RICOH

Model B-P1 Training
Machine Codes: M002/M003/M004
Printer

Upgrade Course

Based on the B-C4 & B-C3.5

Slide 1

Version - 1.0

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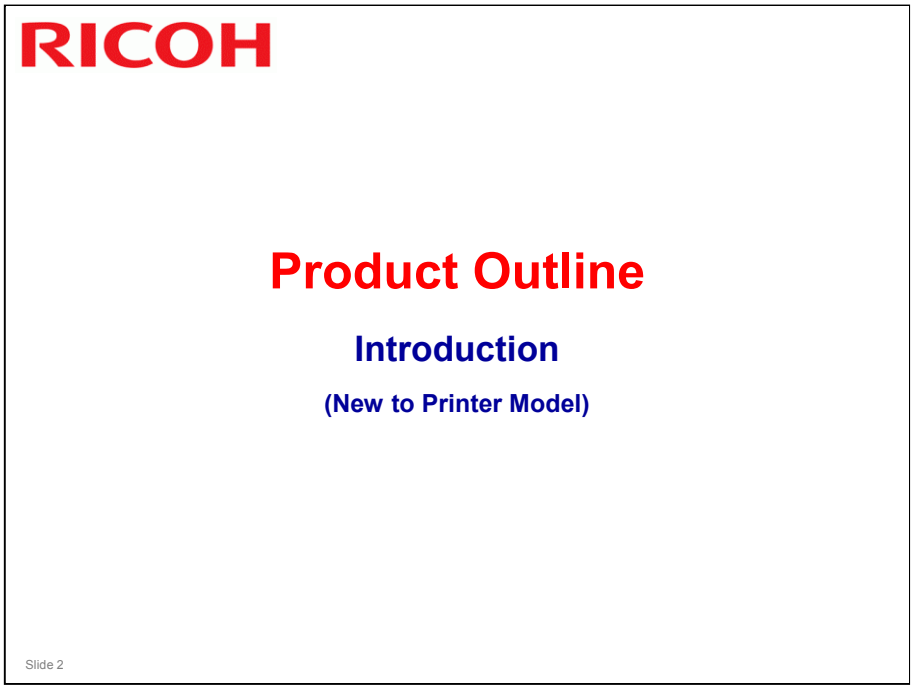
RICOH
Product Outline
Introduction
(New to Printer Model)
Slide 2

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New to Printer Model - 1/8

- **Paper Feed**
  - Feed Rollers - Feed roller replacement has been improved for TCRU. Handles have been redesigned on paper tray drawers for easier handling during TCRU. This is same for both copier and printer.
  - Double-feed Detection - Both machines also use ultra-sound sensors to improve detection of double-feeding.
- **Development Unit**
  - Auger - Angle of oval plate of auger screw has been changed to prevent deterioration of images at leading edges.
  - TD Sensor - A mylar has been attached to detection surface of TD sensor to improve image density control. This prevents accumulation of residual toner which can cause dark images.
- **Note: Development units of copier and printer versions of this machine are interchangeable.**

Slide 3

TCRU - Trained Customer Replaceable Unit(s)

New to Printer Model - 2/8

- **Around the Drum**
  - Drum Thickness - To improve durability of drum, thickness of drum surface membrane has been increased from 0.035 mm to 0.045 mm. Service life has been extended to 2500K (from 2000K).
  - Color Change - The color of plate behind OPC has been changed from black to gray. This distinguishes OPC of new unit (gray) from old unit (black).
  - PTL Stay - Shape of PTL stay has been changed, so thicker paper can be used in new machine.
  - Note: Drum units of copier and printer version of this machine are interchangeable.
- **Drum Cleaning**
  - 1st Cleaning Blade - To improve drum cleaning efficiency, base material of 1st cleaning blade has been changed to make it harder.

Slide 4

New to Printer Model - 3/8

- **Fusing Unit**
  - Web Unit - The web in both the copier and printer version of this machine is longer and the web take-up speed is faster. This change was implemented to improve cleaning of A3 paper as well as smaller paper sizes.
  - Fusing Guide - To improve paper transport, the shape of the fusing guide plate has been changed (it has a more convex shape), and the shape of the slot where paper enters the fusing unit has also been changed.
  - New Anti-static Brush - An anti-static brush has been added. This new brush discharges static from the pressure roller to reduce black spotting and other problems caused by static offset.

Slide 5

New to Printer Model - 4/8

- **Paper Output**
  - Transport Guide - Band on transport guide has been eliminated. (The band scraped coated paper and caused discoloration in prints.)
  - Better Cooling - To prevent formation of condensation, transport guide is perforated and a fan has been added.
  - Transport Rollers, Belt - Material of transport rollers and belt has been changed from black to gray. (This prevents dirty images and roller tracks on printed sheets.)
  - Idle Rollers - Material of idle rollers was changed to polyurethane to prevent rollers from transferring streaks to printed sheets.

Slide 6

New to Printer Model - 5/8

- **Duplex Unit**
  - Transport Rollers - The color of the transport rollers has been changed from black to gray to prevent dirty images and roller tracks on prints.
  - Drive, idle rollers - Polyurethane material is used on some of drive rollers and idle rollers. This prevents roller swelling due to moisture and high temperature of paper. (Swollen rollers in previous machine did not always return to their normal size after cooling.)
  - Guide Plate - A mylar covers complete surface of guide plate to improve paper transport.
- **Control**
  - Line Speed - Line speed when feeding large sizes has been increased by shortening gap between sheets to improve PPM with large paper sizes.

Slide 7

New to Printer Model - 6/8

- **Peripheral Units**
- **These are older peripheral units that can be used with either B-C4 or B-P1 versions of this machine:**
  - Multi Bypass Tray BY5000 (B833-17)
  - Cover Interposer Tray CI5010 (B835)
  - Finisher SR5000 (B830)
  - Punch Unit PU5000 NA, EU, SC (B831-01, -02, -03)
    - » for Finisher SR5000
- **Note: Ring Binder and Perfect Binder can be used with B-C4 model, but not with B-P1 model.**

Slide 8

New to Printer Model - 7/8

- **The peripheral units listed below can be used with either the copier or printer version of this machine.**
- **These are new peripherals, with minor changes from previous units:**
  - LCIT RT5030 (D452-17). Nearly identical to LCIT RT5000 (A4/LT). (One cooling fan has been added.)
  - LCIT RT5040 (D453-17). Nearly identical to LCIT RT5010 (A3/DLT). Seven cooling fans have been added: 1 fan inside LCIT, 6 fans for trays. (Each tray has two fans, one for the front and one for the back.)
- **These are peripherals that were new for B-C4 which can also be used with B-P1.**
  - Decurl Unit DU5000 (D457-17). Installed on left side of main machine. Nip between large soft roller and small metal roller removes paper curl.
  - If paper jam occurs in any downstream peripheral device, two plates are dropped to shunt paper into purge tray and copying is stopped.
  - Note: Decurl Unit is an option for B-C4 but is required for B-P1.

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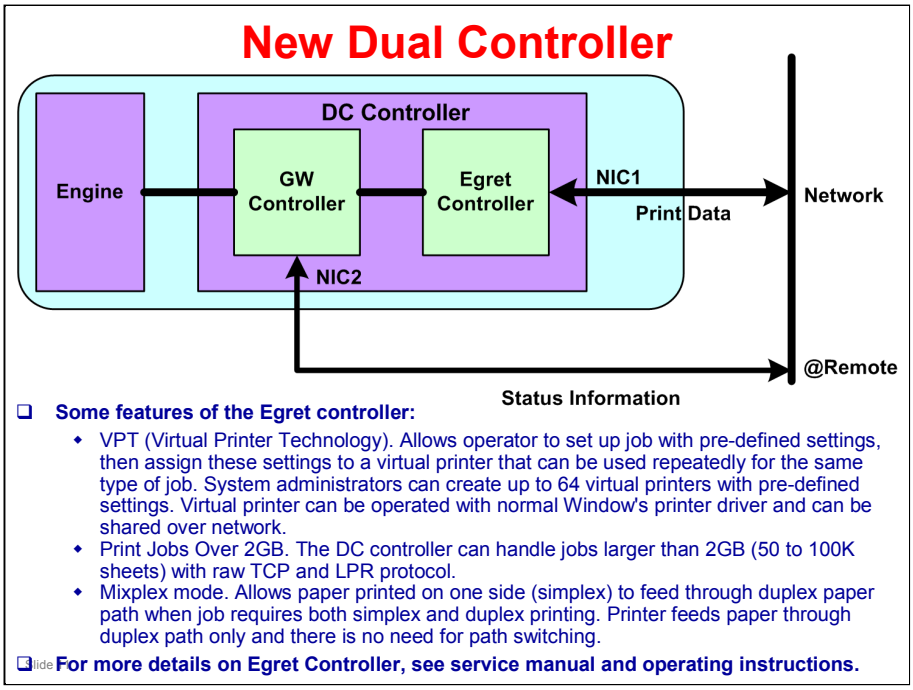
New to Printer Model - 8/8

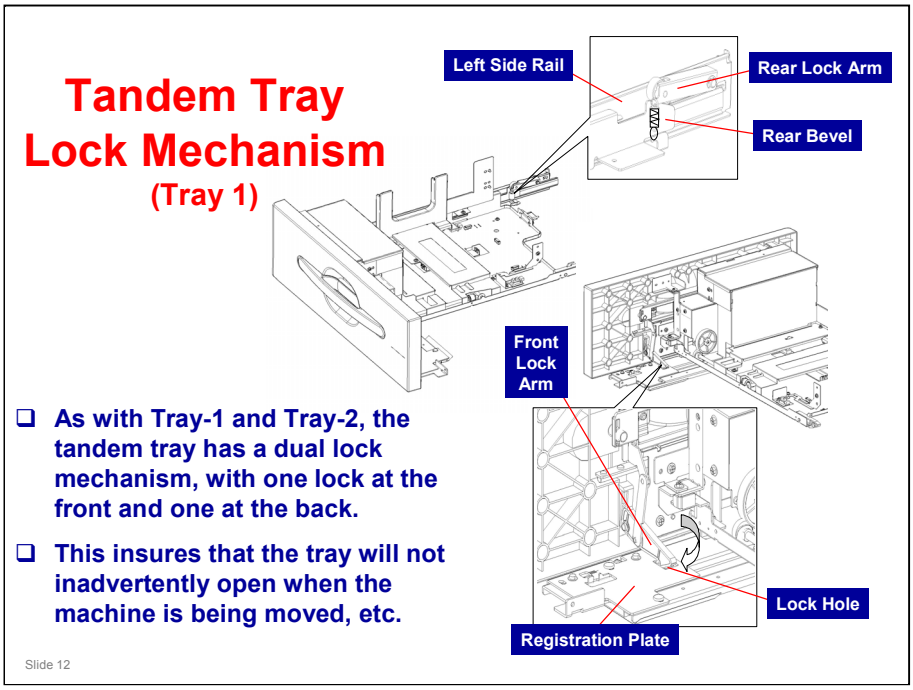
- **Multi-Folding Unit FD5000 (D454-17)**
  - Performs six types of folds on up to three sheets of paper.
- **High Capacity Stacker SK5010 (D477-17)**
  - Stacks up to 5,000 sheets of large-size paper, or 2,500 sheets of small-size paper on pull-away cart.
    - » Two of these units can be installed in the same line, depending on which other finishing options are installed.
- **Booklet Finisher SR5020 (D434-17)**
  - Performs booklet center folding and stapling in addition to corner stapling.
- **Punch Unit PU5020 NA, EU, SC (D449-17, -27, 28) (for Booklet Finisher SR5020)**
  - "Smart punch" that automatically adjusts its position above paper before punching.
- **Trimmer Unit TR5020 (D455-17)**
  - Trims fore edges of folded/stapled booklets sent from Booklet Finisher SR5020.
    - » Trimmer unit is used with SR5020 only (it cannot be used with SR5000).

Slide 10



Note: With the B-P1, the Ethernet connection on the GW controller box is ONLY for @Remote – network printing, etc., is via the Ethernet connection on the Egret controller box.

Caution: The Egret controller box communicates with the main machine via the connection cable running between the Egret controller box and the GW controller box. Therefore the connection cable MUST BE in place for network printing, etc.



Tandem Tray Lock Mechanism

Tray 1, the tandem tray, has two lock mechanisms. One is located at the rear end of the left slide rail, and the other is behind the front cover of the tray on the side registration plate.

When the tray is closed:

- The rear bevel on the end of the slide rail strikes and pushes up the spring-loaded plastic roller and rear lock arm.

- The spring-loaded front lock arm is pushed over the top of the side registration plate toward the hole.

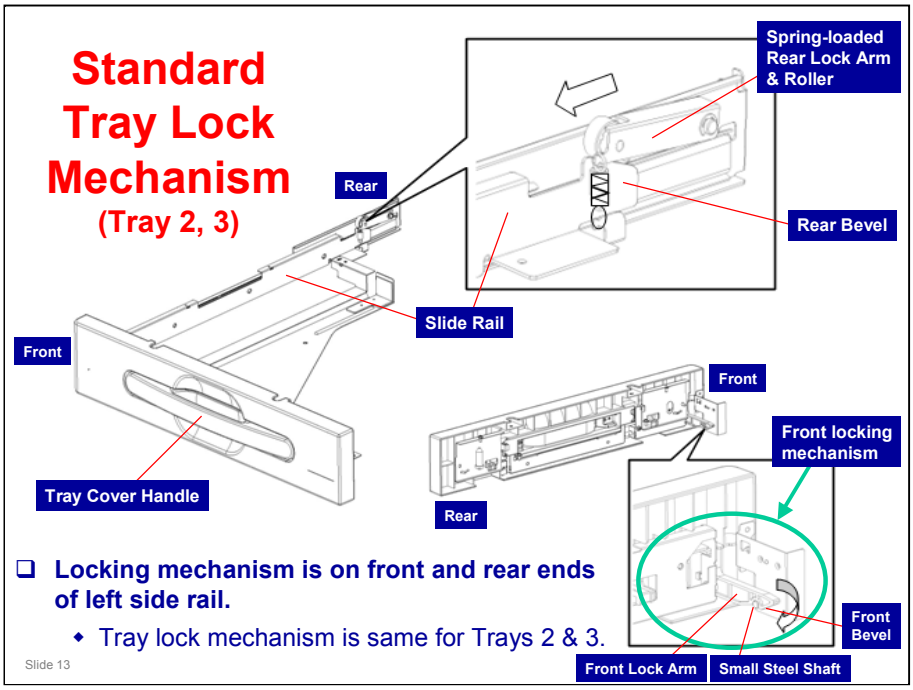
- The spring at the rear pulls the plastic roller over the bevel into the gap on top of the left rear lock arm, while the spring at the front pushes the tip of the front lock arm into the hole on the side registration plate. This locks the tray drawer at both locations.

When the tray is opened:

- Pulling the handle raises the front lock arm out of the hole in the side registration plate.

- The round roller at the rear slides easily out of the slide rail notch. This releases both lock mechanisms at the same time so the drawer opens.

[835]



When the tray is closed:

- The rear bevel on the slide rail pushes up the spring loaded rear lock arm and roller.

- The front bevel of the front lock arm pushes itself over the tip of a small steel shaft.

- At the same time, the spring at the rear forces the rear lock arm down into the gap of the slide rail, and the spring at the front forces the front lock arm down onto the small shaft. This locks the tray.

When the tray is opened:

- Pulling the tray cover handle raises the front lock arm of the tip of the shaft and releases the arm.

- The roller at the rear slides easily out from under the slide rail notch and the tray opens.

B-P1 & Decurl Unit

- Decurl Unit required at installation (not optional).
- Decurl Unit shipped with main machine and installed at customer site with main machine.
- Note: The Decurl Unit itself is not new, but its requirement is new (it was optional before).

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Decurl Unit DU5000 (D457-17)


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Product Outline
Options
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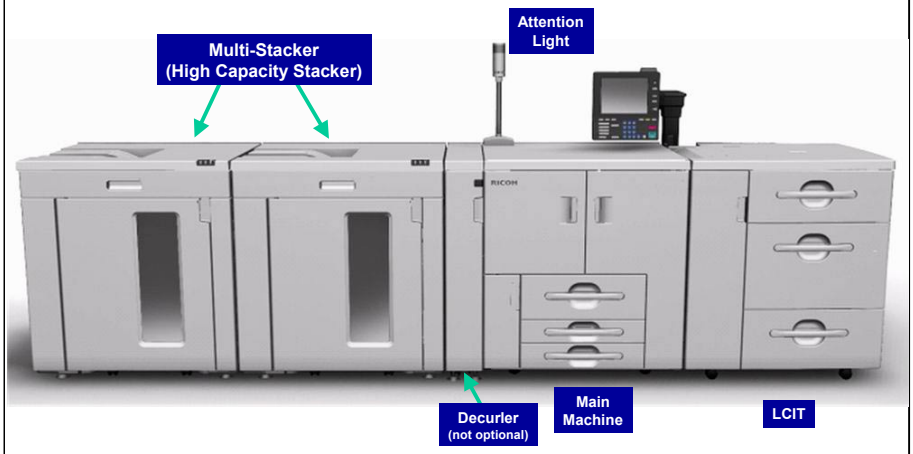
Up to Two High-Capacity Stackers



- **Up to two High Capacity Stackers can be installed in line if no Multi-Folding Unit is installed.**
  - High Capacity Stacker can be the last unit in the line.

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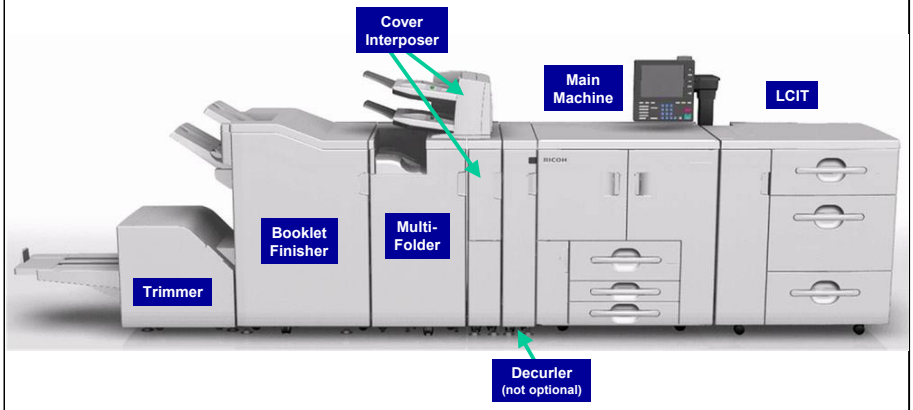
When Multi-Folding Unit is Installed



- **If Multi-Folding Unit is installed**
  - Only one High Capacity Stacker can be installed.
  - Either Booklet Finisher (B834) or Finisher (B830) must be installed.

