Toscana-P1/Toscana-P1N/Piemonte-P1N
Machine Code: J007/J010/J011

SERVICE MANUAL

Mar. 1st, 2006
Subject to change

Safety Instructions

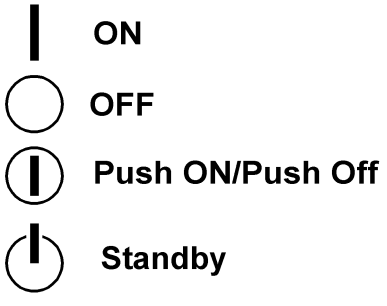
For your safety, please read this manual carefully before you service machine. Always keep this manual handy for future reference.

Safety Information

Always obey the these safety precautions when using this product.

Switches and Symbols

Where symbols are used on or near switches on machines for Europe and other areas, the meaning of each symbol conforms with IEC60417.



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Responsibilities of the Customer Engineer

Maintenance

Maintenance shall be done only by trained customer engineers who have completed service training for the machine and all optional devices designed for use with the machine.

Installation

The main machine and options can be installed by either the customer or customer engineer. The customer or customer engineer must follow the installation instructions described in the operating instructions.

Reference Material for Maintenance

Maintenance shall be done with the special tools and the procedures prescribed for maintenance of the machine described in the reference materials (service manuals, technical bulletins, operating instructions, and safety guidelines for customer engineers).

Important

- **Use only consumable supplies and replacement parts designed for use with the machine.**

Before Installation, Maintenance

Shipping and Moving the Machine

⚠CAUTION

- Work carefully when lifting or moving the machine. If the machine is heavy, two or more customer engineers may be required to prevent injuries (muscle strains, spinal injuries, etc.) or damage to the machine if it is dropped or tipped over.
- Personnel moving or working around the machine should always wear proper clothing and footwear. Never wear loose fitting clothing or accessories (neckties, loose sweaters, bracelets, etc.) or casual footwear (slippers, sandals, etc.) when lifting or moving the machine.
- Always unplug the power cord from the power source before you move the machine. Before you move the machine, arrange the power cord so it will not fall under the machine.

Power

⚠WARNING

- Always turn the machine off and disconnect the power plug before doing any maintenance procedure. After turning the machine off, power is still supplied to the main machine and other devices. To prevent electrical shock, switch the machine off, wait for a few seconds, then unplug the machine from the power source.
- Before you do any checks or adjustments after turning the machine off, work carefully to avoid injury. After removing covers or opening the machine to do checks or adjustments, avoid touching electrical components or moving parts (gears, timing belts, etc.).
- After turning the machine on with any cover removed, keep your hands away from electrical components and moving parts. Never touch the cover of the fusing unit, gears, timing belts, etc.

Installation, Disassembly, and Adjustments

⚠CAUTION

- After installation, maintenance, or adjustment, always check the operation of the machine to make sure that it is operating normally. This ensures that all shipping materials, protective materials, wires and tags, metal brackets, etc., (attached to protect the machine during shipping), have been removed and that no tools remain inside the machine.
- Never use your fingers to check moving parts that are causing spurious noise. Never use your fingers to lubricate moving parts while the machine is operating.

Special Tools

⚠CAUTION

- Use only standard tools approved for machine maintenance.
- For special adjustments, use only the special tools and lubricants described in the service manual. Using tools incorrectly, or using tools that could damage parts, could damage the machine or cause injuries.

During Maintenance

General

⚠CAUTION

- Before you begin a maintenance procedure always switch the machine off.
- Disconnect the power plug from the power source.
- Allow the machine to cool for at least 10 minutes.
- Avoid touching the components inside the machine that are labeled as hot surfaces.

Safety Devices

⚠WARNING

- Never remove any safety device (a fuse, thermistor, etc.) unless it requires replacement. Always replace a safety device immediately.
- Never do any procedure that defeats the function of any safety device. Modification or removal of a safety device (fuse, thermistor, etc.) could cause a fire and personal injury. After removal and replacement of any safety device, always test the operation of the machine to ensure that it is operating normally and safely.
- For replacement parts use only the correct fuses, thermistors, circuit breakers, etc. rated for use with the machine. Using replacement devices not designed for use with the machine could cause a fire and personal injuries.

Organic Cleaners

⚠CAUTION

- During preventive maintenance, never use any organic cleaners (alcohol, etc.) other than those described in the service manual. (Refer the "2. Preventive Maintenance" in the Service Manual.)
- Make sure the room is well ventilated before using any organic cleaner. Always use organic solvents in small amounts to avoid breathing the fumes and becoming nauseous.

- Switch the machine off, unplug it, and allow it to cool before doing preventive maintenance. To avoid fire or explosion, never use an organic cleaner near any component that generates heat.
- Wash your hands thoroughly after cleaning parts with an organic cleaner to avoid contamination of food, drinks, etc. which could cause illness.

Power Plug and Power Cord

⚠CAUTION

- Before servicing the machine (especially when responding to a service call), always make sure that the power plug has been inserted completely into the power source. A partially inserted plug could lead to heat generation (due to a power surge caused by high resistance) and cause a fire or other problems.
- Always check the power plug and make sure that it is free of dust and lint. Clean it if necessary. A dirty plug can generate heat and cause a fire.
- Inspect the entire length of the power cord for cuts or other damage. Replace the power cord if necessary. A frayed or otherwise damaged power cord can cause a short circuit which could lead to a fire or personal injury from electrical shock.
- Check the length of the power cord between the machine and power supply. Make sure the power cord is not coiled or wrapped around any object such as a table leg. Coiling the power cord can cause excessive heat to build up and could cause a fire.
- Make sure that the area around the power source is free of obstacles so the power cord can be removed quickly in case of an emergency.
- Make sure that the power cord is grounded (earthed) at the power source with the ground wire on the plug.
- Connect the power cord directly into the power source. Never use an extension cord.
- When you disconnect the power plug from the power source, always pull the plug, not the cable.

After Installation Servicing

Disposal of Used Items

⚠WARNING

- Ink is flammable. Never attempt to incinerate empty ink cartridges.

⚠CAUTION

- Always dispose of used items in accordance with the local laws and regulations regarding the disposal of such items.

- To protect the environment, never dispose of this product or any kind of waste from consumables at a household waste collection point. Dispose of these items at one of our dealers or at an authorized collection site.

Points to Confirm with Operators

At the end of installation or a service call, instruct the user about use of the machine. Emphasize the following points.

- Show operators how to remove jammed paper and troubleshoot other minor problems by following the procedures described in the operating instructions.
- Point out the parts inside the machine that they should never touch or attempt to remove.
- Confirm that operators know how to store and dispose of consumables such as ink cartridges, ammonia water, paper, etc..
- Make sure that all operators have access to an operating instruction manual for the machine.
- Confirm that operators have read and understand all the safety instructions described in the operating instructions.
- Demonstrate how to turn off the power and disconnect the power plug (by pulling the plug, not the cord) if any of the following events occur:
  1. Something has spilled into the product.
  2. Service or repair of the product is necessary.
  3. The product cover has been damaged.
- Caution operators about removing paper fasteners around the machine. They should never allow paper clips, staples, or any other small metallic objects to fall into the product.

  Important

  - **Make sure the operators understand the following points:**
  - **The operator must lift the output tray to release the paper cassette before loading paper.**
  - **Paper is loaded in the standard paper cassette without removing it from the printer.**
  - **The operator should never attempt to remove the paper cassette from the printer.**

Special Safety Instructions For Ink Cartridges

Accidental Exposure To Ink

⚠CAUTION

- If ink gets on the skin, wash the affected area immediately with soap and cold running water.

- If ink gets into the eyes, immediately flush the eyes with cold running water. If there are signs of irritation or other problems, seek medical attention.
- If ink is swallowed, drink a strong solution of cold water and table salt to induce vomiting. Seek medical attention immediately.
- Ink is difficult to remove from fabric. Work carefully to avoid staining clothing when performing routine maintenance or replacing cartridges.

Handling and Storing Ink Cartridges

⚠WARNING

- Ink is flammable. Never store ink cartridges in a location where they will be exposed to high temperature or an open flame.

⚠CAUTION

- Always store ink cartridges out of the reach of children.
- Always store ink cartridges in a cool, dry location that is not exposed to direct sunlight.

Ink Cartridge Disposal

⚠CAUTION

- Attach the caps to empty ink containers for temporary storage to avoid accidental spillage.
- Return empty ink cartridges to a local dealer who can accept such items for collection and recycling or disposal.
- If the customer decides to dispose of empty ink cartridges, make sure that they are disposed of in accordance with local laws and regulations.

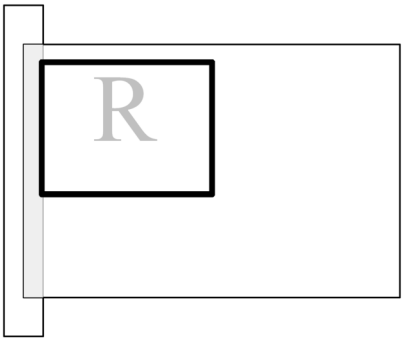
Conventions Used in this Manual

Symbols and Abbreviations

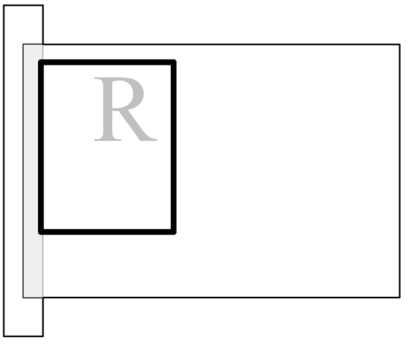
This manual uses several symbols.

Symbol	What It Means
	Screw
	Connector
	E-ring
	Clip ring
	Clamp
	Pawls (sensors)
	Spring

This manual uses the following abbreviations.



SEF



LEF

Throughout this service manual, "SEF" denotes "Short Edge Feed" and "LEF" denotes "Long Edge Feed".

Warnings, Cautions, Notes

In this manual, the following important symbols and notations are used.

⚠WARNING

- A Warning indicates a potentially hazardous situation. Failure to obey a Warning could result in death or serious injury.

⚠CAUTION

- A Caution indicates a potentially hazardous situation. Failure to obey a Caution could result in minor or moderate injury or damage to the machine or other property.

Important

- **Obey these guidelines to avoid problems such as misfeeds, damage to originals, loss of valuable data and to prevent damage to the machine**

Note

- This information provides tips and advice about how to best service the machine.

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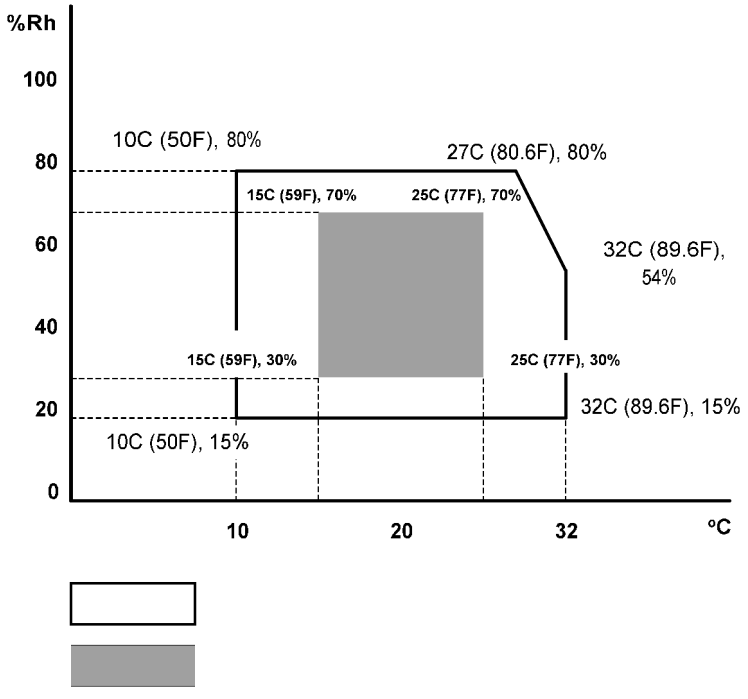
1. Installation

Preparation

Environment



Set up the machine in a location that meets these minimum requirements:

Temperature Range:	10°C to 32°C (50°F to 89.6°F)
Humidity Range:	15% to 80% RH
Ambient Illumination:	Less than 1,500 Lux (never expose to direct sunlight).
Ventilation:	More than 30 m3/hr/person in the work area
Ambient Dust:	Less than 0.10 mg/m3

Choosing a Location

1. Always install the machine:

- On a sturdy, level surface.
- Where it will not become damp.

2. 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.
3. Never install the machine in areas near:
   - Dust, lint, or corrosive fumes.
   - Strong vibration.
4. Do not use the machine at any location higher than 2,000 m (6,500 ft) above sea level.
5. 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.

Required Software Environment

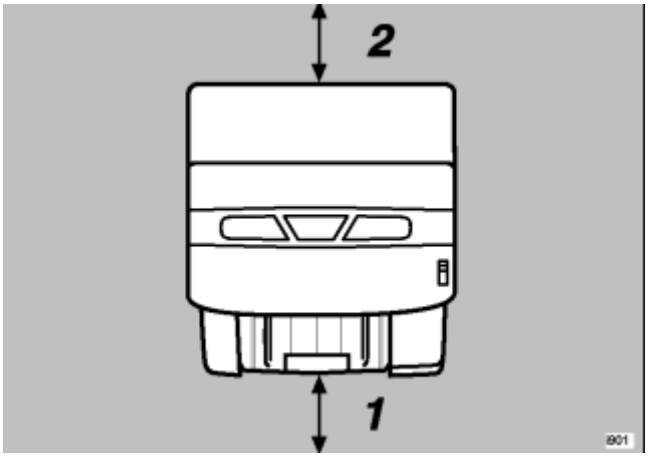
Software	Windows 98, Window Me, Windows 2000, Windows XP, Windows 2003, Window NT 4.0 or later
Hardware	80-100 MB of HDD space available

Limitations

These limitations apply to the use of this printer:

- Ver. 4.0 or later is required for Windows NT.
- Windows NT does not support a USB connection to the printer. Use a network connection.
- The USB connection is supported by Windows 98, Windows Me, Windows 2000, Windows XP, Windows Server 2000.
- USB connection with Windows 98 and Windows Me is limited to USB 1.1.

Minimum Space Requirements



1	At least 190 mm (7.5 in.)
2	At least 120 mm (4.7 in.) At least 350 mm (13.8 in.) with Multi-Bypass Tray B507

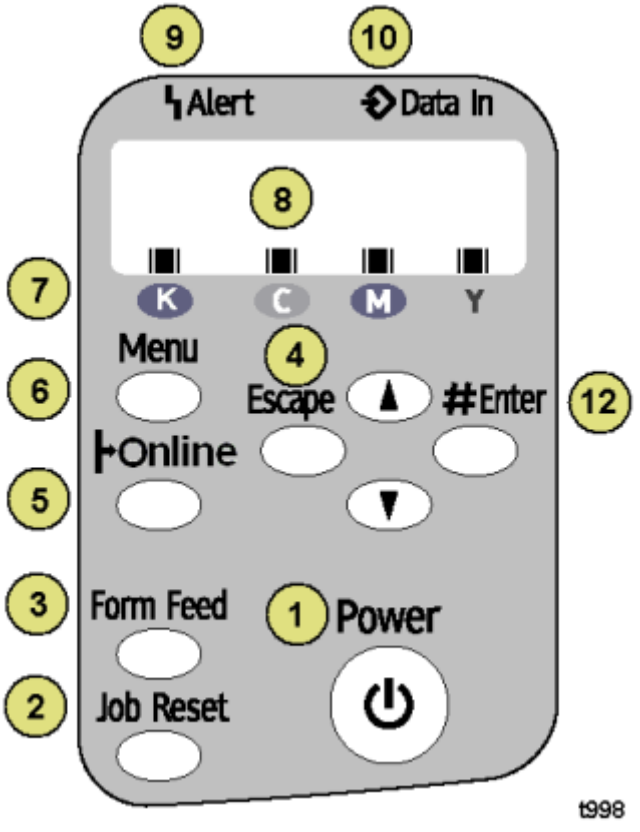
Power Source

North America	100-120 V, 50-60 Hz
Europe	220-240V 50-60 Hz

Using the Operation Panel

1

Here is a brief description of how to use the keys on the printer operation panel.



	Key/Indicator	What It Does
1	Power	Push to turn the printer on/off
2	Job Reset	Push to cancel the print job in progress.
3	Form Feed	When the printer is offline, push to print all the data in the printer buffer.
4	Escape	Push to restore the display to the previous condition.
5	Online	Push to toggle the printer between online/offline. When lit the printer is online, and when off the printer is offline.
6	Menu	Push to view the current printer settings.

	Key/Indicator	What It Does
7	Cartridge End LEDs	Indicate the statuses of the print cartridges.
8	Display	Shows the current printer status and error messages.
9	Alert	Lights when an error occurs. Red indicates an error that will stop printing. Yellow indicates and a potential error (follow the instruction that appears in the display).
10	▲ or ▼	Push once to increment the display setting by 1 (up or down). Press and hold to increment the setting by 10.
11	Data-In	Blinks when the printer is receiving data. Lights and stays on when data is in the printer buffer to be printed.
12	#Enter	Push to execute the menu item on the display.

Here are some more details about how to use these keys.

Note

- In the procedures below, "select" means push ▼ or ▲ on the printer operation panel until you see the item in the display on the printer operation panel.

To turn the printer on and off

1. **To turn the printer on, press and hold the [Power] key for at least 1 sec.**

   The [Power] key flashes and continues flashing until the printer warms up.

   When the printer is ready for operation, the [Power] key lights and remains on. At this time the printer is in standby mode and ready to print.

2. **Press the [Power] key once to turn the printer off. The power LED flashes slowly for a few moments. Then it goes off.**

To print the Config. Page

1. **Push [Menu] and select "List/Test Print".**
2. **Push [#Enter], select "Config. Page" then push [#Enter].**
3. **Push [Online] to return to standby mode.**

To clean all the printheads

1. **First, clean the print head:**
   - Push [Menu], select "Maintenance", push #Enter].
   - Select "Head-cleaning" and push [#Enter].
   - Push [Online] to return to standby mode.
2. **If this doe not solve the problem, flush the printhead:**
   - Push [Menu], select "Maintenance" and push [#Enter].
   - Select "Head-flushing" and push [#Enter].
   - Push [Online] to return to standby mode.

   Important
   - **These procedures consume ink.**
   - **Flushing consumes more ink than cleaning.**
   - **Flush the print head nozzles only if the cleaning (the first procedure) does not solve the problem.**

To print a Nozzle Check Pattern

1. **Push [Menu], select "Maintenance", and push [#Enter].**
2. **Select "Nozzle Check" and push [#Enter]**
3. **Push [Online] to return to standby mode.**

   For more about how to use the Nozzle Check pattern to diagnose and correct problems, see Section "4 Troubleshooting".

To restart an interrupted print job

Press the [Form Feed] key to start a print job again after you remove the cause of an error (paper jam, for example). The [Job Reset] key flashes or lights and stays in this condition for errors. For more, see Section “4. Troubleshooting”.

To feed a sheet manually

1. **Set a sheet of paper in the bypass tray.**
2. **Press the [Form Feed] key when the software application prompts you to do so.**

To feed 1 blank sheet (cleaning):

1. Push [Menu], select "Maintenance", and push [#Enter].
2. Select "Paper Feed Test" and push [#Enter]
3. Push [Online] to return to standby mode.

To feed 3 blank sheets (cleaning):

1. Push [Menu], select "Maintenance", and push [#Enter].
2. Select "De-condensation" and push [#Enter]
3. Push [Online] to return to standby mode.

Reading the Cartridge End LEDs

Each LED shows the position of each Print cartridge in the printer:

K (Black), C (Cyan), M (Magenta), and Y (Yellow)

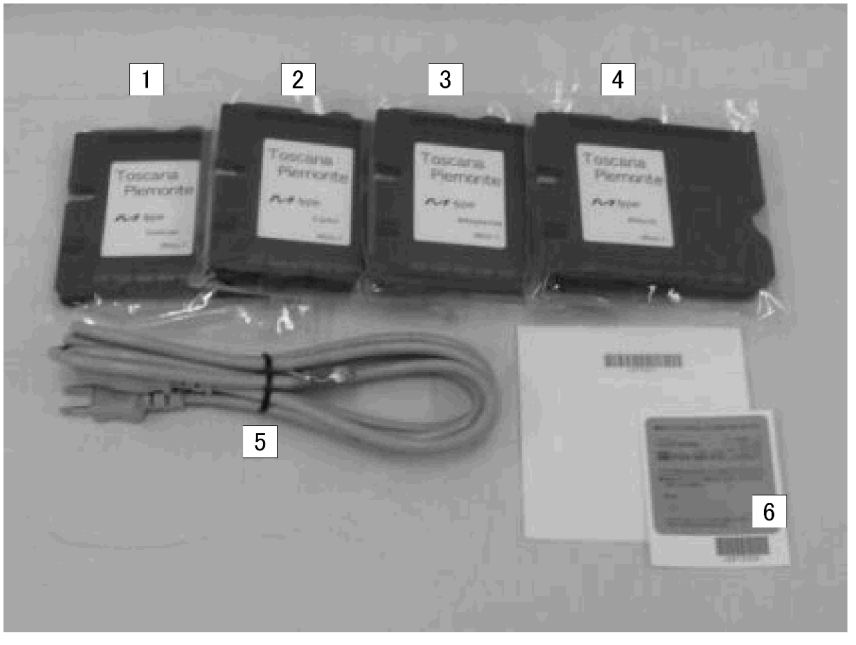
Status	What It Means
Flashing	The cartridge is empty. You can use the printer for a short time. Replace the cartridge as soon as possible.
On	There is no ink in the printer. At this time, you cannot print. Replace the ink cartridge.
All On	A Print cartridge is not in the machine, or, is not installed correctly. Open the right front door. Check all the cartridges.

Installation Procedure

1

Accessory Check

Check the accessories and their quantities against this list:



	Description	Quantity
1	Starter Cartridge - Yellow	1
2	Starter Cartridge - Magenta	1
3	Starter Cartridge - Cyan	1
4	Starter Cartridge - Black	1
5	Power Cord (EU Model Only)	
6	Decals	
7	Quick Installation Guide (not shown)	1
8	Setup Handbook (not shown)	1
9	CD-ROM (Printer driver, Utilities, User Guide) (not shown)	1

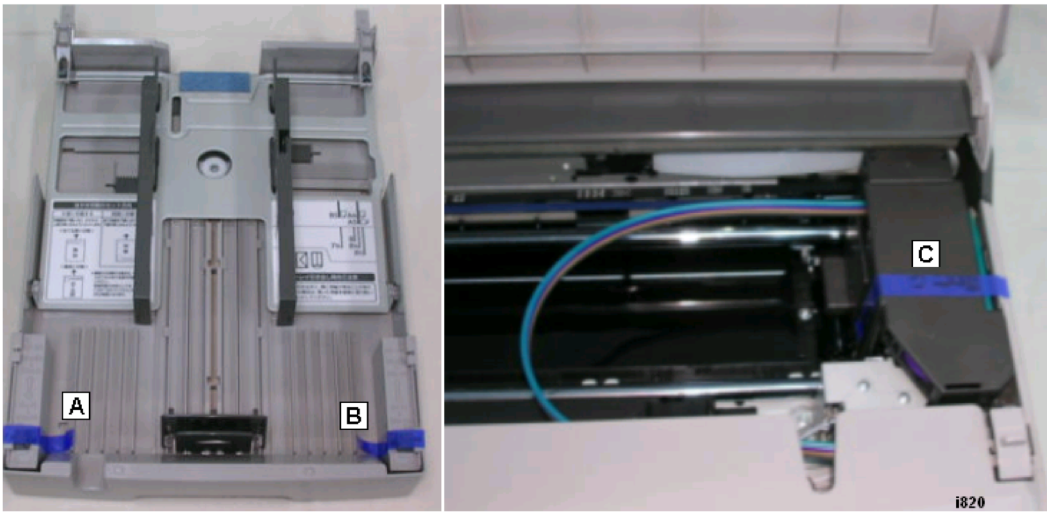
Important

- The power cord is attached to the NA model. The power cord is provided as a separate item for the EU model only.
- A USB cable and LAN cable are not provided and must be purchased separately.

⚠CAUTION

- Before you do any of the procedures in this manual, make sure the printer is turned off and unplugged from the power source. Do not turn the printer on until you instructed to do so.

Remove the Shipping Material



1. Remove the plastic shrink-wrap covering the printer.
2. Remove all the other orange tape from the printer body (front, top, back).
3. Pull out the paper cassette and remove the orange tape [A] and [B].
4. Open the top cover and remove the tape from the carriage [C].

Carrying the Printer

Hold the printer by the grips provided on each side.

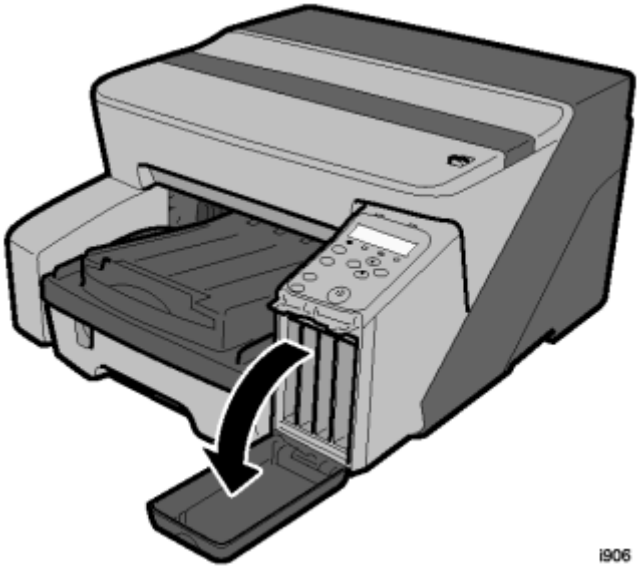
Important

- **To prevent damage to the printer, always carry the printer as shown above.**
- **Never lift the printer with your hand under the duplex unit in the back or under the paper cassette in the front.**

Install the Print Cartridges

⚠CAUTION

- If ink gets on the skin, wash the affected area immediately with soap and cold running water.
- If ink gets into the eyes, immediately flush the eyes with cold running water. If there are signs of irritation or other problems, seek medical attention immediately.
- If ink is swallowed, drink a strong solution of cold water and table salt to induce vomiting. Seek medical attention immediately.
- Ink is difficult to remove from fabric. Work carefully to avoid staining clothing when performing routine maintenance or replacing cartridges.
- Always store ink cartridges out of the reach of children.



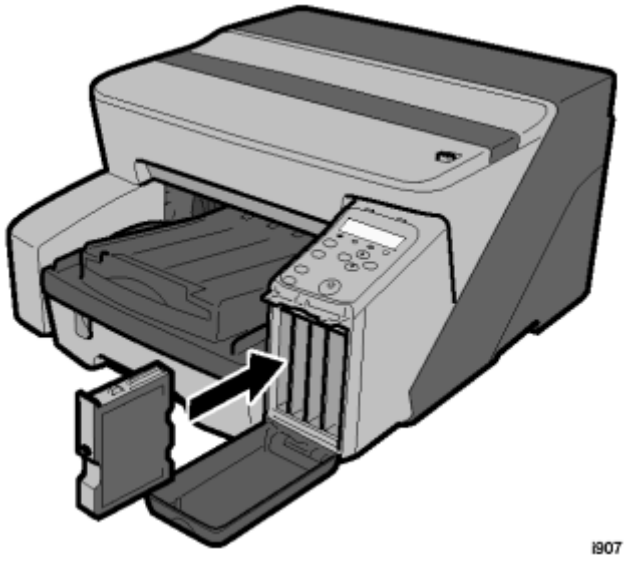
i906

1. Unpack the four cartridges provided with the printer.

Important

- The "Starter" ink cartridges provided for installation contain a limited supply of ink. Make sure that you have and additional set of ink cartridges available for replacement before you use the printer.
- Use only Ricoh Print Cartridges designed for use with this printer.

2. Open the right front cover.



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3. Remove the Black Print cartridge from its package.

4. **Hold the black cartridge as shown.**

Important

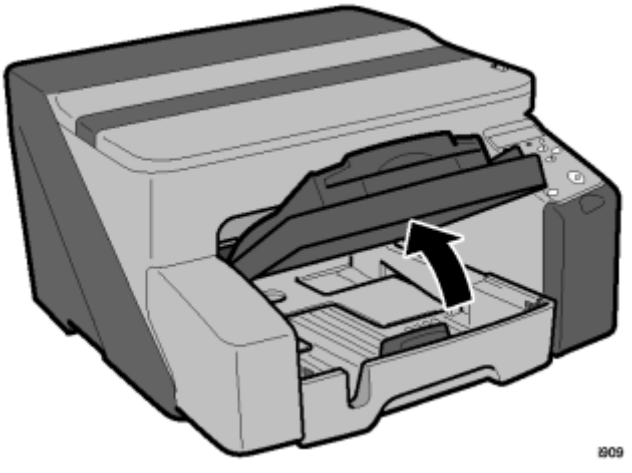
- **Never touch the metal contact plate on the rear side.**

Note

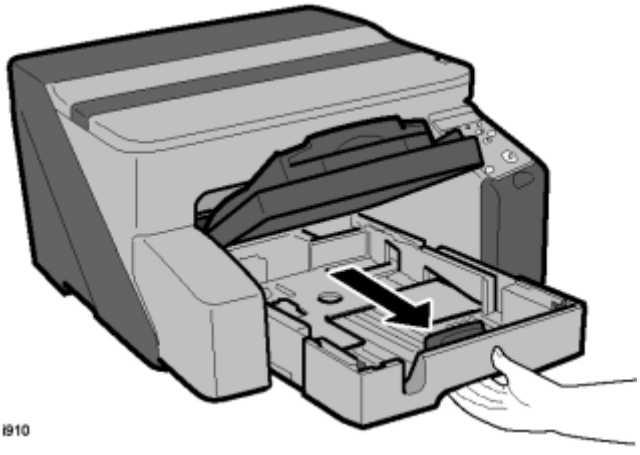
- Each cartridge is marked with a color label.
- The Cartridge End LED marks below the display show you the order of insertion from left to right (K (Black), C (Cyan), M (Magenta), Y (Yellow).

5. **Insert the black ink cartridge in the first slot on the left.**
6. **Press on the area marked "PUSH" to insert the cartridge completely.**
7. **Continue from the left. Do Steps 4-6 again to insert the other cartridges.**
8. **Make sure that the four cartridges are inserted in this order, from left to right:**
   - K (Black)
   - C (Cyan)
   - M (Magenta)
   - Y (Yellow)
9. **Close the right front door.**

Load Paper



1. **Raise the output tray.**



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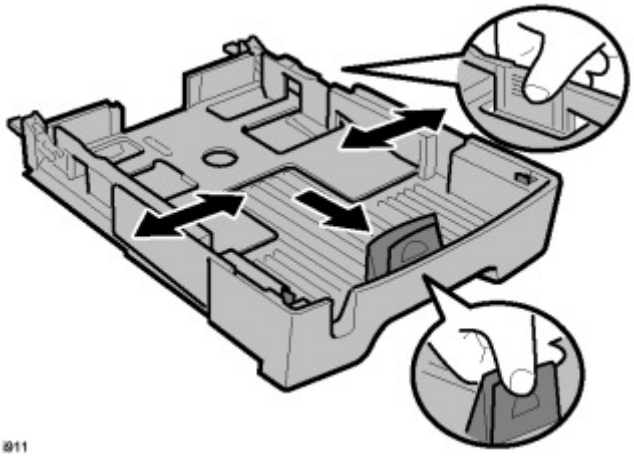
2. Pull out the paper feed tray.



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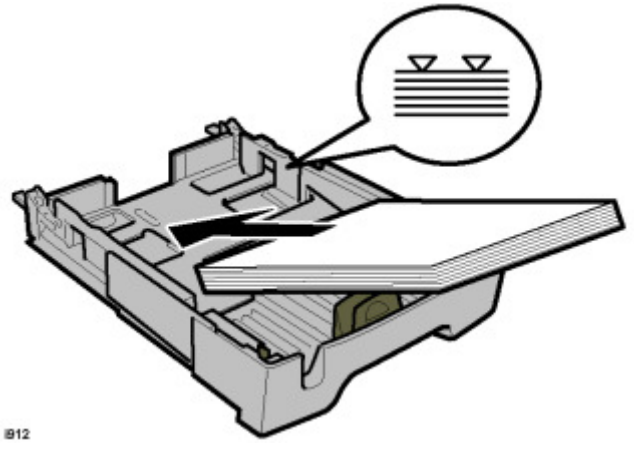
3. Squeeze the paper guide release and slide the paper guides to a position wider than the paper size.
4. Fan the stack to remove static cling.



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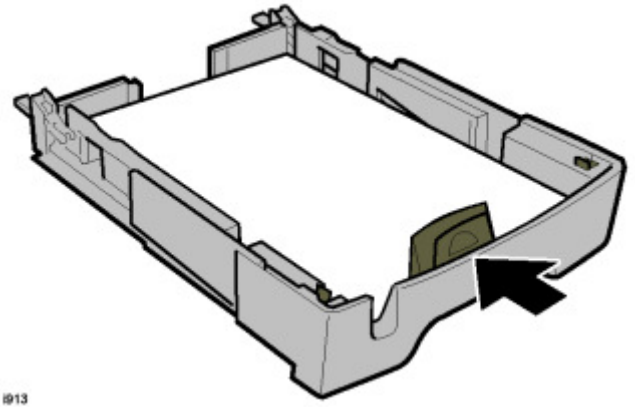
5. **Load the stack with the print side facing down.**
6. **Make sure the top of the stack does not exceed the load limit mark.**



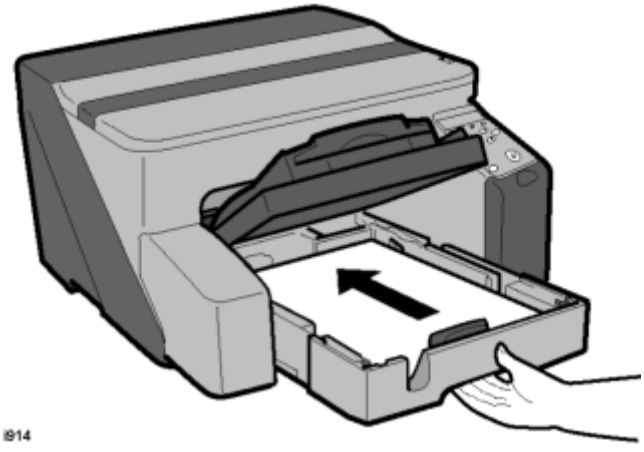
i913

7. **Squeeze the paper guides and slide them to the sides of the paper stack.**

Note

- The width side fences and bottom fence should not be too tight against the sides and bottom of the stack.
- If the stack bows upward, the fences are too tight.

8. **Adjust the side fence positions so the top of the stack is perfectly flat.**



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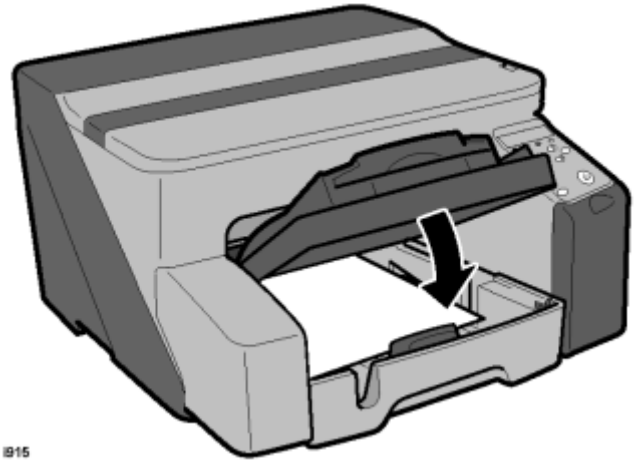
9. **Push the tray slowly into the printer until it stops.**



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10. **Lower the output tray.**

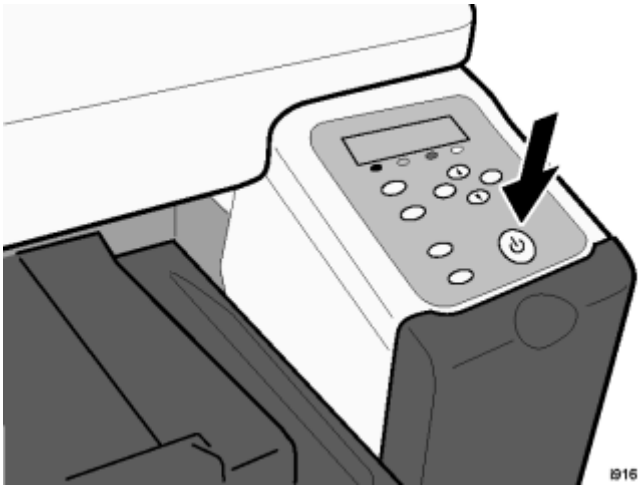
Connect the Power Cord

⚠WARNING

- Always connect the printer to a correct power source.
- Do not share the printer power source with another electrical device or appliance.
- Connect the power cord directly into the power source. Never use an extension cord.
- Never attempt to modify the power cord in any way.
- Never put heavy objects on the power cord.
- Make sure that the area around the power source is free of unwanted obstacles so you can disconnect the power cord quickly in case of an emergency.

- Make sure the power cord is not coiled or wrapped around any object such as a table or desk leg.
- Never coil the power cord around itself to make it shorter. This can cause the cord to overheat and cause a fire.
- Never handle the power cord with wet hands.

1. **Remove the orange tape from around the power cord.**
2. **Plug the power cord into the power source.**
3. **Ground the power cord at the power source with the ground wire attached to the plug.**



4. **Press the [Power] key.**
   - The printer starts feeding ink into the ink tanks.
   - Two alternating messages are displayed with a progress bar to keep you informed about the progress of ink filling.
   - Filling the ink tanks requires about 6 to 10 minutes.
   - Do not use the printer or touch any key on the operation panel until you see the "Ready" message on the operation panel display.
   - As soon as the "Ready" message is displayed, the Power lamp lights and remains on.

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 you accidentally turn the printer off while the ink tanks are filling, the printer will dump the ink and empty the tanks. The next time the printer is turned on, it will display the 'ink out' alert**
- **You might hear a clicking sound while the ink tanks are filling. This is normal and the noise will stop after a few minutes.**

Important

- This printer has no mechanism to automatically detect tray paper size and type.
- The paper size and type must be set with the menu on the operation panel.
- Do the paper type setting for the paper loaded in the printer cassette (A4, Plain or LT Plain, for example).

5. Press [Menu] key on the operation panel.
   - Select "Paper Input" then press [#Enter].
   - Select "Tray Paper Size" then press [#Enter].
   - Select "Tray 1" then push [#Enter].
   - Select the size of the paper loaded in the tray and press [#Enter].
   - Press [Escape] twice.
   - Select "Paper Type" and push [#Escape].
   - Select the type of paper loaded in the printer and push [#Enter].
6. If the bypass tray is installed, press [Escape] to return to the previous level and do the same settings (paper size, paper type) for the bypass tray.

   -or-

   Press [Online] to leave the menu mode and return online.
7. Print the Configuration Page.
   - Push [Menu] on the operation panel.
   - Select "List/Test Print" and press [#Enter].
   - Select "Config. Page" and press [#Enter].
   - The Config. Page starts to print.
   - Push [Online] to return to standby mode.

Do the USB Connection

The printer driver and USB driver are on the installer CD-ROM provided with the printer.

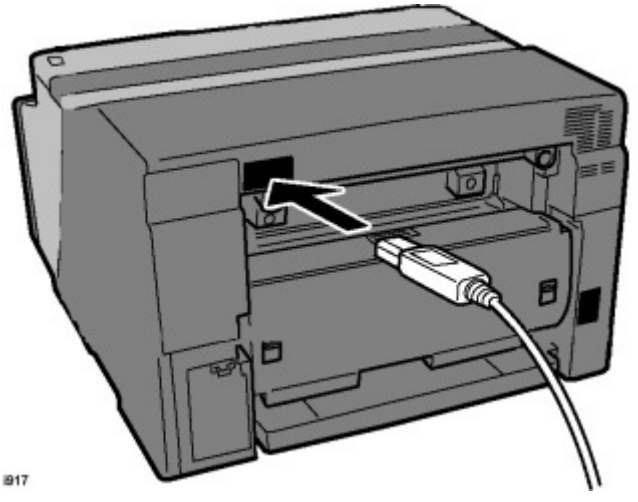
Important

- You cannot use the USB cable to connect the printer and PC if you use Windows 95 or Windows NT 4.0. You must use a network connection.
- You can only use the USB cable with Windows 98, Windows Me, Windows 2000, Windows XP, or Windows Server 2003.
- You must use USB 1.1 if you use Windows 98 or Windows Me. The printer is set for "Auto Detection" by default. In this mode the printer can use either USB 1.1 or USB 2.0.

1. Remove the paper seal from the USB port of the printer.
2. Mount the installer CD-ROM in the CD-ROM drive of the computer.
3. Follow the instructions on the screen to install the printer driver and USB driver.

Important

- Do not connect the USB cable until you are instructed to do so by the installer.



4. Connect the Type B (hexagonal) connector of the USB cable [A] to the connection point on the back of the printer.
5. Connect the Type A (rectangular) connector of the USB cable into the PC.

Clean the Print Heads and Do a Test Print

To clean all the print heads

1. Push [Menu], select "Maintenance", and push [#Enter].
2. Select "Head-cleaning" and push [#Enter].
3. Push [Online] to return to standby mode.

To print a Nozzle Check Pattern

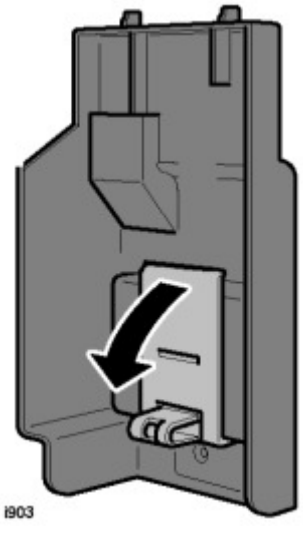
1. Push [Menu], select "Maintenance", and push [#Enter].
2. Select "Nozzle Check" and push[#Enter].
3. Push [Online] to return to standby mode.
4. Check the four ladder patterns of the Nozzle Check Pattern.

Options

Network Interface Board J508

The Network Interface Board is an option for the J007 printer only. The network board is built into the J010/J011.

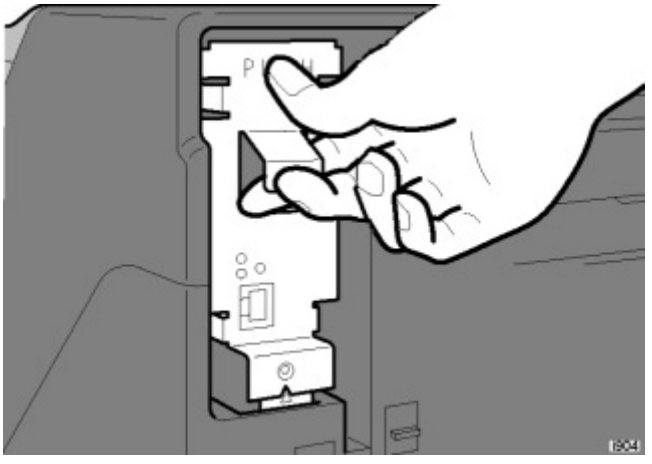
1. **Check the type of printer to be installed:**
   - The network interface board is built into the J010/J011, so the installation procedure described below is not necessary.
   - However, the Network Interface Board J508 is an options for the J007/J008 and must be installed.
2. **Make sure that the printer is switched off and disconnected from its power source.**
3. **Turn the rear cover screw counter-clockwise and remove the cover.**
4. **Remove the spacer and discard it.**



5. **Before you touch the network interface board, touch a metal surface to ground any static charge.**

   Important

   - Handle the network interface board carefully.

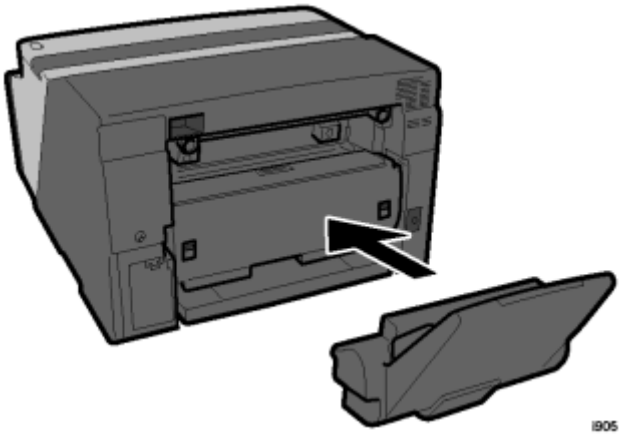


6. **Align the network interface board notch with the triangular mark on the printer.**
7. **Push the part marked "PUSH" to set the network interface board. Make sure the board is inserted completely.**
8. **Re-attach the rear cover (x1).**

Multi Bypass Tray J507

The multi-bypass tray is an option that can be installed on the J007/J010 or J011 printers.

1. **Make sure that the printer is switched off and disconnected from its power source.**
2. **Remove the multi-bypass tray from its box.**
3. **Remove all the orange shipping tape and plastic from the bypass tray.**



4. **Push the multi-bypass tray into the back of the printer as shown unit it clicks.**
5. **Pull out the extension of the multi-bypass tray.**

6. Load paper in the tray with the print side facing up.

Important

- Never remove the duplex unit from the back of the printer.
- The duplex unit is part of the paper feed path and must be installed, even if the customer is not doing duplex printing.

Paper Feed Unit

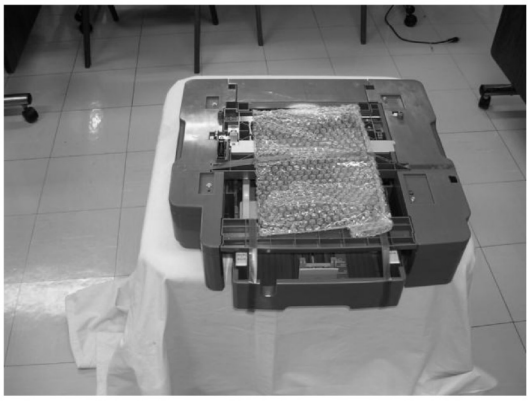
Install the Paper Feed Unit

The Paper Feed Unit J508 is an option for the J010 only. It cannot be used with the J007.

Important

- The paper feed unit must be prepared and set up before the printer is placed on top of the unit.

1. Make sure that the printer power cord is not connected to the power source.
2. Remove the paper tray from its box.



3. **Remove all of the orange tape and other shipping materials from the paper feed unit and its paper cassette.**

4. **Remove the paper cassette cover from its wrapping and set it on the paper cassette.**

5. Position the 500-Sheet Paper Tray paper tray where the printer will be set up.
6. Mount the cover on the paper tray.
7. Align the connection point holes in the bottom of the printer with the pegs of the paper tray while you hold the printer as shown.
8. Slowly set the printer on top of the paper tray.

Load Paper in the Paper Feed Unit

1. Raise the paper tray slightly and pull it toward you to remove it.
2. Remove the paper tray cover.
3. Pinch the tabs of the bottom fence then slide it completely forward.
4. Fan a stack of paper to remove static cling.
5. Load the paper into the cassette.
6. Add paper until it as far as the load limit marks .

   Important

   - To prevent paper jams, never load paper higher than the load limit mark.
7. Pinch the tabs of the bottom fence . Then move it to the edge of the stack.
8. Make sure the top of the stack is perfectly flat. Do this if the top of the stack bends upward:
9. Adjust the positions of the side fences and bottom fence.

10. Reattach the paper tray cover .
11. Slowly insert the paper tray into the printer.
12. Make sure that the paper tray is correctly inserted.

Important Information

Make sure that the customers understand the following points about moving, storing, and using the printer.

Checklist Before Moving the Printer

- Turn the printer off. Disconnect the power cord.

  Important

  - **Never disconnect the power cord without first turning off the printer.**
- The printer is light and weighs 14.5 kg (32 lb.). To lift the printer, grip it at the center of each side by the hand recesses provided.
- Never grip the Duplex Unit on the back of the printer.
- Make sure the covers and trays are closed. Secure them with tape. Attach the tape at the same area you removed at the time of installation.
- Disconnect the power cord. Tape the power cord to the back of the printer.
- Remove all paper in the feed trays.
- Do a test print to confirm that the printer operates correctly after you move it to another location. Do the cleaning procedures with the printer driver, if necessary.
- The ink cartridges should remain in the printer. It is not necessary to remove the before transporting the printer. However, ink must be purged from the print head tanks before the printer is transported. (See procedure below.)

Important

- **To avoid ink spillage, always hold the printer level when you move it. Work carefully to avoid dropping it or colliding with other objects in the work area.**

If the Printer Is Not Used Frequently...

1. **Turn the power off, disconnect the USB cable, and unplug the power cord.**
2. **To prevent the print nozzles from drying out, periodically print something.**
3. **Turn the printer on for a few minutes once a month.**
4. **After storage or a long period of disuse, use the printer driver to print a nozzle check text pattern and clean the printhead nozzles if necessary.**

2. Preventive Maintenance

PM Table

There are no maintenance procedures prescribed for periodic care or replacement. However, the "Service Call Procedures" listed below should be done by the service technician. For more details about how to do these procedures, please refer to "Cleaning Procedures" in Section 3.

Service Call Procedures

Description	At Service Call, or As Required
External Covers	Damp cloth.
Feed Roller	Damp cloth. Release the feed clutch lock. Rotate the roller freely as you clean it.
Flushing Unit Gate	Dry cloth. Always remove the ink that has hardened around the flushing gate when you replace the waste ink tank. To remove hardened ink, you may need to use a small screwdriver or similar tool.
Friction Pad	Damp cloth. This is the cork friction pad on the front edge of the standard paper cassette.
Ink Collection Tank	Replace when SC992 appears. The waste ink tank is full, or when the display prompts that the printer needs maintenance. Open the printer driver to confirm either condition. For more, see section "3. Replacement and Adjustment".
Maintenance Unit	Dry cloth. Always use a tightly wrapped dry cloth to remove the ink that has hardened around the suction cap and wiper blade when you replace the waste ink tank.
Print Heads	Dry cloth. Gently wipe clean the print head nozzles and nozzle loop plates on the front side when you replace the waste ink tank.
Printer Operation, Print Quality	Print a Nozzle Check Pattern. Then check the results. Clean the print heads if necessary. For more, see "Image Adjustment" in section "3. Replacement and Adjustment".
Transport Belt	Damp cloth. Then dry cloth. **Important** • **To protect the surface of the transport belt, never use alcohol or any other type of organic solvent.**

3. Replacement and Adjustment

Removals

Maintainable Items

The swap-and-repair system is used for this printer. The table below lists the level of difficulty for replacement of each item.

