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Technical Training for BRG-MF1a/BRG-MF1c/BRG-MF1c BT (J030/J032) and BRG-G1L/BRG-G1b/BRG-G1c (J027/J028/J029)

Options:
Multi-bypass Tray BY1040 (J313)
Paper Feed Unit TK1160 (J312)

Slide 1

Draft started 26 January, 2012
First draft: 10 February, 2012
Final: 21 February, 2012
Modified for BRG-MF1c BT: 23 October, 2013

- Changed slides: 1, 24, 37
- Inserted slides: 23, 38, 40, 103-114

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J030/J032/J027/J028/J029
Service Training

1) Product Outline

Slide 2

No additional notes.

The Products

BRG-MF1
basic unit

BRG-MF1
with optional
paper feed
units and
multi-bypass
tray

BRG-G1
basic unit

BRG-G1
with optional
paper feed
units and
multi-bypass
tray

Slide 3

No additional notes.

Product Concepts

- **Competitive TCO**
  - Affordable cost for those customers with high print volume or high use of color prints.
- **High productivity**
  - Good print speed
    - » With ISO Chart: Color: 9 ppm, B/W: 10.5 ppm
    - » With Ricoh Speed Priority Chart: 29 ppm
  - Fast duplex speed
    - » Over 75% of simplex speed
  - Fast first print speed
    - » B/W: Less than 5.5 s
    - » Color: Less than 6.5 s
- **Environmentally friendly**
  - Low power consumption

Slide 4

- TCO = Total Cost of Ownership
- See the FSM for more details on the print/duplex speeds.
- J027 does not have a duplex function.
- Power consumption during printing:
  - J027: 27W
  - J028: 30W
  - J029: 33W
  - J030: 45W
  - J032: 54W

New with this Model

❑ New functions:

- Embedded @Remote
  - » Printer models are equipped with embedded RC Gate.
- Wireless network*

❑ New options/peripherals*

- Paper Feed Unit TK1160
- Multi Bypass Tray BY1040

*See the next slide.

Slide 5

No additional notes.

Enhancements

Enhanced paper handling capability

Multi Bypass Tray Option
Paper Weight: 60-256g/m2 (16-68lb)
Paper Size: min.55x127mm / max.216x1295.4mm

Paper Feed Unit Option
250 sheets x max. 2 units

WiFi is standard with J029, J030, and J032

Slide 6

No additional notes.

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2) Specifications

Slide 7

No additional notes.

Specifications - 1/4

❑ Configuration

- Desktop

❑ Printing Method

- On-demand GelJet Ink printing technology
- Pigment-based ink

❑ Power Consumption

- Print Mode
  - » J028: 30W or less, J029: 33W or less, J027: 27W or less
  - » J030: 45W or less, J032: 54W or less

❑ Dimensions (W x D x H)

- J028/J029: 399 x 436.5 x 212.5 mm
- J027: 399 x 360 x 212.5 mm
- J028/J029 with full options : 399 x 571 x 492 mm
- J030/J032: 399 x 436.5 x 329.5
- J030/J032 with full options: 399 x 671 x 507.5

Slide 8

- ❑ Full options = base unit + PFUx2 and multi bypass tray
- ❑ See the FSM for more details about power consumption.
- ❑ See the FSM for information about dimensions with option combinations.

Specifications - 2/4

- **Weight**
  - J030/J032
    - » Less than 15.3 kg (BT model: Less than 16.0 kg)
  - J028/J029
    - » Less than 10.5 kg
  - J027
    - » Less than 9.5 kg

    (See the field service manual for weights with options)
- **Estimated Service Life**
  - Base unit (all models)
    - » 5 years, or 150,000 prints
  - Multi-bypass tray
    - » 60,000 feeds
  - Paper feed unit
    - » 150,000 feeds
- **Monthly Volume (average)**
  - J030: 350 prints
  - J032: 750 prints
  - J028/J029: 600 prints
  - J027: 250 prints

Slide 9

No additional notes.

Specifications - 3/4

- **Warm-up Time**
  - Less than 35 seconds
- **Printer Languages**
  - J032/J028/J029
    - » RPCS, PCL5c/6
  - J030/J027
    - » RPCS
- **First Print Speed (RPCS)**
  - Less than 5.5 seconds (mono), Less than 6.5 seconds (color)
- **Print Speed (RPCS)**
  - "Standard, Speed Priority"
    - » Color: 9 ppm (8 ppm for J032 only) using the J6 chart
    - » BW: 10.5 ppm using the mono J1 chart
  - "Standard, High Speed" (Max speed utilizing speed priority chart)
    - » 29 ppm (BW and color)

Slide 10

No additional notes.

Specifications – 4/4

- **Output tray capacity**
  - 100 sheets
- **Multi-bypass tray (J313)**
  - Capacity 100 sheets
  - Paper weight 60 – 256 g/m^2 (16 – 68 lb)
- **Paper Feed Unit (J312)**
  - Capacity 200 sheets
  - Paper weight 60 – 105 g/m^2 (16 – 28 lb)

Refer to the FSM for full specifications.

Slide 11

- J312 and J312 are not used on the J027.

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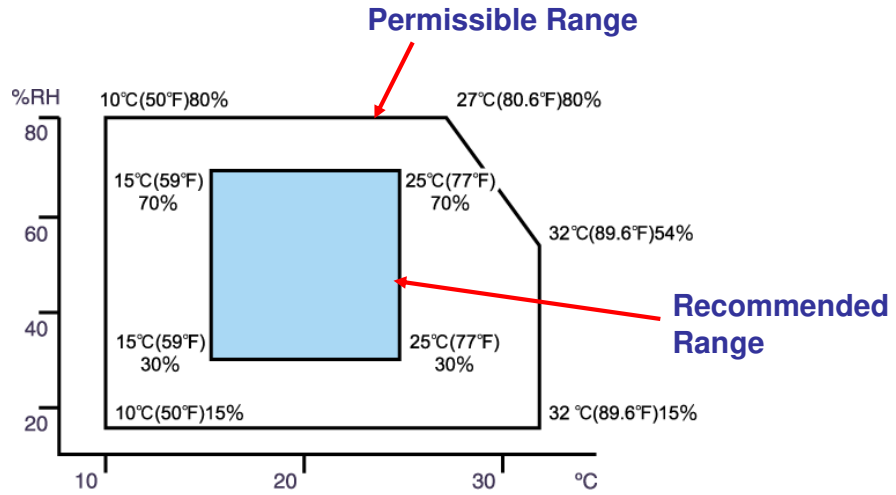
Service Training

3) Installation

Slide 12

No additional notes.

Environment



- **Note the optimal temperature & humidity ranges in the above chart.**
- **Caution: Dry (and hot) operating environments may cause higher instances of ink drying in heads.**
  - Also, see the notes below.

Slide 13

Choosing a Location

- Always install the machine:
  - On a sturdy, level surface.
  - Where it will not become damp.
- Make sure the machine is never exposed to:
  - Extreme changes from low to high temperature or high to low temperature.
  - Cold or cool air directly from an air conditioner.
  - Heat from a space heater.
- Never install the machine in areas near:
  - Dust, lint, or corrosive fumes.
  - Strong vibration.
- Do not use the machine at any location higher than 2,500 m (8,200 ft) above sea level.
- Set up and use the machine on a sturdy, level surface.
  - Place a carpenter's level on the machine front-to-back, and side-to-side and confirm that it is level.
  - Variations between the front/back and left/right level readings should be less than 2 degrees.

Installation-related Cautions

- **Starter cartridges are primarily for initialization purposes and must not be thought of as standard issue cartridges. Please understand that they will run out of ink in a much shorter span of time than regular replacement cartridges.**
  - Never attempt to initialize machine with used cartridges.
- **Note that it takes 6-7 minutes to fill internal ink tanks (for initial fill). Do not open any covers, touch any keys, or turn machine off until "Ready" message appears on operation panel display.**
  - If printer is turned off while ink tanks are filling, some ink wastage will result when machine resumes filling process.
  - A clicking sound might be heard while ink tanks are filling. This is normal and will stop after a few minutes.
- **Load paper in accordance with procedures outlined in the operation manual.**
- **Paper size and type is not automatically detected, so must be manually set with menu via Operation Panel.**

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Important:

-Never switch off the printer or disconnect the power cord while the tanks in the print head are being filled for the first time. If the printer is accidentally turned off while the ink tanks are filling, some ink wastage will result when the machine resumes the process.

-You might hear a clicking sound while the ink tanks are filling. This is normal and the noise will stop after a few minutes.

General Installation Procedures

- These machines and peripherals are customer installed.
- See user guide for general installation procedures.

Slide 15

No additional notes.

Firmware Updating

- **Firmware updates can be performed by the customer.**
  - Study the procedures and cautions in the FSM or the Operating Instructions.
    - » FSM → System Maintenance Reference → Firmware Updates

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No additional notes..

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4) Machine Overview

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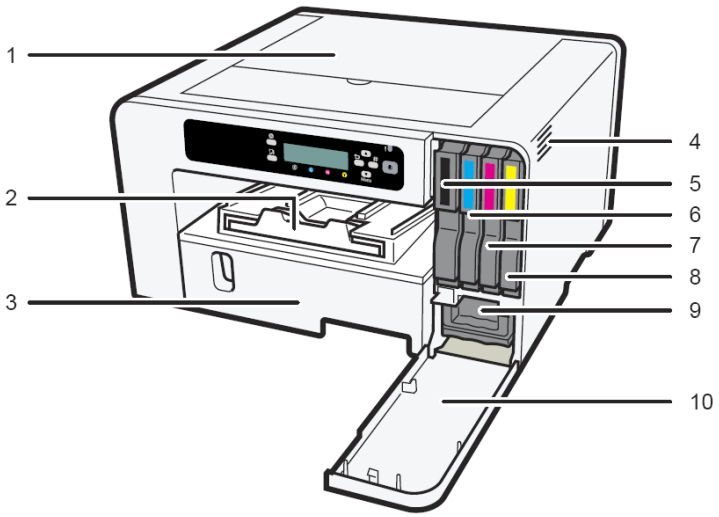
No additional notes.

BRG-G1 – Front View

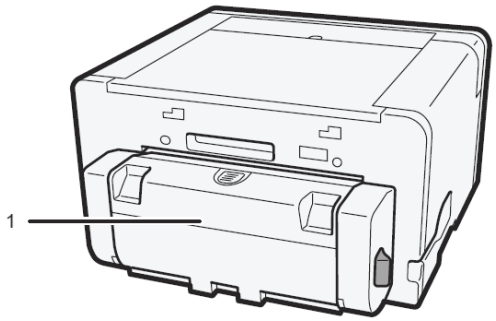
1. Top Cover
2. Output tray
3. Tray 1
4. Air vent
5. Black ink cartridge
6. Cyan ink cartridge
7. Magenta ink cartridge
8. Yellow ink cartridge
9. Ink collector unit
10. Right front cover



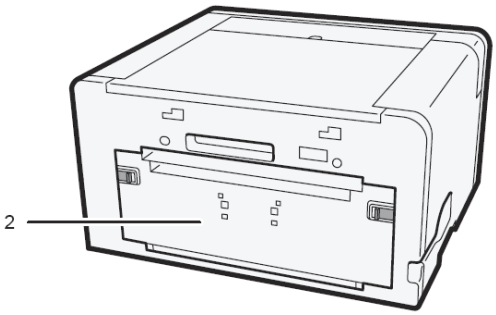
Slide 18

No additional notes.

BRG-G1 – Rear View



J028/J029



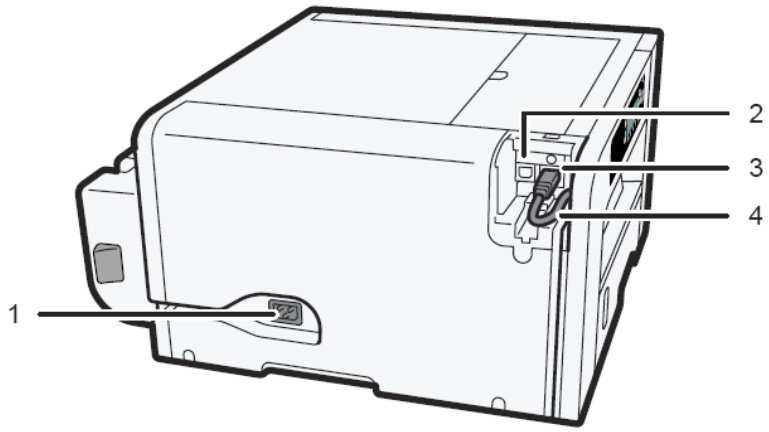
J027

1. Duplex unit (J028 and J029 only)
2. Rear cover (J027 only)

Slide 19

No additional notes.

BRG-G1 – Left Side

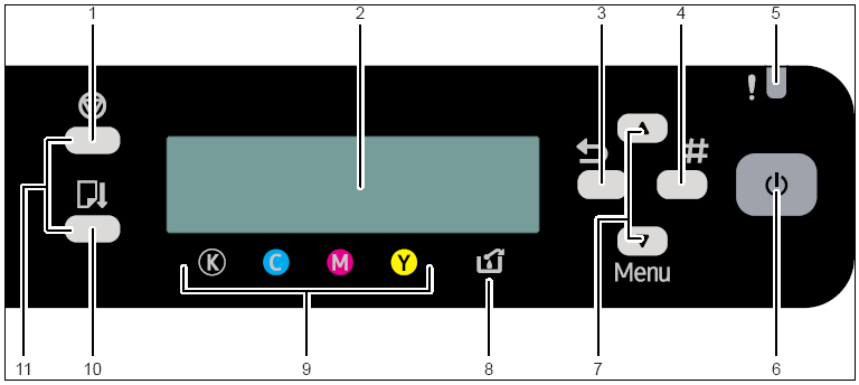


1. Power inlet
2. USB port
3. Ethernet port
4. Wireless LAN cable

Slide 20

No additional notes.

BRG-G1 Operation Panel



1. [Job Reset] key	7. ▲▼ Menu keys
2. Display	8. Waste ink full indicator
3. [Escape] key	9. Cartridge replacement indicator
4. [#Enter] key	10. [Form Feed] key
5. Alert indicator	11. No-Fuss Head Cleaning
6. [Power] key	

Slide 21

1. [Job Reset] key – When the machine is online, press this key to cancel an ongoing print job.

2. Display – Displays the current machine status and messages.

3. [Escape] key – Press this key to return to the previous condition on the display.

4. [#Enter] key – Press this key to execute menu items selected on the display.

5. Alert indicator – Lights up or blinks whenever a machine error occurs. If the red light is on, follow the instructions that appear on the display.

6. [Power] key – Press this key to turn the power on. To turn the power off, press and hold down this key for one second. Blinks when the machine is receiving data from a computer or if there is data to be printed.

7. ▲▼ Menu keys – Use these keys to increase or decrease values on the display when making settings. When the machine is in standby mode, press the [Menu] key to make and check the current machine settings.

8. Waste ink full indicator – The amount of waste ink is indicated on the six-level display. A message appears when it is time to replace the ink collector unit.

9. Cartridge replacement indicator – Each color corresponds to a print cartridge.

10. [Form Feed] key – Use this to force the machine to print data received when the paper size or type does not match the actual size or type of paper loaded in the tray.
If there is a paper jam, press this key according to the displayed error message and remove the jammed paper.
If a print job using the PCL driver does not start, press this key to force it to print.

11. No-Fuss Head Cleaning – When the machine is in standby mode, press the [Job Reset] and [Form Feed] keys at the same time to perform head cleaning for all colors.

BRG-MF1 – Front/Right View

1. Scanning glass
2. Exposure glass cover
3. Exposure glass
4. Telephone connector (J032 only)
5. G3 line (J032 only)
6. Air vent
7. Ink cartridges
8. Ink collector unit
9. Right front cover
10. Paper cassette
11. Output tray
12. USB port

Slide 22

- See the FSM for additional information.

BRG-MF1c BT Front View

J030/J032-17, -22, -27

J032-13, -23

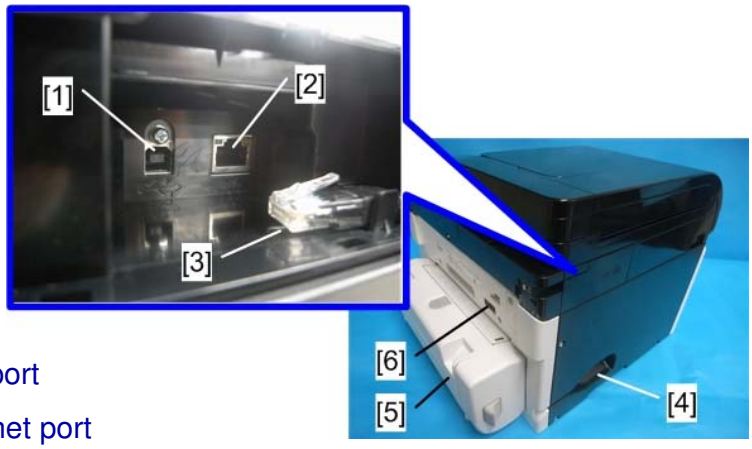
j031z0026

- **The photo on the right side shows the new model.**
- **This model does not use an internal power supply board. It comes with an AC adapter and an optional rechargeable battery.**
- **Note items 2 and 3.**
  - 2: LED battery status indicator
    - » See 1. Product Information > What's New in the service manual for details on this indicator.
  - 3: Battery cover: Remove the battery before disassembling the machine. Just open the cover and pull out the battery.

