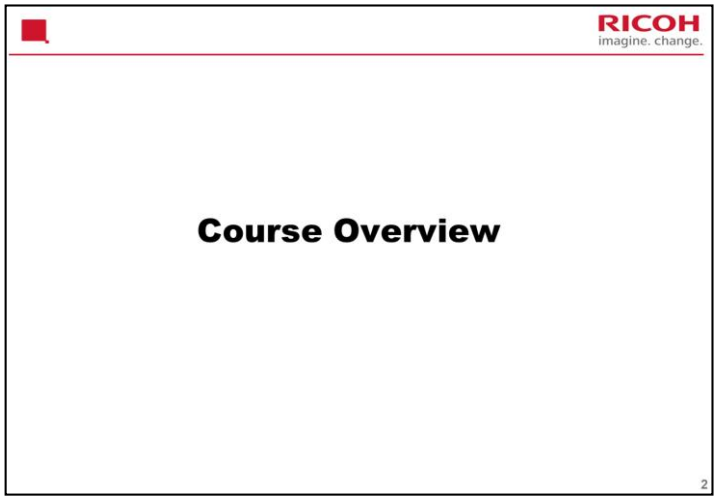
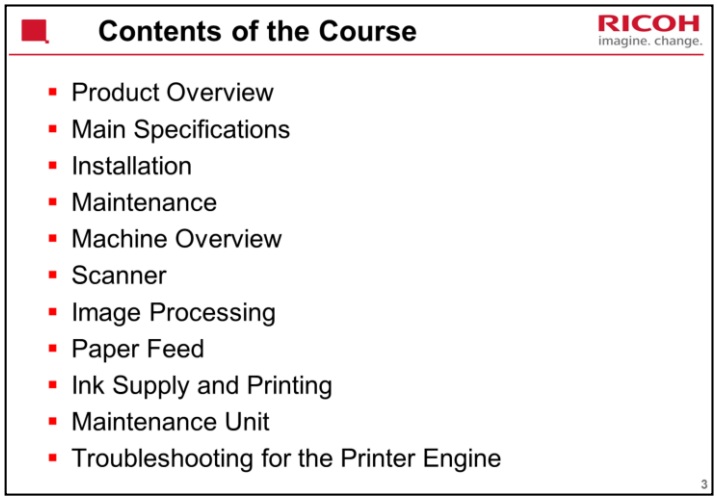
This is a service training course for the Mo-C2 color copier. This is a full course.



This section provides an overview of the sections of the training course.



The Operation Details section contains detailed descriptions of certain procedures, such as power on initialization, paper roll initialization, and so on.

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

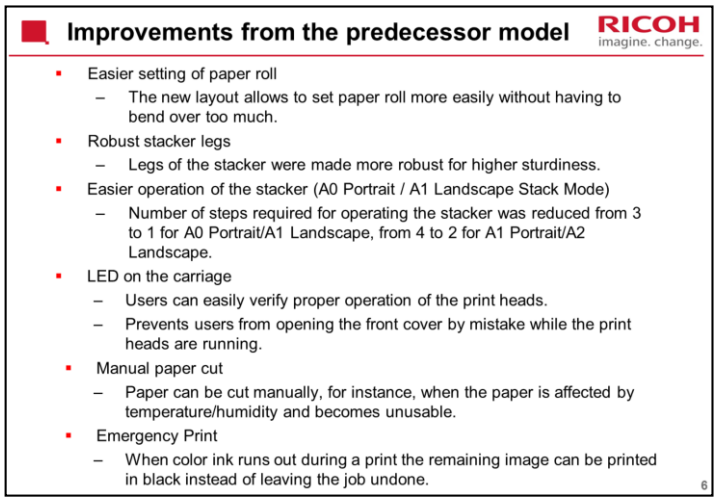
What Models are there in the Series?

RICOH imagine. change.

- Mo-C2 (D262): MP CW2201 SP
  - Output speed (A1 LEF, high speed mode):
    - 3.8 ppm (black-and-white), 2.0 ppm (color)
    - 5 sheets A1 LEF in 101 s (black-and-white), 175 s (color)
    - 5 sheets D LEF in 104 s (black-and-white), 169 s (color)
    - First copy: Less than 31 s
  - Warm-up time: Less than 40 s (23 degrees C)
  - Paper thickness: 51 to 220 g/m2
  - Durability: 72 km
  - Paper Size:
    - Width: 210 to 914.4 mm (8.3 to 36 in)
    - Length 210 to 15,000 mm (8.3 to 591 in.)
- Contains scanner and printer kits as standard equipment
- Contains one roll unit, bypass feed, an original stacker and a printout exit stacker as standard equipment.
- Supports SDK solutions such as Global Scan NX.

The warm-up time includes time for the controller to start up.

Output speed: For printing, there are three types: standard, quality, and high speed, selectable with the printer driver. For copying, there is high speed and standard only.

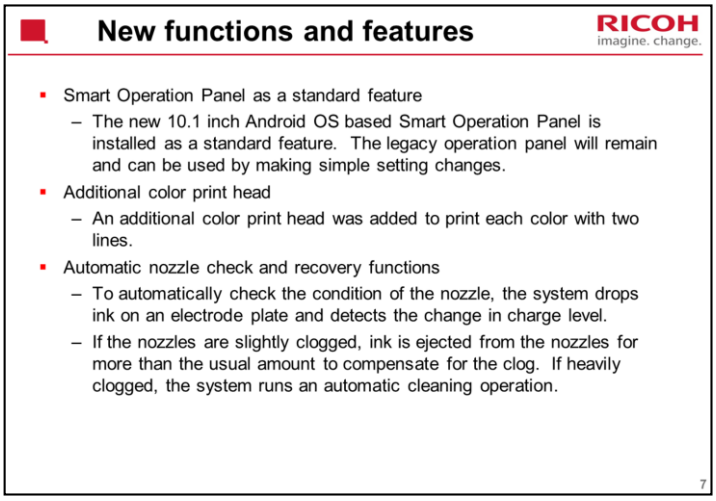


Additional Features

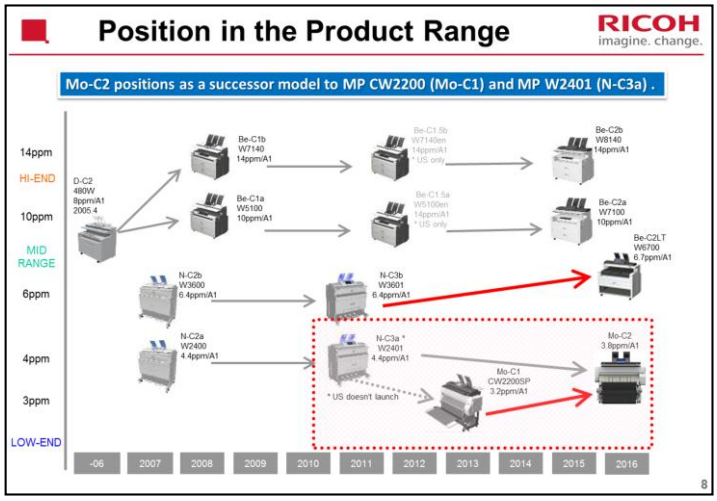
Full front operation

Increased languages from N-C3 (Brazilian Portuguese and Greek support)

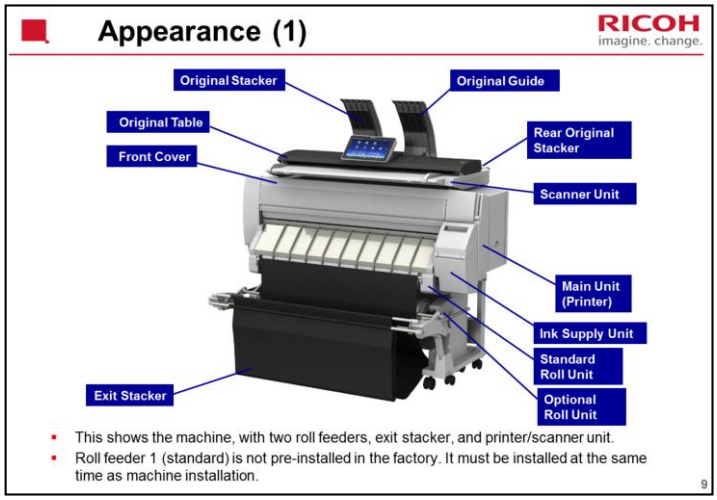
HDD overwrite/encryption functions are standard



No additional notes



This is an office color machine, not a professional color machine.



In this photo, the standard roll unit is obscured by the ink supply unit.

Roll unit: Also known as a roll feeder unit.

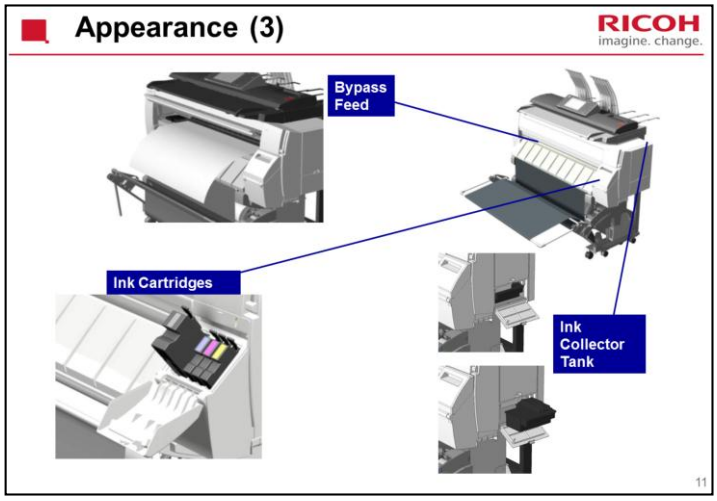
Appearance (2)

RICOH
imagine. change.

- The exit stacker can be folded.
- The operation panel and scanner unit can be separated from the main unit and put on a table or a separate stand.

10

The operation panel and scanner unit cannot be turned around so that the exit is the other side of the machine from the operator.



Ink Collector Tank

Capacity: 425 cc

Replace every 8,000 m (APV: 360m, Color ratio: 10%, Coverage: B/W 6%, CMYK 5% each)

Replaced by users

Ink cartridges

Cartridge Capacity: Black 180ml, CMY 80m

Target Yield (A1 LEF, APV = 360m, 1P/J, Coverage B/W= 6% Color= 5%x4C=20%, Usage ratio Black 90% Color 10%):

Black: 774 Copies, 460 m

Cyan: 342 Copies, 203 m

Magenta: 347 Copies, 206 m

Yellow: 355 Copies, 211 m

Warranty period

Unopened: 24 months

Opened: 6 months

Environment

Storage: Temperature -30 to 43 degrees Celsius, Humidity 15 to 80%

Use: Temperature 10 to 32 degrees Celsius, Humidity 15 to 80%

Transport: Temperature -30 to 50 degrees Celsius, Humidity 15 to 90%

Front View

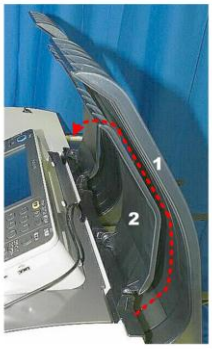
RICOH
imagine. change.

1. Original Stacker
2. Operation Panel
3. USB Cable
4. Scanner Unit
5. Original Table
6. Front Cover
7. Paper Exit Guide
8. Paper Holding Lever
9. Ink Cartridge Cover
10. Exit Stacker

12

No additional notes

Original Stacker



d124f004

- As each original is scanned, the original guide (1) guides it to the original stacker (2) on top of the machine.
- If the original guide is removed, the original feeds out to the rear.

13

No additional notes

Scanner Unit Cover

RICOH
imagine. change.

- The scanner unit opens easily for removal of paper jams (1).
- It can also be opened to the full vertical position (2) for servicing
  - This requires disconnection of the arms on the left and right.

14

No additional notes

Original Table

RICOH
imagine. change.

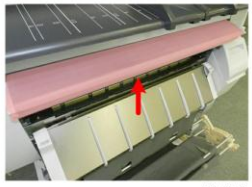
- The plates on the original table of the scanner unit can be adjusted to accept originals up to 914.4 mm (36 in.) for scanning.
- Original length is limited to 15 m (49 ft.)

15

The SMC list from the factory is attached under the right hand side of the original table.

Front Cover - 1

RICOH
imagine. change.

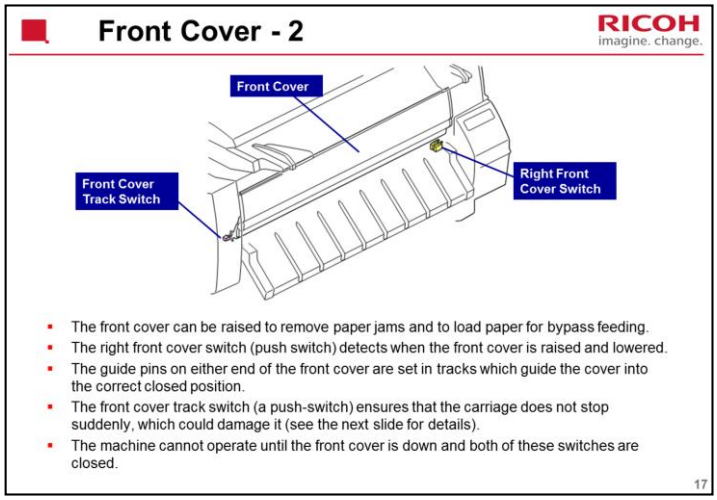


d124f010

- The front cover can be easily raised to expose the platen for cleaning and jam removal.
- The front cover locks in place and remains open after it has been raised, as shown on the left.
- Two sensors (micro-switches) on each end of the front cover detect when the cover is opened and closed.
- To open the front cover, lift it and then fold the bottom into the machine so that it locks and remains open, as shown on the right.
- Do not open during operation, or copying/printing will stop.

16

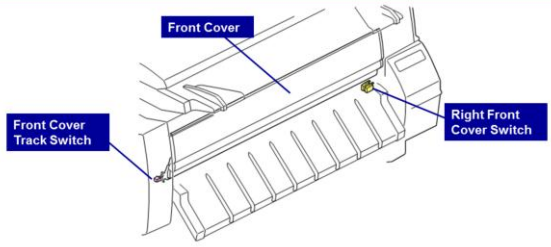
No additional notes



No additional notes

Front Cover - 3

RICOH
imagine. change.

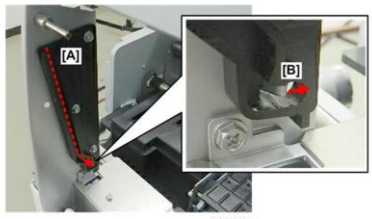


- If the front cover is opened during copying, the front cover track switch opens first. When the machine detects this, the carriage slows down.
- Then, when right cover switch opens, the carriage stops.
- This mechanism ensures that the carriage will not stop suddenly if the cover is opened.
- The carriage will not start again until the track switch closes again.

18

No additional notes

Front Cover - 4



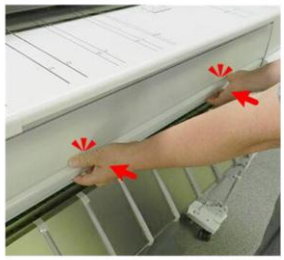
d1241029

- Front cover track switch: When the pin on the left of the front cover is inserted correctly into its track [A], it slides down and pushes a micro-switch [B] to the rear. This signals that the front cover is installed correctly.
- If the switch stays open when the front cover is down, this indicates that the cover is not correctly set in the track.

19

No additional notes

Front Cover - 5



d124i308

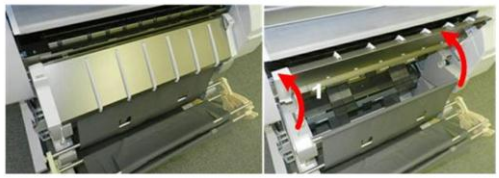
- When you close the front cover, push it in and make sure that it locks.

20

No additional notes

Paper Exit Guide - 1

RICOH
imagine. change.



- This guides printed paper from the machine into the exit stacker at the front of the machine.
- Two magnets on either end of the guide hold it in place when it is open.
- A microswitch on the right detects when the guide is opened and closed.
- Do not open during operation, or copying/printing will stop.

21

No additional notes

Paper Exit Guide - 2

RICOH
imagine. change.

d1241030

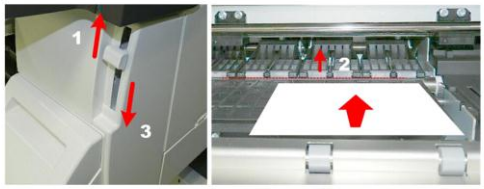
- A torque limiter on the right hinge of the paper exit guide acts as a damper to slow the descent of the guide after it is separated from the lock magnet above.
- This prevents the guide from falling abruptly.

22

No additional notes

Paper Holding Lever

RICOH
imagine. change.



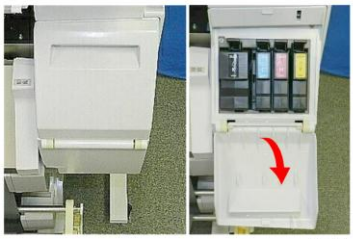
- The right side of the platen functions as the bypass feed station.
- If you lift the paper holding lever [1], the idle rollers above the registration rollers [2] lift, so that cut-sheet paper can be loaded on the right side of the platen.
- Lowering the lever [3] clamps the paper in position for paper feed.

23

No additional notes

Ink Cartridge Cover

RICOH
imagine. change.

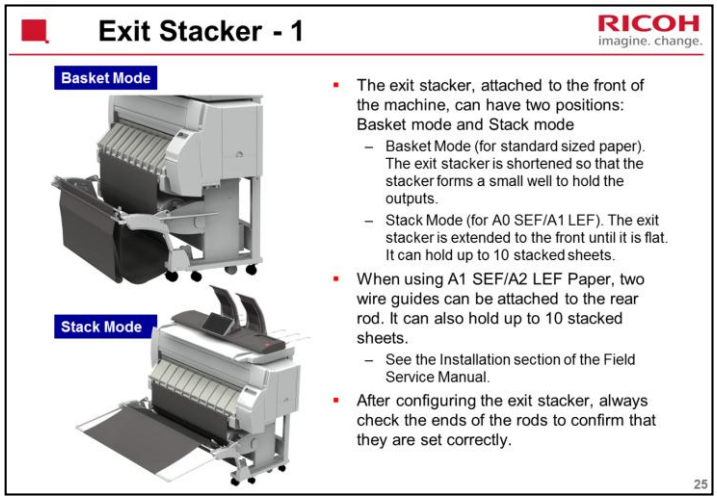


d124f013

- The ink cartridge cover can be opened and closed to insert and remove the four ink cartridges.
- A small sensor (micro-switch) detects when this cover is opened and closed.

24

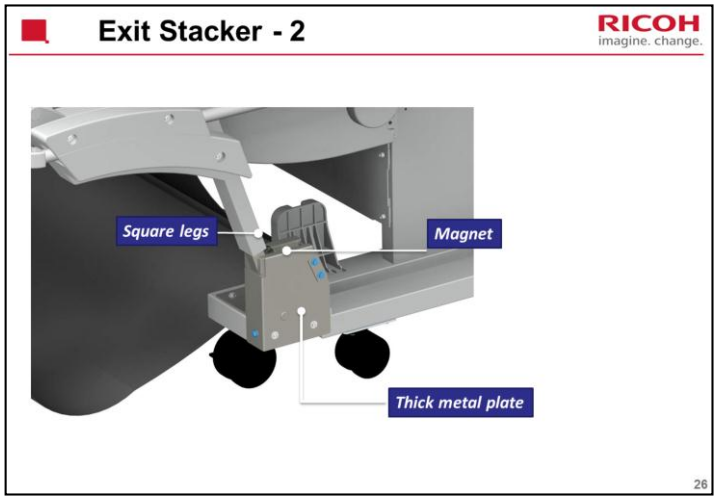
No additional notes



Basket mode: Capacity depends on paper size. Here are some test results.

A0 SEF: 2 sheets

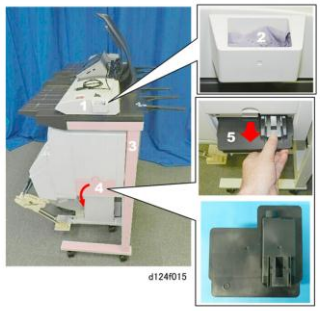
A1 SEF: 6 sheets



No additional notes

Right Side View

RICOH
imagine. change.



- The optical cloth holder [1] holds the accessory optical cloth [2] which can be used to clean the exposure glass.
- The scanner stand [3] holds the scanner unit above the main unit.
- The ink collector tank cover [4] can be opened and closed to insert and remove the ink collector tank [5].

27

No additional notes

Left Side View

RICOH
imagine. change.

d124f016

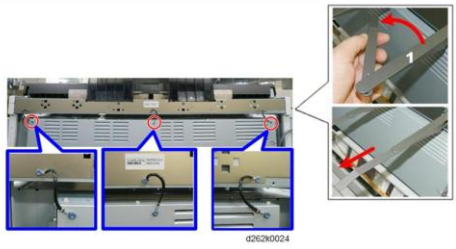
- The power cord [1], power switch [2], and manual pocket [3] are on the left side of the machine.
- This is the only power switch that can cycle the machine off and on.
- After the power switch is turned off, the system does a safe shut down. 'Please wait' appears on the operation panel. This prevents hard disk damage and makes sure that the carriage gets back to home position.

28

No additional notes

Rear View

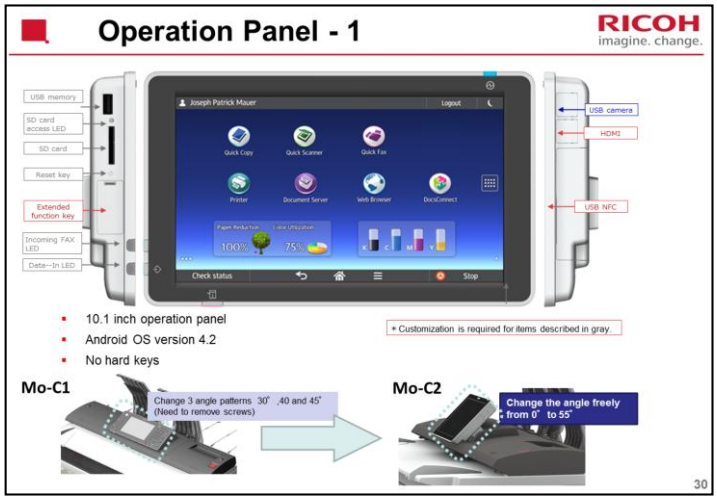
RICOH
imagine. change.



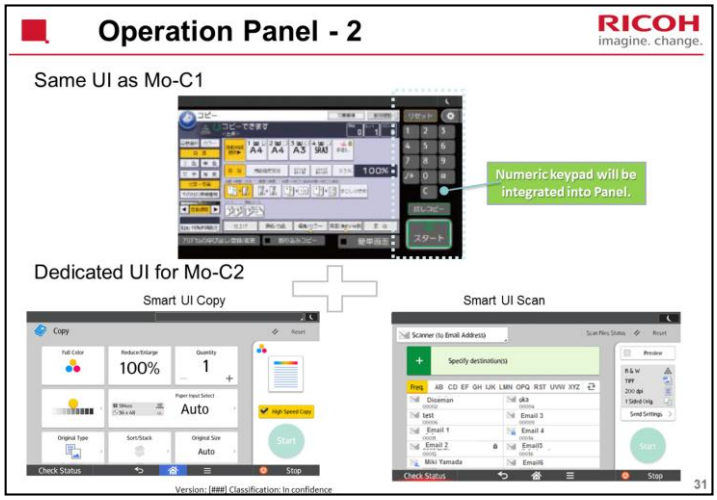
- Four rear output guides [1] can be attached to the back of the machine to hold originals that exit from the back of the machine.
- The PCB box cover [2] covers the area where the controller board and all other PCBs are mounted on the back of the machine.
- Three braided ground harnesses are connected with screws to the back of the scanner unit and the PCB box cover.

29

No additional notes



No additional notes



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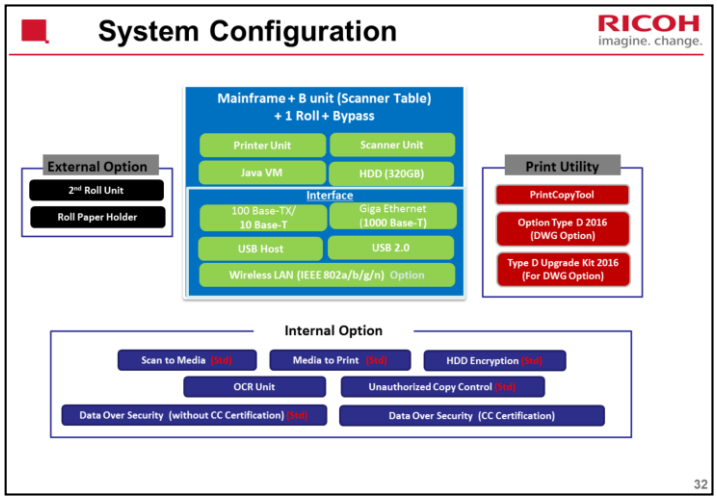

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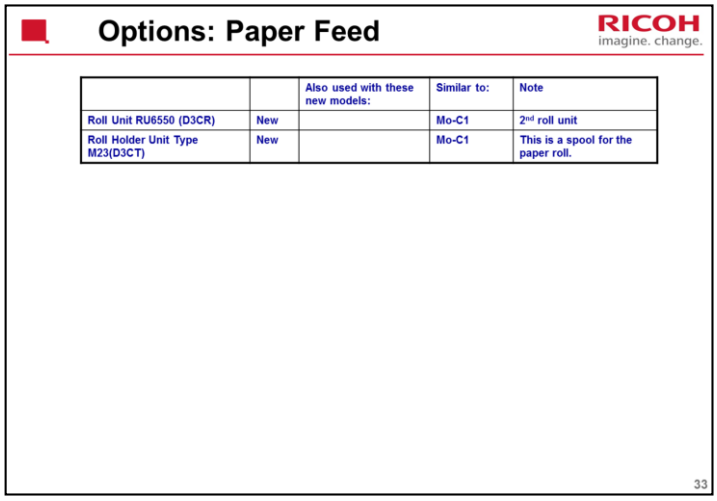
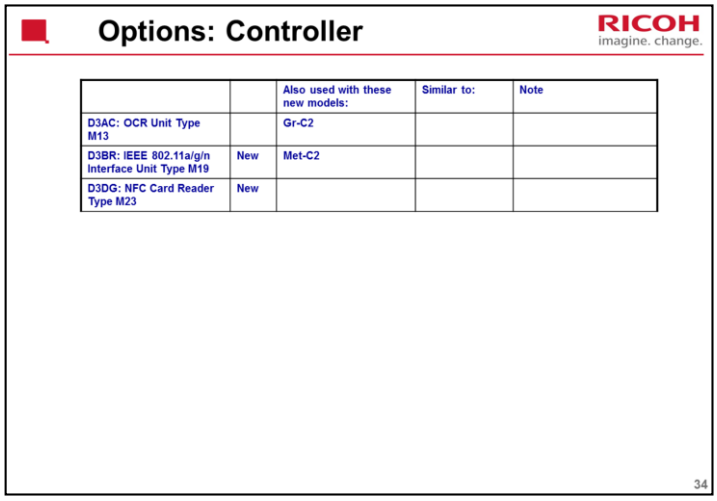
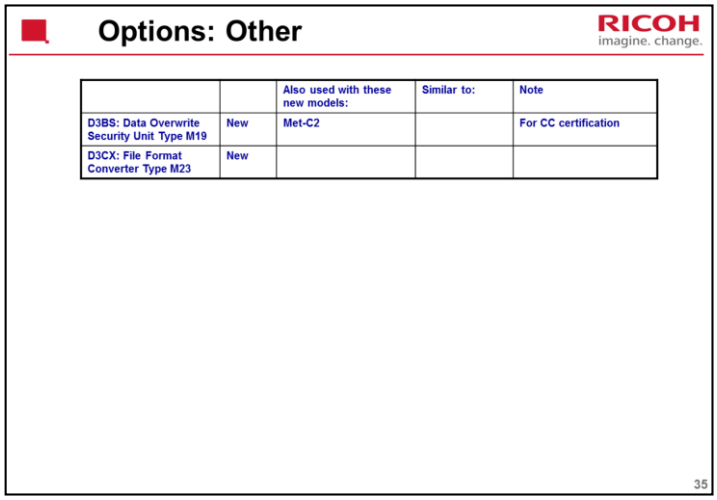


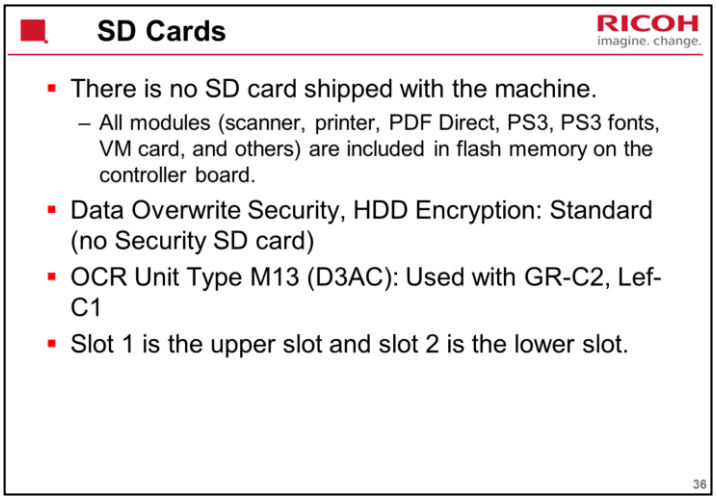
In the Mo-C1, the customer has to change the position of the pawls depending on the roll type. For the Mo-C2, this is not necessary.



No additional notes



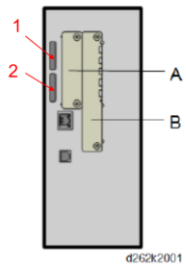
No additional notes



No additional notes

Slots

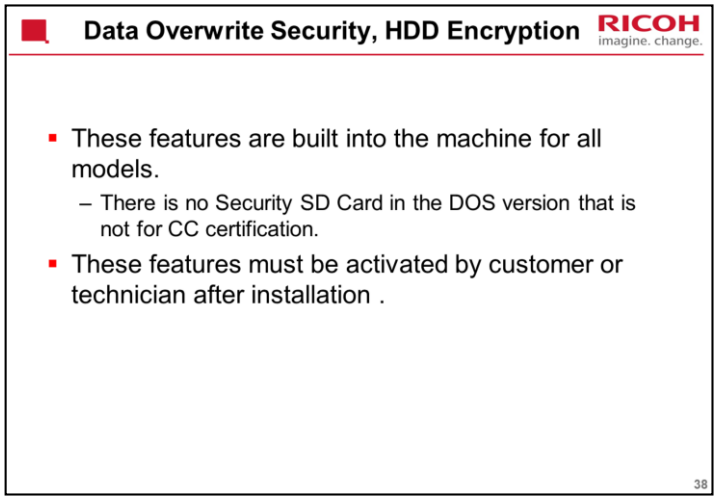
RICOH
imagine. change.



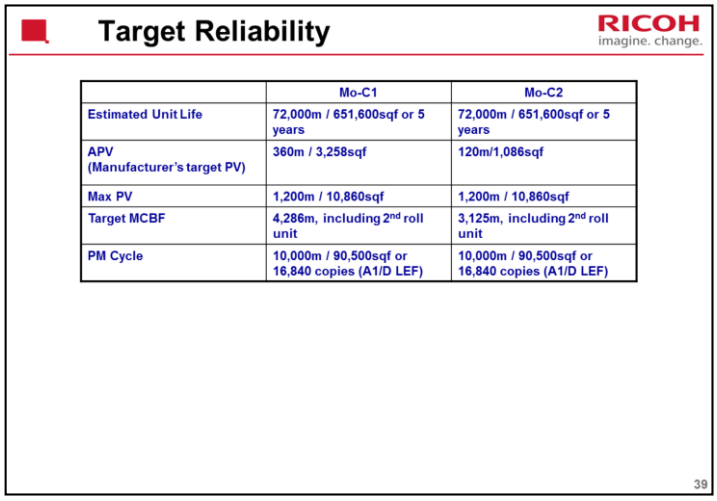
- Board slots
  - Slot A: Wireless LAN
  - Slot B: File Format Converter
- SD card slots
  - Slot 1: Option slot
  - Slot 2: Service slot
  - Option SD cards must go into slot 1. If more than one card is used, the modules must be merged onto one SD card.

37

No additional notes



No additional notes



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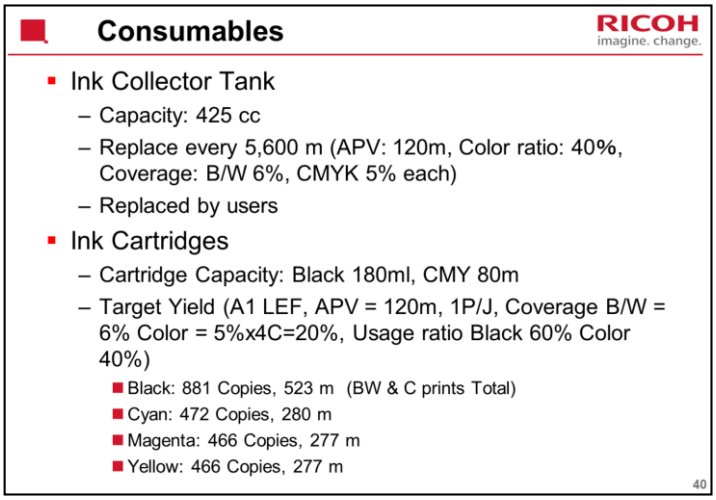
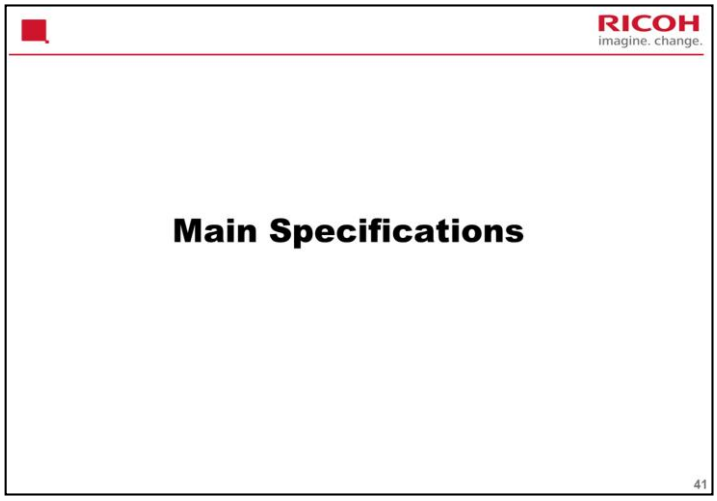
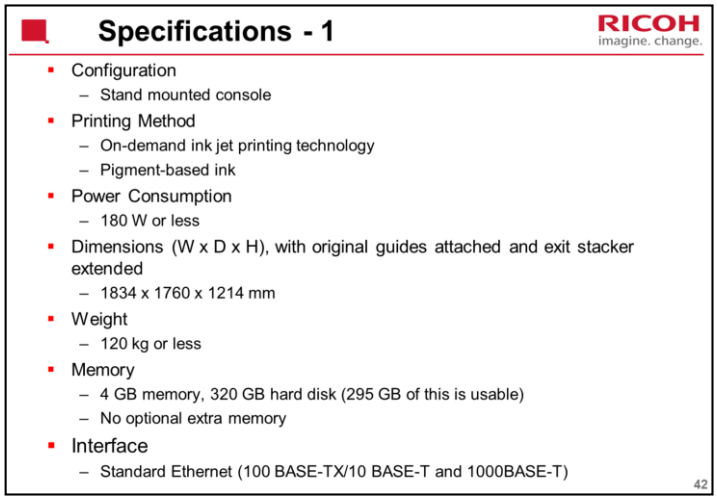


No additional notes

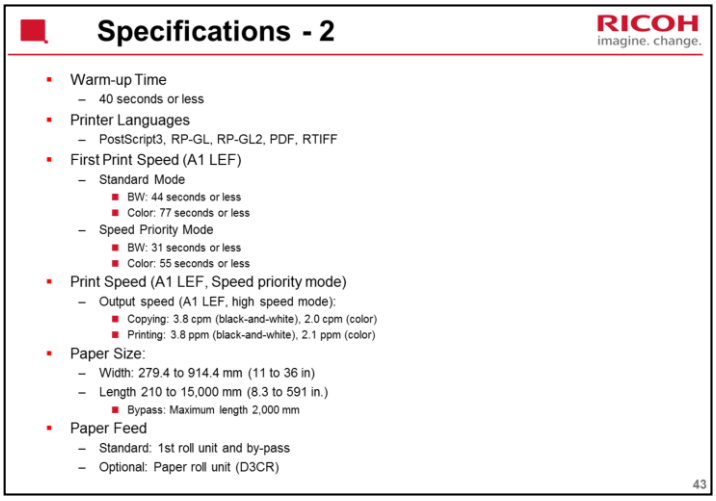


No additional notes



See the FSM for additional specifications and details.

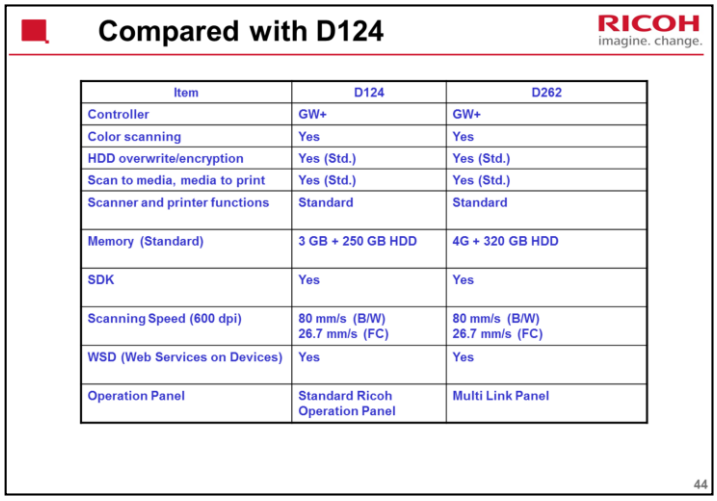
The print head is similar to the Mo-C1.



Target color ratio is 6:4 (b/w ; color).

15,000 mm maximum length only applies to paper widths 841 mm or wider (and must be plain paper or recycled paper). For other paper types, the maximum is 3,600 mm.

See the FSM for additional specifications and details.



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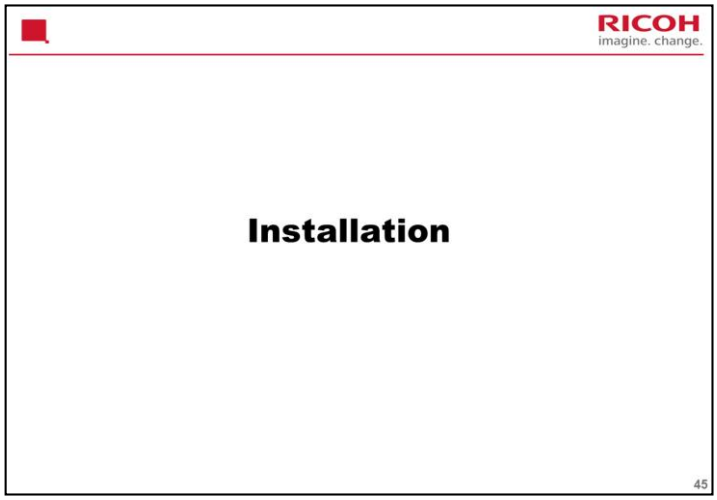
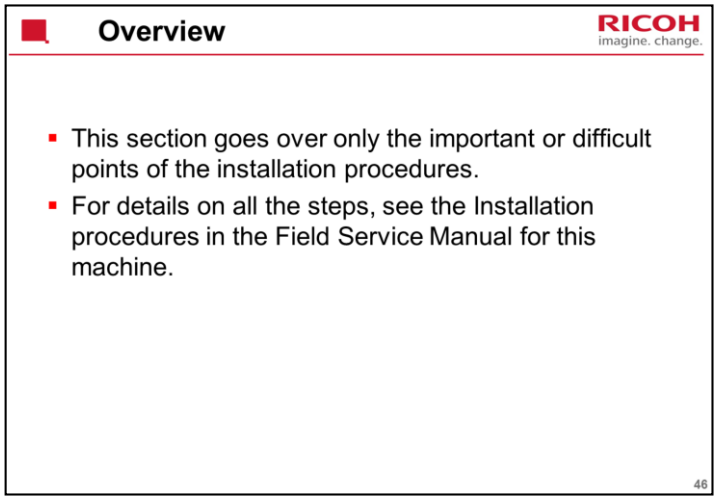
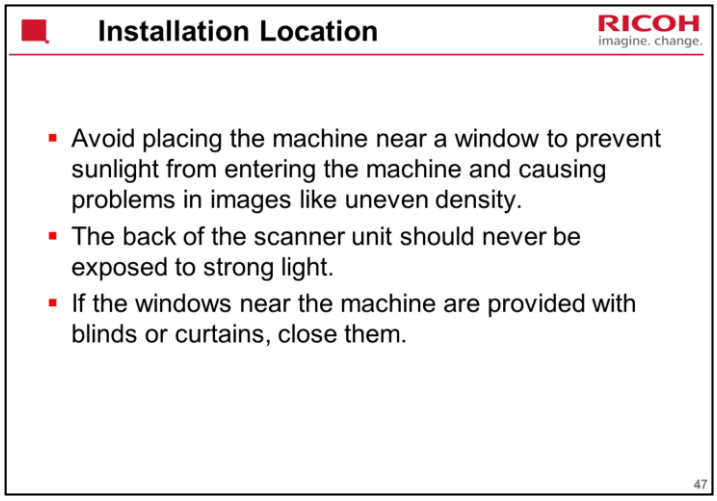


This section explains the main points of the installation procedure.
For full details, refer to the Installaiton section of the Field Service Manual.



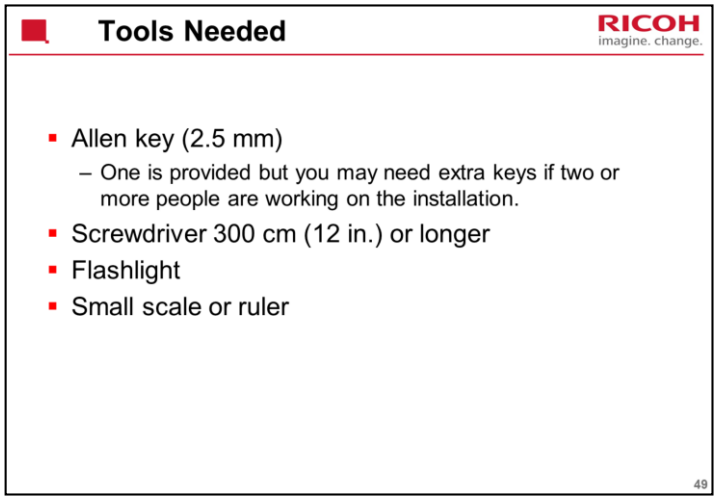
No additional notes



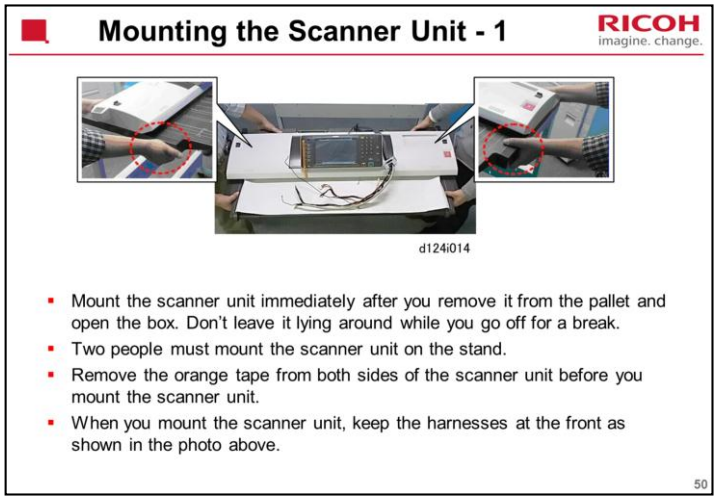
The back of the scanner has a sheet that protects against sunlight, but the sun can get in if the angle is wrong.

This can cause image problems such as white lines on scanned images.

No additional notes



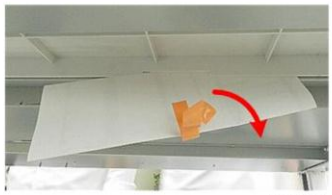
No additional notes



There are at least three separate boxes (scanner stand, scanner unit, main unit, and each box contains a lot of screws). Each unit should be unpacked in the order of installation and then installed immediately to prevent mixing screws, brackets, parts, etc. If all the boxes are opened up and the contents all mixed up before starting the installation, you could have some problems.

Also, it is not a good idea to lay the scanner unit down with the exposed CIS glass on the bottom.

Mounting the Scanner Unit - 2

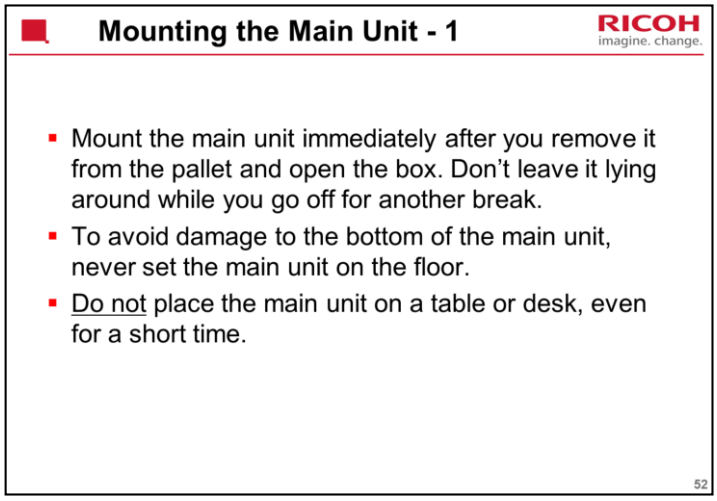


d124i203

- Remove the Factory Settings Sheet from under the front right end of the scanner unit.
  - Make a copy of the Factory Settings Sheet and leave the original with the machine for future reference.

51

No additional notes



Note that some items needed for installing this are packed with the roll feeder unit.

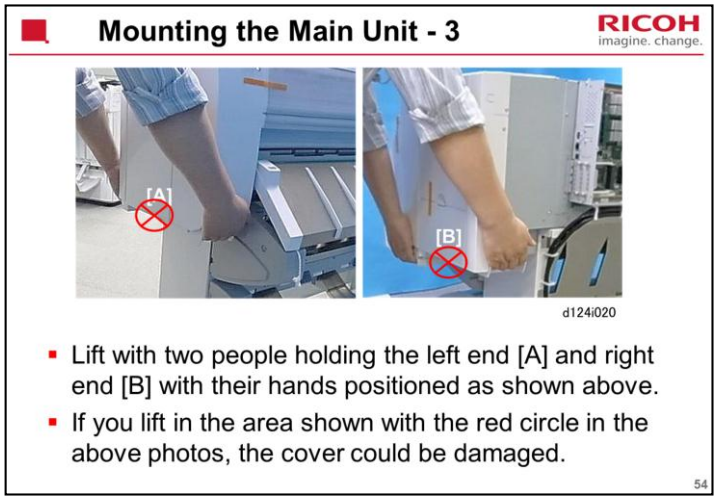
Mounting the Main Unit - 2

RICOH
imagine. change.

- Look for the carrying handles on the left and right sides of the main unit.

53

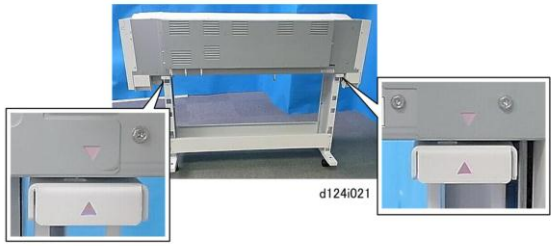
No additional notes



Important: Use the handles as shown above.

Mounting the Main Unit - 4

RICOH
imagine. change.



- Position the main unit over the top of the stand so that the triangle marks at the rear are aligned.

55

No additional notes

Mounting the Main Unit - 5

RICOH
imagine. change.

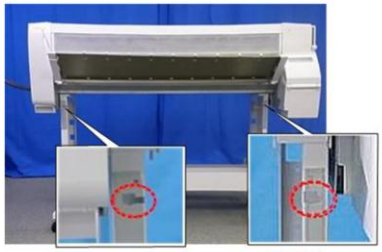
- Under the stand, tighten these three Allen screws.
  - Tighten them strongly. Otherwise, you may lose these screws when you move the machine.

56

No additional notes

Installing the 1st Roll Unit - 1

RICOH imagine. change.



d124i028

- Locate the upper set of cutouts in the left and right legs of the main unit stand. You will install the 1st roll unit here.

57

No additional notes

Installing the 1st Roll Unit - 2

RICOH
imagine. change.

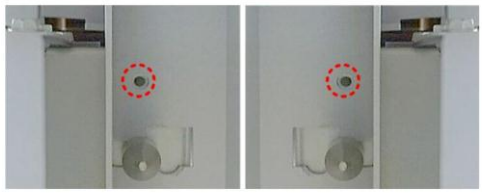
- While holding the unit with both hands:
  - Set the positioning pins on the left and right ends of the roll feed unit into the cut-outs in the supports
  - Push the roller feeder in.
  - Slide it slightly to the right to lock the unit in place.

