This course explains the wide-format ink-jet printer MA-P1.

This section explains the outline of the course, and the documents that you will need to study the machine.

Overview of the Course - 1

- **Machine Overview**
  - Explains the main specifications, purpose of the machine, and other basic information
- **Installation**
  - Explains the main points about installing the machine. Refer to the Installation procedure in the service manual when installing the machine in the field.
- **Operation**
  - Explains the main points about operating the machine. This is not the same as a typical Ricoh MFP or printer.
- **Service Mode**
  - Explains the service mode menus and some important service features. For how to access service mode, see your technical supervisor.

Slide 3

No additional notes

Overview of the Course - 2

- **Maintenance by Users**
  - The customer has to do a lot of maintenance to keep the machine working properly. This section explains the jobs that the customer is expected to do.
- **Maintenance by Technicians**
  - This section explains what the technician has to do for maintenance.
- **Replacement and Adjustment**
  - This section explains the important procedures for this machine. When working on the machine, always refer to the service manual.
- **Head Cleaning and Troubleshooting: Procedures for Customers**
  - This section explains the procedures that are available for customers.
- **Head Cleaning and Troubleshooting: Procedures for Technicians**
  - This section explains the procedures that technicians can do.

Slide 4

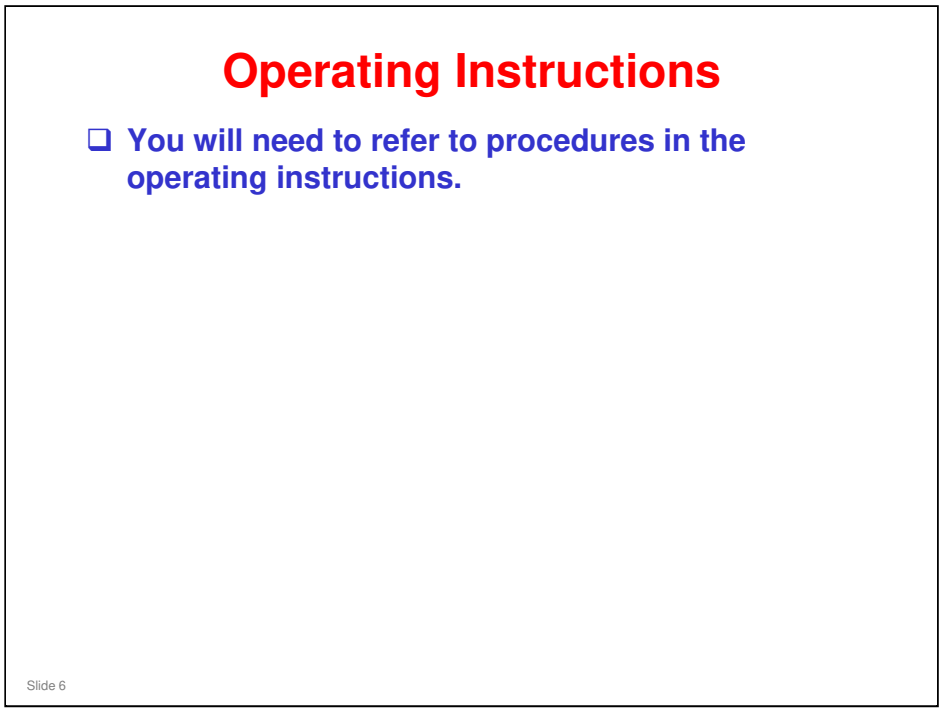
No additional notes

Documentation

- **You will need the following manuals:**
  - Service Manual
  - Operating Instructions
  - Requests for Daily Care and Maintenance
- **For details on how to enter service mode, please consult your technical supervisor.**

Slide 5

No additional notes



No additional notes

This section introduces you to the MA-P1, covering basic points such as the number of models in the series, specifications, and so on.

How Many Models?

- **M152: Ricoh Pro L4130**
  - Maximum printing width: 1361 mm
- **M153: Ricoh Pro L4160**
  - Maximum printing width: 1610 mm

Slide 8

- The maximum printing width is the only difference between the two models.

Appearance

Appearance

- Fan Units
  Keep the temperature constant in the printer, and stabilize printing
- Ink Slots
- Operation panel
- Waste ink bottle
- Drying heater
  Dries ink by hot air
- Heater cover
  Keeps the temperature constant

Slide 9

No additional notes

Basic Specifications - 1

- Print heads: Two piezoelectric heads
- Resolution: 900x900, 1200x900, 1200x1200
- Connection to PC: By USB only
- Ink: Y,M,C,K,Or,G,W
  - 4 colors (K,M,C,Y)
  - 6 colors (K,M,C,Y,Or,G)
  - 6 colors+W (K,M,C,Y,Or,G,W)
- Ink supply: From ink cartridges through tubes.
  - 8 slots

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For full details, see the appendix of the operating instructions.

There is a LAN port on the machine, but it is not used at this time.

Basic Specifications - 2

- **Ink capacity**
  - 4 colors: 600cc x 2 cartridges for each color
  - 6 colors: 600cc 1 cartridge for each color (M,C: 2 cartridges/color,)
  - 6 colors+W: 600cc 1 cartridge for each color (W: 220cc 2 cartridges)
- **Waste ink bottle: 2,000 cc**
- **Media:**
  - Thin coat paper, PET, Tarpaulin, Weatherproof PVC, Polyester cloth, Cotton

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No additional notes

Basic Specifications - 3

- **Max. printing width: 1361 mm (M152), 1610 mm (M153)**
- **Roll media size**
  - Maximum: 1371 mm (M152), 1620 mm (M153)
  - Minimum: 210 mm
  - Thickness: 0.3 mm or less
  - Roll outside diameter: 180 mm or less
  - Roll weight: 25 kg or less
  - Roll inside diameter: 3 or 2 inches
  - Printing surface: Side facing outward
  - Roll end treatment: The roll end must be gently fixed to the core with weak adhesive tape or weak glue.
- **Single-sheet media**
  - Maximum and minimum width, same as for roll media size
  - Thickness: 0.2 mm or less

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No additional notes

Basic Specifications - 4

- **Print margins**
  - Roll:
    - » Left end and right end: 15 mm (Default)
    - » Front: 150.0 mm
    - » Rear: 0 mm
  - Cut sheet:
    - » Left end and right end: 15 mm (Default)
    - » Front: 150.0 mm
    - » Rear: 200 mm
- **Print head gap**
  - L: 1.8mm, M: 2.3mm, H: 2.8mm
- **Media cutting: Cutter blade**
  - Cutting accuracy: 1.0 mm or less.
- **Media delivery: Take-up device supplied as a standard accessory (switching possible between face in and face out).**

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No additional notes

Basic Specifications - 5

- **Power supply:**
  - Single phase 100V to 120V 15A, 2 lines
  - Single phase 200V to 240V, 10A, 2 lines
- **Power consumption: 1440W x 2 (100V-120V), 1800W x 2 (200V-240V)**
- **Installation environment**
  - Temperature: 20 deg C to 30 deg C (68F to 86F)
  - Relative humidity: 35% to 65% Rh (no condensation)
  - Precision guaranteed Temperature: 20 deg C to 25 deg C
  - Temperature gradient: +-10C/h or less
  - Dust: Office equivalent
- **Weight**
  - 203kg (448lbs): Ma-P1a
  - 240kg (530lbs): Ma-P1b
- **Width:**
  - 2634mm, 103.5inch: Ma-P1a
  - 2879mm, 113.2inch: Ma-P1b

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No additional notes

Basic Specifications - 6

❑ Print Speed (Ma-P1a)

Full Color Printing ㎡/h (sqf/h)

Inkset	4C	6C / 6C+W
Draft	17.0 (182.9) (1200x900, ND, 6P, Bi)	8.5 (91.4) (1200x900, ND, 12P, Bi)
High Speed	12.9 (138.8) (1200x1200, ND, 8P, Bi)	6.5 (69.9) (1200x1200, ND, 16P, Bi)
Standard	10.1 (108.7) (900x900, VD, 12P, Bi, Hi)	5.1 (54.8) (900x900, VD, 24P, Bi, Hi)
High Quality	6.1 (65.6) (1200x1200, VD,16P, Bi, Hi)	3.1 (33.3) (1200x1200, VD, 32P, Bi, Hi)

White Printing*

	W (Single layer)	6C+W (2 layers)	6C+W+6C (3 layers)
Standard	2.7 (29.0) (900x900,VD,24P,Uni,Hi)	0.9 (9.6) (900x900,VD,24P,Uni,Hi) Drying Level 2	0.9 (9.6) (900x900,VD,24P,Uni,Hi) Drying Level 1
High Density	1.8 (19.3) (1200x1200,VD,32P,Uni,Hi)	0.6 (6.4) (1200x1200,VD,32P,Uni,Hi) Drying Level 2	0.6 (6.4) (1200x1200,VD,32P,Uni,Hi) Drying Level 1

* The print speed of white layer printing depends on the printing quality of the spot color arrangement (Level 1 to 3).
The print speed above is performed when Mimaki's standard media is used. The print speed may vary depending on the media.

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No additional notes

Basic Specifications - 7

❑ Print Speed (Ma-P1b)

Full Color Printing ㎡/h (sqf/h)

Inkset	4C	6C / 6C+W
Draft	18.2 (195.9) (1200x900, ND, 6P, Bi)	9.1(97.9) (1200x900, ND, 12P, Bi)
High Speed	13.8 (148.5) (1200x1200, ND, 8P, Bi)	7.0(75.3) (1200x1200, ND, 16P, Bi)
Standard	11.0 (118.4) (900x900, VD, 12P, Bi, Hi)	5.6 (60.2) (900x900, VD, 24P, Bi, Hi)
High Quality	6.6 (71.0) (1200x1200, VD,16P, Bi, Hi)	3.3 (35.5) (1200x1200, VD, 32P, Bi, Hi)

White Printing*

	W (Single layer)	6C+W (2 layers)	6C+W+6C (3 layers)
Standard	2.9 (31.2) (900x900,VD,24P,Uni,Hi)	1.0 (10.7) (900x900,VD,24P,Uni, Hi) Drying Level 2	1.0 (10.7) (900x900,VD,24P,Uni,Hi) Drying Level 1
High Density	1.9 (20.4) (1200x1200,VD,32P,Uni,Hi)	0.6 (6.4) (1200x1200,VD,32P,Uni, Hi) Drying Level 2	0.6 (6.4) (1200x1200,VD,32P,Uni,Hi) Drying Level 1

* The print speed of white layer printing depends on the printing quality of the spot color arrangement (Level 1 to 3).
The print speed above is performed when Mimaki's standard media is used. The print speed may vary depending on the media.

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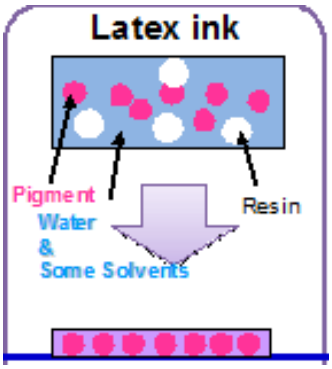
No additional notes

Ink Basics



- This machine uses latex ink, which is less toxic and more environmentally friendly than the solvent-based inks which are commonly used for this type of machine.
- Latex resin and ink pigment are applied simultaneously. After heating, the pigment is fixed.

Slide 17

No additional notes

Latex Ink

- **Latex ink covers a wide range of applications**
  - Print on uncoated media which is not available for solvent or aqueous ink printing
  - 2 or 3 layers printing on transparent media with white ink
  - For both indoor and outdoor use
    - » (Odorless/High outdoor durability/ High scratch resistance/ Exempt from HAPs)
- **Wider gamut by using Orange and Green inks**
  - For food POP/Poster
  - For reproduction of corporate colors
  - For package/label proofs, which uses spot colors
- **Various user-friendly solutions**
  - Quick delivery accomplished by fast drying ink
  - Stable printing by advanced technologies (MAPS/UISS/MCT/Nozzle Recovery)

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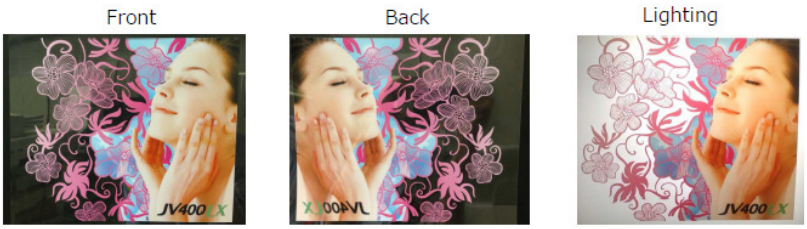
No additional notes

No additional notes

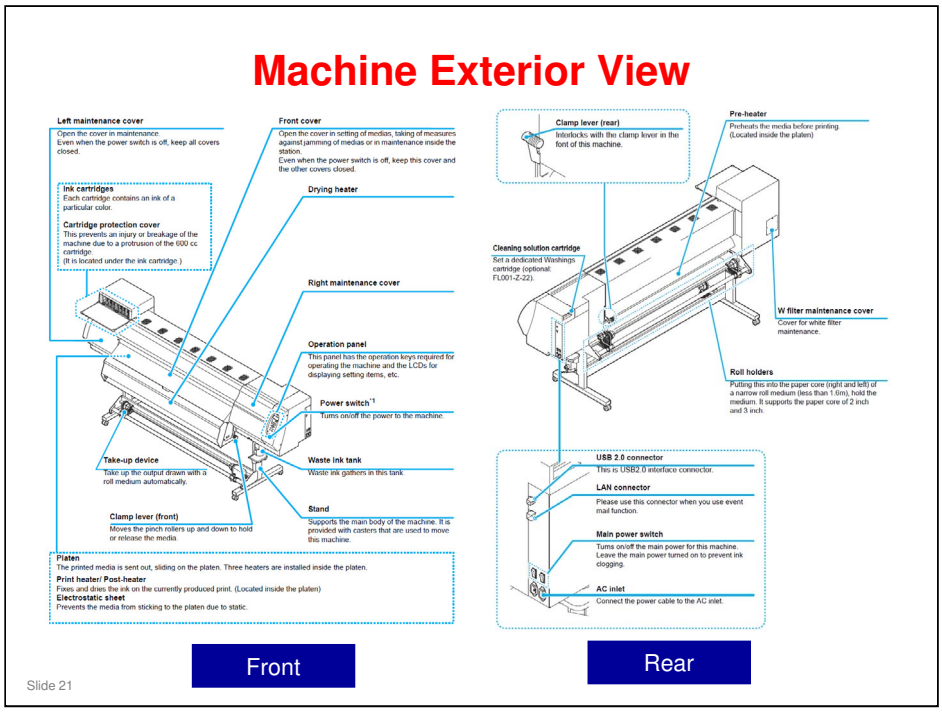
Three-layer Printing for Backlighting



- Three layers are printed on a transparent sheet. The same image is printed twice, with a white ink layer between.

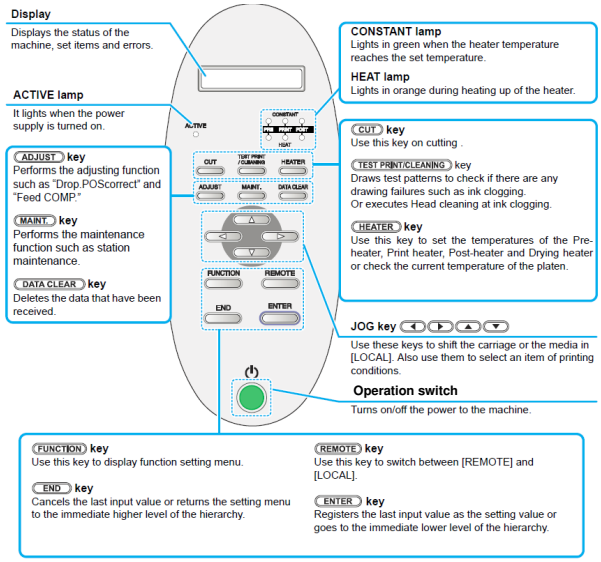
Slide 20

No additional notes



No additional notes

Operation Panel



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No additional notes

Supplies: Ink

- D853-23/30: Pro Ink Pack Black L4160
- D853-24/31: Pro Ink Pack Cyan L4160
- D853-25/32: Pro Ink Pack Magenta L4160
- D853-26/33: Pro Ink Pack Yellow L4160
- D853-27/34: Pro Ink Pack Orange L4160
- D853-28/35: Pro Ink Pack Green L4160
- D853-29/36: Pro Ink Cartridge White L4160

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- In the product code, the first two digits is for the North America version, and the second two digits is for Europe/Asia.
  - Example: D853-23/30

    D853-23: North America version

    D853-30: EU/AA version
- The packages are different for the three regions due to local regulations.

Supplies: Maintenance (1)

- **D854: Pro Maintenance Kit Type A**
  - Customer uses for daily maintenance
- **D854: Pro Flushing Cartridge Type A**
  - This cartridge is installed at the rear of the machine.
  - Fluid from this cartridge enters the machine periodically to clean the wiper. After flushing, the fluid goes to the waste ink bottle.
  - The customer replaces this cartridge every 2 or 3 months.
- **D854: Pro Filter Kit Type A**
  - This is the white ink filter; replaced by the customer
- **D854: Pro Wiper Kit Type A**
  - Replaced by the customer

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No additional notes

Supplies: Maintenance (2)

- **D854: Pro Waste Ink Bottle Type A**
  - Replaced by the customer
- **D854: Pro Cutter Blade Type A**
  - Replaced by the customer
- **D854: Pro Cleaning Stick Type A**
  - Used during cap and wiper cleaning
- **D854: Pro Absorbent Sponge Kit Type A**
  - Replaced by the customer; also known as the C Absorber Kit
- **D854: Pro Eco Cartridge Type A**
  - This is the case for the ink pack. There are 8 of these in the machine. The customer can order this as a spare part in case one of the cases in the machine breaks.

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No additional notes

Ink Specifications

- Colors: Black, Cyan, Magenta, Yellow, Orange, Green, White
- Ink capacity: 600cc (220cc for White ink)
- Shelf life: 1 year from the date of manufacture (at room temperature)
- Storage temperature
- Storage: 0 to 25° C (Average daily temperature)
- Transportation: -20 to 60° C
- Do not disassemble ink cartridges and do not refill them with ink.
- Ink could freeze if kept in a cold place for an extended period. If the ink freezes, thaw it at room temperature (25° C) spending more than three hours before use.

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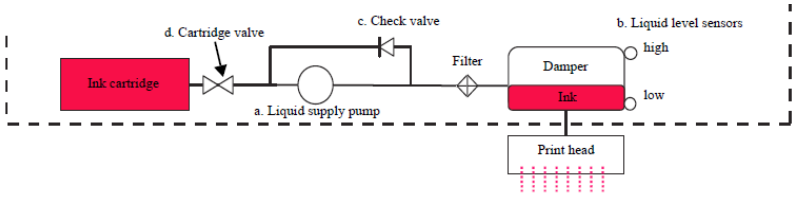
No additional notes

Ink System
Overview



- A pump supplies ink from a cartridge into a sub tank (called a 'damper'), and on to the print head.
- This is the path for all inks except white, which has an additional circulation circuit, as we shall see later.

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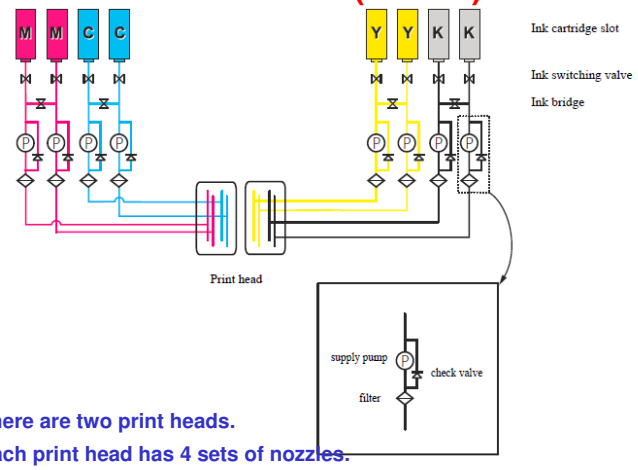
No additional notes

Ink System
Schematic (KCMY)



- There are two print heads.
- Each print head has 4 sets of nozzles.
- For CMYK, the heads are connected up as shown above.
- Each color has two cartridges. Note the ink bridge, which allows ink to flow from either of the two cartridges to either of the two sets of nozzles.

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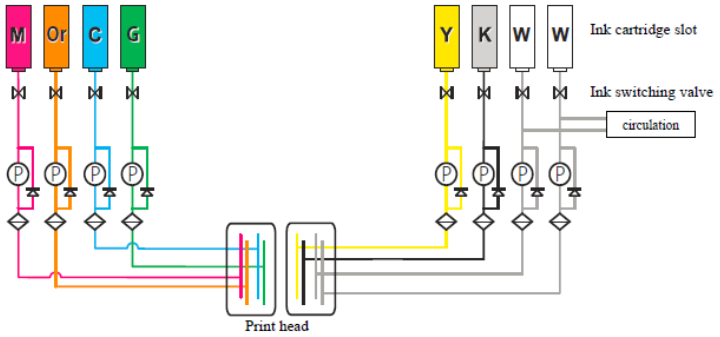
No additional notes

Ink System
Schematic (KCMY+Or+G+W)

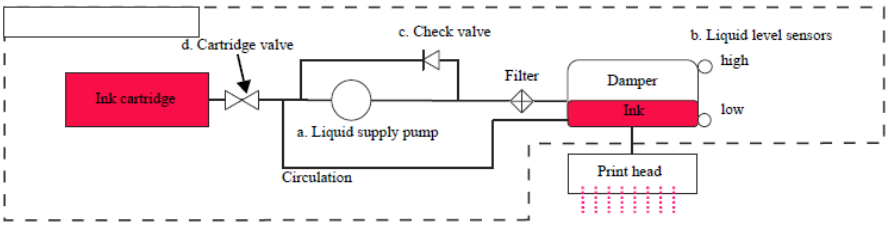


- This shows the head connections for CMYK + orange + green + white.
- The white ink has an additional set of tubing for circulation (see the next slide).
- Note that white has no ink bridge. Each set of white nozzles receives ink from only one cartridge.

Slide 29

- In the 6 color model, M and C each have two cartridges, and there is an ink bridge between the two.

Ink System
Circulation for White Ink



- At intervals, the white ink in the damper circulates back towards the cartridge and back to the damper. This prevents the white pigment from settling in the damper.

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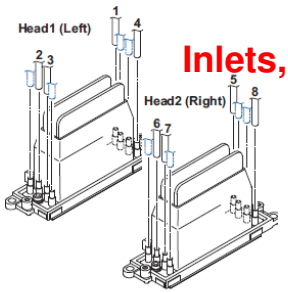
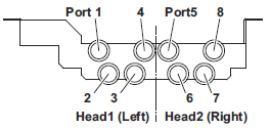
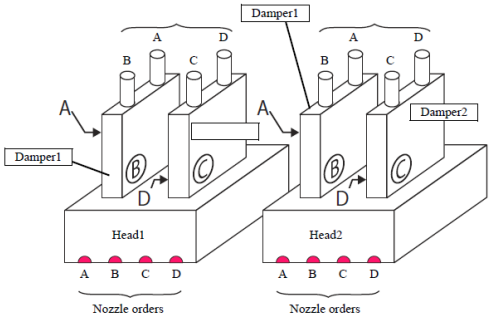
No additional notes

Ink System
Inlets, Ports, and Nozzles



Tube connecting allocation (Front of Carriage)





- **This shows the relationships between the inlets at the top of the heads, the ports at the front, and the nozzles in the base. Each row has 320 nozzles.**
  - The ports are used for some procedures, as we shall see later, so it is important to know which is the right port to open during a procedure.

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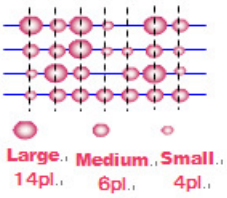
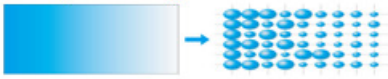
- Each row of nozzles is 54.2 mm long.

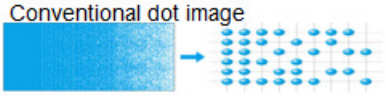
Ink System
Drop Size Control



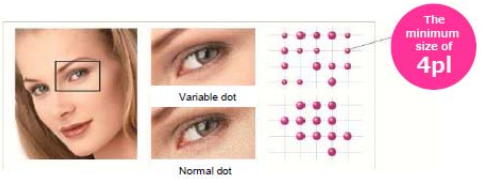
◆ Multiple dot image



◆ Conventional dot image



- ❑ The machine can provide 3 different drop sizes at once.
- ❑ The drop sizes of ink from the print head can be selected to a minimum of 4pl to suit for various media types or resolution settings.



