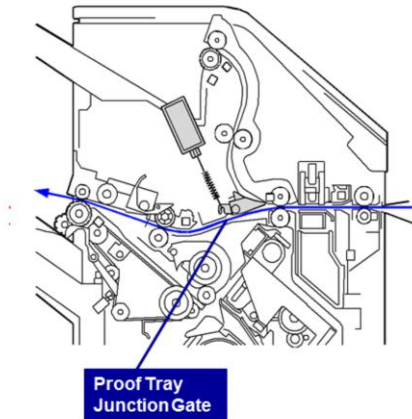
Slide 268

No additional notes



- ☐ The B793 has two junction gates. The D686/D687 have only one.
- ☐ The upper transport and entrance motors control the rollers.

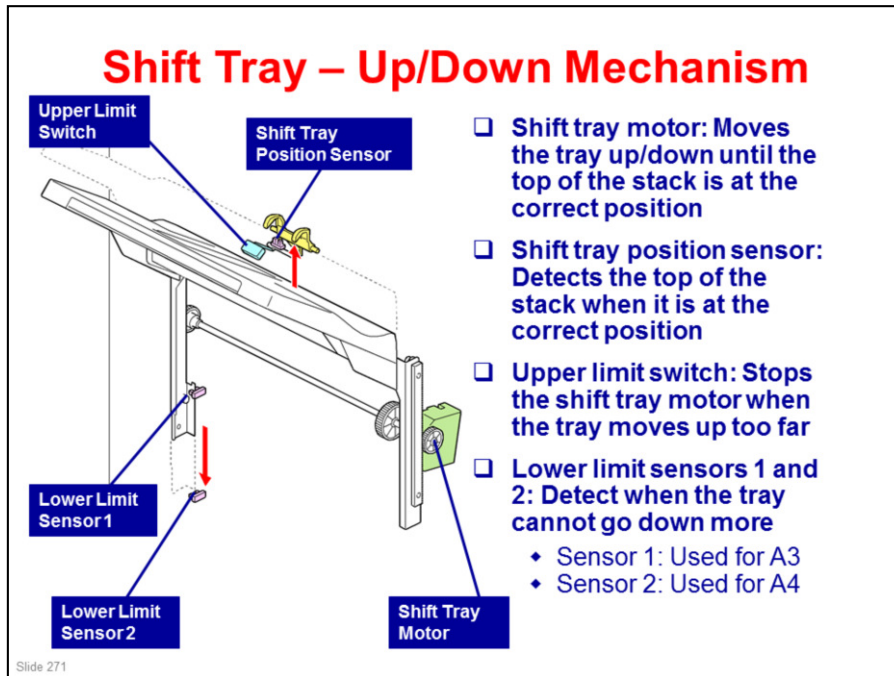
Shift Tray



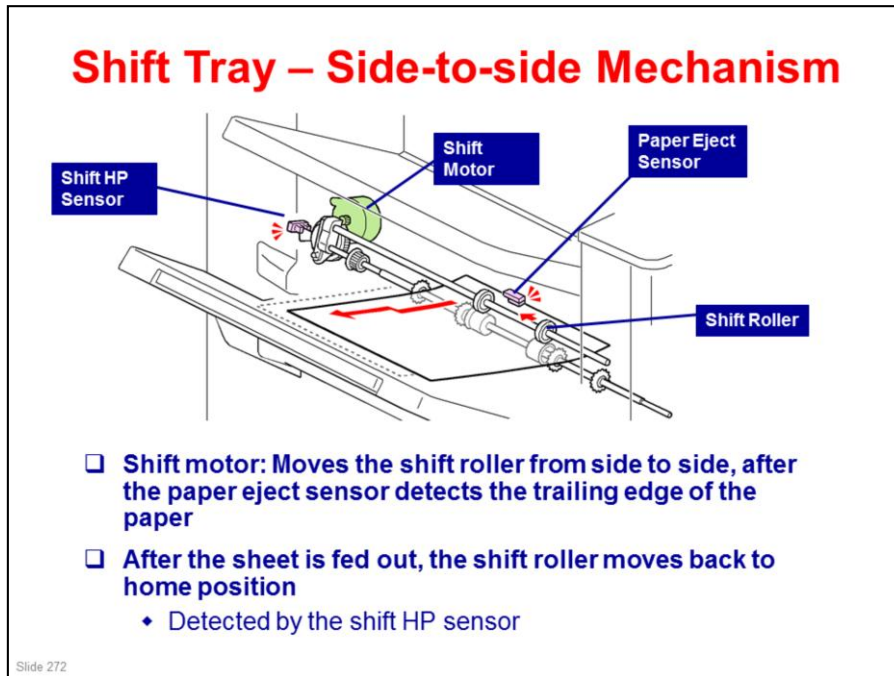
- ☐ Has shift-sorting and up/down mechanism.
- ☐ Proof tray junction gate solenoid: Does not turn on
- ☐ This is the default mode.

Slide 270

No additional notes



- ❑ The B793 has two lower limit sensors. The D686/D687 have only one.
- ❑ The tray moves up/down to keep the top of the stack at the correct position.
 - Detected by the shift tray position sensor.
- ❑ If the lower limit sensor turns on, copying stops.
- ❑ During sort/stack mode, the tray position is adjusted every 5 pages.
- ❑ During staple mode, the tray position is adjusted after every stapled set is fed out.



- ❑ This is basically the same as the B793 finisher.
- ❑ The shift roller moves the sheet to one side while it is fed out.
- ❑ All sheets of the same set are moved across to the same side, one at a time. Then, for the next set, the shift roller moves in the opposite direction.
- ❑ The shift roller goes back to home position after it feeds out each page.
 - Home position is in the middle.
- ❑ In shift mode, if the set is one sheet, the motor moves every sheet. In this case, the output speed of the finisher is reduced to 60%.

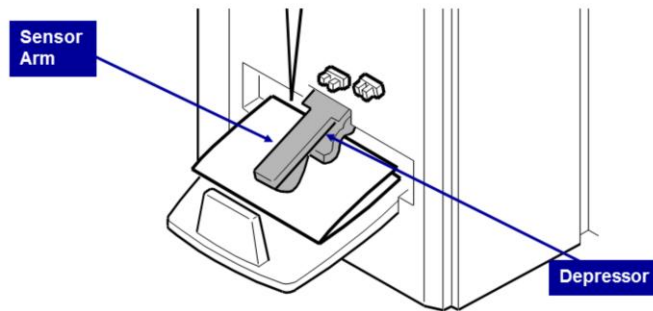
Booklet Tray - Overview

- ☐ This tray does not have a lift mechanism.
- ☐ Two sensors detect when the tray is full.
- ☐ The actuators for these sensors are attached to the sensor arm.
- ☐ This tray is for booklets only.

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- ☐ This is the same as the B793 finisher.