58

No additional notes

Installing the 1st Roll Unit - 3

RICOH
imagine. change.



- Behind the stand on both sides, make sure that the holes of the roll feed unit and the stand frame are aligned.
  - Pass a long, thin screwdriver (30 cm: 12 in.) through each pair of holes to make sure that they are aligned.

59

No additional notes

Installing the 1st Roll Unit - 4

RICOH
imagine. change.

- When fastening the roll feed unit to the stand, be sure to use the screws with the washers attached.
- Note that the types of screw used here are different from the Mo-C1.

60

No additional notes

Installing the 1st Roll Unit - 5

RICOH
imagine. change.

- There are two pegs on each end of the paper transport guide. Make sure that they fit properly into the cut-outs on the left [A] and right [B].

61

No additional notes

Installing the 1st Roll Unit - 6

RICOH
imagine. change.

- There are six mylar tongues.
- Use a thin edge (like the end of a metal scale) to push them up and behind the plate.
- Paper will not feed from the roll correctly if these mylars not pushed behind the plate.

62

No additional notes

Installing the 2nd Roll Unit - 1

RICOH
imagine. change.

- Before installing the optional roll unit on a machine that has been installed already, remove the stacker and its base plates on both sides.
  - The roll unit is heavy and difficult to position. Remove the plastic base plates of the exit stacker to prevent damaging them.

63

No additional notes

Installing the 2nd Roll Unit - 2

RICOH
imagine. change.

- Locate the lower set of cutouts in the left and right legs of the main unit stand. You will install the 2nd roll unit here.

64

No additional notes

Installing the 2nd Roll Unit - 3

RICOH
imagine. change.

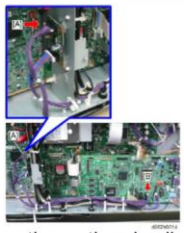
- Behind and under the machine, hold the guide plate as shown (above left). Then, at the top, set the cut-outs in the left and right over the pegs.
- Lift the guide slightly, and then insert the bottom pegs into the cut-outs at the lower left and lower right corners.
- Check each corner of the plate to be sure that each peg is installed properly in its cut-out.
- Make sure that you know how to do this because it is a bit tricky.

65

No additional notes

Installing the 2nd Roll Unit - 4

RICOH
imagine. change.



- After installing the optional roll unit, check the clamps and harnesses.
  - Make sure that the clamps are closed and that there is absolutely no slack in the harnesses.
  - The harnesses must be flat up against the bottom of the PCB box to prevent them from interfering with paper in the bypass feed path.
    - The cables must not hang below the red line in the photo above.

66

During bypass feed, the trailing edge of the paper comes out from the back of the machine, and then reverse feeds back into the machine.

Connecting the Scanner and the Main Unit - 1

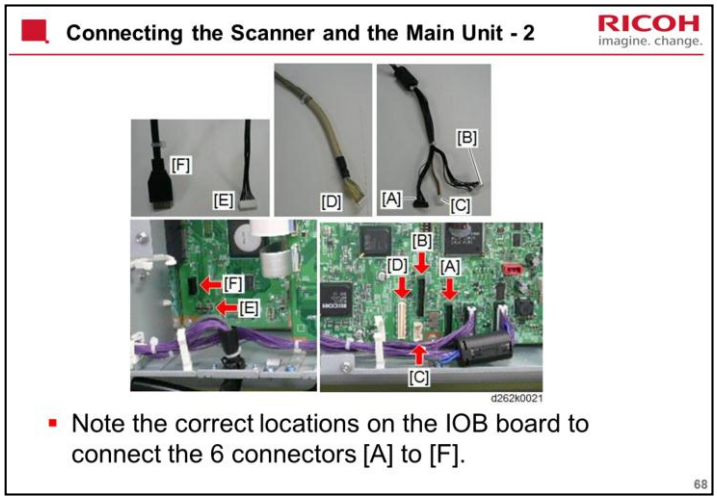
RICOH
imagine. change.

d262k0100

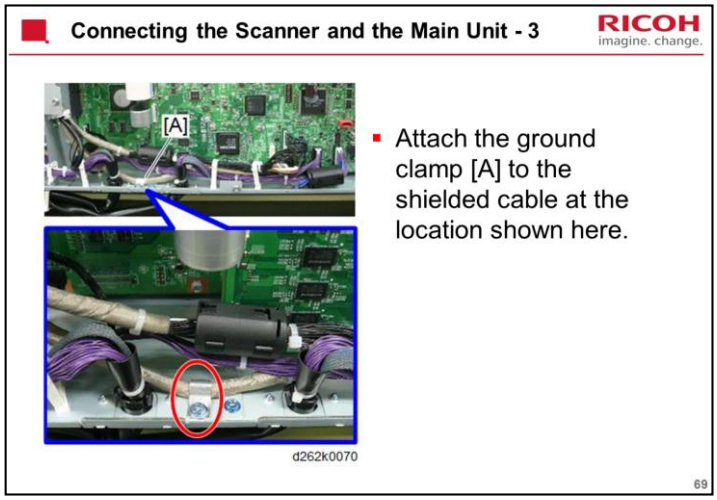
- The scanner unit is top heavy and unstable. It can fall over easily.
- Grip the supports below the scanner unit and push it slowly when you move it.

67

No additional notes



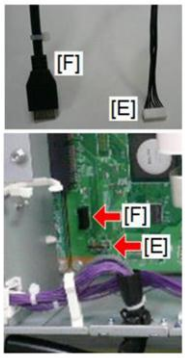
No additional notes



No additional notes

Connecting the Scanner and the Main Unit - 4

RICOH
imagine. change.



- [F] is a USB cable, but the power indicator is not close to the connector, unlike usual USB cable connectors.
  - See the next slide for details.

70

No additional notes

Connecting the Scanner and the Main Unit - 5

RICOH
imagine. change.

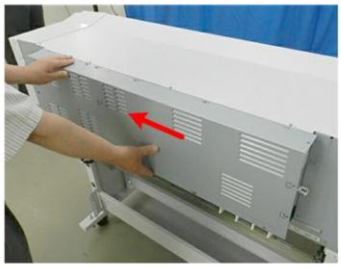
- Before you disconnect any of the cables, make sure that the LEDs on the BICU have turned off completely.
- In this model, note that the LEDs are not as close to the USB cable as usual.

71

No additional notes

Connecting the Scanner and the Main Unit - 6

RICOH
imagine. change.



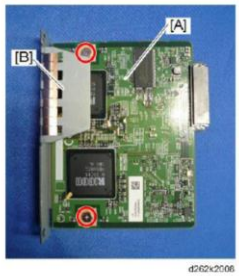
- Before you put the rear cover back on, install the controller options.

72

No additional notes

Installing the File Format Converter (MLB)

RICOH
imagine. change.



- During the procedure, you do not have to take out the mother board and install another one.
  - In the Mo-C1, you have to do that.

73

No additional notes

Ink Collector Tank Storage Shelf

RICOH imagine. change.

- The ink collector tank storage shelf [A] is attached to the bottom cross-piece of the scanner stand.
- Set the extra ink collector tank on the shelf.
  - When the ink collector tank becomes full, the machine will stop.
  - The operator can remove the full tank and replace it with the empty tank.
  - At the next PM visit, the service technician can swap the full tank with another empty tank.

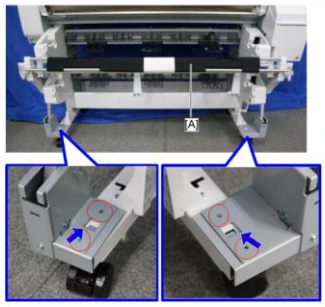
74

The PM interval for the machine is 10,000 m. But the ink collector tank fills up at about 5,600 m (depending on the image contents of the printouts that have been made).

The user can replace this tank easily, so when you arrive at 10,000 m, you can take away the old tank from the shelf and put a new empty one on the shelf in its place.

Installing the Exit Stacker - 1

RICOH
imagine. change.



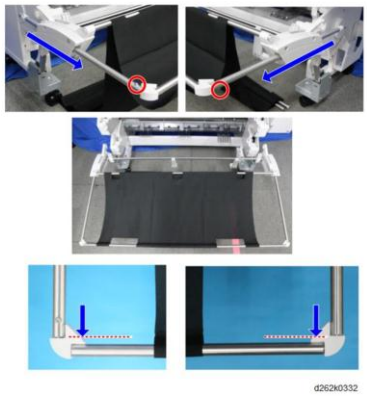
- The exit stacker is pre-assembled in the factory, except for the pipes (see the next slide). Fasten the four screws (red circles) at the bottom of the stand.
- The stacker can be set up in one of three ways:
  - Basket Mode. For standard size paper. The exit stacker is shortened so that it is rounded and deep to hold paper in a small well.
  - Stack Mode (for A0 SEF/A1 LEF). The exit stacker is extended to the front until it is flat. It can hold up to 10 stacked sheets.
  - Wire guide mode (for A1 SEF/A2 LEF). Two wire guides can be attached to the rear rod.

75

No additional notes

Installing the Exit Stacker - 2

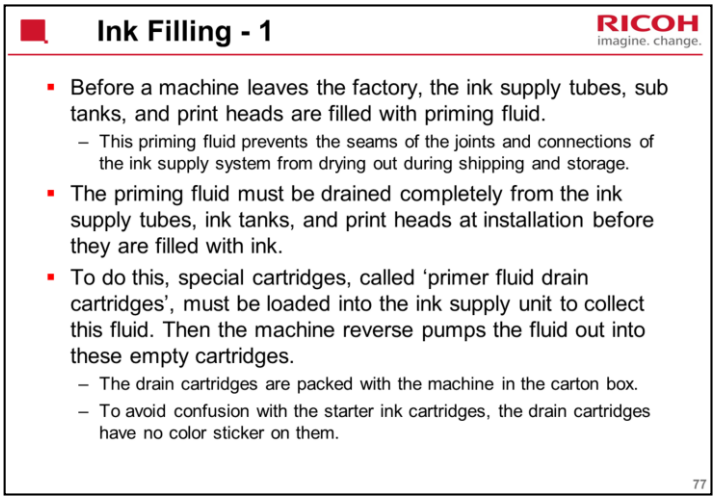
RICOH
imagine. change.



- When assembling the pipes, make sure to push the ends of the pipes firmly into the connection pieces and attach with screws.
- Otherwise, the entire assembly might come apart.

76

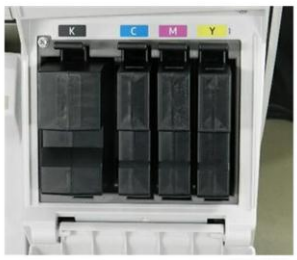
No additional notes



Also, bubbles form in the fluid between the cartridge and the print head. If these go out through the nozzles, the can damage the nozzles. So the fluid must be drained back into empty cartridges, not out through the nozzles.

Ink Filling - 2

RICOH
imagine. change.



d1241003

- Insert the primer fluid drain cartridges, then close the ink cartridge cover.
- Turn the machine power on, wait for the machine to beep twice, and make sure that SP2012-001 is set to "9".
- Next, set SP2100-004 to "31" and press #.
  - The ink pumps start operating in reverse to draw the fluid out of the print heads and the tubes.
  - This takes about 7 min. and 20 sec.
- When the display shows that the operation is finished, turn the machine off.
- If draining does not start, there is an alternative procedure (explained later).

78

At the end of the procedure, the machine disables the primer cartridges so that they can no longer be used.

Ink Filling - 3

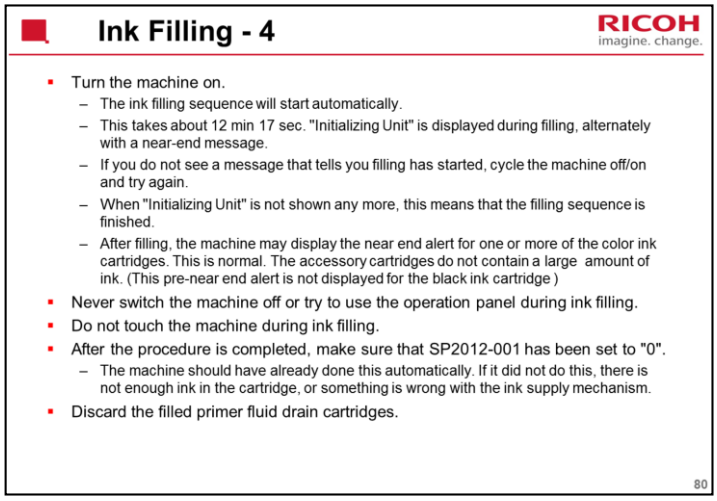
RICOH
imagine. change.

d1241004

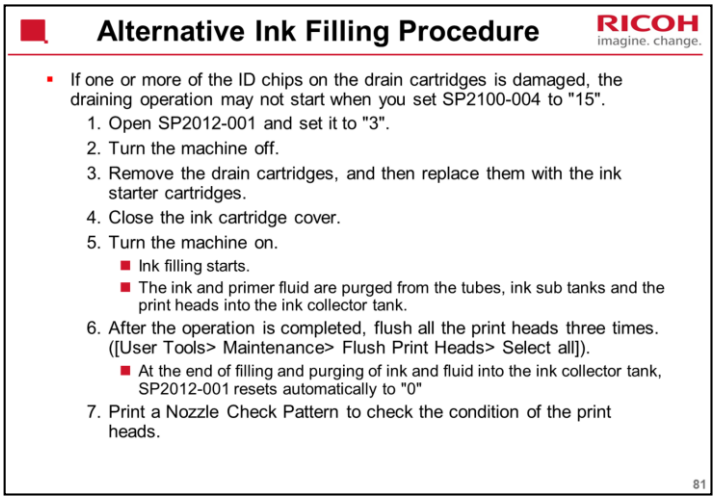
- Remove the primer fluid drain cartridges and replace them with the starter ink cartridges.
  - Left to right: K > C > M > Y.
- Close the cartridge cover.

79

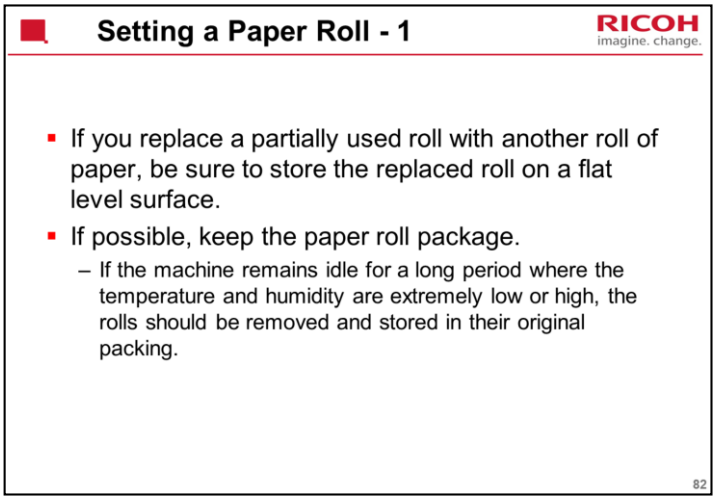
Obey the local laws and regulations regarding the disposal of items such as the primer fluid drain cartridges.



No additional notes



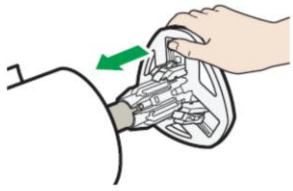
No additional notes



No additional notes

Setting a Paper Roll - 2

RICOH
imagine. change.



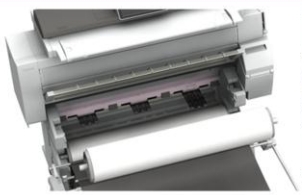
- Before you install the roll, do Paper Type Selection at the operation panel. Select a paper type for each paper feed station.
  - User Tool > System Settings > Tray Paper Setting > Next > Paper Type: Tray
- Press in the stopper completely until it is in contact with the paper roll. The levers do not have to be lowered. The procedure is same for 2-inch core and 3-inch core paper rolls.

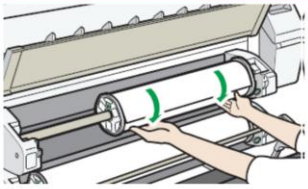
83

Paper size is detected automatically by the machine by the DRESS sensor, as will be explained later.

Setting a Paper Roll - 3

RICOH
imagine. change.





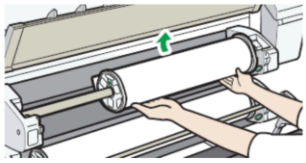
- Set the left and right ends of the rolls in the roll feeder sockets, then pull the leading edge of the paper slightly so that it hangs down.
  - Always feed the paper from the bottom of the roll, not the top.
    - Feeding paper from the top of the roll places an excessive load on the paper feed rollers, and could cause problems with paper feed and cutting.
    - Also, feeding the paper from the top sets the paper against the direction of paper curl, which causes the paper to rise and rub against the print heads, leading to poor copy quality and damage to the print heads.
- While holding both sides of the leading edge of the paper, rotate and feed the paper up about 1/3 the distance into the machine.
- Make sure that the leading edge of the paper passes over the top of the paper guide inside the machine (see the upper left part of the diagram).

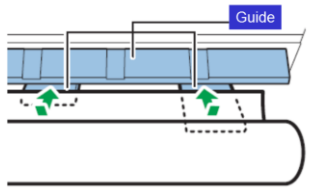
84

No additional notes

Setting a Paper Roll - 4

RICOH
imagine. change.

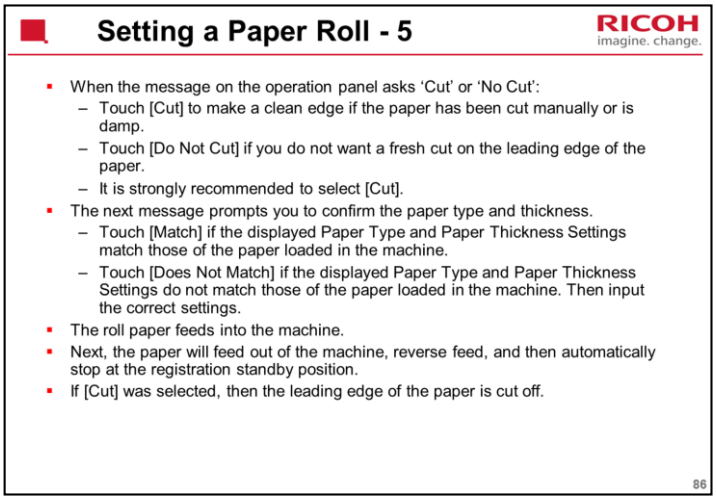




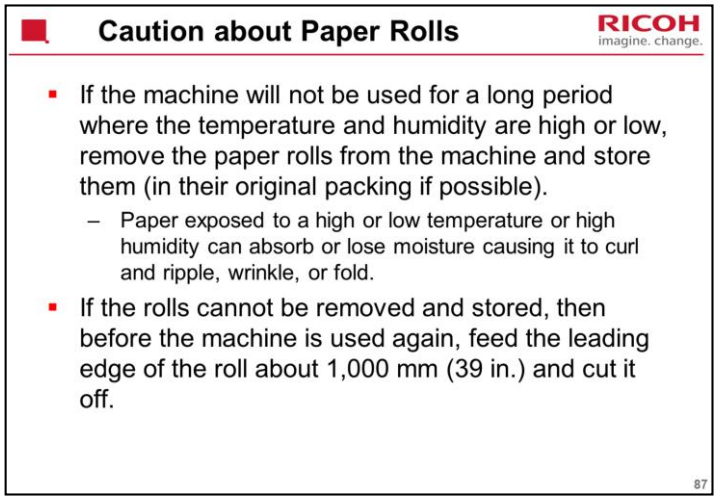
- Insert the leading edge of the roll paper below the roller at the feed slot, and then feed the paper into the machine until the machine grabs and pulls the paper slightly.
  - When the machine detects the leading edge of the paper, it will grab it and then sound a buzzer.

85

No additional notes



No additional notes

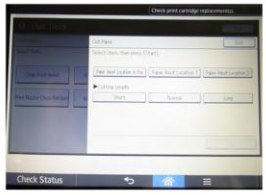


The interior of the roll unit is exposed to the air, so if the rolls will not be used for a long time, they should be put back in their original packaging.

If this cannot be done, feed the paper one or two rotations and cut off the paper, as explained above.

Manual Cut (User Tool)

RICOH
imagine. change.



- Manual Cut is to feed and discard paper that is damaged by moisture or paper jam.
- Three different cut lengths can be selected.
  - Short: 210 mm
  - Normal: 450 mm
  - Long: 650 mm

88

No additional notes

Removing a Roll - 1

RICOH
imagine. change.

d124i204

- You need to rewind the roll before removing it for temporary storage or swapping it for another roll.
  - Press and hold the rewind button on the right side for 2 seconds or more.
  - The roll will reverse feed out of the machine onto the roll.
- The paper rolls installed in the machine are not enclosed and remain exposed to ambient temperature and humidity.
- If the machine has remained idle for a long time, before you use the machine it is recommended that your rewind the roll, cut off the equivalent of two full roll rotations, and then reload the paper.

89

If the paper leading edge is at the print waiting position, 2 seconds should be long enough. However, if the paper leading edge is at the registration roller, you may have to press the rewind button one more time.

Removing a Roll - 2

RICOH
imagine. change.

d124r012

- Avoid touching the paper with your hands. Grip the roll at the plastic holders on both ends, and then lift the paper roll out of the machine.
- Lay the roll horizontally on a flat clean surface.

90

No additional notes

User Tools – Maintenance Menu

RICOH
imagine. change.

d124-660

d124-661

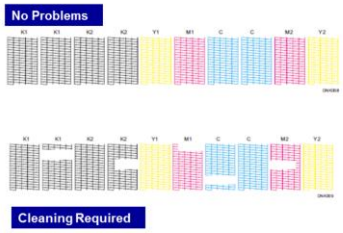
- In the User Tools, select Maintenance.
- You will use some of the tools shown above (on the right) to print the test pattern and adjust the machine.
  - Print Nozzle Check Pattern: Prints the test pattern
  - Clean Print Heads, Flush Print Head: You need to use these if the test pattern output is not perfect.

91

Replacement and Adjustment > Print Head Cleaning and Adjustment

Printing the Nozzle Check Pattern - 1

RICOH imagine. change.

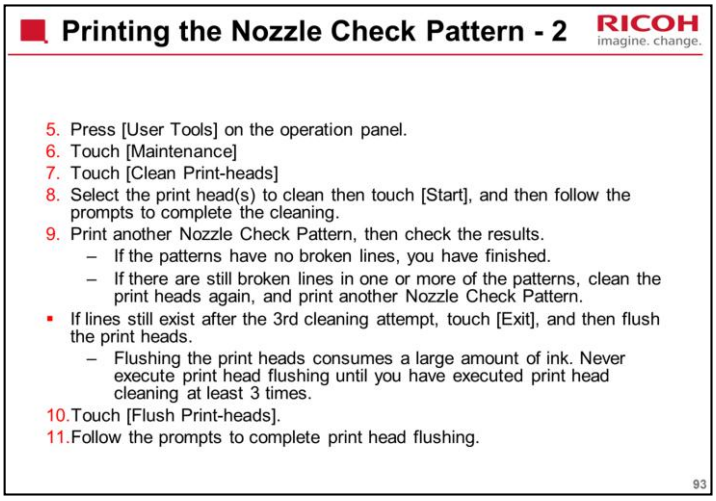


- The Nozzle Check Pattern ensures that the print heads are operating normally.

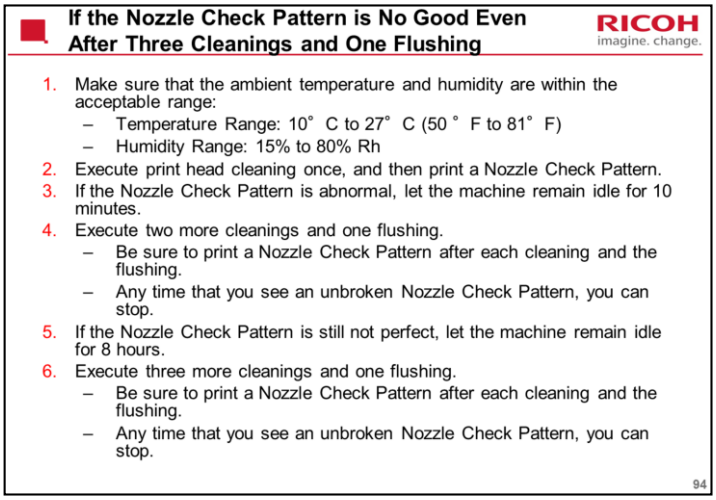
1. Press [User Tools] on the operation panel.
2. Touch [Maintenance] and then select "Print Nozzle Check Pattern".
3. Follow the prompts to start printing the pattern.
4. Use a loupe or magnifying glass to check the condition of the pattern.
   - If the pattern shows no broken lines, the machine is ready for operation.
   - If any of the lines are broken, identify the patterns where the broken lines exist, and then clean the print heads.

92

No additional notes



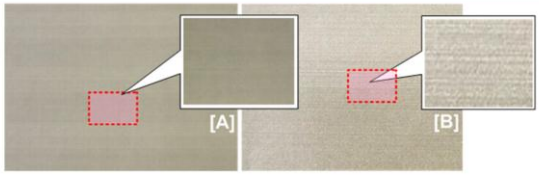
No additional notes



No additional notes

Halftone Check

RICOH
imagine. change.



- Leftover primer fluid can cause streaking in halftone areas. Do this check to confirm that all of the primer fluid has been drained from the from the ink sub tanks and ink supply tubes.
  - User Tools > Printer Features > List/Test Prints > [Color Sample].
- The color sample may require a minute or so to finish printing.
- Check some of the blocks on the printout
  - If the pattern is like [A], no adjustment is necessary.
  - If the pattern is streaked with light streaks [B], primer fluid did not drain completely.
- If you detect streaking, flush the print head of the color where you see the problem.
  - User Tools > Maintenance > Flush Print-heads: Do it 3 times.

95

No additional notes

Other User Tool Adjustments

RICOH
imagine. change.

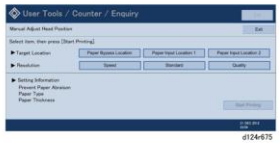
- After checking the nozzle check pattern, make sure that the machine is level and that the casters are set correctly.
- Then do the following three adjustments in this order:
  - Manual Adjust Head Position
  - Adjust Paper Feed
  - Adjust Print Position

96

Replacement and Adjustment > Print Head Cleaning and Adjustment

Manual Adjust Head Position - 1

d124v674



d124v675

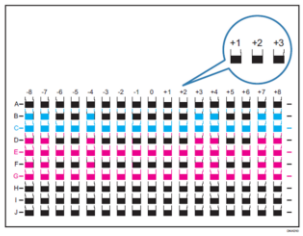
- Select a Paper Source and a Resolution, and touch [Start Printing].

97

No additional notes

Manual Adjust Head Position - 2

RICOH
imagine. change.

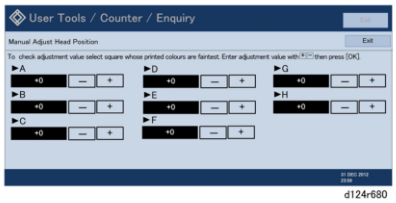


- Look at the test pattern.
- In each row (A to J, or in some cases A to G), Identify the number of the column where the square is faintest, or select the square where the internal lines overlap to form a solid color.
  - The number above the square is the adjustment value.
  - If you still cannot determine the adjustment value, select the square that is between the straightest vertical lines.

98

No additional notes

Manual Adjust Head Position - 3



d124r680

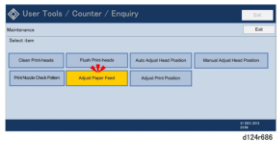
- Touch [Adjustment].
- Input a value for each row.
  - Use the + and – buttons.
- Print another test pattern to make sure that the adjustment is correct.
  - The numbers that you just entered must correspond to the condition of the patches on the new test chart, as explained on the previous slide.

99

No additional notes

Adjust Paper Feed - 1

RICOH
imagine. change.



d124v686

d124v687

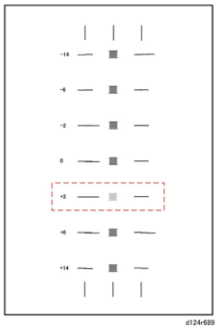
- Adjust paper feed if you see these problems in the prints:
  - Broken horizontal lines
  - Patchy images (uneven filled areas)
  - White lines at regular intervals
- Select [Print Test Sheet] for the required paper feed source.

100

No additional notes

Adjust Paper Feed - 2

RICOH
imagine. change.



- The adjustment value appears to the left of the lightest gray square with straight horizontal lines on both sides.

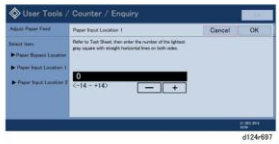
101

No additional notes

Adjust Paper Feed - 3

RICOH
imagine. change.

d124v690



d124v697

- Touch [Adjustment].
- Touch the plus or minus key to enter the value from the test print.

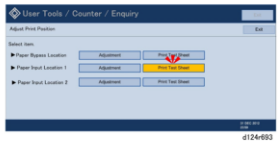
102

No additional notes

Adjust Print Position - 1

RICOH
imagine. change.

d124v692



d124v693

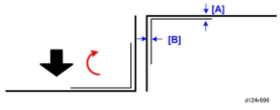
- Do this procedure to check and adjust the print start position at the upper left corner of each sheet.

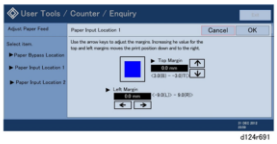
103

No additional notes

Adjust Print Position - 2

RICOH
imagine. change.

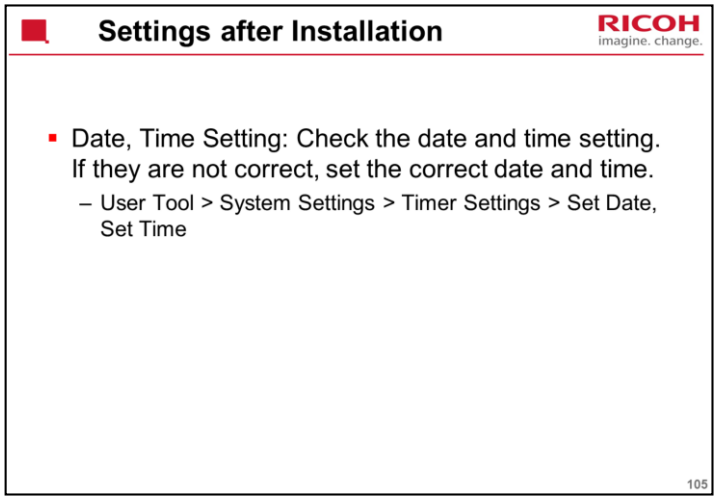




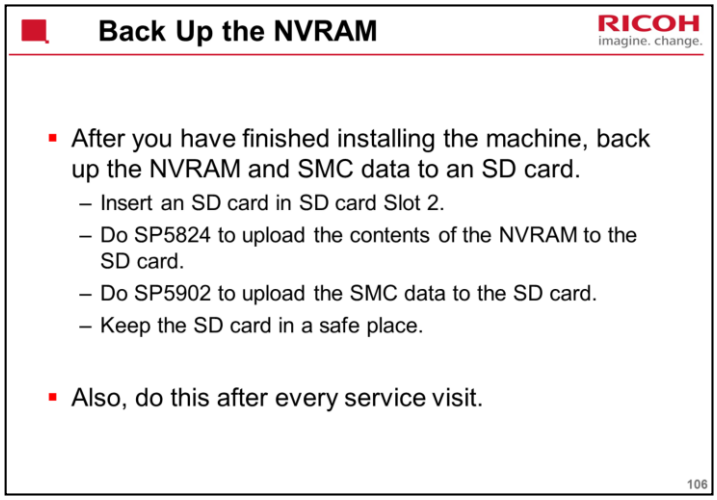
- A test pattern prints. The black arrow indicates the direction of paper feed.
- Rotate the test sheet 180 degrees. [A] is the top margin and [B] is the left margin.
- Touch the arrow keys to adjust the margins.
  - Increasing the value for the top and left margin moves the print position down and to the right.
  - You will see the blue square move as you change the settings, so you can confirm the effect of the changes.

104

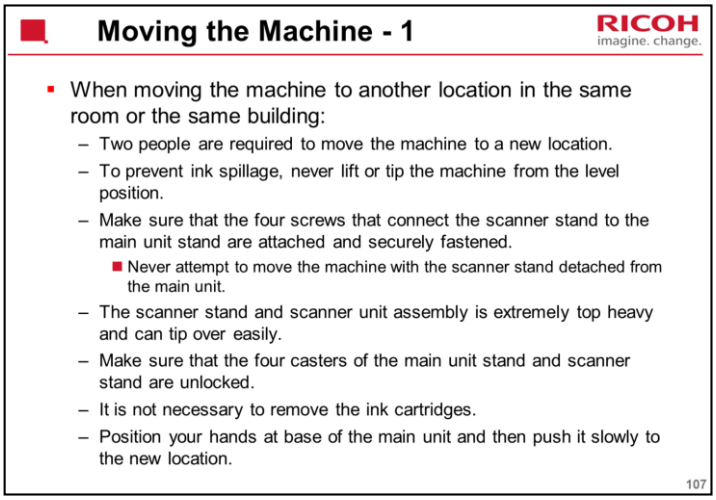
No additional notes



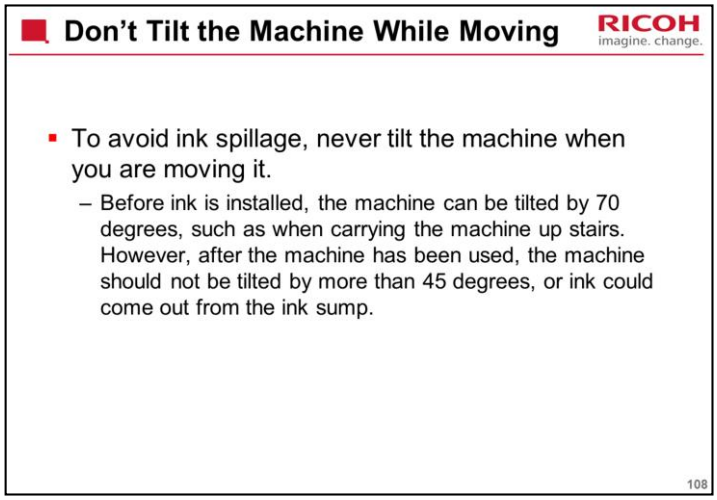
Paper size is detected automatically by the machine by the DRESS sensor, as will be explained later.



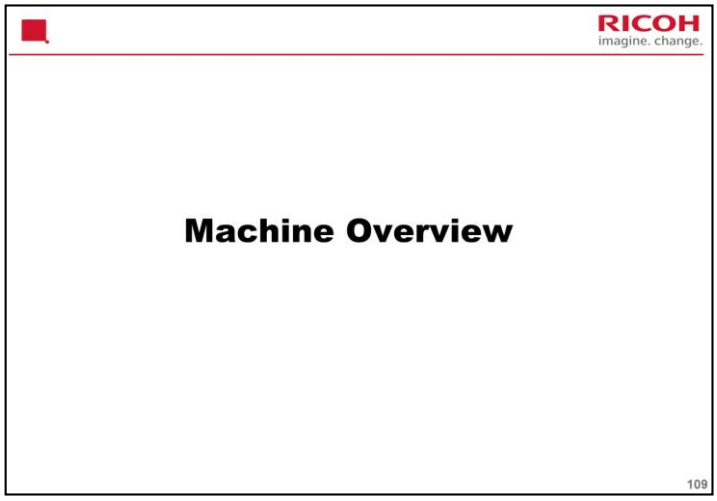
No additional notes



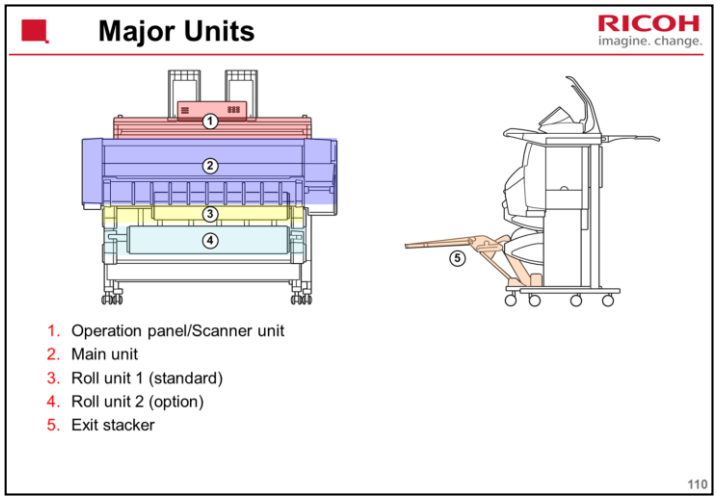
Before ink is installed, the machine can be tilted by 70 degrees, such as when carrying the machine up stairs. However, after the machine has been used, the machine should not be tilted by more than 45 degrees, or ink could come out from the ink sump.



No additional notes



This section introduces the mechanisms of this engine. Details will be explained in later sections.

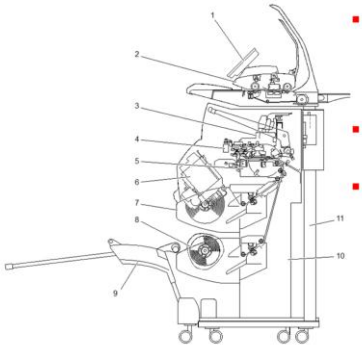


The scanner unit and main unit are mounted on separate racks.

The units can be easily separated for servicing, or for placing the scanner on a low table or desk so that it can be operated from a sitting position.

Main Unit Layout - 1

RICOH
imagine. change.



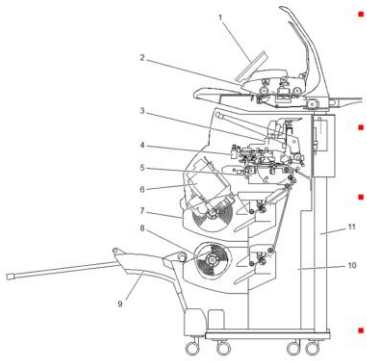
- The operation panel [1] and scanner unit [2] are mounted on the scanner stand [11].
- The main unit [7] is mounted on the main unit stand [10].
- The main unit and scanner stand can be separated easily.
  - Most service procedures require that the main unit stand and scanner stand be separated.

111

No additional notes

Main Unit Layout - 2

RICOH
imagine. change.



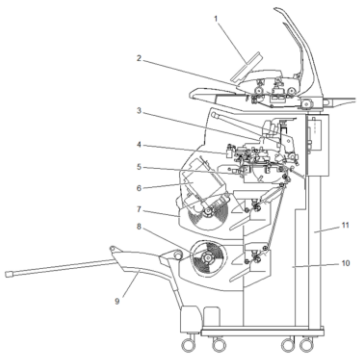
- The carriage unit [3] contains the print head units, and sensors for monitoring ink level, registration, and gap between print head and paper.
- The air release solenoid [4] purges air from the ink supply system.
- The maintenance unit [5] cleans the print heads on the bottom of the carriage unit.
  - Two motors and three sensors control the print head cleaning cycle.
- The ink supply unit [6] contains the ink cartridges and ink pumps that supply ink to each print head.

112

No additional notes

Main Unit Layout - 3

RICOH
imagine. change.



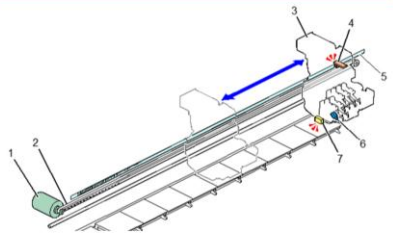
- Roll Unit 1 [7]: Holds one roll of paper.
  - The stoppers can be adjusted easily to accept different widths of roll paper.
- Roll Unit 2 [8] (option): Holds one roll of paper.
  - Its stoppers can also be adjusted easily to adjust for different roll core sizes.
- The exit stacker [9] must be installed on the front of the machine.
  - The exit stacker can be folded in when it is not being used (or for stacking in a well-type structure) or extended for output of long sheets.

113

No additional notes

Horizontal Carriage Movement

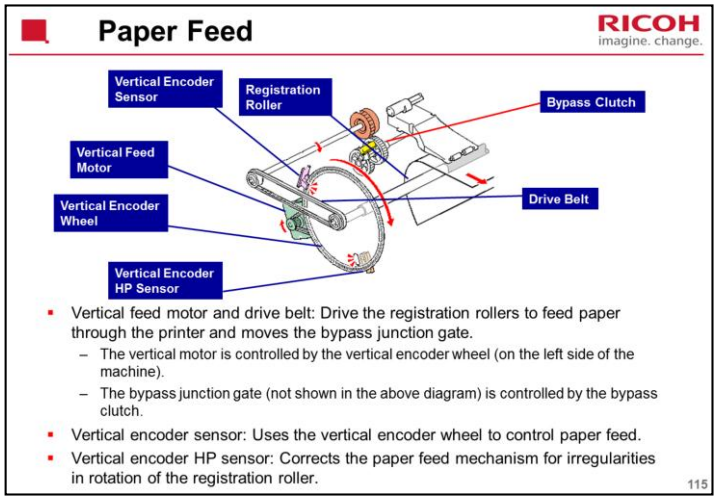
RICOH
imagine. change.



- Horizontal motor [1] and drive belt [2]: Drive the carriage unit [3] and print heads from left to right.
  - The horizontal motor is controlled by a long horizontal encoder strip [5] stretched across the width of the main unit.
  - The carriage unit contains 5 print heads (K x 2, C, M, Y)
- Horizontal encoder sensor [4] (on the back of the carriage unit): Uses the encoder strip to control operation of the motor and carriage unit.
- LED [6]: Lights during operation to prevent users from opening the front cover by mistake.

114

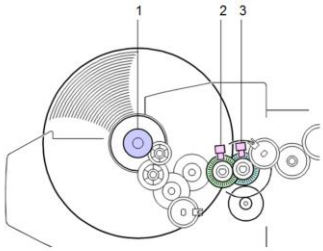
[7] is the DRESS sensor.



Vertical encoder HP sensor: Home position of the paper feed mechanism is determined by the print standby position and paper feed standby positions for the two rolls. However, if the registration roller is slightly off center, the amount of paper fed for a set amount of motor rotation may be different from normal. By giving the encoder wheel a set home position, and determining the amount of paper fed (by monitoring the time that the leading edge gets to the sensors), the machine can correct for these errors.

Paper Feed Control

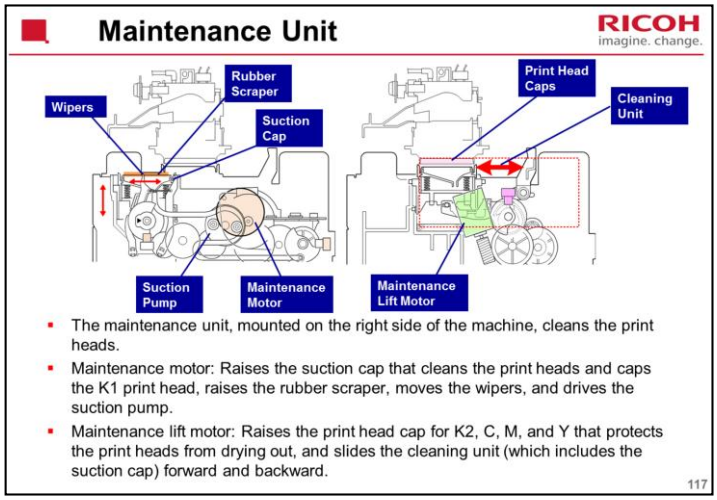
RICOH
imagine. change.



- A DSP control (Digital Signal Processing) system controls paper feed with encoder wheels.
- It assures accurate roll paper feed and constantly monitors the amount of paper remaining on the rolls.

116

No additional notes



Previous ink jet machines had only one motor, the maintenance motor.

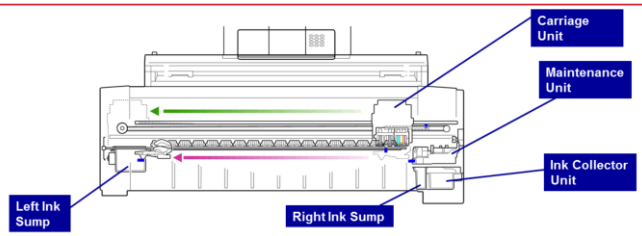
The maintenance lift motor and the sliding cleaning unit are new. These and other features of the maintenance unit are explained in a later section.

Why move the cleaning unit forward and backward?

The print heads are not all in a line. This will be explained later.

Print Head Cleaning

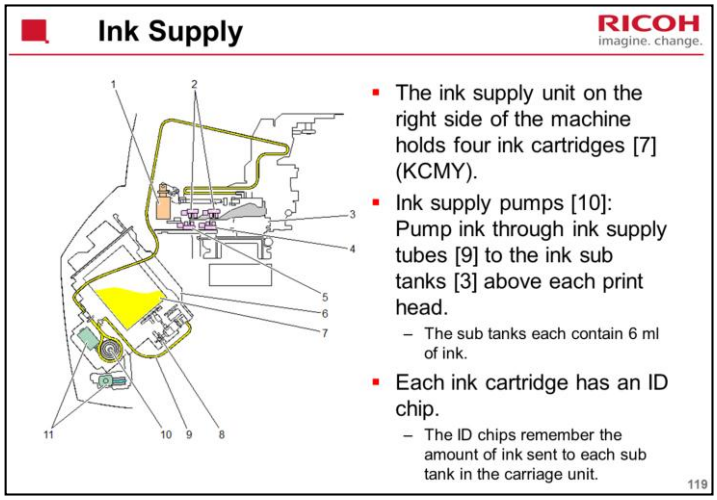
RICOH
imagine. change.



- The maintenance unit cleans the print heads to prevent them from becoming clogged with paper dust or other foreign matter.
  - Cleaning is done occasionally during print jobs and can also be executed manually by the operator.
- The ink collector unit and right ink sump collect waste ink taken from the print heads by the maintenance unit.
- At infrequent intervals, the machine will force the carriage unit to pause over the left ink sump so that ink can be purged from the print heads to prevent clogging.
  - This is controlled by the firmware and cannot be done by the operator.

118

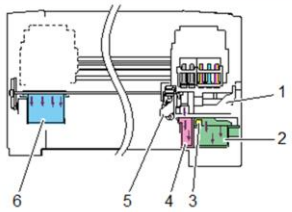
No additional notes



11. In the Mo-C1, there is only one motor.

Waste Ink Collection

RICOH
imagine. change.



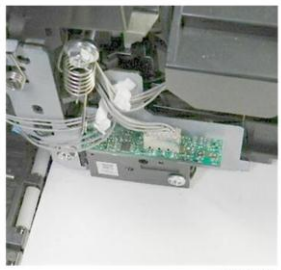
- Waste ink collector tank (on the right side of the machine) [2]: Collects the ink removed from the print heads by the maintenance unit [1] during print head cleaning. The ink collector has an ID chip, which keeps count of the amount of ink in the tank (a message appears when the tank must be replaced).
- Right ink sump [4]: Catches waste ink that is scraped from the surfaces of the print heads during print head cleaning.
- Left ink sump [6]: (on the left side of the machine): Collects ink that is occasionally vented from the print heads during printing. This primes the print heads and prevents them from clogging.

120

No additional notes

DRESS Sensor - 1

RICOH
imagine. change.



d1249416

- Here is a closer look at the DRESS sensor.
- It is mounted on the left side of the carriage unit.
- The machine uses it for the following:
  - Paper width detection: The sensor checks the right and left edges of the paper on the platen to check the size of the paper. These readings are used to position the image between the right and left margins.
  - Paper registration (leading edge and side-to-side) Every time paper is fed to the registration standby position, it detects the leading edge of roll paper. It also checks the right edge of the paper twice to correct paper skew.
  - Skew correction: See above
  - Dot position correction

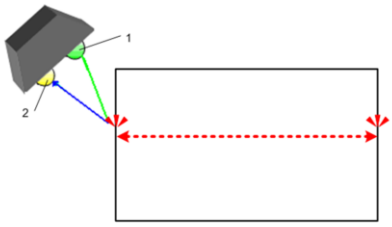
121

DRESS: Direct Realization Edge Scanning Sensor

Dot position correction: Because the carriage unit is moving sideways during printing, the ink drops do not fall vertically. In bi-directional printing (when the data is printed both when the carriage moves right-to-left and left-to-right), it is important to deposit the ink in the same position across the page when moving in each direction. The DRESS sensor is used for this process. The amount of the correction will also depend on the print head height setting, paper thickness, and the speed of the carriage. This correction also handles color registration, to make sure that the dots of each color ink are deposited in exactly the right positions on the paper when making colors in the printout.

DRESS Sensor - 2

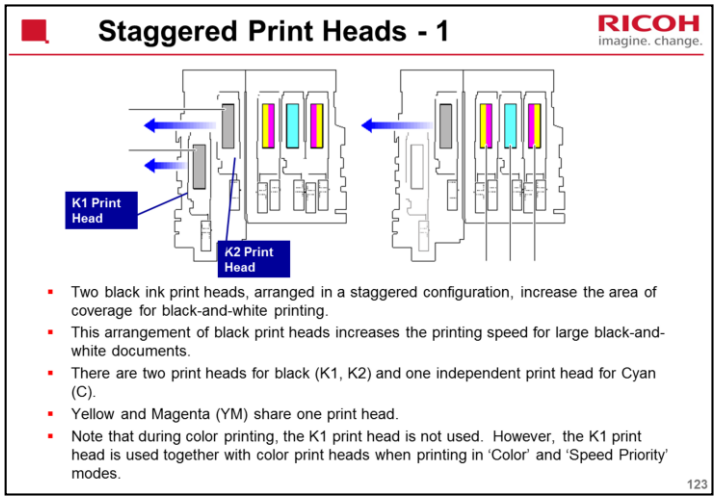
RICOH
imagine. change.