In the table below **R**=Replace, **C**=Clean

Level 1: User can repair.		
1	Top Cover	R
2	Cartridge Cover	R
3	End Fence	R
4	Paper Cassette	R
5	Rear Plate	R
6	Duplex Unit	R
7	Tray Upper Cover (Optional PFU)	R
8	Ink Collection Unit	R
9	Paper Cassette (Optional PFU)	R
10	End Fence (Optional PFU)	R
11	Print Head Cleaning (Normal)	Use printer driver
12	Print Head Cleaning (Full)	Use printer driver
13	Firmware Update	Via USB Connection
Level 2: Technician can repair easily		
1	Covers: Front, Right, Left, Rear	R

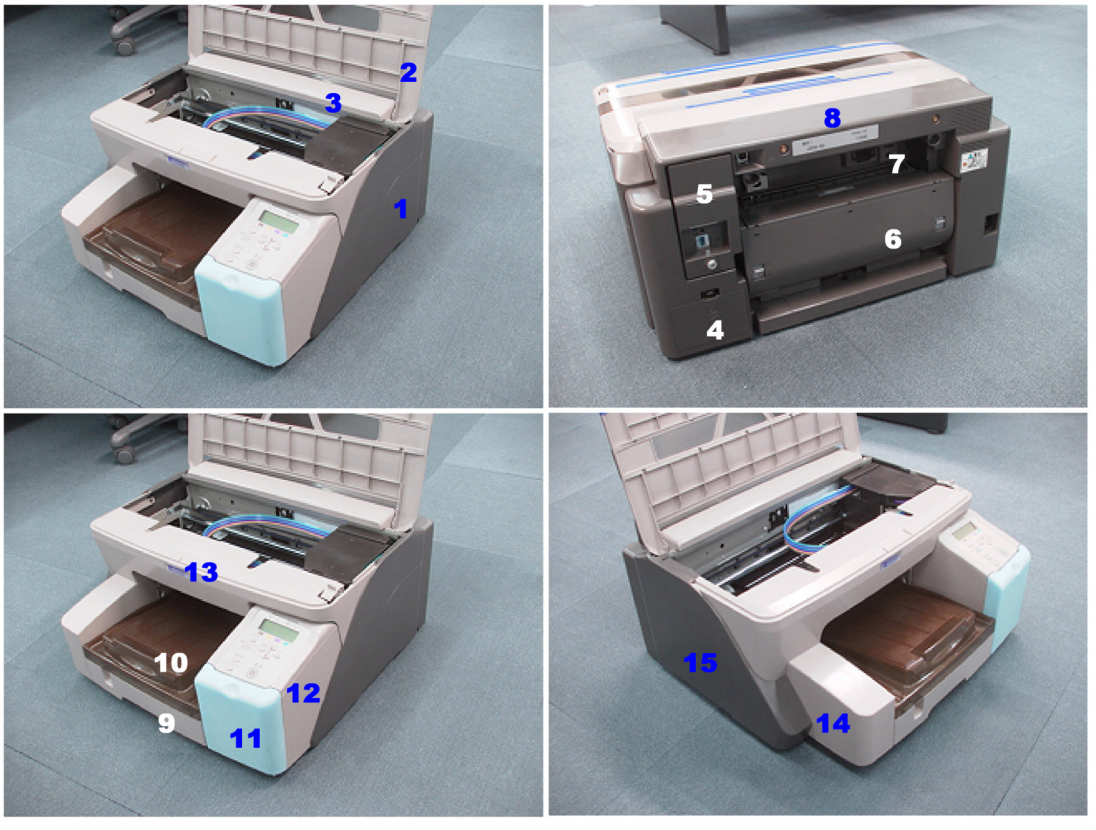
2	Flushing Unit	R
3	Maintenance Unit	R
4	Operation Panel	R
5	PSU	R
6	High Voltage Power Supply (HVPS)	R
7	Horizontal Motor	R
8	Vertical Motor	R
9	Vertical Encoder Sensor	R
10	Vertical Encoder Wheel	R
11	Cooling Fan	R
12	Duplex Unit Detection Board	R
13	Carriage Position Sensor	R
14	Air Release Solenoid	R
15	2nd Registration Sensor	R
16	Friction Pad	R
17	Feed Roller	C
18	Transport Belt	C
Level 3: Technician can repair, special tool required		
1	Main Control Board	**R (with ROM replacement)**
2	Carriage Unit	**C (use cleaning liquid)**

Level 4: Cannot repair, requires precision adjustment at factory		
1	Carriage Unit	---
2	Ink Supply Pump Unit	---
3	Transport Belt	---
4	Charge Roller	---
5	Temperature/Humidity Sensor	---
6	Paper End Sensor	---
7	Paper Feed Roller	---

Before You Begin

Important

- The covers of this printer are interlocked with plastic tabs and slots. These tabs and slots are very fragile.
- To avoid breaking the cover connection points, remove the covers in the order described below.



Rec. Order	Item	Rec. Order	Item
1	Right Cover	9	Paper Cassette (Tray 1)
2	Top Cover	10	Output Tray
3	Crosspiece (J011 only)	11	Right Front Cover
4	Ink Collection Tank Cover	12	Operation Panel
5	NIB Cover	13	Front Cover
6	Duplex Unit	14	Left Front Cover
7	Rear Plate	15	Left Cover
8	Rear Cover		

Note

- Items 4, 5, 6, 7, 9, 10 can be removed by the customer.

- These items must always be removed by the service technician following this order: 1⇒2⇒3⇒8⇒11⇒12⇒13⇒14⇒15

Easy Removals

⚠CAUTION

- Switch the printer off and disconnect it from the power supply before you do the procedures in this section.
- To avoid ink spills, never turn the printer upside down or set it on either its left or right side. The printer must always remain upright on a flat surface during servicing.

Top Cover (J011)

Important

- **This procedure is for the J011 only. Before removing the top cover from the J007/J010, you must remove another cover. This is described in the later section "Top Cover (J007/J010)".**

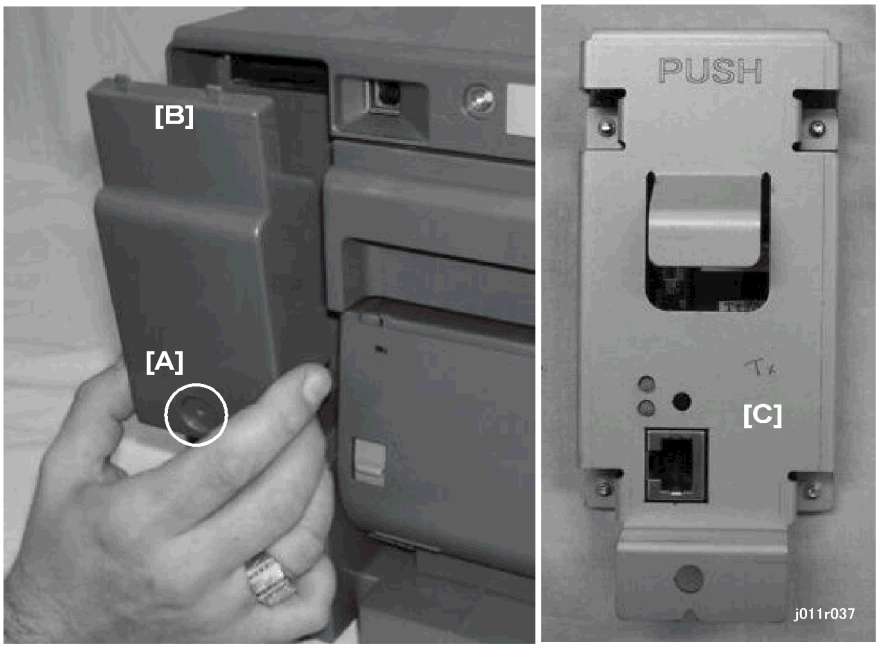
r000

1. **Spread the hinge tabs slightly on the left and right side of the top cover.**
2. **Remove the top cover.**

Output Tray, Paper Feed Cassette

1. Raise the output tray [A].
2. Pull the paper cassette [B] out of the printer.
3. Press in the arms of the output tray [C] to release the tabs then pull the output tray out of the printer.

NIB Cover, NIB

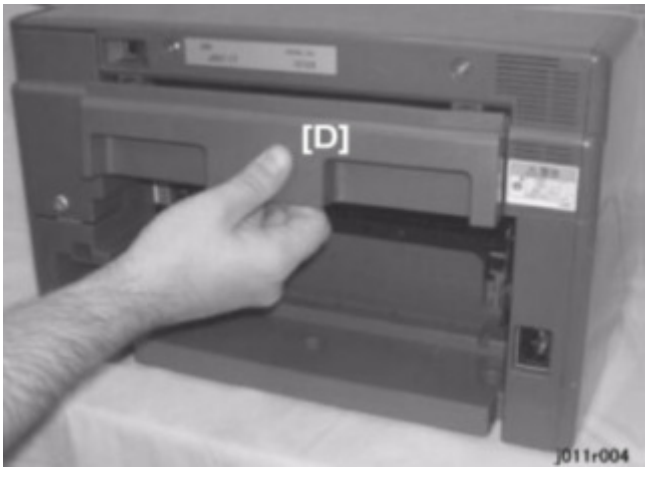


1. At the right rear corner, remove the knob screw [A].

2. Disconnect the cover hooks from the printer body and remove the cover [B].
3. Remove the NIB [C].

Duplex Unit, Rear Plate

1. Raise the left and right release tabs [A] and [B] to unlock the duplex unit..
2. Lift and pull the Duplex Unit [C] out from the back of the printer.



1. Pull out the guide plate.

Reinstallation

- Always press down and lock the left and right release tabs after you set the Duplex Unit in the machine.

Ink Collection Tank

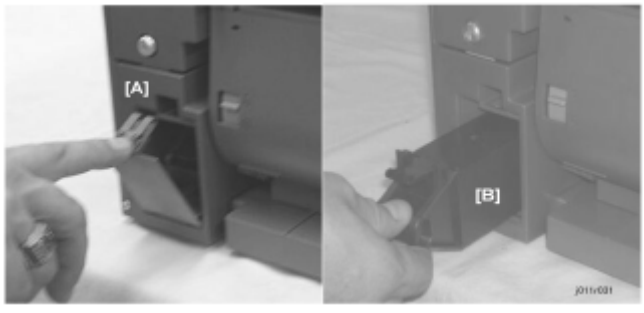
Preparation

- Obtain a self-sealing plastic bag to hold the ink collection tank.

Important

- The ink collection tank contains used ink.

- Never remove the ink collection tank from the printer unless you are going to replace the tank.



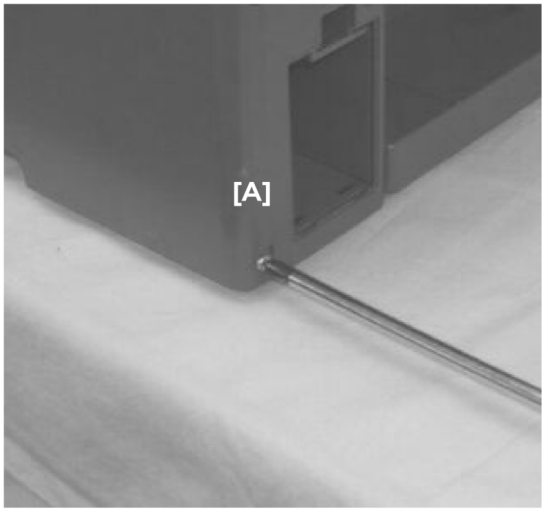
1. **Push down on the tab [A] to release the cover then remove it.**
2. **Slowly pull the ink collection tank [B] out of the printer.**
3. **Put the ink collection tank in a plastic bag and seal it.**
4. **Obey the local laws and regulations regarding the disposal of such items.**

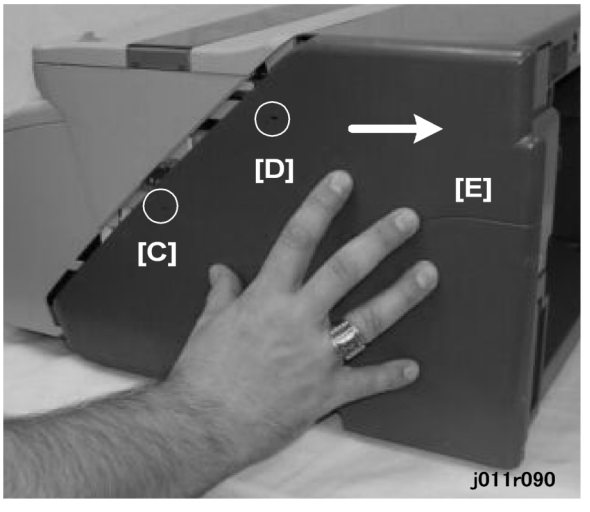
⚠CAUTION

- The ink collection tank contains old ink cleaned from the print heads. Handle the tank carefully.
- The ink can stain furniture and clothing. Set it on a flat surface where it will not be knocked over or dropped accidentally.
- Dispose of a used ink collection tank immediately.
- Never attempt to clean a used tank for reuse.
- Always keep the ink collection tank out of the reach of small children.

Removing the Covers

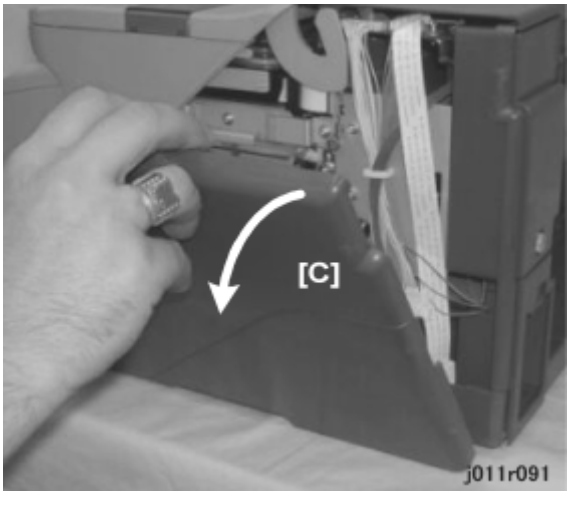
Right Cover





1. **Remove the screw [A].**
2. **Insert the tip of a very small screw driver into the holes [C] and [D] to disconnect the pawls behind the cover.**
3. **Slide the cover [E] to the rear about 2 cm.**

   The cover is also held in place by two tabs on the bottom edge of the cover.

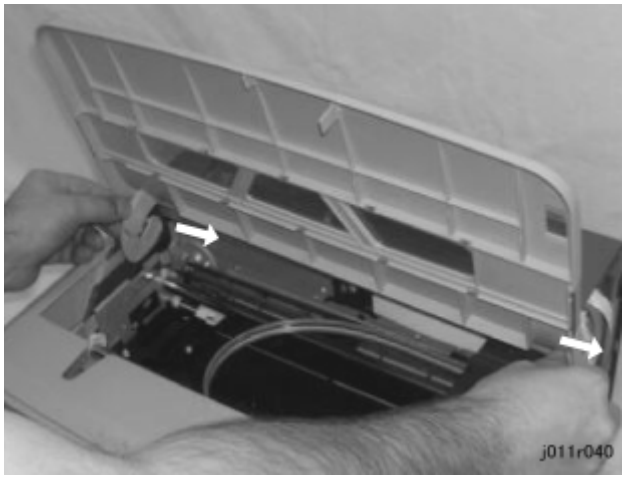


4. Slowly rotate the right cover [C] away from the side of the printer.

Top Cover (J007/J010)

Preparation

- Remove the right cover.

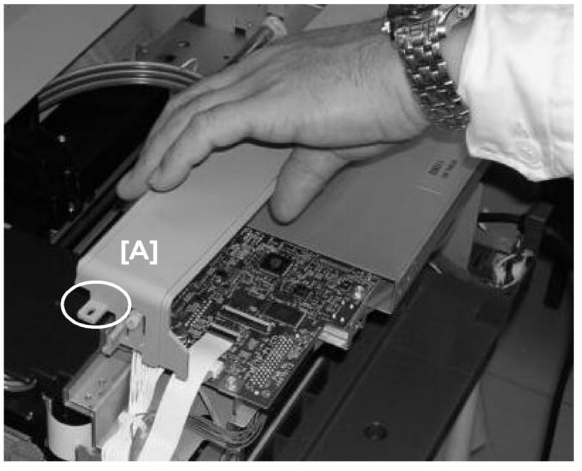


1. Push both arms to the right to release them at the same time.
2. Detach the top cover from the printer.

Crosspiece (J011)

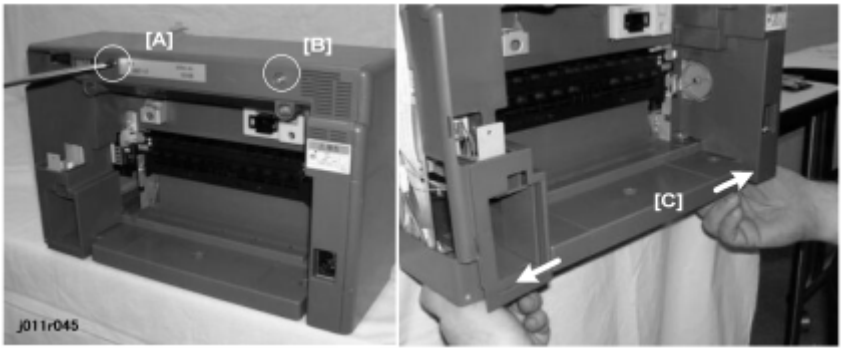
Important

- This crosspiece is part of the J011 only.
- The crosspiece does not need to be removed unless removal of the control board is necessary.



1. **Remove the screw on the left [A] and the screw on the other end (x2).**
2. **Raise the crosspiece to remove it.**

Rear Cover



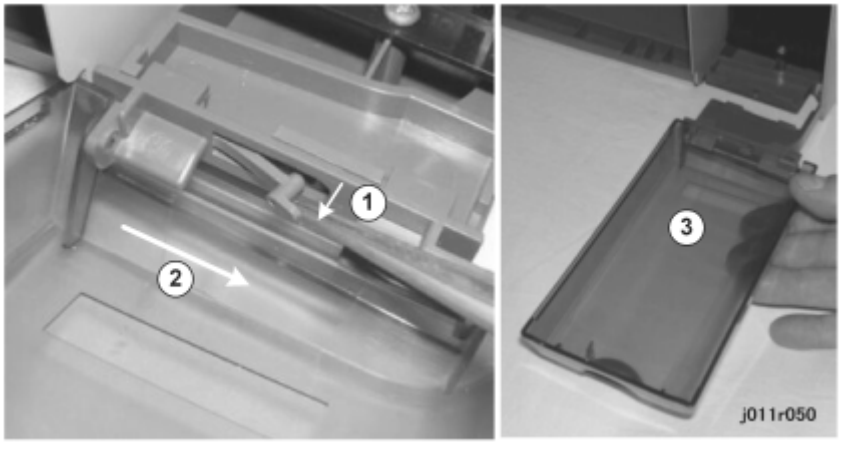
1. **Remove:**
   - Ink collection tank
   - NIB cover and NIB (if installed)
   - Duplex unit, Guide plate
2. **Remove the screws [A] and [B] (x 2).**

   The rear cover is fastened to the rear bottom edge of the printer by two tabs.
3. **Under the printer, pull the edges of the cover down and to the left and right [C] to disengage the slots of the cover from the tabs then remove the cover.**

Note

- If the rear cover slots are difficult to disconnect, you may need to use the head of a small screwdriver to separate them from the tabs..

Right Front Door



1. Open the right front door
2. Pull out the tab ❶ to release it.
3. Push the cover to the right ❷ and detach it.
4. Pull the cover away from the printer ❸.

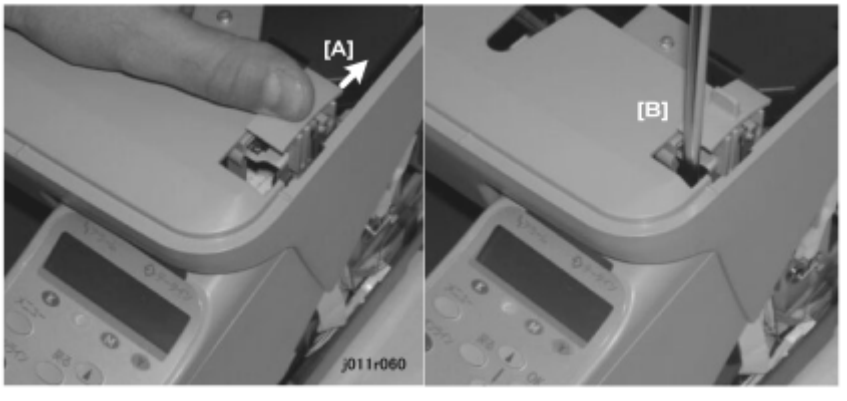
Reinstallation

1. Insert the tabs into the cutouts.
2. Push the door to the left.
3. Push down tab ❶ so it is flat. Make sure that the tab is flat.

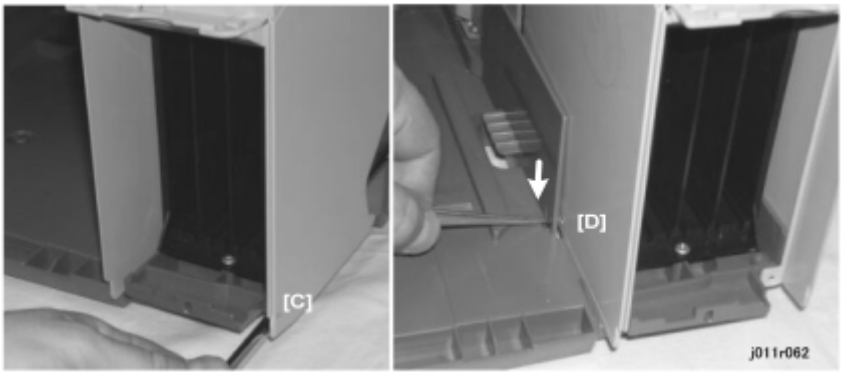
Right Front Cover, Operation Panel

1. Remove:
   - Output tray
   - Paper cassette
   - Right front door

2. Pull out the Print cartridges (K, C, M, Y)

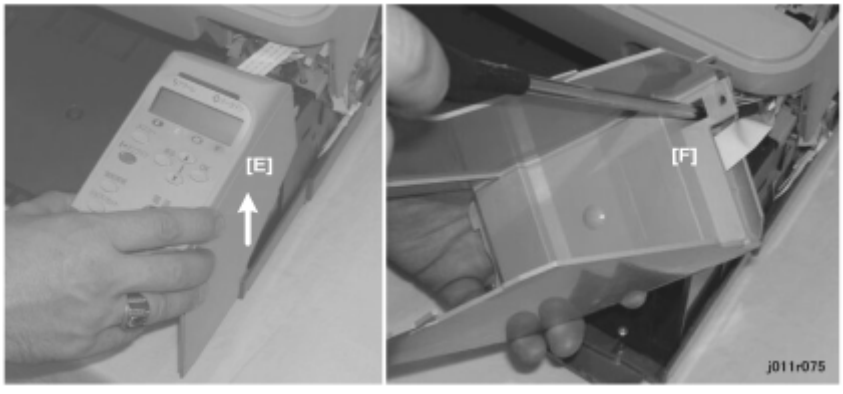


3. Push the envelope selector [A] to the rear so you can see the screw below.
4. Remove the screw [B] (x1).



5. Remove the screw [C] (x1)

6. Use a small screwdriver to depress the pawl [D] to release the left side of the cover.



7. Lift up the ink cartridge compartment cover [E].

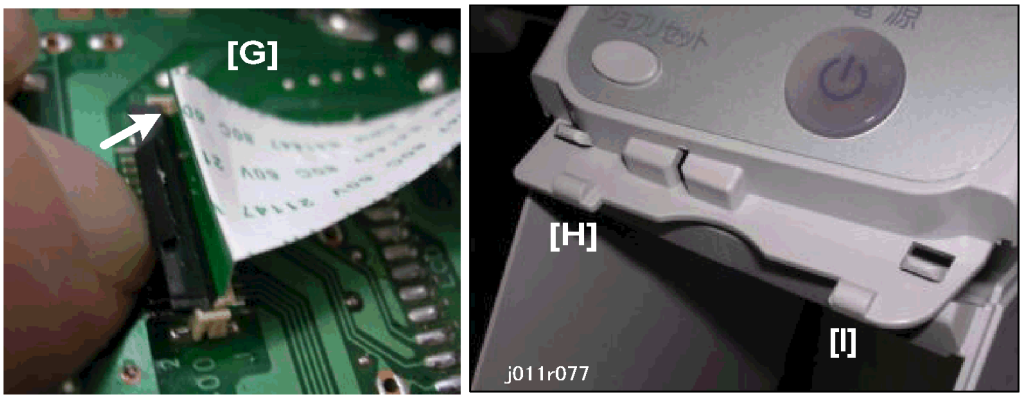
Important

- The operation panel is connected by a fragile FFC (flat film connector).
- Do not disassemble the operation panel unless you are replacing it

8. Turn over the cover and remove the screw [F].

Important

- The operation panel of the J011 is fastened with two screws. Remove both screws.



9. Push the latch [G] of the FFC connector away from the board to release the FFC.
10. Carefully separate the tabs and slots [H] and [I] to disconnect the operation panel from the cover

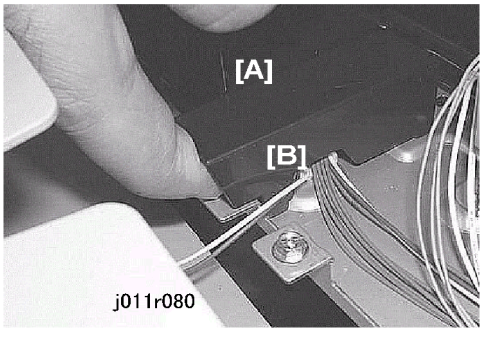
Reinstallation

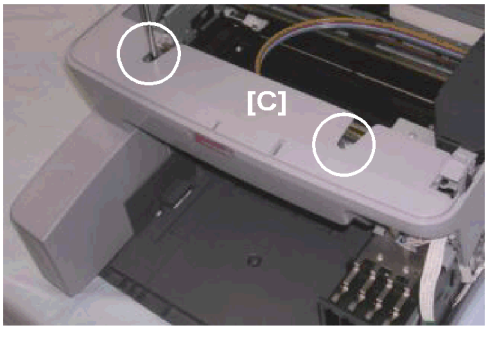
To reconnect the FFC:

- Pull the FFC release away from the PCB.
- Insert the tip of the FFC into the slot with the GREEN side up.

- Push the FFC release toward the PCB to lock the FFC in place.

Front Cover



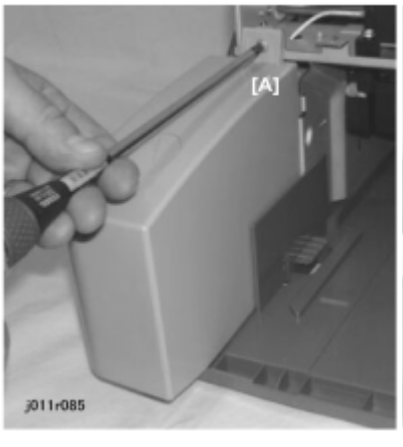


1. **Remove the connector cover [A] and disconnect the front cover sensor [B] (x1, x1)**
2. **Remove the front cover [C] (x2)**

Note

- Just loosen these screws enough so the feet of the posts can be removed. These screws need not be removed.

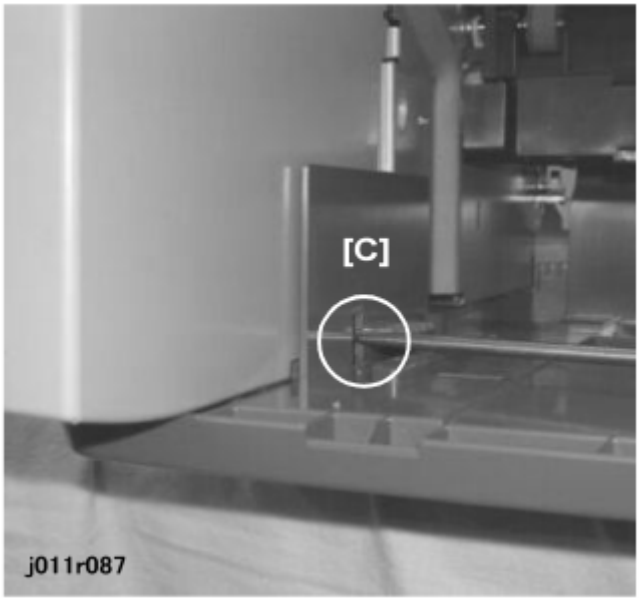
Left Front Cover



1. **Remove:**
   - Ink cartridge cover.
   - Front cover (x2, x1)
2. **Remove screw [A] (x1)**

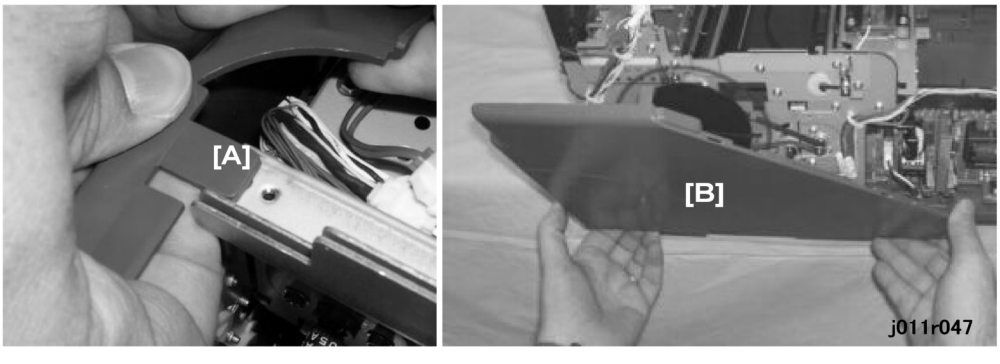
Important

- One tab slot is on the front bottom edge of the left front cover.
- To avoid breaking the slot, use the head of a small screw to disengage the slot as you gently pull and rock the cover forward.



3. Insert the head of a small screwdriver into the hole [C] and push down the pawl to disconnect it.
4. Rotate the left front cover down and toward you to remove it.

Left Cover



1. On the J011, disconnect the top tab [A] from the hole on the frame.

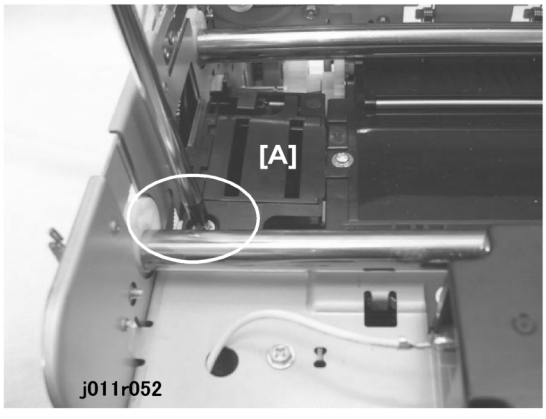
Note

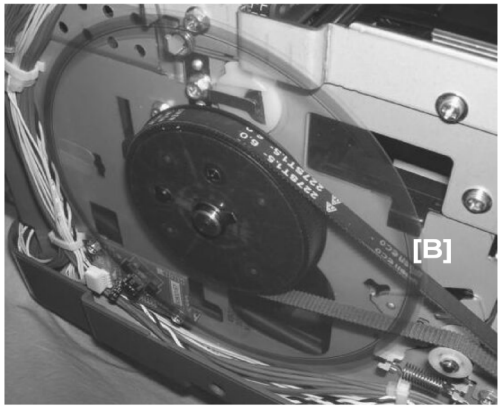
- There is no tab on the top edge of the cover of the J007/J010.

2. **Slowly rotate the left [B] cover away from the side of the printer.**
3. **You may need to use a small screwdriver to disconnect the cover slots from the tabs on the bottom edge of the cover.**

Component Removal

Flushing Unit

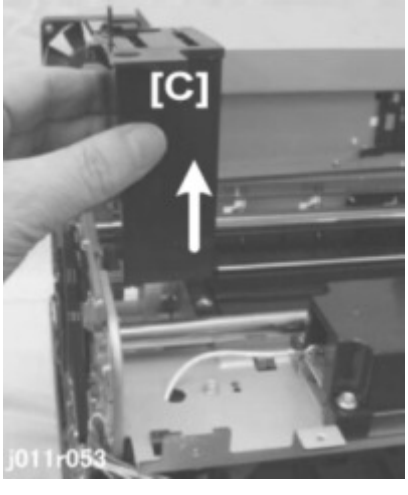




1. Open the top cover.
2. Remove screw [A] (x 1).
3. Use the tip of a small screwdriver to disengage tab [B].

Important

- Work carefully to avoid damaging the vertical encoder wheel.



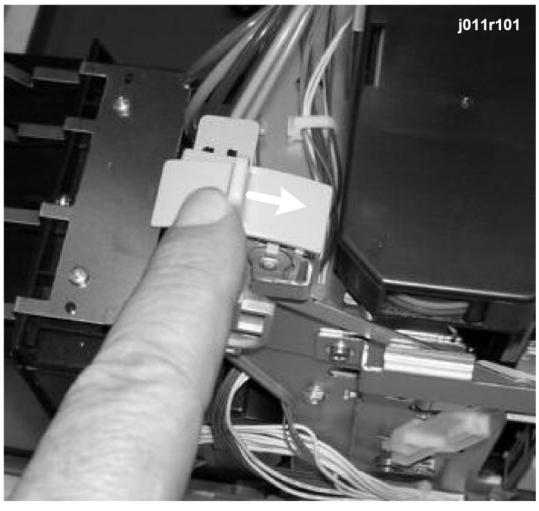
4. Lift the Flushing Unit out of the printer.

Maintenance Unit

1. **Remove:**
   - Output tray
   - Paper cassette
   - Print cartridges x 4 (Y, M, C, K)
   - Right front door
   - Right cover with operation panel
   - Right cover
   - Top cover

2. **Use a plus (+) screwdriver to turn the screw [A] counter-clockwise until the tip of the triangle [B] is aligned with the tip of the triangle [C].**

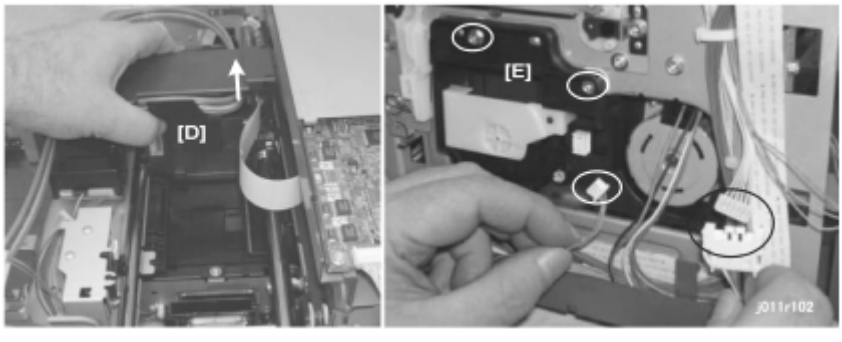
   This unlocks the carriage.



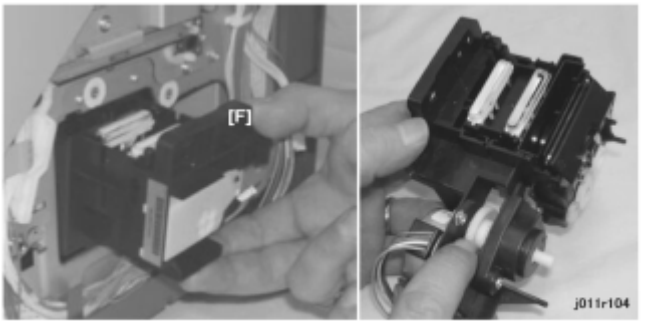
3. Push the envelope selector to the rear.

Important

- Pushing the envelope selector to the rear raises the print heads.
- This prevents damage to the print heads when the carriage is moved manually.
- Always push the envelope selector to the rear before moving the carriage manually.

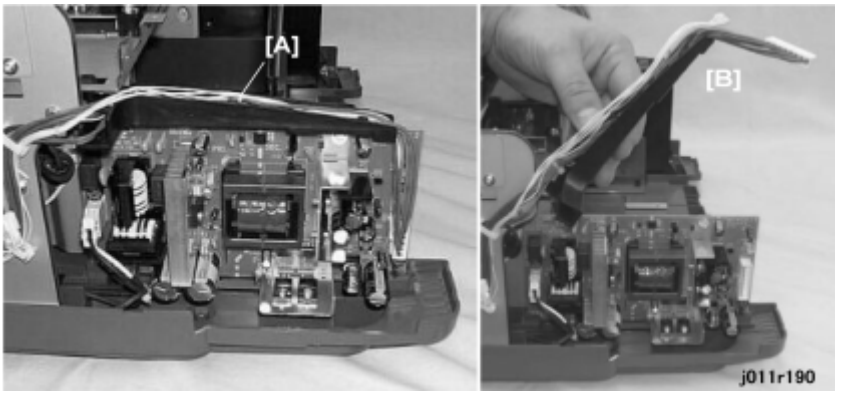


4. Push the unlocked carriage [D] to the middle of the platen.
5. Disconnect the maintenance unit [E] (x2, x2).



6. **While tilting the maintenance unit [F] as shown, slowly remove it from the printer.**

PSU



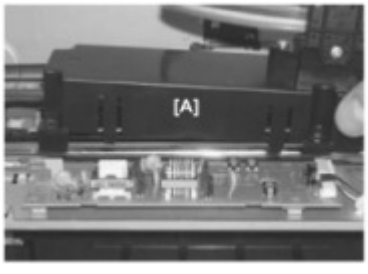
1. **To access the PSU, remove:**
   - Front right cover
   - Raise the top cover
   - Front cover
   - Left front cover
2. **Disconnect the lock arm [A] (x2, x1).**
3. **Raise the arm [B].**

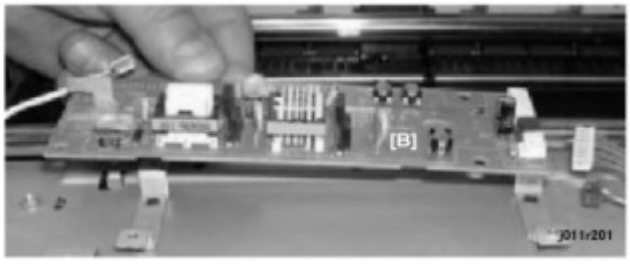
4. **Remove the PSU (x4, x1)**

High Voltage Power supply Board

Remove:

- Right cover
- Top cover
- Front cover





1. **Remove the HVPS cover [A] (x4, (x4)**
2. **Remove the HVPS board (x3)**

Important

- **Press up gently as you pull if the bayonet is difficult to disconnect**

.Main Control Board

Before replacing the control board and NVRAM together, you should always print a System Summary, Service Summary, and Engine Summary Chart. You will need these reports to do important settings after replacement.

Important

- **You will need these printouts to reference previous settings that may require resetting.**

To print the System Summary:

- Confirm that paper is loaded in the paper tray.
- Push [Menu].
- Push ▼ or ▲ to display "List/Test Print" and push [#Enter].
- With "List/Test Print" displayed push [#Enter].

3

To print the Service Summary:

- Confirm that paper is loaded in the paper tray.
- Push [Menu].
- Push ▼ or ▲ to display "List/Test Print" and push [#Enter].
- Push ▼ or ▲ to display "Config. Page" and push [#Enter].

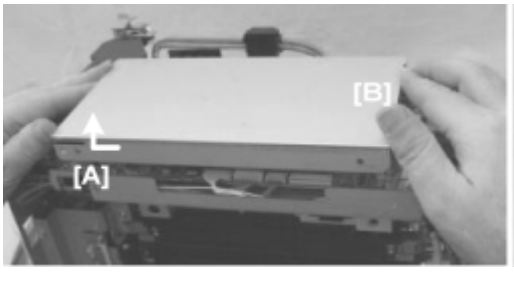
To print the Engine Summary Chart:

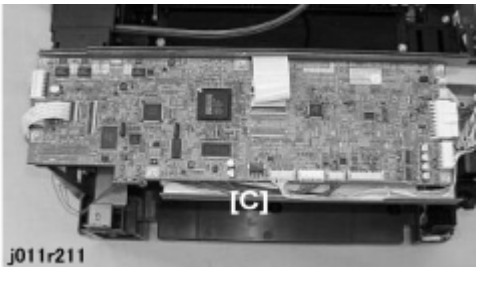
Do SP5200 (Print SMC). (Printing requires about 3 minutes.)

Note

- For more details about these status reports, please refer to the descriptions of these reports at the end of Section "5. Service Tables".

1. **Remove:**
   - Right cover
   - Top cover
   - Rear cover
   - Crosspiece (J011 Only)





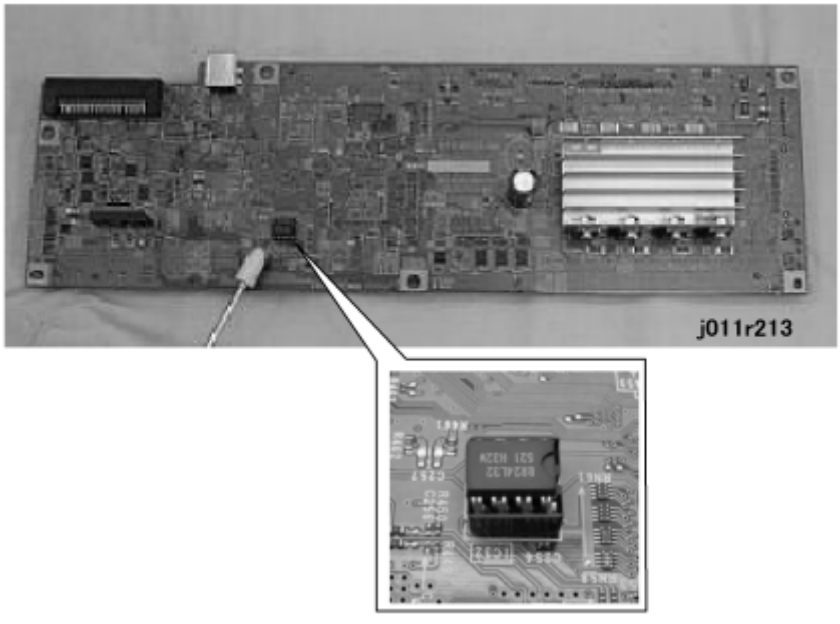
2. **From the back of the printer, pull the corner [A] of the cover to disengage the metal tab.**
3. **Slowly push the cover bracket from the right [B] about only 4 cm (1½") to the left to disengage the hook below and lift it up.**

⚠CAUTION

- Apply only enough force to slide the bracket off of its hook.

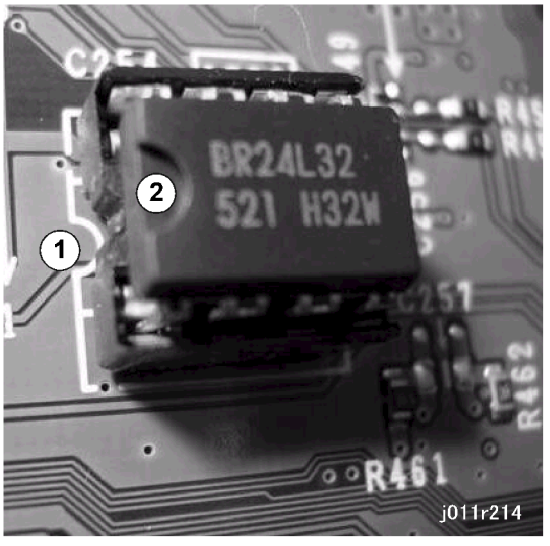
- If you push too hard, the bracket may release suddenly from the frame and the edge of the cover may shear components from the control board.

4. **Touch a metal surface before you touch the control board.**
5. **Remove the control board [C] (x8, x6).**
6. **The NVRAM is on the bottom of the board. Turn the board over and lay it on a flat surface.**



If the control board is being replaced:

1. **Pull the NVRAM from the control board removed from the printer.**
2. **Install the NVRAM on the new control board.**



Important

- **Attach the new NVRAM so the curvature of the white line on the board [1] matches the curvature of the indentation [2] on the NVRAM chip.**

3. **Install the new control board in the printer.**

The table below lists the counters and other items that are cleared as a result of replacing the controller board and NVRAM or replacing only the NVRAM. Some items require manual resetting, and others do not require resetting.

In the table below:

Case 1: Control Board and New NVRAM.

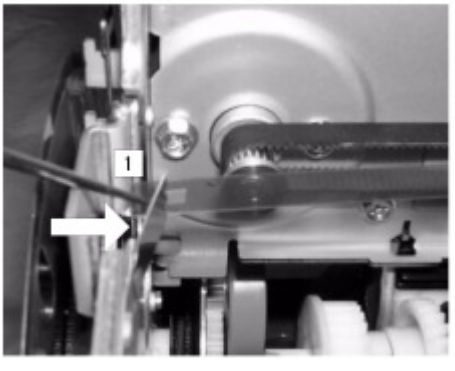
Case 2: New Control Board only (with old NVRAM reattached).

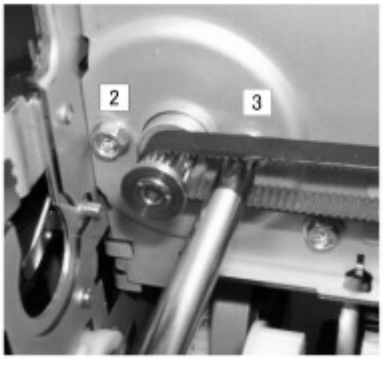
Item	Case 1	Case 2	Related SP, UP Settings	Reset Procedure	Comment
User Menu - Paper Size - System Setting - I/F Setting	YES	NO	All User Menu Items	Print a System Summary. Confer with the operator to determine how to do the settings.	
Bit Switches	YES	NO	---	Print a Service Summary. Refer to the printed Service Summary and reset.	Bit SW 1 to 8

Item	Case 1	Case 2	Related SP, UP Settings	Reset Procedure	Comment
Settings Clear	---	---	---		Initial System Settings/Counter Settings
Plug-and-Play	YES	NO	---	Print a Service Summary. Refer to the printed Service Summary and confirm that the printer model numbers are correct and reset if necessary.	
Counter Display Settings	YES	NO	---	Print a Service Summary and reset.	
FAX number setting	YES	NO	---	Consult operator and reset	
Print Head Rank	YES	NO	SP3100-3107	Do SP5200 to print the Engine Summary chart. Refer to the previously printed summary chart and re-enter the SP settings.	The Engine Summary Chart (7-8 pages) requires about 3 min. to print.
Print Head Gap Adjustment	YES	NO	User Menu "Maintenance"	Do some test prints and adjust.	This setting can be done with one execution of SP5102 for all print heads.
LF Adjustment	YES	NO	User Menu, "Maintenance"	Do some test prints and adjust.	
Registration Adjustment (Vertical/Horizontal)	YES	NO	User Menu, "Maintenance"	Do some test prints and adjust.	
Print Gamma	YES	NO	SP3300-3303	Enter the number recorded on the print head cover.	This setting can be done with one execu-

Item	Case 1	Case 2	Related SP, UP Settings	Reset Procedure	Comment
					tion of SP5102 for all print heads.
Ink Collection Tank Replace	YES	NO	---	---	The software counts for these items are lost after NVRAM replacement and cannot be reset. Therefore, these items must be replaced.
Flushing Unit Replace	YES	NO	---	---	

Horizontal Motor

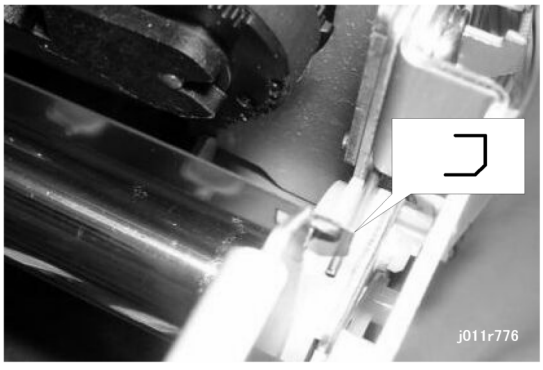




1. **Push the leaf spring [1] to the right to release pressure on the horizontal encoder strip, then disconnect both ends of the strip and remove it.**
2. **Remove screws [2] and [3].**

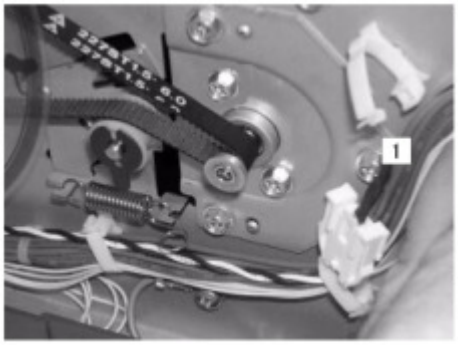
3. **At the rear corner of the printer, remove the horizontal motor (x1).**

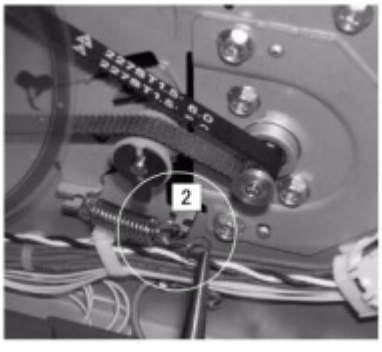
Reassembly



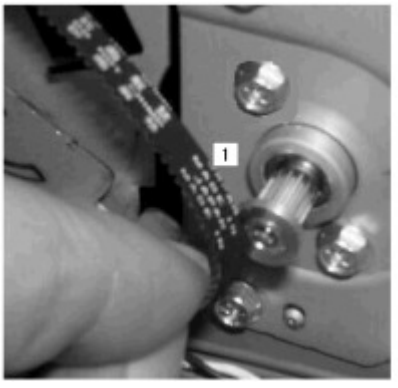
1. First, reattach the horizontal encoder strip on the right side with its notched corner down as shown above.
2. Attach the left end of the horizontal encoder strip to the left

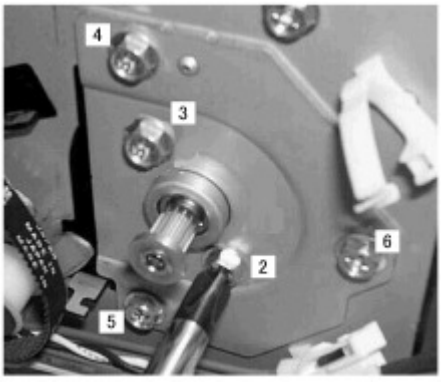
Vertical Motor



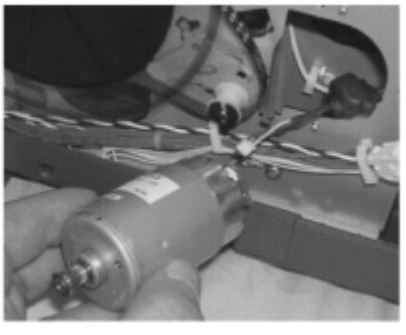


1. Release harness [1] (x1)
2. Remove spring [2] (x1)



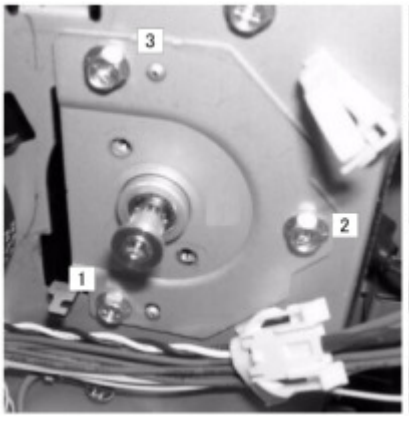


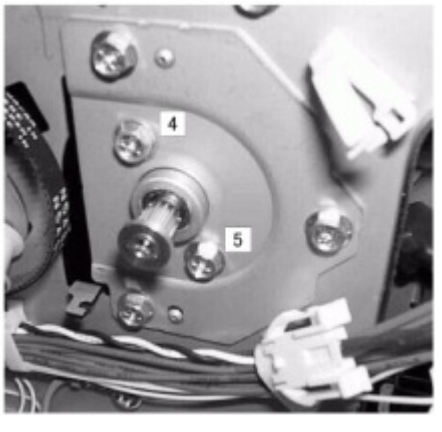
3. Remove timing belt [1].
4. Remove motor screws [2], [3] (x2)
5. Remove motor plate screws [4], [5], [6] (x3).



6. Pull out the vertical motor (x1).

Reassembly

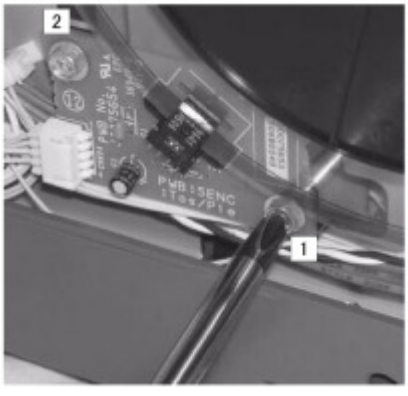


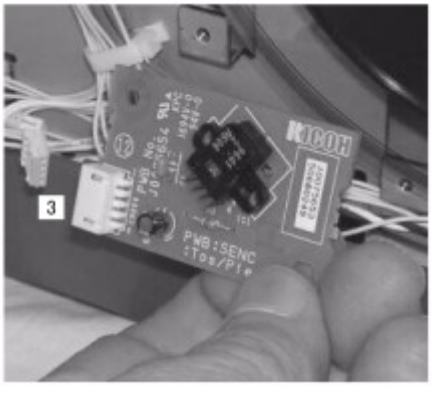


1. Connect the motor and insert it.

2. Make sure the motor is perfectly horizontal.
3. Position the plate and reattach screws [1], [2], [3] (x3).
4. Attach the motor screws [4], [5] to fasten the motor to the plate (x2).

Vertical Encoder Sensor



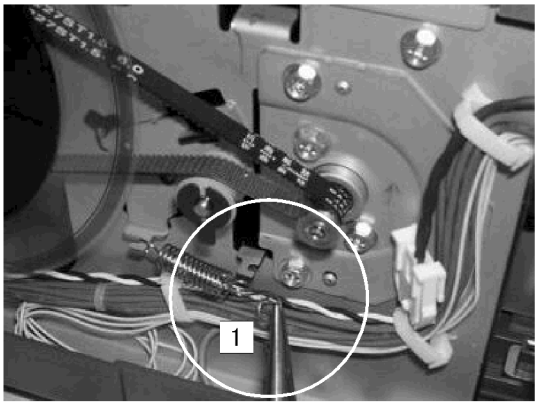


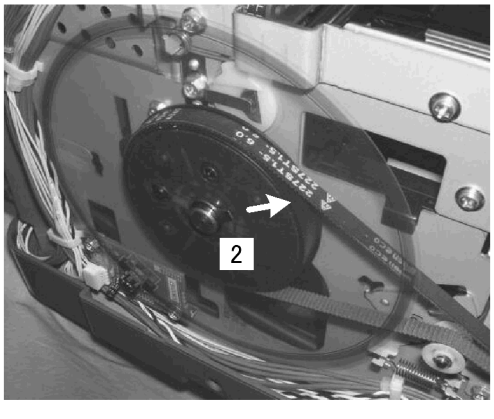
Important

- Work carefully to avoid bending or scratching the edge of the vertical encoder sensor wheel.

