Metis-C1

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D146/D147/D148/D149/D150
MP C3003SP/3503SP/4503ASP/4503SP/
5503ASP/5503SP/6003SP
Service Master Update Training

Ricoh Academy Europe

Objectives

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- After completing this training you should be:
  - Able to install the MP C3003 series in the field.
  - Able to perform routine maintenance.
  - Able to troubleshoot and repair the product in the field.
  - Familiar with the Cheetah operation panel.

- To reach these objectives you must have knowledge about the predecessor Athena-C3 and Apollon-C3.

Requirements

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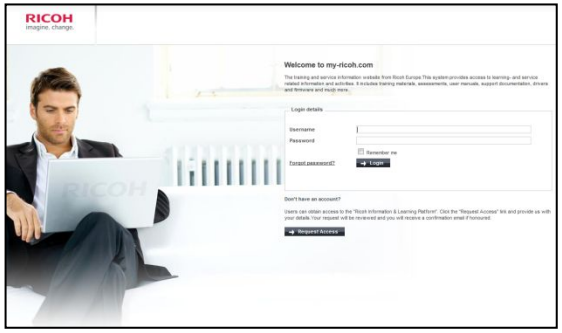
- Metis-C1 with Cheetah operation panel.
- Windows PC.
- Field Service Manual.
- This presentation.

Pre-requisites and exam

- Before starting this training you must already have followed the My-Ricoh training for:
  - Printing 2012
  - Basic Colour
  - MP C3003 series – Introduction

- At the end of this course, you can do the exam on:

www.my-ricoh.com



Module overview

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- 1. Introduction
- 2. Installation
- 3. Maintenance
- 4. Detailed Section Descriptions
- 5. Troubleshooting
- 6. Android Operation Panel

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1. Introduction

Metis-C1

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- The Metis-C1 is the successor model of the Athena, Apollon and Diana series.
- The Metis-C1 comes in 7 different speeds (20/25/30/35/45/55 and 60 ppm) and standard with different options like:
  - ARDF
  - SPDF
  - Cheetah (Smart Operation Panel)
- GW2012A controller.

Different models

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Model	Model Name	Print Speed (ppm)	Standard Option	Operation Panel
Metis-C1a	MP C3003SP	30	ARDF	Conventional
	MP C3003ZSP	30	ARDF	Cheetah
Metis-C1b	MP C3503SP	35	ARDF	Conventional
	MP C3503ZSP	35	ARDF	Cheetah
Metis-C1c	MP C4503SP	45	ARDF	Conventional
	MP C4503ASP	45	SPDF	Conventional
	MP C4503ZSP	45	ARDF	Cheetah
	MP C4503ZASP	45	SPDF	Cheetah
Metis-C1d	MP C5503SP	55	ARDF	Conventional
	MP C5503ASP	55	SPDF	Conventional
	MP C5503ZSP	55	ARDF	Cheetah
	MP C5503ZASP	55	SPDF	Cheetah
Metis-C1e	MP C6003SP	60	SPDF	Conventional
	MP C6003ZSP	60	SPDF	Cheetah
Metis-C1y	MP C2003SP	20	ARDF	Conventional
	MP C2003ZSP	20	ARDF	Cheetah
Metis-C1z	MP C2503SP	25	ARDF	Conventional
	MP C2503ZSP	25	ARDF	Cheetah

Conventional panel

Cheetah panel

ARDF

SPDF

Difference between the models

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- Fusing unit:
  - Fusing lamps and shield is different between a/b models and c/d/e models.
- Toner cartridge:
  - The amount of toner inside the cartridge is different between the a/b models and the c/d/e models.
- Print speed at 1200 dpi:
  - Print speed is reduced to half for the a/b models.

	Metis-C1 a/b	Metis-C1 c/d/e
Laser Unit	1 Laser beam	2 Laser beams
Air flow	8 fans	11 fans
Double feed detection	No	Only Metis-C1e
Bypass		side fence contact sensor mechanism (metis-c1e only)

Yield and consumables

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- Toner cartridges:
  - Metis-C1a/b:
    - K: 28k prints/bottle
    - YMC: 18k prints/bottle
  - Metis-C1c/d/e:
    - K: 31k prints/bottle
    - YMC: 22.5k prints/bottle
- Waste toner bottle: 100k
  - Replaced by customer (default)
  - With SP5-073-001, this can be changed to technician replacement.

Targets & reliability

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- Average Print Volume (APV):
  - Metis-C1a: 5k/month
  - Metis-C1b: 7k/month
  - Metis-C1c: 10k/month
  - Metis-C1d: 12k/month
  - Metis-C1e: 15k/month
- Colour ratio: 30%.
- PM interval: 300k, 400k.
- Machine life:
  - a/b models: 1200k/5 years.
  - c/d/e models: 3000k/5 years.

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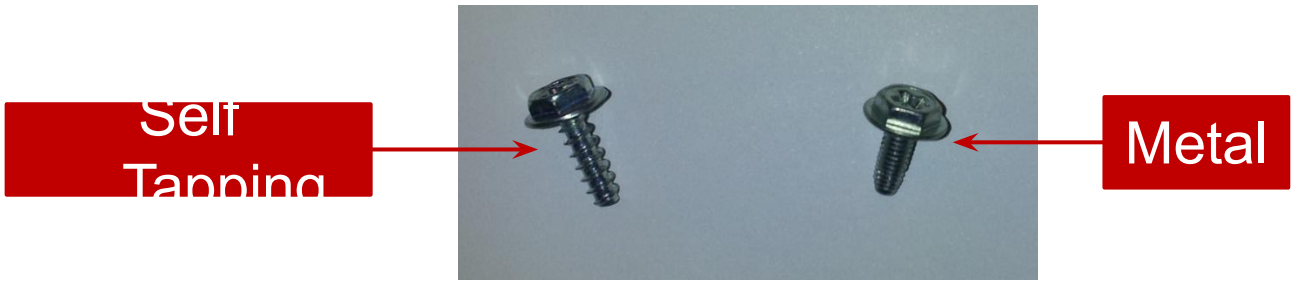
2. Installation

Important

- 1 of the changed items from the predecessor is the total weight of the machines.
- This is achieved by (where it is possible) replacing metal frame by plastic frame.
- So the screws which are used are:
  - Self tapping
  - Metal
- The way to insert these screws is different.
  - The self tapping screw always turn them counter clockwise first until you feel a click.



Hardware Installation

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- Basically, this is very simple.
  - Remove packing materials.
  - Remove the seals from the PCDUs (if applicable).
  - Connect the PCDU harnesses.
  - Rotate two levers on the ITB clockwise until they point down.
  - Install the toner bottles.
    - Toner is transported to the hopper when the machine is switched “on” for the first time. This will take about 5 minutes.

Lifting the machine

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- Always lift the machine with the handles at the bottom.
- When shipped from the factory, these handles are obscured by packing materials. So, remove the packing materials before you attempt to lift the machine.

Removing the PCDU seals

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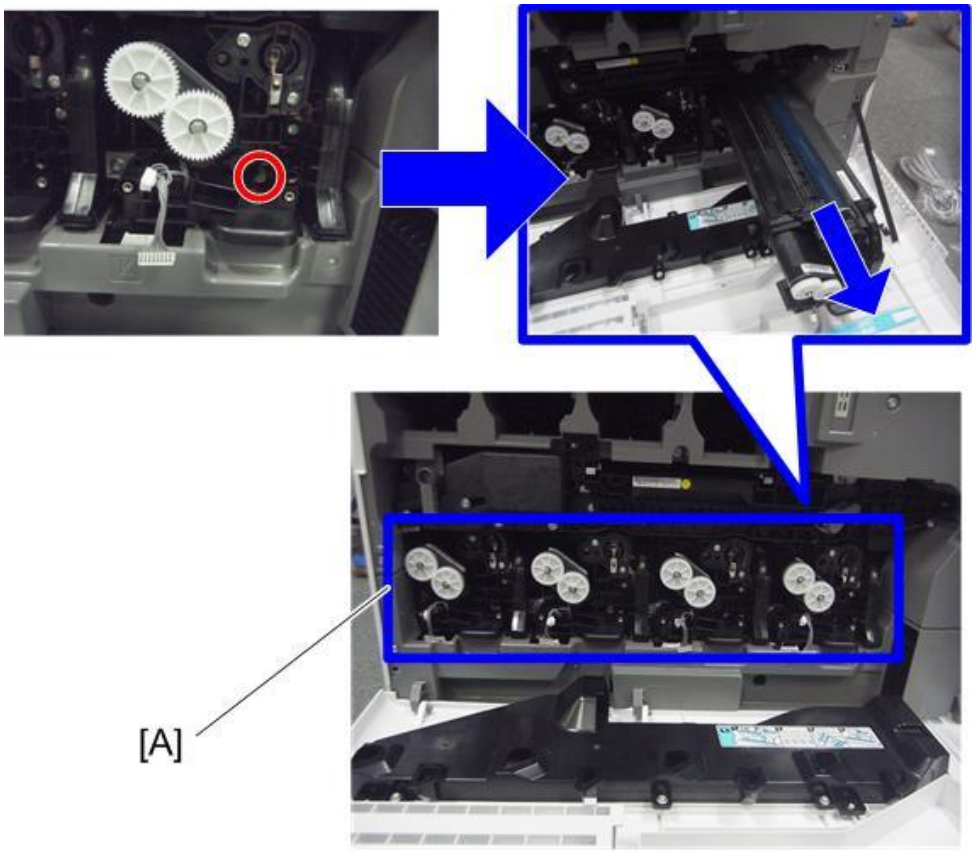
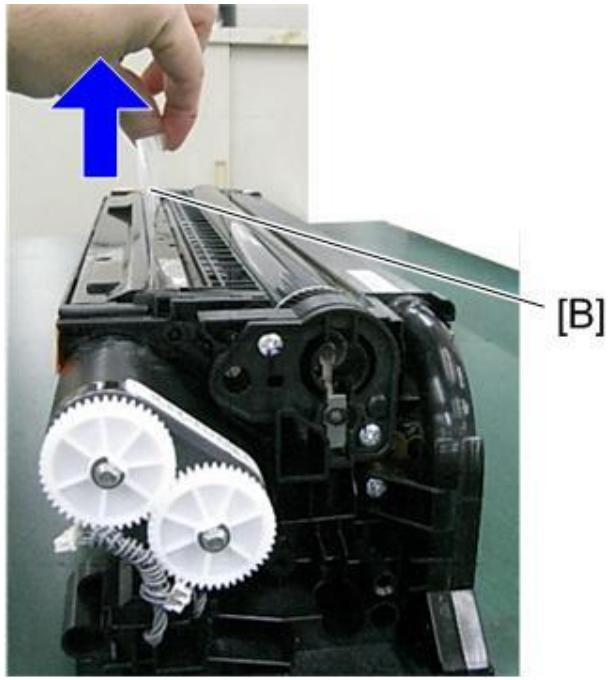
- Each PCDU [A] has a seal [B] that must be removed during installation.





Front covers PCDU's & ITB unit

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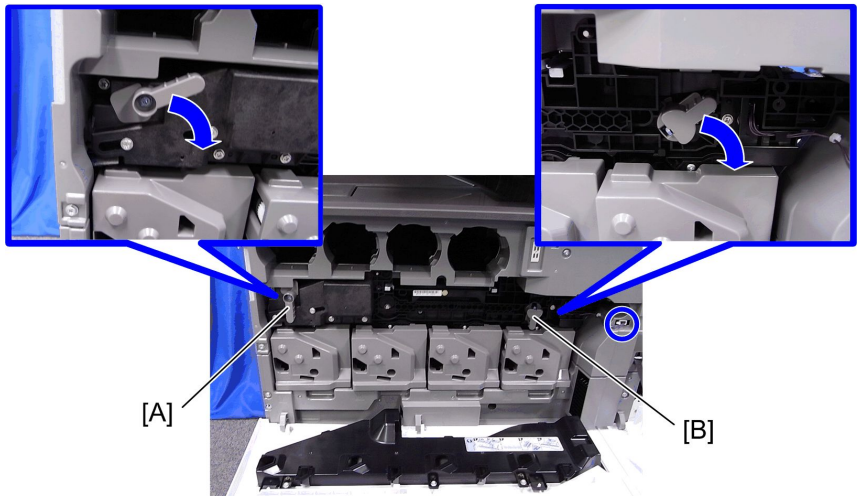
- Covers are not installed on the machine when it is from the factory.
- After the seal is removed from each PCDU and the levers are down, attach the covers.

ITB levers

- Two levers:
  - Move them down for normal operation.
  - Move them up when you want to pull out or push in the ITB unit.
- Waste toner bottle contact lever (A):
  - The lever must be moved so that the waste toner path from the ITB connects to the waste toner bottle.
- ITB contact lever (B):
  - The ITB belt is moved down to contact the black PCDU.



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.

ARDF

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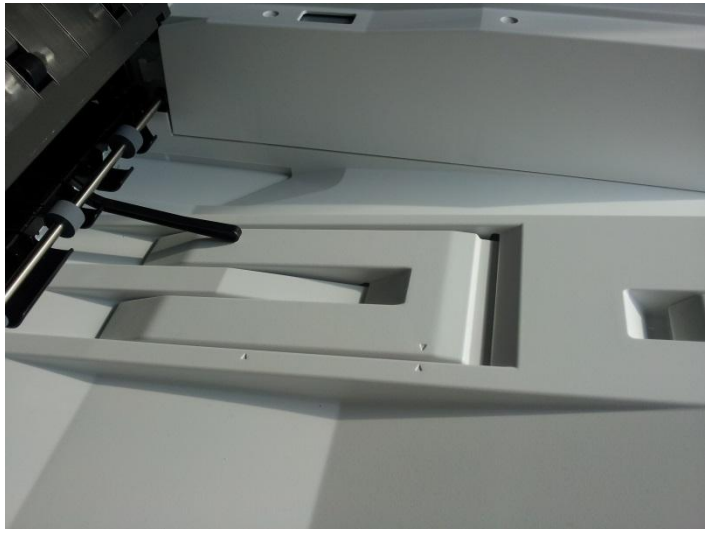
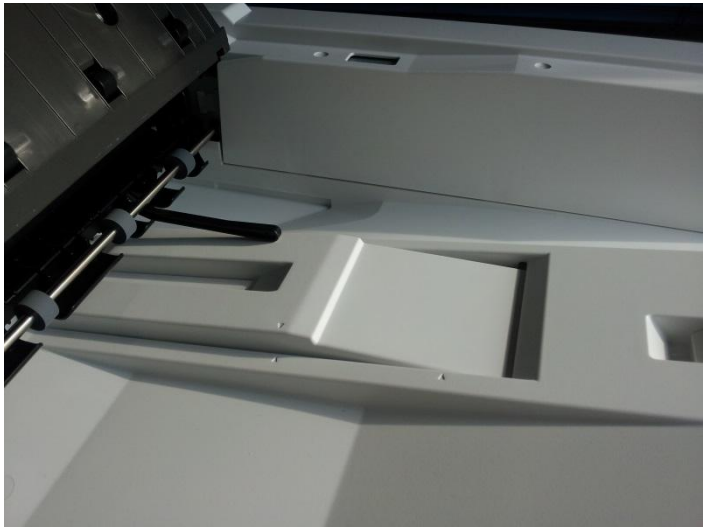
- To prevent original jams when feeding thin originals the slider in the exit can be adjusted.

Normal paper

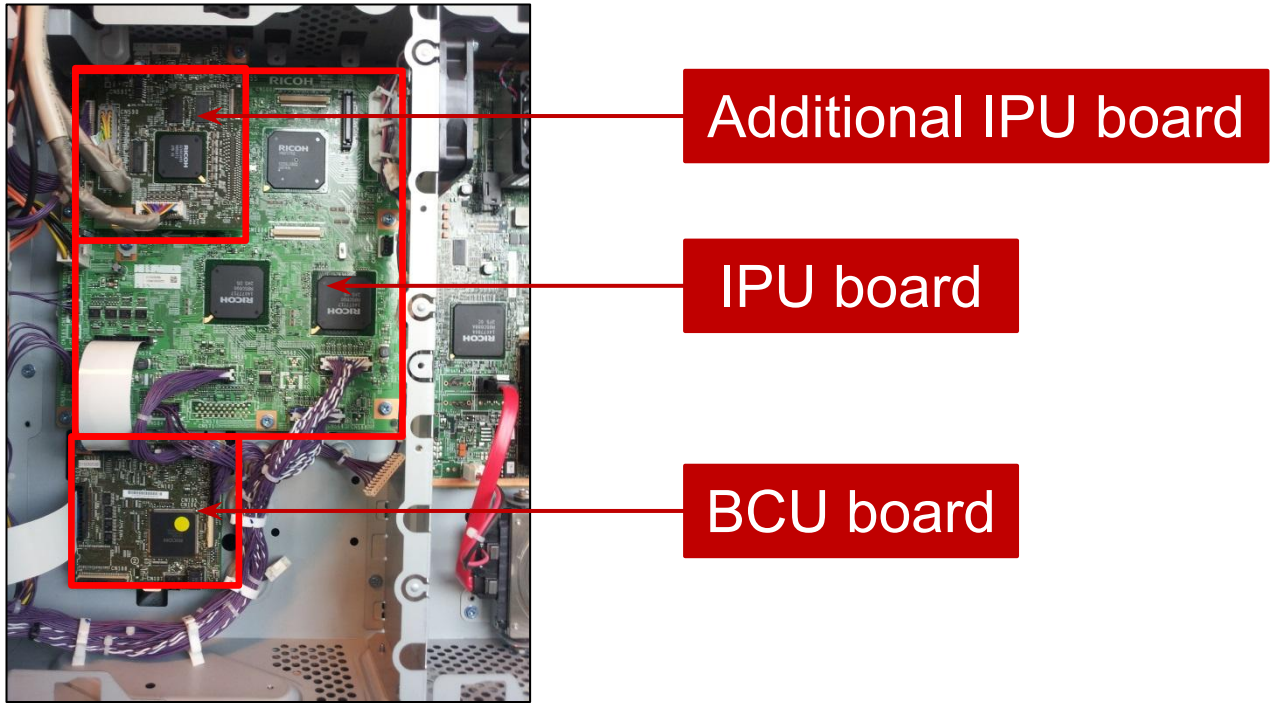


Thin paper



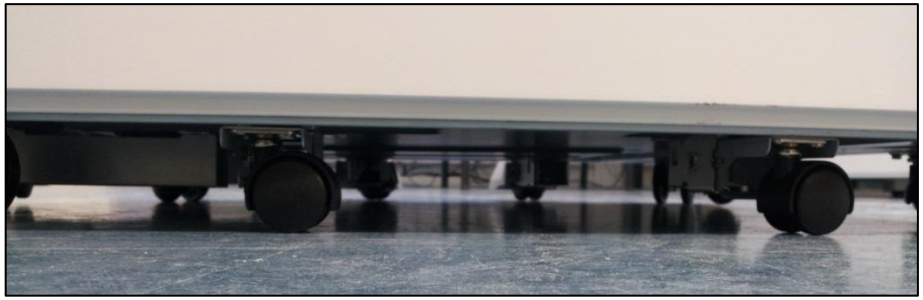
Boards (SPDF/ARDF)

- An additional IPU board is installed on the SPDF model.
- The BCU board is different between the SPDF model and the ARDF model.



Internal finisher

- The punch unit for this finisher must be installed first before you install the finisher.
- When the one-bin tray is installed, install this first.
  - See the installation procedure for the internal finisher in the service manual for details.
- Always install the stabilizers on the base machine.
  - The stabilizers are included in the accessories.



Finisher SR3140 (D687)

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- 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.

Imageable area extension unit

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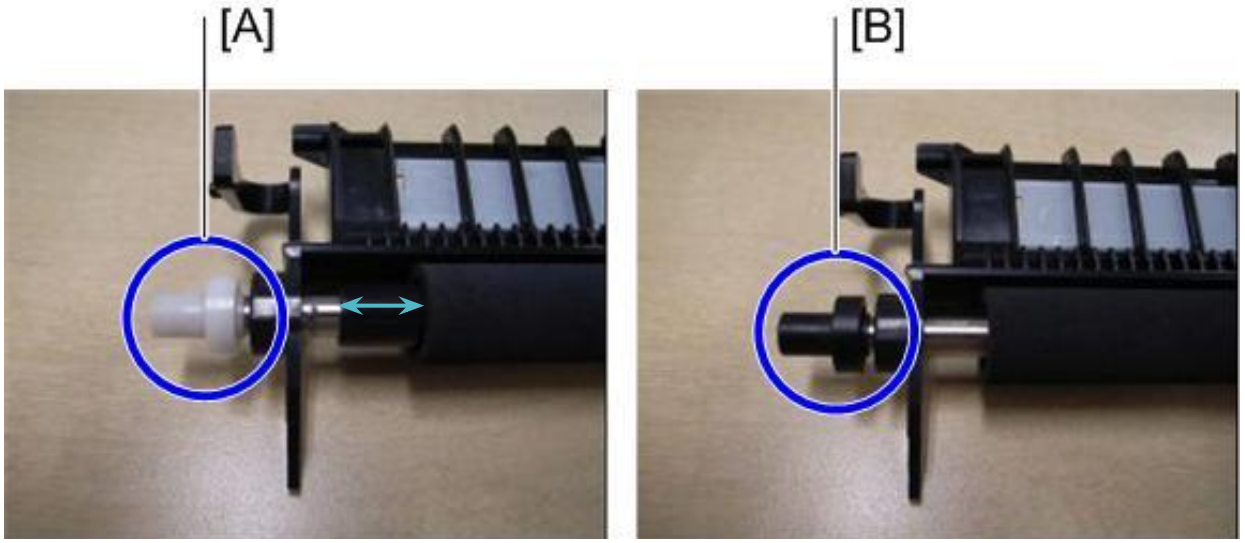
- You need this option for printing on 320mm width paper.
- During installation:
  - Change some SP mode settings
  - Install the hardware option (new paper transfer roller)
- The SP mode settings are related to process control.
  - Real time process control must be disabled.



What can happen?

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- SP setting is the normal setting (SRA3 paper not supported) and 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).
  - Real-time process control is not performed correctly.
- SP setting is for SRA3 and 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 productivity will decrease.
  - The waiting time for fusing temperature rise is longer than intended.

Enter SP Mode

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- The number sequence to enter SP mode is changed.

SD Card Slots

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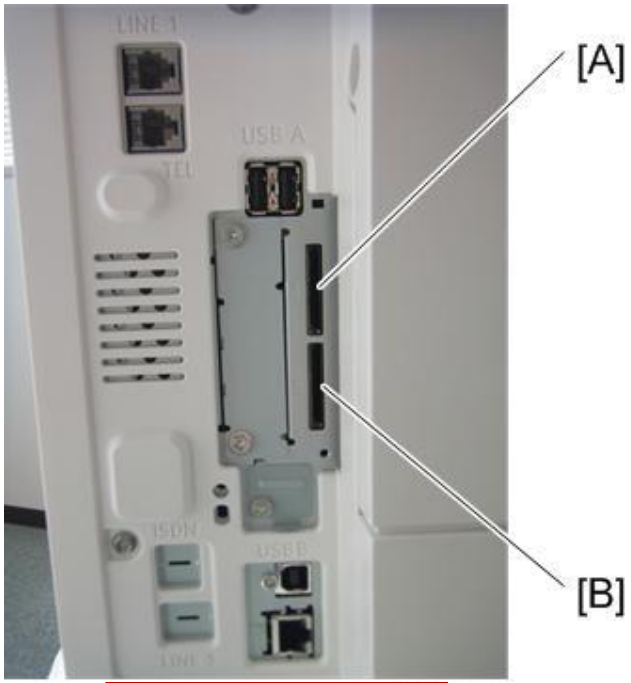
- [A]: SD card slot 1 (option slot)
- [B]: SD card slot 2 (service slot)



D146/D147

D148/D149/D150

SD Card Merging

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- In former models there are some SD card options that can't be merged.
- In Metis-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.
  - Recommend that you insert SD card options in slot 1, because slot 2 is also used as the service slot.

Embedded OCR (Searchable PDF)

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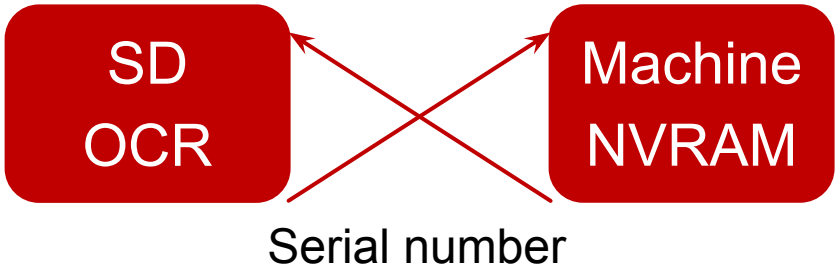
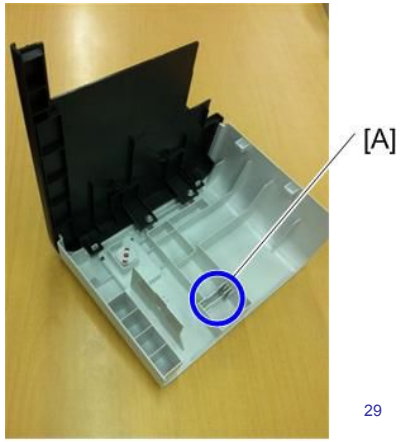
- Do the installation procedure according to the field service manual.
  - SP 5-878-004 must be done twice:
    - First time is to link the SD card to the machine.
    - Second time is to copy the dictionary data to the machine.
- After installation:
  - Remove the SD card from the SD slot.
  - Save the SD card in the storage space under the switch cover (A).





After Installing the Machine and All Options

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- After you have finished installing the machine, back up the NVRAM to an SD card. Also, do this after every service visit.

3. Maintenance

PM Parts

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- PCDU
  - PCU-K: 400k
  - 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 5-073-001)
  - Exhaust Filters: 300k

Yield Parts

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- Development Unit – CMY: 600k
- PCU – CMY: 270k

- ARDF Feed Belt, Pick-up Roller, Reverse Roller: 120k originals

Replacing a PM Part

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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
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.

SP Modes before PM part replacement

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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
- SP3-701-093 ITB Unit
- SP3-701-102 ITB Cleaning
- SP3-701-109 PTR
- SP3-701-118 Pressure Roller
- SP3-701-131 Ozone filter
- SP3-701-132 Exhaust filter
- SP3-701-206 ADF pick up roller
- SP3-701-207 ADF feed
- SP3-701-208 ADF reverse

New Function: PM Counter

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- New features on the PM counter display allow you to see the following:
  - Estimated usage rate / Remaining days (with relation to PM yield)
  - Commissioning Status Report

New Function: PM Counter

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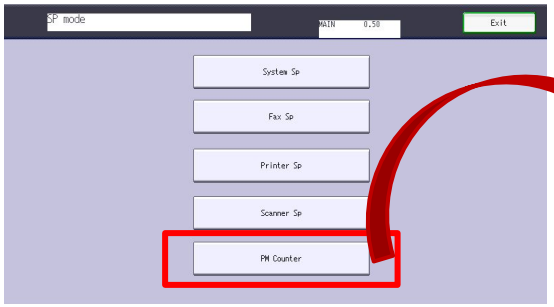
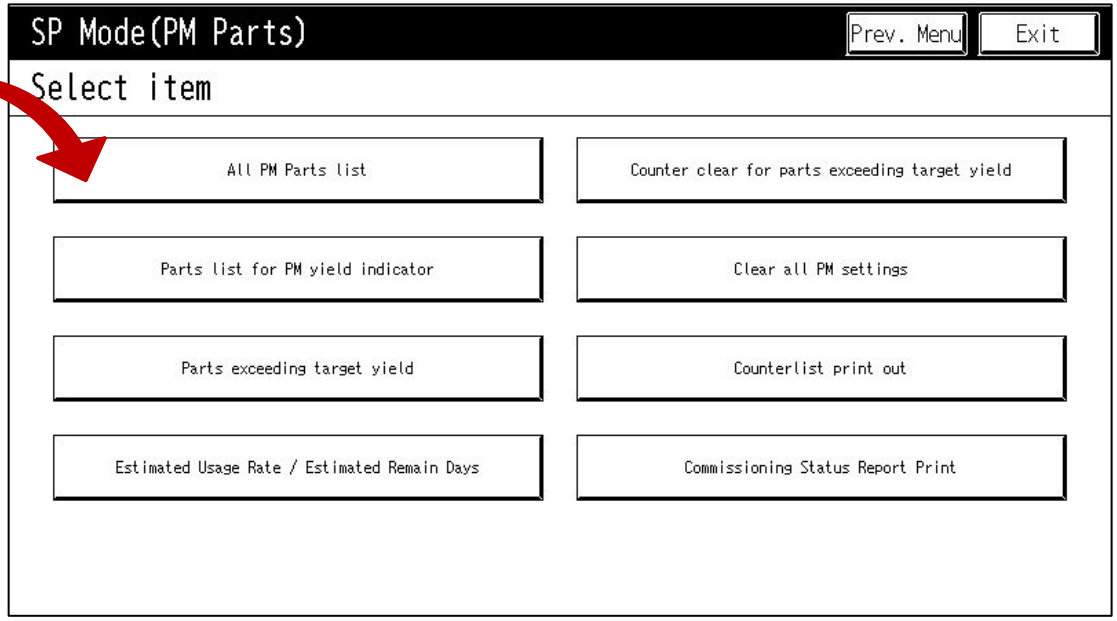
- For some machines this function was already available.

SP Mode initial screen

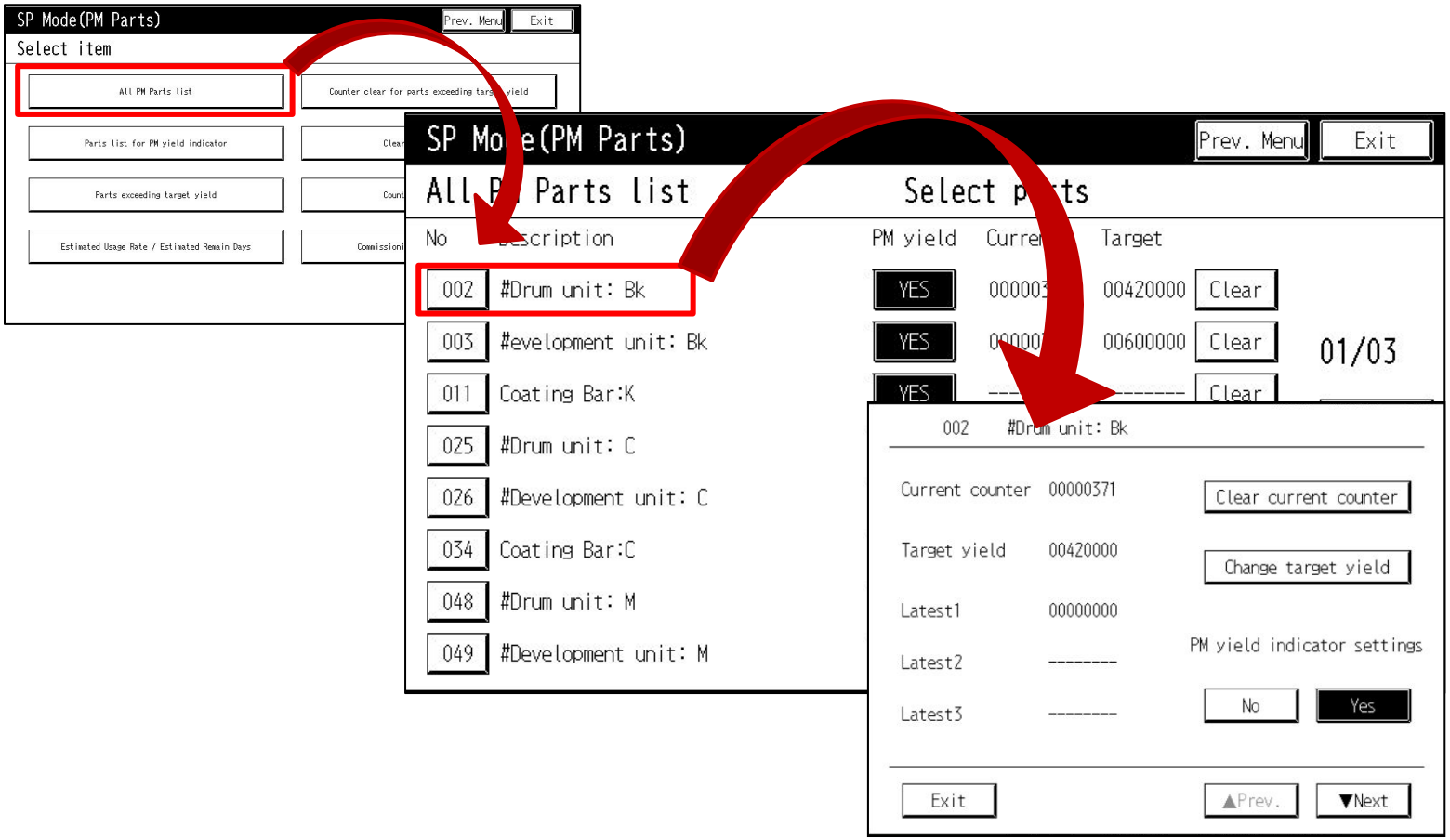
PM counter

- By pressing the PM Counter button, you go into the PM Parts menu of the SP Mode.