- The DRESS sensor contains an LED (1) and receiver (2). The sensor detects the edge of the paper when it picks up the change in reflectivity between the paper and platen at the edges.

122

No additional notes



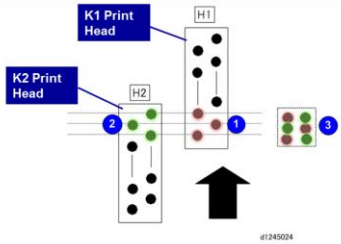
Staggered Print Heads

This is why the cleaning unit has to move back and forward. The cleaning unit is level with the K1 print head (the K1 suction cap is also the K1 print head cap). To clean the other heads, the cleaning unit must move back.

In some situations, the K1 print head will be moved back level with the other four before cleaning starts. Cleaning will be explained in detail later.

Staggered Print Heads - 2

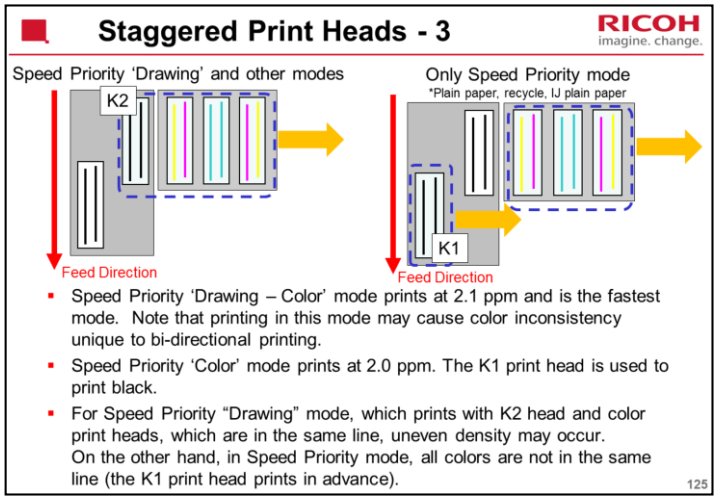
RICOH
imagine. change.



- The K1 print head sits forward of the K2 print head in the direction of paper feed.
- Three nozzles at the rear section of K1 (1) and three nozzles at the front section of K2 (2) overlap the same area on the paper.
- However, the arrangement of the nozzle ports is staggered (3), so the positions of the nozzles complement one another when ink is put down on the paper.

124

No additional notes

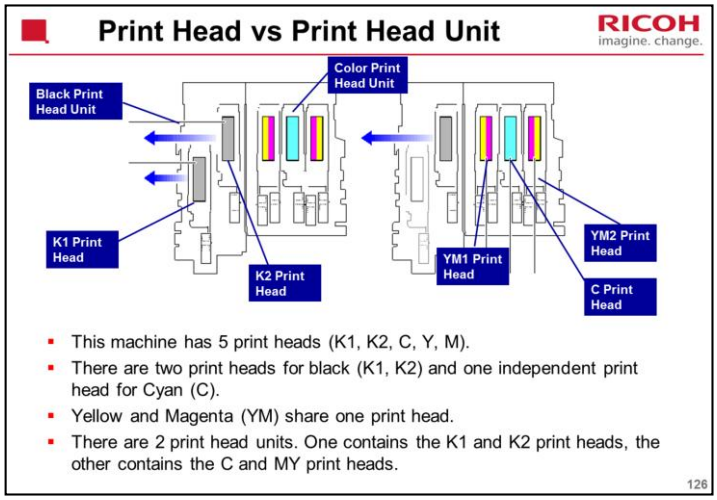


Speed Priority 'Drawing' mode should be used for line drawings.

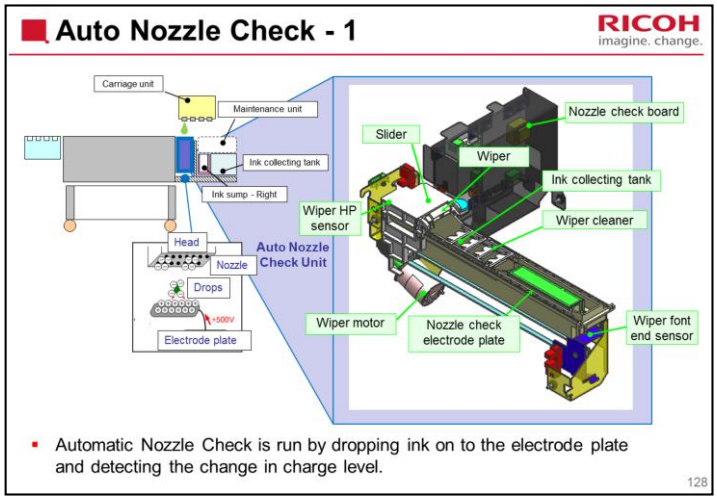
For images with solid color, Speed Priority mode should be used.

'Color inconsistency unique to bi-directional printing': When moving from left to right, black is printed last. But when printing from right to left, black is printed first. This can cause inconsistencies.

In the above diagrams, the amount of overlap between the K1 head and the other heads is exaggerated.



No additional notes



No additional notes

Auto Nozzle Check - 2

RICOH imagine. change.

- After verifying the condition of the nozzles, either of the following processes is performed:
  - If the nozzle is slightly clogged, nozzles around the clogged nozzles drop extra amount of ink to compensate for the clog.
  - If the nozzle is heavily clogged, the system runs the auto cleaning process.
- Auto nozzle detection settings
  - Standard: Check is run when turning on the power at the beginning of the day.
  - Frequent: Check is run before each job.
  - OFF : No auto check

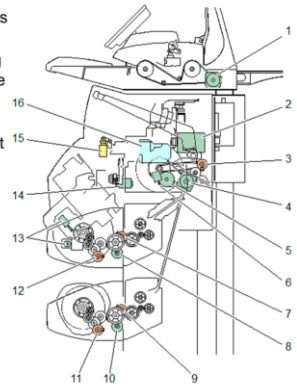
129

No additional notes

Drive Components - 1

RICOH
imagine. change.

- Scanner motor [1]: Drives the original entrance rollers and original exit rollers of the scanner unit.
- Horizontal motor [2]: Drives the timing belt that moves the carriage unit to the left and right during printing.
- Vertical motor [4]: Drives the registration rollers in the main unit that feed paper through the printer.
- Roll feed motor 1 [8]: Feeds paper from Roll Unit 1.
- Roll feed motor 2 [10]: Feeds paper from Roll Unit 2.
- Cutter motor [14]: Drives the circular cutter from left to right during paper cutting.



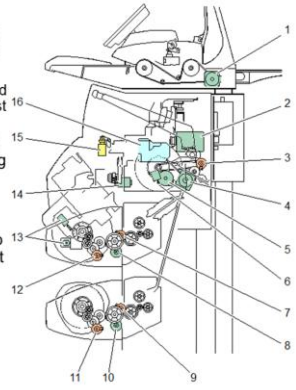
130

No additional notes

Drive Components - 2

RICOH
imagine. change.

- Maintenance motor [5] (in the maintenance unit):
  - Lifts and lowers the left print head cap to cap and uncap the K1 print head
    - The left print head cap is also used for cleaning all print heads, not just K1.
  - Operates the waste ink pump that sucks ink from the print head being cleaned
- Maintenance lift motor [6] (also in the maintenance unit):
  - Lifts the right print head cap to cap and uncap the K2, C, and YM print heads
  - Moves the left print head cap that holds the cleaning components (suction cap, wipers) to the front and rear.



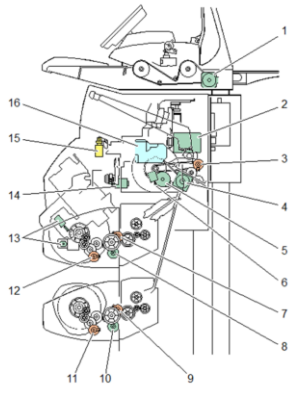
131

No additional notes

Drive Components - 3

RICOH
imagine. change.

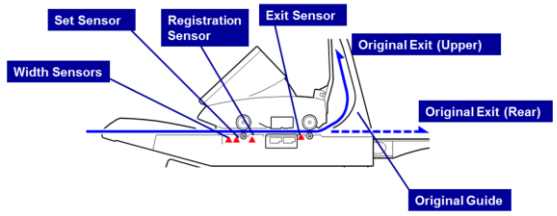
- Ink pump motors [13] (x5, two for each print head): Drive the pumps that supply ink to the print heads.
- Air release solenoid [15]: Purges air from the ink sub tanks when excess air is detected.
  - This one solenoid is used to purge all the tanks. The heads are moved sideways until the required tank is opposite the solenoid.
- Head lift motor [16] (on the right side of the main unit frame, and controlled by two lift sensors in the carriage unit): Raises and lowers the carriage unit to adjust the gap between the paper and the print heads for different thicknesses of paper.
  - This prevents the print heads from rubbing the surface of thick paper during printing.



132

No additional notes

Original Feed Paths



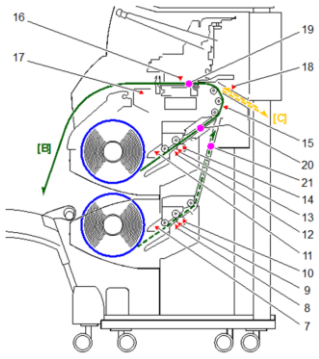
- Original width sensors: Detect the width of the original on the original table.
- Original set sensor: Detects when an original is set on the original table. Also functions as an original width sensor.
- Original registration sensor: Detects the leading edge of the original and stops the original feed roller. The user can then manually make the original straight if it is out of position.
  - This sensor also detects the leading and trailing edges of the original as it passes during scanning.
- Original exit sensor: Detects when the trailing edge of the original exits the scanner unit.
  - The original exits to the upper exit if the original guide is installed, and exits to the rear if the original guide is removed.

132

No additional notes

Paper Feed Path - 1

RICOH
imagine. change.



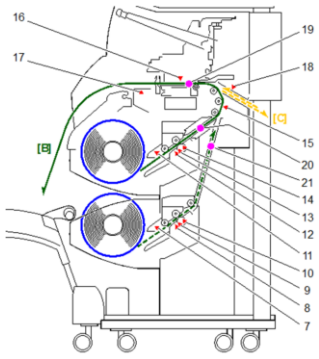
- Roll entrance sensors [7]: When the user installs a roll, these sensors detect the leading edge of the paper that the user feeds manually. This triggers the roll feed sequence and feeds paper into the vertical feed path.
- Pre-registration sensor [15]: Detects the leading edge of the roll paper when it is fed into the vertical paper path.
- DRESS sensor [16]: Functions as a paper registration sensor when the user installs a new roll, at the start of a print job, and after cutting at the end of a print job.

133

DRESS: Direct Realization Edge Scanning Sensor

Paper Feed Path - 2

RICOH imagine. change.



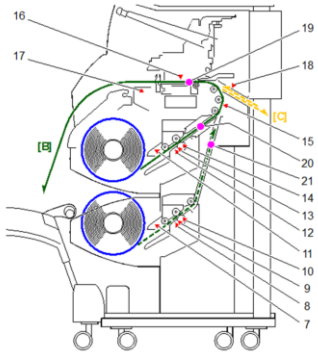
- Paper exit sensor 17]: Detects the trailing edge of the roll paper when it leaves the main machine after cutting.
- Roll exit sensors [8]: If the user reverse feeds a roller so that the roll can be removed, these sensors detect the leading edge of the roll paper when it is reverse fed.
- The output exits at the front of the machine, and onto the exit stacker.

134

DRESS: Direct Realization Edge Scanning Sensor

Paper Feed Path - 3

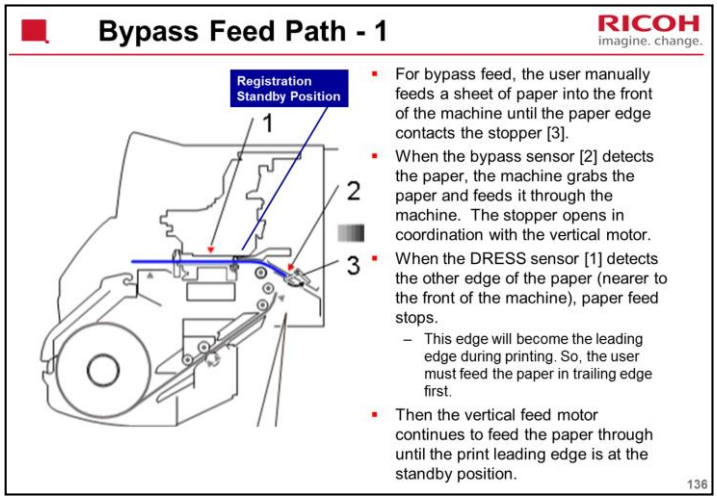
RICOH
imagine. change.



- There are two standby positions.
- If Roll Unit 2 or bypass feed is selected for a job, but paper from Roll Unit 1 is at the registration standby position [19], the machine rewinds roll 1 to paper standby position 1 [20].
- Similarly, if Roll Unit 1 or bypass feed is selected for a job when paper from Roll Unit 2 is at the registration standby position [19], the machine rewinds roll 2 to paper standby position 2 [21].
- Both the paper standby positions are 51.5 mm away from the pre-registration sensor.

135

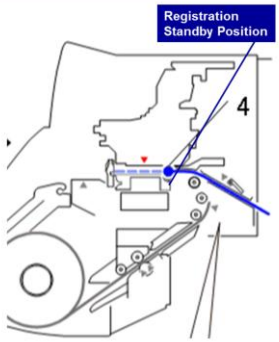
DRESS: Direct Realization Edge Scanning Sensor



No additional notes

Bypass Feed Path - 2

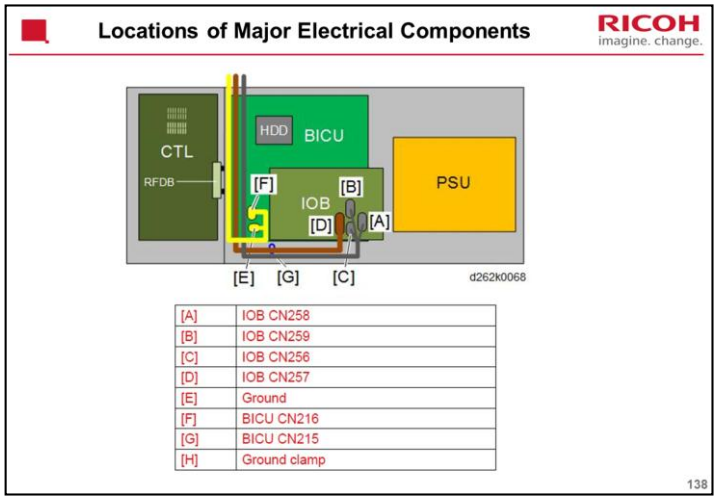
RICOH
imagine. change.



- The carriage unit makes one pass over the paper so that the DRESS sensor can detect the width of the paper.
- The machine knows the paper length from the paper size that the user inputs with the operation panel.
  - The user must input the correct size before using bypass feed.

137

No additional notes



The motherboard is mounted sideways between the controller board and the HDD bracket, so it is not easy to see.

The IPU is mounted behind the MCU and the HDD bracket, so only part of it is visible in this photo.

The HRB board is inside the carriage unit.

Functions of Main Boards

RICOH
imagine. change.

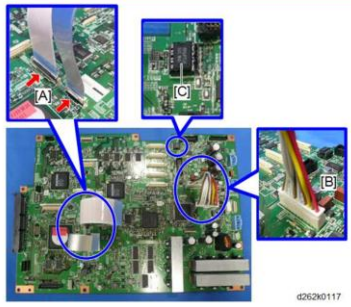
- BICU (Based Image Control Unit): This is the engine control board, and controls image processing.
- Controller: GW+ controller
- SIB (Scanner Interface Board): Located at the left rear corner of the scanner unit, interfaces with five CIS elements. Sends scanned image data to the BICU.
- HRB (Head Relay Board): Relays signals to the control board from the horizontal encoder sensor, DRESS sensor, thermistors, ink collection tank, and K2/C/Y/M print heads.
- PSU: Supplies power to the components of the machine.
- HDD: Hard disk
- RFDB: Drive board for optional roll unit 2.

139

No additional notes

BICU Board

RICOH
imagine. change.



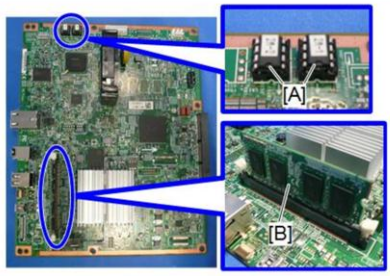
- If you install a new BICU, you must remove the EEPROM [C] from the old BICU and install it on the new BICU.

140

No additional notes

Controller Board

RICOH
imagine. change.



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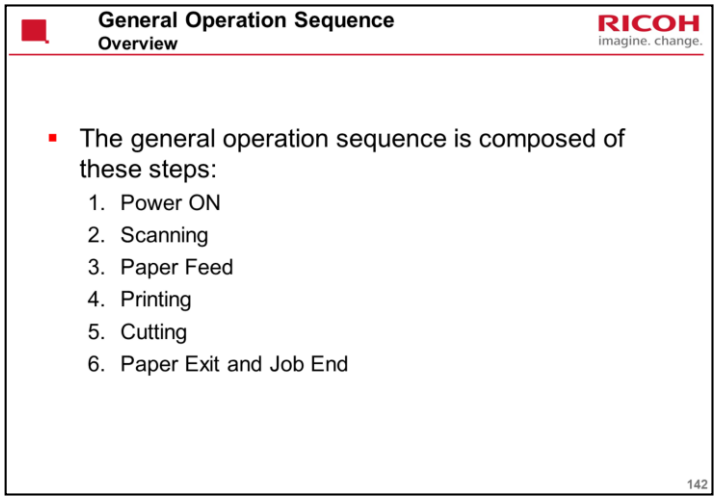
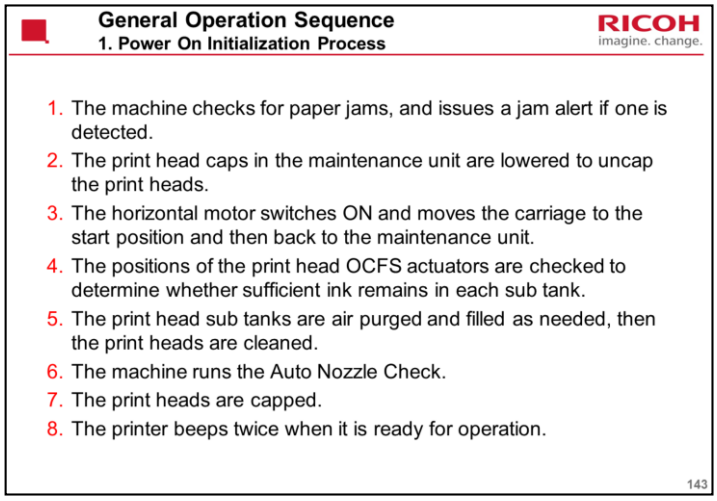
- If you install a new controller board, attach the NVRAM and memory DIMM from the old board to the new controller board.

141

No additional notes

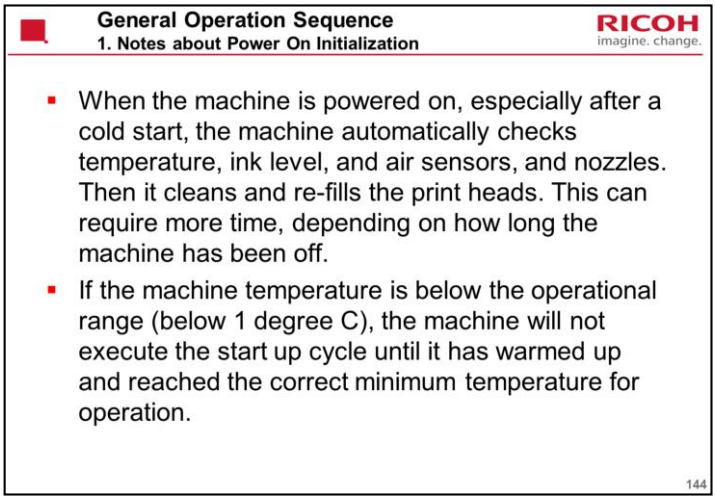


No additional notes

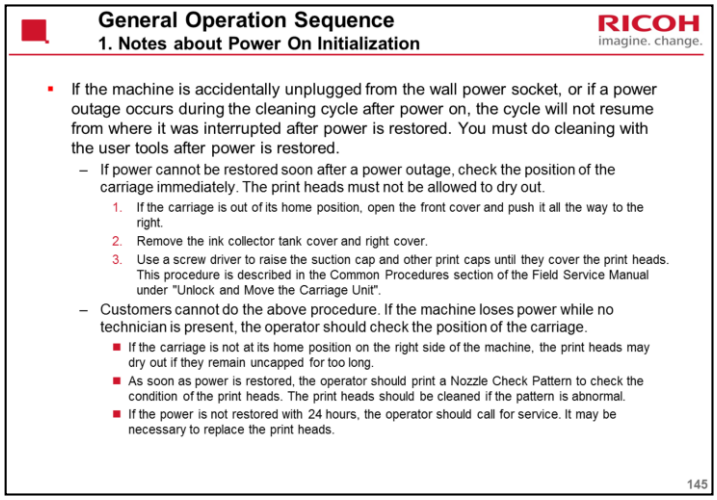


OCFS, air purging: These will be explained in detail later

OCFS basically checks the level of ink in the sub tanks.



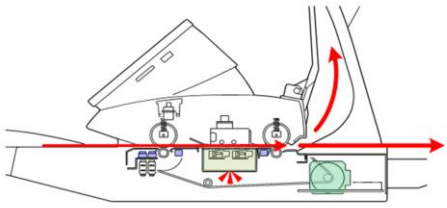
No additional notes



No additional notes

General Operation Sequence
2. Scanning

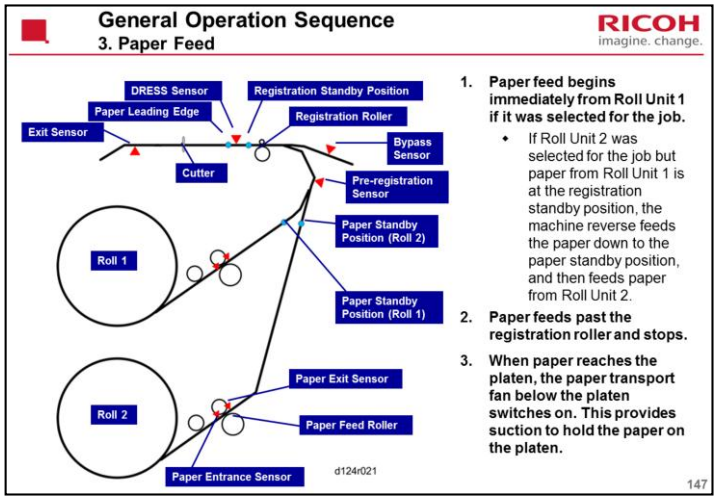
RICOH
imagine. change.



1. The operator selects the paper feed station.
2. The original is laid face down on the original table.
3. The scanner unit grabs the original and feeds it a short distance.
4. The original set sensor detects the presence of the original and the array of original width sensors detect its width.
5. The scanner motor switches on and rotates the original entrance roller and original exit roller to feed the paper past the CIS unit, which is below the original path
6. The original is fed to the upper exit. If the original guide has been removed, the original feeds straight out the back of the machine.

146

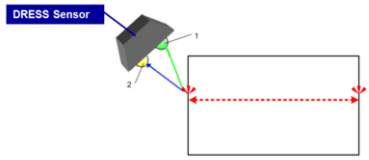
No additional notes



DRESS: Direct Realization Edge Scanning Sensor

General Operation Sequence
3. Paper Feed

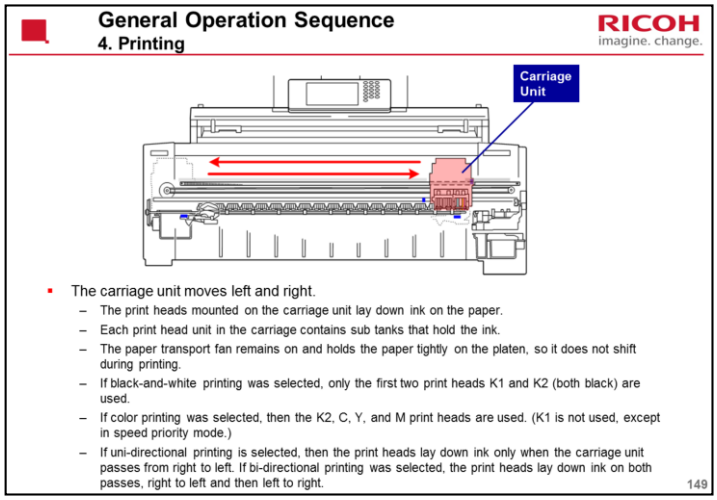
RICOH
imagine. change.



- To check for paper skew:
  - The carriage moves to the left and the DRESS sensor, mounted on the left side of the carriage, checks the right edge of the paper. The machine feeds more paper and then the sensor checks the right edge again.
  - If the 1st and 2nd readings deviate by more than ±10 mm, this indicates excessive skew.
  - The paper is rewound and the operator must set the paper again.
  - If no skew is detected, the paper is fed into the machine. Then the paper feed motor reverses while the vertical motor continues to feed the paper forward. This takes up slack in the paper, and then both motors turn OFF.
  - Then skew is checked again, but the tolerance this time is ±5 mm.
  - If the deviation is within ±5 mm, paper registration ends and the paper is reverse fed as far as the registration roller. This is the registration standby position and the machine is ready to start printing.
  - If the deviation is not within ±5 mm, the paper is released, the machine rewinds the paper and then fed again, slack is removed again, and ±5 mm skew checked again.
- During the above process, the carriage moves to the left side of the machine and the DRESS sensor detects the left edge of the paper. This detection of the right and then the left edge of the paper is for paper width detection and image registration.

148

No additional notes



Uni-directional vs bi-directional printing.

For copy jobs, the type of printing depends on the paper type, and for paper types that require uni-directional printing (translucent, matte film, coated, or special paper types), the setting cannot be changed.

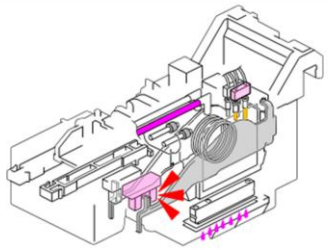
Print jobs always use uni-directional printing, and cannot be switched to bi-directional.

Bi-directional printing is not allowed if the print heads are raised (if either the "Strong“ or "Weak“ setting is selected).

For more on raising the print heads, see ‘Print Head Gap Adjustment ‘ in ‘Ink Supply and Printing’.

General Operation Sequence
4. Printing

RICOH
imagine. change.



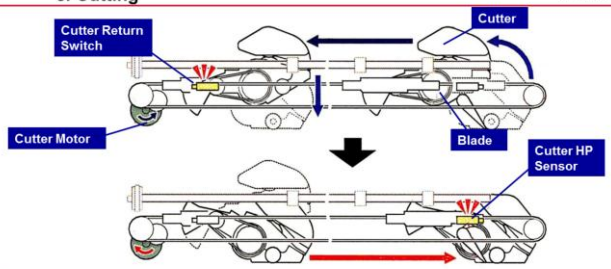
- During printing, an actuator arm on each sub tank, with actuators paired with OCFS (On Carriage Filling Sensors), constantly monitor the condition of each sub tank above the print heads.

150

No additional notes

General Operation Sequence
5. Cutting

RICOH
imagine. change.



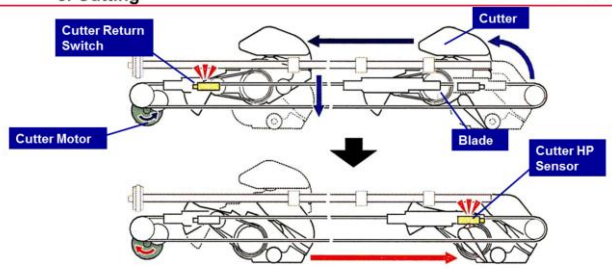
1. When printing is finished, the print head moves away from the platen, so that the cutter can cut the paper.
   - If the last line printed ends on the left side, the carriage moves to the left side of the machine.
   - If the last line printed ends on the right side (bi-directional printing), the carriage moves the right to its home position.
2. Paper feeds a short distance and stops.
3. Normally, there is no delay before the cut is done, except for tracing paper (15 s delay).
4. If you need a delay to allow the ink on the paper to dry before it is cut, adjust with SP 3140 (Ink Drying Time Setting). There is a setting for each paper type.
   - If a long delay (more than 30 sec.) has been specified by the operator, the horizontal motor will switch ON and move the carriage back to its home position so that the print heads can be capped to prevent them from drying out.

151

No additional notes

General Operation Sequence
5. Cutting

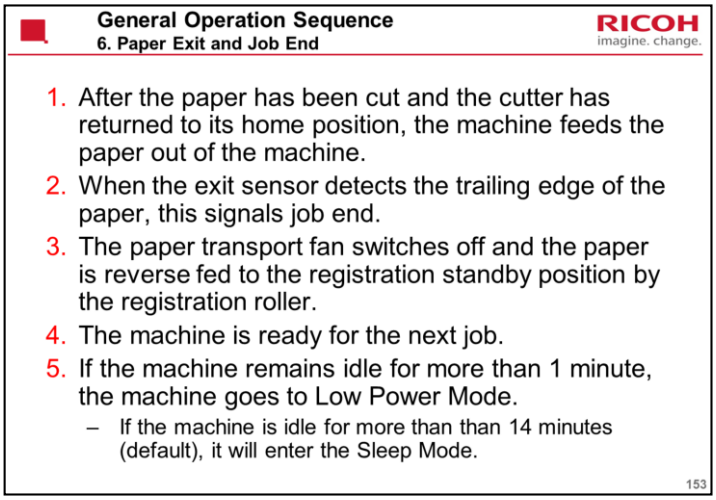
RICOH
imagine. change.



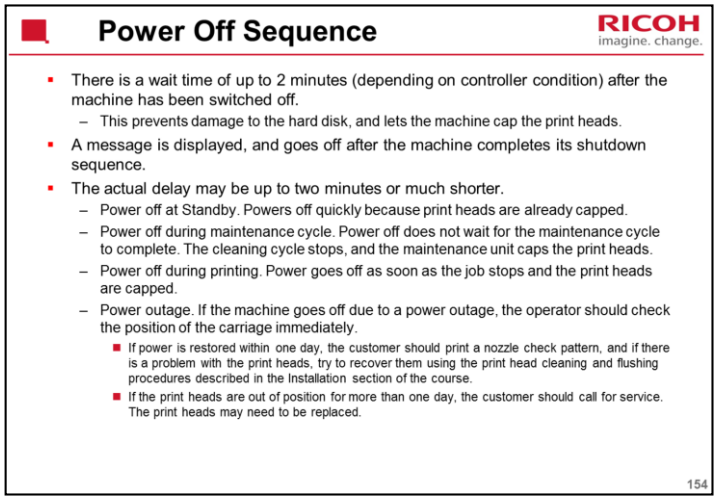
5. The cutter motor switches on and drives the circular cutter from right to left to cut the paper.
6. When the cutter reaches the left side of the machine, the cutter drops into a track below the paper, and then the cutter motor reverses and returns the cutter (passing below the paper) to its home position on the right side of the machine.

152

No additional notes

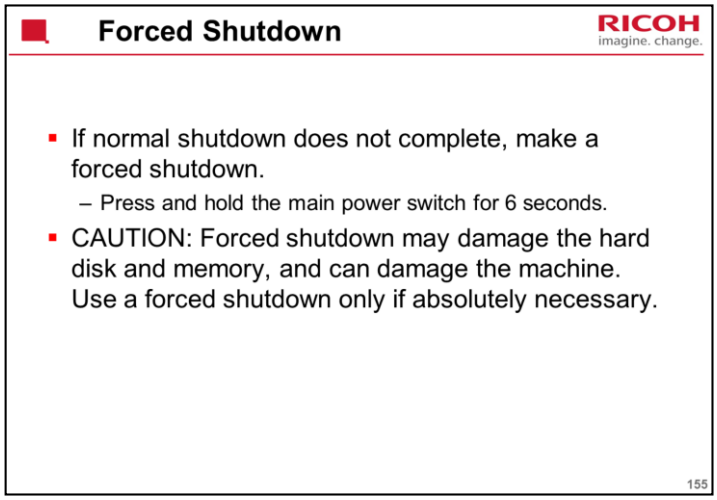


No additional notes

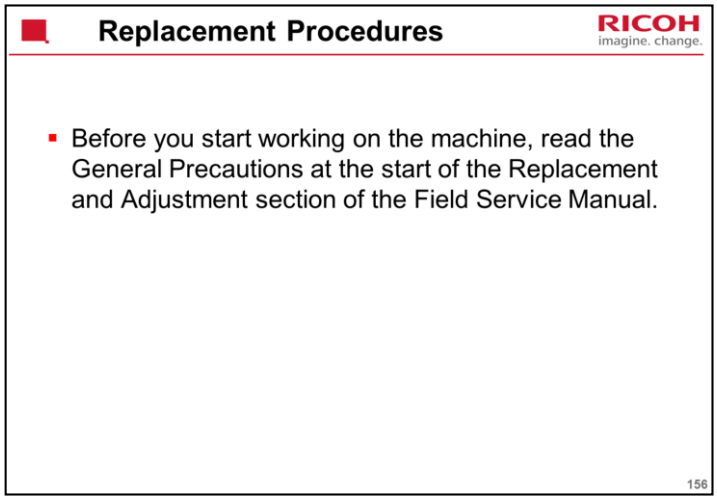


SW11: Horizontal Motor Interlock Switch

This small switch is attached to the top of the main power switch. If the main power is switched off, this interlock switch will keep the circuit closed until the horizontal motor stops operating, and then it will open the circuit to switch off the power. This ensures that the carriage unit is at rest on the right side of the machine with the print heads capped. (This causes a slight delay and a 2 minute warning when the main power is switched off.)



No additional notes



These cautions are mentioned in various parts of the training course.

Service Precautions
Rollers

RICOH
imagine. change.

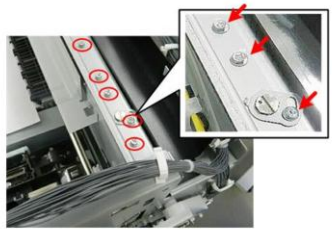
- The surfaces of the main rollers (original feed roller, original exit roller, registration roller, and exit roller) are covered with a soft urethane coating. This coating can be damaged quite easily (even with a fingernail).
- Never touch the surface of these rollers with bare hands.
- Always hold the rollers by the bare ends, where they are not coated.
- Never use any type of strong organic solvent to clean the surface of these rollers. Use only a cloth very slightly dampened with alcohol or water.

157

No additional notes

Service Precautions
Main Frame Screws

RICOH
imagine. change.



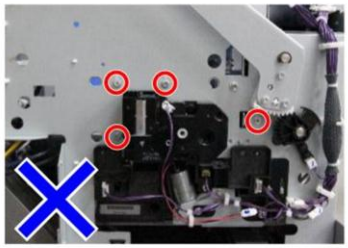
- There are paint-locked screws across the top of the machine (under the top cover).
- These screws are positioned and adjusted at the factory. Never loosen or attempt to adjust these screws.

158

No additional notes

Service Precautions
Right Plate Screws

RICOH
imagine. change.



d262k8096

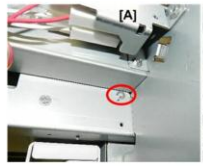
- You can see the heads of four paint-locked screws around the top of the maintenance unit. These screws hold a re-enforcement plate.
- Never loosen or remove any of these screws.

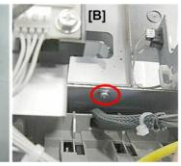
159

No additional notes

Service Precautions
Maintenance Unit Base Plate

RICOH
imagine. change.





- The maintenance unit base plate supports the maintenance unit. These screws hold the base plate under the maintenance unit, which must always remain in the same position below the carriage print heads.
  - The two base plate screws at the back on the right rear panel should never be loosened or removed.
  - There are also two paint-locked screws at the front. One screw at the front below the switch bracket [A] on the right. The other screw [B] is to the right of the temperature/humidity sensor above the ink supply unit.

160

No additional notes

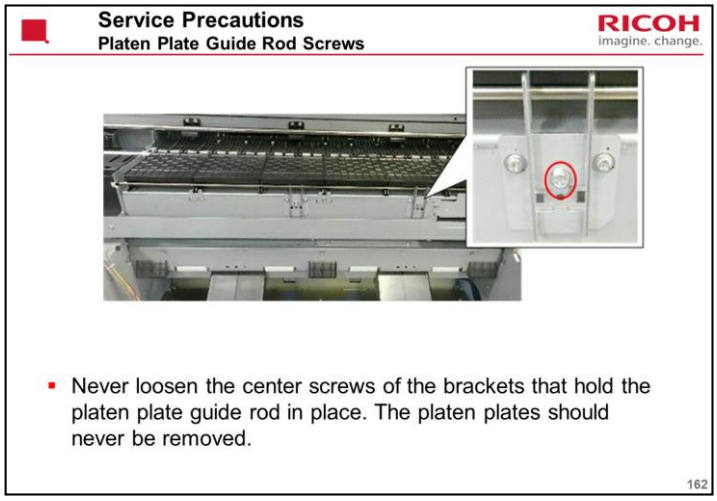
Service Precautions
Main Carriage Screws

RICOH
imagine. change.

- The illustration shows the left cover of the carriage unit removed.
- It is extremely important you never loosen or remove these screws.
- Tampering with these screws could cause the carriage unit to fall out of alignment or onto the platen plates.

161

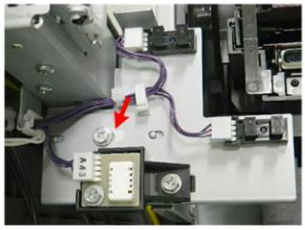
No additional notes



No additional notes

Service Precautions
Temperature/Humidity Sensor Bracket

RICOH
imagine. change.

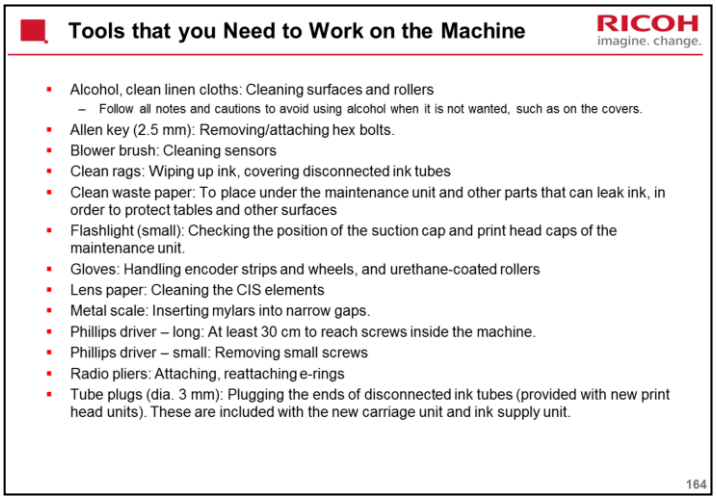


d124r774

- This screw is paint-locked. However, the bracket must be removed when you remove the carriage unit. The bracket must be re-installed at exactly the same position, so that the sensors are in the correct place.

163

No additional notes



No additional notes

Before you Start

RICOH
imagine. change.

- Before doing any procedure, always turn off the power switch and unplug the machine from its power source.
- To prevent damage to these parts, and to prevent interference with raising and lowering the top of the scanner unit, always remove the following before servicing the machine:
  - [A] Original guides
  - [B] Original stacker
  - [C] Rear output guides

165

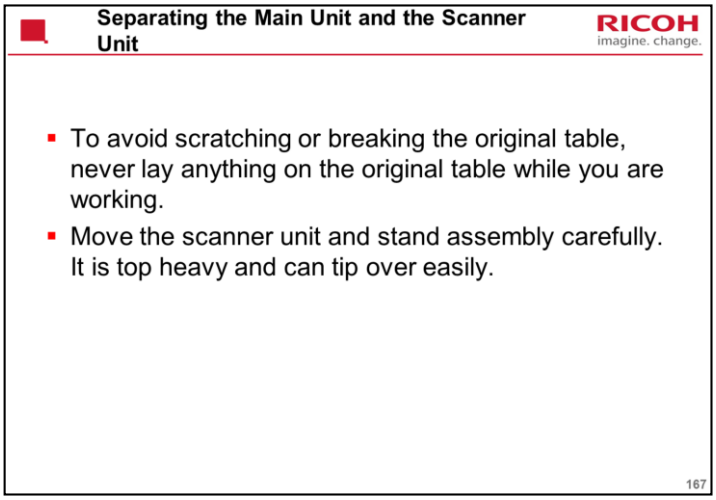
Replacement and Adjustment > Common Procedures

Reinstalling the Original Stacker

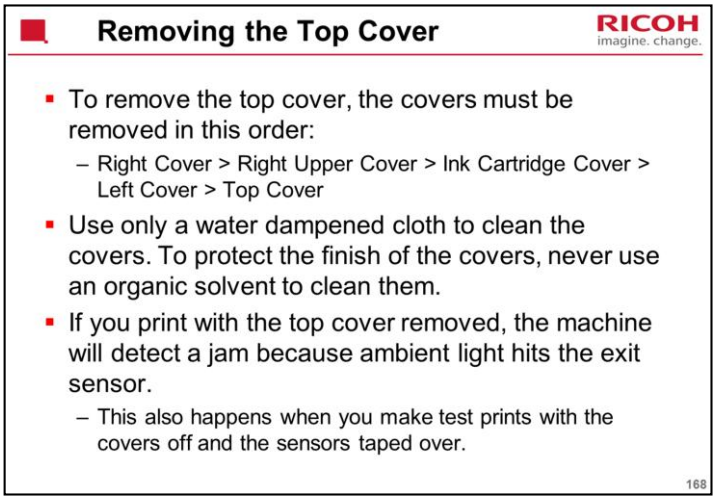
RICOH imagine. change.

- Pull out the light shield and confirm that the gap at the top of the scanner unit is completely covered.
  - This light shield prevents light from entering the scanner unit.
  - If this gap is not covered, strong light could enter the back of the scanner unit and cause image distortion during scanning.

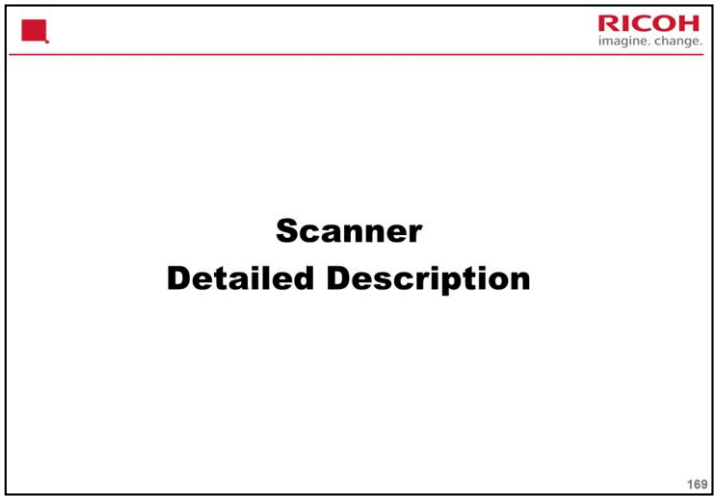
166



Replacement and Adjustment > Common Procedures



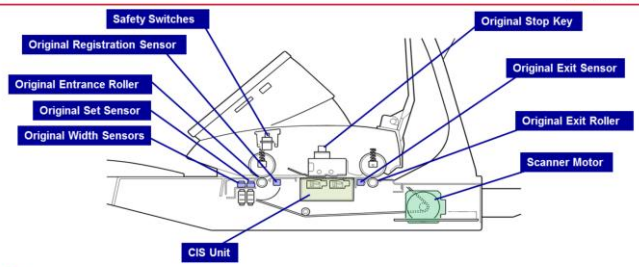
Replacement and Adjustment > Common Procedures



The scanner is based on the N-C3.

The original feed and exit rollers are made of a different material.

Overview



- Registration sensor: Detects the leading edge of the original and stops feed long enough for the operator to align the original manually if it is not straight.
- CIS unit: Scans the original and sends the data to the SIB in the scanner unit.
- Original exit sensor: Detects the leading and trailing edges of the original to check the original feed timing.
- Scanner motor: Drives the scanner entrance roller and the exit roller via a single timing belt.
- Two safety switches (micro-switches) on the left side of the scanner unit disconnect power to the scanner unit when the scanner unit cover is opened. This prevents the CIS unit from switching on while the cover is open.
- Original stop key (red button on the right side of the scanner unit): Press this to interrupt scanning if a problem occurs during scanning (jam, wrinkling, skew).

170

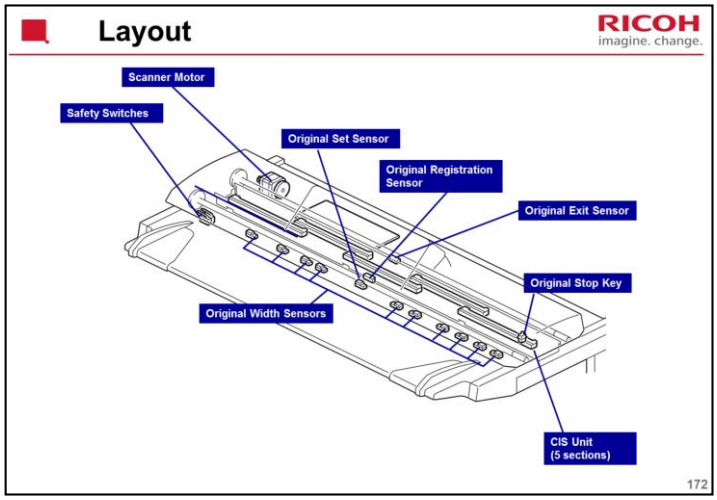
No additional notes

Original Stop Key

- Press this to interrupt scanning if a problem occurs during scanning (wrinkling, skew), to prevent damage to the original.

171

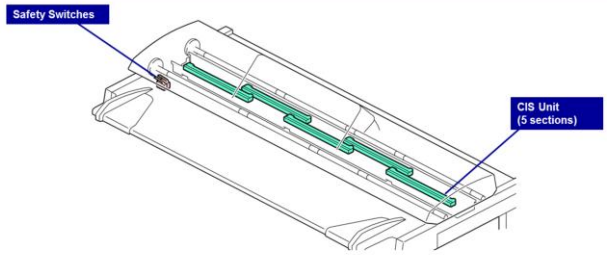
No additional notes



No additional notes

CIS Structure - 1

RICOH
imagine. change.



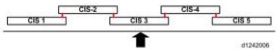
- The CIS unit has 5 contact image sensors linked in a staggered configuration, below the original feed path.
- Two safety switches cut off the power to the CIS unit when the scanner cover is lifted. This prevents the CIS unit from lighting up accidentally when the cover is open.

173

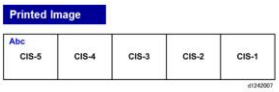
No additional notes

CIS Structure - 2

RICOH
imagine. change.



- The CIS unit is made of 5 contact image sensors connected at 4 joints.
- From above, the CIS sections are numbered from left to right as CIS-1 to CIS-5.
- But, when you look at the copy to identify the areas scanned by each section, the numbering is in the opposite sequence, with CIS-5 on the left to CIS-1 on the right.

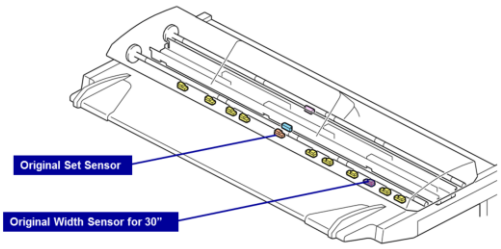


174

No additional notes

Original Width Detection - 1

RICOH
imagine. change.



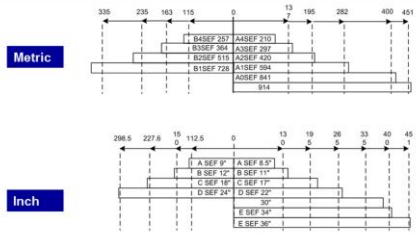
- These sensors detect the width of the original when it is set on the original table:
  - Metric version: 10 sensors (9 original width sensors plus the original set sensor [1], which also functions as a width sensor).
  - Inch version: 11 sensors (9 original width sensors, the original set sensor [1], and one additional width sensor [2] to detect 30").

175

No additional notes

Original Width Detection - 2

RICOH
imagine. change.



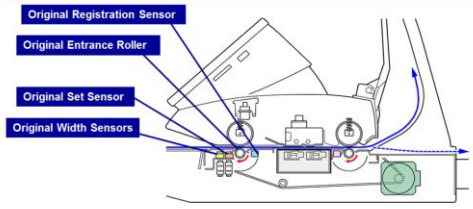
- The sensors to the left of center (set sensor position "0") detect B series (Metric) or Architecture (USA) sizes.
- The sensors to the right of center (set sensor position "0") detect A series (Metric) or Engineering (USA) sizes.
- If only the original set sensor turns on, the machine detects an A4 or 8½" (A size) SEF original.

176

No additional notes

Scanning Sequence - 1

RICOH
imagine. change.