Slide 23

No additional items

BRG-MF1 – Rear/Left View

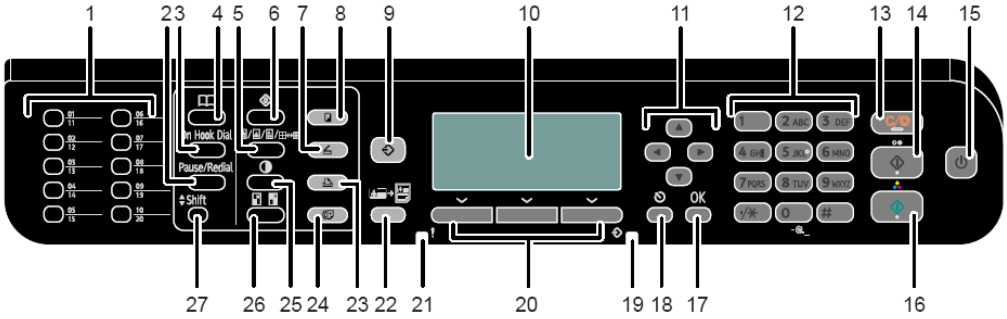


1. USB port
2. Ethernet port
3. Wireless LAN cable
4. Power inlet (MF1c BT – the AC adapter plugs in here)
5. Duplex unit
6. By-pass tray connection point

Slide 24

- See the FSM for additional information.

BRG-MF1 Operation Panel



1. Quick dial keys*	10. Screen	19. Data In indicator
2. [Pause/Redial] key*	11. Scroll keys	20. Selection keys
3. [On-hook Dial] key*	12. Number keys	21. Alert indicator
4. [Address Book] key*	13. [Clear/Stop] key	22. [ID Card Copy] key
5. [Image Quality] key	14. [B&W Start] key	23. [Printer] key
6. [User Tools] key	15. [Power] key	24. [Facsimile] key*
7. [Scanner] key	16. [Color Start] key	25. [Density] key
8. [Copy] key	17. [OK] key	26. [Reduce/Enlarge] key
9. [Program] key	18. [Escape] key	27. [Shift] key*

* = Fax functions (J032 only)

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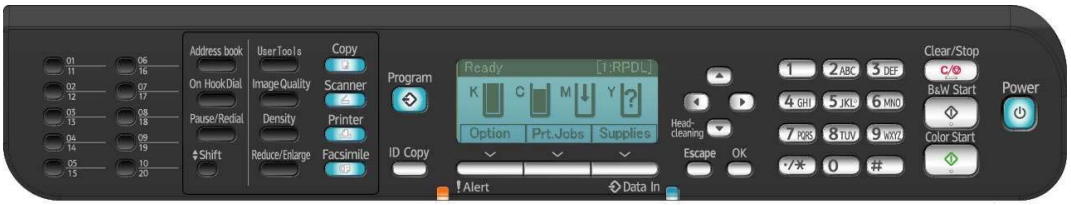
The illustration shows the J032 op-panel. The J030 op-panel is slightly different.

1. Quick Dial Keys – Press to select a scan or fax destination registered as quick-dial in the address book.
2. [Pause/Redial] key – Press to insert a pause in a fax number or to display the last used scan or fax destination.
3. [On Hook Dial] key – Press to use on-hook dialing.
4. [Address Book] key – Press to select a scan or fax destination from the address book.
5. [Image Quality] key – Press to select scan quality for the current job.
6. [User Tools] key – Press to display the menu for configuring the machine's system settings.
7. [Scanner] key – Press to switch to scanner mode.
8. [Copy] key – Press to switch to copier mode.
9. [Program] key – Press to switch to Program mode.
10. Screen – Displays the current status and messages.
11. Scroll keys – Press to move the cursor on the screen.
12. Number keys – Use to enter numerical values when specifying settings such as fax numbers and copy quantities, or enter letters when specifying names.
13. [Clear/Stop] key – Press to cancel the current job, the current setting, or temporary settings.
14. [B&W Start] key – Press to scan or copy in black and white, or start sending a fax.
15. [Power] Key – Press to turn the power on.
16. [Color Start] key – Press to scan or copy in color.
17. [OK] key – Press to confirm settings or enter the next level of the menu tree.
18. [Escape] key – Press to cancel the last operation or exit to the previous level of the menu tree.
19. Data In Indicator – This indicator flashes when the machine receives a print job and remains lit during printing.
20. Selection keys – Press the key that corresponds to an item shown on the bottom line of the screen to select it.
21. Alert Indicator – Lights when ink is running out, there is a paper jam, a cover is open, or there is an SC error.
22. [ID Card Copy] key – Press to jump to the ID card copy setting menu.
23. [Printer] key – Press to switch to printer mode. The key stays lit while the machine is in printer mode.
24. [Facsimile] key – Press to switch to fax mode. The key stays lit while the machine is in fax mode.
25. [Density] key – Press to adjust image density for the current job.
26. [Reduce/Enlarge] key – Press to change the copy enlargement/reduction ratio.
27. [Shift] key – Press to switch between Quick Dial numbers 1 to 10 and 11 to 20 when specifying a scan or fax destination using the Quick Dial keys.

BRG-MF1 North American Operation Panel



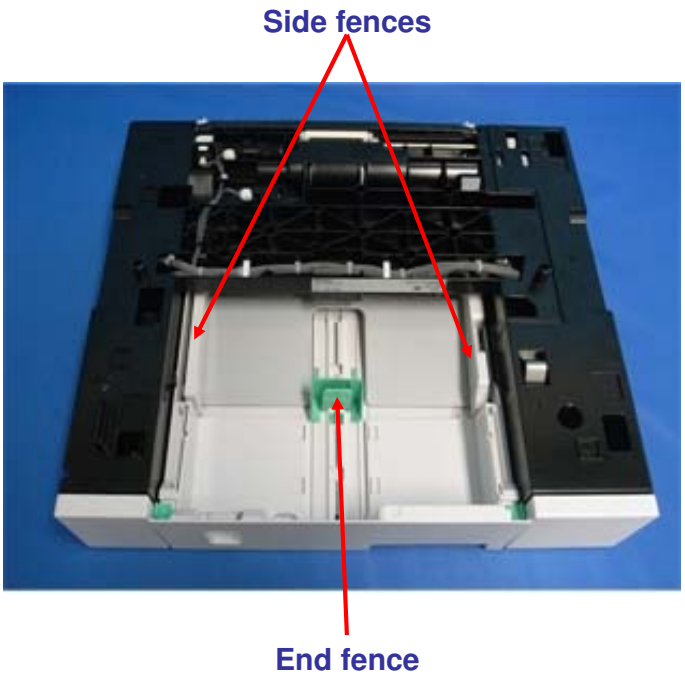
- The previous slide shows the European operation panel. This is the North American version.
- Panel names are the same as the previous slide.

Slide 26

No additional notes.

Paper Feed Unit TK1160 (J312) - 1/2

- 250 sheet capacity
- J028 and J029 only



Slide 27

No additional notes.

Paper Feed Unit TK1160 (J312) - 2/2

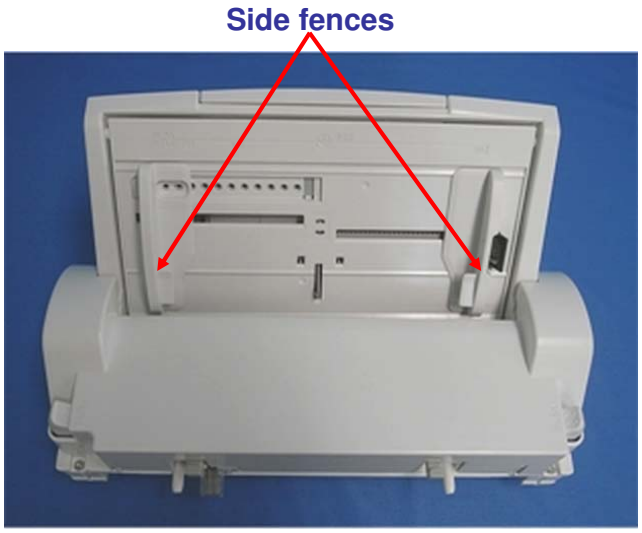
Optional PFUs (trays 2 & 3) are not used on the J027.

Up to two PFUs may be installed, as shown here.

Slide 28

No additional notes.

Multi Bypass Tray BY1040 (J313)



- This multi bypass tray is available as an option for all models except the J027.
- Holds up to 100 sheets of paper.

Slide 29

No additional notes.

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Service Training

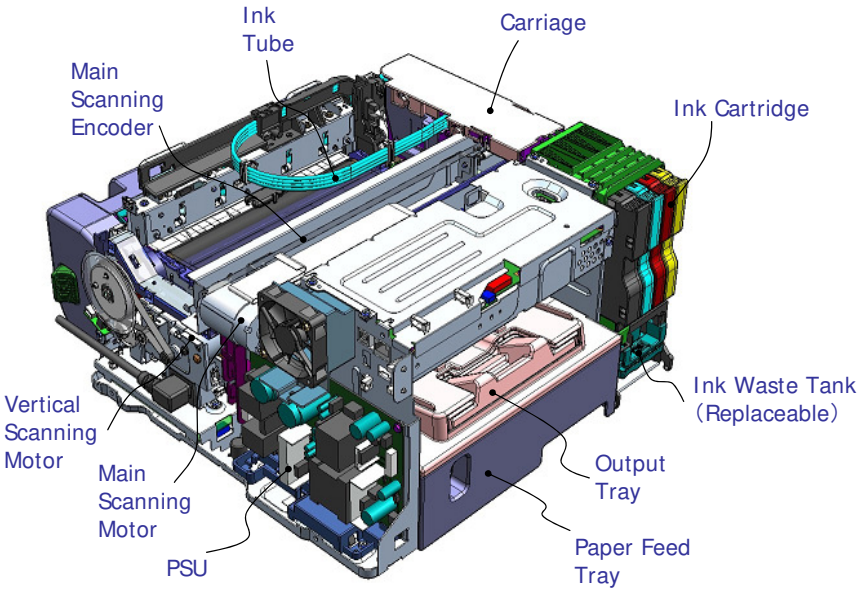
5) Print Engine Components

Slide 30

No additional notes.

Inside - 1/2

Front View

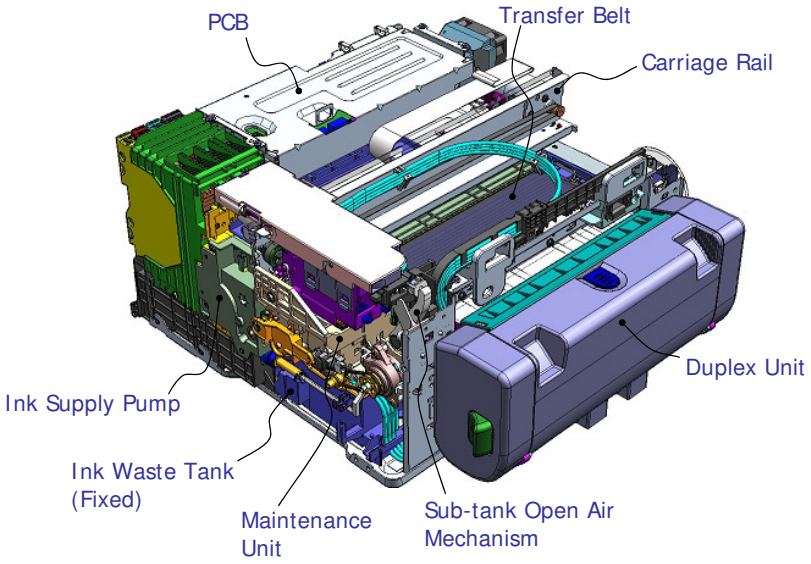


Slide 31

No additional notes.

Inside - 2/2

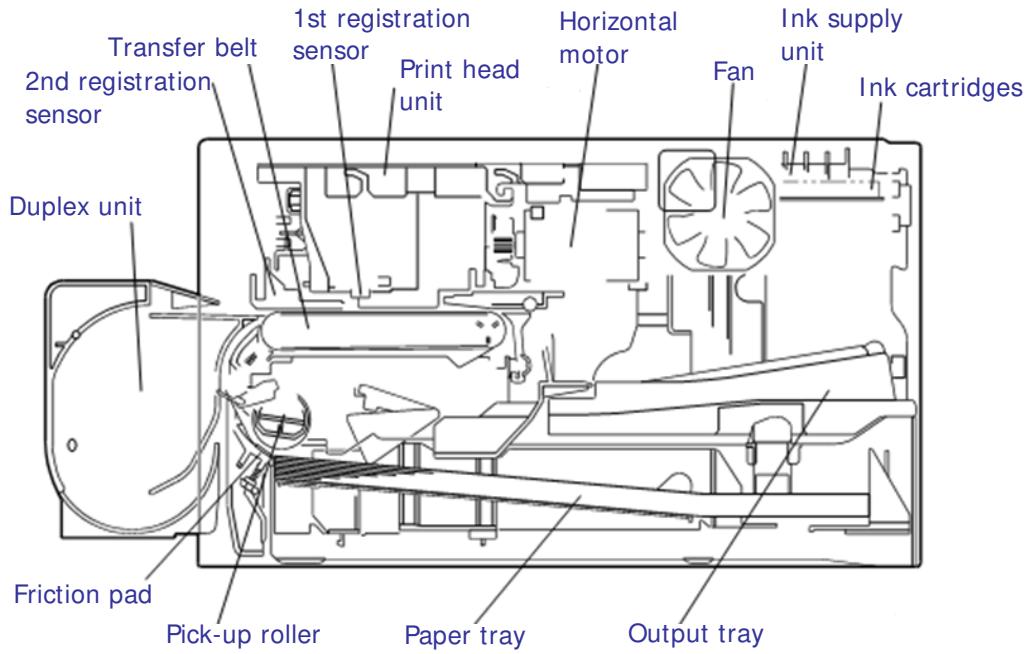
Rear View



Slide 32

No additional notes.

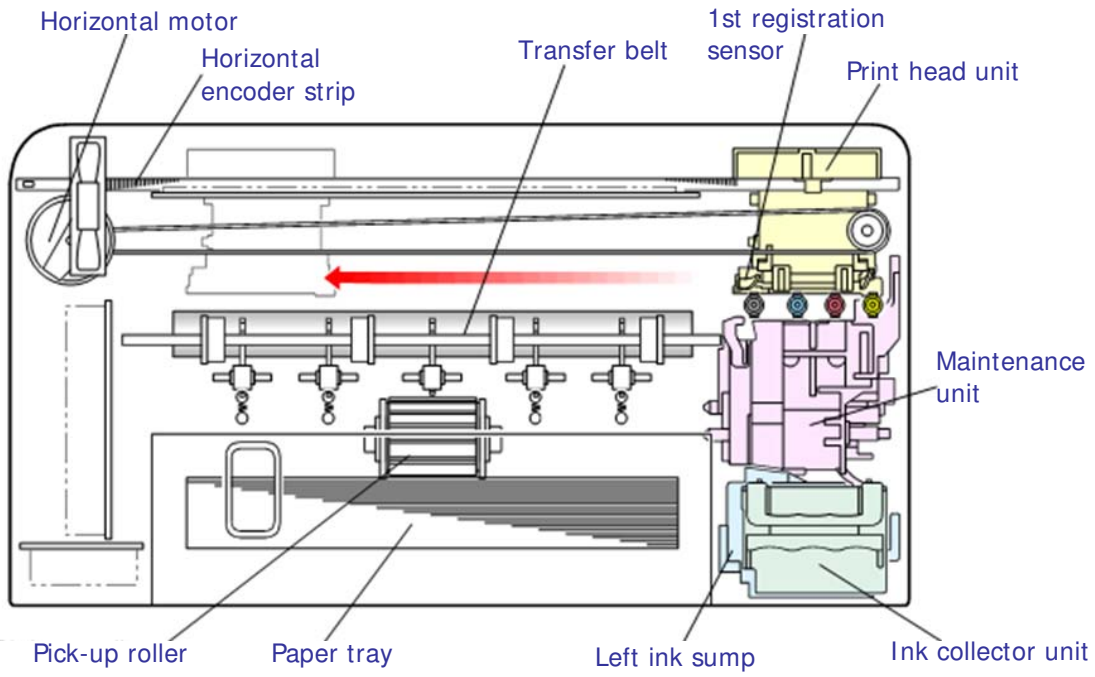
Cross Section (Left Side View)



Slide 33

No additional notes.

Cross Section (Front View)



- **Note that print head unit moves completely across picture above -- from right to left and back. Its resting place is over maintenance unit, where the heads are capped to prevent them from drying out.**

Slide 34

No additional notes.