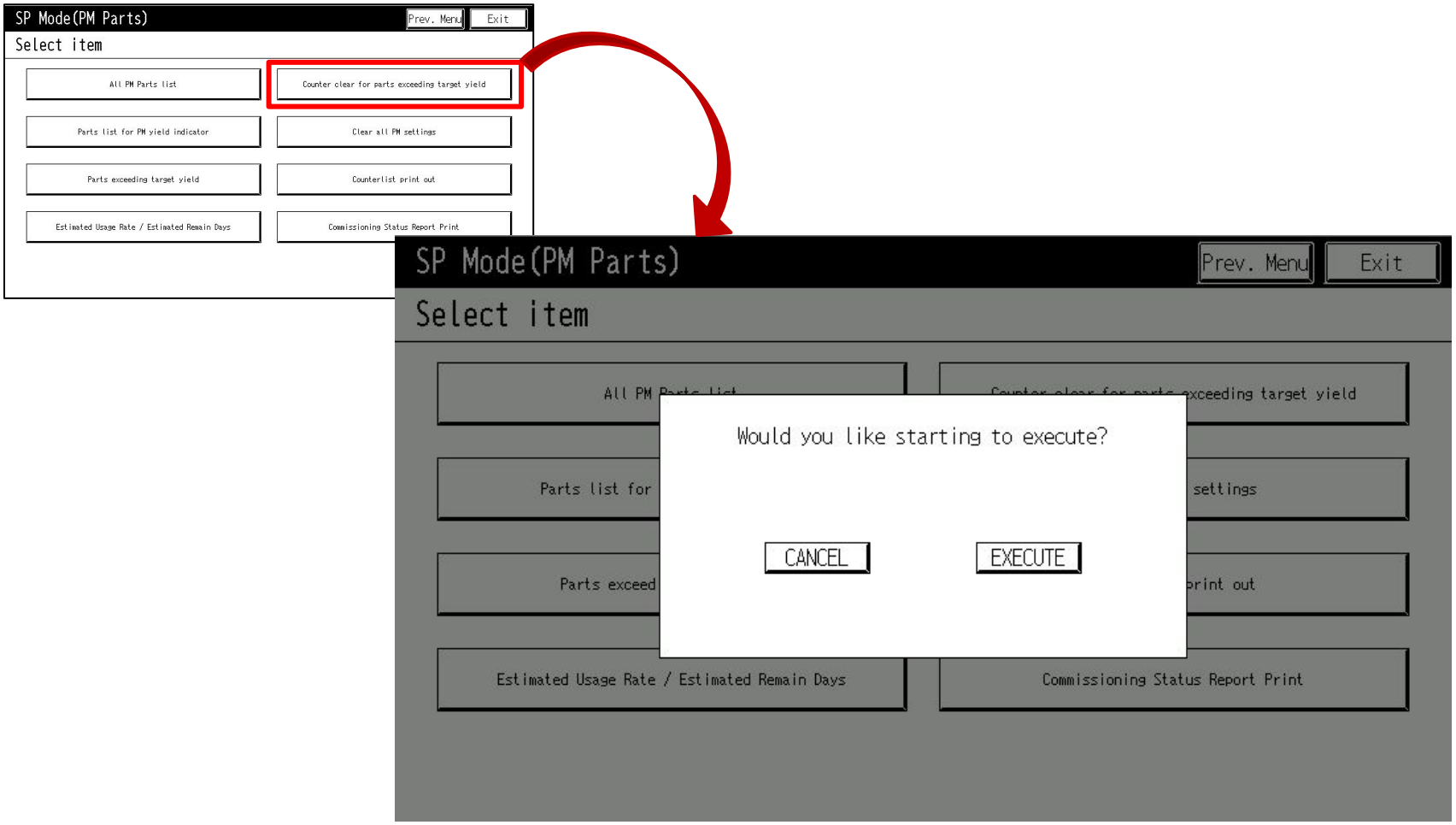




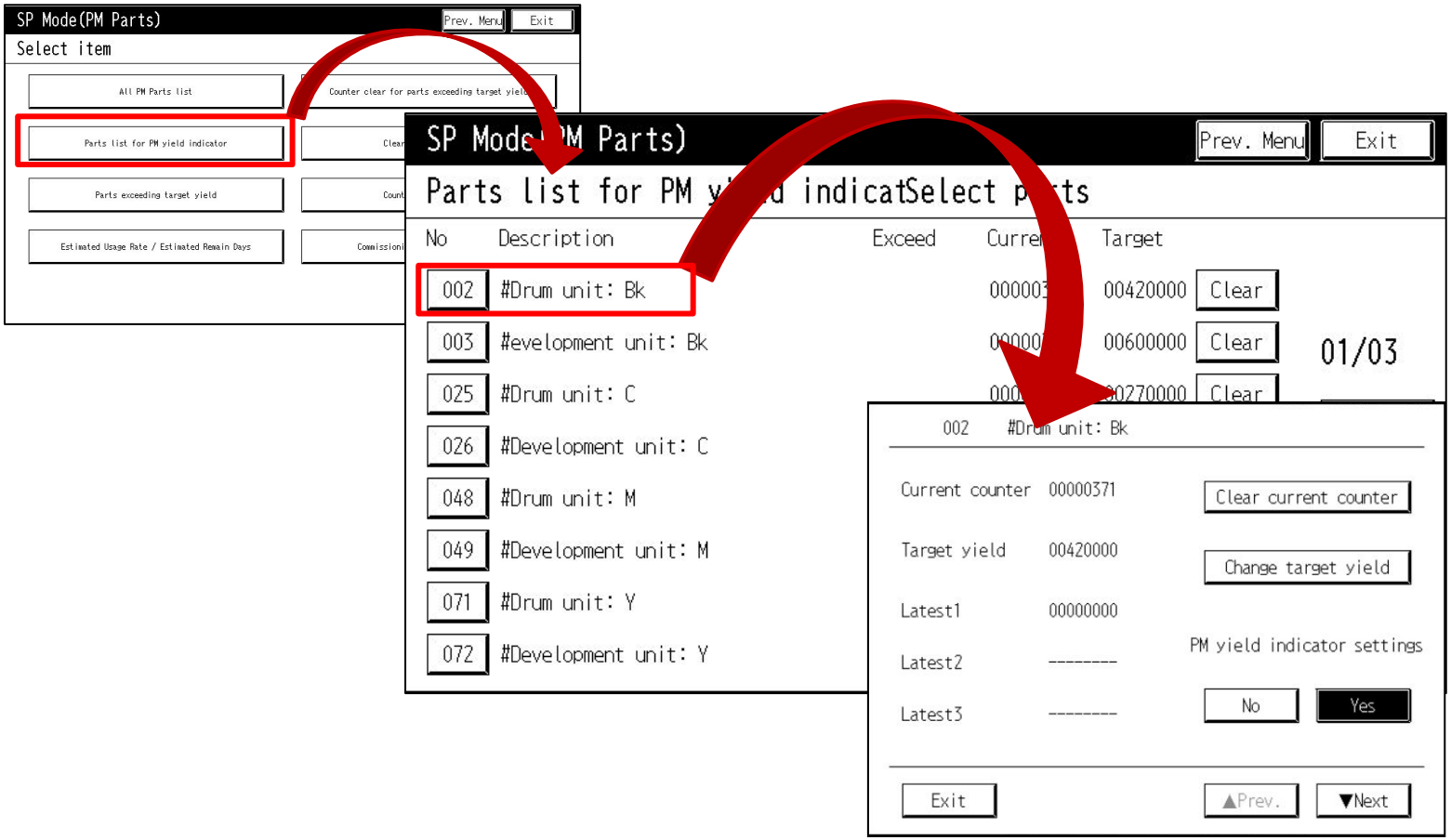
All PM parts list



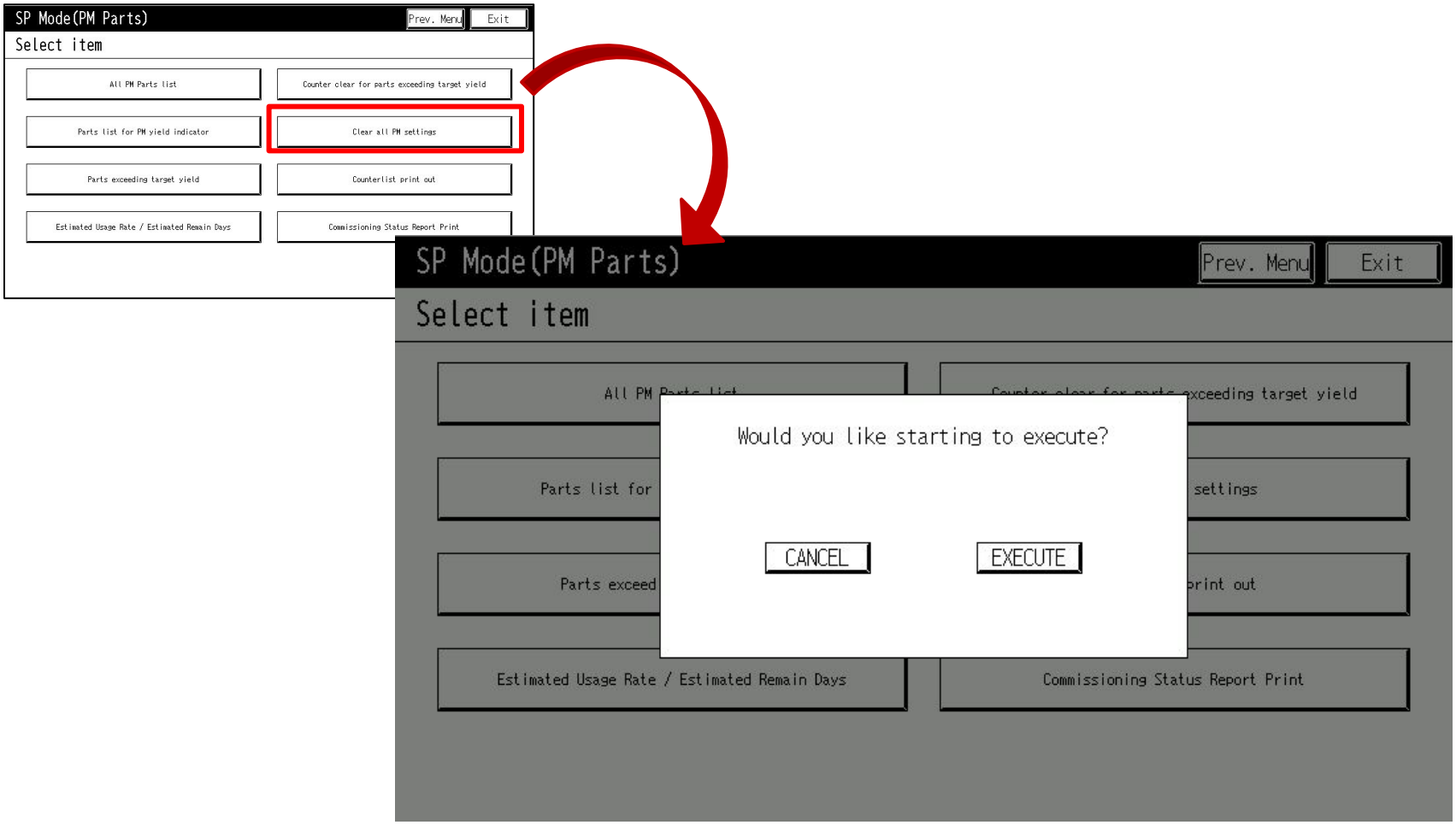
Counter clear for parts exceeding target yield



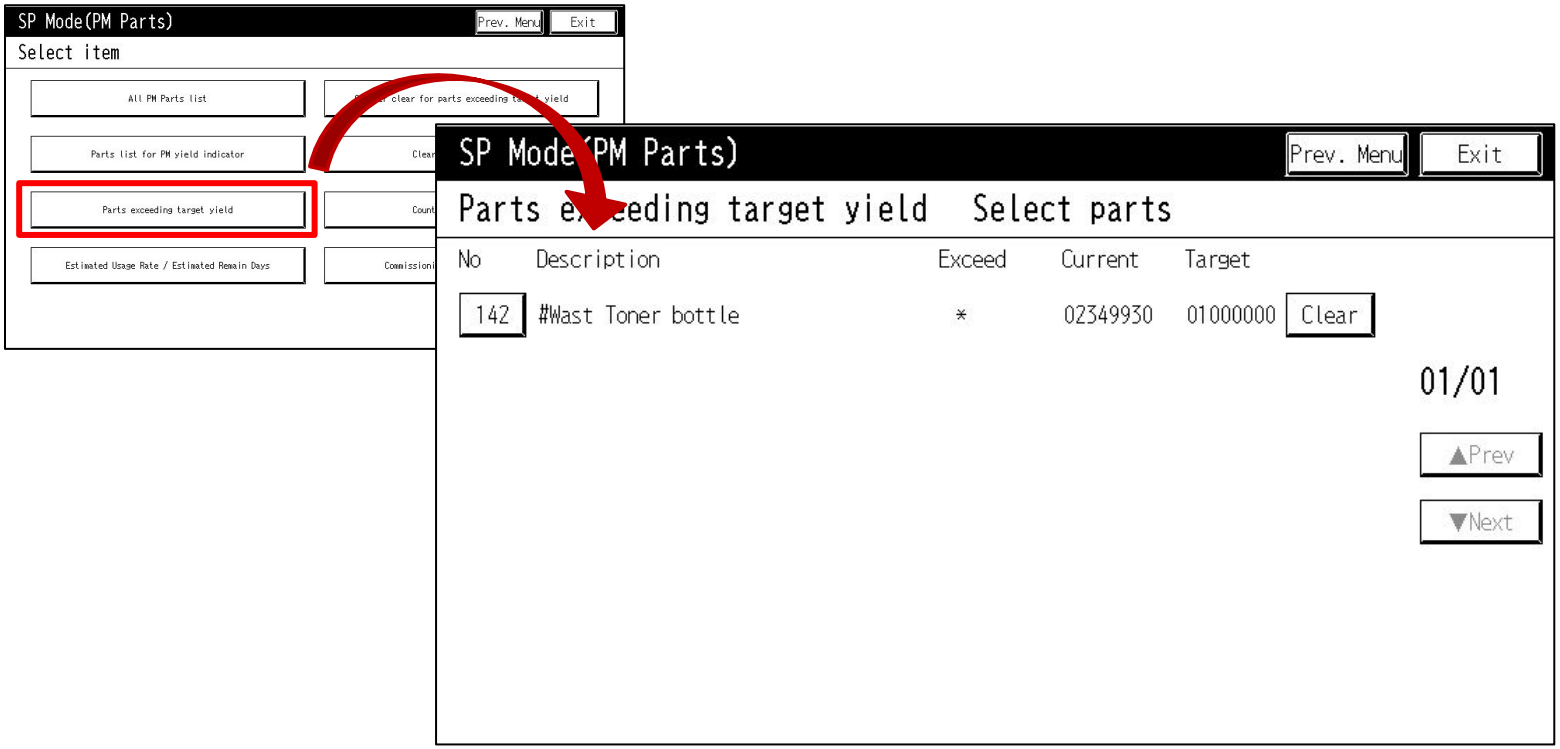
Parts list for PM yield indicator



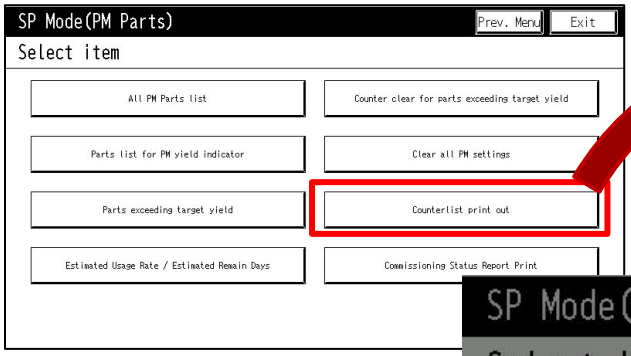
Clear all PM settings

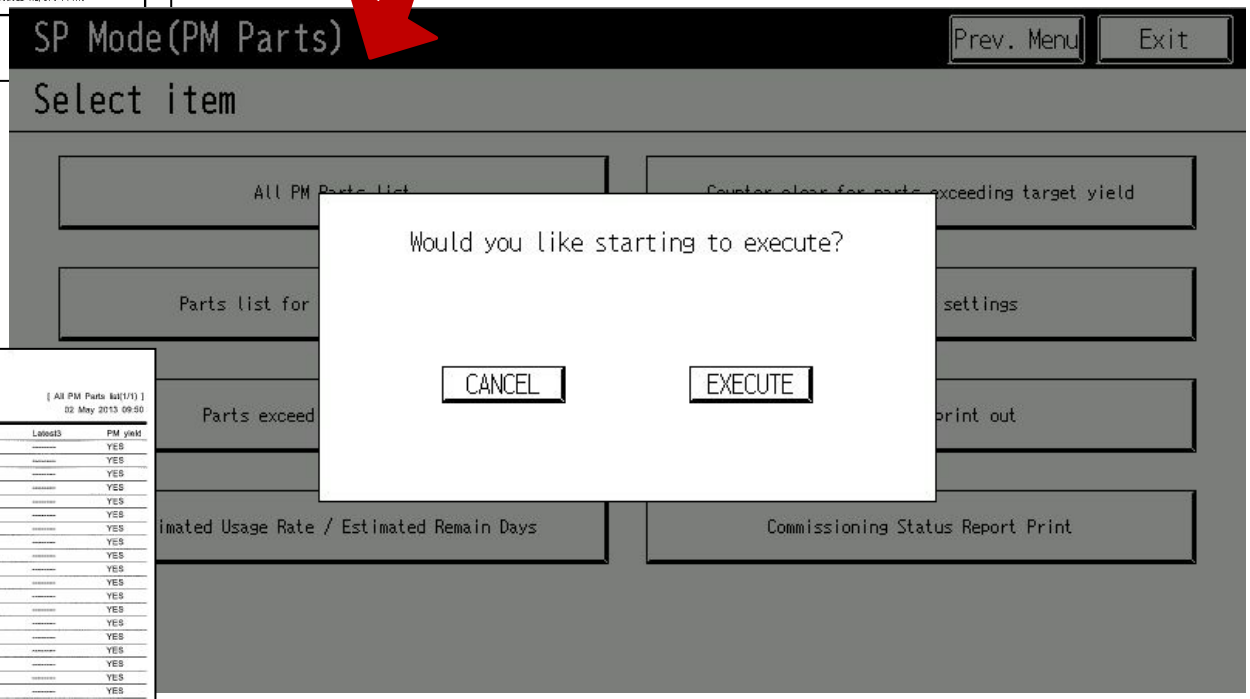


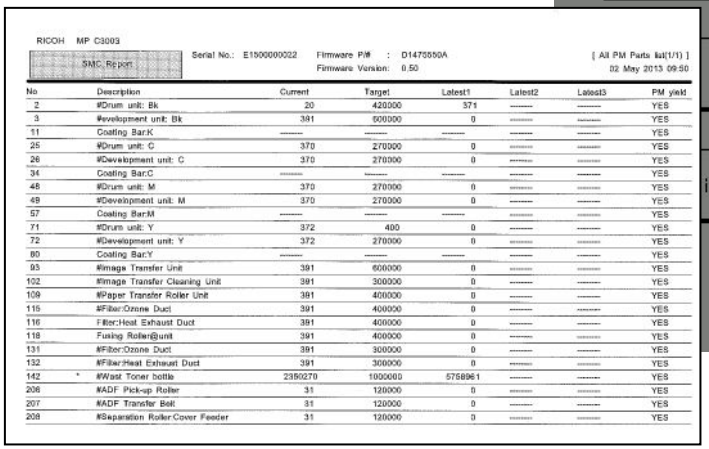
Parts exceeding target yield



Counter list print out







RICOH MP C3003

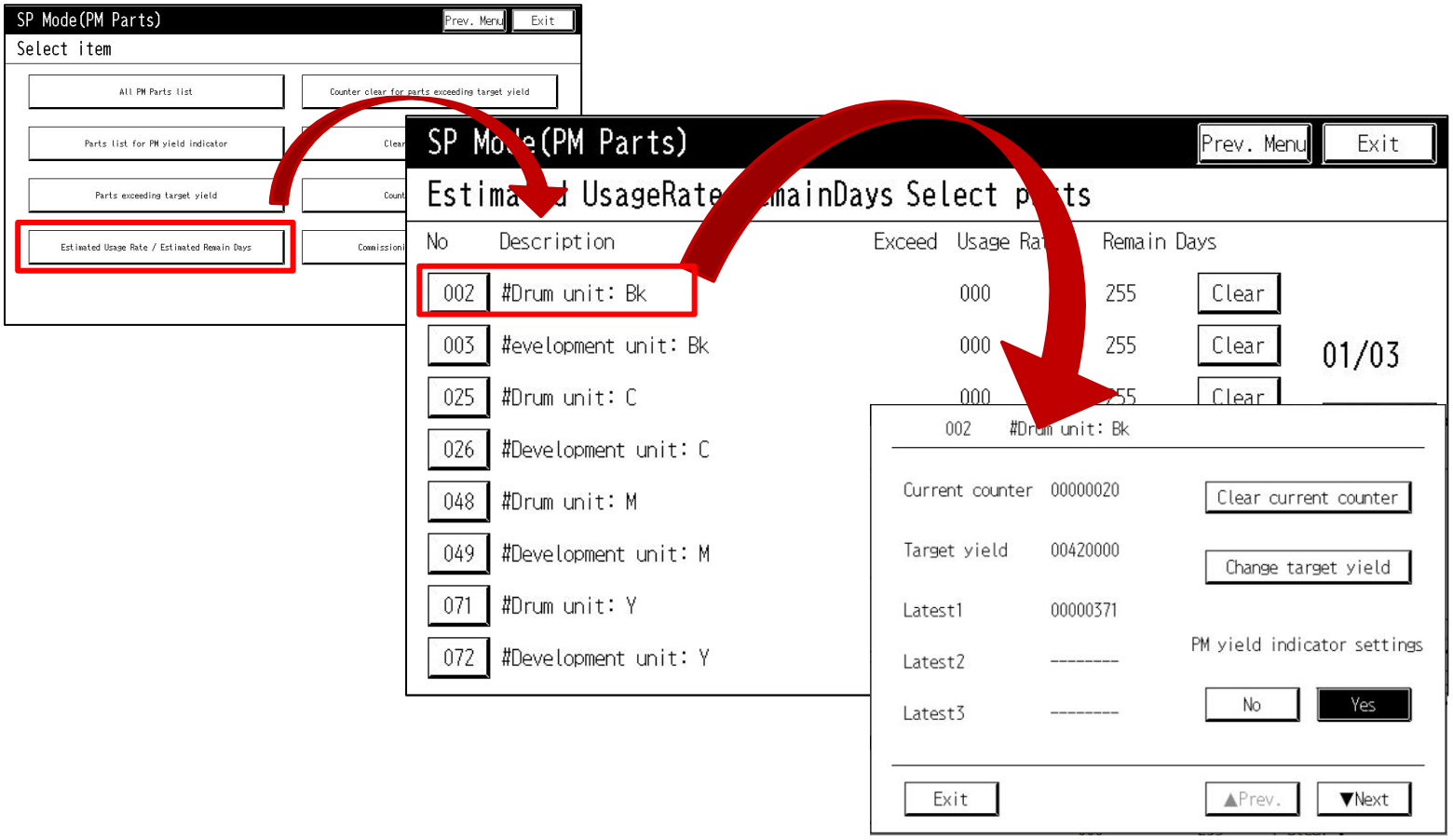
SMC Report

Serial No.: E1500000022 Firmware P/# : D1475550A Firmware Version: 0.50

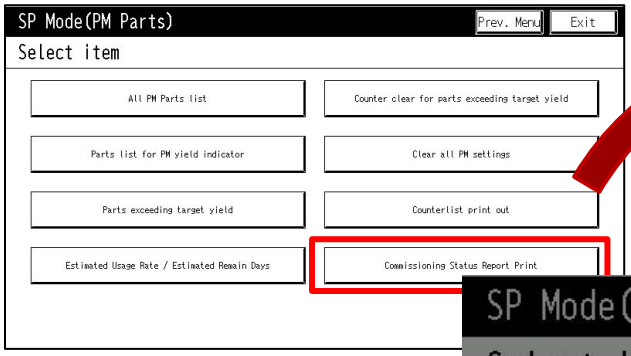
[All PM Parts list(1/1)] 02 May 2013 09:50

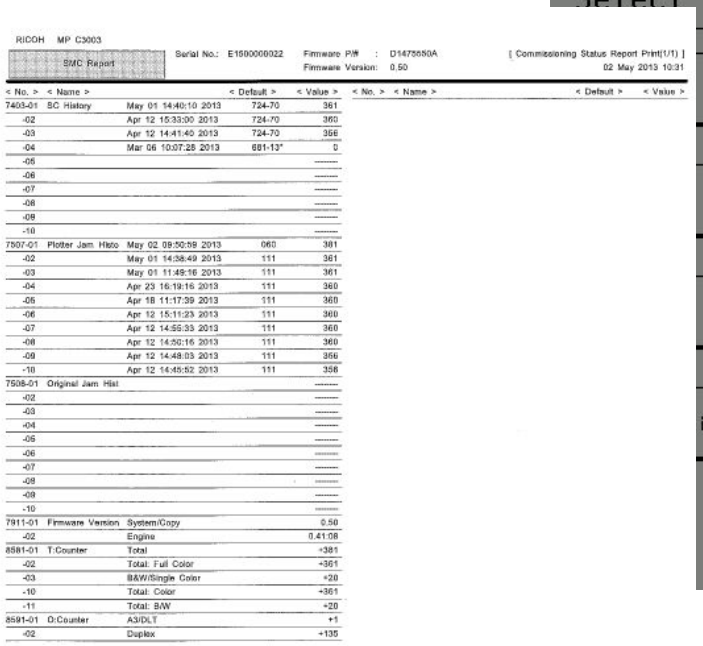
No	Description	Current	Target	Latest1	Latest2	Latest3	PM yield
2	#Drum unit: Bk	20	420000	371	------	------	YES
3	#evelopment unit: Bk	391	600000	0	------	------	YES
11	Coating Bar:K	------	------	------	------	------	YES
25	#Drum unit: C	370	270000	0	------	------	YES
26	#Development unit: C	370	270000	0	------	------	YES
34	Coating Bar:C	------	------	------	------	------	YES
48	#Drum unit: M	370	270000	0	------	------	YES
49	#Development unit: M	370	270000	0	------	------	YES
57	Coating Bar:M	------	------	------	------	------	YES
71	#Drum unit: Y	372	400	0	------	------	YES
72	#Development unit: Y	372	270000	0	------	------	YES
80	Coating Bar:Y	------	------	------	------	------	YES
93	#Image Transfer Unit	391	600000	0	------	------	YES
102	#Image Transfer Cleaning Unit	391	300000	0	------	------	YES
109	#Paper Transfer Roller Unit	391	400000	0	------	------	YES
115	#Fiber:Ozone Duct	391	400000	0	------	------	YES
116	Filter:Heat Exhaust Duct	391	400000	0	------	------	YES
118	Fusing Roller@unit	391	400000	0	------	------	YES
131	#Fiber:Ozone Duct	391	300000	0	------	------	YES
132	#Fiber:Heat Exhaust Duct	391	300000	0	------	------	YES
142	* #Waist Toner bottle	2350270	1000000	5768961	------	------	YES
206	#ADF Pick-up Roller	31	120000	0	------	------	YES
207	#ADF Transfer Belt	31	120000	0	------	------	YES
208	#Separation Roller:Cover Feeder	31	120000	0	------	------	YES

Estimated Usage Rate/Remain Days

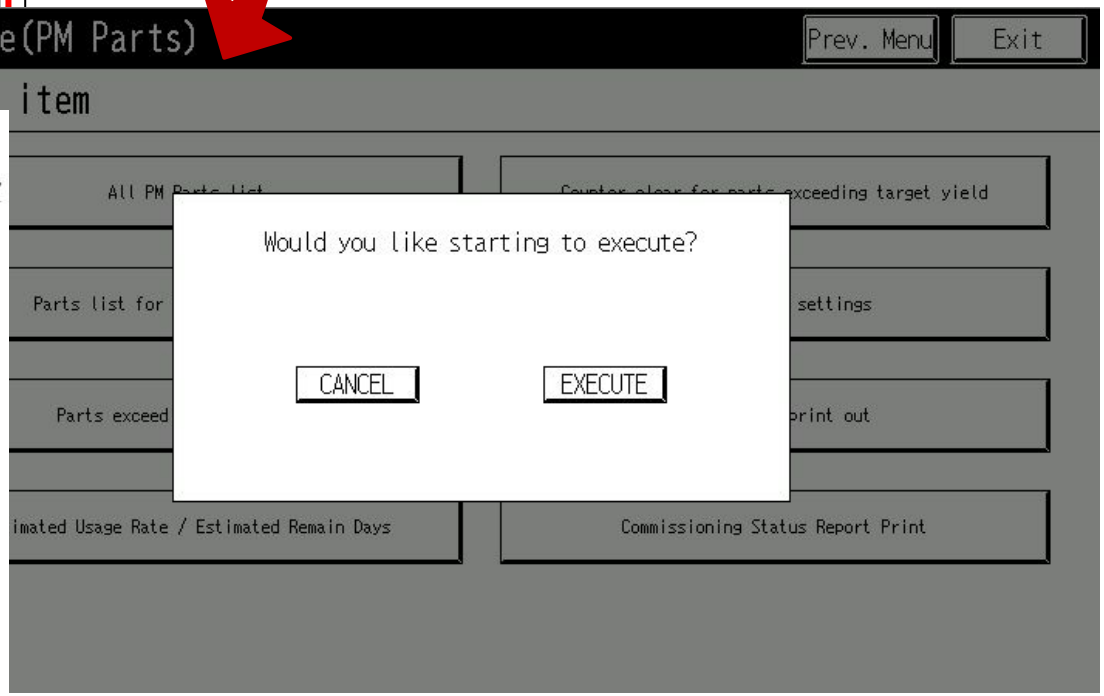


Commissioning Status Report Print




RICOH MP C3003
SMC Report
Serial No.: E1600000022
Firmware P/# : D1475650A
Firmware Version: 0.50
[Commissioning Status Report Print(1/1)]
02 May 2013 10:31

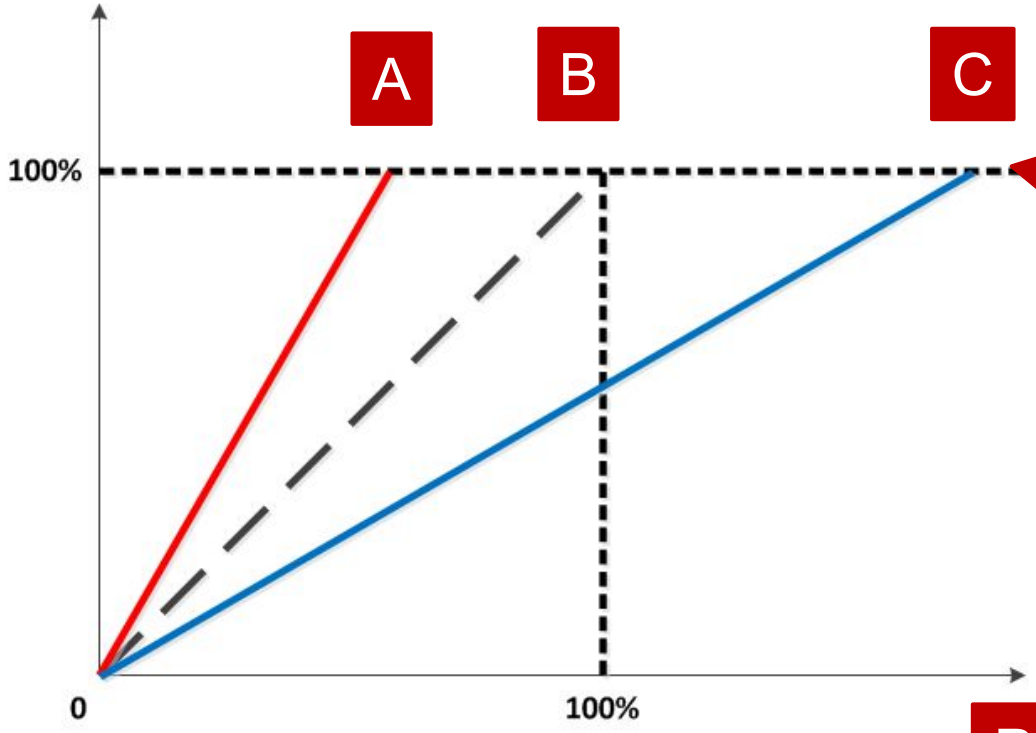
< No. >	< Name >		< Default >	< Value >
7403-01	SC History	May 01 14:40:10 2013	724-70	361
-02		Apr 12 15:33:00 2013	724-70	360
-03		Apr 12 14:41:40 2013	724-70	356
-04		Mar 06 10:07:28 2013	681-13*	0
-05				------
-06				------
-07				------
-08				------
-09				------
-10				------
7507-01	Plotter Jam Histo	May 02 09:50:59 2013	060	361
-02		May 01 14:38:49 2013	111	361
-03		May 01 11:49:16 2013	111	361
-04		Apr 23 16:19:16 2013	111	360
-05		Apr 18 11:17:39 2013	111	360
-06		Apr 12 15:11:23 2013	111	360
-07		Apr 12 14:55:33 2013	111	360
-08		Apr 12 14:50:16 2013	111	360
-09		Apr 12 14:48:03 2013	111	356
-10		Apr 12 14:45:52 2013	111	356
7508-01	Original Jam Hist			------
-02				------
-03				------
-04				------
-05				------
-06				------
-07				------
-08				------
-09				------
-10				------
7911-01	Firmware Version	System/Copy		0.50
-02		Engine		0.41.08
8581-01	T:Counter	Total		+361
-02		Total: Full Color		+361
-03		B&W/Single Color		+20
-10		Total: Color		+361
-11		Total: B/W		+20
8591-01	D:Counter	A3/DLT		+1
-02		Duplex		+135



Page counter and Running distance

RICOH
imagine. change.

Running Distance



You should replace the part when the running distance reaches 100%

Page Counter and Running Distance

RICOH
imagine. change.

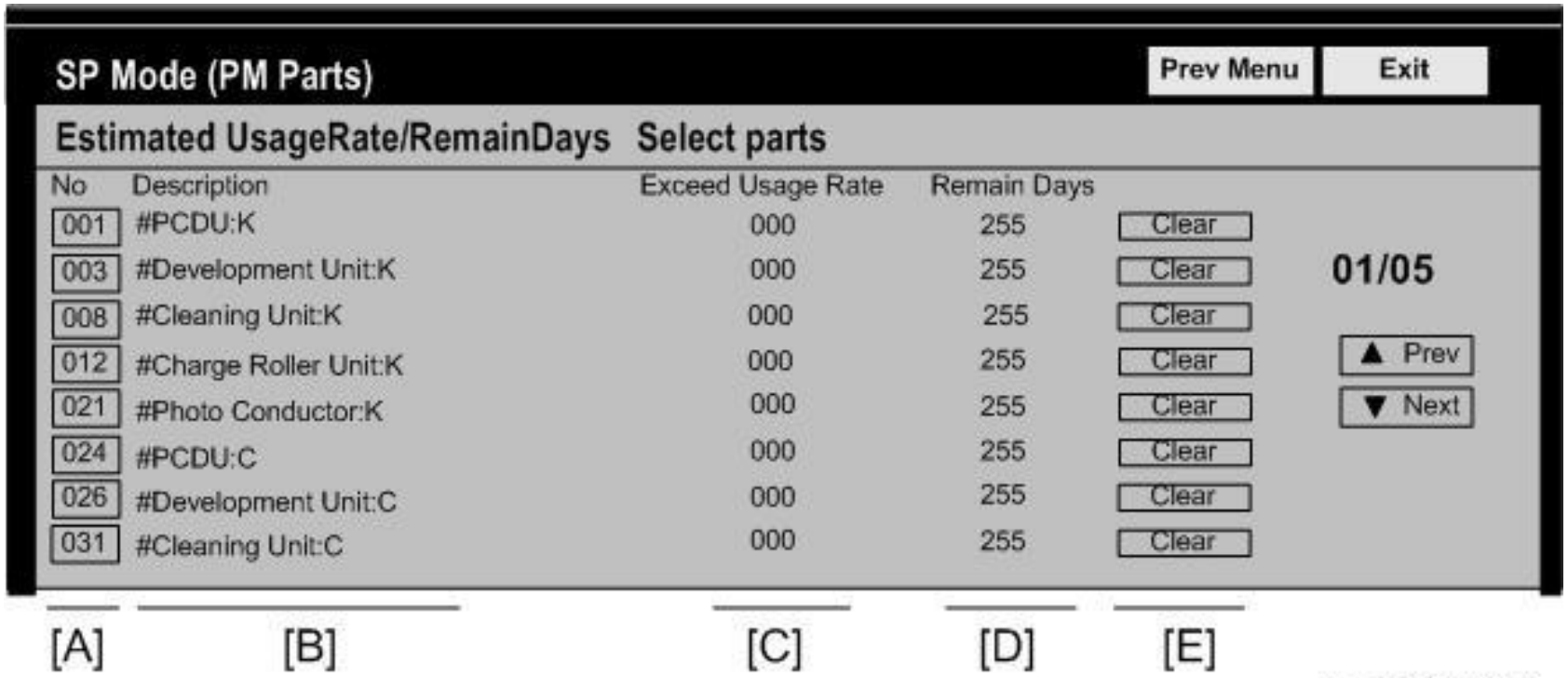
- PM parts yield is based on the page counter when the customer prints using the target conditions.
- But, for most PM parts, the yield depends on running distance
  - See the formula below for how this is calculated.
- So, a function was added to display the estimated PM yield, in which the running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

Running Distance (m) (SP7-944-001~127)

= Motor rotation time (s) × Paper speed (mm/s)/1000

Estimated Value Display

RICOH
imagine. change.



Estimated Usage Rate Display

RICOH
imagine. change.

- 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*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*100
A: Current distance value (SP7-944-xxx)
B: Standard distance end value (SP7-940-xxx)

Estimated Remaining Days Display

RICOH imagine. change.

- Displays the smaller of these two values: Page counter (SP7-951-XXX) and running distance (SP7-952-XXX).
- Again, 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 (SP7-623-xxx)
B: PM page counter (SP7-621-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 (SP7-940-xxx)
B: PM distance counter (SP7-944-xxx)
C: Average distance per day = PM distance counter (SP7-944-xxx) /Number of days since last replacement

Commissioning Status Report

RICOH
imagine. change.

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

1.	SP7-403-001~010	SC History
2.	SP7-507-001~010	Printer Engine Jam History
3.	SP7-508-001~010	Original Jam History
4.	SP7-910-001, 002	ROM No
5.	SP7-911-001, 002	Firmware version
6.	SP8-581-001	T: Counter
7.	SP8-591-001	O: Counter

RICOH
imagine. change.

4. Detailed Section Descriptions

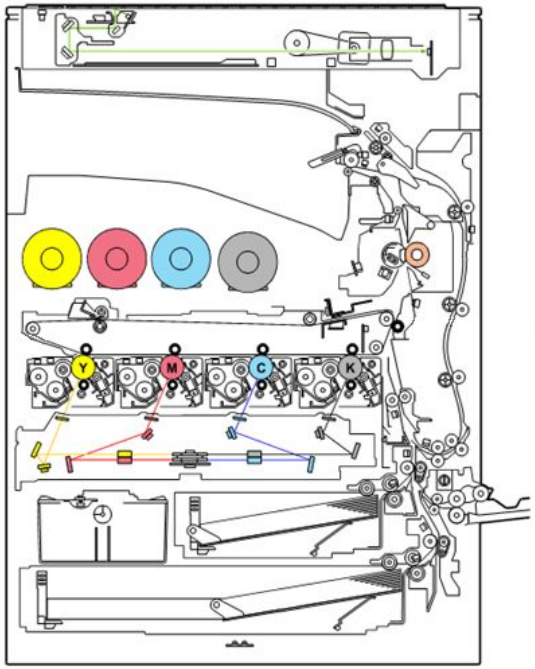
Chapter Overview

RICOH
imagine. change.

- 4.1 Machine Overview
- 4.2 Scanner
- 4.3 Laser Unit
- 4.4 PCDU
- 4.5 Toner Supply
- 4.6 Image Transfer
- 4.7 Fusing
- 4.8 Paper Exit, Duplex
- 4.9 Waste Toner Collection

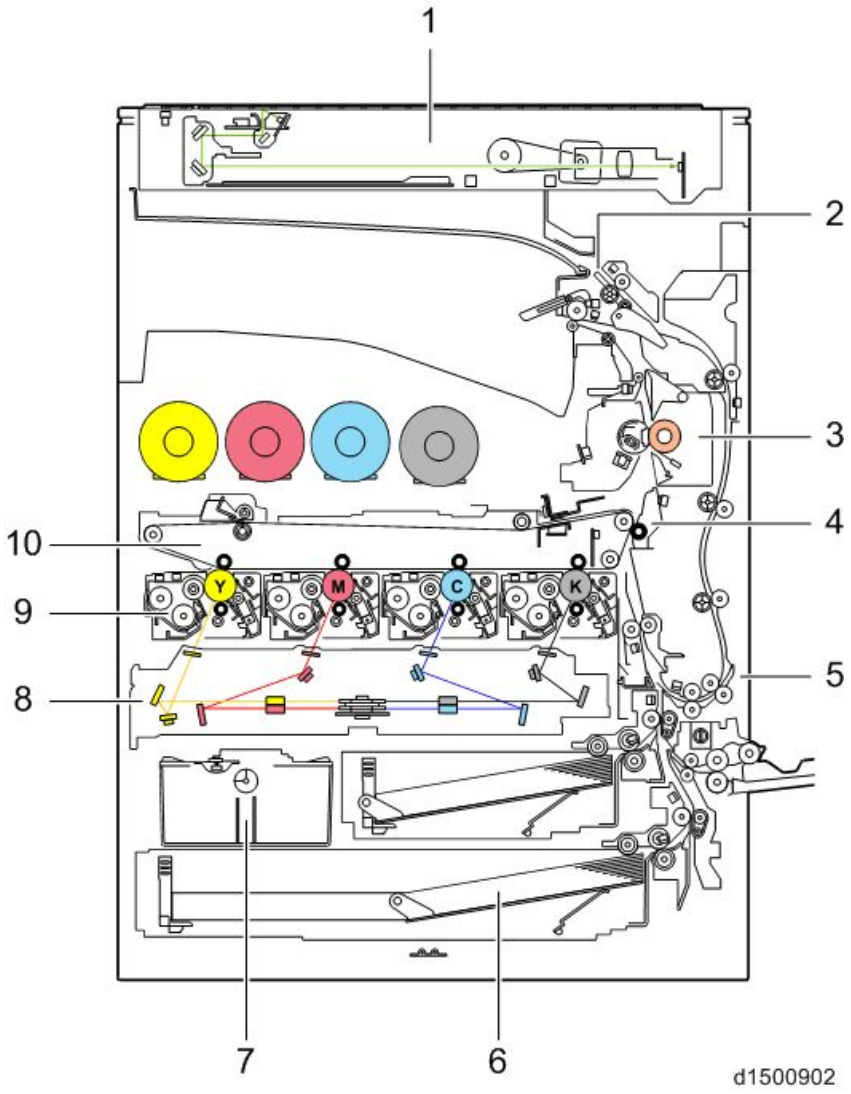
RICOH
imagine. change.

