Model A-P4
Machine Code: G147

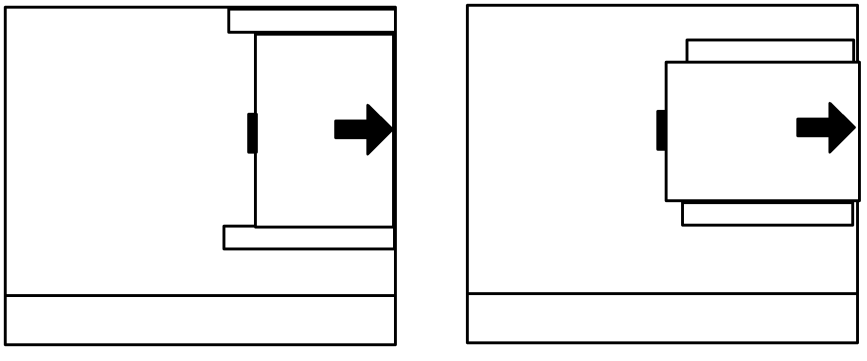
SERVICE MANUAL

May. 12th, 2006
Subject to change

Conventions Used in This Manual

This manual uses several symbols.

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



_pseflef

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.

Trademarks

- Microsoft®, Windows®, and MS-DOS® are registered trademarks of Microsoft Corporation in the United States and /or other countries.
- PostScript® is a registered trademark of Adobe Systems, Incorporated.
- PCL® is a registered trademark of Hewlett-Packard Company.
- Ethernet® is a registered trademark of Xerox Corporation.
- PowerPC® is a registered trademark of International Business Machines Corporation.
- Other product names used herein are for identification purposes only and may be trademarks of their respective companies. We disclaim any and all rights involved with those marks.

Safety Instructions

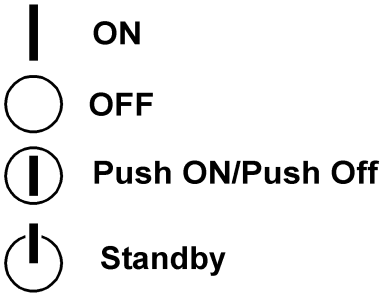
For your safety, please read this manual carefully before you service machine. Always keep this manual handy for future reference.

- 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.



_onoff

Responsibilities of the Service Technician

- 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 or 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.

- Lithium Batteries -

⚠WARNING

- Always replace a lithium battery on a PCB with the same type of battery prescribed for use on that board. Replacing a lithium battery with any type other than the one prescribed for use on the board could lead to an explosion or damage to the PCB.
- Never discard used batteries by mixing them with other trash. Remove them from the work site and dispose of them in accordance with local laws and regulations regarding the disposal of such items.

- Ozone Filters -

⚠CAUTION

- Always replace ozone filters as soon as their service life expires (as described in the service manual). An excessive amount of ozone can build up around machines that use ozone filters if they are not replaced at the prescribed time. Excessive ozone could cause personnel working around the machine to feel unwell.

- Power Plug and Power Cord -

⚠WARNING

- Before serving 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 which could cause a fire.
- Inspect the 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 on the plug, not the cable.

After Installation

- 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

  - **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.**

Safety Instructions for Toner and Ink

This section describes information for users in regard to the use of toner and ink.

Accidental Physical Exposure

- PPC Toner Exposure -

⚠CAUTION

- Work carefully when removing paper jams or replacing toner bottles or cartridges to avoid spilling toner on clothing or the hands.
- If toner is inhaled, immediately gargle with large amounts of cold water and move to a well ventilated location. If there are signs of irritation or other problems, seek medical attention.
- If toner gets on the skin, wash immediately with soap and cold running water.
- If toner gets into the eyes, flush the eyes with cold running water or eye wash. If there are signs of irritation or other problems, seek medical attention.
- If toner is swallowed, drink a large amount of cold water to dilute the ingested toner. If there are signs of any problem, seek medical attention.
- If toner spills on clothing, wash the affected area immediately with soap and cold water. Never use hot water! Hot water can cause toner to set and permanently stain fabric.

- Ink Exposure -

⚠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.
- Ink is difficult to remove from fabric. Work carefully to avoid staining clothing when performing routine maintenance replacing ink packs or ink cartridges.

Handling and Storing Toner and Ink

- Handling and Storing PPC Toner -

⚠WARNING

- Toner, used toner, and developer are extremely flammable. Never store toner, developer, toner cartridges, or toner bottles (including empty toner bottles or cartridges) in a location where they will be exposed to high temperature or an open flame.

⚠CAUTION

- Always store toner and developer supplies such as toner and developer packages, cartridges, and bottles (including used toner and empty bottles and cartridges) out of the reach of children.
- Always store fresh toner supplies or empty bottles or cartridges in a cool, dry location that is not exposed to direct sunlight.

- Handling and Storing Ink -

⚠WARNING

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

⚠CAUTION

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

Toner and Ink Disposal

- PPC Toner Disposal -

⚠WARNING

- Never attempt to incinerate toner, used toner, or empty toner containers (bottles or cartridges). Burning toner can explode and scatter, causing serious burns.
- Always wrap used toner and empty toner bottles and cartridges in plastic bags to avoid spillage. Follow the local laws and regulations regarding the disposal of such items.
- Dispose of used toner and toner cartridges at one of our dealers or at an authorized collection site. Always dispose of used toner cartridges and toner bottles in accordance with the local laws and regulations regarding the disposal of such items.

- Ink Disposal -

⚠CAUTION

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

Safety Precautions for This Machine

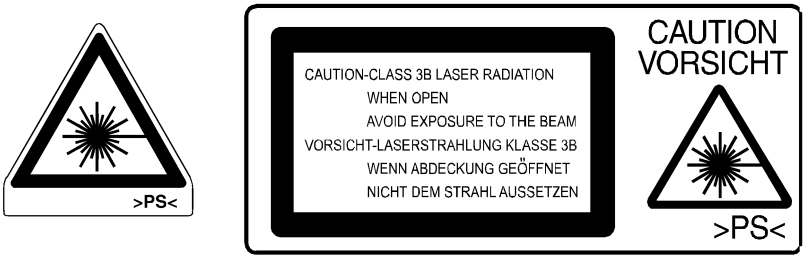
Laser Safety

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

⚠WARNING

- Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.
- Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes.

Caution Labels



_safelabel

Lithium Batteries (Memory Back-up)

⚠CAUTION

- The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

TABLE OF CONTENTS

2. Preventive Maintenance

3. Replacement and Adjustment

4. Troubleshooting

5. Service Tables

6. Details

7. Specifications

1. Installation

Cautions

⚠CAUTION

- To avoid damaging the hard disk or memory, never turn off the power switch when the power LED is lit or flashing.

Note

- The power LED lights or flashes while the machine is communicating with the network server, or while the machine is accessing the hard disk or memory to read and write data.

Installation Requirements

1

Environment

1. Temperature Range: 10 °C to 32 °C (50 °F to 90 °F)
2. Humidity Range: 15% to 80% RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m^3/hr/person
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10^{-6} oz/yd^3)
6. Avoid areas exposed to sudden temperature changes:
    - Areas directly exposed to cool air from an air conditioner.
    - Areas directly exposed to heat from a heater.
7. Do not place the machine where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the main machine on a strong and level base. Inclination on any side should be no more than 5 mm (0.2").
10. Do not place the machine where it may be subjected to strong vibrations.

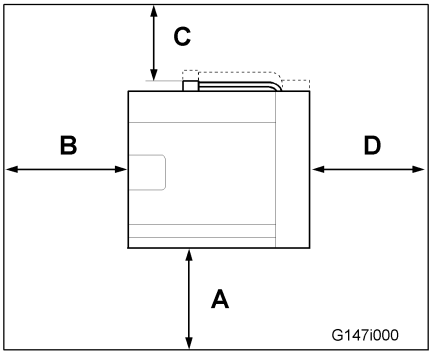
Machine Level

Front to back: Within 5 mm (0.2") of level

Right to left: Within 5 mm (0.2") of level

Minimum Space Requirements

Place the main machine near the power source, providing clearance as shown:



A: Front: >75 cm (29.6")

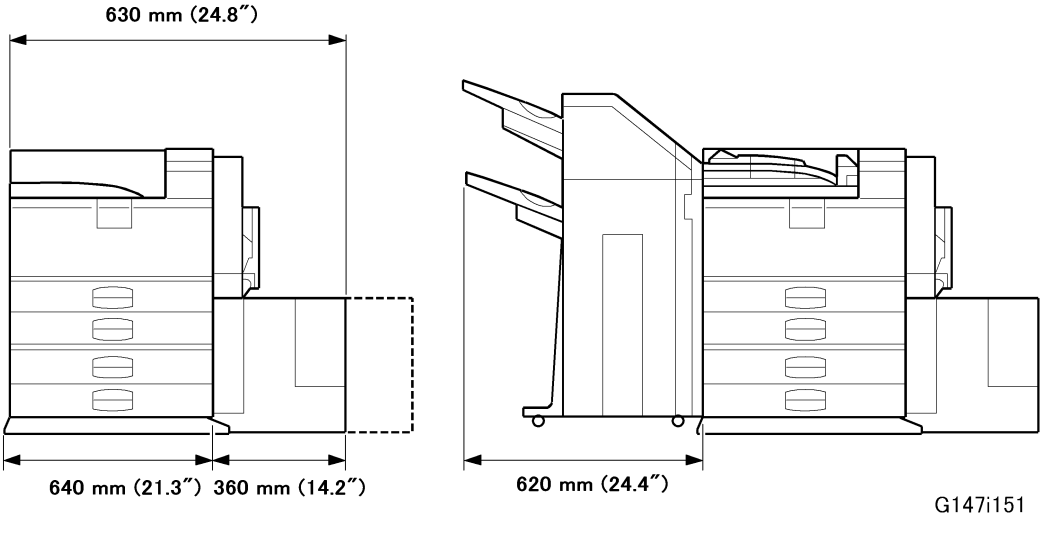
B: Left: > 10 cm (4")

C: Rear: > 10 cm (4")

D: Right > 10 cm (4")

Note

- The 75 cm (29.5") recommended for the space at the front is for pulling out the paper tray only. If the operator stands at the front of the main machine, more space is required.



Power Requirements

⚠CAUTION

- Make sure that the wall outlet is near the main machine and easily accessible. Make sure the plug is firmly inserted in the outlet.

- Avoid multi-wiring.
- Be sure to ground the machine.

1. Input voltage level:
    - North America 120 V, 60 Hz: More than 12.5 A
    - Europe/Asia 220 V ~ 240V, 50 Hz/60 Hz: more than 8 A
2. Permissible voltage fluctuation: 10% to 15%
3. Never set anything on the power cord.

Main Machine Installation

Installation Overview

The installation procedures of the following items are in the Operating Instructions:

- Printer G147 (main machine) Installation
- Paper Tray G839 (Option)

Note

- The Paper Tray G839 must be installed before the Finisher 3000 G838 can be installed.

