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BJC-8500

SERVICE MANUAL

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BJC-8500

SERVICE MANUAL

Canon

Target Readers

This manual is published by Canon Inc. for qualified persons and contains the necessary technical information for technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, it may contain information that does not apply to your locality.

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CANON INC.

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This manual was produced on an Apple Macintosh™ Power Mac 7300/180 personal computer and Apple LaserWriter™ II NTX-J laser beam printer; final pages were printed on Agfa SelectSet Avantra 25.

A YANO 640MO drive system NJ640MO with MITSUBISHI MO disk cartridge MR230M1 were used for storing large volumes of page layout and graphic data for this manual.

All graphics were produced with MACROMEDIA FREEHAND™ 7.0J.

All documents and all page layouts were created with QuarkXPress™ 3.3J.

I. ABOUT THIS MANUAL

This manual is divided into five parts containing the information required for servicing the BJC-8500 printer.

Part 1: Safety and Precautions

This part contains information on how to service the unit safely. It is very important, and must be read.

Part 2: Product Specifications

This part outlines the product and its specifications.

Part 3: Operating Instructions

This part explains how to operate the unit properly, how to set it up properly, and how to use the service mode.

Part 4: Technical Reference

This part outlines the unit operation giving a technically.

Part 5: Maintenance

This part explains maintenance of the unit. It includes details of disassembly/assembly, adjustments required when assembling, troubleshooting procedures, and wiring/circuit diagrams, etc.



REF.

This manual does not contain complete information required for disassembling and assembling the BJC-8500 printer. Please also refer to the separate Parts Catalog.



NOTE

This printer prints various ink and plain paper ink optimizer (except in the draft mode when plain paper, envelope or thick paper is selected). This plain paper ink optimizer is an almost transparent, colorless liquid. For convenience, this manual sometimes refers to the plain paper ink optimizer simply as "ink optimizer" and the combination of ink and plain paper ink optimizer as "ink."
This manual also refers to the BJ cartridge and print head (head) as the one and same thing.

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1. PERSONAL SAFETY PRECAUTIONS

1.1 Moving Sections of the Printer

Be careful not to let your hands or fingers, hair, clothes, accessories, etc., become caught in any moving sections of the printer. The moving sections of the printer are driven by the carriage motor, paper feed motor, or the purge motor.

Moving sections driven by the carriage motor:

Carriage belt, idle pulley, carriage, etc.

Moving sections driven by the paper feed motor:

Paper feed rollers, pinch roller, cleaning unit, eject roller, spur unit, transmission gear, flapper unit, etc.

Moving sections driven by the purge motor:

Purge unit, pick-up roller of the sheet feeder unit, pick-up rollers in the upper and lower cassettes, paper feed roller, etc.

During operation close the top cover (except when checking operation), and take care not to touch the above moving parts. Also note that the spurs are made of metal and have sharp edges. Avoid touching these inadvertently with bare hands.

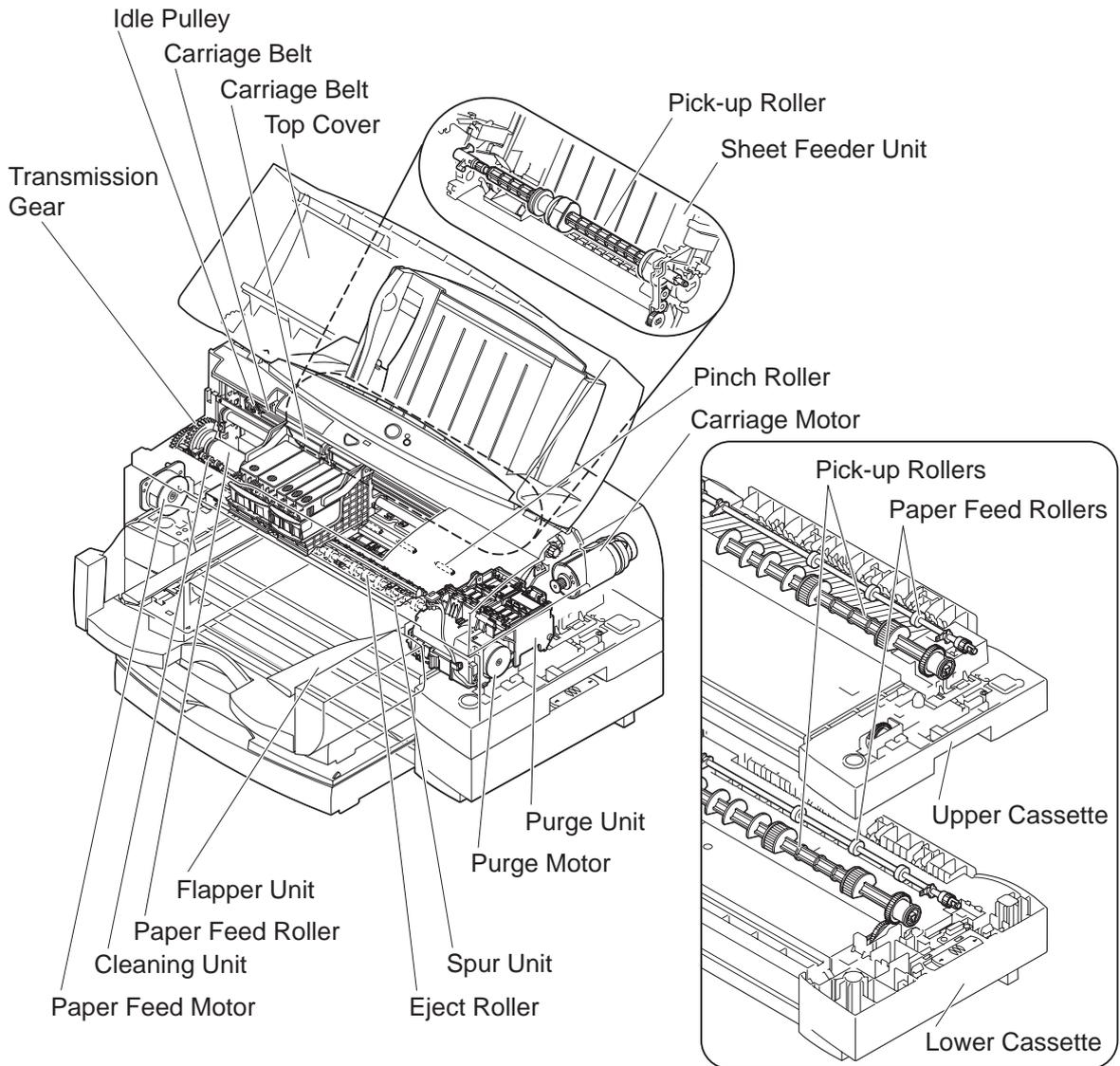


Figure 1-1 Moving Sections of the Printer

1.2 Ink Stains

1.2.1 Ink path

Be careful not to touch the ink path on the printer, or get ink stains on your hands or fingers, clothing, printer while it is operating and on the work table.