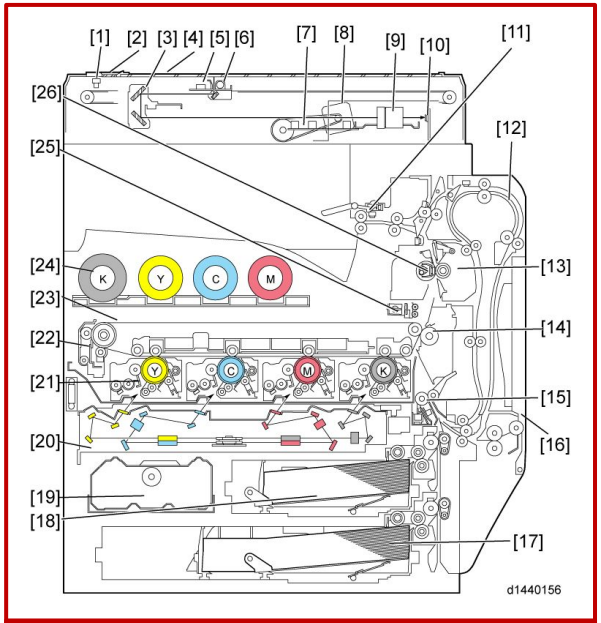
4.1 Machine Overview



Components

RICOH
imagine. change.

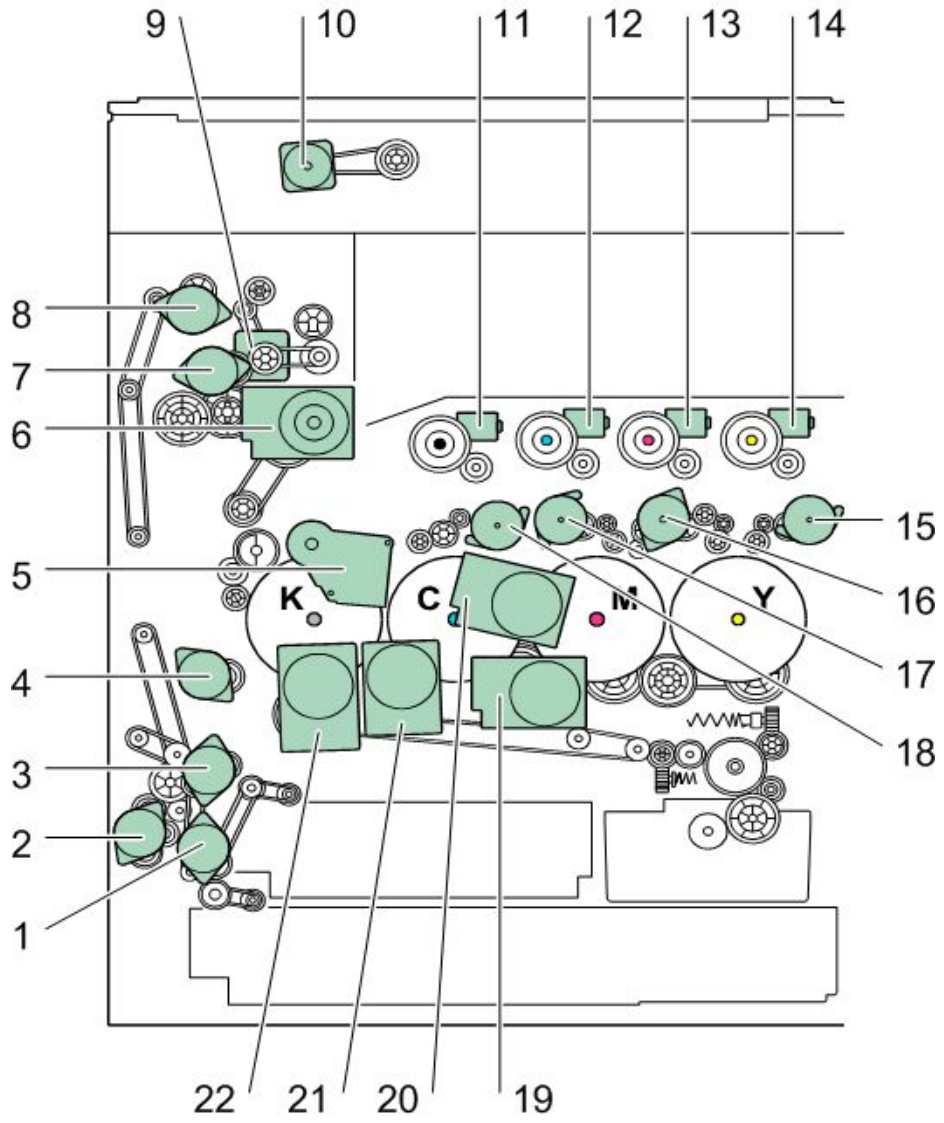


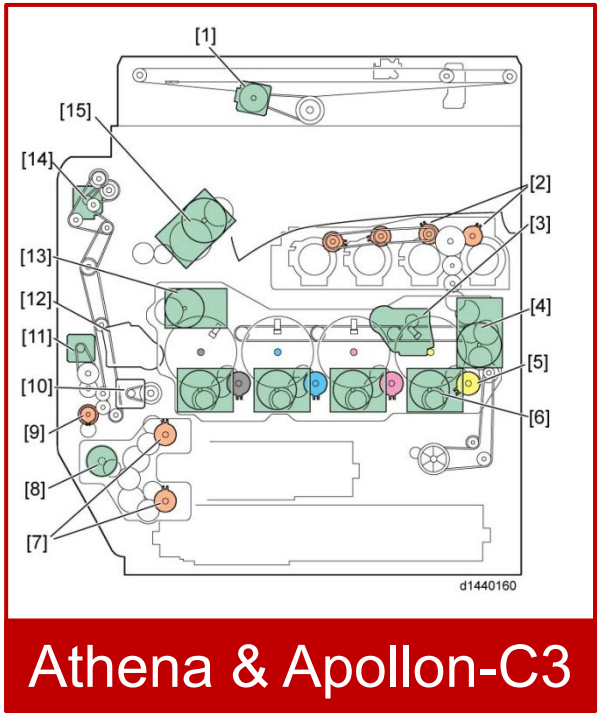


Athena & Apollon-C3

Drive Components

RICOH
imagine. change.





Athena & Apollon-C3

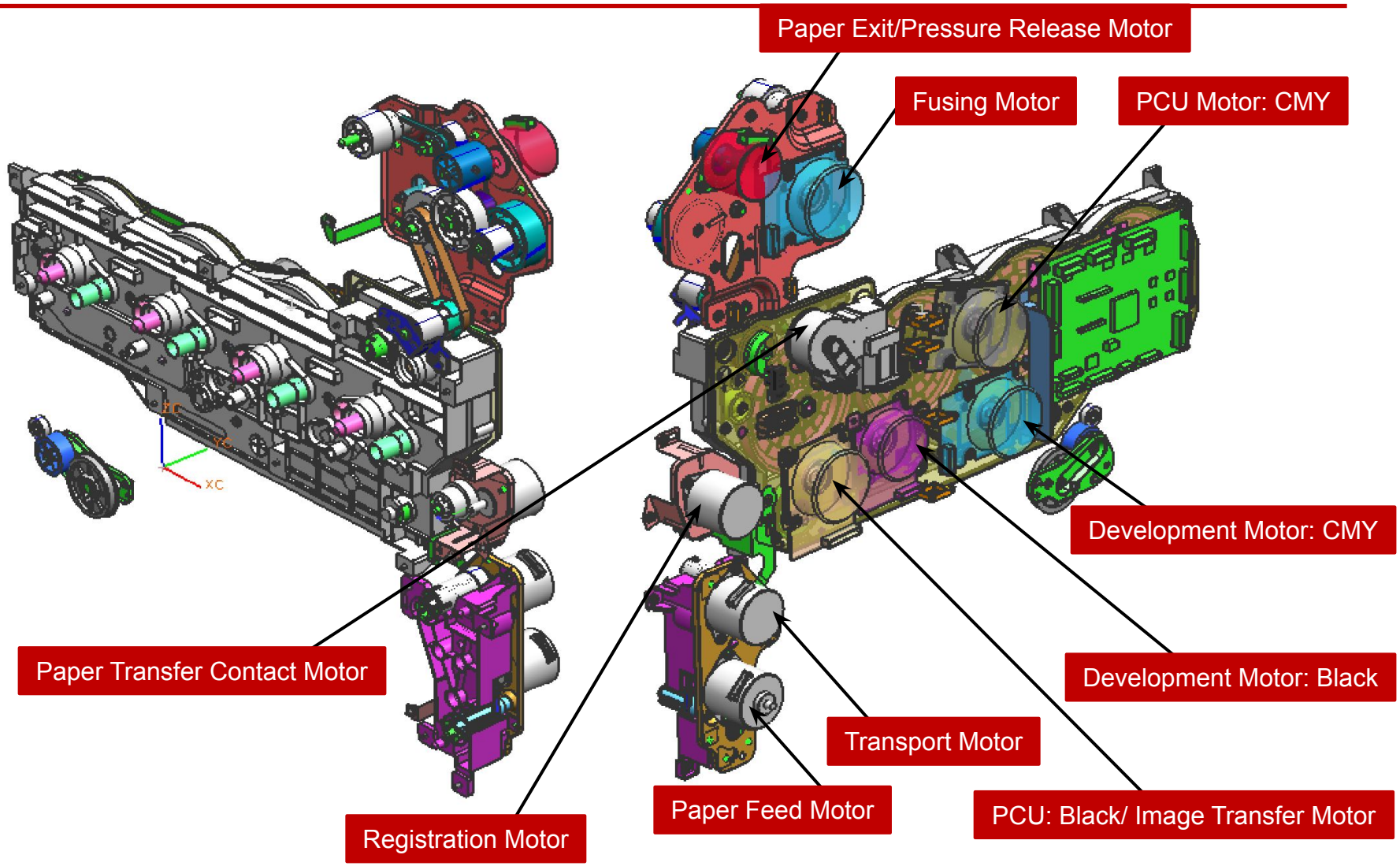
Differences from Predecessors: Drive

RICOH
imagine. change.

	Metis-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, higher productivity and less noise
2	Individual motors for paper exit and fusing drive.	One motor for fusing and exit.	Different layout

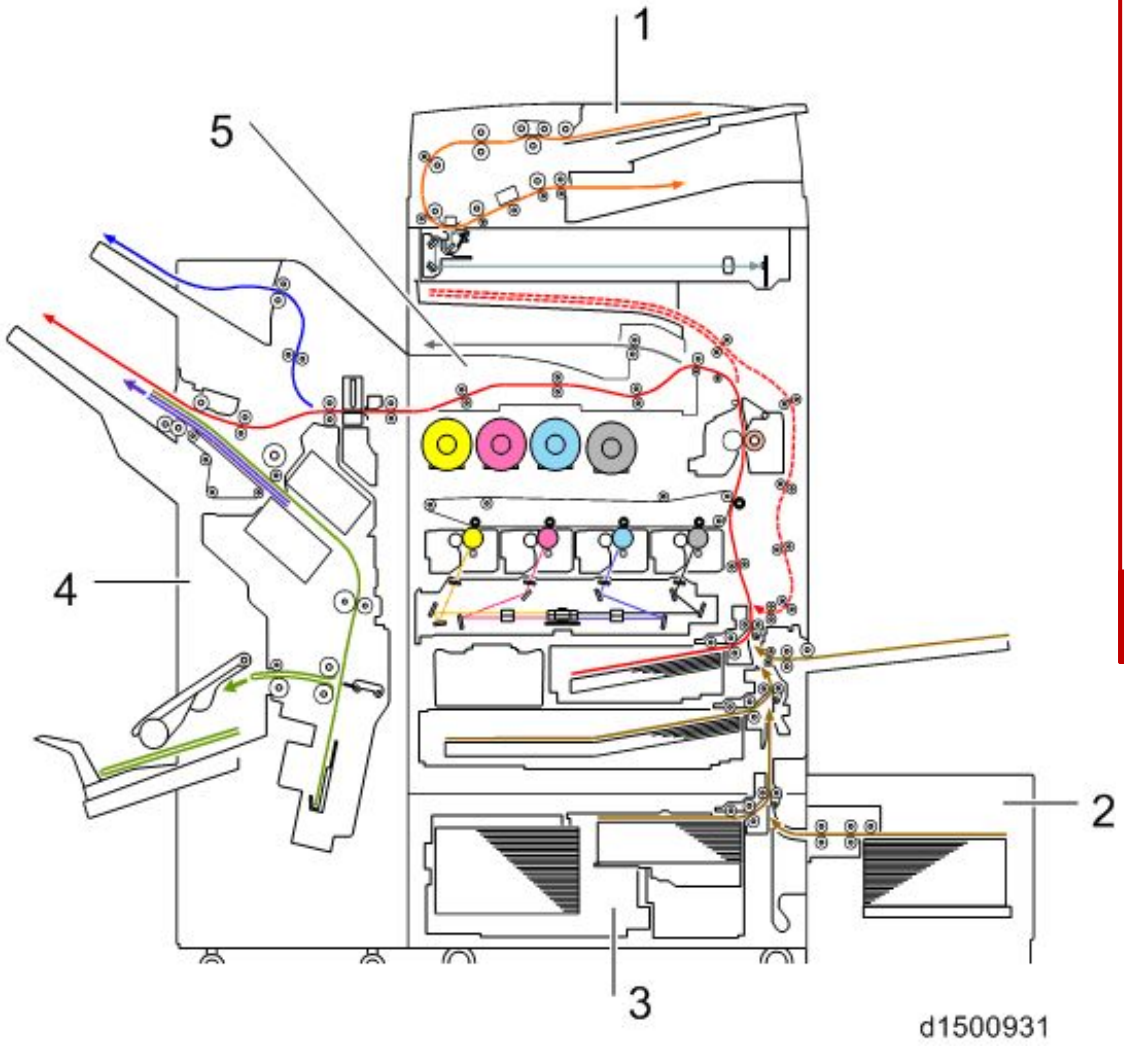
Drive Components

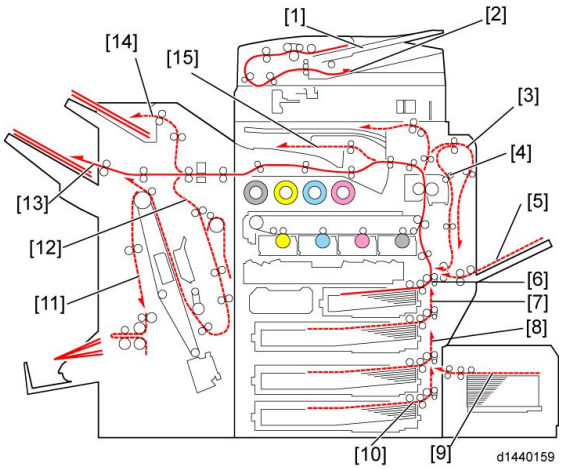
RICOH
imagine. change.



Paper Path (1/3)

RICOH
imagine. change.

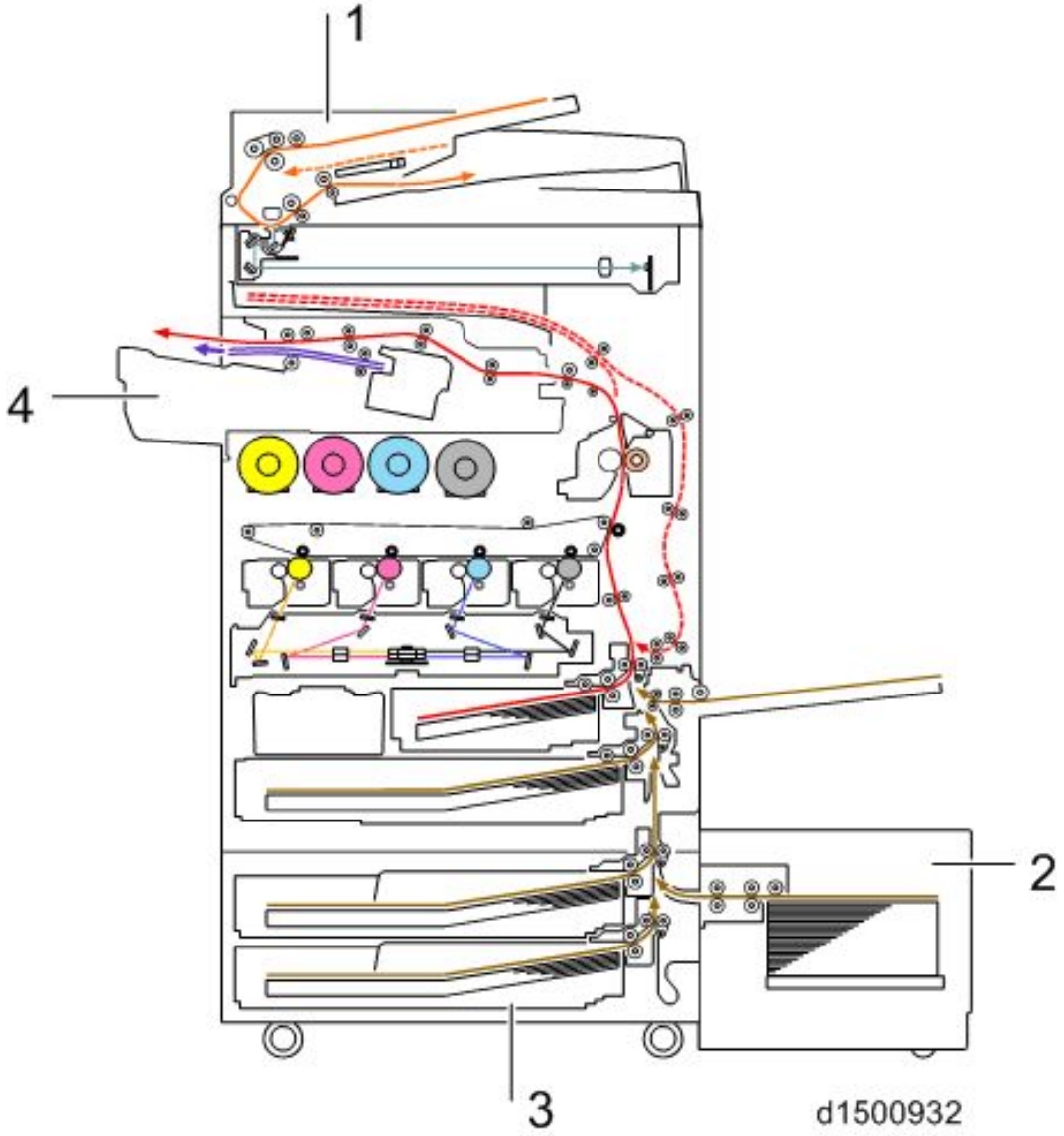




Athena & Apollon-C3

Paper Path (2/3)

RICOH
imagine. change.

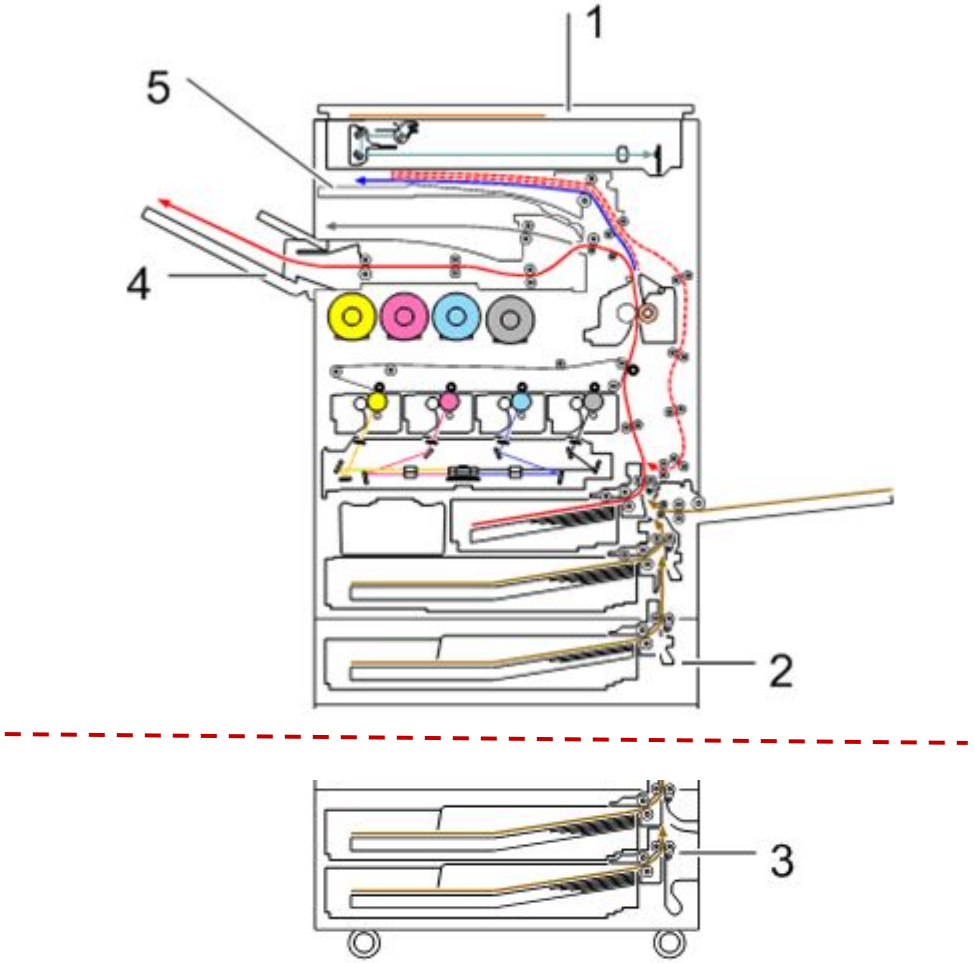


Internal Finisher not available.

Athena & Apollon-C3

Paper Path (3/3)

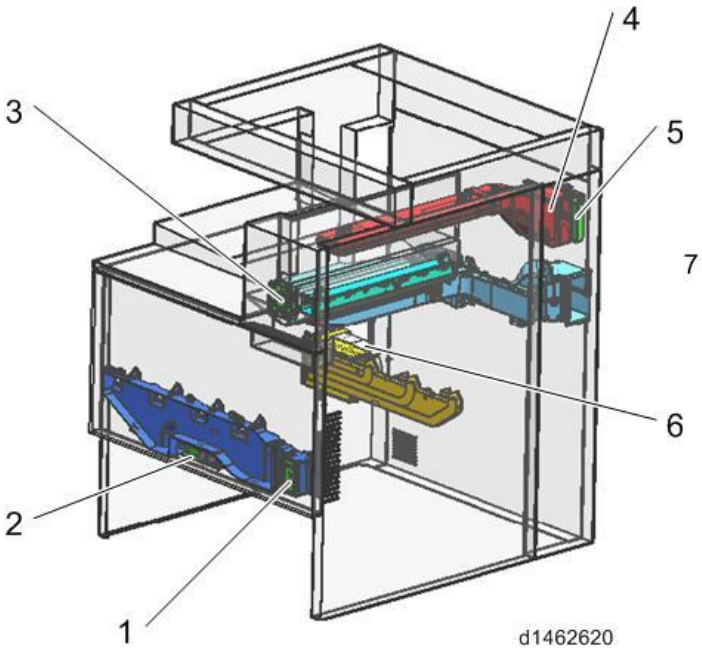
RICOH
imagine. change.



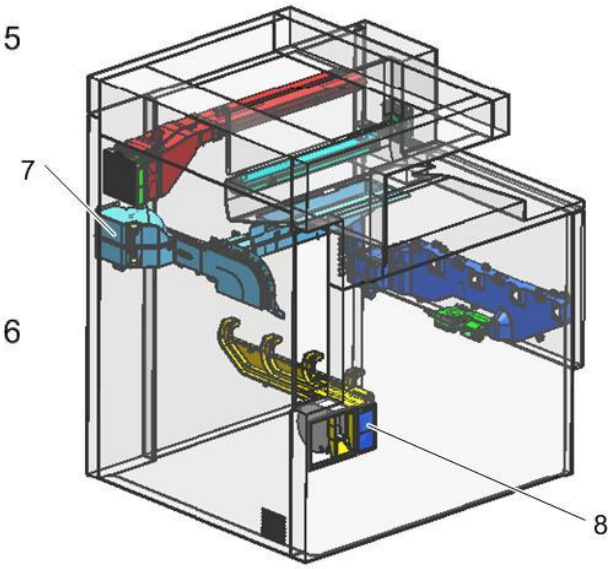
Cooling Metis-C1 a/b

RICOH
imagine. change.

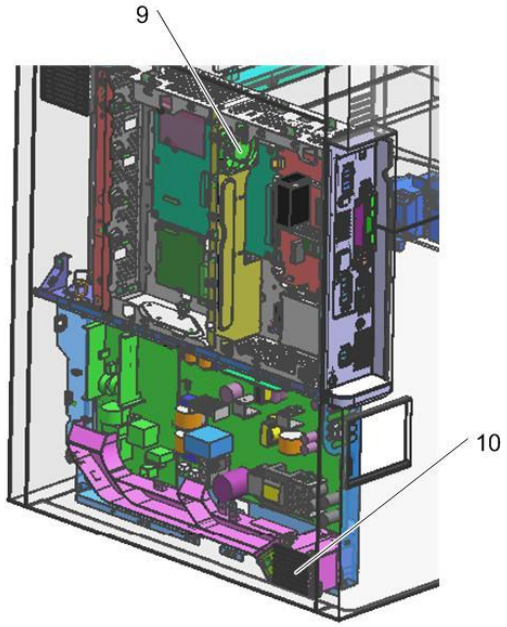
- 8 Fan's are used for cooling.



Front



Rear

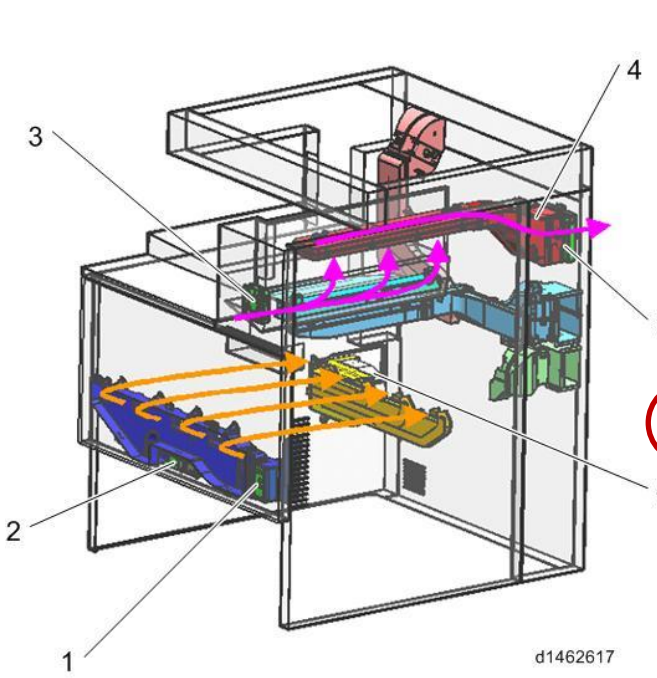


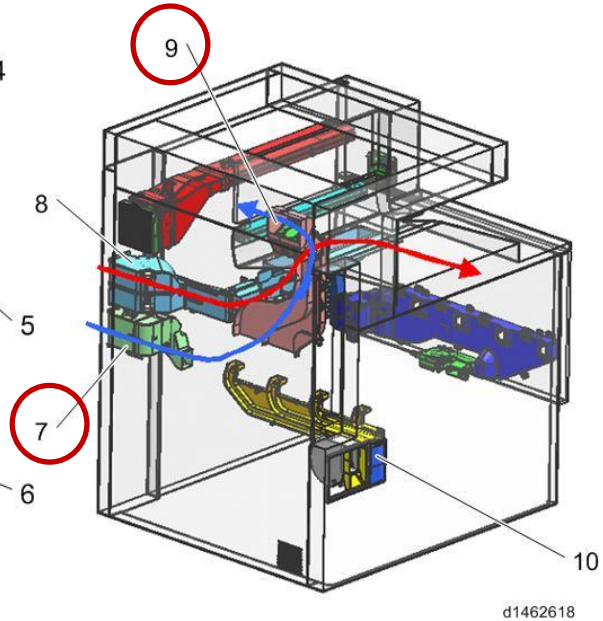
PCBs

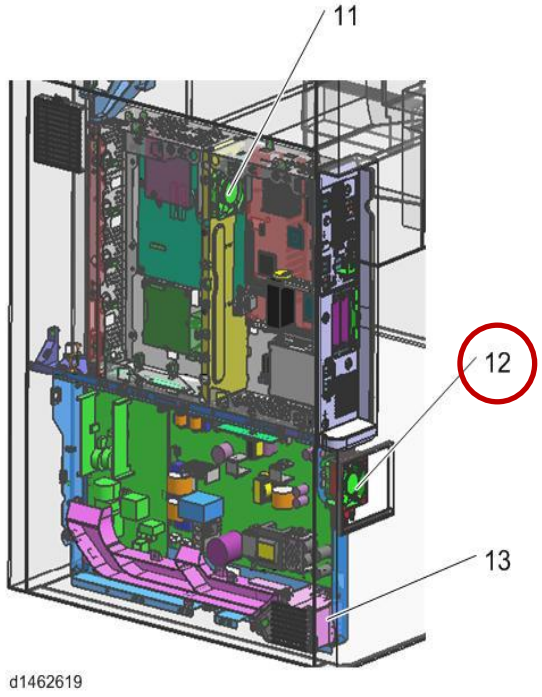
Cooling Metis-C1 c/d/e

RICOH
imagine. change.

- 11 Fan's are used for cooling.







Front

Rear

PCBs

Function of fans

RICOH
imagine. change.

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

Cooling Notes

RICOH
imagine. change.

- 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
  - curling
  - condensation in the paper exit area.
- During output, the operation of fans depends on the machine's internal temperature.
  - This temperature is measured by a temperature/humidity sensor at the rear of the PCDUs.
- After output, the fans stay on until the machine cools enough.

Differences from Predecessors: Electrical Components

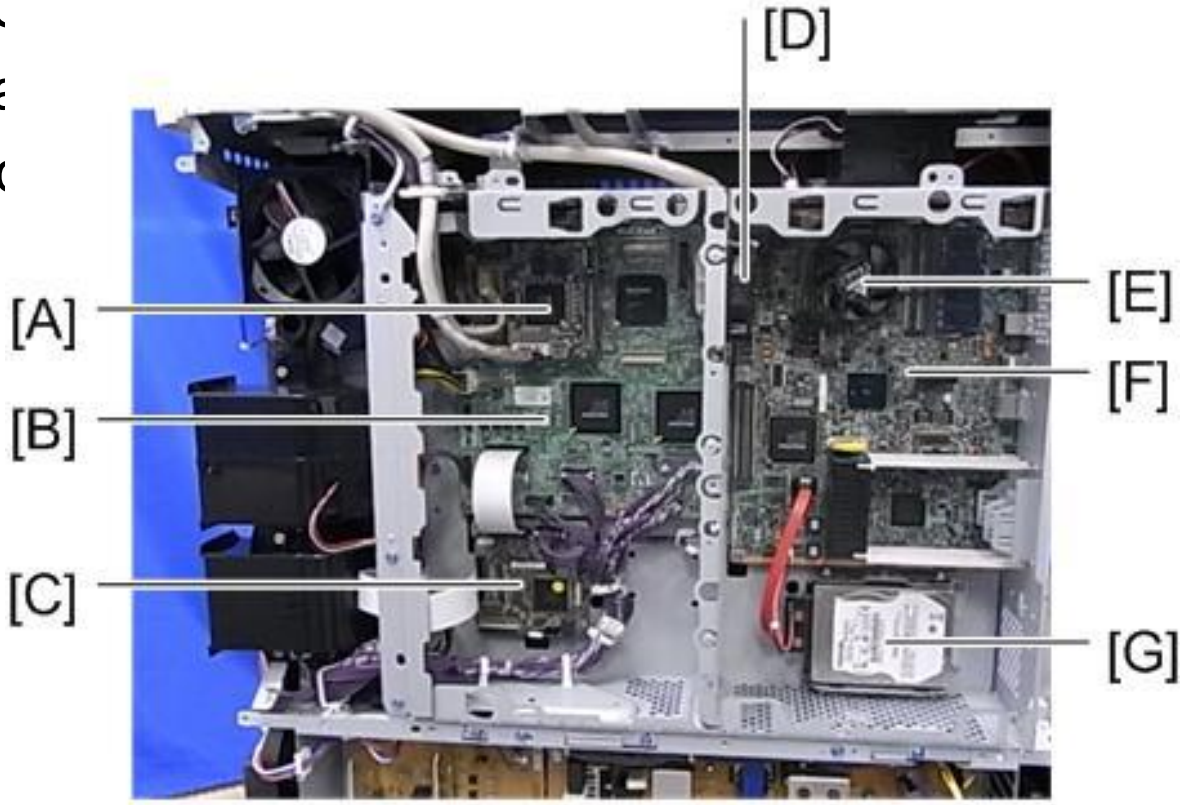
RICOH
imagine. change.

	Metis-C1	Predecessor	Purpose
Operation Panel	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 NVRAM's	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

Locations of PCBs Inside the Controller Box

RICOH
imagine. change.

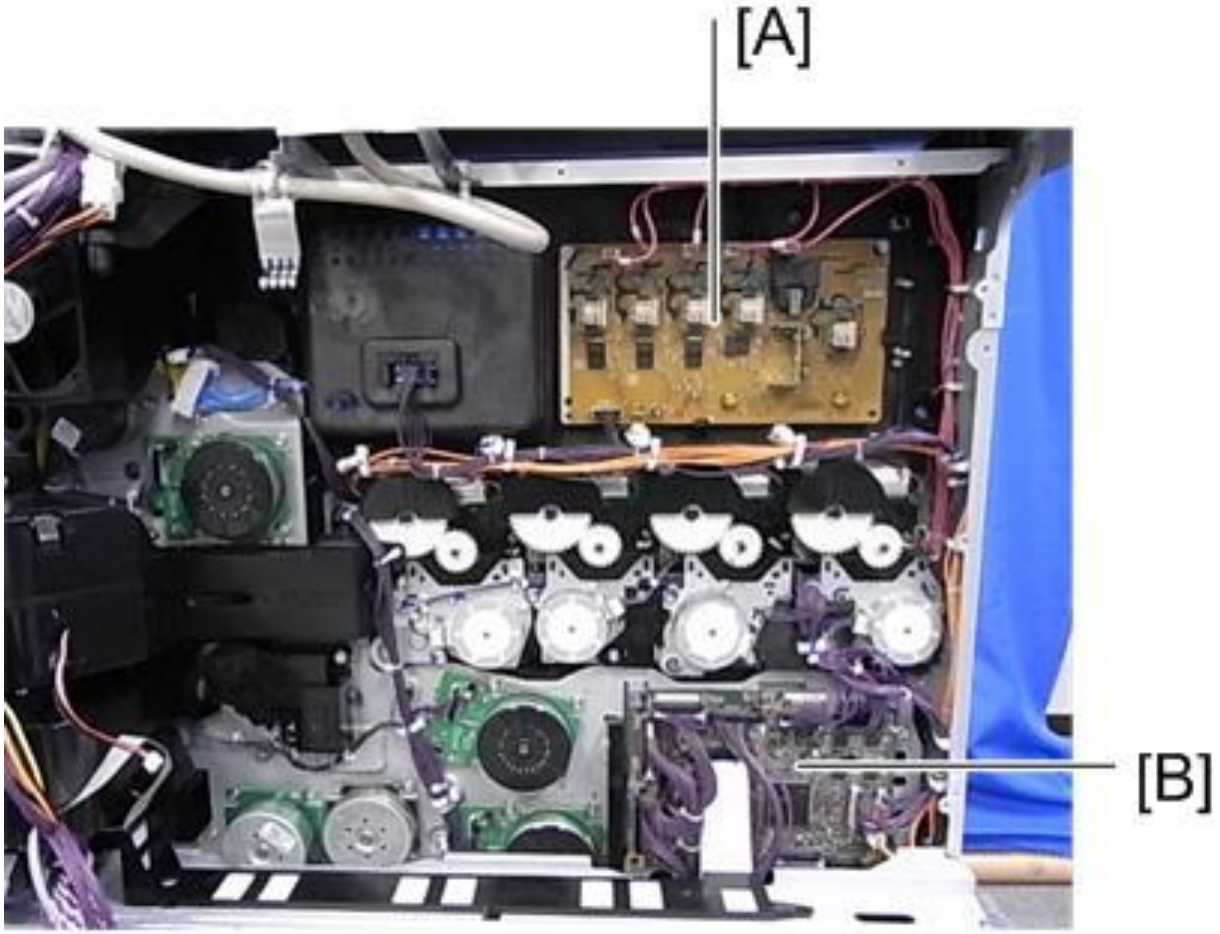
A. IPU Sub (only if an SPDF is present)
B. IPU
C. BCU
D. Controller Box C
E. CPU Cooling Fa
F. Controller Boar
G. HDD



Locations of PCBs Behind the Controller Box

RICOH
imagine. change.