The installation procedures of the following options are in this service manual:

Hardware Options

- LCIT RT45 B543
- Bridge Unit B538 (for Finisher 3000)
- Finisher 3000 SR 3040 G838
- Punch Unit B377 (for Finisher 3000)

Controller Options

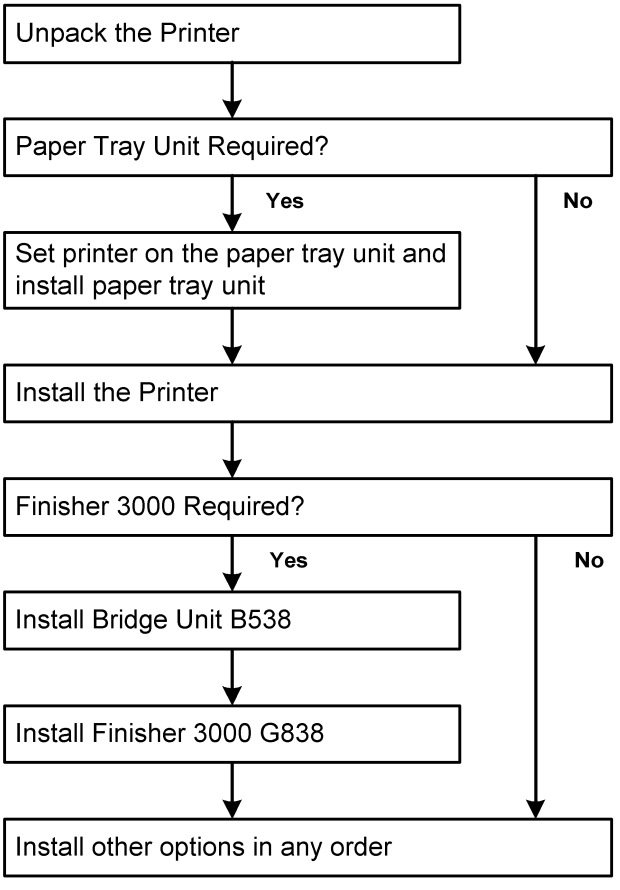
- IEEE1284 Interface Board B679
- IEEE802.11b Interface Unit B813
- USB Interface Unit G819
- Data Overwrite Security Unit B735 (Type C)

The installation procedures of the following controller options are in the operating instructions:

- Gigabit Ethernet G874
- VM Card G874
- Data Storage Card B874
- User Account Enhance Unit (Optional NVRAM)

1

Installation Flowchart



G147i510

LCT (B543)

Accessory Check: LCT

Check the quantity and condition of the accessories in the box against the following list:

No.	Description	Q'ty
1.	Joint Pin	2
2.	Stepped Screw M3 x 18	4
3.	Installation Procedure	1

Installation Procedure: LCT

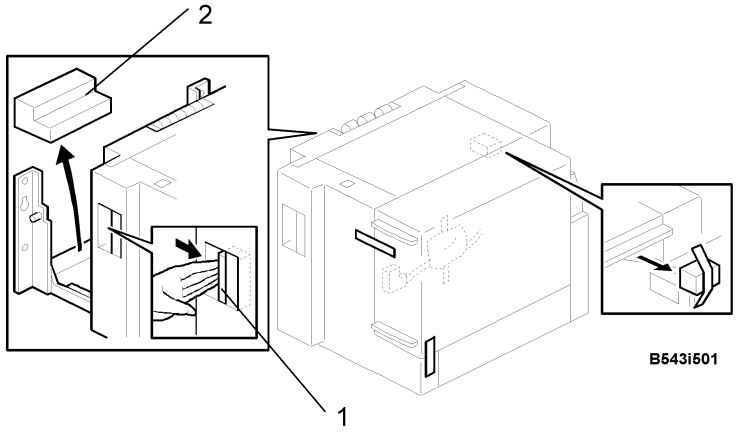
⚠CAUTION

- Unplug the main machine power cord before starting the following procedure.

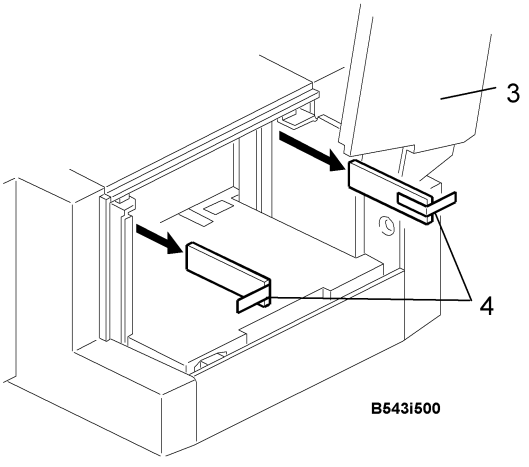
Note

- The Paper Tray G839 must be installed before installing the LCT.

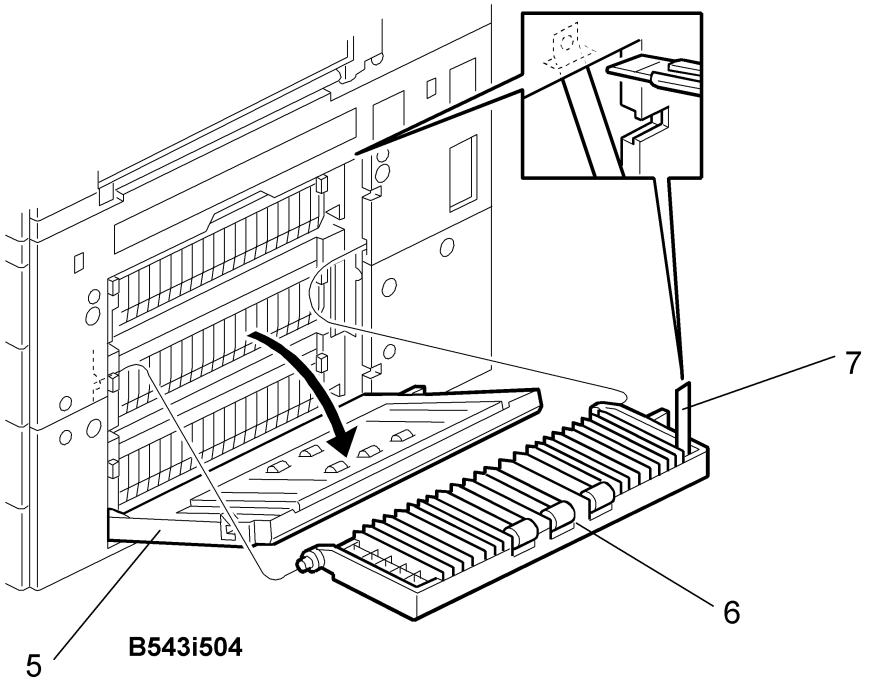
1. **Unpack the LCT.**



2. **Remove the tapes on the unit.**
3. **Release the lever [1] and remove the spacer [2].**



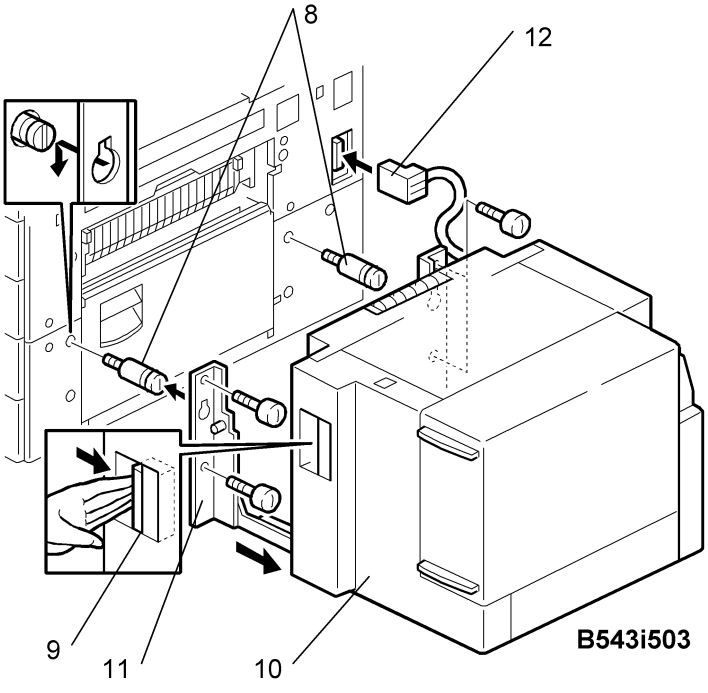
4. Open the cover [3] and remove the tape and shipping material [4] from inside.



5. Open the right cover of the paper tray unit [5].
6. Open the lower right cover [6].
7. Cut the band [7] and remove the lower right cover.

Note

- The upper part of the band must be cut as shown. Otherwise, paper jams may occur.



1. Install the joint pins [8].
2. Push the release lever [9] and slide the LCT to the right (front view).
3. Hang the LCT [10] on the joint pins, then secure the brackets [11] (x 4).
4. Return the LCT to the previous position and connect the LCT cable [12].
5. Open the LCT cover and load the paper.
6. Turn on the ac switch and check the LCT operation.

Bridge Unit (B538)

1

Accessory Check: Bridge Unit

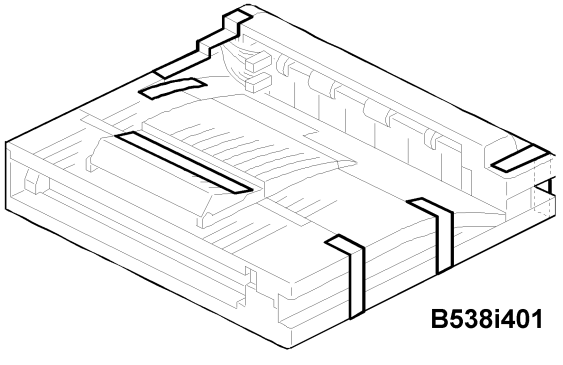
Check the quantity and condition of the accessories in the box against the following list:

No.	Description	Q'ty
1.	Stepped Screw	2
2.	Connector Cover	1
3.	Exit Mylar	2
4.	Installation Procedure	1

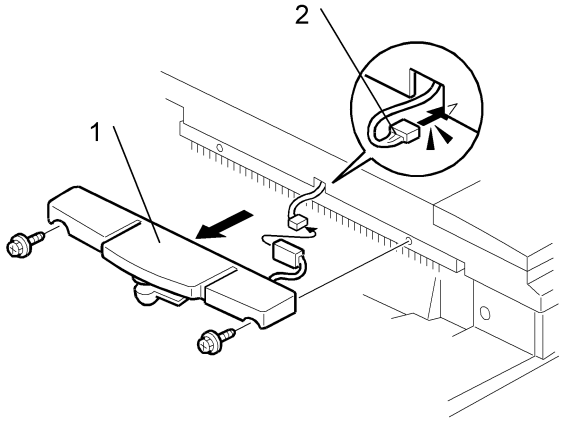
Installation Procedure: Bridge Unit

⚠CAUTION

- Unplug the main machine power cord before starting the following procedure.