The ink path is comprised of the nozzle section of BJ cartridges, suction caps, waste ink tubes, wiper section, wiper cleaner, maintenance jet section, wiper unit, wiper unit transfer pad and waste ink absorber.



CAUTION

The ink and plain paper ink optimizer are not substances harmful to the human body. They do, however, contain organic solvents (Ink: isopropyl alcohol 67-63-0, glycerin 56-81-5, Plain Paper Ink optimizer: ethleneglycol 111-46-6, glycerin 56-81-5). Be careful not to get any ink in your mouth or eyes. Also, keep ink and plain paper ink optimizer out of the reach of small children.

If you do get any into your eyes, wash it out immediately with plenty of water. If you inadvertently swallow a large amount of ink, consult a doctor immediately.

Since ink contains dyes, if it gets on your clothes, etc., it will not come out even through washing.

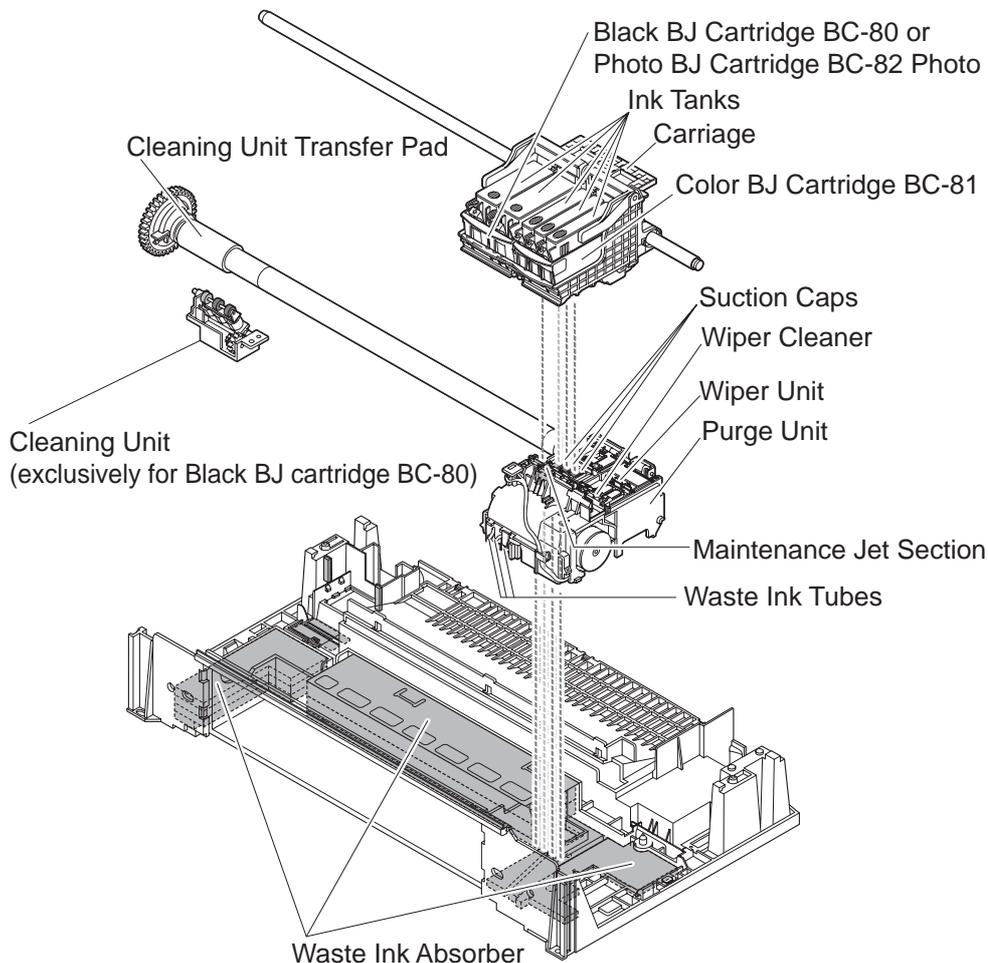


Figure 1-2 Ink Path

The ink path includes the filters of the Black BJ cartridge [BC-80], Color BJ cartridge [BC-81] and Photo BJ cartridge [BC-82 photo], and each ink outlet of the ink tanks. Take care of the ink path when handling BJ cartridges and ink tanks.

Never unnecessarily remove ink tanks from BJ cartridges. When an ink tank is removed from a BJ cartridge, air can enter the ink path and may adversely affect printing. If an ink tank is removed from a BJ cartridge, carry out cleaning. (Cleaning is automatically carried out when the ink tank is attached after a no ink tank error is detected. For details, see "Part 4: TABLE 4-7 CLEANING EXECUTION CONDITIONS, CLEANING TIME AND INK SUCTION AMOUNTS." (page 4-25))