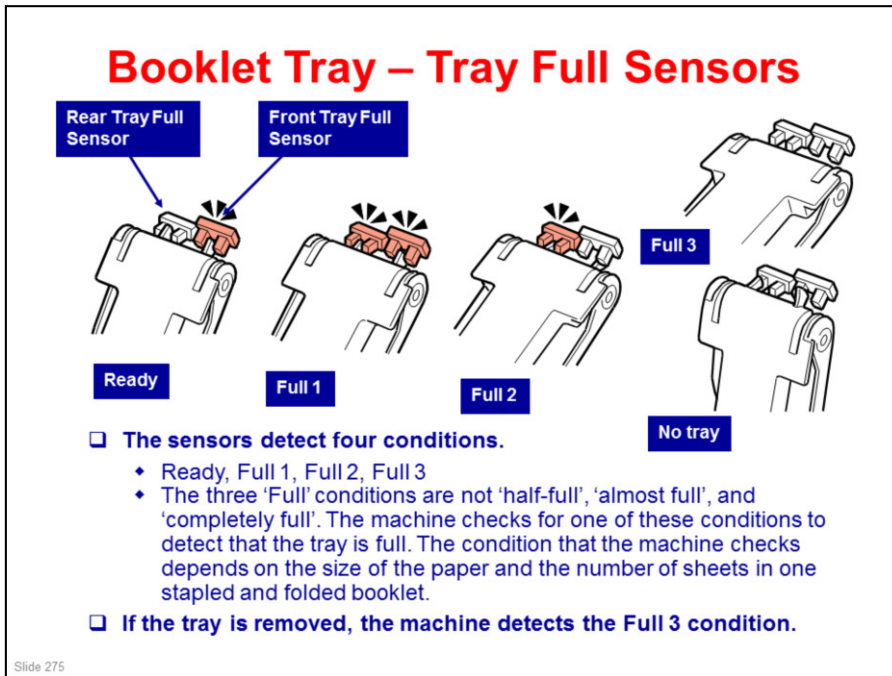
Booklet Tray – Stacking



- ☐ The sensor arm rests on the top of the booklets.
- ☐ The depressor pushes the open ends of the booklets down.
- ☐ This lets the machine stack more booklets on the tray.

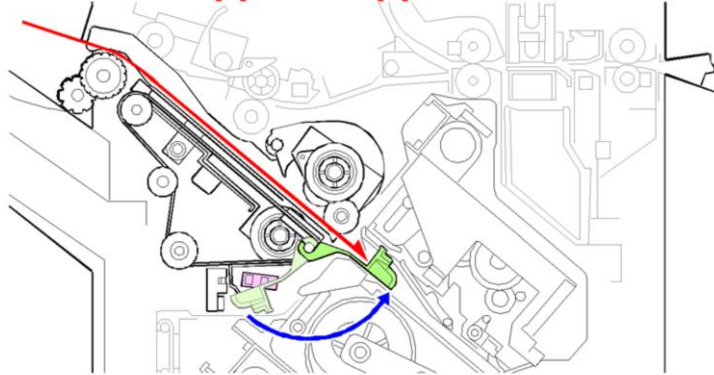
Slide 274

No additional notes



- ❑ The red sensors are 'ON'. The actuator is in the sensor.
- ❑ The three 'Full' conditions are not 'half-full', 'almost full', and 'completely full'. The machine checks for one of these conditions to detect that the tray is full. The condition that the machine checks depends on the size of the paper and the number of sheets in one stapled and folded booklet.
- ❑ After a booklet is fed out, the machine checks every 100 ms. Then, if the required 'full' condition is detected a set number of times (called "Cnt" in the service manual), the tray is full.
 - The only exception to this is Full 3. The machine must check this at all times to make sure that the tray was not removed.
- ❑ There are some examples in the service manual.
- ❑ The two-sensor mechanism is designed to take account of the way that booklets of various size and thickness settle on the output tray when the tray is getting full. The 'Cnt' values are the results of evaluations by the machine's designers, and they are the optimum values for the detection process in this model.

Stoppers for Stapling Upper Stopper - 1

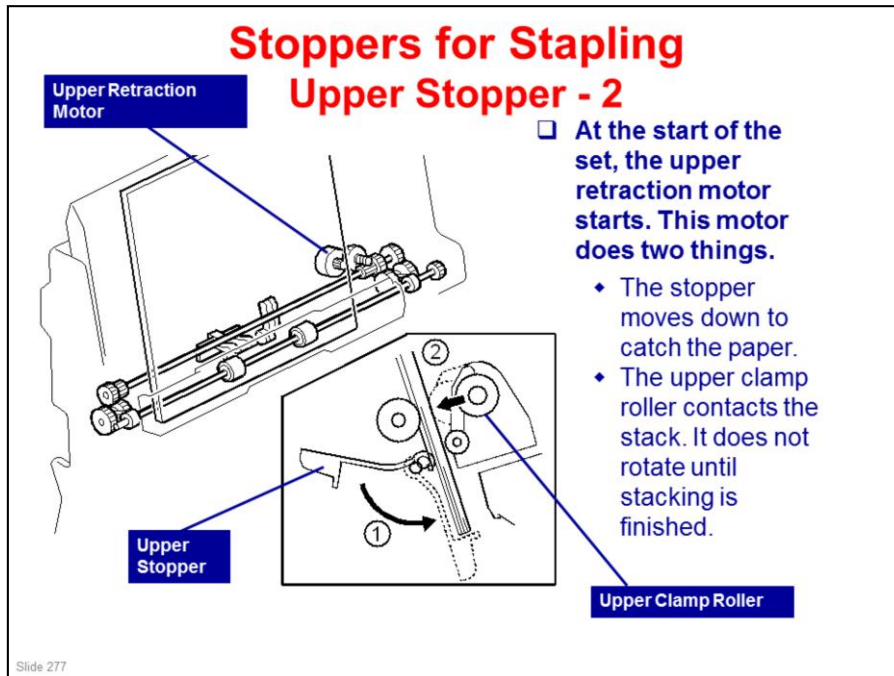


❑ **Used for the following:**

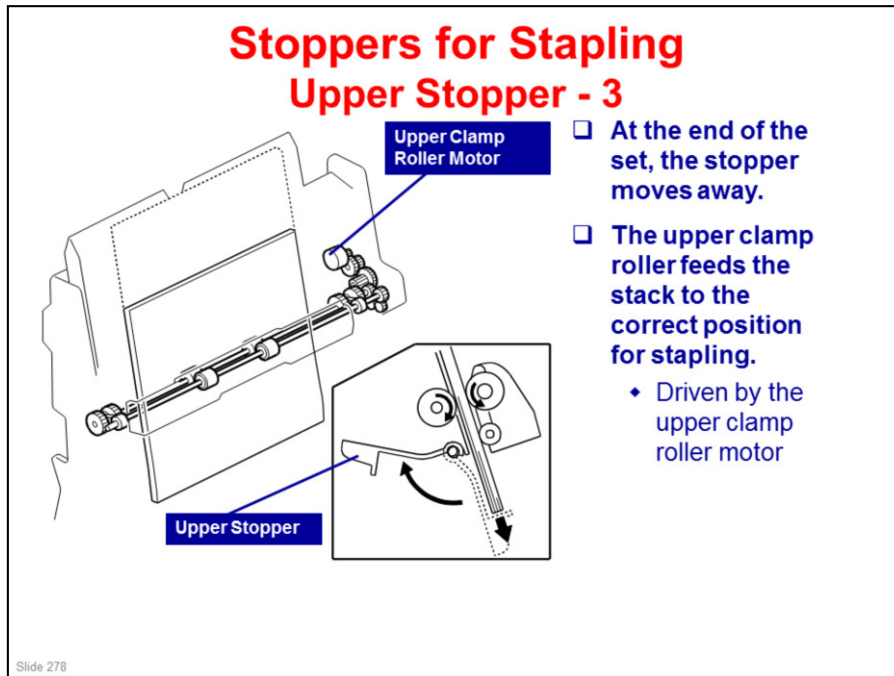
- ◆ Corner stapling: All paper sizes
- ◆ Booklet stapling: B5, A4, LT

Slide 276

- ❑ This is similar to the B793 finisher.