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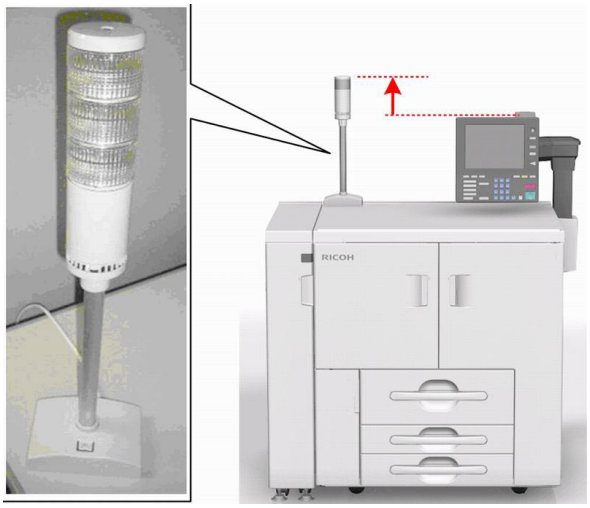
Attention Light (Optional)



- **In large open work area, normal status light may be difficult to see.**
- **Attention light is very visible with its beacon light standing several centimeters higher than top of operation panel.**
  - Attention light is an option for B-P1 only (it cannot be installed on B-C4).

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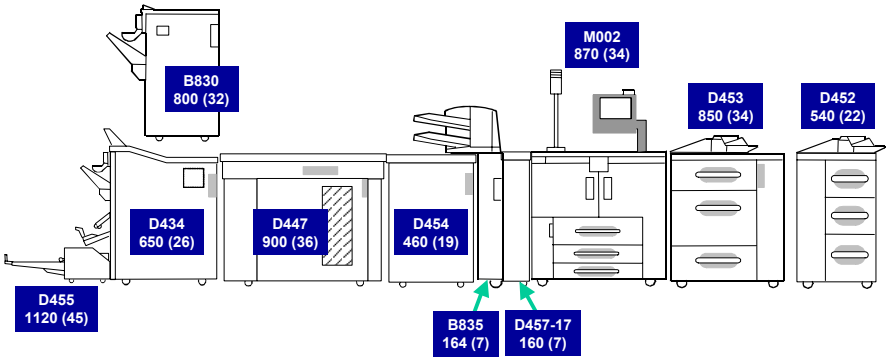
Space Requirements
(& Model Numbers)



- **Sizes above for width (mm/inch).**
  - See following slide for machine type.
- **Necessary depth and height for all units above is 860 (34) x 1370 (54).**
  - The height for M002 is 1550 (61) with Attention Light AL5000 (option)

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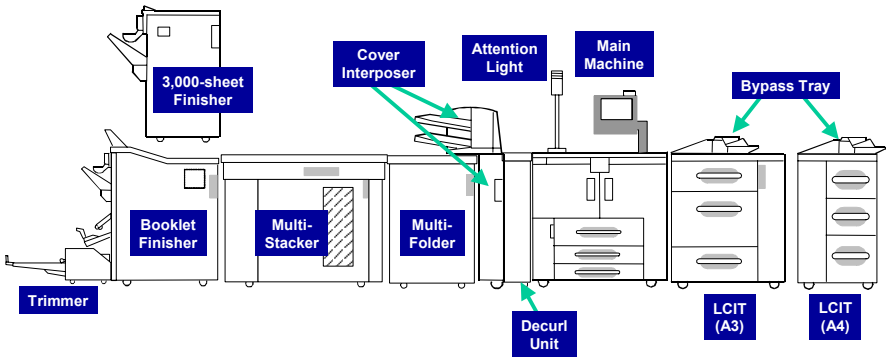
m002i803

Relevant Machine Types



- **Necessary depth and height for all units above is 860 (34) x 1370 (54).**
  - The height for M002 is 1550 (61) with Attention Light AL5000 (option)
- **See preceding slide for model numbers.**

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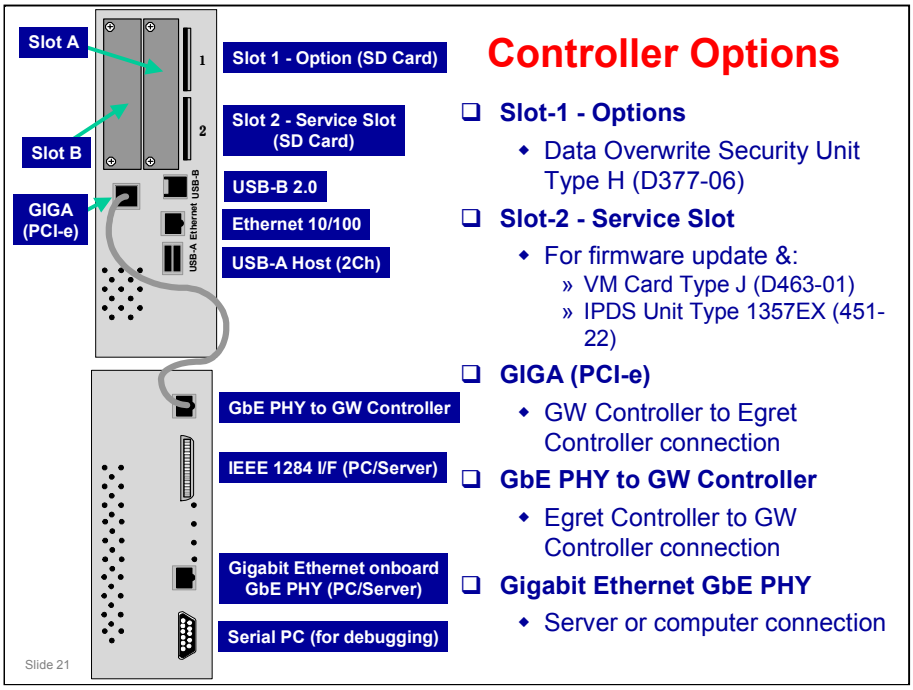
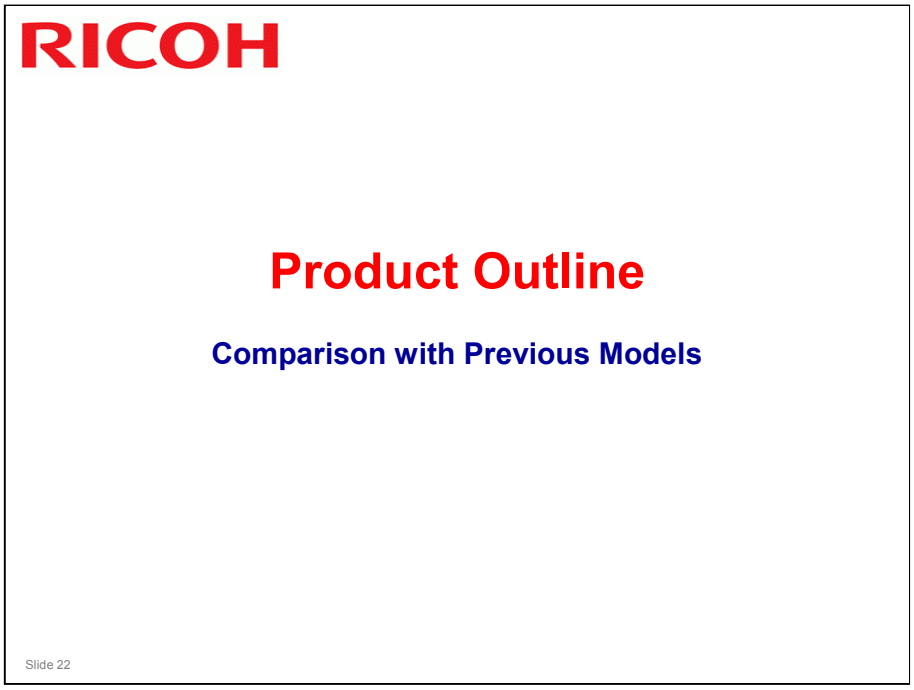
m002i803



Slot A & Slot B are not intended to be used on this machine.


RICOH
Product Outline
Comparison with Previous Models
Slide 22

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Product Names & Numbers

Evolution of Product Codes

	2006	2008	2009
Development Name	Bellini-C3	Bellini-C3.5	Bellini-C4/P1
Marketing Code Name	Katana	Katana-C1.5	Katana-C2/P1

Product Codes Used in Service Manual

No.	Name	U.S. Generic
M002-17	Bellini-P1a (90 ppm)	InfoPrint Pro 907
M003-17	Bellini-P1b (110 ppm)	InfoPrint Pro 1107
M004-17	Bellini-P1c (135 ppm)	InfoPrint Pro 1357

- **In this training material, machines will be usually be referred to as M002, M003, & M004.**
- **For more details, see the service manual and other available documentation.**

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Comparison - 1/2

Item	Bellini-C4	Bellini-P1
Controller	GW Type-Ex 1 only	DC Controller (GW Type-Ex 1 + Egret 4)
PPM	90/110/135 ppm	90/110/135 ppm
Resolution	300/600/1200 dpi	300/600/1200 dpi
PDL	RPCS/PCL/PS*/IPDS*	PS/PCL/IPDS*
Utility	Web Image Monitor, @Remote, Web SmartDeviceMonitor	Web Interface (Egret), Web Image Monitor, @Remote
Peripherals	Interposer, Multi-Folding Unit, High Capacity Stacker, Finisher, Booklet Finisher with Trimmer, Perfect Binder, Ring Binder	Interposer, Multi-Folding Unit, High Capacity Stacker, Finisher, Booklet Finisher with Trimmer

- ***Optional**
- **For more details see the service manual and other available documentation.**

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Comparison - 2/2

- **B-P1 has no ADF (no copier/scanner functions).**
- **Decurl Unit DU5000 (D457-17 is required for B-P1 (not optional).**
- **Attention Light AL5000 is a new option for B-P1 (it is not available for B-C4).**
- **DC CTL. This is a new controller, provided as standard with the B-P1.**
  - The DC Controller is composed of:
    - » GW Controller
    - » Egret Controller
      - – Note that the two controller boxes work as pair, with an Ethernet cable connecting them together.
- **Perfect Binder and/or Ring Binder cannot be used with the B-P1.**

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General Comparison - B-C4 & B-P1

- **Operation panel**
  - Copier and printer versions use (nearly) the same operation panel.
- **Board layout**
  - Board replacement and adjustment procedures are the same with one exception:
    - » Printer version has one additional controller box (Egret controller) mounted below the GW controller box.
- **Paper weight**
  - Heavier paper (up to 300 g/m2) can be used with both machines.
  - Coated paper can also be used with both machines.

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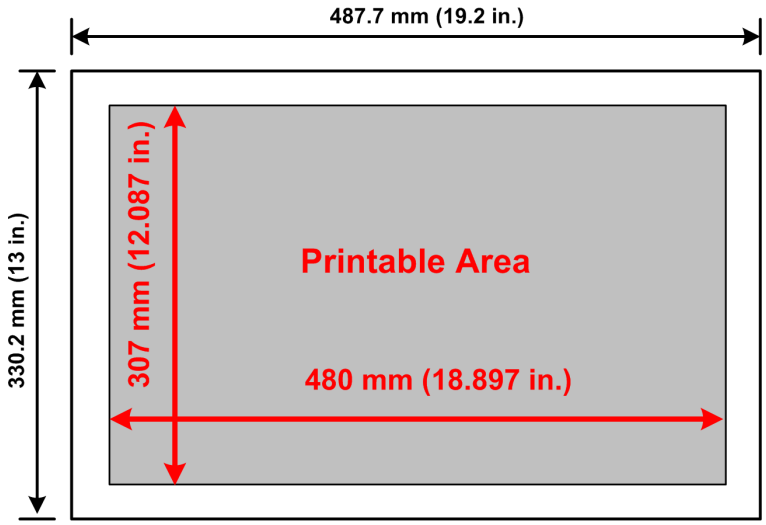
Paper Size Accommodation



- Accommodates paper up to 487.7 mm (19.2 in.)

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Operation Panel - 1/2

- **Operation Panel is same Flexible Super VGA operation panel used with B-C4, with the following exceptions:**
  - No [Stop] key
  - Total number and layout of cutouts for option keys is slightly different.

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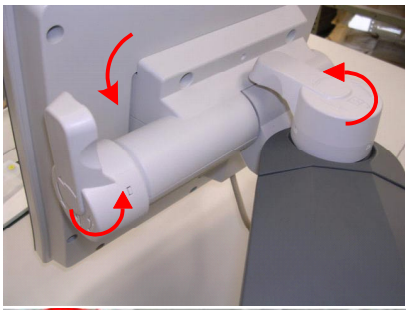

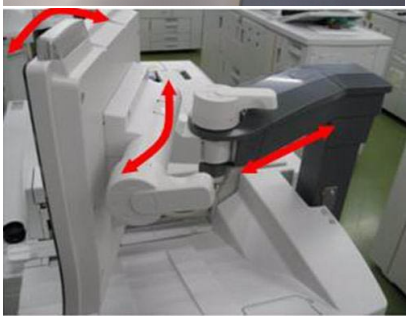

Operation Panel - 2/2

- Operation panel of B-P1 (like B-C4) can be turned side to side and tilted up and down to give operator best view.
- Panel arm can also be extended forward by service engineer at installation (or later).

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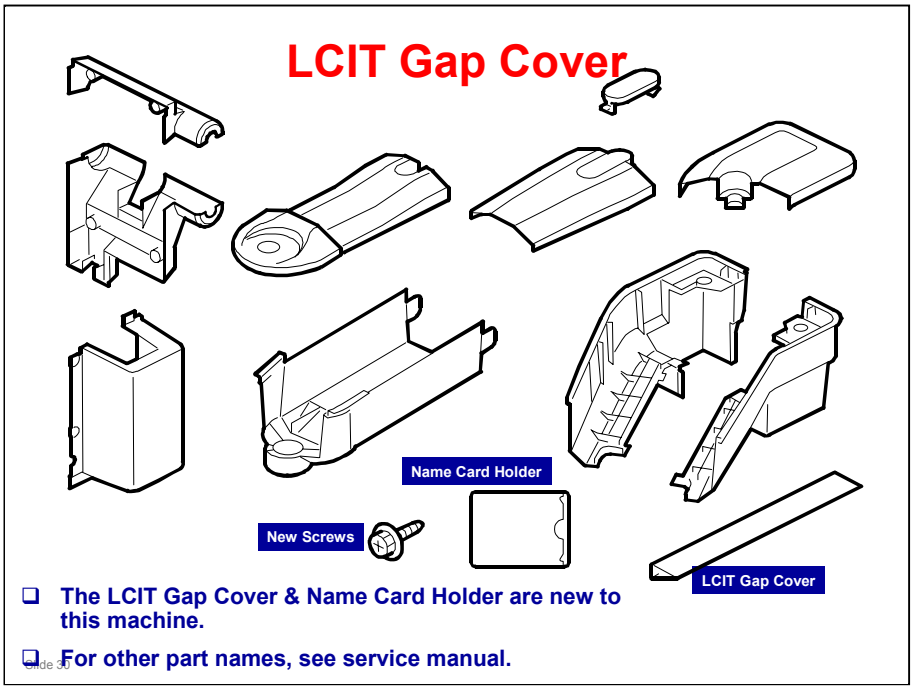
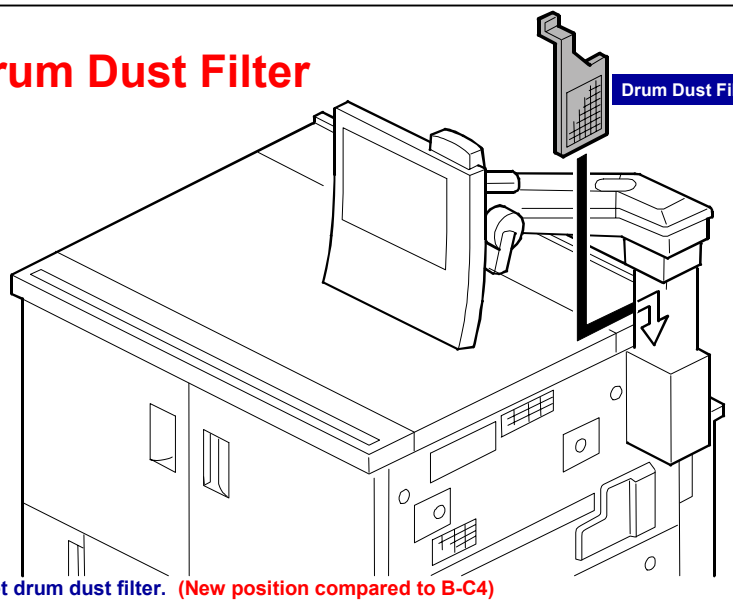
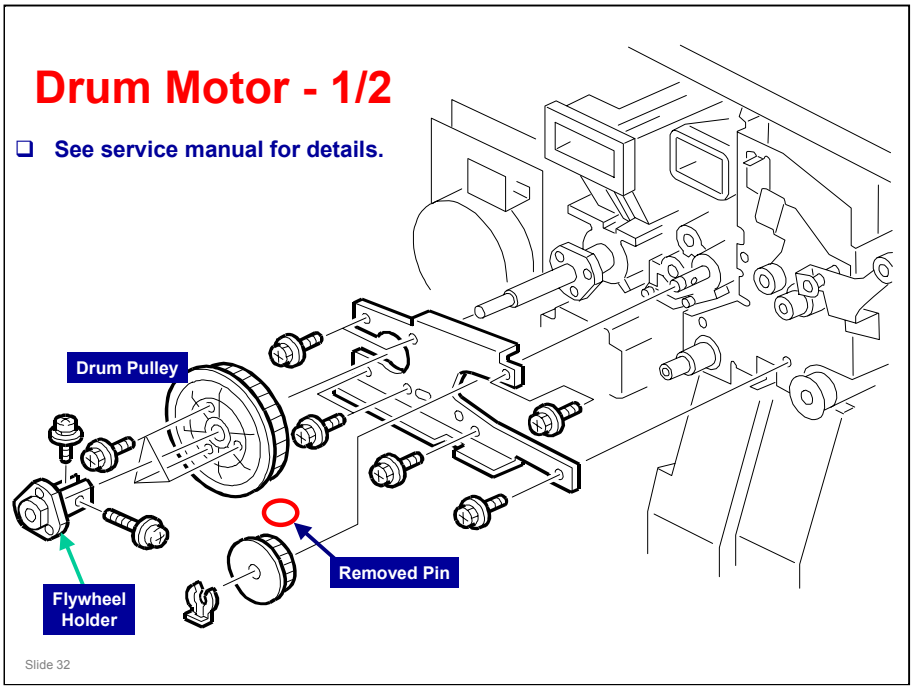


LCIT - Large Capacity Input Tray

Drum Dust Filter



- Set drum dust filter. (New position compared to B-C4)
- Loosen bottom knob to adjust optimal view angle of operation panel, then tighten knob.
- Repeat for side knob.