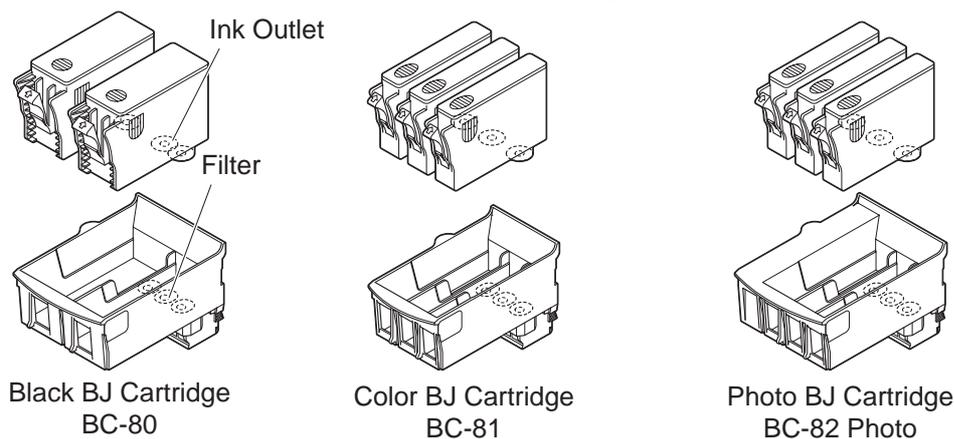


Figure 1-3 BC-80, BC-81, and BC-82 Photo

1.2.2 Ink mist

With the BJ cartridges used on this printer, minute ink droplets rise up and bounce back from the paper during printing as "ink mist." This printer generates a much larger amount of ink mist than conventional Canon printers. As a countermeasure, two fans, A and B, are provided to create an air path to draw the ink mist behind fan B into the ink mist absorber. Fan A pulls in air, while fan B sucks in this blown air. When servicing or disassembling this printer, wear gloves. Hands, fingers or clothes may become soiled by this ink mist. If necessary, wipe off ink mist using a soft cloth moistened with water.

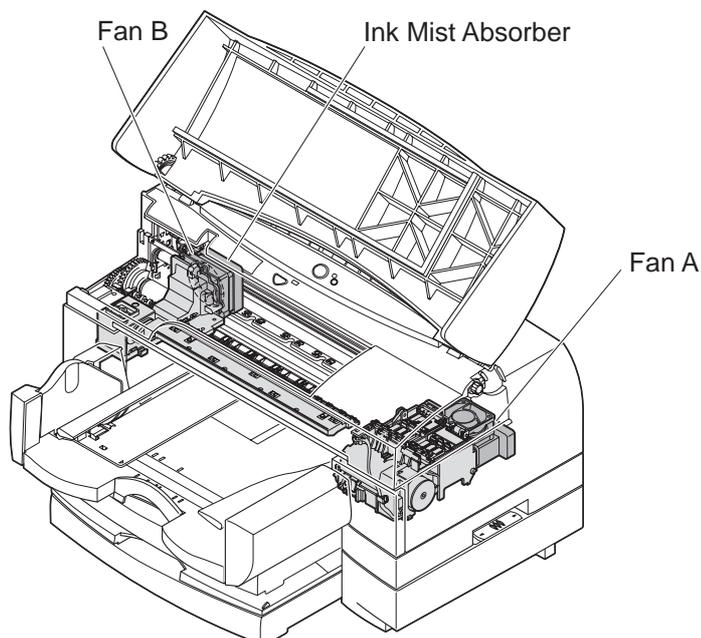


Figure 1-4 Ink Mist

1.3 Electrically Live Sections of the Printer

All electrical sections of the printer supplied with AC power are electrically live when the power cord is connected whether the printer is turned ON or OFF using the *POWER* button.

Be careful of electric shock when checking printer operation with the covers removed during servicing. For this reason, be sure to unplug the power cord from the power outlet during servicing.



CAUTION

As the AC main voltage is supplied to the primary side of the power supply unit, there is always the danger of an electric shock.

Always unplug the AC power cord before disassembling for service.

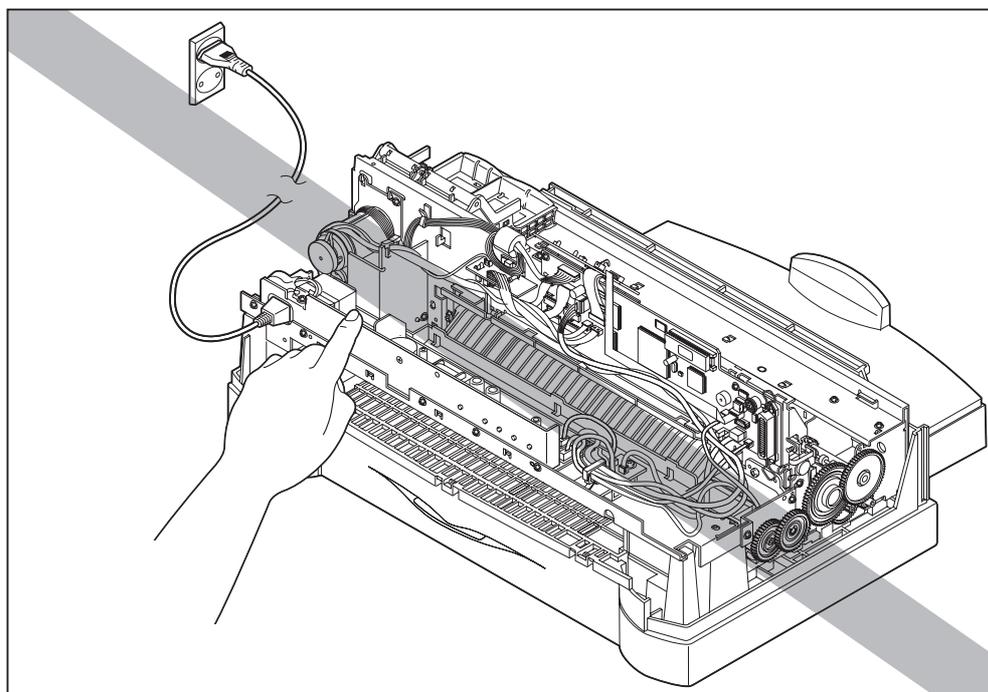


Figure 1-5 Power Supply Unit

2. MACHINE PRECAUTIONS

2.1 Handling BJ Cartridges

2.1.1 Unpacking BJ cartridges

Do not unpack the BJ cartridges until they are ready to be used. Before installing the BJ cartridge in the printer, gently remove the cap protecting the nozzles as shown in *Figure 1-6 Removing the Protective Cap*.