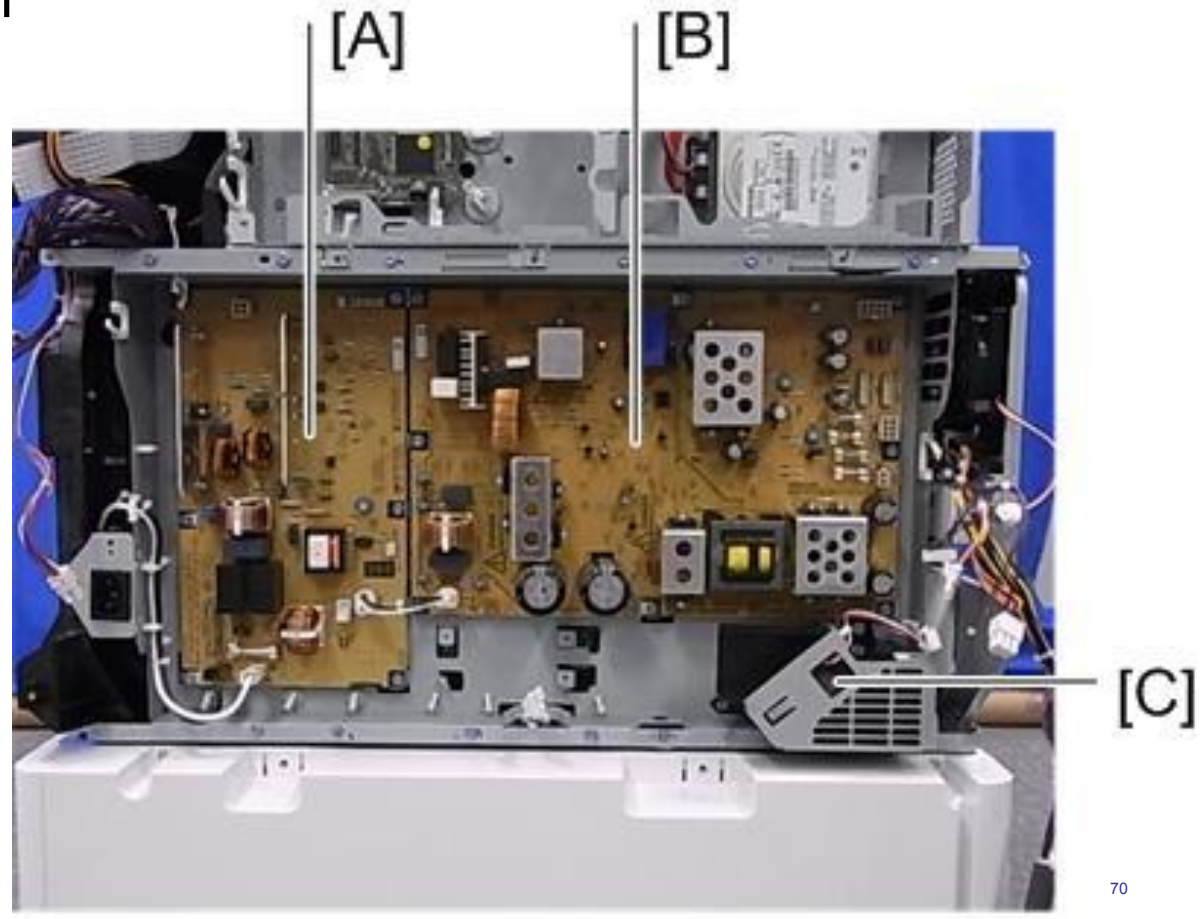
A. HVP_TTS
B. Imaging IOB



Locations of PCBs Inside the Power Box

RICOH
imagine. change.

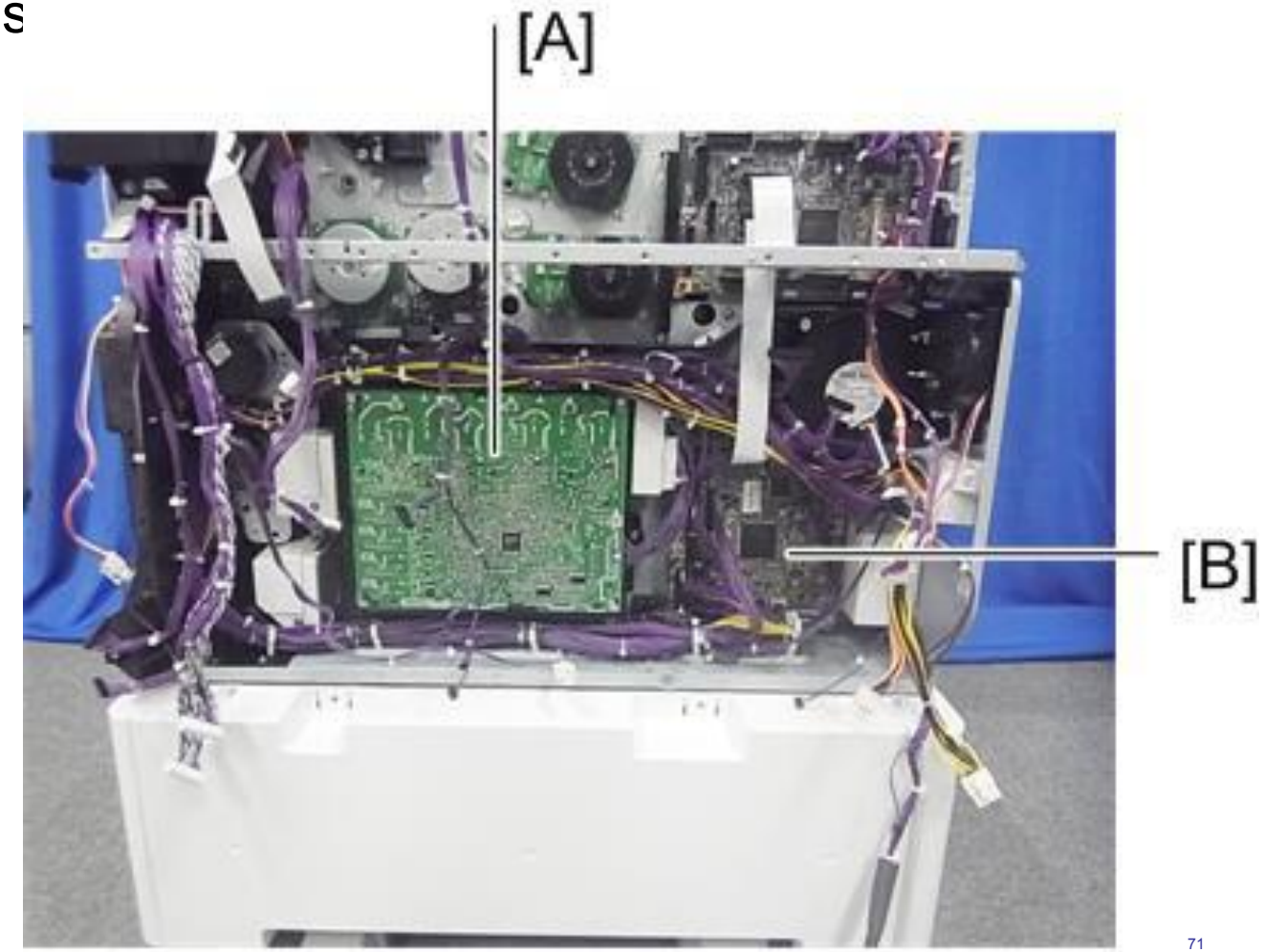
A. PSU (AC controller board)
B. PSU (DC Power)
C. PSU Cooling Far



Locations of PCBs Behind the Power Box

RICOH
imagine. change.

A. HVP_CB
B. Paper Trans



Differences from Predecessors: Servicing

RICOH
imagine. change.

	Metis-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 only 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.

Switch off procedure

- Push the power switch [A] on the machine.
  - Wait until the shut-off screen disappears.
- Take out the power cord.
- Push the power switch [A] again to remove the residual charge.
- Note: If some LEDs on any of the boards are blinking or lit, current is still present.

Starting the machine again

RICOH
imagine. change.

- To start the machine, press the main power switch.
- If you press the main power switch during the shutdown procedure, the machine will not start.

Forced Shutdown

RICOH
imagine. change.

- In case normal shutdown does not complete, 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.

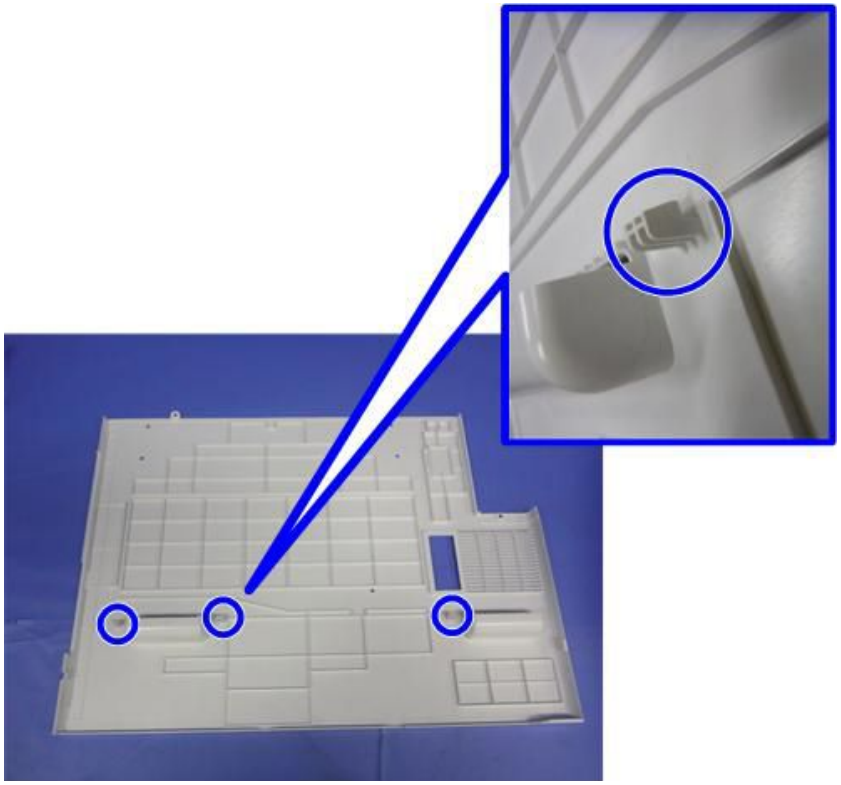
Use a forced shutdown only if it is unavoidable.

Replacement of parts

RICOH
imagine. change.

- 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.

For example:
Upper Left Cover



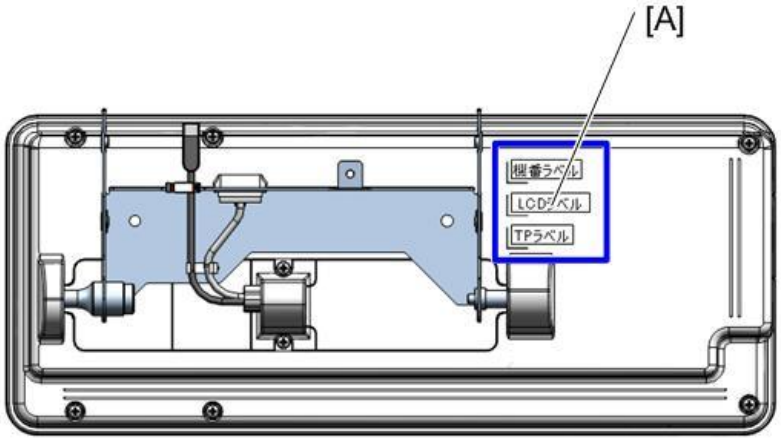
LCD Panel (1/2)

RICOH
imagine. change.

- LCD panels from two different vendors are used.
- Depending on which type is used in the machine:
  - The bracket for attaching the panel has a different shape.
  - 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.

LCD Panel (2/2)

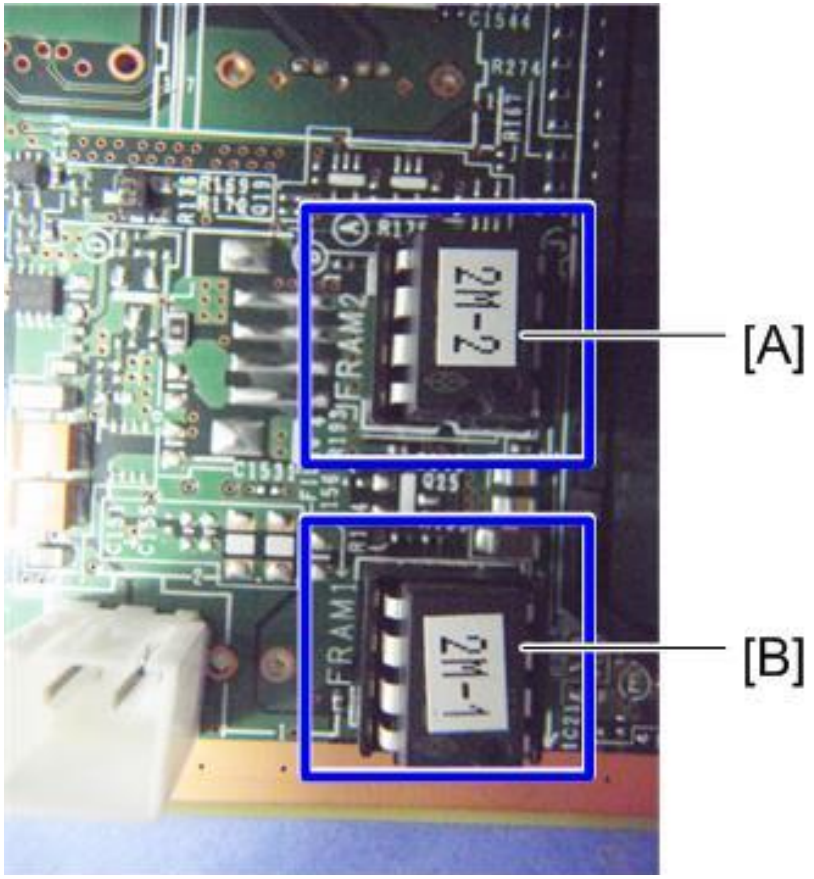
- How to determine the correct type to install?
- There are three labels on the rear of the operation panel. The center label [A] shows the LCD model number.
- The first letter is either an S or a C, to indicate the different vendors.
- If your machine has a label starting with S, you can only replace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



Replacing NVRAMs on the Controller Board

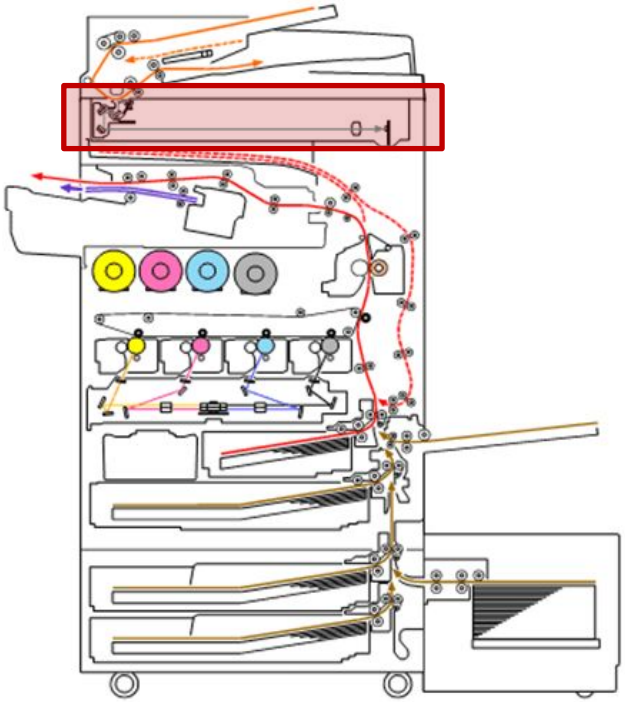
RICOH
imagine. change.

- Make sure that the NVRAMs are installed in the correct sockets.
  - 2M-1 must be in FRAM1 next to it.
  - 2M-2 must be in FRAM2 next to it.



RICOH
imagine. change.

4.2 Scanner

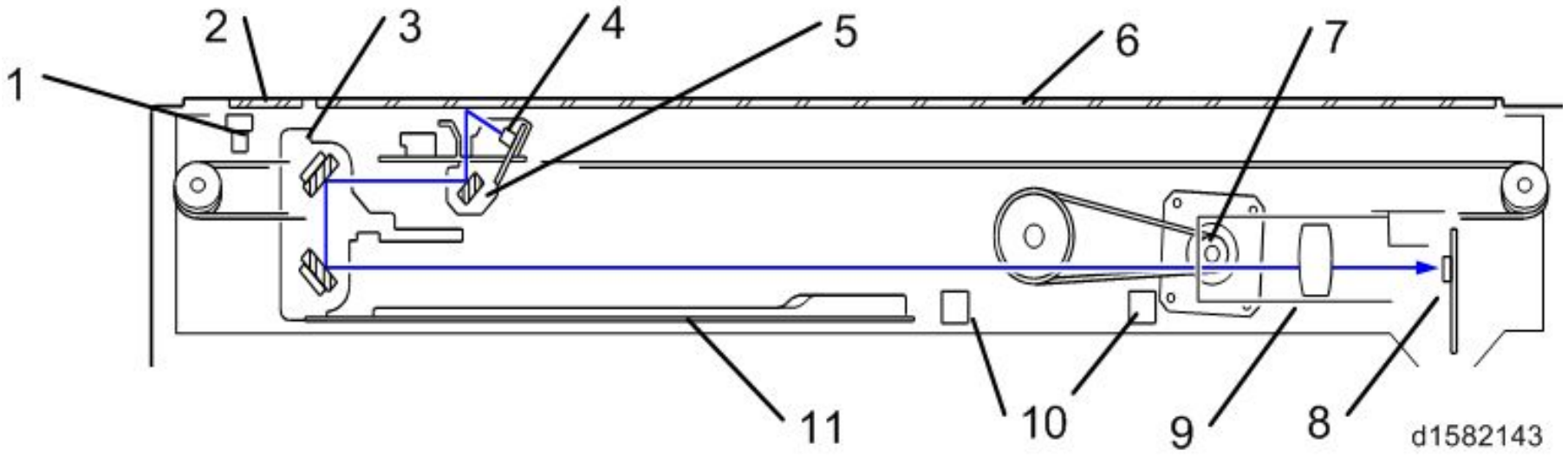


Differences from Predecessors: Scanner unit

RICOH
imagine. change.

	Metis-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

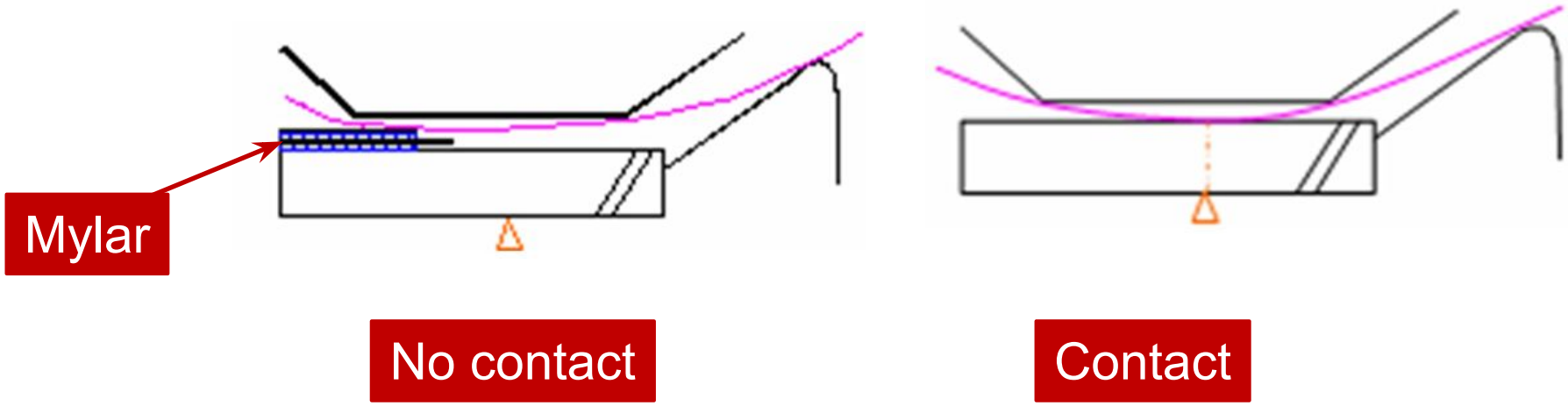
Scanner Unit



DF exposure glass

RICOH
imagine. change.

- Originals may cause streaks on the exposure glass.
- To prevent these streaks non-contact scan is done.
  - The ADF exposure glass has a mylar, which guides the original over the glass.



Dust Detection – Overview

RICOH
imagine. change.

- 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.

Dust Detection (SP 4-020)

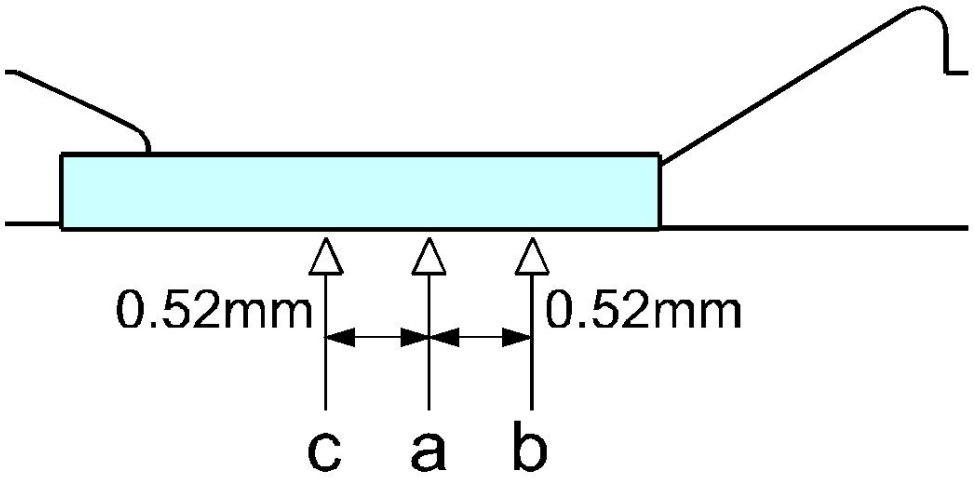
RICOH
imagine. change.

- SP 4-020-001: Enable/disable (default – disabled)
- SP 4-020-002: Sensitivity adjustment
- SP 4-020-003: Do not adjust in the field
- SP 7-852: Counts how many times the machine detected dust on the ADF.

Dust Detection - Action Taken

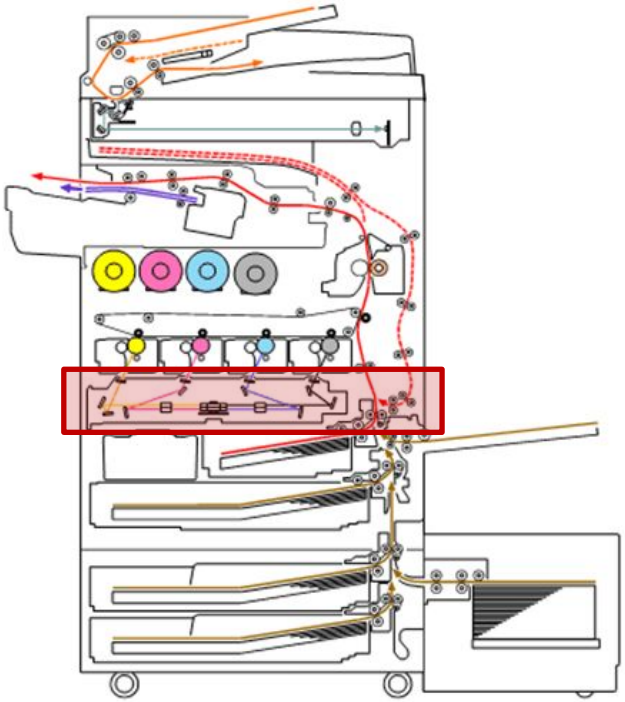
RICOH
imagine. change.

- 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 >



RICOH
imagine. change.

Laser Unit



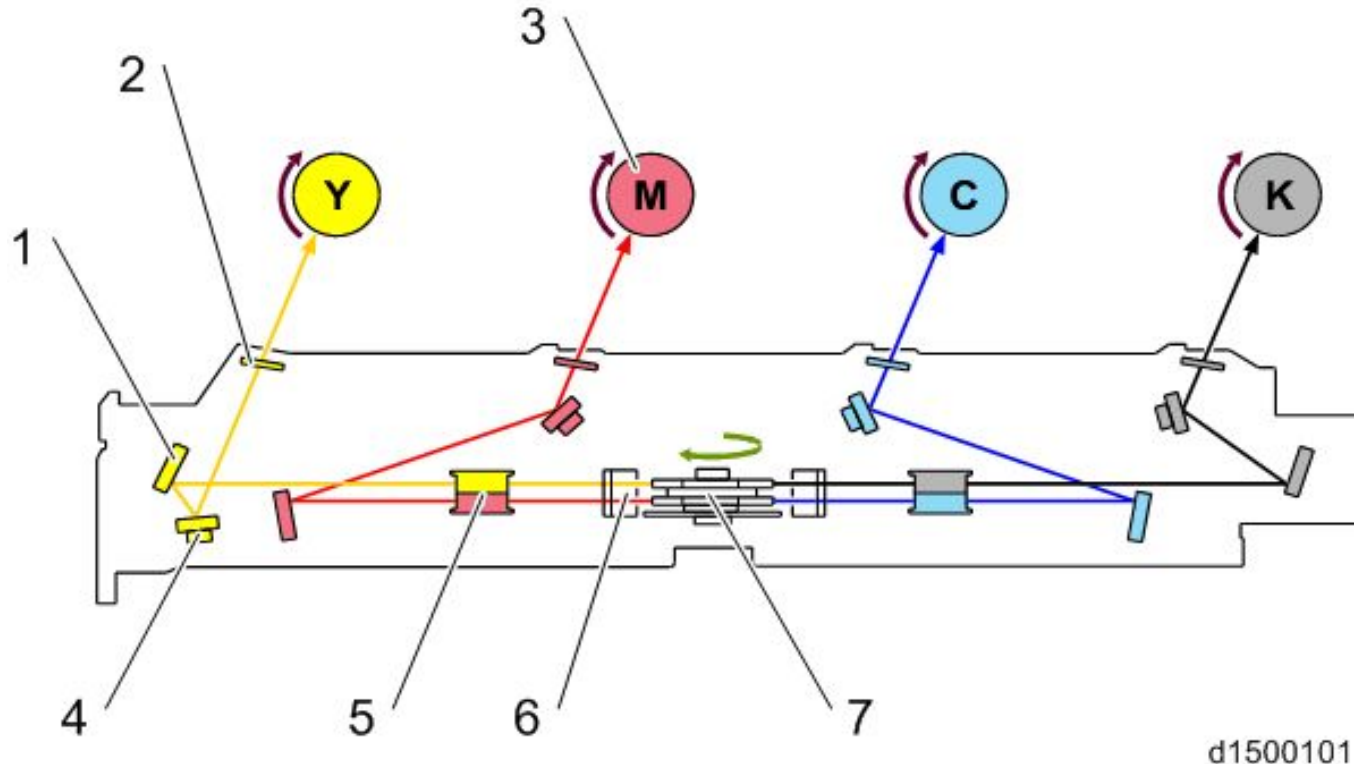
Differences from Predecessors: Laser unit

RICOH
imagine. change.

	Metis-C1	Predecessor	Purpose
1	Adjustment after laser unit replacement ❑Download the SP values from the unit ❑One SP for coarse and fine MUSIC adjustment	Adjustment after laser unit replacement ❑Input values into SP mode by hand by referring to a sheet included with the unit. ❑Two SPs for coarse and fine MUSIC adjustment	Easier to service

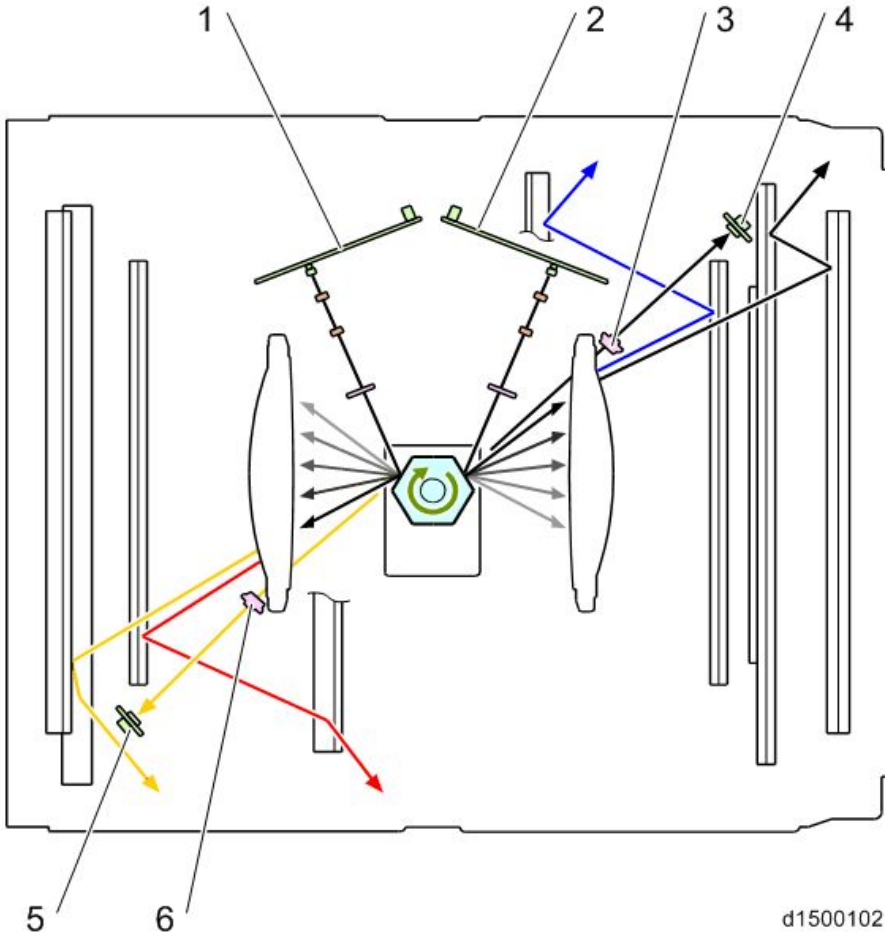
Overview

RICOH
imagine. change.



Components

- There are two LD drive boards.
  - M150, M149, M148: 2 beams/colour
  - M147, M146: 1 beam/colour



Skew Adjustment

RICOH
imagine. change.

- 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.

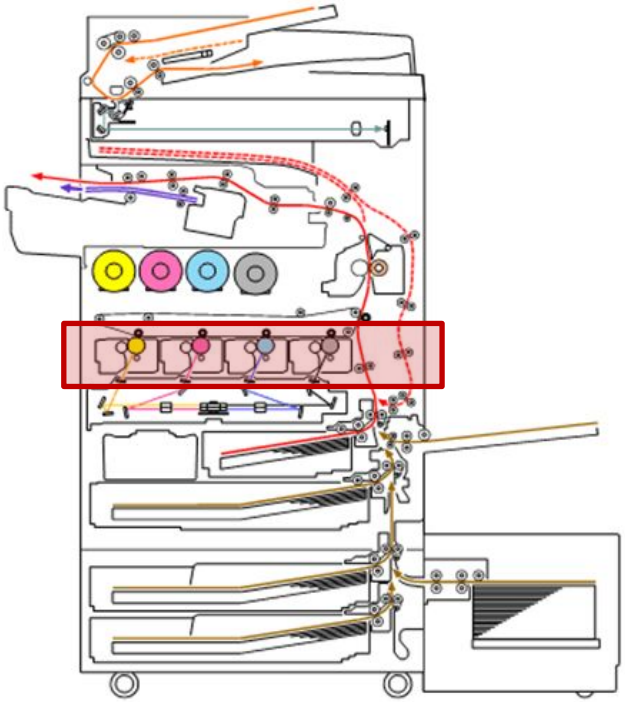
Replacing the Laser Unit

RICOH
imagine. change.

- After installing the new unit:
  - Disconnect the skew correction motor harness.
- Execute SP modes as explained in the service manual to download the correction values from the new laser unit.
- It is not necessary to execute color registration after replacing the laser unit.

RICOH
imagine. change.

PCDU



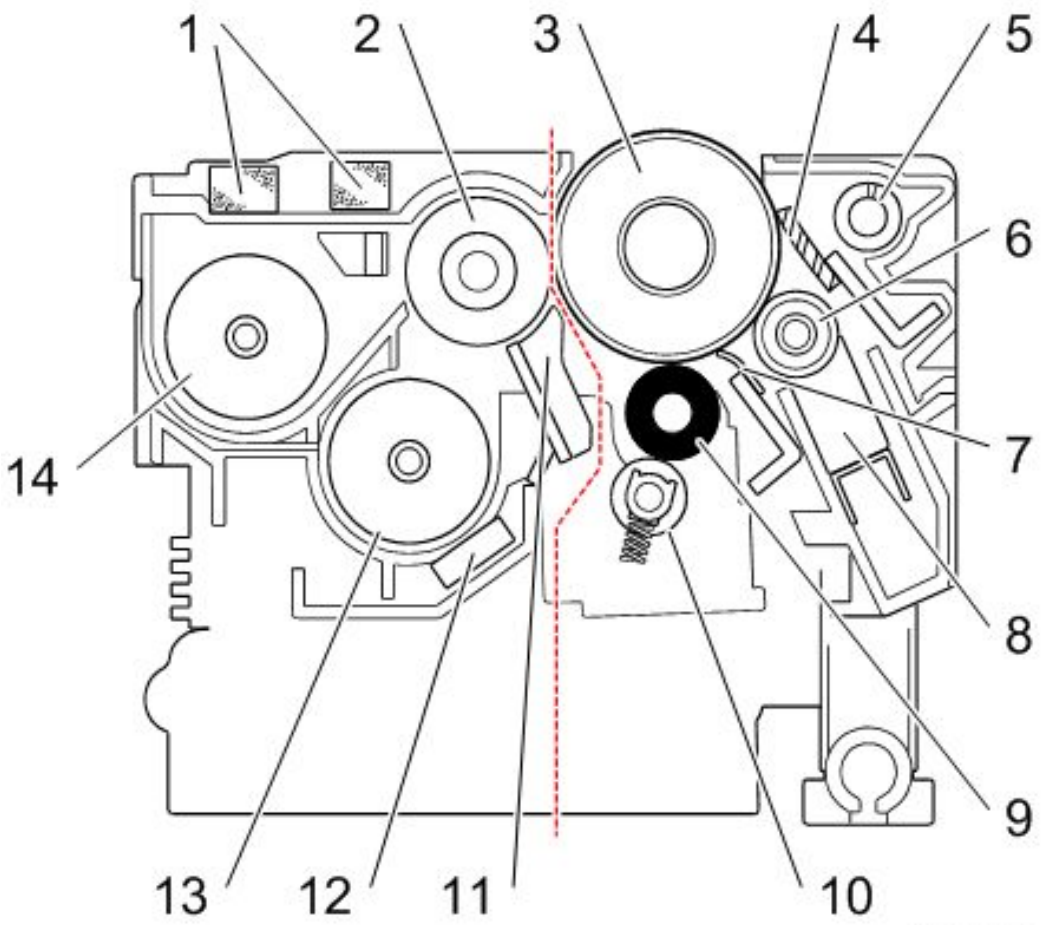
Differences from Predecessors: PCDU

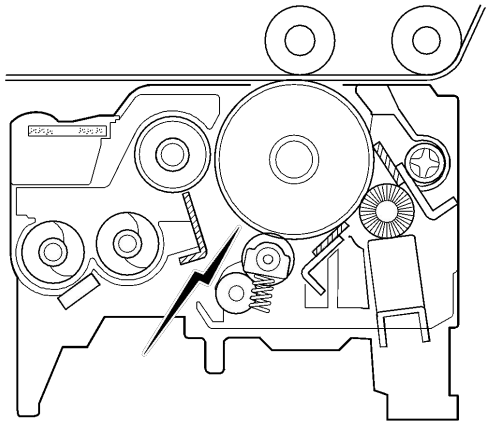
RICOH
imagine. change.

	Metis-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	

Layout

RICOH
imagine. change.





Athena & Apollon-C3

Differences from Predecessors: PCU

RICOH
imagine. change.