1. Unfasten the vertical encoder PCB by removing screws [1], [2] (x2).
2. Disconnect and remove the vertical encoder sensor board and sensor (x1)

Vertical Encoder Wheel





1. Remove the spring [1] to release tension on the feed belt (x1).
2. Remove the flexible plastic clamp [2] from the tip of the shaft.

Important

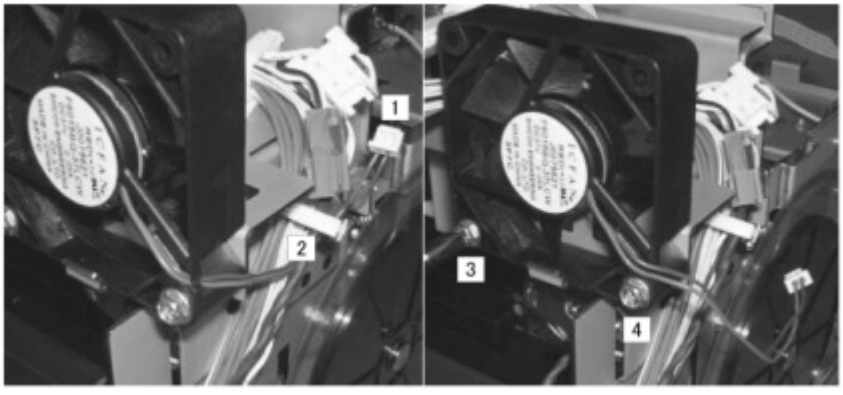
- Avoid touching the edges of the vertical encode sensor wheel.

3. Insert a screwdriver between the frame and the hub of the wheel on its shaft.
4. Slowly turn the screwdriver to the left and right to free the wheel from the shaft.

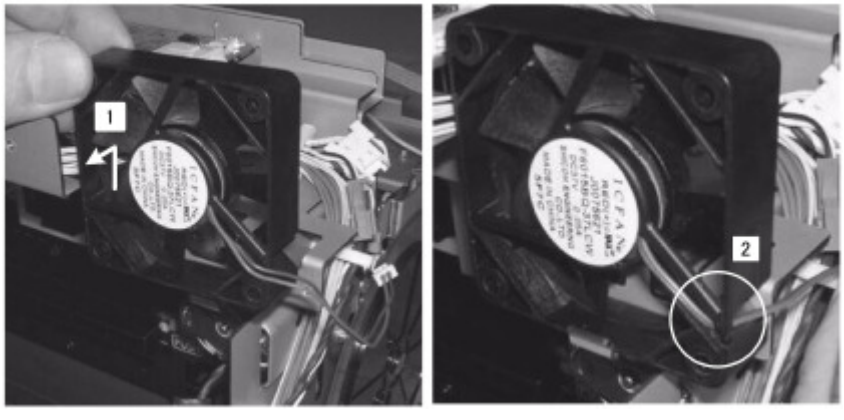
Reassembly

1. Rotate the shaft so the long pin is vertical.
2. Align the long groove at the center on the back of the wheel, then push it onto the shaft.
3. Make sure that the wheel is locked onto the long pin.

Cooling Fan



1. **Disconnect the fan harness [1], [2] (x1, x1)**
2. **Remove screws [3], [4] (x2)**



3. **Remove the cooling fan [1].**

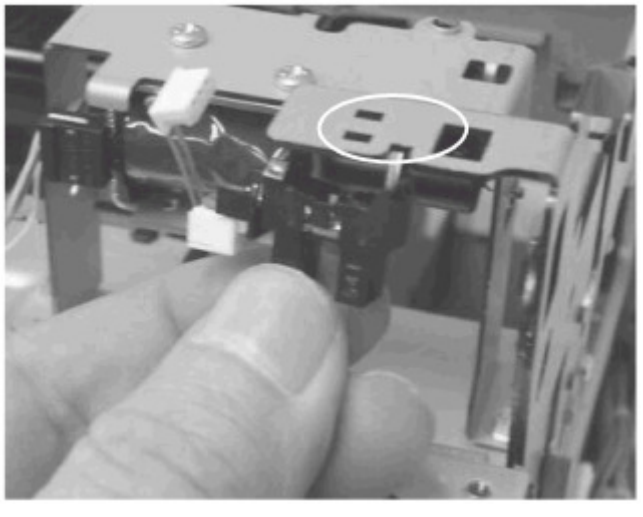
Reassembly

Make sure that the harness is set in the gap [2] before you reconnect the motor.

Duplexer Detection Board

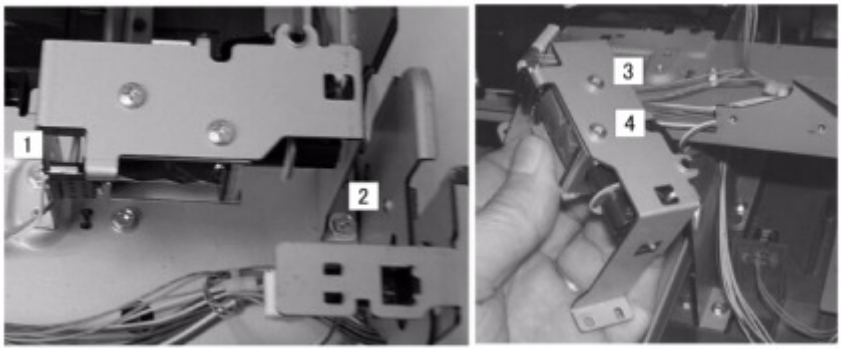
1. Remove screws [1], [2] (x2).
2. Disconnect the PCB (x1)

Carriage Position Sensor



1. Remove the sensor from the top of the air release solenoid bracket (x3)
2. Disconnect the sensor (x1).

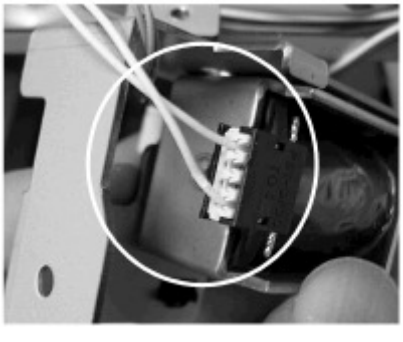
Air Release Solenoid



1. Remove the bracket screws [1], [2] (x2).
2. Remove the solenoid screws [3], [4] (x2).

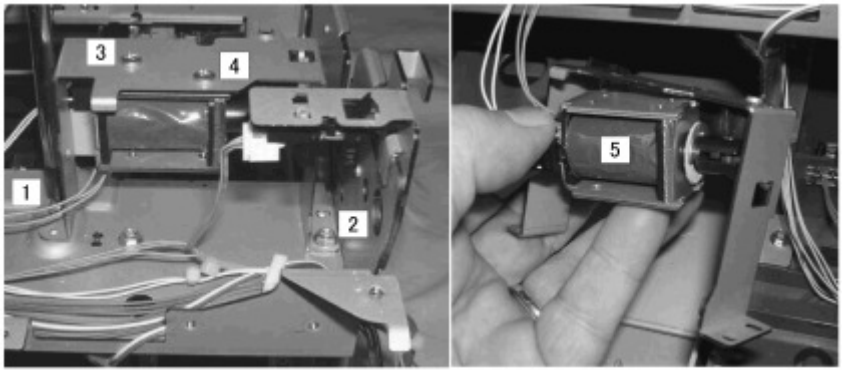
3. Disconnect the air release solenoid and plunger [5] (x1).

Reassembly

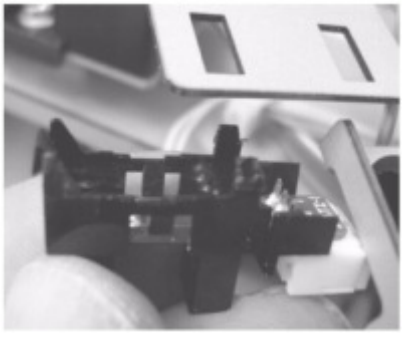


1. Make sure that the solenoid and harness are positioned as shown above before you fasten the solenoid to the bracket.

Ink Level Sensor

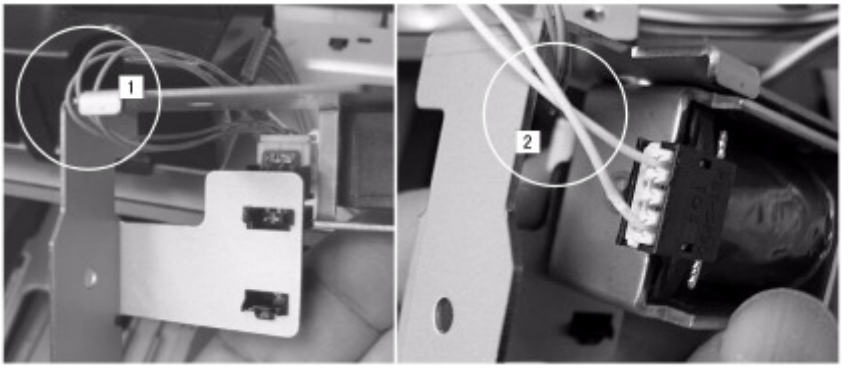


1. Remove the bracket screws [1], [2] (x2)
2. Remove the air release solenoid screws [3], [4] (x2).
3. Remove the air release solenoid [5].



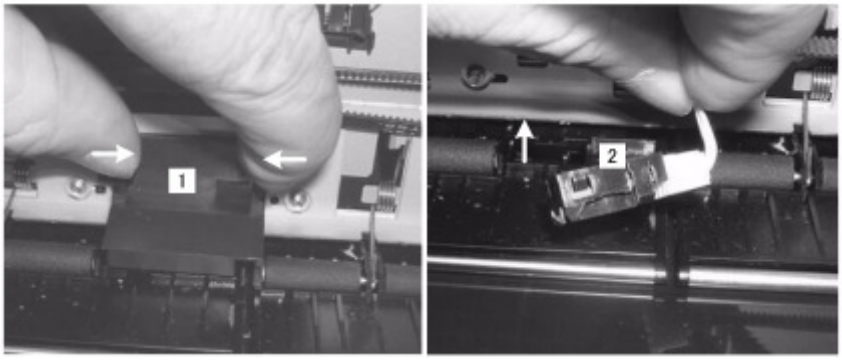
4. Disconnect the ink level sensor from the bracket frame (x3, x1)

Reassembly



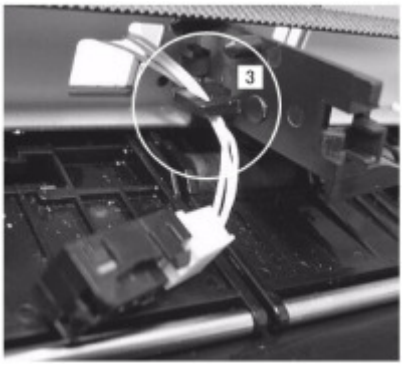
1. Make sure that the harnesses are positioned correctly before you reconnect the solenoid.
   - [1] Ink level sensor harness
   - [2] Air release solenoid harness

2nd Registration Sensor



1. Pinch the sides of the cover [1] to release its pawls and remove the cover (x2
2. Remove the photosensor [2] (x2, x1)

Reassembly



1. Set the harness in the bracket of the cover before reattaching the sensor.

Important

- This sensor is extremely sensitive to light.
- Make sure the sensor cover is reattached correctly with the pawls connected on each side. If the cover is not set correctly, this could interfere with the operation of the sensor.

Cleaning Procedures

There are no printer parts that require scheduled maintenance or replacement. However, the customer engineer should do the procedures described in this section when a service call is requested.

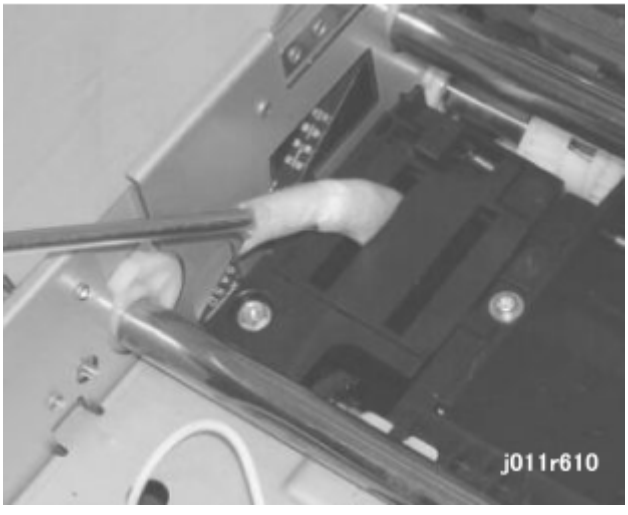
Service Call Procedures

Description	At Service Call (or When Necessary)
External Covers	Damp cloth.
Feed Roller	Damp cloth. Release the feed clutch lock. Rotate the roller freely as you clean it.
Friction Pad	Damp cloth. This is the cork friction pad on the front edge of the standard paper cassette (Tray 1).
Printer Operation, Print Quality	Print a Nozzle Check Pattern. Then check the results. Clean the print heads if necessary. For more, see "Image Adjustment" in section "3. Replacement and Adjustment".
Ink Collection Tank	Replace when SC992 shows. The ink collection tank is full, or when the display prompts that the printer needs maintenance. Open the printer driver to confirm either condition. For more, see section "3. Replacement and Adjustment".
Flushing Unit Gate	Dry cloth. Always remove the ink that has hardened around the flushing gate when you replace the ink collection tank. To remove hardened ink, you may need to use a small screwdriver or similar tool.
Maintenance unit	Dry cloth. Always use a tightly wrapped dry cloth to remove the ink that has hardened around the suction cap and wiper blade when you replace the ink collection tank.
Maintenance unit	Dry cloth. Always use a tightly wrapped dry cloth to remove the ink that has hardened around the suction cap and wiper blade when you replace the ink collection tank.

Service Technician Responsibility

The responsibility of the service technician is limited because this machine is adjusted for optimum performance at the factory before it gets shipped. Return the printer to the repair center or replace the printer if a serious problem occurs.

Flushing Gate Cleaning



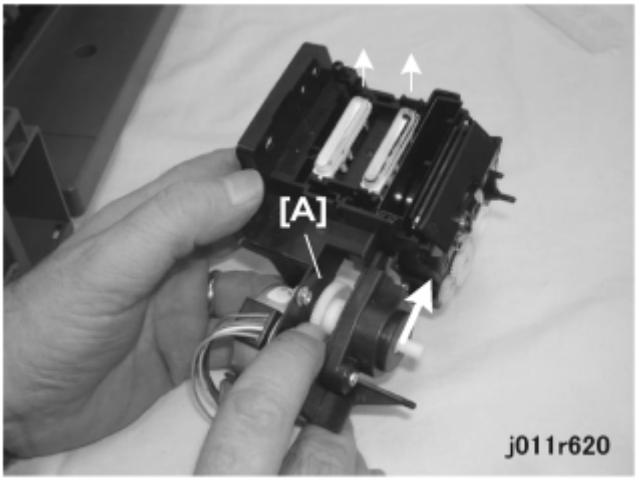
Dry ink flakes that collect around the flushing gate can cause streaking in printouts.

1. **Open the top cover.**
2. **Use the tip of a screwdriver or other tool wrapped in soft cloth to remove the ink that has hardened inside the slits the flushing gate.**
3. **Use a slightly damp cloth to wipe clean the ink splatter around the flushing gates.**

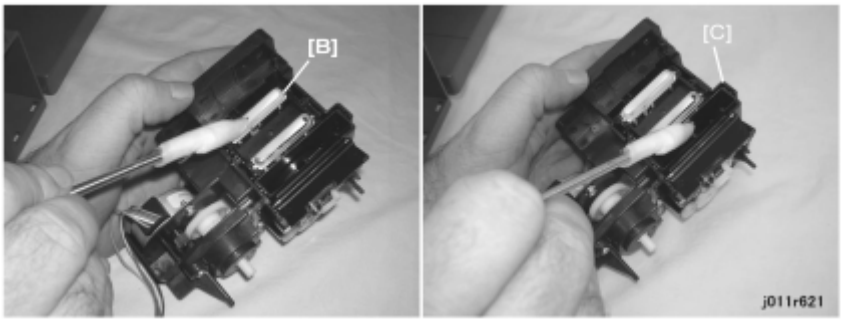
Maintenance Unit Cleaning

Cleaning the Suction Cap, Right Air Vent, and Wiper Blade

1. **Remove the maintenance unit. (See "Maintenance Unit" for more about removal.)**



2. Turn the drive gear [A] of the maintenance motor in the direction of the arrow to raise the suction caps.



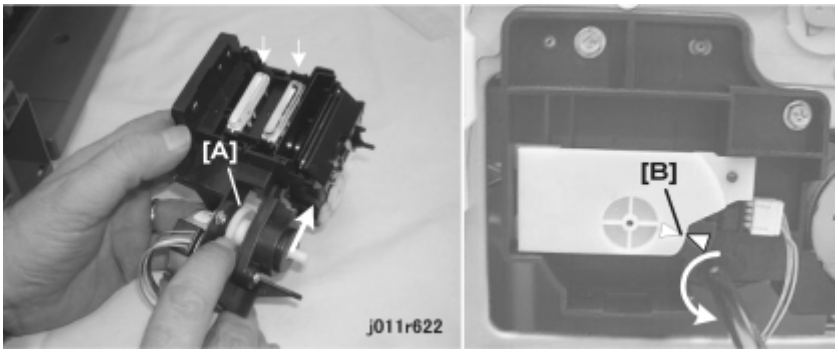
3. Wrap the tip of screwdriver or similar tool with a damp cloth.
4. Use the wrapped tip of the screwdriver to clean inside and around the caps [B] to remove hardened ink.
5. Turn the gear until the cleaning blade opens, then clean the right air vent and wiper blade [C] blade.

Important

- Always wrap the tip of the tool with a damp cloth to prevent scratching the suction cup.
- A scratched suction cup could cause poor print quality.

Print Head Cleaning

After Maintenance Unit Cleaning



Do this procedure before you reinstall the maintenance unit:

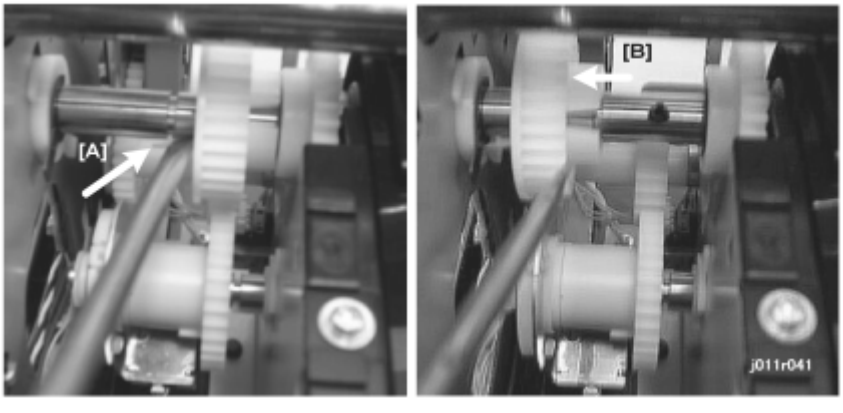
1. **Turn the drive maintenance motor drive gear [A] in the direction of the arrow to lower the suction cap and wiper blade.**
2. **Make sure they are at the lowest position.**
3. **Make sure the triangle marks [B] on the sides of the maintenance unit match.**

   If the triangle marks are not aligned, use a screwdriver to turn the screw counter-clockwise until they are aligned.

   Important

   - **The tips of the triangles must be aligned before you reinstall the maintenance unit.**

Feed Roller Cleaning



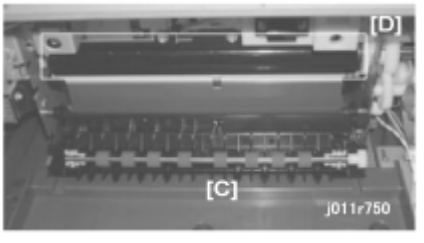
1. **Open the top cover.**

2. Remove the paper cassette.
3. Remove the flushing unit.
4. Use the tip of a screwdriver to release the Teflon lock tab [A] of the transport roller.
5. Slide the transport roller gear [B] to the left.

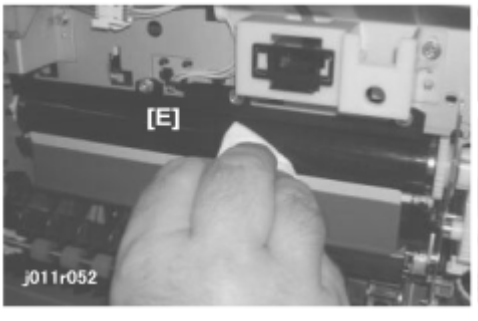
   This unlocks the roller and allows it to rotate freely.
6. Rotate the roller and clean it with a dry cloth.

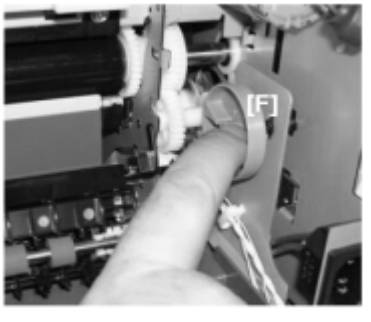
3 Transport Belt Cleaning

1. Remove the duplex unit and rear guide from the back of the printer.



2. Release the left and right locks [A] and [B] (marked "PUSH") of the reverse guide plate.
3. Open and lower the reverse guide plate [C] to expose the surface of the transport roller [D].





4. First, use a cloth [E] soaked in alcohol to wipe clean the surface of the transport belt.
5. Use a dry cloth to wipe the belt.
6. Turn the feed guide [F] to rotate the transport belt and expose the next area of the belt.
7. Repeat Steps 4 to 6 until the entire surface of the belt is clean.
8. Make sure that the entire surface of the belt is completely dry.

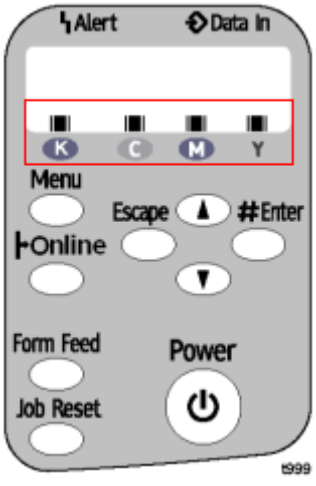
Important

- Water on the surface of the transport belt could interfere with the operation of the printer.

4. Troubleshooting

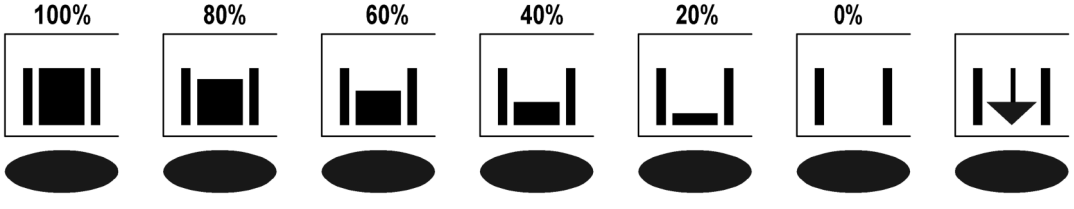
Printer Display Summary

Operation Panel Display



Operation Panel Ink Low/Ink End Indicator

The printer shows a 6-level dynamic display that keeps the operator informed about the status of the ink levels in the tanks. The example below for Black (K)shows the progression in the display from full on the left to completely empty on the right.



- At 100% the ink cartridge is completely full.
- The 0% display is the cartridge near end alert. Printing is still possible until the ink in the print head is gone.
- The arrow display (↓) is the ink cartridge end alert. The printer cannot be used until the ink cartridge has been replaced.

Display Menu Summary

Here is a summary of the function menus. Items needed for printer maintenance or troubleshooting are marked with an asterisk (*).

Menu/Menu Item	Function
Paper Input	
Tray Paper Size	Specifies size of paper loaded in the paper tray.
Paper Type	Specifies type of paper loaded in the paper tray.
Aut. Tray Select	Specifies whether to select automatically the tray according to paper size and type (Tray 1 or optional bypass tray).
Tray Priority	Specifies priority paper tray selection (Tray 1 or bypass tray). Default: Tray 1
List/Test Print	
List/Test Print	Prints information that tells you the current configuration of the printer.
Config.Page*	**System Reference**. Lists printer version, attached options, name of print language, amount of ink remaining for each ink cartridge. **Paper Input**. Lists the specified Tray Priority setting and the Paper Input menu settings. **Host Interface**, Interface Information. Lists the settings of the Host Interface menu
Maintenance	
Nozzle Check*	Prints the cross-hatch test pattern so you can visually confirm whether inks are ejecting correctly from the print head.
Head-cleaning*	Cleans the print head. Clean the print head when certain colors are missing or printing faintly. Head cleaning consumes ink.
Head-flushing*	Cleans the print head more thoroughly than "Head-cleaning". Flushing consumes more ink. Use this function only after "Head-cleaning" fails to solve the problem.
Head Position*	Adjusts the alignment of the print head if the Nozzle Check test pattern shows broken vertical lines, or if printed images are blurred.
Adj. Paper Feed*	Adjusts the paper feed setting if the Nozzle Check test pattern shows horizontal misalignment, or if printed images appear uneven.
Registration	Adjusts the print starting point for each paper tray. Use the Nozzle Check test pattern as reference.

Menu/Menu Item	Function
Key Repeat	Enables/disables repetition of a key pushed and held down on the operation panel.
Paper Feed Test*	Feeds and ejects 1 blank sheet of paper to remove moisture inside the machine.
De-condensation*	Feeds and ejects 3 blank sheets of paper to remove moisture inside the machine.
System	
Auto Continue	Determines how the printer handles a print job when the specified paper size and type is not loaded in the tray. **Off**: The job does not print if the specified paper size/type is not loaded in the tray. The job will execute once the specified paper size/type is loaded. **On**: The job prints even if the specified paper size/type is not loaded in the tray.
Sub Paper Size	Determines whether to print on A4 paper if LT size paper is specified in the printer driver, and vice versa. **Default**: Off
Unit of Measure	Determines the units of measure ("mm" or "in.") **Default**: mm
Energy Saver	Switches the energy saving function on/off. When this function is on, the printer will automatically shut down some of its functions automatically after it remains idle for the prescribed amount of time. The "E. Saver Timer" can be set for 5, 15, 30, 35, 60 min. Once the printer enters the energy save mode, it will require some time to recover full operation once it receives a print job.
Notify by Email*	Determines whether a notification is sent to a specified email address when a printer error occurs. Be sure to cycle the printer off/on after doing this setting.
Page Size	Determines the default paper size. (The size selected automatically in the printer driver.) Presents a variety of standard NA/EU paper sizes.
Ink CU Replace*	Sets the ink storage counter after the ink collection unit is replaced.
Host Interface	
I/O Timeout	Determines how long the printer waits for the interface to respond. After the specified time elapses, the printer can receive data from another interface. If the specified time is too short, a timeout might occur while a data transfer is in progress. If this occurs, the print job will be interrupted by a new job from another interface. Default: 15 sec.

Menu/Menu Item	Function	
Network Setup	Use to do the network settings.	
	Setting	**Default**
	DHCP	On
	IP Address	0.0.0.0
	Subnet Mask	0.0.0.0
	Gateway Address	0.0.0.0
	Frame Type (NW)	Auto Select
	Active Protocol	All Active
	Ethernet Speed	Auto Select
	USB Setting	
	USB Speed	Auto
	Port	Off
Language	Determines the language used for all prompts and messages on the operation panel display.	
English	English, German, French, Italian, Dutch, Swedish, Norwegian, Danish, Spanish, Portuguese. Default: English	

Operation Panel Status and Error Messages

Here is a summary of the status and error messages that appear on the display of the printer operation. panel. A status message tells you the current status of the printer, and does indicate a problem. There is no reason to take any action, other than wait while the printer completes its task.

Message	Type	What It Means
Cannot use. High Temp. Power Off On	Error	The printer is overheated. Turn the printer off. Allow it to cool. Turn the printer on again.
Cannot use. Low Temp. Power Off On	Error	Temperature inside the printer is abnormally low. Cycle the printer off/on.

Message	Type	What It Means
Change Setting Tray #	Error	The size of the paper in the selected tray does not match the paper size selected for the print job. Load the tray with the specified size, then on the operation panel change the paper size setting for the tray. Or you can load the other tray with the specified paper size, push [Form Feed], select the other tray, and push [#Enter].
Change Settings Tray #	Error	The type of paper in the selected tray does not match the specified paper type. Load the tray with the paper of the specified type, and then change the paper type setting for the tray. Or you can load the required paper in the other tray, push [Form Feed], select the other tray, and push [#Enter].
Close Duplex Unit Cover	Error	The duplex unit cover is open. Close it.
Close Top Cover or reset Duplex Unit Correctly	Error	The top cover is open, or the duplex unit is not installed and locked in place. Close the top cover, or set the duplex unit correctly.
Dry Waiting...	Status	Ink on a printed OHP transparency is drying. Please wait.
Energy Saver	Status	The printer is in the energy save mode. It will awaken from this mode after a key is pushed on the operation panel when the printer receives a print job.
Guide Board is open Close the Guide Board	Error	Close the guide board.
Hardware Problem Ethernet	Error	An error has occurred in the network interface board.
Ink Collector Full Replace Ink Collector Unit	Error	The ink collection unit is full. Replace the ink collection unit on the back of the printer.
Ink Collector Unit Almost Full	Error	The ink collection unit is almost full. Make sure that an replacement is available.
Ink Depleted	Error	Ink has run out in an ink cartridge. Change the indicated ink cartridge immediately. The printer cannot be used until the cartridge has been replaced.
Load Paper: Tray # or Form Feed	Error	The tray has run out of paper. Reload the tray. Or you can push [Form Feed], select the other tray, and push [#Enter].
Loading Ink...	Status	The ink tanks inside the print head are filling with ink from the ink cartridges. Wait for the operation to finish.

Message	Type	What It Means
Low ink.	Error	One or more of the ink cartridges is running low. Determine which cartridge is low and obtain a replacement. The printer can be used for a short time, but the cartridge should be replaced as soon as possible.
Maintenance in progress...	Status	The printer is busy cleaning or flushing the print head. Please wait.
Offline	Status	Printer is offline. Push [Online] to set the printer for printing.
Power Off/On Call Service if error reoccurs	Error	An error has occurred inside the printer.
Printing...	Status	A print job is printing.
Ready	Status	The printer is ready and able to print.
Remove Misfeed Bypass	Error	Paper has jammed feeding from the bypass tray Remove the jammed paper. **Note**: This is the result of a registration sensor late error or registration sensor lag error.
Remove Misfeed Duplex	Error	Paper has jammed in the duplex unit. Open the duplex unit and remove the jammed paper. **Note**: This is the result of 1) Trailing edge sensor lag error during either simplex or 2) Duplex printing, registration sensor late error during duplex printing.
Remove Misfeed Output	Error	Paper has jammed at the output tray. Remove the jammed paper.
Remove Misfeed Top Cover	Error	Paper has jammed under the top cover. Open the top cover and remove the jammed paper.
Remove Misfeed Tray 1	Error	Paper has jammed feeding from Tray 1 (registration sensor late error). Remove the jammed paper.
Reset Duplex Unit correctly	Error	The duplex unit is not installed correctly. Remove it and install it again.
Reset the cartridge	Error	No ink cartridge is installed, or the ink cartridge is not installed properly.

Message	Type	What It Means
Resetting job...	Status	The printer is re-initializing a print job. Please wait.
Right Front Cover is open Close Right Front Cover	Error	The right front cover is open. Close it.
Setting change...	Status	The printer is changing its settings. Please wait.
Temp. alert Please wait...	Error	The printer is overheated. Wait for the printer to cool. When you see "Ready" on the operation panel, the printer is ready to resume operation.
Waiting...	Status	The printer is busy. Please wait.

Status Monitor Messages

Here is a brief summary of the Status Monitor error messages. For more, please refer to the User Guide.

Important

- **At the time of writing the exact wording of the messages that show on the Status Monitor computer screen has not been decided. Therefore, the exact wording of these messages may change without prior notice.**

If the Status Monitor Does Not Open...

The Status Monitor should open for every print job. If the Status Monitor does not open for the shared printer:

- Check the printer settings in Windows.
- Confirm whether the Web Browser supports Status Monitor. (Internet Explorer Ver. 4.0 or later supports the Status Monitor.)

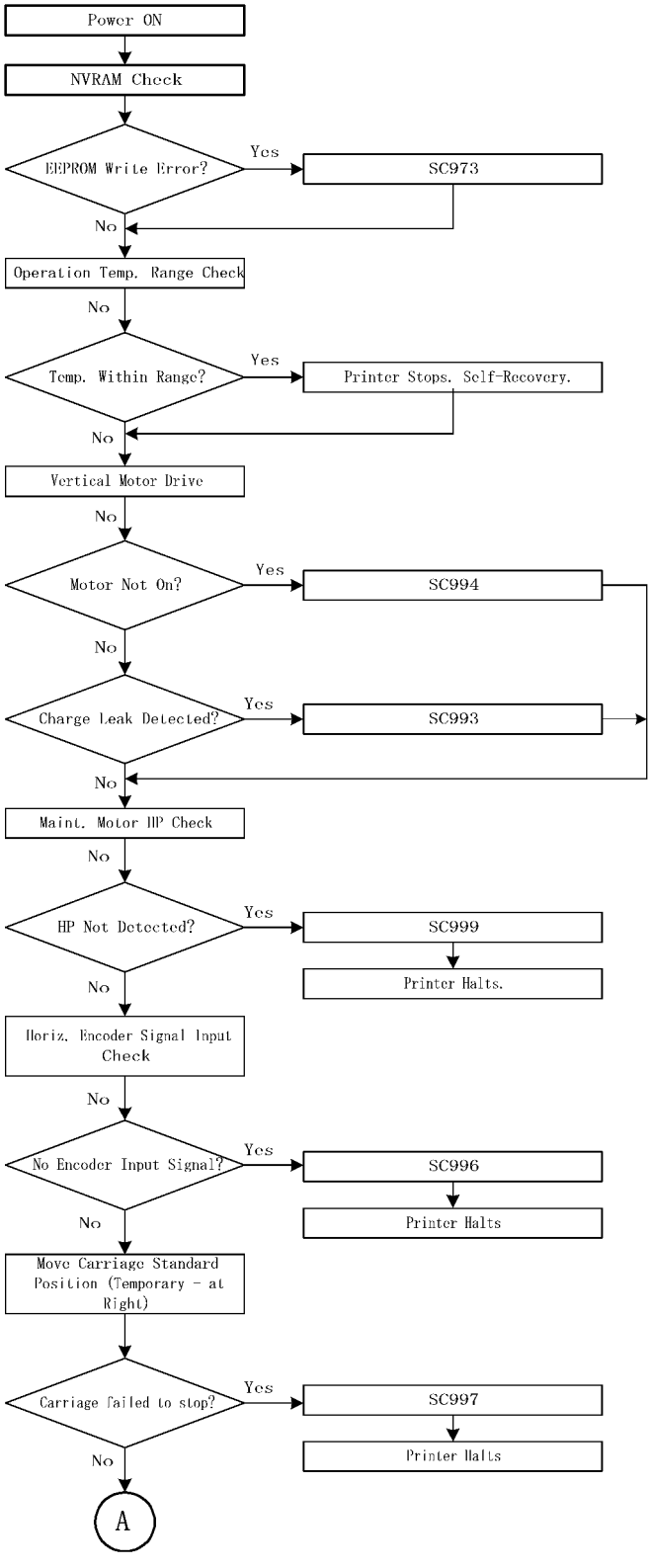
Status Monitor Messages

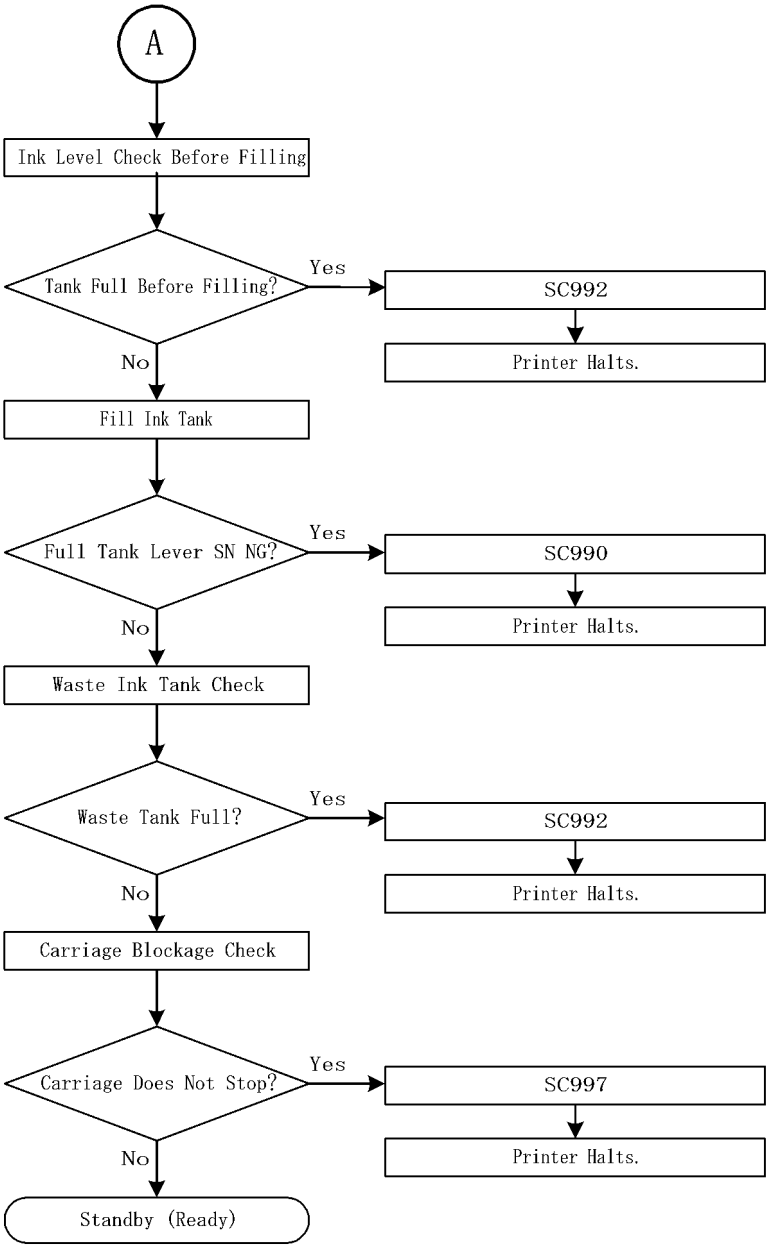
Status Monitor Message	What It Means
Cartridge End	• One or more ink cartridges empty? • Check the operation panel display. You will see "LOW" displayed over the indicator of the cartridge that is almost empty. **Note** • Printing can continue for a short time but the ink cartridge should be replaced as soon as possible.

Status Monitor Message	What It Means
Cartridge/Print head Tank Empty	• One or more ink cartridges empty? • Check the operation panel display. You will see "Ink Depleted" displayed over the indicator of the cartridge that is almost empty. **Note** • The ink cartridge and the ink tank inside the printer head are both empty. The printer cannot be used until the empty cartridge has been replaced.
Cover Open	• Top cover open? • Duplex unit cover open? • Duplex unit installed properly and locked in place? **Note** • If the covers are closed, open and close them
Cover Open/Ink cartridge(s) Not Detected	• Right front cover open? • All ink cartridges installed (x4)? • All ink cartridges installed correctly?
Duplex Unit Not Detected	• Duplex unit attached correctly? • Duplex locks lever down and locked? **Important** • **Even if you do not used duplex printing, the duplex unit must always be attached.**
Ink Collector Unit Almost Full/ Full	The ink collection unit is full and must be replaced.
Ink Collector Unit Not Detected	• Ink collection unit attached correctly?
Network Interface Board Error	• Network interface card installed properly?
No Paper/Tray Not Detected (Bypass Tray)	• Bypass tray empty? • Load bypass tray, press [#Enter]
No Paper/Tray Not Detected (Tray 1)	• Tray 1 empty? • Paper loaded correctly?

Status Monitor Message	What It Means
No Response From Printer	• Printer turned on? • Printer USB connection secure? • "USB" selected on the "Ports" sheet of the printer driver?
Out of Printable Temperature Range	• Printer located where the temperature range is 10 to 32°C (50 to 89.6°F)? • Turn the printer off and allow it to cool. Note • If humidity is higher than 54%, the high end of the temperature range will be lower. The printer will not return to standby mode until it has acclimated to the room temperature. Wait for the Power lamp to stop flashing
Paper Size Mismatch/Paper Type Mismatch (Auto Tray Select)	Tray specified for automatic selection loaded with the paper size, paper type specified for the print job? Can print with [Form Feed]? Push [Form Feed]> Select Size/Type for Bypass> [#Enter]
Paper Size Mismatch/Paper Type Mismatch (Bypass Tray)	• Bypass tray loaded with paper size, paper type specified for the print job? • Can print with [Form Feed]? Push [Form Feed]> Select Size/Type for Bypass> [#Enter]
Paper Size Mismatch/Paper Type Mismatch (Tray 1)	• Tray 1 loaded with paper size, paper type specified for the print job? • Can print with [Form Feed]? Push [Form Feed]> Select Size/Type for Tray 1> [#Enter]
Printer Error	• An error has occurred in the printer. • Cycle the printer off/on. • If the printer has just been moved from a cold location to a warm room, wait at least 1 hour and try again.

Self-Diagnostic Test Flow


Power ON
NVRAM Check
EEPROM Write Error?
Yes
SC973
No
Operation Temp. Range Check
No
Temp. Within Range?
Yes
Printer Stops. Self-Recovery.
No
Vertical Motor Drive
No
Motor Not On?
Yes
SC994
No
Charge Leak Detected?
Yes
SC993
No
Maint. Motor HP Check
No
HP Not Detected?
Yes
SC999
Printer Halts.
No
Horiz. Encoder Signal Input Check
No
No Encoder Input Signal?
Yes
SC996
Printer Halts
No
Move Carriage Standard Position (Temporary - at Right)
Carriage failed to stop?
Yes
SC997
Printer Halts
No
A


A
Ink Level Check Before Filling
Tank Full Before Filling?
Yes
SC992
Printer Halts.
No
Fill Ink Tank
Full Tank Lever SN NG?
Yes
SC990
Printer Halts.
No
Waste Ink Tank Check
Waste Tank Full?
Yes
SC992
Printer Halts.
No
Carriage Blockage Check
Carriage Does Not Stop?
Yes
SC997
Printer Halts.
No
Standby (Ready)

SC Error Codes

Summary of Error Levels

Level	Definition	Typical Errors
A	The printer is damaged or disabled, and the printer cannot operate. Even after removing the cause of the problem, turning the printer off and on does not solve the problem.	SC Error Code. This is a Service Call Error.
B	An abnormal condition exists in the printer, and the printer cannot operate until the problem is corrected. Once the operator removes the cause of the problem, turning the printer off and on should restore the printer to normal operation.	Cover open. Paper jams. Ink cartridge out. Ink cartridge missing. Ink cartridge installed incorrectly. Paper size error.
C	The printer can continue to print, but if the problem is not corrected soon the printer will no longer be able to operate. The operator must correct the problem as soon as possible.	Ink near end. Ink collection tank near full.

Out-of-Range Temperature Errors

	Printer Status at Error	Status After Error
Power ON	Power to the printer turns on, and printer enters and remains in standby mode.	As soon as the temperature of the print heads reaches the operational temperature range, the printer enters the "Ready" mode.
During Printing	Printer halts printing and enters the standby mode.	The printer remains in the "Standby" mode. The operator must switch the printer off and on again to restore normal operation.

Important

Make sure that the room temperature is within the allowed range 10°C to 32°C (50°F to 89.6°F) with Rh 15% to 80%. For more, see Section "1. Installation".

Let 1 hour pass for the printer to adjust to room temperature before you use it after moving to a new location. This is very important after the printer is moved from cold location into a warm room.

SC Code Tables

Note

- Print the Config. Page to see the 5 most recent SC codes that occurred.

950	A	USB Chip ID Read Error	
		A USB chip read error occurred at power on.	• Control board defective.
951	A	No Definition Assigned to USB Chip	
		The USB chip definition is missing.	• The USB chip definition is missing.
970	A	Flash ROM Erase Error J011	
		The device erasing the Flash ROM generated an error.	• Flash ROM device defective.
971	A	Flash ROM Write Error J011	
		The device writing to the Flash ROM generated an error.	• Flash ROM device defective.
972	A	Flash ROM Verify Error J011	
		The verify operation after write failed (the data written to the Flash ROM did not match the content of the data in the Flash ROM).	• Flash ROM device defective.
973	A	EEPROM Write Error	
		An EEPROM write error was detected at power on, or during a print job.	• The EEPROM device is defective.
984	A	DRV Circuit Temperature Abnormal	

		The temperature of the DRV board (driver board) is out of range.	• The temperature of the DRV board (driver board) circuit is not within the specified range: -13°C to 55°C (11.2°F to 131°F)
985	A	Print head Temperature Sensor Abnormal J011	
		Print head temperature sensor was detected as abnormal when the printer was turned on.	• Print head temperature sensor was detected as abnormal when the printer was turned on without the product number registered.
986	A	Humidity Sensor Abnormal	
		The printer detected that the humidity sensor was abnormal.	• Sensor connector loose, damaged, or defective. • Sensor defective
987	A	Protection During Transport	
		At power on the printer detected that the ink in a cartridge is non-standard ink.	• Use only ink cartridges that are designed for use with this printer. • Never use re-filled ink cartridges.
988	A	Air Sensor Abnormal	
		Printer detected air sensor was abnormal when suction was applied 3 times when the printer was powered on for the first time for ink tank filling or print head refreshing, but no air was detected.	• Cycle the printer off and on and try again. • If the problem persists, the print head air sensors may be defective.
990	A	Ink Collection Unit Full Sensor Defective	
		The ink collection tank full sensor (a photo-sensor) on the corner of the ink collection tank is not operating.	• Remove the ink collection tank and inspect the sensor. • Re-insert the tank and try again. • If the problem persists, replace the ink collection tank.

992	A	Ink Collection Tank Full Error	
		At power on, the printer detected that the left ink collection tank was full.	• Replace the ink collection tank with a new tank. • Never attempt to clean the old tank and reinstall it. • Obey the local laws and guidelines regarding disposal of items such as the ink collection tank.
993	A	High Voltage Leak	
		At power on or during a print job, a leak detection signal was detected. The signal was triggered by the accumulation of condensation or ink spillage onto the transport belt.	• This signal is triggered by the HVPS due to an accumulation of condensation or ink spillage onto the transport belt. • Clean the transport belt.
994	A	Vertical Motor Error	
		The vertical encoder input signal was judged to be abnormal when the vertical motor was operating.	• Vertical encoder connector loose, broken, or defective. • SENC defective.
996	A	No Input Signal from the Horizontal Encoder	
		No input signal from the horizontal encoder was detected during operation of the horizontal motor.	• Horizontal encoder sensor loose, broken, or defective. • Horizontal encoder film broken, disconnected, or installed upside down. • HRB defective
997	A	Input Signal from the Horizontal Encoder Abnormal	
		When the carriage moved to the right, the carriage did not stop at the HP. Or, the carriage scan check failed.	• Horizontal encoder sensor loose, broken, or defective.

			• Horizontal encoder film broken, disconnected, or installed upside down. • HRB defective
999	A	Maintenance Stepping Motor Out of Home Position	
		The maintenance motor HP sensor failed to detect the motor at the home position.	• Maintenance HP sensor connector loose, broken, or defective • Maintenance motor connector loose, broken, or defective

General Troubleshooting

Poor Quality Image

Colors not what you expect

Cause 1:	The correct paper was not used for the print job, or the paper was not loaded correctly.
Solution 1:	Check the selection for the type of paper in the printer driver (transparency, ink jet, plain paper, etc.). Confirm that the same type of paper is loaded correctly in the printer.
Cause 2:	The print mode selection was not correct.
Solution 2:	Make sure that the print mode selection in the printer software application and the printer driver is correct (Paper Type, Print Quality, Level Color, etc.)
Cause 3:	Job settings in the software application are not correct.
Solution 3:	Check the settings for the print job in the software application. The settings in the software application have priority over the printer driver settings.
Cause 4:	One or more print heads are blocked.
Solution 4:	Do "Head-Cleaning" 3 times. If head-cleaning does not solve the problem, do "Head-Flushing".
Cause 5:	The ink cartridges are old.
Solution 5:	Ink cartridges should be opened before their expiration date and used within 6 months of being opened.
Cause 6:	Printing on the wrong side of the paper.
Solution 6:	Normal PPC or plain paper can be printed on either side. Special paper, such as ink jet paper however, is restricted to printing on only one side. If the wrong side is printed on, the quality may be lower and this may also cause the printer interior to become dirty.

Colors faint

Cause 1:	The correct paper was not used for the print job.
Solution 1:	Check the selection for the type of paper in the printer driver (transparency, ink jet, plain paper, etc.). Confirm that the same type of paper is loaded in the printer.

Cause 2:	Envelope selector is set to the rear position.
Solution 2:	Set the selector to the rear for envelopes. Set the select to the front for all other types of paper, transparencies, etc.
Cause 3:	The print mode selection was not correct.
Solution 3:	Make sure that the print mode selection in the printer software application and the printer driver is correct (Paper Type, Print Quality, Level Color, etc.) Make sure that the color/ black-and-white selection is correct.
Cause 4	One or more print heads are blocked.
Solution 4	Do "Head-Cleaning" 3 times. If head-cleaning does not solve the problem, do "Head-Flushing".

Prints blotted, dirty

Cause 1:	Paper is either too thick or too thin.
Solution 1:	Check the "Specifications" at the end of the User Guide. If paper is too thick, the print head will scratch the surface. If too thin, the ink will leak through it.
Cause 2:	Fingerprints on the print surface.
Solution 2:	Never touch the print side of paper either before or after printing. Some print media, such as transparencies or glossy paper, require longer to dry so handle them carefully after printing. Remove the sheets one at a time from the output tray.
Cause 3:	A re-filled ink cartridge was used.
Solution 3:	Never use any ink cartridge other than one designed for used with this printer. Never use re-filled ink cartridges.
Cause 4	Duplex printing with heavy coverage.
Solution 4	Avoid duplex printing if one side of the paper has a high-density image, or an image with a large areas of fill.

Color print job prints in monochrome

Cause 1:	Monochrome was selected for the print job.
Solution 1:	Make sure that the printer driver is set up for color printing.

Cause 2:	Correct data not selected for the print job.
Solution 2:	Confirm that the software application printed the correct data.

White patches, or horizontal white lines

Cause 1:	Original image abnormal.
Solution 1:	In the software application, check the original image for streaking (especially at borders between different colors). Correct the original image.
Cause 2:	One or more print heads are blocked.
Solution 2:	Do "Head-Cleaning" 3 times. If head-cleaning does not solve the problem, do "Head-Flushing".

Vertical white lines

Cause:	Solid or intermittent white lines from the top to the bottom of the sheet caused by a blocked ink nozzle.
Solution:	Do "Head-Cleaning" 3 times. If head-cleaning does not solve the problem, do "Head-Flushing".

Image chaffed in horizontal direction

Cause:	Solid or intermittent white lines from edge to edge of the sheet caused by a blocked ink nozzle. This is a common problem if the printer has not been used for a long period.
Solution:	Do "Head-Cleaning" 3 times. If head-cleaning does not solve the problem, do "Head-Flushing".

Only 1 line printed at leading edge

Cause 1:	Paper with punched holes, or thin or slick paper with too much “play” was used that allowed slippage during feed.
Solution 1:	Check the paper used for the print job and make sure that it meets standards for use with this printer. For more see the Operating Instructions or the last section “Specifications” of the User Guide.

Cause 2:	Paper is jammed or slipping on the transport belt due to the accumulation of paper dust, etc. on the belt.
Solution 2:	Clean accumulated paper dust, etc. from the transport belt. The service technician must clean the transport belt.

Unwanted dots

Cause:	Flakes of paper dust or dry ink have fallen onto the printed sheet.
Solution:	Do "Head-Cleaning" 3 times. If head-cleaning does not solve the problem, do "Head-Flushing".

Skewed image

Cause 1:	Paper skewed immediately after loading, before paper out (last sheet), or after removing a paper jam.
Solution 1:	Remove the paper from the paper tray. Fan it to remove static cling. Tap the edge of the stack on a flat surface to align the edges, and load it again. Before loading the paper again: • Make sure that the paper is approved for use with this printer. For more, see the last section of the User Guide ("Specifications"). • Make sure the paper is free of curl, creasing, etc. or any other deformity. • Make sure the side and end fences of the paper cassette are set at the correct positions. • Make sure that the top of the stack does not exceed the load limit mark on the side of the cassette.
Cause 2:	The guide plate was not set correctly (half locked) after cleaning by the service technician.
Solution 2:	Service technician should make sure that the guide plate is set correctly.

Text dirty

Cause 1:	Print job was not set up correctly for special print media.