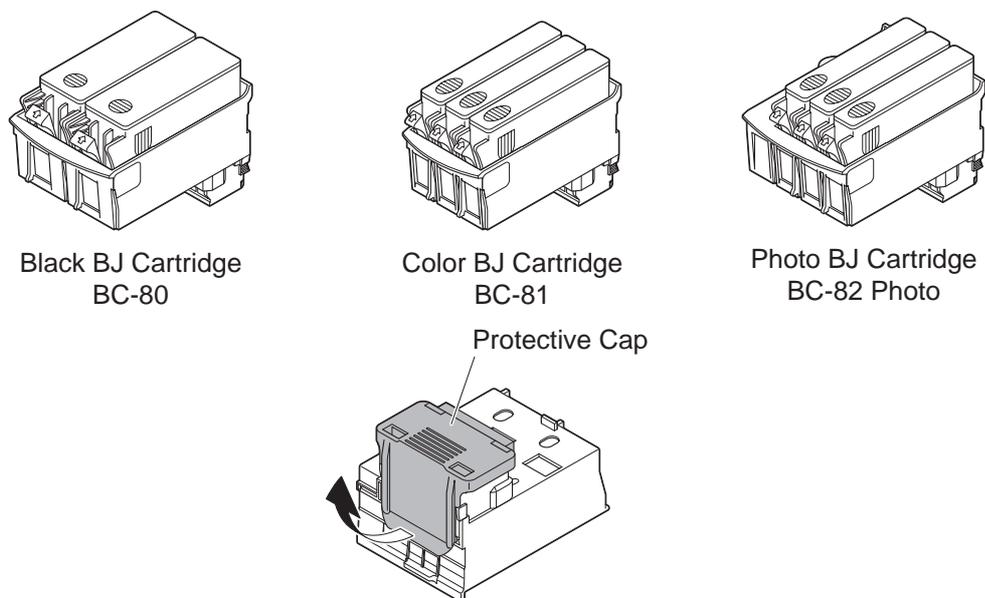


Figure 1-6 Removing the Protective Cap



Never re-use a protective cap once it has been removed. Re-using a protective cap may cause defective printing. Also, be sure to use BJ cartridge container SB-80 for storing BJ cartridges. If the protective cap is re-attached to the BJ cartridge, the film or tape on the cap may form an ink path with other inks. This, in turn, may cause inks of different colors to mix or cause the nozzles to clog.

2.1.2 Protecting BJ cartridges

To prevent clogging of the nozzles due to foreign matter, never touch the nozzle section of the BJ cartridge, filters, and ink outlets on the ink tanks, or wipe off foreign matter or clogged ink with tissue paper or the like.

Once you have removed the protective cap from a BJ cartridge, either install the BJ cartridge in the printer or store it in the cartridge container (SB-80) to prevent clogging of the nozzles due to ink drying or foreign matter.

Do not re-attach a protective cap once it has been removed.

Also, never leave a BJ cartridge exposed with the ink tank removed. (Doing so may allow the ink outlets to dry and cause defective printing.)

Do not disassemble or assemble BJ cartridges, and do not wash the heads with water as this may cause the nozzles to clog.



Clogging of the nozzles causes defective printing. If cleaning does not restore proper printing, you must replace the BJ cartridge.

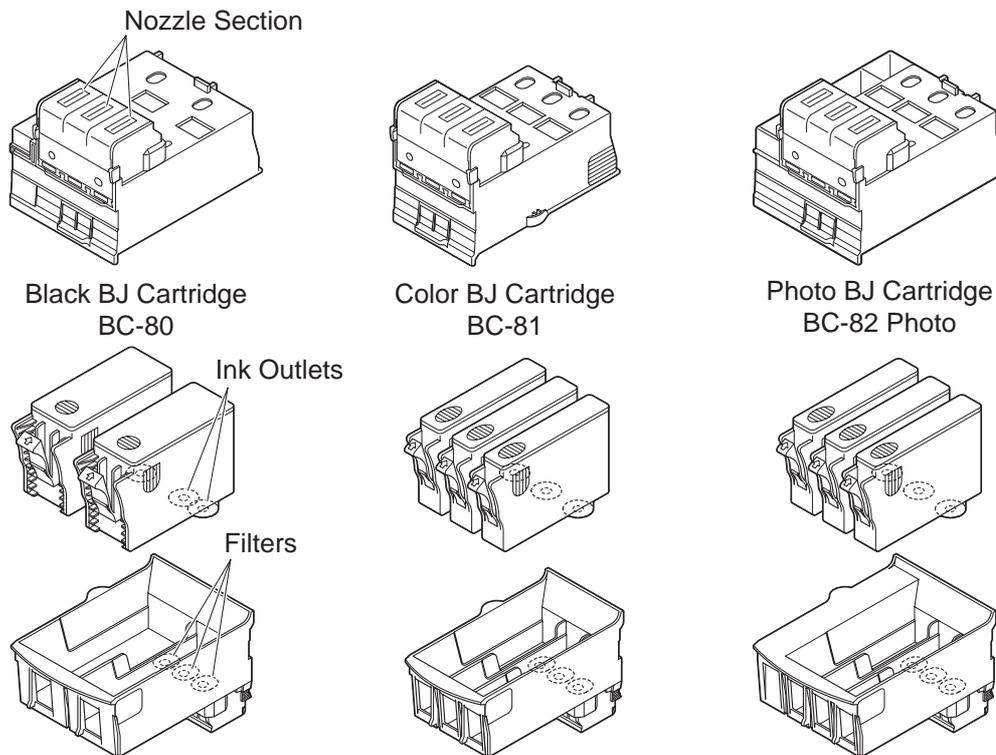


Figure 1-7 BJ Cartridges

2.1.3 Turning the printer ON/OFF

When the power is switched OFF with the *POWER* button, the printer automatically caps the nozzle section of the BJ cartridge to protect it and prevent ink leakage. If you unplug the power cord before the printer is turned OFF with *POWER* button, the printer may stop without capping the nozzles, depending on the position of the carriage. If this happens, reconnect the power cord, start up the printer as usual, turn the power OFF with the *POWER* button, make sure that the carriage returns to the home position and that the nozzles are capped before disconnecting the power cord.



If the nozzle section is not capped, ink may leak or dry, causing the nozzles on the BJ cartridges to clog.

2.1.4 When not using the printer

Keep the Color BJ cartridge BC-81 installed in the printer even when the printer is not in use to ensure the quality of the BJ cartridge. Install either the Black BJ cartridge BC-80 or Photo BJ cartridge BC-82 photo in the printer, and store the other in BJ cartridge container SB-80.



If the BJ cartridge is removed from the printer and left unprotected, foreign matter may stick or dry ink may clog the nozzles, making it impossible to use the BJ cartridge.

Ink may also leak from the caps if cleaning is not performed after the BJ cartridge is removed and the printer is carried or transported.

2.1.5 Ink electroconductivity

The ink in the BJ cartridge is electrically conductive. If it leaks onto a mechanical section, wipe it up with a damp paper towel or the like. If it leaks onto an electrical circuit, wipe it up completely with tissue paper or the like. If ink leaks onto the logic board or into the power supply unit and gets into the electrical components and PCB, and is difficult to clean, replace the logic board or other electrical components with new ones.