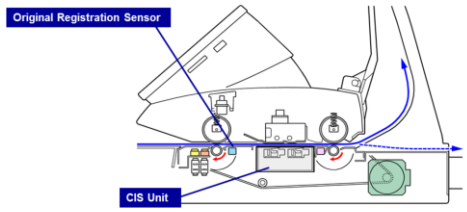
- First, the original set sensor detects the leading edge of the original and the original width sensors detect the width of the original.
- The original entrance roller grabs the leading edge, feeds it a short distance and then stops for 1 second.
  - This is called Delay 1. This gives the operator time to set the paper again if it is not perfectly straight.
- Then, the original entrance roller feeds the original to the registration sensor.

177

No additional notes

Scanning Sequence - 2

RICOH
imagine. change.



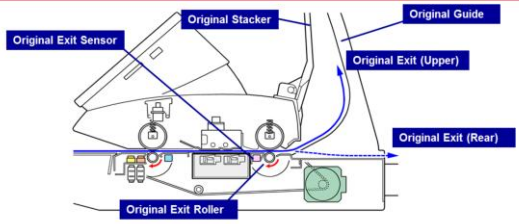
- When the registration sensor detects the leading edge of the original, the machine stops original feed again for 1 second.
  - This is called Delay 2. This gives the operator another chance to check that the original is straight. If the original is not straight, the user can push the original stop key on the right side of the scanner unit, remove the original, and try again.
  - The length of time for Delay 1 and Delay 2 to pause can be adjusted with User Tools > System Settings > General Features > Original Feed Delay.
- Then the CIS (Contact Image Sensor) scans the original from below.

178

No additional notes

Scanning Sequence - 3

RICOH
imagine. change.



- The original exit sensor checks the time between the leading and trailing edges of the original to make sure that there is no jam.
- The original exit roller feeds the original out of the scanner unit while the scanned image is processed.
- The original goes to the upper exit after scanning.
  - Long originals will curl in the tray.
  - If the original guide is removed, the original goes out of the rear of the machine.
  - The user should remove the original guide when scanning thick originals.

179

No additional notes

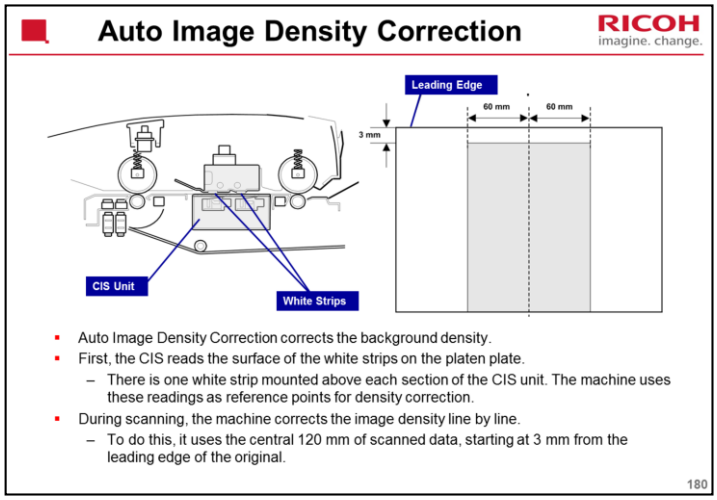


Image density correction strip: These positions (3 mm, 60 mm).

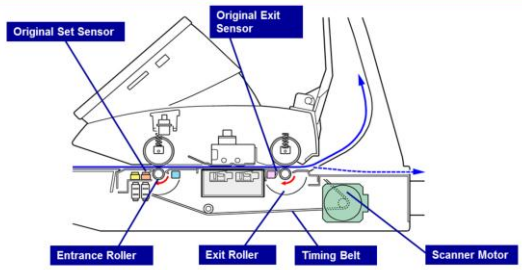
SP4901-005 Digital AE -Start Position

SP4901-006 Digital AE -Left Start Position

SP4901-007 Digital AE -Right Start Position

Scanner Mechanism

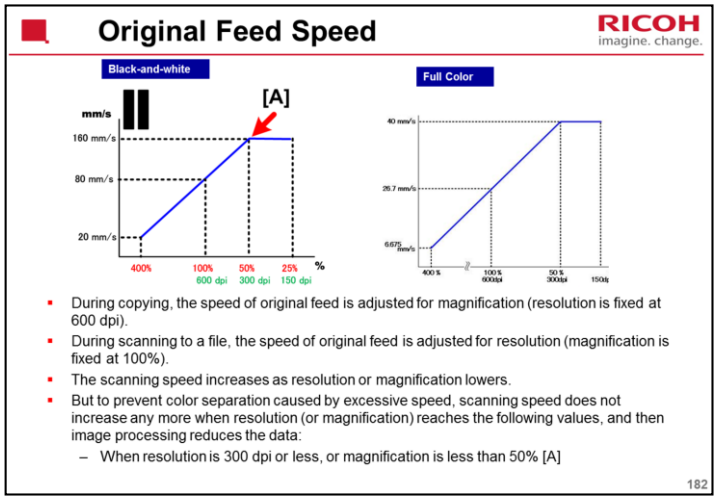
RICOH
imagine. change.



- The scanner motor is a stepper motor. It uses a timing belt to drive the original entrance roller and original exit roller.
- The original set sensor turns the motor on when an original is set.
- The exit sensor switches the motor off when the sensor detects the trailing edge of the original.

181

No additional notes



Black-and-white Standard for Copying

Resolution: 600 dpi (fixed). Copy resolution cannot be adjusted.

Magnification: 100%

Original scanning speed : 80 mm/s

Black-and-white Standard for Scan to File

Resolution: 200 dpi

Magnification: 100% (fixed)

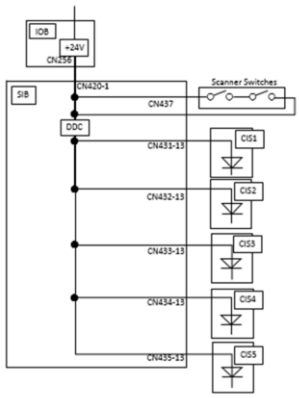
Scanning speed: 160 mm/s (with electronic magnification)

This graph shows the reciprocal relation between copy magnification and scan job resolution. For example:

A copy reduced to 50% (one-half of an image at 100% 600 dpi) is reduced by removing half the pixels.

This is the same as a 300 dpi copy at 100%, in other words, the same as a document scanned to a file at 300 dpi.

Scanner Safety Switches



- Two switches inside the scanner prevent the LEDs in the CIS from switching on accidentally.
  - When the original feed unit is opened and the switches open, a +24V line connecting each LED driver on the SIB board is disconnected.
  - When the original feed unit is closed and the switches close, the +24V line is re-connected.

183

No additional notes

Scanning Long Originals - 1

RICOH
imagine. change.

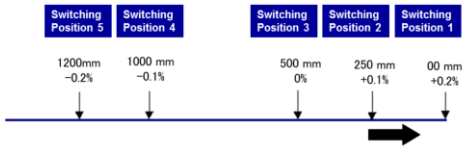
- When long originals (or special originals in a carrier sheet) are fed into the scanner, the scanned portion of the original behind the scanner unit may sag. This can cause the original to slip in the original feed path and interfere with smooth operation of the scanner motor.
- To correct this, the scanning speed can be changed at designated points:
  - Up to 15 switching points can be designated for a long original up to the maximum length of 15,000 mm (15 m or approximately 50 ft.).
  - The first starting point (the reference point) is upstream of the CIS.
  - SP4992 determines whether this function is on or off (default is off).
  - The points can be entered with SP codes SP4993 and SP4994
  - The speed of the scanner motor can be set in the range of ±10% and it can be adjusted in fine increments (±0.1%)

184

No additional notes

Scanning Long Originals - 2

RICOH
imagine. change.



- Look at the settings above. Note that as more of the original feeds through the scanner unit, the speed of the scanner motor is decreased slightly.
  - "0" means that the speed is 100% of the normal speed of the scanner motor.
  - If the image is to be magnified, the speed of the vertical motor is automatically adjusted to account for the changes in scanning speed so that magnification will not be affected.

185

No additional notes

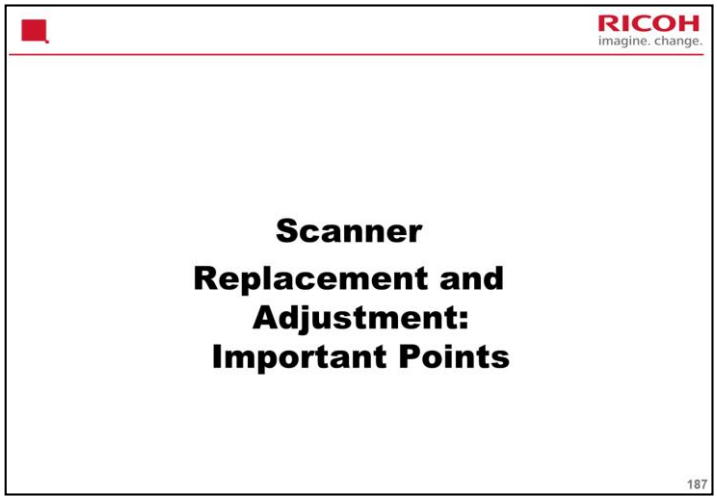
Prevent Originals from Falling

RICOH
imagine. change.

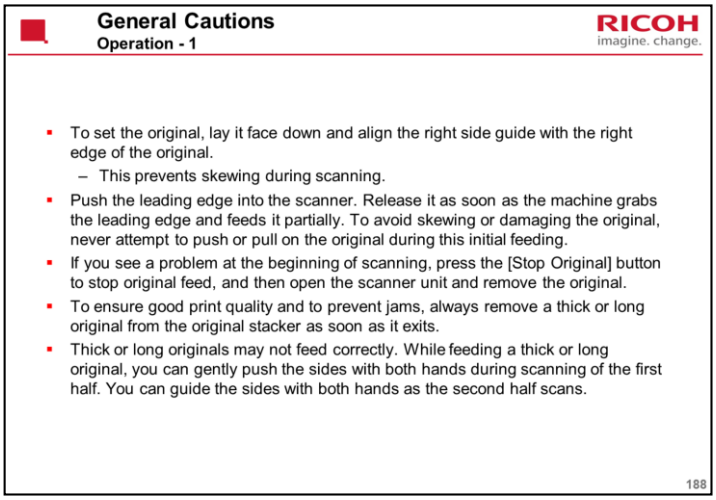
- The machine can be set up to hold the trailing edge of the original at the end of the scan job.
- This prevents the original from falling on the floor. The trailing edge is held in the nip of the exit roller until it can be removed manually.
- This feature can be switched on/off with SP4975 (Prevent Original Falling).

186

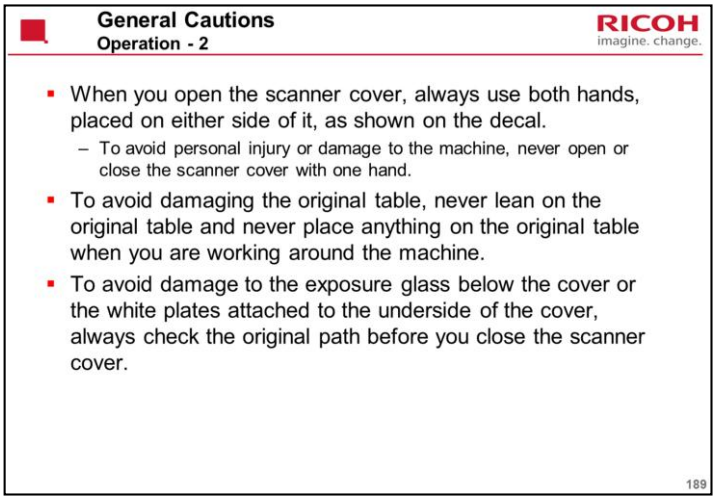
No additional notes



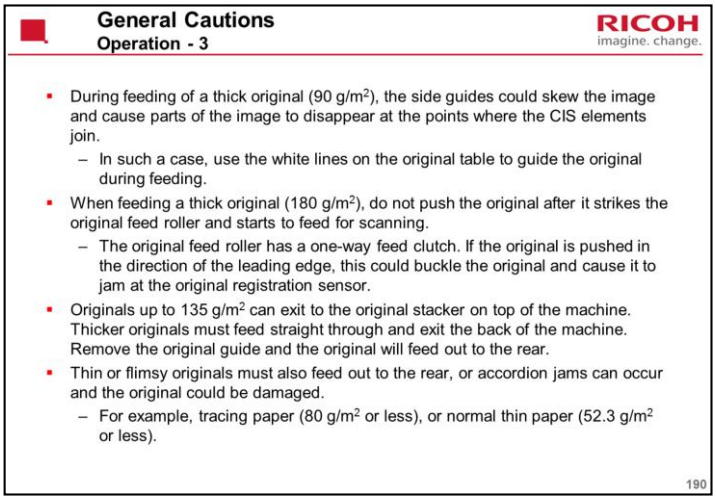
For full details of all procedures, see the service manual.



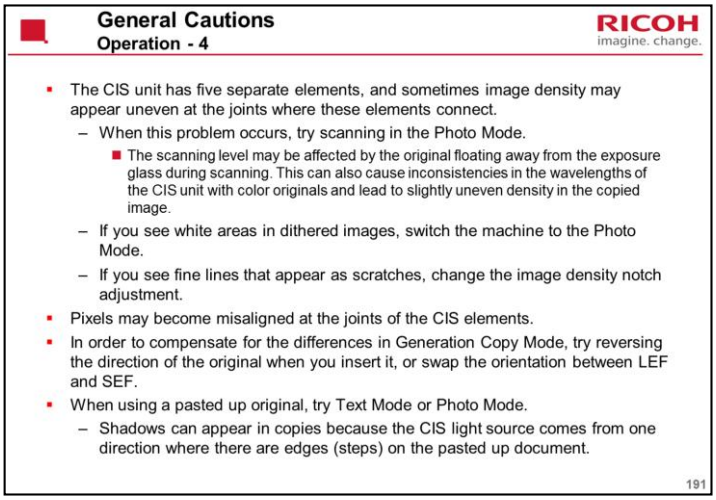
No additional notes



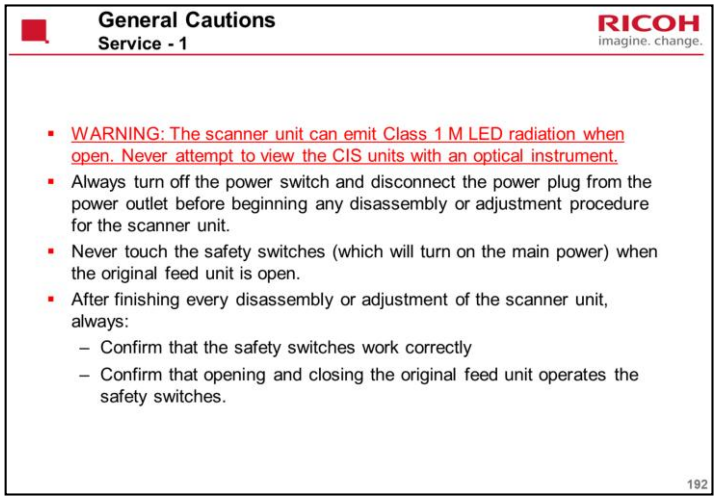
No additional notes



No additional notes



No additional notes

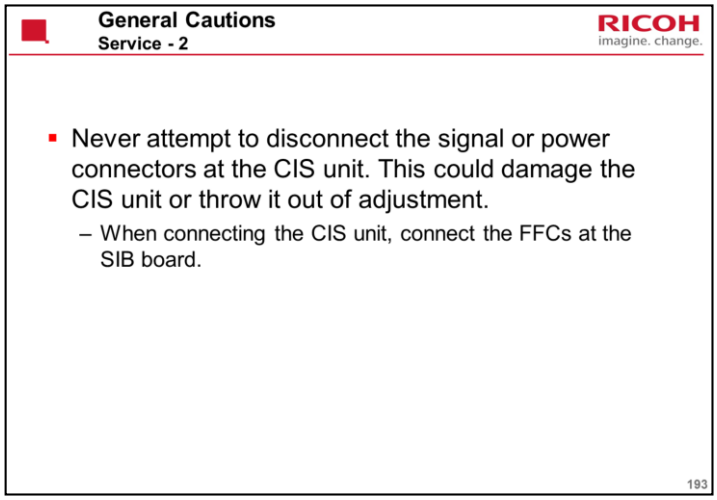


Radiation output

Blue: Wavelength 452-463 nm and an output of 6.9 mW

Green: Wavelength 520-531 nm and an output of 3.9 mW

Red: Wavelength 629-634 nm and an output of 4.8 mW



No additional notes

Lifting the Left End of the Scanner Unit

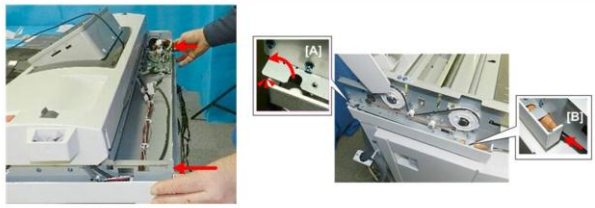
RICOH
imagine. change.

- By disconnecting and lifting the left end of the scanner unit, you can do many procedures on the scanner unit without completely disconnecting the scanner unit and removing it from the machine.
- If you do this, remove the hex bolts at the left side, but loosen (do not remove) the bolts at the right side.

194

Lifting off the Scanner Unit

RICOH
imagine. change.



- After you have removed the screws, to prevent the scanner unit from falling onto the floor, push it over the main unit slowly.
- Then, slowly, lift the scanner unit and set it on top of the left rear corner of the scanner stand [A].
- Place the square handle of a screwdriver or a block of wood or cardboard between the front left corner of the unit and the rack frame [B].
  - A block of wood 10 cm long and 2 cm thick (4 x 1 in.) is ideal.
  - This block stabilizes the front end and prevents it from falling.

195

No additional notes

Original Table

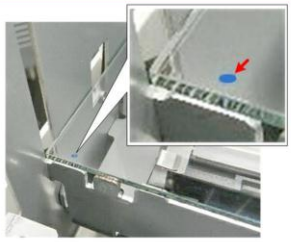
RICOH
imagine. change.

- Make sure to put the screws back in the correct places.
  - Left side [A]: Pivot screw [B].
  - Right side [C]: Tapping screw [D]

196

Replacing the Exposure Glass

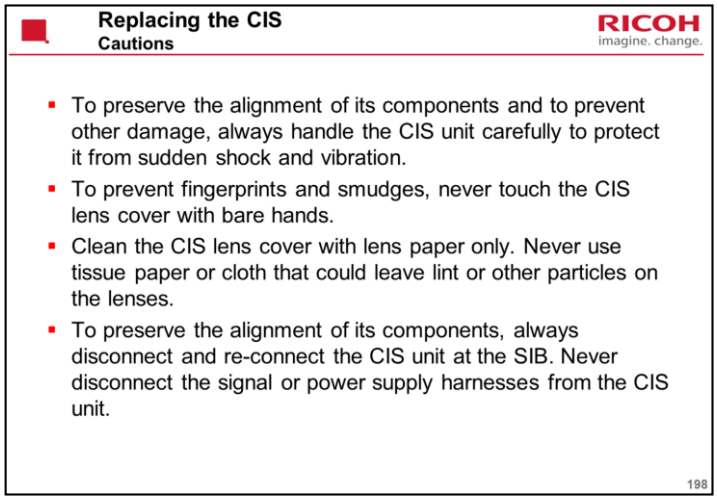
RICOH
imagine. change.



- The exposure glass is very long and thin. It is very easy to break, so handle it carefully.
- When you reinstall the exposure glass, set the glass so that the blue dot is on the top surface of the front left corner of the glass.

197

There is no beveled edge on this exposure glass.



No additional notes

Replacing the CIS
Connecting the CIS to the SIB board

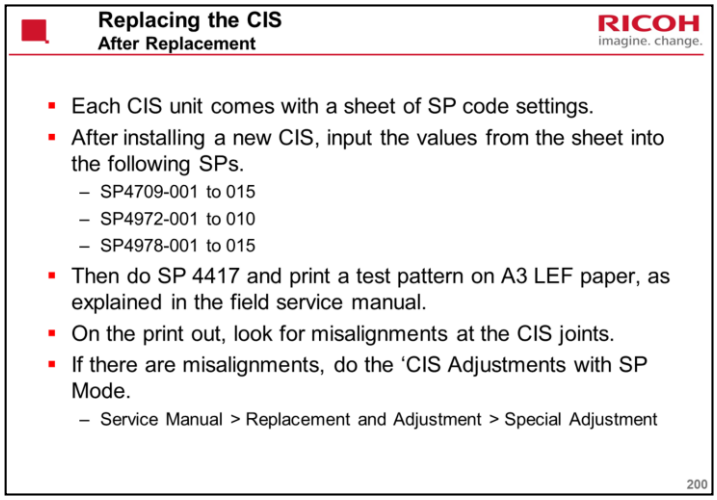
RICOH
imagine. change.

d262k1026

- When connecting up the cables, look at the CN numbers on the cable and on the printed circuit board.

199

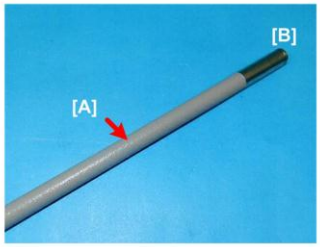
No additional notes



Replacement and Adjustment > Scanner > CIS

Original Feed Roller, Original Exit Roller

RICOH
imagine. change.



- The urethane coating [A] is fragile. Always hold the roller at [B], where its surface does not have a coating.

201

No additional notes

Removing the Top of the Scanner Unit

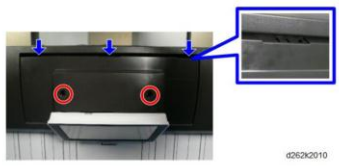
RICOH
imagine. change.

- After disassembly (see the service manual), lift and remove the top of the scanner unit.
- The latches on either end can fall off easily. Immediately after you lay the top down, confirm that both these latches are still on the shaft and have not fallen off while lifting and moving the top.

202

No additional notes

Removing the Operation Panel



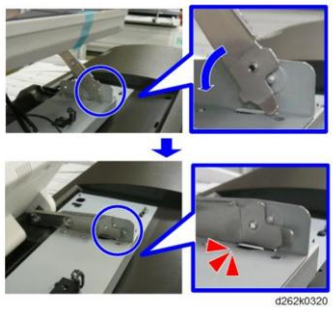
- When removing the cover, unhook the 3 hooks at the rear, and slide it towards the rear.

203

No additional notes

Replacing the Operation Panel

RICOH
imagine. change.



- When attaching the new operation panel, set the L angle of the bracket against the boss, then sliding the hole over the boss while rotating forward.

204

No additional notes

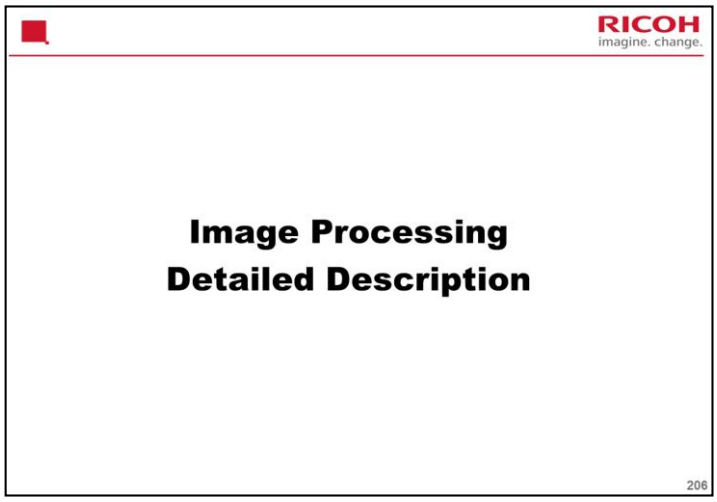
Scan Magnification Correction (Sub-scan)

RICOH
imagine. change.

- Magnification (enlargement/reduction) in the sub scan (vertical) direction is done by adjusting the speed of the scanner motor with SP2116 (Copier Sub Scan Magnification Setting)
- Adjustment is done relative to the default setting of 0, which means 100%.
  - If you reduce the setting, this increases the speed of the scanner motor and the sub-scan length of the image is reduced when it is printed.
  - If you increase the setting, this reduces the speed of the scanner motor and the sub-scan length of the image is enlarged when it is printed.

205

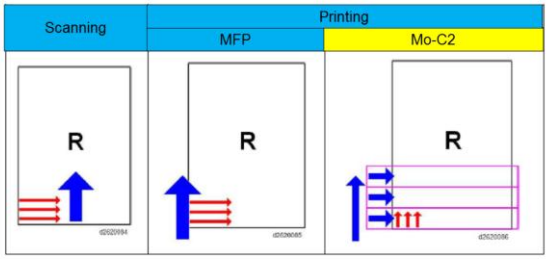
No additional notes



No additional notes

Image Processing Features

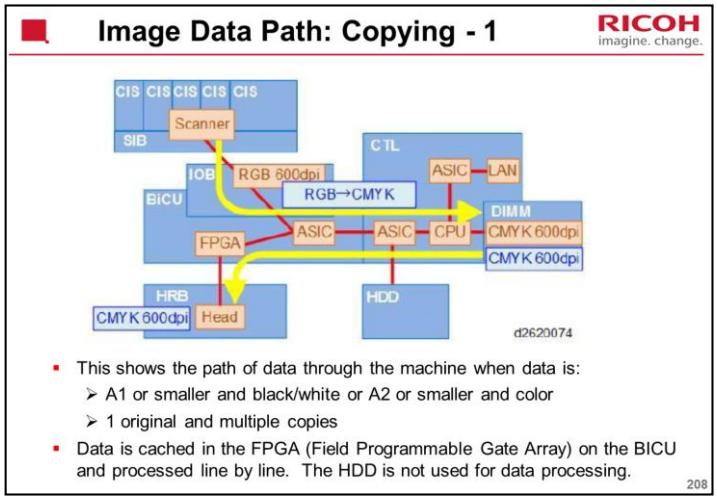
RICOH imagine. change.



- Data converted in the BICU is printed line by line.
- Mirror and compressing/uncompressing jPEG are done in the BICU.

207

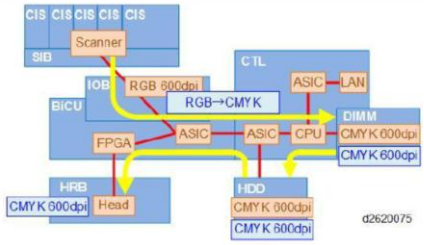
No additional notes



The yellow arrows show the path of data through the machine.

Image Data Path: Copying - 2

RICOH imagine. change.



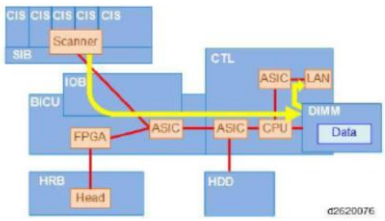
- This shows the path of data through the machine when data is:
  - Larger than A1 and black/white or larger than A2 and color
  - Original contains multiple pages
- Data is temporarily stored in the HDD, cached in the FPGA of the BICU and processed line by line.

209

No additional notes

Scanning: Twain

RICOH
imagine. change.



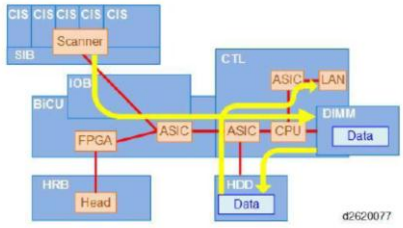
- The format of the converted data is dependent on the printer driver setting.
- Data is processed and transferred page by page.

210

No additional notes

Scanning: Scan to

RICOH
imagine. change.



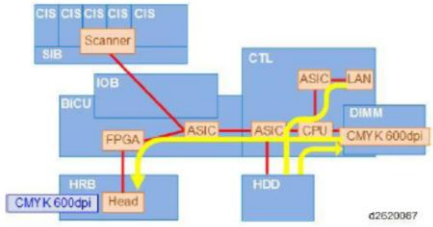
- The format of the converted data is dependent on the machine setting.
- Data is temporarily stored on the HDD.
- Data is transferred via LAN.

211

No additional notes

Printing

RICOH
imagine. change.



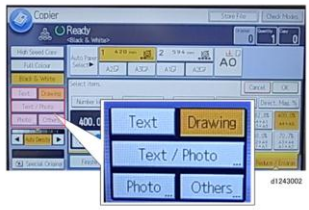
- Data is temporarily stored in the HDD, cached in the FPGA on the BICU and processed line by line.

212

No additional notes

Copy Mode Image Processing Selections

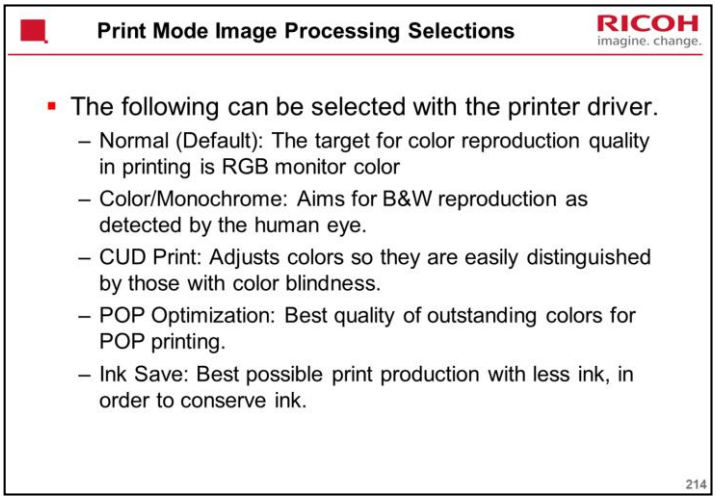
RICOH
imagine. change.



- Drawing: For line drawings with fine lines that could easily break up during copying.
- Text: Mainly text with few or no illustrations.
- Photo: Glossy photos, photos printed on paper, re-produced photos (generation copies).
- Text/Photo: Text mixed with photos and drawings.
- Glossy Photo: Photos or illustrations printed on glossy surface paper.
- Printed Photo: Printed photos and artwork on magazine pages.
- Copied Photo: Photos or illustrations copied onto paper and printed in color.
- Background Lines: Forces background lines of graph paper, for example, to drop out. (Forcing blue to drop out may be difficult.)
- Patched Original: Text, photos, drawings, pasted up on paper or boards for layout.
- Generation Copy: Originals copied many times in succession with text letters starting to become distorted.
- Map: Full color maps with fine lines.
- Highlight Pen: Text marked with yellow highlight that you do not want to lose in a black-and-white copy.

213

No additional notes



CUD: Color Universal Design

POP: Point of Purchase

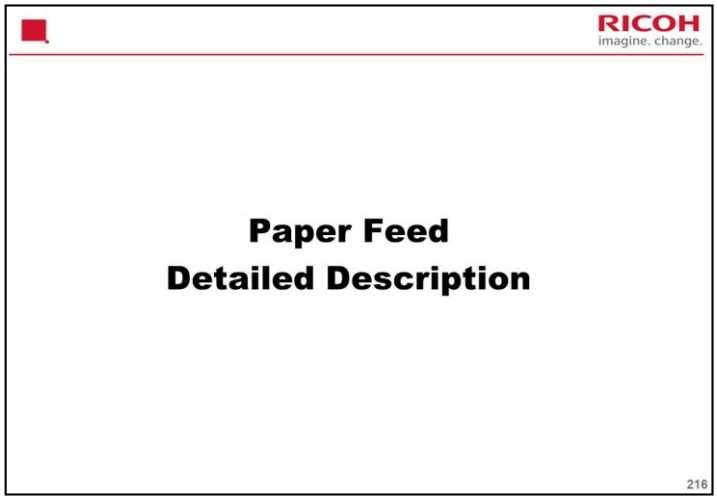
Image Processing Problems

RICOH
imagine. change.

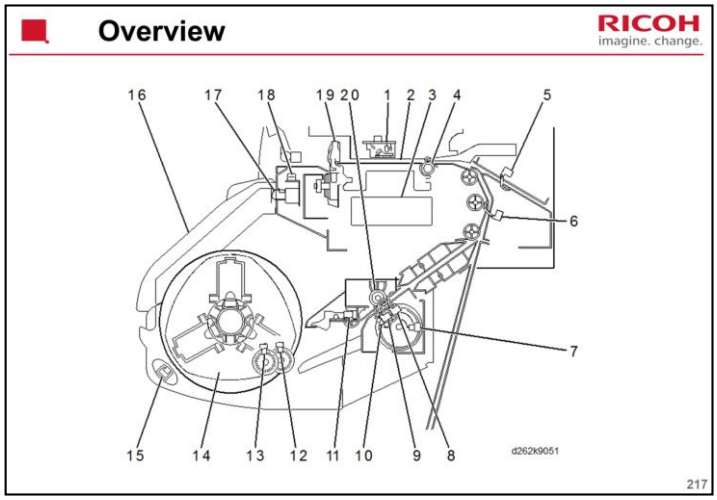
- Photo images that have areas filled with dithering or fine lines frequently exhibit moiré.
- For images where moiré does not stand out with 1:1 copying, changing the rate of magnification could cause moiré to appear.
- If 0.5 mm bands occur in halftone areas of uneven density, switch to Photo/Text mode (or Text mode), so that banding does not stand out.
  - Inconsistencies in the self-focusing lens array of the CIS can cause slight unevenness in image density.
- The thickness of fine lines (0.1 mm or less), or the lines in enlarged copies of originals previously reduced, may look different in the copies compared with the originals.
  - This is because the position of the elements in the CIS unit and position of the fine lines in the original may not be consistent.
- If dirty background still appears in a copy using the Auto Density setting, adjust the notch to a lighter setting.

215

No additional notes

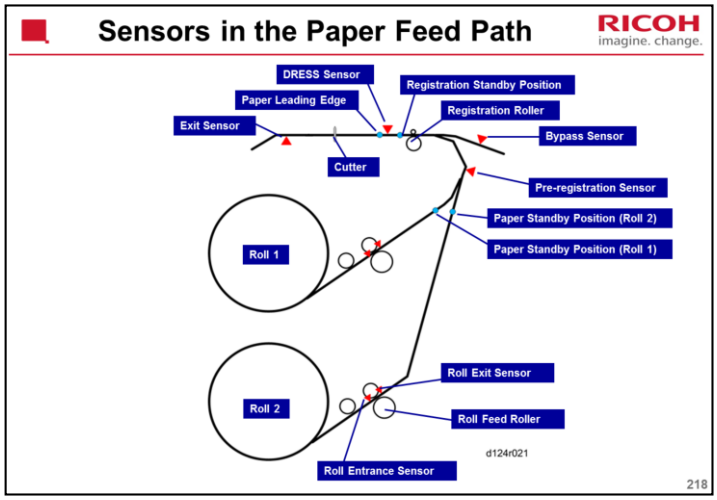


No additional notes

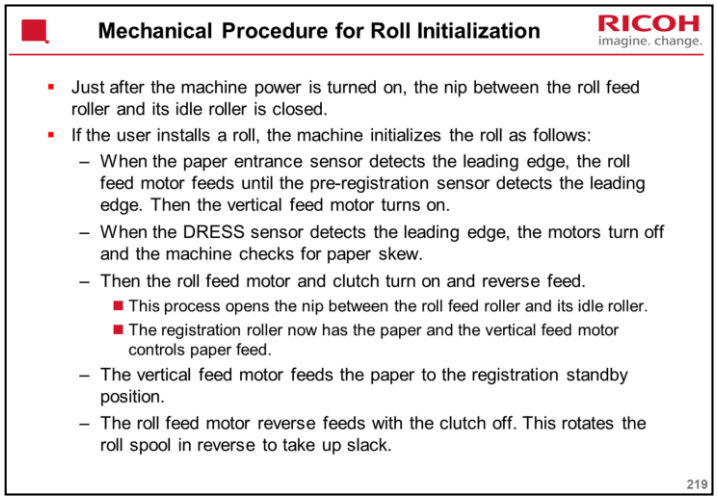


This slide introduces the main components of the paper feed mechanism. Details for each component will be explained later.

1.DRESS sensor
2.Platen
3.Paper transport fan
4.Registration roller
5.Bypass sensor
6.Pre-registration sensor
7.Paper release sensor
8.Roll feeder exit sensor
9.Roll feeder entrance sensor
10.Roll feeder entrance sensor
11.Roll end sensor
12.Encoder sensor 1 (motor)
13.Encoder sensor 2 (paper)
14.Spool
15.Roll rewind switch
16.Paper exit guide
17.Paper exit guide switch
18.Exit sensor
19.Cutter
20.Feed roller



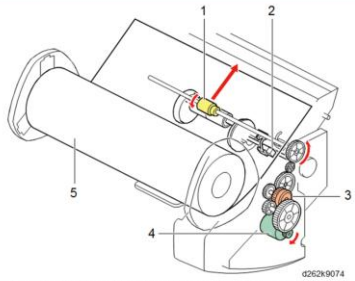
Refer to this slide while studying the next few slides about paper feed mechanisms and timing.



The details of the mechanisms are explained later. This is just the procedure.

Roll Feed Mechanism

RICOH
imagine. change.



- When the roll paper feed motor [4] rotates forward, the feed roller [1] feeds the paper into the machine.
- When the roll paper feed motor rotates in reverse with the roll feed clutch [3] OFF, the spool reverses (for example, to take up slack).
- When the roll paper feed motor rotates in reverse with the roll feed clutch ON, the feed roller rotates in reverse. The cam also rotates, and this moves the idle roller into and out of contact with the feed roller, so the paper reverse feeds intermittently.

220

The next few slides explain what happens when the user installs a new or partially used roll in one of the feed stations.

The roll feed clutch and the paper release sensor are only used for lifting the idle rollers, not for paper feed.

Initializing the New Paper Roll - 1

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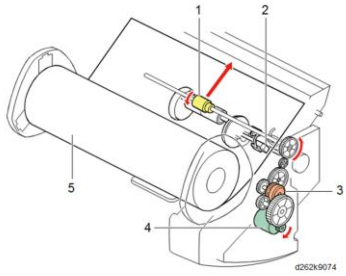


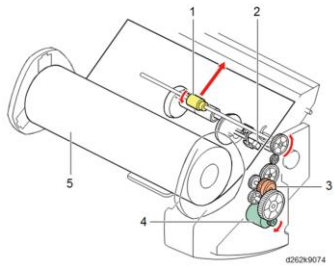
- The operator manually inserts the leading edge of the roll sheet into the paper path slot of the roll feeder.
- The roll feed roller rotates briefly. This grabs the paper, and the roll paper feed motor stops.

221

No additional notes

Initializing the New Paper Roll - 2

RICOH
imagine. change.

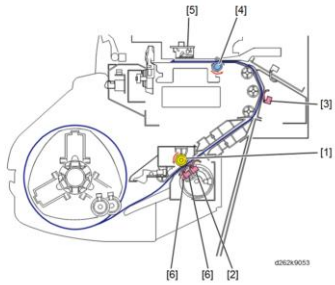


- A prompt appears on the screen and asks the user if the paper should be cut ("Cut" or "No Cut"). The operator presses "Cut" (recommended).
- The user then selects Paper Type and Thickness.
- The roll paper feed motor [4] starts rotating clockwise. This turns the shaft of the roll feed roller and feeds the paper.
  - The roll paper feed motor rotates the roll feed roller via the drive gear.
  - The paper continues to feed through the nip of the roll feed roller and the idle rollers, which are still lifted into contact with the feed roller.

222

No additional notes

Initializing the New Paper Roll - 3

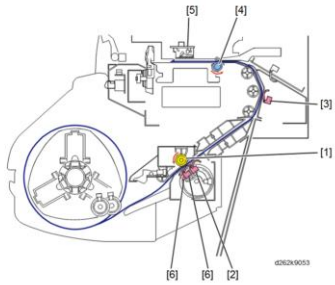


- The roll feed roller [1] feeds the paper over the feeler of the paper exit sensor [2] and out of the roll feeder into the vertical feed path of the main machine.
- When the leading edge of the paper reaches the pre-registration sensor [3], the vertical motor (on the left side of the machine) turns on and rotates the registration roller [4].

223

No additional notes

Initializing the New Paper Roll - 4



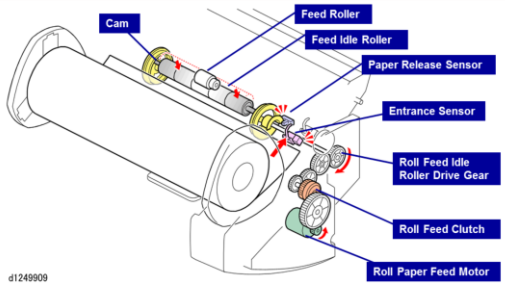
- When the DRESS sensor [5] detects the leading edge of the paper, the vertical motor stops.

224

No additional notes

Initializing the New Paper Roll - 5

RICOH
imagine. change.

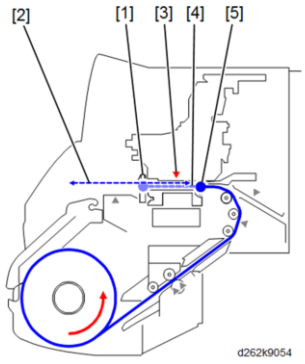


- At the same time, the roll feed motor [4] and clutch [3] also stop.
- Then the clutch turns on again but the motor rotates counter-clockwise.
- When the motor turns in this direction, the cam shaft rotates and moves the idle roller down until the paper release sensor turns on.
- The feed roller and idle roller are now separated.

225

No additional notes

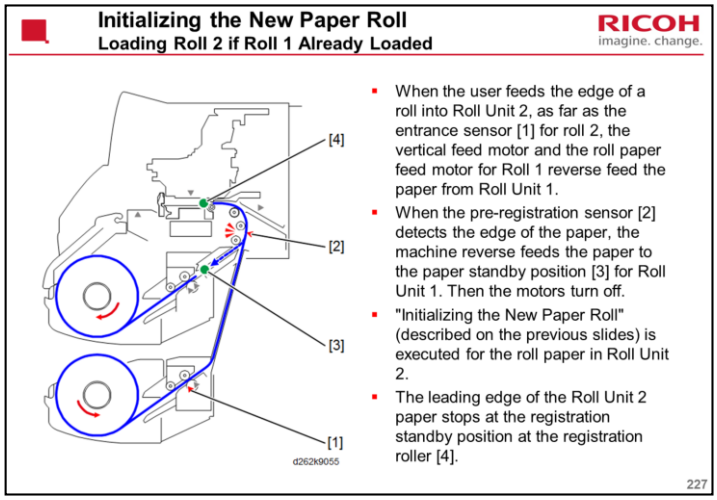
Initializing the New Paper Roll - 6



- The vertical motor turns on again, and feeds the paper forward to the cutter [1].
- The cutter turns on and cuts the paper.
- The vertical feed motor turns on again, feeds the paper forward out of the front of the machine a short distance [2], stops, and then reverses.
- When the DRESS sensor [3] detects the edge of the paper again, it starts a count, and then stops the paper at the registration standby position [4] above the registration roller [5].

226

No additional notes



Here are some important points to remember:

The last roll feeder loaded (or replaced) remains selected for paper feed.

If the other roll is selected, the machine will reverse feed the paper in the paper path to its paper standby position, and then move the leading edge of paper from the selected roll to the registration standby position.

If both roll feeders are installed at installation, they do not need to be installed in any particular order.

If the machine starts automatic print head cleaning after the machine is turned on, and the operator loads a roll while cleaning is already in progress, the machine waits for cleaning to end before feeding the roll into the machine. The machine will beep twice when cleaning is finished.

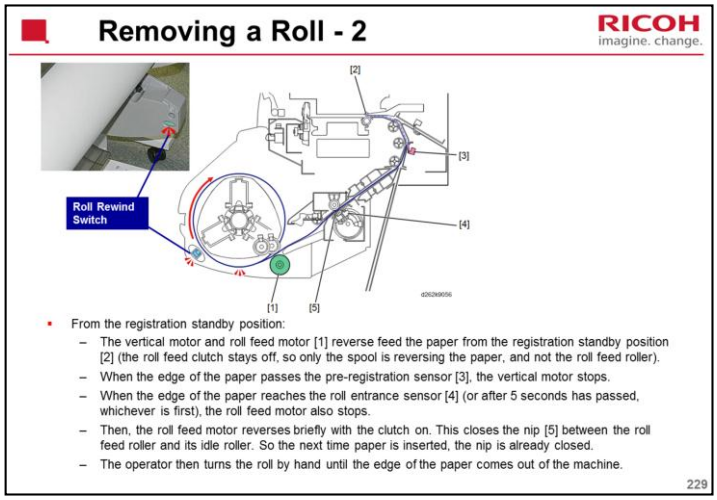
Removing a Roll - 1

RICOH
imagine. change.

- Before a roll can be removed, the paper must be rewound onto the roll.
  - To do this, the user presses the roll rewind switch for at least 2 seconds and then release it.
- After this point, there are two different procedures:
  - Reversing a roll from the registration standby position
  - Reversing a roll from the paper standby position

228

No additional notes



If the paper leading edge is at the print waiting position, 2 seconds should be long enough. However, if the paper leading edge is at the registration roller, you may have to press the rewind button one more time.

The paper rolls installed in the machine are not enclosed and remain exposed to ambient temperature and humidity.

If the machine has remained idle for a long time, before you use the machine it is recommended that your rewind the roll, cut off the equivalent of two full roll rotations, and then reload the paper.

Removing a Roll - 3

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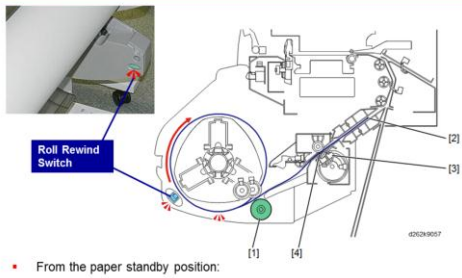
imagine. change.



- From the paper standby position:
  - Only the roll feed motor [1] reverse feeds the paper from the paper standby position [2] (the roll feed clutch stays off, so only the spool is reversing the paper, and not the roll feed roller).
  - When the edge of the paper reaches the roll entrance sensor [3] (or after 5 seconds has passed, whichever is first), the roll feed motor stops.
  - Then, the roll feed motor reverses briefly with the clutch on. This closes the nip [4] between the roll feed roller and its idle roller. So the next time paper is inserted, the nip is already closed.
  - The operator then turns the roll by hand until the edge of the paper comes out of the machine.

230

The only difference from the previous slide is the first step.

Vertical Feed Mechanism - 1

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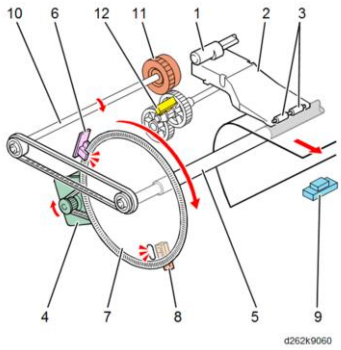
imagine. change.



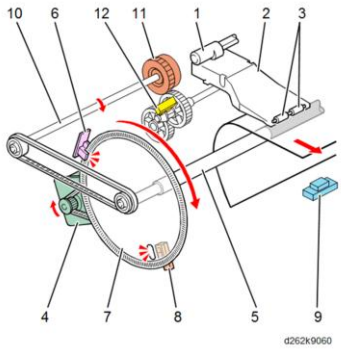
- When the paper holding lever is down, the paper holding lever cam (1) depresses the pressure arm (2) that keeps downward pressure on the registration idle rollers (3). This closes the nip at the registration standby position.
- When the paper holding lever is raised, this rotates the paper holding lever cam down to raise the idle rollers and open the nip. This is done to load paper for bypass feed.
- The vertical motor (4) uses one drive belt to drive the registration roller (5).

231

1. Paper holding lever cam
2. Pressure arm
3. Registration roller idle rollers
4. Vertical motor
5. Registration roller
6. Vertical encoder sensor
7. Vertical encoder wheel
8. Vertical encoder HP sensor
9. Exit sensor
10. Bypass stopper shaft
11. Bypass stopper clutch
12. Bypass stopper clutch sensor

Vertical Feed Mechanism - 2

RICOH imagine. change.



- The vertical encoder sensor (6) reads the edge of the vertical encoder wheel (7). These readings are used to control vertical paper feed in the main machine.
- The vertical encoder HP sensor (8) detects the small hole in the encoder wheel, and then stops the vertical motor with the wheel at the home (start) position.
- The exit sensor (9) detects the leading edge and trailing edges of the paper.

232

1. Paper holding lever cam
2. Pressure arm
3. Registration roller idle rollers
4. Vertical motor
5. Registration roller
6. Vertical encoder sensor
7. Vertical encoder wheel
8. Vertical encoder HP sensor
9. Exit sensor
10. Bypass stopper shaft
11. Bypass stopper clutch
12. Bypass stopper clutch sensor

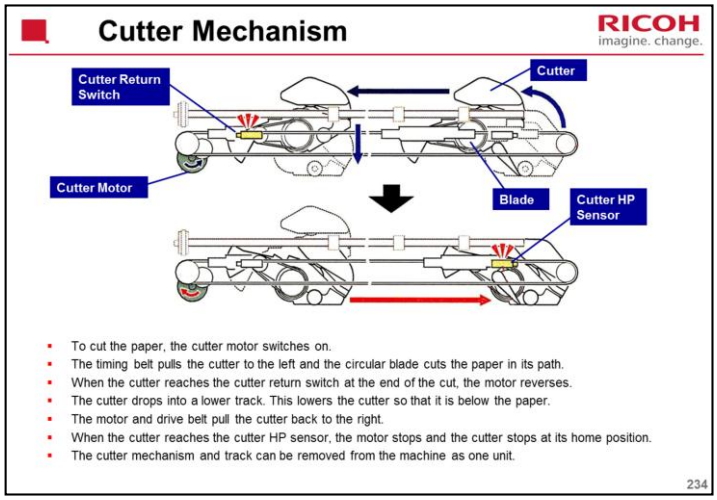
Handling the Vertical Encoder

RICOH
imagine. change.