	Metis-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

Differences from Predecessors: Development

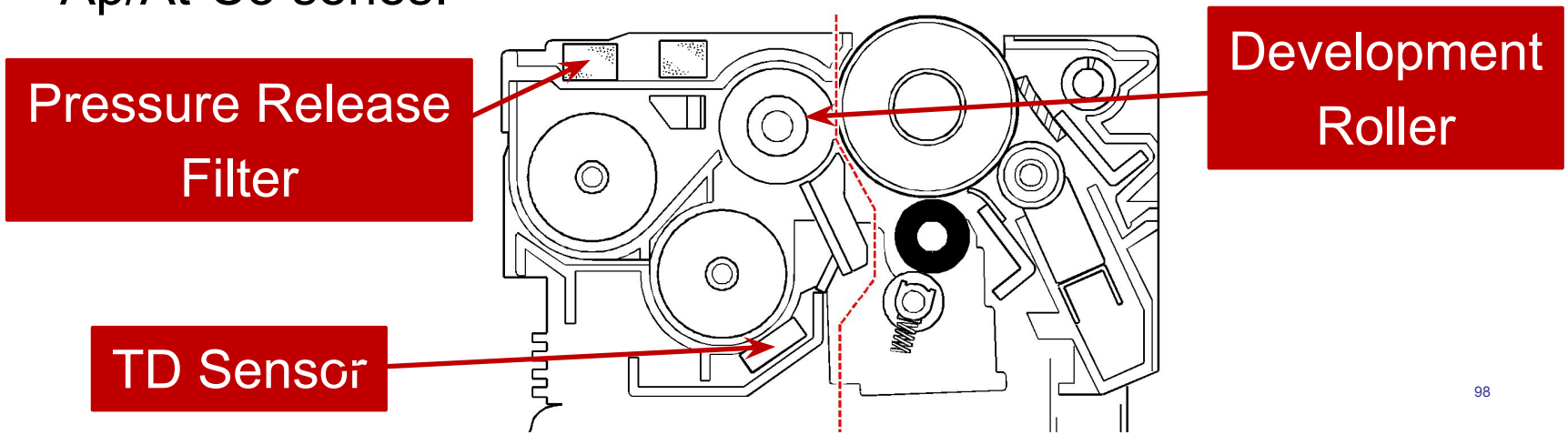
RICOH
imagine. change.

	Metis-C1	Predecessor	Purpose
1	Developer moves through the unit along more than one path	Developer moves through the unit along 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

Development

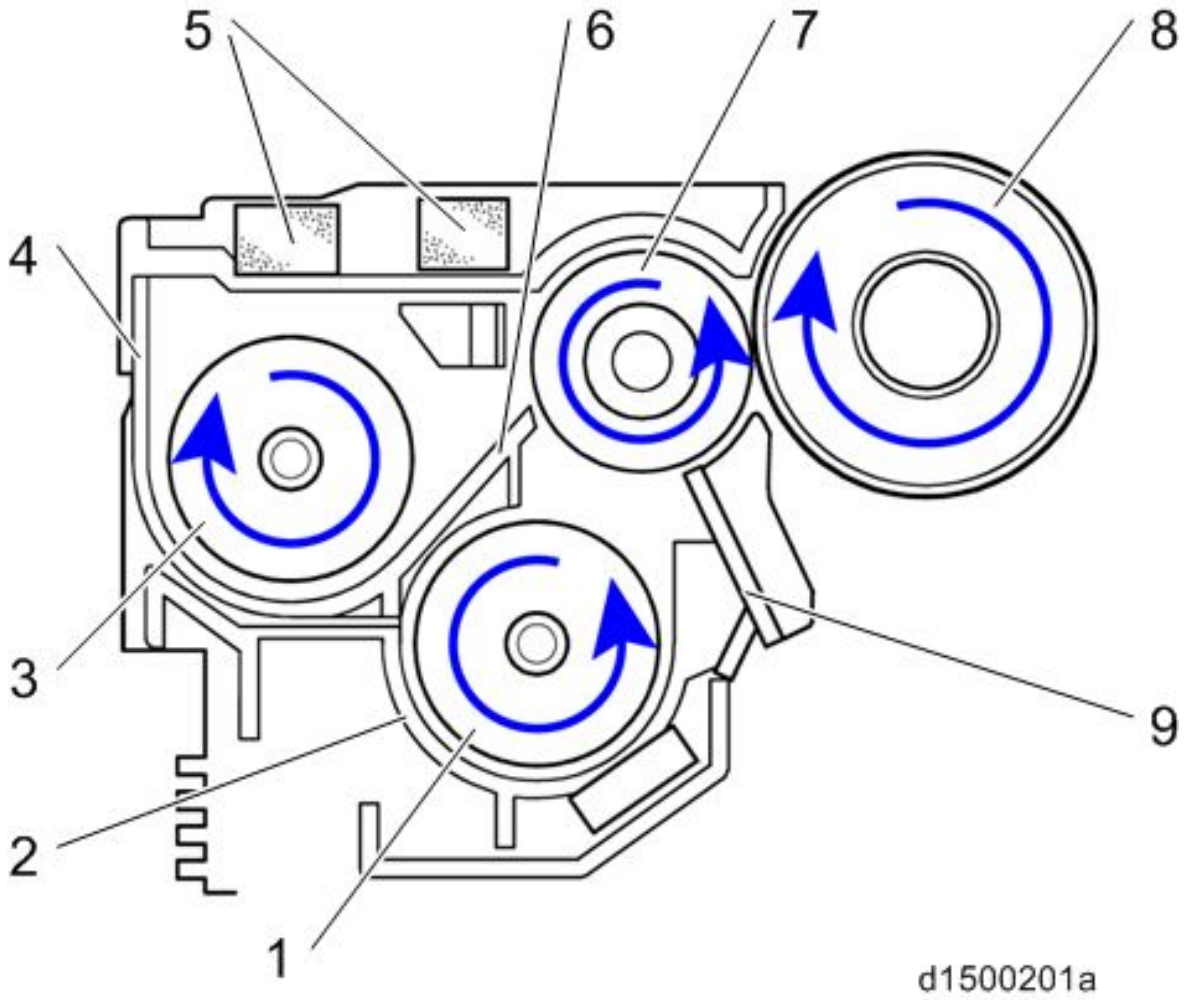
RICOH
imagine. change.

- A two-component development system is used.
- One motor drives the K development, and another motor drives the three color development units.
- The TD sensor is a non-contact type, containing an ID chip.
- Development bias is applied via a plate spring on the rear cover of the PCDU.
- The pressure release filter is larger than the one in the Ap/At-C3 series.



Development Unit Components

RICOH
imagine. change.



Replacing Note for PCDU or PCU

RICOH
imagine. change.

- Before replacing a PCU or PCDU, 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.)

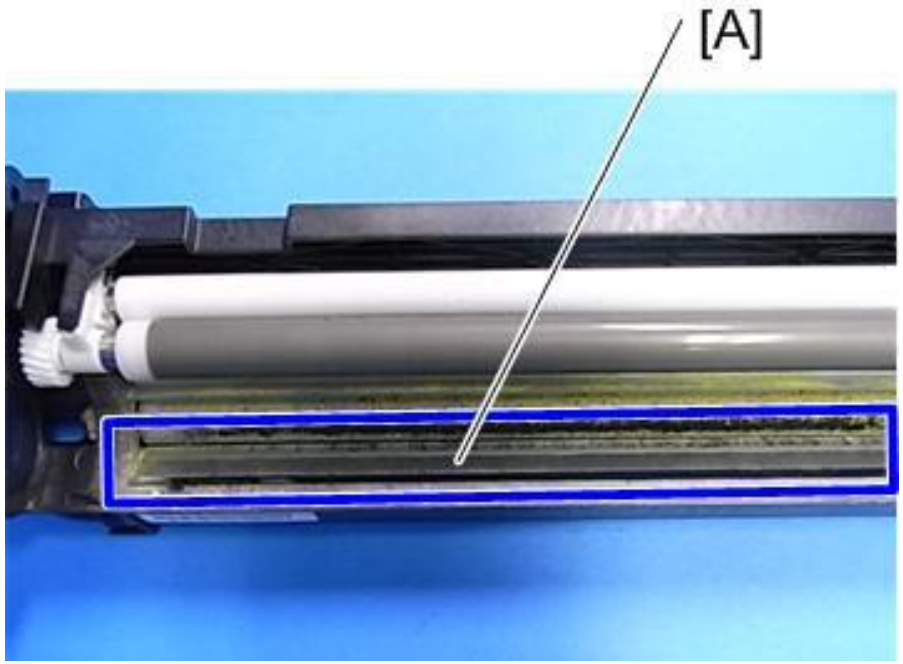
Replacement (1/3)

RICOH
imagine. change.

- 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.

Replacement (2/3)

- 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.



Replacement (3/3)

RICOH
imagine. change.

- To check that toner lines do not appear, turn the drum in the direction of the arrows.
- 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 and another for the development unit.
  - Then replace the unit and switch the power ON.
  - The counter will be reset

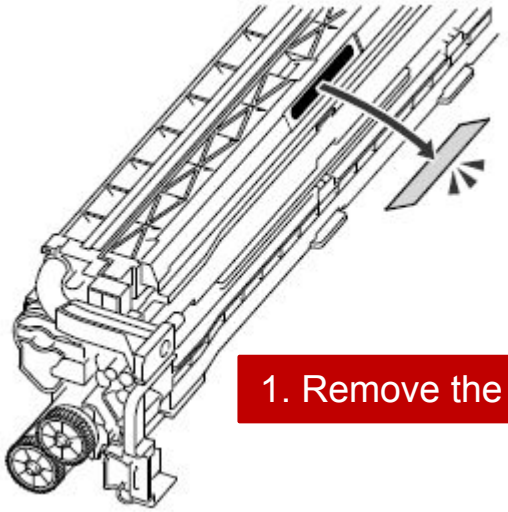
Replacing the PCDU / PCU on a D149 or D150

RICOH
imagine. change.

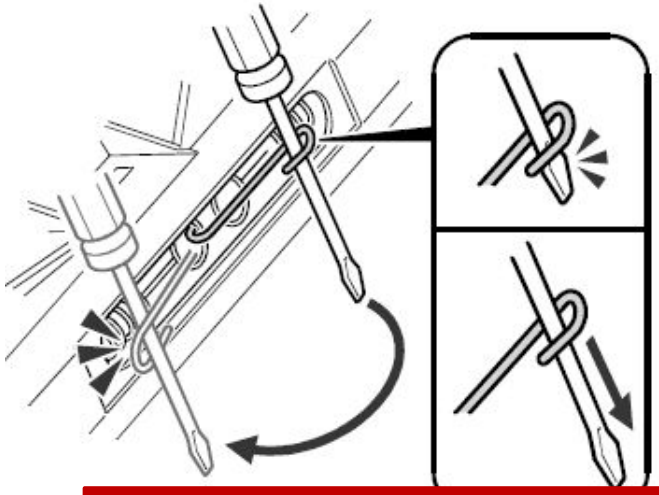
- An additional procedure is required when replacing the PCDU or PCU (drum unit) on the D149 and D150.
  - This is not necessary for the D146, D147, or D148.
- During this procedure, spring pressure is adjusted. If this is not done, the lubricant bar is consumed more quickly, and the life of the PCDU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

Replacing the PCDU or PCU on a D149 or D150

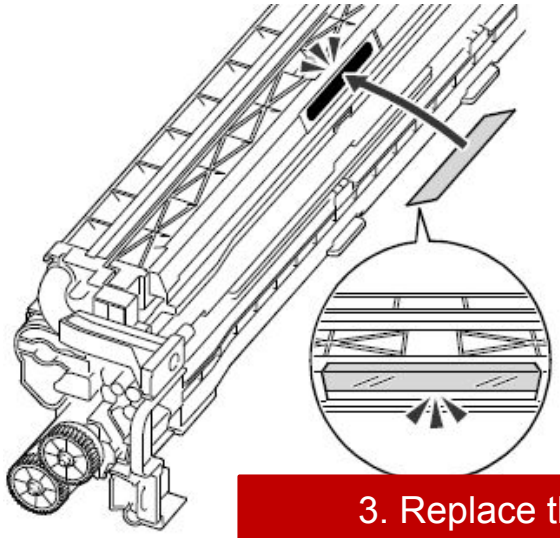
RICOH
imagine. change.



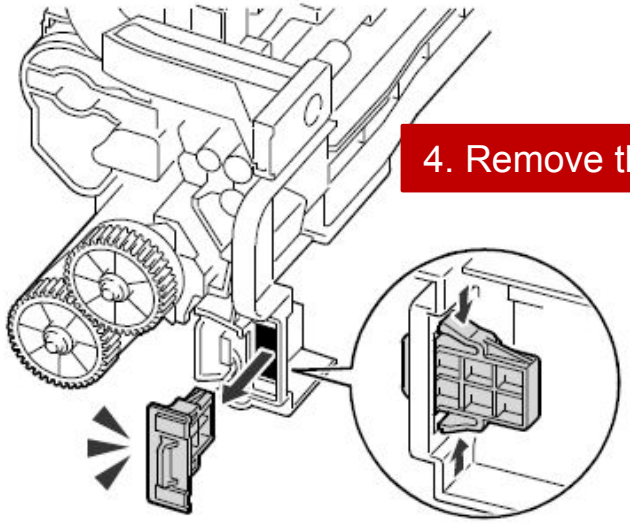
1. Remove the seal



2. Move the hook with a screwdriver.
Do not use your fingers for this.



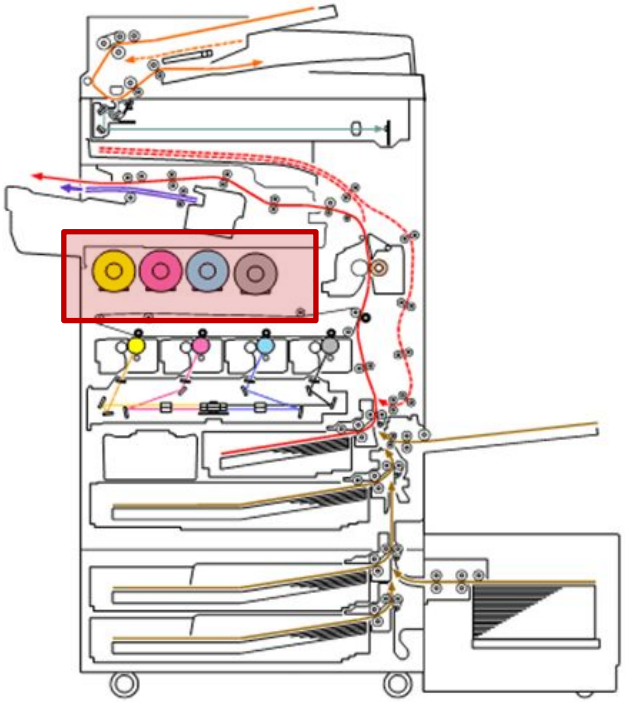
3. Replace the seal.
Make sure it is the right way up.



4. Remove this component

RICOH
imagine. change.

Toner Supply



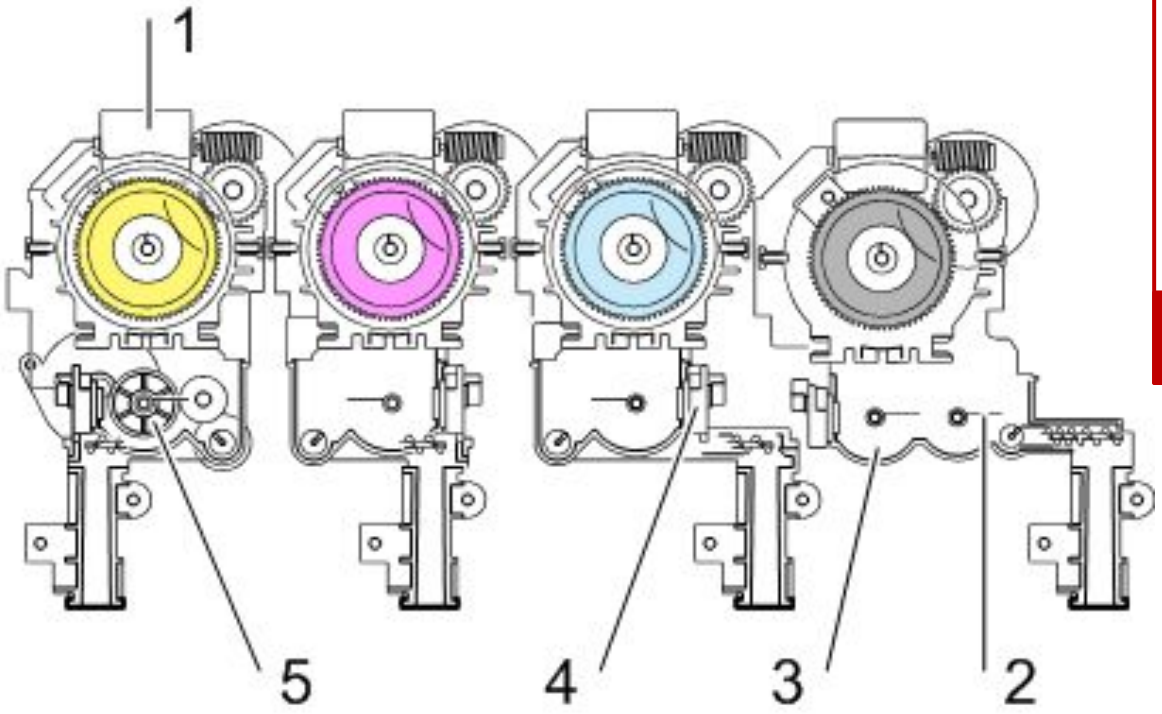
Differences from Predecessors: Toner Supply

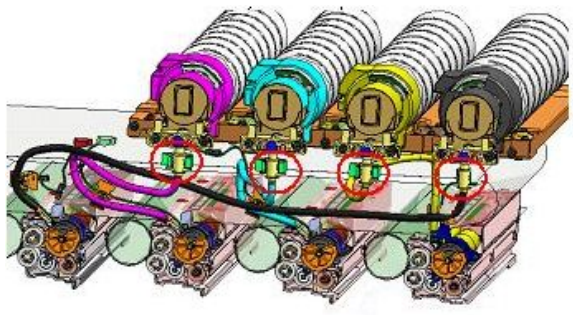
RICOH
imagine. change.

	Metis-C1	Predecessor	Purpose
1	Hi-ACT system Sub hopper toner supply system	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	

Layout

RICOH
imagine. change.

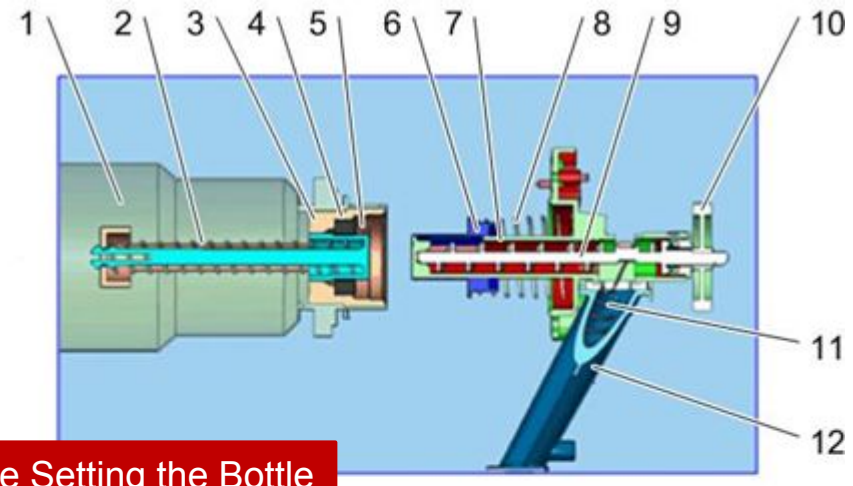




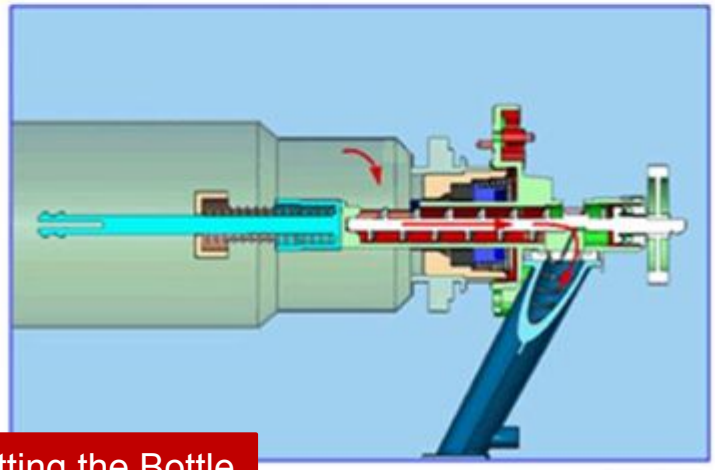
Athena & Apollon-C3

From bottle to sub hopper (1/2)

RICOH
imagine. change.



Before Setting the Bottle

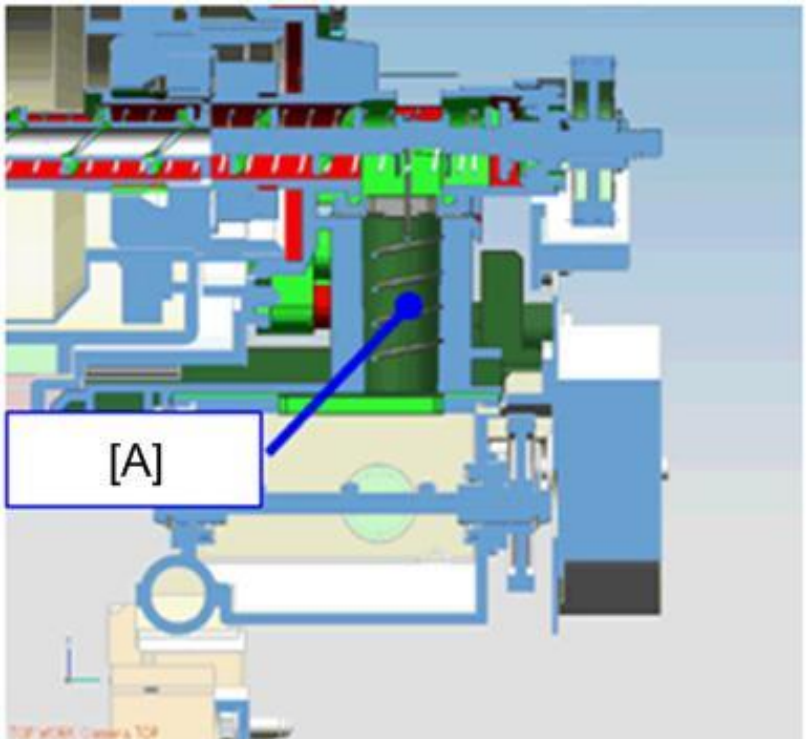


After Setting the Bottle

- When toner end is detected, the toner in the bottle is transported by a coil [9].
- Transported toner falls directly into the sub-hopper via the transport pipe [12].

From bottle to sub hopper (2/2)

RICOH
imagine. change.



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

Toner Near-end Detection

RICOH
imagine. change.

- 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

‘Estimated Toner Near-end’

RICOH
imagine. change.

- If the amount of remaining toner falls below a certain limit (SP3-110-001 to 004; default 65g), the machine enters the ‘estimated toner near-end’ state.

‘Definite Toner Near-end’

RICOH
imagine. change.

- 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.

Definite Toner Near-end detection

RICOH
imagine. change.

- 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.

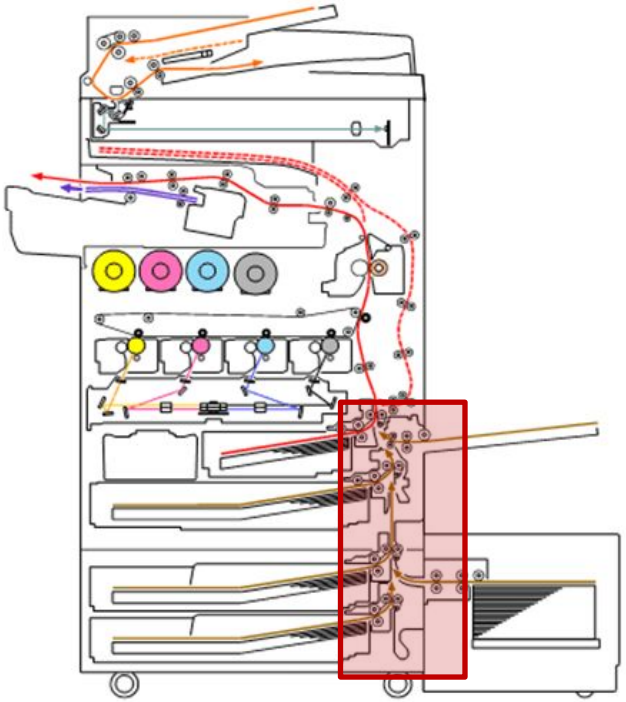
Toner End Detection

RICOH
imagine. change.

- 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

RICOH
imagine. change.

Paper Feed



Differences from Predecessors: Paper Feed

RICOH
imagine. change.

	Metis-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	Use ability improvement
7	Paper dust case removable by technician	Paper dust case removable by user	Spec improvement
8	Tray pull-in mechanism	Locked tray	Use ability improvement
9	Double-feed detection (D150 only)	Nothing	Use ability improvement

Differences from Predecessors: By-pass

RICOH
imagine. change.

	Metis-C1	Predecessor	Purpose
1	Side fence contact sensor function (D150 only)	No side fence contact sensor function	Improved use ability

Differences from Predecessors: Optional PFU

RICOH
imagine. change.

	Metis-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 use ability
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	-

Differences from Predecessors: Tandem LCT

RICOH
imagine. change.

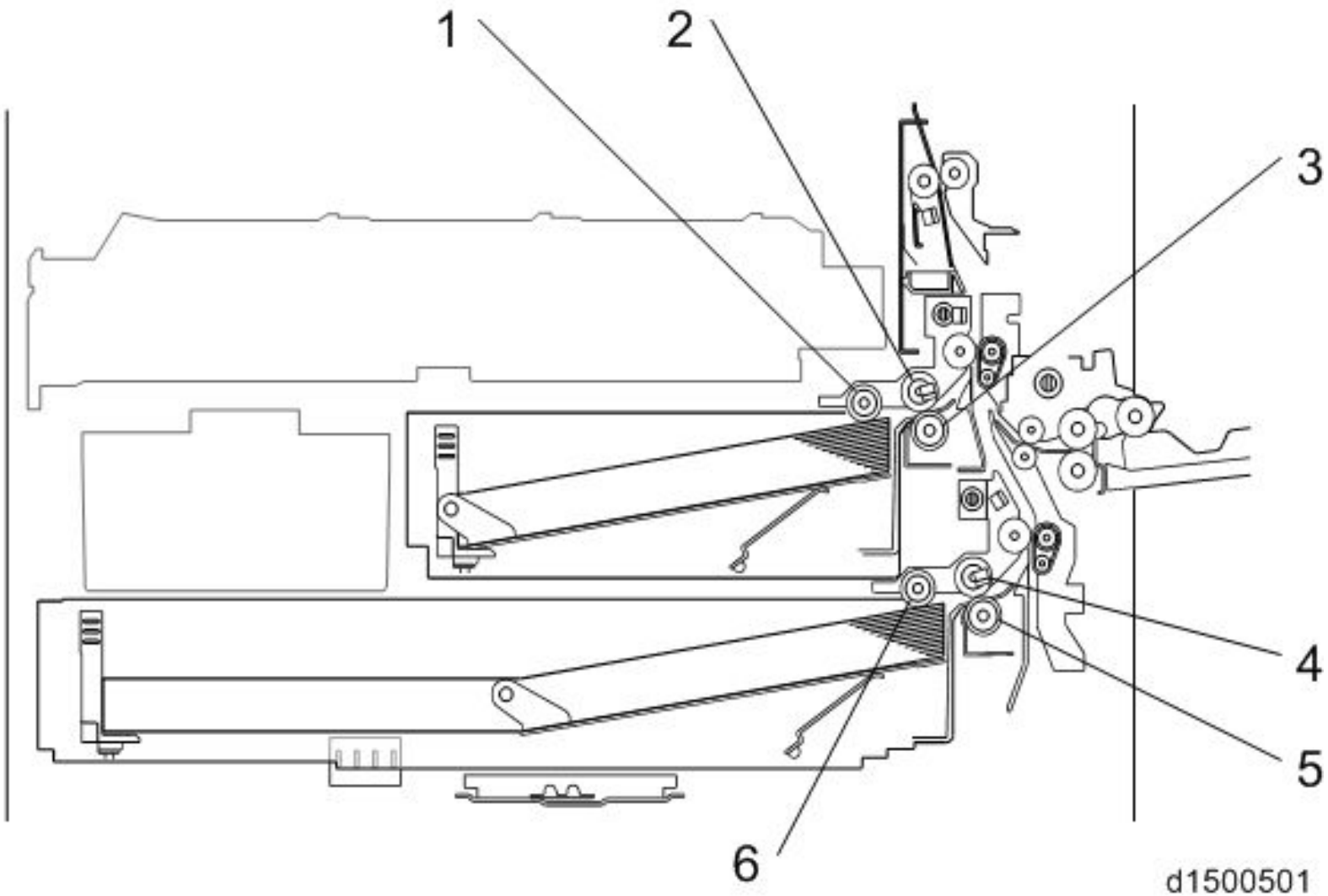
	Metis-C1	Predecessor	Purpose
1	One sensor to detect remaining paper	Three sensors to detect remaining paper	Simplified layout
2	One motor to transfer the left tray	Feed motor and clutch to transfer the left tray	Energy saving
3	Only paper detection ON or OFF on left tray	Detection for remaining paper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

Differences from Predecessors: Side LCT

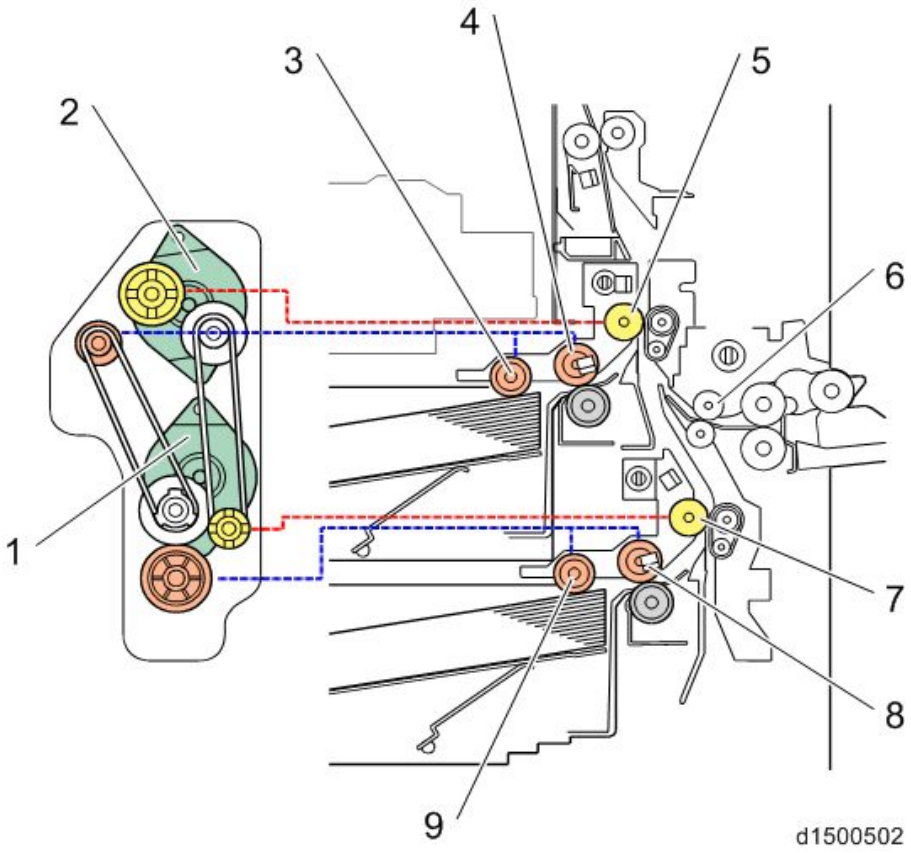
RICOH
imagine. change.

	Metis-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

Overview

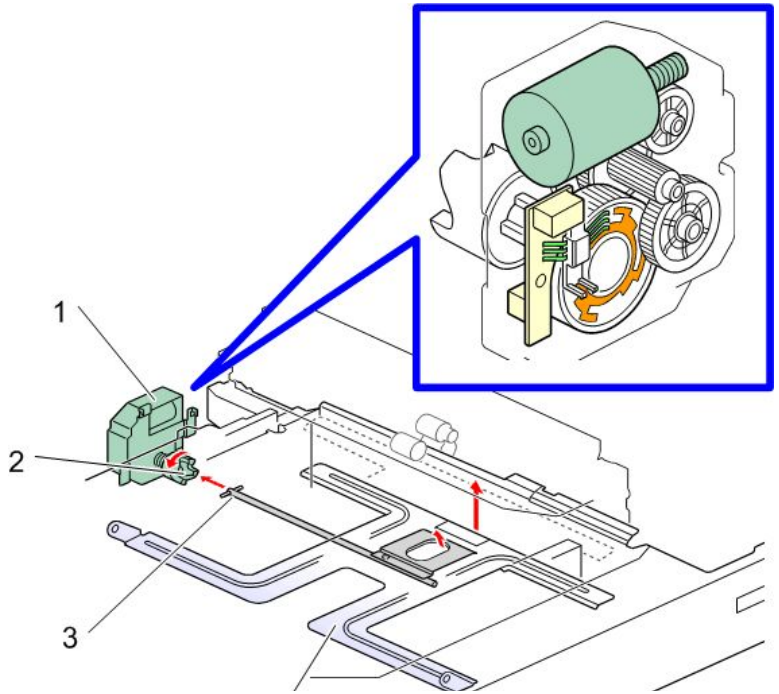


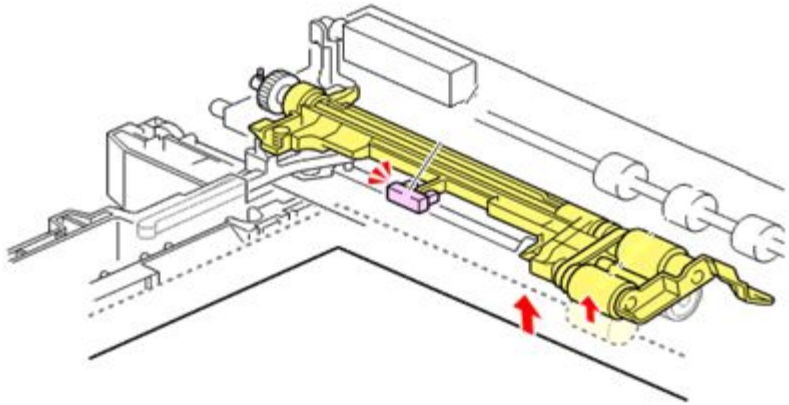
Drive (1)



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

Bottom Plate Lift

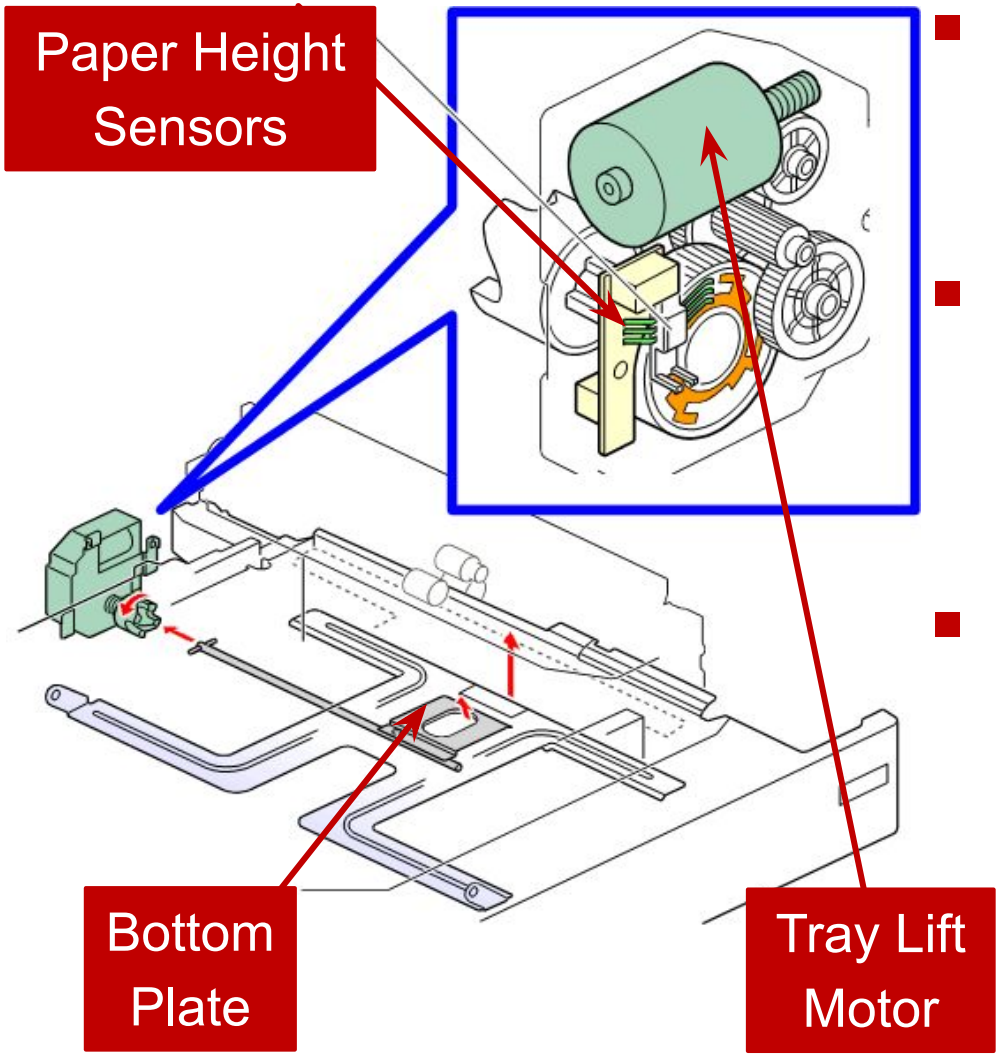




- When the tray is removed, the coupling is released, and the base plate moves down. The lift motor then rotates until the coupling returns to the home position.