If the power cord is connected to the printer with ink leaked, this may damage the electrical section. Never switch the power on if there has been a leak.

2.2 Handling the Ink Tanks

2.2.1 Unpacking the ink tanks

Do not unpack the ink tank from its package until it is ready to be used. Before installing the ink tank in the BJ cartridge, unpack the ink tank and remove the protective cap protecting the ink outlets.

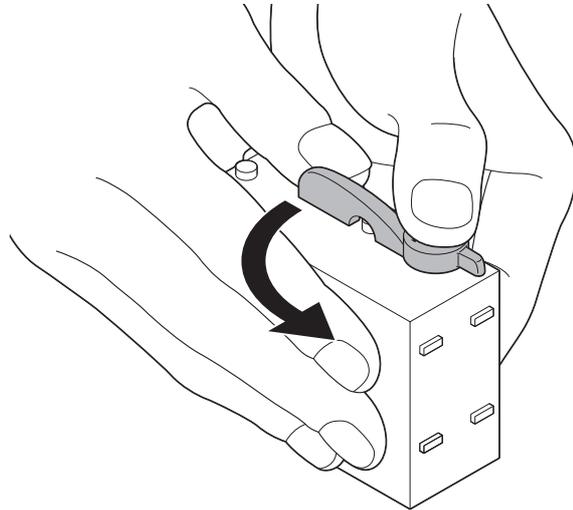


Figure 1-8 Removing the Ink Tank Protective Cap

2.2.2 Protecting the ink tanks

To prevent poor ink suction due to foreign matter on the joints with the BJ cartridge, never touch the ink outlets of the ink tank with your hands or fingers. After removing the protective cap from the ink tank, immediately install the ink tank in the BJ cartridge to prevent the nozzles from clogging due to ink drying. Do not remove ink tanks from BJ cartridges unless replacing them. (When not using an ink tank, place them, installed in the BJ cartridge, in BJ cartridge container SB-80.)

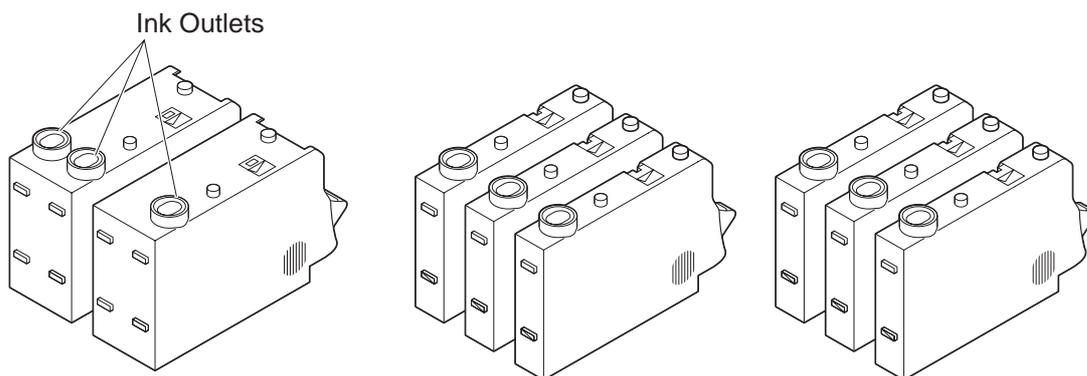


Figure 1-9 Ink Outlets

2.3 Handling the Printer

2.3.1 Spurs

Metal spurs are used for feeding and outputting paper after printing. The tips of the spurs are also sharp and pointed. They are small and easily deformed. Take care not to deform them. Take care to prevent injury when handling them.

If the tips of the spurs become deformed or worn, and their surface contact area with the paper increases, a minute line of dots may appear on the paper. If this happens, replace the spurs. (refer to "Part 5: 1.1 Periodically-replaced Parts" (page 5-1))

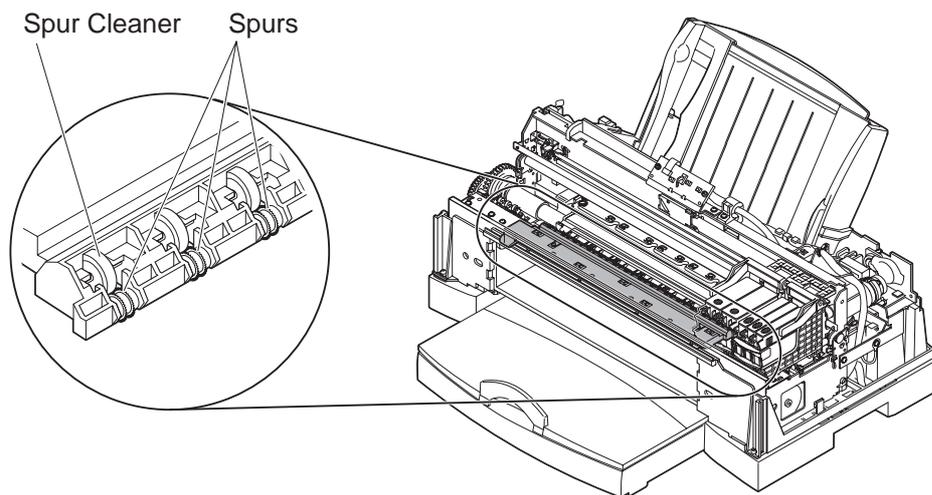


Figure 1-10 Spurs

2.3.2 Encoder

The BJ cartridge used on this printer generates a lot of ink mist as described in "Part 1: 1.2.2 Ink mist" (page 1-3). So, the encoder film and encoder head may become coated with ink mist.

To clean the encoder film, wipe with lint-free paper or a dry cloth. Do not wipe with a wet cloth. Replace the encoder film if wiping does not clean it. When replacing the encoder film, make sure that it is installed facing the correct way. (The top of the encoder film is marked as shown in Figure 1-11 Encoder Film and Carriage Board.)