Solution 1:	Special procedures are necessary to set up print jobs for special print media such as postcards, envelopes, and transparencies. Review and carefully follow the instructions in the operating instructions..
Cause 2:	The sheets are not flat or are deformed in some way.
Solution 2:	Make sure the sheets are perfectly flat (especially envelopes, postcards). Make sure the sheets are neither curled nor deformed in any way. If using thick or any type of coated paper, make sure that the paper is approved for use with this printer.
Cause 3:	Print head nozzles are blocked.
Solution 3:	Do "Head-Cleaning" 3 times. If head-cleaning does not solve the problem, do "Head-Flushing".

Backs of sheets stained with ink

Cause:	Paper has jammed in the printer or the transport belt is dirty.
Solution:	Run a print job with several blank sheets of paper to clean up the ink. Use a damp cloth to clean the surface of the transport belt, and then use a clean, dry cloth to clean the surface of the belt.

Transparency sheets scratched

Cause:	More than 1 sheet of transparency was set.
Solution:	Set transparencies one-by-one and print one sheet at time.

Miscellaneous

Cause 1:	The paper in use is not the correct paper for the print job.
Solution 1:	Check the paper loaded for feeding. Make sure that it matches the type of paper specified for the print job (transparency, ink jet, plain paper, etc.). Make sure that the paper is approved for use with this printer. For more, see the “Specifications” in the last section of the User Guide.
Cause 2:	The print mode selection was not correct.
Solution 2:	Make sure that the print mode selection in the printer software application and the printer driver is correct. Make sure that the color/monochrome selection is correct.

Cause 3:	Job settings in the software application are not correct.
Solution 3:	Check the settings for the print job in the software application. The settings in the software application have priority over the printer driver settings.
Cause 4:	Correct data not selected for the print job.
Solution 4:	Confirm that the software application printed the correct data.
Cause 5:	One or more of the nozzles is blocked.
Solution 5:	Do "Head-Cleaning" 3 times. If head-cleaning does not solve the problem, do "Head-Flushing".

Paper Misfeed

Paper Does Not Feed.

Cause:	Printer is receiving a data or is doing some other task.
Solution:	If the Data-In indicator is lit or flashing, just wait. The printer is receiving data and cannot start printing yet. Check the operation panel display for status messages or error messages. Push [Job Reset] to cancel the job and solve the problem.

Paper skew

Cause 1:	Paper skewed immediately after loading, before paper out (last sheet), or after removing a paper jam.
Solution 1:	Remove the paper from the paper tray. Fan it to remove static cling. Tap the edge of the stack on a flat surface to align the edges, and load it again. Before loading the paper again: • Make sure the paper is approved for use with this printer. For more, see the last section of the User Guide “Specifications”. • Make sure the paper is free of curl, creasing, etc. or any other deformity. • Make sure the side and end fences of the paper cassette are set at the correct positions.

	• Make sure that the top of the stack does not exceed the load limit mark on the side of the cassette.
Cause: 2	The guide plate was not set correctly after cleaning by the service technician.
Solution 2:	Paper skew occurred immediately after loading, before paper out (last sheet), or after removing a paper jam.
Cause 3:	The correct paper was not used for the print job, or the paper was not loaded correctly.
Solution 3:	Check the selection for the type of paper in the printer driver (transparency, ink jet, plain paper, etc.). Confirm that the same type of paper is loaded correctly in the printer.

Double-feeding.

Cause 1:	Paper skewed immediately after loading or at paper out (last sheet).
Solution 1:	Remove the paper from the paper tray. Fan it to remove static cling. Tap the edge of the stack on a flat surface to align the edges, and load it again. Before loading the paper again: • Make sure the paper is approved for use with this printer. For more, see the last section ("Specifications") of the User Guide. • Make sure the paper is free of curl, creasing, etc. or any other deformity. • Make sure the side and end fences of the paper cassette are set at the correct positions. • Make sure that the top of the stack does not exceed the load limit mark on the side of the cassette.
Cause 2:	The correct paper was not used for the print job, or the paper was not loaded correctly.
Solution 2:	Check the selection for the type of paper in the printer driver (transparency, ink jet, plain paper, etc.). Confirm that the same type of paper is loaded correctly in the printer.

Failure to feed correctly

Cause 1:	Paper skewed immediately after loading, before paper out (last sheet), or after removing a paper jam.
Solution 1:	Remove the paper from the paper tray. Fan it to remove static cling. Tap the edge of the stack on a flat surface to align the edges, and load it again. Before loading the paper again:

	• Make sure the paper is approved for use with this printer. For more, see the last section ("Specifications") of the User Guide. • Make sure the paper is free of curl, creasing, etc. or any other deformity. • Make sure the side and end fences of the paper cassette are set at the correct positions. • Make sure that the top of the stack does not exceed the load limit mark on the side of the cassette.
Cause: 2	The paper cassette is making a strange noise because it is not installed completely.
Solution 2:	Pull the paper cassette out. Make sure the paper is loaded correctly. Confirm that there is no paper inside the printer. Insert the paper cassette completely.
Cause 3:	The correct paper was not used for the print job, or the paper was not loaded correctly.
Solution 3:	Check the selection for the type of paper in the printer driver (transparency, ink jet, plain paper, etc.). Confirm that the same type of paper is loaded correctly in the printer.

Paper jam – Type 1

Cause 1:	Paper skewed immediately after loading, before paper out (last sheet), or after removing a paper jam.
Solution 1:	Remove the paper from the paper tray. Fan it to remove static cling. Tap the edge of the stack on a flat surface to align the edges, and load it again. Before loading the paper again: • Make sure the paper is approved for use with this printer. For more, see the last section ("Specifications") of the User Guide. • Make sure the paper is free of curl, creasing, etc. or any other deformity. • Make sure the side and end fences of the paper cassette are set at the correct positions. • Make sure that the top of the stack does not exceed the load limit mark on the side of the cassette.
Cause 2:	The guide plate was not set correctly after cleaning by the service technician.
Solution 2:	Service technician should make sure that the guide plate is set correctly.
Cause 3:	The Duplex Unit is not installed correctly.
Solution 3:	Remove the Duplex Unit and reinstall it correctly. The locks on both sides of the duplex unit should be down and locked. The duplex unit must always be installed, even for one-

	sided printing. For more, see the Quick Start Guide or Section "1. Installation" of this service manual.
Cause 4:	The paper in use is not the correct paper for the print job.
Solution 4:	Check the paper loaded for feeding. Make sure that it matches the type of paper specified for the print job (transparency, ink jet, plain paper, etc.). Make sure that the paper is approved for use with this printer. For more, see the "Specifications" in the last section of the User Guide.
Cause 5:	The sheets are not flat or are deformed in some way.
Solution 5:	Make sure the sheets are perfectly flat (especially envelopes, postcards). Make sure the sheets are neither curled nor deformed in any way. If using thick or any type of coated paper, make sure that the paper is approved for use with this printer.

Paper jam – Type 2

Cause 1:	Paper failed to feed from Tray 1
Solution 1:	Remove the paper cassette. Check inside the printer to make sure that no paper remains in the printer. If the paper has torn, make sure no scraps remain. Remove the paper from the tray. Fan it to remove static cling. Tap the edge of the stack on a flat surface to align the edges, and load it again.
Cause 2:	Carriage has stopped on the left side.
Solution 2:	Make sure no paper remains in the paper path. The service technician must clean the transport belt.

Poor output stacking, sheets fall from output tray.

Cause:	The correct paper was not used for the print job, or the paper was not loaded correctly.
Solution:	Check the selection for the type of paper in the printer driver (transparency, ink jet, plain paper, etc.). Confirm that the same type of paper is loaded correctly in the printer.

Poor Printer Performance (Miscellaneous)

Cannot set paper cassette.

Cause:	The cassette is damaged or there is a jammed sheet of paper inside the printer.
Solution:	Remove the paper cassette. Remove the jammed sheet from inside the printer. Inspect the paper cassette for damage. If the cassette is damaged, replace the paper cassette.

Cannot remove paper cassette.

Cause:	The paper cassette is blocked.
Solution:	Raise the paper output tray and reset it. Attempt to remove the paper cassette again. Replace the paper cassette.

Printer does not turn on.

Cause:	The power cord is not connected to the power source.
Solution:	Follow the instructions on the screen if an error message appears in the Status Monitor, or do the following: • Make sure the power cord is securely connected to the printer and to the power source. • Make sure the operator knows how to switch on the printer correctly. For more, refer to the Quick Start Guide or User Manual. • Switch the printer off. Disconnect the power cord from the power source. Wait 2 minutes then connect the power cord and switch the printer on.

Printing stops before print job finishes.

Cause 1:	The print heads have overheated.
Solution 2:	The printer has stopped to allow the print heads to cool. After the print heads have cooled down to the standard operating temperature, the print job will resume.
Cause 2:	A fatal error has occurred on the computer side.

Solution 2:	Check the screen for messages. Shut down the computer. Switch off the printer. Check the USB connection at the printer and the computer. Switch the printer on. Restart the computer.

Printer loses power.

Cause:	Power loss at the source.
Solution:	Power to the printer has been interrupted, due to a power failure or some other external cause. Unplug the printer from the power source. Wait 2 minutes. Reconnect the power plug and switch the printer on.
Cause:	The printer has blown a fuse.
Solution:	The printer must be returned to the service center for replacement of the F300 board.

Firmware update failed.

Cause:	Incorrect procedure.
Solution:	Update the firmware. (xref)

Unusual Noises

Printer emits strange noises at power on

Cause 1:	Paper scraps remain inside the printer.
Solution 1:	Open the top cover, rear cover (or Duplex Unit) cover and inspect inside the printer and Duplex Unit for paper scraps left behind after clearing a paper jam.
Cause 2:	Special print media may make a noise on feeding the last sheet.
Solution 2:	Load one blank sheet of plain paper at the bottom of a stack of special media (coated paper, etc.) This problem may occur with a new paper cassette.

Image Correction

You can see the image adjustment features on the “Maintenance” menu of the printer operation panel.

Note

- The test prints and adjustments described in this section can also be done with the printer driver.
- For more details about doing these test prints and adjustments with the printer driver, please refer to the printer User Guide.

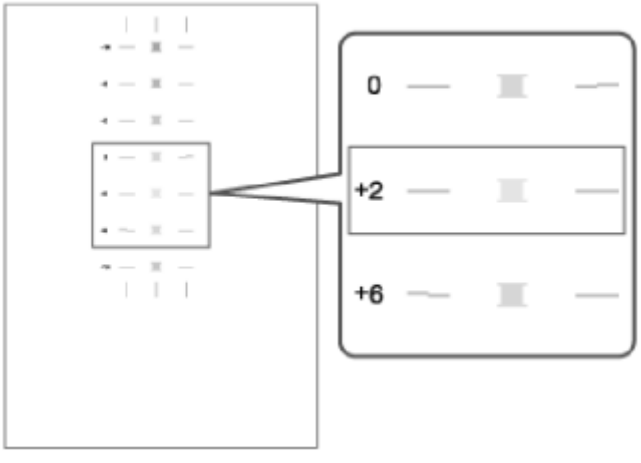
Preparing for Test Printing

1. **Make sure A4 size or LTR size paper is loaded in the printer.**
2. **Make sure the printer is ready to print.**

Adjust Paper Feed

Print the ‘Adjust Paper Feed Test Pattern’ and do this adjustment if you see broken horizontal lines or uneven colors in the printouts:

1. **Push [Menu], select "Maintenance", then push [#Enter].**
2. **Select "Adj. Paper Feed" and push [#Enter].**
3. **Select "Pr. Test Print" and push [#Enter]. The test pattern prints.**



4. **Examine the test print. Note the number of the best pattern. The best pattern is the pattern where the horizontal lines should be perfectly flat.**
5. **Select "Adjustment" and push [#Enter].**

6. **Enter the number of the pattern you selected in Step 4 and push [#Enter]. This completes the adjustment.**
7. **Push [Online] to leave the menu mode.**

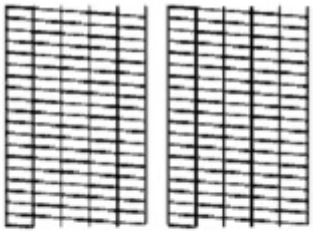
Nozzle Blockage Check

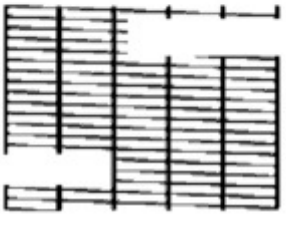
One or more of the nozzles is blocked if you see:

- Broken lines
- Uneven patches of white in the printouts.

Do the following procedure to correct these problems.

1. **Push [Menu], select "Maintenance", and push [#Enter].**
2. **Select "Nozzle Check" and press [#Enter]. The Nozzle Check pattern prints.**
3. **Examine the Nozzle Check pattern for broken lines or white patches. The first sample below is normal, the second sample shows white patches.**





4. **Note which colors are not printing normally.**
5. **Do the print head cleaning procedure for the print head that is blocked.**

Important

- Do “Head-Cleaning” up to 3 times to correct the problem. Do “Head-Flushing” if three "Head-Cleaning" executions does not solve the problem..
- "Head-Flushing" uses a large amount of ink. Do not do the “Head-Flushing” until you have done the “Head-Cleaning” at least 3 times.
- The procedure for "Head-Cleaning" and "Head-Flushing" is described in the next section.

Print head Cleaning and Flushing

1. **Make sure the envelope selector is forward.**
2. **Push [Menu] select "Maintenance" and push [#Enter].**
3. **Select "Head-cleaning" or "Head-flushing" and push [#Enter].**
4. **Select the color or the print that is blocked or select "All Heads" to clean all the print heads and push> [#Enter].**
5. **Wait for cleaning or flushing to finish. This may require a few minutes to complete.**
6. **Push [Online] to leave the menu mode.**
7. **Print another Nozzle Check pattern (see previous section) to determine if the problem has been solved.**
8. **Repeat Steps 2 to 7 for "Head-Cleaning" two more times.**
9. **If three "Head-Cleanings" does not solve the problem, do "Head-Flushing".**
10. **If "Head-Flushing" does not solve the problem, the print heads must be replaced.**

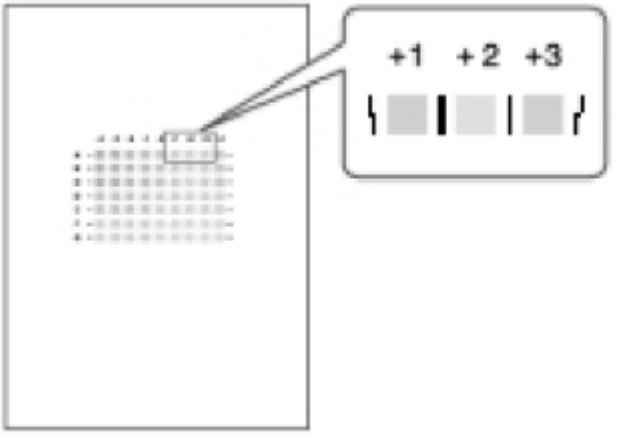
Adjust Print head Position

The print head is out of position if you see these:

- Broken vertical lines
- Smeared or streaked colors

Do the following procedure to correct these problems.

1. **Push [Menu], select "Maintenance" and push [#Enter].**
2. **select "Head Position" and push [#Enter].**
3. **Select "Pr. Test Pattern" and push [#Enter].**
4. **Select the test pattern for print head position adjustment and push [#Enter]. The test pattern prints.**

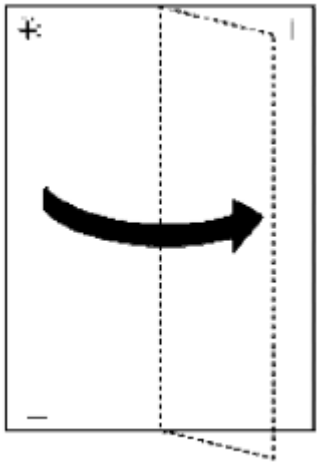


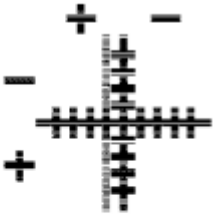
5. **Select the best pattern.**
   - The best pattern is the gray square with straight vertical lines on both sides.
   - The pattern setting is read as a matrix value from the pattern. For example, if the best pattern is in column "+2", line "A", the entry for adjustment will be "A" then "+2"
6. **Select "Adjustment" and push [#Enter].**
7. **Select same setting selected for "Pr. Test Pattern" (High Speed, etc.) and push [#Enter].**
8. **Select the letter of the line of the best pattern noted in Step 5 and push [#Enter].**
9. **Select the number of the line of the best pattern noted in Step and push [#Enter]. This completes the adjustment.**
10. **Push [Online] to leave the Menu mode.**

Registration

Do this procedure to adjust the print start position. The print start position is the point at the upper left corner of each sheet where printing begins.

1. **Push [Menu] select "Maintenance", and push [#Enter].**
2. **Select "Registration" and push [#Enter].**
3. **Select "Pr. Test Sheet" and push [#Enter].**
4. **Select the paper tray ("Tray 1 for example) and push [#Enter].**
5. **Select the paper type and push [#Enter]. The test pattern for Registration prints.**





6. **Fold the printed sheet in half lengthwise as shown above.**
7. **Determine the 1st adjustment for the Read Direction.**
   - After folding the test print in half parallel to its long edge as shown above, the adjustment value in the **Read Direction** is the difference between the single vertical line and cross vertical line that you can see when the folded sheet is held up to the light.
   - If the difference is one calibration mark, for example, the adjustment is +1.0.
8. **Fold the sheet in half widthwise.**
9. **Determine the 2nd adjustment for the Feed Direction.**
   - The value read after folding the sheet widthwise, is the adjustment value for the Feed Direction.
10. **Select "Adjustment" and push [#Enter].**
11. **Select the paper tray and push [#Enter].**
12. **Select the paper type and push [#Enter].**
13. **Enter the adjustment for the Read Direction determined in Step 7 and push [#Enter].**
14. **Enter the adjustment for the Feed Direction determined in Step 9 and push [#Enter]**
15. **Push [Online] to leave the Menu mode.**

Drive Cleaning

Follow the procedure below to do drive cleaning. Here are some important points you should know about drive cleaning.

- Drive cleaning should be done only after head cleaning and head flushing fail to clean the print heads successfully.

- Drive cleaning is done by changing a bit switch setting in the SP mode and should always be done by the service technician.
- Drive cleaning forces the piezo element to switch off and on repeatedly to force ink out of the nozzle ports. (The piezo element does not operate during head cleaning or head flushing done with the operator panel or the printer driver.)
- Drive cleaning consumes more ink than either head cleaning or head flushing and requires more time to complete.
- Only one print head at a time can be cleaned with this procedure.

1. **Push and hold down ▼ and ▲ for 3 sec. then push [#Execute] to enter the SP mode.**
2. **Push [#Enter].**
3. **Select "Engine Mainte."**
4. **When you see "SP No. 1000", select "5301" then push [#Enter].**
5. **When you see "ENGINE SW" push [#Enter].**
6. **Select "1" for Bit 1. This enables drive cleaning control.**
   - Reading from left to right, the digits represents Bit 7 to 0.
   - "1" switches a bit ON and "0" sets a bit OFF.
   - The second line of the display contains the cursor. This tells you which bit is currently active for selection.

   ```
   ENG SW #1 00001000
   bit0 _
   ```

   Note
   - Push [Escape] at any time if you want to return to the previous level.
7. **Push ▼ or ▲ to position the cursor under Bit 1 (2nd digit from the right).**

   ```
   ENG SW #1 00001000
   bit0 _
   ```
8. **Push ▼ or ▲ to display "1".**

   ```
   ENG SW #1 00001000
   bit1 1
   ```
9. **Push [#Enter] to set "1" for Bit SW 1.**
10. **After setting Bit 1 to "1", push [Escape] until the display returns to "ENGINE MAINTE."**
11. **At "3. END" press [#Enter] to leave the SP mode.**
12. **Push [Menu] then select "Maintenance"> "3. Head-Flushing".**

13. **Select the one print head (or all) for drive cleaning and push [#Enter].**
    - The print head is flushed. In addition to flushing, drive cleaning is also performed with the piezo element switching on and off..
    - Once drive cleaning is completed for the selected print head, Bit 1 resets to "0" automatically.
    - If you need to do this procedure again for another print head, you must repeat this procedure and set Bit 1 to "1" again in the SP mode.

Note

- Drive cleaning cannot be performed if the ink tank of the selected print head is almost empty.

Cleaning the Print heads Before Long Term Storage

Do this procedure to clean the print heads before storing the printer for one month or longer.

Important

- **This procedure should be done at the Repair Center before storing a printer until it can be reused. This procedure is not intended for use at the job site for the customer.**

1. **Turn the printer on.**
2. **When the printer enters standby mode, enter the SP mode.**

   Note

   - To enter the SP mode press ▼ or ▲ together for at least 3 sec. then push [#Enter].
3. **Select "2. ENGINE MAINTE.".**
4. **Select "5007" and push [#Enter].**
5. **When you see "WASHING" push [#Execute].**
6. **Open the ink cartridge cover, remove the ink cartridges, replace them with the cleaning cartridges, and close the ink cartridge cover.**
7. **Confirm that "WASHING" and "EXEC" are still displayed, then push [#Enter].**
8. **When you see "OK?" push [#Enter].**
   - "RUNNING" displays while the cleaning sequence executes.
   - When cleaning is finished, the display returns to "WASHING" and "EXEC"

   Note

   - If the "Alert" lamp lights red, this indicates that an error has occurred. At this step you cannot see the error displayed on the printer operation panel.
   - Complete the procedure to return to standby mode, read the number of the error displayed to determine the cause of the error.
9. **Press [Escape] to return to the "2. ENGINE MAINTE." display.**

10. Select "3. END" and push [#Enter] to return to standby.
11. Switch the printer off.
12. Remove the cleaning cartridges and store the printer.

Important

- The initial ink fill counter resets at the end of washing. The next time the ink cartridges are installed and the printer is switched on, the initial filling sequence will begin.
- Do not install the ink cartridges and turn the printer on again after washing until you are ready to use or service the printer again.

Transport Belt Charge Adjustments

You can use "Engine Mainte." on the Service Mode menu to adjust the charge pitch for different areas on the Transport Belt. These charge pitch settings seldom require adjustments in a normal operating environment unless the following conditions occur:

- When the temperature and humidity are low, the print head nozzles frequently become blocked.
- The print head nozzles frequently become blocked when printing on special paper.

The diagram below shows the relationship between charge pitch and the areas where charge is applied to the transfer below the paper.

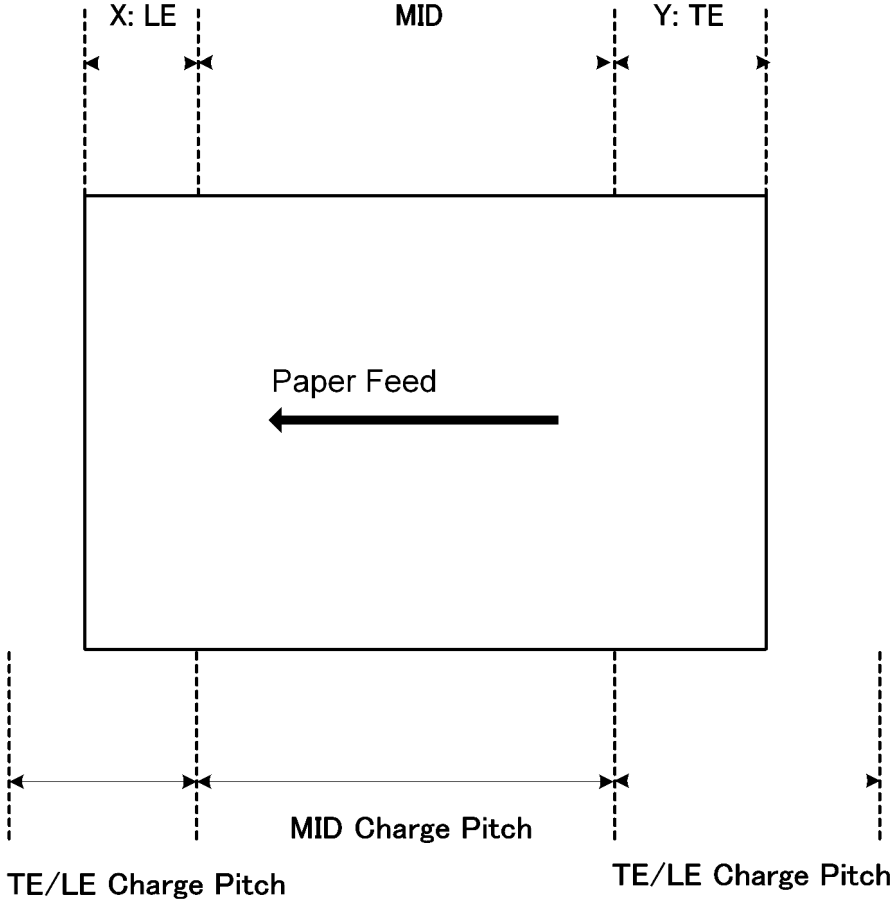


Fig. 1 Charge Areas and Pitch

Here is a summary of important terms and abbreviations..

Term	What It Means
LE Charge Area	**Leading Edge Charge Area**. This is the length of the area where charge is applied to the Transport Belt below the leading edge of the paper above.
TE Charge Area	**Trailing Edge Charge Area**. This is the length of the area where charge is applied to the Transport Belt below the trailing edge of the paper above.
MID Charge Area	**Middle Charge Area**. This is the length of the area were charge is applied to the Transport Belt below the middle of the paper above between the leading edge and trailing edge area.
LE/TE Charge Pitch	The pitch of the charge (cycles) applied to both the leading edge area and the trailing edge area.
MID Charge Pitch	The pitch of the charge (cycles) applied to the middle area between the leading edge and the trailing edge.

The Charge Area

The size of the charge area varies with what paper or special print medium is fed on the transport belt.

The factory settings for the length of the areas where charge is applied at the leading and trailing edges are shown below.

Table 2-1 Factory Settings for Charge Areas

Paper Type		LE Area	TE Area
OHP		35 mm	20 mm
Not OHP	Side 1	10 mm	20 mm
	Side 2	35 mm	20 mm

Note

- "Side 1" denotes the side of the paper that prints during simplex or 1st side of duplex printing.
- "Side 2" denotes the side of the 2nd side of the paper that prints during duplex printing.
- "Not OHP" denotes specifically normal PPC, High-Gloss Paper, Glossy Paper, Postcards, Envelopes, and OHP.

The settings for each charge area can be adjusted with **SP1232** to **SP1237** on the "2. Engine Mainte." menu in the Service Mode. The settings are stored in NVRAM on the main control board after they adjusted and remain in effect after the machine is cycled off/on.

Charge Area Service Mode Menus

Units: mm, Factory Default Settings: All "0

SP No.	Menu Title	Meaning
1201	CHG:AREA1:OHP	Set Charge Area 1 for LE/TE OHP
1202	CHG:AREA1:F	Set Charge of Area 1 for LE/TE Duplex Any Other Than OHP
1203	CHG:AREA1:B	Set Charge of Area 2 for LE/TE Duplex Any Other Than OHP
1204	CHG:AREA2:OHP	Set Charge Area 1 for TE OHP
1205	CHG:AREA2:F	Set Charge of Area 2 for TE Duplex Any Other Than OHP
1206	CHG:AREA2:B	Set Charge of Area 2 for TE Duplex Any Other Than OHP

During paper transport if the leading edge of the paper separates from the transport belt this will cause a paper jam, or if the trailing edge separates from the belt the paper will touch the print heads causing ink to smear on the printout. The area settings in the table above can be adjusted to solve these problems. The values for the settings are absolute values measured in mm units.

Example: Setting the Charge Area of the Leading Edge to 40 mm for Transparency Sheets

Open **SP1201** in the Engine Maintenance mode and set it to "40".

Charge Pitch

Charge pitch changes with the following conditions:

- Temperature
- Humidity
- Print mode selected with the printer driver

Paper Type

The printer uses three lookup tables to select the value of the charge pitch automatically. These tables include:

1. **Print Mode Table**: Used to assign "Mj" based on the type of paper selected in the printer driver (this assignment is used to select the reference Temperature/Humidity Table).
2. **Temperature/Humidity Table**: Used to look up the Charge ID.
3. **Charge Pitch Table:** Used to look up and retrieve the charge pitch for the Charge ID and side to be printed.

Print Mode Table

The Print Mode Table is referenced to look up "Mj" (the print drive wave form) for the paper type and print quality items selected in the printer driver. The value of Mj retrieved from the Print Mode Table is used to select the Temperature/Humidity table. The Print Mode Table holds the following values (1 to 4) based on paper type and print mode.

Table 3. Print Mode Defaults

Paper	Image Quality	Mjn (Print Drive Wave)	Comments
Normal PPC	High Speed (Draft)	1	
	Std. (Speed Priority)	2	Default
	Std. (Quality Priority)	2	
	High Quality	2	Duplex Mode
Envelopes, Thick Paper, Official Postcards	High Speed (Draft)	1	
	Std. (Speed Priority)	2	Default
	Std. (Quality Priority)	2	
	High Quality	2	Duplex Mode
Official Postcards (Address Side)	High Speed (Draft)	1	
	Std. (Speed Priority)	2	Default
	Std. (Quality Priority)	2	
	High Quality	2	Duplex Mode
High-Gloss Paper	High Speed (Draft)	2	Duplex Mode
	Std. (Speed Priority)	2	Default
	Std. (Quality Priority)	2	
IJ Postcards (Coated Side)	High Speed (Draft)	2	Duplex Mode
	Std. (Speed Priority)	2	Default
	Std. (Quality Priority)	2	

Paper	Image Quality	Mjn (Print Drive Wave)	Comments
IJ Postcards (Address Side)	High Speed (Draft)	2	Duplex Mode
	Std. (Speed Priority)	2	Default
	Std. (Quality Priority)	2	
Glossy Paper	Std. (Speed Priority)	2	Default
	Std. (Quality Priority)	4	
Transparencies (OHP)	Std. (Quality Priority)	2	Default

Temperature/Humidity Table

There is a Temperature/Mode Table for every value of Mj (Mj1 to Mj4) that is retrieved from the Print Mode Table. The system takes Mj from the Print Mode Table and the readings of the temperature/humidity sensor and then selects for reference the appropriate Temperature/Humidity Table, matrix of values defined by stepped ranges temperature and humidity---15 columns for temperature and 8 rows for humidity. The tables below are the Temperature/Humidity Tables stored in NVRAM before the printer is shipped from the factory.

J011

Print Drive Wave Form: Mj1

Charge Pitch ID		Temperature [°C]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1200
	10–25	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1201
	25–35	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1202
	35–45	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1203
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1204
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1205
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1206
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1207

Table 3-1 Mj1 Temperature/Humidity Table (t912)

Print Drive Wave Form: Mj2

Charge Pitch ID		Temperature[℃]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1208
	10–25	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1209
	25–35	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1210
	35–45	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1211
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1212
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1213
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1214
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1215

Table 3-2 Mj2 Temperature/Humidity Table (T913)

Print Drive Wave Form: Mj3 *

Charge Pitch ID		Temperature [℃]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1216
	10–25	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1217
	25–35	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1218
	35–45	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1219
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1220
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1221
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1222
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1223

Table 3-3 Mj3 Temperature/Humidity Table **T914

Note

- At present there is no print mode that accesses Print Wave Form Mj3

Print Wave Form: Mj4

Charge Pitch ID		Temperature [℃]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1224
	10–25	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1225
	25–35	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1226
	35–45	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1227
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1228
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1229
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1230
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1231

Table 3-4 Mj4 Temperature/Humidity Table **T915

J007/J010

Print Drive Wave Form: Mj1

Charge Pitch ID		Temperature [°C]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1200
	10–25	3	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1201
	25–35	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1202
	35–45	3	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1203
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1204
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1205
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1206
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1207

Table 3-5 Mj1 Temperature/Humidity Table **T916

Print Drive Wave Form: Mj2

Charge Pitch ID		Temperature [°C]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1208
	10–25	3	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1209
	25–35	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1210
	35–45	3	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1211
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1212
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1213
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1214
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1215

Table 3-6 Mj2 Temperature/Humidity Table **T917

Print Drive Wave Form: Mj3 *

Charge Pitch ID		Temperature [°C]															SP No.
		>2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1216
	10–25	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	1217
	25–35	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1	1218
	35–45	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1219
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1220
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1221
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1222
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1223

Table 3-5 Mj3 Temperature/Humidity Table **T918

Note

- At present there is no print mode that accesses Print Wave Form Mj3.

Print Wave Form: Mj4

Charge Pitch ID		Humidity [°C]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	35	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1224
	10–25	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	1225
	25–35	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1	1226
	35–45	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1227
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1228
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1229
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1230
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1231

Table 3-6 Mj4 Temperature/Humidity Table **T919

The functions to adjust each table are in **SP1200** to **SP1231** (Engine Maintenance Mode). The settings are stored in NVRAM on the main control board after they adjusted and remain in effect after the machine is cycled off/on.

4

Table 3-9 Mj1 Temperature/Humidity Table

Factory Default Settings: All "0"

SP No.	Menu Title	Meaning	SP No.
1200	CHG:PITCH:A1	Charge ID Table: Less than 10% Humidity (Mj1)	1200
1201	CHG:PITCH:A2	Charge ID Table: 10% to 25% Humidity (Mj1)	1201
1202	CHG:PITCH:A3	Charge ID Table: 25% to 35% Humidity (Mj1)	1202
1203	CHG:PITCH:A4	Charge ID Table: 35% to 45% Humidity (Mj1)	1203
1204	CHG:PITCH:A5	Charge ID Table: 45% to 55% Humidity (Mj1)	1204
1205	CHG:PITCH:A6	Charge ID Table: 55% to 65% Humidity (Mj1)	1205
1206	CHG:PITCH:A7	Charge ID Table: 65% to 75% Humidity (Mj1)	1206
1207	CHG:PITCH:A8	Charge ID Table: More than 75% Humidity (Mj1)	1207
1208	CHG:PITCH:B1	Charge ID Table: Less than 10% Humidity (Mj2)	1208
1210	CHG:PITCH:B3	Charge ID Table: 25% to 35% Humidity (Mj2)	1210
1211	CHG:PITCH:B4	Charge ID Table: 35% to 45% Humidity (Mj2)	1211
1212	CHG:PITCH:B5	Charge ID Table: 45% to 55% Humidity (Mj2)	1212
1213	CHG:PITCH:B6	Charge ID Table: 55% to 65% Humidity (Mj2)	1213
1214	CHG:PITCH:B7	Charge ID Table: 65% to 75% Humidity (Mj2)	1214
1215	CHG:PITCH:B8	Charge ID Table: More than 75% Humidity (Mj2)	1215

SP No.	Menu Title	Meaning	SP No.
1216	CHG:PITCH:C1	Charge ID Table: Less than 10% Humidity (Mj3)	1216
1217	CHG:PITCH:C2	Charge ID Table: 10% to 25% Humidity (Mj3)	1217
1218	CHG:PITCH:C3	Charge ID Table: 25% to 35% Humidity (Mj3)	1218
1219	CHG:PITCH:C4	Charge ID Table: 35% to 45% Humidity (Mj3)	1219
1220	CHG:PITCH:C5	Charge ID Table: 45% to 55% Humidity (Mj3)	1220
1221	CHG:PITCH:C6	Charge ID Table: 55% to 65% Humidity (Mj3)	1221
1222	CHG:PITCH:C7	Charge ID Table: 65% to 75% Humidity (Mj3)	1222
1223	CHG:PITCH:C8	Charge ID Table: More than 75% Humidity (M3)	1223
1224	CHG:PITCH:D1	Charge ID Table: Less than 10% Humidity (Mj4)	1224
1225	CHG:PITCH:D2	Charge ID Table: 10% to 25% Humidity (Mj4)	1225
1226	CHG:PITCH:D3	Charge ID Table: 25% to 35% Humidity (Mj4)	1226
1227	CHG:PITCH:D4	Charge ID Table: 35% to 45% Humidity (Mj4)	1227
1228	CHG:PITCH:D5	Charge ID Table: 45% to 55% Humidity (Mj4)	1228
1229	CHG:PITCH:D6	Charge ID Table: 55% to 65% Humidity (Mj4)	1229
1230	CHG:PITCH:D7	Charge ID Table: 65% to 75% Humidity (Mj4)	1230
1231	CHG:PITCH:D8	Charge ID Table: More than 75% Humidity (Mj4)	1231

Changing one humidity setting for one item of a row in a service table sets the temperature settings for the entire row. (See the "SP No." columns of Tables 3-1 to 3-8.) Note that the same Charge ID appears many times in the rows of the Temperature/Humidity Tables.

The table below shows how the system reads and records the number of times Charge ID1, Charge ID2, and Charge ID3 is repeated in each row of the Temperature/Humidity Table. These readings are used to the determine the final settings.

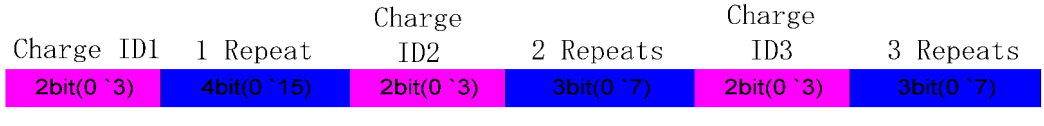


Fig. 3-1 How Settings of the Charge ID Table Are Determined **T920

How the Settings Are Used

Here are some examples that show you how the values of these settings are determined.

Example 1: Mj1 when humidity is greater than 75%

Charge Pitch ID		Temperature [°C]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	<10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1200
	10–25	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1201
	25–35	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1202
	35–45	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1203
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1204
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1205
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1206
	>75	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1207**
			"2" repeats 6 times						"1" repeats 4 times				"0" repeats 5 times				

Table 3-10a Mj1 Temperature/Humidity Table (Bold Text Shows Row for >75%) **T921

If we read this row from left to right, we see "2" repeats 6 times, "1" repeats 4 times, and "0" repeats 5 times. The firmware takes the number of times the each ID is repeated and converts this reading first to binary, hexadecimal, and then finally to decimal to determine the actual value of the setting that will be used.

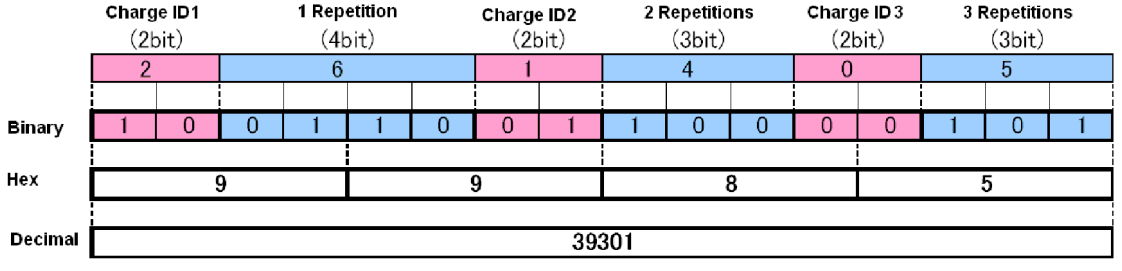


Fig. 3-2 Table Map for Reading Conversion **T922

In the table above we can see that the hexadecimal value "9985" converts to decimal "39301" so this means that **SP1207** is set to "**39301**".

Rules for Changing Settings

1. Only three Charge ID settings can be done per line.
2. If the counts for either "2" or "3" exceed 7 in the same row, then only 2 Charge IDs can be set for that row.
3. If the number of repetitions is set to "15", then the set all the count settings for Charge ID2 and Charge ID3 to "0".
4. If the total sum of the repetition counts does not reach "15", do the Charge ID3 settings for the remaining areas.
5. If the total sum of the repetition counts exceeds "15", then only the settings up to "15" can be done.

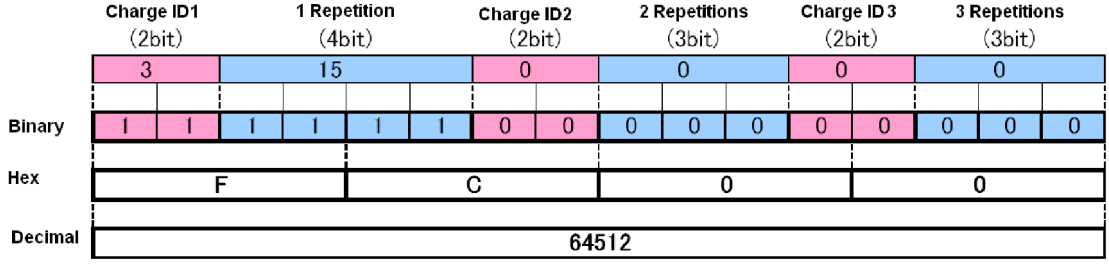
Example 2: Mj4 and Humidity Is Less Than 10%

Charge Pitch ID		Temperature [°C]															SP No.
		<2.5	2.5–5.0	5.0–7.5	7.5–10.0	10.0–12.5	12.5–15.0	15.0–17.5	17.5–20.0	20.0–22.5	22.5 25.0	25.0–27.5	27.5–30.0	30.0–32.5	32.5–35.0	>35.0	
Humidity [%]	**<10**	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	**1224**
	10–25	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	1225
	25–35	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1	1226
	35–45	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1227
	45–55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1228
	55–65	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1229
	65–75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1230
	>75	2	2	2	2	2	2	1	1	1	1	0	0	0	0	0	1231

Table 3-10b Mj4 Temperature/Humidity Table (Bold Text Shows Row for <10%) **T923

Reading this line from left to right we count 15 repetitions for "3" and the table below how shows how the firmware calculates the actual value of the setting. The count for Charge ID1 exceeds 15 counts for the remaining IDs are set to "0".

The firmware takes the number of times the each ID is repeated and converts this reading first to binary, hexadecimal, and then finally to decimal to determine the actual value of the setting that will be used. **T924



In the table above we can see that the hexadecimal value "FC00" converts to decimal "64512" so this means that **SP1224** is set to "**64512**".

Charge Pitch Table

The variables that determine which value is retrieved from the Charge Pitch Table are 1) the ID determined with the Temperature/Humidity Table, 2) the the paper type, 3) whether printing will be done on Side 1 or Side 2.

The tables below are the Charge Pitch Tables stored in NVRAM before the printer is shipped from the factory.

J011

Print Drive Wave Form: Mj1

Chg ID	Side 1				Side 2			
	LE/TE		MID		LE/TE		MID	
	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No
0	12mm	1100	12mm	1101	12mm	1132	12mm	1133
1	8mm	1102	8mm	1103	8mm	1134	8mm	1135
2	4mm	1104	4mm	1105	4mm	1136	4mm	1137
3	4mm	1106	2mm	1107	4mm	1138	2mm	1139

Table 3-11 Mj1 Charge Pitch Table **T925

Print Drive Wave Form: Mj2

Chg ID	Side 1				Side 2			
	LE/TE		MID		LE/TE		MID	
	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No
0	12mm	1108	12mm	1109	12mm	1140	12mm	1141
1	8mm	1110	8mm	1111	8mm	1142	8mm	1143
2	4mm	1112	4mm	1113	4mm	1144	4mm	1145
3	4mm	1114	2mm	1115	4mm	1146	2mm	1147

Table 3-12 Mj2 Charge Pitch Table **T926

Print Drive Wave Form: Mj3 *

Chg ID	Side 1				Side 2			
	LE/TE		MID		LE/TE		MID	
	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No
0	12mm	1116	12mm	1117	12mm	1148	12mm	1149
1	8mm	1118	8mm	1119	8mm	1150	8mm	1151
2	4mm	1120	4mm	1121	4mm	1152	4mm	1153
3	4mm	1122	2mm	1123	4mm	1154	2mm	1155

Table 3-13 Mj3 Charge Pitch Table **T927

Print Wave Form: Mj4

Chg ID	Side 1				Side 2			
	LE/TE		MID		LE/TE		MID	
	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No
0	12mm	1124	12mm	1125	12mm	1156	12mm	1157
1	8mm	1126	8mm	1127	8mm	1158	8mm	1159
2	4mm	1128	4mm	1129	4mm	1160	4mm	1161
3	4mm	1130	2mm	1131	4mm	1162	2mm	1163

Table 3-14 Mj4 Charge Pitch Table **T928

Printing on Transparencies (OHP)

Chg ID	Side 1	
	LE／TE	MID
	Chg Pitch	Chg Pitch
0	8mm	8mm
1	8mm	8mm
2	6mm	2mm
3	6mm	2mm

Table 3-15 OHP Charge Pitch Table

J007/J010

Print Drive Wave Form: Mj1

Chg ID	Side 1				Side 2			
	LE／TE		MID		LE／TE		MID	
	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No
0	12mm	1100	12mm	1101	12mm	1132	12mm	1133
1	8mm	1102	8mm	1103	8mm	1134	8mm	1135
2	4mm	1104	4mm	1105	4mm	1136	4mm	1137
3	4mm	1106	2mm	1107	4mm	1138	2mm	1139

Table 3-16 Mj1 Charge Pitch Table **T930

Print Drive Wave Form: Mj2

Chg ID	Side 1				Side 2			
	LE／TE		MID		LE／TE		MID	
	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No
0	12mm	1108	12mm	1109	12mm	1140	12mm	1141
1	8mm	1110	8mm	1111	8mm	1142	8mm	1143
2	4mm	1112	4mm	1113	4mm	1144	4mm	1145
3	4mm	1114	2mm	1115	4mm	1146	2mm	1147

Table 3-17 Mj2 Charge Pitch Table **T931

Print Drive Wave Form: Mj3 *

Chg ID	Side 1				Side 2			
	LE／TE		MID		LE／TE		MID	
	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No
0	12mm	1116	12mm	1117	12mm	1148	12mm	1149
1	8mm	1118	8mm	1119	8mm	1150	8mm	1151
2	4mm	1120	4mm	1121	4mm	1152	4mm	1153
3	4mm	1122	2mm	1123	4mm	1154	2mm	1155

Table 3-18 Mj3 Charge Pitch Table **T932

Print Wave Form: Mj4

Chg ID	Side 1				Side 2			
	LE／TE		MID		LE／TE		MID	
	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No	Chg Pitch	SP No
0	12mm	1124	12mm	1125	12mm	1156	12mm	1157
1	8mm	1126	8mm	1127	8mm	1158	8mm	1159
2	4mm	1128	4mm	1129	4mm	1160	4mm	1161
3	4mm	1130	2mm	1131	4mm	1162	2mm	1163

Table 3-19 Mj4 Charge Pitch Table **T933

Printing on Transparencies (OHP)

Chg ID	Side 1	
	LE／TE	MID
	Chg Pitch	Chg Pitch
0	8mm	8mm
1	8mm	8mm
2	6mm	2mm
3	6mm	2mm

Table 3-20 OHP Charge Pitch Table

The functions to adjust each table are in **SP1100** to **SP1163** (Engine Maintenance Mode). The settings are stored in NVRAM on the main control board after they adjusted and remain in effect after the machine is cycled off/on.

Table 3-21 Mj1 Charge Pitch Table Service Menu

Units: mm, Factory Defaults: All "0"

SP No.	Menu Title	Meaning
1100	CHG:W1:EDGE:1	Charge Width Setting: Simplex (LE/TE: Mj1: ID1)
1101	CHG:W1:MIDL:1	Charge Width Setting: Simplex (MID: Mj1: ID1)
1102	CHG:W1:EDGE:2	Charge Width Setting: Simplex (LE/TE: Mj1: ID2)
1103	CHG:W1:MIDL:2	Charge Width Setting: Simplex (MID: Mj1: ID2)
1104	CHG:W1:EDGE:3	Charge Width Setting: Simplex (LE/TE: Mj1: ID3)
1105	CHG:W1:MIDL:3	Charge Width Setting: Simplex (MID: Mj1: ID3)
1106	CHG:W1:EDGE:4	Charge Width Setting: Simplex (LE/TE: Mj1: ID4)
1107	CHG:W1:MIDL:4	Charge Width Setting: Simplex (MID: Mj1: ID4)
1108	CHG:W1:EDGE:5	Charge Width Setting: Simplex (LE/TE: Mj2: ID1)
1109	CHG:W1:MIDL:5	Charge Width Setting: Simplex (MID: Mj2: ID1)

SP No.	Menu Title	Meaning
1110	CHG:W1:EDGE:6	Charge Width Setting: Simplex (LE/TE: Mj2: ID2)
1111	CHG:W1:MIDL:6	Charge Width Setting: Simplex (MID: Mj2: ID2)
1112	CHG:W1:EDGE:7	Charge Width Setting: Simplex (LE/TE: Mj2: ID3)
1113	CHG:W1:MIDL:7	Charge Width Setting: Simplex (MID: Mj2: ID3)
1114	CHG:W1:EDGE:8	Charge Width Setting: Simplex (LE/TE: Mj2: ID4)
1115	CHG:W1:MIDL:8	Charge Width Setting: Simplex (MID: Mj2: ID4)
1116	CHG:W1:EDGE:9	Charge Width Setting: Simplex (LE/TE: Mj3: ID1) (Future Use)
1117	CHG:W1:MIDL:9	Charge Width Setting: Simplex (MID: Mj3: ID1) (Future Use)
1118	CHG:W1:EDGE:10	Charge Width Setting: Simplex (LE/TE: Mj3: ID2) (Future Use)
1119	CHG:W1:MIDL:10	Charge Width Setting: Simplex (MID: Mj3: ID2) (Future Use)
1120	CHG:W1:EDGE:11	Charge Width Setting: Simplex (LE/TE: Mj3: ID3) (Future Use)
1121	CHG:W1:MIDL:11	Charge Width Setting: Simplex (MID: Mj3: ID3) (Future Use)
1122	CHG:W1:EDGE:12	Charge Width Setting: Simplex (LE/TE: Mj3: ID4) (Future Use)
1123	CHG:W1:MIDL:12	Charge Width Setting: Simplex (MID: Mj3: ID4) (Future Use)
1124	CHG:W1:EDGE:13	Charge Width Setting: Simplex (LE/TE: Mj4: ID1)
1125	CHG:W1:MIDL:13	Charge Width Setting: Simplex (MID: Mj4: ID1)
1126	CHG:W1:EDGE:14	Charge Width Setting: Simplex (LE/TE: Mj4: ID2)
1127	CHG:W1:MIDL:14	Charge Width Setting: Simplex (MID: Mj4: ID2)
1128	CHG:W1:EDGE:15	Charge Width Setting: Simplex (LE/TE: Mj4: ID3)
1129	CHG:W1:MIDL:15	Charge Width Setting: Simplex (MID: Mj4: ID3)
1130	CHG:W1:EDGE:16	Charge Width Setting: Simplex (LE/TE: Mj4: ID4)
1131	CHG:W1:MIDL:16	Charge Width Setting: Simplex (MID: Mj4: ID4)
1132	CHG:W2:EDGE:1	Charge Width Setting: Duplex (LE/TE: Mj1: ID1)
1133	CHG:W2:MIDL:1	Charge Width Setting: Duplex (MID: Mj1: ID1)
1134	CHG:W2:EDGE:2	Charge Width Setting: Duplex (LE/TE: Mj1: ID2)

SP No.	Menu Title	Meaning
1135	CHG:W2:MIDL:2	Charge Width Setting: Duplex (MID: Mj1: ID2)
1136	CHG:W2:EDGE:3	Charge Width Setting: Duplex (LE/TE: Mj1: ID3)
1137	CHG:W2:MIDL:3	Charge Width Setting: Duplex (MID: Mj1: ID3)
1138	CHG:W2:EDGE:4	Charge Width Setting: Duplex (LE/TE: Mj1: ID4)
1139	CHG:W2:MIDL:4	Charge Width Setting: Duplex (MID: Mj1: ID4)
1140	CHG:W2:EDGE:5	Charge Width Setting: Duplex (LE/TE: Mj2: ID1)
1141	CHG:W2:MIDL:5	Charge Width Setting: Duplex (MID: Mj2: ID1)
1142	CHG:W2:EDGE:6	Charge Width Setting: Duplex (LE/TE: Mj2: ID2)
1143	CHG:W2:MIDL:6	Charge Width Setting: Duplex (MID: Mj2: ID2)
1144	CHG:W2:EDGE:7	Charge Width Setting: Duplex (LE/TE: Mj2: ID3)
1145	CHG:W2:MIDL:7	Charge Width Setting: Duplex (MID: Mj2: ID3)
1146	CHG:W2:EDGE:8	Charge Width Setting: Duplex (LE/TE: Mj2: ID4)
1147	CHG:W2:MIDL:8	Charge Width Setting: Duplex (MID: Mj2: ID4)
1148	CHG:W2:EDGE:9	Charge Width Setting: Duplex (LE/TE: Mj3: ID1) (Future Use)
1149	CHG:W2:MIDL:9	Charge Width Setting: Duplex (MID: Mj3: ID1) (Future Use)
1150	CHG:W2:EDGE:10	Charge Width Setting: Duplex (LE/TE: Mj3: ID2) (Future Use)
1151	CHG:W2:MIDL:10	Charge Width Setting: Duplex (MID: Mj3: ID2) (Future Use)
1152	CHG:W2:EDGE:11	Charge Width Setting: Duplex (LE/TE: Mj3: ID3) (Future Use)
1153	CHG:W2:MIDL:11	Charge Width Setting: Duplex (MID: Mj3: ID3) (Future Use)
1154	CHG:W2:EDGE:12	Charge Width Setting: Duplex (LE/TE: Mj3: ID4) (Future Use)
1155	CHG:W2:MIDL:12	Charge Width Setting: Duplex (MID: Mj3: ID4) (Future Use)
1156	CHG:W2:EDGE:13	Charge Width Setting: Duplex (LE/TE: Mj4: ID1)
1157	CHG:W2:MIDL:13	Charge Width Setting: Duplex (MID: Mj4: ID1)
1158	CHG:W2:EDGE:14	Charge Width Setting: Duplex (LE/TE: Mj4: ID2)
1159	CHG:W2:MIDL:14	Charge Width Setting: Duplex (MID: Mj4: ID2)

SP No.	Menu Title	Meaning
1160	CHG:W2:EDGE:15	Charge Width Setting: Duplex (LE/TE: Mj4: ID3)
1161	CHG:W2:MIDL:15	Charge Width Setting: Duplex (MID: Mj4: ID3)
1162	CHG:W2:EDGE:16	Charge Width Setting: Duplex (LE/TE: Mj4: ID4)
1163	CHG:W2:MIDL:16	Charge Width Setting: Duplex (MID: Mj4: ID4)

Adjustment of the charge pitch settings can prevent the occurrence of nozzle blockage when printing on paper other than transparencies. (Adjustment cannot be done for transparencies.)