Remaining Paper Detection – Trays 1 and 2

RICOH
imagine. change.

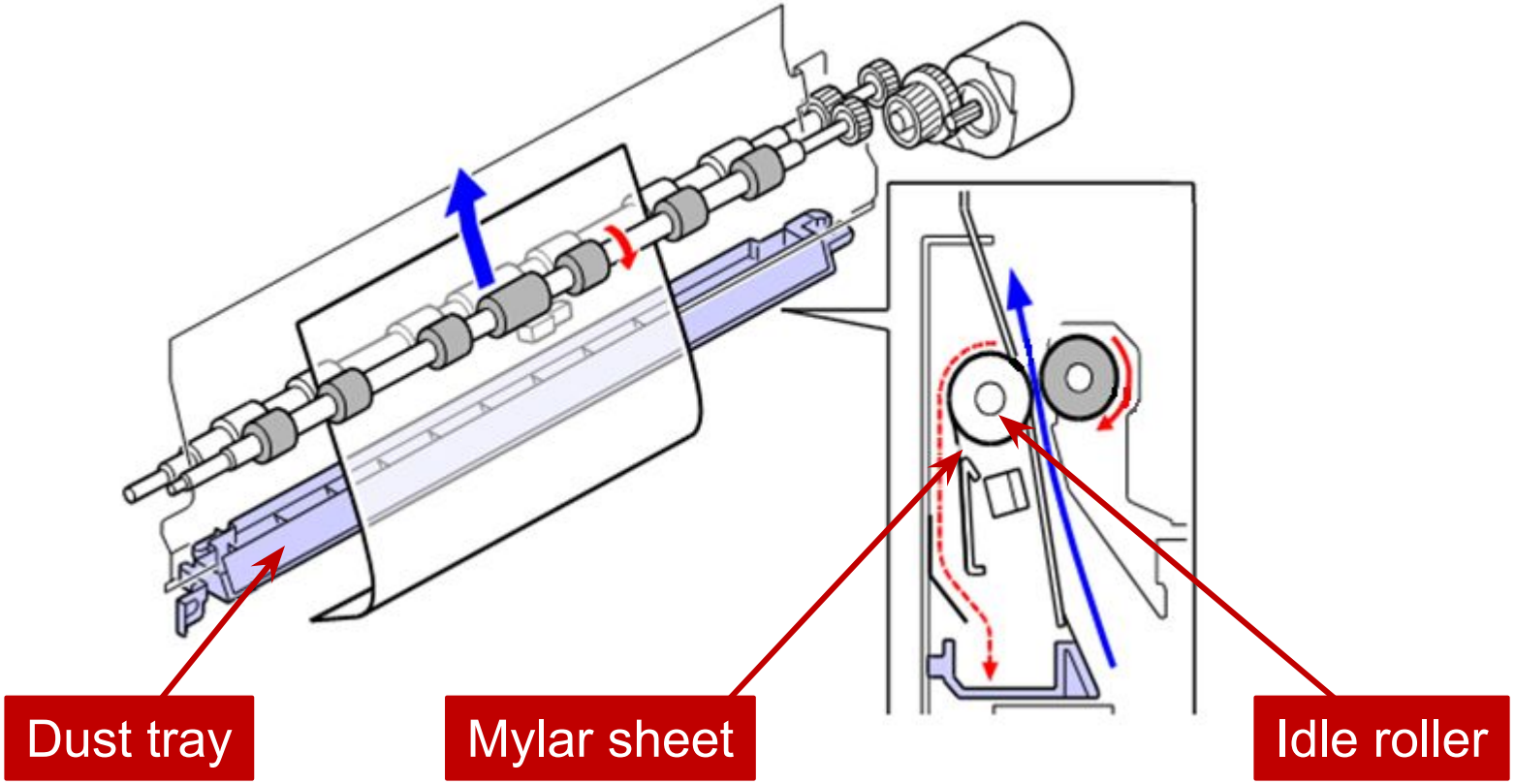


- The lift motor assembly contains two height sensors, and two semi-circular actuators.
- When paper is used up, the bottom plate is lifted and the shaft rotates. This changes the positions of the actuators.
- The remaining paper indicator on the operation panel reflects the states of the sensors. The levels are 100%, 70%, 30%, and 10%.

Paper Dust Removal

RICOH
imagine. change.

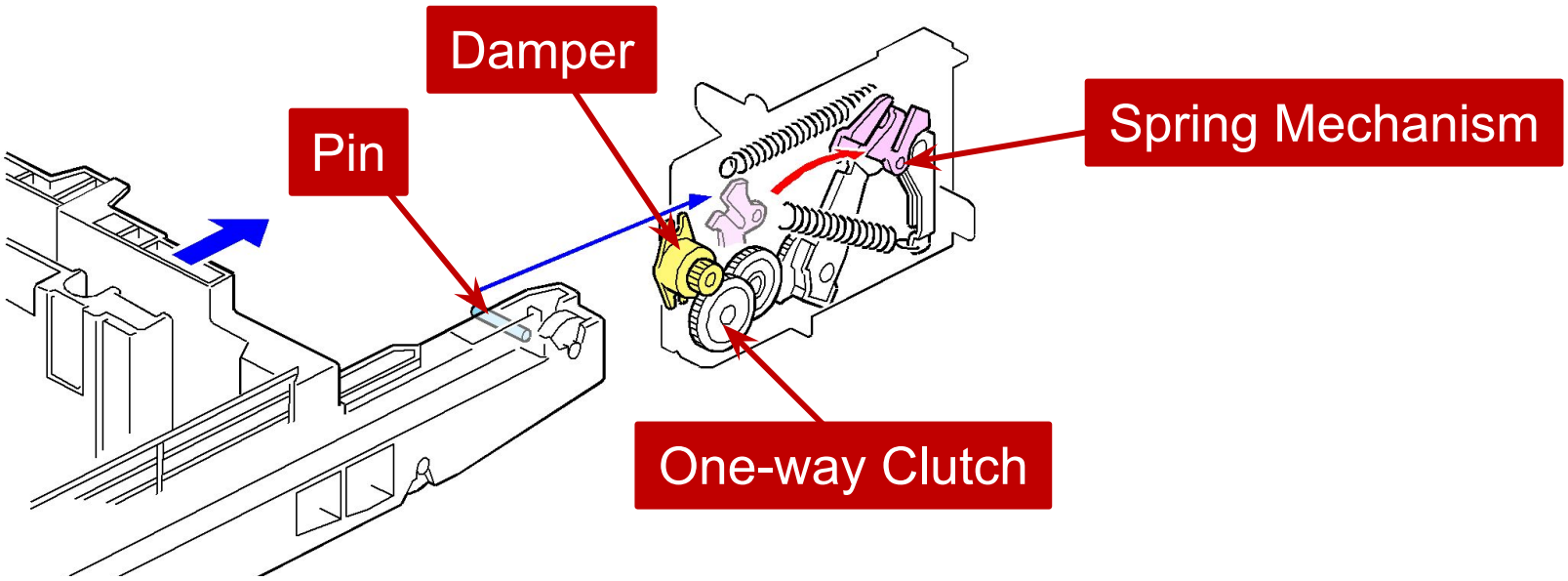
- A mylar sheet contacts the registration idle roller, and sends paper dust to the dust tray.



Tray Pull-in Mechanism

RICOH
imagine. change.

- 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.



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

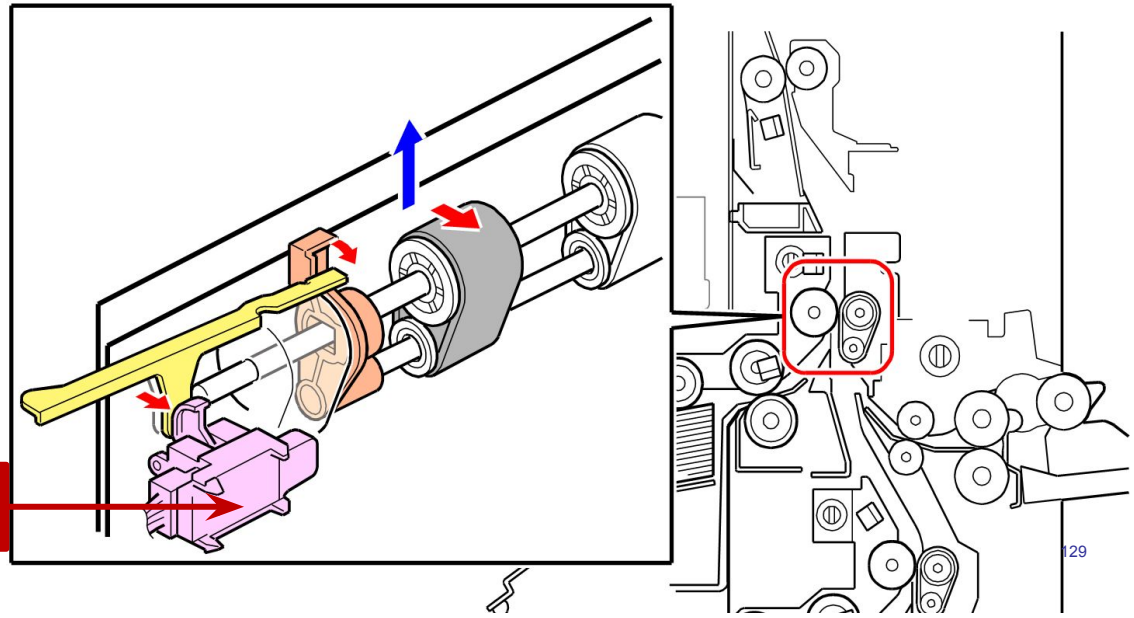
RICOH
imagine. change.

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

Paper thickness & Double-feed Detection (Metis-C1e only)

RICOH
imagine. change.

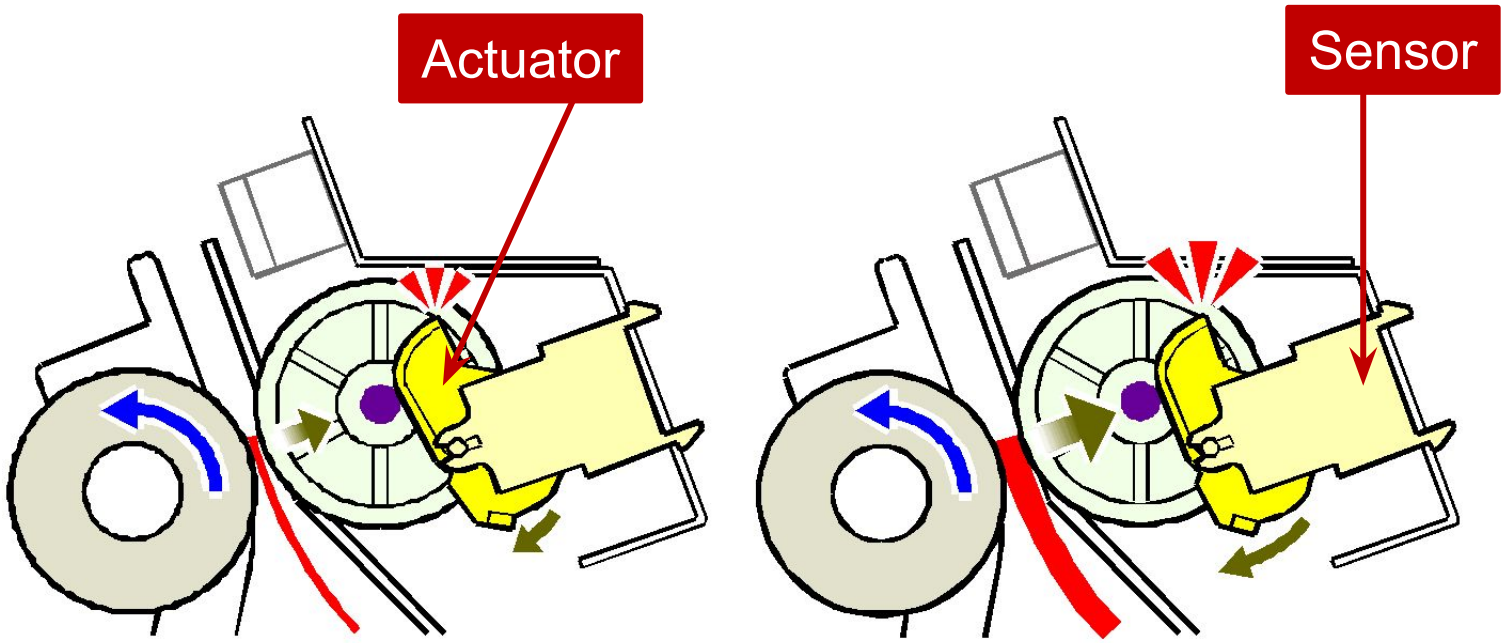
- If the wrong paper weight setting is used the following can occur:
  - Paper jam
  - Insufficient fusing
  - Damage to the machine.
- In the Metis-C1e, if the paper being fed does not match the selected paper type, paper feed is stopped.
- The same mechanism also detects multi-feeds.



Paper Thickness Sensor

Principle

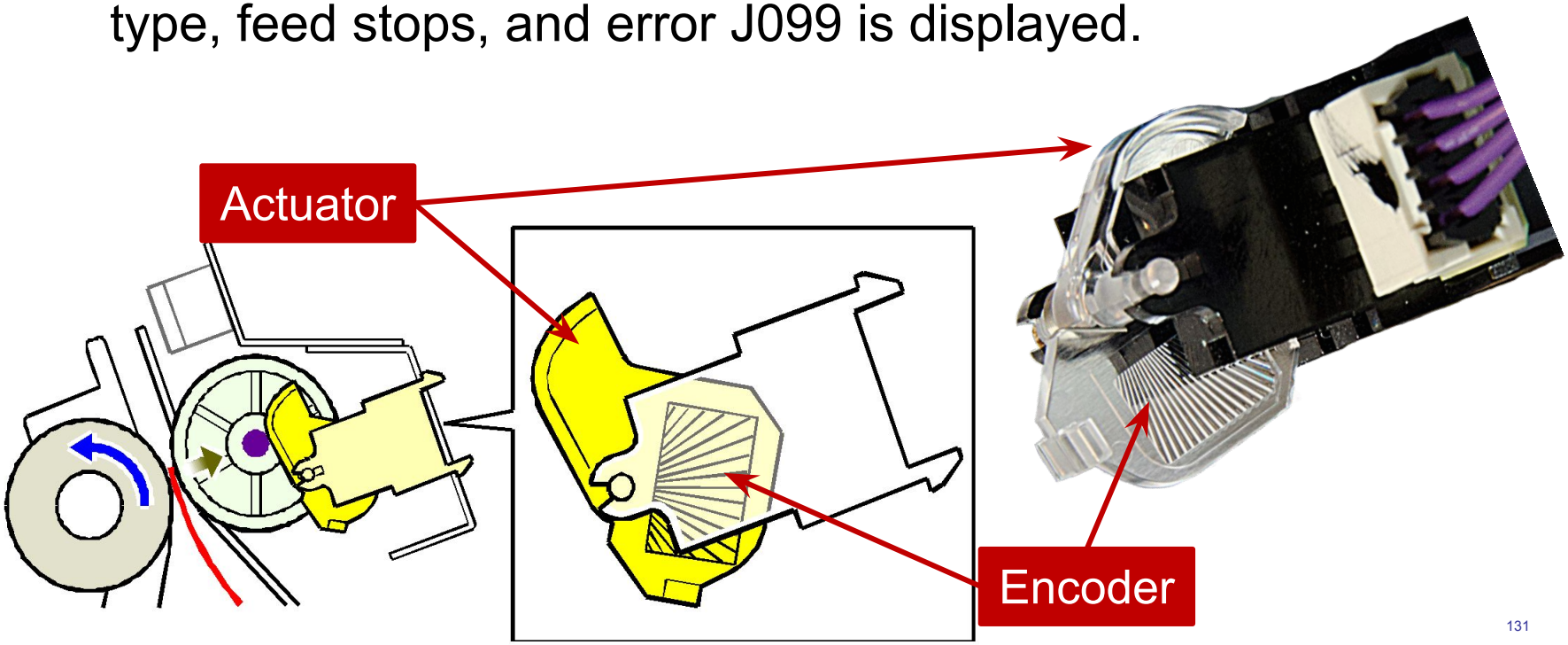
- On the left, normal paper is being fed.
- On the right, thick paper is being fed.
- The thickness of the paper affects the angle of the actuator that is attached to the relay roller.



Inside Paper Thickness Sensor

RICOH
imagine. change.

- There is an encoder inside the sensor to measure the angle of the actuator.
- The machine uses this angle to calculate the thickness of the paper.
- If the thickness is outside the range for the selected paper type, feed stops, and error J099 is displayed.



Double-feed Detection

RICOH
imagine. change.

- The machine compares the thickness of the current sheet with the previous sheet.
- If the difference between the two is over a certain threshold (SP1-304-001 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).

Sensor Tolerance

RICOH
imagine. change.

- 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

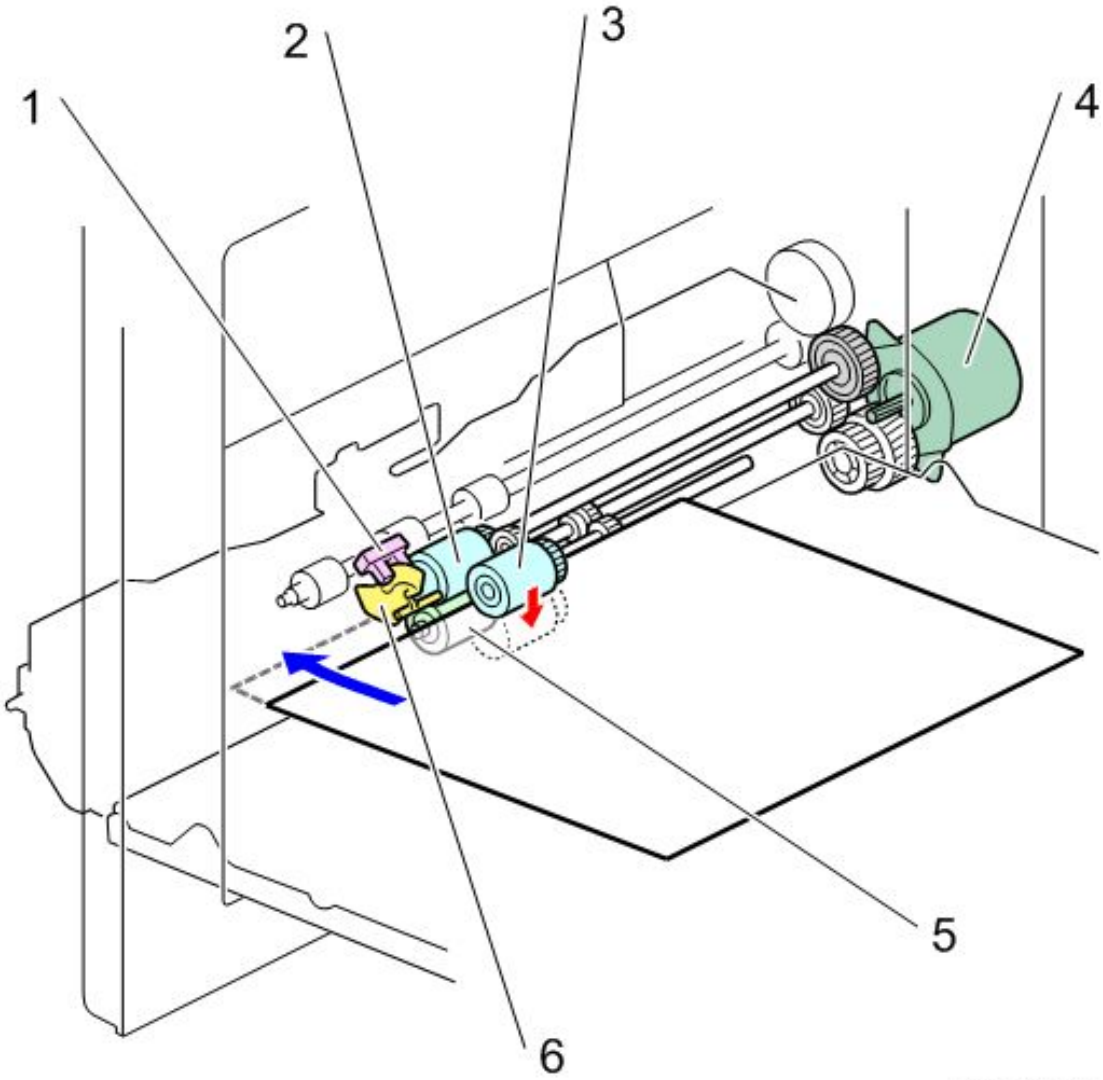
Paper Thickness Detection
Other Points

RICOH
imagine. change.

- 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

By-pass Tray Components

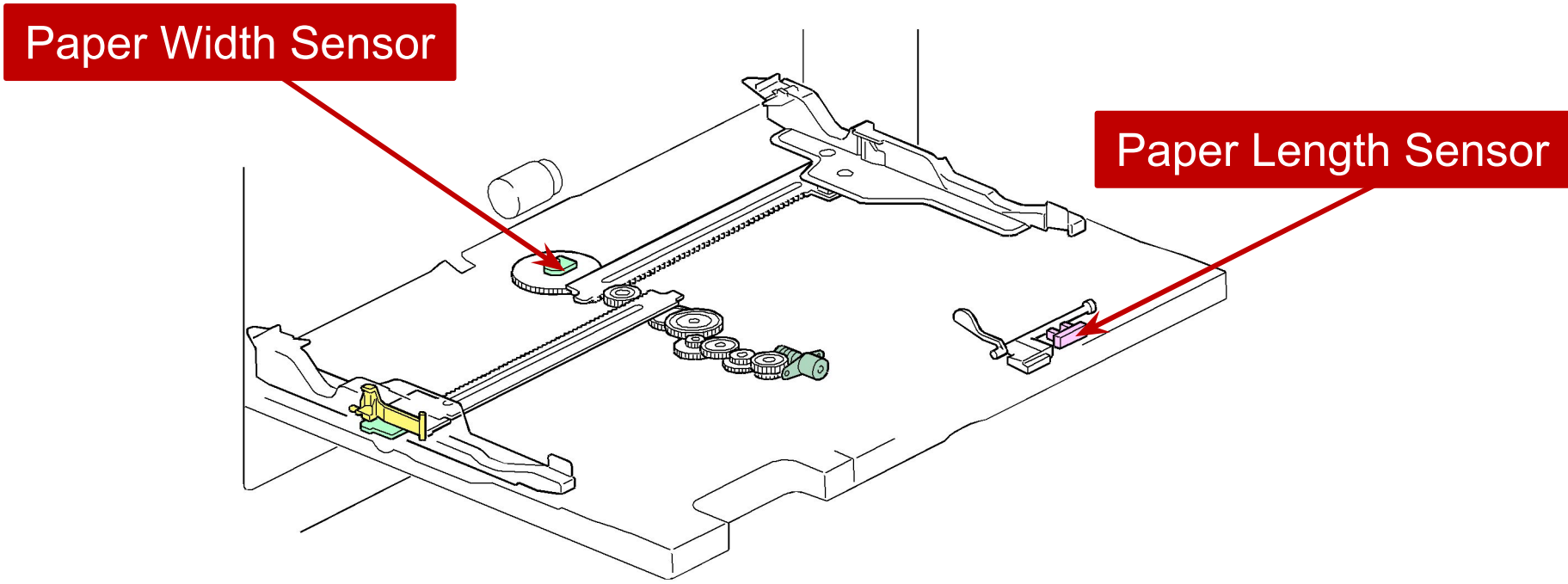
RICOH
imagine. change.



By-pass Tray Size Detection

RICOH
imagine. change.

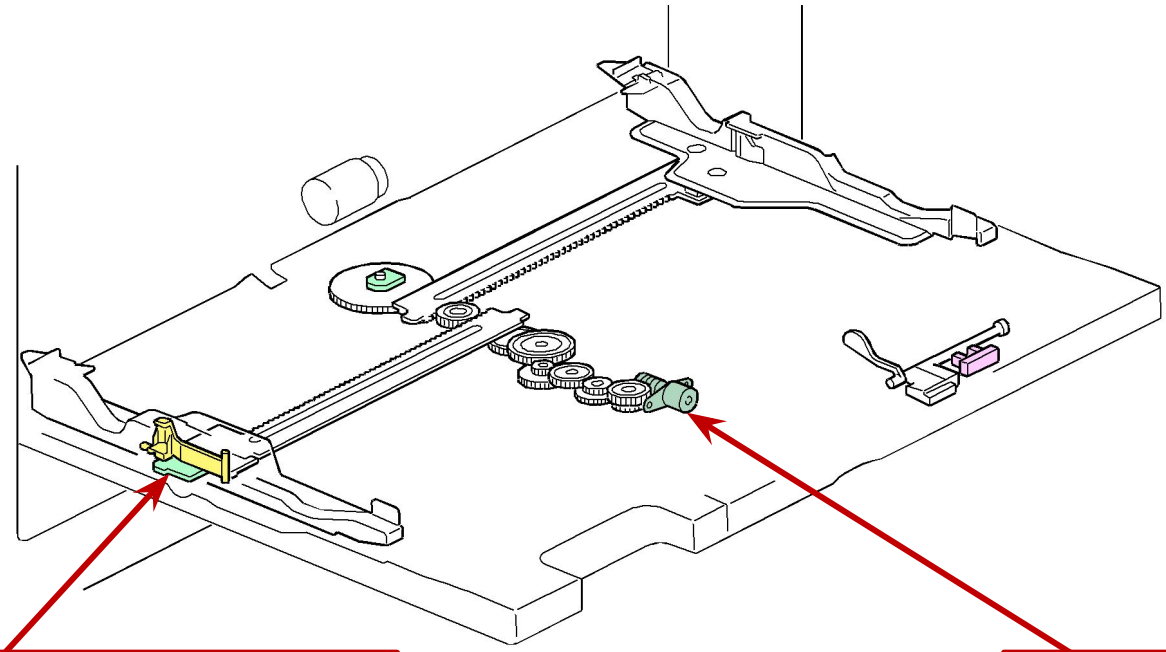
- The width sensor is a rotary switch, connected through gears and a rack and pinion to the side fences.
- The length sensor helps to determine the paper size when a longer size of paper is placed on the bypass feeder.



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

RICOH
imagine. change.

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



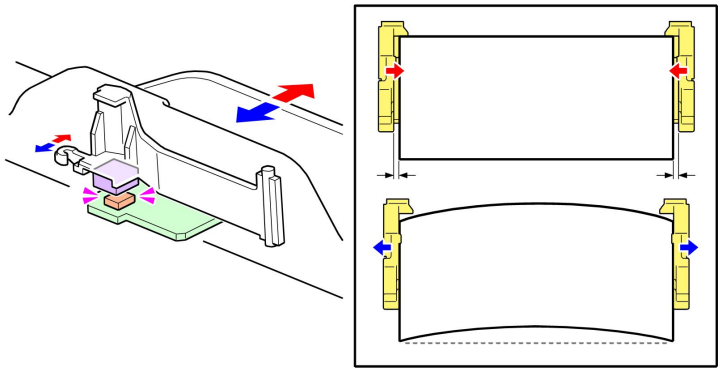
Side Fence Contact Sensor

Side Fence Motor

Side Fence Contact Mechanism

RICOH
imagine. change.

- 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.



Exercise

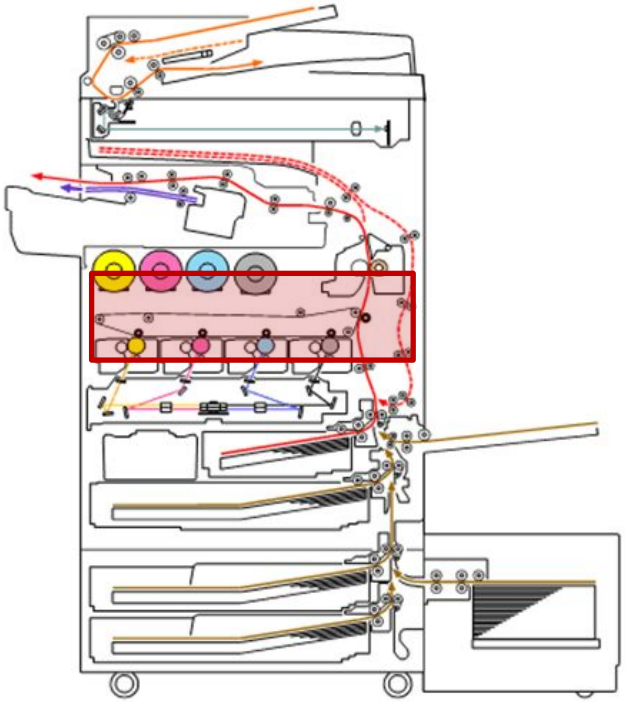
RICOH
imagine. change.

- Remove the 1st and 2nd paper feed unit and remove on the D150 the paper thickness sensor according to the field service manual.

- The 1st paper feed unit can be removed without removing the right side cover(just open the right side cover) and after pulling out the paper tray, you can remove the paper feed unit.
- Note that the 1st paper feed unit and 2nd paper feed unit are not interchangeable.

RICOH
imagine. change.

Image Transfer



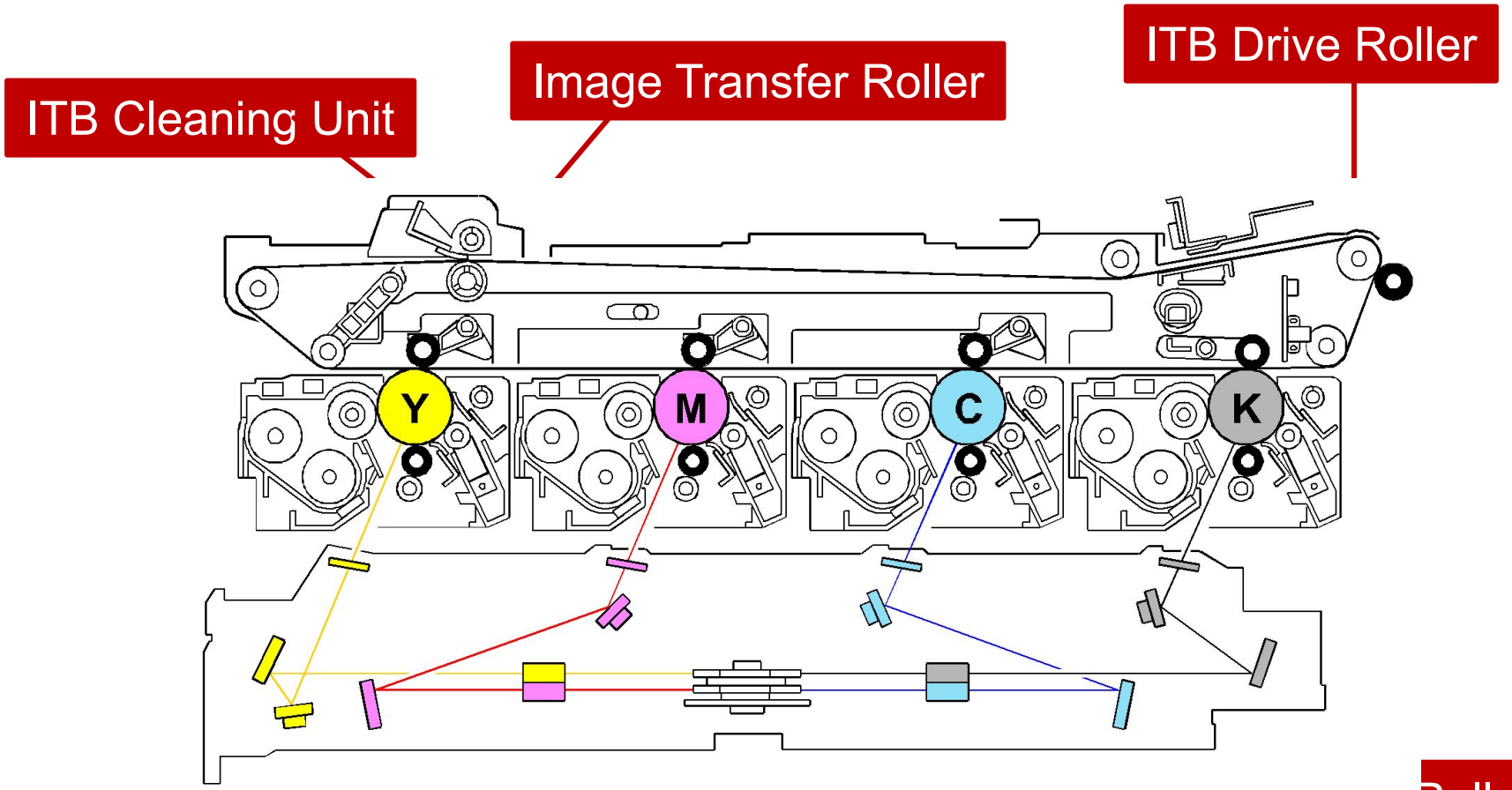
Differences from Predecessors: Image Transfer

RICOH
imagine. change.

	Metis-C1	Predecessor	Purpose
1	Location of ITB cleaning unit above ITB	Location of ITB cleaning unit to the left 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 attached to the ID sensor	Adjustment values for the new ID sensor are provided on a sheet included with 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

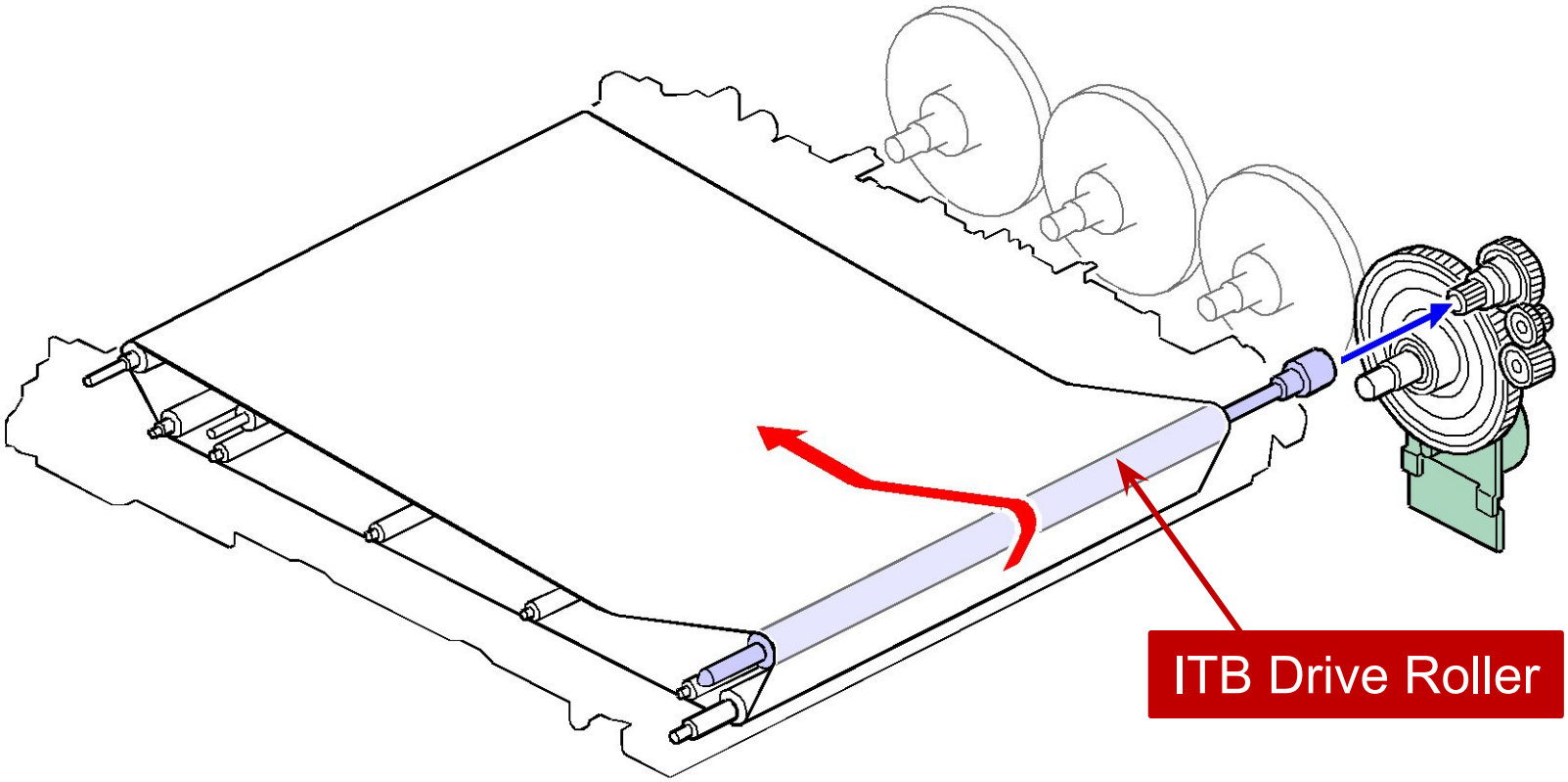
Overview

RICOH
imagine. change.