Do not wipe off ink mist on the encoder head. Replace with a new head (mounted on the carriage board.) (refer to "Part 5: 1.1 Periodically-replaced Parts" (page 5-1))

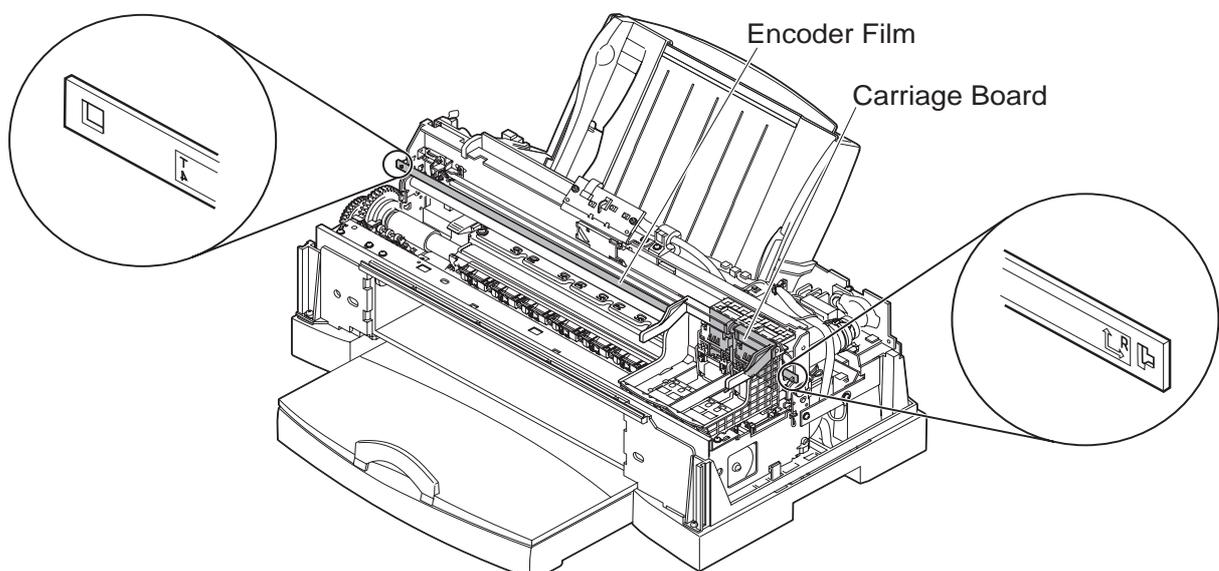


Figure 1-11 Encoder Film and Carriage Board

2.3.3 Paper feed roller unit

The surface of the paper feed roller is blast-finished to ensure a maximum resolution of 1200×1200 dpi. Take care not to scratch the surface of this roller. The drive gear used on the paper feed roller is also finished to high precision to feed the paper in small increments for $1/1200$ inch feeding. Take special care not to leave any knock marks on this gear.

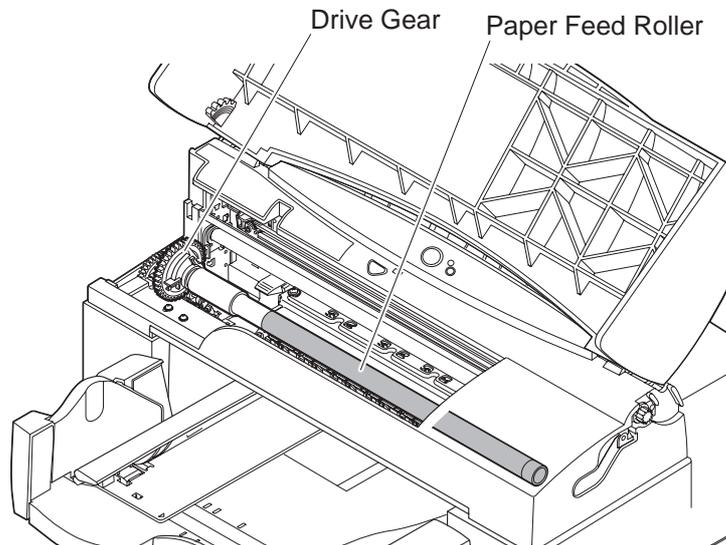


Figure 1-12 Paper Feed Roller

2.3.4 Purge motor

The purge motor is very hot immediately after repeated printing or cleaning. Take care not to touch the purge motor directly with bare hands after these operations.

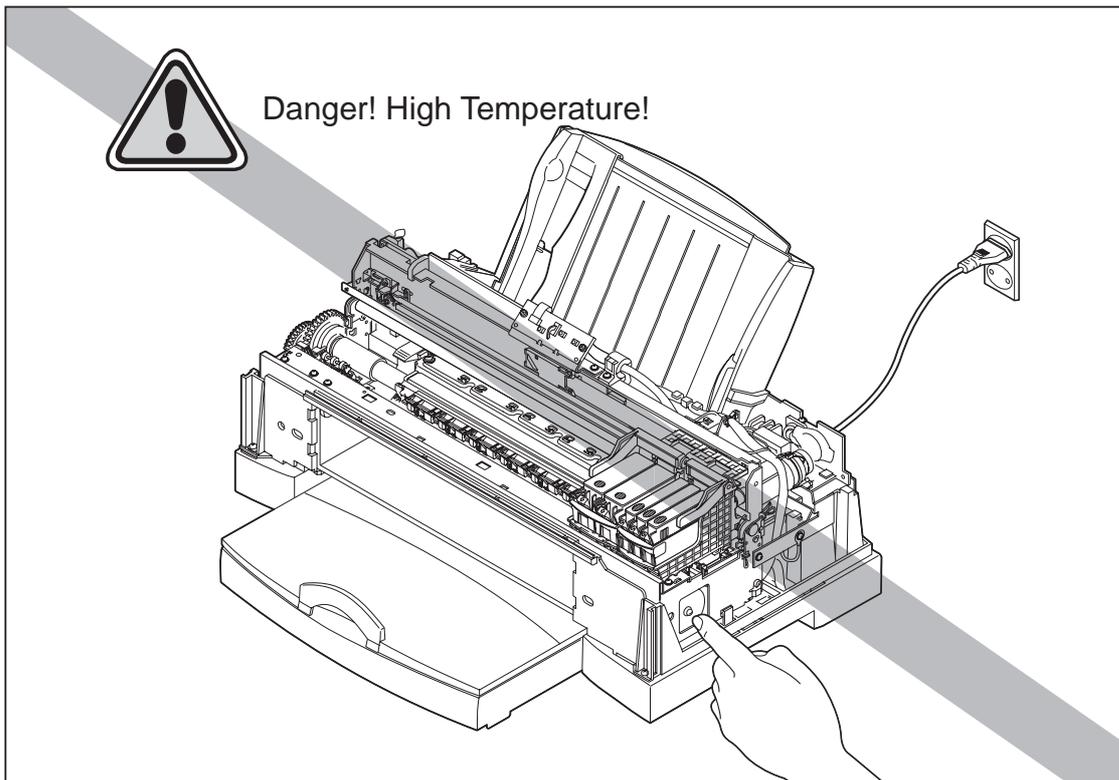


Figure 1-13 Purge Motor

2.3.5 Precautions to prevent damage from static electricity

The electrical charge accumulated on a person when clothes rub can damage electric elements or change their electrical characteristics. Never touch the contact section on carriage top or the contact section on BJ cartridges.