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6) Electrical Components

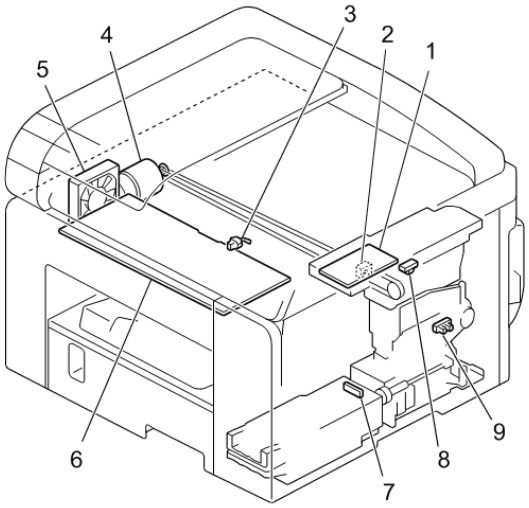
Slide 35

No additional notes.

Print Engine Electrical Components - 1

1. Head relay board (HRB)
2. Horizontal encoder sensor
3. Scanner unit cover sensor (J030/J032)
   Top cover switch (J027/ J028/J029)
4. Horizontal motor
5. Fan
6. CTL board
7. Ink collector ID chip
8. 1st registration sensor
9. Maintenance HP sensor

(See descriptions in the notes section below.)



Slide 36

1. Head relay board

- Mounted on the top part of the carriage unit. This board performs many functions: 1) contains the horizontal encoder sensor that reads the horizontal encoder (the film strip) that controls the reverse/forward timing of the horizontal motor that moves the carriage during printing, 2) relays the readings of the 1st registration sensor mounted on the left edge of the carriage, 3) contains a small thermistor that detects the temperature around the print heads, 4) receives and relays signals from the ink collector unit to the control board.

2. Horizontal encoder sensor

- Mounted on the carriage with the horizontal encoder (a film strip) positioned in its gap. This sensor reads the code on the edge of the horizontal encoder as the carriage and print heads move horizontally to control the operation of the horizontal motor during printing as the carriage moves left and right during printing.

3. Scanner unit cover sensor/Top cover switch

- Mounted under the front edge of the top of the printer engine. Detects when the top cover of the printer or the scanner unit is open or closed. The printer will not operate if the top cover is open.

4. Horizontal motor

- Drives a timing belt to move the carriage left and right during printing.

5. Fan

- Cooling fan

6. CTL board

- Mounted on top of the printer and below the top cover (protected by a metal plate). Controls overall operation of the printer.

7. Ink collector ID chip

- Contacts the WTR when the ink collector is inserted in the machine. This tells the machine the tank is inserted correctly. Also, stores the software count for the service life of the ink collector tank. The ink collector unit is completely sealed and there are no serviceable parts inside the unit. Full ink collector units are discarded.

8. 1st registration sensor

- Attached to the left side of the carriage. As the carriage moves from side to side during printing. The registration sensor performs two important functions for print control: 1) It detects the leading edge of every sheet, and 2) it detects the width of the 1st sheet of every print job when the carriage and sensor pass horizontally over the vertical edge of the 1st sheet as it feeds.

9. Maintenance HP sensor

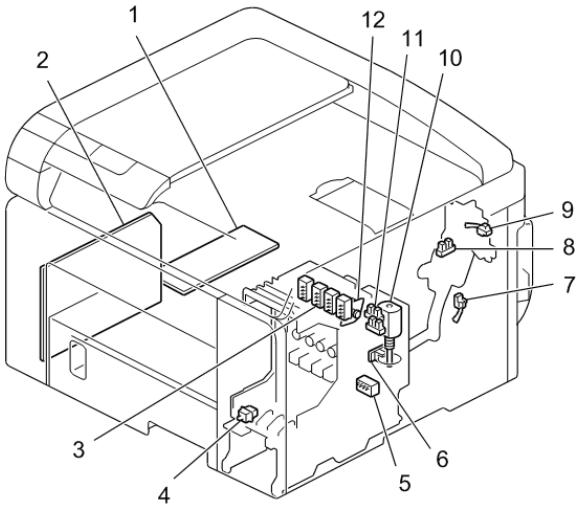
- An interrupt sensor mounted in the maintenance unit that controls the operation of the drive module motor in the print head cleaning cycle.

Print Engine Electrical Components - 2

1. HVPS
2. PSU (or ACB board/battery in the MF1c BT): See the next slide
3. Ink cartridge set switches
4. Right front cover switch
5. WTR (waste tank relay)
6. Maintenance unit control sensor
7. Duplex unit set switch
8. Ink level sensor
9. Air purge detection switch
10. Drive motor (DC motor)
11. Drive switching position sensor
12. Drive switching motor

(See descriptions in the notes section below.)

Slide 37



1. HVPS (high voltage power supply)

- Mounted under the AC socket on the left of the machine. Generates the voltages applied to the transport belt that hold the paper on the belt during printing.
- In the BRG-MF1c BT, the HVPS is standardized for LCC (Limited Current Circuit). Because of this, the HVPS is wider.

2. PSU (power supply unit)

- Supplies power to the machine.
- In the BRG-MF1c BT, this is replaced by a battery and the ACB board. Explained later. See the next slide for a component layout.
- ACB Board (AC adapter Battery selector Board)

3. Ink cartridge set switches

- There is a micro-switch for each ink cartridge. They tell the machine whether the ink cartridges are inserted correctly.

4. Right front cover switch

- A micro-switch mounted at the lower right corner of the machine. The machine will not operate until the right front cover is closed and locked.

5. Waste tank relay

- The WTR is inside the printer. The ID chip on the rear end of the ink collector tank contacts this switch when the tank is inserted in the machine. This tells the machine that collector is set correctly.

6. Maintenance unit control sensor

- Mounted on the bottom of the drive switching module. This sensor controls the speed and period of rotation of the drive motor (DC motor).

7. Duplex unit set switch (Rear cover switch on the J027)

- Mounted behind the printer. Actuated by the duplex unit's lever, it detects if the duplex unit is not installed (or installed incorrectly) and if the duplex unit's cover is open. Must be actuated (closed) for the printer to operate. With the J027, it detects if the rear cover is open.

8. Ink level sensor

- Monitors the positions of the ink level lever of each ink tank. The vacuum created inside the ink tanks as ink is consumed gradually draws the base of the spring-loaded arms in against the sides of the tank. Drawing the base closer to the side of the tank forces the tip of the arm out. The ink level sensor detects the position of the tip every time it passes through the gap of the sensor.

9. Air purge detection switch

- Mounted on the rear of the machine at the upper right. It detects the status of the release latch, which actuates the head tank's air release valve. If it cannot detect the status correctly, ink filling and maintenance operations, which require air to be released, cannot be performed.

10. Drive motor (DC motor)

- Mounted in the drive switching module. The four ink pump motors, maintenance motor, and air release solenoid of previous models have been combined into a single DC motor. It provides power for ink supply, maintenance, and air release.

11. Drive switching position sensors (K&C)

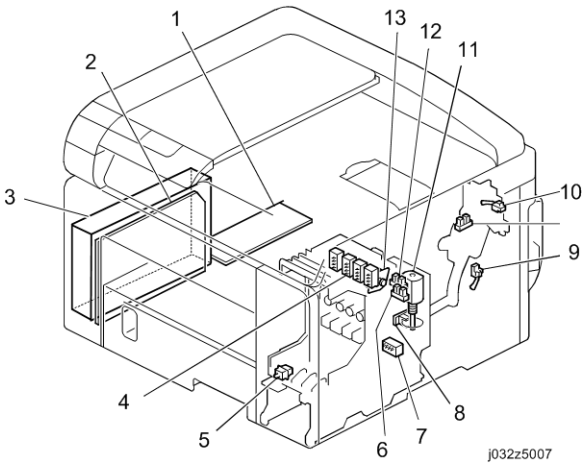
- Two sensors. They detects when the drive module is set to supply black and cyan ink or magenta and yellow ink.

12. Drive switching motor

- Mounted in the drive switching module. It rotates a cam to switch between supplying ink (black and cyan or magenta and yellow), releasing air, and performing maintenance.

Print Engine Electrical Components – 2a

1. HVPS
2. ACB board
3. Battery
4. Ink cartridge set switches
5. Right front cover switch
6. WTR (waste tank relay)
7. Maintenance unit control sensor
8. Duplex unit set switch
9. Ink level sensor
10. Air purge detection switch
11. Drive motor (DC motor)
12. Drive switching position sensor
13. Drive switching motor



BRG-MF1c BT

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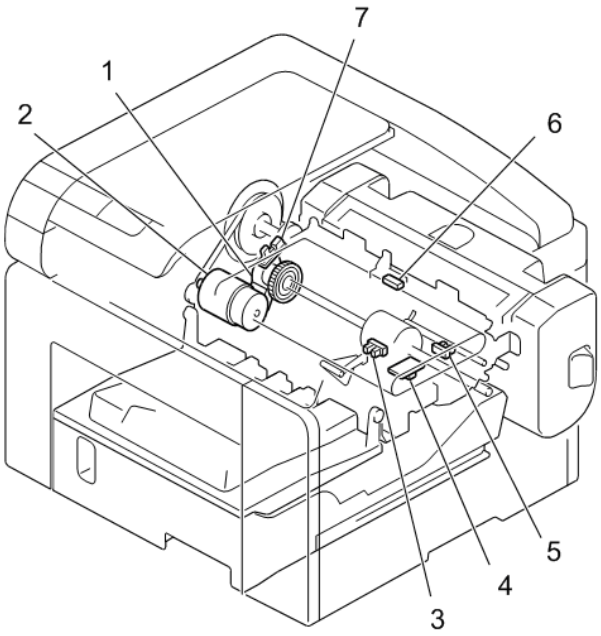
No additional notes

Print Engine Electrical Components - 3

1. Paper feed clutch
2. Vertical motor
3. Paper end sensor
4. Temperature/humidity sensor
5. Trailing edge sensor
6. 2nd registration sensor
7. Vertical encoder sensor

(See descriptions in the notes section below.)



Slide 39

1. Paper feed clutch

- Controls the operation of the paper feed roller in Tray 1.

2. Vertical motor

- Drives the transport belt.

3. Paper end sensor

- Detects paper end in the 1st tray.

4. Temperature/humidity sensor

- Located inside the printer near the transport belt. Constantly measures temperature and humidity around the transport belt. The printer uses these readings to adjust the amount of charge applied to the areas of the belt that contact the leading edge, center, and trailing edge of the paper.

5. Trailing edge sensor

- Mounted at the right, rear corner of the printer. The feeler of this interrupt sensor is mounted in the center of the paper path and connected to a long shaft. The length of time the sensor remains on is used to measure the length of the paper for print timing control. The sensor issues a paper end alert if the sensor does not turn on after two rotations of the paper feed roller.

6. 2nd registration sensor

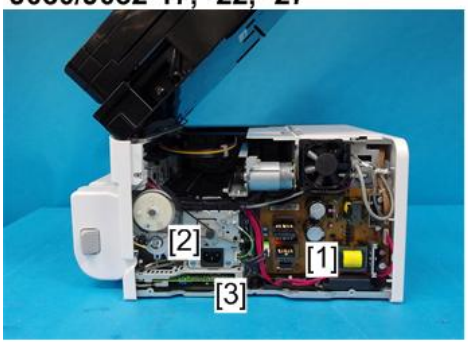
- Located above the transport belt and behind the horizontal motor timing belt. This photo-sensor detects the leading and trailing edge of each sheet when the printing. Controls job timing and to detects paper jams.

7. Vertical encoder sensor

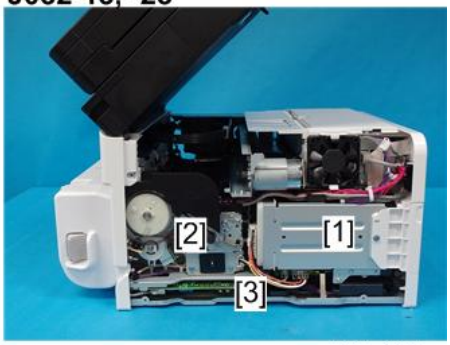
- This sensor reads the code on the rim of the vertical encoder wheel as it rotates to control the operation of the vertical motor during paper feed.

BRG-MF1c BT Power Supply

J030/J032-17, -22, -27



J032-13, -23



j031z0027

- **The diagram on the left shows the previous models in the series, and the diagram on the right shows the new model, BRG-MF1c BT.**
  - [1]: In the old models, this is the PSU. In the new model, this is a battery and the ACB board.
    - » The ACB board is located behind the battery socket.
    - » The ACB board switches power supply for the machine from either the adapter or the battery. It also charges the battery, detects the remaining battery voltage, and makes 5V and 37V power supplies for the machine
  - [2]: In the old models, this is an AC inlet. In the new model, it is a DC inlet, for the AC adapter.

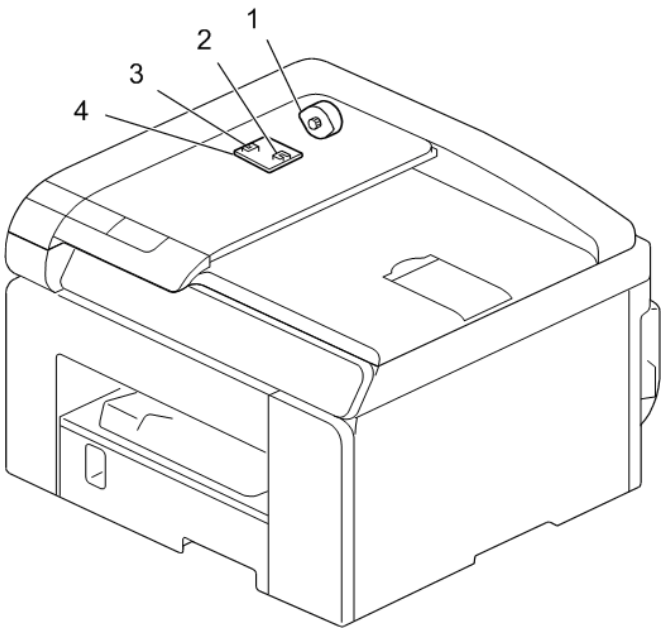
Slide 40

No additional notes

ADF Electrical Components (J030/J032)

1. Original feed motor
2. Original set sensor
3. Registration sensor
4. ADF sensor board

(See descriptions in the notes section below.)



Slide 41

1. Original feed motor

- Drives all the rollers in the ADF.

2. Original set sensor

- Performs two functions: 1) Detects the originals on the original feed tray to prepare the ADF for feed, and 2) Determines whether the ADF is open or closed.

3. Registration sensor

- Performs two functions: 1) Detects the leading and trailing edge of the original and detects a jam if the trailing edge does not exit within the prescribed time, and 2) Delays switching on paper feed clutch to buckle the leading edge against the paper feed roller to correct skew.

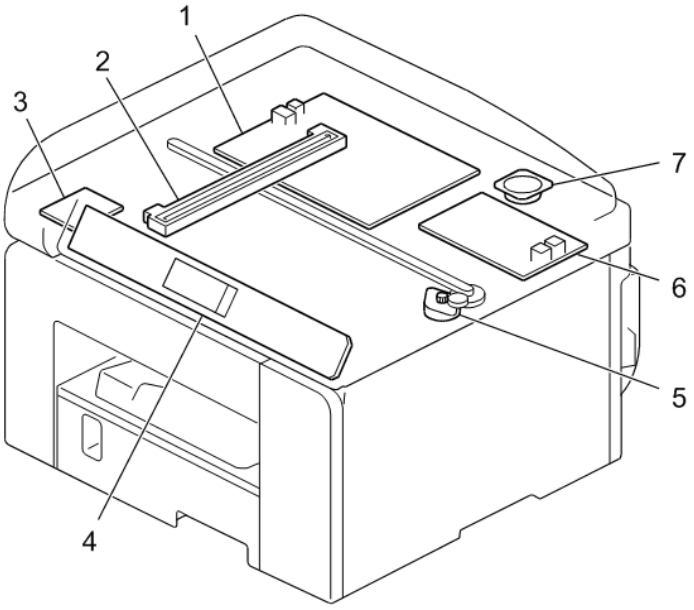
4. ADF sensor board

- ADF sensors are mounted here.

Scanner Electrical Components (J030/J032)

1. Scanner main board
2. CIS
3. Wireless LAN board
4. Operation panel
5. Scanner drive motor
6. Fax board (J032 only)
7. Speaker (J032 only)

(See descriptions in the notes section below.)



Slide 42

1. Scanner main board

- Controls operation of the scanner.

2. CIS (contact image sensor)

- Scans the face-down original and sends the image data to the scanner main board.

3. Wireless LAN board

- Controls the wireless LAN functions.

4. Operation panel

- Provides the keys for operation of the copier and fax.

5. Scanner drive motor

- Moves the scanner across the document on the exposure glass.

6. Fax board (J032 only)

- Controls the fax functions.

7. Speaker (J032 only)

- Produces the sounds of fax transmission, reception, and dial tone. Also produces the on-hook dial tone.