Checking Charge Pitch Applied for the Print Mode

1. **Check Table 3 to find print drive wave for the selected print mode (the print mode selected in the printer driver determines the print drive wave form.) (Table 3)**
2. **Use SP5402 and SP5403 to check the printer temperature and humidity.**
3. **Select the print drive wave from the Temperature/Humidity Table, and then determine the Charge ID from the temperature and humidity readings from SP5402 and SP5403. (Tables 3-1 to 3-6)**
4. **Use the Charge Pitch Table to determine the charge pitch to be applied during printing. (Tables 3-11 to 3-20)**

   The charge pitch settings are adjusted in mm units with absolute numbers.

   Example: Changing the LE/TE Charge Pitch from 12 mm to 10 mm for Mj2 Side 1 Printing

   In the Engine Maintenance Mode set SP1108 to "10".

Temperature/Humidity Calibration

The temperature/humidity sensor can be calibrated for the ID readings from the Temperature/Humidity Table for Side 2 printing.

Before the printer is shipped from the factory the temperature/humidity sensor is set to read the front/back side of each sheet in the same way.

The humidity and temperature can be calibrated with SP1164 to 1165 on the "2. Engine Mainte." menu in the Service Mode.

Table 4 Service Mode Menu for Humidity, Temperature Calibration

Units: 0.1%, Factory Defaults: Both "0"

SP No.	Menu Title	Meaning
1164	CHG:HUMI:B	Calibrate Humidity Setting for Duplex
1165	CHG:TEMP:B	Calibrate Temperature Setting for Duplex

Do these settings when you want to change temperature or humidity column referenced to determine the Charge ID for printing on Side 2.

The settings are adjusted in increments of 0.1°C from the settings of Side 1. The range is –128 to +127.

Example: Setting the Temperature for Side 2 2°C Higher (+2°C) than Side 1

Open SP1165 in the Engine Maintenance mode and set it to "20". If the temperature/humidity sensor reads 25°C for Side 1, the machine will adjust this reading to 27°C then use 27°C to look up the Charge ID for Side 2.

5. Service Tables

Before You Begin

Entering/Exiting SP Mode

To enter SP Mode

1. Push and hold down ▲ and ▼ together for at least 3 sec then release.
2. Push [#Enter].

To exit SP mode

1. Press ▲ or ▼ to display "3. End" on the LCD.
2. Push [#Enter] to leave SP mode and return to the normal operation display.

Using the SP Menus

The system version number appears on the LCD after the printer enters the SP mode. This is the top menu, the initial SP mode selection screen.

Top Menu

There are three selections on the top menu.

1. Service Menu.
2. Engine Mainte.
3. End.

To select and open one of these press the ▲ or ▼ to display the item, then push [#Enter].

Important

- Every menu display is a rolling display.
- If you press ▲ with the first item on the LCD, the display will rotate to the last item.
- If you press ▼ with the last item on the LCD, the display will rotate to the first item.

Selecting Menu Items

1. Push ▲ or ▼ to display "1. Service Menu".
2. Push [#Enter].

3. If you see ">>" on the right side of the LCD, this means there are more menu selections on the same level. Push ▲ or ▼ to display group number of the SP mode that you want to open.
4. Press [#Enter].
5. Push ▲ or ▼ to display the item to select, then push [#Enter].
6. To return to a previous level, push [Escape].
7. To exit the SP mode, push [Escape] repeatedly to return to the top menu, then press [#Enter].

SP Tables

SP Table Key

Notation	What It Means	
[range/**default**/step/units]	Example: [-127 to +128/**4.5**/1/0.1 mm].	
	-127 to +128	Range
	4.5	Default
	1	Screen increments
	0.1 mm	Unit change for every screen increment.

Here is a summary of common terms and abbreviations used in the SP code descriptions.

Term	What It Means
DFU	Denotes “Design or Factory Use”. Do not change this value.
DOM	"Domestic" market only (Japan)
EXP	"Export" markets (North America, Europe, Asia)
NA	North America
EUA	Europe/Asia
Sub Scan	This is printing vertically down the length of an SEF (portrait) page.
Main Scan	This is printing horizontally across the width of an SEF (portrait) page.
LEF	Long Edge Feed (paper feeds sideways with the long edge feeding first)
SEF	Short Edge Feed (paper feeds lengthways with the short edge feeding first)
FA	"Factory Adjusted". The default setting is set at the factory or service center.
LE	Leading Edge
TE	Trailing Edge
LE/TE	Leading Edge/Trailing Edge

Group 1000

Main Scan, Sub Scan Registration

1000	REG:FD:NORM:F	Adjust Sub Scan Registration (Normal Paper)
	Use this SP code to adjust writing in the sub scan registration for normal paper. Do this setting when registration does not match the direction of paper feed selected in the user image adjustment menu. [-128 to +127/FA/1/0.1 mm]	
1001	REG:TR1:NORM:F	Adjust Main Scan Registration (Normal Paper: Tray 1)
	Use this SP code to adjust writing in the main scan direction for normal paper loaded in Tray 1. Do this setting when registration does not match the image start position on the user image adjustment menu. [-128 to +127/FA/1/0.1 mm]	
1002	REG:TR2:NORM:F	Adjust Main Scan Registration (Tray 2: Normal Paper: FA)
	Use this SP code to adjust writing in main scan direction for normal paper loaded in Tray 2. Do this setting when registration does not match the image start position on the user image adjustment menu. [-128 to +127/FA/1/0.1 mm]	
1003	REG:MAN:NORM:F	Adjust Main Scan Registration (Bypass: Normal Paper: FA)
	Use this SP code to adjust writing in the main scan direction for normal paper loaded in the bypass tray. Do this setting when registration does not match the image start position on the user image adjustment menu. [-128 to +127/FA/1/0.1 mm]	
1004	REG:FD:GROS:F	Adjust Sub Scan Registration (Glossy Paper: FA)
	Use this SP code to adjust writing in the the sub scan registration for glossy paper. Do this setting when registration does not match the direction of paper feed selected in the user image adjustment menu. [-128 to +127/FA/1/0.1 mm]	
1005	REG:TR1:GROS:F	Adjust Main Scan Registration (Glossy Paper: FA)
	Use this SP code to adjust writing in the main scan direction for glossy paper loaded in Tray 1. Do this setting when registration does not match the image start position on the user image adjustment menu. [-128 to +127/FA/1/0.1 mm]	

1006	REG:TR2:GROS:F	Adjust Main Scan Registration (Tray 2: Glossy Paper: FA)
	Use this SP code to adjust writing in the main scan direction for glossy paper loaded in Tray 2. Do this setting when registration does not match the image start position on the user image adjustment menu. [-128 to +127/**FA**/1/0.1 mm]	
1007	REG:MAN:GROS:F	Adjust Main Scan Registration (Bypass: Glossy Paper: FA)
	Use this SP code to adjust writing in the main scan direction for glossy paper loaded in the bypass tray. Do this setting when registration does not match the image start position on the user image adjustment menu. [-128 to +127/**FA**/1/0.1 mm]	
1008	REG:FD:OHP:F	Adjust Sub Scan Registration (OHP: FA)
	Use this SP code to adjust writing in the sub scan direction for transparencies (OHP). Do this setting when registration does not match the direction of paper feed selected in the user image adjustment menu. [-128 to +127/**FA**/1/0.1 mm]	
1009	REG:TR1:OHP:F	Adjust Main Scan Registration (Tray 1: OHP: FA)
	Use this SP code to adjust writing in the main scan direction for transparencies (OHP) loaded in Tray 1. Do this setting when registration does not match the image start position on the user image adjustment menu. [-128 to +127/**FA**/1/0.1 mm]	
1010	REG:MAN:OHP:F	Adjust Main Scan Registration (Bypass: OHP: FA)
	Use this SP code to adjust writing in the main scan direction for transparencies (OHP) loaded in the bypass tray. Do this setting when registration does not match the image start position on the user image adjustment menu. [-128 to +127/**FA**/1/0.1 mm]	
1011	REG:FD2:NORM:F	Adjust Sub Scan Registration (Normal Paper: 2nd Registration: FA)
	Use this SP code to adjust writing in the sub scan registration for normal paper. Do this setting when it is necessary to fine adjust the line feed position. [-128 to +127/**FA**/1/0.1 mm]	
1012	REG:FD2:GROS:F	Adjust Sub Scan Registration (Glossy Paper: 2nd Registration: FA)
	Use this SP code to adjust writing in the sub scan registration for glossy paper. Do this setting when it is necessary to fine adjust the line feed position.	

	[-128 to +127/FA/1/0.1 mm] Note: This function is under development and is not available for the J007/J010 and J011	
1013	REG:FD2:OHP:F	Adjust Sub Scan Registration (OHP: 2nd Registration: FA)
	Use this SP code to adjust writing in the sub scan direction for transparencies (OHP). Do this setting when it is necessary to fine adjust the line feed position. [-128 to +127/FA/1/0.1 mm] Note: This function is under development and is not available for the J007/J010 and J011	

Paper Feed

1014	FDLEN:F	Adjust Amount of Paper Feed (FA)
	Do this SP adjust the amount of line feed for 1 scan line. Do this setting only if the line feed amount cannot be adjusted on the user menu of the printer operation panel with "Adj. Paper Feed". [-1000000 to +1000000/FA/1 µm]	
1015	FDLEN:OFFSET	Adjust Amount of LF Offset in Sub Scan Direction
	Use this SP to set the amount of line feed before the print head begins its 2nd pass during bi-directional printing. Do this SP when it is necessary to correct color offset that occurs during bi-directional printing. [-128 to +128/FA/1/Vertical Encoded Pulse Count]	

Carriage

1016	ADJ:SIDEBOARD	Adjust Sideboard (Carriage Home Position)
	Use this SP to set the reference position for installation of the right plate. Do this SP to correct the alignment of the capping position with the carriage. [-128 to +128/FA/1/0.1 mm]	

Suction Vents

1017	PRGPORTS:R	Adjust Position of Right Suction Vent DFU

	Use this SP to adjust the venting position of the right air vent. Do this SP after it has been determined that the ink is not venting at the center of the right ink suction vent. [-128 to +128/**FA**/1/0.1 mm]	
1018	**PRGPORS:L**	Adjust Position of Left Suction Vent **DFU**
	Use this SP to adjust the venting position of the left ink suction vent. (Do this SP after it has been determined that the ink is not venting at the center of the left ink suction vent. [-128 to +128/**FA**/1/0.1 mm]	

Charge Width Setting Mj1: Simplex

1100	**CHG:W1:EDGE:1**	LE/TE: Mj1: ID1
1102	**CHG:W1:EDGE:2**	LE/TE: Mj1: ID2
1104	**CHG:W1:EDGE:3**	LE/TE: Mj1: ID3
1106	**CHG:W1:EDGE:4**	LE/TE: Mj1: ID4
	Use this SP to set the pitch width of the charge applied to the LE/TE of normal paper for printing in the High Speed (Draft) mode. Do this SP when mist build-up near the leading and trailing edges of the paper in use during printing in the High Speed (Draft) mode is clogging the print head nozzles. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1100: ID1 • SP1102: ID2 • SP1104: ID3 • SP1106: ID4 [0 to 255/**0**/1/0.1 mm]	
1101	**CHG:W1:MID:1**	MID: Mj1: ID1
1103	**CHG:W1:MID:2**	MID: Mj1: ID2
1105	**CHG:W1:MID:3**	MID: Mj1: ID3
1107	**CHG:W1:MID:4**	MID: Mj1: ID4
	Use this SP to set the pitch width of the charge applied to the MID area of normal paper (excluding the LE/TE) for printing in the High Speed (Draft) mode. Do this SP when mist build-up	

	in the MID area of the paper in use during printing in the High Speed (Draft) mode is clogging the print head nozzles. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1101: ID1 • SP1103: ID2 • SP1105: ID3 • SP1107: ID4 [0 to 255/**0**/1/0.1 mm]

Charge Width Setting Mj2: Simplex

1108	CHG:W1:EDGE:5	LE/TE: Mj2: ID1
1110	CHG:W1:EDGE:6	LE/TE: Mj2: ID2
1112	CHG:W1:EDGE:7	LE/TE: Mj2: ID3
1114	CHG:W1:EDGE:8	LE/TE: Mj2: ID4
	Use this SP to set the pitch width of the charge applied to the LE/TE of any paper in any print mode except: normal paper in High Speed (Draft) mode and glossy paper in High Quality Mode. Do this SP when mist build-up up near the leading and trailing edges of the sheets is clogging the print head nozzles during printing with any paper in any mode, except normal paper in High Speed (Draft) mode and glossy paper in High Quality mode. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1108: ID1 • SP1110: ID2 • SP1112: ID3 • SP1114: ID4 [0 to 255/**0**/1/0.1 mm]	
1109	CHG:W1:MID:5	MID: Mj2: ID1
1111	CHG:W1:MID:6	MID: Mj2: ID2
1113	CHG:W1:MID:7	MID: Mj2: ID3
1115	CHG:W1:MID:8	MID: Mj2: ID4

	Use this SP to set the pitch width of the charge applied to the MID area of any paper in any print mode except: normal paper in High Speed (Draft) mode and glossy paper in High Quality Mode. Do this SP when mist build-up in the MID area of the paper in use is clogging the print head nozzles during printing with any paper in any mode, except: normal paper in High Speed (Draft) mode and glossy paper in High Quality mode. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below. • SP1109: ID1 • SP1111: ID2 • SP1113: ID3 • SP1115: ID4 [0 to 255/**0**/1/0.1 mm]

Charge Width Setting Mj3: Simplex

1116	CHG:W1:EDGE:9	LE/TE: Mj3: ID1
1118	CHG:W1:EDGE:10	LE/TE: Mj3: ID2
1120	CHG:W1:EDGE:11	LE/TE: Mj3: ID3
1122	CHG:W1:EDGE:12	LE/TE: Mj3: ID4
	Use this SP to set the pitch width of the charge applied to the LE/TE of paper in future print modes (currently under development). Do this SP when the paper in use is causing mist to build up near the leading and trailing edges of the sheets and causing the print heads to clog. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1116: ID1 • SP1118: ID2 • SP1120: ID3 • SP1122: ID4 [0 to 255/**0**/1/0.1 mm]	

Charge Width Setting Mj3: Simplex

1117	CHG:W1:MID:9	MID: Mj3: ID1

1119	CHG:W1:MID:10	MID: Mj3: ID2
1121	CHG:W1:MID:11	MID: Mj3: ID3
1123	CHG:W1:MID:12	MID: Mj3: ID4
	This SP code is currently under development. Use this SP to set the pitch width of the charge applied to the MID area of paper in future print modes except: normal paper in High Speed (Draft) mode and glossy paper in High Quality Mode. Do this SP when the paper is use is causing mist to build up in the MID area and clogging the print head nozzles. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1117: ID1 • SP1119: ID2 • SP1121: ID3 • SP1123: ID4 [0 to 255/**0**/1/0.1 mm]	

Charge Width Setting Mj4: Simplex

1124	CHG:W1:EDGE:13	LE/TE: Mj4: ID1
1126	CHG:W1:EDGE:14	LE/TE: Mj4: ID2
1128	CHG:W1:EDGE:15	LE/TE: Mj4: ID3
1130	CHG:W1:EDGE:16	LE/TE: Mj4: ID4
	Use this SP to set the pitch width of the charge applied to the LE/TE of glossy paper for printing in the High Quality mode. Do this SP when the mist build-up near the leading and trailing edges of glossy paper is causing the print heads to clog during printing in High Quality mode. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1124: ID1 • SP1126: ID2 • SP1128: ID3 • SP1130: ID4 [0 to 255/**0**/1/0.1 mm]	

Charge Width Setting Mj4: Simplex

1125	CHG:W1:MID:13	MID: Mj4: ID1
1127	CHG:W1:MID:14	MID: Mj4: ID2
1129	CHG:W1:MID:15	MID: Mj4: ID3
1131	CHG:W1:MID:16	MID: Mj4: ID4
	Use this SP to set the pitch width of the charge applied to the MID area of the paper when printing on glossy paper in the High Quality mode. Do this SP when mist build-up in the MID area of glossy paper is causing the print heads to clog during printing in High Quality mode. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1125: ID1 • SP1127: ID2 • SP1129: ID3 • SP1131: ID4 [0 to 255/**0**/1/0.1 mm]	

Charge Width Setting Mj1 : Duplex

1132	CHG:W2:EDGE:1	LE/TE: Mj1: ID1
1134	CHG:W2:EDGE:2	LE/TE: Mj1: ID2
1136	CHG:W2:EDGE:3	LE/TE: Mj1: ID3
1138	CHG:W1:EDGE:4	LE/TE: Mj1: ID4
	Use this SP to set the pitch width of the charge applied to the LE/TE on the back side of normal paper during duplex printing in the High Speed (Draft) mode. Do this SP when mist build-up near the leading and trailing edges on the back sides of the paper during duplex printing in the High Speed (Draft) mode is clogging the print head nozzles. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1132: ID1 • SP1134: ID2 • SP1136: ID3 • SP1138: ID4	

	[0 to 255/**0**/1/0.1 mm]	
1133	CHG:W2:MID:1	MID: Mj1: ID1
1135	CHG:W2:MID:2	MID: Mj1: ID2
1137	CHG:W2:MID:3	MID: Mj1: ID3
1139	CHG:W1:MID:4	MID: Mj1: ID4
	Use this SP to set the pitch width of the charge applied to the MID area on the 2nd side of normal paper (excluding the LE/TE) for duplex printing in the High Speed (Draft) mode. Do this SP when mist build-up in the MID area on the back sides of the paper during duplex printing in the High Speed (Draft) mode is clogging the print head nozzles. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below. • SP1133: ID1 • SP1135: ID2 • SP1137: ID3 • SP1139: ID4 [0 to 255/**0**/1/0.1 mm]	

Charge Width Setting Mj2: Duplex

1140	CHG:W2:EDGE:5	LE/TE: Mj2: ID1
1142	CHG:W2:EDGE:6	LE/TE: Mj2: ID2
1144	CHG:W2:EDGE:7	LE/TE: Mj2: ID3
1146	CHG:W1:EDGE:8	LE/TE: Mj2: ID4
	Use this SP to set the pitch width of the charge applied to the LE/TE on the 2nd side of any paper in any print mode during duplex printing except: normal paper in High Speed (Draft) mode and glossy paper in High Quality Mode. Do this SP when mist build-up up near the leading and trailing edges on the 2nd side is clogging the print head nozzles during duplex printing with any paper in any mode, except: normal paper in High Speed (Draft) mode and glossy paper in High Quality mode. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below. • SP1140: ID1 • SP1142: ID2	

	• SP1144: ID3 • SP1146: ID4 [0 to 255/**0**/1/0.1 mm]	
1141	CHG:W2:MID:5	MID: Mj2: ID1
1143	CHG:W2:MID:6	MID: Mj2: ID2
1145	CHG:W2:MID:7	MID: Mj2: ID3
1147	CHG:W1:MID:8	MID: Mj2: ID4
	Use this SP to set the pitch width of the charge applied to the MID area on the 2nd side of any paper in any print mode during duplex printing except: normal paper in High Speed (Draft) mode and glossy paper in High Quality Mode. Do this SP when mist build-up in the MID area on the 2nd side of the paper in use is clogging the print head nozzles during duplex printing with any paper in any mode, except: normal paper in High Speed (Draft) mode and glossy paper in High Quality mode. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1141: ID1 • SP1143: ID2 • SP1145: ID3 • SP1147: ID4 [0 to 255/**0**/1/0.1 mm]	

Charge Width Setting Mj3: Duplex

1148	CHG:W2:EDGE:9	LE/TE: Mj3: ID1
1150	CHG:W2:EDGE:10	LE/TE: Mj3: ID2
1152	CHG:W2:EDGE:11	LE/TE: Mj3: ID3)
1154	CHG:W1:EDGE:12	LE/TE: Mj3: ID4
	This SP is currently under development. Use this SP to set the pitch width of the charge applied to the LE/TE on the 2nd side of paper in future print modes (currently under development) during duplex printing. Do this SP when mist build-up near the leading and trailing edges of the 2nd side is causing the print heads to clog.	

	This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1148: ID1 • SP1150: ID2 • SP1152: ID3 • SP1154: ID4 [0 to 255/**0**/1/0.1 mm]	
1149	CHG:W2:MID:9	MID: Mj3: ID1
1151	CHG:W2:MID:10	MID: Mj3: ID2
1153	CHG:W2:MID:11	MID: Mj3: ID3
1155	CHG:W1:MID:12	MID: Mj3: ID4
	This SP is currently under development. Use this SP to set the pitch width of the charge applied to the MID area of the 2nd side of paper in future print modes (currently under development) during duplex printing. Do this SP when mist build-up in the MID area is clogging the print head nozzles. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1149: ID1 • SP1151: ID2 • SP1153: ID3 • SP1155: ID4 [0 to 255/**0**/1/0.1 mm]	

Charge Width Setting Mj4: Duplex

1156	CHG:W2:EDGE:13	LE/TE: Mj4: ID1
1158	CHG:W2:EDGE:14	LE/TE: Mj4: ID2
1160	CHG:W2:EDGE:15	LE/TE: Mj4: ID3
1162	CHG:W1:EDGE:16	LE/TE: Mj4: ID4
	Use this SP to set the pitch width of the charge applied to the LE/TE on the 2nd side of glossy paper for duplex printing in the High Quality mode. Do this SP when the mist build-up near the leading and trailing edges on the 2nd side of glossy paper is causing the print heads to clog	

	during duplex printing in High Quality mode. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1156: ID1 • SP1158: ID2 • SP1160: ID3 • SP1162: ID4 [0 to 255/**0**/1/0.1 mm]	
1157	CHG:W2:EDGE:13	MID: Mj4: ID1
1159	CHG:W2:EDGE:14	MID: Mj4: ID2
1161	CHG:W2:EDGE:15	MID: Mj4: ID3
1163	CHG:W1:EDGE:16	MID: Mj4: ID4
	Use this SP to set the pitch width of the charge applied to the MID area on the 2nd side of glossy paper for duplex printing in the High Quality mode. Do this SP when mist build-up in the MID area on the 2nd side of glossy paper is causing the print heads to clog during duplex printing in High Quality mode. This SP setting is linked to the charge pitch tables (SP1200 to SP1231). The IDs are determined by the temperature and humidity. There are 4 IDs associated with the SP numbers listed below: • SP1157: ID1 • SP1159: ID2 • SP1161: ID3 • SP1163: ID4 [0 to 255/**0**/1/0.1 mm]	

Calibrate Humidity/Temperature for Duplex

1164	HUMI:B	Calibrate Humidity Setting for Duplex
	Use this SP to calibrate the temperature/humidity sensor for humidity readings during duplex printing. Do this SP to update the charge pitch table for duplex printing. This SP setting is linked to the humidity steps in the charge pitch tables (SP1200 to SP1231). [-128 to +127/**0**/1/0.1%]	
1165	TEMP:B	Calibrate Temperature Setting for Duplex

	Use this SP to calibrate the temperature readings for duplex printing. Do this SP to update the charge pitch table for duplex printing. This SP setting is linked to the temperature steps in the charge pitch tables (SP1200 to SP1231). [-128 to +127/**0**/1/0.1%]

Charge ID Tables: Mj1

1200	CHG:PITCH:A1	Mj1: Less Than 10% Lookup Table
1201	CHG:PITCH:A2	Mj1: 10% → 25% Lookup Table
1202	CHG:PITCH:A3	Mj1: 25% → 35% Lookup Table
1203	CHG:PITCH:A4	Mj1: 35% → 45% Lookup Table
1204	CHG:PITCH:A5	Mj1: 45% → 55% Lookup Table
1205	CHG:PITCH:A6	Mj1: 55% → 65% Lookup Table
1206	CHG:PITCH:A7	Mj1: 65% → 75% Lookup Table
1207	CHG:PITCH:A8	Mj1: More than 75% Lookup Table
	Use this SP to configure the charge ID table for printing on normal paper in High Speed (Draft) mode. Do this SP when mist build-up on the paper in use is clogging the print head nozzles. This setting is linked to the charge pitch settings (SP1100 to 1107, SP1133 to 1139). [0 to 0xffff ffff/**0**/1/---] For more details, please refer to Section 4 "Transport Belt Charge Adjustments".	

Charge ID Tables: Mj2

1208	CHG:PITCH:B1	Mj2: Less Than 10% Lookup Table
1209	CHG:PITCH:B2	Mj2: 10% → 25% Lookup Table
1210	CHG:PITCH:B3	Mj2: 25% → 35% Lookup Table
1211	CHG:PITCH:B4	Mj2: 35% → 45% Lookup Table
1212	CHG:PITCH:B5	Mj2: 45% → 55% Lookup Table
1213	CHG:PITCH:B6	Mj2: 55% → 65% Lookup Table

1214	CHG:PITCH:B7	Mj2: 65% → 75% Lookup Table
1215	CHG:PITCH:B8	Mj2: More than 75% Lookup Table
	Use this SP to configure the charge ID table for printing on any paper in any mode except: normal paper in High Speed (Draft) mode and glossy paper in High Quality mode. Do this SP when mist build-up on the paper in use is clogging the print head nozzles during printing with any paper in any mode, except: normal paper in High Speed (Draft) mode and glossy paper in High Quality mode. This setting is linked to the charge pitch settings (SP1108 to 1115, SP1140 to 1147). [0 to 0xffff ffff/**0**/1/---] For more details, please refer to Section 4 "Transport Belt Charge Adjustments".	

Charge ID Tables: Mj3

1216	CHG:PITCH:C1	Mj3: Less Than 10% Lookup Table
1217	CHG:PITCH:C2	Mj3: 10% → 25% Lookup Table
1218	CHG:PITCH:C3	Mj3: 25% → 35% Lookup Table
1219	CHG:PITCH:C4	Mj3: 35% → 45% Lookup Table
1220	CHG:PITCH:C5	Mj3: 45% → 55% Lookup Table
1221	CHG:PITCH:C6	Mj3: 55% → 65% Lookup Table
1222	CHG:PITCH:C7	Mj3: 65% → 75% Lookup Table
1223	CHG:PITCH:C8	Mj3: More than 75% Lookup Table
	Use this SP to configure the charge ID table for future print modes (under development). Do this SP when mist build-up on the paper in use is clogging the print head nozzles. This setting is linked to the charge pitch settings (SP1116 to SP1123, SP1148 to SP1155). [0 to 0xffff ffff/**0**/1/---]	

Charge ID Tables: Mj4

1224	CHG:PITCH:D1	Mj4: Less Than 10% Lookup Table
1225	CHG:PITCH:D2	Mj4: 10% → 25% Lookup Table
1226	CHG:PITCH:D3	Mj4: 25% → 35% Lookup Table

1227	CHG:PITCH:D4	Mj4: 35% → 45% Lookup Table
1228	CHG:PITCH:D5	Mj4: 45% → 55% Lookup Table
1229	CHG:PITCH:D6	Mj4: 55% → 65% Lookup Table
1230	CHG:PITCH:D7	Mj4: 65% → 75% Lookup Table
1231	CHG:PITCH:D8	Mj4: More than 75% Lookup Table
	Use this SP to configure the charge ID table for printing on glossy paper in Quality mode. Do this SP when mist build-up on glossy paper in use is clogging the print head nozzles. This setting is linked to the charge pitch settings (SP1124 to 1131, SP1156 to 1163). [0 to 0xffff ffff/**0**/1/---]	

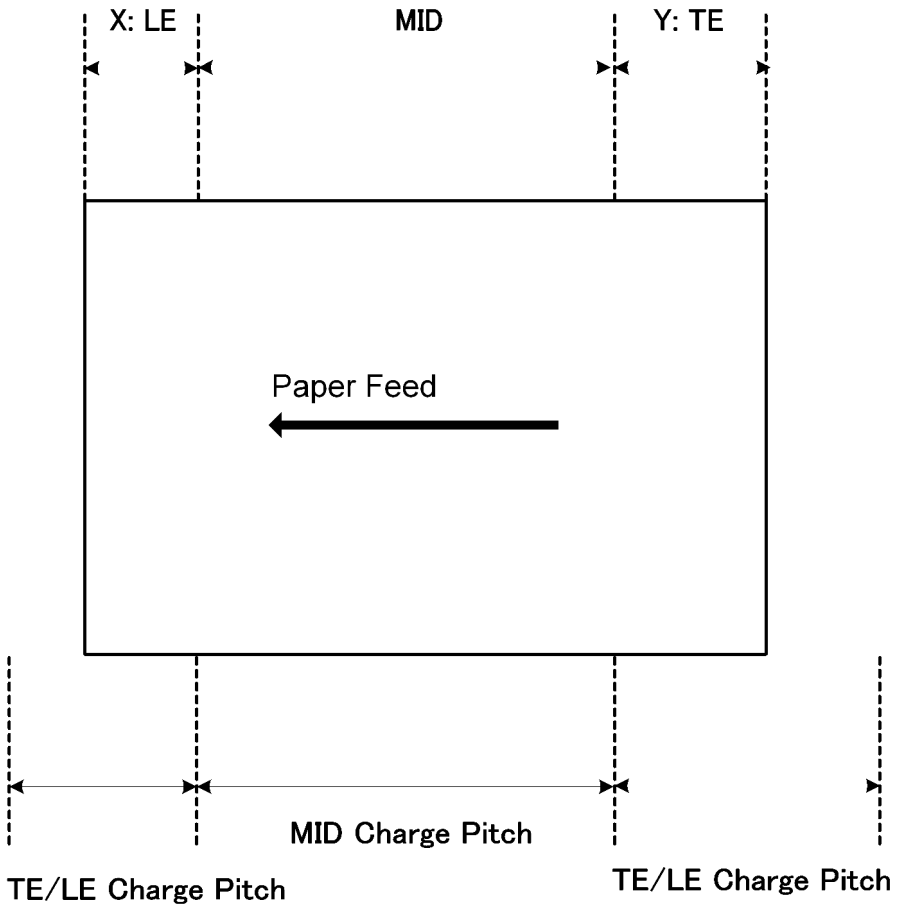
5

Set Charge Area 1

1232	CHG:AREA1:OHP	Set Charge of Area 1 for LE/TE: OHP
	Use this SP to set the size of the leading and trailing edges of transparencies (OHP). Do this setting when you want to adjust pitch amount of the charge applied to the leading and trailing edge of transparencies for printing. The areas of the leading and trailing edges is shown below. [5 to 255/**0**/1/mm]	
1233	CHG:AREA1:F	Set Charge of Area 1 for LE/TE: Simplex: Any Other Than OHP
	Use this SP to set the size of the leading and trailing edges for the 1st side of any paper except transparencies (OHP). Do this setting when you want to adjust pitch amount of the charge applied to the leading and trailing edges on the 1st side any paper except transparencies. The areas of the leading and trailing edges is shown below. [5 to 255/**0**/1/mm]	
1234	CHG:AREA1:B	Set Charge of Area 1 for LE/TE: Duplex: Any Other Than OHP
	Use this SP to set the size of the leading and trailing edges for the 2nd side (duplex printing) of any paper except transparencies (OHP). Do this setting when you want to adjust pitch amount of the charge applied to the leading and trailing edges on the 2nd side any paper except transparencies for duplex printing. The areas of the leading and trailing edges are shown below. [5 to 255/**0**/1/mm]	

Set Charge Area 2

1235	CHG:AREA2:B	Set Charge of Area 2 for MID: OHP
	Use this SP to set the size of the MID area of transparencies (OHP). Do this setting when you want to adjust pitch amount of the charge applied to the MID area of transparencies for printing. The MID area is shown below. [5 to 255/**0**/1/mm]	
1236	CHG:AREA2:F	Set Charge of Area 2 for MID: Simplex: Any Other Than OHP
	Use this SP to set the size of the MID on the 1st side of any paper except transparencies (OHP). Do this setting when you want to adjust pitch amount of the charge applied to the MID area on the 2nd side of any paper other than transparencies. The MID area is shown below. [5 to 255/**0**/1/mm]	
1237	CHG:AREA2:B	Set Charge of Area 2 for LE/TE: Duplex: Any Other Than OHP
	Use this SP to set the size of the MID on the 2nd side of any paper except transparencies (OHP) for duplex printing. Do this setting when you want to adjust pitch amount of the charge applied to the MID area on the 2nd side of any paper other than transparencies for duplex printing. The MID area is shown below. [5 to 255/**0**/1/mm]	



Set Charge for Target Market

1238	CHG:REGION	Set Charge for Geographic Region
	Use the SP to set the charge for the areas listed below. 0: Enable geographical area setting 1: Japan 2: NA (North America) 3: Europe 4: China (Mainland) 5: China (Taiwan) "5" and "4" refer to same pitch table. 6: Asia. "4" "5" "6" refer to same charge pitch table	

	If any item other than "0" is selected that item and its setting is enabled and takes priority. [0 to 6/**0**/1/---]

Print Head Temperature Thresholds

1300	HTEMP:H:STOP	Trigger Shutdown: Standby, Printing
1301	HTEMP:H:JUDG	Trigger Shutdown: Power On
1302	HTEMP:H:RCVR	Recovery After High Temp Shutdown
1303	HTEMP:L:RCVR	Recovery After Low Temp Shutdown
1304	HTEMP:L:JUDG	Trigger Shutdown: Power On
1305	HTEMP:L:STOP	Trigger Shutdown: Standby, Printing
	Use this SP to set the threshold for the operating temperature range of the print head. [0 to 1000/**0**/1/0.1°C	

Ambient Temperature Thresholds

1306	ETEMP:H:STOP	High Temperature to Trigger Shutdown: Standby, Printing
1307	ETEMP:H:JUDG	High Temperature to Trigger Shutdown: Power On
1308	ETEMP:H:RCVR	Recovery After High Temp Shutdown
1309	ETEMP:L:RCVR	Recovery After Low Temp Shutdown
1310	ETEMP:L:JUDG	Low Temperature to Trigger Shutdown: Power On
1311	ETEMP:L:STOP	Low Temperature to Trigger Shutdown: Standby, Printing
	Use this SP to set the threshold for the operating humidity range of the print head. [0 to 1000/**0**/1/0.1°C	

Goup 2000

Set Threshold for Near-Full Alert

2000	TH:WASTE:R:SNS	Ink Collection Unit Sensor
	Use this SP to set the threshold value to trigger near full alert for the ink collection tank sensor. [0 to 1023/**0**/1/---]	
2001	TH:WASTE:R:SOFT	Software Count : Right Ink Collection Unit
	Use this SP to set the threshold value to trigger the full alert for the ink collection tank sensor. [0 to 2147483647/**0**/1/nl]	
2002	TH:WASTE:R:FULL	Software Count : Right Ink Collection Unit
	Use this SP to set the threshold value of the firmware counter to trigger the full alert for the right ink collection tank sensor. [0 to 2147483647/**0**/1/nl]	
2003	TH:WASTE:L:NEAR	Software Count : Left Ink Collection Unit
	Use this SP to set the threshold value of the firmware counter to trigger the full alert for the left ink collection tank sensor. [0 to 2147483647/**0**/1/nl]	
2004	TH:WASTE:L:FULL	Software Count: Left Ink Collection Unit
	Use this SP to set the threshold value of the firmware counter to trigger the full alert for the left ink collection tank sensor. [0 to 2147483647/**0**/1/nl]	

Set Threshold for Automatic Print Head Cleaning

2100	TH:ACL:MIST:B	Before Capping (Mist Count)
	Use this SP to set the threshold value of the mist counter that triggers automatic print head cleaning before capping at the end of a print job. [0 to 2147483647/**0**/1/nl]	
2101	TH:ACL:MIST:B	During Printing

	Use this SP to set the threshold value of the mist counter that triggers automatic print head cleaning between pages during a print job. [0 to 2147483647/**0**/1/nl]	
2102	TH:ACL:FEED	Before Capping (Paper Dust Count)
	Use this SP to set the threshold value of the paper dust counter that triggers automatic print head cleaning before capping at the end of a print job. [0 to 65535/**0**/1/Pages]	
2103	TH:ACL:AL:T1H1	Idle Time (1 Hour): Humidity Step 1
2104	TH:ACL:AL:T1H2	Idle Time (1 Hour): Humidity Step 2
2105	TH:ACL:AL:T1H3	Idle Time (1 Hour): Humidity Step 3
2106	TH:ACL:AL:T1H4	Idle Time (1 Hour): Humidity Step 4
	Use this SP to set the threshold value for the de-capping time for automatic print head cleaning done before the start of printing. [0 to 65535/**0**/1/sec.]	
2107	TH:ACL:AL:T2H1	Idle Time (2 Hours): Humidity Step 1
2108	TH:ACL:AL:T2H2	Idle Time (2 Hours): Humidity Step 2
2109	TH:ACL:AL:T2H3	Idle Time (2 Hours): Humidity Step 3
2110	TH:ACL:AL:T2H4	Idle Time (2 Hours): Humidity Step 4
	Use this SP to set the threshold value for the de-capping time for automatic print head cleaning done before the start of printing. [0 to 65535/**0**/1/sec.]	

Set Threshold Idle Time for Maintenance Alarm

2111	TH:ALM:TM1	Time 1: 20 Hours
2112	TH:ALM:TM2	Time 2: 7 Days
2113	TH:ALM:TM3	Time 3: 1 Month
2114	TH:ALM:TM4	Time 4: 3 Months

	Use this SP to set the threshold time for the printer to remain idle for maintenance to execute before the start of a print job. (Default: 7 Days). These threshold values are related to SP2115 to 2118. [0 to 65535/**0**/1/sec.] **Note**: These SP codes are still under development and will be used in the future but at the present time changing these settings has no effect on the J007/J010 and J011.

Set Maintenance Method

2115	TH:ALM:MNT1	After Time 1 Alarm (SP2111): Venting
2116	TH:ALM:MNT2	After Time 2 Alarm (SP2112): Cleaning
2117	TH:ALM:MNT3	After Time 3 Alarm (SP2113): Cleaning *1
2118	TH:ALM:MNT4	After Time 4 Alarm (SP2114): Cleaning *2
	Use this SP to select the type of maintenance that will be executed before the first print job begins after the idle time threshold has elapsed. *1 Air venting/filling is done if Bit 1 of SW8-3 is ON. *2 Print head refreshing (flushing) is done if Bit 2 of SW8-3 is ON. [0 to 65535/**0**/1/hours.] **Note:** • These SP codes are still under development and will be used in the future. But at the present time changing these settings has no effect on the J007/J010 and J011.	

Set Threshold for Venting During Printing

2200	TH:PRG:HUM11	35% Humidity
2201	TH:PRG:HUM12	65% Humidity
	Use this SP to set the threshold value in the humidity table switches to the table for air venting during printing. • SP2200: Looks up the low humidity table (35%). • SP2201: Looks up the high humidity table (65%). [0 to 100/**0**/1/°C.]	

Group 3000

Adjust Printhead Gap for dpi

3000	GAP:300:H1:G:F	Print Head 1: 300 dpi: 1st Pass
3001	GAP:300:H1:B:F	Print Head 1: 300 dpi: 2nd Pass
3002	GAP:300:H2:B:F	Print Head 2: 200 dpi: 2nd Pass
3003	GAP:300:H3:G:F	Print Head 3: 300 dpi: 1st Pass
3004	GAP:300:H3:B:F	Print Head 3: 300 dpi: 2nd Pass
3005	GAP:300:H4:G:F	Print Head 4: 300 dpi: 1st Pass
3006	GAP:300:H4:B:F	Print Head 4: 300 dpi: 2nd Pass
	[-128 to +127/FA/1/count.]	
3007	GAP:600:H1:G:F	Print Head 1: 600 dpi: 1st Pass
3008	GAP:600:H1:B:F	Print Head 1: 600 dpi: 2nd Pass
3009	GAP:600:H2:B:F	Print Head 2: 200 dpi: 2nd Pass
3010	GAP:600:H3:G:F	Print Head 3: 600 dpi: 1st Pass
3011	GAP:600:H3:B:F	Print Head 3: 600 dpi: 2nd Pass
3012	GAP:600:H4:G:F	Print Head 4: 600 dpi: 1st Pass
3013	GAP:600:H4:B:F	Print Head 4: 600 dpi: 2nd Pass
	Use this SP to adjust the print head gap for 600 dpi printing. [-128 to +127/FA/1/count.]	
3014	GAP:1200:H1:G:F	Print Head 1: 1200 dpi: 1st Pass
3015	GAP:1200:H1:B:F	Print Head 1: 1200 dpi: 2nd Pass
3016	GAP:1200:H2:B:F	Print Head 2: 200 dpi: 2nd Pass
3017	GAP:1200:H3:G:F	Print Head 3: 1200 dpi: 1st Pass
3018	GAP:1200:H3:B:F	Print Head 3: 1200 dpi: 2nd Pass
3019	GAP:1200:H4:G:F	Print Head 4: 1200 dpi: 1st Pass

3020	GAP:1200:H4:B:F	Print Head 4: 1200 dpi: 2nd Pass
	Use this SP to adjust the print head gap for 1200 dpi printing. [-128 to +127/FA/1/count.]	

Set Print Head Rank (Wave)

3100	HRANK:H1:W	Print Head 1
3101	HRANK:H2:W	Print Head 2
3102	HRANK:H3:W	Print Head 3
3103	HRANK:H4:W	Print Head 4
	Use this SP to set the print head rank (wave rank) [0 to 7/FA/1/---]	

Set Print Head Rank (Voltage)

3104	HRANK:H1:V	Print Head 1
3105	HRANK:H2:V	Print Head 2
3106	HRANK:H3:V	Print Head 3
3107	HRANK:H4:V	Print Head 4
	Use this SP to set the print head rank (voltage rank) [0 to 7/FA/1/---]	

Set Amount for Standard Ink Coverage

3200	COVER:REG:B	Black: 319 u1
3201	COVER:REG:M	Magenta: 273 u1
3202	COVER:REG:C	Cyan: 187 u1
3203	COVER:REG:Y	Yellow: 276 u1
	Use this SP to adjust the standard amount of ink to be applied for full coverage areas. (Items in parentheses show the default values).	

	[0 to 65535/0/1/um]

Group 4000

Not used.

Group 5000

Reset and Restoration Settings

5000	RST:FACT	Restore Factory Default Setting
	Resets and threshold settings and user adjusted values.	
5001	RST:INIT CNT:F	Reset Initial Tank Fill Count to Manufacturing Operation Count
	Resets the initial fill counter to the initial factory setting (-2).	
5002	RST:INIT CNT:A	Reset Initial Tank Fill Count to Factory Shipping
	Resets the initial fill counter to the initial factory setting before shipping (-1).	
5003	RST:WASTE:R	Reset Ink Collection Count/Flag: Right Ink Collection Unit
	Resets the ink flag and ink counter for the right ink collection tank.	
5004	RST:WASTE:L	Reset Ink Collection Count/Flag: Left Ink Collection Unit
	Resets the ink counter for the left ink collection tank.	

Firmware Upload, Download

5005	NV:DOWNLOAD	Download Printer Firmware : Computer → Printer
	Downloads the firmware data from a PC to the NVRAM (EEPROM) in the printer.	
5006	NV:UPLOAD	Upload Printer Firmware: Printer → Computer
	Uploads the firmware data from the NVRAM (EEPROM) in the printer to a PC.	

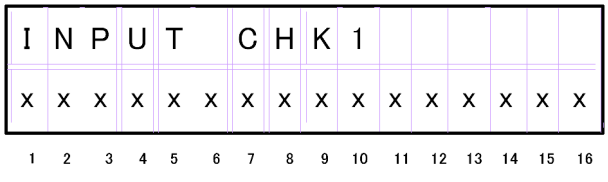
Maintenance, Replacement

5007	WASHING	Execute Auto Washing
	Executes the automatic flushing procedure.	
5100	PURGE:MAINTE	Purge Maintenance: Right Vent
	Moves the carriage in order to access the right air vent for cleaning.	
5101	CARRIAGE CHANGE	Set Printer in Carriage Replace Mode
	Use this SP to reset the print head rank setting after print head replacement and to re-initialize the initial filling counter. **Carriage Replacement Flow** 1. Enter the print head rank (wave) of • Print head 1. • Print head 2. • Print head 3. • Print head 4. 2. Enter the print head rank (voltage) of • Print head 1. • Print head 2. • Print head 3. • Print head 4. **Initial Fill Counter Reset** 1. Turn the printer off. 2. After executing this menu, turn the printer on to start initial filling of the print head tanks. 3. After executing this menu, the carriage adjustment mode can be executed.	
5102	CARRIAGE ADJUST	Set Printer n Carriage Adjust Mode
	Use this SP to adjust the print head gap after print head replacement and print the Nozzle Check pattern. **Carriage Adjustment Mode Flow** Before executing this menu, you must execute the carriage replacement mode. 1. Print the print head gap adjustment chart (High Speed). 2. Adjust the gap (High Speed). 3. Print the print head gap adjustment chart (High Speed).	

	4. Print the print head gap adjustment chart (Std. (Speed Priority). Std. (Quality Priority)). 5. Adjust the gap (Std. (Quality Priority, Std. (Speed Priority)). 6. Print the print head gap adjustment chart (Std. (Speed Priority). Std. (Quality Priority)). 7. Print the print head gap adjustment chart (High Quality). 8. Adjust the gap (High Quality). 9. Print the print head gap adjustment chart (High Quality). 10. Print the Nozzle Check test pattern.	
5200	PRINT SMC	Print an Engine Maintenance Summary
	Use this SP to print an engine maintenance summary. You need at least 8 sheets of paper to do this print. It will take at least 3 minutes before the print will start.	
5300	DUMMY NUMBER	Set a Dummy Number
	Use this SP to set the dummy number. Operation Panel Flow	

Input Check: Sensors 1/2

5400	INPUT CHK1	Check Input Sensors (1)
	Use this SP to display the on/off status of each sensor. The status of each sensor (O, X) is displayed on the 2nd line of the display.	

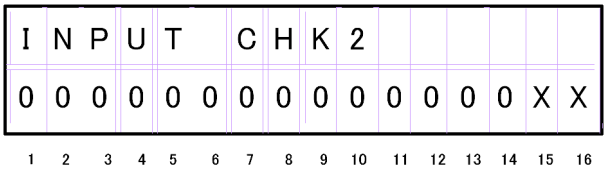


No.	Meaning	No.	Meaning
1	Ink Cartridge Set Switches	9	PFU Set Sensor
2	Maintenance HP Sensor	10	PFU Relay Sensor
3	Ink Collection Tank Sensor	11	Duplexer Cover Sensor
4	Carriage Position Sensor	12	Duplexer Set Sensor
5	Not Used	13	Trailing Edge Sensor
6	Paper End Sensor – Tray 2	14	Registration Sensor 1

No.	Meaning	No.	Meaning
7	Paper End Sensor – Tray 1	15	Registration Sensor 2
8	Bypass Tray Set Sensor	16	Right Front Cover Sensor

Input Check: Sensors 2/2

5401	INPUT CHK2	Check Input Sensors (2)
	Use this SP to display the on/off status of each sensor. The status of each sensor (O, X) is displayed on the 2nd line of the display.	



No.	Meaning
1	NIC Detection Sensor
2	USB Connection Sensor

Input Check: Temperature and Humidity

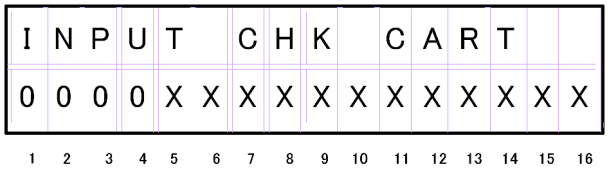
5402	INPUT CHK HTEMP	Display Print Head Temperature
	Displays the temperature reading of the print head temperature sensor. Units: 0.1°C	
5403	INPUT CHK HUTMP	Display Temperature/Humidity Sensor Reading: Temperature
	Use this SP to display the temperature reading of temperature/humidity sensor. Units: 0.1°C	
5404	INPUT CHK HUM1	Display Temperature/Humidity Sensor Reading: Humidity
	Use this SP to display the humidity reading of temperature/humidity sensor. Units: 0.1%	

Input Check: Air

5405	INPUT CHK AIR1	Tank 1: Analog
	Use this SP to display the analog reading of the air sensor in print head tank 1.	
5406	INPUT CHK AIR2	Tank 2: Analog
	Use this SP to display the analog reading of the air sensor in print head tank 2.	
5407	INPUT CHK AIR3	Tank 3: Analog
	Use this SP to display the analog reading of the air sensor in print head tank 3.	
5408	INPUT CHK AIR4	Tank 4: Analog
	Use this SP to display the analog reading of the air sensor in print head tank 4.	
5409	INPUT CHK AIR5	Tank 5: Analog
	Use this SP to display the analog reading of the air sensor in print head tank 5.	
5410	INPUT CHK AIR6	Tank 6: Analog
	Use this SP to display the analog reading of the air sensor in print head tank 6.	

Input Check: Ink Cartridge Set Sensors

5411	INPUT CHK CART	Display Status of Ink Cartridge Set Sensors
	Use this SP to display the status of the cartridge set sensor. The status of each sensor is assigned to a column in the 2nd line of the operation panel display as shown below.	



No.	Meaning	No.	Meaning
1 to 4	Not Used	11	Cyan Ink Cartridge: Re-Fill
5	Yellow Ink Cartridge: Re-Fill	12	Cyan Ink Cartridge: Brand New

No.	Meaning	No.	Meaning
6	Yellow Ink Cartridge: Brand New	13	Cyan Ink Cartridge: Set Sensor
7	Yellow Ink Cartridge: Set	14	Black Ink Cartridge: Re-Fill
8	Magenta Ink Cartridge: Re-Fill	15	Black Ink Cartridge: Brand New
9	Magenta Ink Cartridge: Brand New	16	Black Ink Cartridge: Set Sensor
10	Magenta Ink Cartridge: Set		

Input Check: Ink Cartridge Levels

5412	INPUT CHK RES:Y	Yellow Ink Cartridge
5413	NPUT CHK RES:M	Magenta Ink Cartridge
5414	NPUT CHK RES:C	Cyan Ink Cartridge
5415	NPUT CHK RES:K	Black Ink Cartridge
	Use this SP to display the amount of ink that remains in each ink cartridge. Units: %	

Input Check: Ink Collection Unit Sensor

5416	INPUT CHK WASTE	Current Analog Reading
	Use this SP to display the analog reading of the ink collection tank sensor.	

Encoder Readings

5417	INPUT CHK MENC	Horizontal Encoder
	Use this SP to display the current reading of the main scan encoder.	
5418	INPUT CHK SENC	Vertical Encoder
	Use this SP to display the current reading of the sub scan encoder.	

Board Temperature Sensors

5419	INPUT CHK PTEMP	PSU Ambient Temperature Sensor
	Displays the temperature reading of the PSU ambient temperature sensor. Note: At present nothing displays because there is no temperature sensor in the PSU. Units: 0.1°C	
5420	INPUT CHK DTEMP	Drive Board Temperature Sensor
	Displays the temperature reading of the temperature sensor in the DRV board circuits. Units: 0.1°C	

Group 6000

Not Used

Group 7000

Display Charge Count

7000	CHG CNT:S:P:M	Single Counter: Monochrome Application
7001	CHG CNT:S:P:L	Single Counter: Multi-Level Color Application
7002	CHG CNT:S:P:C	Single Counter: Color Application
7003	CHG CNT:W:P:M	Double Counter: Monochrome Application
7004	CHG CNT:W:P:L	Double Counter: Multi-Level Color Application
7005	CHG CNT:W:P:C	Double Counter: Color Application
	Use this sensor to display the charge counts.	

Display Coverage Count

7006	COVER CNT:P:M	Monochrome Application
7007	COVER CNT:P:L	DColor Application

7008	COVER CNT:P:C	Multi-Level Color Application
	Use this sensor to display the charge counts.	

Display User Cleaning Count

7100	USER CL CNT:H1	Print Head 1
7101	USER CL CNT:H2	Print Head 2
7102	USER CL CNT:H3	Print Head 3
7103	USER CL CNT:H4	Print Head 4
	Use this SP to display the total number of print head cleanings executed from the printer driver and from the printer operation panel.	