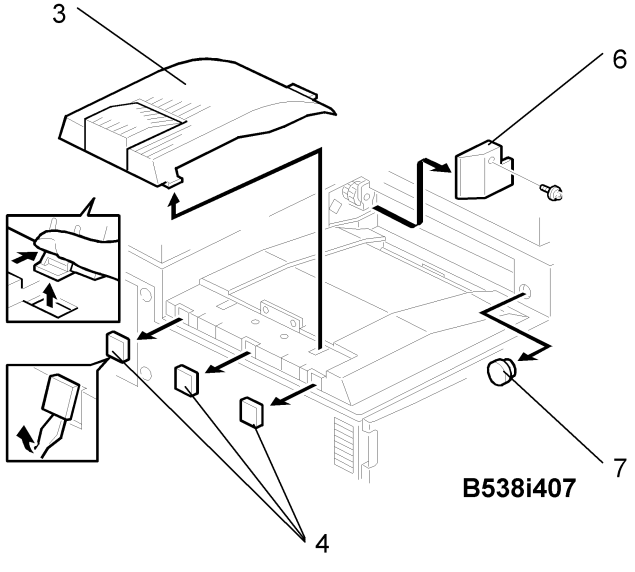


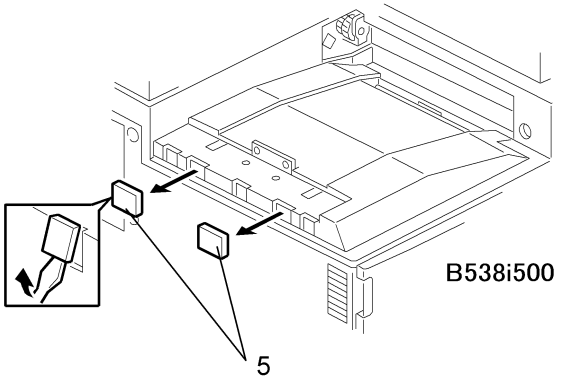
1. **Unpack the bridge unit and remove all tapes and shipping retainers.**



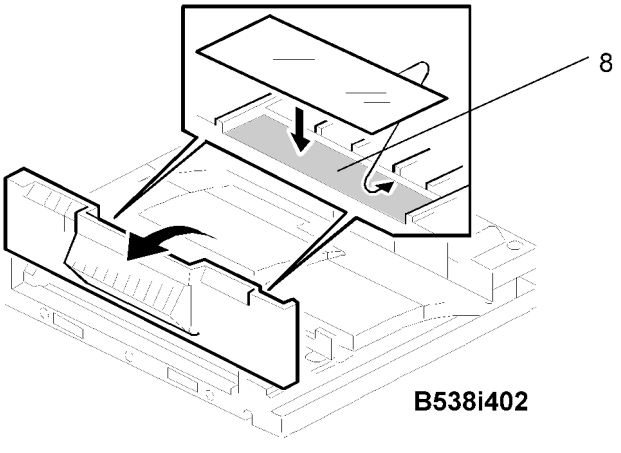
G147I152

2. **Remove the tray full sensor cover [1] (x2, x1).**
3. **Insert the loose connector [2] into the hole.**

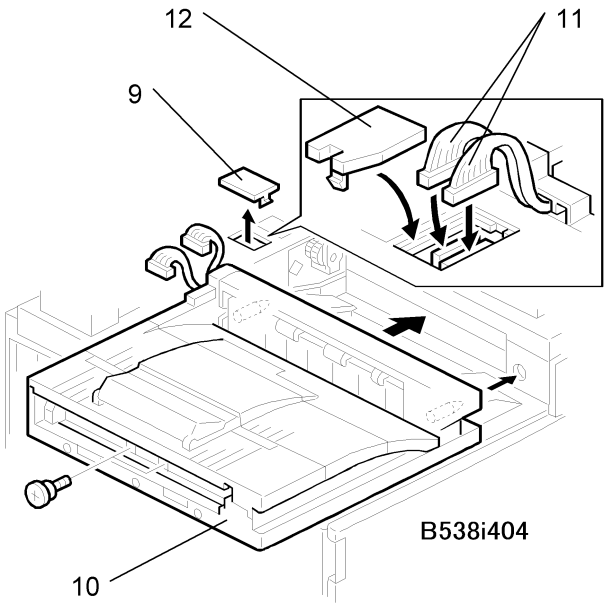




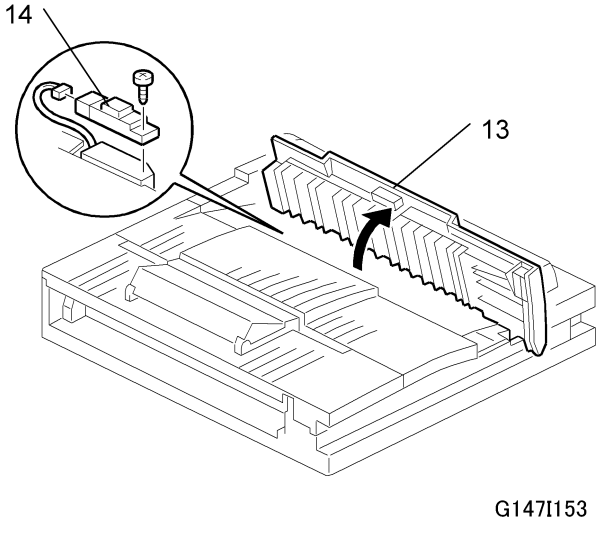
4. Remove the inner tray [3].
5. On the side of the machine, remove the three small covers [4].
6. Remove the two larger covers [5].
7. Remove the cover [6] (x 1).
8. Remove the cap [7].



9. If an optional finisher is to be installed, attach two mylars [8] to the bridge unit.



10. Remove the cover [9].
11. Install the bridge unit [10] (x 2).
12. Connect the bridge unit I/F harnesses [11] (x 2).
13. Install the connector cover [12].



14. Open the cover to expose the sensor connector [13].
15. Attach the paper sensor [14] (provided) (x1, x1).

16. **Turn on the main switch and check the bridge unit operation (make sure that there are no paper jams).**

Two-Tray Finisher (G838)

Accessory Check: Two Tray Finisher

Check the quantity and condition of the accessories in the box against the following list:

No.	Description	Q'ty
1.	Front Joint Bracket	1
2.	Rear Joint Bracket	1
3.	Shift Tray	2
4.	Screw – M4 x 8	2
5.	Screw – M4 x 12	5
6.	Ground Plate	1
7.	Installation Procedure	1

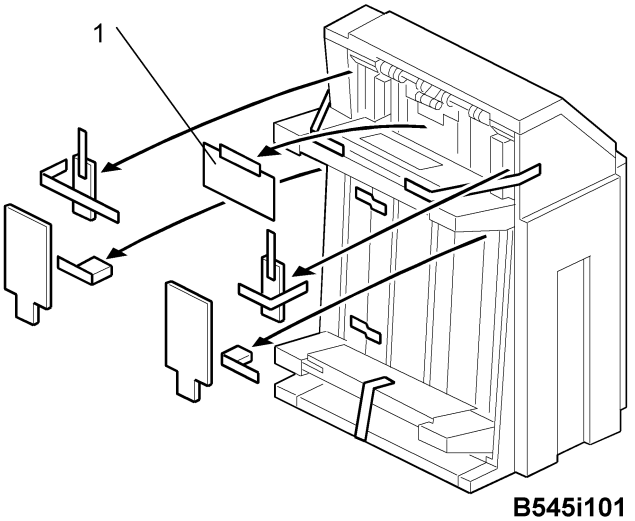
Installation Procedure: Two-Tray Finisher

⚠CAUTION

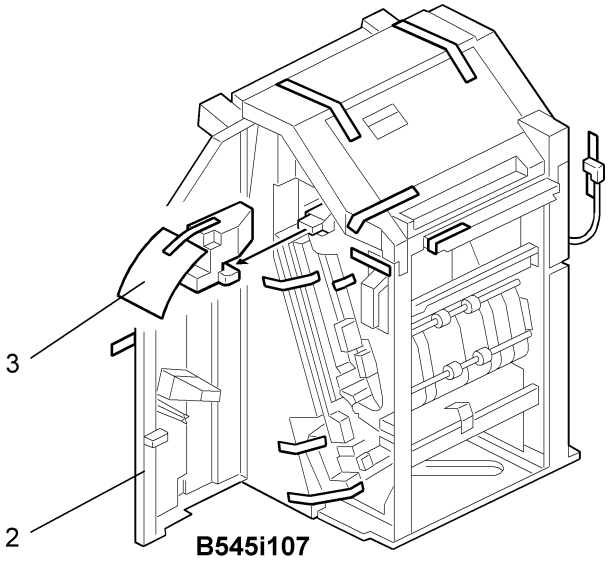
- Unplug the main machine power cord before starting the following procedure.

Note

- The bridge unit (B538) and paper tray unit (G839) must be installed before installing this finisher.



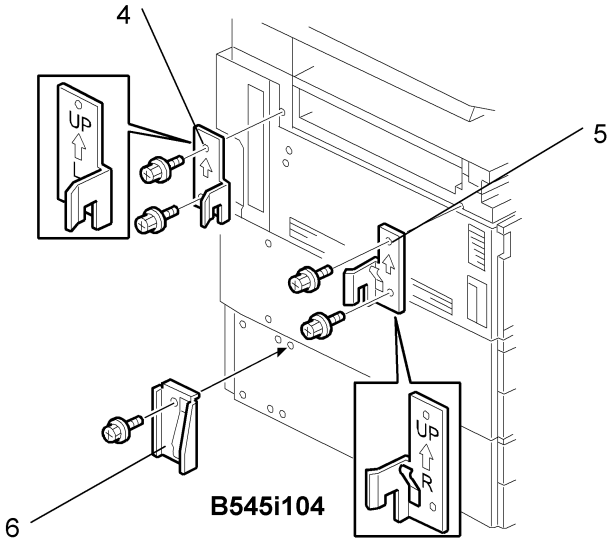
1. **Unpack the finisher and remove all tapes and shipping retainers from outside the unit [1].**



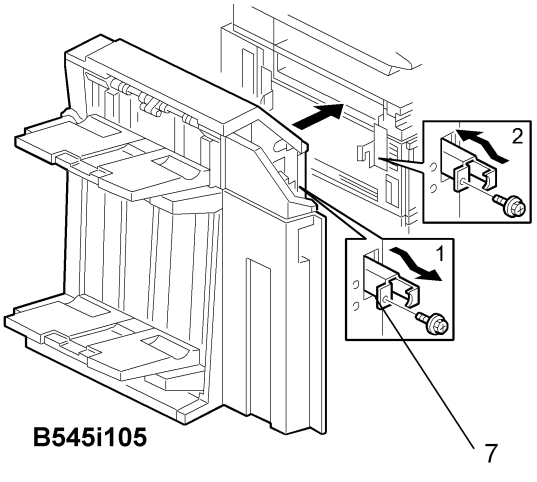
2. **Open the front door [2] and remove all tapes and shipping materials from inside the finisher unit.**
3. **Save the retainer [3] and other shipping material.**

Note

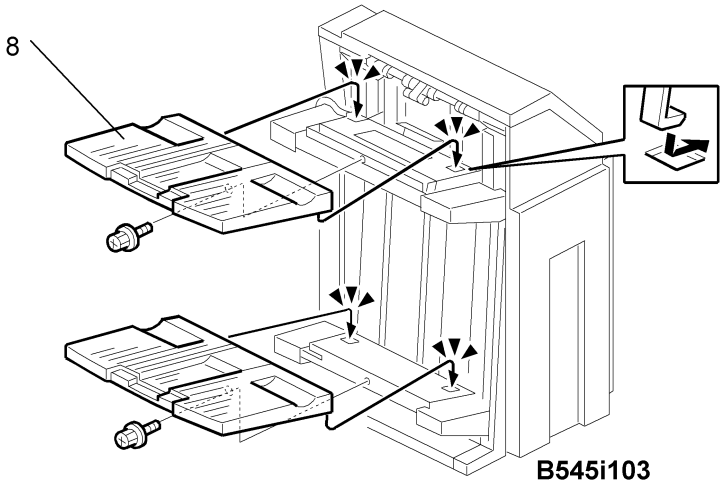
- The retainer [3] must be re-installed in the finisher before moving or shipping the finisher to another location.