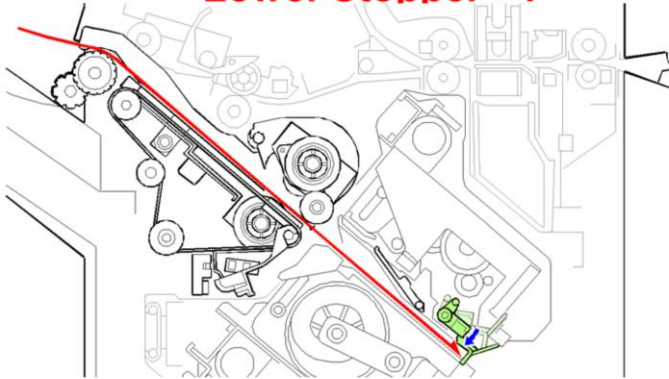


- ❑ These diagrams are copied from the B793. The mechanism is similar, but the layout is different, because the stapler tray is at a less steep angle in the D686/D687.



- ❑ These diagrams are copied from the B793. The mechanism is similar, but the layout is different, because the stapler tray is at a less steep angle in the D686/D687.

Stoppers for Stapling Lower Stopper - 1



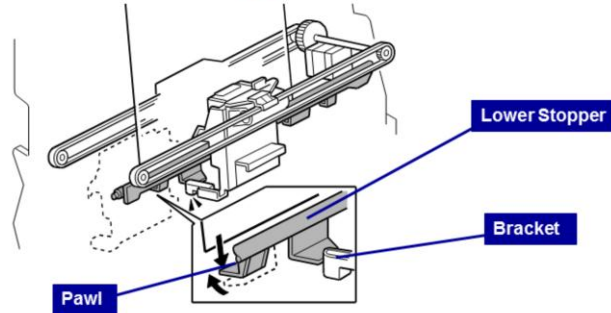
❑ **Used for the following:**

- ◆ Booklet stapling: LG, B4, A3, DLT, 12"x17.7"

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- ❑ This is similar to the B793 finisher.

Stoppers for Stapling Lower Stopper - 2

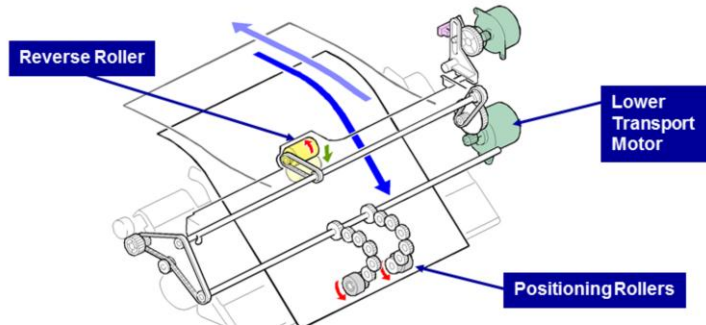


- ❑ At the start of the set, the stapler moves to the center.
- ❑ A bracket on the stapler pushes the stopper, and the pawl moves into the correct position to catch the leading edge of the paper.
 - ♦ The upper clamp roller holds the stack (see the previous slide).
- ❑ When the stack is complete, the stapler moves to the rear-side position, and the stopper moves away. The upper clamp roller feeds the stack to the correct position for stapling.

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- ❑ This diagram is copied from the B793. The mechanism is similar, but the layout is different, because the stapler tray is at a less steep angle in the D686/D687.

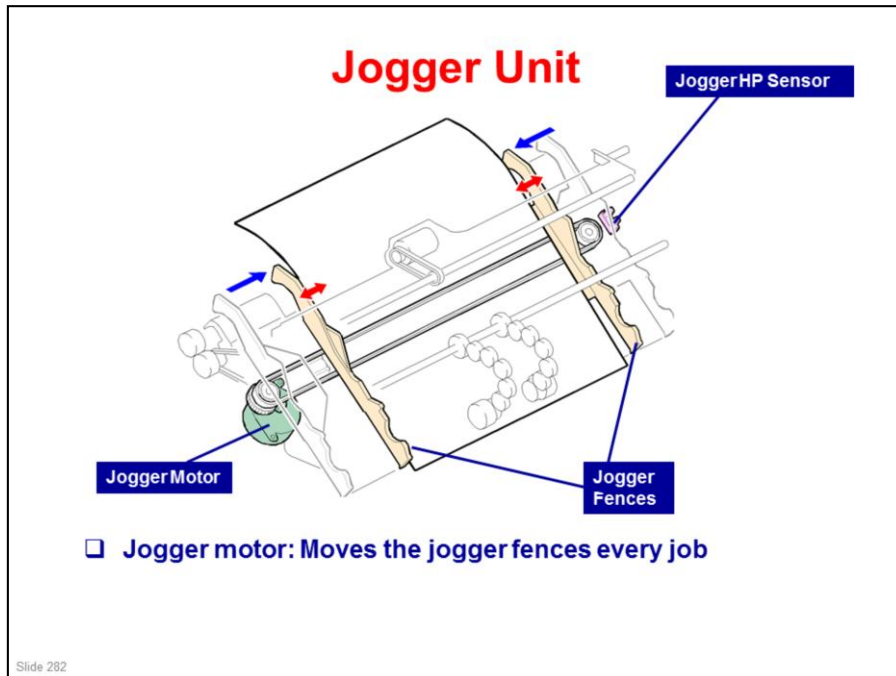
Stacking in the Stapler Tray



- ❑ To send the paper to the stapler, the paper must be fed back into the machine.
- ❑ The lower transport motor drives the reverse roller, which feeds the paper into the stapler.
 - ♦ It also drives the positioning rollers, which feed the edge of the paper against the stopper.
- ❑ The other motor in this diagram moves the reverse roller up/down.
 - ♦ A sensor detects the position of the roller.