Drum Motor - 1/2
See service manual for details.
Drum Pulley
Flywheel Holder
Removed Pin
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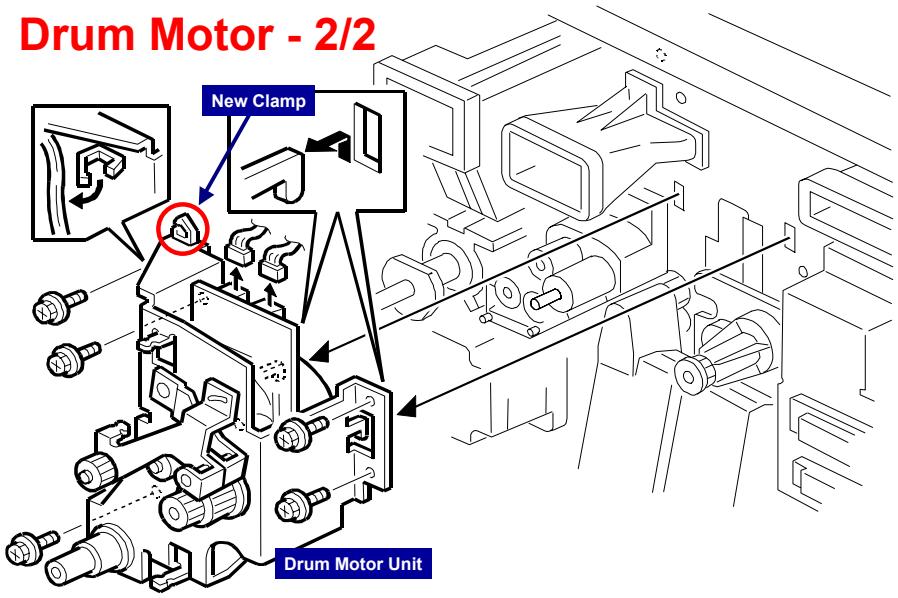
Drum Motor - 2/2



- See service manual for details.

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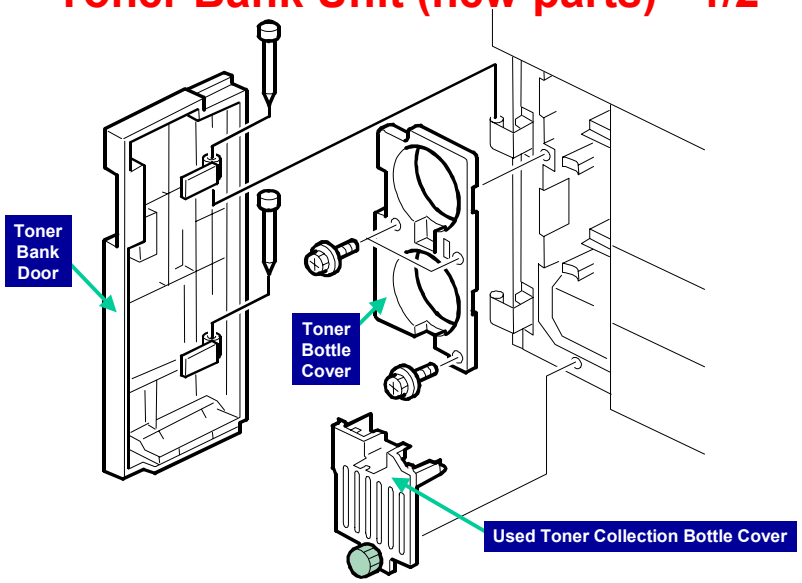
Toner Bank Unit (new parts) - 1/2



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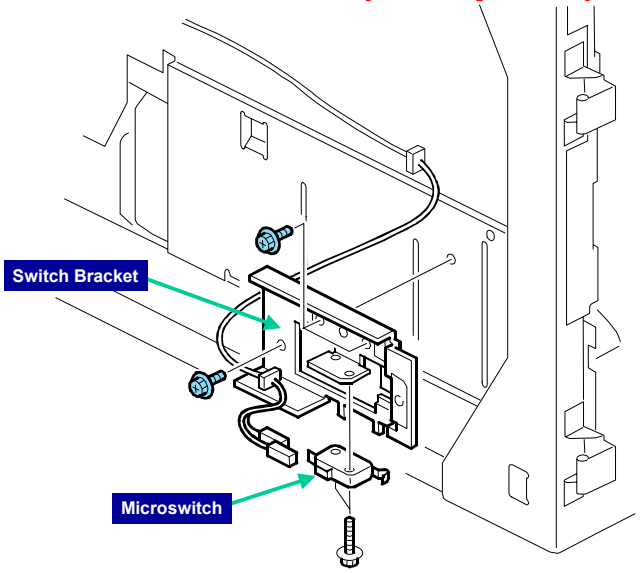
- See service manual for details regarding removal procedures, etc.

Toner Bank Unit (new parts) - 2/2



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- See service manual for details regarding removal procedures, etc.

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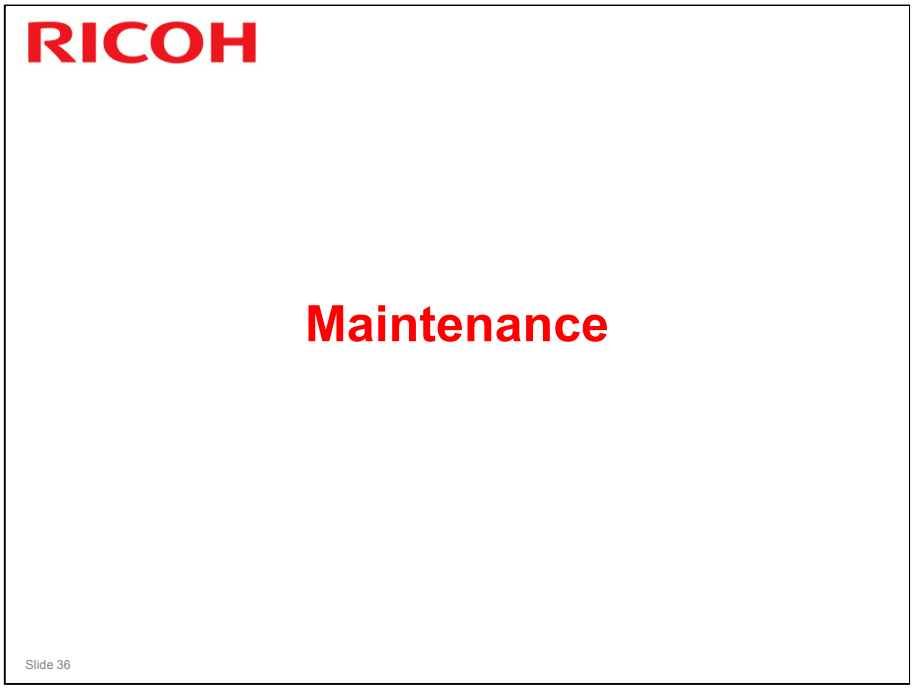
RICOH
Maintenance
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TCRU (Trained Customer Replaceable Units)

- **The B-P1 (as with the B-C4) will be part of the TCRU system.**
  - Trained operators can replace key components (including paper feed rollers) without calling for service.
  - The objective of this system is to reduce down time.
- **Changeable units include:**
  - Drum
  - Development Unit
  - Cleaning Unit
  - Charger
  - Pre-Charge
  - Fusing Unit
  - Cleaning Web
  - Paper Feed Rollers
- **Note: The toner bottle is a CRU (Customer Replaceable Unit) which can be replaced easily by the operator.**

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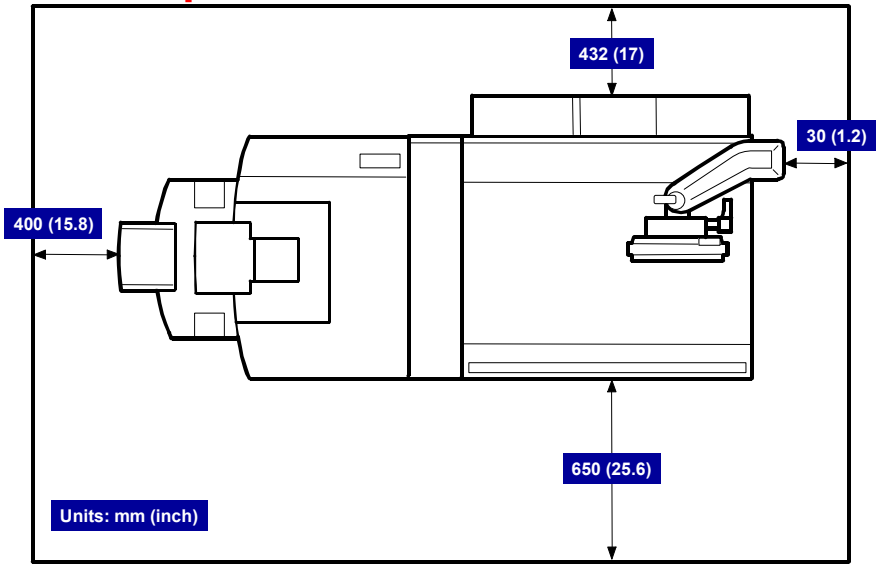
Space Around the Machine



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- The above amount of space is required around the machine.

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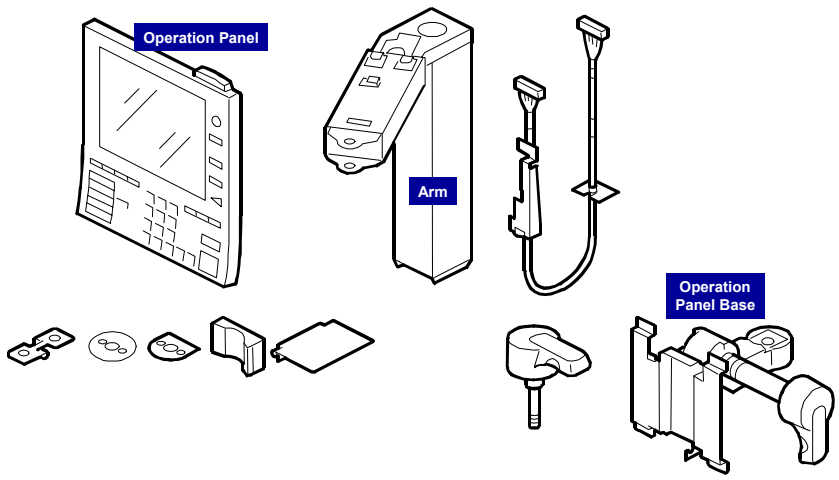
Accessories



- Above are some of the accessory parts that are included with the machine. (See service manual for full details.)

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Full TCRU Menu for Skilled Operators

- **For all TCRU menu items to be visible, SP-5185 must be set to ON.**
  - Enter Service Mode, open SP-5185
  - Confirm that this SP code is switched ON
    - » If not, select ON, close SP mode and cycle machine off/on.
    - » This ensures that TCRU items [0119], [0120], [0121] will appear in Skilled Operators' menus accessed from User Tools screen.

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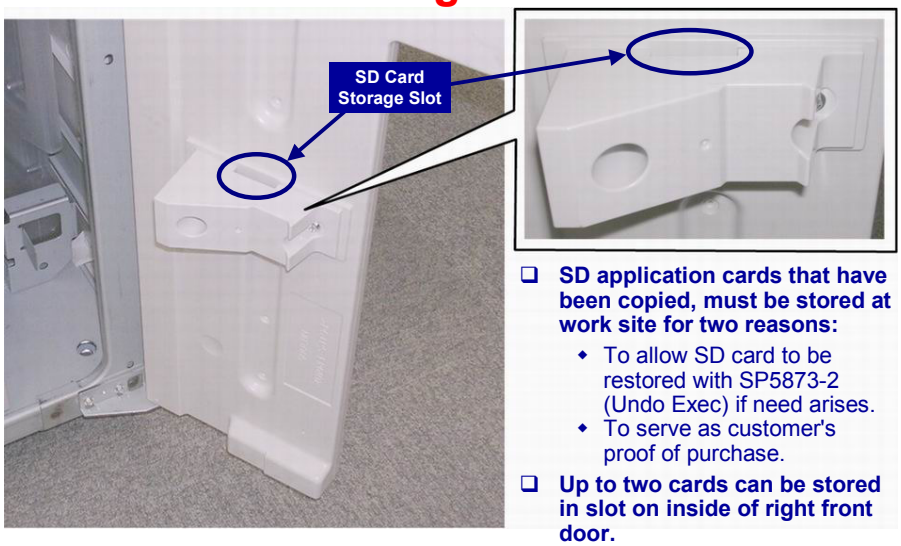
TCRU - Trained Customer Replaceable Unit(s).

On-Site Storage of SD Cards



- **SD application cards that have been copied, must be stored at work site for two reasons:**
  - To allow SD card to be restored with SP5873-2 (Undo Exec) if need arises.
  - To serve as customer's proof of purchase.
- **Up to two cards can be stored in slot on inside of right front door.**
- **To retrieve cards after dropping into slot, storage box must be removed.**

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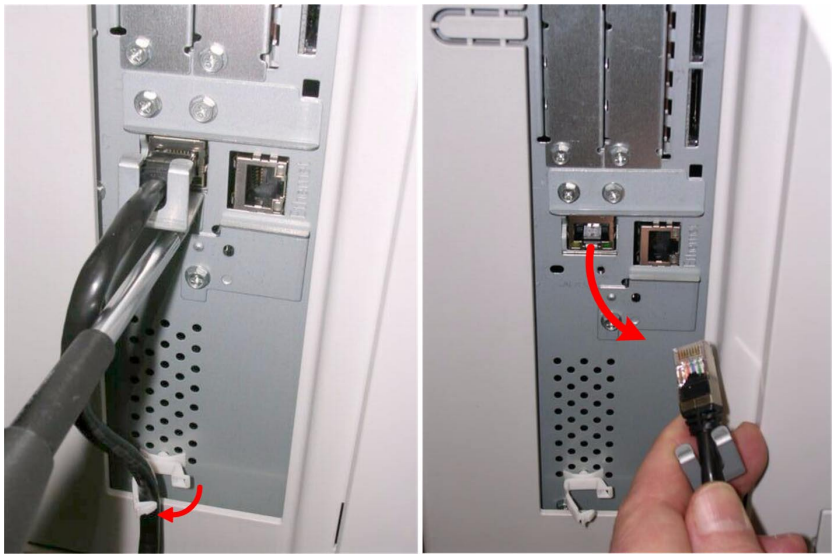
Connection Cable Removal

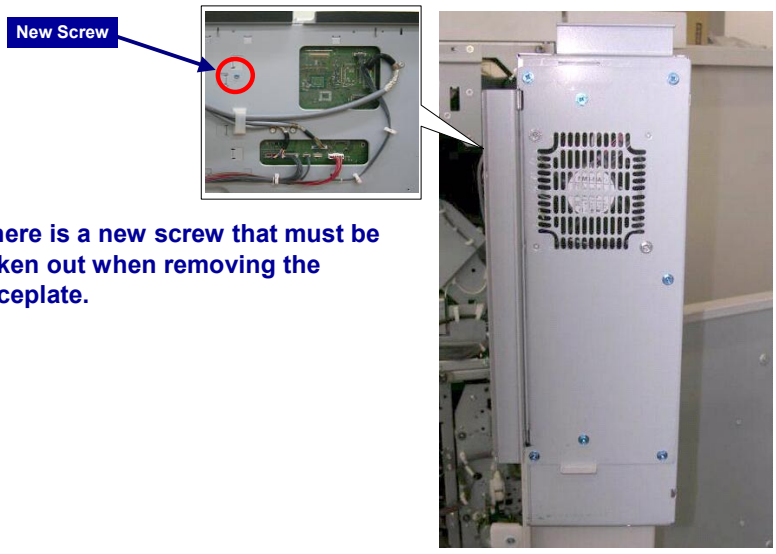


- Clamp (one screw) must be removed before connection cable (network Cat-5e) can be removed.

Slide 6

Note: Connection cable is a standard network (Cat-5e) cable.

BICU Access - (New Screw)



- There is a new screw that must be taken out when removing the faceplate.

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BICU - Base (engine &) Image Control Unit

Recommended Reading in Service Manual - 1/2

- **PM Parts**
  - PM Counter
    - » Displaying the PM Counter
    - » All PM Parts List: Main Menu
    - » Parts List for PM Yield Indicator
    - » Parts Exceeding Target Yield
    - » Counter Clear for Parts Exceeding Target Yield
    - » Clear All PM Settings
    - » Counter List Print Out
  - PM Tables: Main Machine & Decurl Unit
- **Printed Image Adjustment**
  - Printing
    - » Blank Margin
    - » Magnification Adjustment
  - Parallelogram Image Adjustment

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Recommended Reading in Service Manual - 2/2

- **Firmware Update**
  - Before You Begin...
  - Downloading the Egret Software Update File
    - » Required Items
    - » Required Hardware
    - » Installing the Egret Update File
    - » Sending Egret Update File to Printer
  - Updating Machine Firmware
  - Egret Backup/Restore
    - » Egret Backup
    - » Egret Restore
  - Egret Firmware Update
    - » Firmware Update Errors
    - » Installing Another Language

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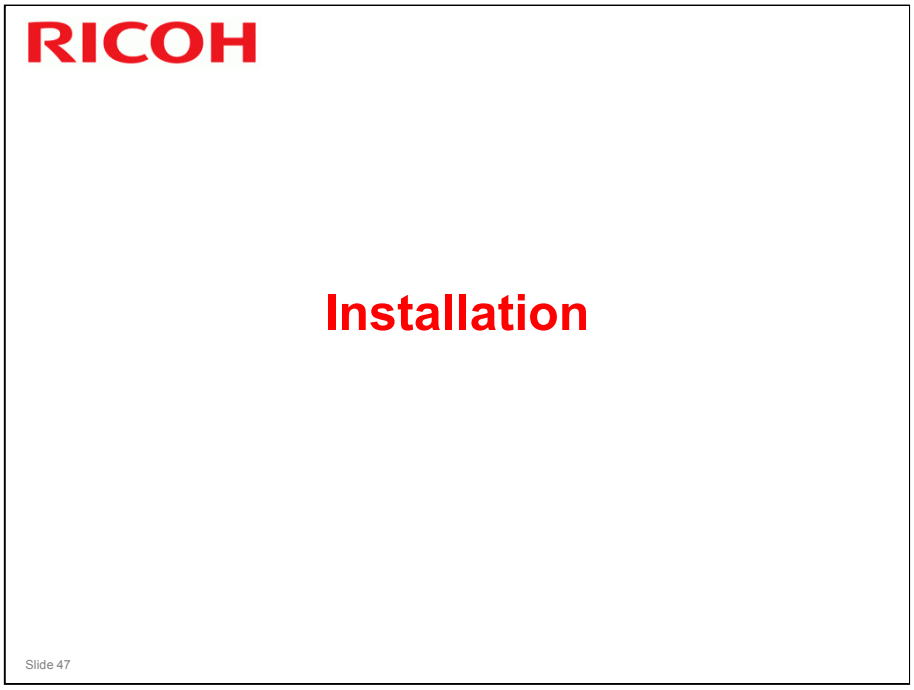
Egret Controller SC Codes

- **SC-915**
  - 001 - Egret Controller Board Error
    - » Egret controller board defective
  - 002 - HDD Serial Communication Error
    - » Egret HDD cable defective
    - » Egret HDD defective
  - 003 - Egret CPU Overheat Error
    - » Replace Egret controller board
  - 004 - Egret-GW Controller Communication Error 1
    - » Replace GW controller board
  - 005 - Egret-GW Controller Communication Error 2
    - » Egret-to-GW controller board cable defective

Slide 46


RICOH
Installation
Slide 47

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Regarding Installation

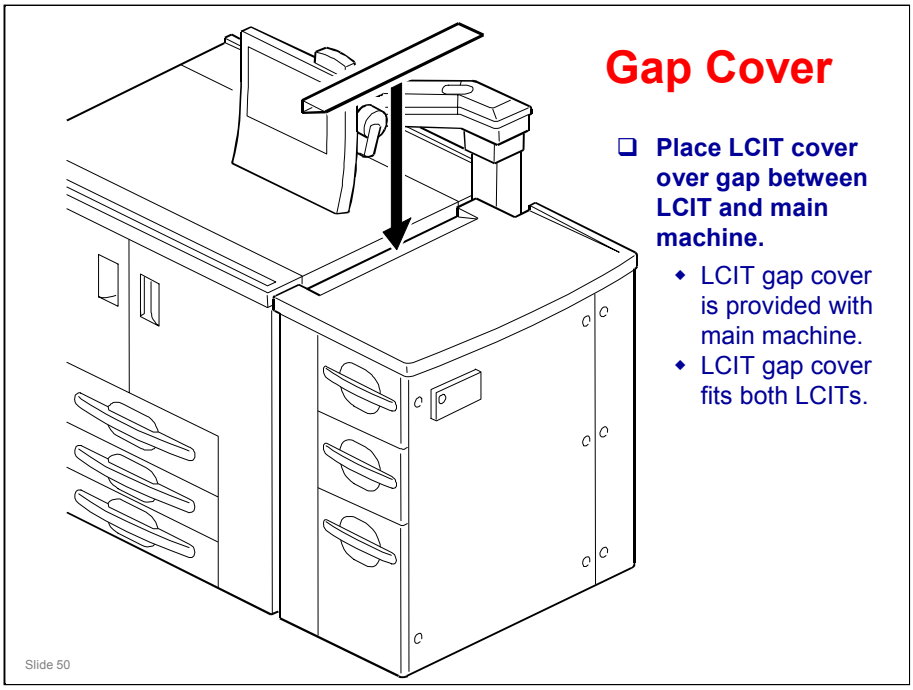
- **For full installation instructions, see other available documentation, such as:**
  - Service Manual
  - Operating Instructions
  - Full training material for earlier generations of this machine.