- Handle the encoder wheel by its central hub. Never touch the edges of the vertical encoder wheel with bare hands.
- To clean the edges of the encoder wheel, wipe it with a clean linen cloth dampened with alcohol to remove dust, ink, or fingerprints.
- Never use a cotton swab, tissue, or any other kind of material that could leave fibers on the surface of the encoder.

233

No additional notes



No additional notes

Roll End Detection - 1

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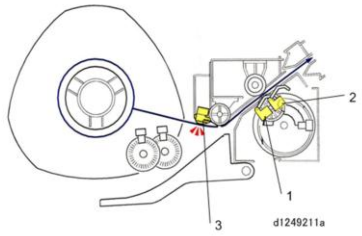
imagine. change.



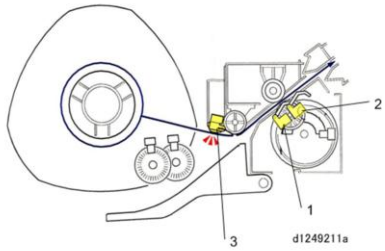
- If the trailing edge is not fastened to the roll core:
  - The machine signals roll paper end when the trailing edge passes the roll entrance sensor (1) and then the roll exit sensor (2).
  - Both actuators pop up when the trailing edge of the paper passes.

235

Is the trailing edge fastened to the roll core? It depends on the type of roll.

Roll End Detection - 2

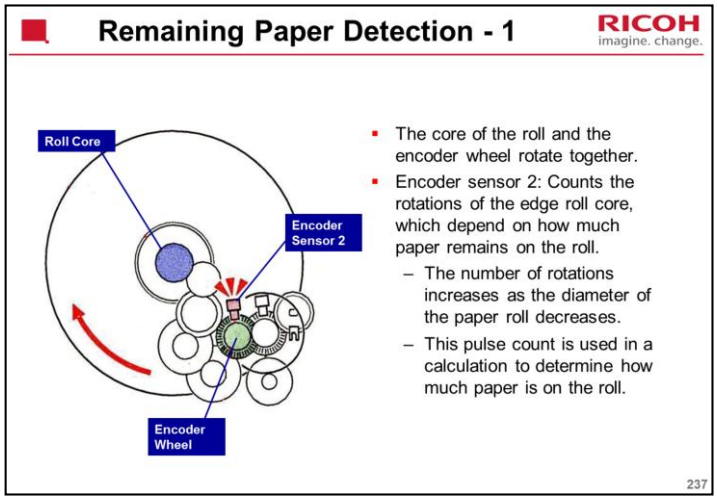
RICOH
imagine. change.



- If the trailing edge is fastened to the roll core:
  - At the end of the roll, the trailing edge of the paper remains attached to the roll core, but the paper continues to feed.
  - The paper is pulled tight, up against the actuator of the roll end sensor (3). This signals paper end and switches off the vertical feed motor and horizontal motor. This shuts down paper feed and printing.

236

Is the trailing edge fastened to the roll core? It depends on the type of roll.



The other encoder wheel in the diagram is used to measure the operating time of the roll feed motor (explained later).

The machine calculates the amount of paper remaining on a roll based on the diameter of the roll and the number of rotations made by the core, and then displays the amount of paper remaining as it diminishes.

The encoder wheel and sensor, and a small PCB in the roll feeder, measure the amount of paper remaining on the roll.

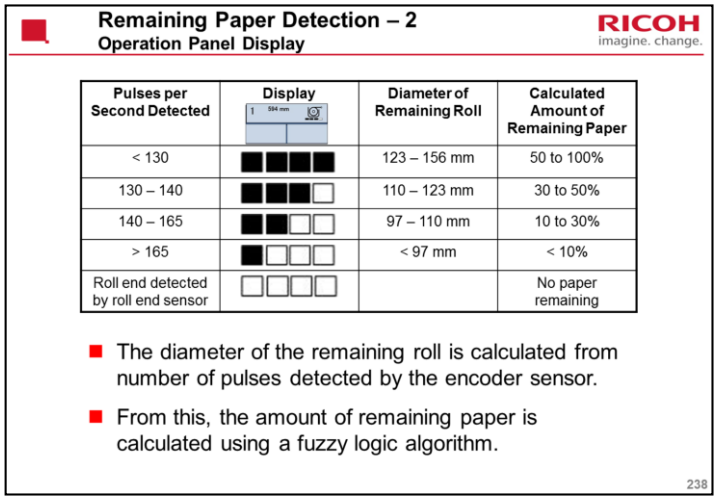
The encoder wheel has 40 slits (spokes) around its center, and is capable of generating 503 pulses with one rotation.

The encoder wheel and sensor also count the rotations of the roll core when the machine feeds paper out of the machine, or reverse feeds the leading edge of the paper to the registration standby position. This is done at the following times:

When the roll is replaced or exchanged for another roll.

When the paper is fed back to the registration standby position after the paper is cut at the end of a job.

When the other paper roll is selected for paper feed. For example, if paper from Roll Unit 1 is at the paper registration position, and Roll Unit 2 is selected.



Remaining Paper Detection – 2
Operation Panel Display

RICOH
imagine. change.

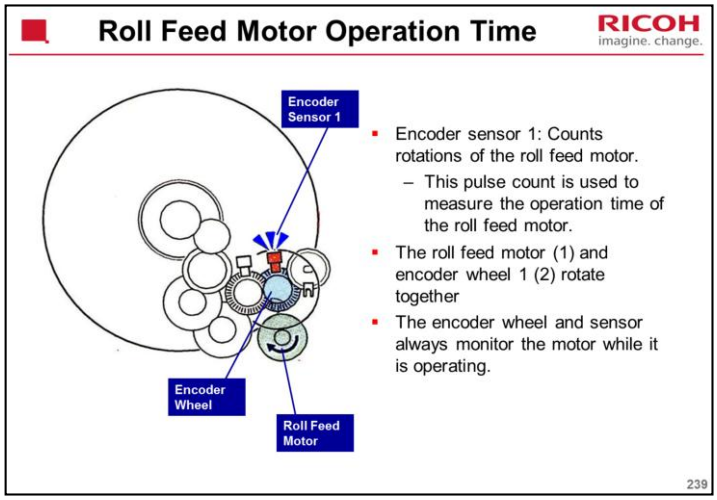
Pulses per Second Detected	Display	Diameter of Remaining Roll	Calculated Amount of Remaining Paper
< 130	■■■■	123 – 156 mm	50 to 100%
130 – 140	■■■□	110 – 123 mm	30 to 50%
140 – 165	■■□□	97 – 110 mm	10 to 30%
> 165	■□□□	< 97 mm	< 10%
Roll end detected by roll end sensor	□□□□		No paper remaining

- The diameter of the remaining roll is calculated from number of pulses detected by the encoder sensor.
- From this, the amount of remaining paper is calculated using a fuzzy logic algorithm.

238

After measuring the diameter, the amount of paper remaining depends on the thickness of the paper. This can be calculated by measuring how much the rotation speed increases as paper is used up.

However, another factor is the core diameter. This can be either 2 inches or 3 inches. The sensor cannot detect this, so for a 3-inch core, the amount of paper remaining will be less than for a 2-inch core.



Why do we need a separate encoder for this?

During paper feed and printing, the paper is fed through the machine by the vertical motor, not the roll feed motor. So, the amount of roll rotation does not equal the amount of rotation by the roll feed motor.

Paper Holding Lever

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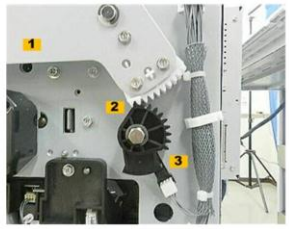
imagine. change.

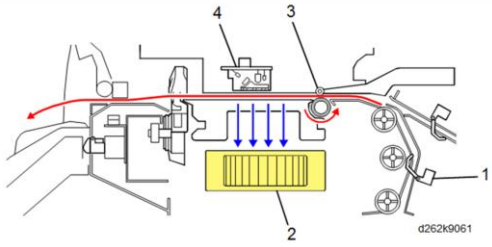


- The registration release sensor [3] detects whether the paper holding lever [1] is up or down.

240

No additional notes

Paper Transport Fan

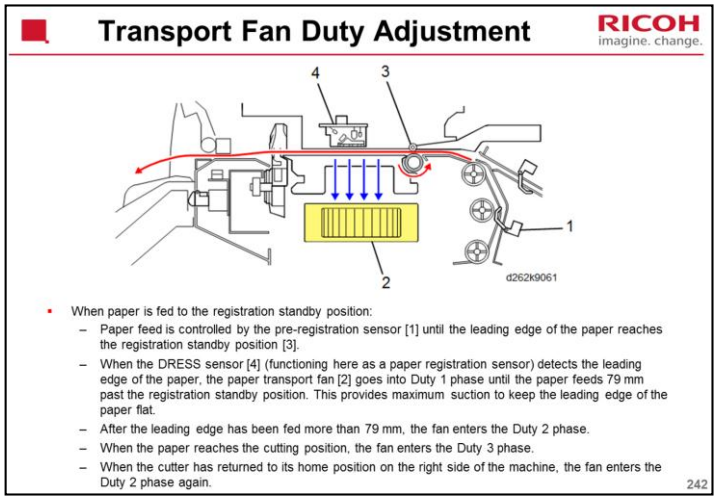


- This fan provides suction to make sure that the paper stays flat on the platen.
- When the DRESS sensor [4] detects the leading edge of the paper, the paper transport fan [2] turns ON. This pulls the paper down onto the perforated platen plates and keeps it perfectly flat during printing.
- After the paper is cut, the fan remains ON until the last sheet exits the machine at the end of the job.

241

The machine adjusts the duty of the transport fan automatically for the size and type of paper selected for the job.

The duty also changes at different times during paper feed.



This shift in the operation of the paper transport motor Duty 1 > Duty 2 > Duty 3 and back to Duty 2 is the same for every size and type of paper. However:

The level of the duty, that is, the amount of suction applied by varying the speed of the motor, is different for each paper size (width) and paper type.

As a general rule, Duty 1 is the highest setting to ensure that the leading edge of the paper remains flat as it passes over the platen.

The Duty settings of thicker paper are much higher than those of thinner, lightweight paper.

The Duty settings are selected automatically as soon as paper size and type are selected for the job.

SP codes

SP1956-001: Use this SP to review the current duty settings.

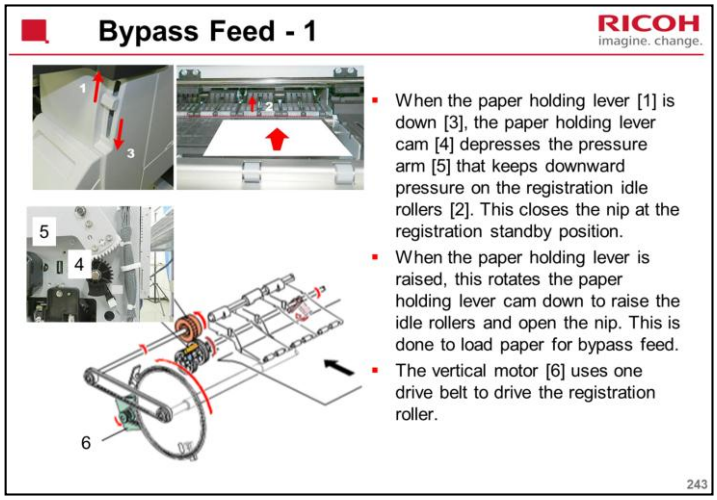
SP1955-001: Adjusts fan DUTY in the range of ±20% for all duty phases. The firmware checks the current fan operation setting and then uses a lookup table to fetch the specified setting (the percentage to added to current operation level.)

The optimum duty settings for each paper size and type are done at the factory before the machine is shipped.

SP1955-002 to 010: Adjusts fan duty in the range of ±20% for the duty phases of different types of paper. The firmware checks the current fan operation setting of the motor for the selected paper type, and then uses a lookup table to fetch the specified setting (percentage to added to current operation level.)

It is important to remember that if an adjustment is done with this SP code for a particular paper type, it will be added to any

change previously specified with SP1955-001.



These slides explain how paper is fed to the standby position if bypass feed is selected.

1. Paper holding lever cam
2. Pressure arm
3. Registration roller idle rollers
4. Vertical motor
5. Registration roller
6. Vertical encoder sensor
7. Vertical encoder wheel
8. Vertical encoder HP sensor
9. Exit sensor
10. Bypass stopper shaft
11. Bypass stopper clutch
12. Bypass stopper clutch sensor

Bypass Feed - 2

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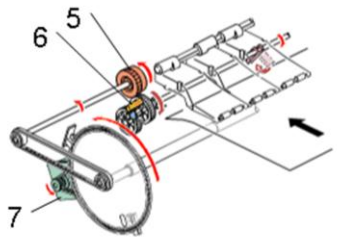
imagine. change.



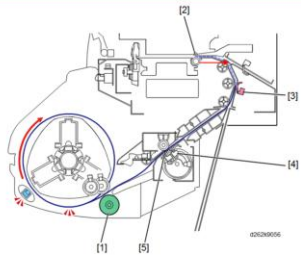
- The vertical motor (7), controlled by the vertical encoder wheel, vertical encoder sensor, and vertical encoder HP sensor, drives the timing belt that rotates the registration roller.

244

No additional notes

Bypass Feed - 3

RICOH
imagine. change.



- If there is roll paper at the registration standby position [2], the user must press the roll rewind button to rewind the paper to the paper standby position.
- The user must then set the correct paper size before starting to make the copy/print.
  - To do this, select Bypass on the Copier screen as the paper feed location, then press # and select the size.

245

No additional notes

Bypass Feed - 4

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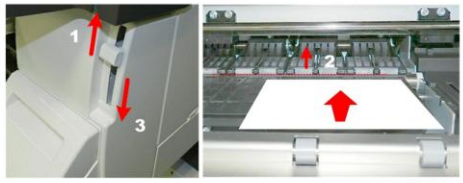
imagine. change.



d124f012

- The user raises the front cover, and then raises the paper holding lever [1] on the right side of the machine.
- The user inserts the paper at the front of the machine as far as the bypass stopper. The paper must be inserted with the right edge of the paper on the alignment mark on the right end of the platen.
  - The part of the paper that will be the trailing edge of the print must be fed in first.

246

No additional notes

Bypass Feed - 5

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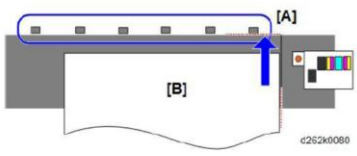
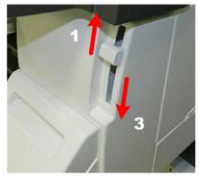
imagine. change.





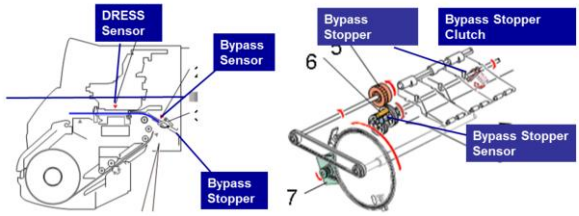
- The paper is pushed into the machine through the open nip of the registration roller (and out the back of the machine) to the bypass stopper [A]. Next, the user lowers the paper holding lever, and closes the front cover.
- The paper type settings are displayed, and the user must select whether they match the actual paper used for the job (select Matches or Does Not Match).
  - If Does Not Match, input the correct settings then continue.
- The user sets the original.

247

No additional notes

Bypass Feed - 6

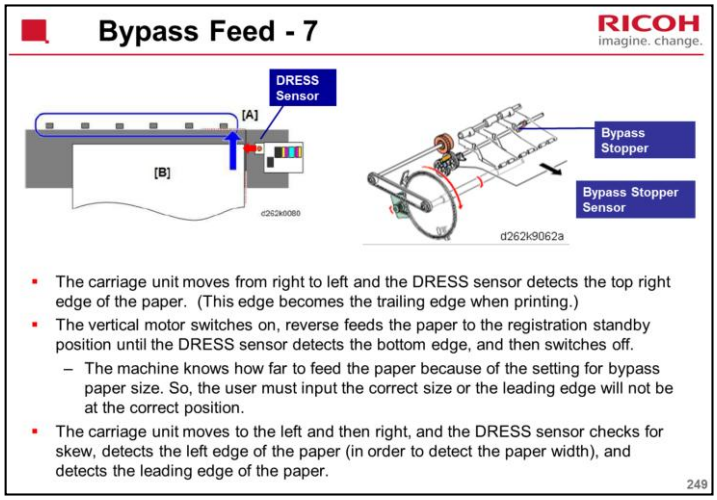
RICOH
imagine. change.



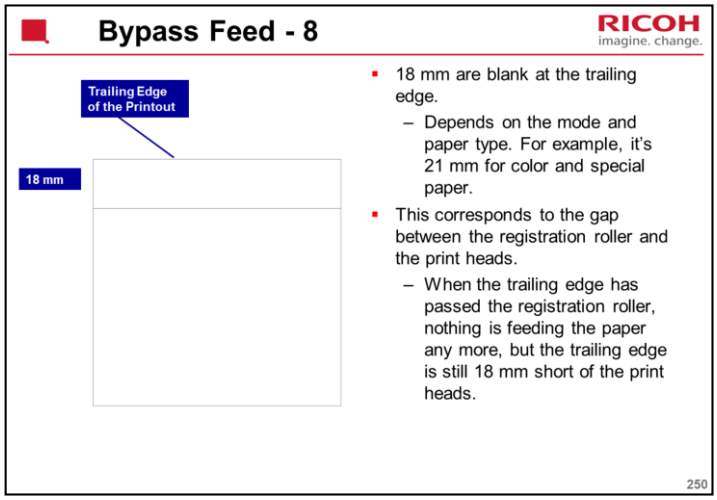
- The paper transport fan switches on.
- The vertical motor switches on and rotates in reverse to open the bypass stopper.
- The bypass stopper sensor detects the stopper and the bypass stopper clutch turns off.

248

No additional notes



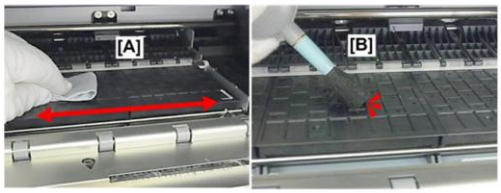
No additional notes



No additional notes

Cleaning the Platen

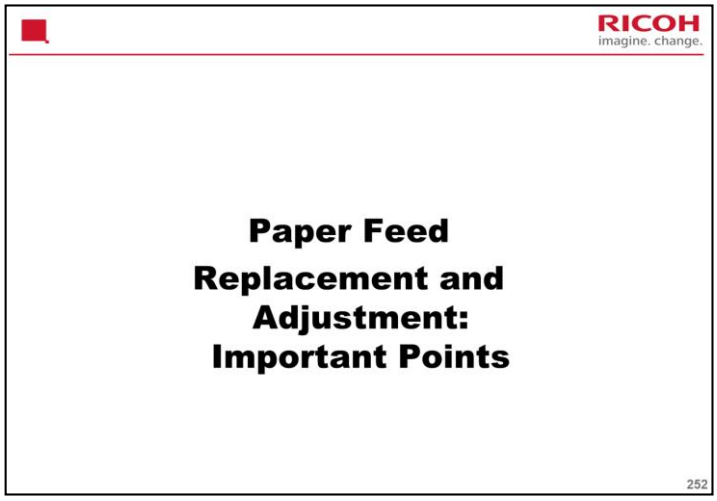
RICOH
imagine. change.



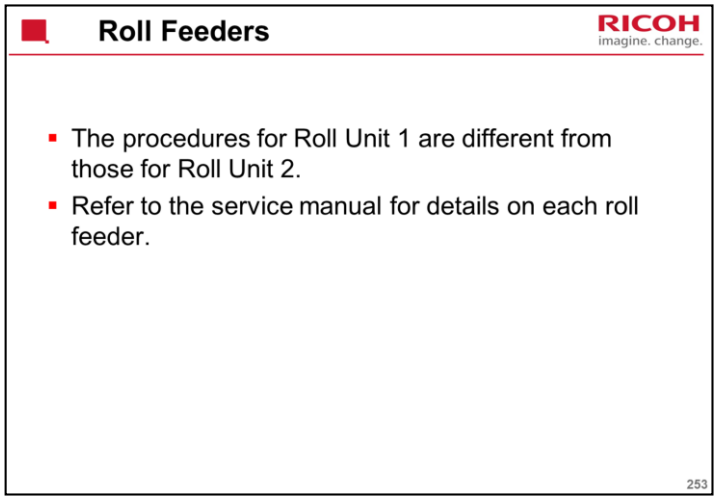
- There are nine platen plates. It is difficult to adjust their heights correctly after removal, so do not remove the platen plates in the field.
- Cleaning the platen plates:
  - Open the front cover.
  - Use a linen cloth dampened slightly with water to clean the surface of the platen [A]. Then wipe with a dry cloth.
    - **Never use alcohol to clean the platen. This will cause discoloration.**
  - Use a blower brush to clean the holes in the plates [B].

251

No additional notes



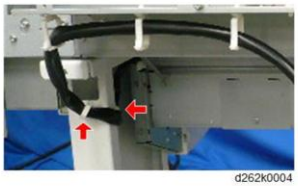
For full details of all procedures, see the service manual.



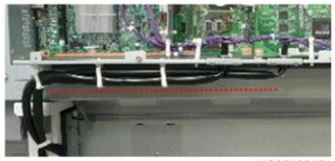
No additional notes

Installing a Roll Unit

RICOH
imagine. change.



d262k0004



d262k0018

- At the end of the replacement procedure, check the clamps and harnesses at the rear.
  - Make sure that the clamps are closed and that there is absolutely no slack in the harnesses.
  - The harnesses must be tight against the bottom of the PCB box to prevent them from interfering with paper in the bypass feed path.

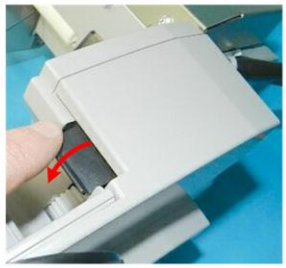
254

During bypass feed, the trailing edge of the paper comes out from the back of the machine, and then reverse feeds back into the machine.

We discussed this during the Installation section.

Roll Unit Right Covers

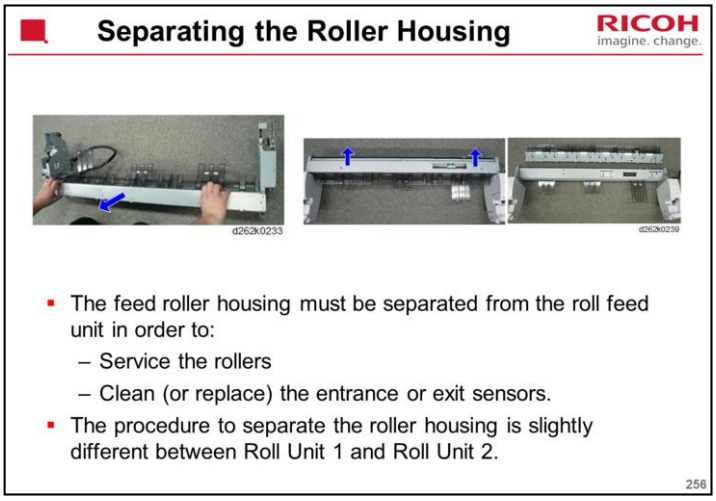
RICOH
imagine. change.



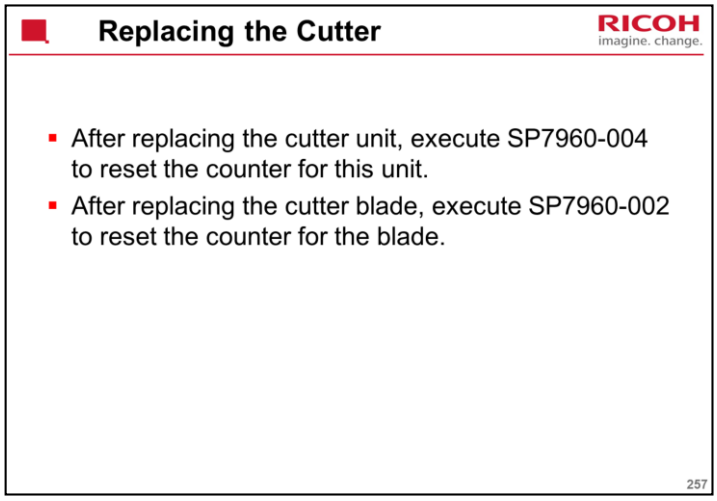
- After attaching the cover, pull the latch forward and then release it, so that it flips back to the rear.
- Do this a few times to make sure that the cover is not blocking the latch movement.
- If the latch does not move freely, it may not be possible to install a roll of paper.

255

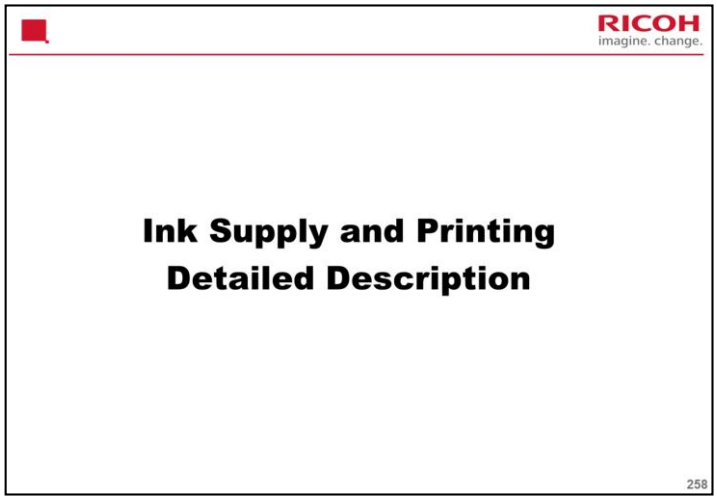
No additional notes



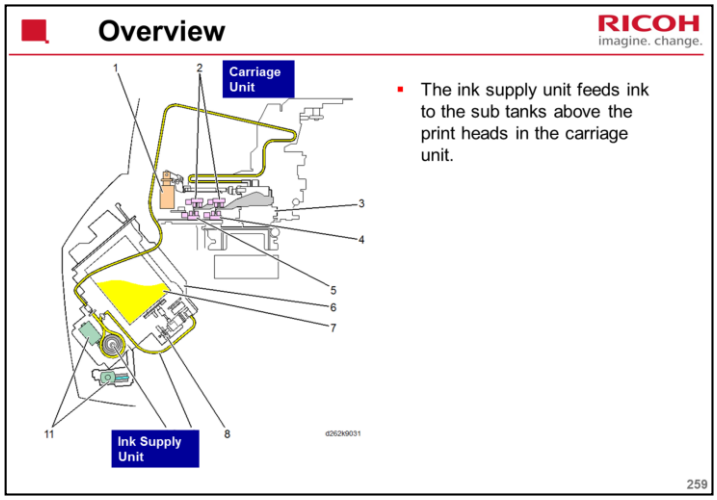
Roll Unit 1 [A] and Roll Unit 2 [B] are the same with the exception of the top covers. Roll Unit 1 has no top cover while Roll Unit [2] has a shiny metal cosmetic cover. This causes some small differences in the procedure to separate the roll feeder housing from the feeder.



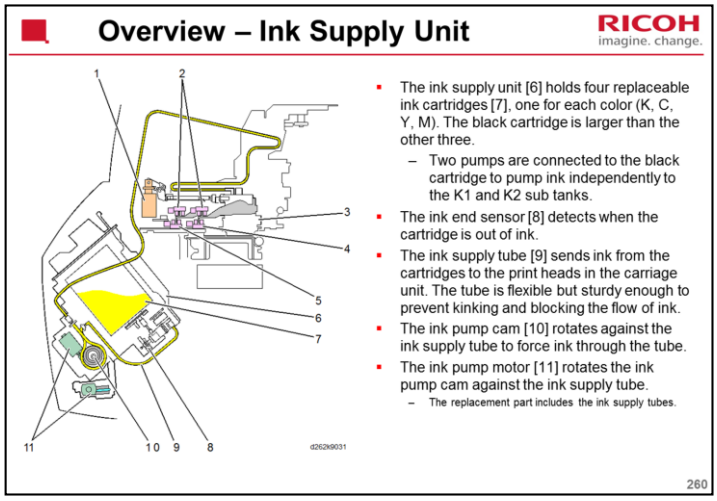
No additional notes



No additional notes

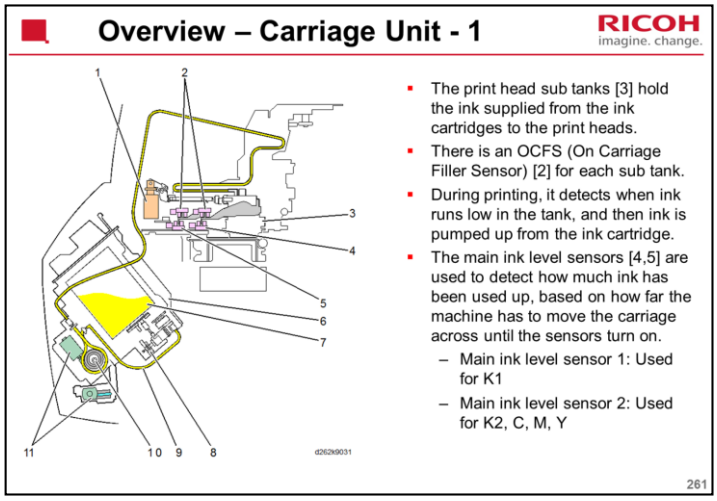


1. Air release solenoid
2. OCFS (On Carriage Fill Sensors)
3. Print head sub tanks
4. Main ink level sensor 1
5. Main ink level sensor 2
6. Ink supply unit
7. Ink cartridges
8. Ink end sensors
9. Ink supply tubes
10. Ink pump cams
11. Ink pump motors



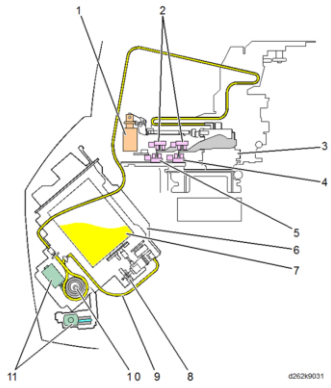
There are four short ink supply tubes (one for each cartridge) from the ink cartridge port to the pumps.

Before the pump, the black ink supply tube splits into two, one for K1 and one for K2, bringing the total of tubes to 5, and the number of ink pumps is also 5 (one for K1 and one for K2).



The sensor actuator has actuators for the OCFS sensors and the main ink level sensors.

Overview – Carriage Unit - 2



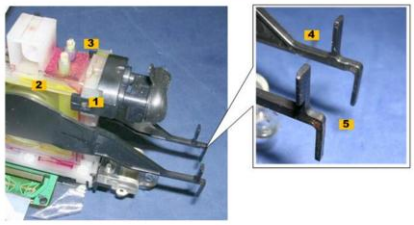
- The air release solenoid [1] releases excess air from the print head sub tanks.
- The machine reads the horizontal encoder to position the carriage at the correct position so that the solenoid can actuate the purge valves.

262

No additional notes

Overview - OCFS (On Carriage Filler Sensors) - 1

RICOH
imagine. change.



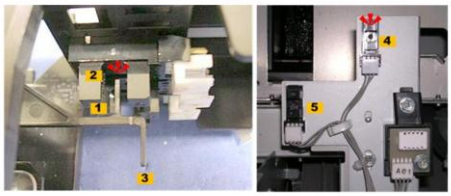
- The photo above shows the YM print head (1).
- This unit contains two sub tanks, the Y tank (2) on the left and M tank (3) on the right.
- The Y actuator arm (4) is attached to the side of the Y sub tank, and the M actuator arm (5) is attached to the side of the M sub tank.
- Each actuator arm has two vertical actuators on the end of each actuator, one pointing up and one pointing down.
- When ink is used up in one of the sub tanks, the side of the ink sub tank shrinks inwards, and the end of the actuator moves across.

263

No additional notes

Overview - OCFS (On Carriage Filler Sensors) - 2

RICOH
imagine. change.



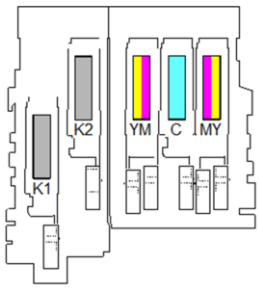
- During printing, when ink in the sub tank is partly used up, the sides of the tank move the actuator inwards through the sensor. The part of the actuator pointing up (1) interacts with the OCFS (2) above when it swings in and out of the sensor gap.
- If the actuator leaves the gap in the OCFS, the machine pumps ink from the cartridge to the sub tank.

264

No additional notes

Overview - Print Heads

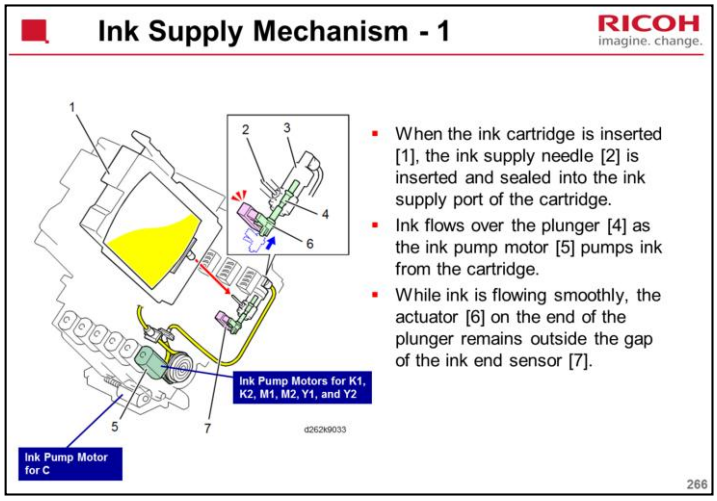
RICOH
imagine. change.



- Two black ink print heads, arranged in a staggered configuration, increase the area of coverage for black-and-white printing.
- This arrangement of black print heads increases the printing speed for large black-and-white documents.
- There are two print heads for black (K1, K2) and one independent print head for Cyan (C).
- There are two print heads for Yellow and Magenta, which are both shared by these two colors (YM, MY).

265

No additional notes



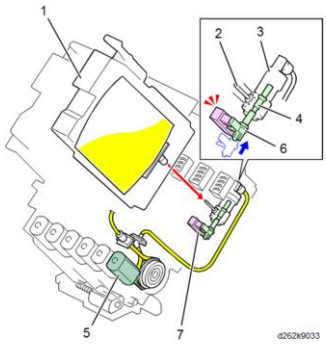
This slide shows the mechanism for yellow. The others are similar.

The ink pump cam is explained in more detail later.

The flow of ink through the machine is shown by red arrows.

Ink Supply Mechanism - 2

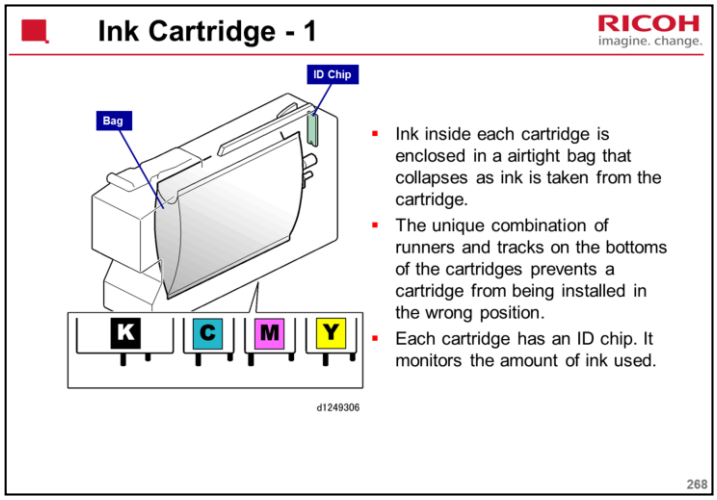
RICOH
imagine. change.



- When ink runs out, the ink pump motor continues to try to pull ink from the ink port. But with no ink, this creates suction between the pump and the ink cartridge.
- When the suction becomes strong enough, it pulls the actuator on the end of the plunger into the ink end sensor. Then, the machine detects that the ink cartridge is empty.

267

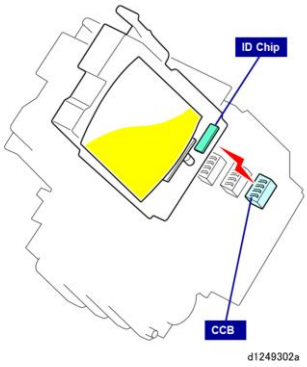
The ink pump cam is explained in more detail later.



No additional notes

Ink Cartridge - 2

RICOH
imagine. change.

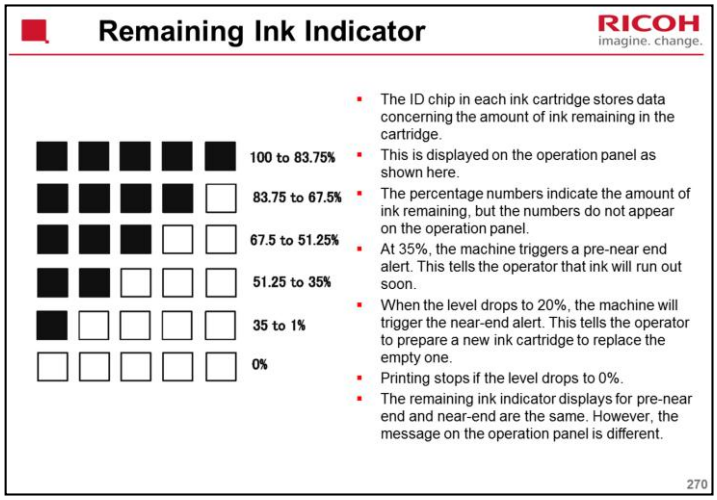


d1249302a

- When an ink cartridge is inserted, the ID chip contacts a CCB (Cartridge Control Board) at the back of the ink supply unit slot.
- When the ID chip and CCB make contact, this tells the machine that the cartridge is inserted correctly.
- Ink usage is based on pulse counts taken during operation of the ink pump motors.
  - The machine transfers this data to the ID chip in the cartridge.

269

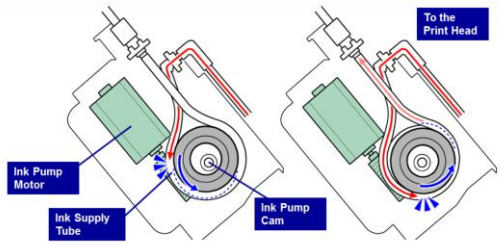
No additional notes



Even if only a color ink has run out, black-and-white printing is not possible.

Ink Pump

RICOH
imagine. change.



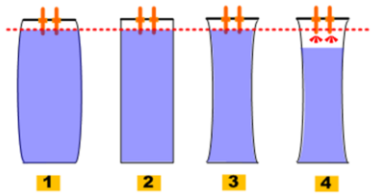
- The ink pump motor drives the ink pump cam counter-clockwise.
- The cam compresses the ink supply tube.
- The pressure on the tube drives ink up ahead of the cam and creates enough suction to pull ink through the tube.
- In this way, the cam alternately applies and releases pressure. This drives the ink out of the pump, out of the ink supply unit, and up to the print head sub tank in the carriage unit.

271

No additional notes

Controlling the Ink Supply to the Sub Tanks
Structure of the Sub Tank

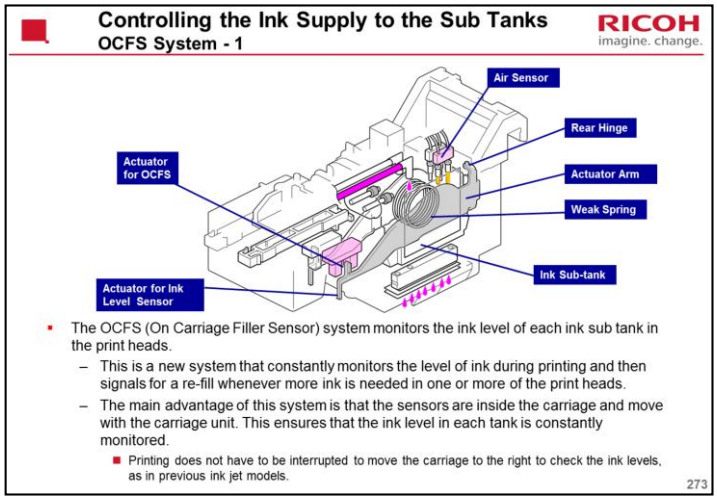
RICOH
imagine. change.



- The sides of the sub tanks are flexible.
- The sides may bend out slightly when the tank is full [1], and then gradually collapse as ink is drained from the tank [2] and [3].
  - The actual level of the ink does not change at [2] and [3] even though there is less ink in the tank.
- However, if air enters the tank [4], the air sensors at the top of the tank will be exposed and detect air in the tank.

272

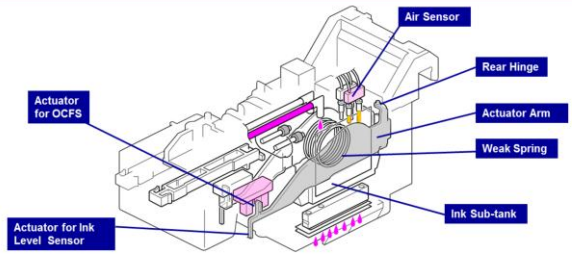
No additional notes



This shows the mechanism for Magenta. The others are similar.

Controlling the Ink Supply to the Sub Tanks
OCFS System - 2

RICOH imagine. change.



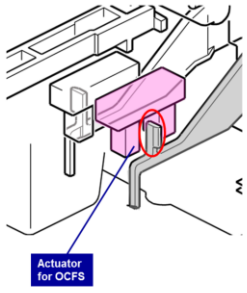
- The OCFS system contains the following parts:
  - An actuator arm is attached to a hinge at the rear.
  - The center of the actuator is mounted on a weak spring attached to the flexible side of the ink sub tank.
  - When the sub tank is full of ink, the actuator on the tip of the actuator arm points straight to the front and remains in the gap of the OCFS.
  - The air sensors are a pair of vertical terminals attached to the top of the ink sub tank. These sensors detect if there is excessive air in the tank.

274

This shows the mechanism for Magenta. The others are similar.

Controlling the Ink Supply to the Sub Tanks
OCFS System - 3

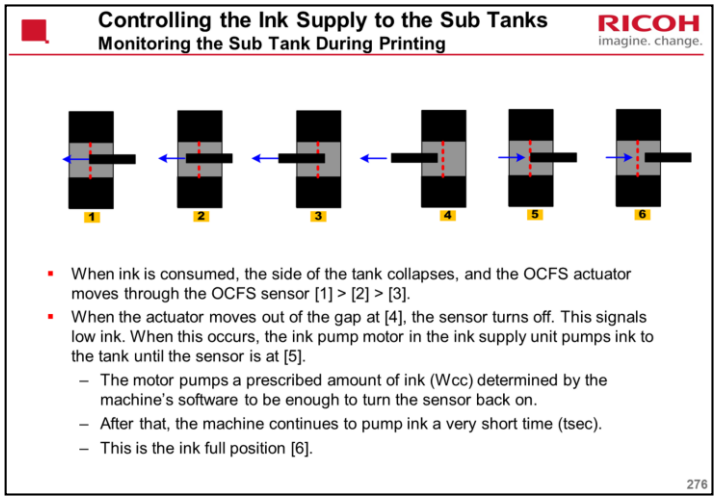
RICOH
imagine. change.



- Note that the OCFS actuator is not symmetrical.
- The side of the actuator away from the tank (circled in red) has a wing attached to it.
- This means that when the actuator moves through the sensor from right to left in the diagram, the actuator takes a long time to clear the sensor than a normal actuator.
- Keep this in mind when studying the OCFS system, as explained on the next few slides.

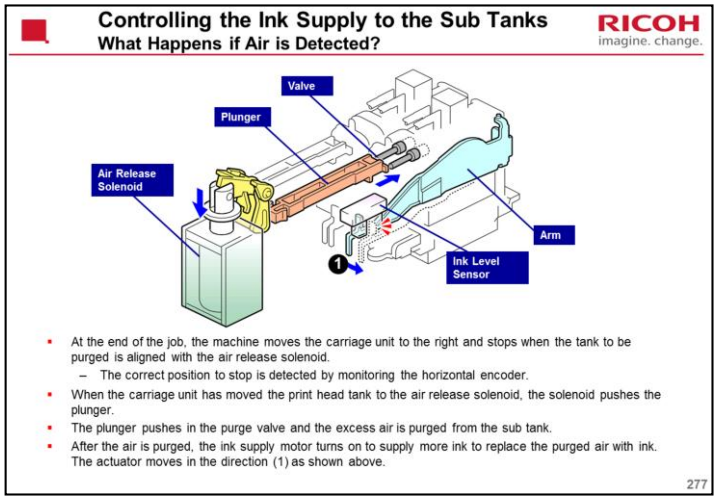
275

No additional notes



"Wcc" is the software count stored for the amount of ink needed to fill each tank at initial ink filling when the machine was installed.

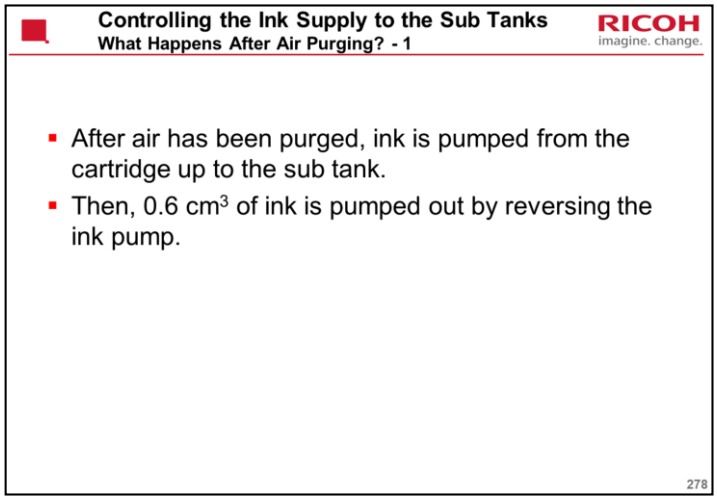
At the end of a job, if the amount of ink supplied did not reach Wcc, ink is supplied again before capping.



This machine uses the same solenoid mechanism used in the previous ink jet machines. However, the duty of the solenoid operation is controlled to cope with high temperatures and to reduce operation noise.

The duty for the YM sub tank is higher because there are two sub tanks serviced by only one plunger.

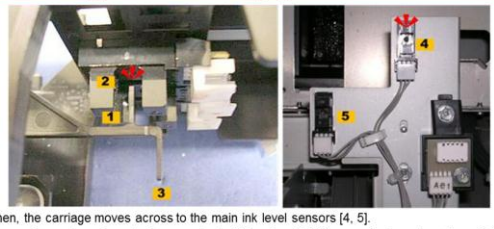
The air solenoid duty can be adjusted with SP2910-009 (Maintenance Mode Setting).



No additional notes

Controlling the Ink Supply to the Sub Tanks
What Happens After Air Purging? - 2

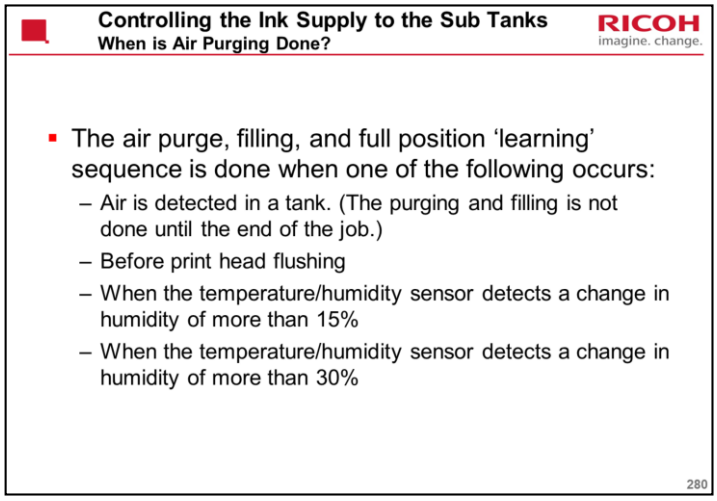
RICOH
imagine. change.



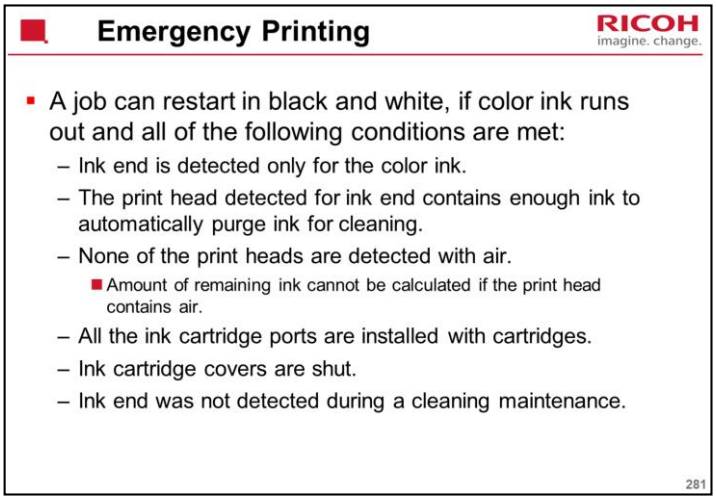
- Then, the carriage moves across to the main ink level sensors [4, 5].
- The carriage stops when the lower actuator [3] on the OCFS sensor feeler enters the main ink level sensor.
  - Main ink level sensor 2 (4) detects the actuators of K2, C, Y, and M.
  - Main ink level sensor 1 (5) detects the actuator of K1 only.
  - Two main ink level sensors are required because the K1 print head is not level with the other 4 print heads.
- The machine records how much the carriage has moved along the horizontal encoder, and stores this as the new Tank Full Position.
- At the end of a job, the machine moves the carriage to the main ink level sensor to compare with the most recent Tank Full Position.
  - This is also done at cleaning and flushing. The carriage does not move to this sensor during printing. Ink level during printing is checked with the OCFS sensors.