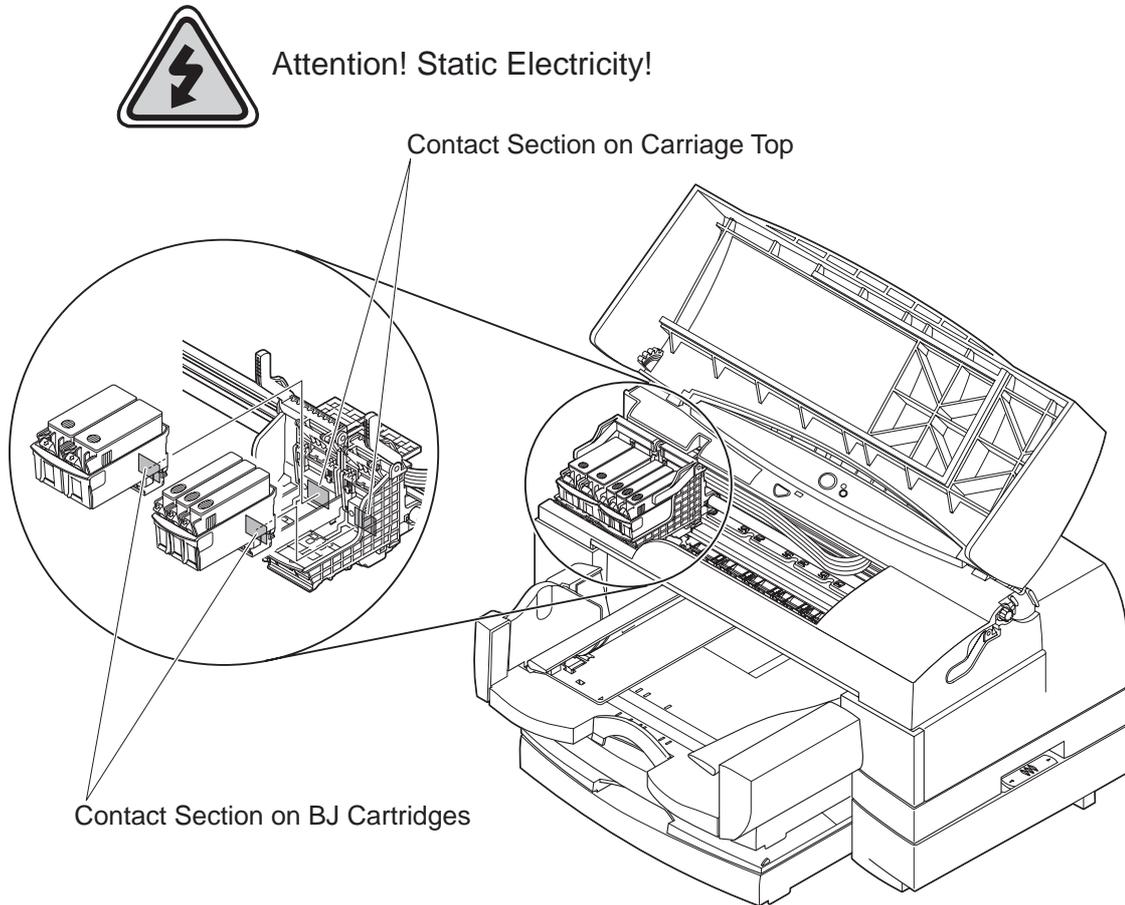


Figure 1-14 Contact Sections

2.3.6 Ink leakage/ink dry-up precautions

Always turn the printer OFF by the *POWER* button with the BJ cartridges installed. The following operation is automatically carried out when powering OFF with the *POWER* button.

Capping

The head cap covers and secures the nozzle section to prevent the nozzles on the BJ cartridge from drying. If the power cord is unplugged from the power outlet by mistake without turning the printer OFF by the *POWER* button, reconnect the power cord to the power outlet, turn the power ON, then OFF again, by the *POWER* button, and make sure that the nozzles are capped before unplugging the power cord.

If the power is turned OFF with the BJ cartridge removed or the power is turned OFF after unplugging the power cord from the power outlet, the nozzles are not capped. This may cause ink to leak or dry up.

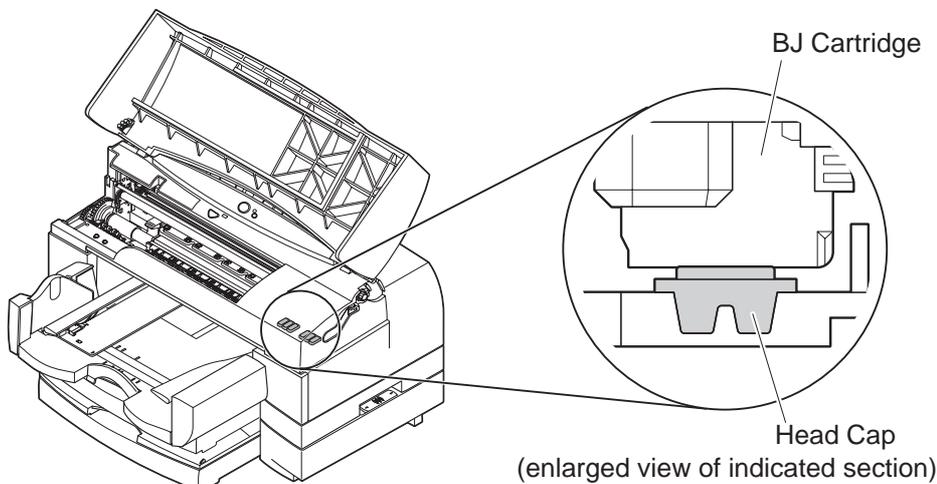


Figure 1-15 Capping



If the power cannot be turned ON due to printer trouble, manually lock the nozzle cap. For details, see "*Part 3: 2.2 Capping Lock/Unlock*" (page 3-16).