Slide 48

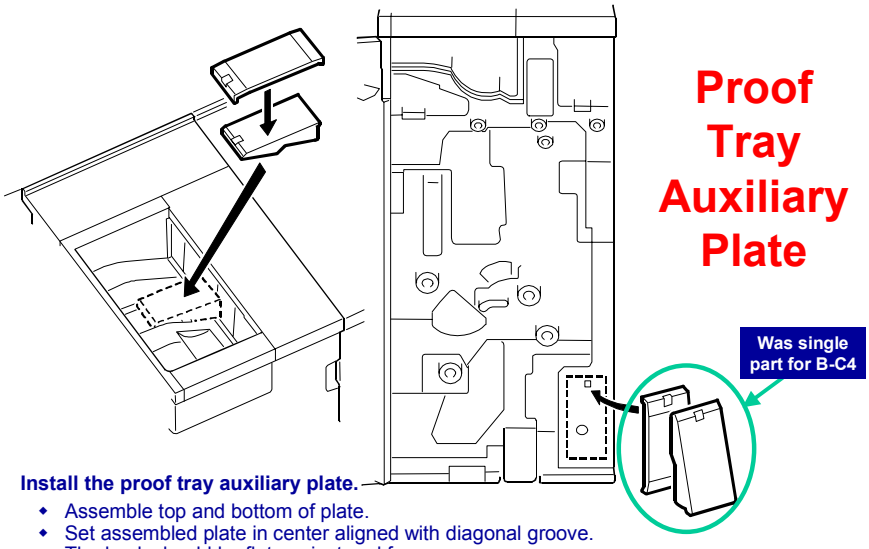
Controller Box Cautions

- **GW Controller Ethernet connection**
  - ONLY for @Remote
- **Egret Controller Ethernet connection**
  - For network printing (and everything except @Remote)
- **New firmware for Egret controller**
  - Must be saved to Egret controller's internal HDD before updating.
  - Cannot be updated via SD card.
- **All controller box related error codes refer to GW Controller unless identified as Egret errors.**
  - Example: SC-915-001 - "Egret Controller Board Error"

Slide 49


Gap Cover
Place LCIT cover over gap between LCIT and main machine.
LCIT gap cover is provided with main machine.
LCIT gap cover fits both LCITs.
Slide 50

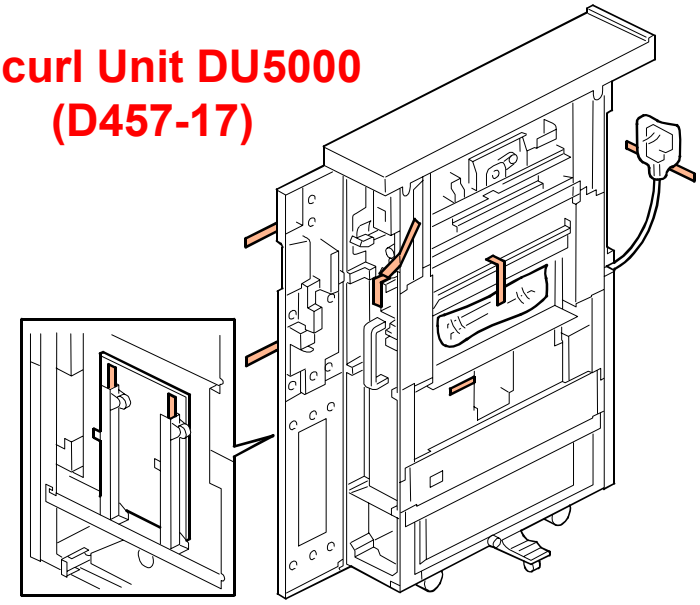
Proof Tray Auxiliary Plate



- **Install the proof tray auxiliary plate.**
  - Assemble top and bottom of plate.
  - Set assembled plate in center aligned with diagonal groove.
  - The back should be flat against end fence.
- **When plate is not being used, open front door and store assembled plate at inside inner cover.**
  - Plate should be used when Z-folded paper (all sizes) is output to proof tray.
  - If plate is not used with Z-folded output, pages could mix and overlap.

Slide 51

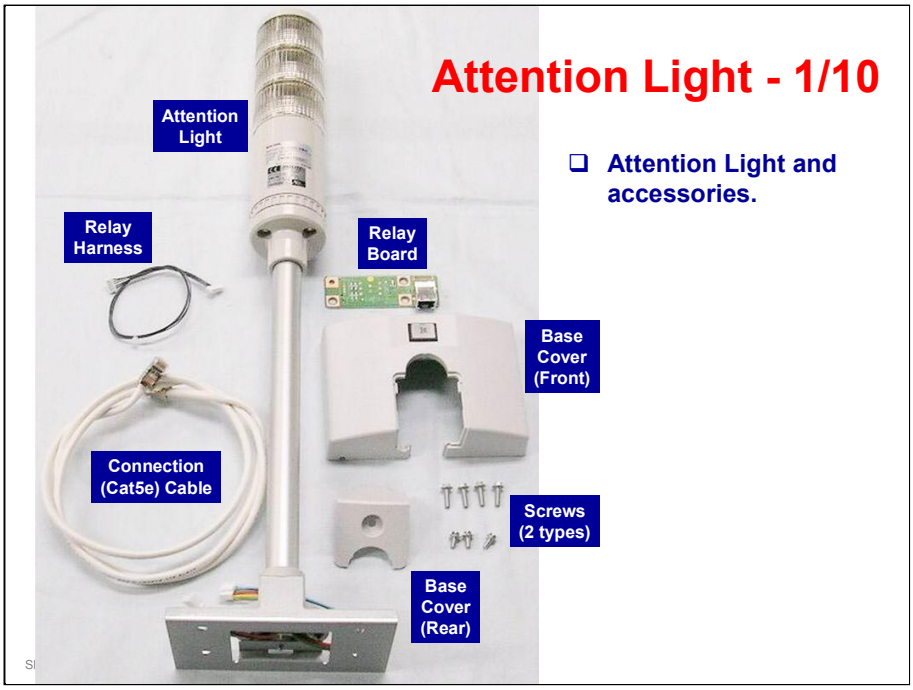
Decurl Unit DU5000 (D457-17)



- **Decurl Unit must be installed with M002/M003/M004 machines.**
  - For installation details, see service manual (or B-C4/B-C3.5 training material).

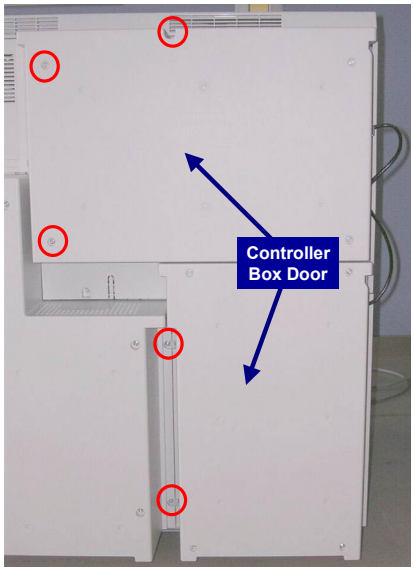
Slide 52

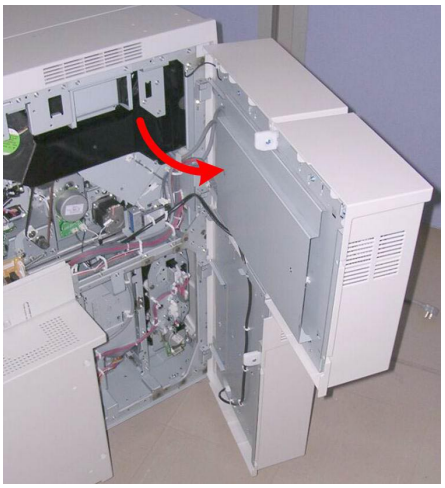
.


Attention Light - 1/10
Attention Light and accessories.
Attention Light
Relay Harness
Relay Board
Base Cover (Front)
Connection (Cat5e) Cable
Screws (2 types)
Base Cover (Rear)

.

Attention Light - 2/10





- Controller box door consists of upper & lower sections combined.

Slide 54

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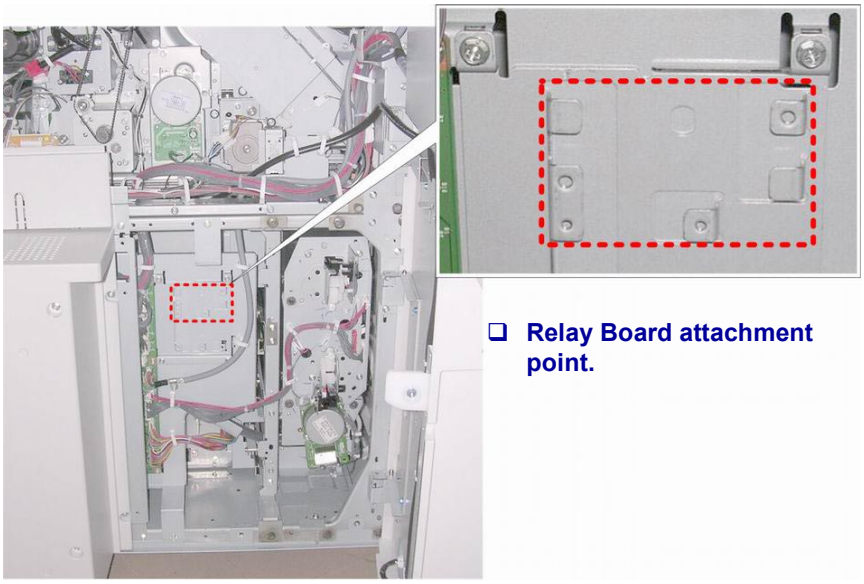
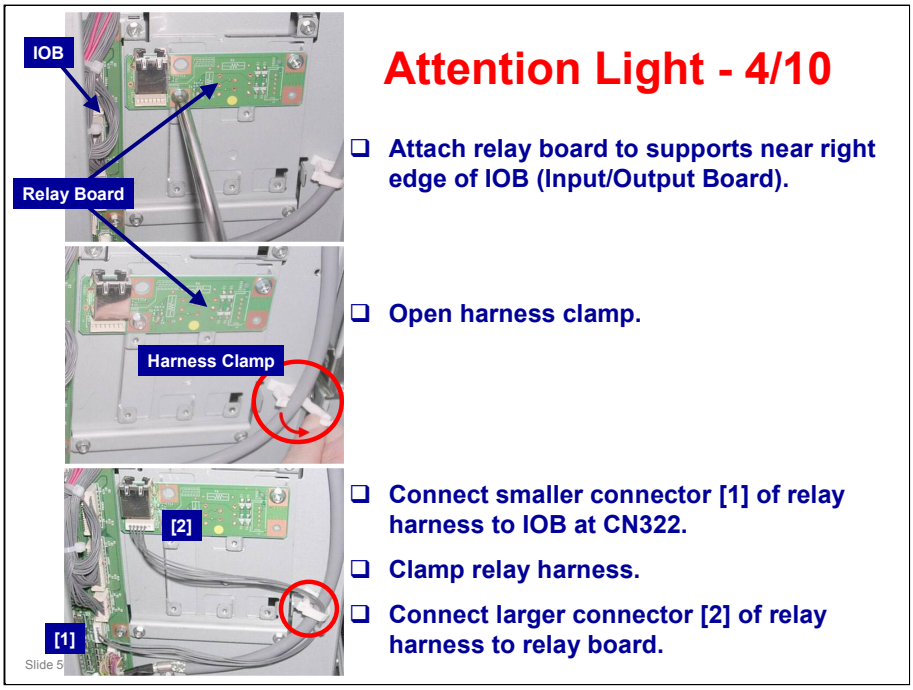
Attention Light - 3/10



- Relay Board attachment point.

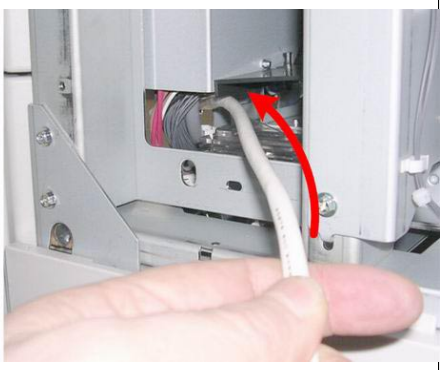
Slide 55

.



IOB - Input/Output Board

Attention Light - 5/10

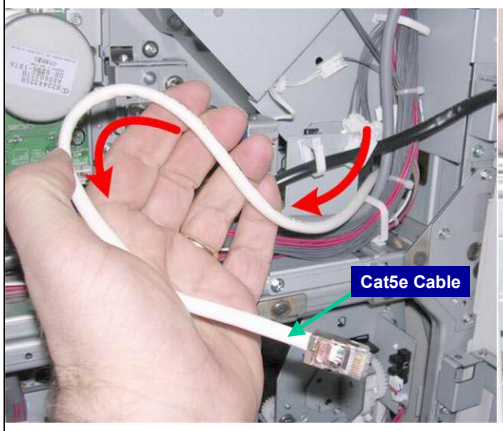


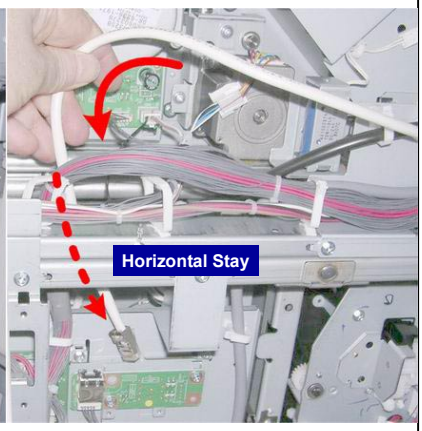
- Connection cable (Category 5e cable) is inserted near hinge of controller box door.
- First insert one end of connection cable as shown above.

Slide 57

.

Attention Light - 6/10



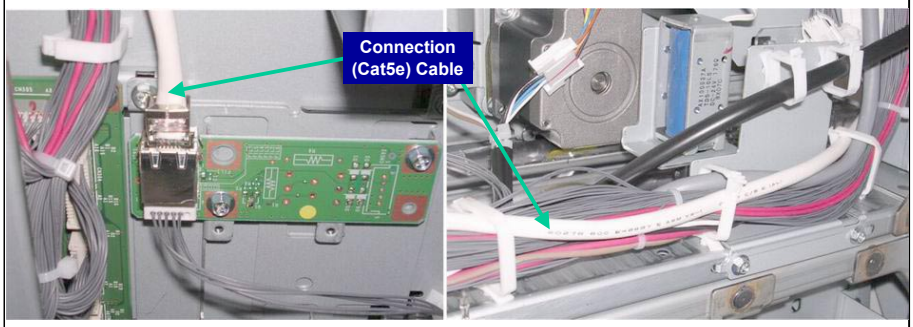


- From other end of control box door (behind machine) pull other end of cable through frame.
- Pass cable behind horizontal stay as far as relay board.

Slide 58

.

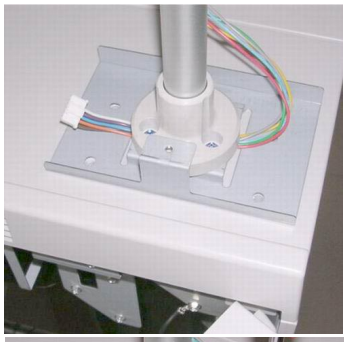
Attention Light - 7/10



- Connect connection cable (Cat5e) to relay board.
- Put connection cable within white clamps.

Slide 59

.

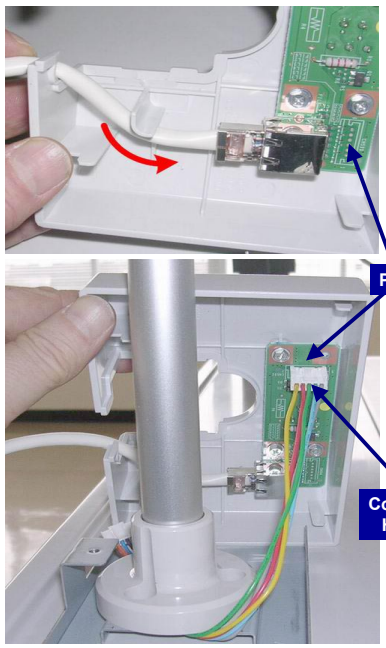


Attention Light - 8/10

- Set base of light on left rear corner of machine with plate facing rear edge of machine.
- Align holes of base plate with holes in machine top.
- Use long screws to fasten base plate to top of machine.