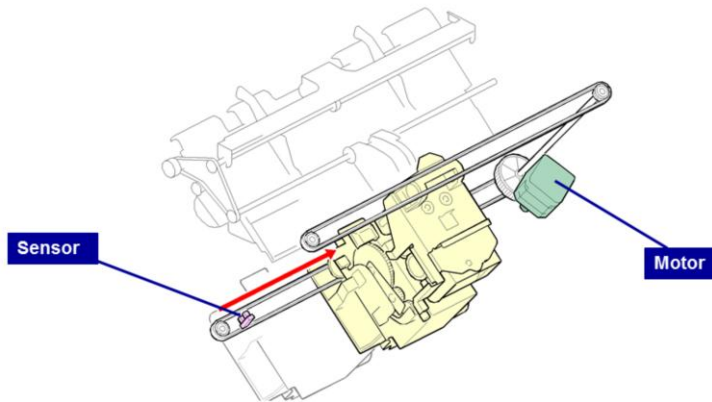
Slide 281

- ❑ This is basically the same as the B793 finisher.



- ☐ This is basically the same as the B793 finisher.

Stapler Unit Movement

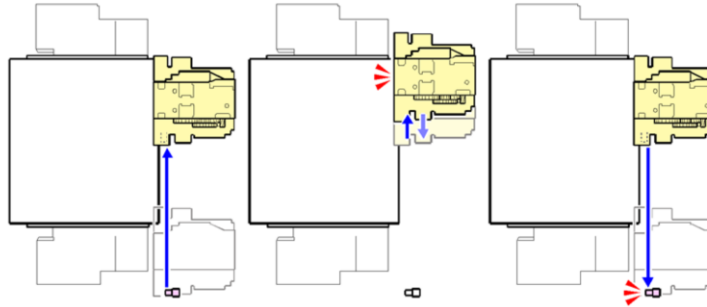


- ❑ **Stapler unit motor:** Moves the stapler from side to side
- ❑ **Stapler HP sensor:** After the job, the stapler moves back to this position

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- ❑ This is basically the same as the B793 finisher.

Corner Stapling One Staple

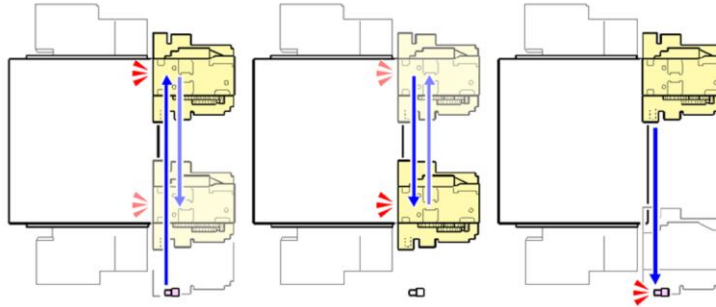


- ❑ The home position is at the front of the machine.
- ❑ The stapler moves to the stapling position, which is at the rear of the machine, and inserts the staple.
- ❑ The stapler stays at the rear until all copies are stapled, then comes back to home position.

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No additional notes

Corner Stapling Two Staples



- ❑ On the first copy, the stapler inserts the first staple at the rear of the machine, and the second at the front of the machine. Then the first copy is fed out.
- ❑ For the second copy, the first staple is inserted at the front. Then the stapler moves to the rear and inserts the second staple. Then the second copy is fed out.
- ❑ The stapler returns to home position after all copies are stapled.

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No additional notes

Booklet Stapling B5, A4, LT



- ❑ The stapler moves from the home position to the rear of the machine, then to the center.
- ❑ The stapler then moves to the first stapling position, towards the rear from the center, and inserts the staple.
- ❑ The stapler then moves to the second stapling position, towards the front from the center, and inserts the staple.
- ❑ The booklet is then fed to the booklet folder, while the stapler waits at the rear of the machine for the next copy.

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No additional notes

Booklet Stapling LG, B4, A3, DLT, 12"x17.7"

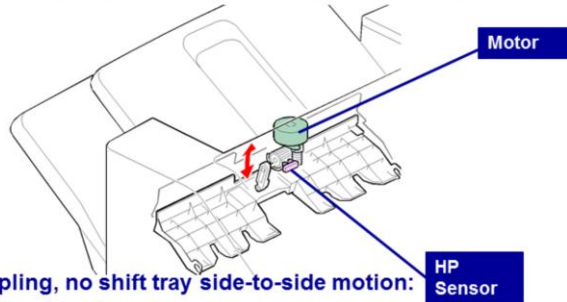


- ❑ The stapler first moves to the center position. At this position, the bracket on the stapler releases the lower stopper, which is necessary to catch the bottom edge of long paper.
- ❑ The stapler then moves to the first stapling position, towards the rear from the center, and inserts the staple.
- ❑ The stapler then moves to the second stapling position, towards the front from the center, and inserts the staple.
- ❑ The booklet is then fed to the booklet folder, then the stapler moves to the center position for the next copy.

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- ❑ When the stapler is at the center position, a bracket releases the lower stopper, which catches the bottom edge of the paper for booklet stapling with longer paper sizes.