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J030/J032
Service Training

7) ADF and Scanner

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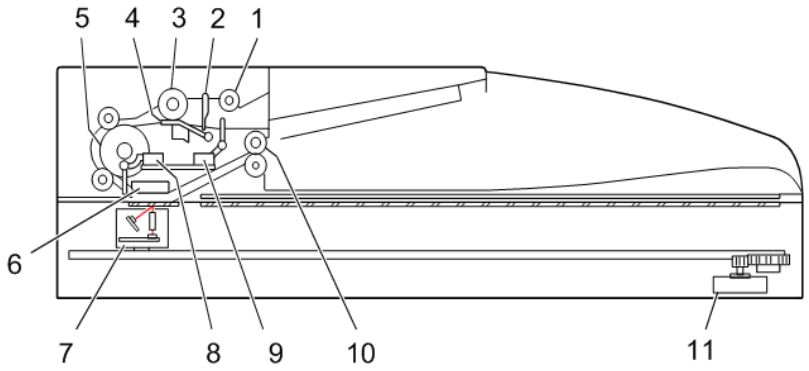
No additional notes.

ADF and Scanner Cross-section View

1. Pick-up roller
2. Original stopper
3. Original feed roller
4. Friction pad
5. Original transport roller
6. Platen board
7. CIS
8. Registration sensor
9. Original set sensor
10. Original exit roller
11. Scanner drive motor



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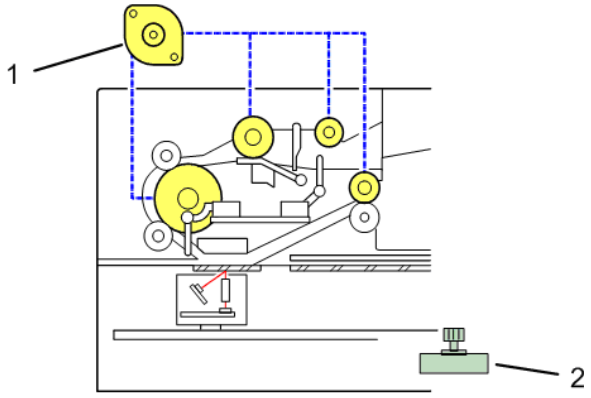
No additional notes.

ADF and Scanner Drive

1. ADF drive motor
2. Scanner drive motor

- The ADF drive motor turns all the driven rollers (yellow) in the ADF.
- The scanner drive motor moves the scanner, which contains the LED light source and the imaging elements, via a timing belt.



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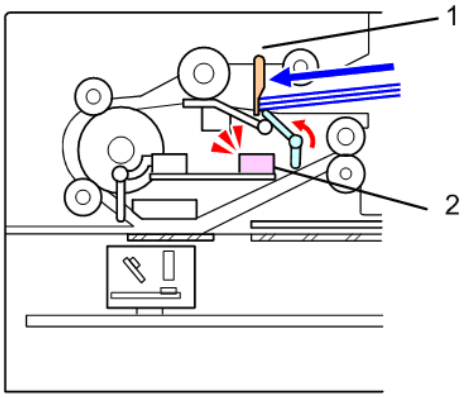
No additional notes.

Original Transport – 1

- When originals are set, the leading edges are aligned at the feed position by the stopper [1].
- Original documents are detected by the original set sensor [2] on the ADF/scanner board.

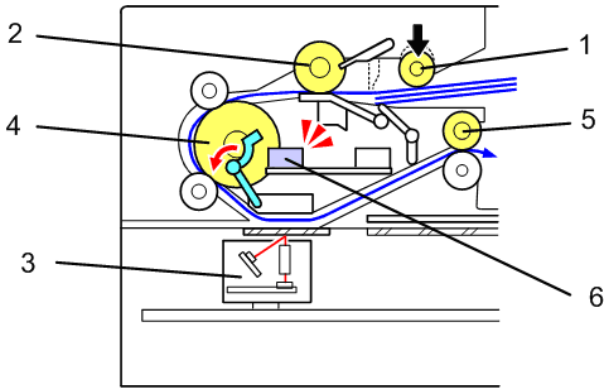


Slide 46

No additional notes.

Original Transport – 2

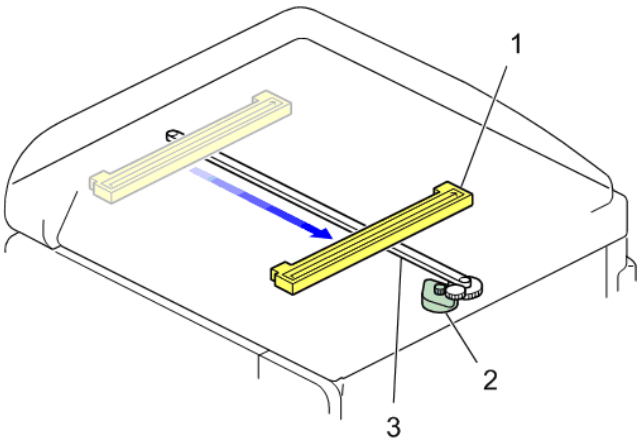
- When a copy job starts, the pick-up roller [1] lowers and it moves the top original to the original feed roller [2].
- After that, the original is scanned by the CIS [3] as the original is driven past it by the transport roller [4].
- The scanned original is fed out by the original exit roller [5].
- Original jams are detected by the registration sensor [6] on the ADF sensor board.



Slide 47

No additional notes.

Scanner Mechanism



- This machine uses a CIS [1] for scanning originals.
- The CIS is driven by the scanner drive motor [2] by way of the drive belt [3].

(See the Core Technology manual for a description of how a CIS works.)

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No additional notes.

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Service Training

8) Image Processing

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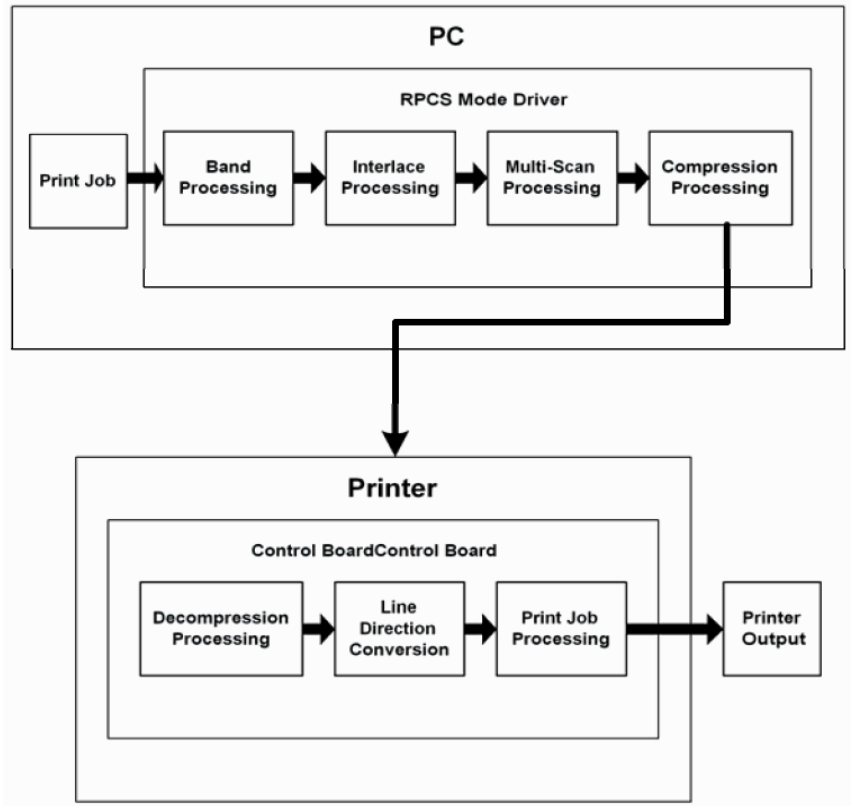
No additional notes.

Image Processing



Slide 50

No additional notes.

RICOH

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Service Training

9) Print Heads

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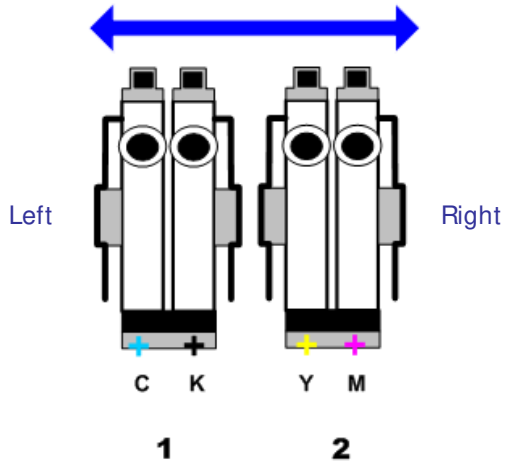
No additional notes.

Print Heads - 1/2

- **All three models use the same print heads.**
- **There are two print head units with two print head ink tanks on each unit.**
  - Print heads: 2
  - Nozzles/print head: 2
    - »C, K on print head 1
    - »Y, M on print head 2
  - Nozzles/color: 1



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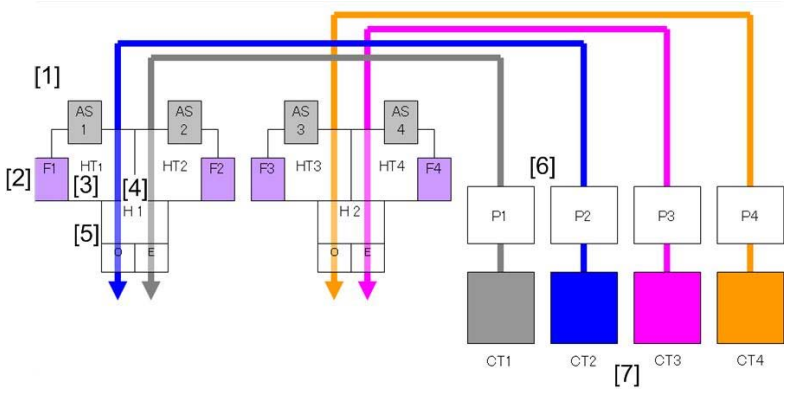
No additional notes.

Print Heads - 2/2



- **The print head configuration is shown schematically in the above illustration.**
- **Operation description is in the notes below.**

No.	Abbreviation	Description
1	AS	Air sensors (4)
2	F	Feelers (4)
3	HT	Head tanks (4)
4	F	Filters (4)
5	H	Print heads (2) H1 : K & C, H2 : M & Y
6	P	Pumps (4)
7	CT	Ink cartridges (4)

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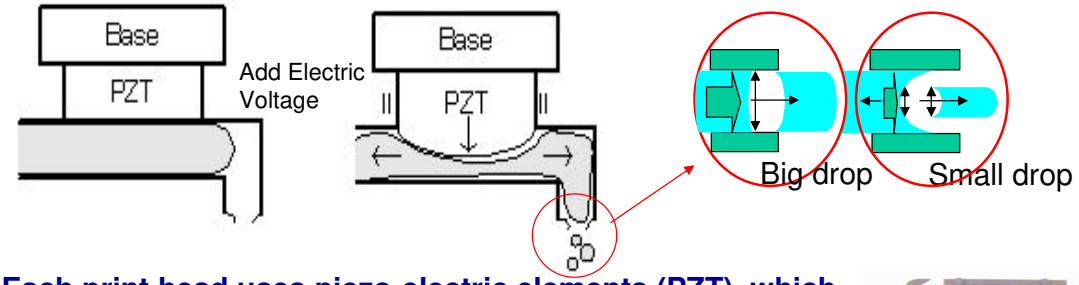
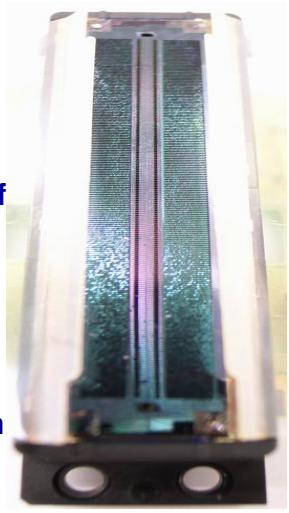
- When a request to supply ink is received, the drive switching motor turns the gear of the drive switching module to the position for supplying ink, and ink is supplied by the drive motor.
- Ink is supplied from the print cartridge [7] to each head tank [3] by the pump [6]. Ink is supplied at different gear positions for head tanks (black and cyan) and head tanks (magenta and yellow).
- The drive motor is also used to release air from the head tanks and for maintenance operations.
- Ink supplied to the head tanks passes through the filter unit and is supplied at constant pressure to the print heads.
- The ink level sensor detects the ink remaining in each head tank according to the position of the feeler on the side of each tank and requests ink supply if the ink is low.
- The air sensor [1] detects air in the head tanks. If it detects excess air, the gear of the drive switching module turns to the position where the air release lever presses the valve to release the air and fill the tanks with ink.

Nozzles - 1/2



- Each print head uses piezo-electric elements (PZT), which force ink from ink reservoirs, out of ink nozzles, and then onto paper.
  - This is done with pressure. At prescribed time, electric charge is applied to PZT, making PZT expand.
  - Expansion of PZT puts pressure on ink, forcing it out of ejection port.
  - This is a unique design that has several technical advantages over bubble-jet printers, such as faster printing speeds and more durable ink.
  - By reshaping Piezo elements using electronic signals, various ink drop sizes can be made.
  - Piezo system supports two-bit / multi-bit controller with only one nozzle.
  - Piezo elements are expensive.



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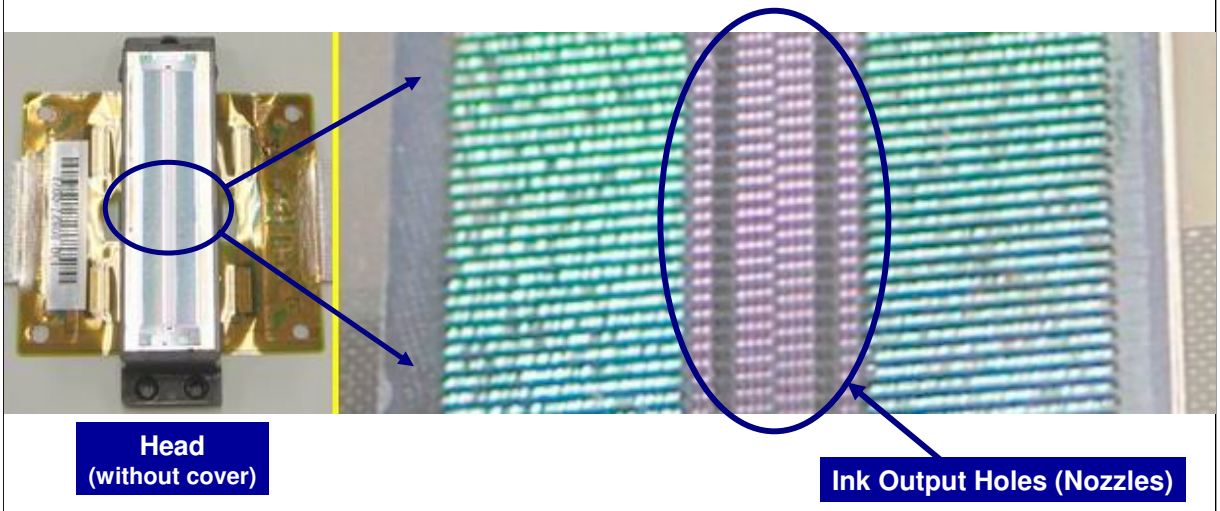
Note: View above is of head with it's surface cover removed.

Nozzles - 2/2



- Under magnification (right - with head cover removed), staggered alignment of ink output holes can be seen.

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No additional notes.

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Service Training

10) Ink Supply

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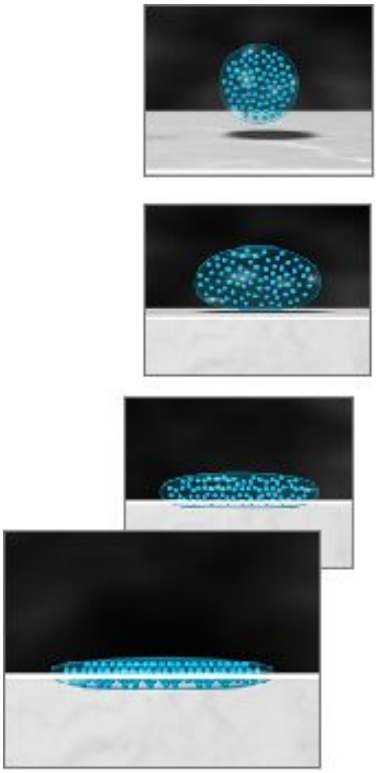
No additional notes.

GelJet Technology

- **Advanced Gel technology provides high color image quality on plain paper at fast printing speeds.**
- **Viscous Ink**
  - Penetration
    - » Dries quickly
    - » Supports high speed printing
    - » No stain on back of print-out
    - » Enables high speed duplex printing
  - Viscosity
    - » Prevents blurs on plain paper
    - » Low penetration of paper, enabling clean duplex printing
  - Durable print-image
    - » Waterproof
    - » Strong fade resistance



Slide 57

No additional notes.

Photo & Text Ink Density

Condition: Note that density of both images and text is reduced by around 20% when printing in duplex.

Reason: GelJet ink is more viscous than typical ink-jet ink, but still seeps into paper more than laser printers' toner, and ink density reduction results in better looking duplex prints.

Solution: If users would like higher density photos (density reduction is more noticeable with photos than with text), they will achieve better results printing single sided pages.