Drive

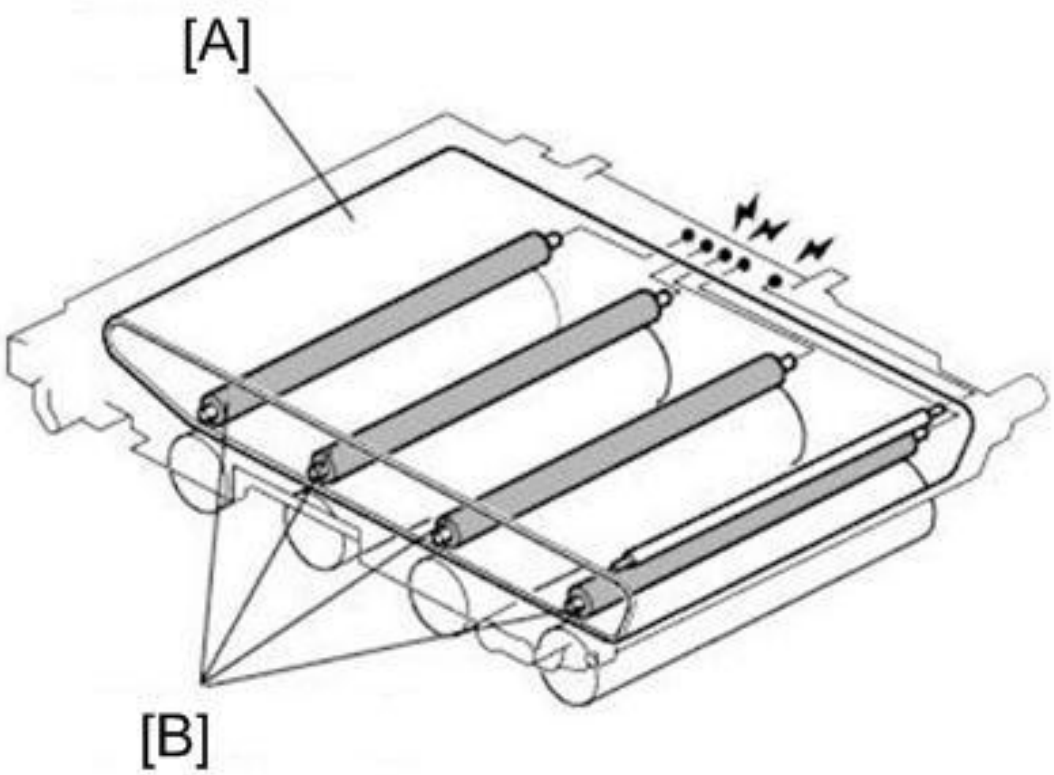
- The K drum motor drives the image transfer belt (ITB).
- The motor contains a monitoring system to ensure constant belt rotation.
  - It does not use encoders.



Power Supply

RICOH
imagine. change.

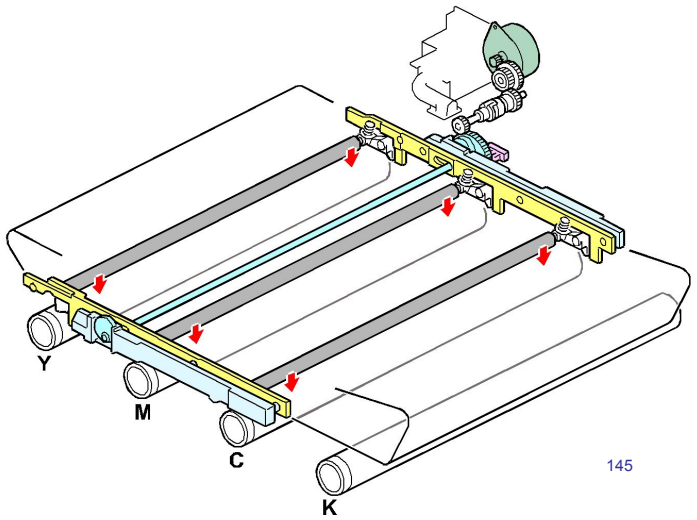
- Power is supplied to the image transfer rollers and the ITB drive roller from the transfer power pack.
  - [A]: Image transfer belt
  - [B]: Image transfer rollers



ITB Contact and Release

RICOH
imagine. change.

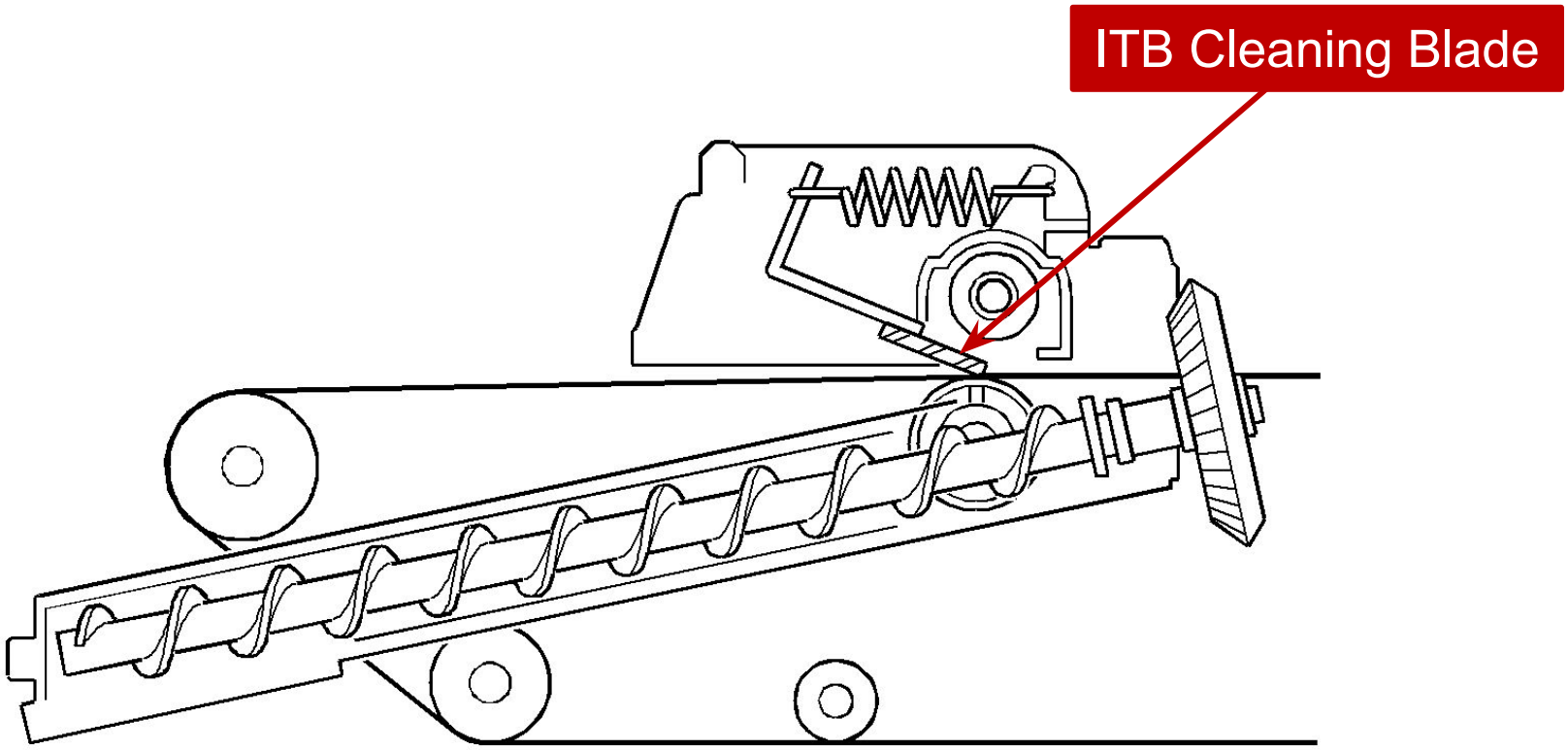
- The motor is also the toner supply motor for magenta.
  - The direction of the motor determines whether the ITB contact mechanism moves or the magenta toner supply unit operates.
- If a job is mixed (black-and-white and color pages in the same job), the mechanism will switch between modes when different 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



ITB Cleaning

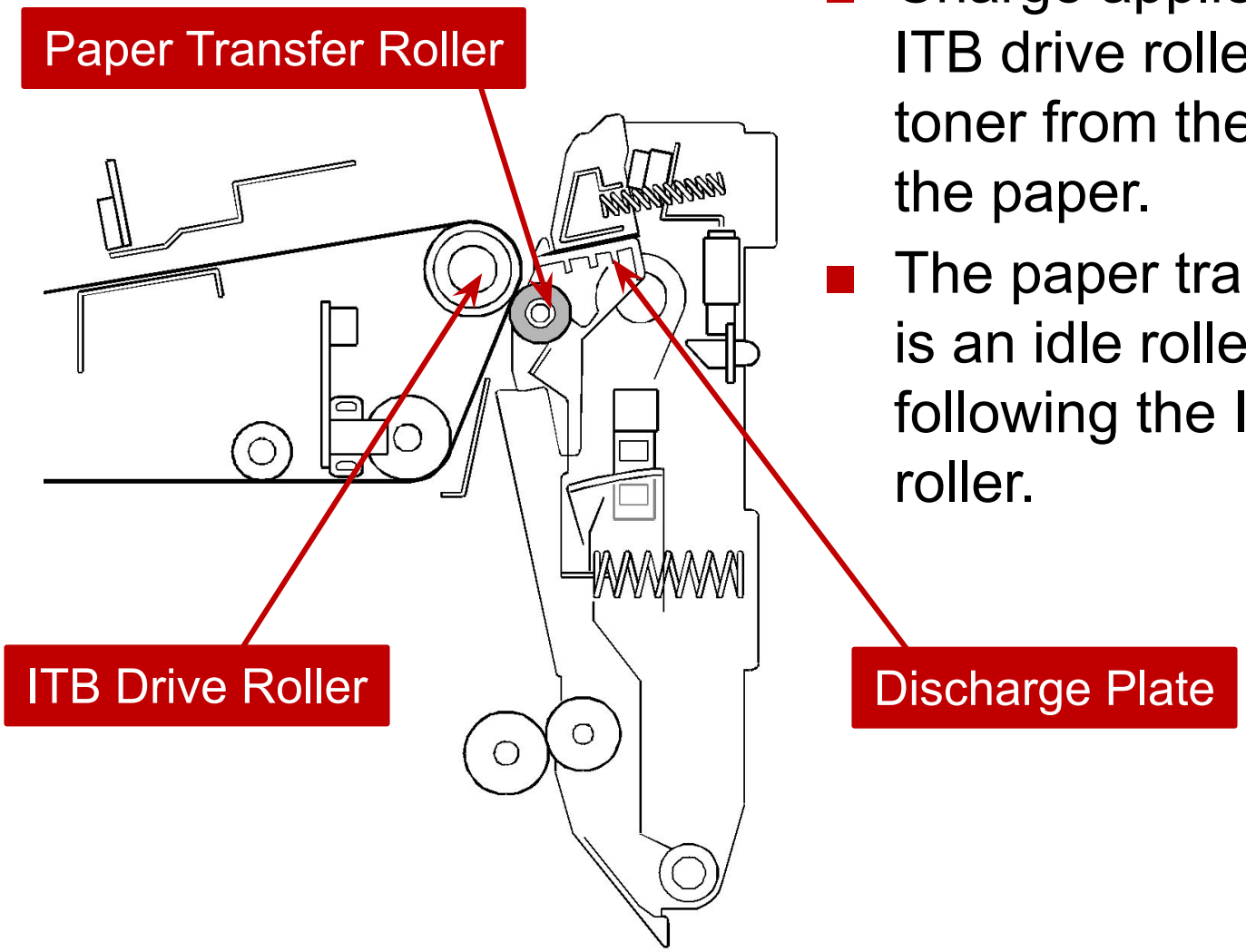
RICOH
imagine. change.

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



Paper Transfer Roller (PTR)

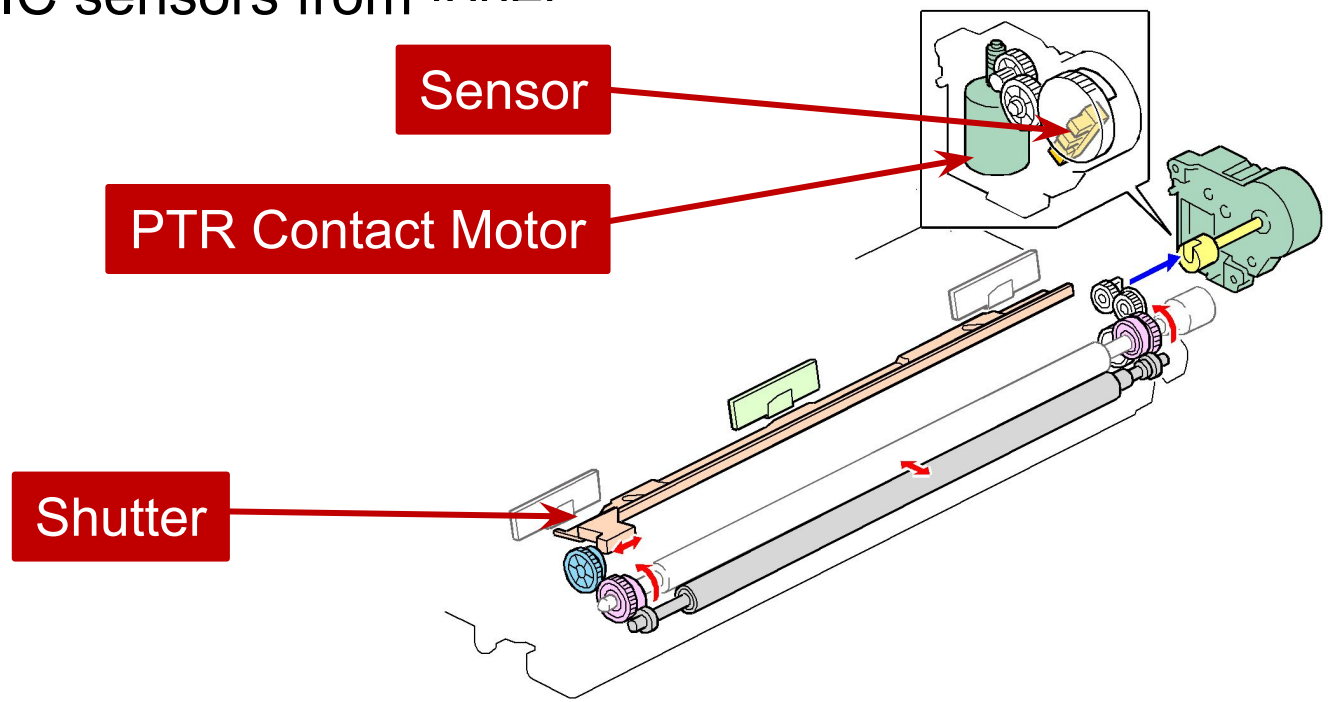
RICOH
imagine. change.



- Charge applied to the ITB drive roller transfers toner from the ITB to the paper.
- The paper transfer roller is an idle roller, following the ITB drive roller.

PTR Contact and Release

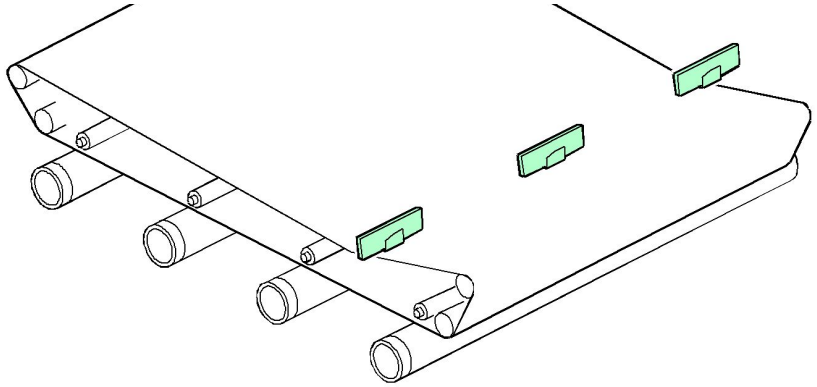
- During Process control or MUSIC the PTR is moved away from the ITB.
- The motor contains a sensor to detect whether the PTR is in contact or away from the ITB.
- This motor also opens and closes a shutter to protect the ID/MUSIC sensors from toner.



ID Sensors

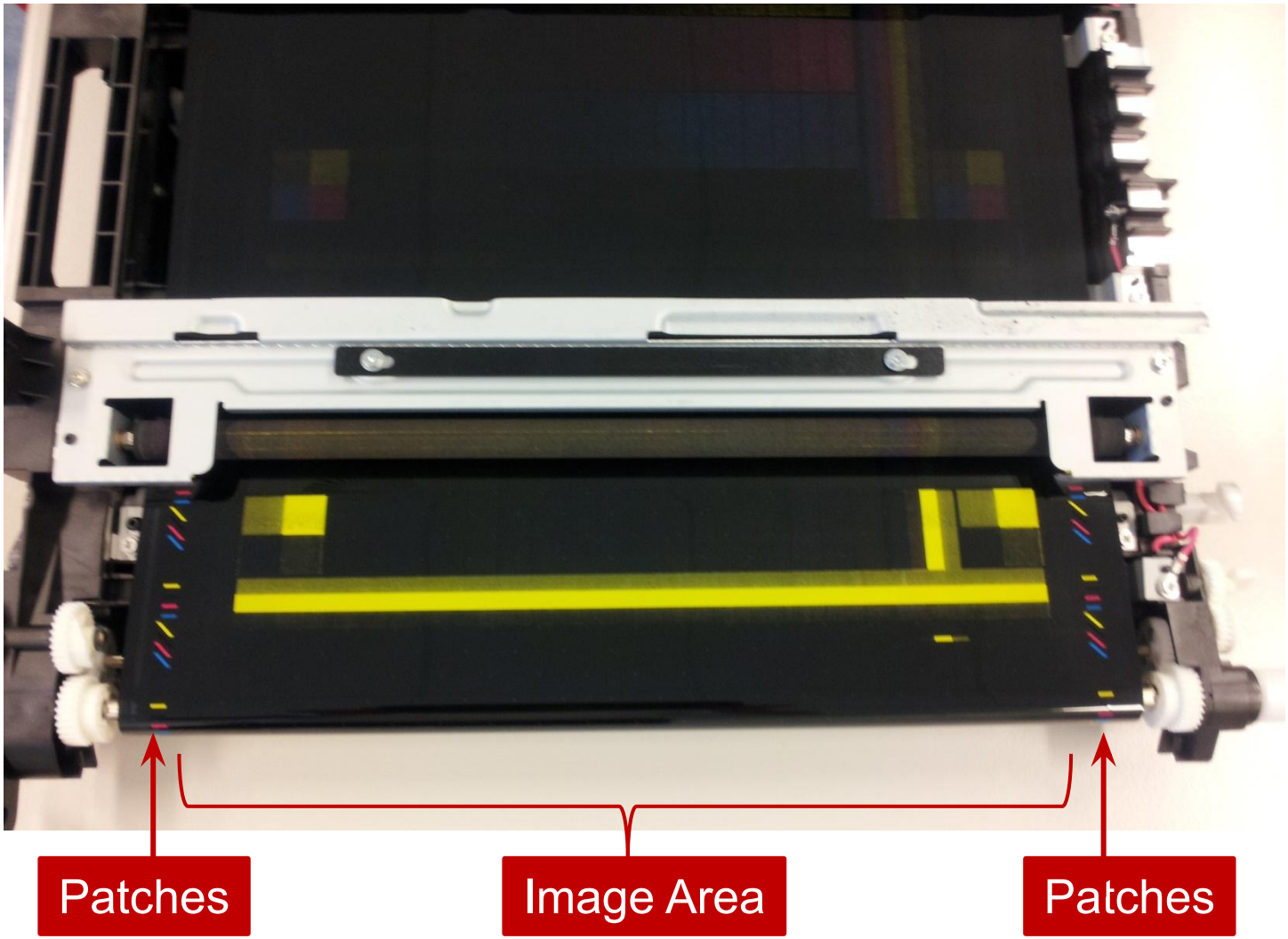
RICOH
imagine. change.

- Three ID sensors are used for process control.
  - The sensors are located above the ITB.
- The central one is used for the normal process control (at the end of the job and so on).
- During printing sensor patches are made on the extreme edges of the ITB and are monitored by the ID sensors at the left and right.
  - This is called ‘real time process control.
    - As a result, process control is not needed in the middle of a job.



Real Time Process Control

RICOH
imagine. change.



Replacement
ITB Lever Position

RICOH
imagine. change.

- Before you remove or insert the image transfer belt unit:
  - Open the right side cover 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.

Replacement ITB Cleaning Unit

RICOH
imagine. change.

- When removing the ITB cleaning unit:
- Turn the ITB unit upside down to prevent toner from coming out of the cleaning unit.
- After installing a new cleaning unit
- Apply some toner to the ITB.
  - Then turn the image transfer belt about 10mm in the reverse direction, then turn it forward one complete revolution.

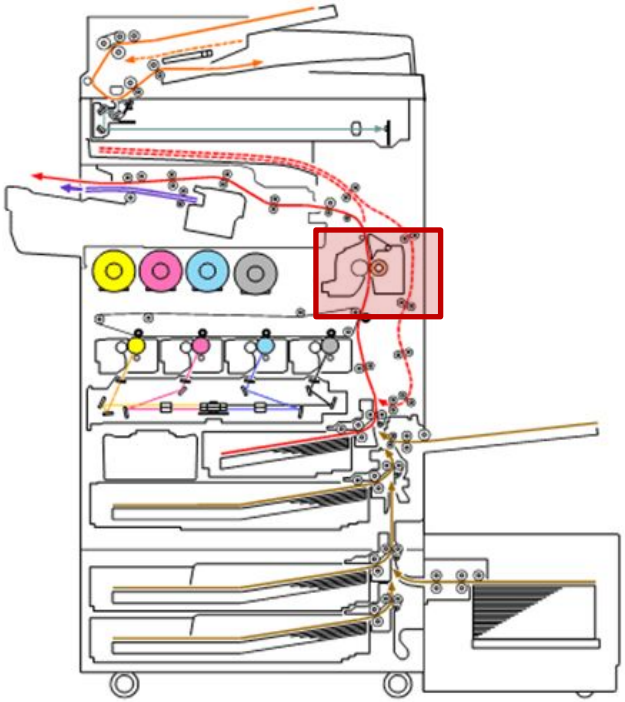
Replacement ID Sensors

RICOH
imagine. change.

- Before you replace 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)

RICOH
imagine. change.

Fusing



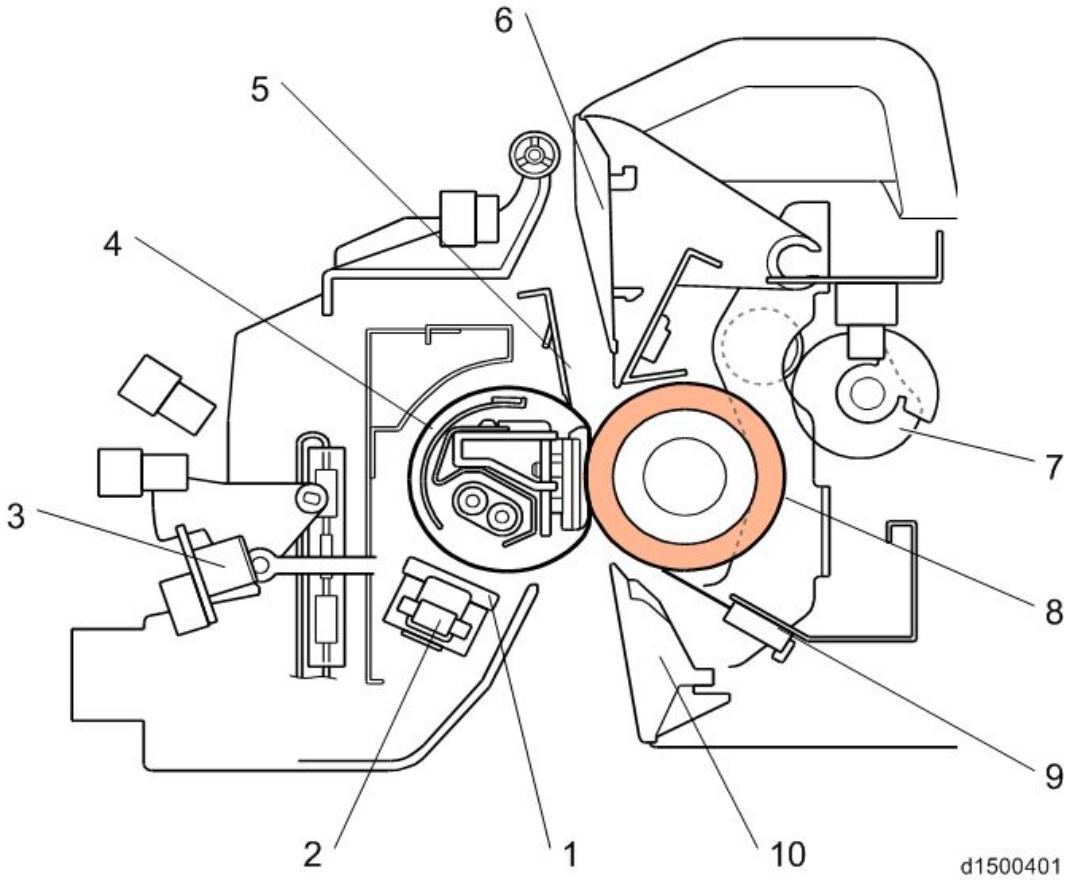
Differences from Predecessors: Fusing

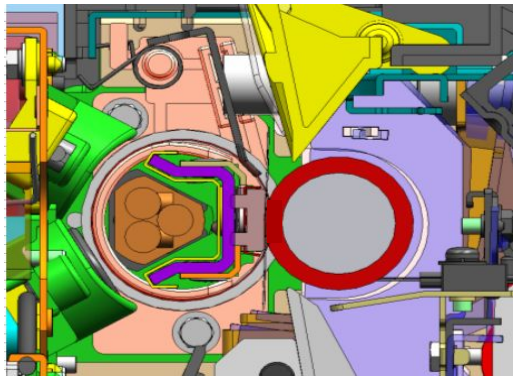
RICOH
imagine. change.

	Metis-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	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

Components

RICOH
imagine. change.



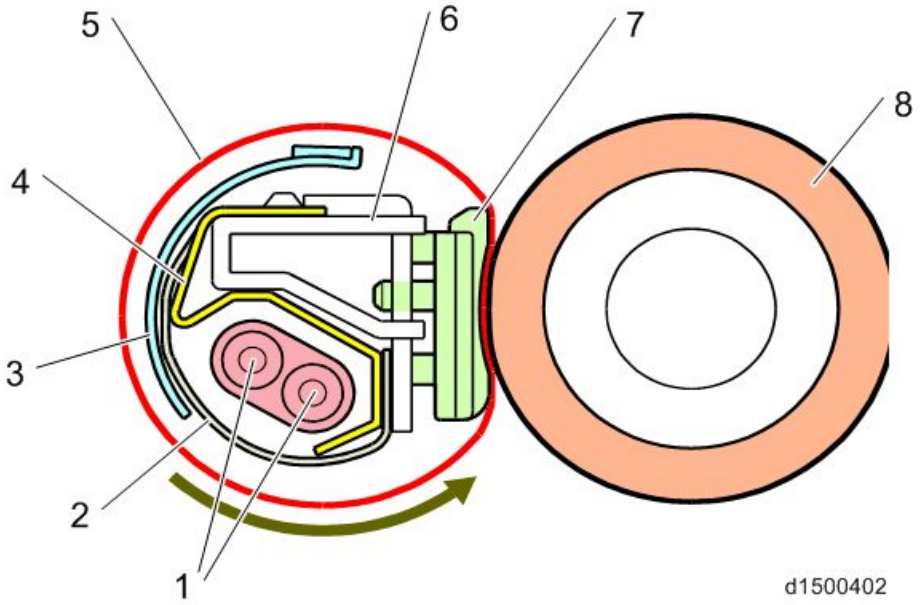


Athena & Apollon-C3

QSU-DH Fusing Method

- The fusing system is the same as the Athena-C3 and Apollon-C3 (free belt fusing)

- New Item:
  - The shield [3] makes sure that the heating sleeve is not heated excessively when narrow paper sizes are fed.



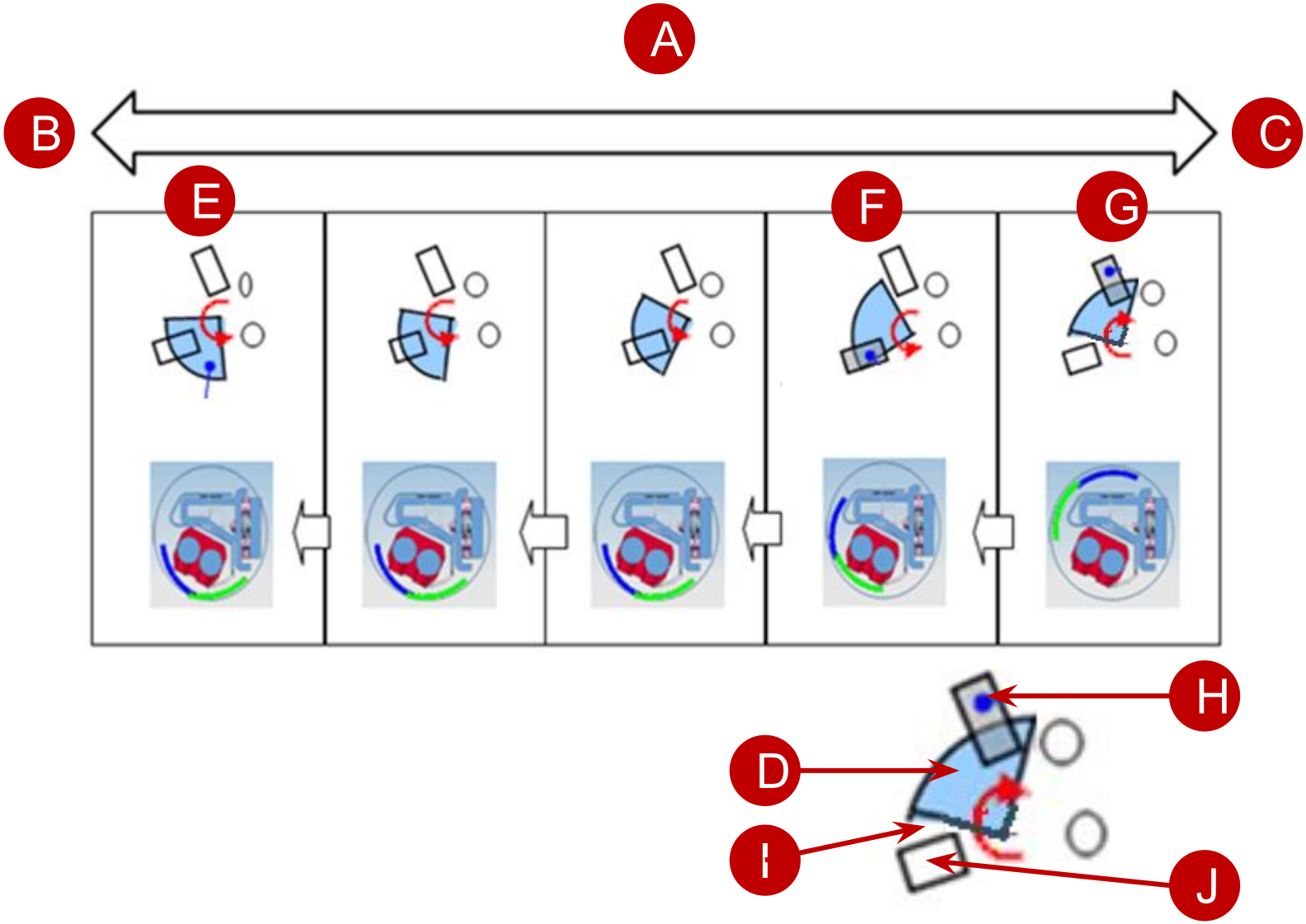
Shield

RICOH
imagine. change.

- 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).

Shield Rotation

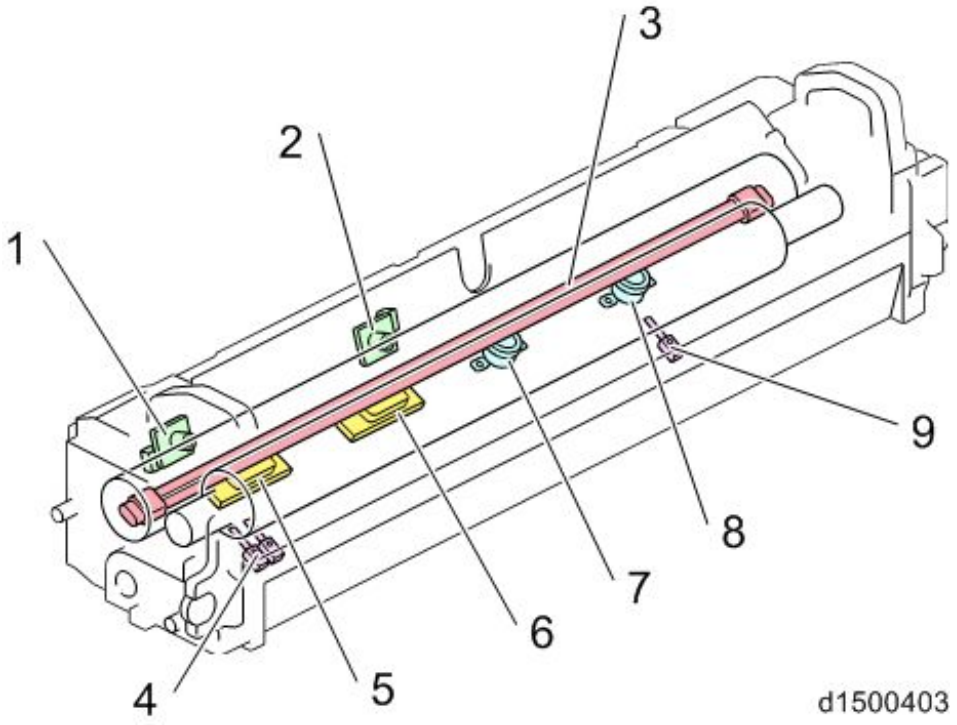
RICOH
imagine. change.



Temperature Control

RICOH
imagine. change.

1. Thermopile (edge)
2. Thermopile (center)
3. Heater
4. Thermistor (edge)
5. NC sensor (edge)
6. NC sensor (center)
7. Thermostat (center)
8. Thermostat (edge)
9. Thermistor (center)



CPM Down Control
Handling Low Temperatures

RICOH
imagine. change.

- 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%

CPM Down Control
Handling High Temperatures

RICOH
imagine. change.

- Because the fusing unit has a low heat capacity, the temperature of those parts of the heating sleeve outside the paper width easily increases, and may get extremely hot.
- Therefore 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/A4)
  - There are differences depending on paper size/paper thickness.

Fusing Temperature Detection

RICOH
imagine. change.

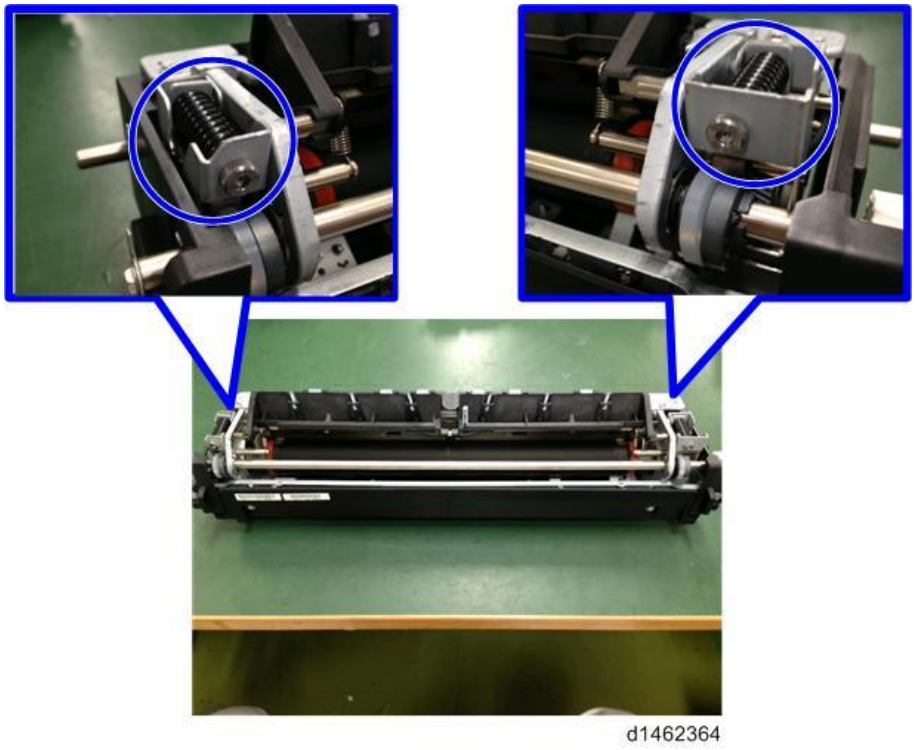
- The temperature is checked at regular intervals.
- If the temperature is above a certain value, the CPM is decreased by 1 level.
- Since the points at which temperature tends to increase depends on the paper size, the sensor used is changed depending on the paper size.
  - A3/B4: Thermistor (pressure roller end)
  - A4: Thermopile (end)
  - B5/A5/B6/A6: Thermistor (pressure roller center)

Paper Passage Time

RICOH
imagine. change.

- 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.