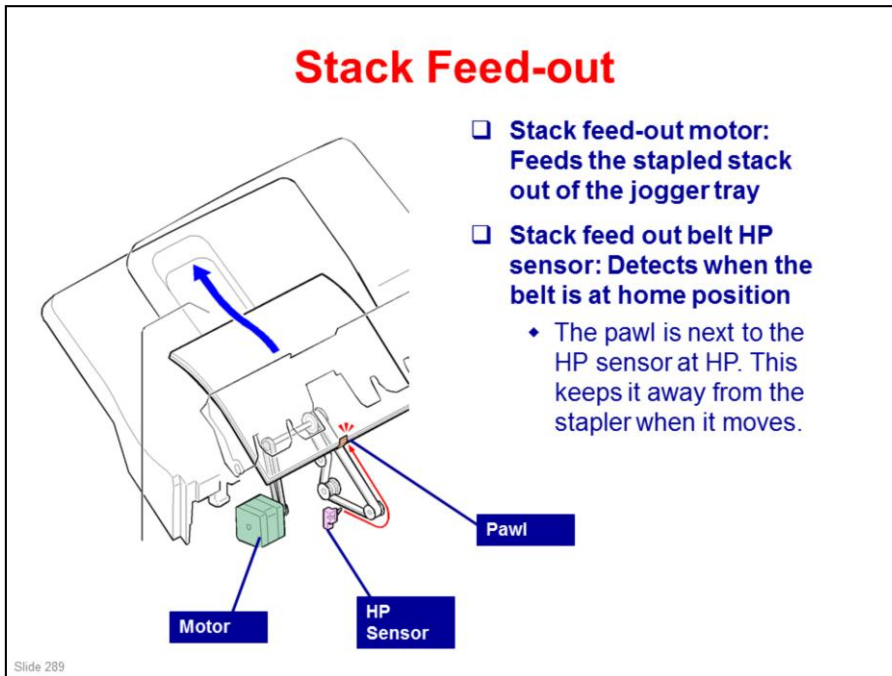
Exit Guide Plate Open/Close



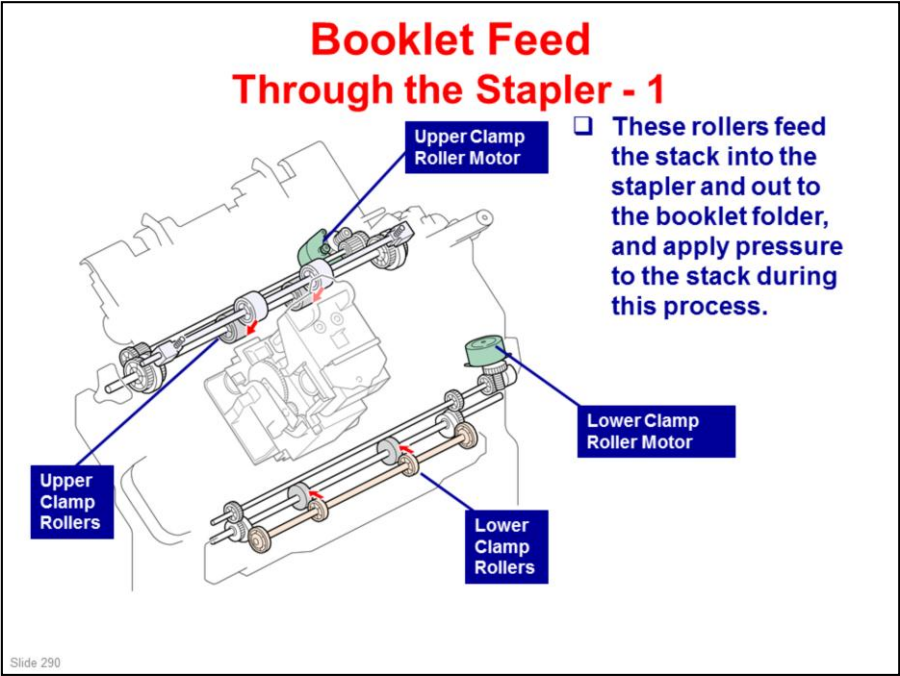
- ❑ **For no stapling, no shift tray side-to-side motion:**
 - ◆ The exit guide plate stays down
- ❑ **Shift tray side-to-side motion**
 - ◆ When the shift motor starts, the exit guide plate motor lifts the exit guide plate. When shift has finished, the exit guide plate drops again.
 - ◆ Stapling: The motor the exit guide plate up at the start of the job and drops it at the end of the job.
 - » Necessary to make sufficient space between the exit rollers for long paper (for example, A3/DLT)
 - » The exit guide plate HP sensor detects the correct time to stop moving down.

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- ❑ This is basically the same as the B793 finisher.
- ❑ The guide plate moves away from the paper path. Because of this, the leading edge of copies in the jogger unit does not hit the exit rollers, and is not aligned incorrectly before stapling.
 - This is done for all paper sizes, but it is only necessary for long paper sizes.



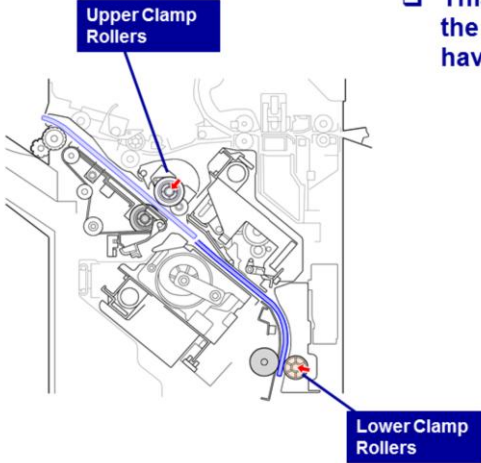
- ❑ This is basically the same as the B793 finisher.
- ❑ The stack feed-out belt feeds the stack out to the shift roller.
 - The pawl on the belt lifts the stack.
 - For booklet stapling, this pawl stays at home position, which is on the rear side, so it does not interfere with booklet stapling.
- ❑ The shift roller continues to feed the stack out.
 - The shift roller does not move from side to side in stapling mode.
 - The exit motor turns the shift roller.



- This is similar to the B793 finisher.

Booklet Feed Through the Stapler - 2

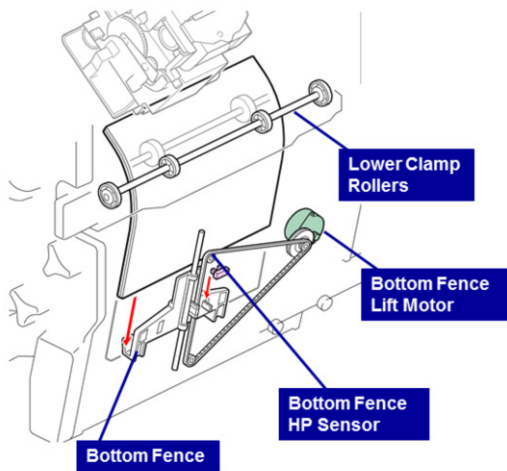
☐ This shows a side view of the mechanism that we have just described.



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No additional notes

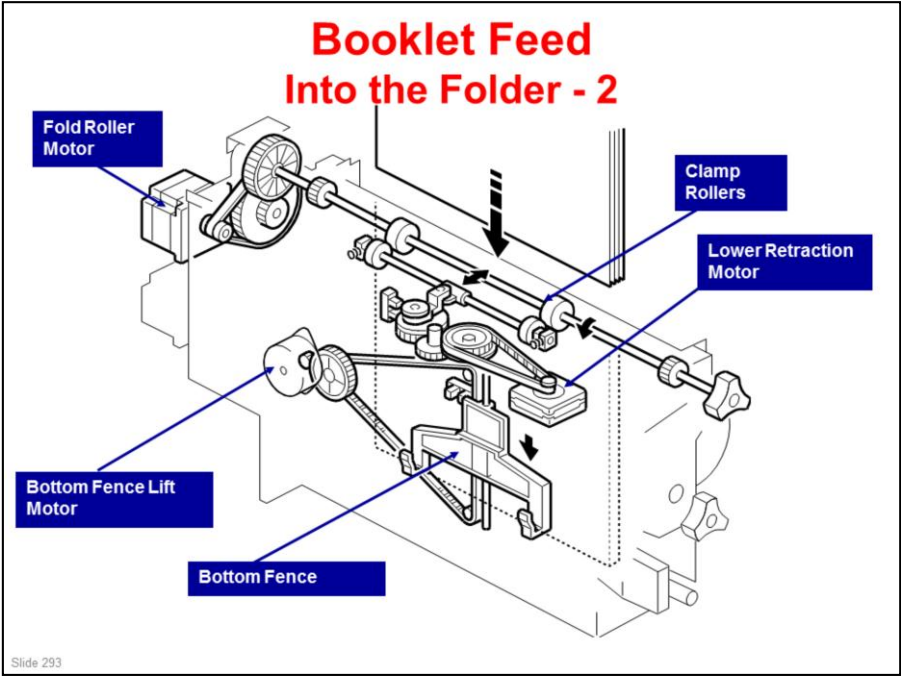
Booklet Feed Into the Folder - 1



- ❑ The lower clamp rollers feed the stack of paper down towards the folder.
- ❑ The bottom fence is lifts the stack to the folding position, based on the paper size used for the booklet.
- ❑ The clamp rollers open to let the booklet fall onto the bottom fence of the folder unit.
- ❑ The lower retraction motor opens and closes the gap between the clamp rollers (see the next slide).