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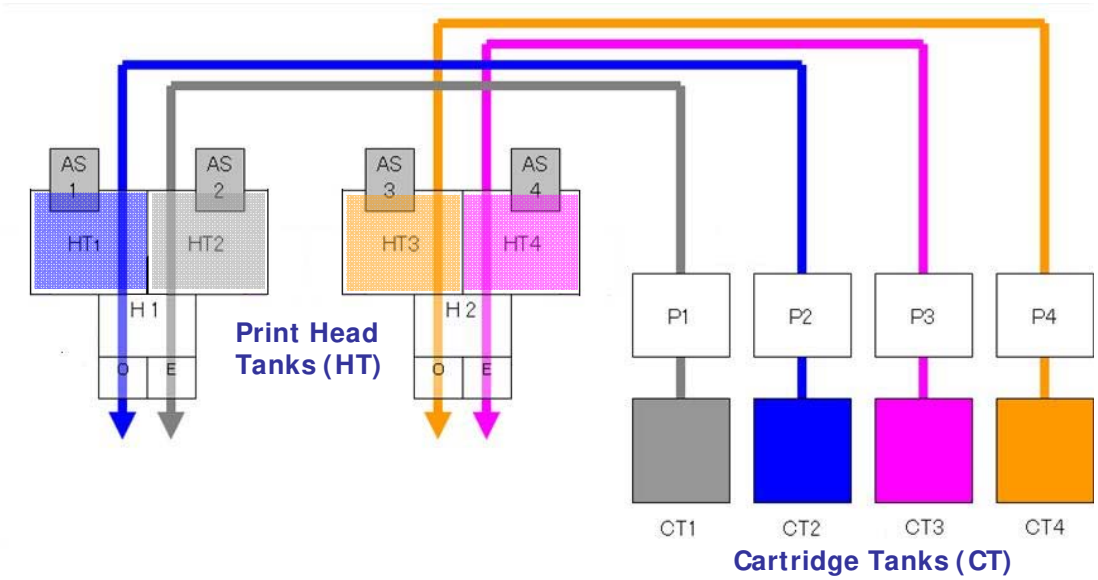
No additional notes.

Ink Flow



- Pumps (P1 – P4) move ink from the cartridge tanks to small tanks on the print heads.
- The dual ink tank system enables print cartridge replacement before the head(s) run out of ink.
- Since ink cartridges are not directly attached to the print heads, the carriage is lighter and easier to drive and control.

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No additional notes.

RICOH

J030/J032/J027/J028/J029
Service Training

11) Print Head Maintenance

Slide 60

No additional notes.

Manual Maintenance

- **User Maintenance**
  - Cleaning
  - Flushing
  - See user guide for details

Slide 61

No additional notes.

Automatic maintenance

- **Before Printing (whenever heads are uncapped)**
  - Small amount of ink ejected
    - » Ensuring smooth surface of ink in nozzle holes
- **After Idle Time**
  - Small amount of ink ejected (after 10 hours)
    - » Ensuring smooth surface of ink in nozzle holes
  - Head cleaning (after one week at power on)
  - Ink purge（after 49 days at power on）
- **While Printing (periodically)**
  - Small amount of ink ejected
    - » Ensuring smooth surface of ink in nozzle holes
- **After Printing (and before capping)**
  - Small amount of ink ejected
    - » Ensuring smooth surface of ink in nozzle holes
- **Air Purge Filling (when air is detected)**
  - See following slide.

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No additional notes.

Air Purge Filling

- **What is Air Purge Filling?**
  - In order to eject the ink properly from the print head, it is necessary to maintain negative pressure (with respect to the surrounding air) inside the head tank. If negative pressure is lost, the ink can leak out from the nozzle and adversely affect the image quality. If this occurs, the negative pressure must be re-established. This process is known as “Air Purge Filling”. The full process from purging to reestablishing negative pressure is now know by two terms, depending on how negative pressure is reestablished.
- **Maintenance Unit Air Purge Filling**
  - Resets the pressure inside the tank by releasing the air release valve
  - Refills the head tanks
  - Closes the air release valve
  - Memorizes the full head-tank position by calibrating the feeler arm
  - Reestablishes negative pressure by vacuuming a small amount of ink from the heads with the maintenance unit
- **Ink Supply Unit Air Purge Filling**
  - Resets the pressure inside the tank by releasing the air release valve
  - Refills the head tanks
  - Closes the air release valve
  - Memorizes the full head-tank position by calibrating the feeler arm(s)
  - Reestablishes negative pressure by running the ink supply unit's ink pumps in reverse

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No additional notes.

Cleaning Count SP Codes

❑ Display User Cleaning Count

- 7-002-001 USER CL CNT:H1 Print Head 1 (C / K)
- 7-002-002 USER CL CNT:H2 Print Head 2 (Y / M)
- Use this SP to display total number of print head cleanings executed from printer driver and from printer operation panel.

❑ Display User Flushing Count

- 7-002-005 USER RF CNT:H1 Print Head 1 (C / K)
- 7-002-006 USER RF CNT:H2 Print Head 2 (Y / M)
- Use this SP to display total number of print head flushings executed from printer driver and from printer operation panel.

❑ Section 7 SP Codes can be used to display a large number of other counts for machine operation events. Please familiarize yourself with these codes.

- FSM → Appendices → SP Mode Service Tables → SP7-XXX

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No additional notes.

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Service Training

12) Carriage

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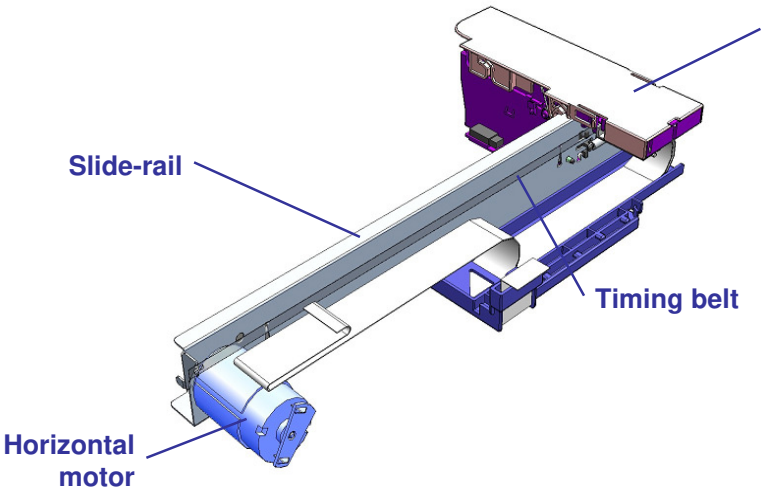
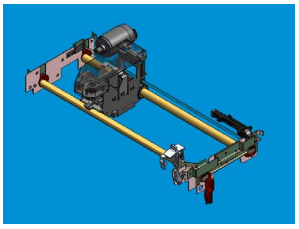
No additional notes.

Carriage Drive



New: Slide-rail system



Old: Guide rod system

- **The BRG-G1 uses a new slide-rail system. The horizontal motor drives the carriage left and right along the slide rail using a timing belt.**
- **The slide rail system allows easy replacement of the carriage unit compared to the old guide rod system.**

Slide 66

No additional notes.

Carriage Unit Replacement

- **The above items are included in the Carriage Replacement Kit for the BRG-G1.**
  - [1] Carriage unit
  - [2] Ink cartridges (x4)
  - [3] Ink collector unit
- **Study the carriage unit replacement procedure in the FSM.**
  - FSM → Replacement and Adjustment → Carriage Unit
- **After carriage unit replacement you must do the following:**
  - Execute SP3-009-002.
  - After the print head ink tanks fill, check the operation and perform maintenance. (See the procedure in the FSM.)

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No additional notes.

RICOH

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Service Training

13) Paper Feed

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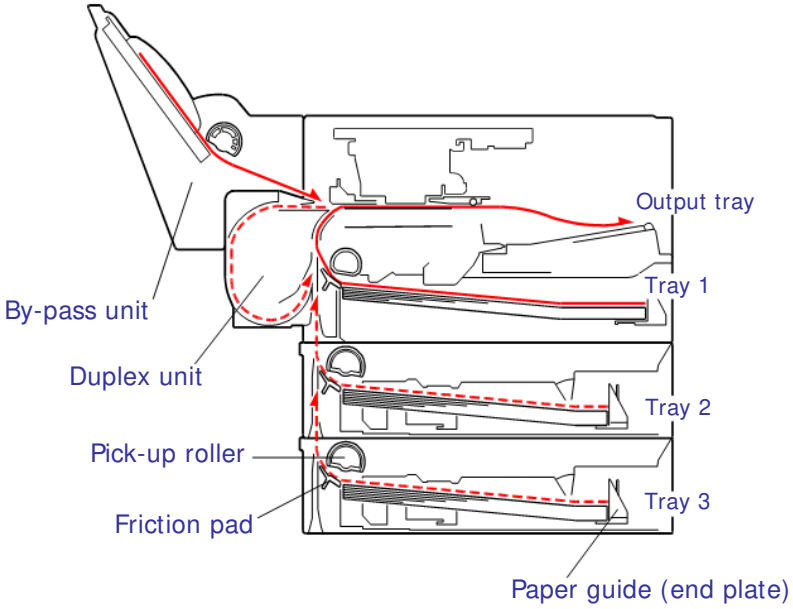
No additional notes.

Overall Paper Path



- **The illustration shows the paper paths within a fully loaded J028/J029 system.**

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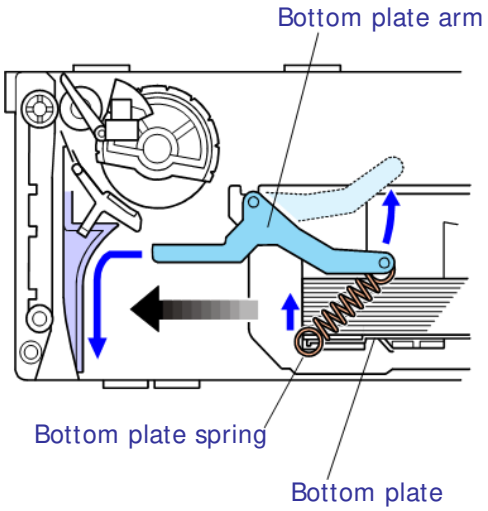
No additional notes.

Paper Lift

- When the paper cassette is inserted, the pegs on the bottom plate arms slide over runners on both sides of the frame. This rotates the bottom plate arms.
- The bottom plate spring expands and applies tension to the bottom plate and raises the paper stack.



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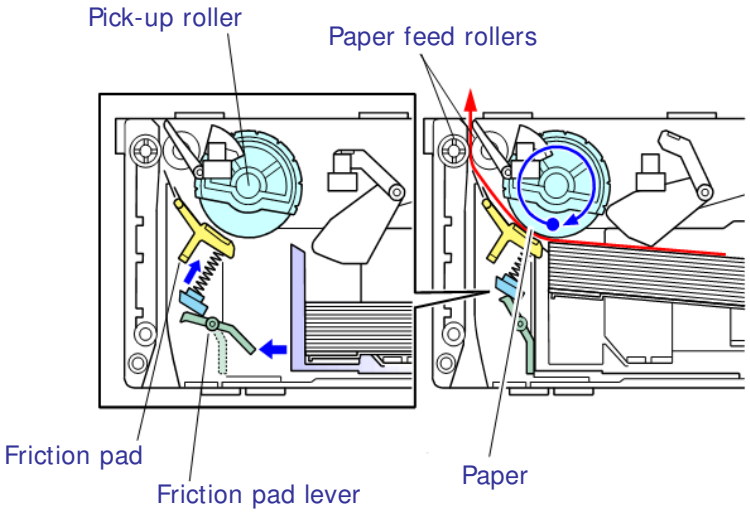
No additional notes.

Paper Feed Process

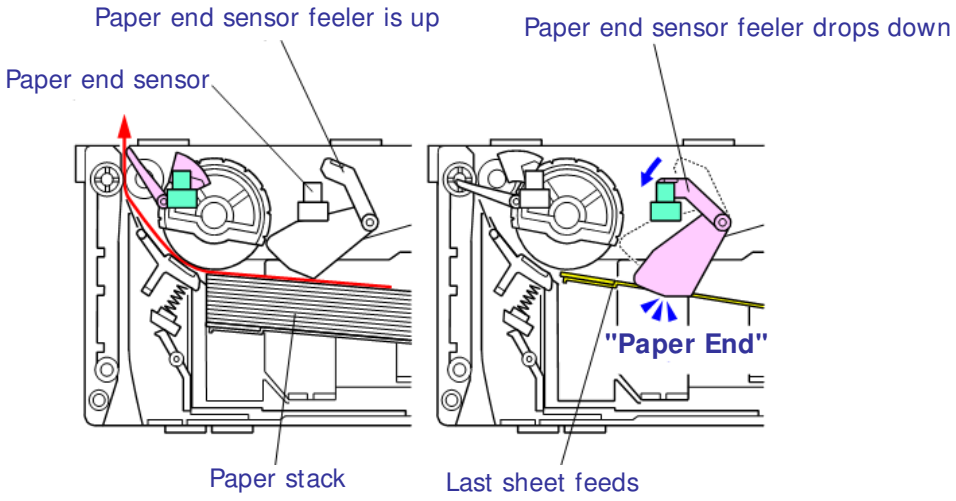


- As the paper cassette slides in, the front of the cassette pushes in the friction pad lever. This raises the friction pad to the level of the paper stack. When the pick-up roller rotates, it pulls the top sheet across the friction pad. If more than one sheet is picked up, the friction pad stops the lower sheets and prevents them from feeding.
- The pick-up roller feeds the sheet between the feed rollers. The paper feed clutch disengages the pick-up roller and stops it after one rotation. The feed rollers continue to feed the sheet out of the tray and into the vertical feed path.

Slide 71

No additional notes.

Paper End Detection



- **As long as there is at least one sheet of paper in the tray, the paper will keep the paper end sensor feeler up. After the last sheet feeds, the weighted bottom of the actuator will drop into a slot in the bottom tray and the top of the actuator will fall into the gap of the paper end sensor. When the actuator enters the sensor gap, the machine displays a paper end alert on the printer operation panel.**

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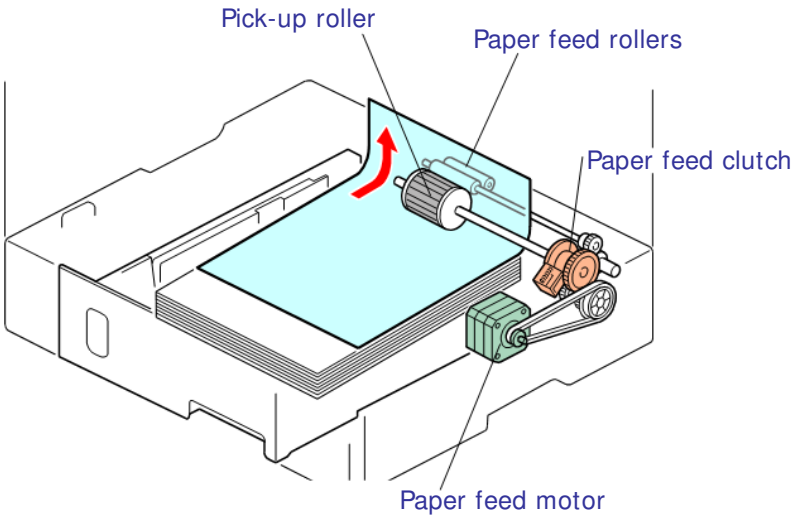
No additional notes.

Paper Feed Drive



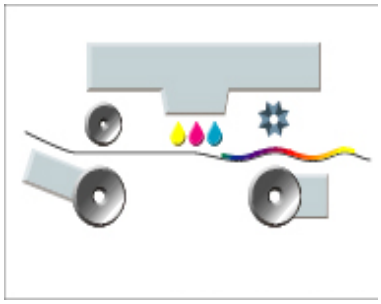
- **The paper feed motor drives the pick-up roller and paper feed rollers.**
- **The paper feed clutch is a magnetic clutch. To feed each sheet, it switches on to rotate the pick-up roller so it can pick up and feed a sheet of paper between the paper feed rollers. Once the paper feed rollers start to feed the sheet, the paper feed clutch switches off and stops the rotation of the pick-up roller. This cycle is repeated to feed each sheet of paper.**

Slide 73

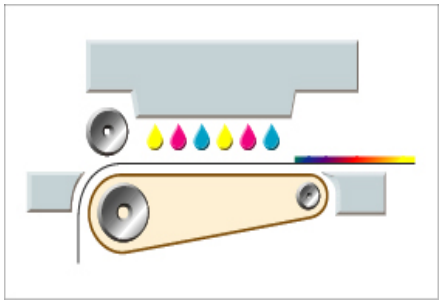
No additional notes.