279

No additional notes



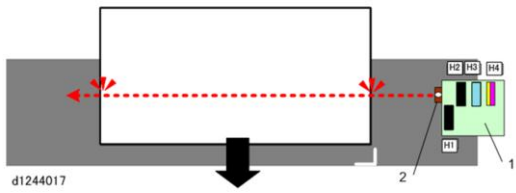
No additional notes



No additional notes

Image Registration – Main Scan (1)

RICOH
imagine. change.



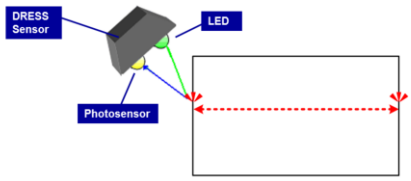
- When a job starts, the horizontal motor switches on and moves the carriage [1] across the paper so that the DRESS sensor [2] can detect the right and left edges of the paper.

282

No additional notes

Image Registration – Main Scan (2)

RICOH
imagine. change.



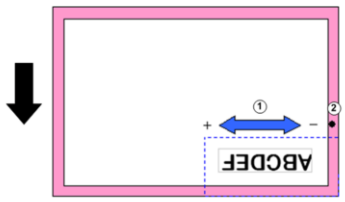
- The DRESS sensor contains an LED and a photosensor.
  - The strength of the reflection of the light from the paper depends on the surface of the paper.
  - Printing problems can occur if the same threshold value of reflectivity is used for every type of paper.
  - For this reason, different threshold values of reflectivity are assigned for different types of paper.

283

No additional notes

Image Registration – Main Scan (3)

RICOH
imagine. change.



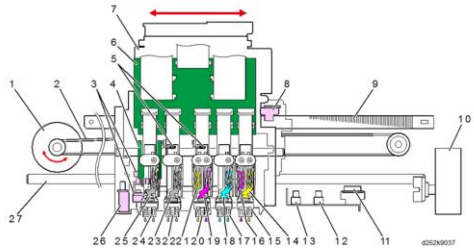
- The readings of the DRESS sensor for the left and right margins are used to determine the horizontal placement of the image on paper.
- This can be adjusted with SP1002 (Print Position Adjustment).
- This adjustment determines where the carriage starts and ends printing with every horizontal pass across the paper.
  - A larger setting moves the image to create a wider left margin.
  - A smaller setting moves the image to create a narrow left margin.

284

No additional notes

Carriage Unit - 1

RICOH
imagine. change.



- During printing, the horizontal motor [1] and drive belt [2] drive the carriage unit [7] to the left and right on its guide rod [27] above the platen.
- The HRB [6] behind the print head units relays signals to the control board from the horizontal encoder sensor, DRESS sensor, thermistors, ink collection tank, and K2/C/Y/M print heads.
- The COM board [4] relays signals between the main machine and the K1 print head, which is also the suction cap for print head cleaning.

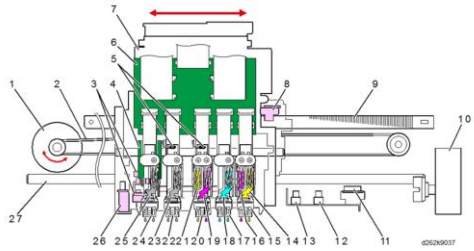
285

1. Horizontal motor
2. Drive belt
3. Head lift sensors
4. COM
5. Print head thermistors
6. HRB (Head Relay Board)
7. Carriage unit
8. Horizontal encoder sensor
9. Horizontal encoder strip
10. Head lift motor
11. Temperature/humidity sensor
12. Ink level sensor 1
13. Ink level sensor 2
14. HT7 (Head Tank Y2)
15. Print head (Y2M2)
16. HT6 (Head Tank M2)
17. Print head (C)
18. HT5 (Head Tank C)
19. HT4 (Head Tank M1)
20. Print head (Y1M1)
21. HT3 (Head Tank Y1)
22. Print head (K2)
23. HT2 (Head Tank K2)

24. Print head (K1)
25. HT1 (Head Tank K1)
26. DRESS sensor
27. Guide rod

Carriage Unit - 2

RICOH
imagine. change.

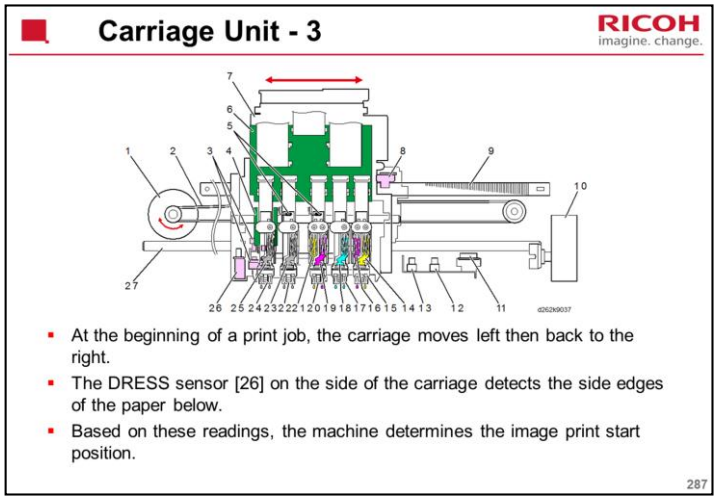


- The horizontal encoder sensor [8] on the carriage unit reads the lines on the top edge of the strip [9]. This controls the operation of the horizontal motor and movement of the carriage unit.
- The thermistors [5] measure the temperature of the black (K1, K2) and color print heads (C, YM). These temperature readings are used to adjust the voltage applied to the piezoelectric elements.
  - There is one piezoelectric element for each print head: K1, K2, C, and YM. An electric charge applied to the element makes it expand and discharge ink through the print head nozzles and onto the paper below.

286

1. Horizontal motor
2. Drive belt
3. Head lift sensors
4. COM
5. Print head thermistors
6. HRB (Head Relay Board)
7. Carriage unit
8. Horizontal encoder sensor
9. Horizontal encoder strip
10. Head lift motor
11. Temperature/humidity sensor
12. Ink level sensor 1
13. Ink level sensor 2
14. HT7 (Head Tank Y2)
15. Print head (Y2M2)
16. HT6 (Head Tank M2)
17. Print head (C)
18. HT5 (Head Tank C)
19. HT4 (Head Tank M1)
20. Print head (Y1M1)
21. HT3 (Head Tank Y1)
22. Print head (K2)
23. HT2 (Head Tank K2)

24. Print head (K1)
25. HT1 (Head Tank K1)
26. DRESS sensor
27. Guide rod

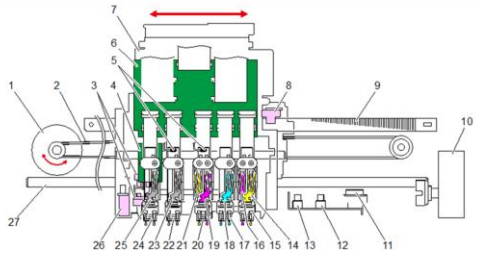


1. Horizontal motor
2. Drive belt
3. Head lift sensors
4. COM
5. Print head thermistors
6. HRB (Head Relay Board)
7. Carriage unit
8. Horizontal encoder sensor
9. Horizontal encoder strip
10. Head lift motor
11. Temperature/humidity sensor
12. Ink level sensor 1
13. Ink level sensor 2
14. HT7 (Head Tank Y2)
15. Print head (Y2M2)
16. HT6 (Head Tank M2)
17. Print head (C)
18. HT5 (Head Tank C)
19. HT4 (Head Tank M1)
20. Print head (Y1M1)
21. HT3 (Head Tank Y1)
22. Print head (K2)
23. HT2 (Head Tank K2)

24. Print head (K1)
25. HT1 (Head Tank K1)
26. DRESS sensor
27. Guide rod

Carriage Unit - 4

RICOH
imagine. change.



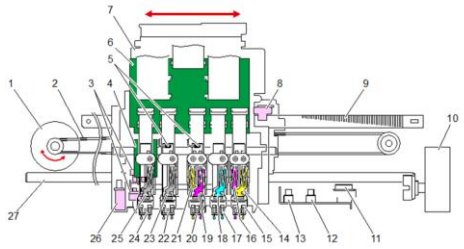
- Ink level sensor 1 [12] checks the position of the actuator mounted on the side of the K1 ink sub tank.
- Ink level sensor 2 [13] measures the positions of the actuators on the sides of the K2, C, Y, and M sub tanks.
- The position of the actuators is used to determine how much ink has been used from the sub tank.
  - Ink level sensor 1 services only the K1 print head, and ink level sensor 2 services the other four sub tanks.

288

No additional notes

Carriage Unit - 5

RICOH
imagine. change.



- The temperature/humidity sensor [11] constantly measures the temperature and humidity inside the machine. The machine uses these readings to adjust its operation.
- The head lift motor [10] can raise the carriage unit (1 mm, 2 mm) to increase the gap between the print heads and thick paper to prevent abrasion.
  - Two head lift sensors [3] control this lift mechanism.

289

No additional notes

Print Head Units - 1

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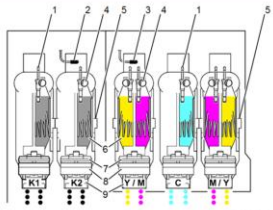


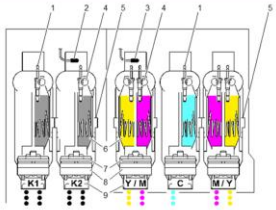
1. Air sensor pairs x7
2. Head thermistor (Black) x1
3. Head thermistor (Color) x1
4. Purge valves x5
5. Ink sub tank feelers x7
6. Ink sub tanks x7 (K1, K2, Y1M1,C, M2Y2)
7. Filter units x5
8. Print heads x5 (K1, K2, Y1M1,C, M2Y2)
9. Ink jet arrays x5

290

No additional notes

Print Head Units - 2

RICOH
imagine. change.



- The illustration above shows the print head units.
  - The left print head unit holds the black print heads (K1, K2) and the right print head unit holds the color print heads (Y1M1, C, M2Y2).
- The black thermistor (2) monitors the heat around the black print head unit, and the color thermistor (3) monitors the heat around the color print head unit.
- A pair of air sensor terminals (1) is attached to the top of each sub tank.
- The purge valves (4) allow air to escape from the ink sub tank if an air sensor detects too much air in the tank. The valve is operated by a plunger and the air release solenoid (not shown).

291

No additional notes

Print Head Units - 3

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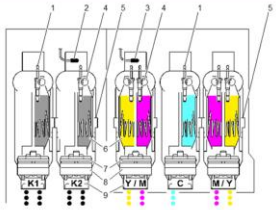
imagine. change.



- The ink sub tanks (6) hold the ink pumped from the ink cartridges by the ink supply unit.
- One ink sub tank feeler (5) is attached to the side of each ink sub tank.
  - The OCFS (On Carriage Filler Sensors) and the stationary main ink level sensors on the right side of the machine check the positions of these feelers to determine the level of ink in the sub tanks.
  - The feeler arms are attached to the right sides of the K1, K2, and C tanks, but the arm is attached to both sides of the Y1M1 and M2Y2 tanks.
- A filter unit (7) sits on top of every print head (8) as an extra precaution to keep the ink free of dirt, paper dust, etc.
- Note that the YM print heads have two tanks on the same print head respectively, but each tank has its own array of ink ports.
- The print heads (9) eject the ink onto the paper.

292

No additional notes

Print Head Units - 4

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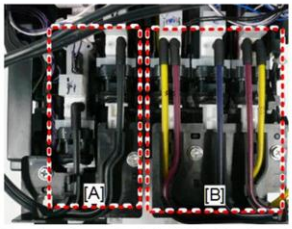

- The black print head unit on the left [A] holds the black print heads and sub tanks (K1, K2).
- The color print head unit on the right [B] holds the color print heads and sub tanks (Y1M1,C, M2Y2).
- You cannot replace one print head (K1, K2, C, or YM) individually; the entire left or right print head unit must be replaced.
- The left and right print head units [A] and [B] can be replaced separately or as a pair.

293

No additional notes

Print Head

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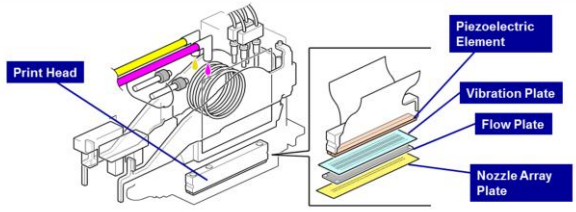

- Each print head contains these parts.
- When a small electric charge is applied to the piezoelectric element, this causes it to expand and expel ink under pressure.
- The vibration plate and flow plate apply the ink evenly to the back of the nozzle array plate.
- The ink flows evenly through the ports of the nozzle array plate.

294

No additional notes

Carriage Drive Mechanism

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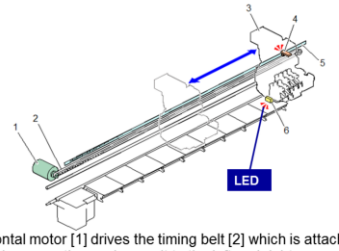
imagine. change.



- The horizontal motor [1] drives the timing belt [2] which is attached to the back of the carriage unit [3]. This moves the carriage unit to the left and right.
- The horizontal encoder sensor detects the top edge of the horizontal encoder strip. This controls the operation of the motor and movement of the carriage unit.
- The DRESS sensor [6] first detects the leading edge of the paper as it is fed, and then detects the right and left edges of the paper.
  - It functions as a paper registration sensor and image registration sensor during paper feed and positioning at the start of a job.
- An LED on the carriage lights during operation to prevent users from opening the front cover by mistake.

295

No additional notes

Handling the Horizontal Encoder

RICOH imagine. change.

- Always handle the encoder strip by its ends and edges. Wearing gloves is recommended.
- Never touch the surface of the horizontal encoder strip with bare hands.
- To clean the encoder, wipe it with a clean linen cloth dampened with alcohol to remove dust, ink, or fingerprints.
- Never use a cotton swab, tissue, or any other kind of material that could leave fibers on the surface of the encoder.

296

No additional notes

Temperature Monitoring - 1

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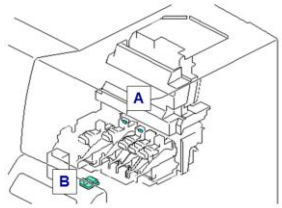
imagine. change.



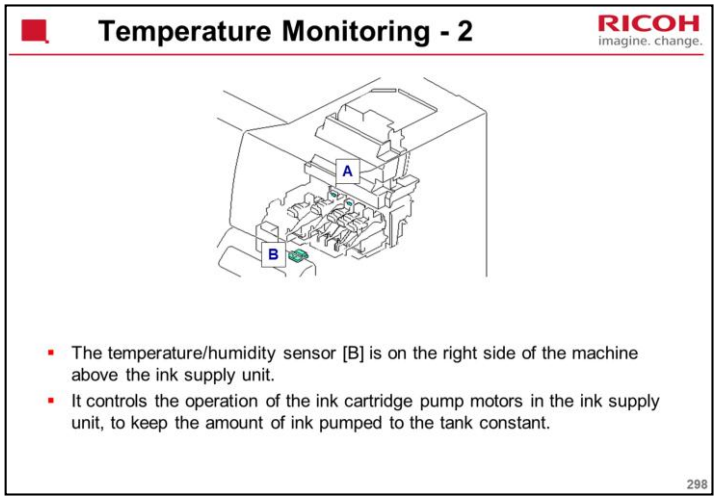
- There are two thermistors [A]. One is for black ink (K1, K2) and one is for color ink (C, YM).
- The thermistors measure the temperature around the print head units.
- The machine uses this information to adjust flow of ink from the print heads.
- Monitoring the temperature near the print heads is very important because the temperature can affect the viscosity of the ink at the nozzles.

297

At low temperatures, the viscosity of the ink becomes high and can slow ink flow.

At high temperatures, the viscosity of the ink becomes low and can cause ink to spill and run.

The adjustment is done by changing the strength of electrical charge used to activate the piezoelectric elements that send ink through the nozzles of the print heads. (The amount of ink ejected varies directly with the amount of charge applied to the piezoelectric element.)

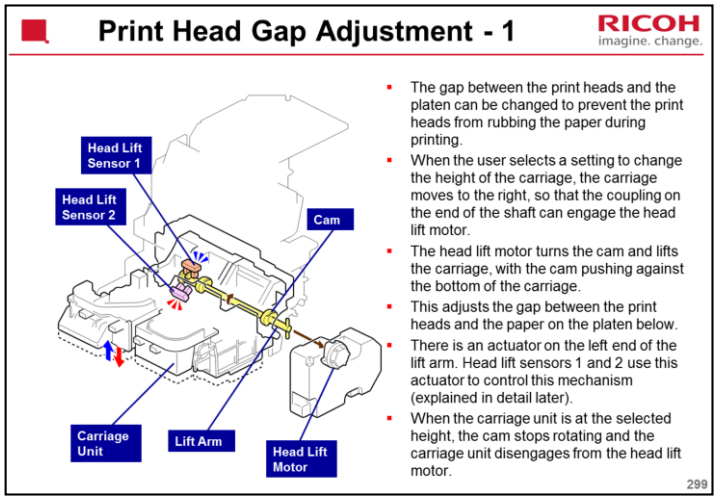


Keeping the amount of ink pumped to the tanks constant: The tubes may expand or contract, so the machine has to compensate for that.

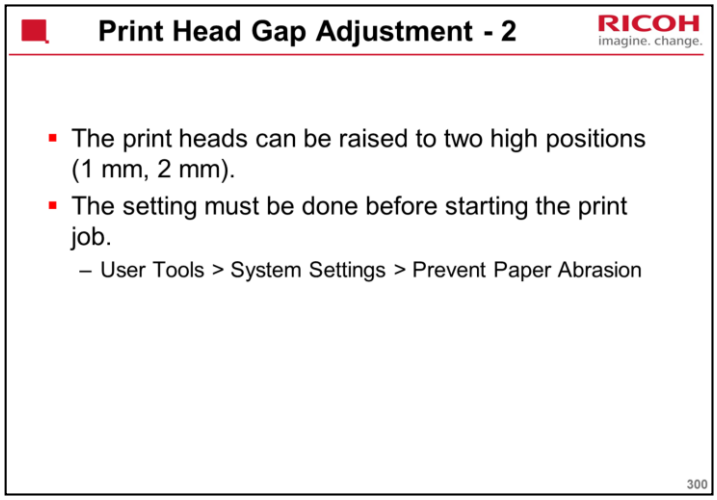
The readings of the K2 print head thermistor and the temperature/humidity sensor are used together to calculate the operating temperature of the machine.

If the machine overheats and the operating temperature exceeds the maximum temperature, the machine will shut down automatically and will not restart until it has cooled and been cycled off/on. The machine must be cycled off/on, even after it has cooled down to the operational range.

If the temperature is too low at a cold start in the morning, for example, the machine will not start the initial cleaning cycle unit the machine has warmed up. In this case, the machine does not require cycling off/on. The initial cleaning will start as soon as the machine has warmed up, and then the machine is ready for operation.

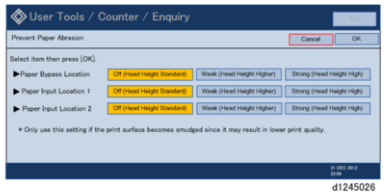


No additional notes



At the end of the job, the setting does not return to the default (off). However, a gap of 1 or 2 mm between the head and the cap is within specifications for head capping and the head should not dry out.

Print Head Gap Adjustment - 3



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- In the User Tools, select [System Settings] > [Next] > [Prevent Paper Abrasion].
- Three selections are available for each feed station:
  - Strong (2 mm), Weak (1 mm), Off (standard).

301

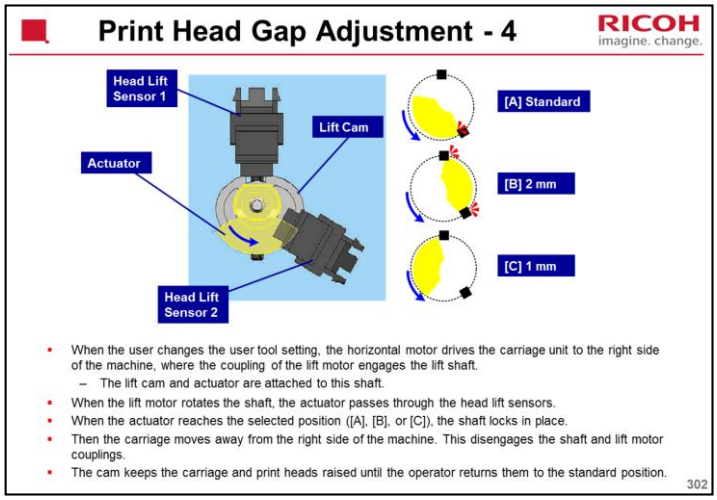
After the setting is changed, the following happens:

No job in progress. If no job is in progress, the print heads are raised or lowered as soon as the procedure is done.

Job in progress. If a signal is sent to raise or lower the print heads while another job is executing, the adjustment will not be done until after completion of the job in progress.

Loss of power. If power is lost during the raising or lowering, the machine returns to the position in effect at the start of the procedure (print heads capped).

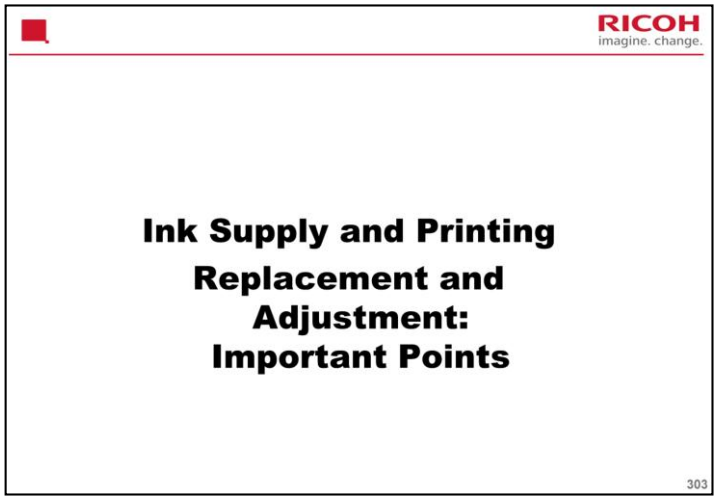
Bi-directional printing is not allowed if the print heads are raised (if either the "Strong“ or "Weak“ setting is selected).



The illustration shows the position of the actuator and status of the sensors for each selection.

The following table shows the sensor status for each position.

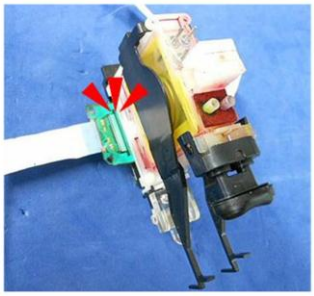
Above	User Tools	Elevation	Sensor 1	Sensor 2
[A]	Off	Default	OFF	ON
[B]	Strong	2 mm	ON	Either
[C]	Weak	1 mm	OFF	OFF



For full details of all procedures, see the service manual.

Caution

RICOH
imagine. change.



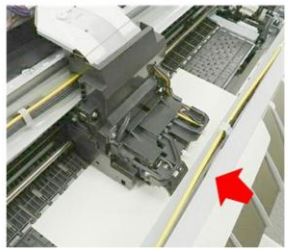
- If ink spills onto a printed circuit board, the print head unit will become unusable and require replacement.
  - Note: Individual heads cannot be replaced. The entire print head unit must be replaced.
- Always follow instructions and work carefully to avoid spilling ink from the ink tubes and from the ink sub tanks.

304

No additional notes

Protect the Platen from Ink Spills

RICOH
imagine. change.



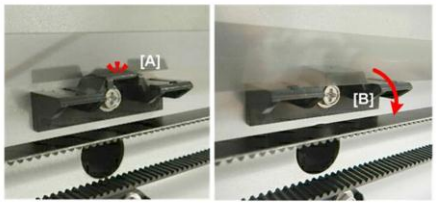
- Always slide a sheet of paper under the carriage unit when you move it to the center. This protects the platen from ink that could drip from the uncapped print heads.
- The sheet must be flat with no wrinkling. Do not use film.

305

No additional notes

Before you Turn the Power on Again

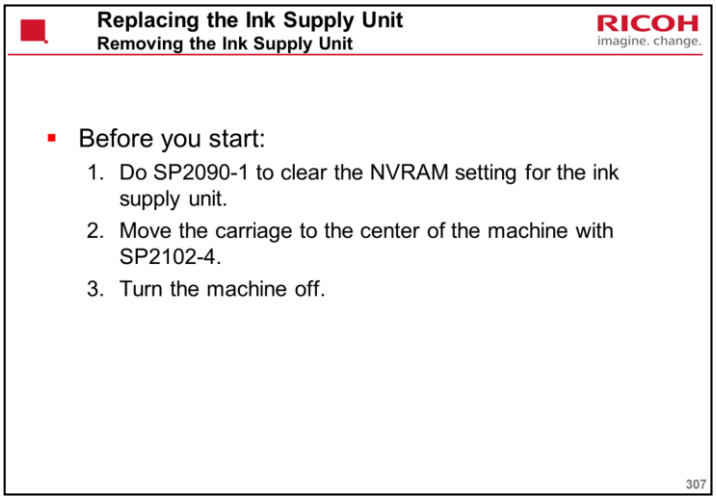
RICOH
imagine. change.



- Before you turn on the power switch to return the carriage unit to its home position on the right, check the position of the horizontal encoder strip on the left.
  - If the encoder strip is up on the bracket as shown at [A], pull it forward and down so that it is in front of the bracket as shown at [B].
  - If the machine is turned on with the strip positioned as shown at [A], the movement of the carriage unit may scratch the surface of the encoder strip.

306

No additional notes



Replacement and Adjustment > Ink Supply

The next few slides show the main points of this procedure. For full details, see the procedure in the field service manual.

Replacing the Ink Supply Unit
Replacement Kit

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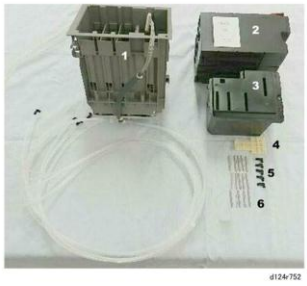


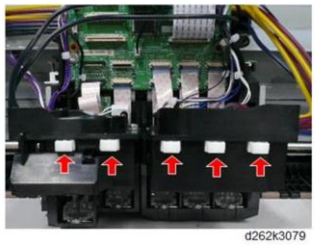
1. Ink Supply Unit (ink tubes attached)
2. Ink Cartridges (K, C, Y, M)
3. Ink Sump
4. Ink Sump Cap
5. Rubber Caps
6. Plugs

308

No additional notes

Replacing the Ink Supply Unit
Before Disconnecting the Tubes

RICOH
imagine. change.



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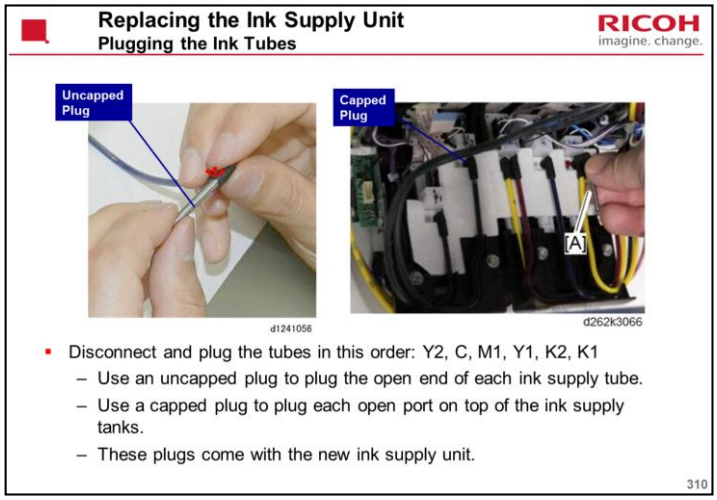
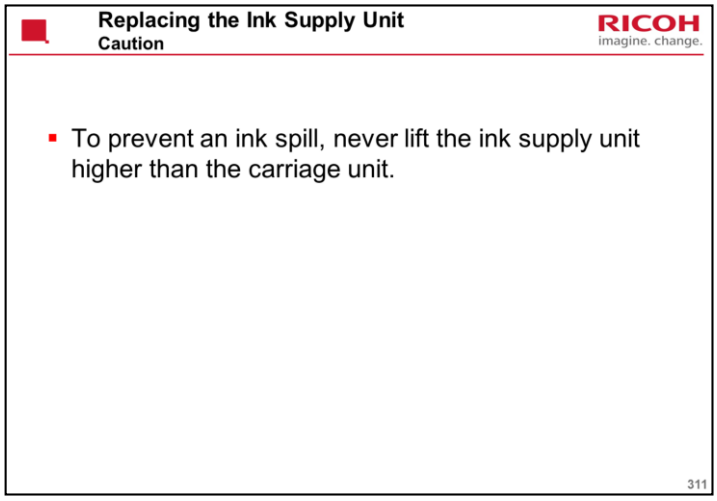
- Before disconnecting the tubes, press the white plungers to purge air from the ink sub tanks.

309

No additional notes



The ink supply unit replacement kit contains a set of these plugs.



No additional notes

Replacing the Ink Supply Unit
Installing a New Ink Supply Unit - 1

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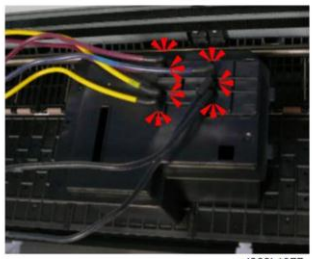
imagine. change.



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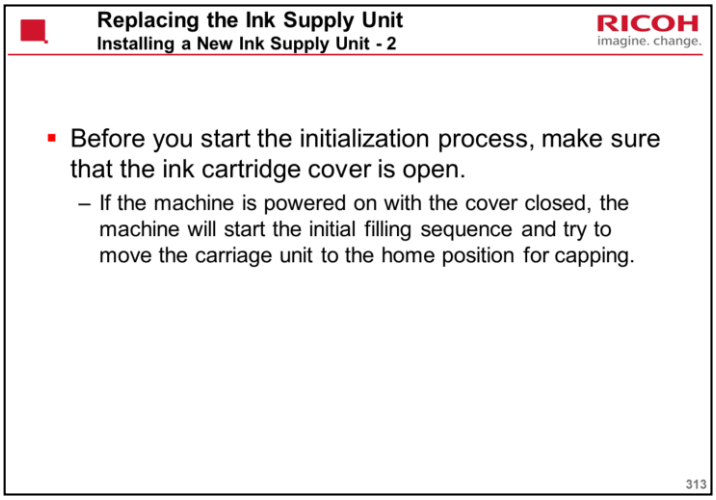
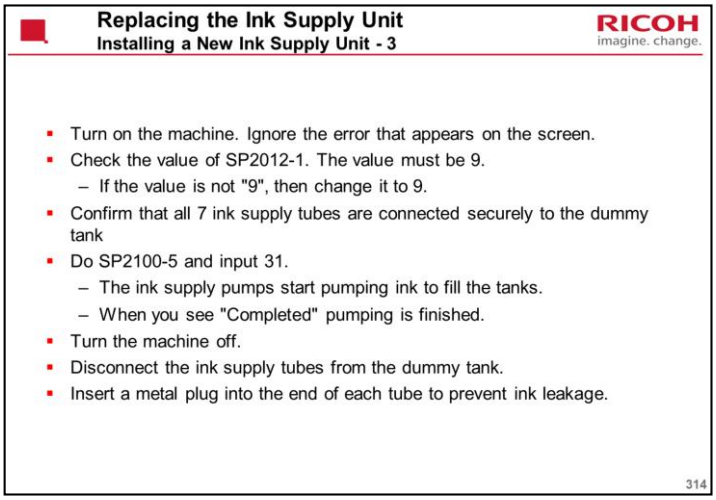
- The following slides show the main points. See the field service manual for full details.
  - Service ink cartridges must be installed in the new ink supply unit before you initialize the new unit.
    - These cartridges come with the new ink supply unit.
    - These cartridges ensure that the customer's ink is not used for the initialization procedure.
  - Set the dummy tank on the platen and connect the tubes to the top of this tank.
    - Ink expelled during initialization will go here.

312

Replacement and Adjustment > Ink Supply



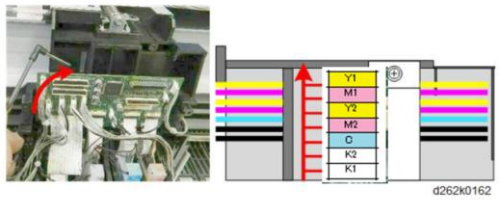
No additional notes



No additional notes

Replacing the Ink Supply Unit
Installing a New Ink Supply Unit - 4

RICOH
imagine. change.



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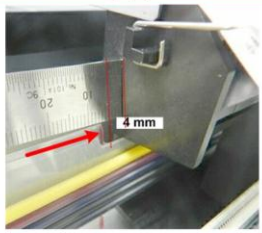
- Make sure the ink supply tubes are flat and stacked correctly.
- Pass each tube through the top of the carriage unit in this order: Y1 > M1 > Y2 > M2 > C > K2 > K1
- The tubes should enter the left and leave the right side of the carriage unit in the order shown above.
  - This ensures that the tubes are not crossed inside the carriage unit.
  - If they are crossed, the tube pressure plate may not set correctly.
- If the plugged tubes do not pass through the top of the carriage unit easily, use a pair of thin nosed pliers to pull them through.

315

No additional notes

Replacing the Ink Supply Unit
Installing a New Ink Supply Unit - 5

RICOH
imagine. change.



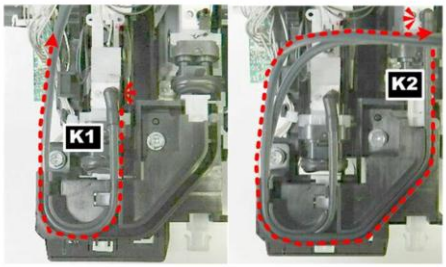
- Before you tighten the pressure plate, push in the ink supply tube bundle until the "L" notch is 4 mm away from the side of the carriage unit.
- Reattach the pressure plate.
- Push the carriage unit to the left and right to make sure that the tubes do not fall of the ink supply tube rail.
- If tubes fall off the rail, there is too much slack to the left of the carriage unit. Remove the pressure plate and make sure that the tubes are pushed as far as possible against the left side of the carriage unit.

316

No additional notes

Replacing the Ink Supply Unit
Installing a New Ink Supply Unit - 6

RICOH
imagine. change.



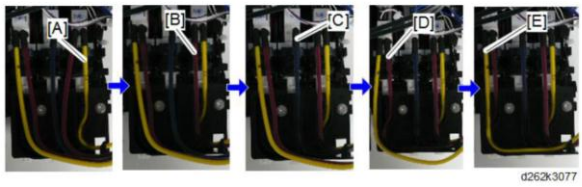
- Connect the ink supply tubes from left to right in this order:
  - K1 first
  - K2 over K1 on the left

317

No additional notes

Replacing the Ink Supply Unit
Installing a New Ink Supply Unit - 7

RICOH
imagine. change.



d262k3077

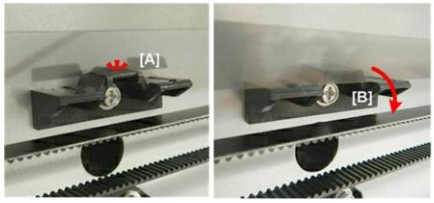
- Set the ink tubes on the route of the head carriage in this order from the right: Y2 > M2 > C > M1 > Y1.
  - Y2 first [A]
  - M2 over Y2 [B]
  - C over M2 [C]
  - M1 over C [D]
  - Y1 over M1 [E]

318

No additional notes

Replacing the Ink Supply Unit
Installing a New Ink Supply Unit - 8

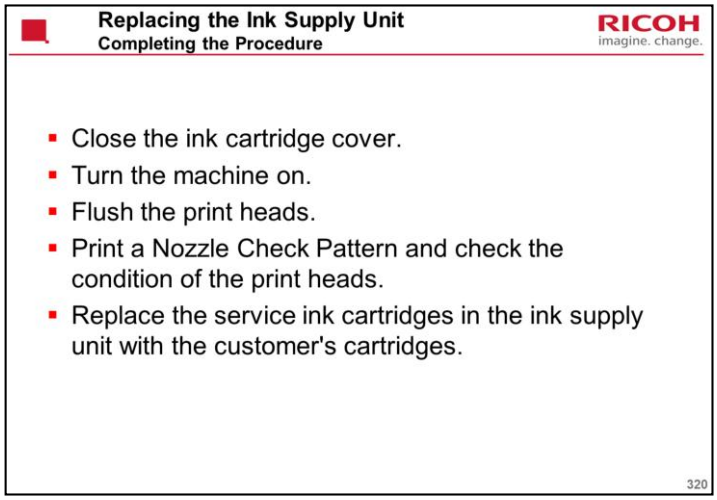
RICOH
imagine. change.



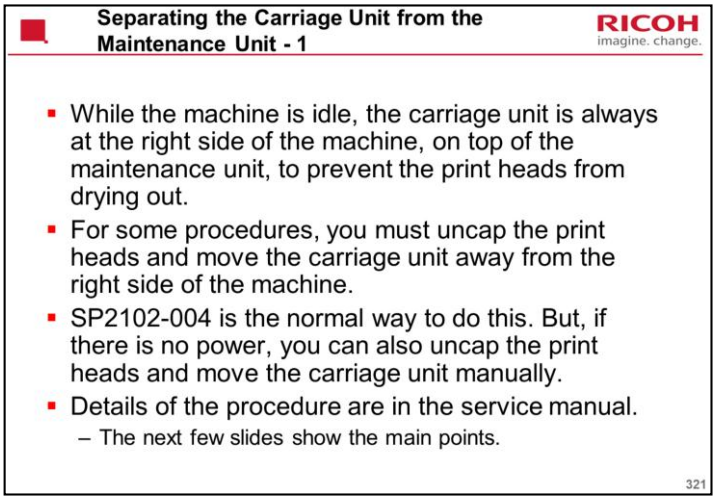
- Before you turn on the power switch to return the carriage unit to its home position on the right, check the position of the horizontal encoder strip on the left.
  - If the encoder strip is up on the bracket as shown at [A], pull it forward and down so that it is in front of the bracket as shown at [B].
  - If the machine is turned on with the strip positioned as shown at [A], the movement of the carriage unit may scratch the surface of the encoder strip.

319

No additional notes



No additional notes


Separating the Carriage Unit from the Maintenance Unit - 1
RICOH
imagine. change.
While the machine is idle, the carriage unit is always at the right side of the machine, on top of the maintenance unit, to prevent the print heads from drying out.
For some procedures, you must uncap the print heads and move the carriage unit away from the right side of the machine.
SP2102-004 is the normal way to do this. But, if there is no power, you can also uncap the print heads and move the carriage unit manually.
Details of the procedure are in the service manual.
– The next few slides show the main points.
321

Separating the Carriage Unit from the Maintenance Unit - 2

RICOH
imagine. change.

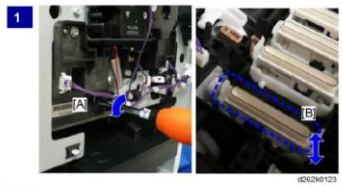
- Moving the carriage unit automatically with 2102-004:
  - Set to 1: Lowers the maintenance unit ink caps and uncaps the print heads. The carriage does not move.
  - Set to 2: Uncaps the print heads and moves the carriage to the left of the platen.
  - Set to 3: Uncaps the print heads and moves the carriage to the center of the platen. Normally, you will use this setting.
- After changing the SP setting, the carriage moves. Then turn the machine off.
- Always slide a sheet of paper under the carriage unit when you move it to the center. This protects the platen from ink that could drip from the uncapped print heads.
- After you reassemble the machine, turn the machine on.
  - The carriage will return to the right side (home position), and the maintenance unit will cap the print heads.

322

No additional notes

Separating the Carriage Unit from the Maintenance Unit - 3

RICOH imagine. change.



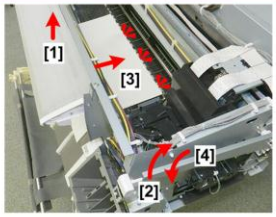
- Moving the carriage unit manually:
  1. Rotate the hex socket at [A] to raise and lower the suction cap [B].
     - This cap must be lowered before you can move the carriage away from the maintenance unit.
  2. Rotate the hex socket at [A] to raise and lower the K2/Y1M1/C/M2Y2 print head caps [B].
     - These caps must be lowered before you can move the carriage away from the maintenance unit.

323

Replacement and Adjustment > Common Procedures

Separating the Carriage Unit from the Maintenance Unit - 4

RICOH
imagine. change.

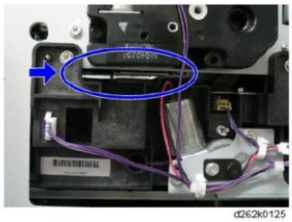


- Before you start work:
  - Remove the front cover [1].
  - Raise the paper holding lever [2].
  - Slide a sheet of paper [3] into the machine as far as the gap between the raised rollers and the platen.
  - Lower the paper holding lever [4] to hold the paper in place.
- This paper protects the platen from ink that may leak from the carriage unit after it is moved away from the right side of the machine.

324

Separating the Carriage Unit from the Maintenance Unit - 5

RICOH
imagine. change.



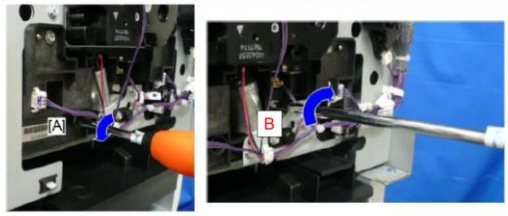
- To prevent damaging the caps, you must confirm that both the suction cap and K2/color print caps are down before you push the carriage unit away from the home position.
- Check at [A].
  - The suction cap and K2/color print head caps should both be down.
  - Your view should not be blocked by either the suction cap or K2/color print head caps.

325

The suction cap is also the K1 print head cap.

Separating the Carriage Unit from the Maintenance Unit - 6

RICOH
imagine. change.

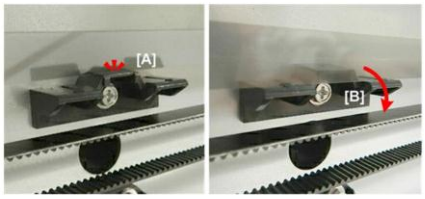


- If the caps are not moved down:
  - Set a screwdriver in hole [A] and rotate it counter-clockwise to lower the suction cap. Use a flashlight to confirm that the suction cap is down.
  - Set a screwdriver in hole [B] and rotate it clockwise to lower the K2/color print head caps. Use a flashlight to confirm that the print head caps are down.

326

No additional notes

Before you Turn the Power on Again



- Before you turn on the power switch to return the carriage unit to its home position on the right, check the position of the horizontal encoder strip on the left.
  - If the encoder strip is up on the bracket as shown at [A], pull it forward and down so that it is in front of the bracket as shown at [B].
  - If the machine is turned on with the strip positioned as shown at [A], the movement of the carriage unit may scratch the surface of the encoder strip.

327

No additional notes

Capping the Print Heads Manually

RICOH imagine. change.

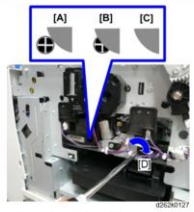
- Do this procedure only when it is absolutely necessary and the print heads cannot be capped automatically by switching the machine on.
- You may need to move the carriage manually in the following cases:
  - If the machine is partially disassembled at the end of the work day, the print heads should be capped manually before leaving the machine to sit for more than an hour.
  - If the machine was operating when a power outage occurred, leaving the carriage unit out of the home position, you must cap the print heads if power cannot be restored within a short time.
    - This is explained in the slides in this course called 'Capping the Print Heads Manually'.
- In order to prevent damage to the wipers and edges of the print head caps, the print heads must be positioned directly above the print head caps within ±0.8 mm.

328

No additional notes

Capping the Print Heads Manually - 1

RICOH imagine. change.



- Slowly, push the carriage unit to the right side of the machine until it stops. The carriage should be over the maintenance unit.
- The cleaning unit may be out of position (to the rear) if the machine power was interrupted during the print head cleaning cycle. You must check that it is in the correct position, and move it if necessary, in order to cap the K1 print head.
- Use a flashlight to look through the hole.
  - If the hex socket is visible [A], no adjustment is necessary.
  - If the hex socket is only partially visible or not visible at all (looks like [B] or [C]), then set a screwdriver at [D] and rotate it counter-clockwise to move the cleaning mechanism until you see [A]. This moves the cleaning unit forward so that you can raise the suction cap.

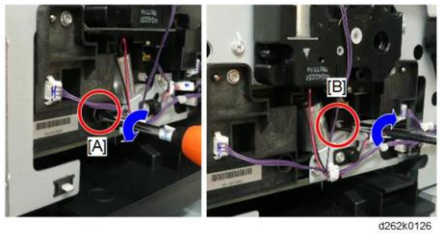
329

If you cannot turn the machine on to return the print heads to their capping positions automatically, do this procedure.

This first slide shows you how to make sure that the cleaning unit (K1 print head cap) is in the correct position for capping the K1 print head.

Capping the Print Heads Manually - 2

RICOH
imagine. change.



d262k0126

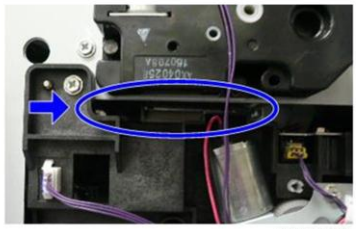
- To lift the suction caps:
  - Set a screwdriver in hole [A] and rotate it counter-clockwise to raise the suction cap. Use a flashlight to confirm that the suction cap is up.
  - Set a screwdriver in hole [B] and rotate it clockwise to raise the K2/color print head caps. Use a flashlight to confirm that the print head caps are up.

330

No additional notes

Capping the Print Heads Manually - 3

RICOH
imagine. change.



d262k0128

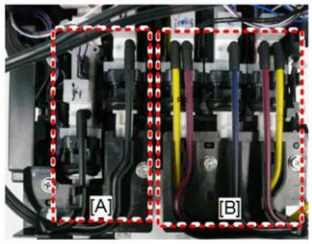
- Check the gap to make sure that the caps are up.
  - The suction cap and K2/color print head caps should both be up.

331

No additional notes

Replacing Print Head Units
Overview

RICOH
imagine. change.



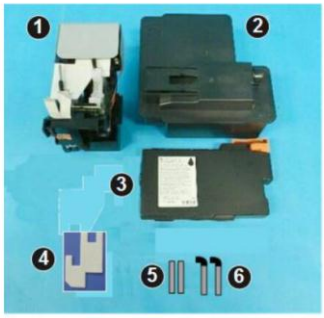
- The unit on the left is the Black Print Head Unit (K1, K2) [A]. It holds the black print heads and sub tanks.
- The unit on the right is the Color Print Head Unit (C, YM) [B]. It holds the color print heads and sub tanks.
- A single print head (K1, K2, C, or YM) cannot be replaced individually; the entire left or right print head unit must be replaced.
- The left and right print head units [A] and [B] can be replaced separately or as a pair.

332

No additional notes

Replacing Print Head Units
Accessories – Black Print Head Unit

RICOH
imagine. change.



d262k3038

1. Black Print Head Unit
2. Ink Collector Tank
3. Ink Cartridge (K)
4. Protective Sheet
5. Plug x 2
6. Plug (Capped) x2
   - Two plugs are also inserted into the ink supply tubes of the print head unit.

333

No additional notes

Replacing Print Head Units
Accessories – Color Print Head Unit

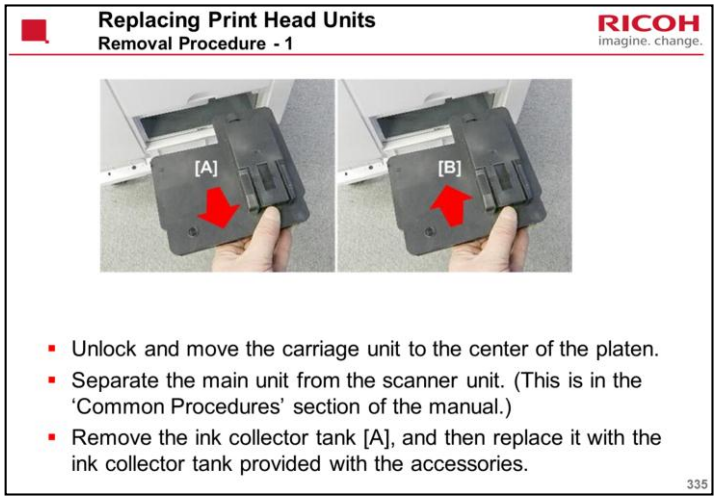
RICOH
imagine. change.

d262k3039

1. Color Print Head Unit
2. Ink Collector Tank
3. Ink Cartridges (C, Y, M)
4. Protective Sheet
5. Plug x 3
6. Plug x3 (Capped) x 3
   - Three plugs are also inserted into the ink supply tubes of the print head unit.