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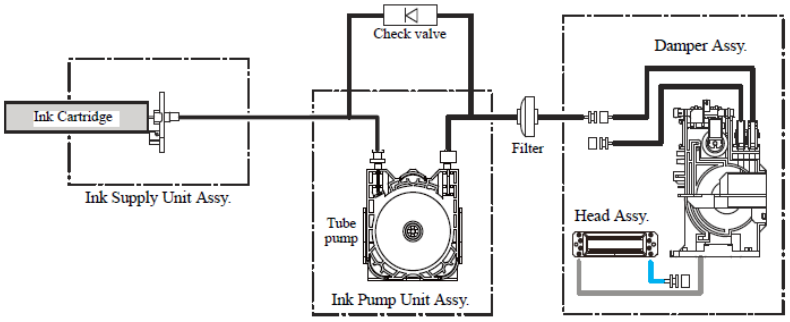
No additional notes

Ink System
Layout (Head 1 A-D, and Head 2 A-B)



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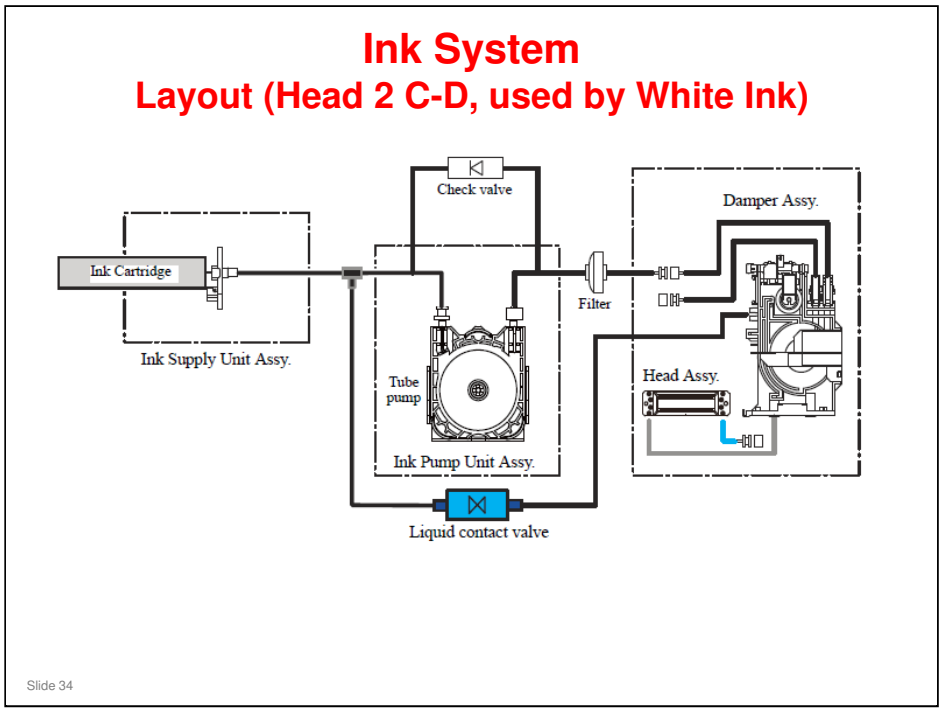
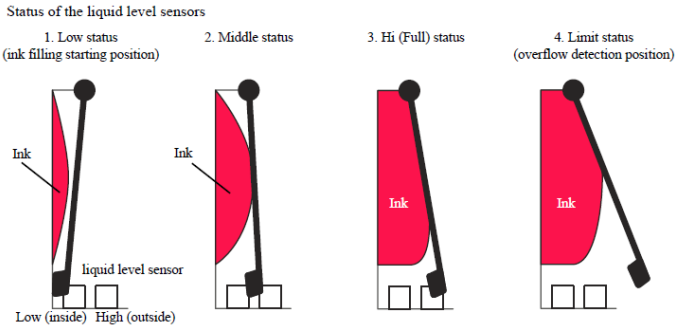
No additional notes



No additional notes

Ink System

Ink Supply Control Inside the Damper



- **There are four of these mechanisms inside each damper.**
  - 1: Ink filling is required. Filling starts automatically during printing or cleaning.
  - 2: Ink filling is required. Filling starts automatically during printing or cleaning.
  - 3: Tank is full (normal). Filling stops after a set time.
  - 4: Overflow. Filling stops immediately and an error occurs

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No additional notes

Ink System
Ink Cartridge Basics

- **The ink cartridge is a soft bag of ink placed inside a hard plastic case called an 'eco case'.**
  - The hard case can be replaced by the customer if it breaks. They must order Pro Eco Cartridge Type A
- **There is an IC chip in the eco case.**
- **When replacing the cartridge, replace the IC chip also.**
- **Ink near-end is detected by firmware (ink consumption is counted). There is no sensor in the cartridge.**
- **However, the sensors in the damper detect when ink has not been supplied from the cartridge because it is empty.**

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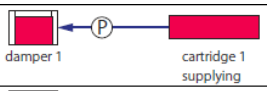
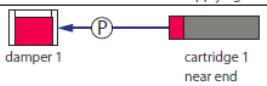
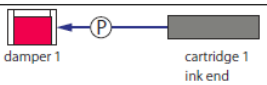
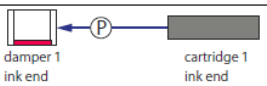
No additional notes

Ink System

End Detection – One Cartridge per Color

1	Beginning of use		
2	Ink near end (Supply system near end) **Cartridge near end**		<LOCAL> INK NEAR END [ENT]
3	Ink near end (Supply system near end) **Cartridge ink end**		<LOCAL> INK NEAR END [ENT]
4	Ink end (Supply system ink end) **Cartridge ink end**		<LOCAL> Can' tPRINT/CART. [ENT]

- **1. Normal status: Ink is supplied from the cartridge to the damper.**
- **2. Ink in the cartridge becomes less. Printing/cleaning can be performed.**
- **3. There is ink in the damper, so printing can be done for a while. Replace the cartridge as soon as possible.**
- **4. Ink has run out both in the cartridge and the damper. Replace the cartridge.**

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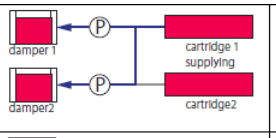
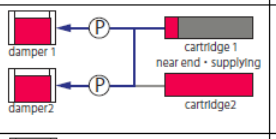
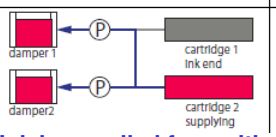
- The operation of the ink cartridge lamp indicators is explained later in the course (Operation section, Ink Cartridge Lamps).

Ink System

End Detection – Two Cartridges per Color (1)

1	Beginning to use	
2	Cartridge near end	
3	Cartridge ink end	

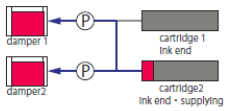
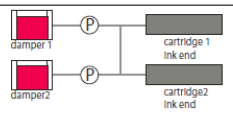
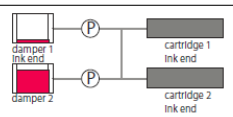
- 1. Normal status. Ink is supplied from either cartridge to both dampers.
- 2. Ink in one cartridge becomes less. Printing/cleaning can be performed.
- 3. Ink in one cartridge has run out. But, there is ink in the other cartridge, so you can continue to use the machine.

Slide 38

No additional notes

Ink System

End Detection – Two Cartridges per Color (2)

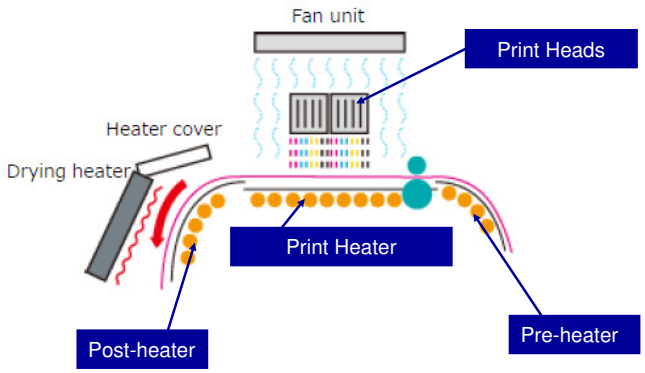
4	Ink near end (Supply system near end) Cartridge near end Cartridge ink end Simultaneous occurrence		<LOCAL> INK NEAR END [ENT]
5	Ink near end (Supply systemnear end) Cartridge ink end Cartridge ink end Simultaneous occurrence		<LOCAL> INK NEAR END [ENT]
6	ink end (Supply system ink end) Cartridge ink end Cartridge ink end Simultaneous occurrence		<LOCAL> Can't PRINT/CART. [ENT]

- 4. Ink in both cartridges become less. You can use the machine, but replace the cartridge as soon as possible.
- 5. Ink in both cartridges has run out. The cartridge ink end warning is also displayed. There is ink in the damper, so printing can be done for a while. Replace the cartridge as soon as possible
- 6. Ink in both cartridges has run out. Ink in the damper has also run out. Printing cannot be done, so replace the cartridge.

Slide 39

No additional notes

Heating



- The Pre-heater, Print heater, and Post-heater are on the platen.
- The Pre-heater is used for pre-heating the media prior to printing to prevent rapid changes in temperature.
- The Print-heater improves the image quality during printing.
- The Post-heater and drying-heater dry the ink after printing.

Slide 40

No additional notes

Regarding Print Media

The machine uses latex ink, allowing it to print on various materials such as the following:

Printing Media	Example Products	Genuine Mimaki Media
PET Film	Films coated for use with inkjet printers and uncoated films	Transparent Illumination Film LX Transparent Adhesive Film LX (All uncoated products)
Paper	Paper coated for use with inkjet printers and paper coated for offset printing	Poster Paper LX
Synthetic Paper	PP, PET film, etc. (Synthetic paper coated for inkjet printing and uncoated synthetic paper)	Water-resistant Adhesive Paper LX
PVC (adhesive)	PVC sheets with adhesive	White PVC G（SPC-0706 series） White PVC M（SPC-0707 series） etc.
PVC (banner)	Tarpaulin, FF acrylic sheet, etc.	New line of products TBA
Textile (cloth)	Pongee, tropical polyester, toromat, etc.	None

For best results, it is very important to adjust the heater configuration between media.

Slide 41

No additional notes

Heater Configuration

The steps for configuring the heater are as follows.
The pre, print, post and fan heaters must all be configured.

Check the type of medium	Check the type of printing medium to be used
Temporary heat settings	Set the heat to the standard outlined in the table (shown later). (If there is a profile for the printing medium, set the heat according to the profile.)
Cockling settings	Check for cockling of the media on the platen, and adjust the pre and print heaters if necessary (see the Troubleshooting section of the course for more on this).
Check print and drying properties	Check the ink drying for the printed item and adjust the post and fan heaters if necessary.
Other points to check	If the medium warps from heat, lower the temperature of the post and fan heaters. If there is blurring, lower the printing speed or raise the number of passes. Finally, check the drying properties of the ink once more.
End of heater configuration	The heaters are now configured.

Slide 42

No additional notes

Checking the Type of Media

Check for additional information regarding media online.

Check	Note
Material	**Heater setting for the medium you would like to use are on the next slide.**
Thickness	**As heat is difficult to transfer through thick (over 300 μ) media, the ink may take more heat to dry.** **Unusually thin media may be difficult to load.**
Coating	**Some film and paper materials come with a coating for use with inkjet printers. Ink will dry best on these types of media.**
Printing side	**Please check which side of the material should be printed on.**
Backing paper	**We do not recommend rough textured fabrics (such as pongee) as the ink will bleed and make the platen and the machine dirty. Please use this type of medium with backing paper.**

Slide 43

No additional notes

Heater Settings

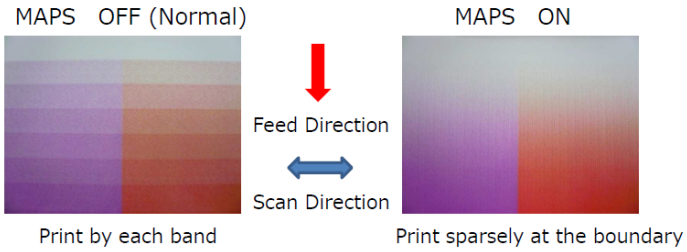
・If your printing medium has a heat setting profile, set the heaters using that information.
・If your printing medium does not have a setting profile, use the estimates in the table below to set the heaters.
・The heating conditions of the medium will change depending on thickness, the presence of surface treatment or protective films, so adjust the settings for each medium after consulting the following table.

Medium	Estimate for Heat Setting(℃)			
	Pre	Print	Post	Fan
PET Film	60	55	60	OFF-20
Paper	50-55	50-55	60-65	10-20
Synthetic Paper (adhesive)	55-60	45-50	60-65	10-20
PVC (adhesive)	60-65	50-55	60-70	OFF-10
PVC (banner)	70	55	65	10-20
Textile (cloth)	No Data			

Slide 44

No additional notes

MAPS (Mimaki Advanced Pass System)



- MAPS can be switched on or off with a user setting.
- If MAPS is off, the same amount of ink is deposited at the top and bottom edges of each pass.
- If MAPS is on, the amount of ink is less nearer the top and bottom edges.
- At the top and bottom edges, ink spreads out a bit, so if MAPS is off, you get 2 layers of ink near the edges, and so you get the lines on the print.

Slide 45

No additional notes

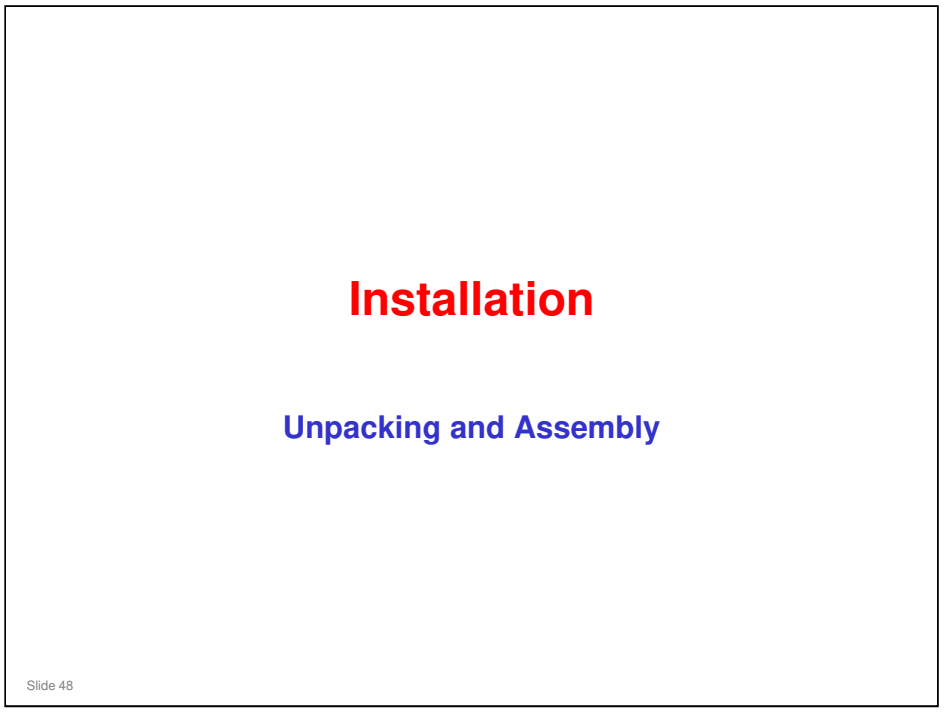
This section explains the main points about installation. For full details, see the service manual.

Overview of the Procedure

- ❑ Unpack the product.
- ❑ Assemble the stand and the main body.
- ❑ Attach the main body to the stand.
- ❑ Mount the drying heater assembly.
- ❑ Attach the waste ink bottle from the accessories.
- ❑ Remove the head stopper.
- ❑ Set up the power supply.
- ❑ Set up the ink
- ❑ Make some initial settings, do the initial ink filling, and make some test prints.
- ❑ Final checks
- ❑ Instruct the user concerning maintenance, troubleshooting, etc

Slide 47

❒ This is a list of the basic steps and the order in which they are done.



2. Installation > Accessories List

2. Installation > Printer Assembly

Service Manual Reference

- **The procedures in this part of the course are in these sections of the service manual.**
  - 2. Installation > Accessories List
  - 2. Installation > Printer Assembly

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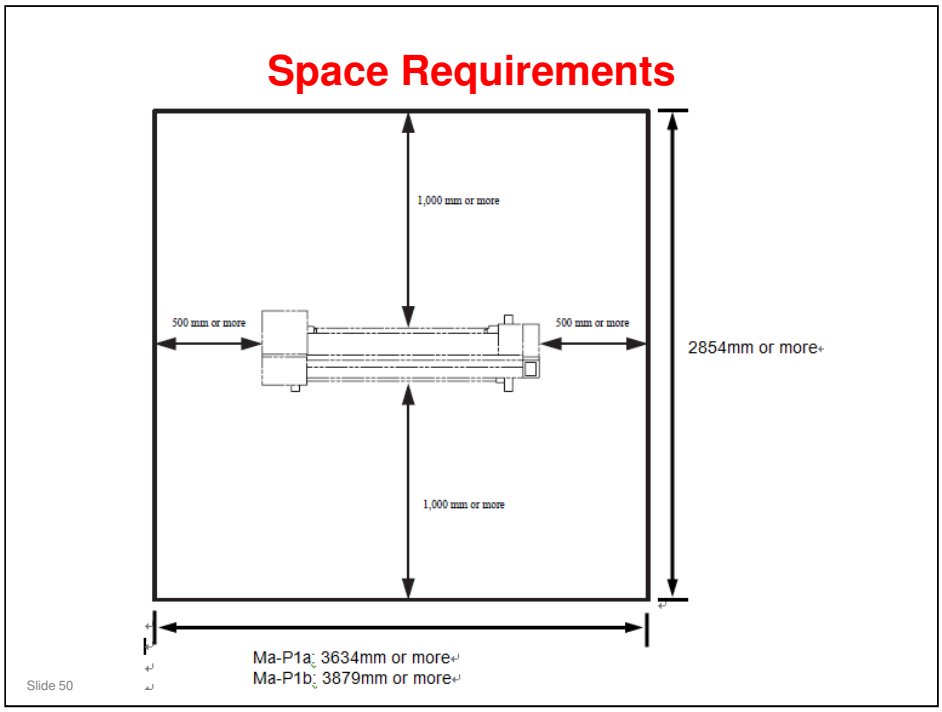
No additional notes



No additional notes

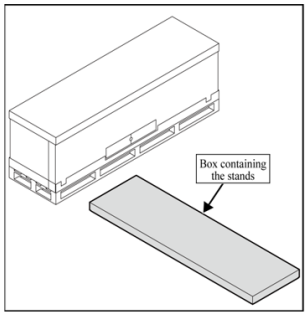
Machine Level

- Front to back: Not more than 5 mm from level
- Right to left: Not more than 5 mm from level
- If not within these specifications, media skewing may occur.

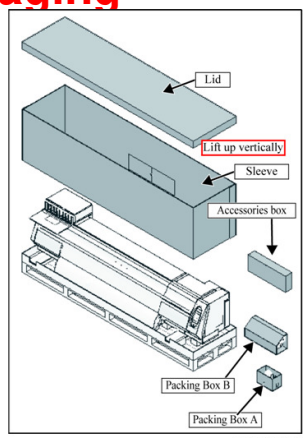
Slide 51

No additional notes

Machine Packaging



w_m1522177



w_m1522178

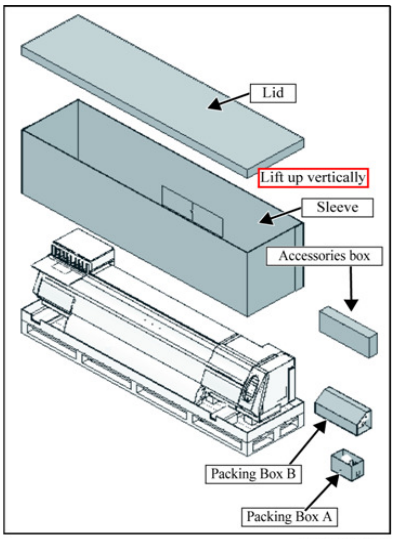
- **The machine comes in two boxes:**
  - Stand Packing Box
  - Main Unit Box: Contains the main unit, an accessories box, packing box A, packing box B, and a paper core
- **Keep the original packaging materials. You will need these if the customer wants to move the machine to another location.**
  - However, bring back all plastic bags away from the customer location, to avoid injuries to children.

Slide 52

2. Installation > Accessories List

- The service manual shows the contents of each box.

Unpacking the Main Unit Box



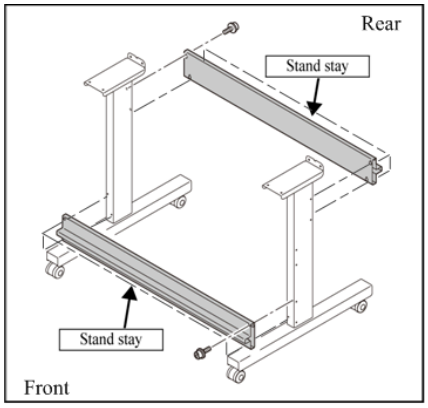
w_m1522178

- The clearance between the main unit and sleeve is small.
- So, lift the sleeve vertically to avoid touching the main unit.

Slide 53

No additional notes

Assembling the Stand



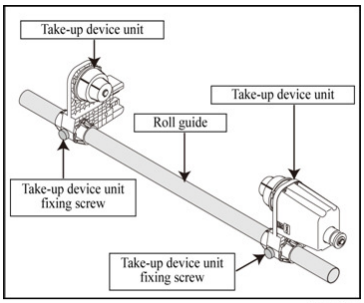
w_m1522179

- **Attach the screws loosely at first (tighten them fully first, while pressing down on the top of the stay, then loosen half a turn).**
  - Follow the instructions in the manual about the correct time to tighten the screws.
- **The stand with the screw holes is for the right side.**
  - These screw holes are for attaching the waste ink bottle tray.
  - Do not attach the waste ink bottle tray until all accessories have been attached.

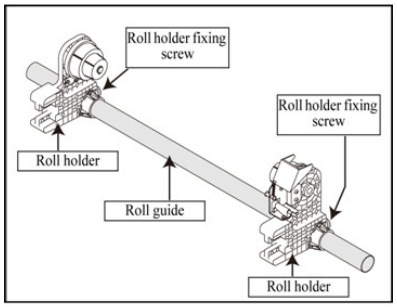
Slide 54

No additional notes

Assembling the Take-up Device and Roll Holder



w_m1522182



w_m1522183

- The take-up device and roll holder are in packing boxes A and B.
- The roll guides are in the stand packing box.

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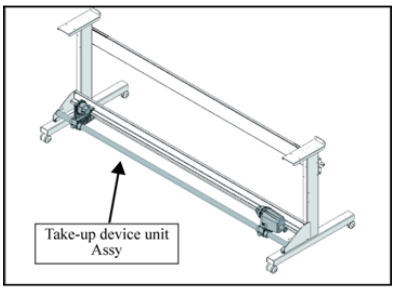
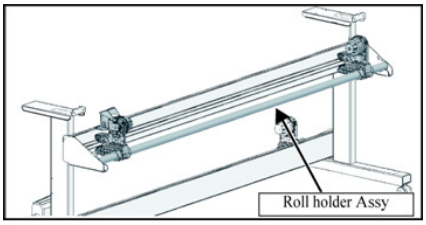
No additional notes

Installing the Take-up Device and Roll Holder - 1



w_m1522186



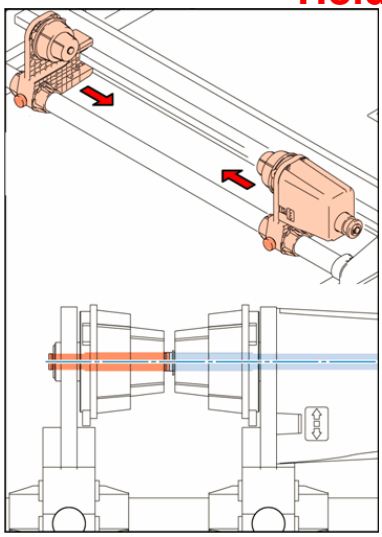
w_m1522190

- The take-up device goes on the bottom as shown.
- Then install the roll holder on the top.

Slide 56

No additional notes

Installing the Take-up Device and Roll Holder - 2



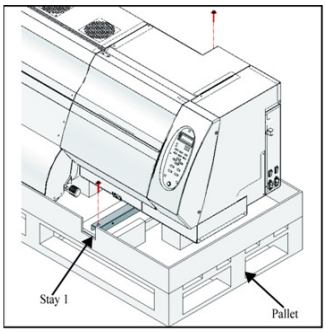
w_m1522575

- **Move the roll holders to the center of the unit.**
  - Keep them in this position until the main unit is has been mounted on the stand.
- **After that, lock the four stoppers on the feet of the stand.**

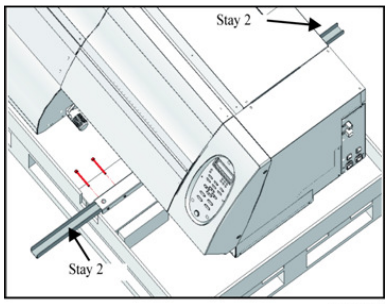
Slide 57

No additional notes

Removing the Main Unit from the Pallet



w_m1522193



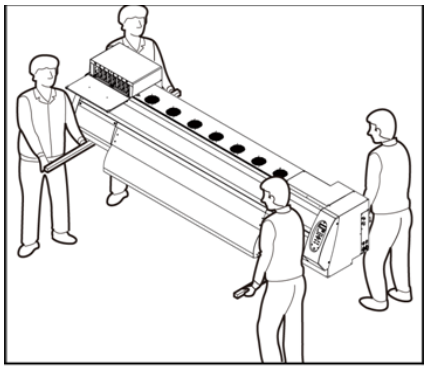
w_m1522194

- Stay 1 holds the main unit to the pallet. Remove this (there is one on the left and one on the right).
- Then attach stay 2 (one on the left and one on the right). These two stays are in the stand packing box.