Transport Belt

Roller feeding system (Competitors)



Belt Transfer system

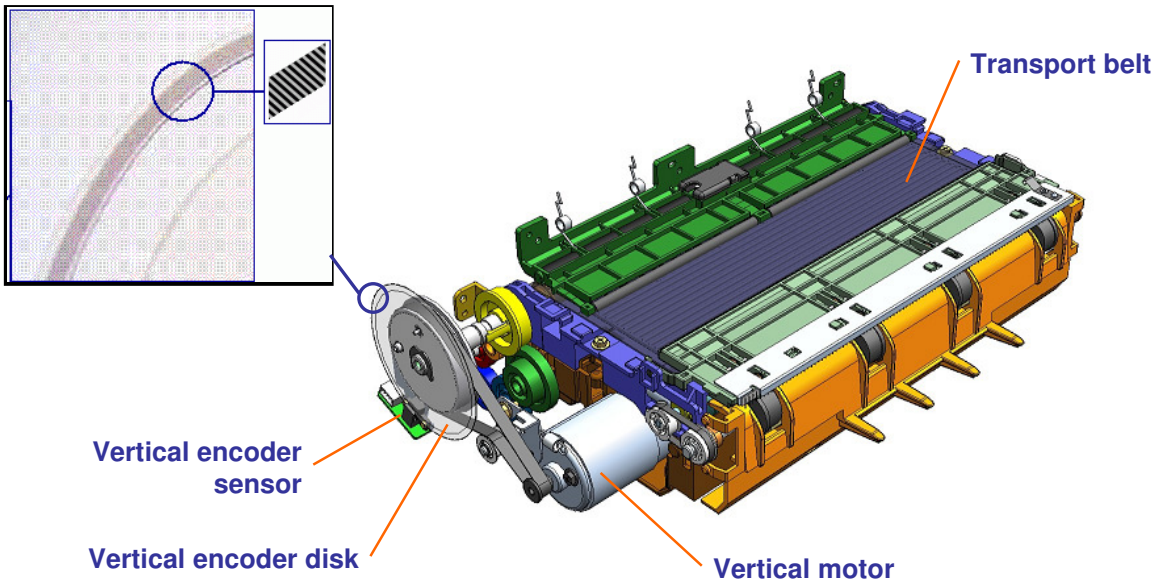


- **Highly accurate print images**
  - J029/J028 (simplex & duplex)
  - J027 (simplex only)
- **Laser-like printable area (with bottom margin 4.2 mm)**

No additional notes.

Slide 74

Vertical Timing



- Machine is able to accurately gauge position of paper on Transport Belt by reading markings on Vertical Encoder, which is connected to transport belt as shown in above diagram.

Slide 75

No additional notes.

Belt Transport System

- **This machine uses a Belt Transport System (BTS) to move paper.**
- **HVPS (High Voltage Power Supply) charges the roller below the transport belt.**
- **Charge Roller then applies charge to Transfer Belt**
  - Static charge holds paper in place
- **Temperature/humidity sensor below transport belt monitors temperature and humidity.**
- **Feedback from temperature/humidity sensor is used to charge width applied to transport belt below print heads.**
- **Electrical field is reduced to smallest size still providing proper charge to keep paper on belt (for even printing over full surface of paper).**

Slide 76

Transport belt enables:

- Highly accurate print images (simplex & duplex printing)
- Laser-like printable area (with bottom margin 4.2 mm)

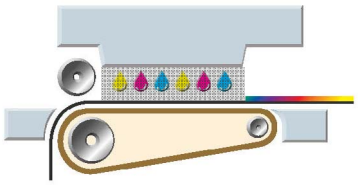
Useful Bit Switch Settings

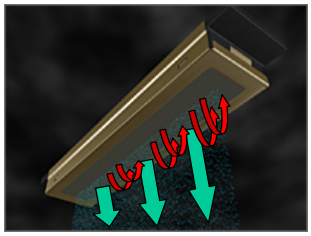
❑ **While printing, heads generate a slight amount of ink mist as byproduct of printing process.**

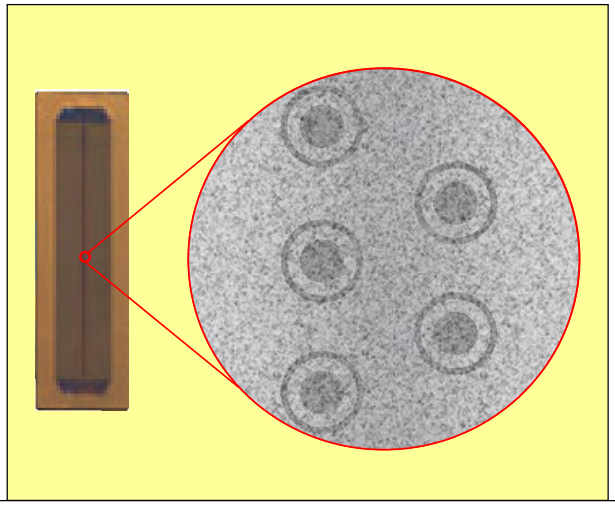
This mist adheres to head surface due to static charge effect on feeding belt. This varies depending on type of paper used, and tends to occur if the customer uses high-resistance paper.

As adhered mist dries on head(s), nozzles can become clogged.

To counter this effect by changing static charge, change BitSW 8-6 to value "1".







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❑ FSM → Appendices → Service Mode, Engine Maintenance → Bit Switch Settings

Charge Leak Detection

- **The printer checks for charge leaks at following times:**
  - Immediately after machine is turned on.
  - When receiving leak detection signal from HVPS (High Voltage Power Supply) during printer operation.
- **When charge leak is detected:**
  - Voltage supply from HVPS is interrupted immediately.
  - Printer stops current job in progress.
  - Carriage goes back to home position
  - Print heads are capped (printing not possible)
- **To restore printer to normal operation**
  - Remove cause of leak
  - Turn machine off, and then on again.

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No additional notes.

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J030/J032/J028/J029
Service Training

14) Duplex Unit

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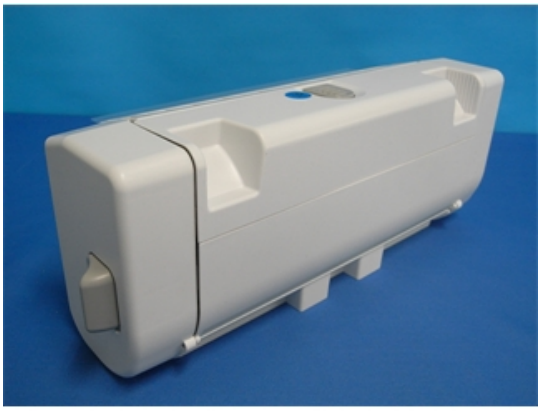
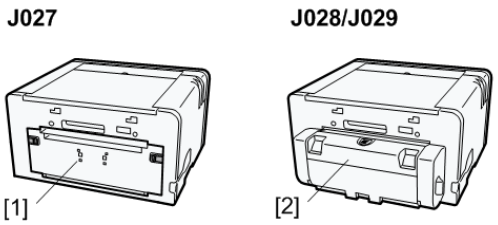
No additional notes.

Duplex Unit

- **This duplex unit [2] is provided as a standard item with the J028 and J029. Due to being a standard item, this unit does not have a product name.**
- **The J027 model is equipped with a rear cover [1] rather than a duplex unit [2].**
- **The duplex unit must be installed for operation. Its removal is detected by a sensor, resulting in the machine becoming inoperative.**

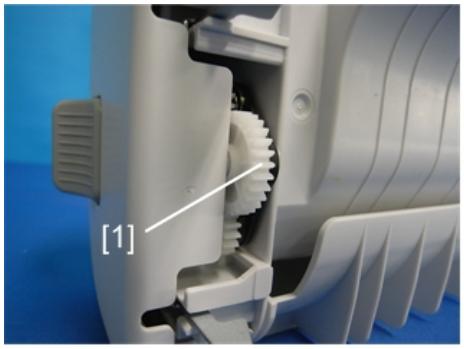




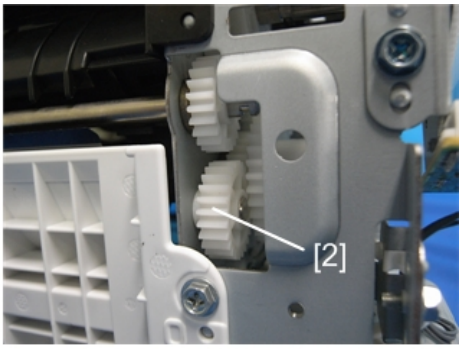
Slide 80

- The duplex unit can be removed in case of paper jams or other problems.

Duplex Unit Drive



Duplex unit gears



Drive gear (Main machine, right rear view)

- **The duplex drive input gear [1] meshes with vertical motor drive gear [2] and drives the inverter rollers in the duplex unit.**
- **The duplex unit is driven by the vertical motor mounted behind the PSU on the left side of the machine. (This motor also drives the vertical encoder wheel and paper transport belt rollers.)**

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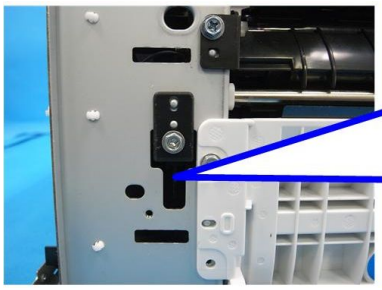
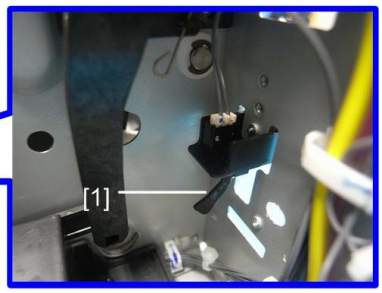
- Once the trailing edge sensor detects the trailing edge of the paper after the front side of the paper is printed, the motor stops.
- The motor then reverses and feeds the paper into the duplex unit where it is inverted and fed once again onto the transport belt so the reverse side can be printed and fed onto the output tray.

Duplex Unit Detection

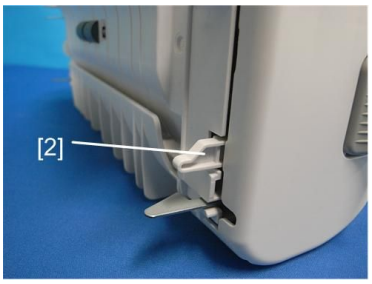
- The duplex unit set switch [1] detects if the duplex unit is installed correctly and that the cover is closed.
- The switch actuator [2] turns on the duplex set switch when the duplex unit is mounted.
- If the duplex unit's cover is opened the duplex cover lever [3] releases the switch actuator and the switch turns off.



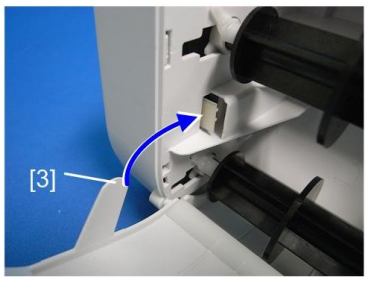
Main machine, rear view



Duplex unit set switch



Switch actuator



Duplex cover lever

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No additional notes.

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Service Training

15) Peripheral Devices

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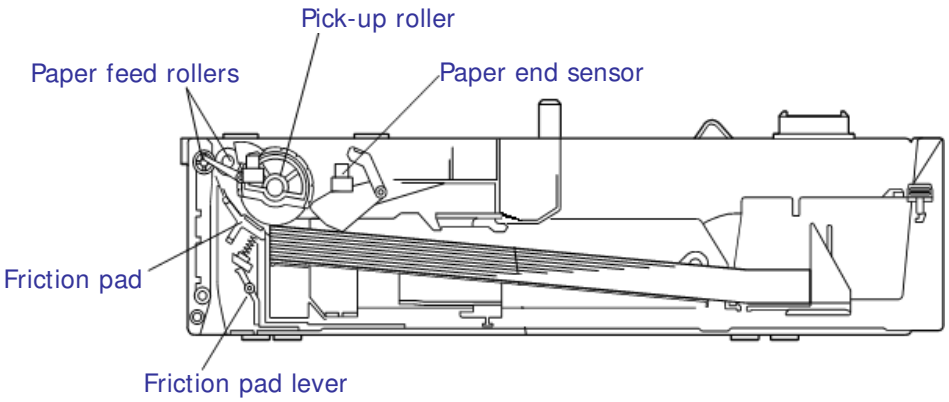
No additional notes.

Paper Feed Unit (J312)

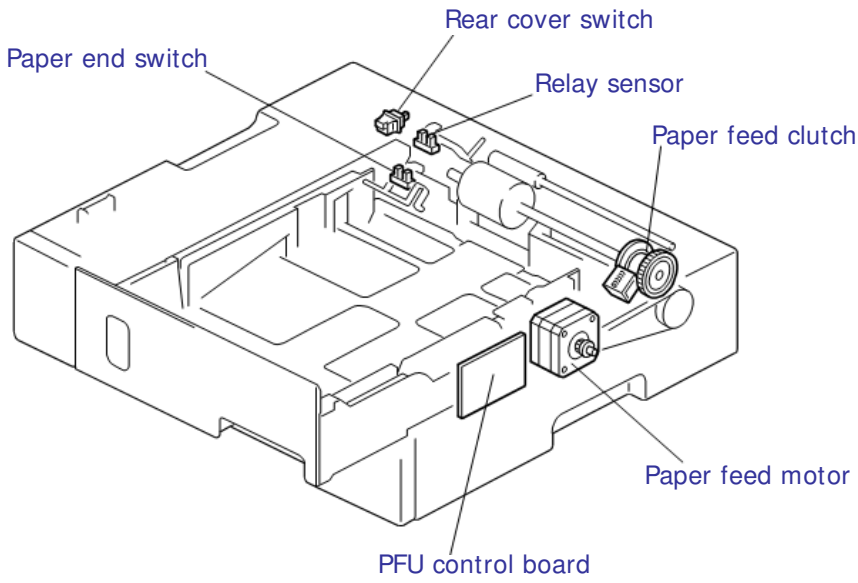


- The illustration shows the components of a paper feed unit.
- The functional operation of the PFU is the same as that of the first tray (described earlier)

Slide 84

No additional notes.

Paper Feed Unit - Electrical Components



- **The illustration shows the electrical components of a paper feed unit.**
  (The electrical component functions are described in the notes below.)

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Paper Feed Clutch

- A one-way clutch that controls the operation of the pick-up roller. Releases and allows the pick-up roller (a half roller) to rotate and pick-up the sheet and feed it. When the roller completes a rotation, the pawl of the clutch stops the pick-up roller. The paper feed motor continues to rotate and drive the paper feed rollers, which transport the paper out of the PFU.

Paper Feed Motor

- Drives the pick-up roller and paper feed rollers. A large heat-sink is fastened to the back of the motor to absorb and dissipate heat generated by the motor during continuous printing.

PFU Control Board

- Controls operation the paper feed tray motor and clutch. Also monitors the sensors.

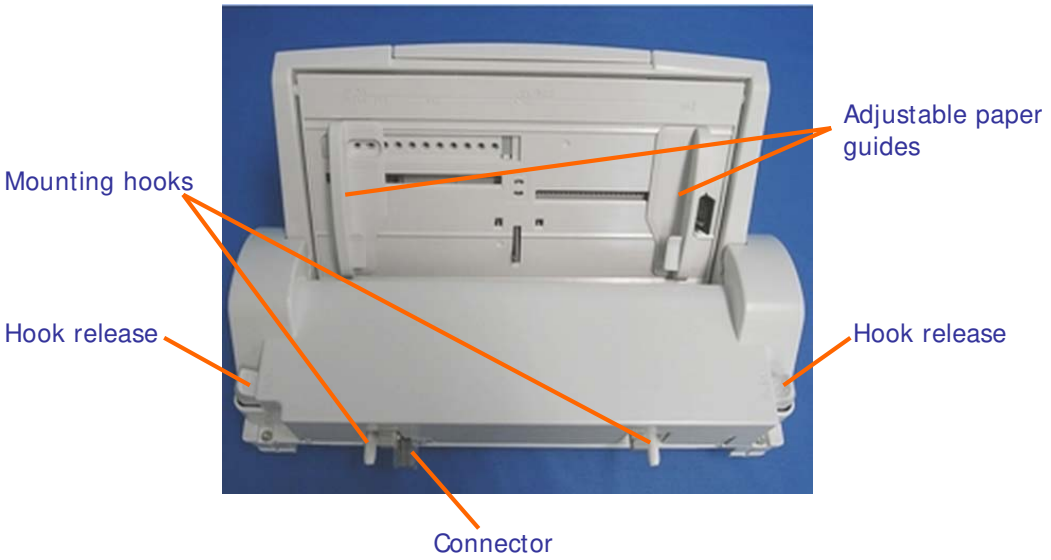
Relay Sensor

- The feeler of this sensor is raised and lowered by the leading and trailing edge of each sheet of paper that leaves the PFU. If the feeler does raise or lower at the prescribed time, the PFU will signal the main unit that a paper jam has occurred at the sensor location.

Rear Cover Switch

- This is a push switch that signals when the rear cover is closed.