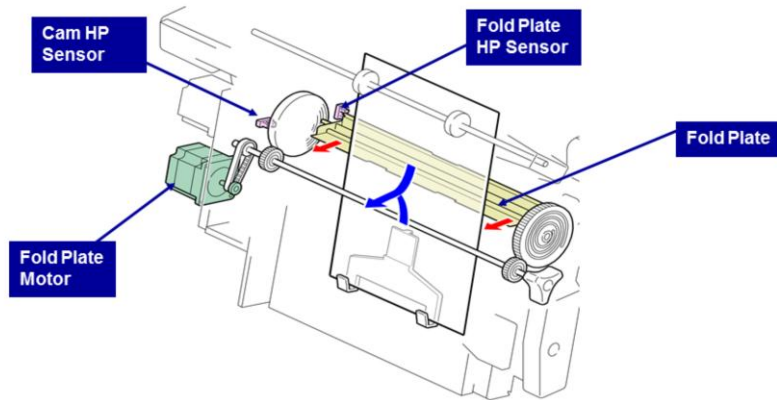
Slide 292

- ❑ This is similar to the B793 finisher.



❑ This diagram is from the B793. The mechanism is similar.

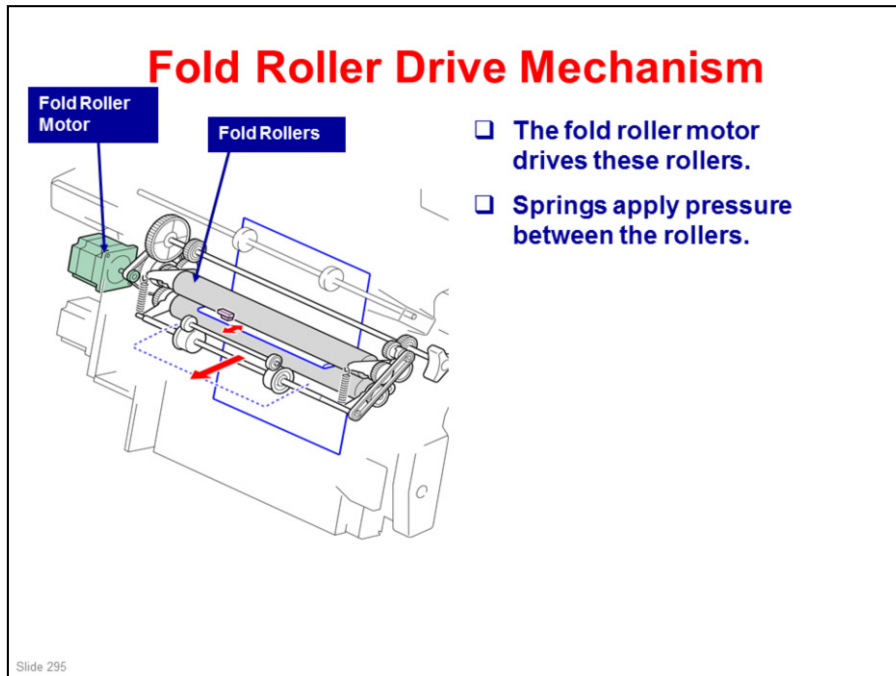
Fold Plate Drive Mechanism



- ❑ A motor and cam drive the fold plate.
- ❑ The fold plate and cam both have home position sensors, to control the folding operation.

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- ❑ This is similar to the B793 finisher.



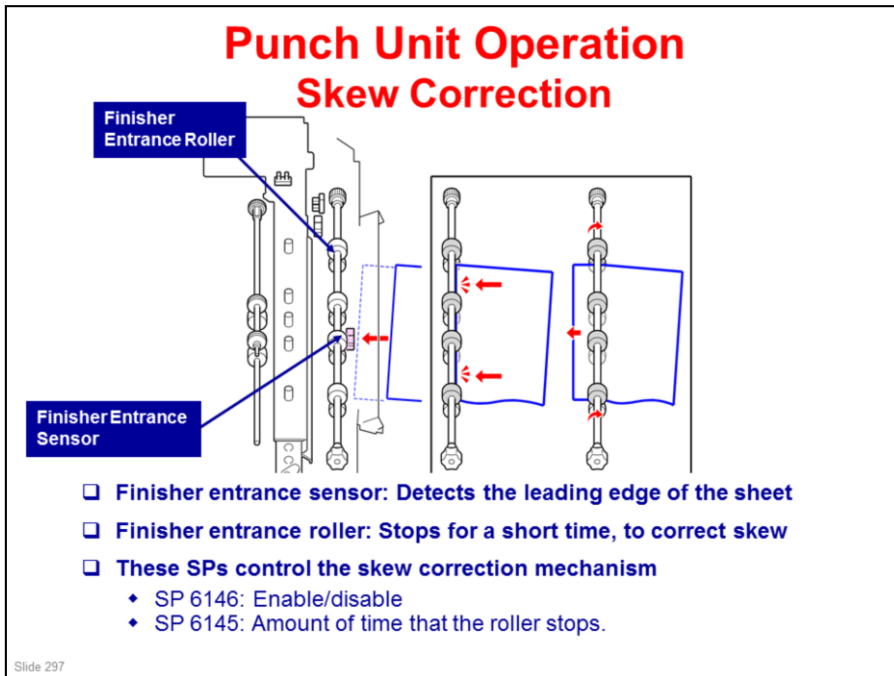
- ☐ This is similar to the B793 finisher.

Punch Unit - Overview

- ❑ **This punch unit has two new mechanisms to make the positions of punch holes more accurate**
 - ◆ **Skew correction**
 - » The punch unit corrects skew in the paper before the holes are punched.
 - ◆ **Side-to-side movement of the punch unit**
 - » The paper must be in the middle of the paper feed path, or the punch holes will be too high or too low along the edge of the paper.
 - » The punch unit detects the distance that the paper is away from the ideal position.
 - » Then it moves the punch unit across to put the holes in the correct position at the edge of the paper.

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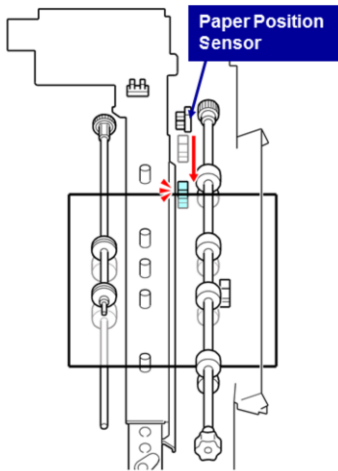
- ❑ The mechanism is the same as the punch unit for the B793, but the layout is a bit different.



- ❑ This shows how the punch unit corrects for skew.