Slide 58

No additional notes

Lifting the Main Unit



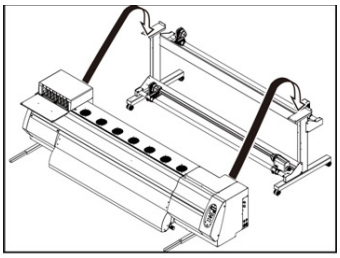
m1522195

- Four people are needed, and one additional person to supervise alignment of the screw holes (see the next slide).

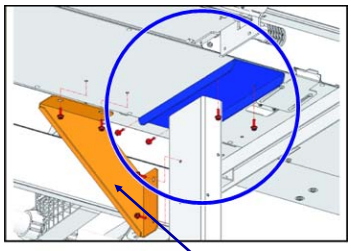
Slide 59

No additional notes

Attaching the Main Unit to the Stand



m1522196



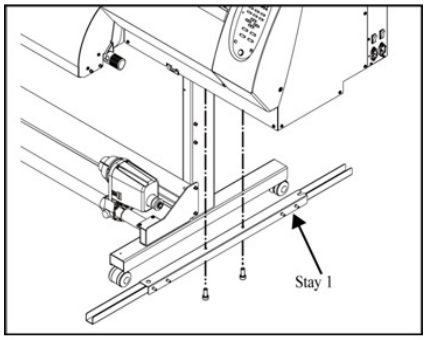
m1522197

- **Attach the main unit to the stand.**
- **Then secure the legs and the stand reinforcement plates.**
  - These plates are in the stand packing box.
  - There are also some hexagonal wrenches in the accessories box. Use these to attach the legs.
- **Then tighten the stand stay screws.**
  - See the slide 'Assembling the Stand'.
- **Make sure all screws are tightened.**

Slide 60

No additional notes

Detaching the Carrying Stays



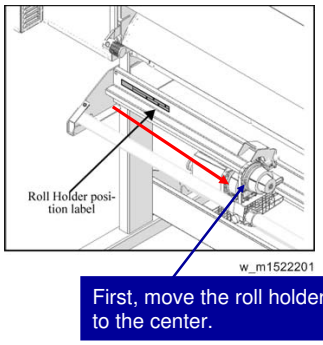
w_m1522199

- If the customer wants to move this printer at a future date, you will need these stays again, so keep them in a safe place.

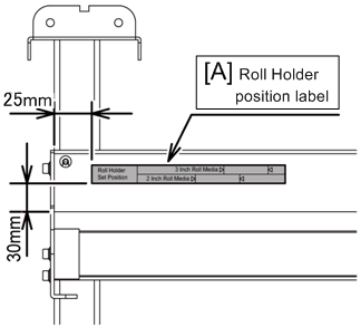
Slide 61

No additional notes

Attaching the Roll Holder Position Label



First, move the roll holder to the center.

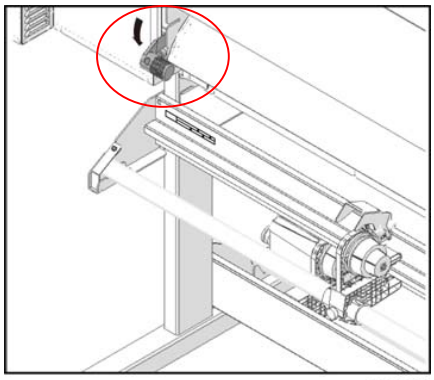


- **Make sure to attach this label in exactly the correct position.**

Slide 62

No additional notes

Checking the Clamp Lever



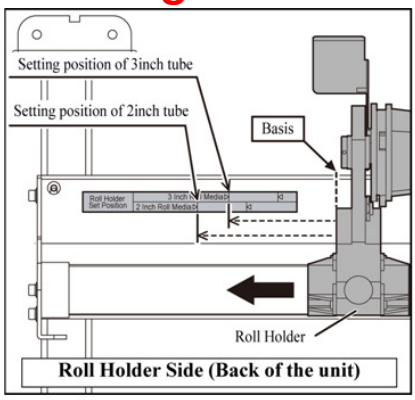
m1522203

- Make sure that this lever is down.

Slide 63

No additional notes

Positioning the Roll Holder



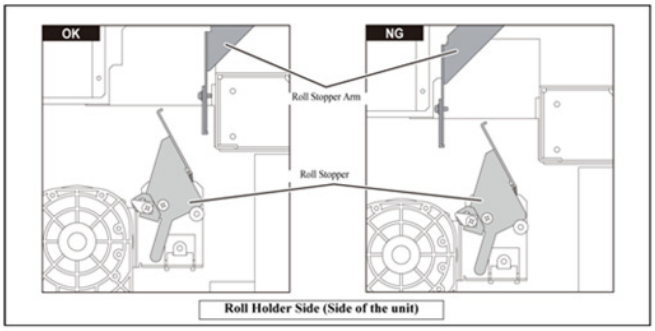
w_m1522204

- **When installing a roll with a 3-inch diameter core, move the roll holder to the left so that the flange on the left of the roll holder (marked 'Basis' in the above diagram) is flush with the 3-inch mark on the label.**
  - For a 2-inch diameter core, move the flange to the 2-inch mark on the label.

Slide 64

No additional notes

Checking the Roll Stopper Arm



w_m1522205

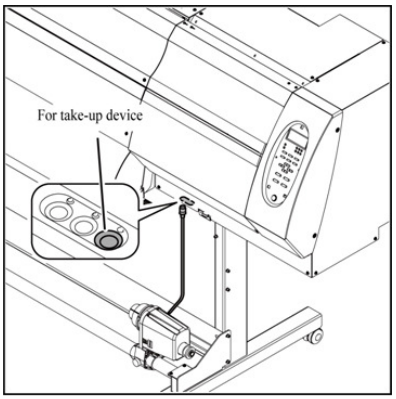
- Make sure that this arm is in the correct position.

Slide 65

No additional notes

Connecting the Take-up Device

- Connect to the bottom of the printer as shown.

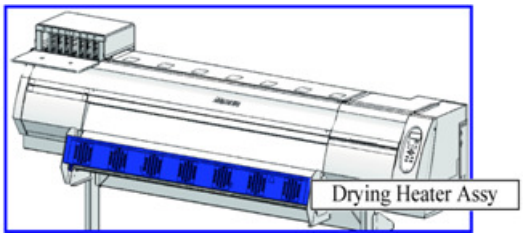


w_m1522206

Slide 66

No additional notes

Installing the Drying Heater

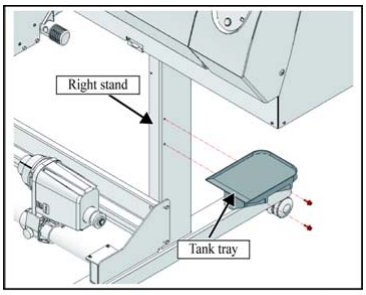


- Install the drying heater as explained in the manual.

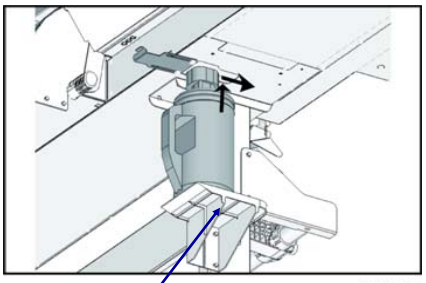
Slide 67

- Steps 6 and 7 of the procedure mention a red tag and a blue tag. This refers to the colors of the plugs on the end of the wires. However, the diagrams do not show the colors.

Installing the Waste Ink Bottle



w_m1522215



m1522216

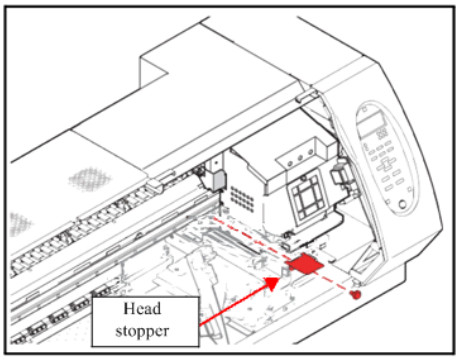
Waste Ink Bottle

- Install the bottle tray and waste ink bottle as explained in the manual.

Slide 68

No additional notes

Removing the Head Stopper

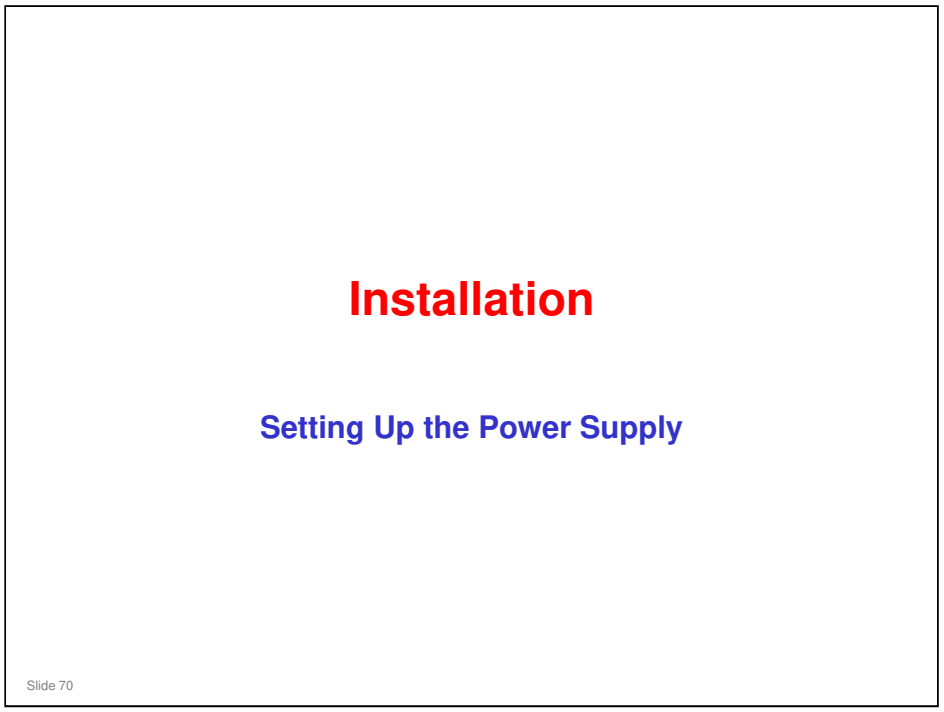


w_m1522219

- The screw is at the rear side of the encoder scale, so be careful not to damage the encoder scale when removing it.
- Do not discard this stopper, because you will need it if the customer wants to transport the machine.

Slide 69

No additional notes



2. Installation > Power Supply Related

Service Manual Reference

- **The procedures in this part of the course are in this section of the service manual.**
  - 2. Installation > Power Supply Related

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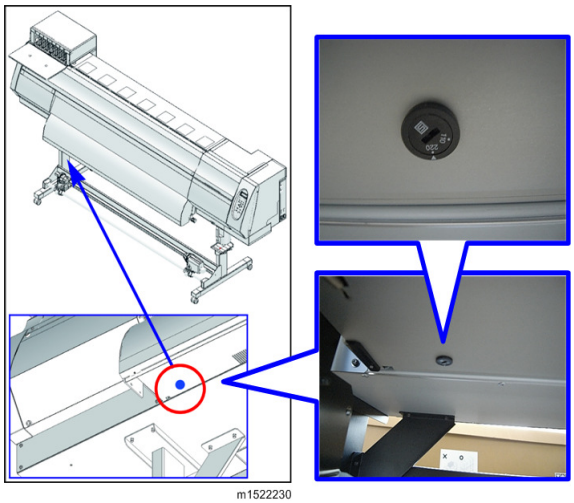
No additional notes

Voltage Selector



- **There are two settings.**
  - 110 (use this for 100 to 120V)
  - 220 (use this for 220 to 240V; this is the default)
- **Make sure to use the correct one.**

Slide 72

No additional notes

2. Installation > Ink Set

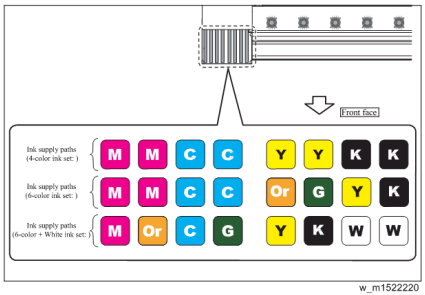
Service Manual Reference

- **The procedures in this part of the course are in this section of the service manual.**
  - 2. Installation > Ink Set

Slide 74

No additional notes

Three Different Ink Color Setups

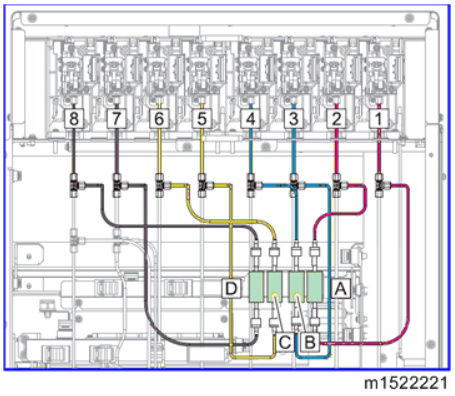


- **In the factory, the machine was set up for four-color printing (MCYK).**
- **However, you may now change this to six colors or six-color plus white if the customer wishes.**
- **To do this, do the following:**
  - Clean the inside of the head and ink paths to be changed (press the CLEANING button, select NORMAL; do for both heads).
  - Change the ink tube connections
  - Set up the ink cartridges; **do not install them in the machine yet**
  - Attach a label on the case to show the ink colors being used.

Slide 75

No additional notes

Ink Tube Connections (MCYK)



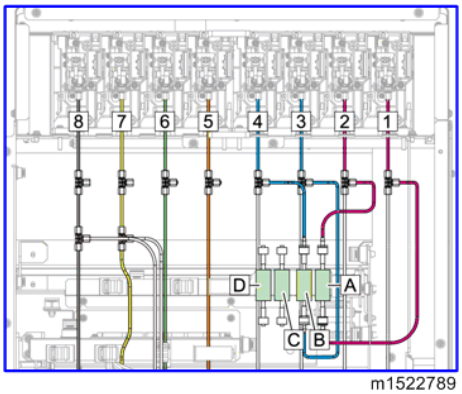
m1522221

- **This is the factory default.**
  - Joints 1 and 2: Magenta
  - Joints 3 and 4: Cyan
  - Joints 5 and 6: Yellow
  - Joints 7 and 8: Black

Slide 76

No additional notes

Ink Tube Connections (MCYK+Or+G)



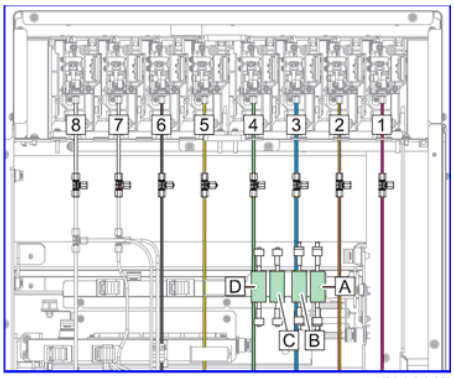
m1522789

- **Remove the tubes attached to the sides of joints 5 to 8 and attach rubber plugs.**
  - Joints 1 and 2: Magenta
  - Joints 3 and 4: Cyan
  - Joint 5: Orange
  - Joint 6: Green
  - Joint 7: Yellow
  - Joint 8: Black
  - Liquid contact valves C and D will not be used.

Slide 77

No additional notes

Ink Tube Connections (MCYK+Or+G+W)



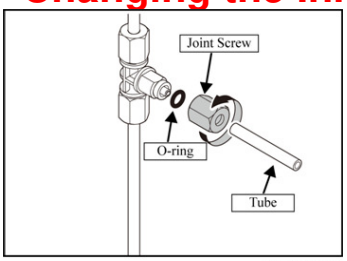
m15222667

- **Remove the tubes attached to the sides of joints 1 to 8 and attach rubber plugs.**
  - Joint 1: Magenta
  - Joint 2: Orange
  - Joint 3: Cyan
  - Joint 4: Green
  - Joint 5: Yellow
  - Joint 6: Black
  - Joints 7 and 8: Black
  - Liquid contact valves A, B, C, and D will not be used.

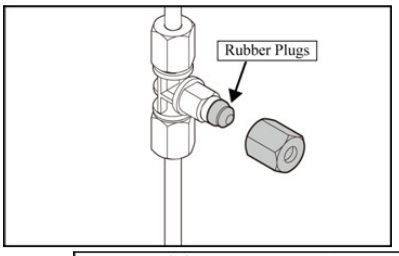
Slide 78

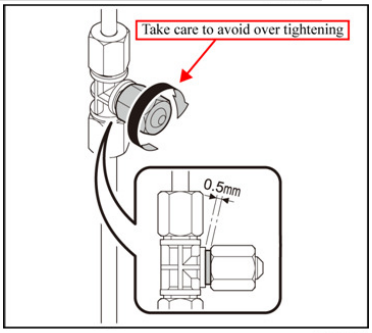
- The ink tube connections diagram for 6 colors without white is not available at this time. It will be released later.

Changing the Ink Tube Connections



w_m1522225





w_m1522227

- Do not lose the O-rings and tubes. The customer will need these if they go back to four-color printing.
- Do not bend the removed tubes.
- Attach rubber plugs and tighten the joint screws.
  - Do not tighten them too much.
- Leave a space of around 0.5 mm as shown.

Slide 79

No additional notes

Setting up the Ink Cartridges - 1

m1522648

Good

m1522649

Bad: The ink bag is too far from the top edge

m1522650

Bad: The ink bag is too slack in places

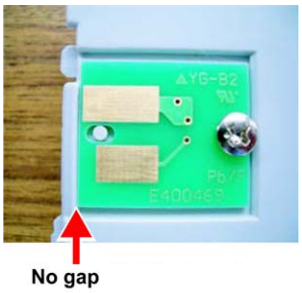
- **Make sure that the corner of the ink bag is right against the corner of the case.**
- **The case is also known as an 'eco cartridge'.**

Slide 80

2. Installation > Ink Set > How to assemble ink cartridge

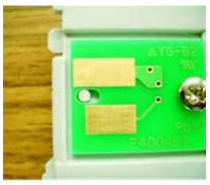
- This slide shows some important points. See the procedure in the service manual for full details of the procedure.
- Ink bags are not shipped with the machine. The customer must install them separately, and the technician installs the bags in the cartridges. However, customers can replace the ink bags when they need changing.

Setting up the Ink Cartridges - 2



w m1522652

Good

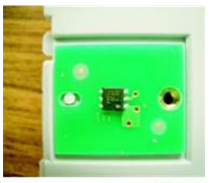


m1522653

Bad: There is a gap

m1522655

Bad: The wrong way around



m1522654

Bad: The wrong side is facing out

- Install the IC chip correctly as shown.

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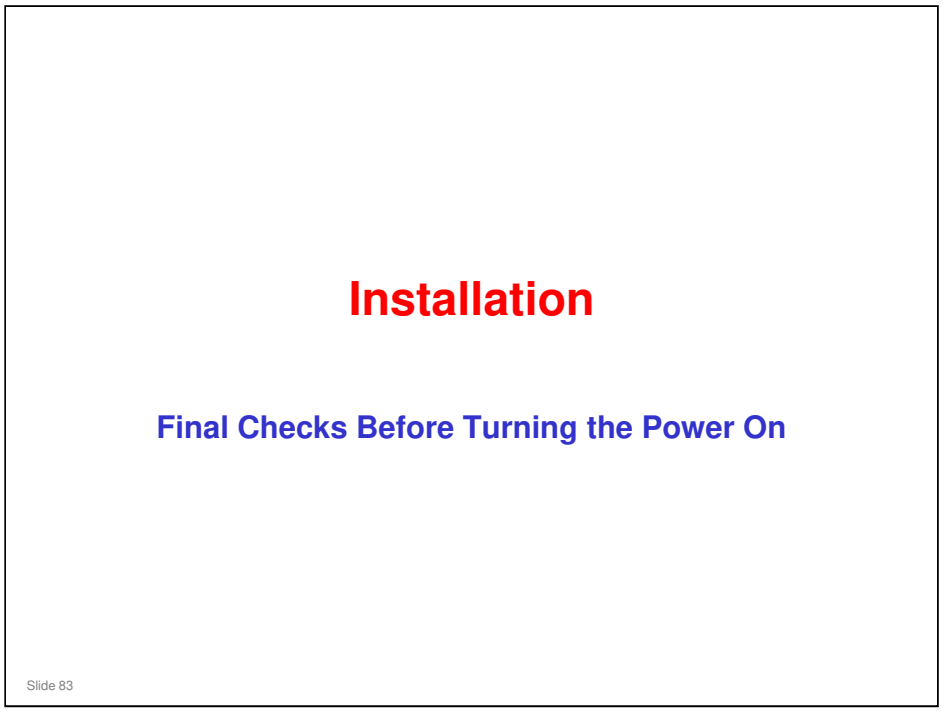
No additional notes

Setting up the Ink Cartridges - 3

- Do not install the ink cartridges in the machine until it is time for the initial ink filling.
- Attach labels to the cases as explained in the manual.

Slide 82

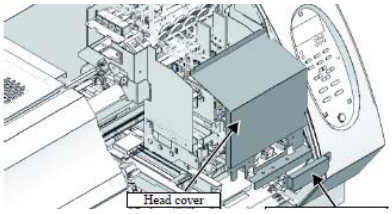
No additional notes



No additional notes

Final Checks Before Power On - 1

- **Set up the ink exhaust tube.**
  - Cut the tube and route it correctly as shown in the manual. Otherwise suction pumps will be damaged.
- **Make sure that the head moves smoothly and that the encoder does not come off.**
  - The encoder is the long mylar just behind the carriage.
- **Take the head cover off. Keep it off, so that you can see whether the tubes and tanks have ink after filling.**



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2. Installation > Power Supply Related > Before Starting Power On

- In the drawing on the right, the purple components are for C and M, and the black ones are for K, Y and white.

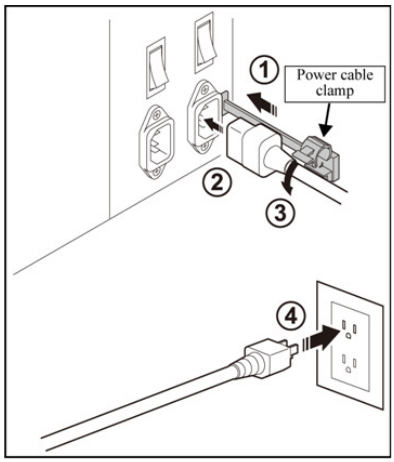
Final Checks Before Power On - 2

- If head and cap are misaligned when in the capping position, the suction pump will not be able to suck ink down through print head.
- First, moisten the cap with maintenance liquid, then check the capping height (gap between head and cap).
- To adjust the capping height, enter service mode, access the #ADJUST menu, and select CAPPING
  - 4. Replacement and Adjustment > Adjustment Items > CAPPING

Slide 85

No additional notes

Connecting the Power Cable



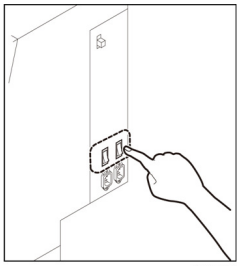
w_m1522234

- **Use the power cable clamp as shown.**
  - It is in the accessories box of the main unit box.
- **Do not connect any other device to the same power socket.**

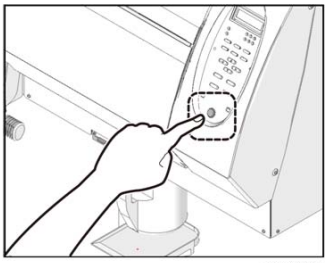
Slide 86

No additional notes

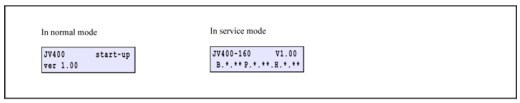
Turning On the Power



m1522235



m1522236



w_m1522111

- Turn on the two main power switches on the rear right side first.
- Then press the operation switch on the operation panel.
- The firmware version is displayed immediately after power is turned on. Make sure it is the most recent version.
  - Firmware update will be explained later.