Multi Bypass Tray BY1040 (J313)



- **This bypass unit is available as an option for all the models except the J027.**

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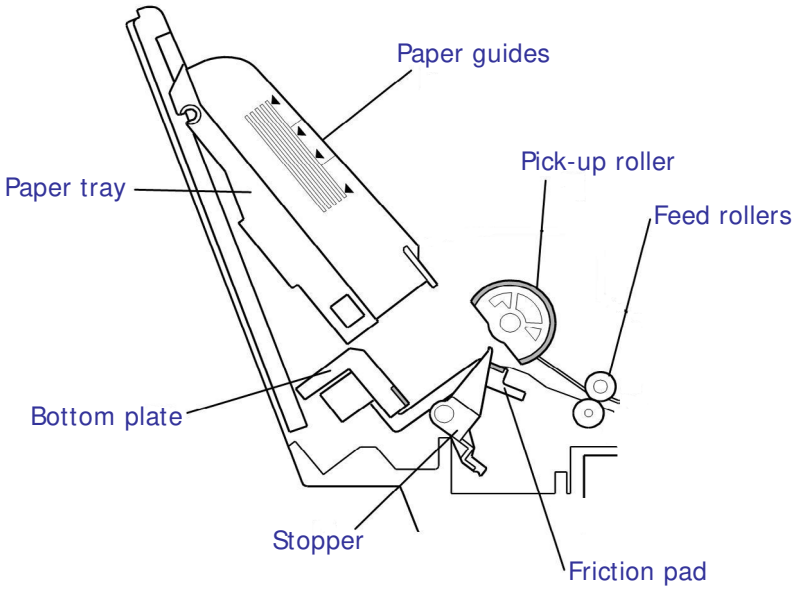
No additional notes

Multi Bypass Tray Cross Section View



- Main parts viewed in cross section

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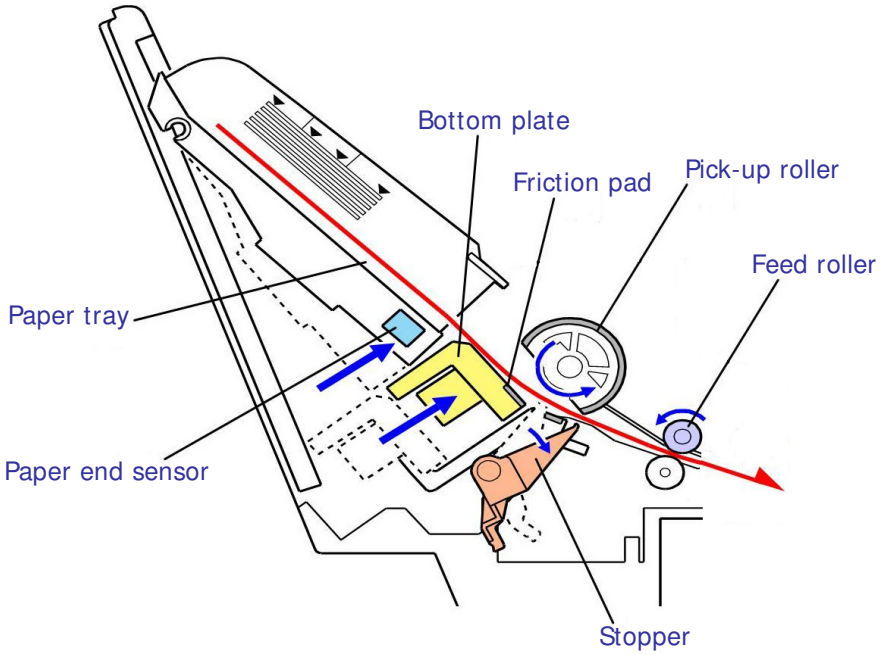
No additional notes.

Multi Bypass Tray Operation



❑ **Refer to the notes below for details.**

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When a print job starts:

- ❑ The bypass feed motor and feed clutch switch on and start to rotate the shaft of the pickup roller. (The bypass feed motor drives all the rollers.)
- ❑ The large cams on both ends of the pickup roller raise the bottom plate and release the stopper to open the paper feed path.
- ❑ The rubber friction pad on the bottom plate below the pickup roller provides enough resistance from below to prevent double-feeding from the tray.
- ❑ The soft rubber surface of the rotating pickup roller pulls one sheet of paper from the tray and sends it to the feed roller.
- ❑ Once the pickup roller completes its arc of rotation for one sheet, the pawl of the paper feed clutch locks the pickup roller and then releases it when the next sheet feeds.
- ❑ This cycle repeats for each sheet of paper fed to the printer.
- ❑ When the last sheet of paper feeds from the bypass paper tray, the bypass paper end sensor (a photo-sensor) detects paper out and signals the main machine that the tray is empty.
- ❑ The machine stops printing and re-starts after more paper is loaded in the bypass tray.

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Service Training

16) Maintenance

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No additional notes.

Standard Service Call Procedures

- **This machine has no PM Parts.**
- **Do the following at each service call.**
  - Clean external covers: Damp cloth
  - Clean connecting rollers and paper feed rollers: Damp cloth
  - Clean the friction pad(s): Damp cloth
  - Clean the maintenance unit: Damp cloth
  - Check printer operation and print quality: Print a nozzle check pattern and check the results. Clean the print heads if necessary.
    - » FSM → Replacement and Adjustment → Print Head Cleaning and Adjustment.
  - Clean the transport belt: Slightly damp cloth, then dry cloth. **Important**: To protect the surface of the transport belt, never use alcohol or any other type of organic solvent.
  - Clean the horizontal encoder strip: Clean linen cloth dampened with alcohol (Do not use cotton, tissue paper, or any material that could shred and leave fibers.)
  - Clean the horizontal encoder sensor: Damp cloth
  - Clean the vertical encoder wheel: Clean linen cloth dampened with alcohol. (Do not use cotton, tissue paper, or any material that could shred and leave fibers.)
  - Clean the exposure glass, the scanning glass, the platen, and the white plate.
- **For details of all cleaning procedures, see the FSM.**
  - FSM → Replacement and Adjustment → Cleaning
  - FSM → Preventive Maintenance → PM Table → Regular Cleaning

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No additional notes.

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Service Training

17) Troubleshooting

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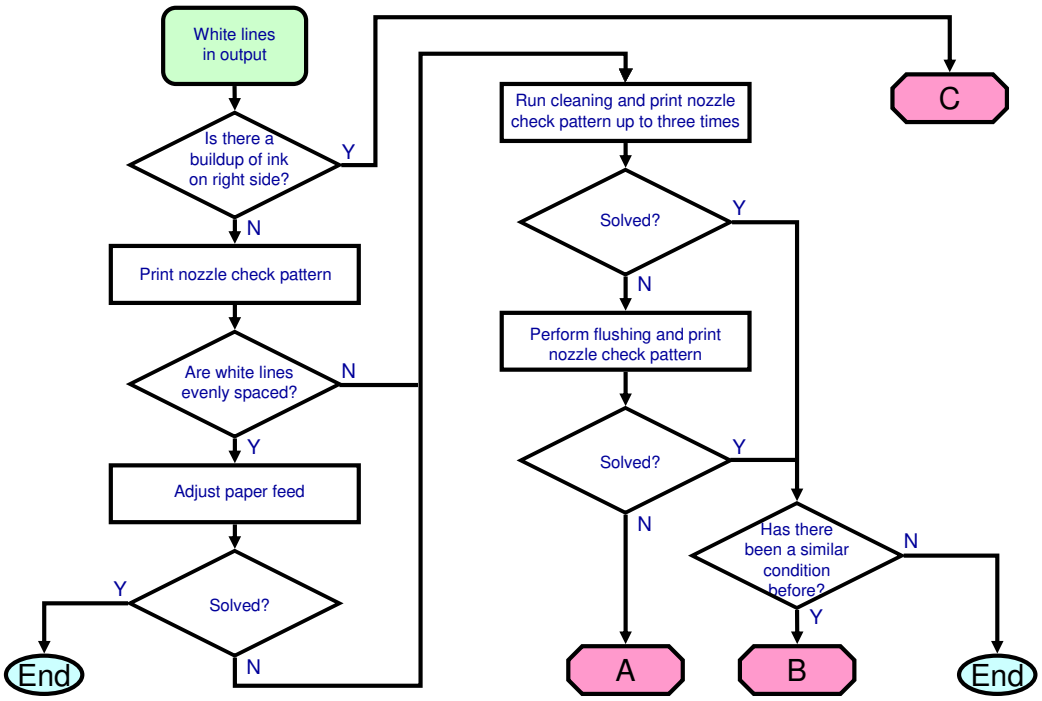
No additional notes.

Image Problem Procedural Flowchart - 1/3



- **Familiarize yourself with the guidelines on this and the following two slides.**

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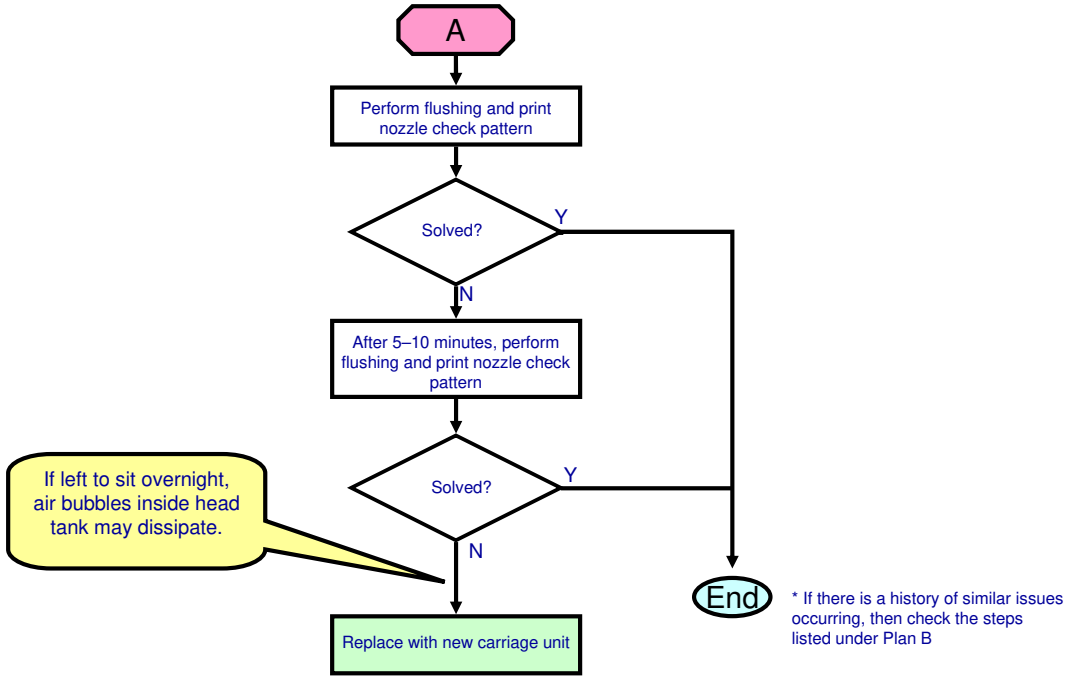
No additional notes.

Image Problem Procedural Flowchart - 2/3

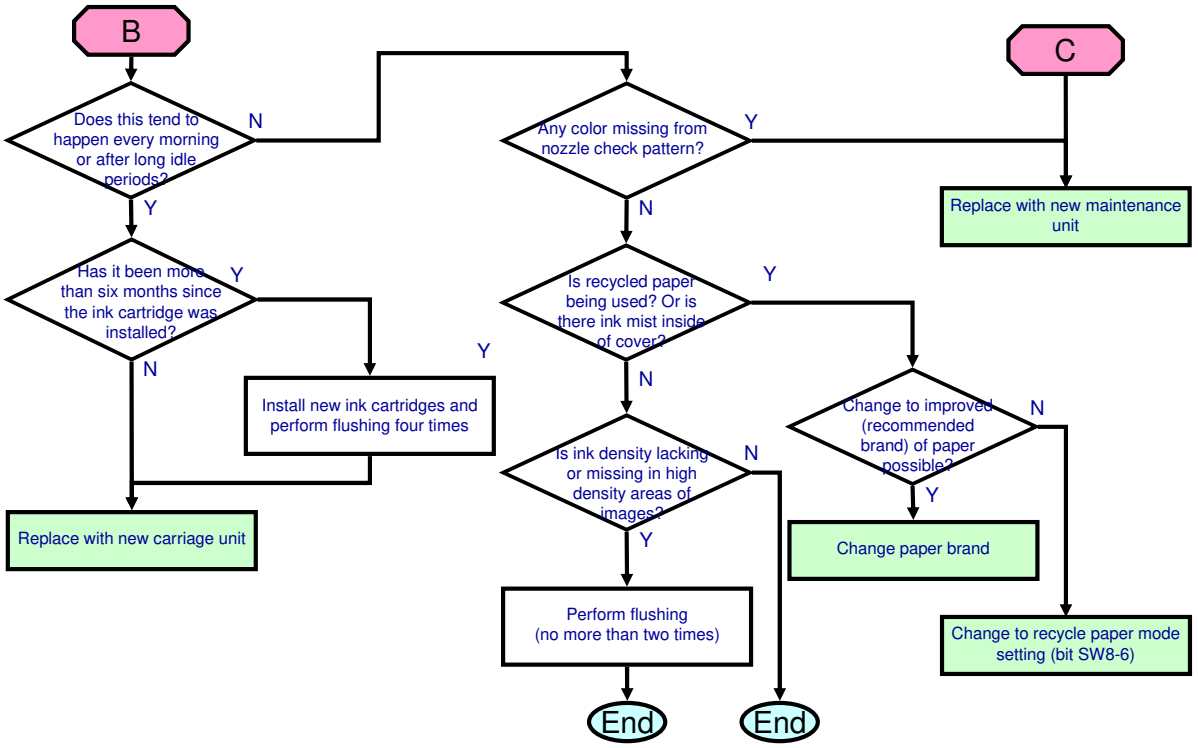


- **Familiarize yourself with the guidelines on this, and preceding & following slides.**

Slide 93

No additional notes.

Image Problem Procedural Flowchart - 3/3



- **Familiarize yourself with the guidelines on this, and the preceding two slides.**

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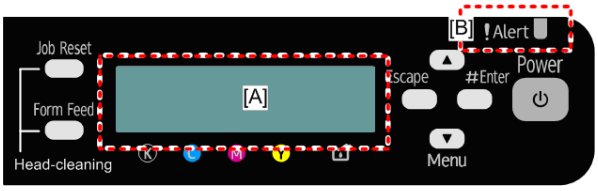
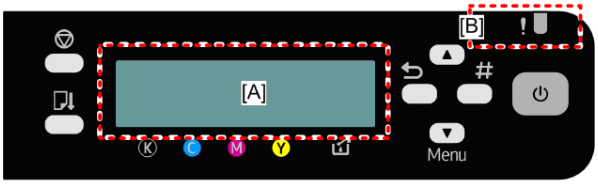
No additional notes.

Troubleshooting Using Operation Panel Display

North America



Europe



- **The LCD [A] and Alert LED [B] indicate errors. There are several error types.**
- **Service Call (SC)**
  - Highest priority, LED: ON, LCD: Displays an SC code*
  - If power ON/OFF does not clear the problem, service is necessary.
- **Operator Call**
  - High priority, LED: ON, LCD: Displays a message*
  - User action is necessary before operation can resume.
- **Warning Condition or Diagnostic Error**
  - Lower priority, LED: Blinks, LCD: Displays a message*
  - Operation may be possible but user intervention is indicated.

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***See notes below.**

- The Alert LED is located below and to the left of the LCD on the J030/J032 operation panel. The function is the same.
- Refer to the FSM for tables listing SC codes, error messages, and recommended actions.
  FSM → Appendices → Troubleshooting
- Familiarize yourself with this section of the FSM and study the contents of the various tables.

Other Troubleshooting Tools

- **Basic items to check**
  FSM → Troubleshooting → Image Problems → Basic Check Points and Specifications
  - Familiarize yourself with the contents of this table.
- **Examples of image problems and suggested solutions**
  FSM → Troubleshooting → Image Problems → Problems and Solutions
  - Study the types of image problems and the suggested actions.
- **Jam codes**
  FSM → Appendices → Troubleshooting → Jam Codes
  - JAM codes do not appear on the machine's panel display. You can check them on the printer driver's status monitor.
  - Familiarize yourself with the contents of the jam code tables.
- **Other recommended reference material**
  - In addition to the FSM, spend some time studying the following for a thorough understanding of the machine and best troubleshooting procedures.
    - » User guide
    - » FAQ in Global Web Site

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No additional notes.

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J030/J032/J027/J028/J029
Service Training

18) Energy Saving

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No additional notes.

Promote Use of Energy Saving Features

- **Energy Saver Mode**
  - Proper use of energy saver modes saves energy and is environmentally friendly.
- **Duplex Settings**
  - Use of Duplex settings reduces amount of paper used, which results in less energy consumption for paper production.