Display User Refreshing Count

7104	USER RF CNT:H1	Print Head 1
7105	USER RF CNT:H2	Print Head 2
7106	USER RF CNT:H3	Print Head 3
7107	USER RF CNT:H4	Print Head 4
	Use this SP to display the total number of print head flushings executed from the printer driver and from the printer operation panel.	

Display Count: Air Purges/Re-fillings After SC990

7108	AOFL CNT:S:H1	Print Head 1
7109	AOFL CNT:S:H2	Print Head 2
7110	AOFL CNT:S:H3	Print Head 3
7111	AOFL CNT:S:H4	Print Head 4
	Use this SP to display the number of air purge/ink tank re-fillings after SC990 has occurred.	

Display Count: Air Purges/Re-fillings After Ink End

7112	AOFL CNT:I:H1	Print Head 1
7113	AOFL CNT:I:H2	Print Head 2
7114	AOFL CNT:I:H3	Print Head 3
7115	AOFL CNT:I:H4	Print Head 4
	Use this SP to display the number of air purge/ink tank re-fillings after an ink tank has run out of ink.	

Display Count: Air Purges/Re-Fillings After Air Detected

7116	AOFL CNT:A:H1	Print Head 1
7117	AOFL CNT:A:H2	Print Head 2
7118	AOFL CNT:A:H3	Print Head 3
7119	AOFL CNT:A:H4	Print Head 4
	Use this SP to display the number of air purge/ink tank re-fillings after the air sensor detected air in a print head ink tank.	

Display Count: Air Detected at Power On

7120	AIR CNT:P:T1	Print Head 1
7121	AIR CNT:P:T2	Print Head 2
7122	AIR CNT:P:T3	Print Head 3
7123	AIR CNT:P:T4	Print Head 4
7124	AIR CNT:P:T5	Print Head 5
7125	AIR CNT:P:T6	Print Head 6
	Use this SP to display the number of times air was detected by the air sensor a print head tank at power on.	

Display Count: Air Detected Before Capping, Between Pages, or When Ink Cartridge Replaced

7126	AIR CNT:BPC:T1	Print Head Tank 1
7127	AIR CNT:BPC:T2	Print Head Tank 2
7128	AIR CNT:BPC:T3	Print Head Tank 3
7129	AIR CNT:BPC:T4	Print Head Tank 4
7130	AIR CNT:BPC:T5	Print Head Tank 5
7131	AIR CNT:BPC:T6	Print Head Tank 6
	Use this SP to display the number of times the air sensor detected air in an an ink tank (1) re-filling before capping at the end of a print job, (2) re-filling between pages, (3) after replacing and ink cartridge.	

Display Count: Air Detected in Print Head Tank After During Maintenance After Purge

7132	AIR CNT:A:T1	Print Head Tank 1
7133	AIR CNT:A:T2	Print Head Tank 2
7134	AIR CNT:A:T3	Print Head Tank 3
7135	AIR CNT:A:T4	Print Head Tank 4
7136	AIR CNT:A:T5	Print Head Tank 5
7137	AIR CNT:A:T6	Print Head Tank 6
	Use this SP to display the number of times air was detected by the air sensor in a print head tank during automatic print head maintenance triggered by the printer remaining idle.	

Display Count: Automatic Cleanings Between Page Prints

7138	ACL CNT:P:H1	Print Head 1
7139	ACL CNT:P:H2	Print Head 2
7140	ACL CNT:P:H3	Print Head 3
7141	ACL CNT:P:H4	Print Head 4

	Use this SP to display the number of automatic print head cleanings between page prints while print jobs were executing.

Display Count: Automatic Cleanings Before Print Head Capping

7142	ACL CNT:B:H1	Print Head 1
7143	ACL CNT:B:H2	Print Head 2
7144	ACL CNT:B:H3	Print Head 3
7145	ACL CNT:B:H4	Print Head 4
	Use this SP to display the number of automatic print head cleanings before print head capping.	

Display Count: Automatic Cleanings After Printer Has Remained Idle

7146	ACL CNT:B:H1	Idle Time 1
7147	ACL CNT:B:H2	Idle Time 2
7148	ACL CNT:B:H3	Idle Time 3
7149	ACL CNT:B:H4	Idle Time 4
	Use this SP to display the number of automatic print head cleanings triggered by automatic maintenance after the printer remained idle longer than the specified threshold time.	

Display Count: Maintenance Operations After Printer Idle

7150	AMNT CNT:TM1	Idle Time 1
7151	AMNT CNT:TM2	Idle Time 2
7152	AMNT CNT:TM3	Idle Time 3
7153	AMNT CNT:TM4	Idle Time 4
	Use this SP to display the number of times maintenance executed automatically.	

Display Count: Total Ink Cartridge Out

7154	EMPTY CNT:C1	Ink Cartridge 1
7155	EMPTY CNT:C2	Ink Cartridge 2
7156	EMPTY CNT:C3	Ink Cartridge 3
7157	EMPTY CNT:C4	Ink Cartridge 4
	Use this SP to display the number of times that each ink cartridge has become empty.	

Display Count: Ink Cartridge Out (Equal or More Than Guaranteed Service Life)

7158	END CNT:C1	Ink Cartridge 1
7159	END CNT:C2	Ink Cartridge 2
7160	END CNT:C3	Ink Cartridge 3
7161	END CNT:C4	Ink Cartridge 4
	Use this SP to display the number of times that each ink cartridge equaled or surpassed the guaranteed service life of the cartridge.	

Display Software Count: Near End for Ink Collection Unit

7200	WASTE CNT:R:NEAR	Right Ink Collection Unit
	Use this SP to display the current software count for the left ink collection tank. Units: ml The near-end thresholds for the printers are: • J011: 528 ml (528000000nl) • J007/J010: 413 ml (413000000nl)	

Display Count: Tank Full: Ink Collection Unit

7201	WASTE CNT:R:FULL	Right Ink Collection Unit
	Use this SP to display the current count for the number of times the status of the right ink collection tank has changed from near-full to full.	

	Units: ml The full thresholds for the printers are: • J011: 11 ml (1100 0000 nl) • J007/J010: 3 ml (3000 000 nl)

Display Count: Tank Full: Ink Collection Unit

7202	WASTE CNT:L:FULL	Left Ink Collection Unit
	Use this SP to display the current count for the number of times the status of the left ink collection tank has changed from near-full to full. Units: ml The near-full, full thresholds for the printers are as follows: **Near Full** • J011: 211 ml (2100 0000 nl) • J007/J010: 80 ml (8000 000 nl) **Full** • J011: 233 ml (2330 00000 nl) • J007/J010: 100 ml (1000 00000 nl)	

Display Count: Swing Plate Contacts With Carriage

7203	SWNG PLATE CNT	Left Ink Collection Unit

Display Count: Mist Counter for Automatic Cleaning

7204	MIST CNT:T1	Print Head Tank 1
7205	MIST CNT:T2	Print Head Tank 2
7206	MIST CNT:T3	Print Head Tank 3
7207	MIST CNT:T4	Print Head Tank 4
7208	MIST CNT:T5	Print Head Tank 5
7209	MIST CNT:T6	Print Head Tank 6

	Use this SP to display the number of times that the swing plate of the left ink collection tank has made contact with the carriage.

Display Count: Paper Dust Counter for Automatic Cleaning

7210	FEED:CNT:H1	Print Head Tank 1
7211	FEED:CNT:H2	Print Head Tank 2
7212	FEED:CNT:H3	Print Head Tank 3
7213	FEED:CNT:H4	Print Head Tank 4
	Use this SP to display the current reading of the ink mist counter that determines when to execute automatic cleaning.	

Display Count: Cap Off Time for Automatic Print Head Cleaning

7214	DECAP TIME	Print Head Tank 1
	Use this SP to display the de-capping time used to determine whether automatic cleaning is executed after the printer returns from idle mode.	

Display Humidity Reading Before Automatic Print Head Cleaning

7215	HUMI:ACL:AL	
	Use this SP to display the temperature reading before capping operation used to determine whether automatic print head cleaning is done after the printer returns from idle mode.	

Display Count: Ink Cartridge Replacements

7300	CART CHG CNT:K	K (Black)
7301	CART CHG CNT:C	C (Cyan)
7302	CART CHG CNT:M	M (Magenta)
7303	CART CHG CNT:Y	Y (Yellow)
	Use this SP to display the number of times the carriage has been replaced.	

Display Date of Ink Collection Unit Replacement

7400	WASTE:DATE	YY:MM:DD
	Use this SP to displayt the date the ink collection tanks were replaced. Date Standard: 2000	

Display Standby Time

7401	PWAIT:DATE	YY:MM:DD
	Display the total time the printer has remained in standby mode. Date Standard: 2000	

Display Operation Start Date

7402	START:DATE	YY:MM:DD
	Display the total time the printer has remained in full operation. Date Standard: 2000	

Display SC Code Log

7403	SC CODE1	Log 1: Previous
7404	SC CODE2	Log 2: Previous -1
7405	SC CODE3	Log 3: Previous -2
7406	SC CODE4	Log 4: Previous -3
7407	SC CODE5	Log 5: Previous -4
	Use this SP to display the SC code history. • The occurrences of SC codes are stored in the order 1, 2, 3, 4, 5. • Duplicate occurrences of SC codes are not recorded (each SC code recorded only once).	

Display Jam Log

7408	JAM CODE1	Log 1: Previous
7409	JAM CODE2	Log 2: Previous -1
7410	JAM CODE3	Log 3: Previous -2
7411	JAM CODE4	Log 4: Previous -3
7412	JAM CODE5	Log 5: Previous -4
	Use this SP to display the jam code history. The occurrences of jam codes are stored in the order 1, 2, 3, 4, 5.	

Display Total Count: Jam Log

7413	JAM COUNT1	Log 1: Previous
7414	JAM COUNT2	Log 2: Previous -1
7415	JAM COUNT3	Log 3: Previous -2
7416	JAM COUNT4	Log 4: Previous -3
7417	JAM COUNT5	Log 5: Previous -4
	Use this SP to display the number of times jam codes have been issued. The occurrences of jam codes are stored in the order 1, 2, 3, 4, 5.	

Display Total Count: Jam Log

7418	FILL PROGRESS1	Log 1: Previous
7419	FILL PROGRESS2	Log 2: Previous -1
7420	FILL PROGRESS3	Log 3: Previous -2
7421	FILL PROGRESS4	Log 4: Previous -3
	Use this SP to display the number of times initial tank filling has been performed.	

Display Maintenance Log

7422	LAST MNT:TM1	Log 1: Previous
7423	LAST MNT:TM2	Log 2: Previous -1
7424	LAST MNT:TM3	Log 3: Previous -2
	Use this SP the total time for all maintenance executions.	

Display Maintenance Log: By Type of Maintenance

7425	LAST MAINTE1	Log 1: Previous
7426	LAST MAINTE2	Log 2: Previous -1
7427	LAST MAINTE3	Log 3: Previous -2
	Use this SP to display the types of maintenance executed. The types of maintenance are number coded as shown below: 1 Maintenance a power on 6 Maintenance idle operation 7 Auto print head cleaning after ilde time elapsed 8 Maintenance air detection 9 Ink tank filling before maintenance page 10 Ink tank filling between maintenance pages 11 Ink tank filling before maintenance capping 12 Maintenance cartridge replacement 13 Cleaning between maintenance pages 14 Cleanings before maintenance capping 15 Maintenance manual cleaning 16 Maintenance manual flushing	

Display Maintenance Log: Total Count

7428	LAST MNT CNT1	Log 1: Previous
7429	LAST MNT CNT2	Log 2: Previous -1

7430	LAST MNT CNT3	Log 3: Previous -2
	Use this SP to display the total count for all maintenance executions.	

Display Near Full Flag: Right Ink Collection Unit

7431	WASTE NEAR FLG	
	Use this SP to display the near-full flag of the right ink collection tank.	

Display Position of Tank Full Feeler for Each Print Head Tank After Air Purge

7500	INIT POS:T1	Print Head Tank 1
7501	INIT POS:T2	Print Head Tank 2
7502	INIT POS:T3	Print Head Tank 3
7503	INIT POS:T4	Print Head Tank 4
7504	INIT POS:T5	Print Head Tank 5
7505	INIT POS:T6	Print Head Tank 6
	Use this SP to display the detected position of the print head tank full sensor at air venting/ink filling.	

Display Normal Position for Detection of Full Print Head Tank

7506	FULL POS:T1	Print Head Tank 1
7507	FULL POS:T2	Print Head Tank 2
7508	FULL POS:T3	Print Head Tank 3
7509	FULL POS:T4	Print Head Tank 4
7510	FULL POS:T5	Print Head Tank 5
7511	FULL POS:T6	Print Head Tank 6
	Use this SP to display the usual position of the print tank full sensor when the ink tank is filled	

Display Count: Number of Manual Printhead Cleanings

7512	DCL CNT:H1	Print Head 1
7513	DCL CNT:H2	Print Head 2
7514	DCL CNT:H3	Print Head 3
7515	DCL CNT:H4	Print Head 4
	Use this SP to display the number of automatic print head cleanings done during printing	

Display Count: Ink Supply Time Up

7516	PTMOUT:CNT:T1	Print Head Tank 1
7517	PTMOUT:CNT:T2	Print Head Tank 2
7518	PTMOUT:CNT:T3	Print Head Tank 3
7519	PTMOUT:CNT:T4	Print Head Tank 4
7520	PTMOUT:CNT:T5	Print Head Tank 5
7521	PTMOUT:CNT:T6	Print Head Tank 6
	Use this SP to display the number of times near-end/end was detected by timeup while ink was being supplied to the ink tanks.	

Display Count: Automatic Print Head Cleanings (After De-Cap Time Elapsed)

7522	ACL:CNT:D:H1	Print Head 1
7523	ACL:CNT:D:H2	Print Head 2
7524	ACL:CNT:D:H3	Print Head 3
7525	ACL:CNT:D:H4	Print Head 4
	Use this SP to display the number of times the automatic print head cleaning executed triggered by time exceeded the threshold set for the de-capping time.	

Display Count: Maintenance Cleanings of Right Vent

7526	PMT:CNT	Right Vent Purges
	Use this SP to display the number of times the right air vent was cleaned during maintenance.	

Display Count: Detections of Air Present Before Maintenance Cleanings

7527	PMT CNT:A:T1	Print Head Tank 1
7528	PMT CNT:A:T2	Print Head Tank 2
7529	PMT CNT:A:T3	Print Head Tank 3
7530	PMT CNT:A:T4	Print Head Tank 4
7531	PMT CNT:A:T5	Print Head Tank 5
7532	PMT CNT:A:T6	Print Head Tank 6
	Use this SP to display the number of times air was detected during maintenance cleaning of the right ink suction vent.	

Bit Switches

Soft bit switches are used to do some basic function settings that determine how the printer operates. This section describes the functions of these bit switches.

Changing Bit Switch Settings

1. **Push and hold down ▼ and ▲ for 3 sec. then release to enter the SP mode.**
2. **Push [#Enter].**
3. **Select "Engine Mainte."**
4. **When you see "SP No. 1000", select "5301" then push [#Enter].**
5. **When you see "ENGINE SW" push [#Enter].**

   ENG SW #1 00001000
   bit0 _

   - Reading from left to right, the digits represents Bit 7 to 0.
   - "1" switches a bit ON and "0" sets a bit OFF.
   - The second line of the display contains the cursor. This tells you which bit is currently active for selection.
   - Push [Escape] at any time if you want to return to the previous level.
6. **Push ▼ or ▲ to position the cursor under the digit of the bit switch that you want to change.**
7. **Push ▼ or ▲ to display "1" or "0".**
8. **Push [#Enter] to enable the setting.**
9. **Push [Escape] until the display returns to "ENGINE MAINTE."**
10. **Select "3. END" and press [#Enter] to leave the SP mode.**

Bit Switch Summary

Bit SW 1: Drive Cleaning

Bit	Meaning	Setting		Default	Details
		0	1		
0	Print Head Cap Control	OFF	ON	1	Do not change this setting.

Bit	Meaning	Setting		Default	Details
		0	1		
1	Drive Cleaning Control	OFF	ON	0	After setting to "1" returns to "0" immediately after drive cleaning is finished.
2	Reserved				Do not change this setting.
3	Ink Supply Pump Long Term Unused	OFF	ON	1	
4	Not Used				
5	Not Used				
6	Not Used				
7	Not Used				

Bit SW 1 is used to perform drive cleaning. Drive cleaning should be performed by the service technician after head cleaning and head flushing (done with either the operation panel or the printer driver) fail to clean the print heads successfully. For more detailed instructions about how to do this, please refer to "Drive Cleaning" at the end of "Image Correction" in Section "4. Troubleshooting".

Bit SW 2. Not used. Do not change these settings.

Bit SW 3 Emulation

Bit	Function	Setting		Default	Details
		0	1		
0	Not Used				
1	Not Used				
2	PCL5e/5c	OFF	ON	0	Makes the printer compatible with old HP PCL printer drivers (HP4000, HP8000, etc.)
3	Not Used				
4	Not Used				
5	Not Used				
6	Not Used				

Bit	Function	Setting		Default	Details
		0	1		
7	Not Used				

Bit SW 4. Not used. Do not change these settings.

Bit SW 5. Functions Common to All Models

Bit	Function	Setting		Default	Details
		0	1		
0	Not Used				
1	Counter menu display for charge on printer use, printing enabled after coverage counted up.	OFF	ON	0	This is a GW specification. 0: Does not print. 1: Prints
2	Error skip.	All	PPC only	0	Switches error skip on/off 0: Errors skipped regardless of paper size, paper type. 1: Error skipped only for PPC.
3	Not Used				
4	Not Used				
5	Counter Display	OFF	ON	0	Switches the counter display on/off. 0: Counter not displayed. 1: Counter is displayed
6	Color Level Display	OFF	ON	0	Switches the color lever display on/off. 0: Color level not displayed 1: Color level displays
7	Not Used				

Bit SW 6. Enable Functions for Individual Printer Models

Bit	Function	Setting		Default	Details
		0	1		
0	Humidity Sensor Check	OFF	ON	1	This switch determines whether the humidity sensor is checked after power on and before the ink tanks are filled. OFF: Check is not done. ON: Check is done If an abnormal condition is detected, this triggers SC986 and the printer will not operate (the tanks are not filled).
1	Self-Diagnostics Execute	OFF	ON	0	This switch sets whether the self-diagnostic test executes automatically if the humidity sensor connection is broken. OFF: No self-diagnostics ON: Self-diagnostics execute
2	Double-Count	OFF	ON	0	Not used for J007/J010, J011
3	Carriage Setting 2	OFF	ON	0	Not used for J007/J010, J011
4	Charge Setting	OFF	ON	0	Shows the flag to indicate updated version allows charge adjustment on the transport belt: 0: Default 1: NVRAM update succeeded, charge can be adjusted.
5	ICB Miscount Recovery	OFF	ON	0	**Japan Only** Determines whether ink collection tank count in NVRAM is corrected or not. 0: Count not corrected 1: Count corrected.
6	USB Serial Signal	0	1	0	Determines how the USB signal is fixed.

Bit	Function	Setting		Default	Details
		0	1		
					0: Serial signal is set with the value in NVRAM. 1: USB serial signal fixed at "0" (value in NVRAM is not changed).
7	Hidden Functions	0	1	0	Determines whether hidden functions (hidden paper sizes A5 SEF, B6 SEF) are displayed. 0: No A5 SEF, B6 SEF display 1: A5 SEF, B6 SEF displayed

Bit SW 7. Enable Functions for Individual Printer Models

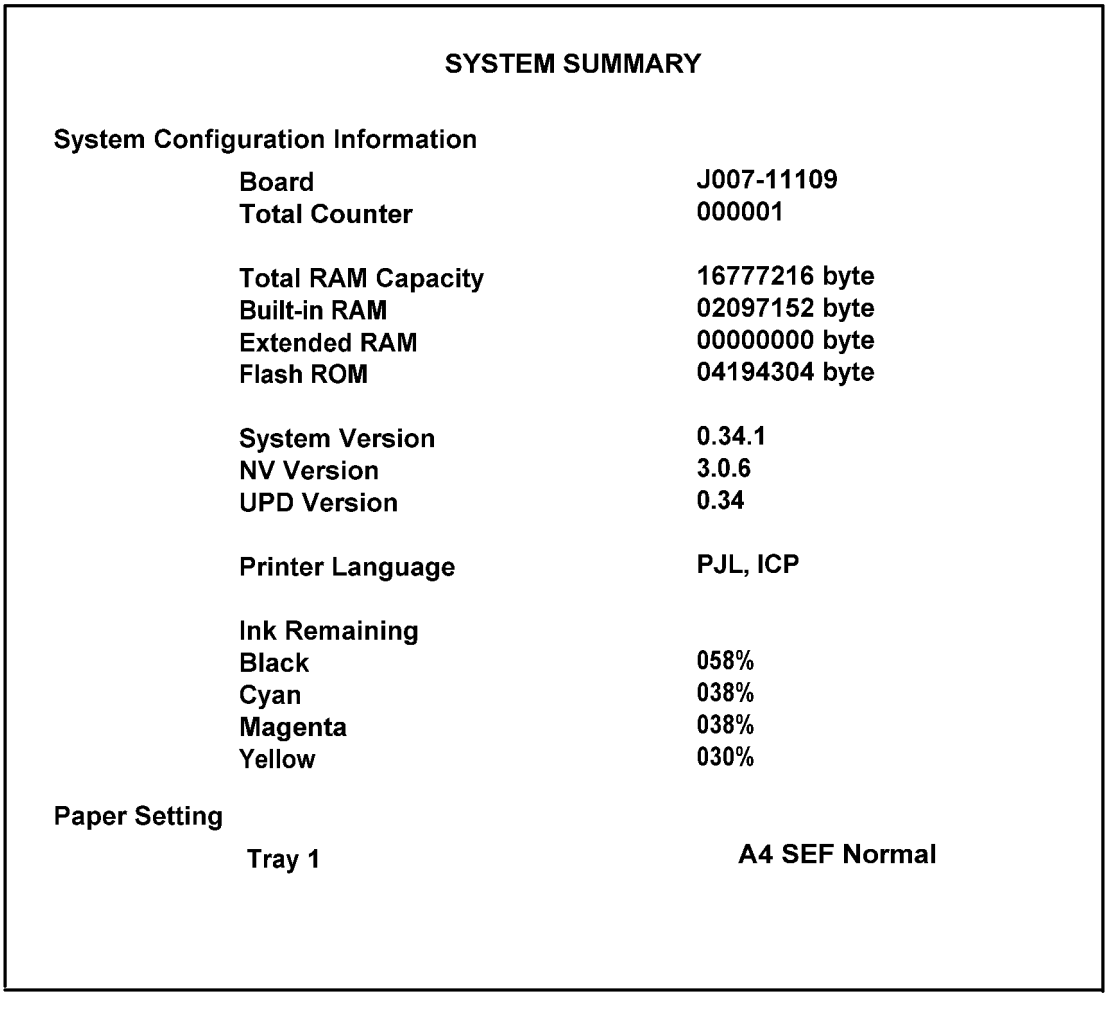
Bit SW 8: GW Bit Switch

Bit	Function	Setting		Default	Details
		0	1		
0	ID Chip	ON	OFF	0	Disables/enables the ID chips. 0: ID chips recognized 1: ID chips not recognized
1	Design Waveform Switching	OFF	ON	0	Designates waveform switch 0: For product 1: For design
2	Speed Mode Priority	OFF	ON	0	Not used for: J007/J010, J011
3	Operation Control Mode After Printer Idle	OFF	ON	0	
4	Maintenance Mode	OFF	ON	0	
5	ASKUL Paper Charge Setting	OFF	ON	0	
6	Auto Clean Disable	OFF	ON	0	
7	Auto Clean for High Paper Volume User	OFF	ON	0	

Status Reports

System Summary

The System Summary consists of one page and lists the most basic information about the configuration of the printer.



SYSTEM SUMMARY

System Configuration Information

Board	J007-11109
Total Counter	000001
Total RAM Capacity	16777216 byte
Built-in RAM	02097152 byte
Extended RAM	00000000 byte
Flash ROM	04194304 byte
System Version	0.34.1
NV Version	3.0.6
UPD Version	0.34
Printer Language	PJL, ICP
Ink Remaining	
Black	058%
Cyan	038%
Magenta	038%
Yellow	030%

Paper Setting

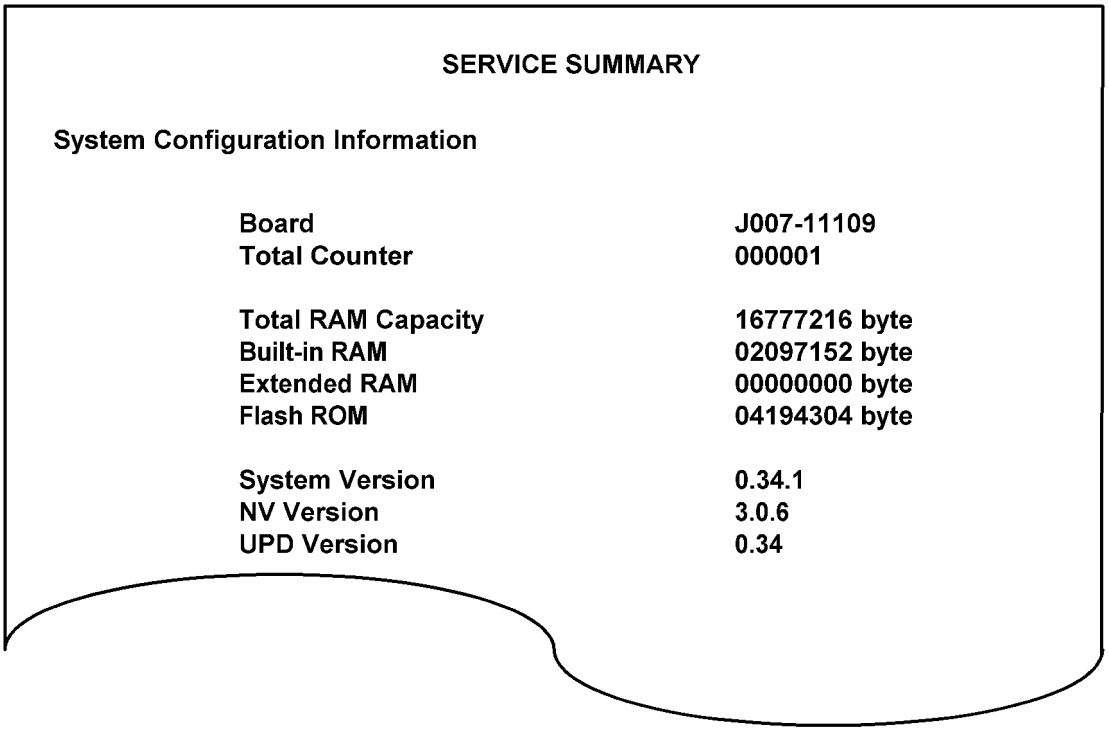
Tray 1	A4 SEF Normal

To print the System Summary:

1. Confirm that paper is loaded in the paper tray.
2. Push [Menu].
3. Push ▼ or ▲ to display "List/Test Print" and push [#Enter].
4. With "List/Test Print" displayed push [#Enter].

Service Summary

The Service Summary consists of two pages and lists the same information as the System Summary but also provides much more detail about the configuration of the printer.



SERVICE SUMMARY

System Configuration Information

Board	J007-11109
Total Counter	000001
Total RAM Capacity	16777216 byte
Built-in RAM	02097152 byte
Extended RAM	00000000 byte
Flash ROM	04194304 byte
System Version	0.34.1
NV Version	3.0.6
UPD Version	0.34

To print the Service Summary:

1. Confirm that paper is loaded in the paper tray.
2. Push [Menu].
3. Push ▼ or ▲ to display "List/Test Print" and push [#Enter].
4. Pusch ▼ or ▲ to display "Config. Page" and push [#Enter].

Engine Summary Chart

The Engine Summary Charge consists of eight pages and requires about three minutes to print. The Engine Summary Chart lists all the current SP code settings.

```
ENGINE SUMMARY CHART                                    P.x/y
MODEL          :        IPSIO XXXXXXXX
SER_NO         :        JXXX--XXXXXXXX
DUMMY NO       :        JXXX---XXXXXXXX
Firm Ver       :        XXX.XXX.XXX
SENSOR1        :        XXXXXXXXXXXXXXX
SENSOR 2       :        XXXXXXXXXXXXXXX

SP No.          Name            Value
1000            REG:FD:NORM     100
.               .               .
.               .               .
2000            FULLPOS1        23
.               .               .
.               .               .
.               .               .
.               .               .

-----<NEXT PAGE>-----
-----<END>-----
```

5

To print the Engine Summary Chart:

Do SP5200 (Print SMC).

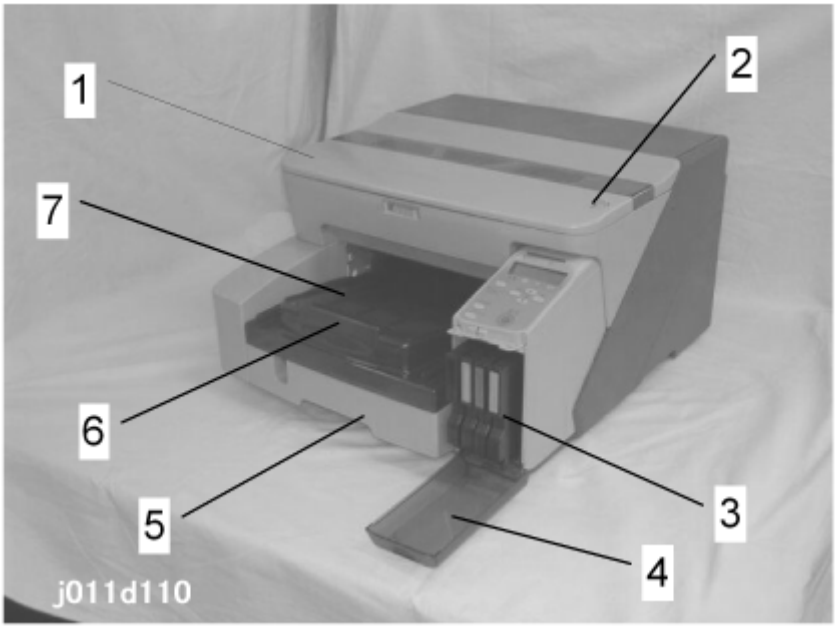
Here is a brief summary of what is listed in the Engine Summary Chart.

Heading	Meaning
ENGINE SUMMARY CHART	Title
MODEL	Number of the Printer Model
SER_NO	Printer Serial Number
Firm Ver	Version number of the firmware in the printer
SENSOR1, SENSOR2	Sensor information
SP No, Name, Value	SP number, name, value of current setting
<NEXT PAGE>	Indicates next page available
<END>	End of summary report (no pages follow)

6. Detailed Section Descriptions

Important Parts

Front View



1. **Top cover**

   Open to remove paper jams. This cover must always stay closed when the machine prints.

2. **Envelope selector**

   Push back to print on envelopes. Pull forward to print on all other types of paper.

3. **Ink cartridges**

   - Y (Yellow)
   - M (Magenta)
   - C (Cyan)
   - K (Black

4. **Right front door.**

   Open to install or replace Ink cartridges.

5. **Paper Cassette Tray (Tray 1)**

   Holds paper to feed to the printer.

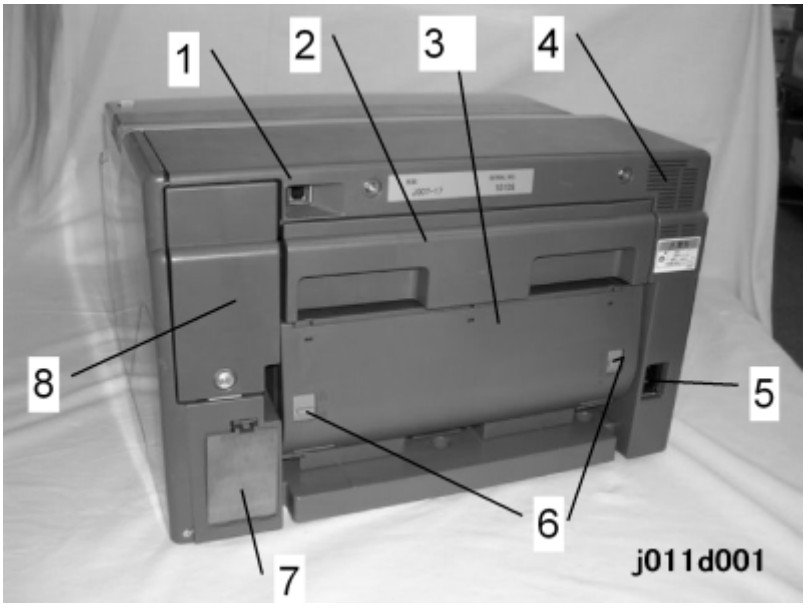
6. **Output tray extension**

Extends the output tray. Pull out this extension when you print on paper longer than A4 or LTR size paper.

7. **Output tray**

   Holds paper that has exited the printer after a print job. Pull out the output tray extension when you print on paper longer than A4 or LTR.

Rear View



1. **USB connection point**

   Connect the USB cable to the printer at this area. Connect the other end to the PC.

2. **Guide plate**

   Pull out to remove jammed paper.

3. **Duplex Unit**

   Takes paper just printed on the front side. Then it reverses the paper. Then it feeds it into the printer again. Then the paper gets printed on the backside.

4. **Ventilation port**

   A cooling fan behind this port blows hot air out of the printer to cool it. Never let this vent get blocked. Too much heat inside the printer could damage its electrical components

5. **Power connector**

   Use only the power cord provided with the printer. Make sure you ground (earth) the head of the plug at the power source.

   - The detachable power cord is provided with the EU model only.
   - The power cord of the NA model is permanently attached.

6. **Duplex unit locks**

Raise both of this tabs to release the duplex unit so it can be removed. Be sure to press them down again after reinstalling the duplex unit.

7. **Ink collection tank cover**

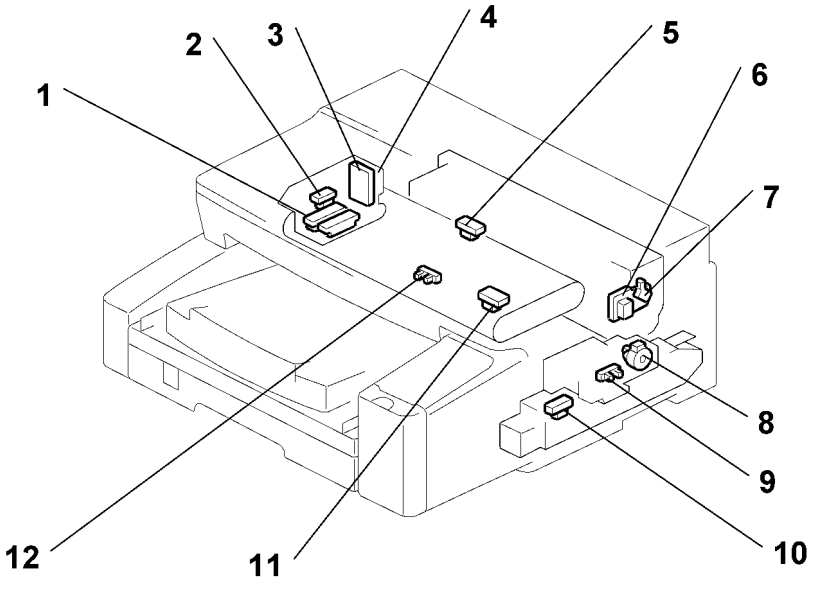
   Open and remove the ink collection tank when it needs to be replaced, or before servicing the printer.

8. **NIB cover**

   Remove this cover to access the network interface board.

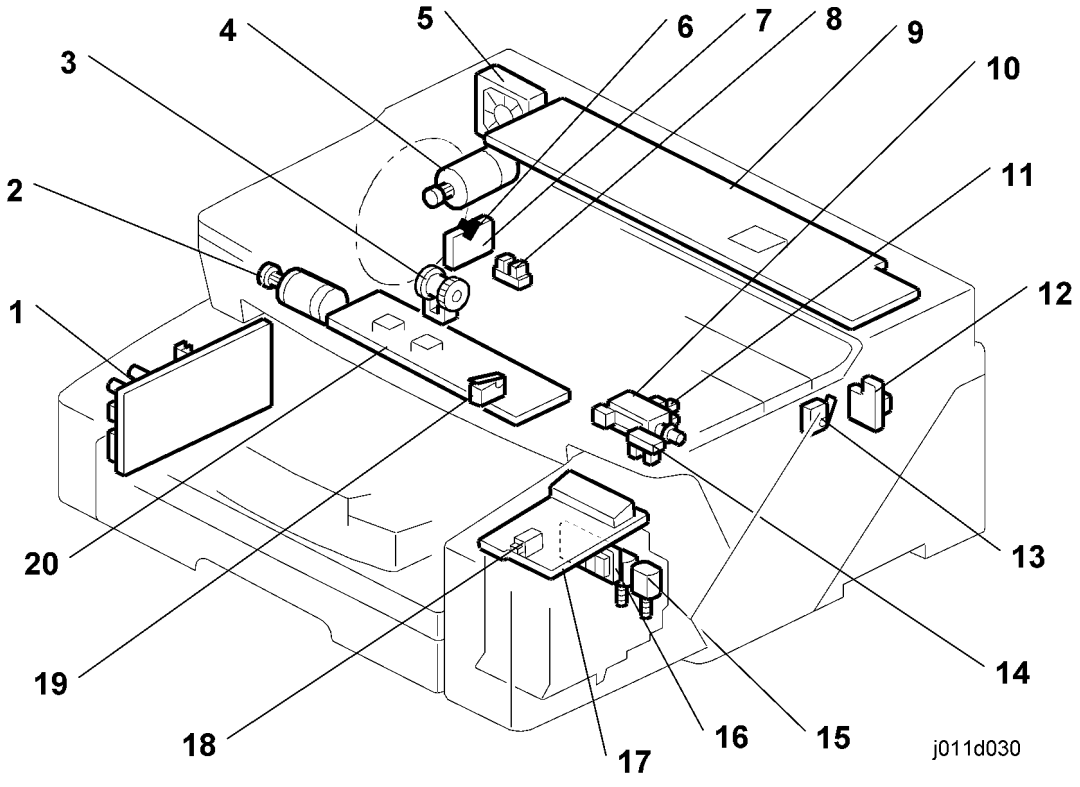
Electrical Components

Overview



j011d020

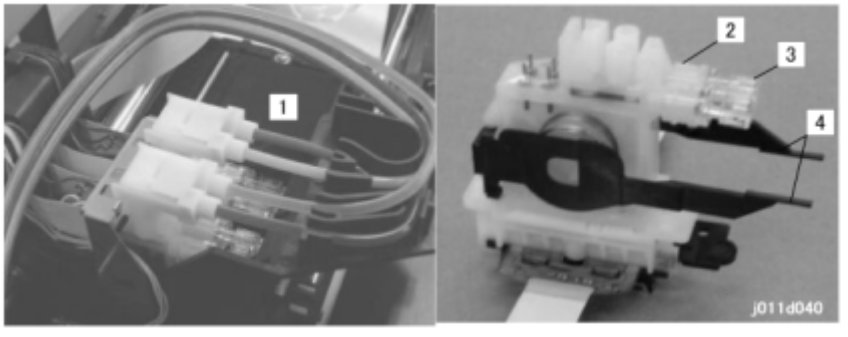
1	Print Heads	7	Duplexer Cover Switch
2	1st Registration Sensor	8	Maintenance Motor
3	HRB	9	Maintenance HP Sensor
4	Horizontal Encoder Sensor	10	Ink Collection Tank Sensor
5	2nd Registration Sensor	11	Temperature/Humidity Sensor
6	DIB	12	Paper End Sensor



1	PSU	11	Ink Level Sensor
2	Vertical Motor	12	Duplexer Detection Board
3	Paper Feed Clutch	13	Duplex Set Switch
4	Horizontal Motor	14	Carriage Position Sensor
5	Cooling Fan	15	Ink Pump Motors (x2)
6	SENC	16	CCB
7	Vertical Encoder Sensor	17	OPU
8	Trailing Edge Sensor	18	Right Front Door Switch
9	Control Board	19	Top Cover Switch
10	Air Release Solenoid	20	HVPS

Carriage Unit

Overview



1	Carriage Unit
2	Print Head Tank
3	Air Release Valve
4	Ink Level Levers

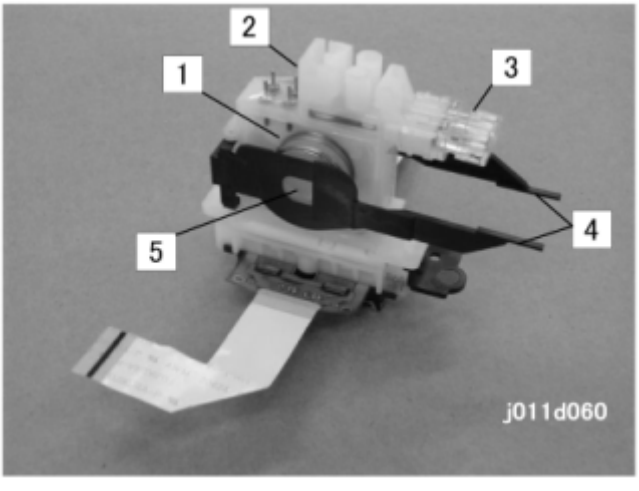
Print Head

The wide print head increases the width of the band printed with one pass. This lets the machine print faster.

Print Head Specifications

Item	J007/J010	J011
Number of Print Heads	2 (Y/M, C/K)	4 (Y, M, C, K)
Number of Nozzles	192 x 4 colors 192 nozzles x 2 lines/head	384 x 4 colors 192 nozzles x 2 lines/head
Array	Cross-Hatch (150 dpi x 2 lines)	
Voltage Element	Piezoelectric	

Print Head Tank



1	Ink Supply Port
2	Ink Reservoir
3	Air Release Valve
4	Ink Level Levers
5	Plastic Bellows

The printer employs a dual-tank system.

Each ink cartridge (Y, M, C, K) is connected to a print head tank via a plastic tube.

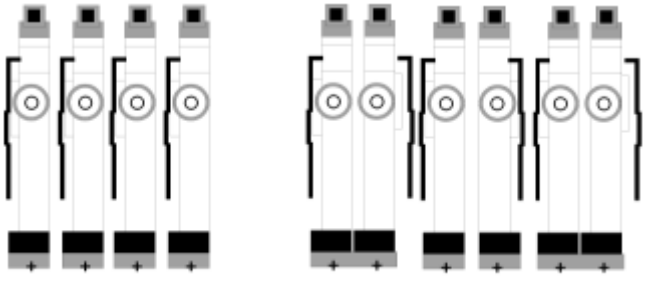
The first tank of the dual-tank system is the ink cartridge that supplies the ink through a tube to the print head tank unit. The second tank is the small ink reservoir inside the print head tank unit.

The high volume ink cartridges and the carriage components are extremely lightweight.

A print head tank has four main parts as shown above:

- **Ink supply port**. Ink enters here from the ink cartridge mounted under the operation panel.
- **Ink reservoir**. This is where ink collects before it is fed to the print head below.
- **Plastic bellows**. A spring forces out the flexible, thin plastic film on the left side of the ink tank.
- **Ink level lever**. When the ink tank is mounted in the printer, this lever pushes the bellows down to increase pressure in the ink reservoir. The ink level sensor mounted on the carriage detects the position of these arms to determine the amount of ink remaining in a tank. (The actuator spreads outward when the bellows gradually collapses as ink is consumed.)
- **Air release valve**. Purges air periodically to keep the ink inside the ink tank unit under the prescribed pressure and the amount of air in the tank low.

The basic operation of the print head tank is identical in both printer models. However, the configuration of the tanks is slightly different.



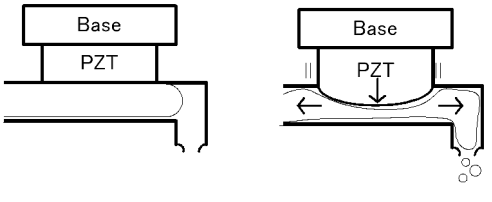
On the J007/J010 there are two combined units.

- Two print head tanks are mounted on one print head.
- Each print head tank unit feeds to its own nozzle array and (one for each color.
- Each print head tank holds 4.3 ml of ink.

On the J011 there are four independent units.

- Each print head tank has an independent print head with a nozzle array.
- Each print head tank holds 4.6 ml of ink.

Ink Ejection Device

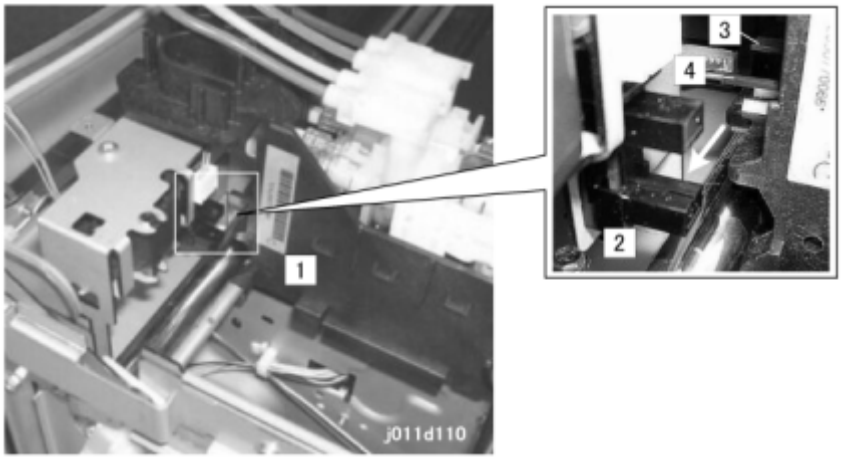


Each print head uses a piezo-electric element (PZT) . This forces ink from the ink reservoirs out of the ink nozzles and onto the paper.

This is done with pressure. At the prescribed time, an electric charge is applied to the PZT. This makes the PZT expand. The expansion of the PZT puts pressure on the ink below. This makes the ink move in both directions. The ink on the right is forced out the ejection port.

This device is unique. Other printers on the market use small heaters that form bubbles to eject ink from the ports.

Ink Near End



The printer detects ink near-end in two ways:

- The printer software maintains a count of how much ink is consumed from each cartridge and signals near-end when a cartridge is nearly empty.
- As a backup method, the ink level sensor monitors the positions of the ink level levers on the sides of the ink tanks. This is described below.

Each print head in the ink tank unit [1] has a ink level lever This lever presses against a spring loaded bellows in the center of the print head tank. The right side of each tank is constructed of flexible plastic:

- As ink enters the tank, the pressure of the ink pushes against the side of the tank and moves the lever away from the side of the print head tank.
- As ink is consumed during printing, the vacuum created by the ink leaving the tank pulls the lever toward the side of the print head tank..

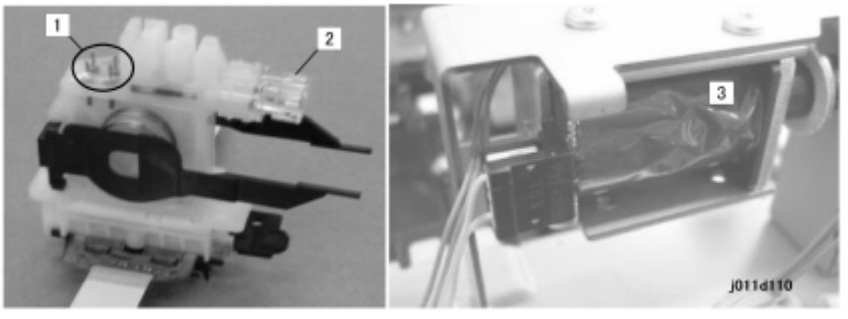
The ink level sensor [2], mounted above the front guide rail, checks the left and right positions of the ink level levers [3] and [4] every time the carriage passes.

When the ink level sensor detects that a lever is completely flat against the side of the tank, the printer sends a prescribed amount of ink to the tank from the ink cartridge.

The sensor signals the 'ink near-end' if the ink level lever does not return to the full position (away from the side of the tank) within the prescribed time after the printer requests a refill from the ink cartridge.

After the near-end alert, the printer will continue to print with the ink that remains in the partially filled tank until the printer issues the ink end alert.

Ink Out



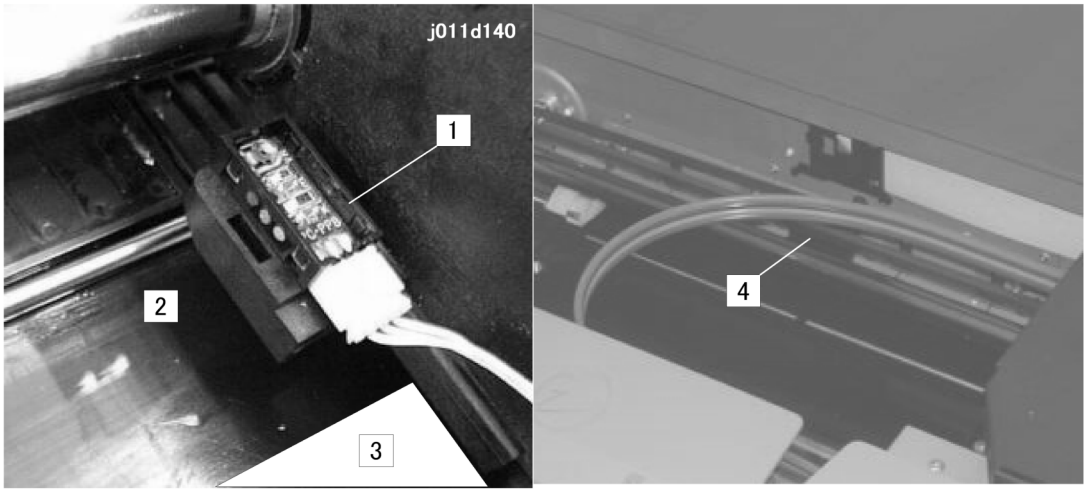
A pair of vertical sensor pins [1] is provided for each tank. These pins detect changes in the voltage differential on the surface of the ink inside the print head tank to detect the presence of air. When these terminals detect air in the tank, air escapes through the air release valve [2] opened by the air release solenoid [3]. This allows more ink to enter the tank.

This is a continuous operation. The sensor pin readings signal the ink-out condition when:

- The ink near-end alert has been issued.
- The continued presence of air in the tank indicates that no ink remains in the tank.

As a backup measure, the firmware counts the amount of ink consumed after every near end occurrence. When this count reaches the value prescribed for the ink cartridge, this will also signal an ink-out condition.

Registration Sensors



1	1st Registration Sensor
2	Transport Belt
3	Paper (Leading Edge)
4	2nd Registration Sensor

1st Registration Sensor

The 1st registration sensor is attached to the left side of the carriage and moves side to side with the carriage during printing.

The 1st registration sensor performs two important functions for print control:

- Detects the leading edge of every sheet
- Detects the width of the paper when the carriage and sensor pass horizontally over the vertical edge of the paper as it feeds.

Important

- **This is not automatic paper size detection. The paper size must be set with the printer driver.**
- **The printer will signal an alert if the detected size does not match the size selected for the print job.**

2nd Registration Sensor

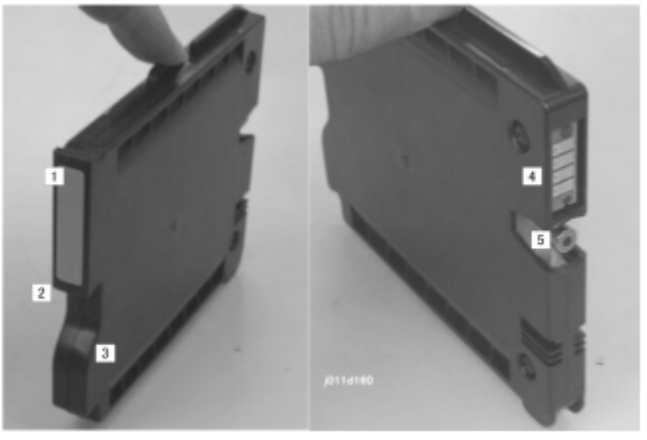
The 2nd registration sensor is a photosensor mounted over the transport belt in the middle of the transport belt. The 2nd registration sensor detects the leading and trailing edge of each sheet during high speed printing. The printer uses this information for print control timing.

Ink Supply System

Overview

1	Ink cartridges (x 4): Y, M, C, K
2	Ink Pump Unit
3	Ink Supply Tubes

Ink cartridges



1	Color index tab
2	Grip
3	Release
4	Contacts
5	Ink supply port

There is a separate ink cartridge for each color (Y, M, C, K). Each ink cartridge is vacuum packed. Ink cartridges are available in different sizes.

Note

- The starter cartridges are provided with purchase of the printer and contain less ink than the medium and large capacity ink cartridges that must be purchased.

Size	Color	Capacity (cc
J007 Starter	K	22.85
	C	23.76
	M	24.41
	Y	24.54
010/J011 Starter	K	24.77
J	C	28.55

Size	Color	Capacity (cc
	M	37.64
	Y	38.03
Medium (for purchase)	K	33.54
	C	25.57
	M	25.48
	Y	25.52
Large (for purchase)	K	67.61
	C	59.53
	M	58.10
	Y	57.97

Note

- The estimated service life of an ink cartridges is only a rough estimate.
- The estimated service life may vary significantly due to the amount of coverage on a page, environmental conditions, and so on.
- After the printer signals the near end alert for an ink cartridge, approximately 40 pages can be printed before the end alert is issued.