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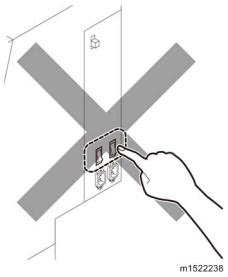
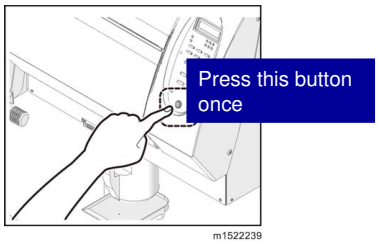
No additional notes

Turning Off the Power





- **Before turning the power off, check that the unit is not receiving data, and there is no remaining data to output.**
- **Check that the head is in the capping station.**
  - Normally, the head returns to the capping station automatically. If the power was turned off without capping, turn the power back on again. The machine returns the head to the capping station to prevent the head from drying out.
  - If the power is turned off during printing, the head might not be parked in the capping station.
- **Do not turn off the main power switch on the back panel, as this will disable automatic cleaning and refreshing at intervals for preventing nozzle blockages.**

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❒ Leaving the head for a long time without capping may cause nozzle blockages.

Back Up the System Parameters

- **Upload the system parameters from the machine to a PC for a backup. using the Parameter Upload procedure.**
  - This is because it is not possible to move the ROM from the old main PCB board to the new one.
- **To do this, turn on the operation panel power switch while pressing the Up and Down arrow keys.**
- **Then select either Upload or Download.**
  - Upload: The machine uploads parameters and log data to the host PC via USB.
  - Download: The machine downloads parameters and log data from the host PC via USB.

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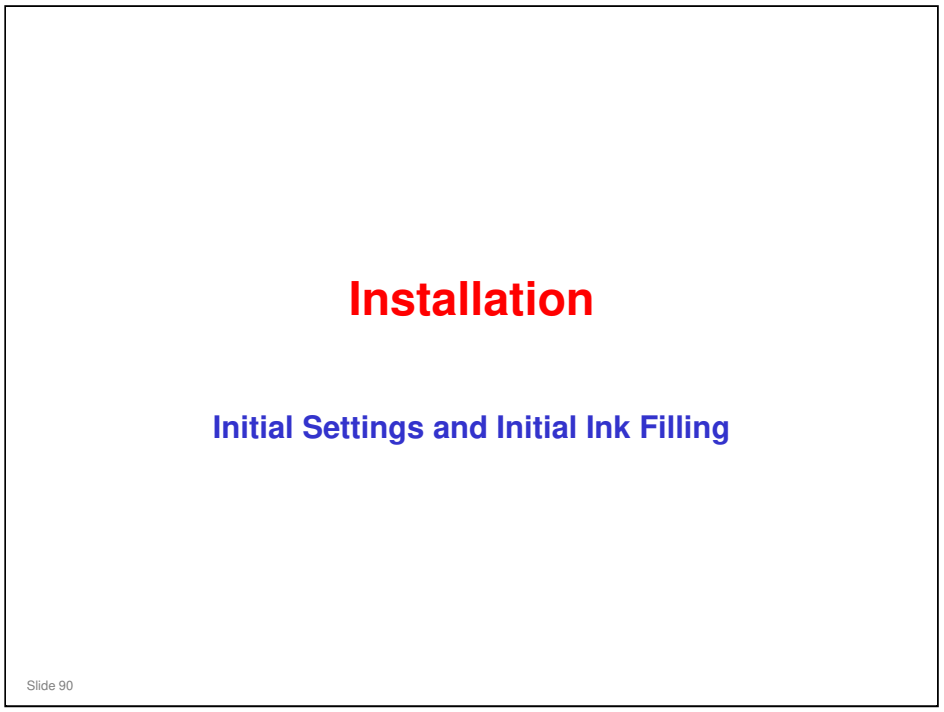
No additional notes



2. Installation > Outputting Plots

Service Manual Reference

- **The procedures in this part of the course are in this section of the service manual.**
  - 2. Installation > Outputting Plots

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No additional notes

Initial Settings

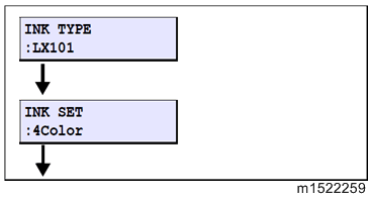
- **First, set the following:**
  - Language
  - Date and time
  - Power supply voltage

Slide 92

No additional notes

Initial Ink Filling - 1

- **First, select the ink type.**
  - Always select Lx101.
- **Then select the ink set-up.**
  - 4 colors (K,M,C,Y)
  - 6 colors (K,M,C,Y,Or,G)
  - 6 colors+W (K,M,C,Y,Or,G,W)



m1522259

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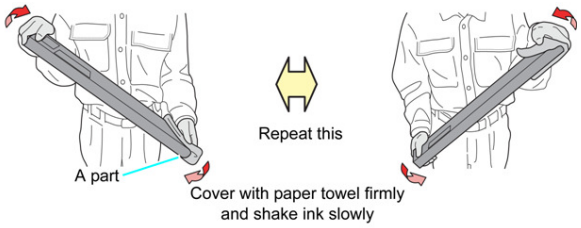
No additional notes

Initial Ink Filling - 2



- **Shake the cartridges gently more than 20 times left and right.**
  - Shake all of them, not only the white ink cartridges.
- **Hold towels over the ends to prevent ink from leaking out of the ports.**
- **If you shake too strongly, the pack inside may be damaged and it may leak.**
- **If there is only a small amount of ink in the cartridge, tilt the cartridge until it becomes vertical.**
- **The white ink settles out very quickly. The machine alerts the user every 24 hours to shake the white ink cartridges.**

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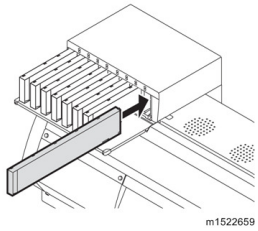
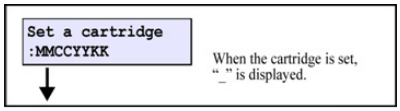
No additional notes

Initial Ink Filling - 3

- Insert the ink cartridges, with the IC chips at the rear, pointing to the left.



m1522659



w_m1522260

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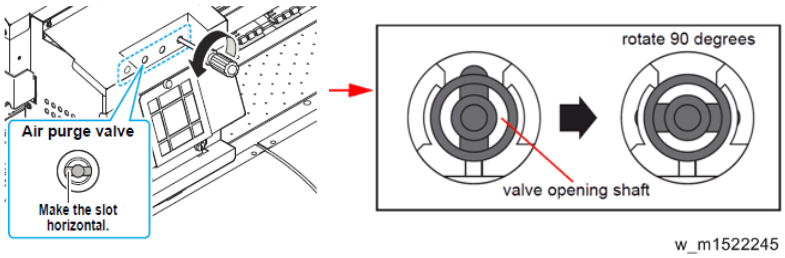
No additional notes

Initial Ink Filling - 4



- Rotate the valve opening shafts 90 degrees with a flathead screwdriver.
- After rotating, press [ENTER].
- Wait until the filling operation has finished.
- Then do the air purge procedure.
  - You have to purge air from all dampers (sub tanks).
  - A summary is shown on the next slide. Refer to the indicated part of the service manual for the complete procedure.

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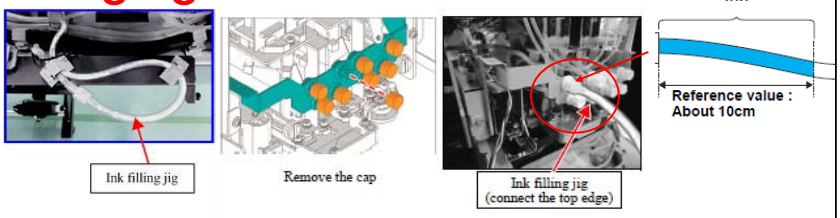
No additional notes

Purging Air from the Ink Circuit



- **Follow the procedure in the service manual (Performing the Initial Ink Fill, steps 8 to 14) for each damper.**
  - Select '12345678' at the operation panel (this means all 4 dampers), connect the ink filling jig to port 1, and press Enter.
    - » Do not remove the caps for any other ports. Only remove the cap for the ports you are purging.
  - Pull the syringe on the ink filling jig until about 10 cm of ink comes into the jig. Then press Enter again to stop the purge.
  - Put the cap back on the port, and repeat the procedure for the other ports.
  - To prevent inks from mixing, clean the top opening of the jig when you start to purge from the port for another color.

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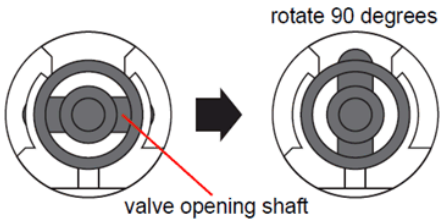
- The ink filling jig is installed inside the machine, at the location shown in the photo. The other end is already connected to the ink collection bottle.
- 1234---- selects the 4 dampers attached to head 1 (left hand side).
- ----5678 selects the 4 dampers attached to head 2 (right hand side).

Cleaning



w_m1522679

- After all dampers have been purged, check there is no air in the dampers, then close the valve again and press Enter.
- Then, cleaning starts automatically.

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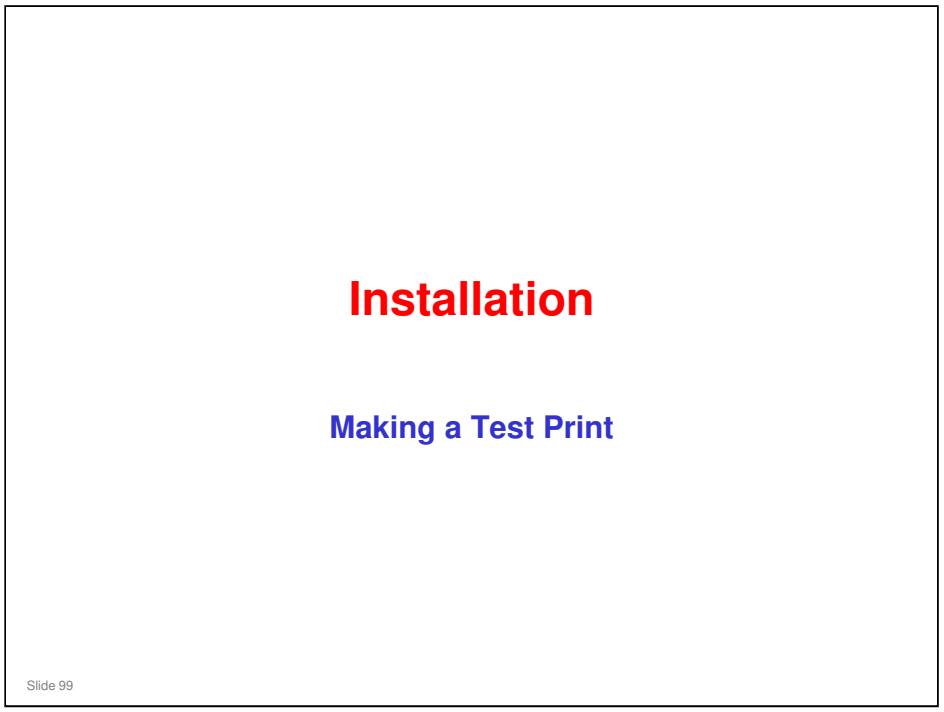
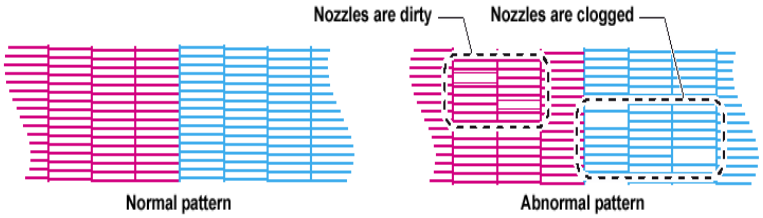
No additional notes



2. Installation > Outputting Plots

Making a Test Print - 1

- **Make a test print.**
- **Press the TEST PRINTING button, then press ENTER.**
  - Details: Operation manual > Chapter 2 Basic Operations > Test Printing
- **Examine the output for missing nozzles.**
- **If there are missing nozzles, do the cleaning procedure.**
  - There are three types of cleaning: Normal, Soft, Hard
  - You can select which head to clean.



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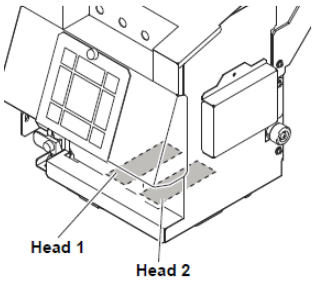
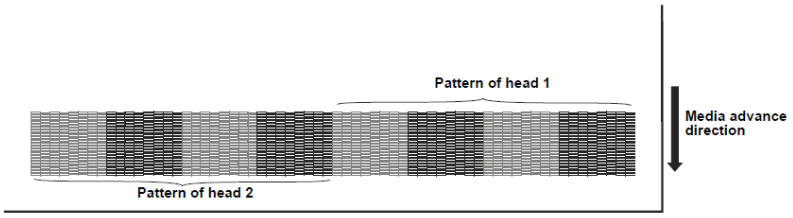
No additional notes

Making a Test Print - 2



- This shows how to interpret the output of the test pattern.



Slide 101

No additional notes

Installation

Image Quality Adjustments

Slide 102

Image Quality Adjustments
Overview

- **Three are three of these:**
  - PRINT ADJUST: Adjusts the drop positions of each color
  - DROP.POScorrect: Fine tunes the drop position for all colors at the same time.
  - FEED COMP: Correct the media feed amount.
- **After you replace the print head (this is a PM part), do the PRINT ADJUST procedure.**
- **The customer must do DROP.POScorrect and FEED COMP every time they change the media type.**

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2. Installation > Outputting Plots > PRINT ADJUST, Image Quality Adjustment

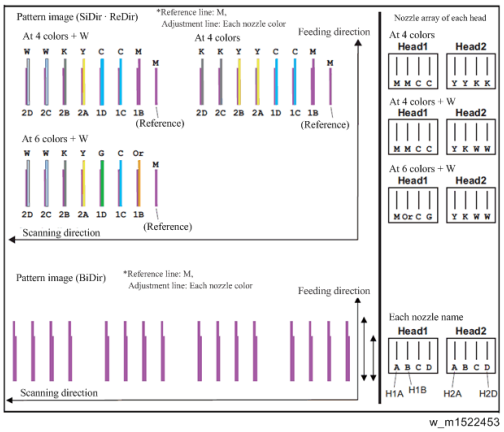
Image Quality Adjustments
PRINT ADJUST – Overview

- This test prints patterns, then you make measurements on these patterns and input corrections.
- Adjust the forward movement (SiDir), reverse movement (ReDir), and back-and-forth movement (BiDir) for each resolution using each of the three selectable waveforms.

Slide 104

No additional notes

Image Quality Adjustments
PRINT ADJUST – Test Patterns



w_m1522453

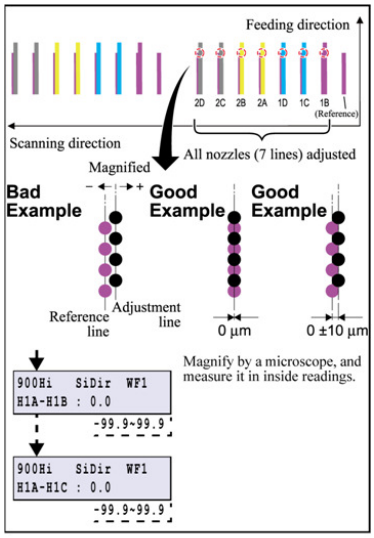
- These are the test patterns that you will print.
- Note that the test pattern for back-and-forth (BiDir) is slightly different, and only magenta ink is used for this adjustment.
- H1A: Nozzle row A on Head 1, etc

Slide 105

No additional notes

Image Quality Adjustments

PRINT ADJUST – Procedure (1)



m1522577

- **Follow the procedure in the service manual.**
- **Select WF1 first, and select the resolution.**
  - You will repeat the procedure for each waveform and each resolution.
- **Select SiDir (forward direction). Then press ENTER to print the pattern.**
- **Study each part of the printout with a magnifying glass or microscope.**
  - For example, the lines with 1B under them can be adjusted when H1A-H1B is displayed.
  - Use the up and down arrow keys to adjust the value in steps of 20 micrometers (about one dot width).
  - After adjusting all values (from H1A-H1B to H1A to H2D), print the pattern again and check that all sets of lines are like 'Good Example' in the diagram'.
- **Then do the same for ReDir (reverse direction).**

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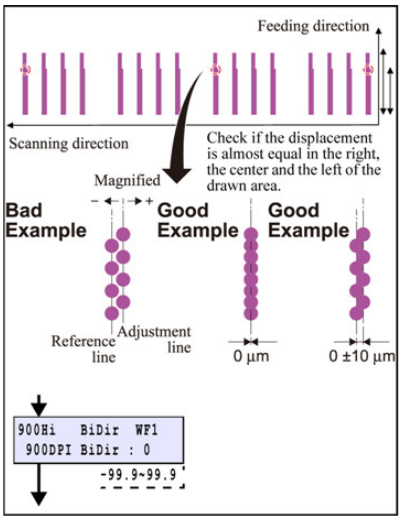
2. Installation > Outputting Plots > PRINT ADJUST, Image Quality Adjustment

Image Quality Adjustments
PRINT ADJUST – Procedure (2)



w_m1522458

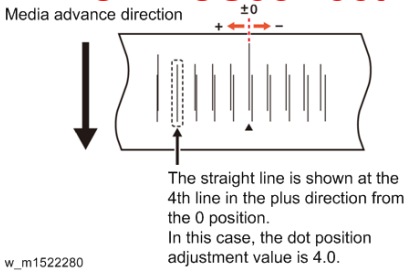
- **Select BiDir (back-and-forth). Then press ENTER to print the pattern.**
- **The heads print the reference lines when moving away from home position, and the adjustment lines when returning.**
- **Adjust in a similar way to SiDir and ReDir, except that only one adjustment is done.**
- **When you are satisfied with the adjustment, select BASIS SET and press ENTER.**
  - This ensures that the values you just input will be used as corrections for all other print modes.

Slide 107

No additional notes

Image Quality Adjustments

DROP.POScorrect

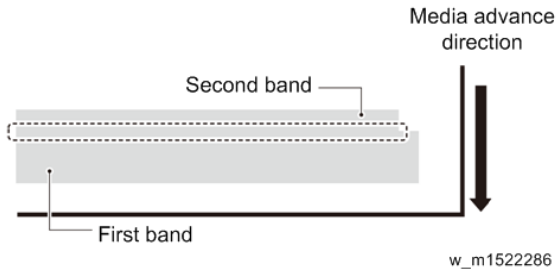


- **Only black ink is used, but the drop position of all colors is adjusted when you do this procedure.**
- **The test patterns in this test are all made up of a series of double lines. On each pattern, look for the pair of lines that are completely superimposed.**
  - In the above example, this is the 4th set of lines to the left of the zero position.
  - Numbers are printed on the top edge of the pattern. Use these numbers when you make the adjustment.

Slide 108

No additional notes

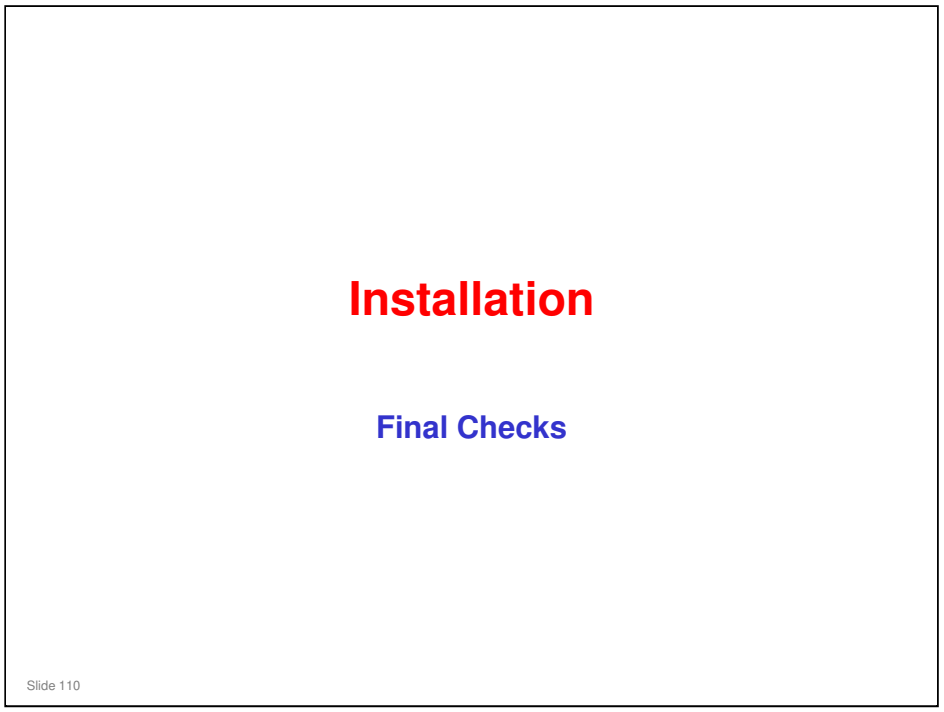
Image Quality Adjustments
FEED COMP



- This test pattern is a pair of bands. Adjust until the two bands are just touching.

Slide 109

No additional notes



2. Installation > Printer Setting and Checking Items before Printing

2. Installation > If paper jam occurred

Check Items before Printing

- **This section of the service manual explains the final checks before handing the machine over to the customer. A few points need to be explained more clearly.**
  - Heaters: There are 3 heaters, prefeed (before printing), platen, after feed (drying). The ink used by this machine takes a long time to dry so we need 3 heaters. The user must turn off the heater switch after the job, and turn it on again before starting the job is best (wait until the temperature is at the target temperature; you can see this on the display. If the user keeps the heaters on all the time, the part of the roll media inside the machine could become distorted by the heat. If the customer does not want to turn the heaters off, then they should rewind the media back onto the roll.
  - Media float: A fan blows air so that the media floats above the platen.
  - Detect the media: The machine automatically detects the roll width.
  - Cockling: This means damage to the media, such as curling, so that the media is not properly flat.

Slide 111

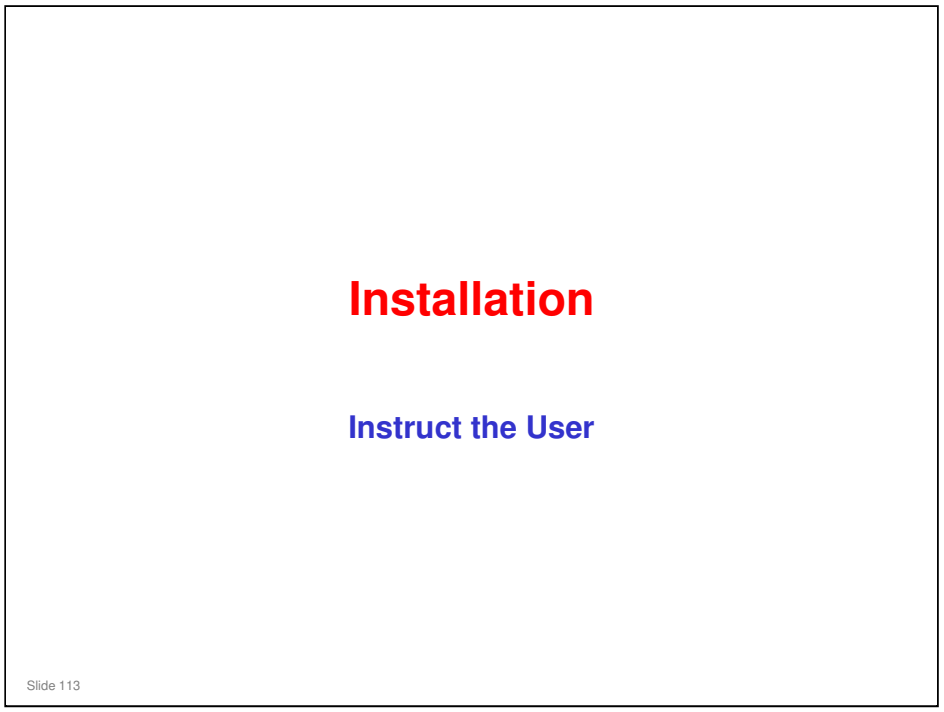
No additional notes

If a Jam Occurred During the Final Checks

- **If the head scratched the media or a jam occurred, immediately do the following:**
  - 1. Remove the Media
    - » Lift the clamp and remove the jammed media.
    - » If the head scratched the media, reset the media.
    - » Move the carriage to the waiting position, and return it to the station with the Enter key.
  - 2. Head Cleaning
    - » Clean the heads as explained in Operation Manual Chapter 2 (Head Cleaning).
  - 3. Test Print
    - » Make a test print. Check there are no missing or bent lines.
    - » If a nozzle is missing:
      - – If the situation cannot be improved by repeated cleaning, wash the head nozzle as explained in the Operation Manual Chapter 4 “When Nozzle Clogging Cannot Be Solved”
  - 4. Recovery
    - » After the head recovered, check the items below:
      - – Check that the media is not skewed, or curled.
      - – Check that the head height is not too low For instructions on how to use, see the operation manual (Chapter 2 Basic Operations > Setting a Media > Adjusting the Head Height)

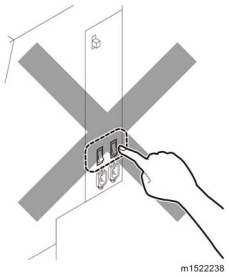
Slide 112

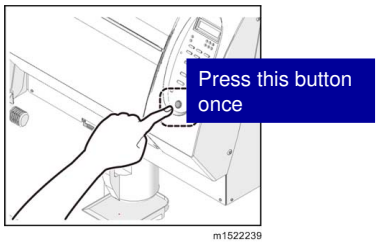
No additional notes



2. Installation > User Training

Turning the Power Off





- **Before turning the power off, check that the unit is not receiving data, and there is no remaining data to output.**
- **Check that the head is in the capping station.**
  - Normally, the head returns to the capping station automatically. If the power was turned off without capping, turn the power back on again. The machine returns the head to the capping station to prevent the head from drying out.
  - If the power is turned off during printing, the head might not be parked in the capping station.
- **Do not turn off the main power switch on the back panel, as this will disable automatic cleaning and refreshing at intervals for preventing nozzle blockages.**

Slide 114

❒ Leaving the head for a long time without capping may cause nozzle blockages.