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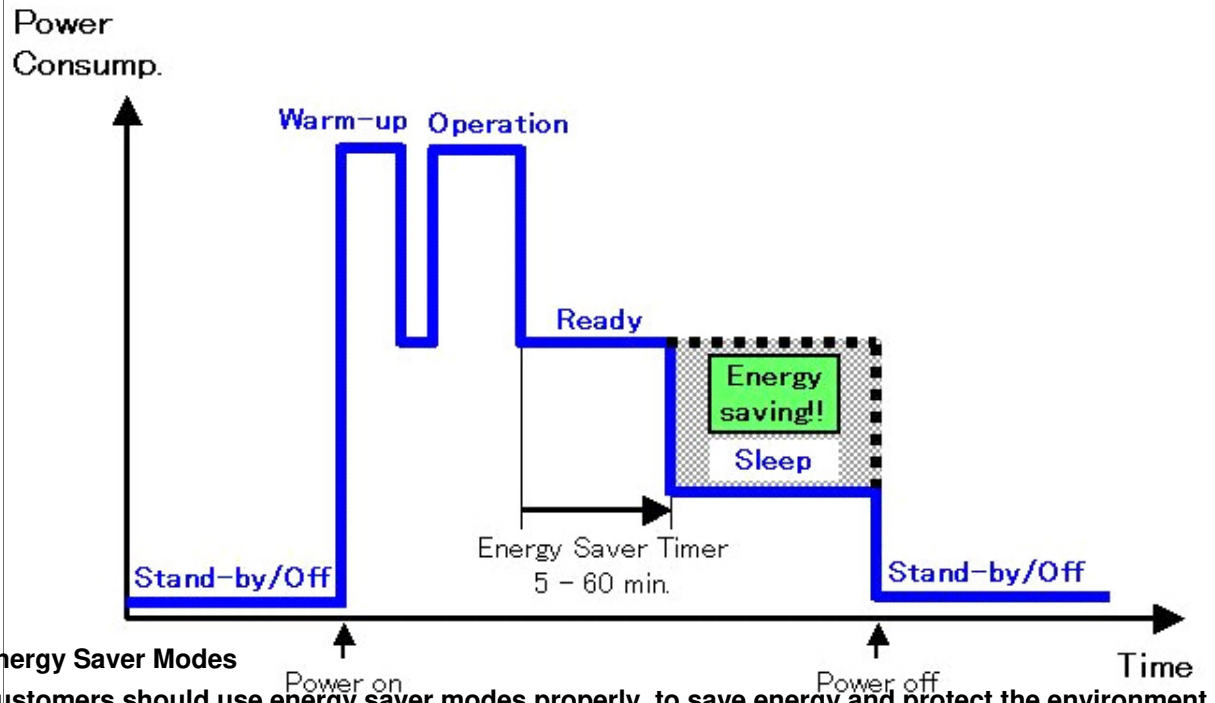
No additional notes.

Energy Saver Modes - 1/2



❑ Energy saver mode should be utilized to save energy & protect environment.

❑ Area shaded grey in diagram above represents amount of energy saved.

Energy Saver Modes

Customers should use energy saver modes properly, to save energy and protect the environment.

The area shaded grey in this diagram represents the amount of energy that is saved when the timers are at the default settings. If the timers are changed, then the energy saved will be different. For example, if the timers are all set to 240 min., the grey area will disappear, and no energy is saved before 240 min. expires.

Timer Settings

The user can set these timers with User Tools (Menu > Admin Settings > Power Saver > Energy Saver Mode1 or Mode2)

- Energy Saver Mode1 (30 sec.): This can be only turned on or off.

- Energy Saver Mode2 (1 to 240 min.): This can be turned on or off and timer setting is adjustable (default: 1min.).

Return to Stand-by Mode

Energy Saver Mode1

- Recovery time: 10 sec.

Energy Saver Mode2

- Recovery time: 23 sec.

Recommendation

We recommend that the default settings should be kept.

- If the customer requests that these settings should be changed, please explain that their energy costs could increase, and that they should consider the effects on the environment of extra energy use.

- If it is necessary to change the settings, please try to make sure that the Energy Saver Mode2 Timer is not too long. Try with a shorter setting first, such as 30 min., then go to a longer one (such as 60 min.) if the customer is not satisfied.

- If the timers are all set to the maximum value, the machine will not begin saving energy until 240 minutes has expired after the last job. This means that after the customer has finished using the machine for the day, energy will be consumed that could otherwise be saved.

Energy Saver Modes - 2/2

- **Timer Settings - User can set Energy Saver timer via:**
  - [Menu]> [up] or [down] "System"> [Enter].
  - [up] or [down]> "Energy Saver"> [Enter].
    - » Default is 5 minutes.
    - » Setting can be changed within a range of 5 to 60 minutes.
    - » After selected time has elapsed, machine will enter Sleep Mode.
- **Return to Standby Mode**
  - Machine returns to standby mode from energy saver mode after 2 seconds (for all three models).
- **Recommendation**
  - We recommend that default settings be used.
  - If customer requests settings change, please explain:
    - » Energy costs could increase
    - » The environment could be impacted.

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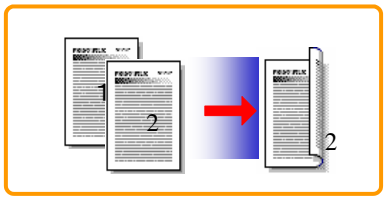
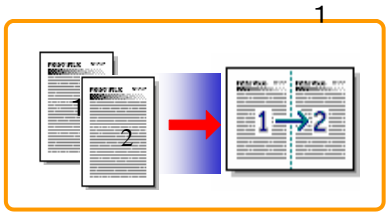
No additional notes.

Paper Saving - 2/2



- **Duplexing and combine functions reduce amount of paper used.**
  - Less energy overall is used for paper production, which helps the environment.
- **Duplex:**
  - Reduce paper volume by 50%!



- **Combine mode:**
  - Reduce paper volume by 50%!

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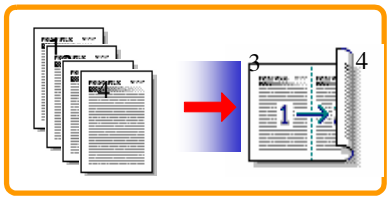
No additional notes.

Paper Saving - 2/2



- **Duplex + Combine:**
- **Using both features together can further reduce paper volume by 3/4!**

- **To check paper consumption, view total counter and duplex counter.**
  - For one duplex page, total counter goes up by 2.
  - For a duplex job of a three-page original, total counter goes up by 3.
- **Duplex counter counts pages with images on both sides.**
  - For one duplex page, duplex counter goes up by 1.
  - For a duplex job of a three-page original, duplex counter will only increase by 1, even though two sheets are used.
- **Recommendation**
  - Please explain these features to customers so they can reduce their paper usage.

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No additional notes.

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Service Training

19) AC Adapter and Battery for BRG-MF1c BT

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No additional notes.

Power Supply System

- **The BRG-MF1c BT has a lithium-ion battery (14.4V/ 5,400 mAh, 78Wh) and an AC adapter to supply power to the machine's electrical components.**
- **The battery supplies power if there is a blackout or other power supply problem.**

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- Replacement battery if required: Rechargeable Battery P5 (J343) – BRG-MF1c BT only

Battery

- **The battery can supply enough power to print 1,000 sheets of paper or copy 500 sheets of paper (ISO/ IEC24734 test chart) when it is fully charged.**
  - Actual capacity depends on the original, print quality, operation interval, operation time and operation environment.
- **The capacity of the battery when fully charged is almost decreased to half by default if the battery has been charged and discharged 500 times.**

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No additional notes.

ACB Board

- **The ACB board does the following:**
  - Switches power supply for the machine from either the AC adapter or the battery.
  - Charges the battery
  - Detects the remaining battery voltage
  - Makes 5V and 37V power supplies for the machine

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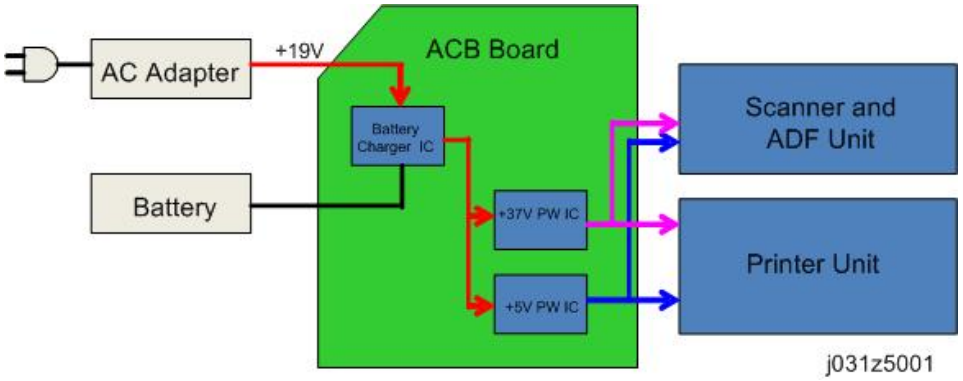
No additional notes.

Operation with AC Adapter



- When power is supplied from both the AC adapter and the battery, the ACB board selects the power supply from the AC adapter.
- However, during the time which is selected with “Peak Shift Function” in the user settings, power is supplied from the battery.

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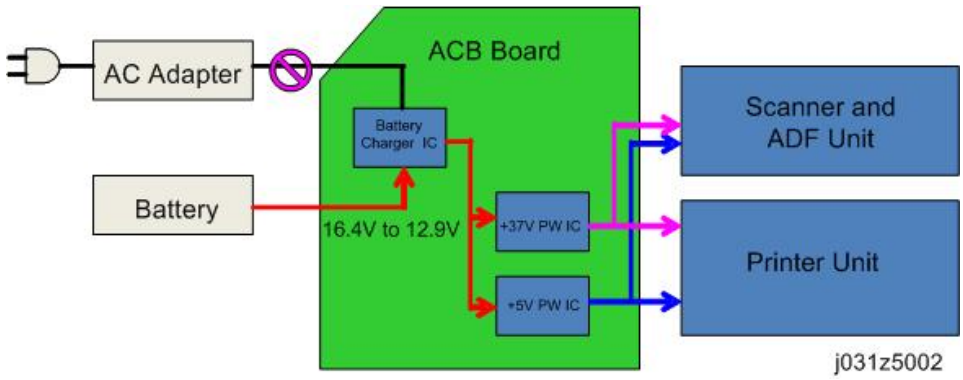
No additional notes.

Operation with Battery



- **When the remaining voltage of the battery becomes 12.9V or less, the ACB board sends a signal to the main board to stop the machine.**

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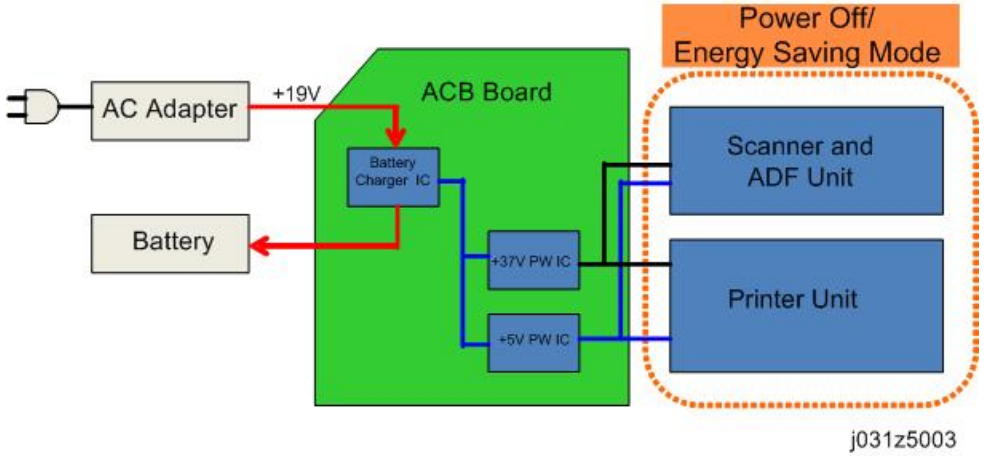
No additional notes.

Charging the Battery



- **The ACB board charges the battery when the machine is turned off or in the "Energy Saving Mode".**
  - The machine never charges the battery while the machine is operating or in the "Standby Mode".
  - This is because the input voltage of the AC adapter may exceed its rating if the battery is charged while the machine is operating or in the "Standby Mode".

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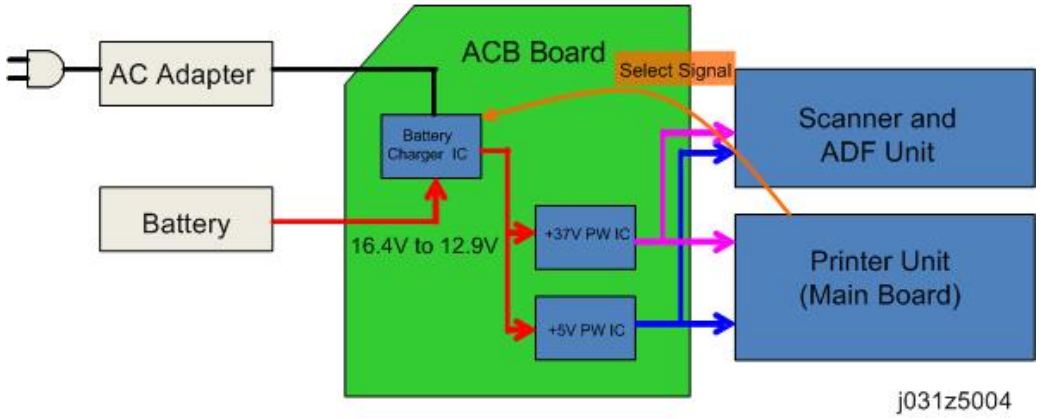
No additional notes.

Peak Shift Function



- **While the "Peak Shift Function" is enabled, and during the selected time interval that this function is active, the main board selects the power supply from the battery.**
  - This happens even if power is available from both the AC adapter and the battery.

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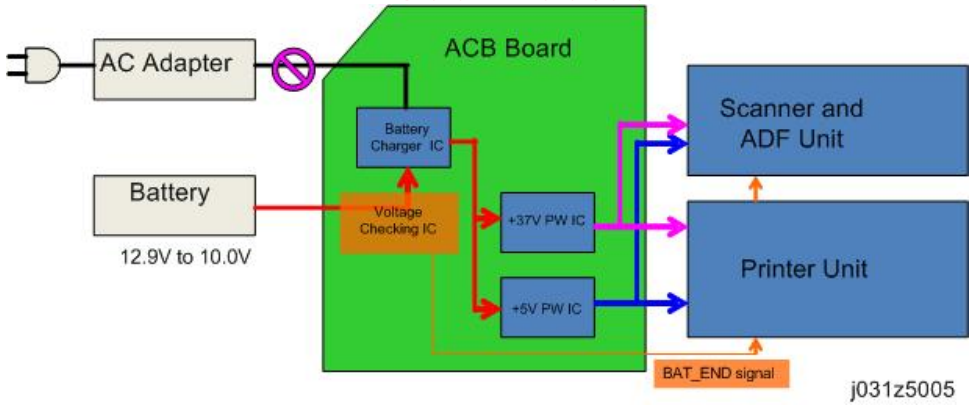
No additional notes.

If the Battery Runs Out, and the AC Adapter is Disconnected



- When the remaining voltage of the battery becomes 12.9V or less, the ACB board sends the BAD_END signal to the main board to stop the machine.
- The ACB board still supplies power to the electrical components after the main board has received the BAD_END signal from the ACB board.
- However, the ACB board interrupts the power supply from the battery just after the remaining voltage of the battery becomes less than 10.0V.

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No additional notes.

Before Working on the Machine

- Open the battery cover [A] and remove the battery [B].

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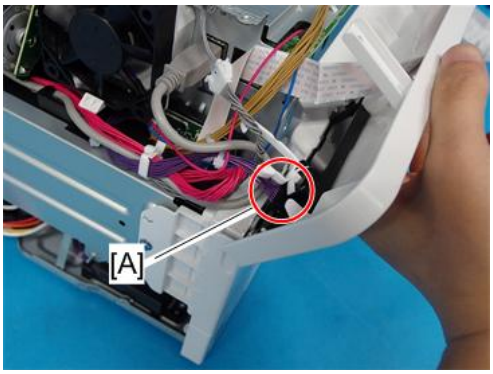
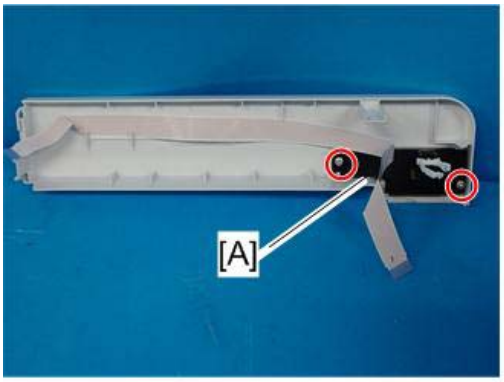
No additional notes

Removing the Front Cover





- **There is a harness from the ACB board to the front cover. Do not pull the front cover strongly until the harness is disconnected.**
- **Slide the front cover to the right to remove it, not to the left.**

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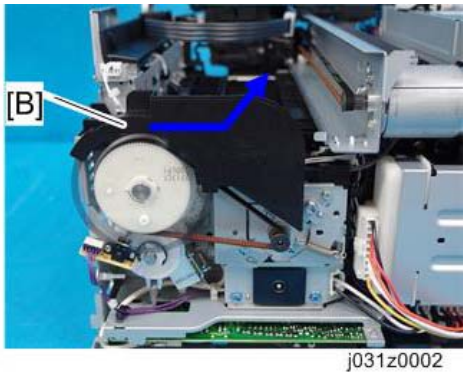
- This is a different point from the previous models in the series.

Vertical Encoder



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- A harness guide [B] has been added near the vertical encoder wheel.
- Be careful not to bend or scratch the vertical encoder wheel when taking out the harness guide.

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No additional notes

End of Course

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No additional notes.