Slide 60

.



Attention Light - 9/10

- **Set connection cable as shown here and connect it to PCB on underside of front base cover.**
- **Connect long connection harness to PCB.**
  - (Shorter harness is not used.)

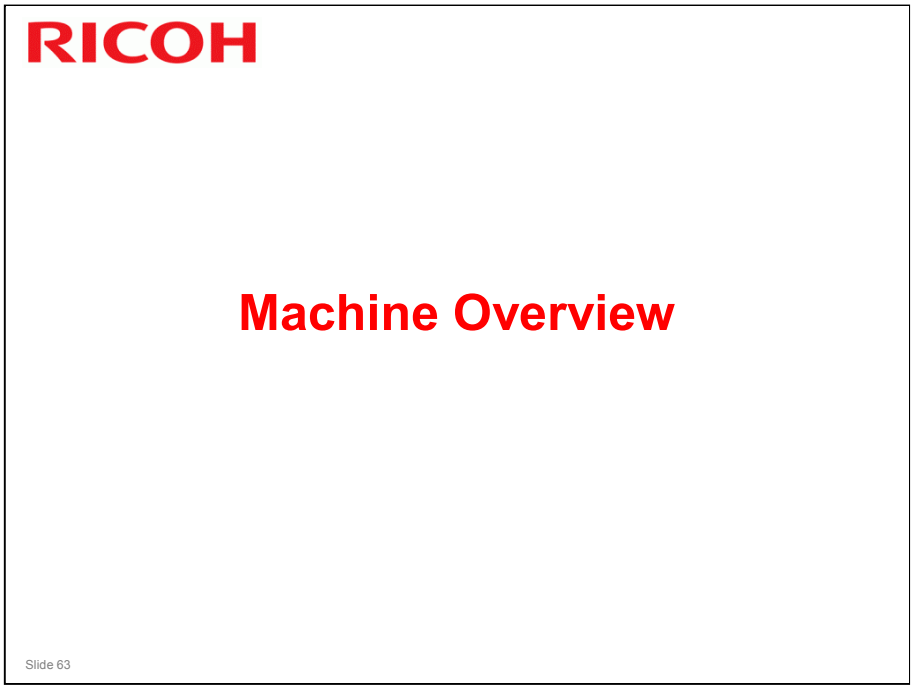
Slide 61

Attention Light - 10/10

- **Fasten Rear Base cover with single screw.**
- **Testing Installation**
  - Connect machine to power source & switch on main power.
  - Open a front door.
  - Confirm attention light illumination.
  - Press LED switch (machine should emit steady beep sound as error alert).
  - Press LED switch again to switch off beeping error alert.
  - Close front door.
- **Attention Light can also be tested with SP5804-207 -208.**
- **For full details, see service manual.**

Slide 62

.


RICOH
Machine Overview
Slide 63

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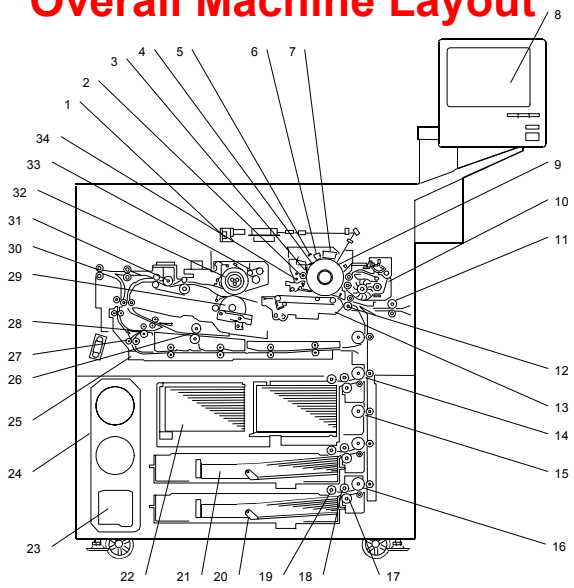
Overall Machine Layout

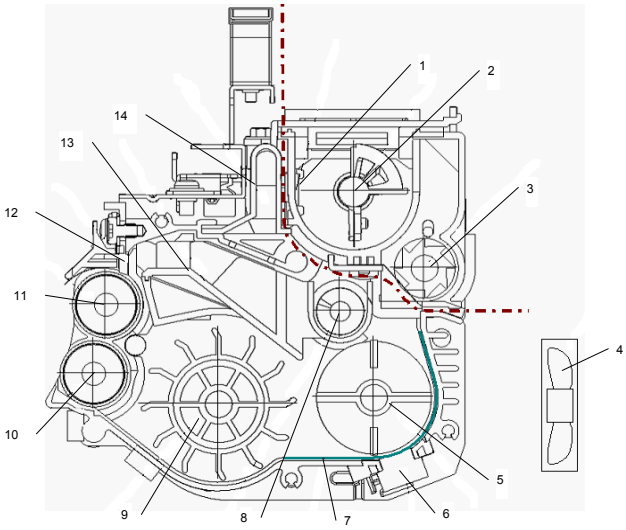


Slide 64 ❑ Components same as B-C4 except for lack of Scanner Unit parts, etc.

Overall Machine Layout:

1. Laser Diode Board
2. Cleaning Brush
3. Cleaning Blade
4. 2nd Cleaning Blade
5. Quenching Lamp
6. Pre-Charge Unit
7. Charge Corona Unit
8. Operation Panel
9. Drum
10. Development Unit
11. LCIT Relay Roller
12. Registration Roller
13. Transfer Belt Unit
14. Upper Relay Roller
15. Vertical Relay Roller
16. 3rd Grip Roller
17. 3rd Separation Roller
18. 3rd Paper Feed Roller
19. 3rd Pickup Roller
20. 3rd Tray (500 Sheets)
21. 2nd Tray (500 Sheets)
22. 1st Tray (Tandem Tray, 1,100 Sheets Each)
23. Toner Collection Bottle
24. Toner Bank Unit
25. Duplex Tray

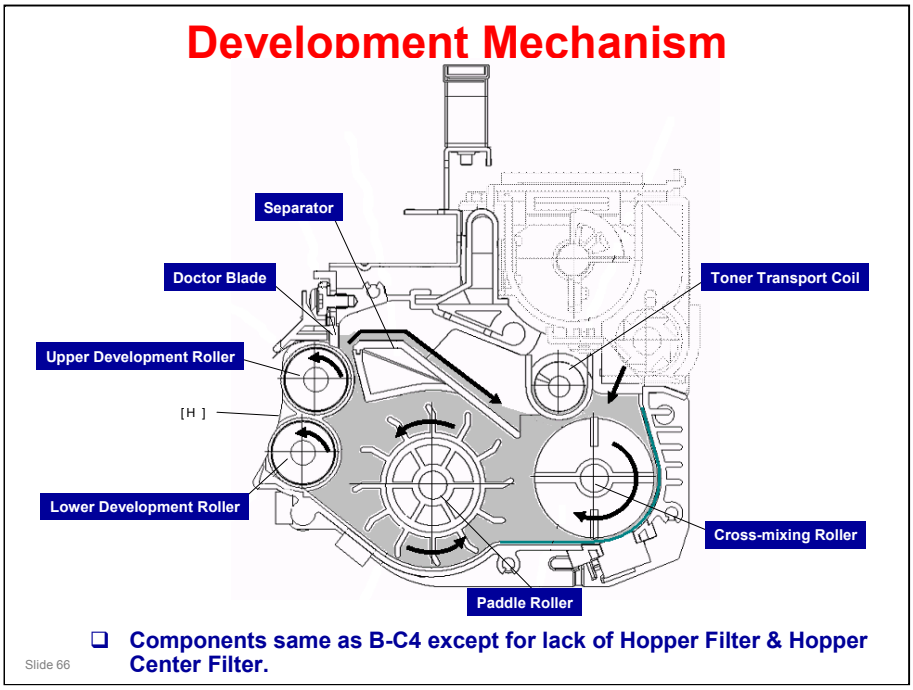
Development (Overview)



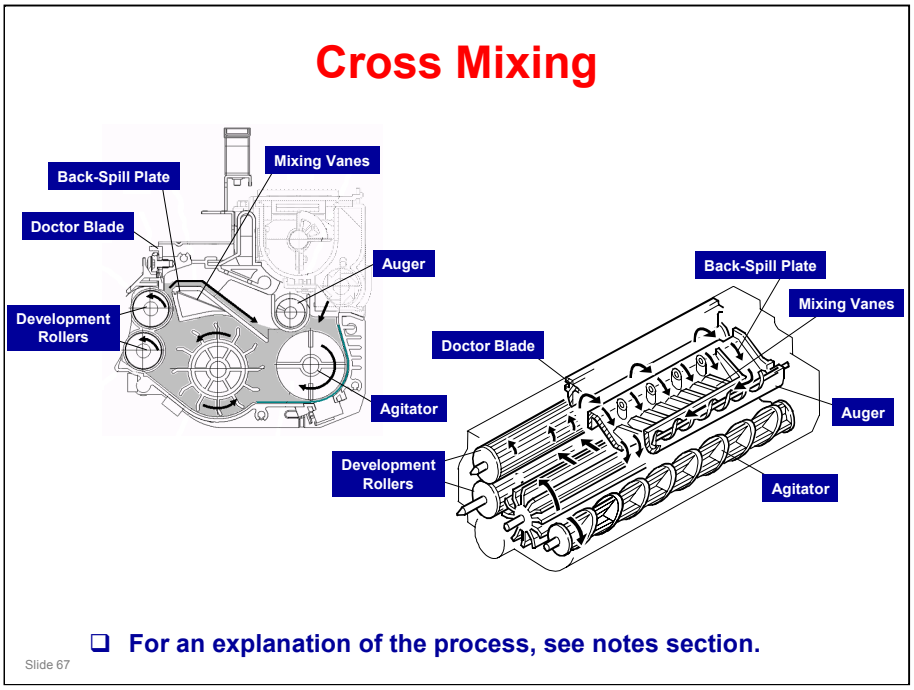
- Components same as B-C4 except for lack of Hopper Filter & Hopper Center Filter.

Slide 65

1. Toner End Sensor
2. Agitator
3. Toner Supply Roller
4. Cooling Fan
5. Cross-mixing Roller
6. TD Sensor
7. Friction Sheet
8. Toner Transport Coil
9. Paddle Roller
10. Lower Development Roller
11. Upper Development Roller
12. Doctor Blade
13. Separator
14. Suction Duct



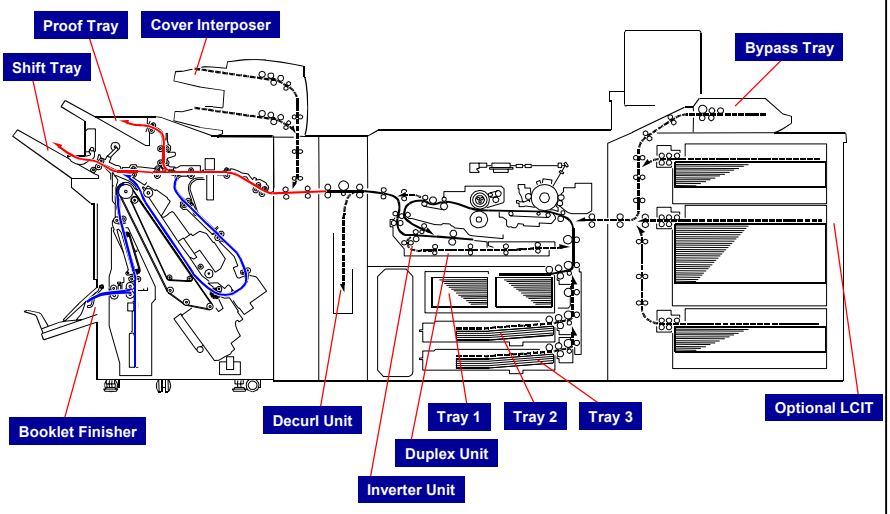
Toner and developer are mixed in toner agitator by Cross-Mixing Roller. Paddle Roller picks up developer and sends it to Upper Development Roller. Internal permanent magnets in development rollers attract developer to development roller sleeve. Developer from upper development roller sleeve is also attracted to Lower Development Roller. Upper development roller carries developer past Doctor Blade which trims developer to desired thickness. Excess developer spills over Separator to Toner Transport Coil. Coil transports developer from back to front as far as cross-mixing roller.



Main machine uses standard cross-mixing mechanism to keep toner and developer evenly mixed. It also helps agitate developer to prevent developer clumps from forming and helps create triboelectric charge. Developer on turning Development Rollers is split into two parts by Doctor Blade. The part that stays on development rollers forms magnetic brush and develops latent image on drum. The part that is trimmed off by Doctor Blade goes to Back-Spill Plate. As developer slides down Back-Spill Plate to Agitator, Mixing Vanes move it slightly toward rear of unit. Part of developer falls into auger inlet and is transported to front of unit by Auger.

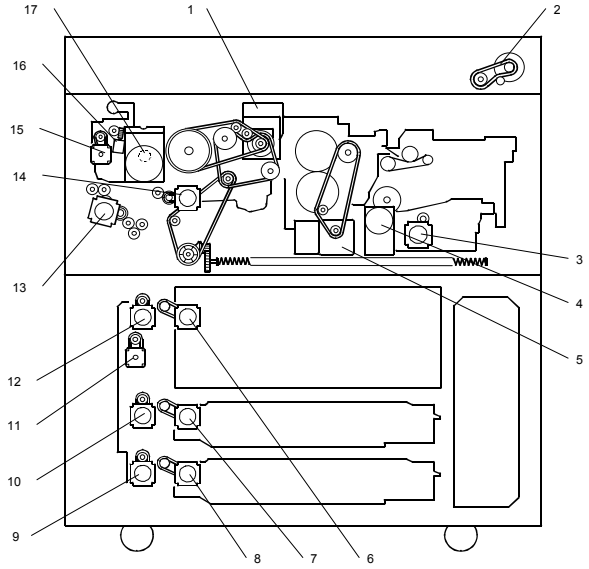
[795]

Paper Path



Slide 68

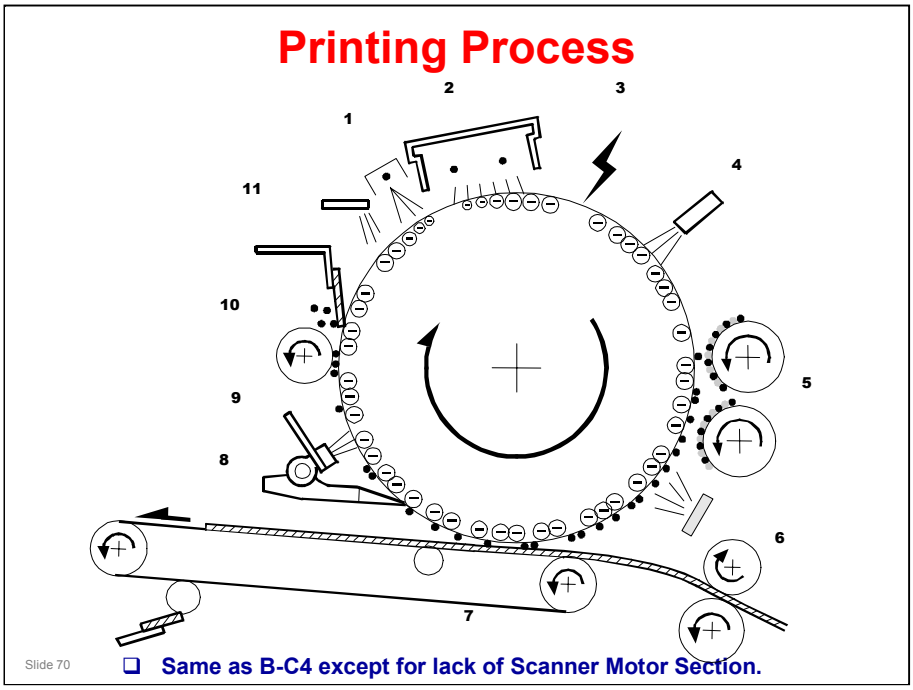
Drive Layout



Slide 69

❑ Components same as B-C4 except for lack of Scanner Motor.

1. Drum Motor
2. Duplex Inverter Motor
3. Exit Motor
4. Fusing Motor
5. Paper Feed Motor
6. 2nd Paper Feed Motor
7. 3rd Paper Feed Motor
8. 3rd Grip Motor
9. 2nd Grip Motor
10. Vertical Relay Motor
11. 1st Grip Motor
12. Upper Relay Motor
13. Registration Motor
14. Toner Supply Motor
15. Hopper Agitator Motor
16. Development Motor



Printing Process

Drum Charge

An OPC (organic photoconductor) drum is used in this machine. In the dark, first the pre-charge unit [1] then the charge corona unit [2] give a negative charge to the drum. The grid plate ensures that corona charge is applied uniformly. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

Laser Exposure

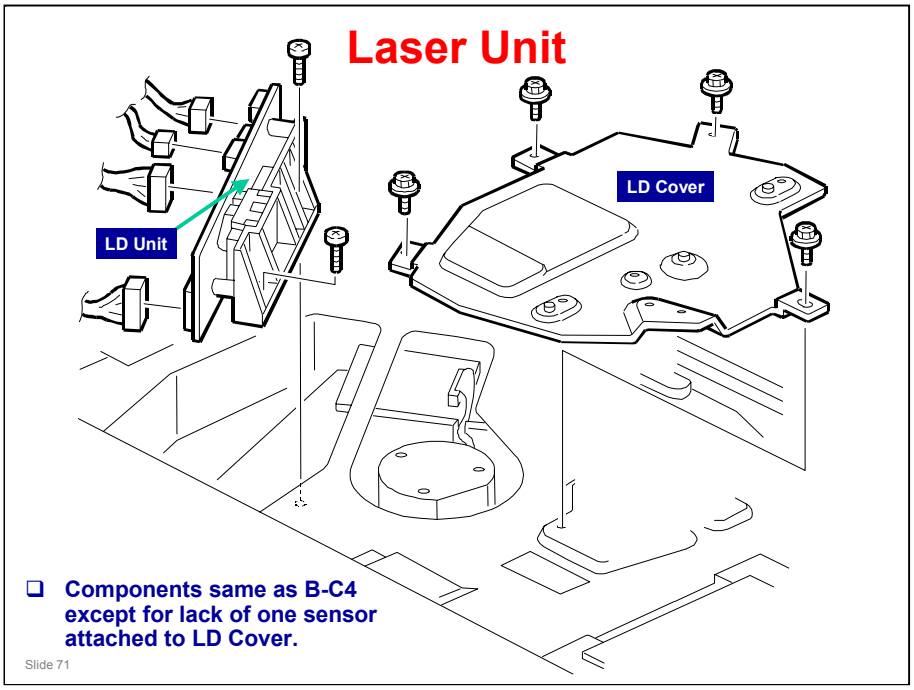
The print job data is retrieved from the hard disk and transferred to the drum by four laser beams, which form an electrostatic latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the LDB [3] (laser diode board). Drum Potential Measurement The drum potential sensor [4] detects the electric potential on the drum to correct various process control elements.