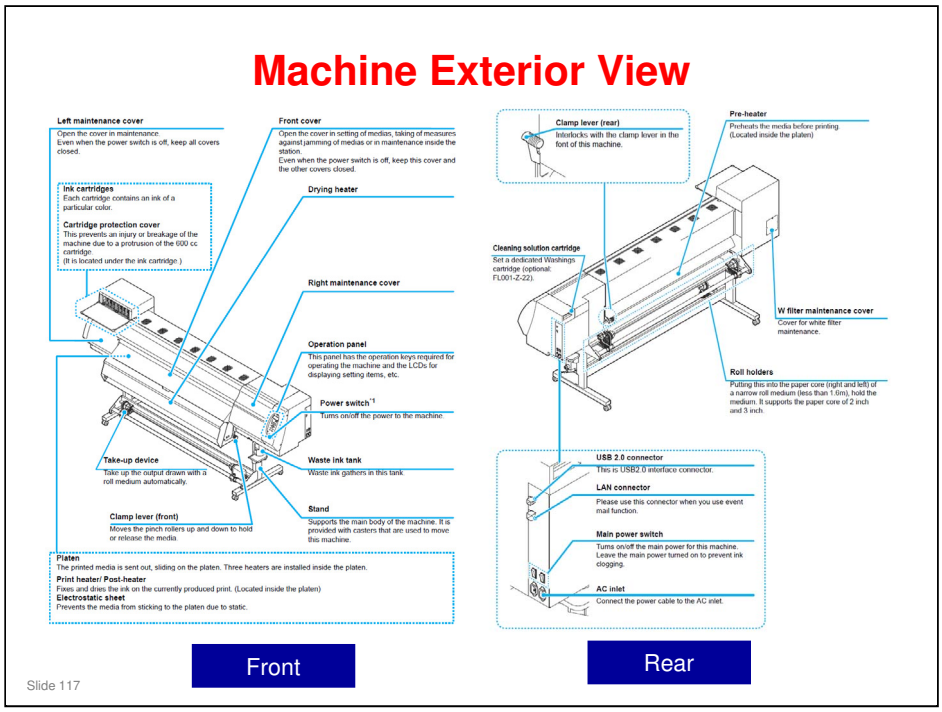
Must do the Daily PM

- **Instruct the user that they must do the daily maintenance procedures.**
  - First, explain the procedures using the Daily Care Manual and the Maintenance Video.
  - Then demonstrate the procedures on the machine so that the user can observe closely.
  - Finally, ask the customer to try the procedures, to confirm that they understand what to do.
- **Visit the customer 1 week after installation to make sure they are doing this.**
- **If they are not, instruct them again, and revisit every week until they get the message.**
  - If the customers do not do the correct daily and weekly maintenance, the machine will have problems, such as blocked nozzles.
- **The procedures for the user are outlined in the section of the course titled 'Maintenance by Users'.**

Slide 115

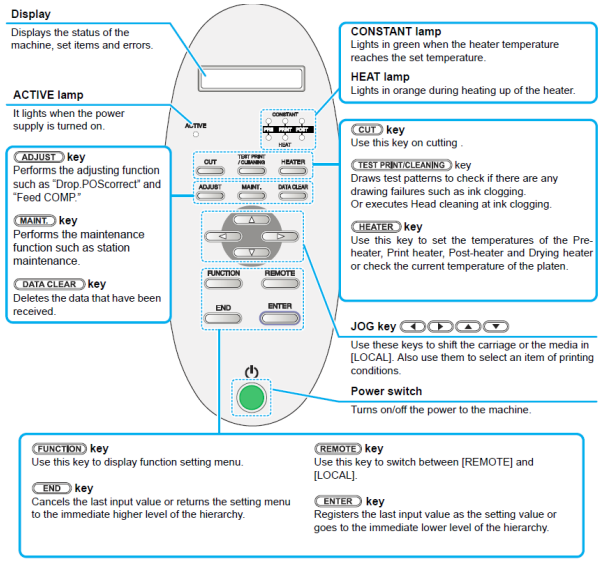
No additional notes

This section explains only the basic points about operating the machine. For full details, see the operation manual and service manual.



No additional notes

Operation Panel



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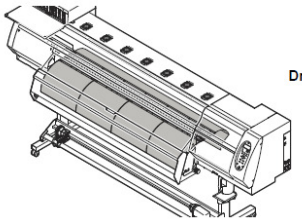
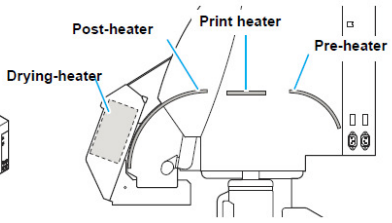
No additional notes

Heaters



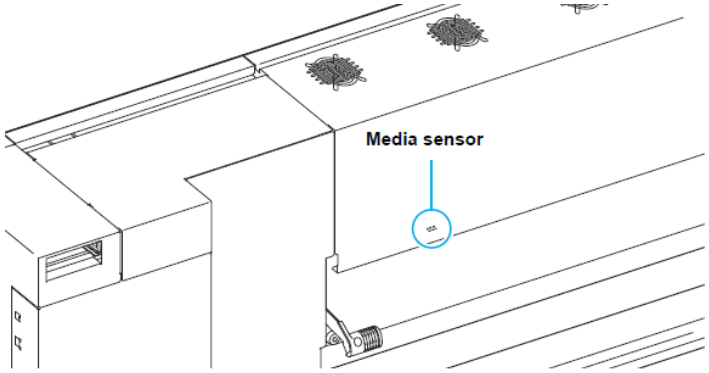


- The Pre-heater is used for pre-heating the media prior to printing to prevent rapid changes in temperature.
- The Print-heater improves the image quality.
- The Post-heater and drying-heater dry the ink after printing.
- While the heater is on, the platen is very hot. When the front cover is to be opened or media is to be replaced, lower the heater temperatures and wait until the platen temperature drops.
- When the media is to be replaced with a thin one, lower the heater temperatures and wait until the platen temperature drops enough. Setting a thin sheet of media while the platen is hot may cause the media to stick to the platen or cause wrinkling or curling of the media.

Slide 119

No additional notes

Media Sensor



- The media sensor is on the platen, at the rear.
- When setting media, be sure to cover this sensor, or the media will not be detected.

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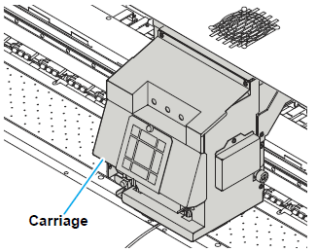
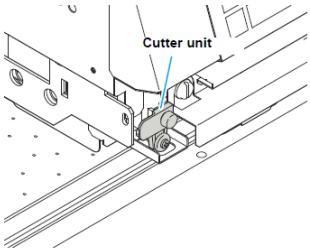
No additional notes

Carriage



- The carriage contains print heads, the cutter, and a lever for adjusting the height of the print head (3 settings).
- The customer can replace the cutter blade.



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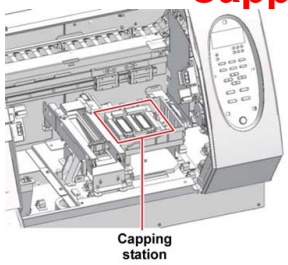
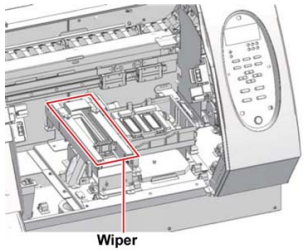
No additional notes

Capping Station



w_m1522134



w_m1522136

- **The capping station consists of the ink caps, the wiper for cleaning the heads, etc.**
- **The ink caps prevent the nozzles in the heads from drying up.**
- **The wiper cleans the nozzles in the heads.**
  - The wiper moves back and forth. It does not move up/down.
  - The wiper can be replaced by the customers.

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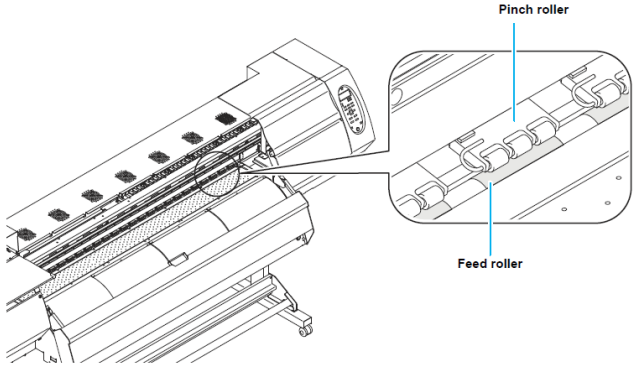
No additional notes

Pinch Rollers and Feed Rollers

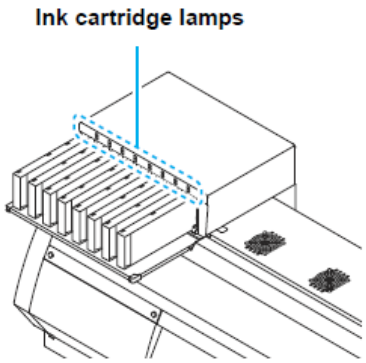


- **Keep the pinch rollers lifted up when this machine is not in use.**
  - Use the clamp lever to lift and lower the pinch rollers.
    - » See the diagram on the left side of the 'Machine Exterior View' slide earlier in this section.
- **If the pinch rollers are left lowered for a long time, they can be deformed and fail to securely retain the media.**

Slide 123

No additional notes

Ink Cartridge Lamps



- **Each cartridge has two lamps: red, and green.**
- **If the green lamp is lit, there is no problem.**
- **If the red lamp blinks slowly, the cartridge is almost empty, or is reaching the expiration date.**
- **If the red lamp blinks quickly, the cartridge has reached its expiration date.**
- **If the red lamp remains lit, ink has run out in that cartridge. Replace the cartridge immediately.**
  - If you keep the empty one in the machine, the automatic nozzle clearing process will not take place, and nozzles may get blocked.

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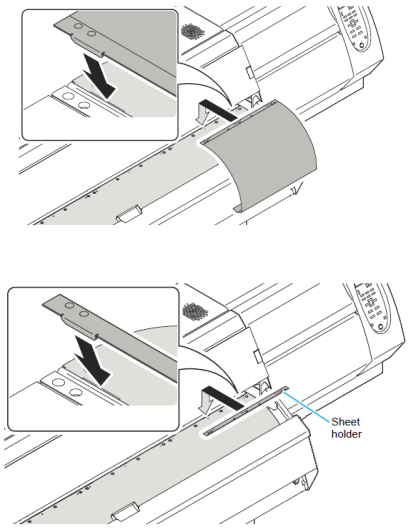
No additional notes

Antistatic Sheets



- Depending on the model, three or four antistatic sheets are provided, to prevent static electricity from causing problems with media feed.
- If the sheets are not attached, install the sheet holders anyway, or the temperature in the machine may become too low to dry the ink properly.

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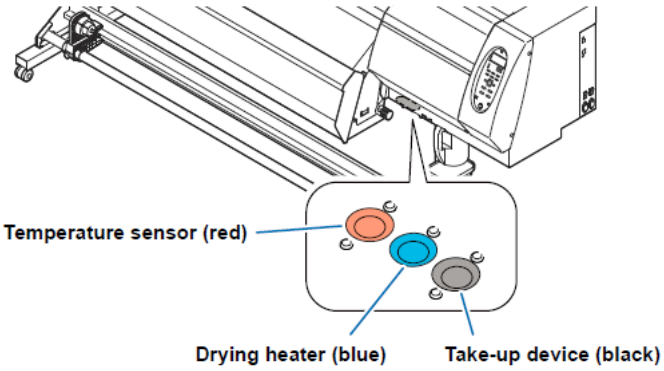
No additional notes

Connectors



- This shows the locations of these three connectors, sometimes referred to in the user's troubleshooting procedures.

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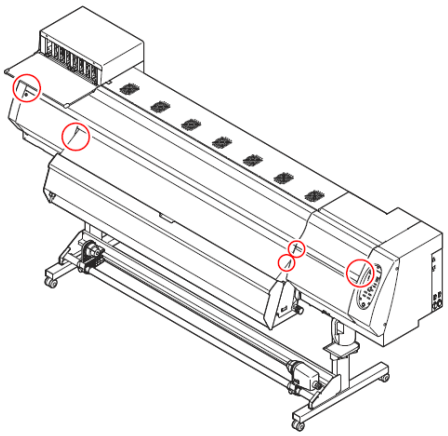
No additional notes

Interlock Switches



- These switches protect the customer if the cover is opened during printing.

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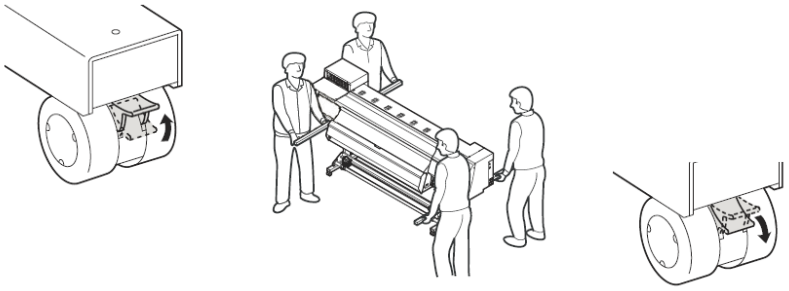
No additional notes

Moving the Machine
To a Location on the Same Floor

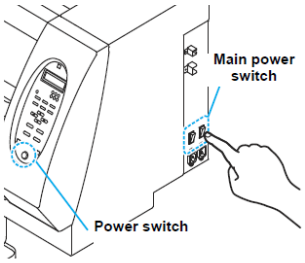


- Unlock the casters before moving.
- Do not push the covers.
- Lock the casters after moving.

Slide 128

No additional notes

Turning the Power On



- **Close the front cover and maintenance cover first.**
- **Then turn the two main power switches on.**
  - Normally, keep these on at all times, or the machine's automatic maintenance routines will be disabled and nozzles will get clogged.
- **Then press the operation switch on the operation panel.**
  - The machine initializes, and displays the firmware version.
  - Then the machine goes to standby mode.
    - » <LOCAL> is displayed, so this is often called LOCAL mode.

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No additional notes

Turning the Power Off

- **Use the operation switch on the operation panel only. Do not turn off the main power switches on the right side of the machine.**
  - Every 30 minutes, if the main power switches are still on, the machine wakes up and does automatic maintenance.

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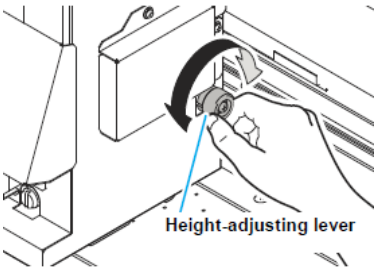
No additional notes

Adjusting the Head Height



- **Adjust the height before you set the media in the machine.**
  - First lift the lever to the H setting.
  - Then insert the media.
  - Then check by eye to see if the head height is appropriate.
    - » The head should not touch the media.
    - » The head should not be too far above the media, or the image will not be sharp.
- **There are three settings. Use the correct setting for the media type.**
  - L (1.8 mm), M (2.3 mm), H range (2.8 mm).

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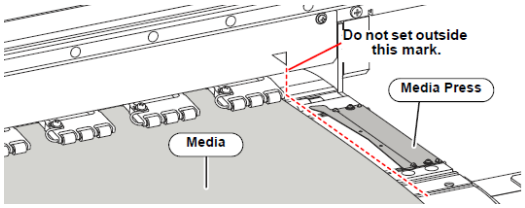
❒ If the image is not sharp, move the head closer.

Setting the Media



- Do not set the edge of the media outside the mark, or the print head could be damaged.
- If the media is set incorrectly, an error message is displayed anyway.
  - ERROR 516 MEDIA SET POSITION

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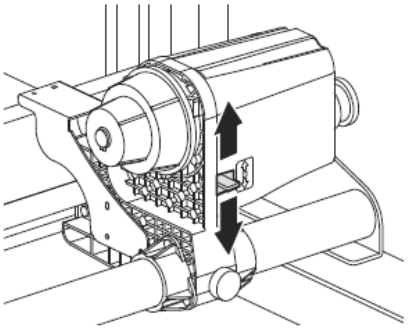
For full details of how to set a media roll, see the operating instructions.

Take-up Device



- **The take-up device collects the output and rolls it up.**
- **The device can be set up in one of three ways.**
  - Lever in top position (REVERSE): The take-up device winds the media with the printed side facing in.
  - Lever in middle position (OFF): The take-up device does not wind the media.
  - Lever in bottom position (FORWARD): The take-up device winds the media with the printed side facing out.

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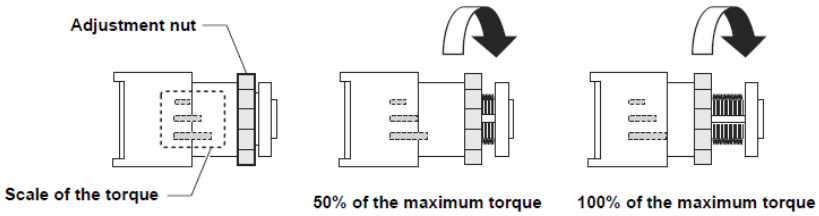
No additional notes

Take-up Device Torque Limiter



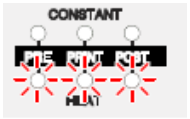
- The torque limiter is set at the maximum value when shipped from the factory.
- If the tension is too strong to use a thin sheet of media, lower the take-up torque.
  - Clockwise turn: Increases torque (a heavy and thicker media such as tarpaulin)
  - Counterclockwise turn: Decreases torque (For light media)
- When the torque limiter is too weak, the media cannot be taken up firmly.
- When the torque limiter is too strong, slack may occur depending on the media and can influence the image quality.

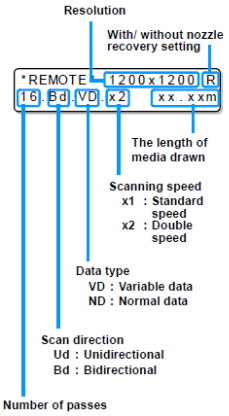
Slide 134

No additional notes

Printing Data

- **After you set the media, check that the three heater lamps are lit.**
- **Send data to be printed from the PC.**
  - The ACTIVE lamp blinks and the printing conditions are displayed.
  - If you want to stop printing, press the REMOTE key. If you then want to delete the received data, wait until LOCAL appears, then press DATA CLEAR then ENTER.
- **After printing, the drying heater dries the media ('Drying' is displayed). Press END if you want to stop this.**
- **To cut the media, press CUT then ENTER. Adjust the cutting position with the arrow keys then press ENTER again.**





Slide 135

No additional notes

Functions of Operation Panel Buttons

- **See the following section of the service manual for a map that shows what happens when you press each button.**
  - 6. Troubleshooting > Print Mode > LOCAL / REMOTE

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No additional notes

Function Menus

- Press the Function key.
- Press the down arrow key to select the following menus
  - SETUP
  - MAINTENANCE
  - MACHINE SETUP
  - INFORMATION
  - #ADJUST (available in service mode only)
  - #TEST (available in service mode only)

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No additional notes

Contents of the Function Menus

- **See the following sections of the service manual for a map that shows what is in each function menu.**
  - SETUP: 6. Troubleshooting > Print Mode > SETUP
  - MAINTENANCE: 6. Troubleshooting > Print Mode > MAINTENANCE
  - MACHINE SETUP: 6. Troubleshooting > Print Mode > MACHINE SETUP
  - INFORMATION: 6. Troubleshooting > Print Mode > MACHINE SETUP
  - #ADJUST: 6. Troubleshooting > Service Mode
  - #TEST: 6. Troubleshooting > Service Mode

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No additional notes

This section explains basic points about the various service modes and some important service functions.

Service Manual > 5. Service Table

Contents of the Service Mode Menus

- **See the following sections of the service manual for a map that shows what is in each service mode menu.**
  - #ADJUST: 6. Troubleshooting > Service Mode
  - #TEST: 6. Troubleshooting > Service Mode
  - Functions that are only available in service mode appear on the screen with a # at the left side.
- **For how to access service mode, see your technical supervisor.**

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No additional notes

Parameter Upload and Download

- **Turn on the operation panel power switch while pressing the Up and Down arrow keys.**
- **Then select either Upload or Download.**
  - Upload: The machine uploads parameters and log data to the host PC via USB.
  - Download: The machine downloads parameters and log data from the host PC via USB.
- **It is a good idea to do this at installation, and after every visit.**

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No additional notes

System Parameter Input

- Do not use this feature unless instructed by your technical supervisor.
- Be very careful when changing these values. An incorrect value could fatally damage the machine.
- Back up the parameters before making adjustments (see Parameter Upload and Download).

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No additional notes

Firmware Update

Normal Firmware Update

- Turn on the operation panel power while pressing [REMOTE].
- The machine receives new firmware from the host PC via USB, and updates the firmware on the main PCB.
- After firmware update, restart the machine by turning the power off/on.

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- Firmware update is available only when the machine is being turned on.

Firmware Update
After Changing the Main PCB

- Before you change the main PCB, upload the system parameters from the machine to a PC for a backup.
- Then change the main PCB.
- Turn on power while pressing [TEST].
- The latest firmware is automatically installed in the main PCB from the PC.
- Initialize the system parameters (set INITIAL to 1).
- Download the system parameters from the PC to the new main PCB.

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No additional notes

This section explains the basic points about the maintenance that is done by the user. See the operation manual for full details.

Overview

- **The tasks expected of the user can be subdivided as follows:**
  - Daily (start of each day): Make a test print to check the nozzles.
  - Daily (end of each day): The customer must clean the following parts at the end of every day.
    - » Head and surrounding area
    - » Wiper and capping station
      - – At this time, check the C absorber (this is a consumable part); replace if dirty
    - » Wiper
    - » Media press
    - » Media sensors
    - » Platen
    - » Exterior surfaces
    - » Heater covers
    - » Waste ink bottle (check if the bottle is full)
  - Weekly
    - » Maintenance of the White Ink Circuit
    - » Ink discharge path
  - Consumable Replacement
  - Preparation for Storage

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No additional notes

Maintenance by Users

Daily Care

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No additional notes

Daily Care (Start of Each Day)
Nozzle Check - 1

- **Make a test print.**
  - This was explained in the Installation section of the course.
- **If defective nozzles are found in the printout, there is a recovery procedure.**
  - A summary is on the next slide.
  - Also, there is a more detailed explanation later in this course in the 'Head Cleaning and Troubleshooting > Procedures for Customers' section.

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No additional notes

Daily Care (Start of Each Day)

Nozzle Check - 2

- **Recovering from Defective Nozzles**
  - First, do the normal head cleaning.
    - » Press the CLEANING key and select NORMAL.
  - If that does not improve the test print, do the hard head cleaning.
  - If that does not improve the test print, clean the nozzles.
    - » Maintenance menu – NOZZLE WASH
    - » Set the cleaning liquid time for 1 minute.
  - If that does not improve the test print, clean the nozzles again.
    - » Set the cleaning liquid time for 10 minutes.
  - If the test print is still not good, do the nozzle recovery mode.
    - » Maintenance menu - NOZZLE RECOVERY
  - Then make another test print, and if that is no good, replace the print head.

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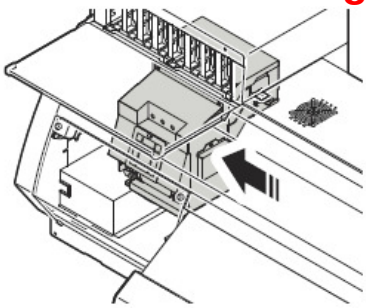
Operation Manual: Chapter 2 Basic Operations > Head Cleaning

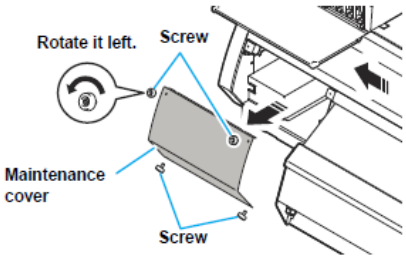
Operation Manual, Chapter 4 Maintenance > When Nozzle Clogging Cannot Be Solved

Nozzle recovery: Service Manual > 4. Replacement and Adjustment > Adjustment Items > Nozzle Recovery

Also see this course: Head Cleaning and Troubleshooting > Procedures for Customers

Daily Care (End of Each Day)
Cleaning the Head - 1





- Do this every day.
- Press the MAINT button, then press ENTER.
- Select HEAD MAINT on the display with the up/down arrow keys, then press ENTER.
  - The carriage moves to the left side of the machine.
- Remove the left maintenance cover (4 screws).