All the colors (Y, M, C, K) are pigment inks.

- These inks require only standard PPC to get quality printouts (special print media are not required).
- The inks do not smear because they dry more quickly.
- They do not fade in bright light. This makes their colors highly durable.

Ink Cartridge Set Sensors

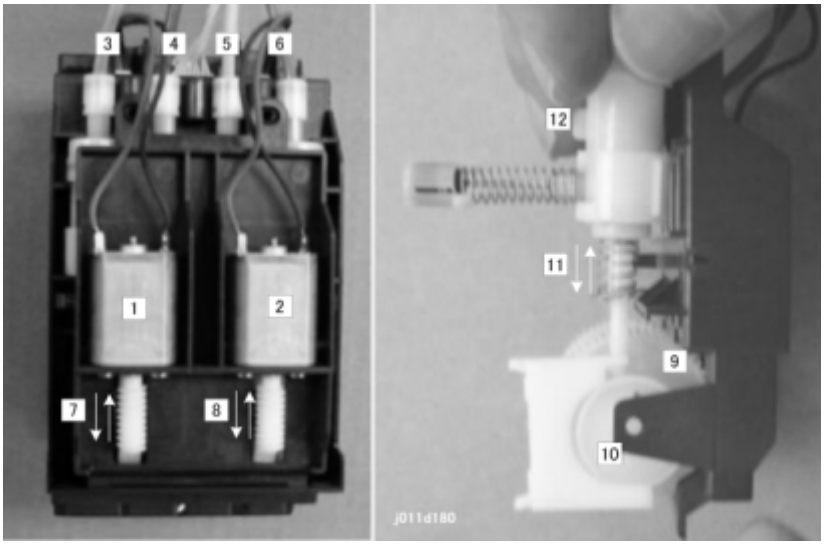
Four micro switches detect the ink cartridges. The switches are connected in series above the cartridge set detection plate [1]. Each tank is provided with a micro-switch. The machine can specifically detect which ink cartridge is not set correctly. An open switch signals when:

- A cartridge is not in the machine
- A cartridge is not installed correctly

To solve this problem, the operator must open the ink cartridge cover and confirm whether:

- A cartridge is not in the machine
- A cartridge is not installed properly

Ink Pumps



1	Ink Pump Motor 1
2	Ink Pump Motor 2
3 to 6	Ink Supply Tubes for Y, M, C, K ink.
7	Worm Gear (1st supply motor)
8	Worm Gear (2nd supply motor)
9	Gear
10	Cam
11	Plunger
12	Pump

Note

- The J011 has three ink pump motors. For more details about the differences in the configurations of the J007/J010 and J011, please refer to the next section.

The ink supply pump is divided into two compartments:

- M/Y compartment (for Magenta, Yellow Ink cartridges)
- K/C compartment (For Black, Cyan Ink cartridges)

Each compartment contains:

- 1 pump motor.
- 2 pumps (one for each ink cartridge)
- 2 cams

When a print head tank needs ink:

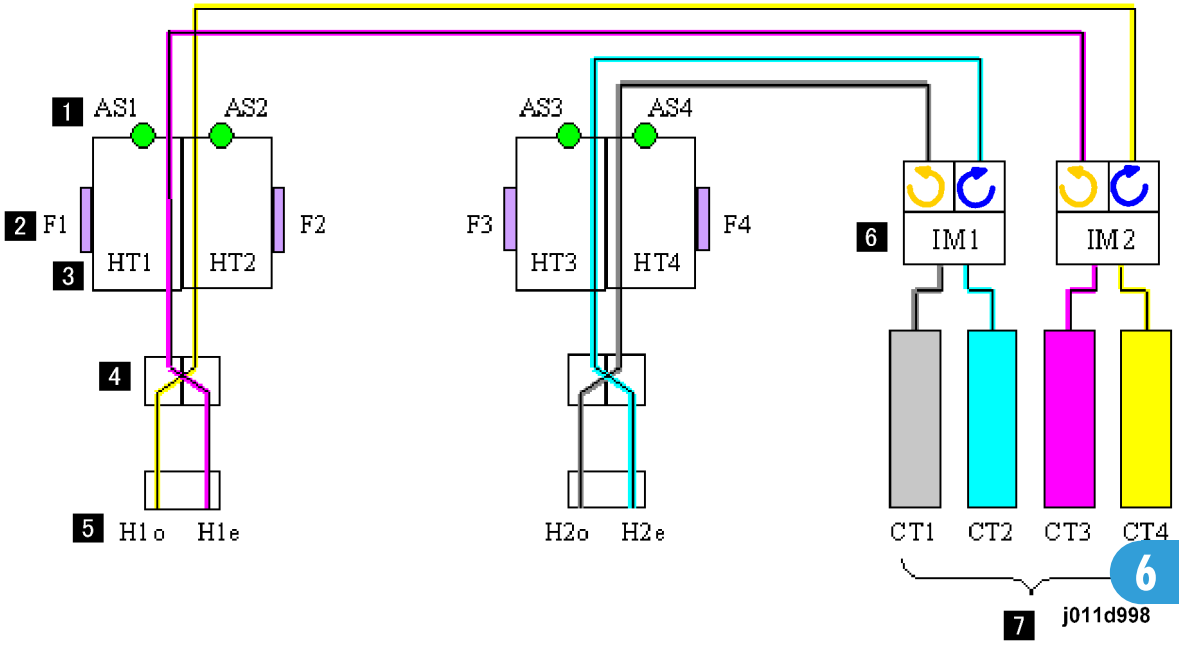
- The printer switches on one ink pump motor. The motor and its worm gear are rotated forward or reverse (depending on which type of ink is requested). Only one pump operates at a time.
- One or the other pump is operated, depending on whether the ink pump motor rotates forward or reverse. (Two pumps that share a motor cannot operate together at the same time.)
- A cam striking a plunger vibrates the plunger to form the vacuum in the line that sucks ink from the cartridge.
- The supply motor operates long enough to pump the prescribed amount of ink to the tank. Then it switches off.

Print Heads

The mechanisms that supply the ink from the ink cartridges to the print heads are identical for both printer models. However, the number of components and their arrangement are slightly different.

The operation of the basic components is first explained with the J007/J010 as a model then the differences of the J011 are described.

J007/J010



No.	J007/J010	
1	AS	Air Sensors x2
2	F	Feelers x4
3	HT	Head Tanks x4
4	---	Filter Units x2
5	H	Print Heads x2
6	IM	Ink Pump Motors x2
7	CT	Ink Cartridges x4

An air sensor [1], two feelers [2], and head tank [3] comprise the reservoir of the ink supply system.

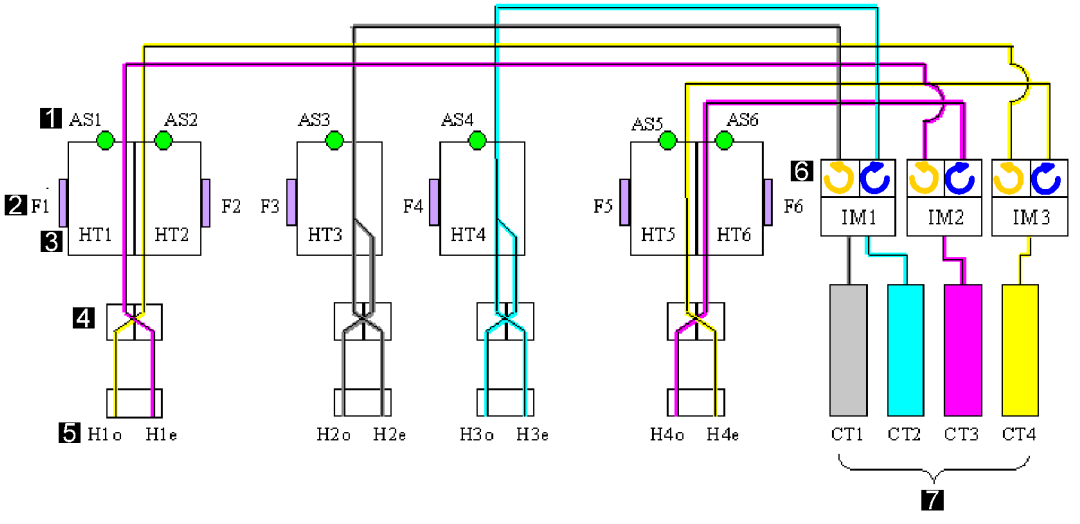
The ink flows from the head tank through a filter [4] that contains the piezoelectric element that expands upon application of a electrical charge to force ink out of the nozzles of the print head [5].

Two ink pump motors [6] drive the simple pump mechanisms that draw ink out of the ink cartridges [7] and send it to the head tanks.

One ink pump motor operates the pumps of two ink cartridges. The ink pump motor drives a single worm gear. The direction of rotation of the gear determines which pump is operated. For example, when the KC

ink pump motor in the illustration above rotates the worm gear forward, the pump draws cyan ink (C) from the C ink cartridge, and when the motor reverses, it draws black ink (K) from the K ink cartridge.

The ink pump motor switches on in response to a request for more ink when the ink level sensor detects that the position of a feeler on the side of a tank indicates that a tank is low. Ink is also drawn into the tank from the ink supply tubes when the air sensors detect too much air in a tank and not enough ink. The air sensor activates the air release solenoid which creates a partial vacuum inside the tank that purges the air from the tank through a vent and at the same time draws more ink from the supply tubes into the tank.



No.	J011	
1	AS	Air Sensors x6
2	F	Feelers x6
3	HT	Head Tanks x6
4	---	Filter Units x4
5	H	Print Heads x6
6	IM	Ink Pump Motors x3
7	CT	Ink Cartridges x4

The components and operation of the print heads in the J011 are identical to those of the J007/J010 described above. However, two additional print head units are provided on the J007/J010.

The outer print heads unit both supply Yellow and Magenta ink.

During bi-directional printing:

- On the left-to-right pass, the print heads on the far right lay down yellow ink over magenta.
- On the right-to-left pass, the print heads on the far left once again lay down yellow ink over magenta.

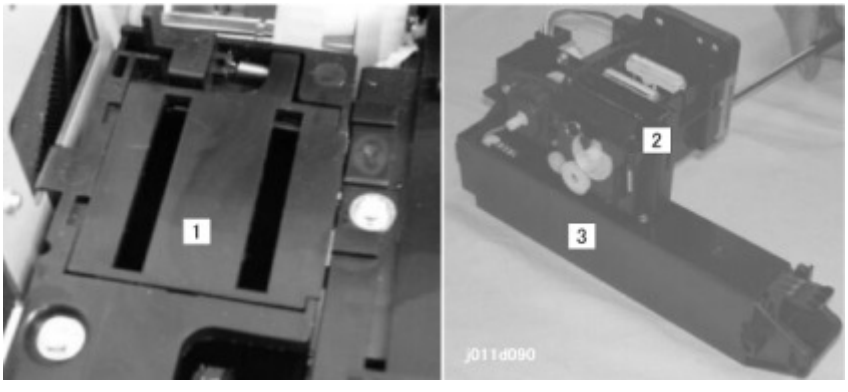
This arrangement ensures that yellow ink is always laid down over magenta ink during bi-directional printing.

The order of application of the other inks (cyan and black) is not important.

Another important difference is that there are three ink pump motors in the J011 (not two as in the J007/J010).

Print Head Maintenance

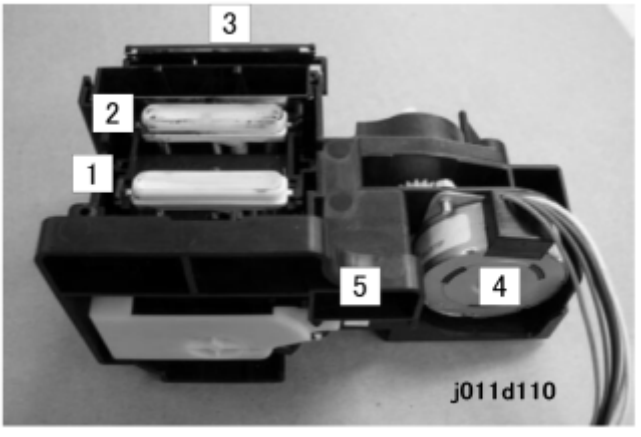
Overview



1	Flushing Gate
2	Maintenance Unit
3	Ink Collection Tank

Maintenance Unit

Overview



The maintenance unit performs two important functions:

- Keeps the surface of the print heads moist when they are not being used.
- Cleans the print heads with suction during print head cleaning. (The print heads are also cleaned automatically at prescribed intervals.

Caps [1] and [2] cover the print heads when the carriage is at the home position on the right side of the printer.

- Cap [2] is the only cap that can siphon excess ink from a print head. The ink gets siphoned from the head with a simple, pressure tube-pump mechanism.

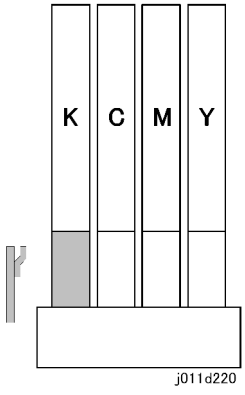
During print head cleaning:

- The maintenance motor [4] runs forward. Two cams lower the bottom of the unit.
- Next, the motor reverses. When the motor reverses, it disengages a one-way clutch attached to the main shaft. This allows it to rotate a second shaft that rotates a cam against the side of the plastic tube. This alternating pressure and release on the side of the tube comprises a very simple pump mechanism.
- At the prescribed time, the motor runs forward again until a feeler on the main shaft reaches the gap of the maintenance HP sensor (located at [5] (but not shown). This switches the motor off.
- Another cam attached to the main shaft raises and lowers the wiper [3]. The wiper cleans the surface of the print head above as the carriage moves left and then right.

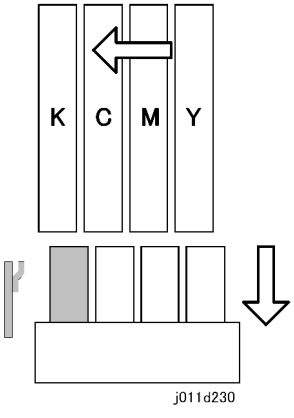
Maintenance Unit Cleaning Cycle

The operator can start the cleaning operation from the printer driver or the operation panel.

You can set the print head for cleaning (or clean them all) if you start the clean job with the printer driver. All the print heads are cleaned if the job starts from the operation panel.

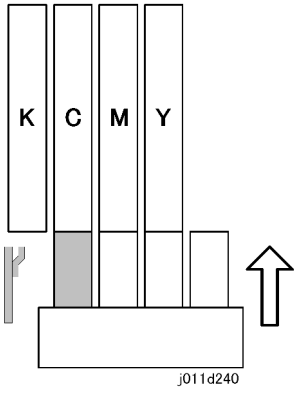


Cleaning starts with the carrier and print heads capped and resting on top of the maintenance unit.



When the cleaning cycle starts, the maintenance unit is lowered by the rotation of the main shaft. The cams rotate away from the bottom of the unit.

At the same time, the carriage moves the print head unit to the left.



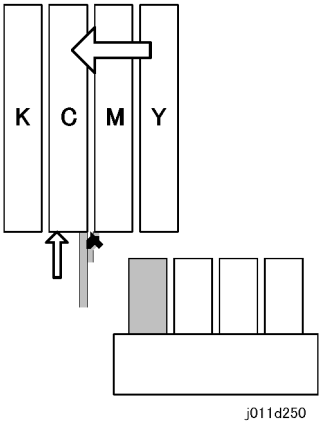
The carriage moves the first print head (in this example, "KC" of the J007/J010) above the first vent of the maintenance unit.

Note

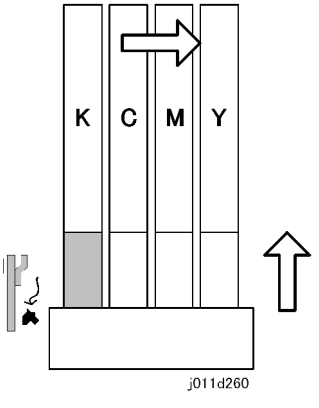
- Only the first vent can siphon ink from the print head into the ink collection tank.

Another cam on the main shaft presses the maintenance unit up so the C print head covers the first vent.

Next, the maintenance motor reverses. The one-way clutch disengages the main shaft and engages the second shaft. This operates the tube-pump. The suction from the pump sucks ink from the surface of the print head.



Next, the maintenance unit lowers, and another cam raises the wiper. At the same time the carriage moves the print heads left far enough so the vacuumed print head touches the wiper. The wiper cleans the ink from the print head.



Next, the carriage moves the print heads back to the home position. The maintenance unit caps the print heads. A cam on the main shaft below vibrates the small scraper. This removes the ink bolus from the wall of the trap and sends it to the ink collection tank.

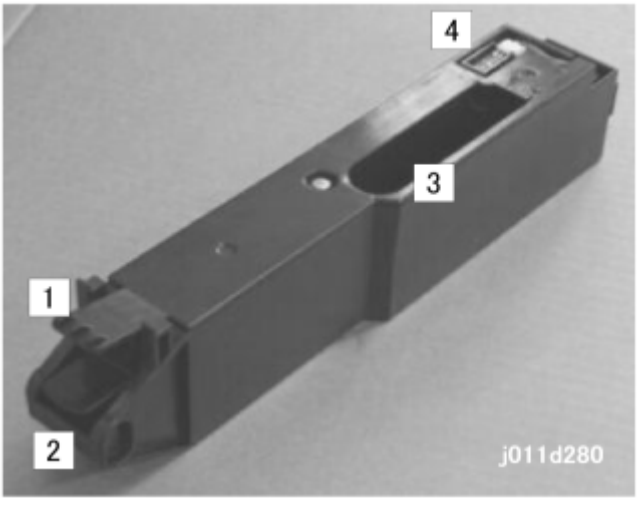
Important

- This cycle is repeated for each print head selected for cleaning. For more, see Section "4. Trouble-shooting".
- This cleaning cycle is also done automatically for all print heads if the printer stays idle for the time intervals shown in the table below.

Cleaning Table

Idle Time	Required Cleaning Time	
	J007/J010	J011
> 10 hours, < 3 days	20 s	24 s
> 3 Days, < 7 Days	20 to 80 s	24 to 160 s
> 7 Days, < 1 Month	80 s	160 s
> 1 Month, < 3 Months	180 s	360 s
> 3 Months	180 s	360 s

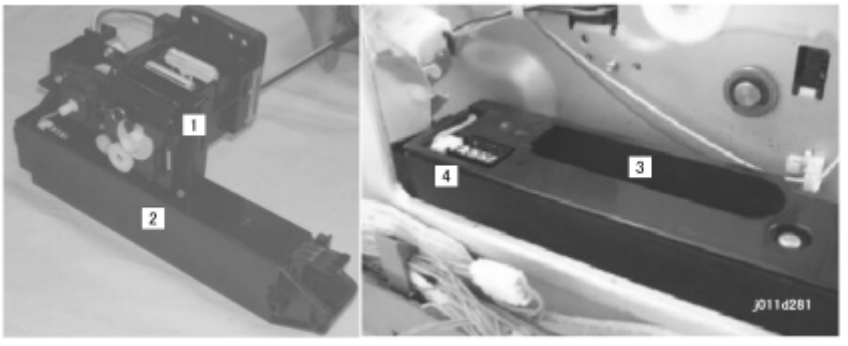
Ink Collection Tank



1	Ink Collection Tank Release
2	Tank Handle
3	Tank Entrance Slot

4	Ink Collection Tank Sensor

The ink collection unit holds the used ink sent to it from the maintenance unit above.



Inside the printer, the maintenance unit [1] sits on top of the ink collection tank [2].

The ink from the maintenance unit enters the tank through the slot [3].

The ink collection tank [4] sensor detects when the tank is full and needs to be replaced.

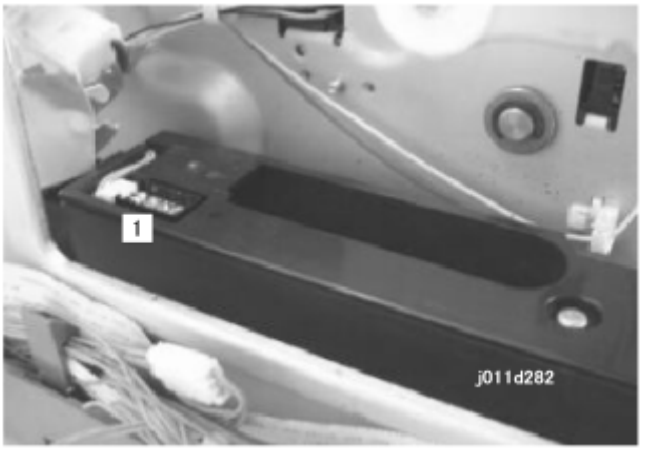
Once the ink collection tank is full, discard it.

Important

- **Obey the local laws and regulations regarding the disposal of items such as the ink collection tank.**
- **Never attempt to clean an ink collection tank and use it again.**

The printer should be able to use one ink collection tank for about 5 years of normal use.

Ink Collection Ink level sensor



The ink collection ink level sensor [1] is a “smart” reflective photosensor.

The photosensor measures the changes in the density of the ink materials in the tank. This lets the printer know when the tank is full.

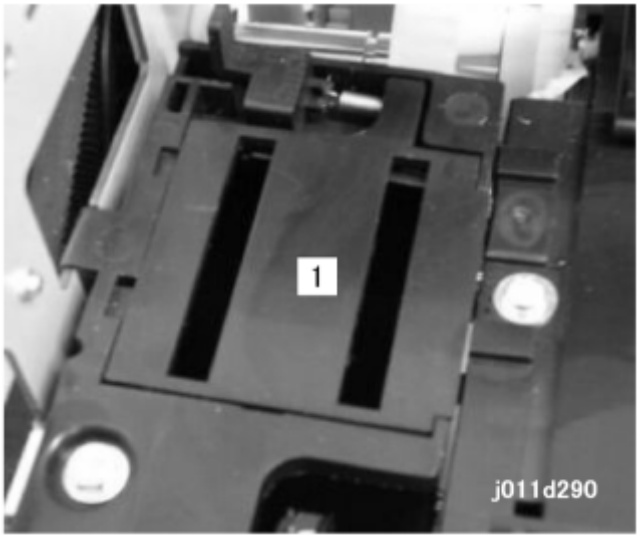
A prompt tells the operator when the printer needs maintenance as soon as this sensor detects the near-full condition. After the near-full alert prompt appears, the printer is allowed to print up to the following number of pages until it stops and the tank must be replaced:

- J007/J010: 200 prints
- J011: 100 prints

Note

- These are only rough estimates. Fewer pages are printed if many normal and full print head cleanings are done after the maintenance alert.
- SC 992 (Ink Collection Tank Full Error) appears if no maintenance procedures are done. The printer cannot be used once SC992 has appeared. The ink collection tank must be replaced before the printer can be used.

Flushing Unit



During a long print job, the machine flushes all the nozzles with a very small amount of ink at 15 second intervals. The ink flushed from the nozzles goes through the slots of the flushing gate [1] into a sump below. This keeps the nozzles clear and in good working condition.

The flushing gates [1] and the ink collection sump (below the gate) are located on the left side of the printer.

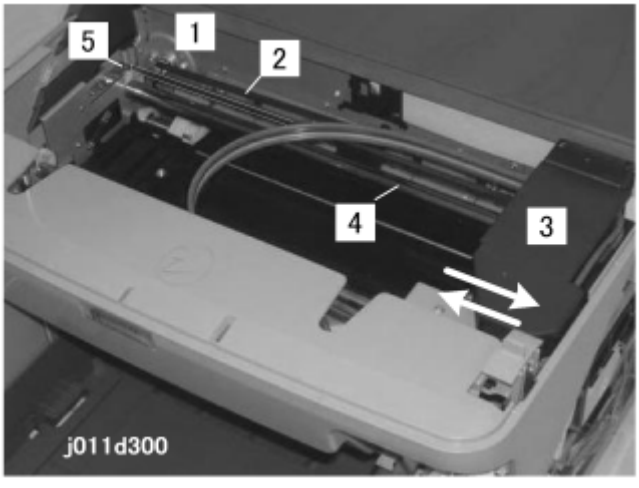
Note

- The sump is not connected to the ink collection tank. Ink flushed into the sump remains there.
- The sump of the collection unit should never fill to capacity for the service life of the printer.

- The flushing gate and sump should never require replacement.

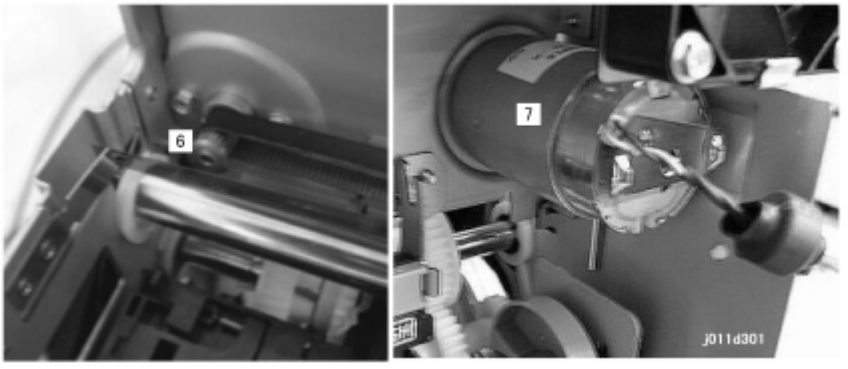
Carriage Drive

Overview



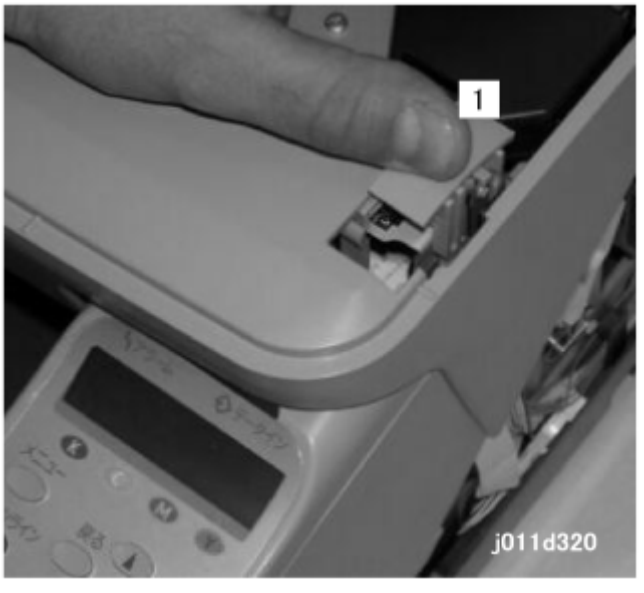
1	Horizontal Motor Drive Gear
2	Timing Belt
3	Carriage (Print Heads)
4	Guide Rod
5	Horizontal Encoder (Translucent Film)

A horizontal motor drive gear turning [1] drives a timing belt [2] connected to the carriage [3]. The forward and reverse rotation of the horizontal drive motor moves the carriage to the left and right side of the printer. The horizontal encoder strip [5], mounted in front of the timing belt is threaded through the horizontal encoder sensor mounted on the carriage. This sensor detects the position of the carriage at the time the carriage moves from side to side during printing.



The picture above shows the horizontal driver gear [6] of the horizontal drive motor [7] mounted on the left rear corner of the printer behind the duplex unit.

Envelope Selector



Move the envelope selector [1] to adjust size of the gap between the print heads and the surface of the paper.

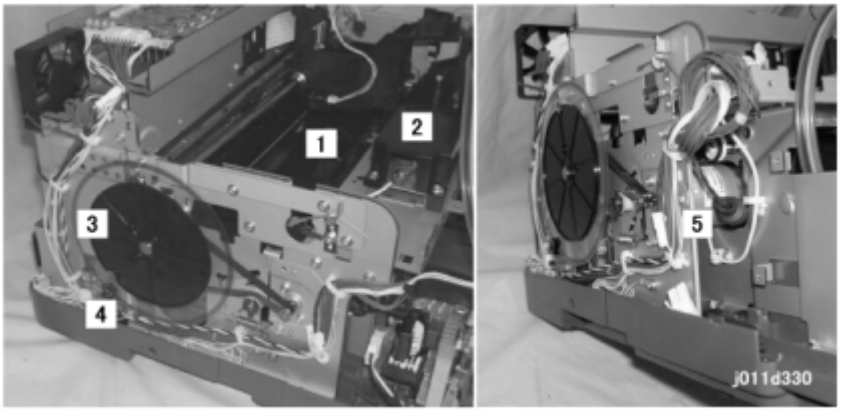
Pushing the lever to the back moves the print heads slightly away from the surface of thick paper and envelopes. This prevents chaffing the printed surface and smearing ink.

A cam operates when the envelope selector pushed back for printing on thick paper or envelopes. This moves a guide rod to create a gap about 0.8 mm wider than the gap for normal printing. Normally, this lever should be set forward for printing on normal paper.

When the envelope selector is pushed back, this raises a feeler into the gap of the carriage position sensor. When the envelope selector is pulled forward, the feeler leaves the gap and switches the sensor off. This mechanism is used to detect the up and down position of the carriage and print heads.

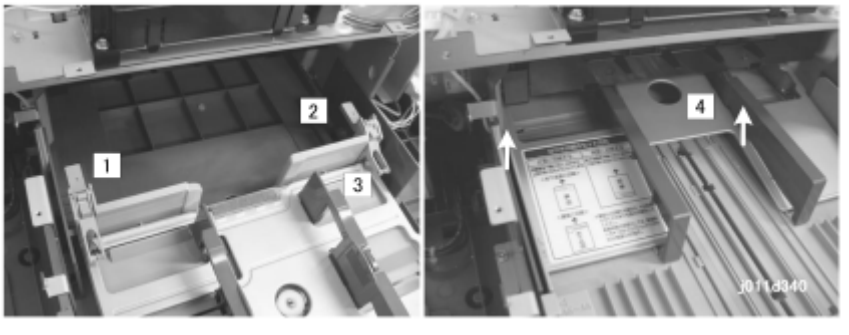
Paper Feed, Transport, Output

Overview



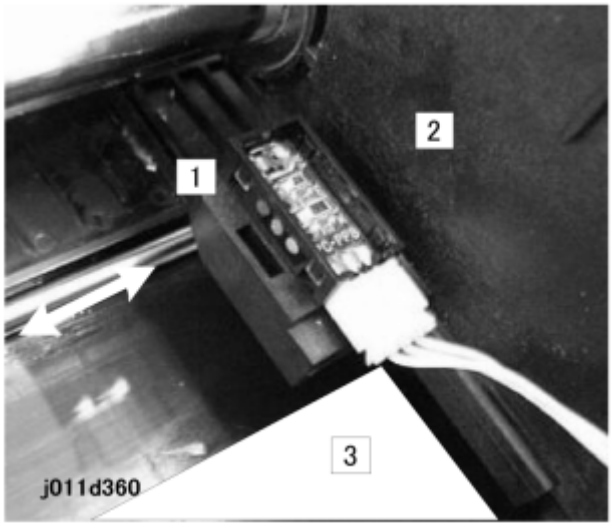
1	Transport Belt Unit
2	HVPS (High Voltage Power Supply)
3	Vertical Encoder
4	Vertical Encoder Sensor
5	Vertical Motor

Cassette Lock/Release



The arms [1] and [2] on both sides of the cassette [3] (guided by rails slanting upward) raise the bottom plate [4] when the paper cassette is pushed into the printer. This raises the paper in the cassette to the correct height for paper feed.

Leading Edge and Paper Size Detection



There is no paper size sensor in the standard paper cassette or in the optional 500-Sheet Paper Tray for the J008. The paper size can be set on the printer operation panel. The paper size can also be selected with the software application or the printer driver.

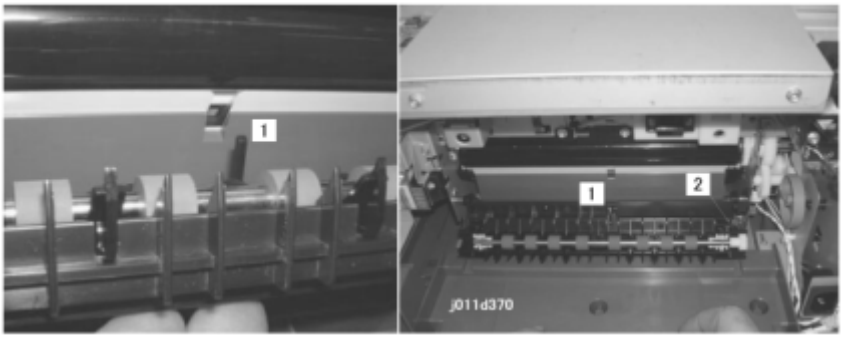
Important

- **The paper size (and other settings) in the software application always have priority over the printer driver settings.**

The 1st registration sensor [1] is mounted on the carriage unit [2] and moves from side to side with the carriage during printing.

- The 1st registration sensor detects the leading edge of the sheet [3] for feed timing.
- The 1st registration sensor also detects the width of the paper when it passes over and detects the left vertical edge of the paper. This ensures that the paper below is wide enough for the maximum printing area specified by the paper size selection for the print job.

Paper Jam, Trailing Edge Detection

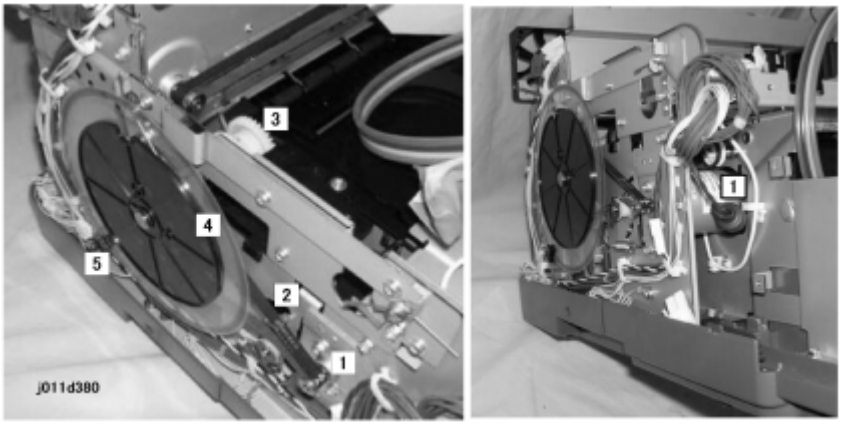


The feeler [1] is pushed down by every sheet of paper that arrives and then pops up again when the trailing edge of the sheet passes over the feeler. When the paper presses down the feeler, this turns on the trailing edge sensor [2]. The length of time the trailing edge sensor remains on is used to measure the length of the paper for printing control.

A paper jam alert occurs when:

- The paper feed roller rotates forward twice.
- The trailing edge sensor does not go on after 2 rotations of the paper feed roller.

Paper Transport Drive



The vertical motor [1] drives the timing belt [2] that rotates the transport roller [3].

The rotation of the transport roller also drives the paper feed roller when the paper feed clutch engages the feed roller (not shown above).

The edge of the vertical encoder [4], attached to the shaft of the transport roller, passes through the gap of the vertical encoder sensor [5] as the encoder wheel rotates. The vertical encoder sensor reads the

coded markings on the rim of the vertical encoder and sends this information to the CPU. The CPU uses these readings to control the on/off timing of the transport belt and the paper feed roller:

Important

- **When servicing the machine, work carefully to prevent scratching, breaking, or bending the vertical encoder wheel.**

Paper Path

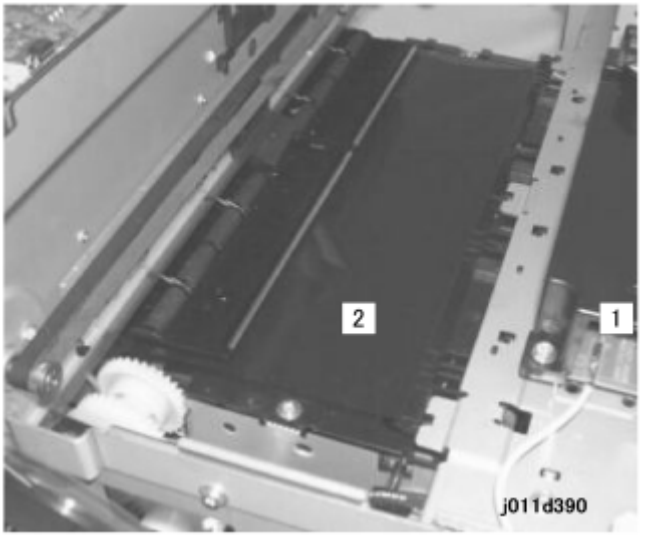
Here is a summary of the operation that sends paper through the printer:

1. The feed clutch energizes and engages the feed roller, then the rotation of the vertical motor drives the feed roller.
2. Paper feed roller feeds 1 sheet from the top of the stack in the paper cassette. A friction pad at the lip of the paper cassette prevents double-feeding.
3. The charge roller charges the transport belt. The electrostatic charge on the transport belt keeps the paper on the transport belt.
4. The sheet feeds onto the transport belt.
5. The feeler of the trailing edge sensor depresses and switches the trailing edge sensor on.
6. When the trailing edge sensor goes on, the carriage moves to the right of center. This lets the 1st registration sensor detect the leading edge of the paper.
7. The 1st registration sensor also detects the right edge of the sheet when the carriage and sensor move toward the carriage HP sensor on the right.
8. The detection of the right edge by the 1st registration sensor is used to determine the width of the paper in the paper path.

   Note

   - The 1st registration sensor reads the right edge of only the 1st sheet of the print job. Thereafter, the 1st registration sensor does not right edge for any until the beginning of the next print job.
9. An area equal to the length of each print head gets printed when the carriage goes across the sheet from right to left.
10. When the last line prints, the transport roller rotates only long enough to feed the length of the last sheet.
11. The print job count increases by 1 after the paper exits.

Transport Belt



This printer uses the BT system to transport paper through the paper path.

A high voltage power supply pack (HVPS) [1] energizes the charge roller below the transport belt [2].

The charge roller applies a charge to the transport belt. This static charge attracts the paper to the transport belt and holds it in place so it does not move during printing.

A temperature/humidity sensor below the transport belt monitors the temperature and humidity near the charge roller and transport belt. The temperature/humidity readings of this sensor are matched with values in lookup tables cross-indexed with combinations of temperature and humidity readings. The values read from the tables are used to adjust the width of the bias (bias pitch) applied to the transport belt. This operation, called belt charge control, operates within the following ranges of temperature and humidity:

Temperature:	0C to 35C (32F to 95F)	Adjusted in 2.5C (4.5F) steps
Humidity:	0% to 100%	Adjusted in 10% steps

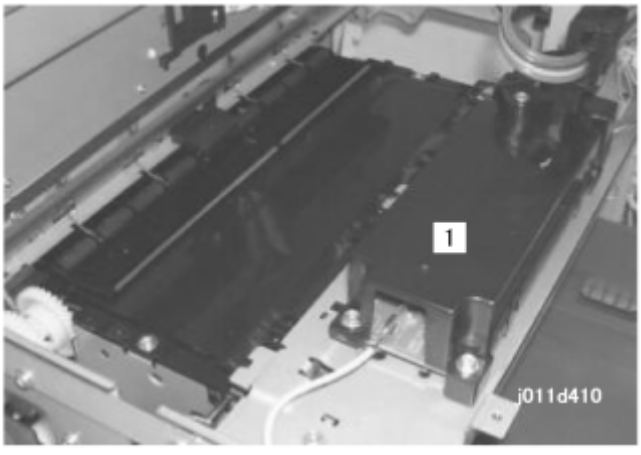
The machine uses the feedback of the temperature/humidity sensor to reduce the width of the charge applied to the transport belt below the print heads. This reduces the size of the electrical field to the smallest size that can still provide the optimum charge to keep the paper on the belt at the leading edge, center, and trailing edge of the paper without interfering with the operation of the print nozzles.

Belt charge control is done for every paper feed station (Tray 1, Tray 2, and bypass) and for every paper type (normal paper, envelopes, thick paper, and OHP).

The sharp curvature of the paper path separates the paper from the transport belt at the time paper gets fed out the paper exit.

For more details about how to adjust the transport belt charge control, please refer to Section "4. Troubleshooting".

Charge Leak Detection



The printer checks for charge leaks:

- Immediately after the printer is turned on.
- When it gets a leak detection signal from the high voltage power pack at the time of printer operation.

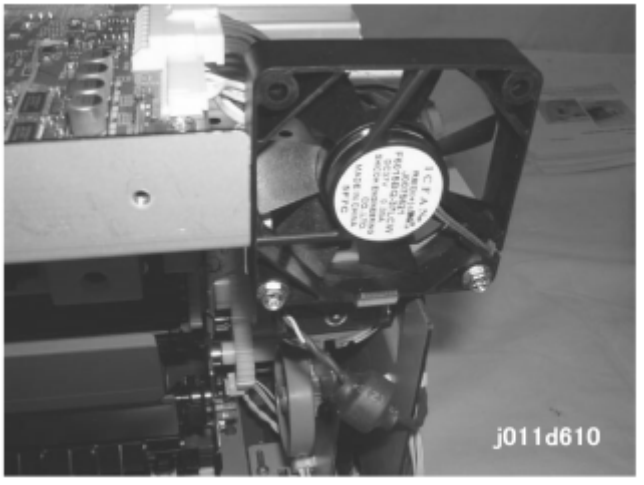
When a charge leak is detected:

- The voltage supply from the power pack [1] gets interrupted immediately
- The printer stops the current print job in progress.
- The carriage goes back to its home position.
- The print heads gets capped. The printer cannot operate.

To restore the printer to normal operation:

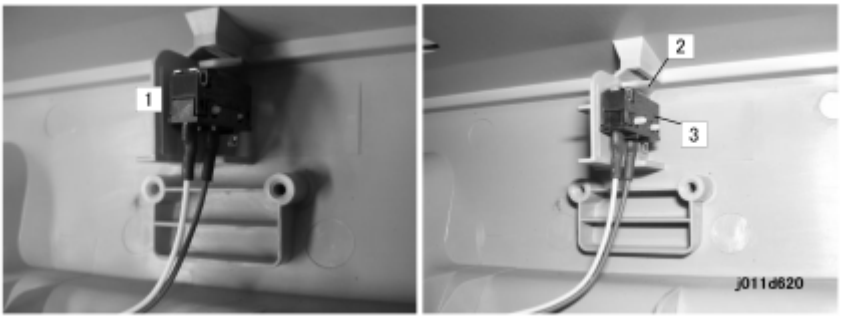
- Remove the cause of the leak.
- Turn the printer off and on.

Cooling Fan



The fan mounted behind the ventilation slots on the left rear corner of the printer draws hot air out of the printer and blows it out of the machine through the ventilation slots. This prevents a temperature rise inside the printer.

Top Cover Switch



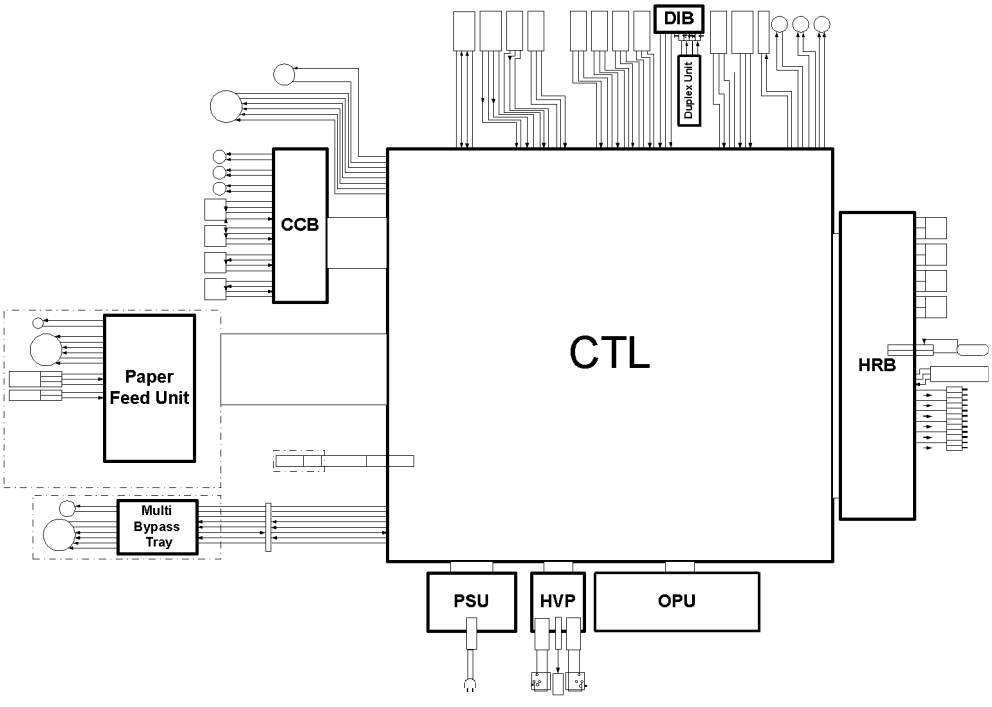
The cover open sensor [1] is mounted inside the front cover.

A plastic tab under the top cover depresses a feeler [2] which activates the top cover sensor [3]. This tells the printer that the top cover is closed.

The printer will not operate until the top cover is closed and this sensor has been activated.

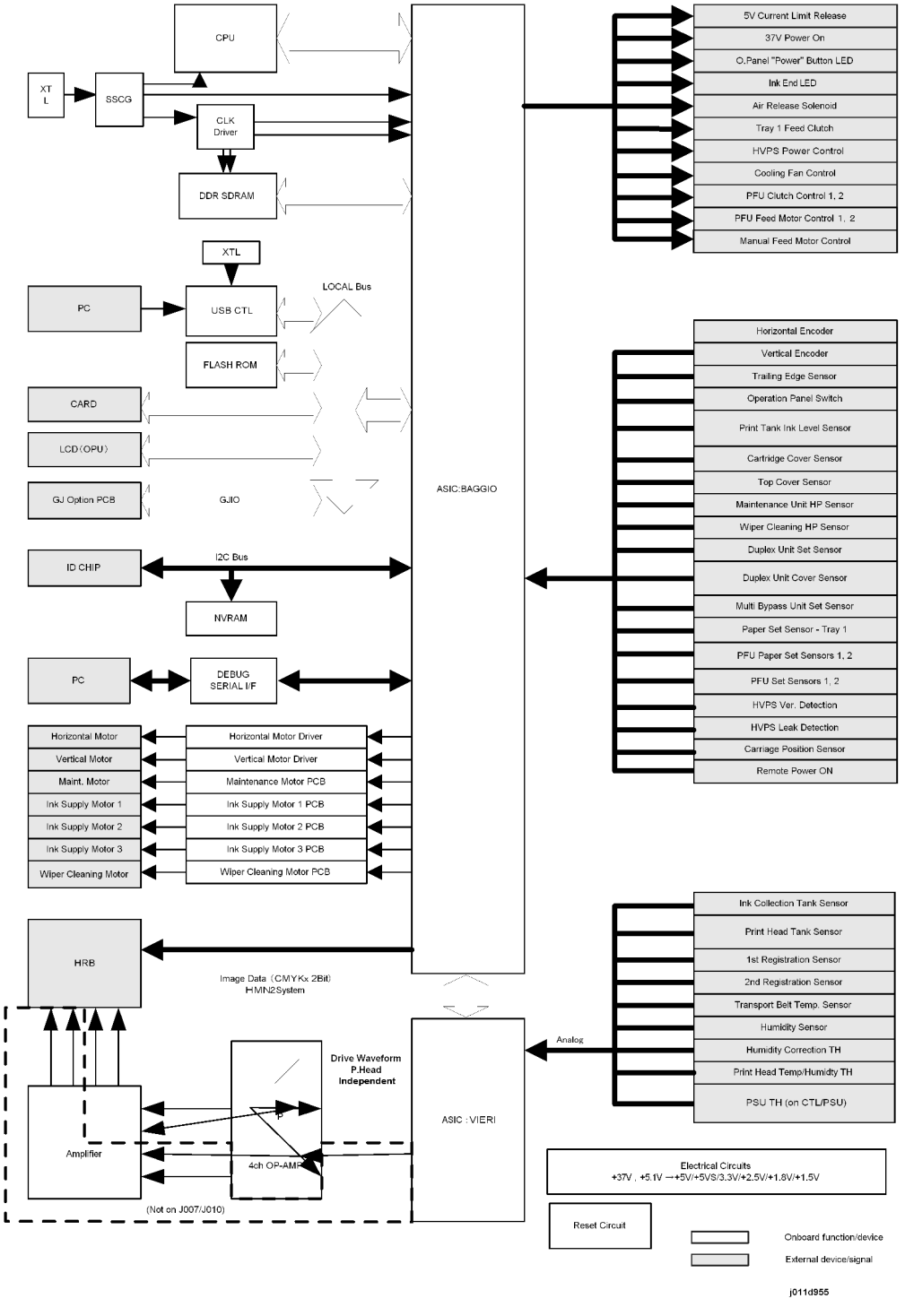
Electrical Component Functions

Main Boards



PCB Abbreviation	What It Means
CTL	Control Board
CCB	Cartridge Connector Board
DIB	Duplex Interface Board
HRB	Head Relay Board
OPU	Operation Panel Unit
HVPS	High Voltage Power Supply
PSU	Power Supply Unit

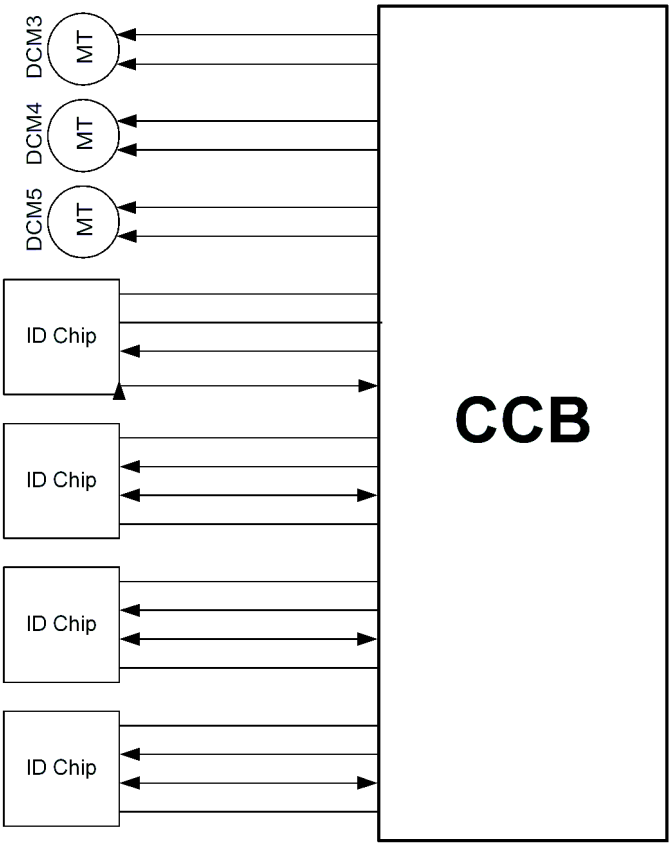
Control Board



The control board exerts overall control of the machine, including

- Image data processing
- Interface management: USB and all the other boards
- Controls all sensors, and motors for all I/O devices

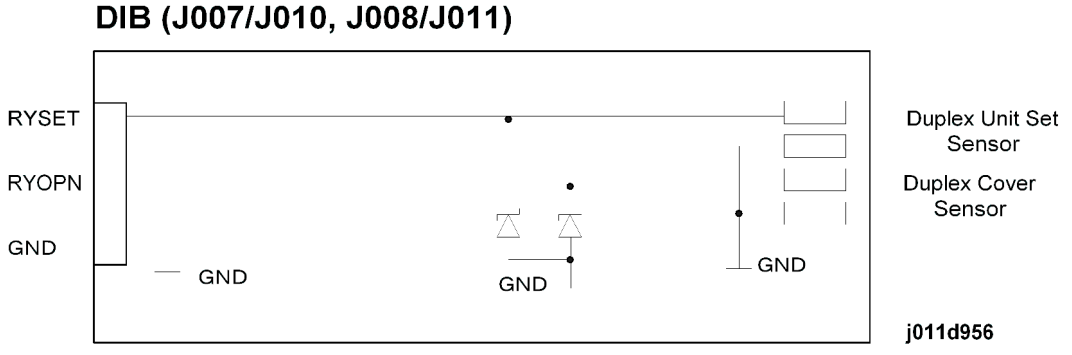
CCB



The CCB (Cartridge Control Board), mounted in the cartridge holder behind the right front door of the printer relays signals between the control board and the ink pump motors and relays the ID chip signals.

- The ink pump motor signals control the operation of the ink pump motors that pump ink from the ink cartridges to the ink tanks in the print heads.
- The ID chip signals are relayed to the control board to confirm that each cartridge is inserted in the correct slot.