Development

The development rollers [5] turn and carry the developer to the drum. When the magnetic developer brush on the development rollers contacts the drum surface, the high negative charge of the white areas in the latent image force the toner with its low negative charge into the black areas. This forced migration of toner over the latent image forms the image on the drum. Pre-Transfer Light from the pre-transfer lamp [6] reduces the amount of charge on the drum surface to improve the ease of image transfer.

Image Transfer

Paper is fed to the area between the drum surface and the transfer belt [7] at the proper time to align the paper and the developed image on the drum.



Note: To avoid damaging the board with static electricity, never touch the printed circuit board.

1. Turn off the main power switch and unplug the machine.

2. Remove the three top covers

3. Remove LD cover

4. Remove LD unit

- Four spacers, each of a different colour, are placed under the LD unit in the factory in order to do a fine positioning adjustment on the LD unit position.

- Before you remove the LD unit, take a careful note of where these spacers are. When replacing the LD unit, these spacers must be in exactly the same position.

- Be sure to remove the mylar from the underside of the old LD unit and attach it to the new one.

5. After installing the LD unit, execute SP2115 001 to 009 to input the pitch settings for the main scan beams.

- The correct settings for these SP codes are printed on a decal attached to the mounting bracket [C] of the LD unit.

The numbers printed on the label correspond to the correct settings of the SP codes.

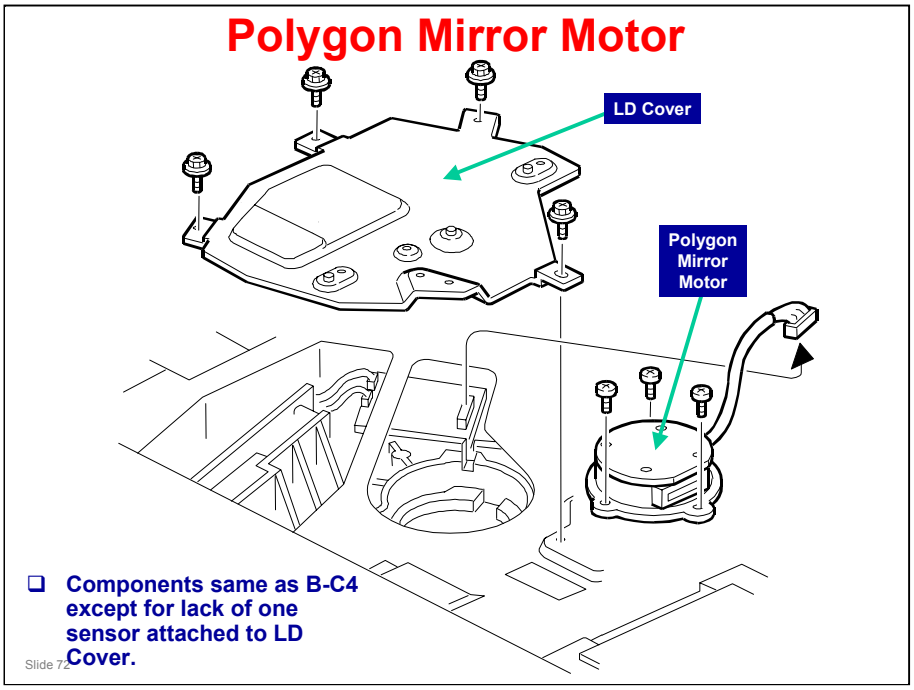
Example:

-10/-2/+10/-100/+0/+100/-10

To enter these numbers, you would execute:

SP2115 001 [*] 1 0 [#]

SP2115 002 [*] 2 [#]



To avoid damaging the polygon motor, switch the machine off and wait 3 minutes to allow the motor to stop rotating before removing it.

1. Turn off the main power switch and unplug the machine.

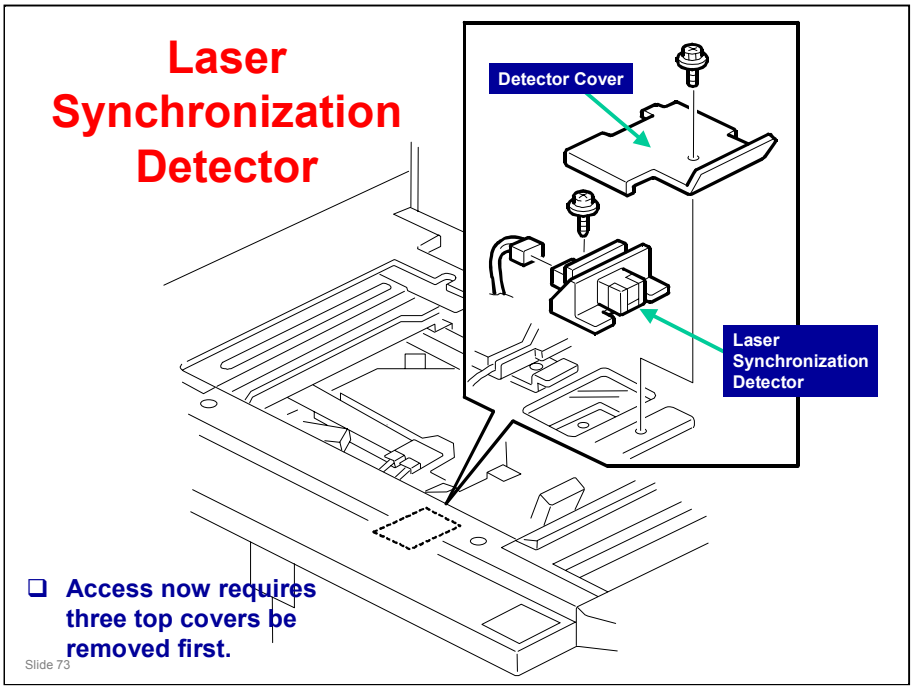
2. Remove the three top covers.

3. Remove LD cover.

4. Remove Polygon mirror motor.

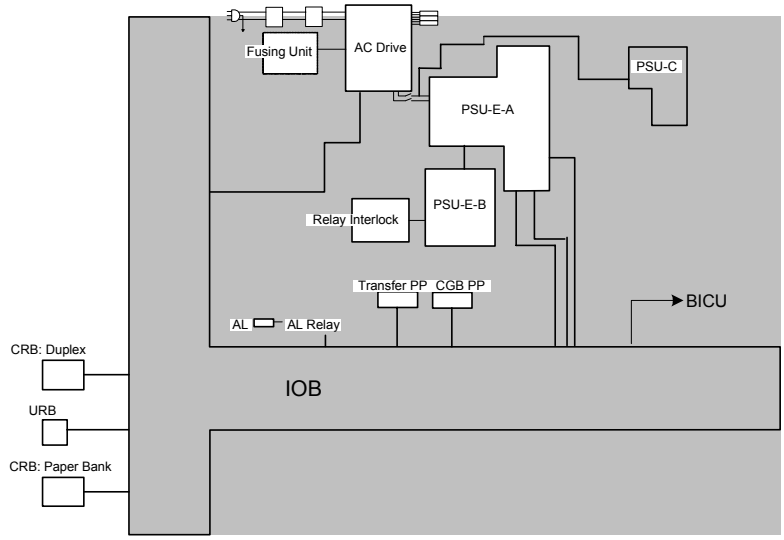
Note: When reinstalling, make sure that the polygon mirror opening faces the right. Never touch the glass surface of the polygon mirror motor with bare hands.

5. After reassembly, do the image adjustments.



1. Turn off the main power switch and unplug the machine.
2. Remove the three top covers.
3. Remove the Detector cover.
4. Laser synchronization detector

Main Boards - 1/3



❑ **See next two slides for details.**

Slide 74

Main Boards - 2/3

- **IOB (Input/Output Board)**
  - Performs three functions:
    - » Converts sensor output from paper bank, toner bank unit, and LCIT, then sends it to BICU.
    - » Converts serial data from BICU to parallel data for control of paper bank, toner bank unit, and LCIT components (motors, solenoids, clutches).
    - » Supplies 24V power supply from PSU to BICU, LCIT, and interlock system for development motor, drum motor, and paper feed motor.
- **AC drive board**
  - Controls AC power for fusing lamps and anti-condensation heaters.
- **PSU-E-A (Power Supply Unit - Engine-A)**
  - Supplies DC power for IOB, LCIT, OPU, and BICU.
- **PSU-E-B (Power Supply Unit - Engine-B)**
  - Supplies DC power for two PSU fans and Relay Interlock Switch.
- **PSU-C**
  - Supplies power to Egret control board.
- **Transfer PP**
  - Transfer Power Pack supplies charge to image transfer roller that pulls image off drum and onto paper.

Slide 75

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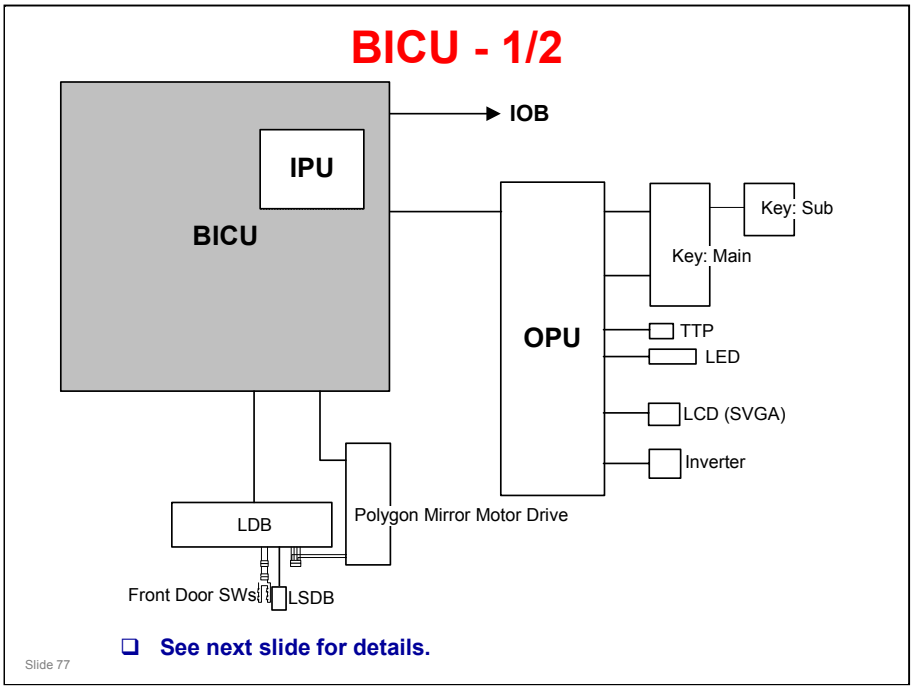
Main Boards - 3/3

- **CGB PP (Charge Grid Bias - Power Pack)**
  - The charge, grid, bias power pack is a dual power pack that supplies high voltage for charge corona wires, grid plate, and development roller.
- **AL Relay**
  - The Attention Light Relay board is installed with Attention Light AL5000 (option) to control operation of attention light.
- **URB (Ultrasound Relay Board)**
  - The Ultra-Sound Relay Board controls operation of double-feed sensors. (There are two sensors. One, an emitter sensor, and the other, a receptor.)
- **CRB: Duplex**
  - The CIS relay board that receives readings of duplex image position sensor, which monitors position of paper in duplex unit.
- **CRB: Paper Bank**
  - The CIS Relay Board that receives input from paper bank
- **CIS (Contact Image Sensor)**
  - Monitors position of paper in paper path.

Slide 76


BICU - 1/2
IOB
IPU
BICU
OPU
Key: Sub
Key: Main
TTP
LED
LCD (SVGA)
Inverter
LDB
Polygon Mirror Motor Drive
Front Door SWs
LSDB
See next slide for details.
Slide 77

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BICU - 2/2

- **BICU - Base (engine &) Image Control Unit**
  - Main control board that controls engine sequence, timing for peripherals, etc.
  - BICU also controls:
    - » High voltage
    - » Duplexing
    - » Paper feed
    - » Paper registration
    - » Fusing
    - » Peripheral interfaces
    - » Drive
    - » Toner supply
- **LDB - Laser Diode Board**
  - Contains and controls laser diodes.
- **OPU - Operation Panel Unit**
  - Controls operation panel and LCD display panel.
- **LSDB - Laser Synchronization Detection Board**
  - Detects when laser is about to start another main scan line across OPC
- **Polygon mirror motor drive board**
  - Controls operation of polygon motor.
- **Front Door Switches**
  - Both switches are wired directly into LDB for safety.
  - Opening either door disables the operation of the LDB.

Slide 78

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RICOH
Controller Details
Slide 79

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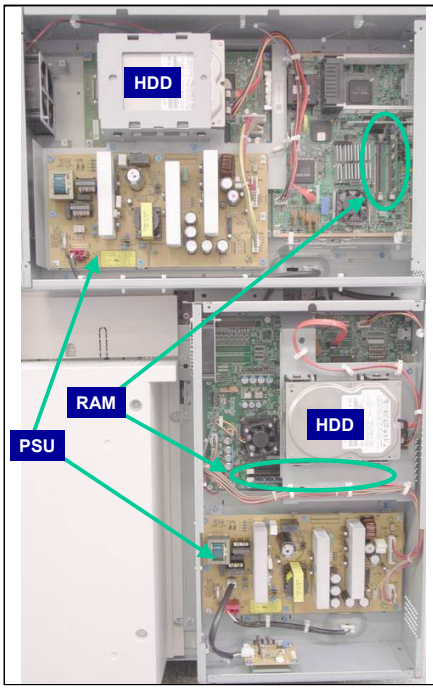
DC Controller - (GW + Egret)

- **DC Controller**
  - DC controller is comprised of GW controller and Egret controller.
  - GW and Egret controllers perform the following functions:
- **GW Controller**
  - Stores job history data
  - Provides temporary data storage during print jobs
  - Manages address book data
- **Egret Controller**
  - Font downloading
  - Stores job history data
  - Print job spooling
  - Image overlay
  - Holds Egret firmware
  - Holds GUI (Graphic User Interface) settings
  - Stores board parameter backup settings
  - Stores error log, events log, maintenance log, E-GAC log (GW I/F log)

Slide 80

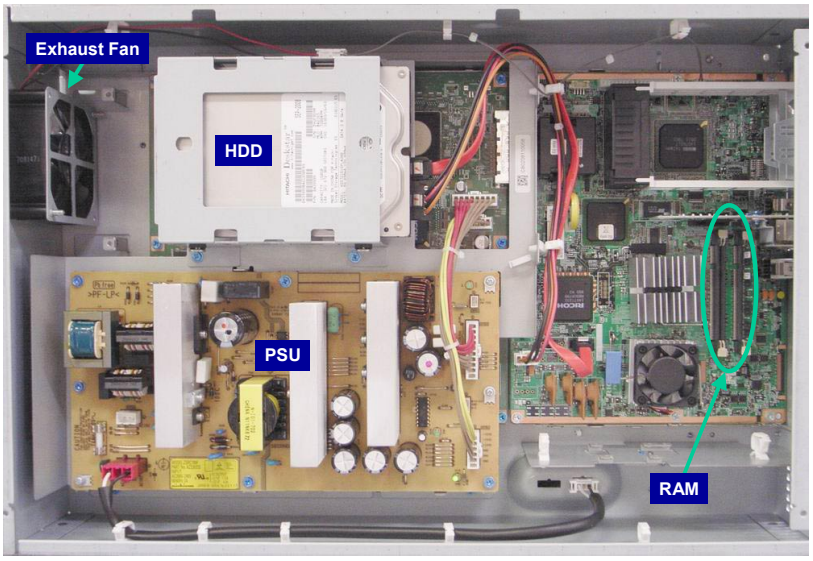


Controller Boxes

- **GW Controller Box is in upper section.**
  - Utilizes short-length memory boards
- **Egret Controller Box is in lower section.**
  - Faster, more advanced CPU (than GW-box CPU)
  - Utilizes long-length memory boards

.

GW Controller Box



- GW Controller Box is horizontally mounted at back of machine (above Egret Controller Box).

Slide

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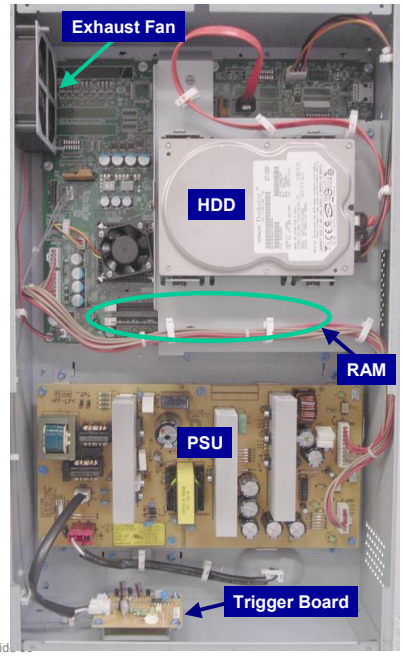
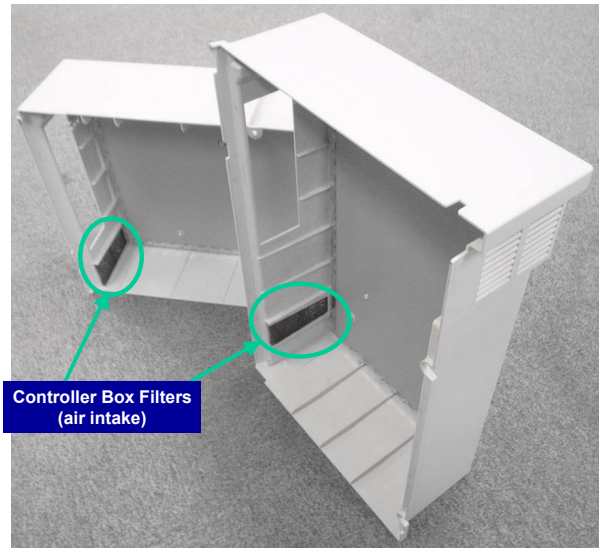


Egret Controller Box

- **Egret Controller Box is vertically mounted on bottom (below GW Controller) at back of machine.**
- **Trigger Board**
  - Detects power loss (of AC power), and signals Egret controller to stop Egret HDD (to protect both hardware and data).