Pressure Roller Replacement

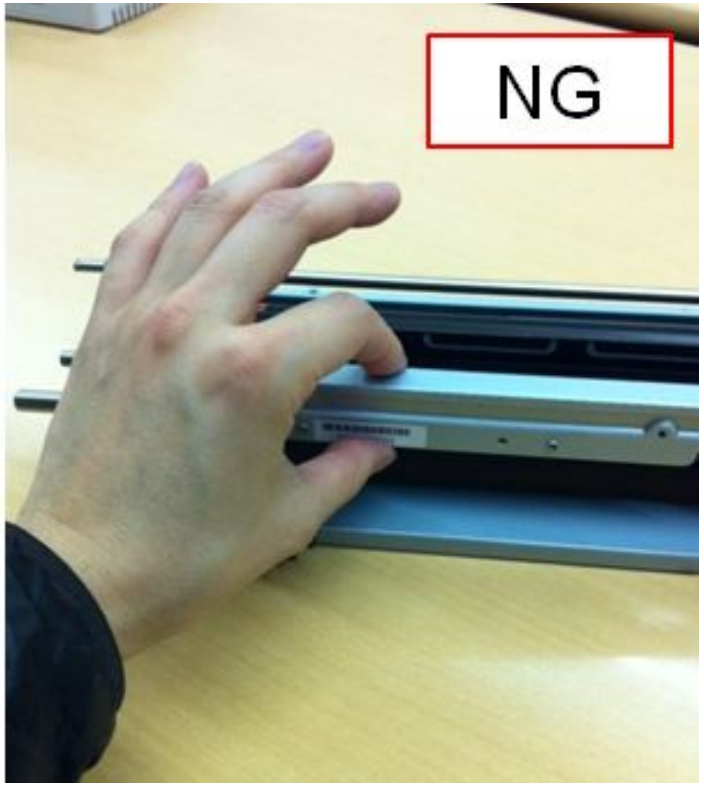


- When replacing the pressure roller do not remove or adjust the pressure adjusting screws.
- Use the FLUOTRIBO MG GREASE(VSSG9002) for the pressure roller gear.

Replacement
Fusing Sleeve Belt Unit

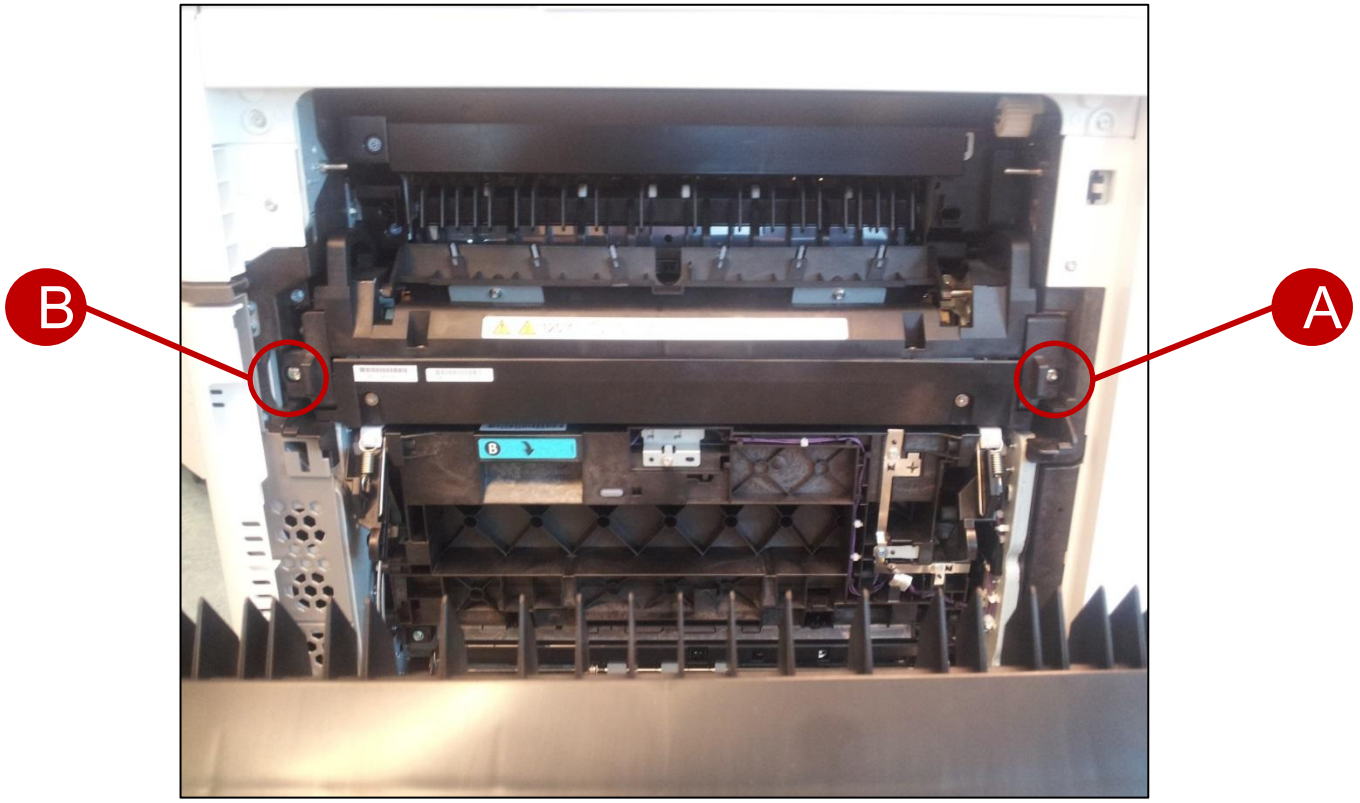
RICOH
imagine. change.

- 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.



Installing Fusing Unit

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



Fusing Shield Motor Test

RICOH
imagine. change.

- Remove the fusing unit.
  - The motor rotation is not visible when the fusing unit is in the machine.
- Remove the waste toner bottle.
  - This is necessary as an additional safety measure to disable the fusing unit so that the fusing lamps will not heat the sleeve belt.
- Do SP 5-804-235 or -236 (clockwise or counterclockwise rotation).

Hardware Detection SC Codes

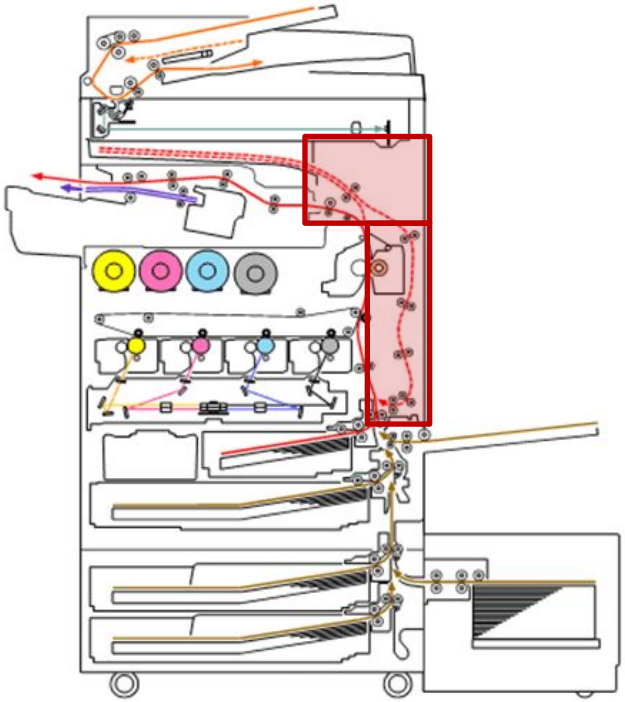
RICOH
imagine. change.

- A new fusing unit / heating sleeve unit must be installed for the SCs in red in the following table

Sensors	Apollon/Athena-C3	Metis-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 (Midle)	Detected as SC544/554/564/574	**SC554-02**

RICOH
imagine. change.

Paper Exit, Duplex



Differences from Predecessors: Duplex

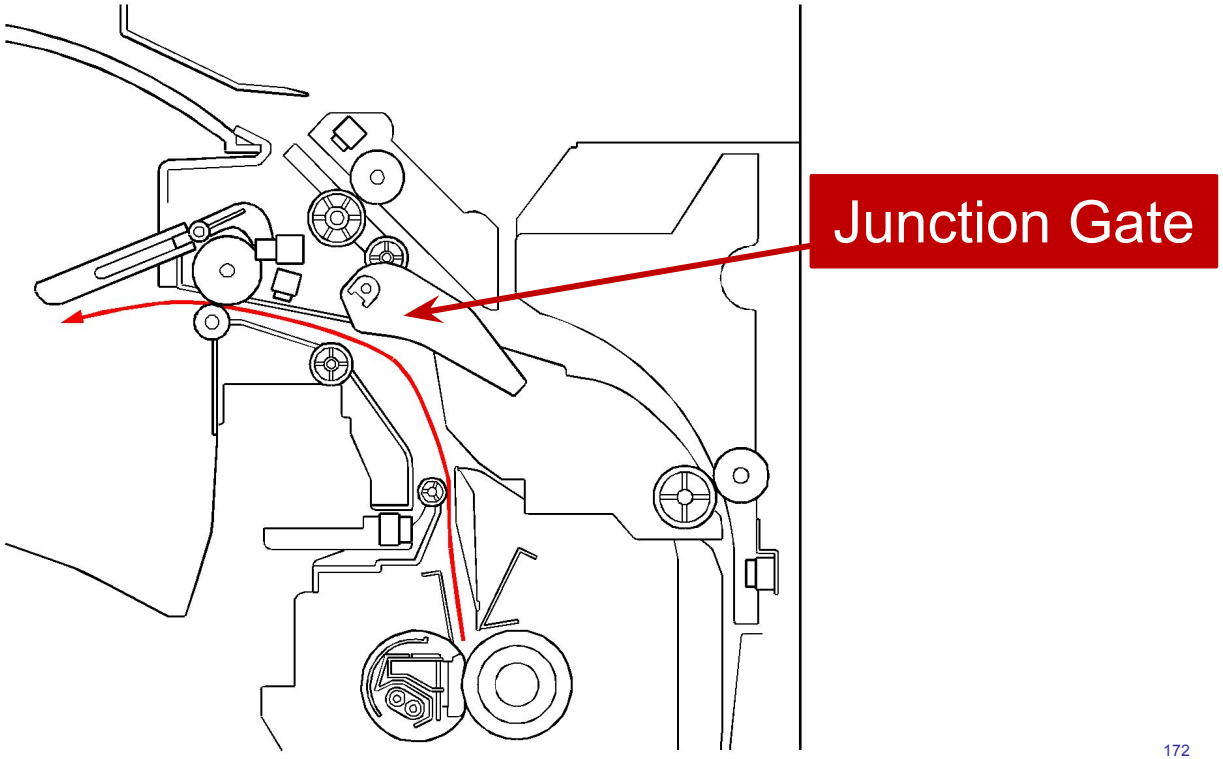
RICOH
imagine. change.

	Metis-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 use ability
4	Real time jam animation	No real time jam animation	Improved use ability

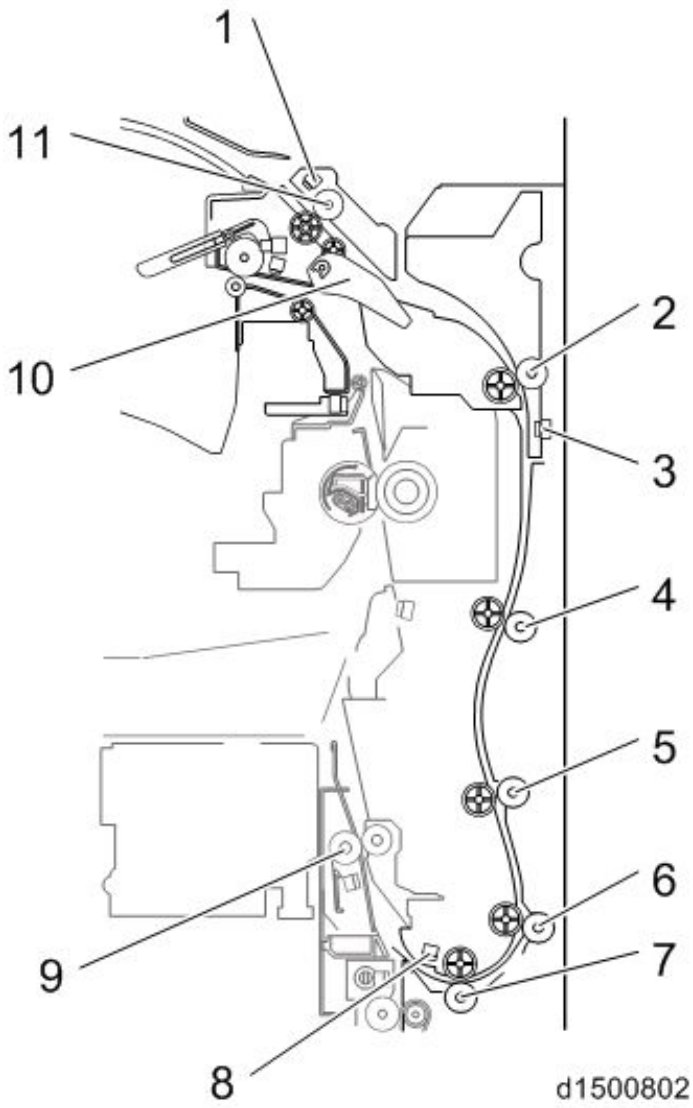
Paper Exit

RICOH
imagine. change.

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

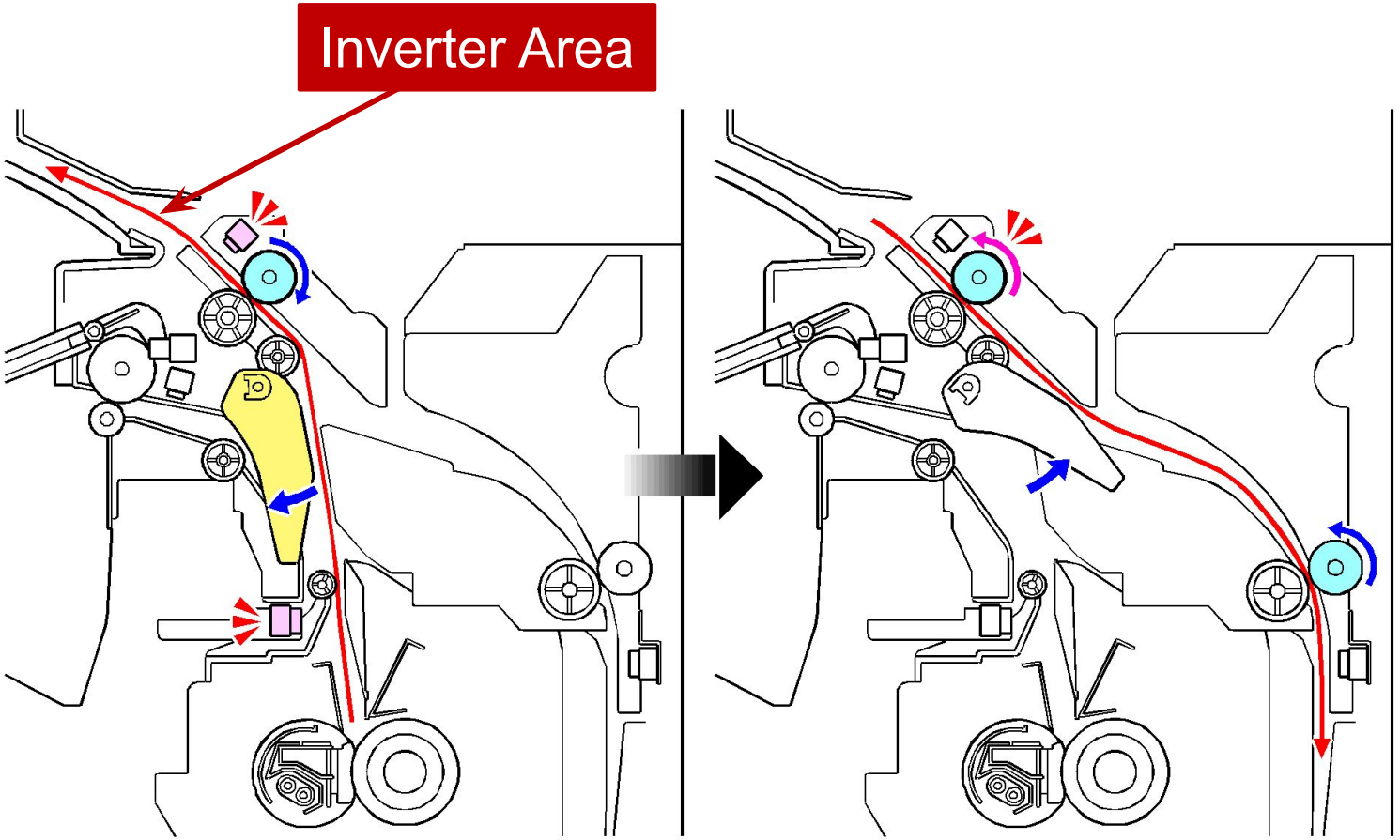


Duplex Feed Path



Duplex Feed

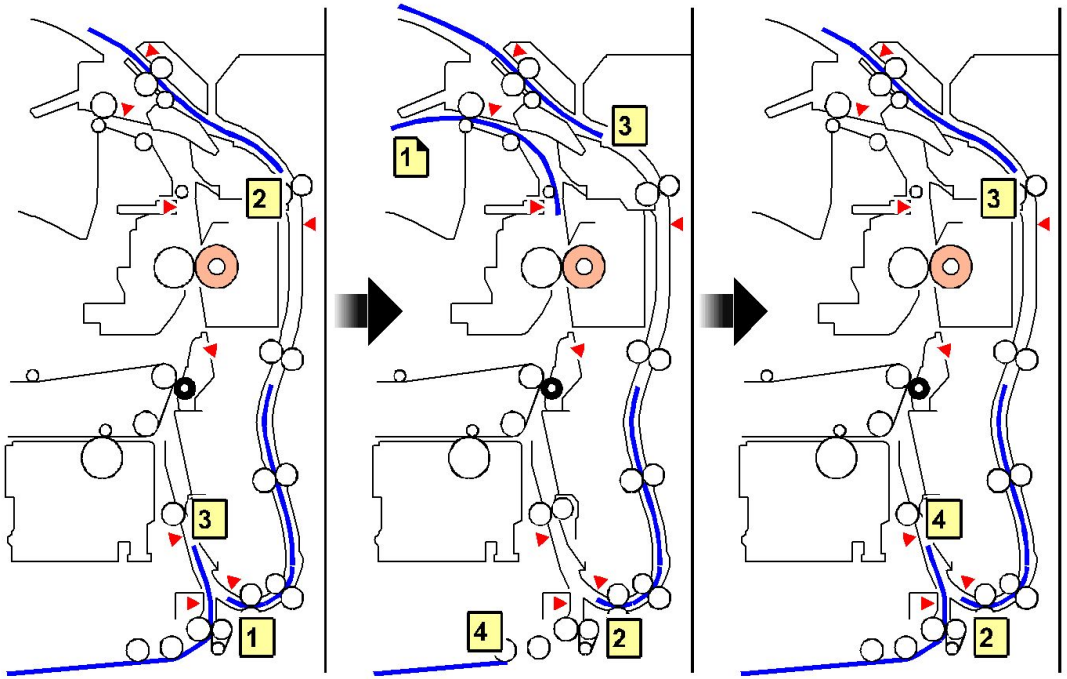
RICOH
imagine. change.



Interleaving

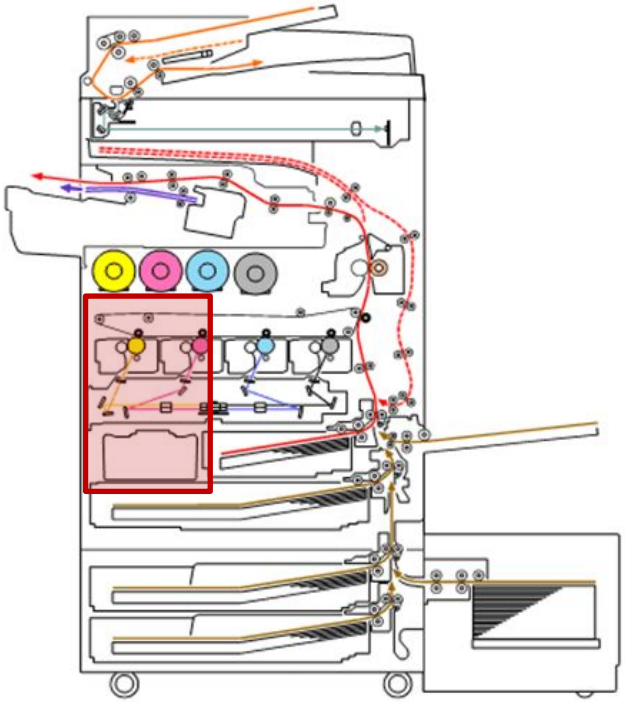
RICOH
imagine. change.

- The following items have influence on the number of sheets inside the machine:
  - Paper length
  - One-bin tray



RICOH
imagine. change.

Waste Toner Collection



Differences from Predecessors: Waste Toner

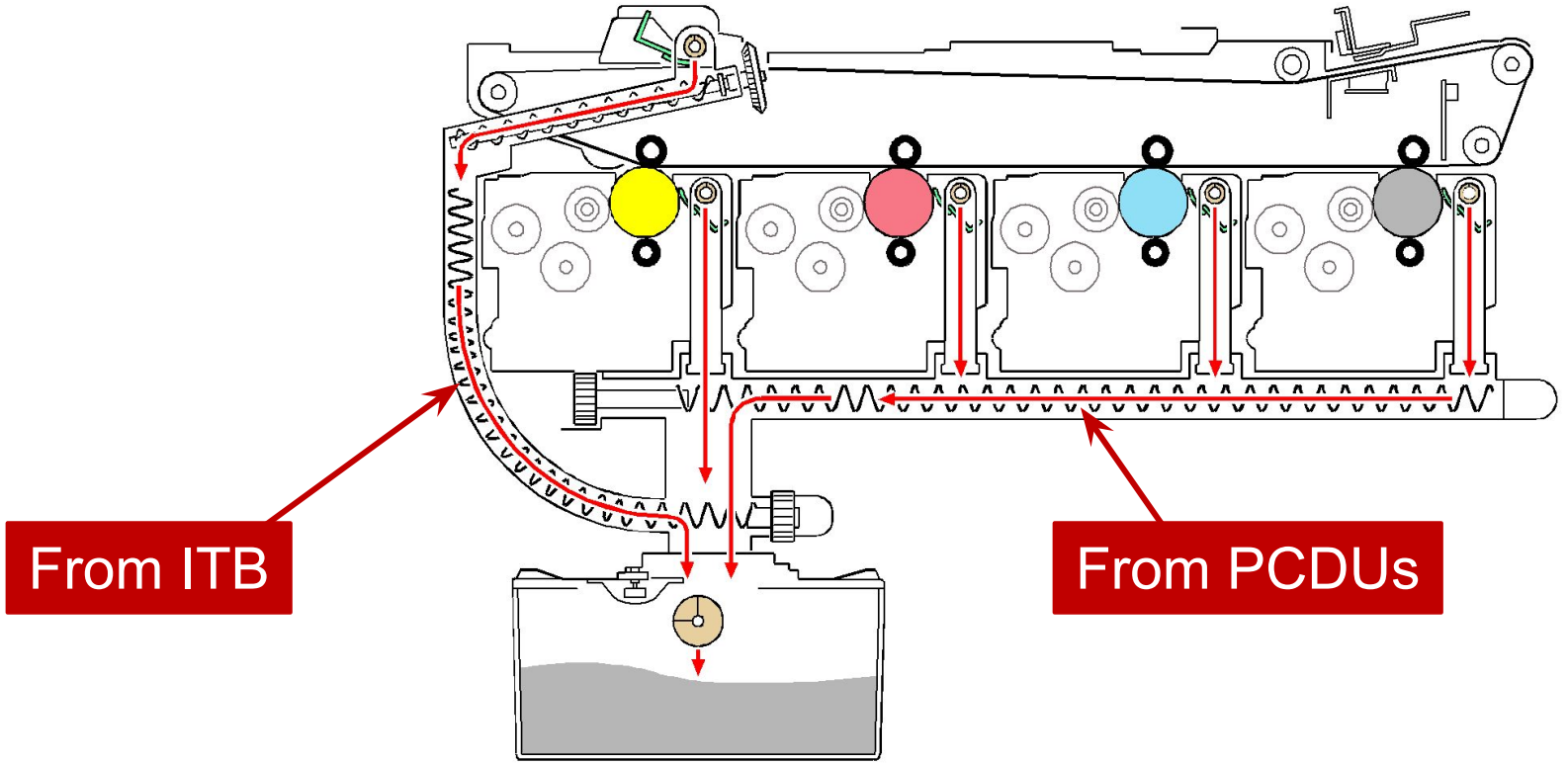
RICOH
imagine. change.

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

Collection Coils

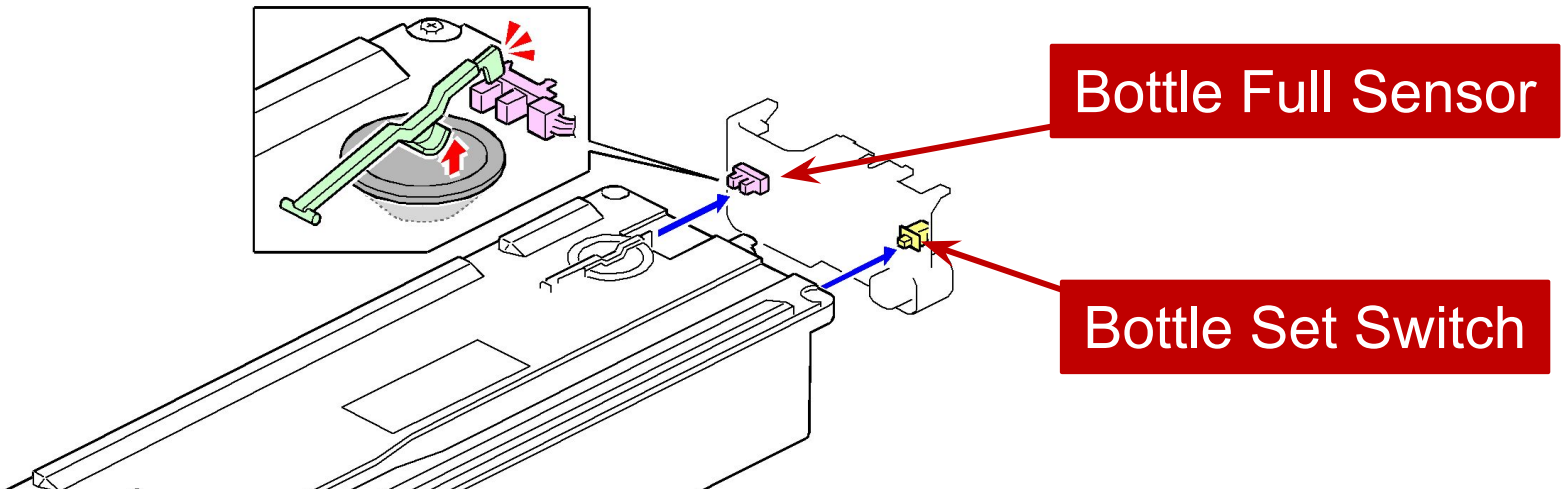
RICOH
imagine. change.

- Waste toner from the PCU and transfer unit is collected at the front of the machine, and sent to the waste toner tank.
- The coils are driven by the Black PCU motor.



Sensors

- Bottle set switch: If this does not detect the bottle, the machine cannot print.
- Bottle full sensor: When the bottle is 80% full, the actuator exits the sensor and the machine starts to count the number of days.
  - 15 days to go: An alert is sent by @Remote
  - 5 days to go: A warning appears on the operation panel
  - 0 days to go: The machine stops



RICOH
imagine. change.

5. Troubleshooting

Capturing the Debug Logs (1/3)

RICOH
imagine. change.

- Debug logs for the controller, engine, and 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.
- 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.

Capturing the Debug Logs (2/3)

RICOH
imagine. change.

- 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.
    - Controller debug log (GW debug log): 2 - 20 minutes
    - Engine debug log: 2 minutes
    - Operation panel debug log: 2 - 20 minutes

Capturing the Debug Logs (3/3)

RICOH
imagine. change.

- 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/opepanel/
    yyyymmdd_hhmmss.tar.gz

6. Android Operation Panel

Smart Operation Panel Type M3 (D148)

Appearance (1/2)

RICOH
imagine. change.

Home key

Main power / Energy save LED

Back key (Only used for Android Apps)

Menu key (Only used for Android Apps)

Stop key

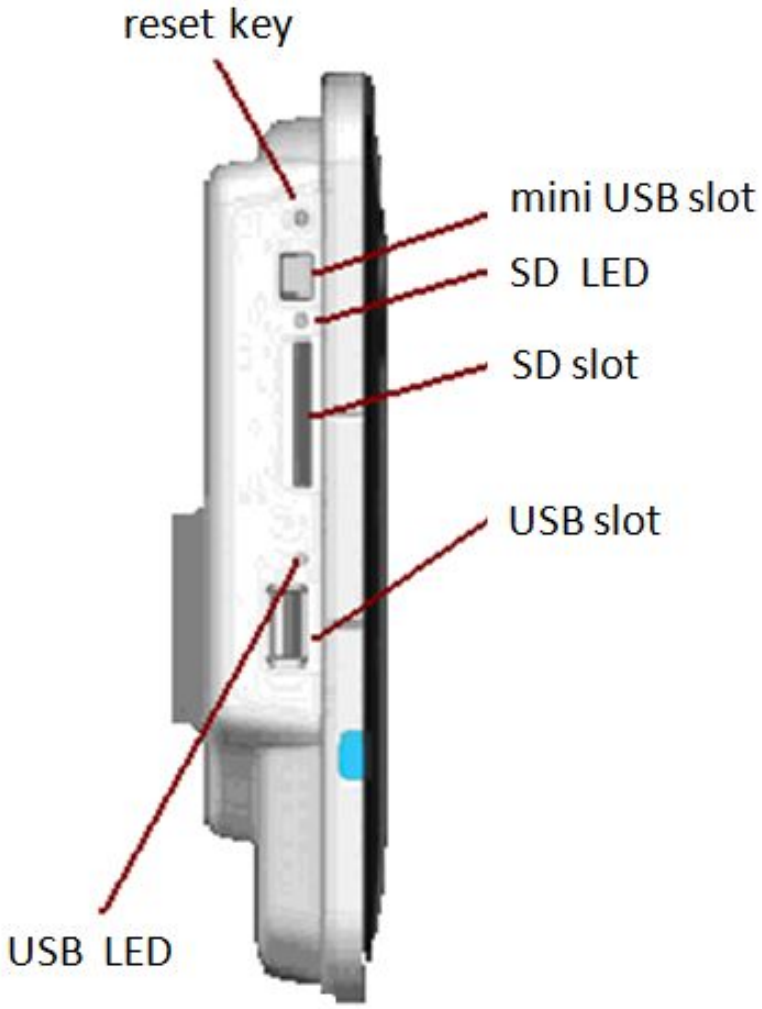
Fax LED

"Data In" LED

Status LED

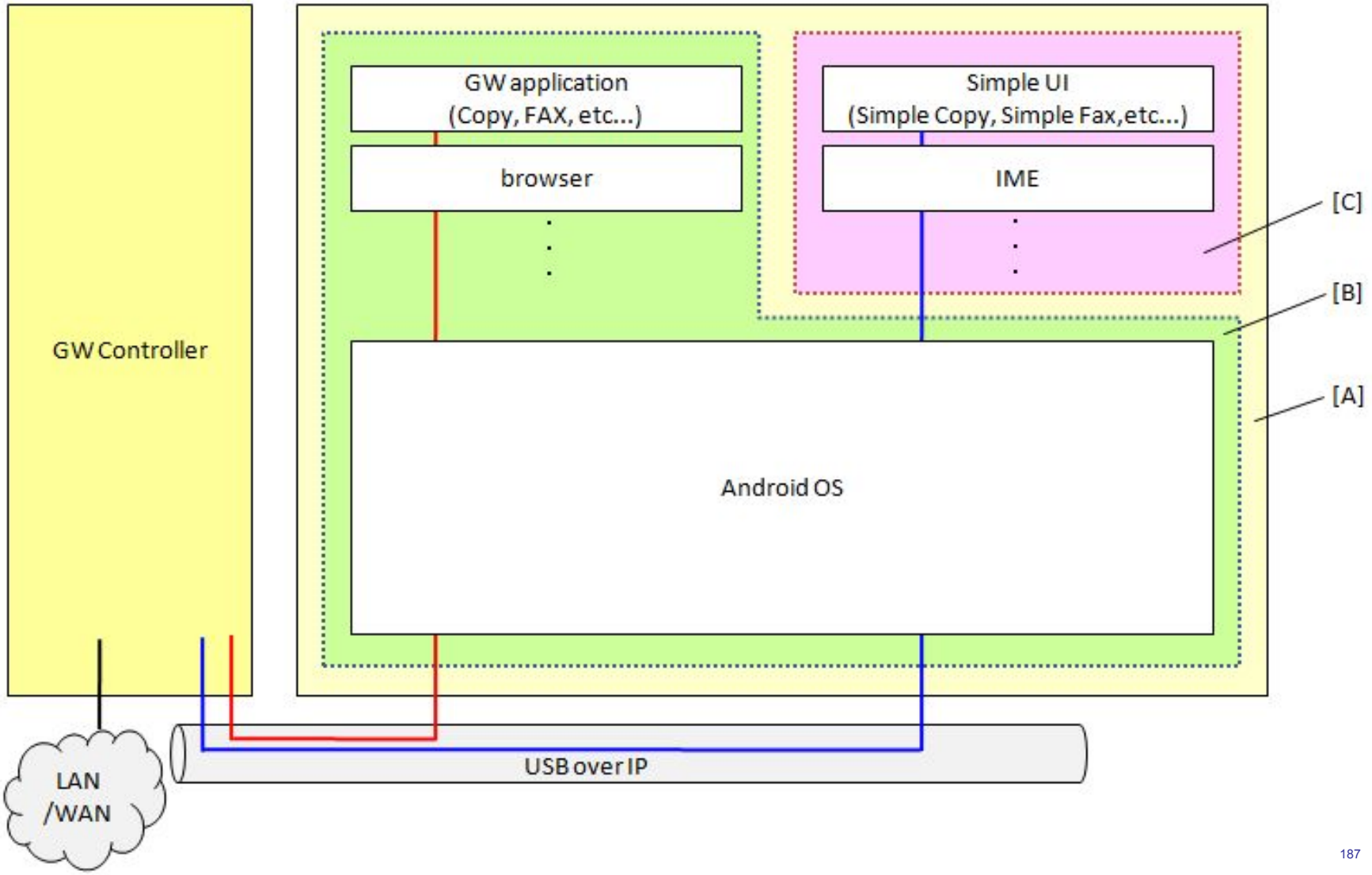
Check status key

Appearance (2/2)



System Configuration

RICOH
imagine. change.



Basic information (1/3)

RICOH
imagine. change.

- 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 (GW Controller)
    - You cannot use “flick input” or “swiping”.
    - You cannot use the “Menu” and “back” keys.

Basic information (2/3)

RICOH
imagine. change.

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

Basic information (3/3)

RICOH
imagine. change.

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

Applications

RICOH
imagine. change.

Application Name	Icon	Description
Quick Copy		The Copy feature is available from the new, Android-based UI.
Quick Scanner		The Scanner feature is available from the new, Android-based UI.
Quick Facsimile		The Facsimile feature is available from the new, Android-based UI.
Scan to Me		This application provides the ability to use Scan to E-mail with a logon account from the new, Android-based UI.
Web Browser		The web browser based on the Android OS has the ability to print pages from the browser.
Scanner		The Scanner feature is available in the conventional UI.
Printer		The Printer feature is available in the conventional UI.
Copier		The Copier feature is available in the conventional UI.
Facsimile		The Facsimile feature is available in the conventional UI.
Document Server		The Document server feature is available in the conventional UI.

Legacy UI on Cheetah

RICOH
imagine. change.

- Legacy UI will be prepared for all MFP functions, such as Copy, Print, Fax, Document Server and SDK software regardless of the provider.

The soft keyboard will appear in the place where there used to be hard keys.

Exactly the same screen is used for the Legacy UI on Cheetah.

Start up

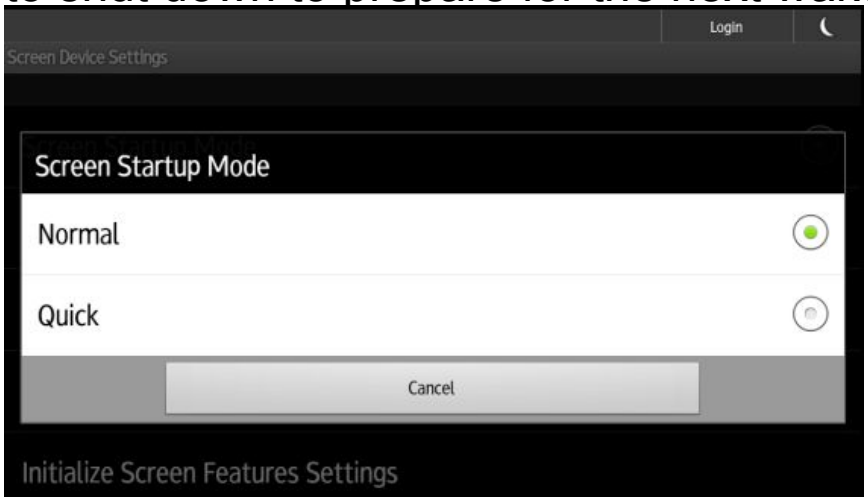
- There are two start up displays: GW controller and Android)

GW controller

Android

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.



Special shut down mode

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- 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.

Service Modes

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- There are three SP modes.
  - Machine service mode
  - Android operation panel service mode
  - Recovery mode: Needed for updating firmware, and for android system recovery

END