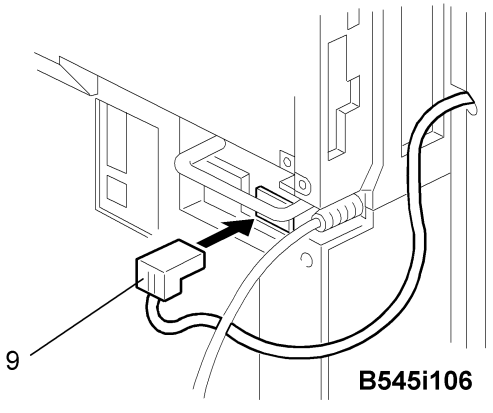
4. Install the left joint bracket [4] (x 2, M4 x 12) and right joint bracket [5] (x 2, M4 x 12).
5. Attach the ground plate [6] (x 1, M4 x 12) to the center of the paper tray unit as shown.



6. Open the front door of the finisher, and pull out the locking lever [7] (x 1).
7. Push the finisher to the side of the machine with the holes in the finisher aligned with the joint brackets, and then dock the finisher against the machine.
8. Push in the locking lever [7] and secure it (x 1), then close the front door.



9. Install two trays [8] (x 1 each).



10. Connect the finisher cable [9] to the main machine below the right, rear handle.
11. Turn on the main switch and check the finisher operation.

Punch Unit (B377)

Accessory Check: Punch Unit

Check the quantity and condition of the accessories in the box against the following list:

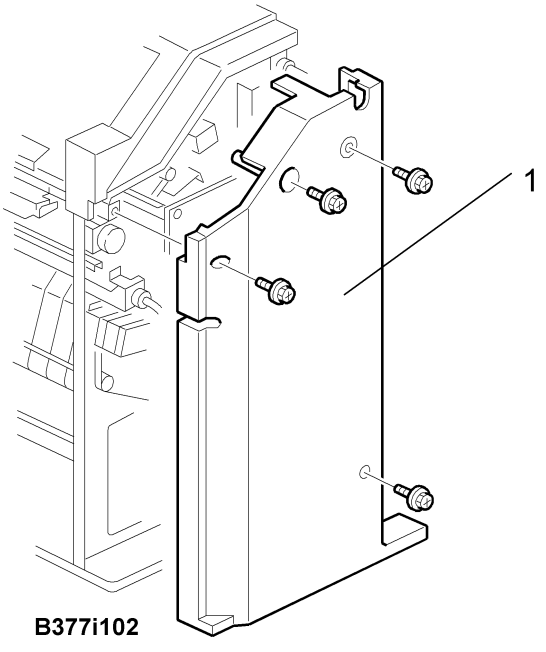
No.	Description	Q'ty
1.	Punch unit	1
2.	Sensor arm	1
3.	Hopper	1
4.	Step screw	1
5.	Spring	1
6.	Spacer (2 mm)	1
7.	Spacer (1 mm)	2
8.	Tapping screw	1
9.	Tapping screw	2

Installation Procedure: Punch Unit

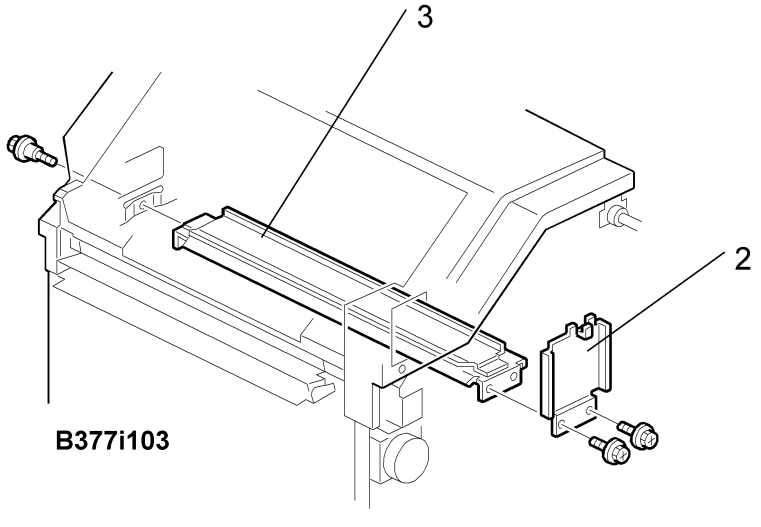
⚠CAUTION

- Switch off the main machine and unplug its power cord. If the Two-Tray Finisher is installed, disconnect it and pull it away from the machine.

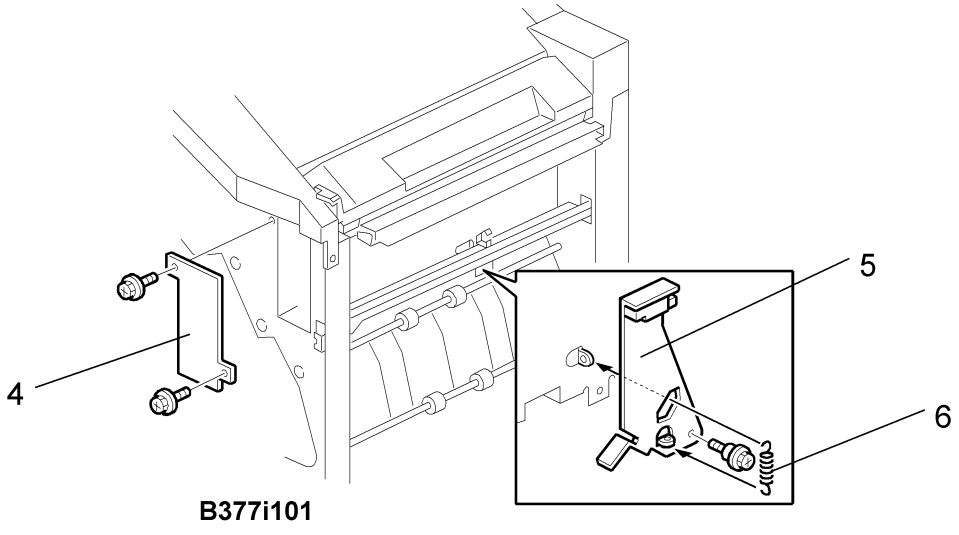
1. **Unpack the punch unit and remove all tapes and shipping retainers.**



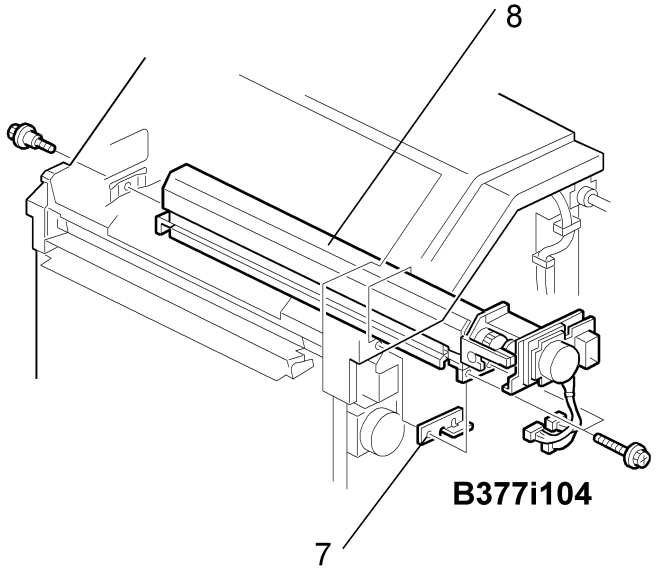
2. Open the front door and remove the rear cover [1] (x4).



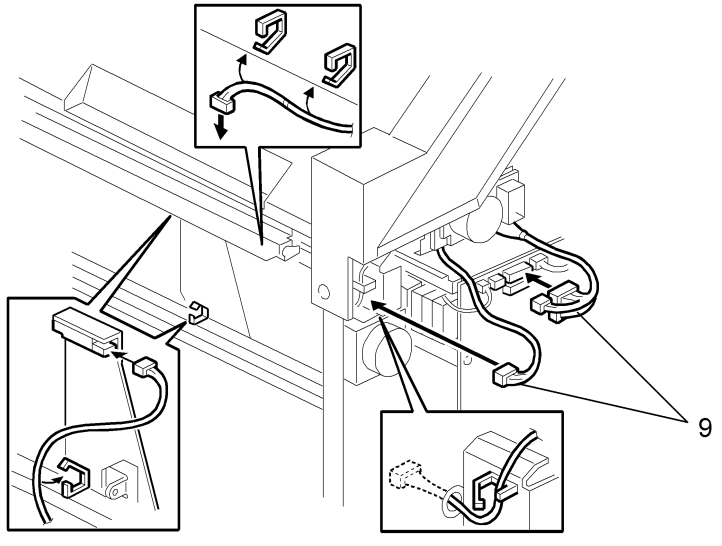
3. Remove the bracket [2] (x2) and paper guide [3] (x 1).



4. Remove the hopper cover [4] (x 2).
5. Install the sensor bracket [5] (Stepped x 1).
6. Install the spring [6].



7. Install the 2 mm spacer [7].
8. Install the punch unit [8] (x 2, Stepped x 1)

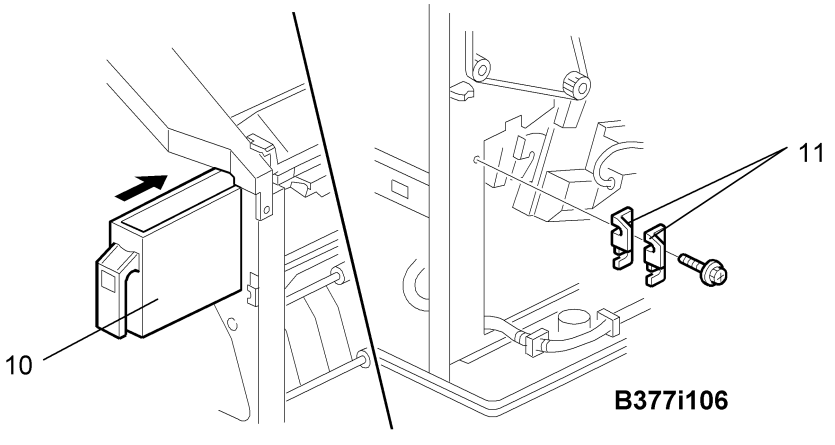


B377i105

9. **Connect the harnesses [9] and clamp them as shown.**

Note

- No special DIP switch settings are required for this punch unit.
- The punch unit has a unique ID that the machine detects automatically so it knows what type of punch unit is installed.



B377i106

10. **Slide the hopper [10] into the machine.**
11. **Fasten the two 1 mm spacers [11] to the rear frame for future adjustment.**

Note

- The spacers are used to adjust the horizontal positioning of the holes.

12. **Reassemble the finisher and check the punch operation.**

Data Overwrite Security Unit (B735)

Before You Begin...

1. Confirm that the Data Overwrite Security unit SD card is the correct type for the machine. The correct type for this machine is type "C".