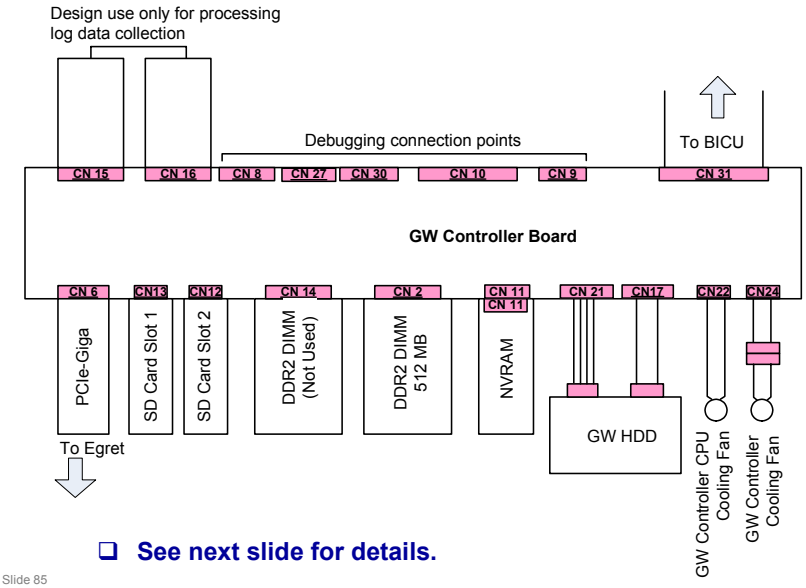
Controller Box Filters



- Each controller box has a filter by its air intake vents.

Slide 84

GW Controller Board - 1/2



❑ **See next slide for details.**

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GW Controller Board - 2/2

- **GW controller board controls:**
  - All devices for memory DIMMs, HDD, and printing.
  - All connection points for easy installation of options.
- **GW controller board also controls:**
  - Printing
  - Document server
  - Image rotation
  - Conversion of all image formats
  - Image compression and decompression
- **DC (Data Center) Controller is comprised of two controller boards:**
  - 1) GW controller (used in copier version of this machine), and
  - 2) Egret controller (new board not used in copier version of this machine).

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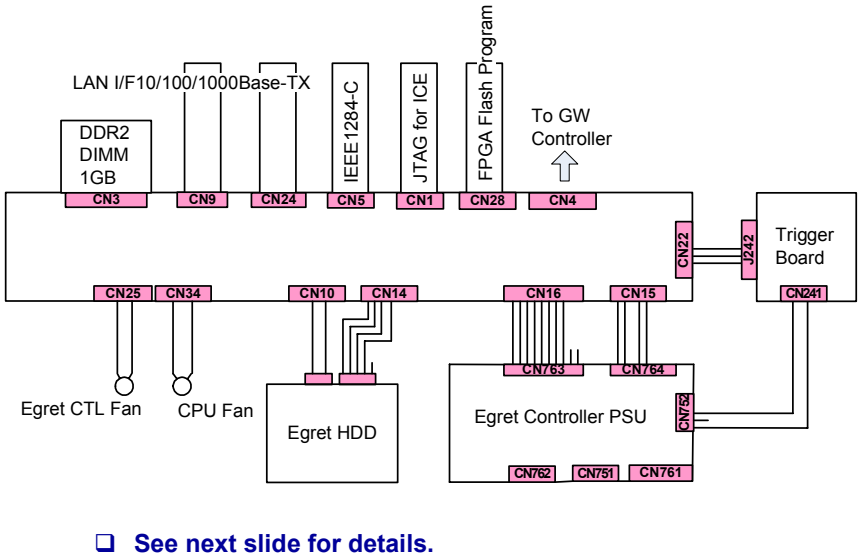
Egret Controller Board - 1/2



❑ **See next slide for details.**

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Egret Controller Board - 2/2

- **The Egret controller:**
  - Controls data processing
  - Supports important features required in production printing market:
    - » VPT (Virtual Printer Technology)
    - » Print Jobs Over 2GB, etc.
    - » These features are available via printer driver. For more information, please refer to operating instructions.
  - This controller board has its own CPU, PSU, HDD, and memory.
  - Trigger board detects loss of power when AC power is cut and signals Egret controller to stop Egret controller HDD.
    - » This stops data processing and prevents loss of data on the HDD.

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RICOH
Replacement and Adjustment
Slide 89

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Firmware Update

- **Both GW Controller and Egret Controller have their own firmware and firmware update procedures.**

- **GW Controller**
  - Firmware is updated via SD card
    - » Firmware updates directly from SD card.
      - – See service manual for details.
- **Egret Controller**
  - Firmware is updated via computer.
    - » Firmware is saved to internal HDD first, and then update procedure is performed from Operation Panel.
      - – See service manual for details.

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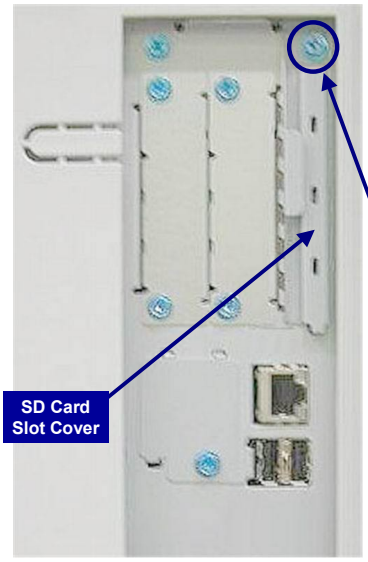
SD Card Slot Cover



- To remove SD card slot cover, first remove single screw holding it in place.

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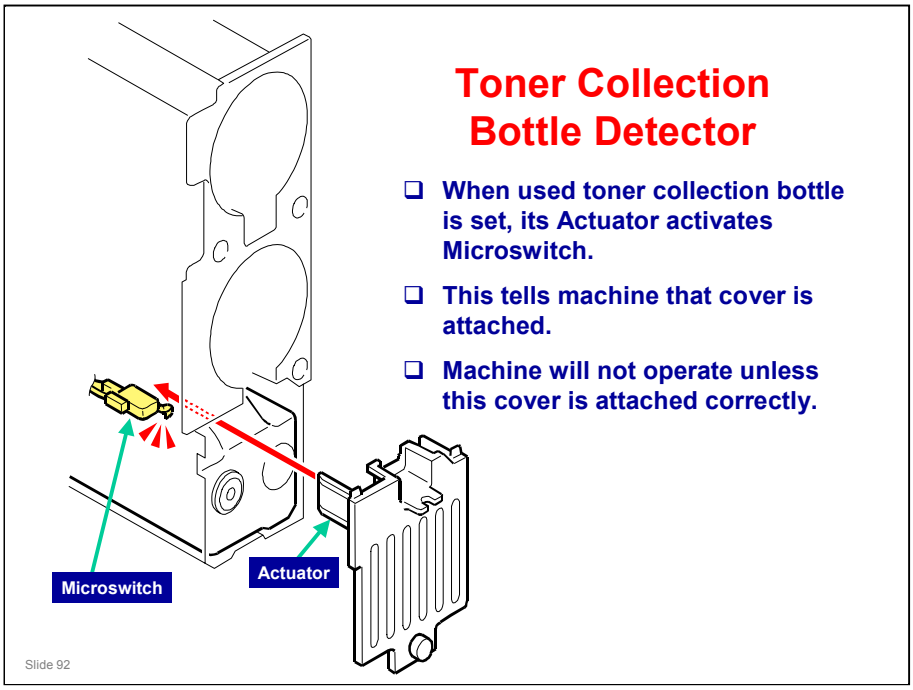
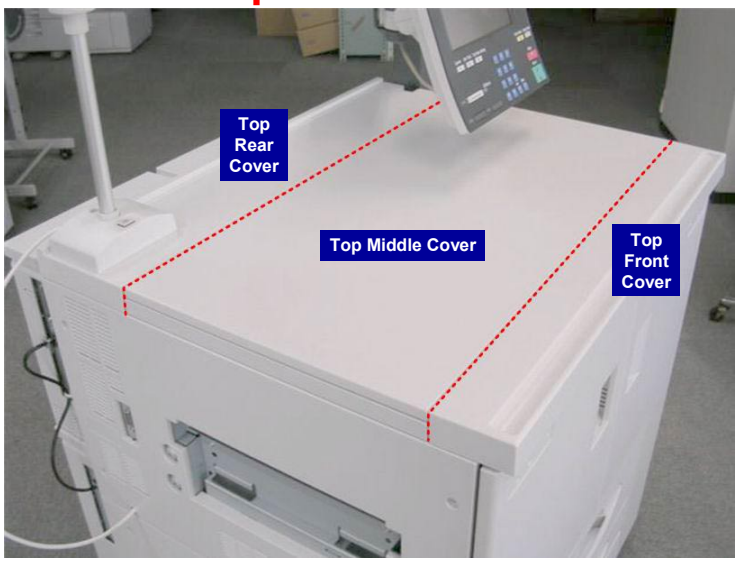


This is a new feature.

Top Covers - 1/4



- There are three top covers: Top Front Cover, Top Middle Cover, & Top Rear Cover

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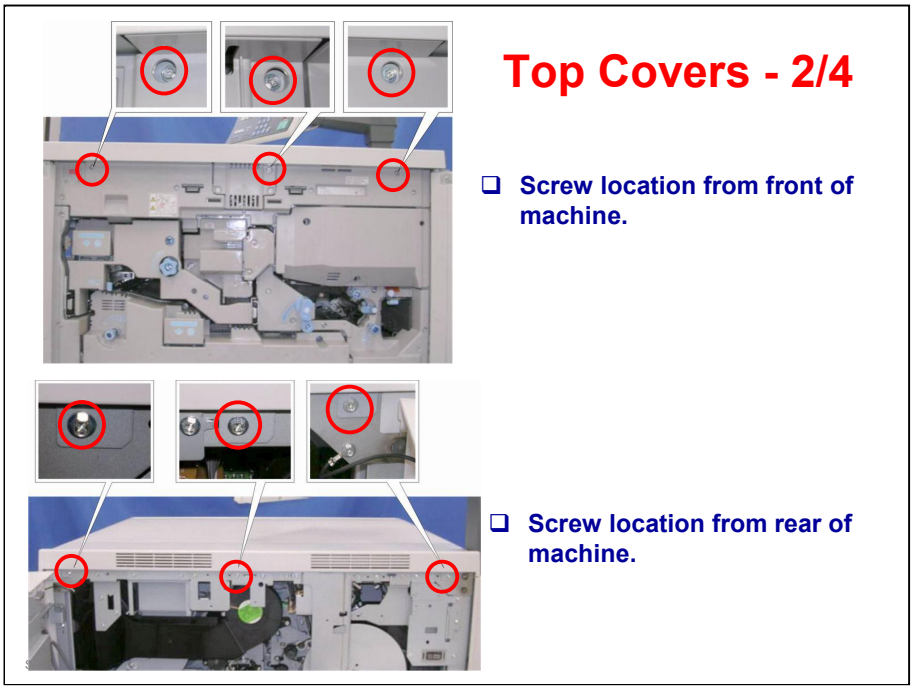
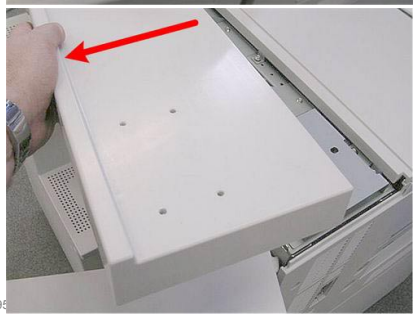
For full top cover removal procedures and photos, see service manual.



For full top cover removal procedures and photos, see service manual.



Top Covers - 3/4

- Front Top Cover
- Rear Top Cover

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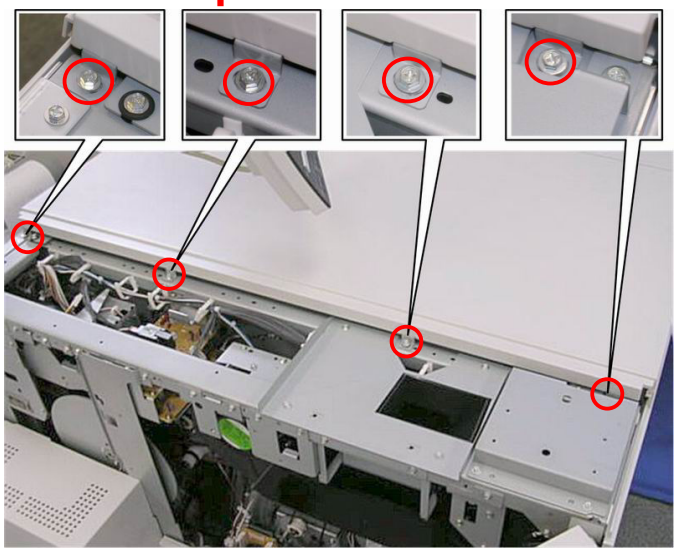
For full top cover removal procedures and photos, see service manual.

Top Covers - 4/4



- Top Middle Cover screw location.

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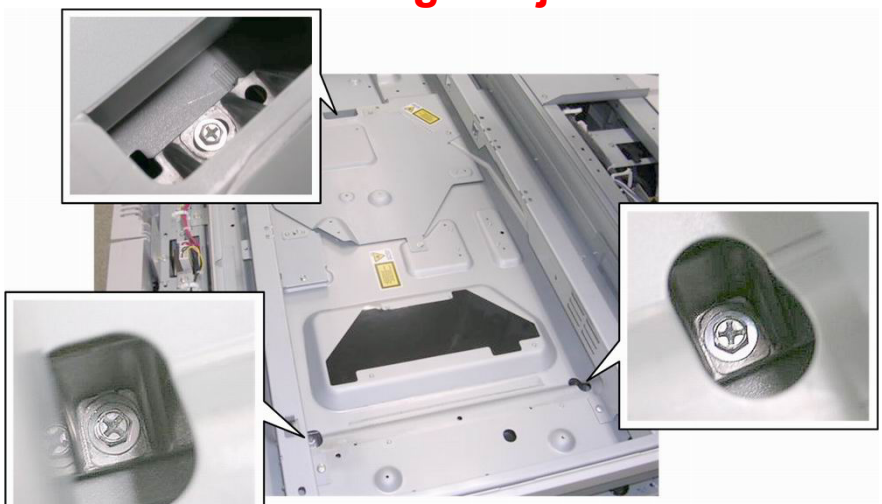
For full top cover removal procedures and photos, see service manual.

Printed Image Adjustment



- Remove top covers. [New]
- Loosen three screws that hold laser unit to make adjustments.
  - See Service manual for details.

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Tandem Tray Side Registration - 1/3

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❑ Remove Right Tandem Tray (not Left Tandem Tray).

Tandem Tray Side Registration

Normally the side registration of the image can be adjusted in the SP mode. If the punch hole positions are not aligned from a particular feed station, however, you can manually adjust the side registration by changing the tray cover position for that tray, and then adjust the side registration of the image (* Image Position Sensors)

1. Remove the right tandem tray. (You do not need to remove the left tandem tray.)

2. Use a stubby driver to remove screws to free plate.

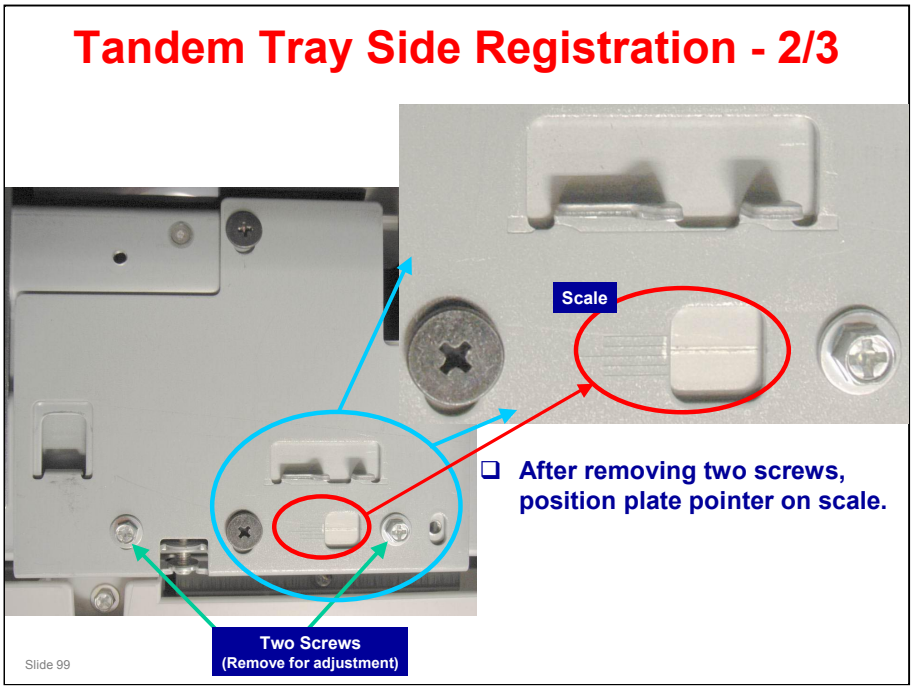
3. Open Tray 2 slightly.

4. Slide the plate to the front or rear and set it at a mark on the scale.

5. You may need to turn the screw clockwise (in - towards the back of the machine) so the full range of movement on the scale is available.

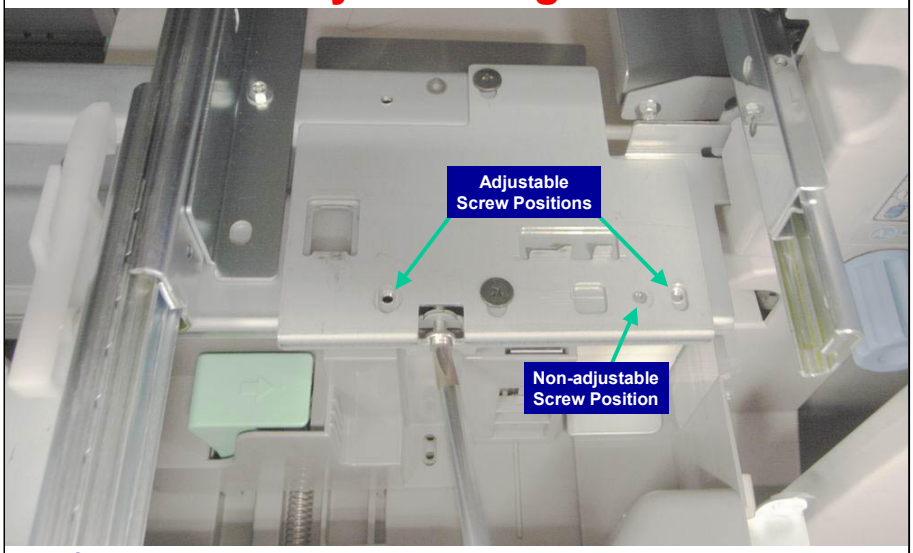
- Removal of two screws in previous step allows only partial movement on scale.

- Rotating stopper screw [C] clockwise until it stops enables the plate pointer to have full range of movement on the scale.



6. Position the plate pointer on the scale.

Tandem Tray Side Registration - 3/3



- **After adjusting, put right screw into adjustable position.**
  - Non-adjustable (original) position is standard setting (before adjusting).