2.3.7 Precautions when carrying the printer

The printer weighs 25 kg. It should be carried by two personnel, holding it on both sides as shown in *Figure 1-16 Precautions when Carrying the Printer*.

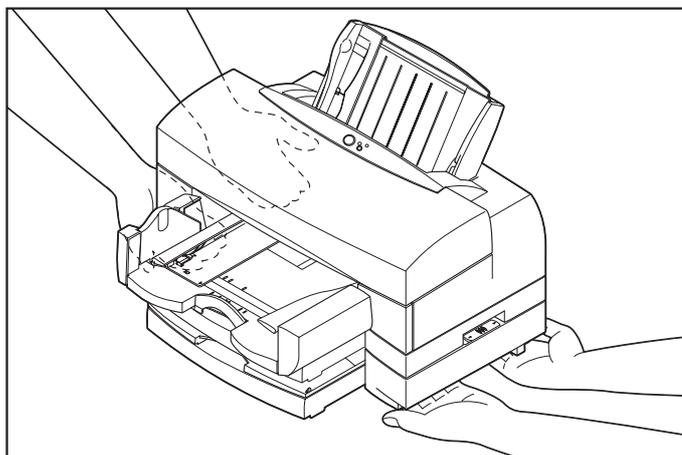


Figure 1-16 Precautions when Carrying the Printer

3. PRECAUTIONS FOR SERVICE

3.1 Precautions Concerning Memory Data

This printer counts the number of BJ cartridge attachments/removals, number of sheets fed, waste ink amount, head position adjustment values, and cleaning count, and stores this data in the EEPROM on the logic board.

Observe the following precautions during servicing.

1) Before servicing:

Check the EEPROM with a test print in the service mode. For details, see "Part 3: 3.4.2 Service mode" (page 3-24).

2) When replacing the logic board:

If the EEPROM is not defective, remove the EEPROM from its socket and attach it to the new logic board. All data settings stored to EEPROM can be used on the new logic board as they are. To check the EEPROM data settings, make a test printout.

If the EEPROM is not attached to the new logic board, the amount of waste ink in the waste ink absorber will not match the waste ink amount (stored in EEPROM), and ink may leak without the waste ink error being displayed.

3) EEPROM defect (replacement of EEPROM or logic board):

When you replace the EEPROM, also replace all of the waste ink absorbers with new ones.

If you do not replace the waste ink absorbers, the amount of waste ink in the waste ink absorber will not match the waste ink amount (stored in EEPROM), and ink may leak without the waste ink error being displayed.

The data in a replacement EEPROM is not defined. So, the EEPROM cannot be used as it is. Initialize the EEPROM when you replace the waste ink absorbers. (For details, see "Part 3: 3.4.2 Service mode" (page 3-24)). Then make a test printout, and make sure that the EEPROM data has been defined.

For details on how to handle the EEPROM, see "Part 3: 3.6 EEPROM" (page 3-27).

4) After replacing a full waste ink absorber:

After you have replaced the waste ink absorber, reset the total waste ink amount by clearing the EEPROM's waste ink level (for details, see "Part 3: 3.4.2 Service mode" (page 3-24)). Then make a test printout, and make sure that the waste ink amount has been reset to zero. (For details, see "Part 3: 3.6.3 EEPROM list print" (page 3-28))

5) If the total waste ink amount is reset to zero, or the EEPROM is initialized by mistake:

Take care when you clear or initialize the EEPROM. Data settings stored in EEPROM cannot be restored once the EEPROM is cleared. If you have cleared EEPROM by mistake, carry out the same process and settings for a defective EEPROM described in 3) above.



After the EEPROM is reset, the data it held cannot be printed out with a test printout. If you want to check the stored data, be sure to execute a test printout before resetting the EEPROM. Data in EEPROM also cannot be rewritten via computer.

When the EEPROM is initialized, all data that was held in EEPROM is lost. When you return the printer after servicing, reset the various function settings (e.g. head position adjustment values) that were set by the user.



When the printer is turned OFF, the printer updates the waste ink amount in EEPROM. To prevent ink leakage when the waste ink amount exceeds the capacity of the waste ink absorber, the printer stops printing and displays a "waste ink full" error. If this happens, remedy the error by following the instructions in "Part 5: 6.2.2 Error recovery 5. Waste Ink Warning / Waste Ink Full Error" (page 5-21).

For details on checking the EEPROM data with a test printout, see "Part 3: 3.6.3 EEPROM list print" (page 3-28).

When you clear EEPROM data, you can choose either to "clear the waste ink amount" or to "initialize EEPROM." For details, see "Part 3: 3.6.2 Resetting the EEPROM" (page 3-27).

3.2 Special Settings

The printer driver has a special settings dialog box. This dialog box is only for servicing and dealing with claims on the market. It is not disclosed to the user.

(1) Operation Procedure

In Windows:

- Select the [Custom Setting] button in Maintenance on the printer driver. You can select the "**Set printer to ECP mode**" and "**Pause page**" setup items. → not disclosed to the user
- If you select the [Custom Setting] button with the [Shift] key held down, you can select all five setup items in (2) below.

On a Macintosh:

- Select the [Settings] button in Utility on the printer driver. You can select the "**Pause Between Pages**" setup item. → not disclosed to the user
- If you select the [Settings] button with the [Shift] key held down, you can select four setup items (excluding "**Set printer to ECP mode**") in (2) below.

(2) Setup Items (underline indicates default ON= , OFF=)

- **Set printer to ECP mode** (OFF/ON)
Sets the printer interface to ECP.
- **Pause Page** (OFF/ON)
When pages containing high-density images are printed continuously, the preceding page may become smudged by the following page if you do not allow enough time for it to dry. In such circumstances, set whether or not to pause before outputting pages.
- **Cleaning after cartridge replacement** (OFF/ON)
To prevent ink consumption, set not to perform cleaning when the head (BJ cartridge) is replaced.
- **Economy Cleaning** (OFF/ON)
To prevent ink consumption, set not to perform cleaning at the first software ON after a hardware ON and not to perform timer cleaning.
- **Display low ink warning** (OFF/ON)
Set not to display low ink warning (Disabling "ink-out" detection) to prevent the ink sensors from malfunctioning.