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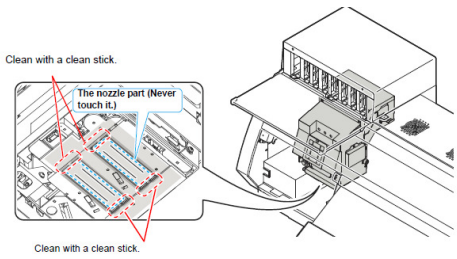
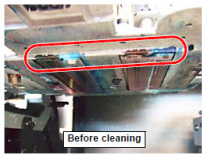
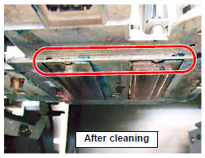
❒ Operation manual: Chapter 4 Maintenance > Cleaning the Head and the Area around It (every day)

Daily Care (End of Each Day)
Cleaning the Head - 2







- **Remove ink and dust from the base of the head with a cleaning stick.**
  - Clean around the head but never touch the nozzles.
- **Press ENTER after cleaning.**
- **Close the left maintenance cover and press ENTER.**
- **The machine initializes itself.**

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No additional notes

Daily Care (End of Each Day)
Cleaning the Wiper and Cap - 1

- **The customer should keep two wipers: one in the machine, and one being immersed in maintenance solution.**
- **Every day, the wipers should be exchanged and the caps cleaned.**
- **Required cleaning agents:**
  - Kim Wipe® (SPA-0207) – do not use any other type of cloth or wipe, because fragments may adhere to the wiper
  - Cleaning liquid from the Pro Maintenance Kit Type A
- **If a wiper is kept in the maintenance solution for longer than a day, it could become deformed.**
- **The maintenance solution should be changed once a week.**

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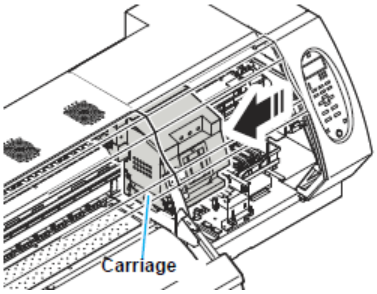
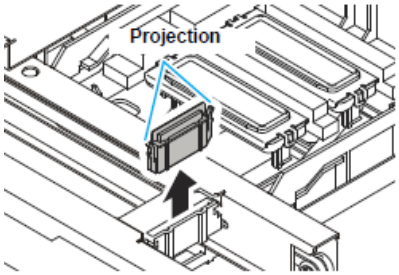
No additional notes

Daily Care (End of Each Day)
Cleaning the Wiper and Cap - 2





- **To take out the wiper, first move the carriage to the maintenance position.**
  - Press the MAINT button, then press ENTER.
  - Select STATION MAINT on the display with the up/down arrow keys, then press ENTER.
    - » The carriage moves to the maintenance position.
    - » Don't move the carriage by hand.

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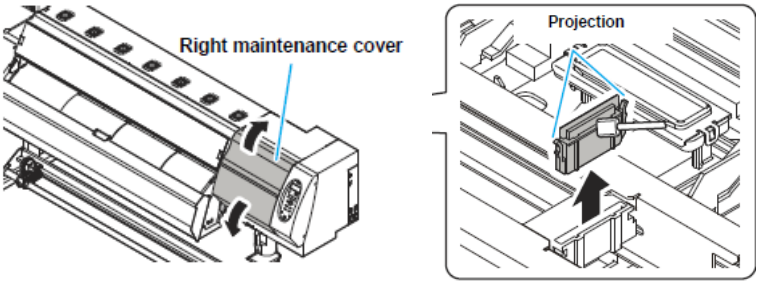
No additional notes

Daily Care (End of Each Day)
Cleaning the Wiper and Cap - 3

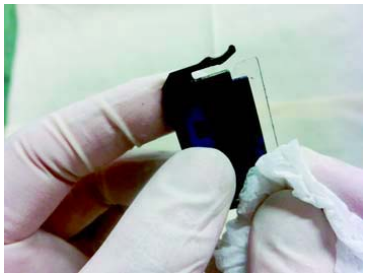


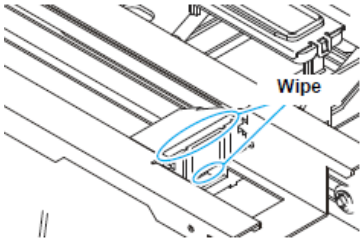
- Open the right maintenance cover then remove the wiper by holding the protrusions at its both ends.

Slide 154

No additional notes

Daily Care (End of Each Day)
Cleaning the Wiper and Cap - 4





- Take the other wiper out from the maintenance solution, and wipe it. Make sure that no fragments of media or cloth etc remain on the wiper surface.
- Clean the wiper slider with the cleaning liquid. Remove all solution after cleaning.

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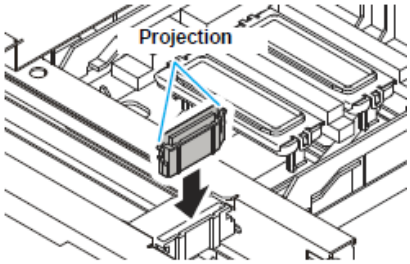
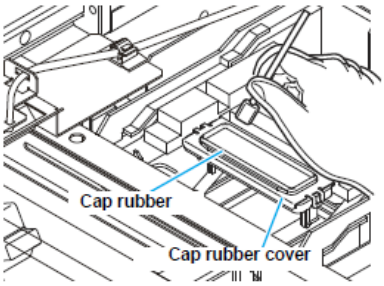
No additional notes

Daily Care (End of Each Day)
Cleaning the Wiper and Cap - 5





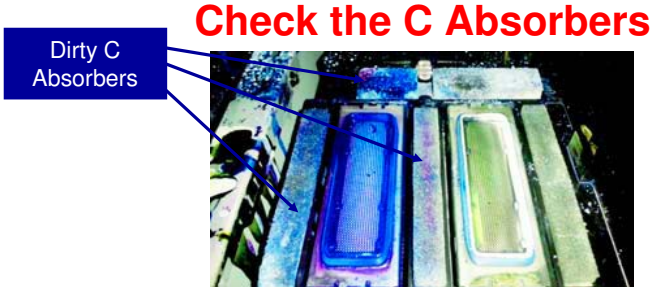
- Put back the wiper.
- Clean the caps (rubbers and covers) with cleaning liquid. Wipe off all solution after cleaning.
- After cleaning is finished, press ENTER, then close the maintenance cover and press ENTER again.
- The machine initializes itself.

Slide 156

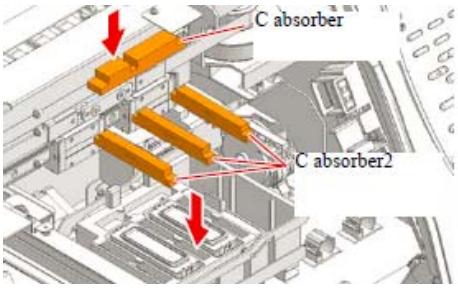
- Replace the wiper if it is deformed, if you cannot remove the ink that is stuck to it, or if the machine asks you to replace it. The user replaces the wiper at a set time, and the machine displays when it is time to replace the wiper.

Daily Care (End of Each Day)

Check the C Absorbers



- Replace if dirty



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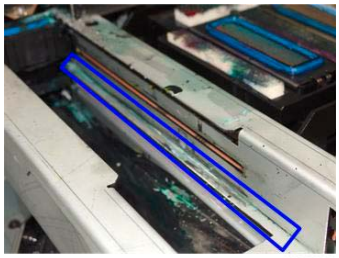
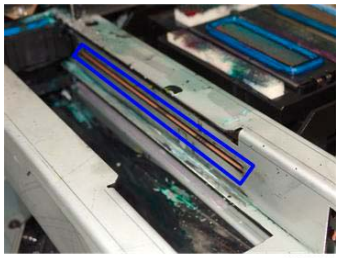
No additional notes

Daily Care (End of Each Day)
Clean the Wiper Slide Rail


m1522733

Correct


m1522734

Inorrect

- Remove ink with a cleaning stick dipped in maintenance solution.
- Clean the area shown in the diagram on the left.
- Do not clean the area shown in the diagram on the right.

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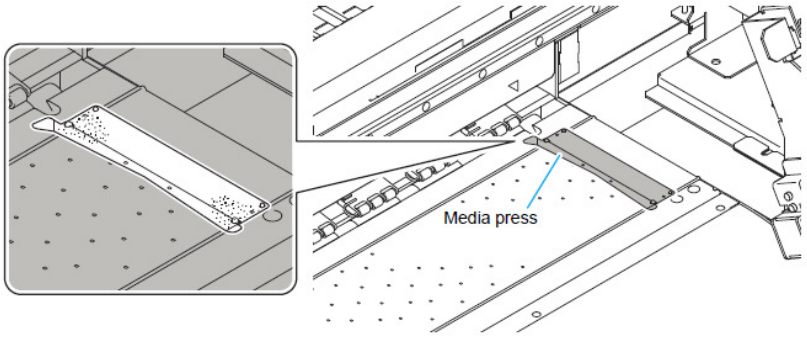
No additional notes

Daily Care (End of Each Day)
Media Press



- **Remove dust from the media press**
  - Such dust can interfere with media feed or block the nozzles
  - Use the cleaning liquid from the Pro Maintenance Kit Type A

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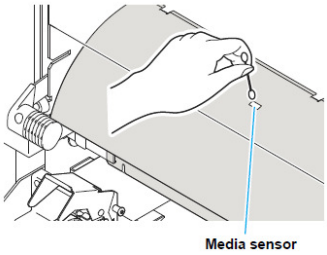
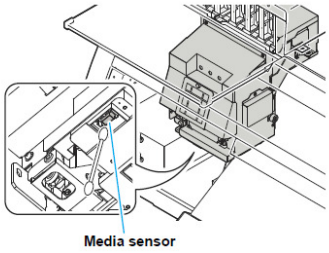
No additional notes

Daily Care (End of Each Day)
Media Sensors





- The media sensors are located on the platen in the backside and the bottom surface of the head. When the sensor is covered with dust, etc., it may cause false detection of media.
- Using a cotton swab, remove the dust, etc. accumulated on the surface of the sensor.
- To clean the sensor on the lower surface of the head, move the carriage to the left end (procedure is explained earlier) and then clean it.
- Do not use a solvent. If a liquid must be used, use a dilute solution of a neutral detergent in water.

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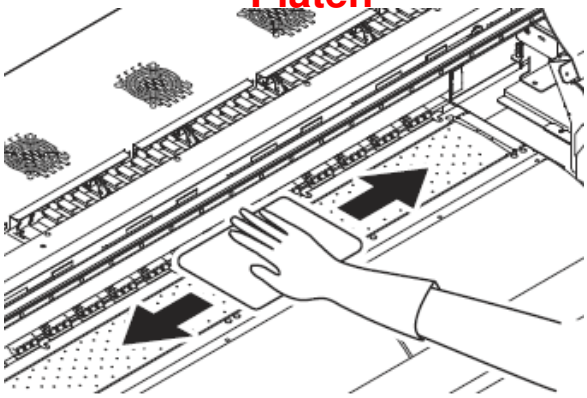
No additional notes

Daily Care (End of Each Day)

Platen



- Remove dust with a soft brush or dry cloth.
- If ink is present, wipe with a paper cloth and a small amount of cleaning liquid.
  - Use the cleaning liquid from the Pro Maintenance Kit Type A

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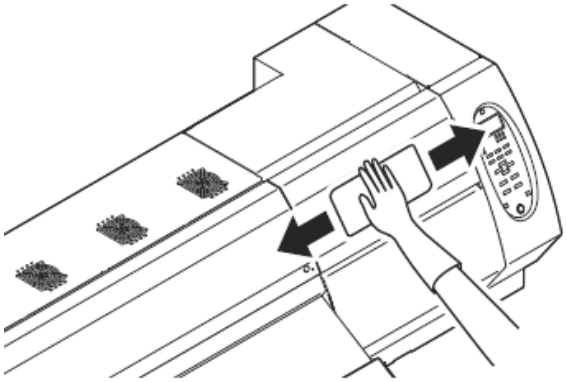
No additional notes

Daily Care (End of Each Day)
Exterior Surfaces



- Soft cloth and water
- Clean daily to prevent dust from entering sensitive parts of the machine

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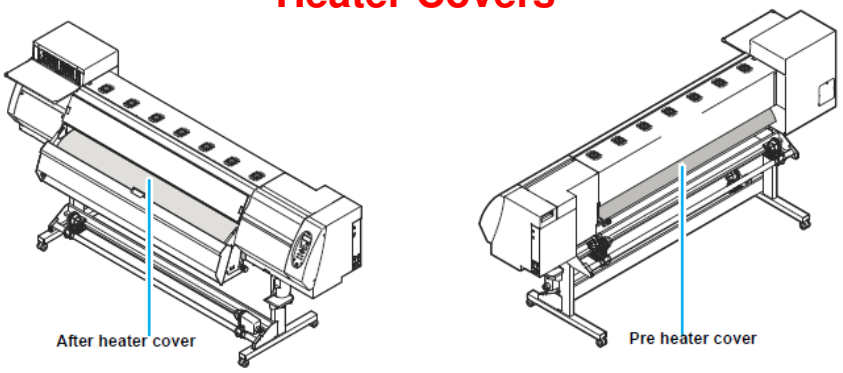
No additional notes

Daily Care (End of Each Day)
Heater Covers



- Soft damp cloth

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No additional notes

Daily Care (End of Each Day)

Waste Ink Bottle

- Check the bottle and empty if it is full.

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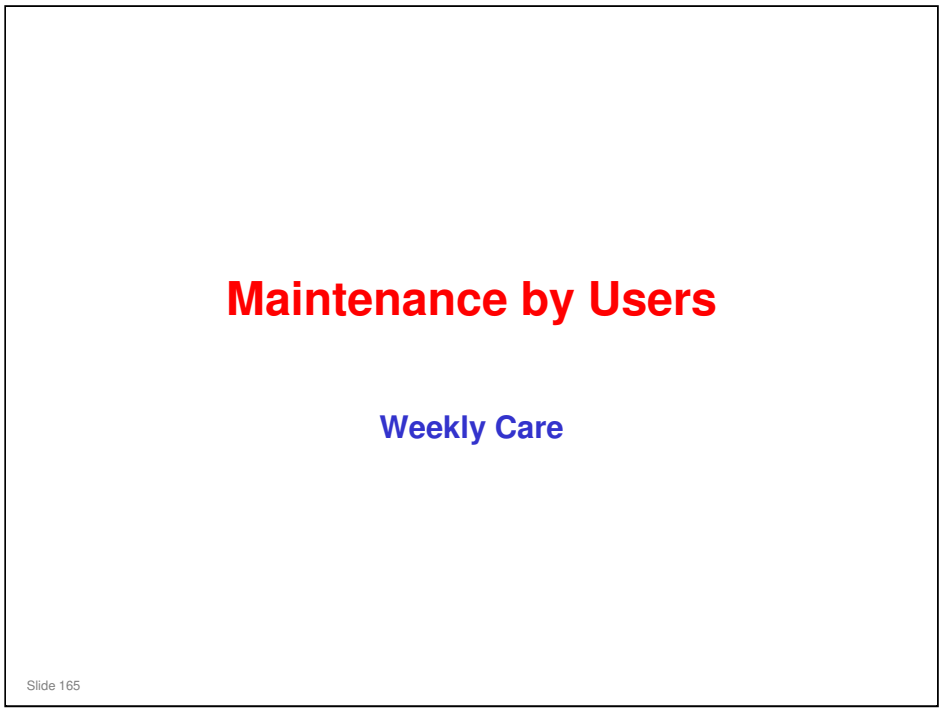
No additional notes



No additional notes

Weekly Care
Maintenance for White Ink

- Do this procedure once a week.
- If not printing for more than two weeks, white ink may precipitate in the ink cartridge or inside the machine.
- When ink precipitates, the nozzle may be clogged.
- Press the FUNCTION key, select the MAINTENANCE menu, and select WHITE MAINT.
- Automatic discharge and filling for the white ink is done.

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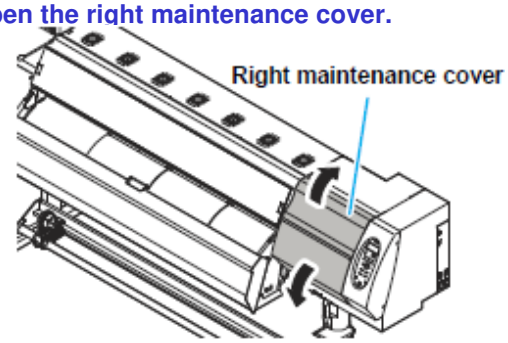
No additional notes

Weekly Care

Washing the Ink Discharge Path - 1

- Do this procedure at the end of every week (before the weekend) to prevent the ink nozzles from clogging.
- Press the MAINT button, then press ENTER.
- Select DISWAY WASH on the display with the up/down arrow keys, then press ENTER.
- Then, open the right maintenance cover.



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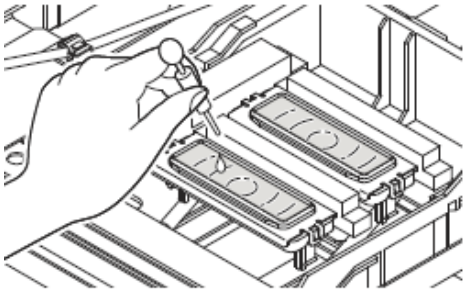
No additional notes

Weekly Care
Washing the Ink Discharge Path - 2



- Fill the cap with maintenance solution. Fill it up until it is almost overflowing.
- Close the maintenance cover and press ENTER.
- The machine cleans the ink discharge path. It takes about 30 seconds.

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No additional notes

No additional notes

Preparation for Short-term Storage

- **Do this procedure every week if the machine will not be used for a week or longer, but with the main power kept on. It cleans the head nozzles and ink discharge path.**
- **Press the MAINT button, then press ENTER.**
- **Select CUSTODY WASH on the display with the up/down arrow keys, then press ENTER.**
  - The carriage moves to the maintenance position.
- **Details of the procedure are in this section of the operation manual:**
  - Chapter 4 Maintenance > Maintaining the Capping Station > When the Machine Is Not Used for a Long Time (CUSTODY WASH)

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❒ Operation Manual: Chapter 4 Maintenance > Maintaining the Capping Station > When the Machine Is Not Used for a Long Time (CUSTODY WASH)

Preparation for Storage with Power Off

- **If the machine will be stored with power off, there could be nozzle errors when you start the machine again. So, the technician has to prepare the machine.**
  - This is explained in the 'Maintenance for Technicians' section of the course.
  - With this procedure, the ink supply tubes are also cleaned.

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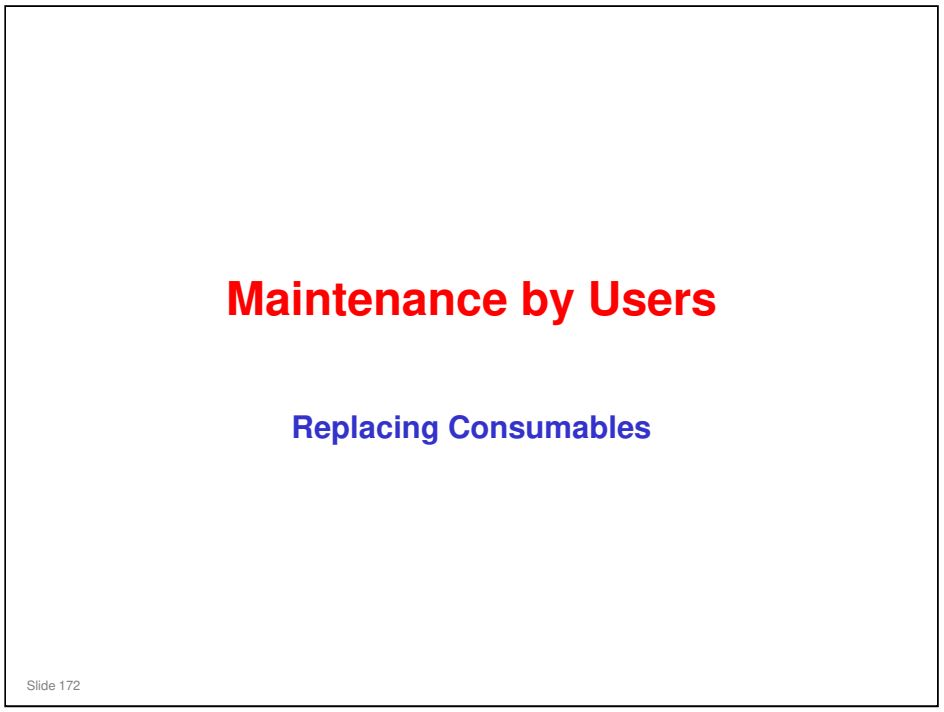
No additional notes



No additional notes

Replacing Consumables
Overview

- **The customer can replace the following consumables**
  - Wiper (removal was explained previously)
  - Waste ink bottle
  - Cutter blade
  - White ink filter
  - C absorbers

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No additional notes

Replacing Consumables
Waste Ink Bottle - 1

- Waste ink from head cleaning etc goes into the waste ink bottle.
- The machine estimates how much is in the bottle. When the bottle reaches 80% full, the display shows 'Check waste ink'.
- The user should look at the level in the bottle, and if it is not 80%, press the MAINTENANCE key, then adjust the amount with the arrow buttons on the operation panel.

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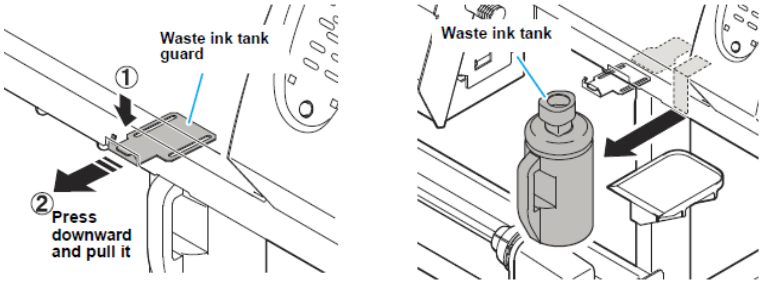
- Operation manual: Chapter 4 Maintenance > Replacing consumables > If a Waste Ink Bottle Confirmation Message Appears

Replacing Consumables
Waste Ink Bottle - 2



- **To remove the waste ink bottle:**
  - Press the waste ink bottle guard down and pull it towards the front.
  - Pull out the waste ink bottle. Put a cap on it and dispose of it in the correct manner.
- **After installing a new bottle, close the cover and press ENTER (this resets the counter).**

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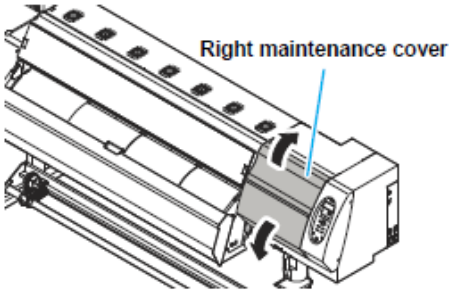
No additional notes

Replacing Consumables
Cutter Blade - 1

- The customer can replace this at any time.
- When replacing the cutter blade, place a sheet of paper under the cutter blade. This will help pick up the cutter blade if it drops.
- Move the carriage to the maintenance position.
  - Press MAINT, then select STATION MAINT
- Then open the right maintenance cover.



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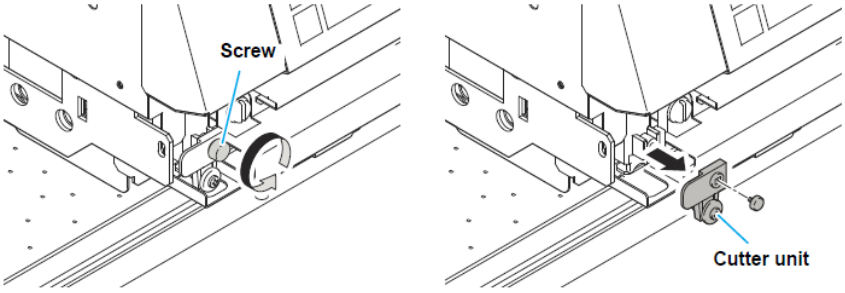
No additional notes

Replacing Consumables
Cutter Blade - 2



- Replace the cutter.
- Close the cover and press ENTER.