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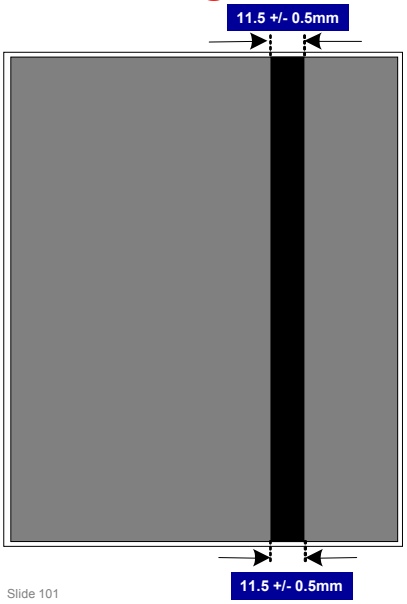
7. Turn screw counter-clockwise until it stops and holds the new plate position.

8. Re-attach the screws removed in Step 2.

- Re-attach the left screw at its original position.

- Re-attach the right screw through the oval hole (not the original round hole) and tighten it.

Fusing Pressure Adjustment - 1/2



- Enter SP Mode
- Do SP-1109 (Fusing Check) and switch fusing nip band check mode 'ON'.
- Select "All Black" test pattern with SP2902-003, Pattern 023.
- Do SP5990-005 to print black sheet. Black sheet will stop between hot roller and fusing roller for 30 seconds to form a dark band (and then exit).
- Measure nip band width (shiny band) at each end (not center).
  - Measurement should be 11.5 ± 0.5 mm at both ends.
- Note: The nip width should be 11.5 mm ± 0.5 mm, with a differential between front and rear of less than ± 0.5 mm.

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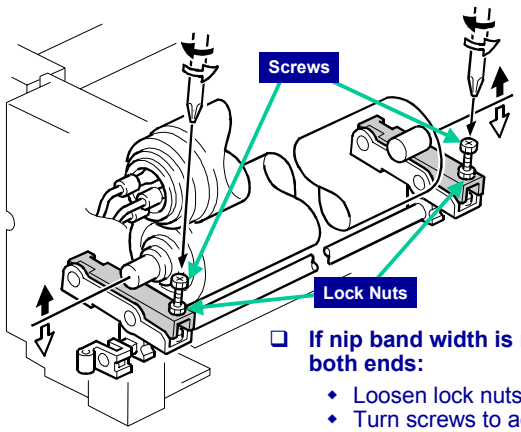
This is a New Procedure.



Fusing Pressure Adjustment 2/2

- **If nip band width is not within specifications at both ends:**
  - Loosen lock nuts.
  - Turn screws to adjust pressure.
    - » Clockwise increases pressure
    - » Counterclockwise decreases pressure
  - Re-tighten nuts after adjusting.
  - Repeat procedure (previous slide) to check width of nip band.

- **Important: SP1109 switches to OFF automatically after leaving SP mode. However, if other test prints are to be made in SP mode, be sure to switch SP1109 off before doing another procedure.**

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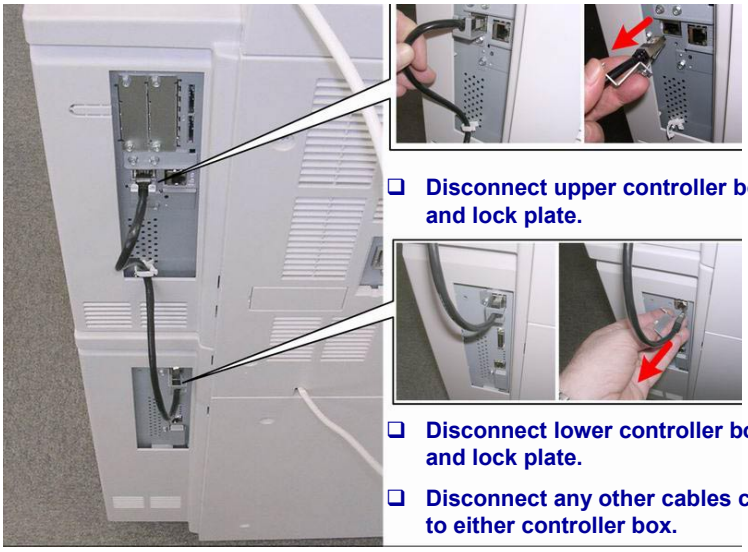
Controller Box Removal - 1/6



- Disconnect upper controller box cable and lock plate.

- Disconnect lower controller box cable and lock plate.
- Disconnect any other cables connected to either controller box.

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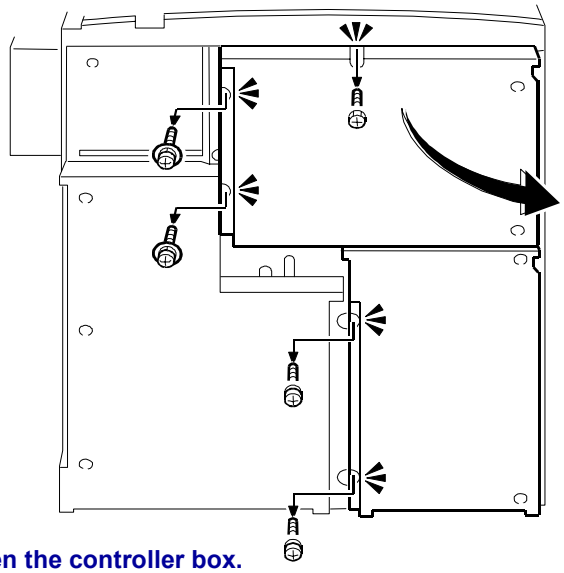
Controller Box Removal - 2/6



- Open the controller box.

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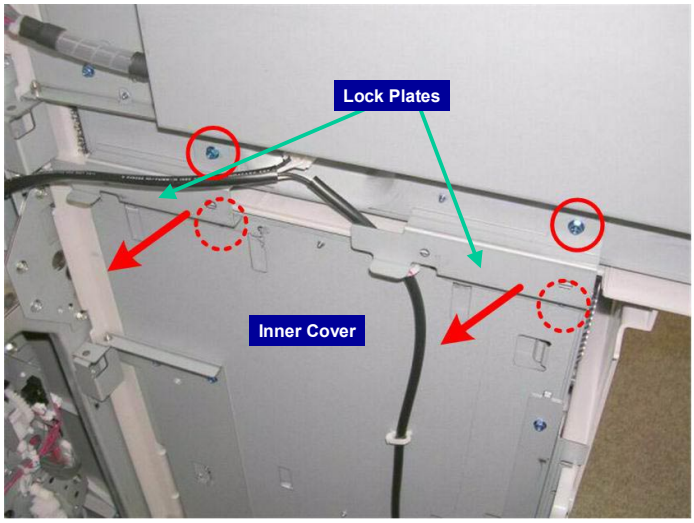
Controller Box Removal - 3/6



- **Remove lock plates, and then inner cover.**
  - Inner cover screws under lock plates.

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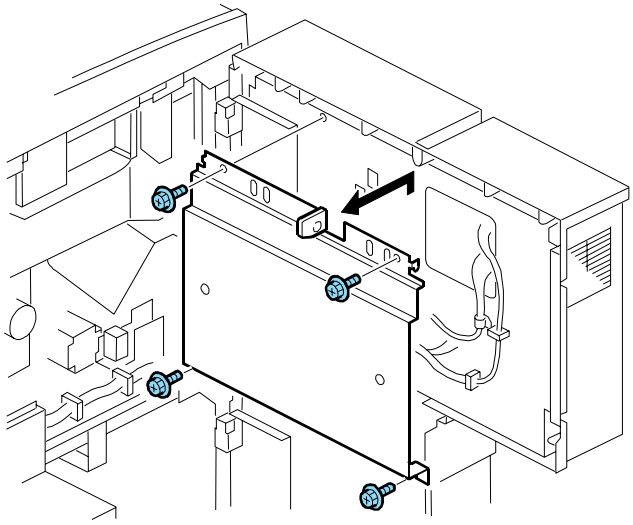
Controller Box Removal - 4/6



- Remove harness cover

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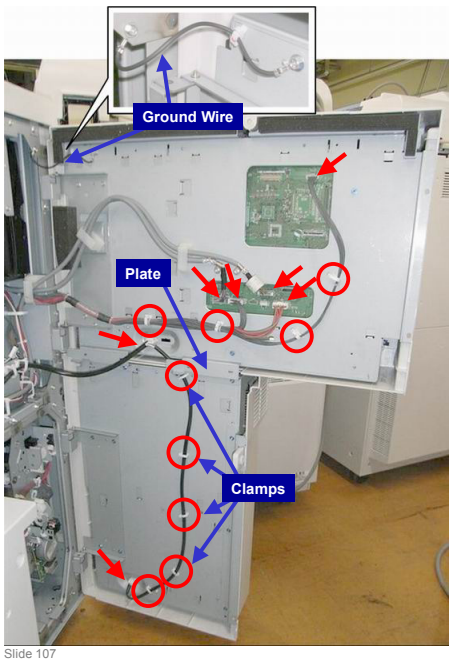

Controller Box Removal - 5/6

- Disconnect clamps
- Disconnect ground wire

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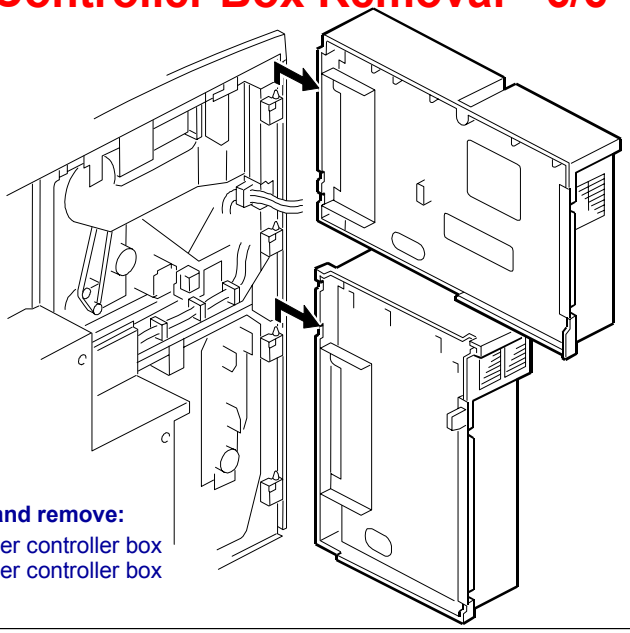
Controller Box Removal - 6/6



- **Lift off and remove:**
  - Upper controller box
  - Lower controller box

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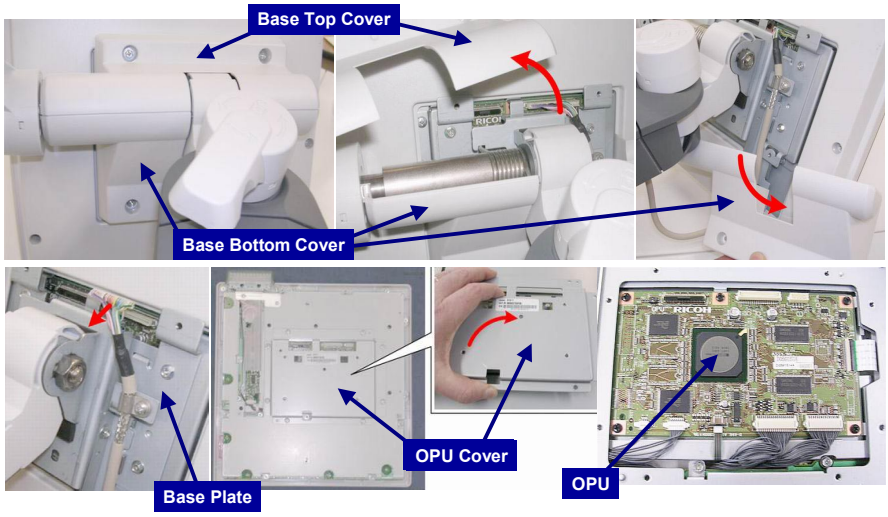
OPU PC Board Access



- **The OPU (Operation Panel Unit) PC board is accessed by removing several covers.**
  - See service manual for details.

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SP Codes

- **2930 (001-008) - 2nd Cleaning Blade**
  - 2nd cleaning blade is provided to reduce incidence of spotting in printed images.
  - These SP codes control time interval between 2nd blade cleanings and length of time blade is held against surface of drum.
  - Note: Shortening interval between cleanings and increasing time 2nd cleaning blade is held against drum can slow productivity.
    - » With B4, this was determined by page count, while with P1, it is the time in seconds.
- **5185 TCRU: Set Machine**
  - Determines whether machine is TCRU compatible or not.
  - [0: OFF] [1: ON]

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User Service Program Mode Tables

- **Adjustment Setting for Operators, or Skilled Operators**
  - There are two procedures for opening adjustment settings menus:
    - » One for Operators
    - » One for Skilled Operators
  - The number of items displayed for selection is determined by which method is used.
  - See the following documentation for details:
    - » "Adjustment Item Menu Guide: TCRU"

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Line Speed Adjustment for Thick Paper

- **Selection in Operator Settings menu of User Tools allows operator to slow line speed when printing on thick paper.**
- **Slower line speed increases length of time required for paper to pass through nip of hot roller and pressure roller.**
- **This improves toner fusing on thick paper.**
  - Press [User Tools] on operation panel
  - Touch "Adjustment Settings for Operators"
  - Touch "[108] Adjust Line Speed"
- **Three selections are available: Normal> Slower> Slow**
  - Note: These settings correspond to three settings that can be adjusted with SP-5160.

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RICOH
Specifications
(New Items Only)
Slide 113

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Specifications (Main Engine) - 1/3

- **Print Technology**
  - 4-channel CCD array
  - Electro-photographic printing
  - Dual-component toner development
- **Print Speed**
  - M002 - 90 ppm
  - M003 - 110 ppm
  - M004 - 135 ppm
- **Print Resolution**
  - 300, 600, 1200 dpi
- **Maximum Printable Area**
  - 307 x 408 mm (12.1 x 16.1 inch)
- **Toner**
  - Toner bottles
    - » Two

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Specifications (Main Engine) - 2/3

- **Input Capacity (sheets)**
  - Standard
    - » Tray 1: 2,200
      - – (two tandem trays, 1,100 each)
    - » Tray 2: 500
    - » Tray 3: 500
  - LCIT A4/LT
    - » Tray 4: 1,000
    - » Tray 5: 1,000
    - » Tray 6: 2,550
  - LCIT A3/DLT
    - » Tray 4: 1,000
    - » Tray 5: 2,000
    - » Tray 6: 1,000
  - Multi Bypass
    - » Tray 7: 500
  - System Maximum
    - » 8,250 sheets with LCIT A4/LG
    - » 7,700 sheets with LCIT A3/DLT

- **Output Capacity**
  - Finisher
    - » 3,000 + 500 sheets
  - Booklet Finisher
    - » 2,500 + 250 sheets
  - High Capacity Stacker
    - » 5,000 + 250 sheets
    - » 10,000 + 250

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LCIT - Large Capacity Input Tray

Specifications (Main Engine) - 3/3

- **Memory**
  - RAM (Random Access Memory)
    - » GW Controller
      - – 512 MB
    - » Egret Controller
      - – 1 GB
- **Data Storage**
  - HDD (Hard Disk Drive)
    - » GW Controller
      - – 160 GB
    - » Egret Controller
      - – 160 GB
- **Size (w x d x h)**
  - Maine Machine (with Attention Light AL5000 installed)
    - » 870 x 60 x 1550 mm
    - » 34" x 34" x 54.1"

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LCIT - Large Capacity Input Tray

Specifications (GW Controller)

- **CPU**
  - Intel PentiumM 1.4 GHz
- **RAM**
  - 512 MB
- **HDD**
  - 160 GB
- **Connectivity (host Interface)**
  - 100 Base-TX/10Base-T
  - USB Host I/F
  - 1000 Base-T (Connects GW and Egret controller boards)
- **Network Protocol**
  - TCP/IP
- **MIB Support: TBA**

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Specifications (Egret Controller) - 1/2

- **CPU**
  - Freescale MC7448 1.7 GHz
- **RAM**
  - 1 GB
- **HDD**
  - 160 GB
- **PDL**
  - Standard: PCL6, PCL5e, Adobe PostScript3
  - Option: IPDS
- **Continuous Print Speed**
  - M002 - 90 ppm
  - M003 - 110 ppm
  - M004 - 135 ppm
- **Print Resolution: 1200 dpi (max.)**
- **Fonts**
  - PCL: 80
  - PS3: 186

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Specifications (Egret Controller) - 2/2

- **Connectivity (host Interface)**
  - 1000 Base-T
  - 100 Base-TX
  - 10 Base-T1
  - IEEE1284
- **Network Protocol**
  - TCP/IP
  - AppleTalk
- **MIB Support: TBA**
- **Network OS**
  - Windows 2000
  - Windows Server 2003
  - Windows Server 2008
  - Windows XP
  - Windows Vista
  - MacOS x 10.5 or later

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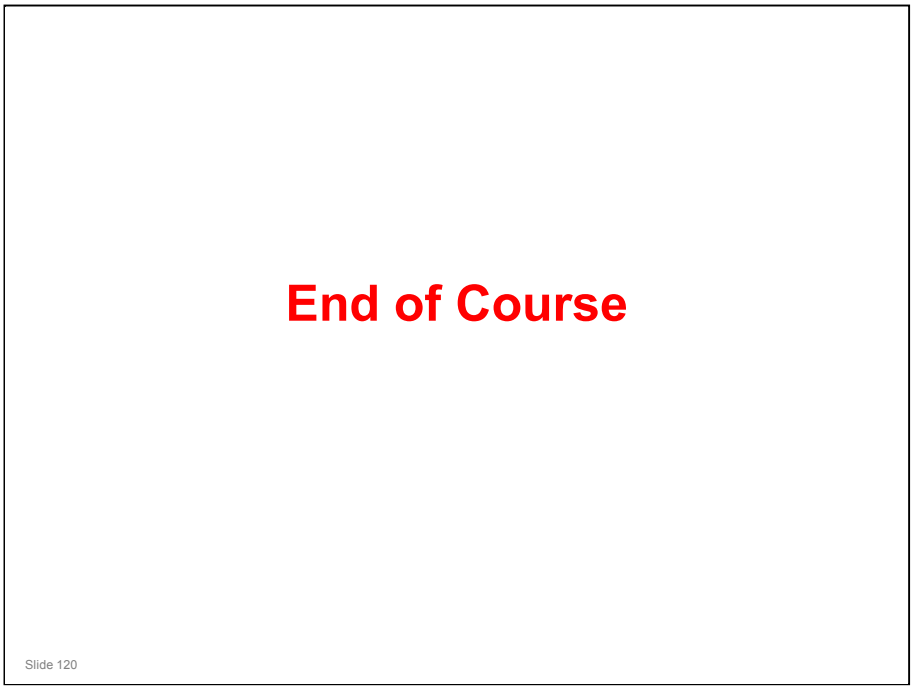
End of Course
Slide 120