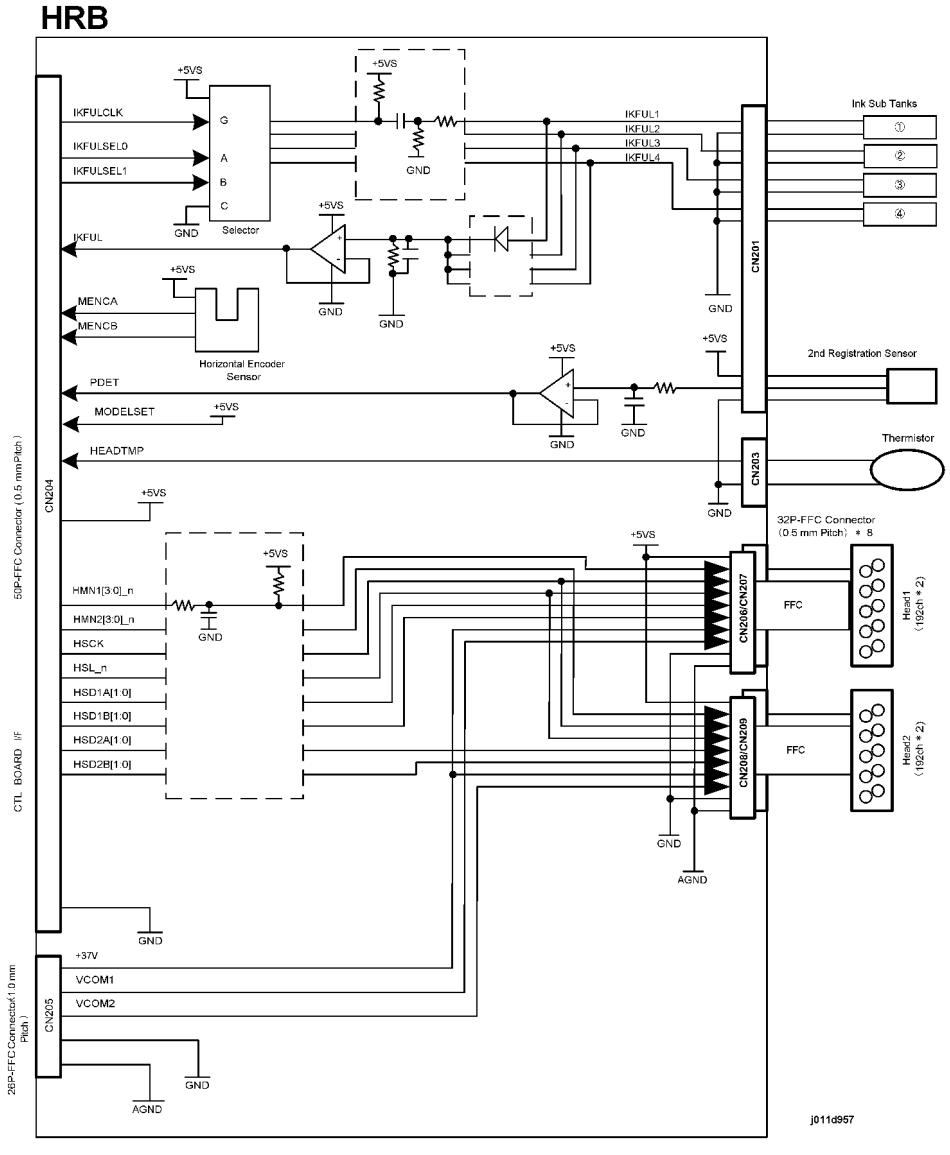
DIB



The DIB (Duplex Interface Board) interfaces between the duplexer and the control board.

- The duplex unit set sensor detects whether the duplex is unit is installed correctly. The printer cannot be used if the duplexer is not installed. (The duplexer is not an option.)
- The duplex cover sensor detects whether the duplex cover is closed. The printer cannot be used if this cover is open.

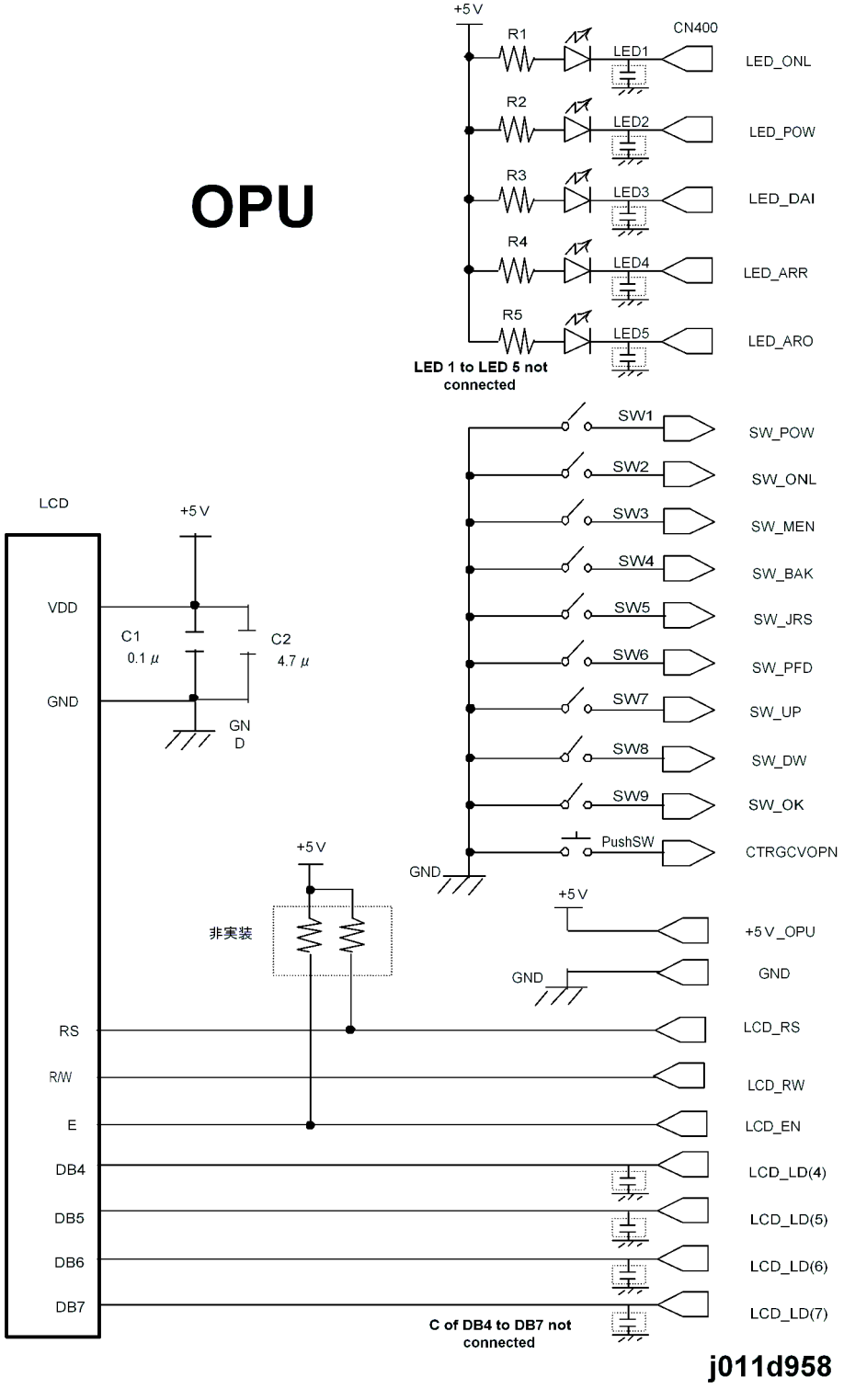
HRB



The HRB contains these important components and functions:

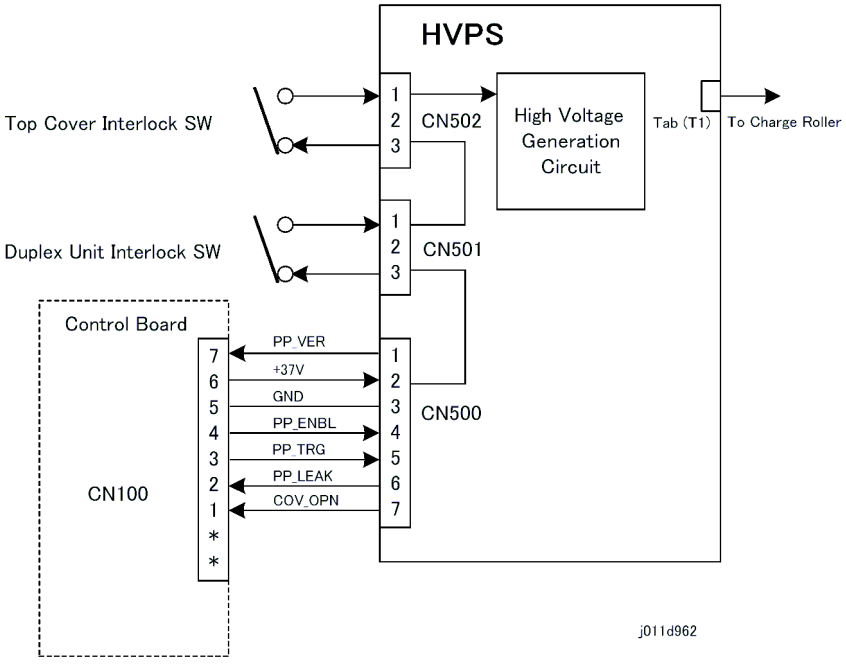
- Carriage horizontal position detection
- Paper leading edge, horizontal width detection
- Temperature detection of the area near the print heads
- Waste ink tank full detection
- Print head control

OPU


OPU
+5 V
R1
LED1
CN400
LED_ONL
R2
LED2
LED_POW
R3
LED3
LED_DAI
R4
LED4
LED_ARR
R5
LED5
LED_ARO
LED 1 to LED 5 not connected
SW1
SW_POW
SW2
SW_ONL
SW3
SW_MEN
SW4
SW_BAK
SW5
SW_JRS
SW6
SW_PFD
SW7
SW_UP
SW8
SW_DW
SW9
SW_OK
PushSW
CTRGCVOPN
GND
+5 V
+5 V_OPU
GND
GND
LCD
VDD
GND
C1
0.1 μ
C2
4.7 μ
GN
D
+5 V
非実装
RS
R/W
E
DB4
DB5
DB6
DB7
LCD_RS
LCD_RW
LCD_EN
LCD_LD(4)
LCD_LD(5)
LCD_LD(6)
LCD_LD(7)
C of DB4 to DB7 not connected
j011d958

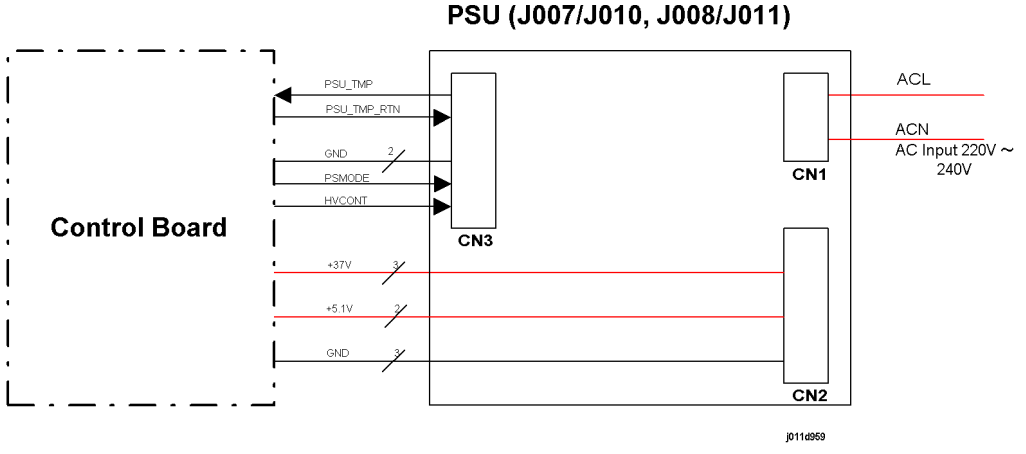
The OPU (Operation Panel Unit) controls the operation of the operation panel mounted on the right side of the printer. The operation panel presents one LCD (16 characters x 2 lines) and 9 keys for operation of the printer and printer menus. The OPU also has the right cover sensor that detects whether the right cover is open or closed.

HVPS



The HVPS (High Voltage Supply) board generates the high voltage that is applied to the transport belt that holds the paper on the belt during printing. Two interlock switches prevent the HVPS from operating with either or both the top cover of the printer or the duplex unit open.

PSU



The PSU supplies both 37V and 5.1V power to the HVPS and all the motors in the printer.

6

Electrical Component Summary

No.	Component	Function
Clutches		
CL	Bypass Paper Feed Clutch – CL4	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 reaches its point of half-rotation, the pawl of the clutch stops the pick-up roller. The paper feed motor continues to rotate and drive the paper feed rollers that transport the paper out of the bypass unit.
CL	PFU Paper Feed Clutch – CL2	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 reaches its point of half-rotation, the pawl of the clutch stops the pick-up roller. The paper feed motor continues to rotate and drive the paper feed rollers that transport the paper out of the PFU paper tray.
CL	Paper Feed Clutch - CL1	This is the magnetic clutch that controls the operation of the paper feed roller.
Motors		

No.	Component	Function
MT	Bypass Paper Feed Motor – STM4	Mounted in the multi bypass tray. Drives the pick-up roller and paper feed rollers that feed paper from the bypass tray into the printer.
MT	Cooling Fan	Mounted on the right rear corner of the printer (viewed from the back). This fan pulls hot air from the interior of the printer and pushes it out through a ventilation port.
MT	Horizontal Motor - DCM1	Mounted on the left side of the printer, drives forward and reverse to control the timing belt that moves the carriage left and right during printing. The operation of the motor is controlled by the horizontal encoder sensor (a long film strip) mounted behind the carriage.
MT	Ink Pump Motor (KC) – DCM3	J007/J010: Runs forward to pump cyan (C) to Print Head 2, reverses to pump black (K) to Print Head 2. J011: Runs forward to pump cyan ink, reverses to pump black ink (K).
MT	Ink Pump Motor (M) – DCM4	J007/J010: Runs forward to pump yellow (Y) to Print Head 1, reverses to pump magenta (M) to Print Head 1. J011: Runs forward to pump magenta (M) to Print Head 4, reverses to pump magenta (M) to Print Head 1.
MT	Ink Pump Motor (Y) – DCM5	J007/J010: Not present. J011: Runs forward to pump yellow (Y) to Print Head 4, reverses to pump Yellow (Y) to Print Head 1.
MT	Maintenance Motor – MT STM1	Mounted in the maintenance unit. Drives the maintenance unit: 1) Rotates forward to drive the shaft that raises and lowers the caps during print head cleaning, 2) Reverses to drive the simple tube pump that siphons ink from the print head through the right, 3) Raises and lowers the wiper that removes ink collected around the print head.
MT	PFU Paper Feed Motor – STM2	Mounted in the PFU. Drives the pick-up roller and paper feed rollers that feed paper from the PFU tray into the printer.
MT	Vertical Motor (DCM2)	Mounted behind the vertical encoder wheel and to the left of the PSU. This motor, controlled by the rotation fo the vertical encoder wheel and SENC board, drives the paper rollers that drive the transport belt.

No.	Component	Function
PCBs		
PCB	CCB (Cartridge Control Board)	Mounted in the cartridge holder behind the right front door of the printer. This PCB relays signals between the control board on top of the printer and the ink pump motors that supply ink to the ink tanks. It also relays the ID chip signals that detect whether the ink cartridges are installed properly in the correct slots of the cartridge holder.
PCB	CTL (Control Board)	Mounted on top of the printer and below the top cover (protected by a metal plate). Controls overall operation of the printer, mainly: 1) image data processing, 2) interface management (USB, duplexer, bypass tray, PFU, etc.) 3) all sensors, motors, other devices.
PCB	DIB (Duplex Interface Board)	Mounted in the duplex unit. This PCB controls the operation of the duplexer. This PCB also contains the duplexer cover switch that detects when the duplexer cover is open and closed. The printer will not operate if the duplexer is not installed properly, or if the duplexer cover is open.
PCB	Duplexer Detection Board	Mounted behind the printer. The metal prongs of the DIB contact this board make the connection between the DIB and the duplexer cover switch mounted on the DIB. This contact must be closed for the printer to operate. The duplexer is not an option. It must be installed at all times, even when printing on only one side.
PCB	HRB (Head Relay Board)	Mounted behind the print heads on the carriage. This board performs many important 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 collection tank to the control board.
PCB	HVPS (High Voltage Power Supply)	Mounted under the top cover and above the transport belt. Generates the voltages applied to the transport belt that hold the paper on the belt during printing. Two interlock switches, one connected to the top cover and the other to the duplexer cover, prevent the HVPS from operating if either or both covers are open.

No.	Component	Function
PCB	ID Chip 1	The identification chip of the black (K) ink cartridge.
PCB	ID Chip 2	The identification chip of the cyan (C ink cartridge.
PCB	ID Chip 3	The identification chip of the magenta (M) ink cartridge.
PCB	ID Chip 4	The identification chip of the yellow (Y) ink cartridge.
PCB	Multi Bypass Tray Control Board	Mounted inside the multi bypass tray. This is the main control board that controls operation of the bypass tray and interfaces with the printer.
PCB	OPU (Operation Panel Unit	Mounted under the operation panel LCD and keypad. Controls the operation of the operation panel. The right front door sensor is also mounted on this PCB.
PCB	PFU Main Board	Mounted in the optional paper feed unit. This is the board that controls operation of the paper feed unit and interfaces with the printer.
PCB	PSU (Power Supply Unit)	Mounted under the left front cover. Supplies both 37V and 5.1V power to the HVPS and all motors in the printer.
PCB	SENC (Sub Scan Encoder)	A small PCB mounted below and slightly to the left of the vertical encoder wheel. The vertical encoder sensor is mounted and positioned on this PCB so the rim of the vertical encoder wheel passes through its gap as the wheel rotates. The sensor reads the code on the rim of the wheel to control the operation of paper feed timing and operation of the vertical feed motor.
Print Heads		
PH	Print Head 1	J007/J010: Contains 2 ink tanks: K, C. J011: Contains 2 ink tanks: Y, M
PH	Print Head 2	J007/J010: Contains 2 ink tanks: M, Y J011: Contains 1 ink tank: K
PH	Print Head 3	J007/J010: None J011: Contains 1 ink tank: C
PH	Print Head 4	J007/J010: None J011: Contains 2 ink tanks: M, Y

No.	Component	Function
Sensors		
SN	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.
SN	2nd Registration Sensor	Located in the center of the printer above the transport belt and behind the horizontal motor timing belt. This photosensor detects the leading and trailing edge of each sheet when the printer is printing at high speed. These readings are used to control job timing and to detect paper jams.
SN	Air Sensors	A pair of vertical pins at the top of each ink tank. This pair of pins detects changes in the voltage differential on the surface of the ink inside the print head tank. When these terminals detect air in the tank, this actuates the air release solenoid and vents air from the tank through the air release valve. This allows more ink to enter the tank.
SN	Carriage Position Sensor	Mounted under the right, front corner of the top cover. Detects the position of the carriage and print heads above the paper. When the envelope selector is pulled forward, the feeler leaves the gap and switches the sensor off. This mechanism is used to detect the up and down position of the carriage and print heads.
SN	Ink Cartridge Set Switches	A microswitch for each ink cartridge connected in series and mounted on the ink cartridge detection plate at the back of the right front cover that holds the ink cartridges. A metal contact on the back of the ink cartridge makes contact with the microswitch when the ink cartridge is inserted. This tells the machine whether the ink cartridge is inserted or inserted correctly.
SN	Ink Collection Tank Sensor	A "smart" reflective sensor mounted at the back of the ink collection tank. Detects when the ink collection tank is almost full and alerts the operator that the ink collection tank needs to be replaced.
SN	Ink Level Sensor	Mounted above the front guide rail. 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-

No.	Component	Function
		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.
SN	Maintenance HP Sensor	An interrupt sensor mounted in the maintenance unit that controls the operation of the maintenance motor in the print head cleaning cycle. At the beginning of the cleaning cycle, a feeler leaves the gap of this sensor and switches the motor on. At the end of the cleaning cycle the feeler rotates into the gap, switches the sensor off. This switches the motor off and the caps and wiper remain down at the home position.
SN	PFU Paper Sensor 1	Located below the above the bottom plate of the paper cassette in Tray 2 (the optional paper feed unit). A spring loaded bottom plate keeps the top of the stack against the pick-up roller for paper feed. A free-swinging feeler rests on top of the stack. After the last sheet feeds, one end of the feeler falls down through a cutout in the bottom plate. An actuator on the other end of the feeler swings up and out of the gap in the paper end sensor. This signals paper end.
SN	Paper End Sensor – Tray 1	Located below the transport belt. A spring loaded bottom plate keeps the top of the stack against the pick-up roller for paper feed. A free-swinging feeler rests on top of the stack. After the last sheet feeds, one end of the feeler falls down through a cutout in the bottom plate. An actuator on the other end of the feeler swings up and out of the gap in the paper end sensor. This signals paper end.
SN	Temperature/Humidity Sensor	Located inside the printer near the transport belt. The temperature/humidity sensor 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. For more, please refer to Section "4. Troubleshooting".
SN	Trailing Edge Sensor	Mounted at the right, rear corner of the printer (viewed from the back). The feeler of this interrupt sensor is mounted in the center of the paper path and connected to a long shaft. The end of the shaft has an actuator that moves in and out of the sensor gap. The feeler is pushed down by every sheet of paper and the actuator leaves the gap, then the feeler pops up again after the trailing edge passes and the actuator enters the gap and switches the sensor

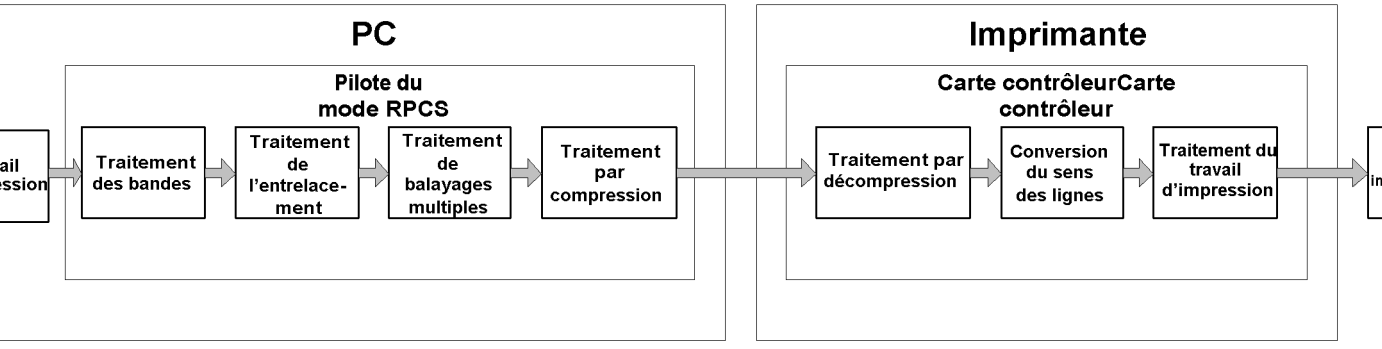
No.	Component	Function
		off. The length of time the sensor remains on is used to measure the length of the paper for print timing control. The sensor issues a paper end alert if the sensor does not turn on after two rotations of the paper feed roller.
SN	Vertical Encoder Sensor	Mounted on the SENC PCB with the rim of the vertical encoder wheel positioned in its gap. 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.
SN	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.
Solenoids		
SOL	Air Release Solenoid – SOL 1	Located under the right corner of the front cover, near the envelope selector. When the air level sensors detect that there is air in a tank, the system activates the air release solenoid to suck air from the tank. The partial vacuum pulls in the sides of the tank. This changes the position of the feeler on the side of the tank (used for ink level detection) and pulls ink into the tank from the ink supply tube.
Switches		
SW	Top Cover Switch	Mounted under the front edge of the top cover of the printer. Detects when the top cover of the printer is open or closed. The printer will not operate if the top cover is open.
SW	Duplexer Cover Switch	Mounted on the DIB inside the duplexer. Detects when the duplexer cover is open or closed. The printer will not operate if the duplexer cover is open.
Thermistor		
TH	Thermistor	This is a small bulb thermistor on the end of a wire and attached to the HRB. This thermistor measures the temperature around the print heads.

Basic Operation

Initialization Sequence at Power On

1. Start: Power ON
2. Operation Panel LED Check
3. Vertical Motor (Transport Belt) Operation Check
4. Maintenance Motor HP Check
5. Carriage HP Check
6. Ink collection tank Full Check
7. Ink Level Check Inside Print Head
8. Carriage All Scan Check
9. Capping
10. End

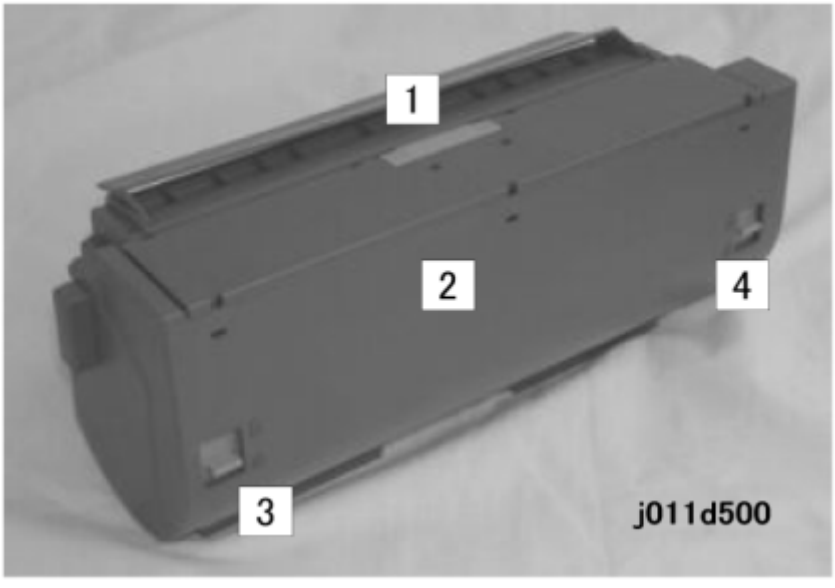
Image Processing



- Here is a brief summary of the steps in image processing:
- **Print Job**. The software application sends the print job to the printer driver.
- **Band Processing**. The print job gets divided into units of bands.
- **Interlace Processing**. The bands get broken into scan (print) units. Then the bits get converted for the direction of printing.
- **Multi-Band Processing**. Processing for individual lines.
- **Compression Processing**. The data gets compressed on the PC side. Then it goes to the printer.
- **Decompression**. The data gets decompressed when it gets to the printer.
- **Line Direction Conversio**n. The lines get converted to match the direction of printing. It gets rotated 90 degrees depending on whether the print job is for Portrait or Landscape orientation.
- **Print Job Processing**. The print job gets output.
- **Printer Output**. The print heads on the carriage print the job.

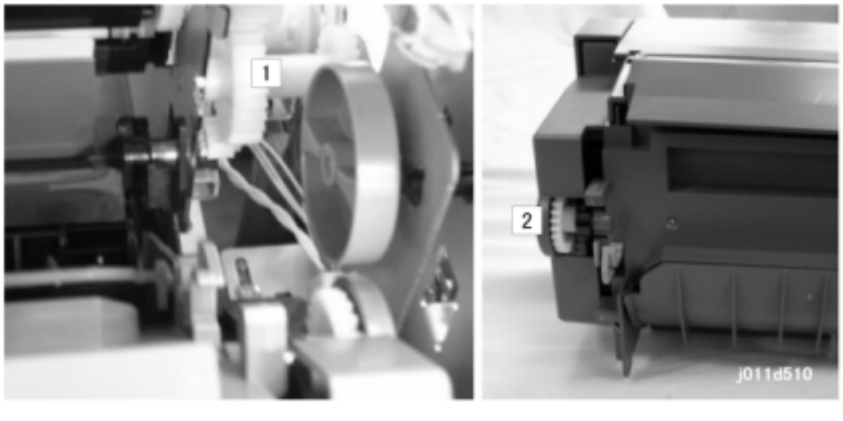
Duplex Unit

Overview



1	Duplexer Cover Button
2	Duplexer Cover
3	Duplexer Locks (x 2)

Duplex Drive

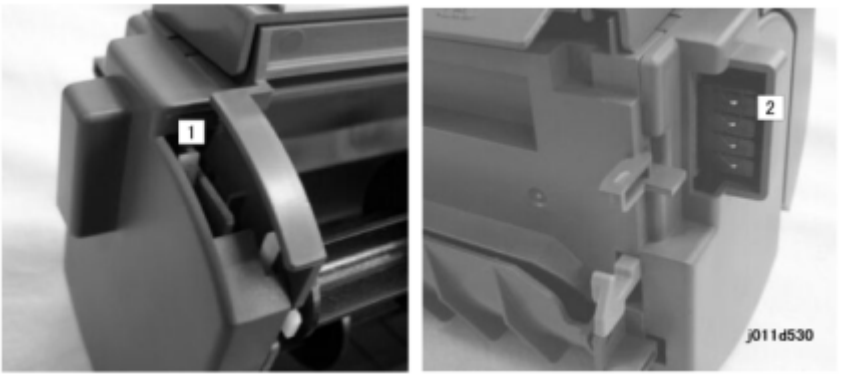


The main gear [1] of the vertical motor of the printer drives the duplex drive gear [2].

Here is a brief summary of how the duplex unit operates:

- The trailing edge sensor goes off after the trailing edge of the sheet passes overhead and the front side has printed.
- The vertical motor stops, and paper transport stops.
- The vertical motor reverses.
- The printed sheet feeds into the Duplex Unit.
- Once again, the vertical motor reveres.
- The inverted sheet feeds into the printer.
- The 2nd side of the sheet prints.

Duplexer Cover Switch



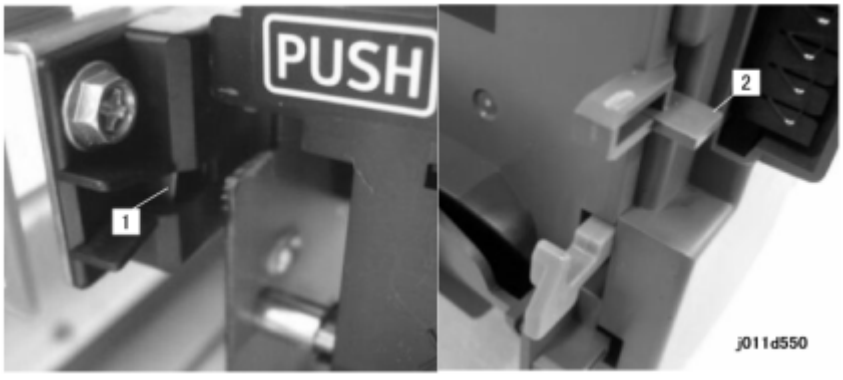
The Duplex Unit cover open switch [1] is a microswitch.

This switch detects if the cover is open or closed.

When the cover is closed the switch is closed. The circuit is closed at the 4 terminal pins [2] that connect to the DIB. The printer controls the Duplex Unit through the DIB.

The switch breaks the connection between the printer and Duplex Unit when the cover is open.

Duplexer Set Switch



The Duplex Unit set switch [1], a micro-switch in the printer, detects the presence of the Duplex Unit.

This occurs when the Duplex Unit is installed correctly on the back of the printer:

The unit the set lever [2] depresses the Duplex Unit set switch. Then it turns it on.

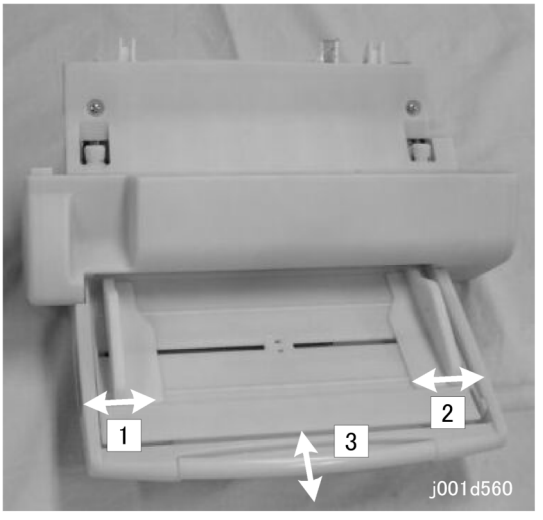
The printer signals an error (Paper Jam – Type 1) at these times:

- The Duplex Unit is not installed correctly
- The set lever has not fully depressed the Duplex Unit set switch

Important

- **The duplex unit is not an option for this printer.**
- **The duplex unit must be installed at all times in order for the printer to operated properly.**

Bypass (Option)



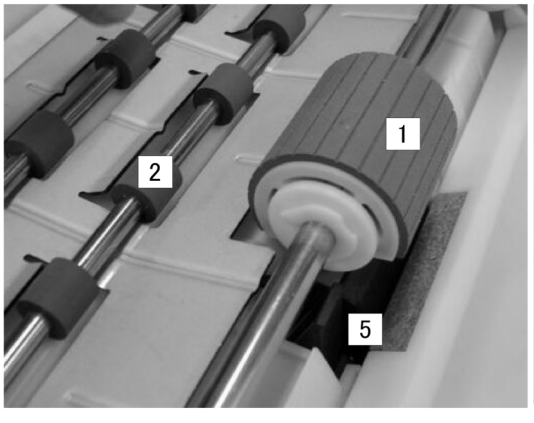
6

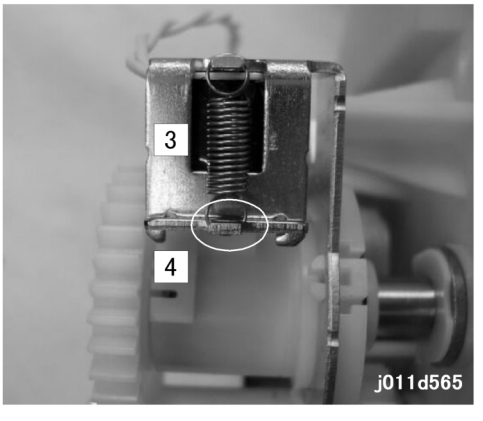
The Multi Bypass Tray J507 is an option that can be used with the J007/J010 or J011. This is an external tray that can be detached and then reattached whenever it is needed.

The bypass tray is equipped with side fences [1] and [2] that can be adjusted to accept a variety of standard paper sizes and envelopes.

The tray extension [3] can be extended for long paper sizes.

The tray can hold 100 sheets of standard weight paper (60 to 105 g/m^2). For more details, please refer to the Section 7 "Specifications".





When a print job starts with the bypass specified as the feed source:

- The bypass paper feed motor switches on and rotates the pick-up roller [1] and paper feed rollers [2].
- The bypass paper feed clutch [3] activates and raises its pawl [4]. This releases the pick-up roller and allows it to rotate.
- When the pick-up roller, a half roller, rotates through its arc of 180 degrees it picks up one sheet of paper and pulls it out of the tray.
- A rubber friction pad [5] below the pick-up roller provides enough resistance to stop any sheet other than the one in contact with the pick-up roller from double feeding.
- Once the pick-up roller completes its arc of rotation (as shown above), the pawl [4] of the paper feed clutch [3] locks the pick-up roller and will not release it until the next sheet feeds.
- However, the clutch allows the paper feed rollers [2] to continue to rotate and feed the sheet out of the bypass tray.

Paper Feed Unit J506 (Tray 2)

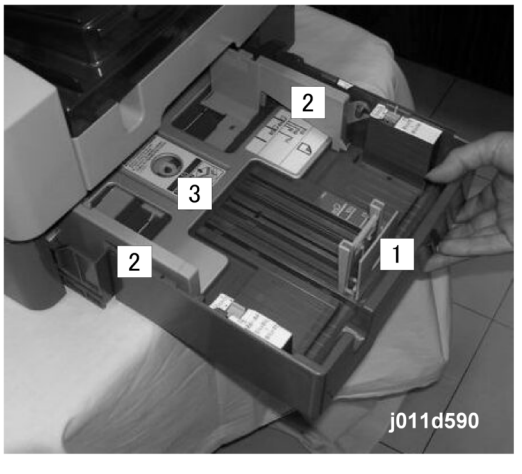
Overview

Paper Feed Unit J506

The Paper Feed Unit (PFU) J506:

- Can be installed with the J008 only.
- Contains one universal paper cassette with adjustable fences that can hold a variety of standard paper and envelope sizes.
- Holds approximately 500 sheets of standard (80 g/m^2 (20 lb.)) A4/LT size paper

For more details, please refer to Section 7 "Specifications".

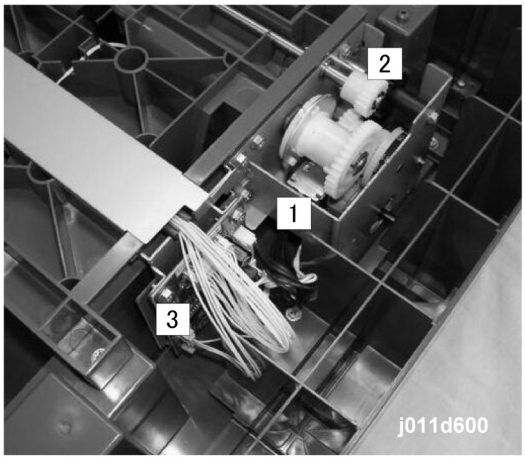


You can adjust and lock the end fence [1] and two side fences [2] to a variety of standard paper sizes.

When the paper cassette is inserted into the tray unit:

- Two guides force down the cassette arms on both sides of the bottom plate [3].
- The bottom plate rises against the bottom of the paper stack as guide rails raises the bottom stack when the cassette is pushed into the printer.
- The pressure of the bottom plate on the bottom of the stack keeps the top of the stack at the correct position to feed the paper.

Paper Feed



The paper feed motor [1] in the tray drives the feed roller [2]. The control board [3] controls the operation of the feed clutch (not shown). This engages the shaft where the feed roller is mounted. Then it rotates it at the prescribed times to feed paper from the tray.

A friction pad at the edge of the cassette below the feed roller does not let sheets double feed.

7. Specifications

Specifications

Printer Engine Base Specifications

Basic

Configuration	Desktop		
Printing Method	On-Demand GEL JET Ink Printing Technology		
First Print Time	J007/J010	Less than 8 sec.	1st feed to output.
	J011	Less than 6 sec.	1st feed to output.
Warm-up Time	J007/J010	Less than 35 sec.	
	J011	Less than 40 sec.	
Operation Pane	Lines x2, LED x4 (Online, Power, Data-In, Alert) Keys x9 (Power, Online, Menu, Escape, Reset, Form Feed, Up arrow, Down arrow, #Enter)		

Print Heads

	J007/J010	J011
Number of Heads	2 Heads (4-Color)	4 Heads (4-Color)
Lines/Head	2 Lines/Head	2 Lines/Head
Number of Nozzles	192 Nozzles/Line	192 Nozzles/Line
Nozzle Pitch	0.169 mm (150 dpi)	0.169 mm (150 dpi)

Print Speed

	Color Mode	J007/J010	J011
High Speed/Normal Paper	Monochrome	>18.5 ppm	>19.5 ppm

	Color	>14.5 ppm	>15.5 ppm
Std. (Speed Priority)/Normal Paper	Monochrome	>10.5 ppm	>18.5 ppm
	Color	>8.5 ppm	>14.5 ppm
Std. (Quality Priority)/Normal Paper	Monochrome	>5.5 ppm	>10.5 ppm
	Color	>4.5 ppm	>7.5 ppm

Resolution

Paper	Mode	dpi		Mono/Bi-direct.
Normal	High Speed (Draft)	J007/ J010	300 x 150 (4-color)	2-direct./1 pass
		J011	300 x 300 (4-color)	2-direct./1 pass
	Std (Speed Priority)	600 x 300 (4-color)		2-direct./1 pass
	Std. (Quality Priority)	600 x 600 (4-color)		2-direct./1 pass
Ink-Jet	Std (Speed Priority)	600 x 600 (4-color)		1-direct./1 pass
	Std. (Quality Priority)	600 x 600 (4-color)		1-direct./1 pass
Glossy Paper	Std (Speed Priority)	600 x 600 (4-color)		1-direct./4 passes
	Std. (Quality Priority)	1200 x 1200 (4-color)		1-direct./4 passes
Transparency	Std. (Quality Priority)	600 x 600 (4-color)		1-direct./4 passes

Recommended Mode Settings

Paper	Mode	dip	Mono/Bi-direct.
Normal	High Quality	600 x 600 (4-color)	1-direct./1 pass
Ink-Jet	High Speed (Draft)	600 x 600 (4-color)	1-direct./1 pass
Glossy Paper			
Transparency			

Print Area

Paper	Maximum	3 mm (0.2 in.) Top, Bottom, Left, Right Margins
	Recommended	4.2 mm (1/6 in.) Top, Bottom, Left, Right Margins
Envelopes	Maximum	8 mm (0.32 in.) Top Margin
		38 mm (1½ in.) Bottom Marin
		3 mm Left, Right Margins
	Recommended	8 mm (0.32 in.) Top Margin
		38 mm (1½ in.) Bottom Marin
		4.2 (1/6 in.) mm Left, Right Margins

Power

Power Supply	NA: 100 to 120 V ±10%, 50 to 60 Hz ±3% EU/ASIA: 220 to 240V ±10%, 50 to 60 Hz ±3%			
Power Consumption	J007	J010	J008	J011
During Operation	38 W	44W	40W	46 W
Energy Saver Mode	6W	10W	10W	10W
Time Shift to Energy Save	15 min.			

Noise Levels

Standby

Sound Pressure Level	Less than 34 dB (A)
Sound Power Level	Less than 40 dB (A)

Printing

	J007/J010	J011

	Std (Speed Priority)	Std (Quality Priority)	Std (Speed Priority)	Std (Quality Priority)
Sound Pressure Level	52 dB (A)	49 dB (A)	54 dB (A)	51 dB (A)
Sound Power Level	63 dB (A)	61 dB (A)	65 dB (A)	63 dB (A)

Environment

Operating Range	10 to 32°C, 15 to 80% RH
Recommended Range	15 to 25°C, 30 to 70% RH
Altitude	Use below 2,500 m (1.5 mi)
Ambient Light	Less than 2,000 Lux

Dimensions

Printer (w x d x h)	J007/ J010	Standalone	416 x 491 x 263 mm (16.4 x 19.3 x 10.4 in.)
		With Option (Bypass)	416 x 713 x 340 (16.4 x 28.1 x 13.4 in.)
	J011	Standalone	500 x 491 x 263 mm (19.7 x 19.3 in.)
		With Options (Bypass + PFU)	500 x 713 x 450 mm (197 x 28.1 x 17.7 in.)

Weight

Printer Weight	J007/ J010	Standalone	Less than 14 kg (30.8 lb.)
		With Option (Bypass)	Less than 16.5 kg (36.3 lb.)
	J011	Standalone	Less than 15.5 kg (34.1 lb.)
		With Options (Bypass + PFU)	Less than 23.5 kg (51.7 lb.)

Paper Types

Tray 1 (Standard)	Standard PPC, Thick Paper, Color Paper, Tractor Drive, OHP
Multi Bypass Tray	Same as Standard Tray 1 + Envelopes

Important

- **Use only recommended paper. Use of any other type of paper could cause problems.**

Paper Trays

Paper Feed: Tray 1

Method	Universal paper cassette		
Paper Capacity	Normal Paper	250 80 g/m^2 (20 lb.)	
	Glossy Paper	20 (all environments)	
	Transparency (OHP)	1 (all environments)	Load 1 sheet at a time.
	Envelopes	20	
Paper Size Range	Max. (W x L)	216 x 356 mm (8½ x 14 in.)	
	Min. (W x L)	90 x 139.7 mm (3$^1/_2$ x 5$^1/_2$ in.)	
Size Detection	None. Printer operation panel setting required.		
Paper Out	Detected by sensor.		
Paper Weight	Normal PPC	60 to 255 g/m^2 (52 to 220 kg, 16 to 68 lb.)	
	Thick Paper	60 to 105 g/m^2 (16 to 20 lb, 52 to 90 kg)	

Paper Feed: Tray 2

The optional paper feed tray (Tray 2) can be installed with the J008 only.

Method	Universal paper cassette with printer mounted above.
Installable units	1 only, below printer

Paper Capacity	Normal Paper	500 80 g/m^2 (20 lb.)	
Paper Size Range	Max. (W x L)	216 x 356 mm (8 ½ x 14 in.)	
	Min. (W x L)	148 x 210 mm (5.8 x 8.3, approx. A5 SEF)	
Size Detection	Printer operation panel setting required.		
Paper Weight	Normal PPC	60 to 105 g/m^2 (52 to 90 kg, 16 to 28 lb.)	

Multi Bypass Tray

Method	Universal paper cassette	
Paper Capacity	100 sheets (80 g/m^2, 70 kg 20 lb)	
Size Range	Max. (W x L)	216 x 1295.4 mm (8 $^1/_2$ x 51 in.)
	Min. (W x L)	55 x 127 mm (2.2 x 5 in.)
Size Detection	None. Printer operation panel setting required.	
Paper Out	Detected by sensor.	
Paper Weight	60 to 255 g/m^2 (52 to 220 kg, 16 to 68 lb.)	

Paper Output Tray

Delivery	Face-up	
Output Tray Capacity	Normal PPC	50 sheets
	Envelopes	30 sheets
	Glossy Paper	20 sheets
	Transparencies	1 sheet (recommended)
Paper Size	Same as paper feed	
Paper Detection	No	
Tray Full Detection	No	

Supported Paper Sizes

North America

Type	Name	Feede	Size	Bypass	Tray 1	Tray 2	Face-up	Duplex
Plain	A3 W	SEF	12" x 18"	N	N	N	N	N
Paper	A3	SEF	297 x 420 mm	N	N	N	N	N
	A4	SEF	210 x 297 mm	Y	Y	Y	Y	Y
	B4	SEF	257 x 364 mm	N	N	N	N	N
	B5	SEF	182 x 257 mm	Y	Y	Y	Y	Y
	B5	LEF	257 x 182 mm	N	N	N	N	N
	B6	SEF	125 x 176 mm	N	N	N	N	N
	B6	LEF	176 x 125 mm	N	N	N	N	N
	DLT	SEF	11" x 17"	N	N	N	N	N
	LT	SEF	81/2" x 11"	Y	Y	Y	Y	Y
	LT	LEF	11" x $8^1/_2$"	N	N	N	N	N
	LG	SEF	$8^1/_2$" x 14"	Y	Y	Y	Y	N
	HLT	SEF	$5^1/_2$" x $8^1/_2$"	N	N	N	N	N
	HLT	LEF	$8^1/_2$" x $5^1/_2$"	Y	Y	Y	Y	Y
	Exe	SEF	$7^1/_4$" x $10^1/_2$"	Y	Y	Y	Y	Y
	Exe	LEF	$10^1/_2$" x $7^1/_4$"	N	N	N	N	N
	F	SEF	8" x 13"	Y	Y	Y	N	Y
	Foolscap	SEF	$8^1/_2$" x 13"	Y	Y	Y	N	Y
	Folio	SEF	$8^1/_4$" x 13"	Y	Y	Y	N	Y
	8 Kai	SEF	267 x 390 mm	N	N	N	N	N
	16 Kai	SEF	267 x 195 mm	N	N	N	N	N

Type	Name	Feede	Size	Bypass	Tray 1	Tray 2	Face-up	Duplex
	16 Kai	LEF	195 x 267 mm	N	N	N	N	N
Enve-lopes	Com10	LEF	$4^{1}/_{8}$" x $7^{1}/_{2}$"	Y	Y	Y	Y	Y
	Monarch	LEF	$3^{7}/_{8}$" x $7^{1}/_{2}$"	Y	Y	Y	Y	Y
	C6	LEF	114 x 162 mm	Y	Y	Y	Y	Y
	C5	LEF	162 x 229 mm	Y	Y	Y	Y	Y
	DL Env	LEF	110 x 220 mm	Y	Y	Y	Y	Y

Remarks:

Y	Supported
N	Not supported.
TBA	To Be Announced (Pending)

Europe/Asia

Type	Name	Feed	Size	Bypass	Tray 1	Tray 2	Face-up	Duplex
Plain	A3 W	SEF	12" x 18"	N	N	N	N	N
Paper	A3	SEF	297 x 420 mm	N	N	N	N	N
	A4	SEF	210 x 297 mm	Y	Y	Y	Y	Y
	A4	LEF	297 x 210 mm	N	N	N	N	N
	A5	SEF	148 x 210 mm	N	N	N	N	N
	A5	LEF	210 x 148 mm	Y	Y	Y	Y	Y
	A6	SEF	105 x 148 mm	Y	Y	Y	Y	Y
	B4	SEF	257 x 364 mm	N	N	N	N	N
	B5	SEF	182 x 257 mm	Y	Y	Y	Y	Y
	B5	LEF	257 x 182 mm	N	N	N	N	N

Type	Name	Feed	Size	Bypass	Tray 1	Tray 2	Face-up	Duplex
	B6	SEF	125 x 176 mm	N	N	N	N	N
	B6	LEF	176 x 125 mm	N	N	N	N	N
	DLT	SEF	11" x 17"	N	N	N	N	N
	LG	SEF	$8^1/_2$" x 14"	Y	Y	Y	Y	N
	LT	SEF	$8^1/_2$" x 11"	Y	Y	Y	Y	Y
	LT	LEF	11" x $8^1/_2$"	N	N	N	N	N
	HLT	SEF	$5^1/_2$" x $8^1/_2$"	N	N	N	N	N
	HLT	LEF	$8^1/_2$" x $5^1/_2$"	Y	Y	Y	Y	Y
	Exe	SEF	$7^1/_4$" x $10^1/_2$"	Y	Y	Y	Y	Y
	Exe	LEF	$10^1/_2$" x $7^1/_4$"	N	N	N	N	N
	F	SEF	8" x 13"	Y	Y	Y	N	Y
	Foolscap	SEF	$8^1/_2$" x 13"	Y	Y	Y	N	Y
	Folio	SEF	$8^1/_4$" x 13"	Y	Y	Y	N	Y
	Folio	LEF	13" x $8^1/_4$"	N	N	N	N	N
	8 Kai	SEF	267 x 390 mm	N	N	N	N	N
	16 Kai	SEF	267 x 195 mm	N	N	N	N	N
	16 Kai	LEF	195 x 267 mm	N	N	N	N	N
Envelopes	Com10	LEF	$4^1/_8$" x $7^1/_2$"	Y	Y	Y	Y	Y
	Mon-arch	LEF	$3^7/_8$" x $7^1/_2$"	Y	Y	Y	Y	Y
	C6	LEF	114 x 162 mm	Y	Y	Y	Y	Y
	C5	LEF	162 x 229 mm	Y	Y	Y	Y	Y
	DL Env	LEF	110 x 220 mm	Y	Y	Y	Y	Y

Remarks:

Y	Supported
N	Not supported.
TBA	To Be Announced (Pending)

Printer Interface, Operating Systems

Interfaces	USB 1.1/2.0	J007/J010,. J011
		R-9100U Wire LAN Connection
		~~R9400W Wireless LAN Connection (802.11b)~~
Network	NIB	J007/J008 Option
		J010/J011 Built-in
Printer Driver	Ricoh RPCR	J007/J010, J007/J010
Operating Systems	Windows 98, Windows Me, Windows NT, Windows 2000, Windows XP, Windows Server2000, Mac OS 9.1 (Ver. 10.3 and later)	
Controller Engine	None	

External Options

Multi Bypass Tray J507	J007/J010, J011 See "Paper Feed: Multi Bypass" above.
Network Interface Board J508	Configuration: For J007/J010 only (built-in for J010/J011) Protocol: TCP/IP (IPv4, IPv6)
Paper Feed Unit	J008 only (See "Paper Feed: Tray 2" above.

Consumables J007/J010, J011

J734	M size Print Cartridge Black – K
J735	M size Print Cartridge Cyan – C
J736	M size Print Cartridge Magenta – M

J737	M size Print Cartridge Yellow – Y
J738	L size Print Cartridge Black – K
J739	L size Print Cartridge Cyan – C
J740	L size Print Cartridge Magenta – M
J741	L size Print Cartridge Yellow – Y

Note

- Four starter ink cartridges (K, C, M, Y) are provided with each printer. Thereafter, replacement ink cartridges must be purchased separately.

Ink cartridges are available win two sizes: Large and Medium. The following tables compares the supply capacity of the Starter (small), Medium, and Large ink cartridges.

Size	Color	Weight (g)/ Volume (cc)	Est. Service Life (Sheets)	
Starter (Small)	K	27.3/25.28	400	These are very approximate estimates. The estimated service life may vary significantly due to the amount of coverage on a page, environmental conditions, and so on. After the printer signals the near end alert for an ink cartridge, approximately **40** pages can be printed before the end alert is issued.
	C	20.1/19/14	400	
	Y	20.1/19/14	400	
	M	20.1/19/14	400	
Medium	K	35.5/32.87	1,500	
	C	26.7/25.43	1,000	
	Y	26.7/25.43	1,000	
	M	26.7/25.43	1,000	
Large	K	68.0/62.96	4,000	
	C	50.9/48.8	3,000	
	Y	50.9/48.8	3,000	
	M	50.9/48.8	3,000	

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