Important

- **If the NVRAM is replaced then the data overwrite security feature must be replaced with the new data overwrite security option.**

2. Make sure that the following settings are not at the factory default settings:
   - Supervisor login password
   - Administrator login name
   - Administrator login password

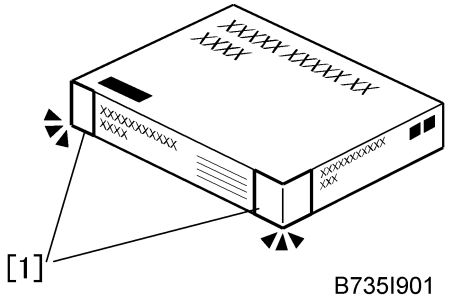
Important

- **These settings must be set up by the customer before the Data Overwrite Security unit can be installed. For details, contact the on-site system administrator.**

Seal Check and Removal

⚠CAUTION

- Before you start the installation, check the box seals to make sure that they were not removed after the items were sealed in the box at the factory.



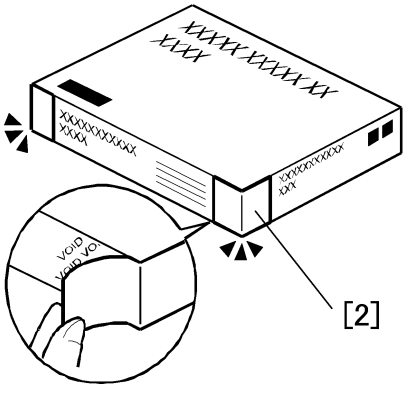
B735I901

1. **Check the box seals [1] on each corner of the box.**
   - Make sure that a tape is attached to each corner.
   - The surfaces of the tapes must be blank. If you see “VOID” on the tapes, do not install the components in the box.

2. If the surfaces of the tapes do not show "VOID", remove them from the corners of the box.

Important

- If you see "VOID" on the tapes, do not install the components in the box. Stop the procedure and contact your Sales Division.



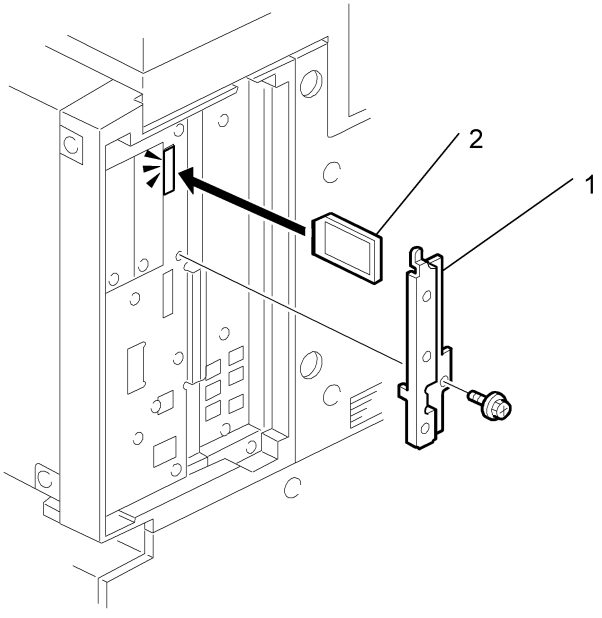
B735I903

3. When you remove each seal, the "VOID" marks [2] can be seen. In this condition, they cannot be attached to the box again.

Installation Procedure: DOS Unit

Important

- The DOS SD card must be inserted in SD card slot C1. Make sure that the Data Overwrite Security Option B735 is "Type C".



B735I101a

1. **If the machine is on, turn off the power switch.**
2. **Disconnect the network cable.**
3. **Turn the power switch on.**
4. **Turn the power switch off.**
5. **Remove the SD card slot cover [1] (x1).**
6. **With the printed side of the SD card [2] facing the rear of the machine, install the SD card in SD card slot C1.**
7. **Reconnect the network cable, if the network is connected.**
8. **Turn the power switch on.**
9. **Do SP5878 and push [#Enter].**
10. **Go out of the SP mode and turn the power switch off.**
11. **Turn the machine power on with the SD card in SD card slot C1.**

- Checking the Installation -

Do this procedure to confirm that the data overwrite security feature is enabled and operating.

1. **Enter the SP mode and do SP5990 005 (Diagnostic Report) to print the Diagnostic Report.**
2. **Check the Diagnostic Report.**
   - Under "[ROM No. / Firmware Version]", you should see "B7355050/0.04" displayed for HDD Format Option.

- Under "[Loading Program]" you should see "GW1a_zoffy: B7355050/0.04".

This completes the installation.

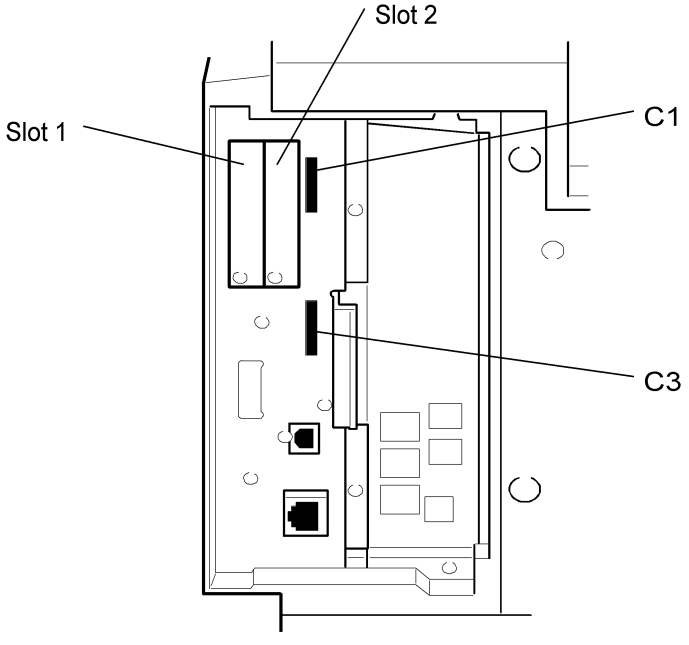
Important

- The Data Overwrite Security SD card must remain in SD card slot C1.
- If the SD card is removed from C1 while the machine is operating, this will cause SC867 (SD Card Removed). Insert the SD card again and cycle the machine off/on.
- Detailed instructions for the operation of the Data Overwrite Security Unit are provided on the CD-ROM provided with the SD card.

Controller Options

Boards and Slots

The machine controller box has two board slots and three SD card slots. Make sure that each board and SD card is put in the correct slot.



B783I101a

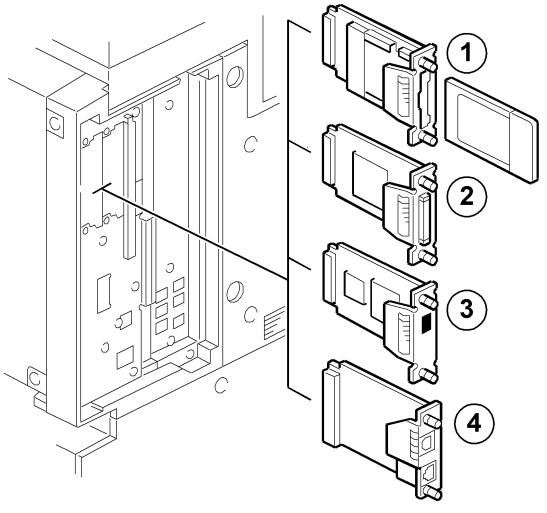
- Boards -

Slot 1, Slot 2. The optional boards are inserted here.

- SD Card Slots -

C1	Data Overwrite Security B735.
C2	Not available on this machine.
C3	Service slot for firmware version updates, moving applications to other SD cards, and downloading/uploading NVRAM contents.

Two slots are available for the following boards:



G147I154

No.	Slot	Board
1*	1 or 2	IEEE802.11b G813 – Wireless LAN
2*	1 or 2	IEEE1284 Interface Board B679 – Centronics
3	1 or 2	USB Host Interface Unit Type G819
4*	1 or 2	Gigabit Ethernet Board B874
*Only one of these boards can be installed at one time.		

Installing SD Cards

⚠WARNING

- Always turn the machine off and disconnect the machine power cord before you install a controller option.

Important

- **To prevent damage to the controller box, always do your work carefully. Do not put your hand or a tool into the box when you remove the controller box or install an option.**
- **To prevent damage to the circuits on the boards, always touch a metal surface to remove static charge from your hands before you touch electronic components.**

SD cards are held in position by a small spring-lock mechanism.

1. **To install an SD card, push it into the slot until it stops, then release it.**

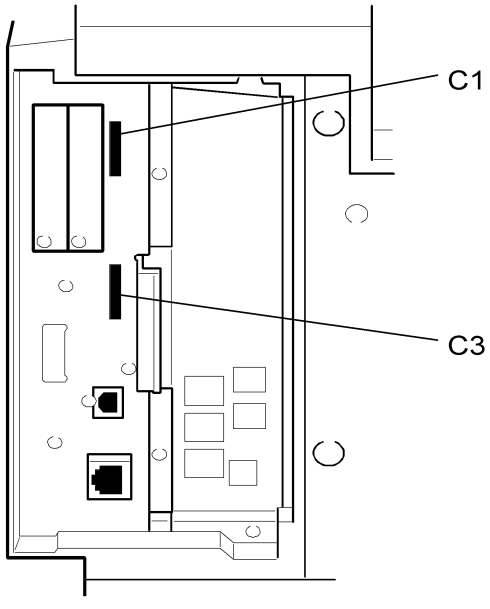
2. To remove an SD card, push the SD card in carefully to release it, and then remove it from the slot.

Important

- To prevent damage to the SD card or the slot lock, always push the card in to release it and then remove it.

Merging Applications on One SD Card

Location of SD Card Slots



B783I101b

The machine has three SD card slots:

- C1 is for applications provided on SD cards. If more than one option is to be installed, the applications must be merged on the same SD card. (see 'Merging Applications').
- C3 is used for servicing only. Otherwise this slot should always be empty.

Important

- The data necessary for authentication is transferred with the application program to the target SD card.
- Do not use an SD card if it has been used with a computer. Correct operation is not guaranteed if this type of SD card is used.

1

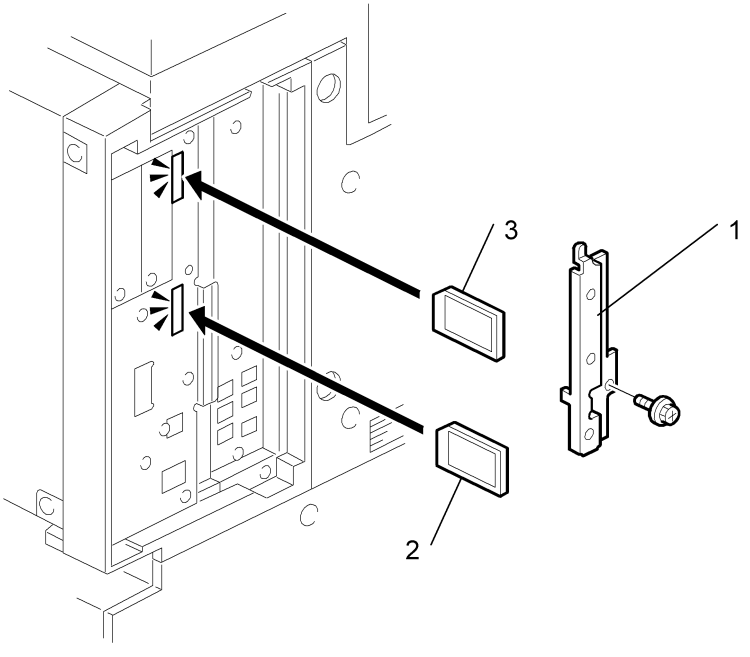
- The SD card is the only evidence that the customer is licensed to use the application program. The service technician may occasionally need to check the SD card and its data to solve problems. SD cards must be stored in a safe location at the work site.A licensing agreement prohibits copying of the PostScript SD card. However, you can copy an application from another SD card to the PS SD card. (This restriction may apply to other SD cards as well.)
- If an SD card was used to combine applications on that card, that SD card cannot be used for any other purpose.