334

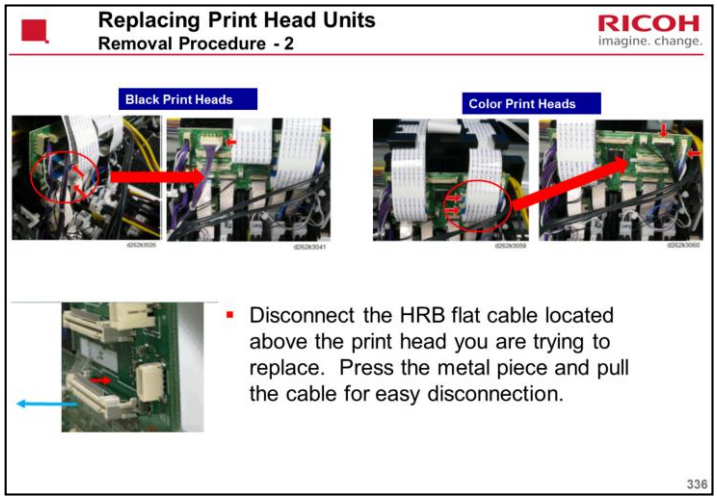
No additional notes



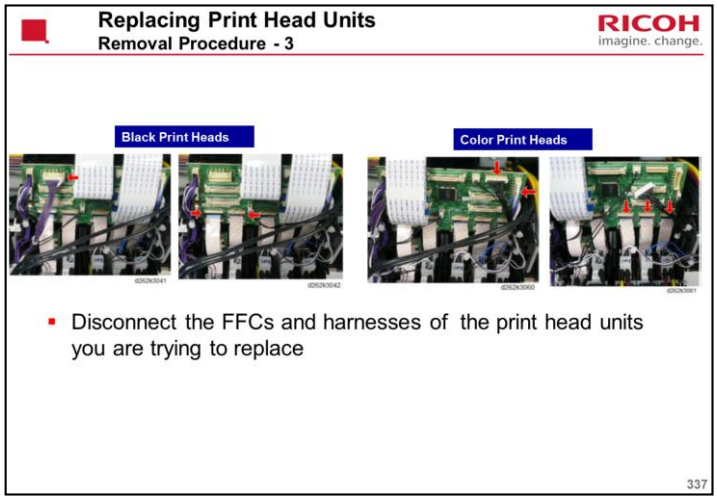
We will now look at the most important points of the replacement procedure.

For full details, see the field service manual.

Replacement and Adjustment > Carriage Unit > Black and Color Print Heads



No additional notes

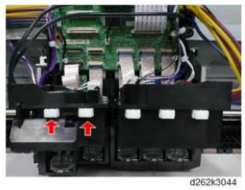


No additional notes

Replacing Print Head Units
Removal Procedure - 4

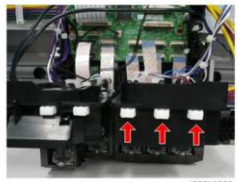
RICOH
imagine. change.

Black Print Heads



d262k3044

Color Print Heads



d262k3063

- Press in the left and then the right plunger to expel air from the ink sub tanks.
- This equalizes the pressure inside the tanks with the atmosphere. If you forget to do this, ink will come out when you take the tubes off.
- CAUTION: If any ink or other liquid gets on the PCB in the print head, do not use this print head. When you turn the power on, this PCB, and maybe the MCU and HRB boards will be damaged. Install a new print head unit.

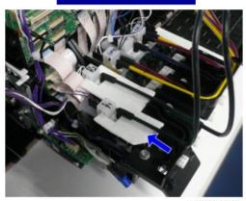
338

No additional notes

Replacing Print Head Units
Removal Procedure - 5

RICOH
imagine. change.

Black Print Heads



d262k3045

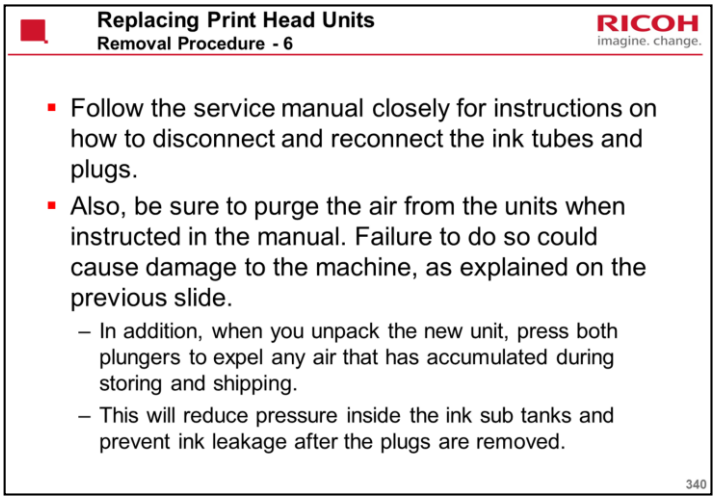
Color Print Heads

d262k3064

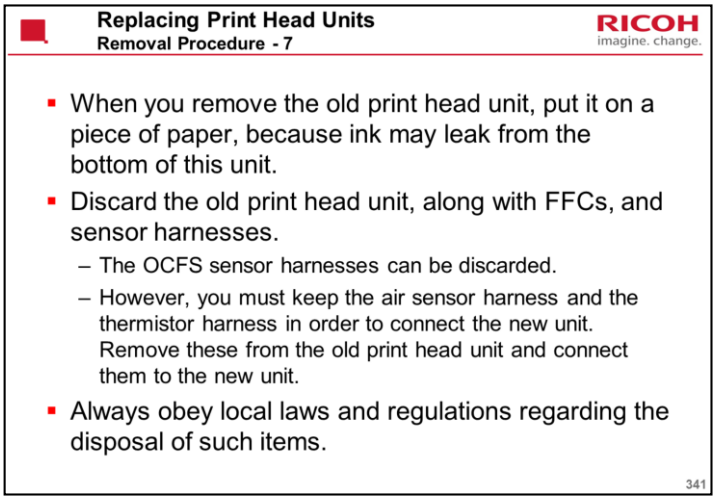
- Attach the protective sheet enclosed in the new head carriage to the head carriage removed, to prevent ink from spilling on the machine.

339

No additional notes



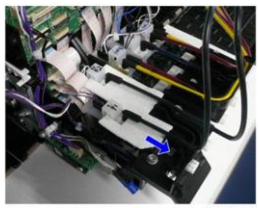
No additional notes



No additional notes

Replacing Print Head Units
Replacement Procedure - 1

RICOH
imagine. change.


d262k3053


d262k3064

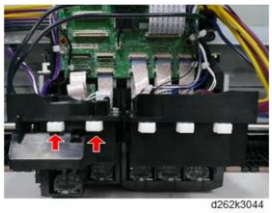
- The new print head units each have a sheet of paper under the metal plugs to protect against damage from accidental ink spills.
- Do not remove this paper until all the ink tubes have been connected to the new unit.

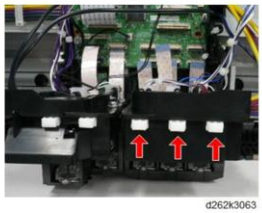
342

No additional notes

Replacing Print Head Units
Replacement Procedure - 2

RICOH
imagine. change.

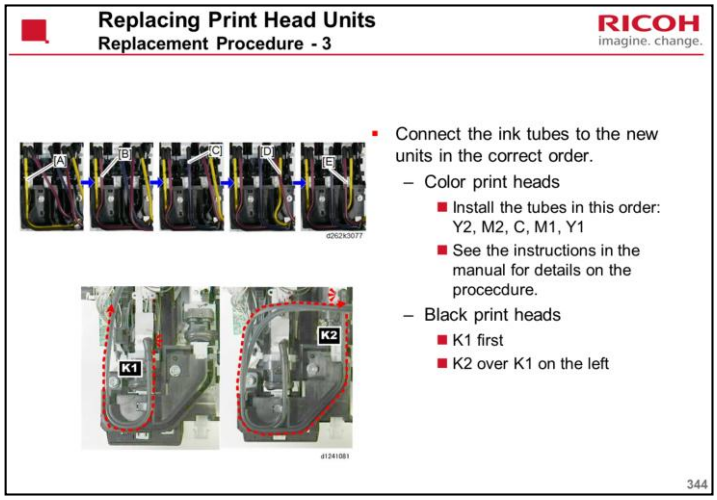

d262k3044


d262k3063

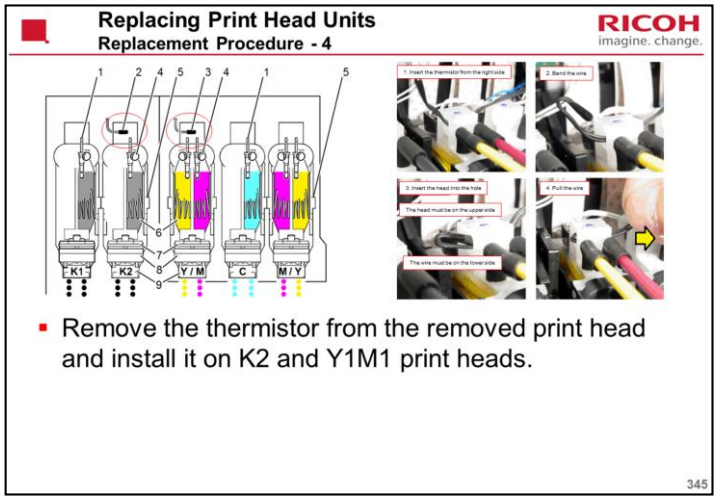
- On the new print head unit, before you connect the ink supply tubes, press in the plungers to purge air from the sub ink tanks.
- CAUTION: If any ink or other liquid gets on the PCB in the print head, do not use this print head. When you turn the power on, this PCB, and maybe the MCU and HRB boards will be damaged. Install a new print head unit.

343

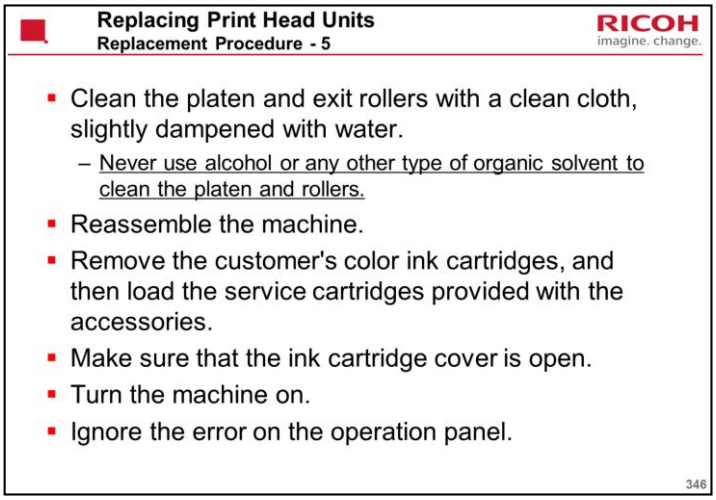
The diagram shows the color print heads. The procedure is similar for the black print heads.



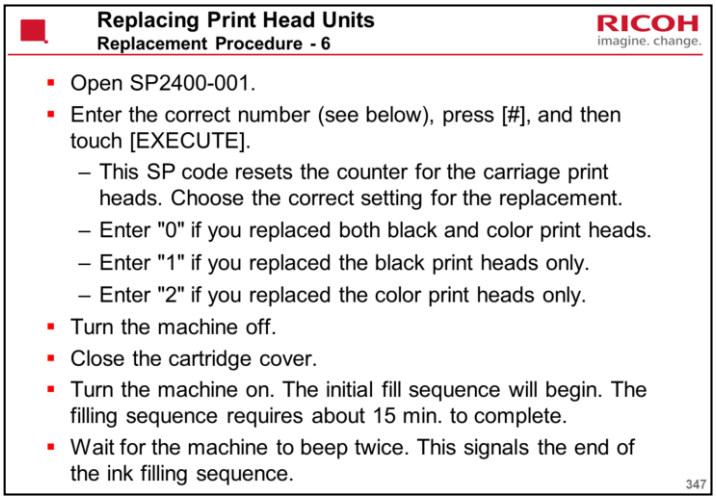
This explanation is also provided in the previous slides “Replacing the Ink Supply Unit Installing a New Ink Supply Unit – 5, – 6”



No additional notes



No additional notes



No additional notes

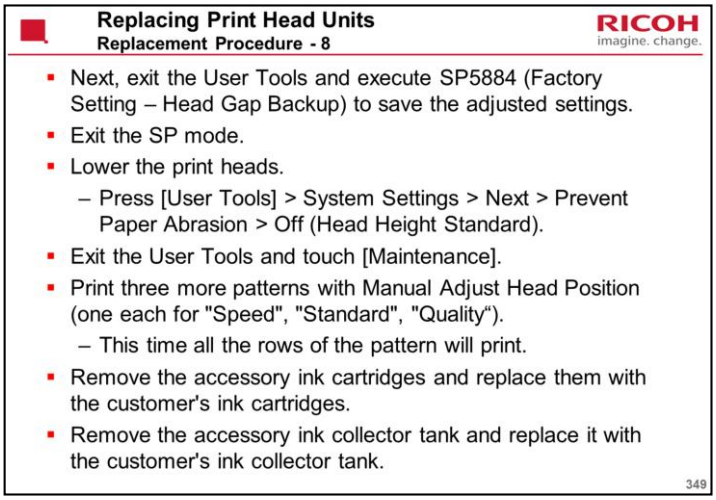
Replacing Print Head Units
Replacement Procedure - 7

RICOH imagine. change.

- Check the nozzles: User Tools > Maintenance > Print Nozzle Check Pattern.
- Then set User Tools – System Settings – Prevent Paper Abrasion to 'Strong'
  - This raises the print heads to the maximum height.
- Then in the Maintenance menu, do the Manual Head Position adjustment. Do the three adjustments (Speed, Standard, Quality).
  - Only the first three rows of the pattern will print because the print heads are at maximum height.
  - The reason for these two steps is because, after putting new print heads in, we are not sure exactly how far above the platen they are. So we set the gap to 'Strong', and then the machine moves the print head height to a known setting. Then we make a fine adjustment with the manual adjustment procedure, and the machine should be back to normal.

348

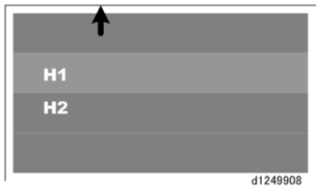
No additional notes



No additional notes

After Replacing the Black Printer Head

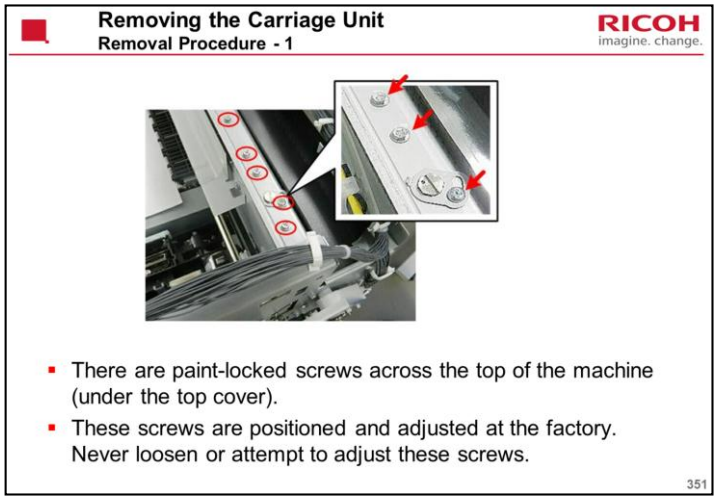
RICOH
imagine. change.



- The print density of the two heads must be made the same. Print the test pattern and adjust the density as explained in the service manual.

350

No additional notes



Replacement and Adjustment > Carriage Unit

Normally, you will not need to do this procedure, unless the horizontal timing belt breaks.

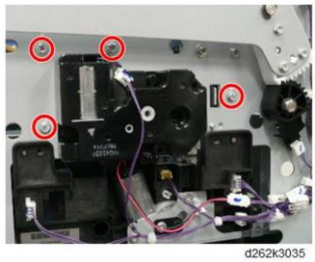
It is not necessary to disconnect the ink tubes. Just detach the carriage and move it to one side.

This is a long procedure and many components must be removed. The next few slides show a few important points. For full details of the procedure, see the field service manual.

You must unlock and move the carriage unit before you can remove the carriage unit.

Removing the Carriage Unit
Removal Procedure - 2

RICOH
imagine. change.



d262k3035

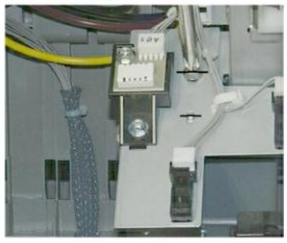
- You can see the heads of four paint-locked screws around the top of the maintenance unit. These screws hold a re-enforcement plate.
- Never loosen or remove any of these screws.

352

No additional notes

Removing the Carriage Unit
Removal Procedure - 3

RICOH
imagine. change.



d124r773

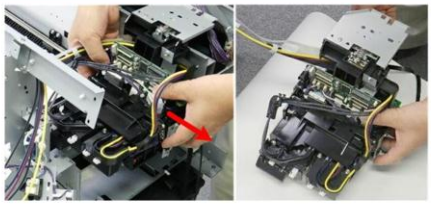
- Before you remove the ink level sensor bracket, use a pencil or marker to mark the positions of the bosses and screw of the plate.
- This plate slides forward and back. It must be aligned precisely when it is reinstalled.

353

No additional notes

Removing the Carriage Unit
Removal Procedure - 4

RICOH
imagine. change.



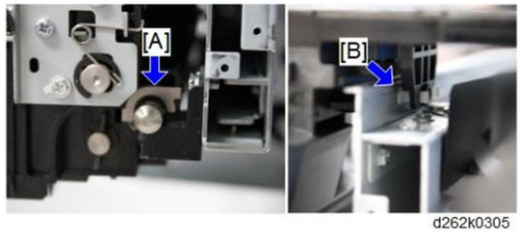
- When you are ready to move the carriage unit out of the machine, prepare a flat clean surface, such as a stool or small table covered with paper, at the right side of the machine.
  - The ink tubes are still connected to the carriage unit, so there is not much space for moving the carriage unit after it is off the guide rod. Place the table or stand as close as possible to the right side of the main unit.
  - To avoid ink leakage, always keep the carriage unit higher than the ink supply unit.
- Follow the instructions in the service manual carefully when you move the carriage unit.

354

No additional notes

Removing the Carriage Unit
Replacement Procedure - 1

RICOH
imagine. change.



d262k0305

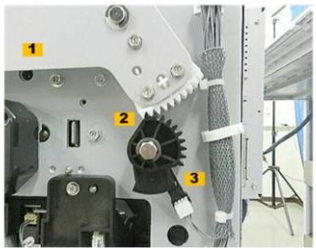
- When reattaching the carriage unit:
  - The bushing [A] must be at the position of the guide rod.
  - The slider [B] which is at the top of the carriage unit must be at the rail.

355

No additional notes

Removing the Carriage Unit
Replacement Procedure - 2

RICOH
imagine. change.



- When you reattach the paper holding lever, make sure that:
  - The paper holder lever [1] is level.
  - The gears are meshed at the first notch of each [2].
  - Actuator [3] is down and in the gap of the registration release sensor.

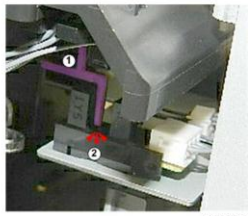
356

No additional notes

Removing the Carriage Unit
Replacement Procedure - 3

RICOH
imagine. change.

d124r773



d1241093

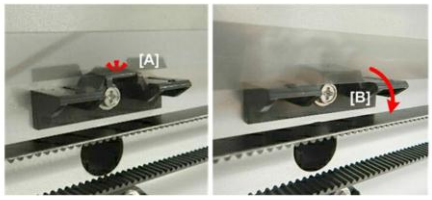
- Attach the ink level sensor bracket but do not tighten it.
- Position the plate so that it is aligned with the marks that you drew when you removed it.
- Check the position of the actuators 1 and 2.
  - The actuators must be centered in the gaps of the sensors above and below.

357

No additional notes

Removing the Carriage Unit
Replacement Procedure - 4

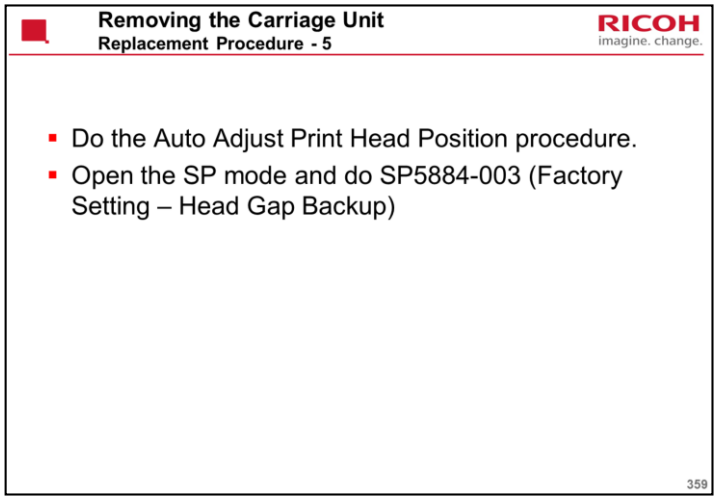
RICOH
imagine. change.



- Before you turn on the power switch to return the carriage unit to its home position on the right, check the position of the horizontal encoder strip on the left.
  - If the encoder strip is up on the bracket as shown at [A], pull it forward and down so that it is in front of the bracket as shown at [B].
  - If the machine is turned on with the strip positioned as shown at [A], the movement of the carriage unit may scratch the surface of the encoder strip.

358

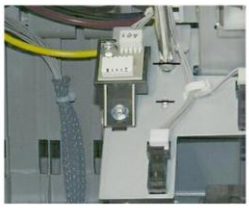
No additional notes

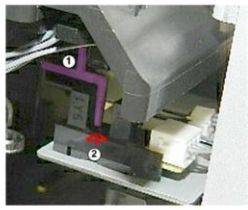


No additional notes

Adjusting the Ink Level Sensors

RICOH
imagine. change.





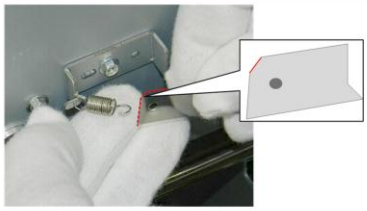
- When you install a new sensor, do not fasten the bracket tightly at first. Some adjustment is needed.
- Attach the ink level sensor bracket but do not tighten it.
- Position the plate so that it is aligned with the marks that you drew when you removed it.
- Check the position of the actuators 1 and 2.
  - The actuators must be centered in the gaps of the sensors above and below.

360

No additional notes

Installing a Horizontal Encoder

RICOH imagine. change.



- If it is dirty, clean it with an alcohol damp cloth, and then dry it with a dry linen cloth.
  - Never use a cotton ball, cotton swab, or tissue paper to clean the surface of the encoder strip.
- Attach the left end of the strip with the beveled corner pointing up (the right end of the strip is square).
  - The machine will not operate if the encoder strip is not installed correctly.

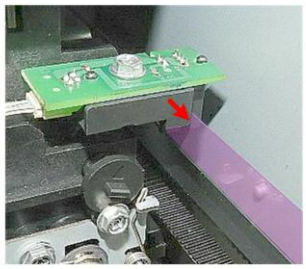
361

Replacement and Adjustment > Main Scan

It is not necessary to unlock and move the carriage unit in order to remove this part.

Installing a Horizontal Encoder Sensor

RICOH
imagine. change.



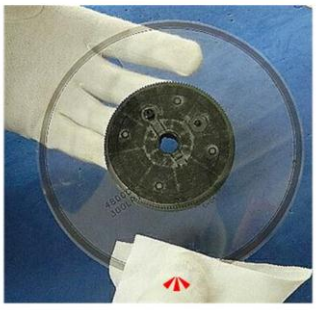
- Make sure the top edge of the horizontal encoder strip is inserted into the slot below the horizontal encoder sensor.

362

You must unlock and move the carriage unit before you can remove the sensor.

Handling the Vertical Encoder Wheel

RICOH imagine. change.



d124r431

- Handle the wheel at its center. Never touch the edges.
- To clean the edges, wipe with a clean linen cloth dampened with alcohol.
  - Never use a cotton ball, cotton swab, or tissue paper to clean the surface of the encoder strip.

363

No additional notes

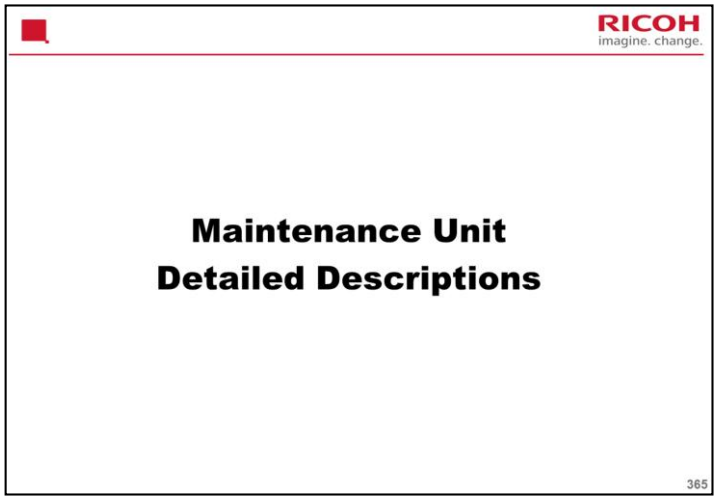
Air Solenoid Bracket

RICOH
imagine. change.

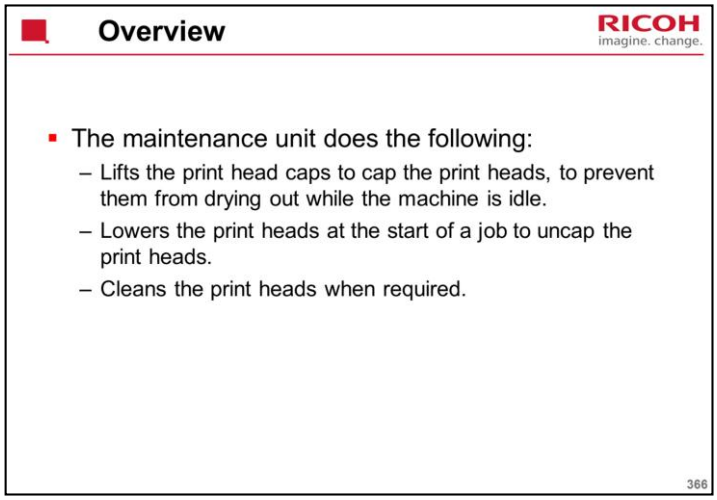
- The position of the air solenoid bracket is adjusted at the factory. Do not remove this screw.

364

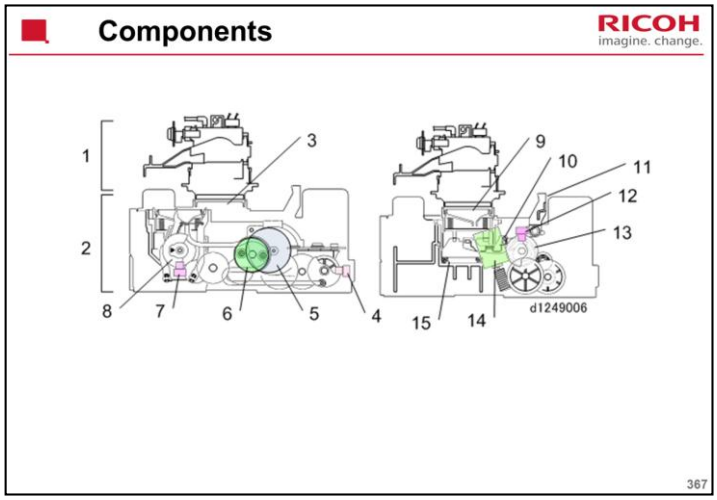
No additional notes



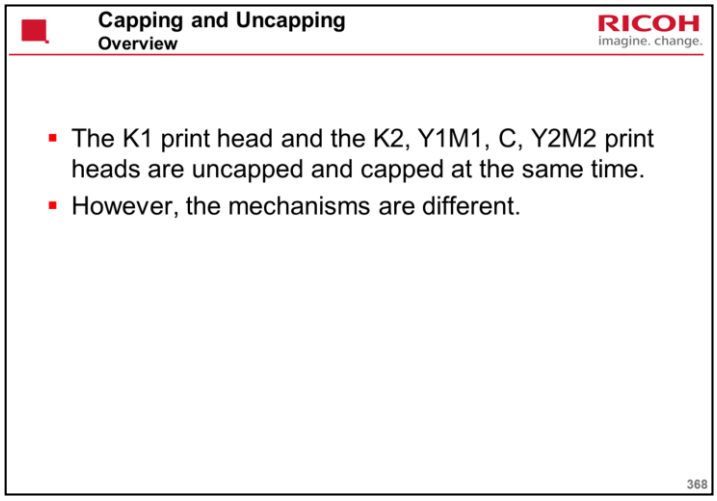
No additional notes



No additional notes



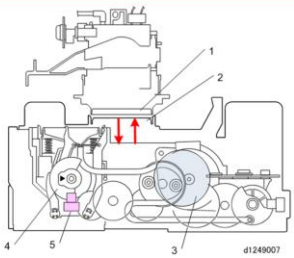
1.Carriage unit
2.Maintenance unit
3.Suction cap/K1 print head cap
4.Slide sensor
5.Maintenance motor
6.Suction pump
7.Suction cap sensor
8.Suction cap actuator
9.Color print head caps (K2, C, YM)
10.Lift lever (K2, C, YM)
11.Carriage stopper
12.Lift sensor
13.Lift sensor actuator
14.Lift motor
15.Cap pads (K2, C, YM)



No additional notes

Capping and Uncapping
K1 Print Head - 1

RICOH
imagine. change.



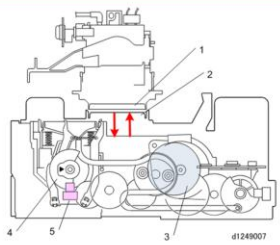
- The maintenance motor (3) uncaps and caps the K1 print head.
- While the machine is idle, the K1 print head (1) on the bottom of the carriage unit is capped and sealed by the suction cap (2) to prevent it from drying out.
- At the start of the next job, the maintenance motor rotates forward and lowers the suction cap to uncap the K1 print head.

369

No additional notes

Capping and Uncapping
K1 Print Head - 2

RICOH
imagine. change.



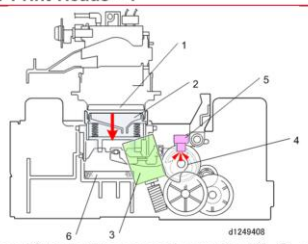
- At the end of the job, the carriage unit (1) moves to the right and positions itself over the maintenance unit (2).
- The maintenance motor (3) rotates forward again and raises the suction cap to cap the K1 print head.
- The rotating suction cap actuator (4) (mounted on a shaft with a lift cam driven by the maintenance motor) and suction cap sensor (5) control the lifting and lowering of the suction cap.

370

No additional notes

Capping and Uncapping
K2, C, MY Print Heads - 1

RICOH
imagine. change.



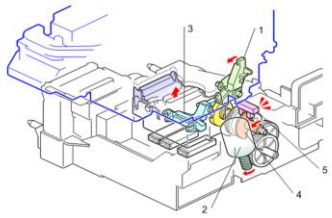
- The maintenance lift motor uncaps and caps the K2, C, and MY print heads.
- While the machine is idle, the K2, C, and YM print heads (1) on the bottom of the carriage unit are capped and sealed by the print head caps (2).
- At the start of the next print job, the lift motor (3) rotates forward and lowers the K2, C, and YM caps to uncap the K2, C, YM print heads.
- The rotating lift actuator (4) (mounted on a shaft with a cam driven by the lift motor) and lift sensor (5) control the lowering of the three print caps.
- The caps rest on the absorbent cap pads (6) while they are down.

371

No additional notes

Capping and Uncapping
K2, C, MY Print Heads - 2

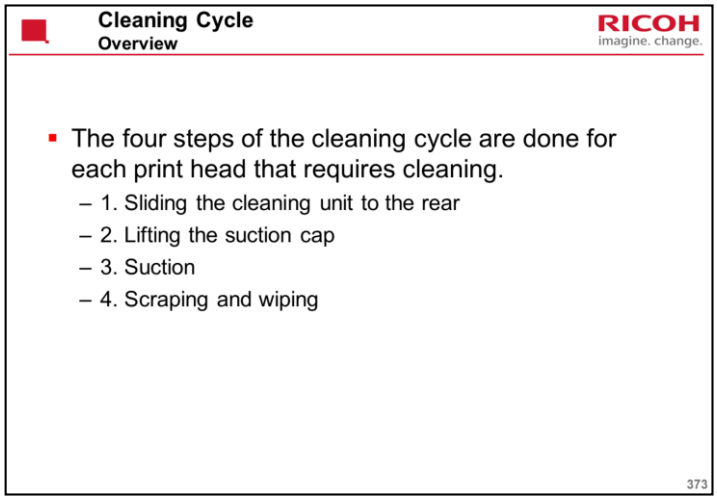
RICOH
imagine. change.



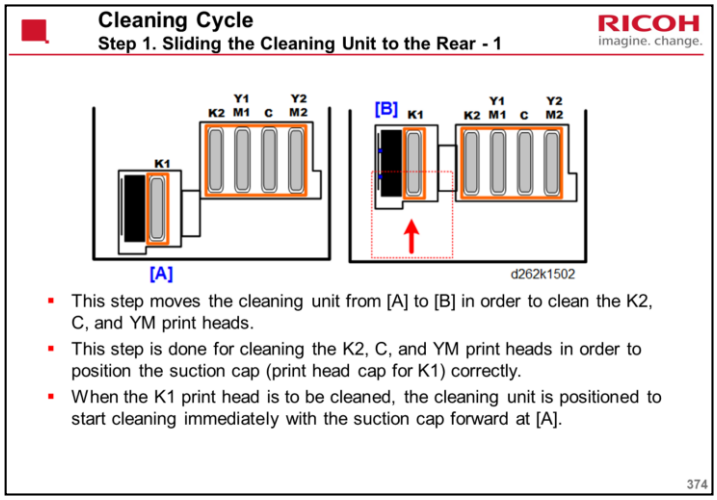
- At the end of a print job, the carriage unit moves to the right and positions itself over the maintenance unit.
- The carriage stopper (1) positions the carriage unit so that the caps and print heads are aligned.
- The maintenance lift motor (2), rotating forward, lifts the K2, C, Y,M print head caps (not shown) on the lift lever (3) and covers the print heads to prevent them from drying out.
- The rotating lift actuator (4) (mounted on a shaft with a lift cam driven by the lift motor) and lift sensor (5) control the raising of the caps.

372

No additional notes



No additional notes

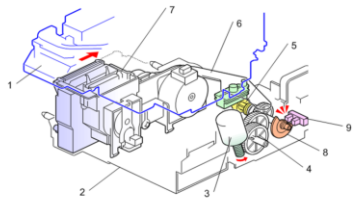


No additional notes

Cleaning Cycle

Step 1. Sliding the Cleaning Unit to the Rear - 2

RICOH
imagine. change.



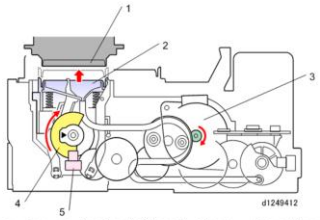
- At the start of the cleaning cycle, the carriage unit (1) positions itself over the maintenance unit (2).
- The lift motor (3) rotates in reverse and drives the gear train (4).
- The gears rotate a shaft with a large cam (5) between two swinging plates attached to the slide arm (6), which is linked to the cleaning unit (7)
- When the cam pushes the front plate forward, the slide arm and cleaning unit move to the rear.
- When the slide actuator (8) (attached to the same shaft driven by the lift motor) activates the slide sensor (9), the lift motor switches off.
- The cleaning unit is now at the rear.

375

No additional notes

Cleaning Cycle
Step 2. Lifting the Suction Cap

RICOH
imagine. change.



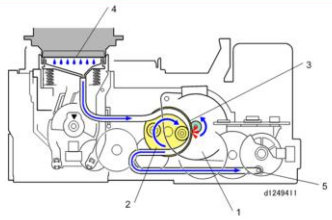
- The carriage moves to the left and stops when the print head (1) to be cleaned is directly above the suction cap (2).
- The maintenance motor (3) rotates forward and raises the suction cap.
- The suction cap actuator (4) and suction cap sensor (5) signal the machine to turn off the motor when the cap is up and sealed on the print head.
  - The actuator is attached to the shaft with the cam driven by the maintenance motor to raise the suction cap.

376

No additional notes

Cleaning Cycle
Step 3. Suction

RICOH
imagine. change.



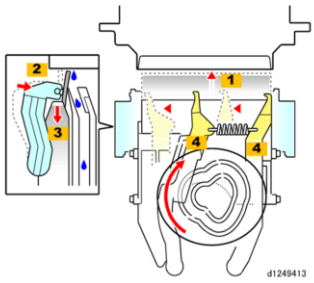
- The maintenance motor (1) reverses and rotates the cam inside the suction pump (2).
- The rotation of the cam alternately squeezes and releases the suction tube (3) to create enough pressure to pull ink from the surface of the print head (4).
- The ink is pulled through the tube which exits at the back of the maintenance unit (5) and continues down to the ink collector tank below the maintenance unit on the right side of the machine.
- The suction cap lowers away from the print head after suctioning ink for the correct time.

377

No additional notes

Cleaning Cycle
Step 4. Scraping and Wiping

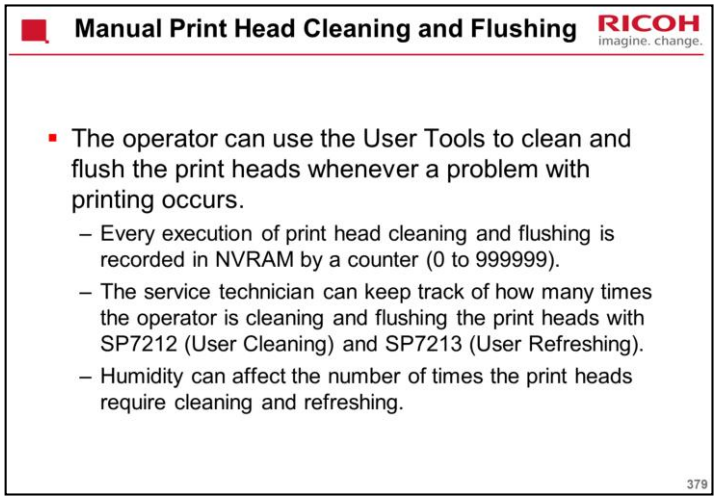
RICOH
imagine. change.



- After lowering the suction cap, the maintenance motor continues to rotate, and drives the cam and linkages that control the scraping and wiping.
- The rubber scraper [1] is raised to the surface of the print head.
- The knock lever [2] taps the edge of the scraper, to scrape ink from the print head. The ink falls into a vent [3] which opens over the right ink sump below the maintenance unit.
- Next, the linkage cocks the spring loaded wipers [4] to the rear, and then releases them so that they spring forward and flick any remaining ink into the vent. This is done twice.
- This completes the cleaning cycle.

378

No additional notes



Details of how to use the User Tools follow later in this training course.

Automatic Downtime Cleaning - 1

RICOH imagine. change.

- Ink can thicken or dry around the nozzles if a print head remains idle for a long time, especially at low temperatures. This can affect the quality of printing.
- To prevent this, the machine will execute a maintenance cleaning cycle that is appropriate for the length of time that the print heads have remained idle.
- This is done automatically without intervention by the operator.
  - It is done automatically at power on, job start, and recovery from sleep mode.
- Idle (or downtime) refers to the length of time that a print head has not been used.
  - For example, if the machine is used for extensive black-and-white printing, a count of idle time for the color print heads (C, YM) is maintained.

380

No additional notes

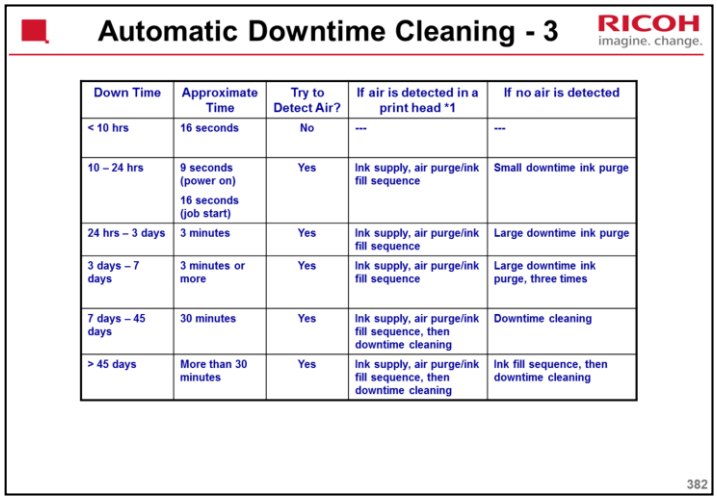
Automatic Downtime Cleaning - 2

RICOH imagine. change.

- The machine monitors two phases of downtime.
  - Idle time 1: Starts after the last sheet exits and all the print heads are capped
  - Idle time 2: Amount of time each head has remained idle
- These idle time counts are used to determine which of these operations to execute:
  - Air purging (ink supply and purging, filling and cleaning, and air purging/filling together)
  - Ink supply sequence
  - Cleanings and flushing (refreshing)
  - Ink purging done after idle time
- The type of maintenance operation is selected automatically, based on the time that has passed after the start of downtime.
  - The maintenance cycle could be brief or require several minutes, depending on ambient conditions and how long the print heads have remained idle.

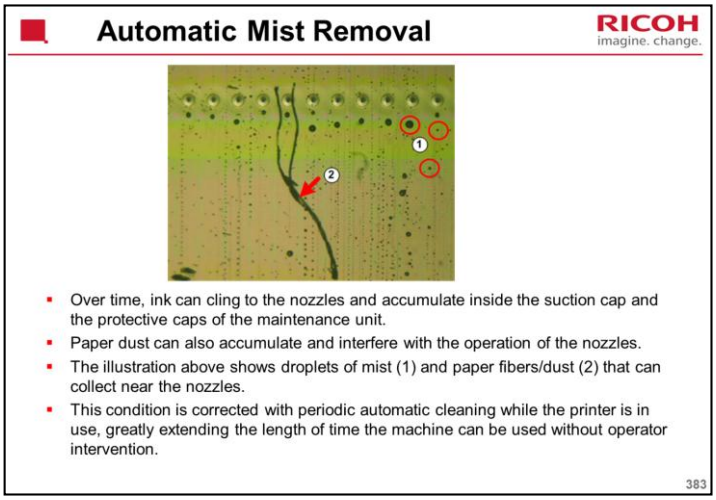
381

No additional notes



Down Time	Approximate Time	Try to Detect Air?	If air is detected in a print head *1	If no air is detected
< 10 hrs	16 seconds	No	---	---
10 – 24 hrs	9 seconds (power on) 16 seconds (job start)	Yes	Ink supply, air purge/ink fill sequence	Small downtime ink purge
24 hrs – 3 days	3 minutes	Yes	Ink supply, air purge/ink fill sequence	Large downtime ink purge
3 days – 7 days	3 minutes or more	Yes	Ink supply, air purge/ink fill sequence	Large downtime ink purge, three times
7 days – 45 days	30 minutes	Yes	Ink supply, air purge/ink fill sequence, then downtime cleaning	Downtime cleaning
> 45 days	More than 30 minutes	Yes	Ink supply, air purge/ink fill sequence, then downtime cleaning	Ink fill sequence, then downtime cleaning

*1: The operations mentioned in this column are done only for print heads that have air detected.

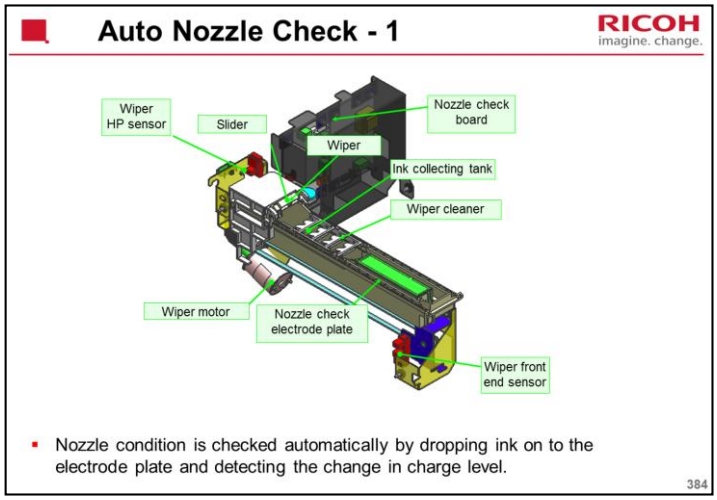


Factors that trigger automatic mist removal

Mist count. A "mist count" triggers automatic cleaning. This mist count can be extended to increase the timing between automatic cleanings. The mist count has been doubled for this machine.

Count adjustment. The count is automatically adjusted for the width of the paper and total print area.

Paper dust count. The paper dust count (the total number of pages printed, cutting count) is used to determine when cleaning is done for paper dust.



No additional notes

Auto Nozzle Check - 2

RICOH imagine. change.

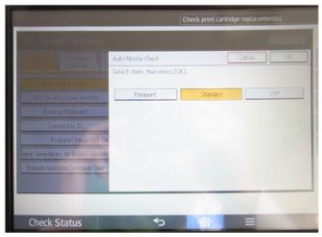
- **Nozzle Check Electrode Plate:** Positions against the nozzles and is charged at 500V.
- **Wiper:** Wipes off the ink dropped on the electrode plate after the nozzle check. The wiper is moved by the slider.
- **Slider:** Attaches to a timing belt and moves the wiper front and back.
- **Wiper Cleaner:** Scrubs off the ink on the wiper with its ribs when the wiper returns to home position.
- **Ink Collecting Tank:** Collects the ink removed by the wiper cleaner.
- **Wiper Motor:** Moves the slider via the timing belt.
- **Wiper Front End Sensor:** Detects the slider when it reaches the front end position, which triggers the wiper motor to rotate in reverse for wiping.
- **Wiper HP Sensor:** Detects the home position of the slider.
- **Nozzle Check Board:** Charges the electrode plate with high voltage (500V) and detects the change in charge level.

385

No additional notes

Auto Nozzle Check - 3

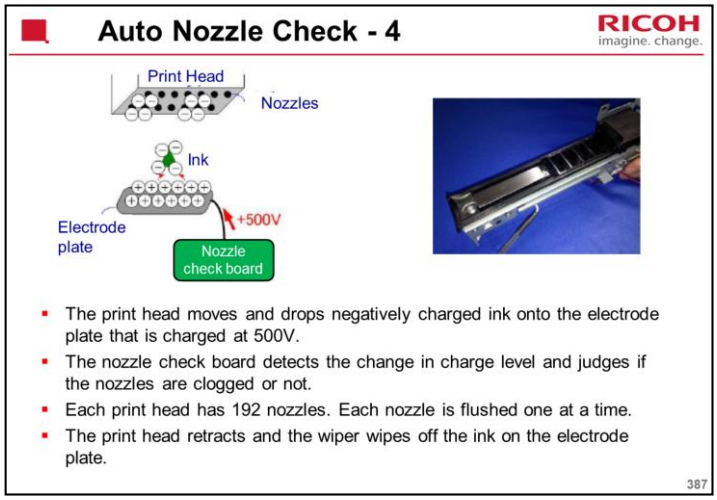
RICOH imagine. change.



- You can specify when to run the Auto Nozzle Check.
  - Standard: Check is run when turning ON the power at the beginning of the day (after 10 hours since the power was turned OFF).
  - Frequent: Check is run before each job.
  - OFF : No auto check
- It takes approximately 25 seconds to check all 5 print heads. (This does not include the cleaning time.)
- Auto Nozzle Check does not run under the following conditions:
  - 9 degrees Celsius or lower
  - 36 degrees Celsius or higher

386

No additional notes



Each nozzle is flushed and checked one by one. They are not flushed all at once.

For example, the 1st nozzle is flushed and checked, then the 2nd nozzle is flushed and checked, then the 3rd nozzle and soon until the 192nd nozzle.

The metal plate is charged at 500V.

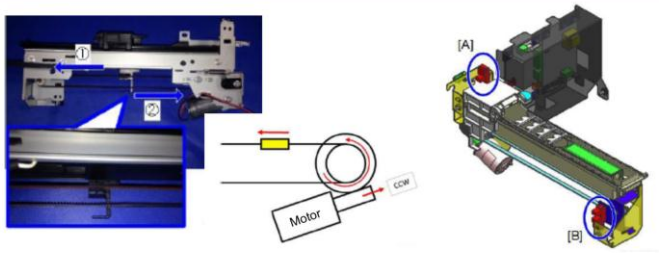
When flushed ink (which has a negative charge) drops on the metal plate, the voltage of the plate changes.

When flushed ink does not drop on the plate, the voltage of the plate does not change.

The nozzle check board detects whether a nozzle is blocked or not by fluctuation of voltage. So, the drop does not have to fall exactly vertically. But if the drop falls outside the plate, the machine will detect a blocked nozzle, even though the nozzle is clear.