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No additional notes

Replacing Consumables
White Ink Filter - 1

- **The user must replace this at the following times:**
  - When 'Replace Filter (White) is displayed
  - When the machine detects an error when checking the ink pack or supplying ink
  - Missing nozzles for white ink cannot be recovered
- **After replacing the white ink filter, the user must:**
  - Fill up the white ink
  - Clear the life counter for the filter

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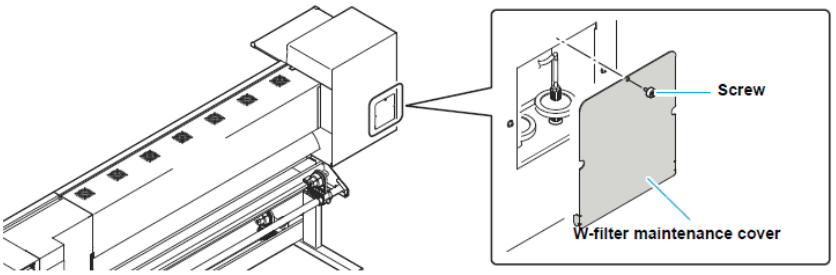
- Operation manual: Chapter 4 Maintenance > Replacing consumables > When white ink filter becomes required to be replaced

Replacing Consumables
White Ink Filter - 2



- Turn the power off (both switches must be off).
- Remove the maintenance cover for the white ink filter.

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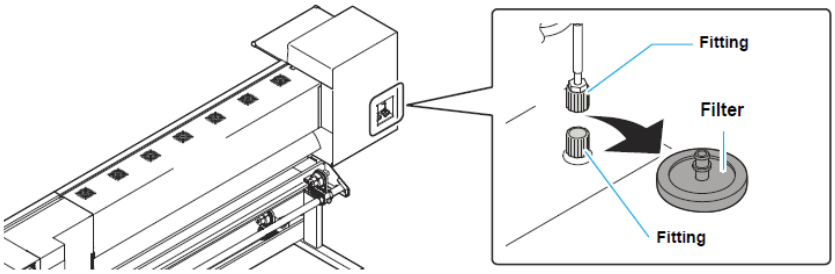
No additional notes

Replacing Consumables
White Ink Filter - 3



- Install a new filter.
- Make sure that the fitting is secure, or ink may leak.

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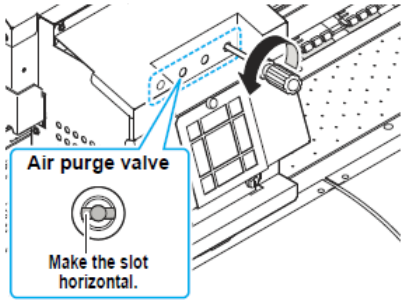
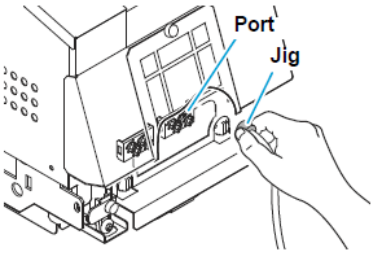
No additional notes

Replacing Consumables
White Ink Filter - 4

- **After replacing the cover, turn the power on.**
- **Fill up the white ink path, then purge air from the white ink path.**
  - Follow the procedure in the operation manual.
  - You will need to open the air purge valve and use the ink filling jig, as explained already in Ink Filling (Installation section).
    - » Wrap a paper towel around the port so that any leaks of ink do not get on the floor.





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No additional notes

Replacing Consumables
White Ink Filter - 5

- **To clear the counter, do the following:**
  - Press the FUNCTION key, select the INFORMATION menu, and select USAGE.
  - Press ENTER until Filter (White) appears.
  - Press the MAINT key, then press ENTER to reset the counter.

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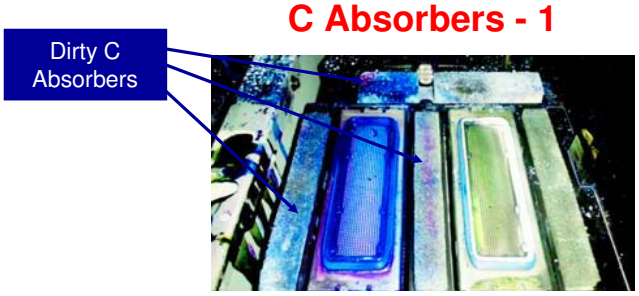
No additional notes

Replacing Consumables
C Absorbers - 1



- Press the MAINT button, then press ENTER.
- Select STATION MAINT on the display with the up/down arrow keys, then press ENTER.
  - The carriage moves to the maintenance position.
  - Don't move the carriage by hand.

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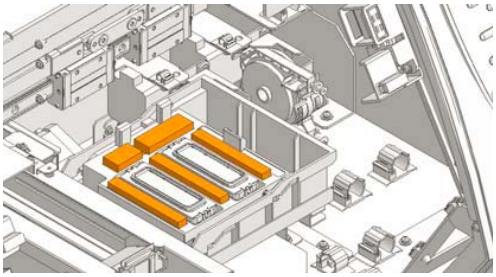
No additional notes

Replacing Consumables
C Absorbers - 2



- Open the right maintenance cover then remove the C absorbers.
- Press ENTER, then close the maintenance cover and press ENTER again.
- The machine initializes itself.

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No additional notes

This section explains the main points about maintenance. For full details, see the service manual.

Things to Check Before PM

- **Check the machine's condition.**
  - Make a backup copy of the machine parameters.
  - Make sure that the machine has the latest firmware.
  - Make sure that the user has been cleaning the
  - (check for missing nozzles or misdirected ink jets).
    - » Do the slant and drop position adjustments if necessary.

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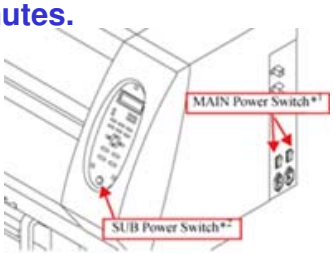
- Parameter upload procedure: Service Tables > Parameter Up/Download
- Firmware update: Service Tables > F/W Update
- Slant adjustment: Replacement and Adjustment > Mechanical Adjustment > Carriage slant adjust

Cautions (1)

- Before starting maintenance, turn off the operation panel power switch first, then the main power switch, then unplug the power cable from the power inlet on the machine, and wait for more than 15 minutes.



- Do not turn off the power during firmware updating. Doing so may disable restarting. The main PCB must be replaced.

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No additional notes

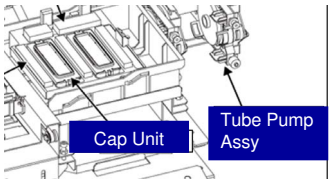
Cautions (2)

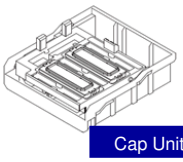
- When removing or installing dampers, take great care not to permit ink leakage and not to stain any parts with ink. A drop of ink on FFCs or connectors may cause a short circuit or poor electrical contact.
- Use the jog keys (arrow keys on the operation panel) to move the media (in the X direction) or the head (in the Y direction).
  - The media or head can be moved by hand with the power turned off. But move them slowly.
- Do not tilt the machine if ink cartridges are filled with ink. Doing so can cause ink leakage.
- Do not use organic solvents to clean the sensors or covers.

Slide 188

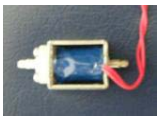
No additional notes

Items to Replace at PM




Cap Unit


Filter


Damper


Head Unit

- **Five parts**
  - Pump Assembly x 10 (suction x 2, pressure feed x 8)
  - Cap unit
  - Dampers x 4
  - Filters x 8
  - Head units x 2
- **The replacement procedures are in the service manual:**
  - Replacement and Adjustment > Ink-related Parts > Pump Assy (for Suction), Pump Assy (for Pressure Feed)
  - Replacement and Adjustment > Ink-related Parts > Cap Unit
  - Replacement and Adjustment > Ink-related Parts > Damper
  - Replacement and Adjustment > Ink-related Parts > Filter
  - Replacement and Adjustment > Ink-related Parts > Head Unit
- **Check the condition of the replaced parts, to see if the user is maintaining the machine correctly.**

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❒ The main points of the important replacement procedures are summarized later in this course.

PM Parts Replacement Cycle

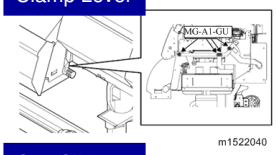
- Replace the parts on the previous slide once a year.
- However, if the print heads are still in good condition, do not replace them.

Slide 190

No additional notes

Items to Lubricate at PM

Clamp Lever



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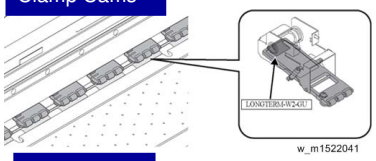
Clamp Cams



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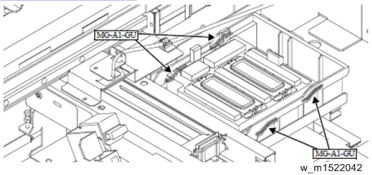
Cap Slider



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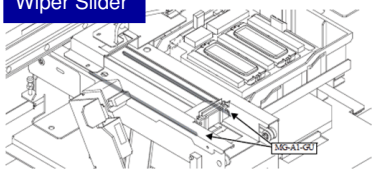
Wiper Slider



w_m1522043

- Clamp Lever: Use MG-A1-GU
- Clamp Cams: Use LONGTERM-W2-GU
  - Apply grease to all the cams.
- Cap Slider: Use MG-A1-GU
- Wiper Slider: Use MG-A1-GU

Slide 191

No additional notes

Tests at PM

- **Sensor test: In the #TEST menu, select SENSOR. Test all the sensors.**
  - Service manual > Troubleshooting > Test Function > SENSOR TEST
- **Operation test: In the #TEST menu, select ACTION TEST. Do all the tests.**
  - Service manual > Troubleshooting > Test Function > ACTION TEST
- **Linear encoder test: In the #TEST menu, select CHECK ENCODER.**
  - Service manual > Troubleshooting > Test Function > CHECK ENCODER
  - Checks the operation of the linear encoder and the motor encoder by moving the slider.
  - "M: xxx E: xxx" is displayed on the lower row of the LCD. M shows the coordinates of the motor encoder, and E shows the coordinates of the linear encoder.
  - With the left and right arrow keys, you can move the slider left and right and check that the numbers change also.
- **Check the counter values: In the #ADJUST menu, select REPLACE COUNTER and check the following.**
  - Hours of use
  - Printing area
  - Printing length
  - Scan count
- **Backup machine parameters again, after all adjustments are made**
- **Make a test pattern**

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No additional notes

Storage with Power Off, or Transportation

- **Before storing the machine with power off (maximum length two weeks), or before transporting the machine.**
  - Use the original packaging materials to transport the machine.
- **Details of the procedure are not available at this time, and will be supplied later.**

Slide 193

No additional notes

This section explains the main points about the most important replacement and adjustment procedures. For full details of all procedures, see the service manual.

Overview

- **We will take a look at the main points about the following procedures.**
  - Damper replacement
  - Head replacement
  - Cap assembly replacement
  - Pump ass'y (for suction) (ink supply pump) replacement
  - Y motor adjustment (belt position adjustment after replacement)
  - Cutter position adjustment
  - Wiper adjustment
  - Capping adjustment,
  - PCB replacement procedures
  - Color change procedure
- **For full details of all replacement and adjustment procedures, see the service manual.**

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No additional notes

Caution

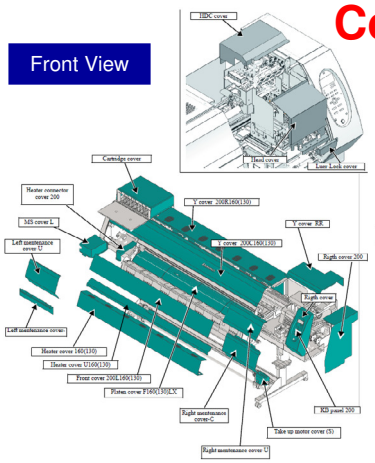
- **Turn off the main power and disconnect the power cord, then wait 15 minutes before you start to disassemble the machine.**
  - Capacitors in the power supplies need to discharge. Sometimes the machine wakes up if these capacitors are not discharged.
- **When removing and replacing components, follow the instructions in the service manual, paying special attention to notes and cautions.**

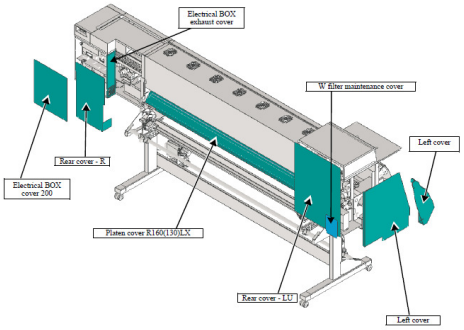
Slide 196

No additional notes

Covers

Front View





Rear View

- **The service manual has diagrams to show where the covers are.**
  - Service Manual > Replacement and Adjustment > Common Procedures > Cover Layout

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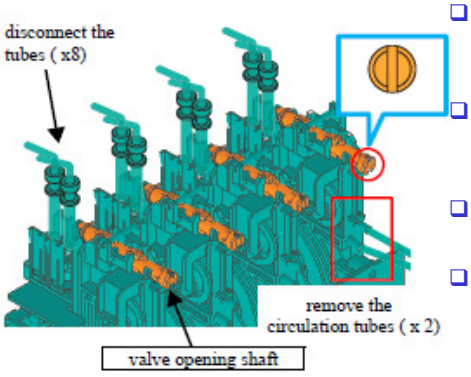
Service Manual > Replacement and Adjustment > Common Procedures > Cover Layout

Replacing the Dampers - 1

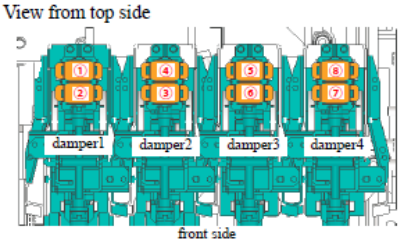


- Wrap paper towels around the heads to prevent leaks.
- Disconnect all ink supply tubes at the top of the dampers.
- For the circulation tubes, only disconnect the tubes for white ink.
- Make sure that the valves are closed (the notch is vertical).
- Discharge ink from the dampers:
  - In the #ADJUST menu, select DAMPER, then DISCHARGE.

Slide 198

- Replacement and Adjustment > Ink-related Parts > Damper
- Replacement and Adjustment > Adjustment Items > Damper Discharge
- Replacement and Adjustment > Adjustment Items > Damper Fillup

Replacing the Dampers - 2



- **Turn off the power.**
- **Disconnect all tubes.**
- **Replace the dampers.**
- **Install them the correct way around, as shown in the diagram.**
- **Fill the dampers with ink :**
  - In the #ADJUST menu, select DAMPER, then FILLUP.
  - Open the air purge valves again (the notch is horizontal).
  - Purge air from the dampers, then fill them with ink.
  - Then close the valves and cleaning starts automatically.

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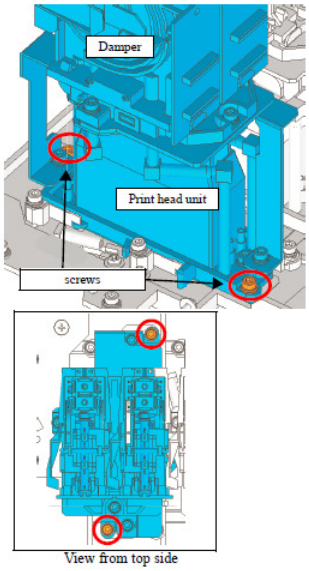
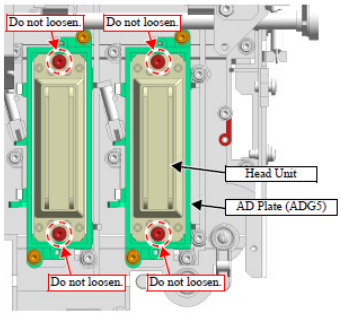
No additional notes

Replacing the Heads - 1



View from top side

- First, disconnect and discharge the dampers.
- Remove two screws at front and rear of the head unit. Do not touch the other screws. It is not possible to re-adjust correctly in the field.



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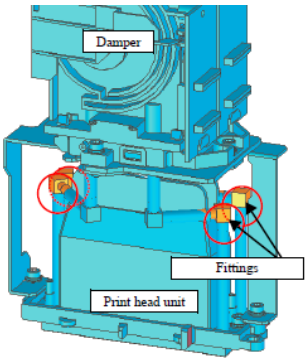
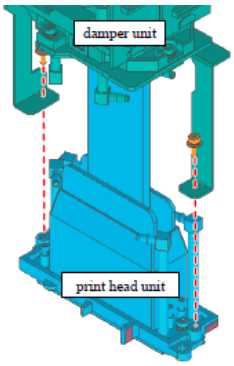
- Replacement and Adjustment > Ink-related Parts > Head Unit
- Replacement and Adjustment > Adjustment Items > Damper Discharge
- Replacement and Adjustment > Adjustment Items > Damper Fillup

Replacing the Heads - 2





- Take out the head and dampers.
- Remove the Fittings from the tube between the damper and the head unit.
  - Each damper has 2 fittings at front and rear, i.e., each head has 4 fittings.
- Remove the damper unit from the print head unit.

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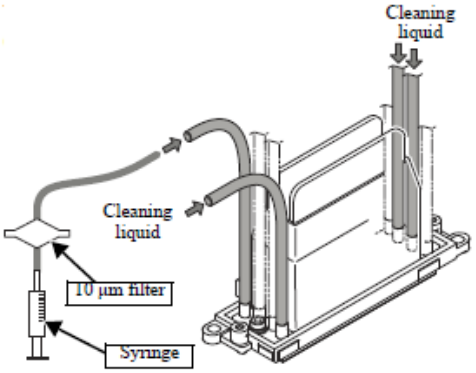
No additional notes

Replacing the Heads - 3



- Wet the inside of each nozzle with cleaning liquid 03 (approx. 10cc) before assembling.
- When supplying the liquid, supply the liquid slowly (without applying force), using a syringe and a 10 µm filter.
- After reassembly, do the damper fillup procedure.
- Do the PRINT ADJUST procedure after replacing a print head.

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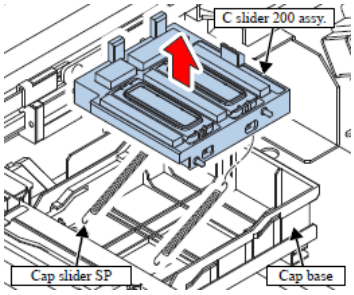
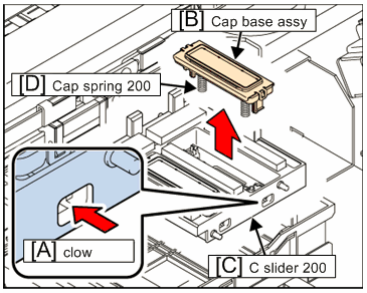
No additional notes

Replacing the Caps





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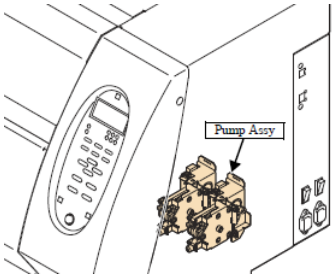
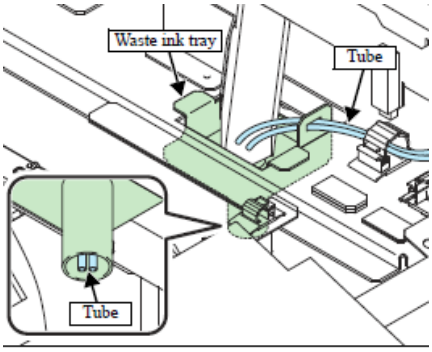
- Move the head unit away manually.
- Disconnect the two springs and remove the cap assembly.
- On each cap, release the claw and pull out the cap.

Slide 203

❒ Replacement and Adjustment > Ink-related Parts > Cap Base Assy

Replacing the Ink Supply Pump





- After replacement, make sure that the tubes from the discharge side of the pump are within the pipe of the waste ink tray.
- Make sure that the tubes do not stick out from the pipe of the waste ink tray.

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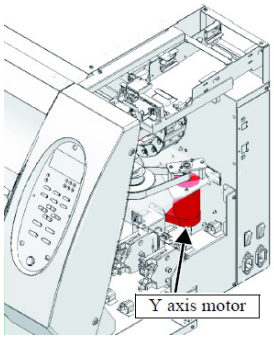
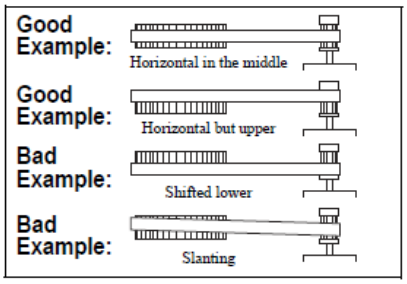
❒ Replacement and Adjustment > Ink-related Parts > Pump Assy (for Suction)

Replacing the Y Motor





- **When reassembling, mount the Y-axis motor so that the belt is horizontal on the Y drive pulley.**
  - In the center is best, but on the upper edge is also acceptable.

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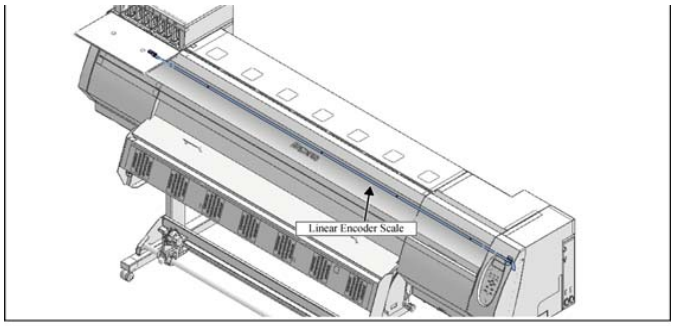
No additional notes

Linear Encoder Scale



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- **Do not touch the scale. Wipe any fingerprints away with a neutral detergent.**

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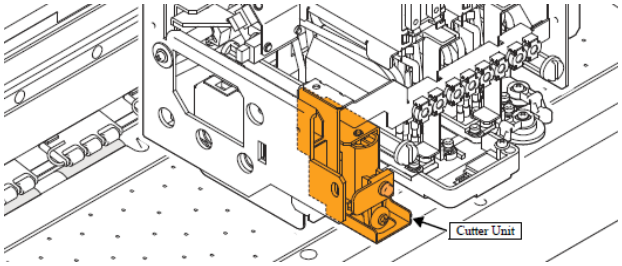
Service Manual > Replacement and Adjustment > Driving Parts > Linear Encoder Scale

Cutter Unit - 1



- After you install a new cutter unit, you have to adjust the location in the main-scan direction (across the media).
- To make this adjustment, the screws must be secured loosely, and the clamp lever must be lowered, with the head height at the L setting.

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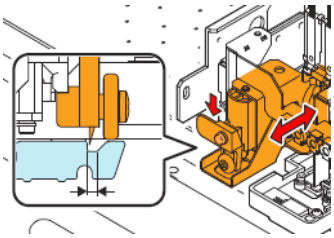
Service Manual > Replacement and Adjustment > Driving Parts > Cutter Assy

Service Manual > Replacement and Adjustment > Mechanical Adjustment > Adjustment of the Mounting Location for the Cutter

Cutter Unit - 2

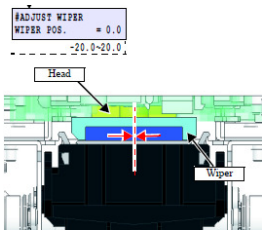


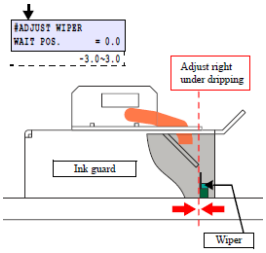
- **Align the front and back of the cutter unit. Lower the cutter blade until it fits into the notch in the platen. Then determine the front and back position of the unit and fix it using the screws.**
- **Move the head unit manually and push down the cutter blade assembly at right, center and left on the platen, to check back-front positioning.**
  - On rare occasions, the blade comes out of the slot because of assembly errors or fluctuation in component dimensions. In such a case, adjust again to the optimum position where the blade is always completely in the slot on the platen.

Slide 208

No additional notes

Wiper Position Adjustment





- **In the #ADJUST menu, select ADJUST WIPER.**
  - WIPER POS: Adjust the horizontal position of the wiper with the left and right arrow keys, so that the center of the wiper is at the center of the head.
  - WAIT POS: Liquid from the flushing cartridge at the rear of the machine enters via a tube at the top of the wiper, when the wiper is at its home position. Adjust the front-to-rear position of the wiper with the up and down arrow keys so that the center of the wiper is directly under the dropping position.

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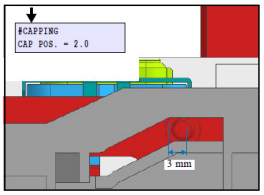
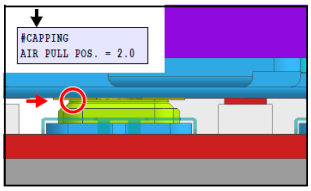
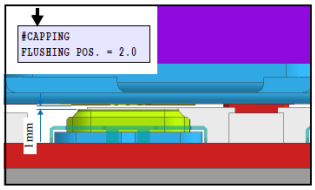
Service Manual > Replacement and Adjustment > Adjustment Items > ADJUST WIPER

Capping Adjustment







- **In the #ADJUST menu, select CAPPING.**
  - CAP POS: Adjust with the left and right arrow keys until the slider is 3mm to the right
  - AIR PULL POS: Adjust with the up and down arrow keys until the head contacts the rubber part at the left.
  - FLUSHING POS: Adjust with the left and right arrow keys until the clearance between the head and the left end of the cap is 1 mm.