Merging Applications

Do this procedure to put more than one application on one SD card.

⚠CAUTION

- During this procedure, make sure that you put the source SD card and the target SD card in the correct slots.



B783I901

1. Turn off the machine.
2. Remove the SD card slot cover [1] (x2).
3. Put the Source (DOS) SD card [2] in C3. This card contains the application that you want to copy.
4. Put the Target SD card in C1 [3]. The application on the card in C3 will be copied to this card.
5. Turn the machine on.

6. Go into the SP mode and select SP5873 001.
7. Push [#Enter].
8. Read the instruction on the display then push [#Enter] to start copying.
9. When the display tells you copying is completed, push [#Enter].
10. Turn the machine off.
11. Remove the Source SD card from C3. Leave the target SD card in C1.
12. Turn the machine on.
13. Confirm that the SD card applications have been enabled:
    - Push [Menu] then select "List/Test Print"> "Config. Page" to print the configuration page.
14. Turn the machine off again, then:
    - Attach the SD card slot cover.
    - Tape the copied source card to the faceplate of the controller box.
    - Attach the rear cover of the machine.

Important

- After an SD card is copied, it cannot be used. But it must be stored at the customer site, to serve as proof of purchase by the customer.
- The original card can also be used to perform an undo procedure (SP 5873 002). Before you tape the copied SD card to the machine, label it carefully so that you can identify it easily if you need to do the undo procedure at a later time (see 'Undo Exec').

Undo Merging

1. Turn the main switch off.
2. Put the SD card with the merged applications in C1.
3. Insert the original destination SD card (the one taped to the faceplate of the controller box) into C3.

   Note

   - The SD card in C3 must be the original SD card of the application you want to move from C1 to C3. You cannot use any blank SD card in C3.
4. Turn the main switch on.
5. Go into the SP mode and do SP5873-002 (Undo Exec)
6. Follow the messages on the operation panel to complete the procedure.
7. Turn the main switch off.
8. Remove the SD cards from the slots.
9. Turn the main switch on.

Installing Controller Options

1

256 MB Memory (G818) or 128 MB Memory (B584)

- Accessories -

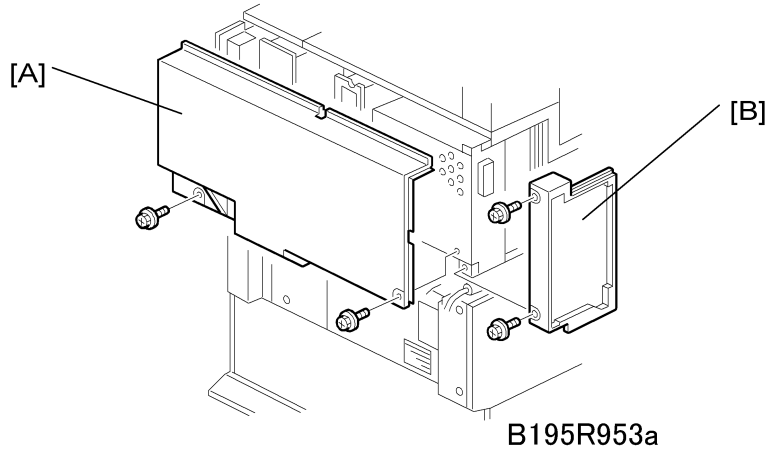
Check the accessories and their quantities against the following list:

No.	Description	Q'ty
1.	Paper Sensor	1
2.	Paper Limit Sensor Unit	1
3.	Tapping Screws M3 x8	2
4.	Pan Head Screw M3 x 8	1
5.	Ferrite Core	1
6.	Stamp	1
7.	CD-ROM (Printer)	1
8.	CD-ROM (Scanner)	1

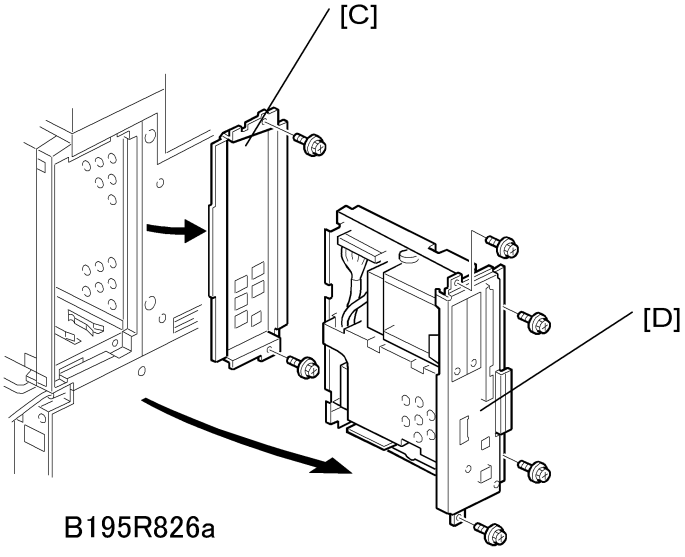
- Installation -

⚠CAUTION

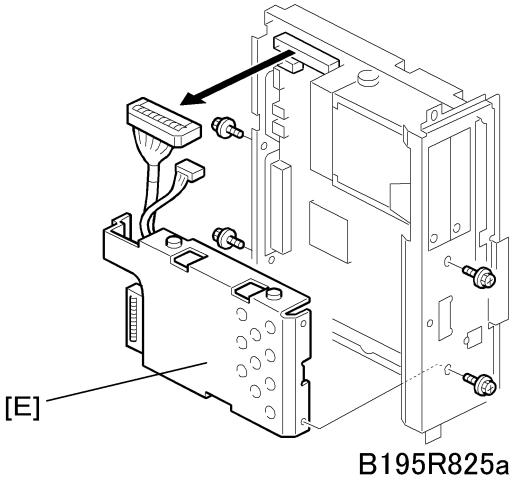
- Turn off the power switch and disconnect the power supply cord.



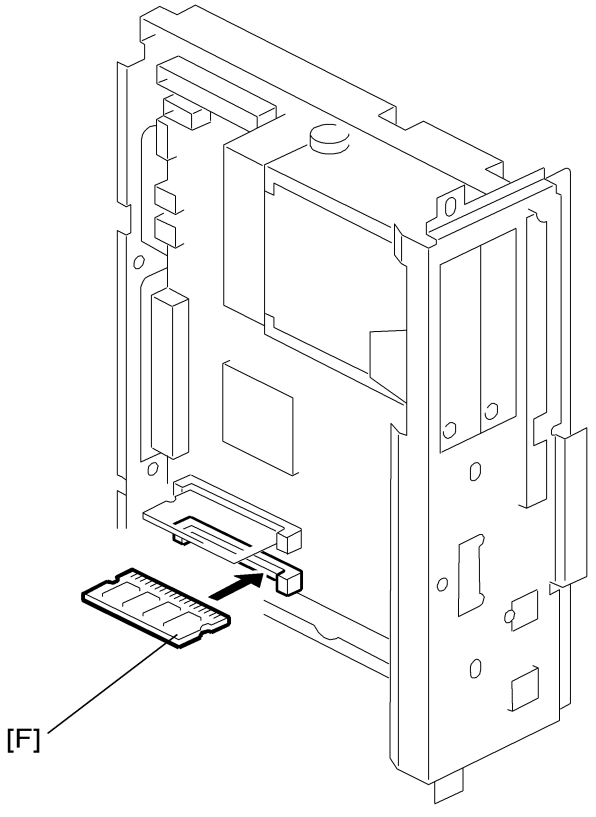
1. Remove the rear upper cover [A] (x2)
2. Remove the controller cover [B] (x2)



3. Remove the controller board faceplate [C] (x 2).
4. Remove the controller board [D] (x 4)



5. Remove the HDD unit bracket [E] (x 4, x 2)



B783I103

6. **Install the memory DIMM [F].**
7. **Reinstall the controller board.**

IEEE 1284 (B679)

- Accessories -

Check the accessories and their quantities against the following list:

Description	Q'ty
1. IEEE 1284 Interface Board B679	1

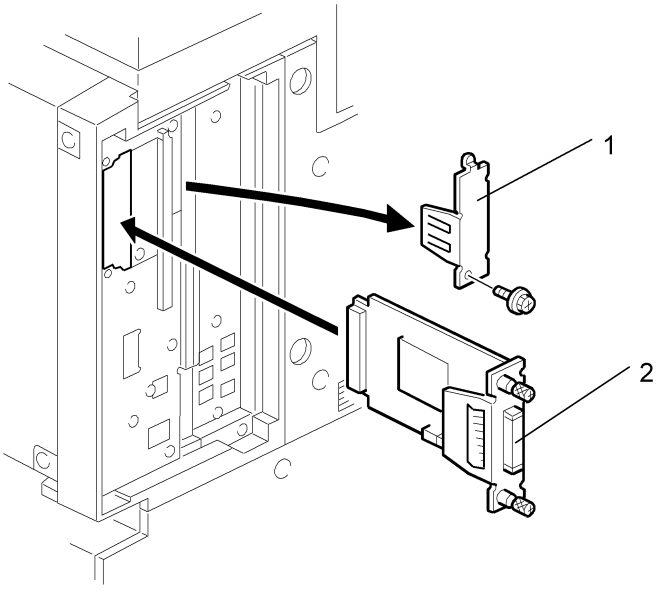
- Procedure -

⚠CAUTION

- Turn off the power switch and disconnect the power supply cord.

Note

- You can only install one of these network interfaces: IEEE 802.11b (Wireless LAN), IEEE1284 (Centronics), or Gigabit Ethernet Board.



B783I904

1. **Remove the cover [1] of board Slot 1 or 2 (x1)**
2. **Install the interface board [2] (x2 knob screws)**

   Note

   - Use a screwdriver to tighten the knob-screws. Do not tighten manually because this can disconnect the board.
3. **Reattach the application cover (x1)**

IEEE 802.11b Interface Kit (G813)

- Accessories -

Check the accessories and their quantities against the following list:

No.	Description	Q'ty
1.	IEEE 802.11b Board	1
2.	PCI Card	1

1

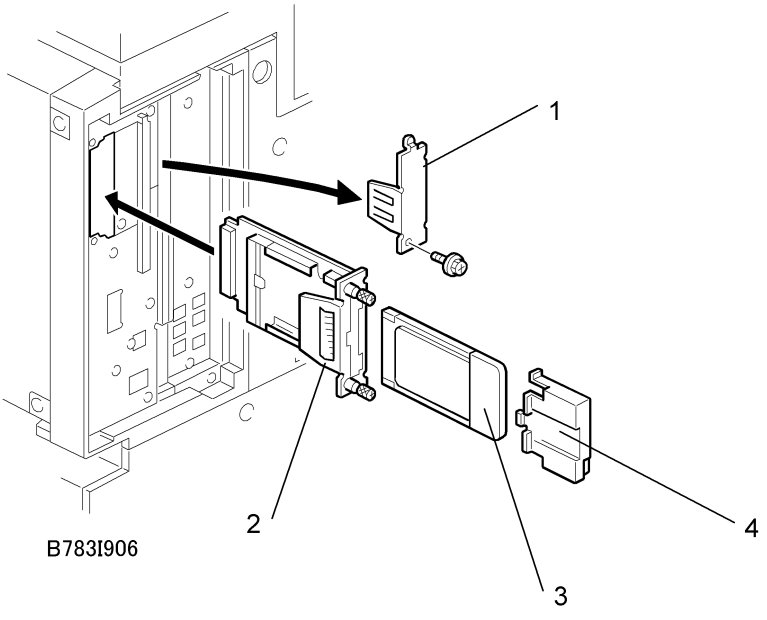
- Procedure -

⚠CAUTION

- Turn off the power switch and disconnect the power supply cord.