Punch Unit Operation

Punch Hole Position Correction - 1

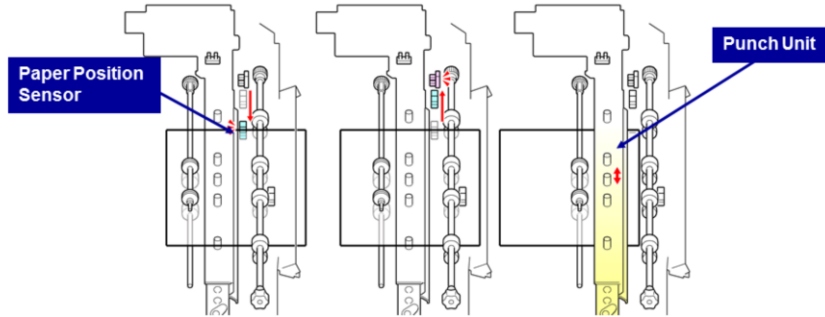


- The paper position sensor is moved until it detects the edge of the paper.
 - ◆ This measures the distance of the paper from the ideal central position in the feed path.
 - ◆ The machine uses this to calculate the distance that the punch unit must be moved across the page.

No additional notes

Punch Unit Operation

Punch Hole Position Correction - 2



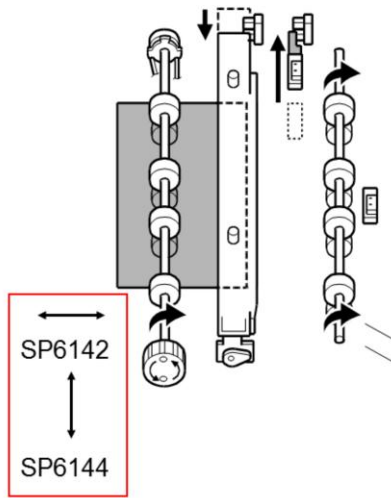
- ❑ The paper position sensor moves back to home position.
- ❑ The rollers feed the paper to the punch position.
- ❑ The punch unit moves across the page, to put the holes in the correct position.

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No additional notes

Punch Unit Operation

Punch Hole Position Correction - 3

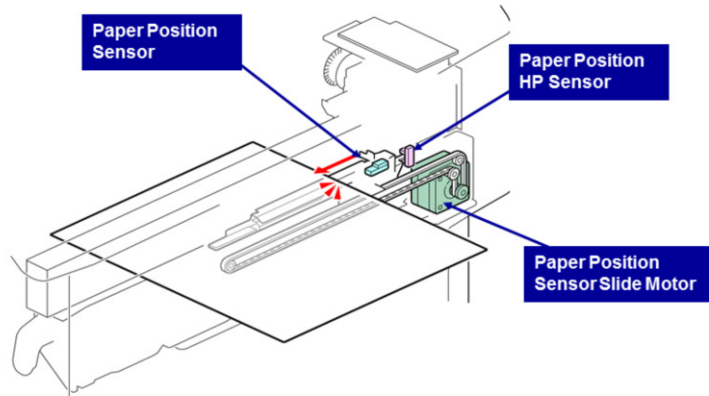


- ❑ The paper is fed out of the punch unit.
- ❑ Punch hole position adjustments
 - ◆ SP 6142: Moves the position parallel to the feed direction
 - ◆ SP 6144: Moves the punch position perpendicular to the feed direction

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No additional notes

Paper Position Detection

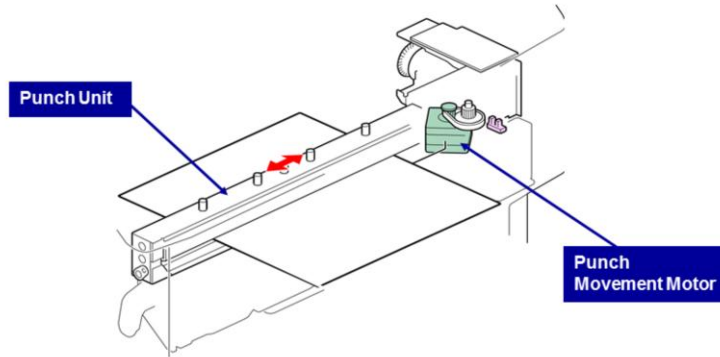


- ❑ The motor moves the sensor across the paper feed path until the sensor detect the edge of the paper.

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- ❑ The other sensor in the diagram is a home position sensor.

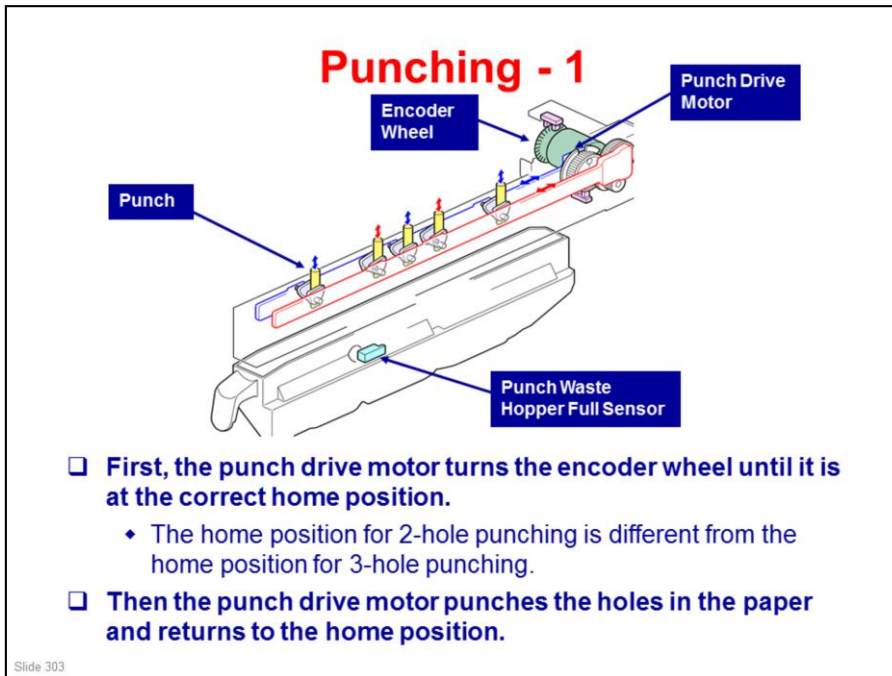
Punch Unit Movement



- ❑ Punch movement motor: Moves the punch unit across until it is in the correct position.
- ❑ Punch drive motor (see the next slide): Puts the punch holes in the paper.

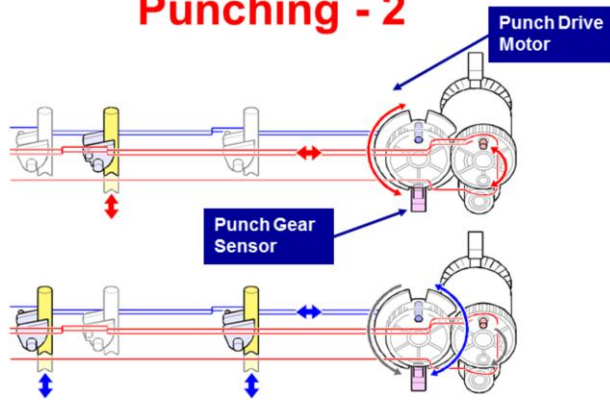
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No additional notes



- ❑ The diagram shows the operation of 3-hole punching in the 2-hole/3-hole punch unit.
- ❑ Punch waste falls into the hopper.
- ❑ The sensor detects when the hopper is full, and if the hopper is not in the machine.