Wiping - 1

RICOH
imagine. change.



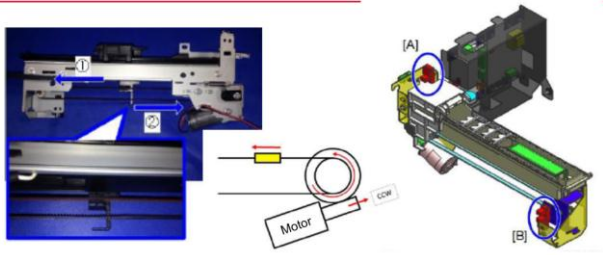
- The Wiper attached to the Slider moves back and forth to wipe off the ink dropped on to the Electrode Plate.
- The Slider moves via the timing belt that is engaged with the gear of the Wiper Motor.
- The home position of the slider is toward the rear of the machine where the Wiper HP Sensor [A] positions. The front most position of the slider is where the Wiper Front End Sensor [B] positions.
- When the Wiper Motor (24V) is positively charged, it rotates the gear counterclockwise and moves the slider from rear to front (in the direction of the arrow indicated #1 above.)

388

No additional notes

Wiping - 2

RICOH
imagine. change.



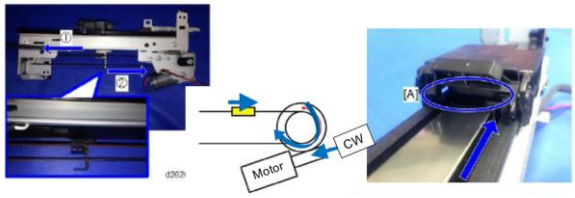
- From the home position (rear), the slider moves toward the rear (in the direction of the arrow indicated #1). At this time, the wiper hovers over and does not wipe the electrode plate yet.
- The slider descends by the slope on the rail when it reaches near the Wiper Front End Sensor [B]. The wiper contacts the electrode plate and is ready to wipe the electrode plate.

389

No additional notes

Wiping - 3

RICOH
imagine. change.



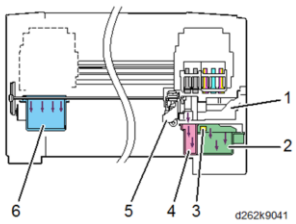
- Wiping starts when the motor rotates in reverse direction and moves the slider from rear to front (in the direction of the arrow indicated #2).
- The slider ascends by the slope on the rail when it reaches near the Wiper HP Sensor. The wiper releases contact with the electrode plate, completing the wiping. The slider stops at home position.

390

No additional notes

Waste Ink Collection

RICOH
imagine. change.



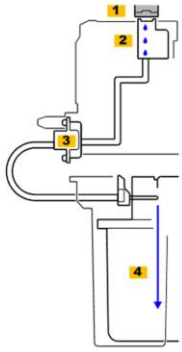
- The ink collector tank [2] collects the ink taken from the print heads by the suction pump in the maintenance unit [1].
- The ink collector chip [3] detects when the ink collector tank is installed correctly. It will signal an error if the tank is not installed correctly, and printing is disabled.
  - This chip also detects when the ink collector tank is full.
- The right ink sump [4] is directly below the K1 print head cap of the maintenance unit. It collects the ink that is wiped and scraped from the print heads at the end of the cleaning cycle.
- During printing, the machine occasionally flushes ink through the print head nozzles (with a very small amount of ink) which falls into the left ink sump [6].
  - This keeps the nozzles primed and in good working condition.
  - This operation is controlled by the machine firmware and is not part of the print head cleaning cycle.

391

No additional notes

Ink Collector Tank - 1

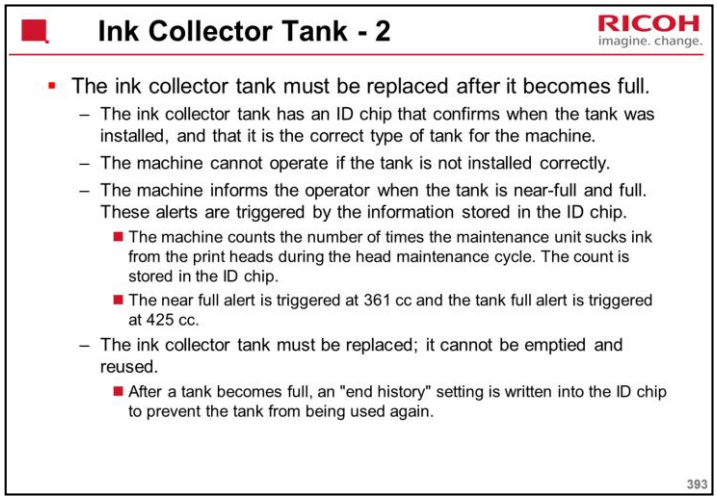
RICOH
imagine. change.



- The ink collector tank collects ink during print head cleaning.
- Ink taken from the surface of the print head [1] by the suction cap [2] and suction pump [3] flows directly out from the rear of the maintenance unit to the ink collector tank [4].

392

No additional notes



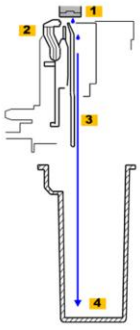
The tank near full and full limits can be adjusted with SP2507-001 or 002, but this not recommended.

Tank near full. A prompt appears on the operation panel of the machine, and the machine will continue to operate.

Tank full. A prompt appears on the operation panel of the machine. If a page is being printed, the job will finish, and then the machine will shut down and cannot be used until after the tank has been replaced.

Right Ink Sump - 1

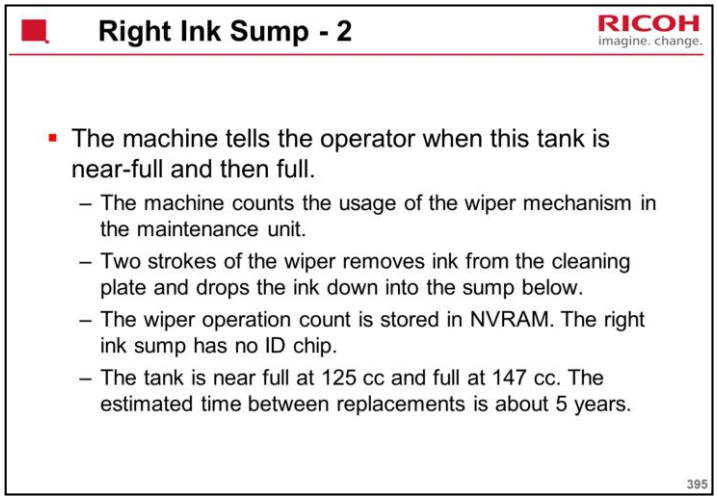
RICOH
imagine. change.



- The ink scraped and wiped from the print head [1] by the scraper and wipers [2] flows through a vent [3], to the right ink sump [4].

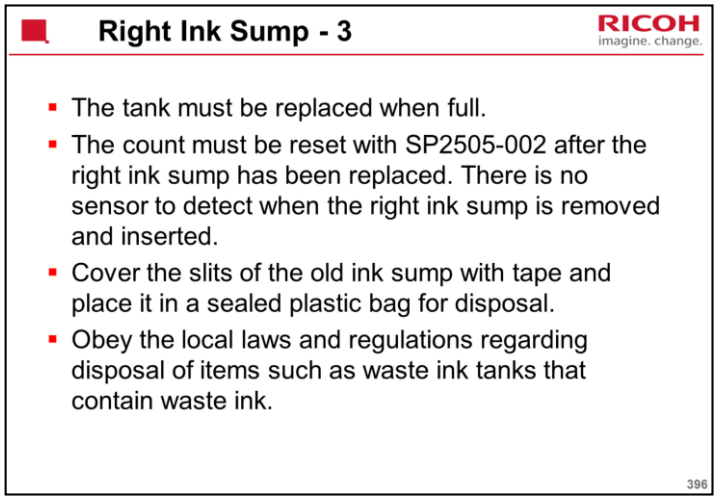
394

No additional notes

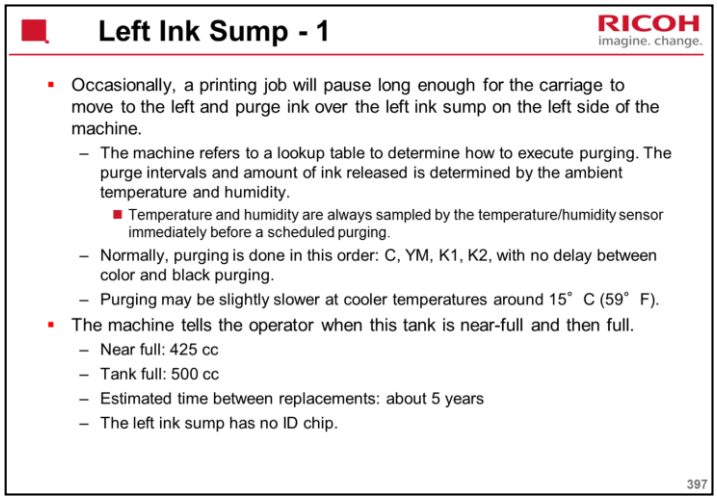


Tank near full. A prompt appears on the operation panel of the machine, and the machine will continue to operate.

Tank full. A prompt appears on the operation panel of the machine. If a page is being printed, the print will finish. Then the machine will shut down. It cannot be used until after the tank has been replaced with a new tank and the counter reset with SP2505-002.

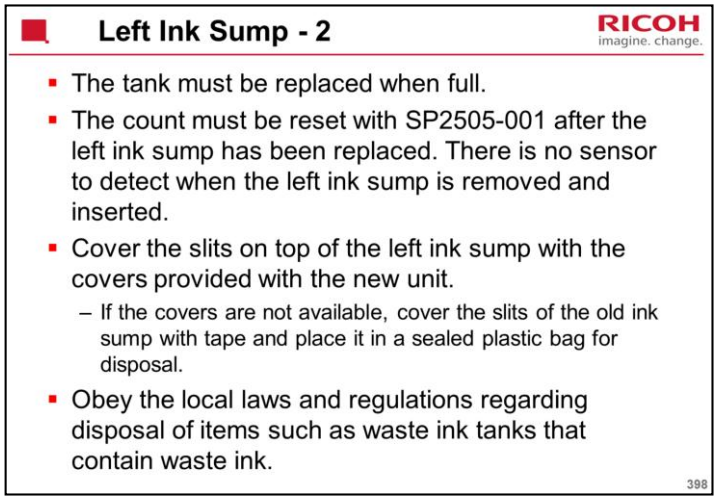


No additional notes

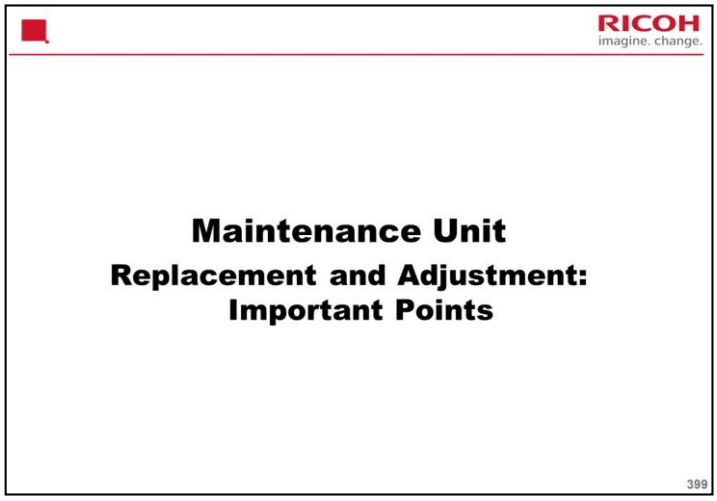


Tank near full. A prompt appears on the operation panel of the machine, and the machine will continue to operate.

Tank full. A prompt appears on the operation panel of the machine. If a page is being printed, the job will finish, and then the machine will shut down and cannot be used until after the tank has been replaced.



No additional notes

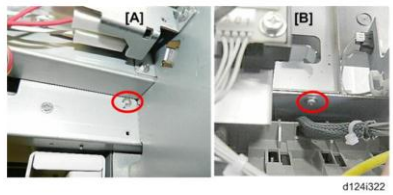


No additional notes

Service Precautions
Maintenance Unit Base Plate

RICOH
imagine. change.


d124r734



d124i322

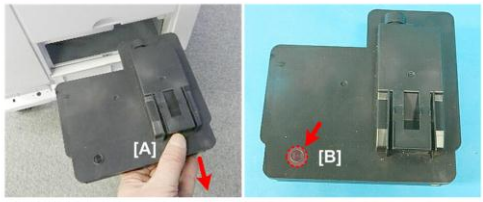
- The maintenance unit base plate supports the maintenance unit. These screws hold the base plate under the maintenance unit, which must always remain in the same position below the carriage print heads.
  - The two base plate screws at the back on the right rear panel should never be loosened or removed.
  - There are also two paint-locked screws at the front. One screw at the front below the switch bracket [A] on the right. The other screw [B] is to the right of the temperature/humidity sensor above the ink supply unit.

400

No additional notes

Ink Collector Tank

RICOH
imagine. change.



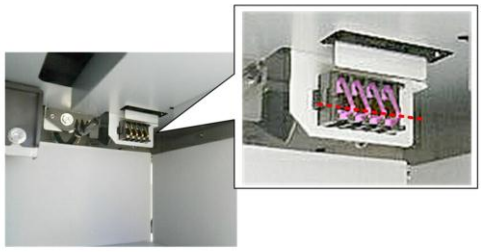
- Pull the tank [A] straight out of the machine.
- Lay the tank on a flat surface with port [B] facing up.
  - The port at [B] is open and will leak ink if the tank is turned on its side or upside down.
- After replacing the ink collector tank:
  - Remove and clean the left ink sump.
  - Clean the suction cap and wiper blade of the maintenance unit.

401

No additional notes

Ink Collector Tank Sensor

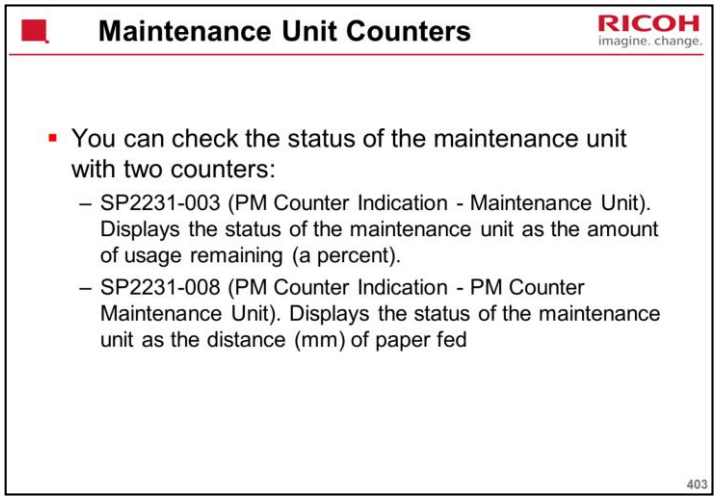
RICOH
imagine. change.



- Make sure that you install the sensor the correct way up.

402

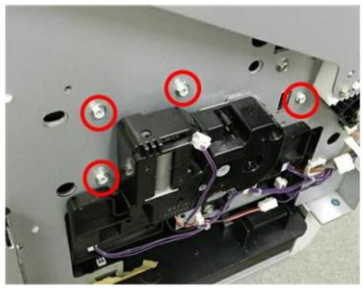
No additional notes



No additional notes

Removing the Maintenance Unit

RICOH
imagine. change.

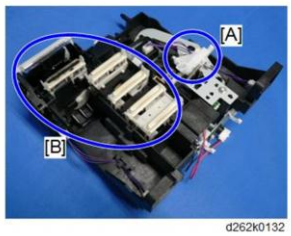


- Never loosen or remove these four screws.

404

No additional notes

Removing the Maintenance Unit



d262k0132

- Be careful not to hit the caps [B] on the machine frame when you pull the maintenance unit out of the machine.
- Before you put the unit back in the machine, put the lever [A] down.
- After you put the unit back in the machine, put the lever up again.

405

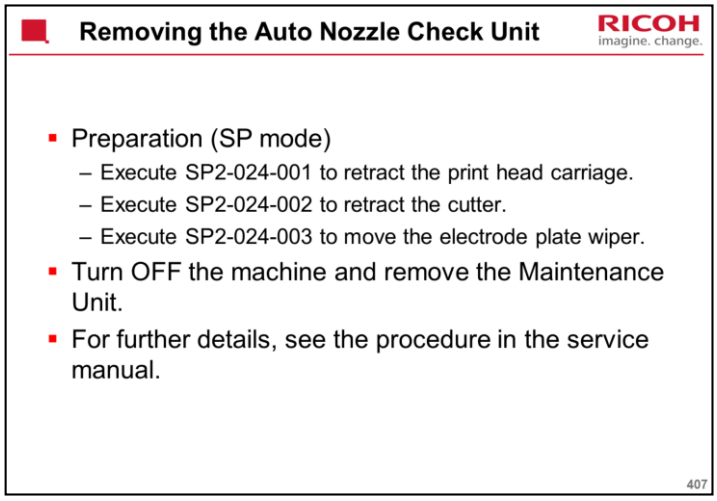
No additional notes

Removing the Maintenance Unit

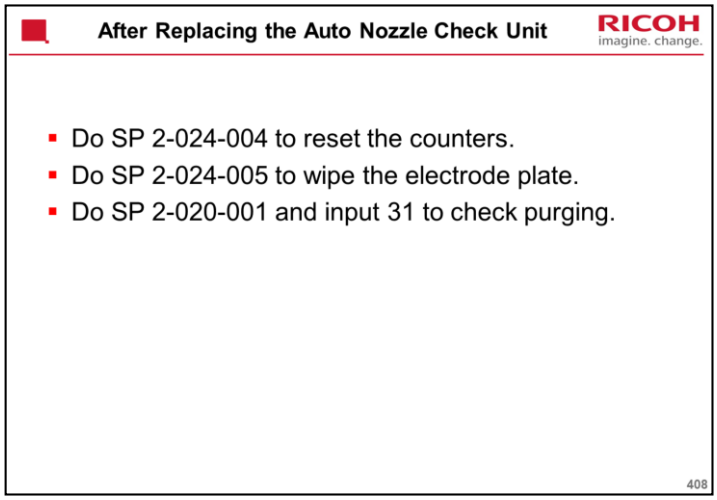
- The bottom edges of the maintenance unit are covered with ink and will stain any surface where it is placed.
- Always set the maintenance unit on a surface covered with paper that will absorb ink and can be discarded later.
- When you reassemble the machine, clean the maintenance unit after you clean the ink collection unit.
- If you install a new maintenance unit, do SP2102-001 to reset the maintenance unit counter.

406

No additional notes



If the three SPs do not move the unit to the required position, you have to remove the entire assembly (auto nozzle check block).



No additional notes

Cleaning Procedures in the User Tools

RICOH
imagine. change.

d124v660

d124v661

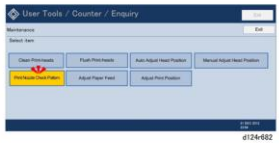
- Clean Print-heads: Do this when you see broken lines or white patches in the Nozzle Check Pattern. Cleaning consumes ink. Never clean the print heads unless the Nozzle Check Pattern is abnormal.
- Flush Print-heads: Do this only after three consecutive cleanings and three checks of the Nozzle Check Pattern show that the problem has not be corrected.
- Auto Adjust Print Head Position: Do this procedure if you see broken vertical lines or blurred, smeared, or streaked colors.
- Manual Adjust Head Position: Do this procedure if the "Auto Adjust Print Head Position" execution fails.
- Print Nozzle Check Pattern. Print this to detect blockages in the flow of ink from one or more of the print heads. Clean the print heads up to three times. If the third cleaning fails, flush the print heads.
- Adjust Paper Feed: Do this procedure if you see broken horizontal lines, patchy images, or white lines at regular intervals in your printouts.
- Adjust Print Position: Do this procedure to adjust the print start position at the upper left corner of each sheet where printing starts.

409

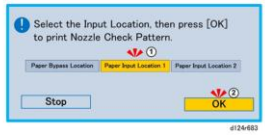
Replacement and Adjustment > Print Head Cleaning and Adjustment

Checking the Nozzles - 1

RICOH
imagine. change.



d124v682

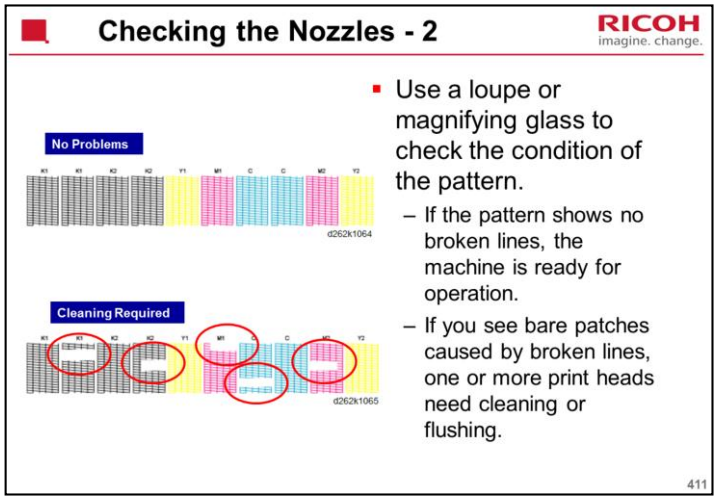


d124v683

- Paper Bypass Location: Bypass feed
  - This will not appear if paper is not set for bypass feed.
- Paper Input Location 1: Roll Unit 1
- Paper Input Location 2: Roll Unit 2 (Option)
  - This will not appear if Roll Unit 2 is not installed.
- Select the paper feed station and then touch [OK].
  - A message will ask you to wait while the pattern is printing.

410

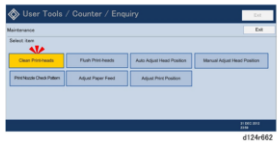
No additional notes



We already studied this during the Installation section of the course.

Cleaning the Print Heads

RICOH
imagine. change.



d124r662

d124r663

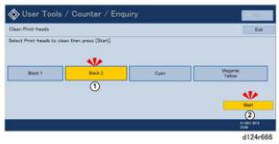
- Print head cleaning consumes ink. Do this procedure only if there are broken lines or white patches in the printed Nozzle Check Pattern.
- First, check the ink level indicator in the printer driver to confirm that there is ink in the cartridge.
  - If one or more ink tanks are empty, replace the ink cartridge, and then print another Nozzle Check Pattern.
- Cleaning one print head takes about 60 s. The Magenta and Yellow print heads require about 120 s.
- After cleaning is finished, print another Nozzle Check Pattern and check the results.
- If one or more pattern is abnormal, repeat the cleaning procedure.
- After cleaning three times, if one or more of the patterns is abnormal, flush the print head where the pattern is abnormal.

412

No additional notes

Flushing the Print Heads

d124r665



d124r666

- Print head flushing consumes a lot of ink. Never flush the print heads until three print head cleanings have failed to solve the problem.
- Flushing a print head requires about 3 minutes.
- After flushing has finished, print another Nozzle Check Pattern.
- If the pattern is still broken after flushing, do the procedure on the next slide.

413

No additional notes

If the Nozzle Check Pattern is No Good Even After Three Cleanings and One Flushing

RICOH imagine. change.

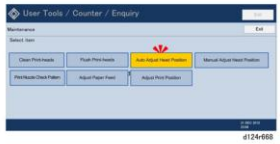
1. Make sure that the ambient temperature and humidity are within the acceptable range:
   - Temperature Range: 10° C to 27° C (50 ° F to 81° F)
   - Humidity Range: 15% to 80% Rh
2. Clean the print heads once, and then print a Nozzle Check Pattern.
3. If the Nozzle Check Pattern is abnormal, let the machine remain idle for 10 minutes.
4. Execute two more cleanings and one flushing.
   - Be sure to print a Nozzle Check Pattern after each cleaning and the flushing.
   - Any time that you see an unbroken Nozzle Check Pattern, you can stop.
5. If the Nozzle Check Pattern is still not perfect, let the machine remain idle for 8 hours.
6. Execute three more cleanings and one flushing.
   - Be sure to print a Nozzle Check Pattern after each cleaning and the flushing.
   - Any time that you see an unbroken Nozzle Check Pattern, you can stop

414

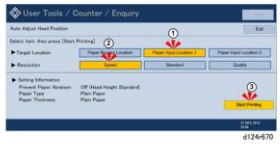
We saw this already in the Installation section of the course.

Auto Adjust Head Position - 1

RICOH imagine. change.



d124r668



d124r670

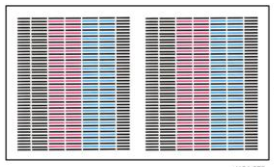
- Adjust the print head position if you see these problems in the prints:
  - Broken vertical lines
  - Blurred or streaked colors
- Select a Paper Source and a Resolution
  - Target Location (Paper Source):
    - Paper Bypass Location: Bypass paper feed
    - Paper Input Location 1: Roll Unit 1
    - Paper Input Location 2: Roll Unit 2
  - Resolution:
    - Speed: Draft
    - Standard: Standard quality
    - Quality: High quality

415

No additional notes

Auto Adjust Head Position - 2

RICOH
imagine. change.

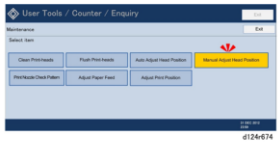


- Touch [Start Printing].
- A pattern is printed.
- If the adjustment succeeded, the pattern will look like this.
  - The black arrow indicates the direction of paper feed.
- If the automatic adjustment fails, "Failed to adjust" will appear.
  - You must do the adjustment manually. (See the next slide.)

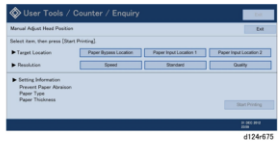
416

No additional notes

Manual Adjust Head Position - 1



d124r674



d124r675

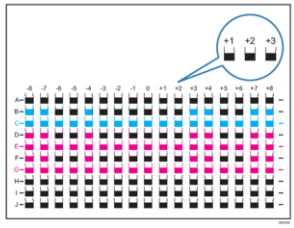
- Select a Paper Source and a Resolution, and touch [Start Printing].

417

No additional notes

Manual Adjust Head Position - 2

RICOH
imagine. change.

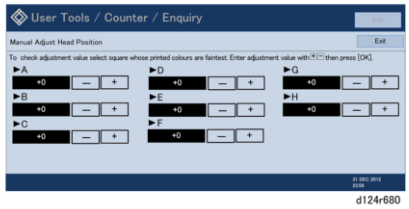


- Look at the test pattern.
- In each row (A to J), Identify the number of the column where the square is faintest, or select the square where the internal lines overlap to form a solid color.
  - The number above the square is the adjustment value.
  - If you still cannot determine the adjustment value, select the square that is between the straightest vertical lines.

418

No additional notes

Manual Adjust Head Position - 3



d124r680

- Touch [Adjustment].
- Input a value for each row.
  - Use the + and – buttons.
- Print another test pattern to make sure that the adjustment is correct.
  - The numbers that you just entered must correspond to the condition of the patches on the new test chart, as explained on the previous slide.

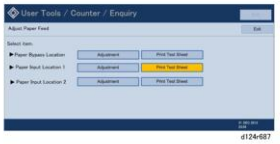
419

No additional notes

Adjust Paper Feed - 1

RICOH
imagine. change.

d124r686



d124r687

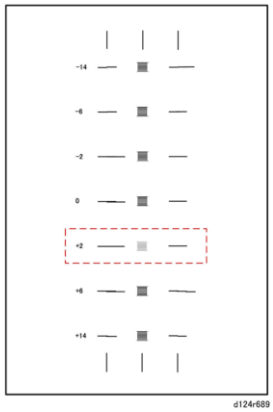
- Adjust paper feed if you see these problems in the prints:
  - Broken horizontal lines
  - Patchy images (uneven filled areas)
  - White lines at regular intervals
- Select [Print Test Sheet] for the required paper feed source.

420

No additional notes

Adjust Paper Feed - 2

RICOH
imagine. change.



- The adjustment value appears to the left of the lightest gray square with straight horizontal lines on both sides.

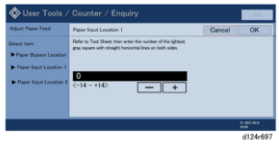
421

No additional notes

Adjust Paper Feed - 3

RICOH
imagine. change.

d124v690



d124v697

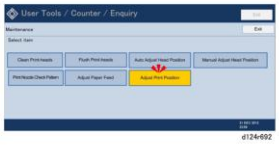
- Touch [Adjustment].
- Touch the plus or minus key to enter the value from the test print.

422

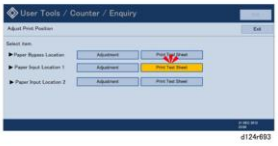
No additional notes

Adjust Print Position - 1

RICOH
imagine. change.



d124v692



d124v693

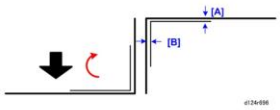
- Do this procedure to check and adjust the print start position at the upper left corner of each sheet.

423

No additional notes

Adjust Print Position - 2

RICOH
imagine. change.



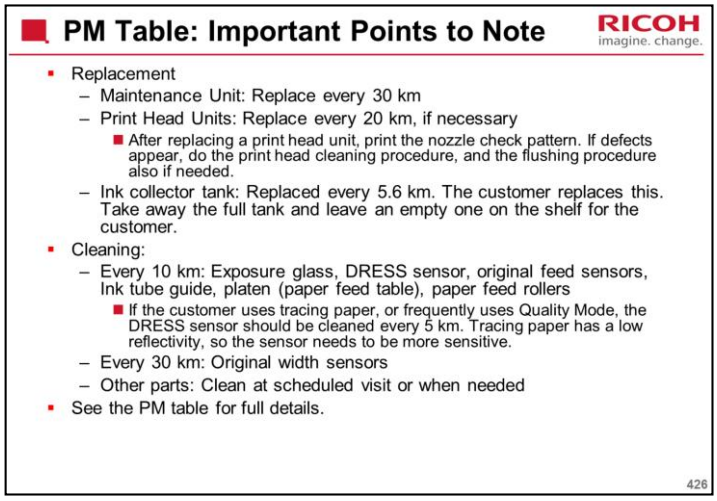
d124r691

- A test pattern prints. The black arrow indicates the direction of paper feed.
- Rotate the test sheet 180 degrees. [A] is the top margin and [B] is the left margin.
- Touch the arrow keys to adjust the margins.
  - Increasing the value for the top and left margin moves the print position down and to the right.
  - You will see the blue square move as you change the settings, so you can confirm the effect of the changes.

424

No additional notes

This section explains the main points about maintenance. For full details about the PM table, and the cleaning and lubrication procedures, see the Maintenance section in the Field Service Manual.

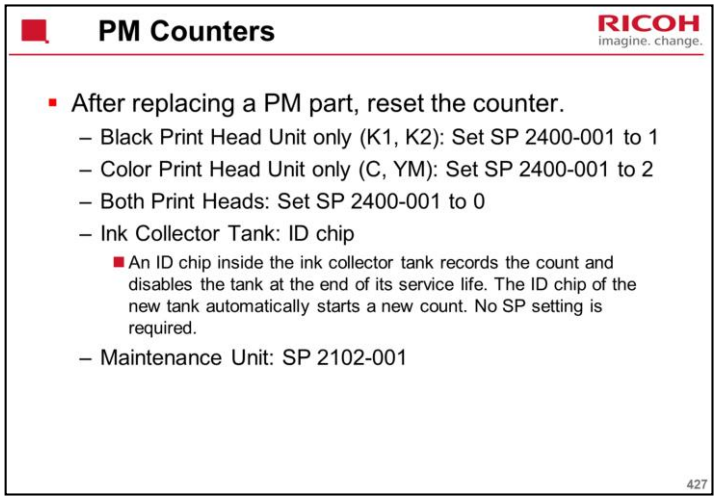


Service Manual > Maintenance > PM Table

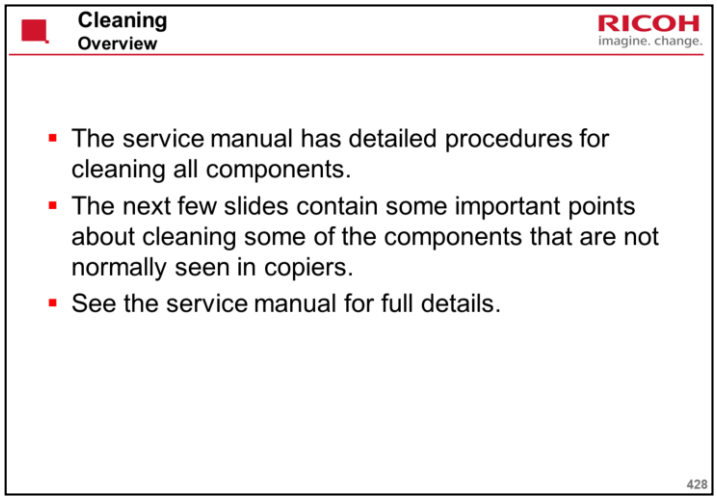
Nozzle check, cleaning, flushing: Was explained in the Installation section.

The left ink sump and right ink sump can also be easily replaced but these are not considered as "PM Parts" because their service life will normally extend beyond the service life of the machine.

The PM intervals of parts may vary, depending on the amount of coverage in prints and the color usage ratio. The expected color ratio for this machine is 9:1 (9 black-and-white prints for every 1 color print.)



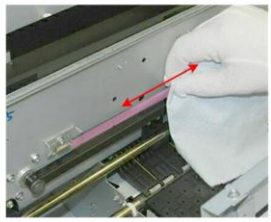
No additional notes



Service Manual > Maintenance > PM Cleaning Points

Cleaning
Horizontal Encoder

RICOH
imagine. change.



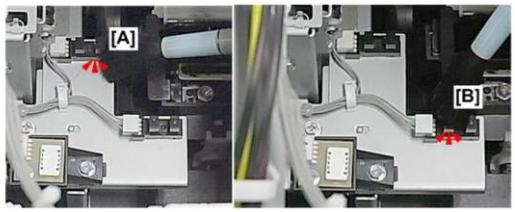
- Wipe both sides of the encoder strip with a piece of clean linen cloth dampened with alcohol.
  - Clean the strip as far as the carriage on the right, move the carriage to the left, and then clean the other end of the strip.
- Never touch or handle the surface with bare hands. Never use a cotton swab or cotton ball, tissue paper, or any other material that could shed and leave fibers on the edge of the encoder wheel.
  - Smudges, fingerprints, and foreign objects can interfere with the sensor readings.

429

No additional notes

Cleaning
Ink Level Sensors

RICOH
imagine. change.



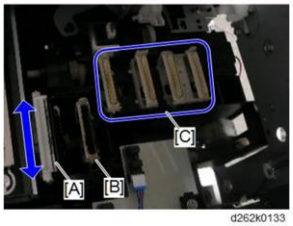
- Move the carriage unit to the left, using SP 2102-4, as explained earlier.
- Clean the sensors with a blower brush.

430

No additional notes

Cleaning
Maintenance Unit

RICOH
imagine. change.



d262k0133

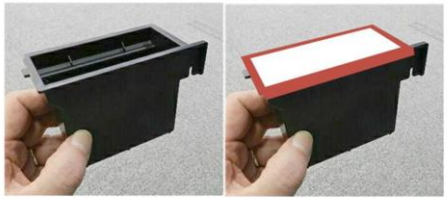
- After replacing the ink collector unit, always remove ink that has hardened around the wiper blade [A], suction cap [B], and three print head caps [C].
- Use a tightly wrapped linen cloth dampened with water.
- Never use cotton, tissue, or any other material that could leave fibers around the suction cap or the print head caps.
- Make sure the cloth is only slightly damp. Do not allow any water near the protective caps [C]. Water on the caps could seep onto the print head nozzles and dilute the ink.

431

No additional notes

Cleaning
Right Ink Sump

RICOH
imagine. change.



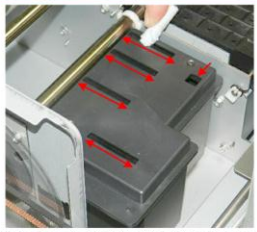
- Replace the right ink sump when the machine alerts you that it is full.
  - Cover the top of the tank with some paper and tape, and then discard it.
  - Follow the local laws and regulations regarding the disposal of this item.
  - Never attempt to empty the right ink sump and re-use it.
- The count must be reset with SP2505-002 after the right ink sump has been replaced.

432

The ink sump has a very long service life (longer than the machine life).

Cleaning
Left Ink Sump

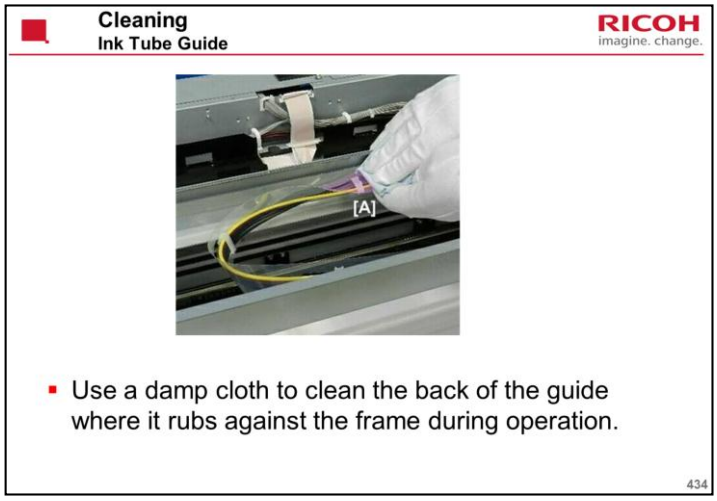
RICOH
imagine. change.



- Use a dry cloth wrapped around the tip of a small screwdriver to clean around the openings.
- Use the bare tip of a small screwdriver to remove hardened ink that cannot be removed by wiping with the cloth.
- Replace the left ink sump when the machine alerts you that it is full.
  - Follow the local laws and regulations regarding the disposal of this item.
  - Never attempt to empty the left ink sump and re-use it.
- The count must be reset with SP2505-001 after the left ink sump has been replaced.

433

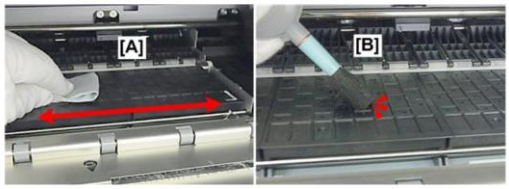
The ink sump has a very long service life (longer than the machine life).



No additional notes

Cleaning
Platen

RICOH
imagine. change.



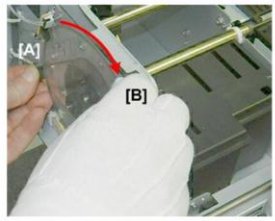
- Use a linen cloth dampened slightly with water to clean the surface of the platen [A]. Then wipe with a dry cloth.
  - **Never use alcohol to clean the platen.**
- Use a blower brush to clean the holes in the plates [B].

435

No additional notes

Cleaning
Vertical Encoder

RICOH
imagine. change.



- While turning gear [A] and the wheel, clean the edge of the wheel [B] with a piece of clean linen cloth dampened with alcohol.
- Never touch or handle the surface with bare hands. Never use a cotton swab or cotton ball, tissue paper, or any other material that could shed and leave fibers on the edge of the encoder wheel.
  - Smudges, fingerprints, and foreign objects can interfere with the sensor readings.

436

No additional notes

No additional notes

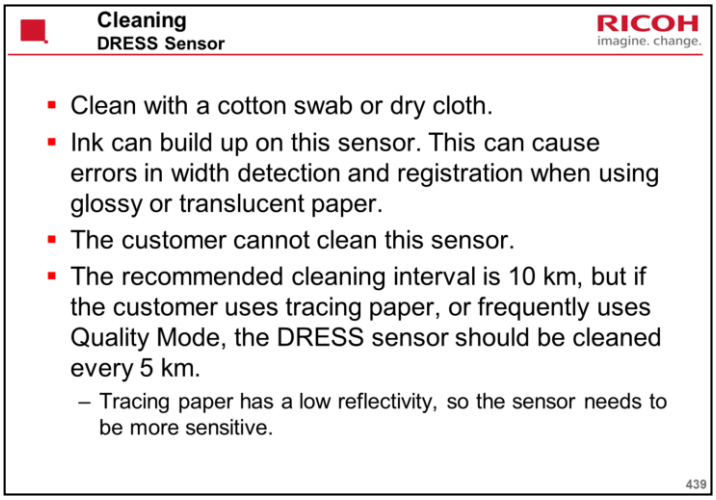
Cleaning
Roll Feed Roller

RICOH
imagine. change.

- Clean the roller with a dry, clean cloth to remove paper dust.

438

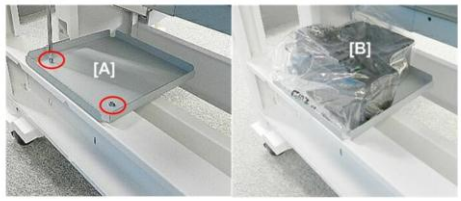
No additional notes



No additional notes

Ink Collector Tank

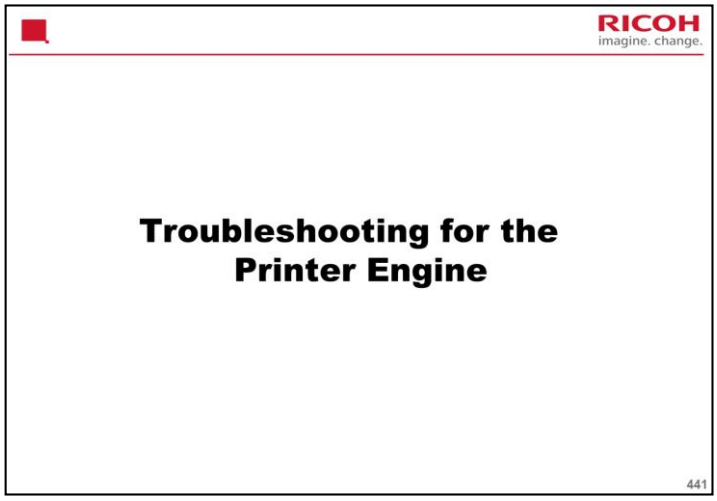
RICOH
imagine. change.



- The PM interval for the machine is 10 km. But the ink collector tank fills up at about 8 km (depending on the image contents of the printouts that have been made).
- The user can replace this tank easily, so when you arrive at 10 km, you can take away the old tank from the shelf and put a new empty one on the shelf in its place.

440

No additional notes

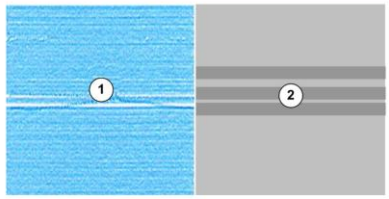


Service Manual > Troubleshooting > Printing Problems

This section gives an outline of troubleshooting steps for various symptoms. Refer to the service manual for full details.

White Lines or Horizontal Banding

RICOH
imagine. change.



- Print heads may be clogged; do the Clean Print-heads procedure from the Maintenance Menu. Use Flush Print-heads if necessary.
- Do the Adjust Paper Feed procedure from the Maintenance Menu.
- Clean or replace the maintenance unit.
- Inspect the vertical encoder wheel for dirt or damage. Clean or replace.
- Replace the print head unit(s).
- Replace the carriage unit.

442

Replacement and Adjustment > Print Head Cleaning and Adjustment

Maintenance Menu: Clean Print-heads, Flush Print-heads, etc were described in the Maintenance section of this course (Cleaning Procedures in the User Tools)

Horizontal Lines In Margins

RICOH
imagine. change.

- If there are horizontal lines in areas (1) and (2):
  - Replace the print head units.
  - Replace the carriage unit.

443

No additional notes

Vertical Banding (White or Colored)

RICOH
imagine. change.

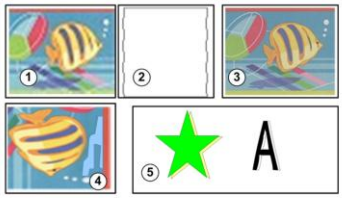
- Print Head Out of Position; do the Adjust Print Head procedure from the Maintenance Menu.
- Check the horizontal encoder strip and make sure that it has been installed correctly.
- Inspect the horizontal encoder strip for dirt or damage. Clean or replace it.

444

No additional notes

Poor Image Quality

RICOH
imagine. change.



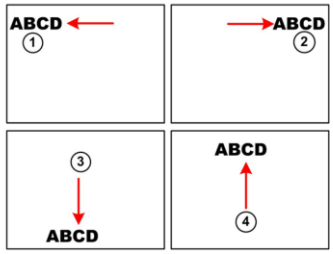
(1) Image blurred
(2) Lines not straight
(3) Overall poor color quality
(4) Uneven density
(5) Double lines in graphics or text

- Gap Adjustment: Make sure that the gap between the carriage and the platen is correct for the type and thickness of the paper.
- Print heads clogged: Clean the print head(s). Flush them if necessary.
- Paper feed is faulty: Do the Adjust Paper Feed Procedure
- Horizontal Encoder Strip: Make sure it has been installed correctly. Clean or replace if dirty or damaged.

445

No additional notes

Text Out of Position



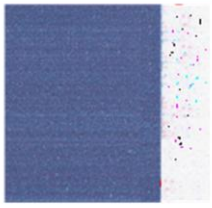
- Inspect the horizontal encoder strip for dirt or damage. Clean or replace.
- Inspect the vertical encoder wheel for dirt or damage. Clean or replace.
- Inspect the platen for shreds of paper or other obstacles.
- Inspect the platen plates for dirt or damage. Clean or replace.
- Faulty Carriage: Replace the carriage unit.

446

No additional notes

Ink Scattering

RICOH
imagine. change.



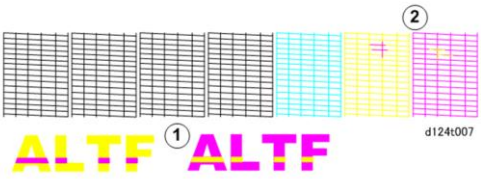
- Gap Adjustment: Make sure that the gap between the carriage and the platen is correct for the type and thickness of the paper.
- Print heads clogged: Clean the print head(s). Flush them if necessary.
- Faulty Maintenance Unit: Clean or replace.
- Faulty Carriage Unit: Replace.

447

No additional notes

Mixed Colours

RICOH
imagine. change.



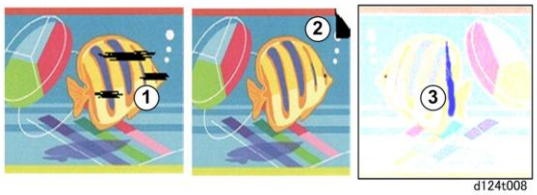
- Mixed colors means two ink colors and one color seeps into the track of another color.
  - This can occur only at the YM print head because the print head is shared.
- Print heads clogged: Clean the YM print head. Flush if necessary.
- Faulty Maintenance Unit: Clean or replace.

448

No additional notes

Image Abraded, Paper Torn or Dog-eared, Ink Running

RICOH
imagine. change.



d124t008

- Gap Adjustment: Make sure that the gap between the carriage and the platen is correct for the type and thickness of the paper.
- Inspect the platen, carriage unit, and maintenance unit for paper fragments.
- Dirty platen plates.
- Faulty Carriage Unit: Replace.

449

No additional notes

Colour Too Light

RICOH
imagine. change.

d124t009

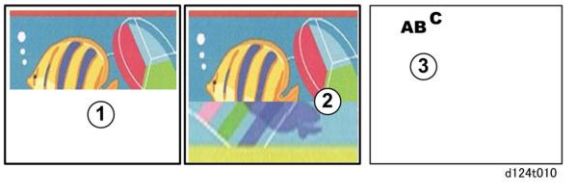
- Make sure the printer driver color settings are set correctly.
- Enhance the image with an image editor.

450

No additional notes

Part of Image Missing, Text Misaligned

RICOH
imagine. change.



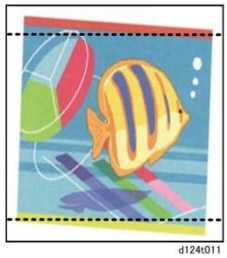
- Make sure that the printer driver settings for paper type match the type of paper loaded.
- Make sure all the print cartridges have sufficient ink.
- Faulty Controller: Replace the controller board.

451

No additional notes

Skewed Image

RICOH
imagine. change.

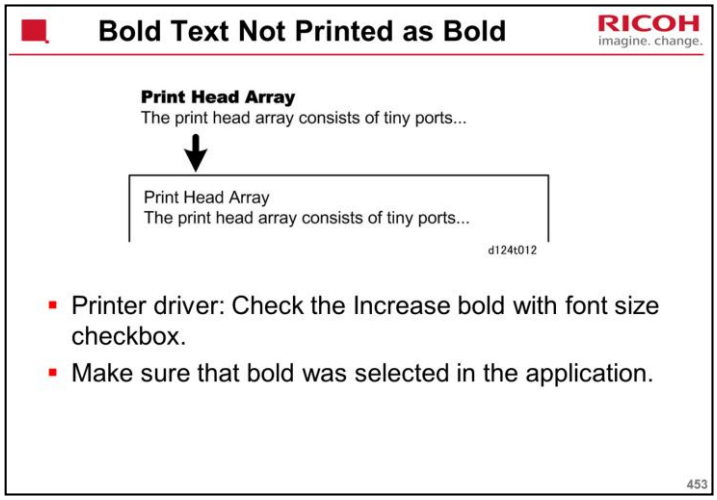


d124t011

- Inspect the platen, carriage unit, and maintenance unit for paper fragments.

452

No additional notes



No additional notes

The End