Note

- You can only install one of these network interfaces: IEEE 802.11b (Wireless LAN), IEEE1284 (Centronics), or Gigabit Ethernet Board.



1. **Remove the cover [1] of board Slot 1 or 2 (x1)**
2. **Attach the interface board [2] to the controller board (x1 knob screw).**

   Note

   - Use a screwdriver to tighten the knob-screws. Do not tighten manually, because this can disconnect the board.
3. **With the printed side facing the front of the machine, insert the interface card [3] board.**
4. **Attach the antenna cap [4].**

- SP Mode Settings for IEEE 802.11b Wireless LAN -

The following SP commands and UP modes can be set for IEEE 802.11b

SP No.	Name	Function
5840 006	Channel MAX	Sets the maximum range of the channel settings for the country.

5840 007	Channel MIN	Sets the minimum range of the channels settings allowed for your country.
5840 011	WEP Key Select	Used to select the WEP key (Default: 00).

USB Host Interface Unit Type 7300 (G819)

- Accessories -

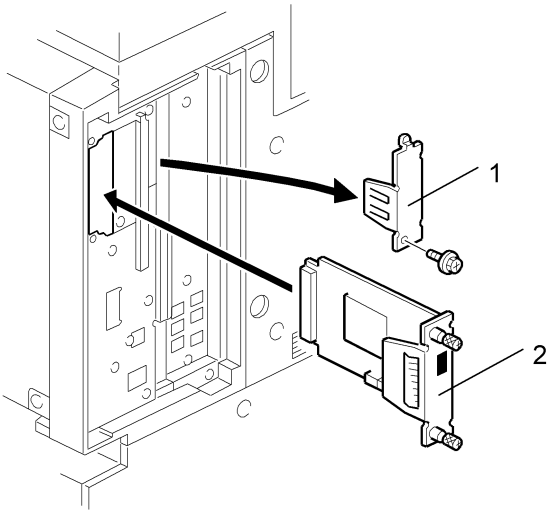
Check the accessories and their quantities against the following list:

Description	Q'ty
1. USB Host Interface Unit Type 7300	1

- Procedure -

⚠CAUTION

- Turn off the power switch and disconnect the power supply cord.



G147I155

1. **Remove the cover [1] of board Slot 1 or 2 (x1)**
2. **Install the interface board [2] (x2 knob screws)**

Note

- Use a screwdriver to tighten the knob-screws. Do not tighten manually, because this can disconnect the board.

3. **Reattach the application cover (x1)**

2. Preventive Maintenance

PM Tables

PM Tables for the Printer

Two maintenance kits are provided for customers.

Name	Contents
Maintenance Kit SP 8100A	PCDU (Photo Conductor Cleaning/Development Unit)
Maintenance Kit SP8100B	Fusing Unit and Transfer Unit

Note

- Components marked with an asterisk (*) must be inspected, serviced, and replaced without the maintenance kits.
- Amounts mentioned as the PM interval indicate the number of prints.

Symbol Key: **C**: Clean, **R**: Replace, **L**: Lubricate, **I**: Inspect

	EM	150K	300K	450K	Note
PCDU					User replaceable
Optics					
Toner Shield Glass		R	R	R	
Drum (OPC) Area					
Quenching Lamp			C		Dry cloth
ID Sensor		C	C	C	Perform SP3001-02 after blower brush cleaning.
Charge Roller*		R	R	R	
Cleaning Roller*		R	R	R	
Pick-off Pawls*		R	R	R	
Spurs		C	C	C	Dry cloth or alcohol

	EM	150K	300K	450K	Note
Cleaning Unit					
Drum Cleaning Blade*		R	R	R	
Cleaning Entrance Seal		C	C	C	Blower brush, replace if required.
Side Seal		I	I	I	
Development					
Development Drive Gears		I	I	I	Replace every 5 PM (750 K)
Development Filter*		R	R	R	
Developer*		I	R	I	
Entrance Seal		I	I	I	
Side Seal		I	I	I	
Development Roller		C	C	C	Dry cloth
Paper Feed					
Registration Roller	C	C	C	C	Water
Registration Sensor		C	C	C	Blower brush
Paper Feed Guides		C	C	C	Water
Paper Feed Roller*	I	R	R	R	Do SP7803. If count ≥ 150 K, replace roller. Do SP7804 to reset counter.
Bottom Plate Pads (Paper Trays)		C	C	C	Water
Bottom Plate Pad (By-pass Tray)		C	C	C	Water
Separation Roller*	I	R	R	R	Do SP7803. If count ≥ 150 K, replace roller. Do SP7804 to reset counter.
Pick-up Roller*	I	R	R	R	
Separation Roller (By-pass feed table)*	I	R	R	R	

	EM	150K	300K	450K	Note
Pick-up Roller (By-pass feed table)	I	R	R	R	
Relay Rollers		C	C	C	Water or alcohol.
Paper Feed Roller Gear (By-pass feed)		L	L	L	Silicone Grease G-501.*
Duplex Unit					
Inverter Roller		C	C	C	Water
Upper Transport Roller		C	C	C	Water
Lower Transport Roller		C	C	C	Water
Transfer Belt Unit					User replaceable
Transfer Belt*	C	R	R	R	Dry cloth
Transfer Belt Cleaning Blade*		R	R	R	
Transfer Belt Rollers		C	C	C	Dry cloth
Entrance Seal		C	C	C	Dry cloth
Transfer Entrance Guide	C	C	C	C	Dry cloth
Used Toner Tank	I	C	C	C	Empty the tank.
Fusing Unit					User replaceable
Exit Guide Plates		C	C	C	Water or alcohol.
Hot Roller*		R	R	R	
Pressure Roller*		R	R	R	
Fusing Thermistors*		R	R	R	
Cleaning Roller		C	C	C	Water or alcohol.
Cleaning Roller Bushings		L	L	L	Grease: Barrierta JFE 55/2
Hot Roller Strippers*		C	R	C	Water or alcohol.
Paper Exit Guide Ribs		C	C	C	Water or alcohol.

	EM	150K	300K	450K	Note
Exit Sensor		C	C	C	Blower brush
Drive					
Drive Belts			I		Replace if necessary

PM Tables for Options

Amounts mentioned as the PM interval indicate the number of prints.

Symbol Key: **C**: Clean, **R**: Replace, **L**: Lubricate, **I**: Inspect

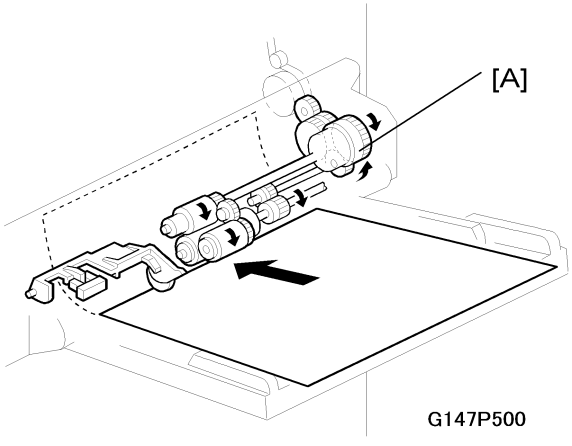
	EM	150K	300K	450K	Note
Paper Tray Unit G839					
Relay Rollers		C	C	C	Dry or damp cloth
Bottom Plate Pad		C	C	C	Dry or damp cloth

	EM	150K	300K	450K	Note
LCIT B543 (RT 45)					
Bottom Plate Pad		C	C	C	Dry or damp cloth

	EM	150K	300K	450K	Note
Finisher 3000 (SR 3040)					
Rollers	C				Water or alcohol.
Brush Roller (A681)	I	I	I	I	Replace if required.
Discharge Brush	C	C	C	C	Dry cloth
Sensors	C				Blower brush
Jogger Fences	I	I	I	I	Replace if required.
Punch Waste Hopper	I	I	I	I	Empty hopper.

Lubrication

Lubricate the paper feed clutch gear [A] with Silicone Grease G501 every PM visit.



3. Replacement and Adjustment

Precautions

General Precautions

⚠CAUTION

- To avoid damage to the transfer belt, drum, or development unit, never turn off the power switch while electrical components are active.

⚠CAUTION

- Always turn off the power switch and unplug the machine before attempting any of the procedures in this section.

Laser Unit Precautions

1. To avoid putting the LD unit out of proper adjustment, never loosen the screws that secure the LD drive board to the laser diode casing.
2. Never adjust the variable resistors on the LD unit, as they are adjusted in the factory.
3. The polygon mirror and F-theta lenses are very sensitive to dust. Never open the optical housing unit.
4. Never touch the glass surface of the polygon mirror motor unit with bare hands.
5. After replacing the LD unit, do the laser beam pitch adjustment. Otherwise, an SC condition will be generated.

⚠CAUTION

- Always dispose of used toner in accordance with local regulations.
- To avoid a serious fire hazard, never expose toner to an open flame.