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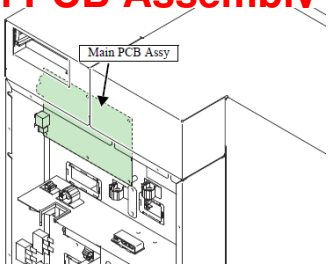
Service Manual > Replacement and Adjustment > Adjustment Items > CAPPING

Electrical Components
Main PCB Assembly



- **Before you change the main PCB, upload the system parameters from the machine to a PC for a backup, using the Parameter Upload procedure.**
  - This is because it is not possible to move the ROM from the old board to the new one.
- **After installing the new PCB:**
  - First, install the latest firmware.
  - Then, download the system parameters from the PC to the new main PCB.

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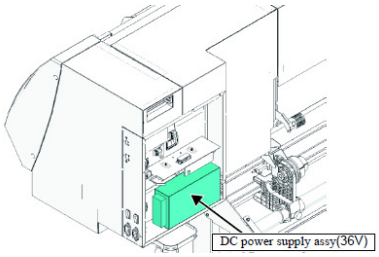
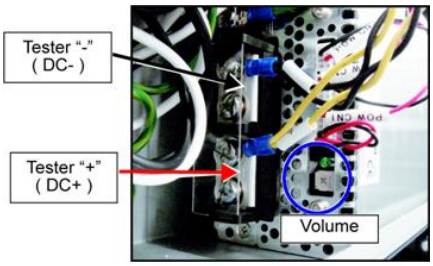
No additional notes

Electrical Components

DC Power Supply (36V)

- **Before you replace the covers, adjust the new power supply using the potentiometer ('volume') on the terminal block. The output must be 37V, not 36V.**





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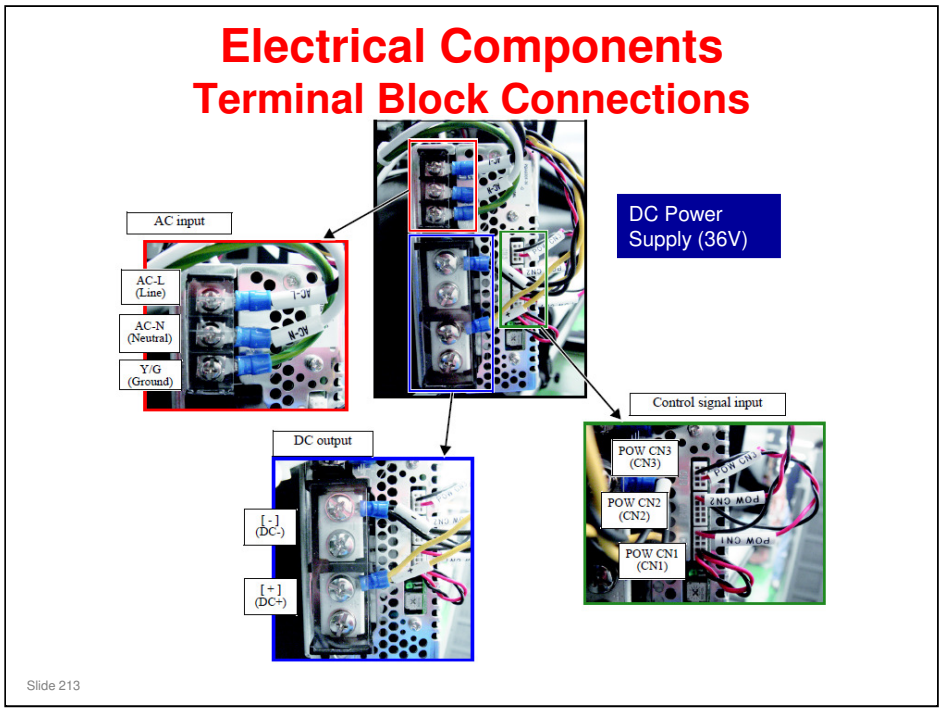
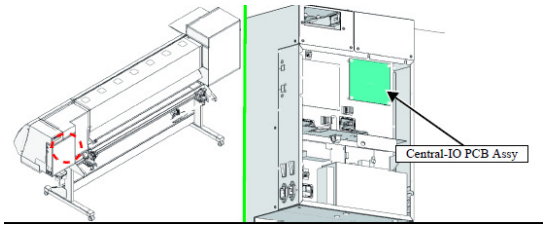
Service Manual > Replacement and Adjustment > Electrical Parts > DC power supply assy (36V)



No additional notes

Electrical Components
Central I/O PCB Assembly



- **First, upload the machine's parameters to a PC.**
  - If the procedure for changing parameter 107 is done correctly, it will not be necessary to use these parameters. But, if you make a mistake, it may be necessary to recover the machine's parameters.
- **Then replace the board.**
- **Then start the machine in system parameter input mode.**
  - Consult your supervisor for how to enter this mode. Be very careful when using this mode.
- **Change system parameter No.107 from "0" to "10".**

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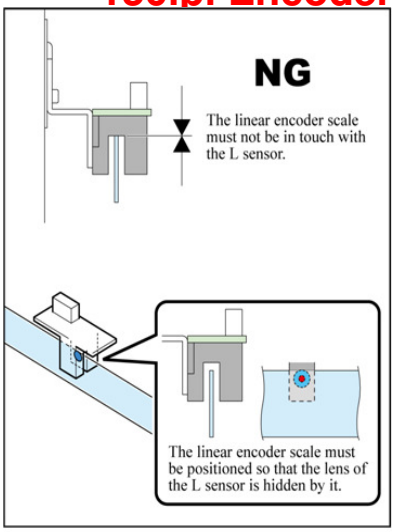
- If you do not start the printer in system parameter mode, turn off the main power switch. Then start up the printer in System Parameter Mode.
  - Do not turn off the printer with the sub power switch on the operation panel. In addition, do not change any parameters while the machine is in this state. This is because the backup data on the main circuit board is rewritten and therefore the data will not be restored the same as before the replacement.
  - If the printer is turned off with the sub power switch, you can recover the machine as follows: Input the system parameter INITIAL= "2" and initialize all parameters, then download the parameters that were uploaded at the start of the procedure. Then, it is not necessary to change system parameter 107.

Electrical Components

150lpi Encoder PCB Assembly



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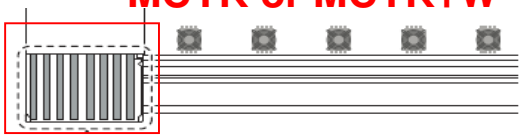
- **After installing the new board, do the following adjustment:**
  - Service Manual > Replacement and Adjustment > Mechanical Adjustment > Positioning of the Encoder Sensor
  - The sensor must be positioned as shown on the left.
  - After doing the adjustment and securing the bracket, do the Check Encoder procedure.
    - » Service Manual > Troubleshooting > Test Function > Check Encoder
    - » This allows you to move the slider left and right to make sure that the mechanism moves freely.

❒ Check Encoder was described already in the Tests at PM slide.

Color Change
MCYK or MCYK+W



4 colors	M	M	C	C	Y	Y	K	K
6 colors	M	M	C	C	Or	G	Y	K
6 colors + white	M	Or	C	G	Y	K	W	W

- **This was explained during the Installation section.**
- **However, if you change the ink connections after the machine has already been in use, you must do the following first:**
  - Execute [#ADJUST] — [HEAD WASH] to discharge the ink.

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No additional notes

#ADJUST Menu

- **For a flow chart of the functions available in this menu, see the following section of the service manual.**
  - Troubleshooting > Service Mode > #ADJUST
- **For descriptions of each test, see the following section of the service manual.**
  - Replacement and Adjustment > Adjustment Items
- **Do not use the following items. They are for design and factory use only.**
  - DEALER, LAN CONFIG, HEAD VOLT ADJ

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- LAN CONFIG is disabled. The machine communicates only by USB.

This section explains the basic points about troubleshooting that is done by the user. See the operation manual for full details.

Head Cleaning Procedures for Customers

- **When LOCAL is displayed, press the CLEANING key two times.**
- **Then with the up and down arrow buttons, select one of the following:**
  - SOFT: When lines are bent, or when any line is missing
  - NORMAL: When any line is missing, or when colors are mixed
  - HARD: When poor image quality cannot be improved by NORMAL or SOFT cleaning
- **Select either head 1, or head 2, or both heads.**
- **Do a test print after cleaning.**

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- See ‘Basic Operations’ in the operation manual for full details.
- Cleaning consists of suction to the head, wiping, and flushing.
- The difference between NORMAL, SOFT, and HARD is the duration of the suction phase.

Setting Up Automatic Cleaning - 1

- Press the FUNCTION key.
- In the SETUP menu, select AUTO CLEANING.
- Set a cleaning interval between 1 and 1000 pages.
- Set either NORMAL, SOFT, or HARD.
- At the end of the job, head cleaning is done if the number of pages since the last head cleaning is over the limit.

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Operation manual > Chapter 3 Extended Functions > Setting Auto Cleaning

Setting Up Automatic Cleaning - 2

- **You can set up the machine to perform refresh and cleaning operations at regular intervals.**
- **Press the FUNCTION key, select the MAINTENANCE menu, and select AUTO MAINT from this menu.**
  - Refresh: A small amount of ink is ejected from the nozzles to prevent clogging.
    - » You can select Lv1, Lv2, or Lv3. The higher the number, the shorter the interval between refreshes.
  - Cleaning: Soft, Normal, or Hard cleaning can be selected at regular intervals.
    - » You can select Lv1, Lv2, or Lv3, as above.
    - » There is a separate setting for white ink, which normally requires stronger cleaning than for the other inks.

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Operation manual > Chapter 4 Maintenance > Automatic Maintenance Function

If Cleaning Did Not Solve the Problem

Overview

- **If the procedures on the previous slide do not return the machine to normal operation, then there are three more procedures that the customer can do.**
  - Washing the nozzles
  - Wiping the nozzles
  - Selecting alternative nozzles for printing
  - Air purge

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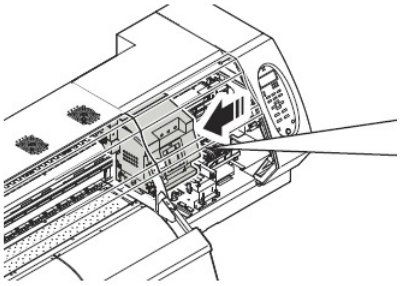
No additional notes

If Cleaning Did Not Solve the Problem

Washing the Nozzles - 1

- **If the machine is in an ink end or ink near-end state, add new ink before you start this procedure.**
- **Press the MAINT button, then press ENTER.**
- **Select NOZZLE WASH on the display with the up/down arrow keys, then press ENTER.**
  - The carriage moves to the maintenance position.



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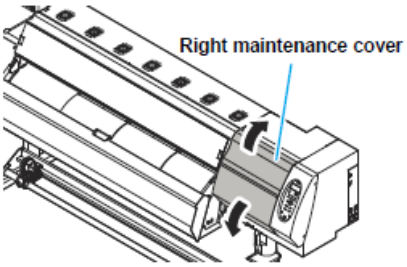
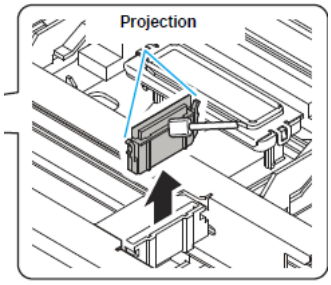
Operation Manual > Chapter 4 Maintenance > When Nozzle Clogging Cannot Be Solved > Washing of Head nozzle

If Cleaning Did Not Solve the Problem
Washing the Nozzles - 2





- Then, open the right maintenance cover.
- Clean the wiper and bracket with maintenance solution. Remove all maintenance solution after cleaning. Then put the wiper back in the machine.

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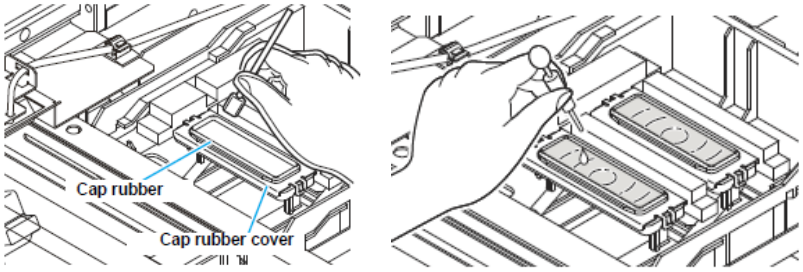
No additional notes

If Cleaning Did Not Solve the Problem

Washing the Nozzles - 3



- Clean the cap rubber and cover.
- Fill the cap with maintenance solution. Fill it up until it is almost overflowing.
- Close the maintenance cover and press ENTER.
- Input a time at the operation panel. The liquid stays in the cap until the time runs out. Then the ink discharge path is washed.
- Then fill the cap again, and press ENTER. The solution stays in the cap during the selected time.

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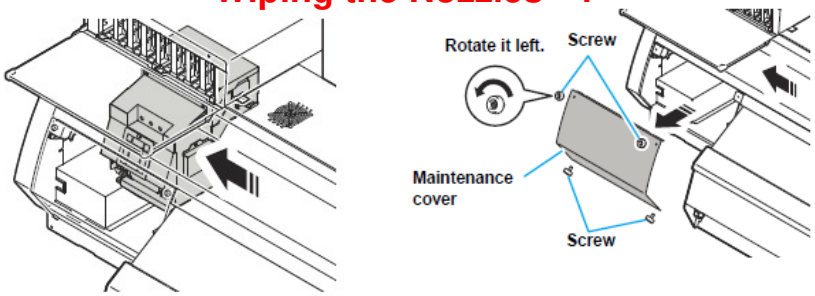
No additional notes

If Cleaning Did Not Solve the Problem

Wiping the Nozzles - 1



- If the problem is still not solved, wipe the nozzles with cleaning liquid 03 as explained below.
- Press the MAINT button, then press ENTER.
- Select HEAD MAINT on the display with the up/down arrow keys, then press ENTER.
  - The carriage moves to the left side of the machine.
- Remove the left maintenance cover (4 screws).

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Operation Manual > Chapter 4 Maintenance > When Nozzle Clogging Cannot Be Solved > Washing nozzle surface

If Cleaning Did Not Solve the Problem

Wiping the Nozzles - 2

- Soak a cotton cloth (COTTON CIEGAL®) in the cleaning liquid.
- Wipe the nozzle surface from the rear to the front twice or three times.
- Do not rub strongly.
- After cleaning, press ENTER. Then replace the cover and press ENTER again.
- After the machine initializes itself, do the head cleaning procedure explained earlier (Head Cleaning Procedures for Customers).

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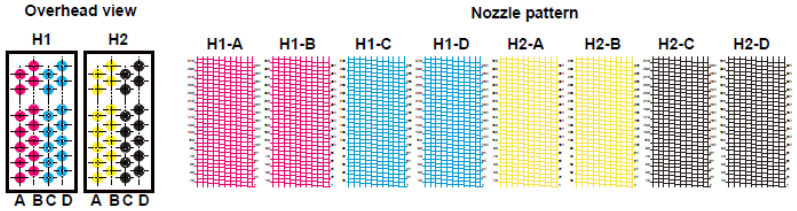
- COTTON CIEGAL®: Fibers do not easily detach from this cloth when used for wiping a component. It is included in the Pro Maintenance Kit Type A.

If Cleaning Did Not Solve the Problem

Selecting Alternative Nozzles - 1

- When nozzles missing can not be improved at specific points, other good nozzles can be used as alternatives for printing.
- Press the FUNCTION key, then select the MAINTENANCE menu, and press ENTER.
- In this menu, select NOZZLE RECOVERY, and press ENTER.
- To make a test pattern, select PRINT then press ENTER.



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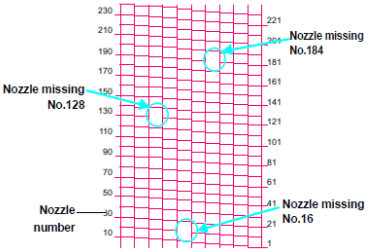
Operation Manual > Chapter 4 Maintenance > When Nozzle Clogging Cannot Be Solved > Alternative nozzles for printing, when nozzles missing can not be improved

If Cleaning Did Not Solve the Problem
Selecting Alternative Nozzles - 2



- **Study the test chart. Look for defective nozzles.**
- **First, select the pattern that contains the defect.**
  - For example, use the arrow keys to select H1 A.
- **For each pattern, you can select up to 10 nozzles that are defective.**
  - In this example, there are 3 defective nozzles.
  - If you access this procedure while you are in service mode, you can set up to 26 defective nozzles.
- **Input the numbers (from 1 to 10) and the corresponding nozzle numbers using the arrow keys. Press the ENTER key after selecting each value.**
- **Press the END key several times after you have finished inputting numbers.**

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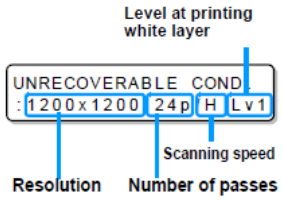
No additional notes

If Cleaning Did Not Solve the Problem

Selecting Alternative Nozzles - 3

- The machine will now adjust itself to avoid the defective nozzles.
- However, in some cases, alternative nozzles cannot be selected.
- To check if this has happened, do the following.
- Select NOZZLE RECOVERY in the MAINTENANCE menu, as before.
- Select CHECK with the up/down arrow keys.
- When you press ENTER, the display shows 'NONE' if alternative nozzles could be selected.
- Otherwise, some data is displayed, as shown below, and the wording UNRECOVERABLE.
  - If this occurs, first check the cap position, then try head cleaning and air purge. If this does not solve the problem, replace the head.



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No additional notes

If Cleaning Did Not Solve the Problem

Selecting Alternative Nozzles - 4

- **If you wish to reset the allocation of nozzles to the default settings (after you replace a head, for example):**
  - Select NOZZLE RECOVERY in the MAINTENANCE menu, as before.
  - Select RESET with the up/down arrow keys.
  - Select the nozzle that you want to reset (for example, H1 A) and press ENTER.

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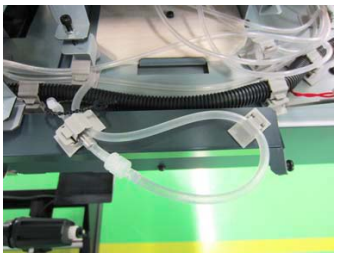
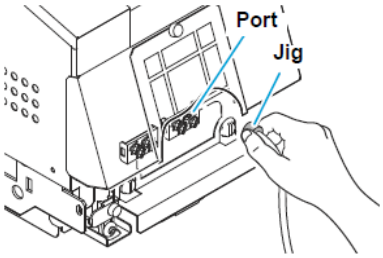
No additional notes

If Cleaning Did Not Solve the Problem

Air Purge - 1

- Do this procedure if missing nozzles cannot be solved, especially if the machine has not been used for a long time (for about two weeks).
- Press the FUNCTION key, then select the MAINTENANCE menu, and press ENTER.
- In this menu, select AIR PG, and press ENTER.
- Select either MMCC or YYKK.
  - The corresponding head moves to the wiper.
- Connect the jig to the port that corresponds to the selected head (MMCC or YYKK).





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Operation Manual > Chapter 5 Troubleshooting > Troubleshooting > When nozzle missing occurs due to ink mixture or aeration

If Cleaning Did Not Solve the Problem
Air Purge - 2

- **Press ENTER to start the purge.**
- **Wait until about 10cm of ink has flowed into the jig, then press ENTER to stop the purge.**
  - The head moves back to the capping position.
- **Disconnect the jig (use a paper towel to collect ink that might escape). Then press ENTER again.**
  - Then ink filling and cleaning is done.

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No additional notes

This section explains the basic points about troubleshooting that is done by the technician. See the service manual for full details.

#TEST Menu

- **For a flow chart of the functions available in this menu, see the following section of the service manual.**
  - Troubleshooting > Service Mode > #TEST
- **For descriptions of each test, see the following section of the service manual.**
  - Troubleshooting > Test Function
- **Do not use the following items. They are for design and factory use only.**
  - AGING, VACUUM FAN, EVENT LOG, CHECK MESSAGE

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No additional notes

Error Messages on the Display

- **For information about what to do when a message appears on the operation panel display, see the following section of the service manual.**
  - Troubleshooting > Details on Errors and Malfunctions

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No additional notes

Fuses

- **For troubleshooting notes related to blown fuses, see the following section of the manual:**
  - 4. Replacement and Adjustment > Electrical Parts > Replacement fuse of the PCB

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No additional notes

Problems with the Ink Supply System

- **For a flow chart of how to handle these problems, see the following section of the service manual.**
  - Troubleshooting > Detailed Methods of Coping with the Malfunctions > Sorting process sheet of ink supply system's troubles
- **The blue text in the flow chart refers to a procedure that appears later in the Detailed Methods of Coping with the Malfunctions section.**

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No additional notes

Ink Drops Appear Even After Normal Maintenance

- Because of dirt on the maintenance structure, routine maintenance of the head and the carriage may be not enough. It may cause ink drops in some cases.
- For details on how to handle this problem, see the following section of the service manual.
  - Troubleshooting > Detailed Methods of Coping with the Malfunctions > Maintenance check

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No additional notes

No additional notes

Cockling Check (Pre and Print Heater Settings)

- Check the appearance of the media on the platen after setting the heat.
  (by pressing the key marked HEATER you can check the heat settings)
- If the medium does not lay flat on the platen or begins to cockle,
  lower the pre and print heat settings.

If there is no sign of cockling, please proceed to checking the drying properties.

If there is a large amount of cockling, the medium will jam. Lower the pre and print heat settings.

Points to note
Printing on cockled paper will result in uneven color distribution, and in extreme cases, it will catch the print head and cause a jam.
If the medium is not set straight, cockling is more likely to occur.
Exercise caution when using paper, as it is prone to cockling due to heat.
Before printing, remove any wrapping film and let the medium adjust to the ambient temperature of the printing area.

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No additional notes

Check Drying Properties (Post & Fan Heater Settings)

After the medium passes the fan heater, rub a finger against the printed surface to check if it is dried (be careful not to burn yourself on the heater).

If drying is insufficient, raise the temperature of the post heater. The post heater can be set up to 70 ℃. If raising the temperature is not enough to dry the medium, raise the number of passes or lower the printing speed.

Points to note
Images that require large volumes of ink (solid images requiring 2+ ink colors, or two layers of color) are difficult to dry, so we recommend appropriate adjustments be made.
On rare occasions, ink may transfer to the backside of the medium when it is rolled up, even after passing the rub test using a finger.
When rubbed strongly and briskly with a nail or coin, ink may be shaved off.

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No additional notes

Other Points to Check

There is a possibility that problems aside from cockling and insufficient drying may occur. Please adjust your heat settings accordingly.

Problem		Solution
Medium Warps 1	After passing the heater, the medium warps (in a uniform diamond pattern)  	・Lower the post and fan heater temperatures. Note: This will affect ink drying, so check the ink's dryness. ・If the item contains adhesive, the warping may not be noticeable when the item is adhered.
Medium Warps 2	After the heater passes, the medium warps (item rolls up entirely)	・Lower the post and fan heater temperatures. ・Do not roll up these media tightly.
Printed Item Blurs	Printed item blurs	・Raise the pre and print heaters as much as possible without causing cockling. (The print heater's max temp. is 55℃.) This may affect ink release. ・Raise the number of passes or lower the printing speed.

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No additional notes

Printing Issues - 1

Problem	Solution Suggestion
Cockling occurs when printing on paper media.	・Remove any protective film before printing, and let the medium adjust to the ambient temperature of the printing area. ・The absorbent nature of paper makes it susceptible to cockling in the event of temperature and/or humidity change as well as the heat from the heaters. ・ If the medium is not set properly, it is prone to cockling, so consult your manual for how to set properly.

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No additional notes

Printing Issues - 2

Problem	Solution Suggestion
Color unevenness occurs when printing solid color. It occurs in the feed direction.	・Cockling is believed to be the cause. Try slightly reducing the temperature (by about 5℃) of the pre and print heaters. However, reducing the heat too much may cause blurring and insufficient drying. ・ If the medium is not set properly, it is prone to cockling, so consult your manual for how to set properly.

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No additional notes

Printing Issues - 3

Problem	Solution Suggestion
When rolling up the printed item, ink transfers to the back side.	・The ink is not sufficiently dry. Raise the temperature of the post and fan heaters. ・Increase the number of passes and lower the printing speed.

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No additional notes

Printing Issues - 4

Problem	Solution Suggestion
When laminating (hot melt type), the laminate does not stick well and peels. It peels from the ink. 	・The ink is not sufficiently dry. Raise the temperature of the post and fan heaters. ・Increase the number of passes and lower the printing speed. ・Waiting some time after printing will help the ink dry. ・The cause is believed to be residual moisture from insufficient drying. Paper media may absorb ink and retain moisture, please check your medium in advance.

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No additional notes