Punching - 2



- ❑ Two-hole punching (top diagram): The motor drives clockwise then reverse.
- ❑ Three-hole punching (bottom diagram): First the punch gear is turned 180 degrees, then the motor drives clockwise then reverse

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No additional notes

Adjustments

❑ SP modes

- ◆ 6140: Stapling position
- ◆ 6141: Booklet stapling position
- ◆ 6143: Position of jogger fences
- ◆ 6147: Folder position adjustment

❑ Dip switches

- ◆ SW100: Stapling position
- ◆ SW101: Jogger fence position
- ◆ If you adjust a dip switch setting, open and close the finisher cover to enable the new setting. It is not necessary to switch the power off/on.

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- ❑ Jogger fence adjustment: This adjusts the distance between the front and rear fences. If the fences are too far apart, skewing may occur. If the fences are too close, the paper may be creased. Also adjust if the edges of stapled stacks are untidy.

Replacement and Adjustment

□ Stapler Unit

- ◆ After you remove this, a special tool is needed when you reassemble the machine.
- ◆ The stapler unit has two parts. The special tool holds the two parts in the correct positions.
- ◆ The special tool is packed with each staple unit that is ordered as a service part.

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No additional notes

Smart Operation Panel

Smart Operation Panel Type M3 (D148)



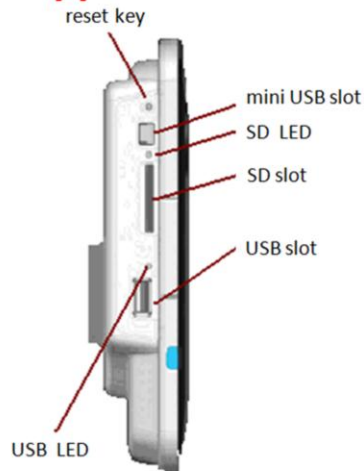
Slide 307

No additional notes



No additional notes

Appearance - 2



- ☐ The operation panel has SD / USB slots.
- ☐ There is a Reset key for Android.

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No additional notes

Basic information - 1

- ❑ There are two kinds of applications.
 - ❑ 1) Android applications
 - ❑ You can use “flick input” and “swiping”.
 - ❑ You can use “Menu” and “Back” keys.
 - ❑ These keys only light for Android applications.
 - ❑ 2) Legacy applications
 - ❑ You cannot use “flick input” or “swiping”.
 - ❑ You cannot use the “Menu” and “back” keys.

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No additional notes

Basic information - 2

□ You can customize the Home display.

- ◆ You can add widgets (Toner remaining, clock, language and so on) and applications.
 - Please push and hold on the Home display
 - Select the object which you want to add.
- ◆ You can delete widgets or application icons.
 - Please push and hold the object which you want to delete.
 - After the trash box appears, move the object to the trash box.

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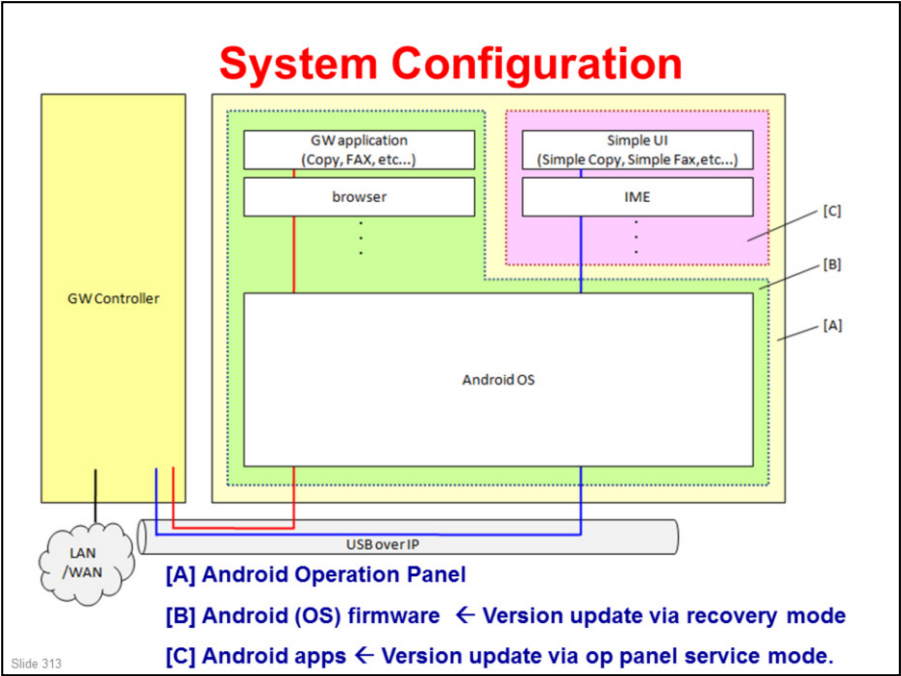
No additional notes

Basic information - 3

- ☐ **SC or machine status is displayed in legacy mode.**
- ☐ **There is no independent Address Book or Authentication for Android.**

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No additional notes



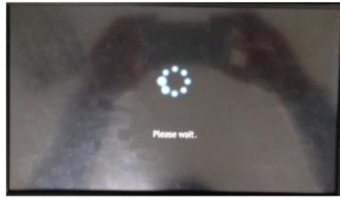
No additional notes

Start up

- There are two start up displays: GW controller and Android)



GW controller

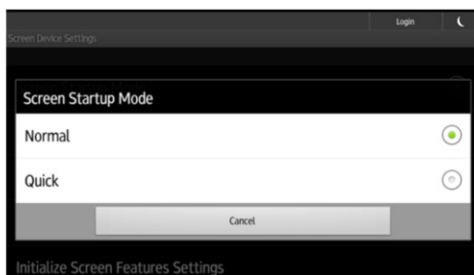


Android

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No additional notes

Screen start up mode



- ❑ **There are two modes for screen start up**
 - ◆ **Normal (Default)**
Low electricity mode. It takes some time to start up the operation panel (about 68 seconds).
 - ◆ **Quick**
Supplying electricity for the operation panel is continued while the machine power is off, to start up quickly (about 18 seconds).
* It takes some time to shut down to prepare for the next wake up.

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- ❑ Display is under sleep mode condition.

Special shut down mode

□ There are two special shut down modes.

- ♦ Shut down for maintenance.
 - » When "Quick" start up mode is set, just enough power is supplied to keep the panel in sleep condition.
 - Procedure: Turn the power off while pushing the "Stop" key. Continue pressing the power switch until "Shutting Down" is displayed.
- ♦ Shut down for main machine update.
 - » You can shut down only the Controller and the Engine (without Android) with this method.
 - » Procedure: Turn the power off while pushing the "Back" key. Continue pressing the power switch until "Shutting Down" is displayed.

Slide 316

No additional notes

Service Modes

- ❑ **There are three SP modes. Contact your supervisor for details on how to access these.**
 - ◆ Machine service mode
 - ◆ Android operation panel service mode
 - ◆ Recovery mode: Needed for updating firmware, and for android system recovery

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- ❑ The firmware update procedure is in the section of the service manual about smart operation panel maintenance.



The End