Special Tools and Lubricants

Special Tools

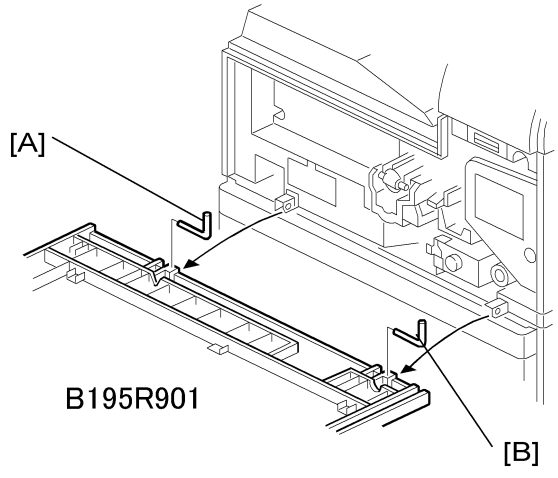
Part Number	Description	Q'ty
VSSM9000	Digital Multimeter – FLUKE 187	1
A2309003	Adjustment Cam – Laser Unit	1
A2309004	Positioning Pin – Laser Unit	1
B6455010	SD Card	1
B6456820	USB Read/Writer	1

Lubricants

Part Number	Description	Q'ty
A2579300	Grease Barrierta S552R	1
52039502	Silicone Grease G-501	1

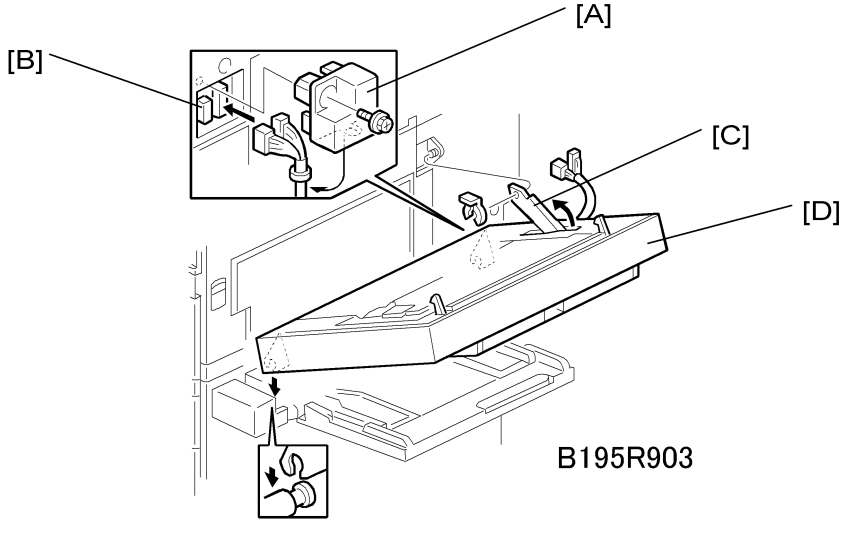
Covers and Common Procedures

Front Door



1. Open the front door.
2. To remove the front door, remove left pin [A], and right pin [B].

Duplex Unit



1. **Connector cover [A] (x1)**
2. **Duplex connectors [B] (x2)**
3. **Duplex support arm [C] (x1)**
4. **Duplex unit [D]**

Note

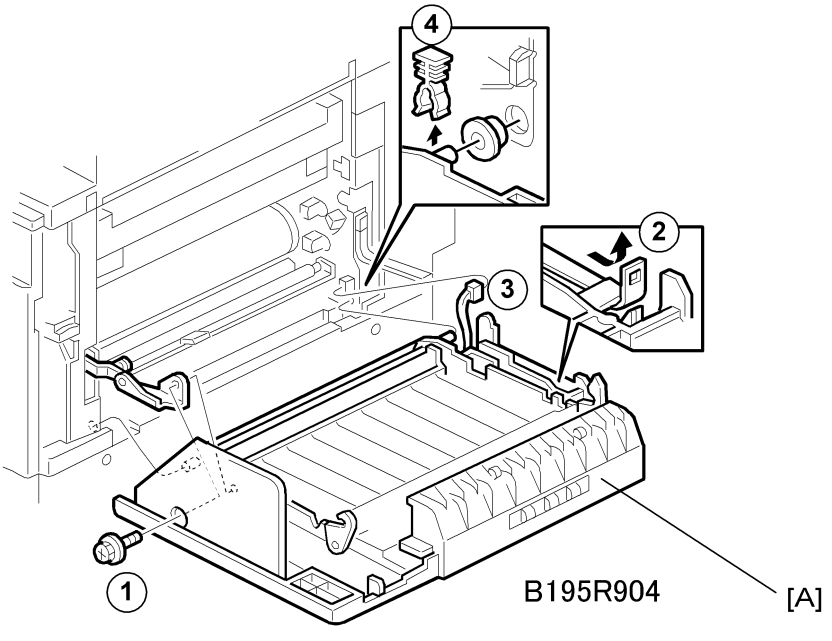
- Grip the duplex unit with both hands, slowly rotate it towards you and then lift up.

Right Upper Cover

Note

- Work carefully to avoid damaging the development roller.

1. **Duplex unit (See 'Duplex Unit'.)**
2. **Transfer belt unit (See 'Transfer Unit – Transfer Belt Unit')**

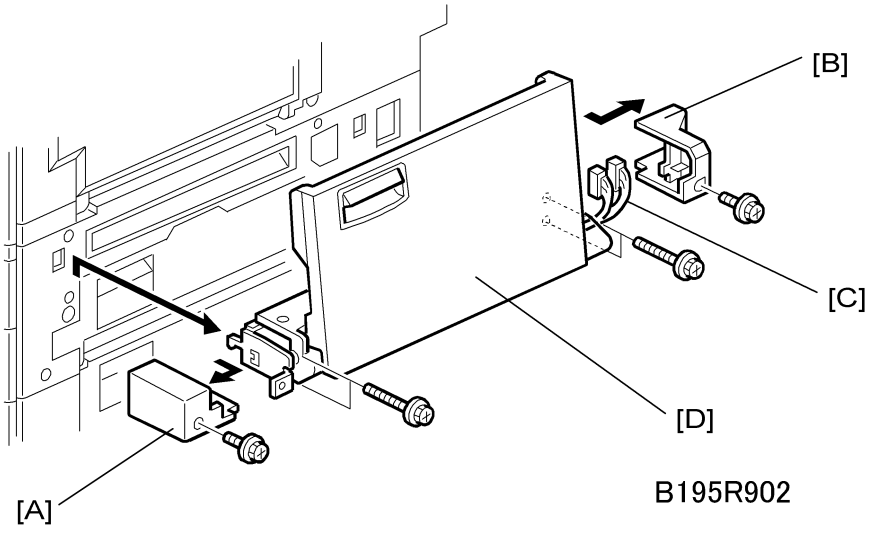


3. **Remove the right upper cover [A]**
   ① (x1)
   ② Loop fastener
   ③ (x1)
   ④ (x1, Bushing x1)

By-Pass Tray Unit

Use this procedure to remove the complete by-pass tray unit from the machine. If you wish to remove only the table, or some of the components of this unit, see 'By-Pass Tray'.

1. **Duplex unit (See 'Duplex Unit'.)**



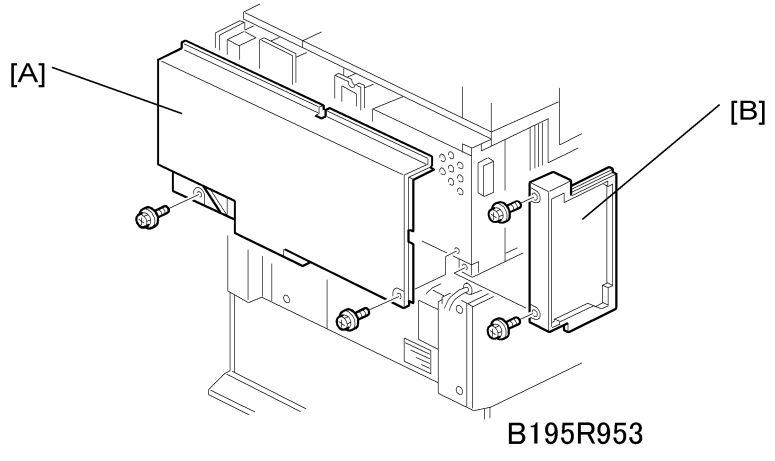
2. **Left cover [A] (x1)**
3. **Right cover [B] (x1)**
4. **Connectors [C] (x2)**
5. **By-pass unit [D] (x4)**

Note

- After removing the screws, lift to unhook the by-pass tray unit from the frame of the machine.

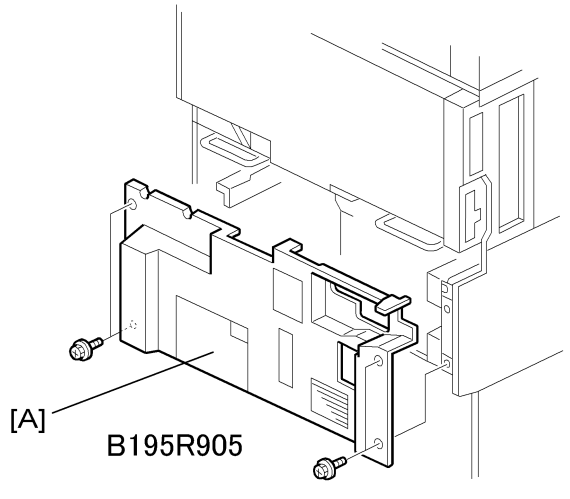
Rear Covers

Rear Upper Cover



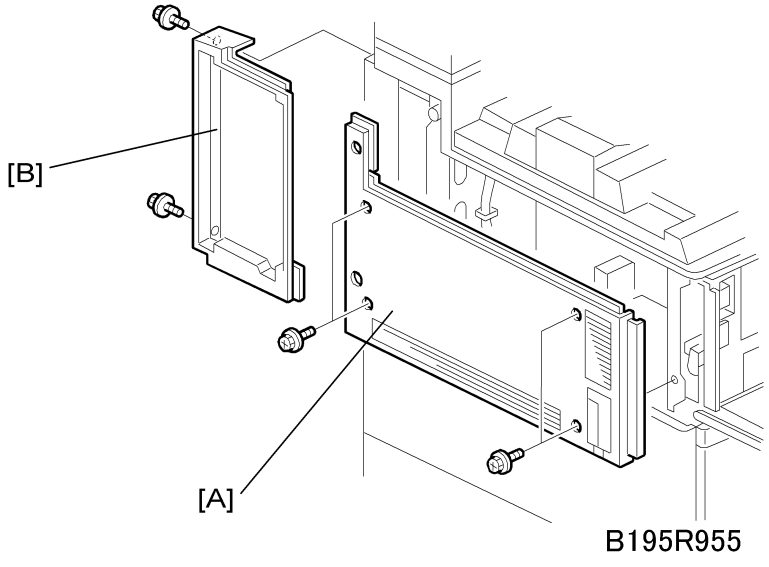
1. Rear upper cover [A] (x2)
2. Controller cover [B] (x2)

Rear Lower Cover



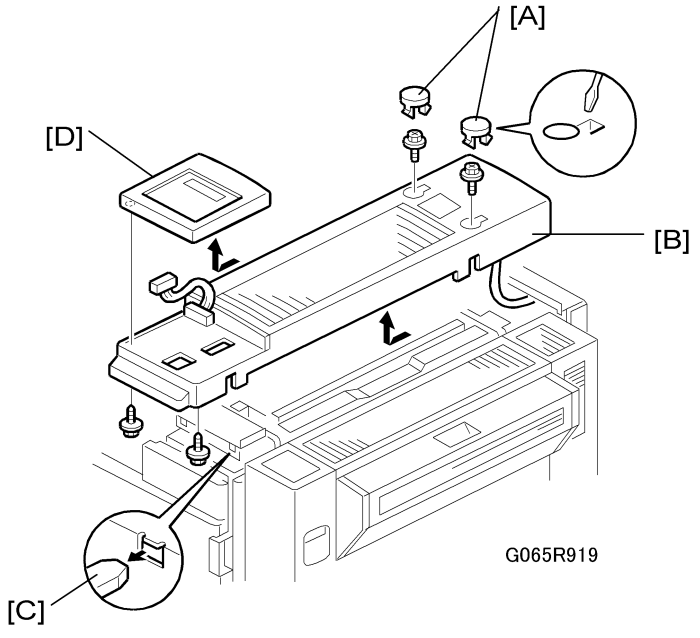
1. Rear lower cover [A] (x4)

Left Covers



1. Left upper cover [A] (x4)
2. Controller cover [B] (x2)

Operation Panel



⚠CAUTION

- The fusing unit below the cover is hot. Allow the machine to cool for 10 minutes before you begin the procedure.

1. **Fusing unit cover [A] (caps x 2, x 2)**

   Insert the tip of a screwdriver into the slot to release the plastic hook and lift. Exert very little pressure to avoid breaking the hooks.

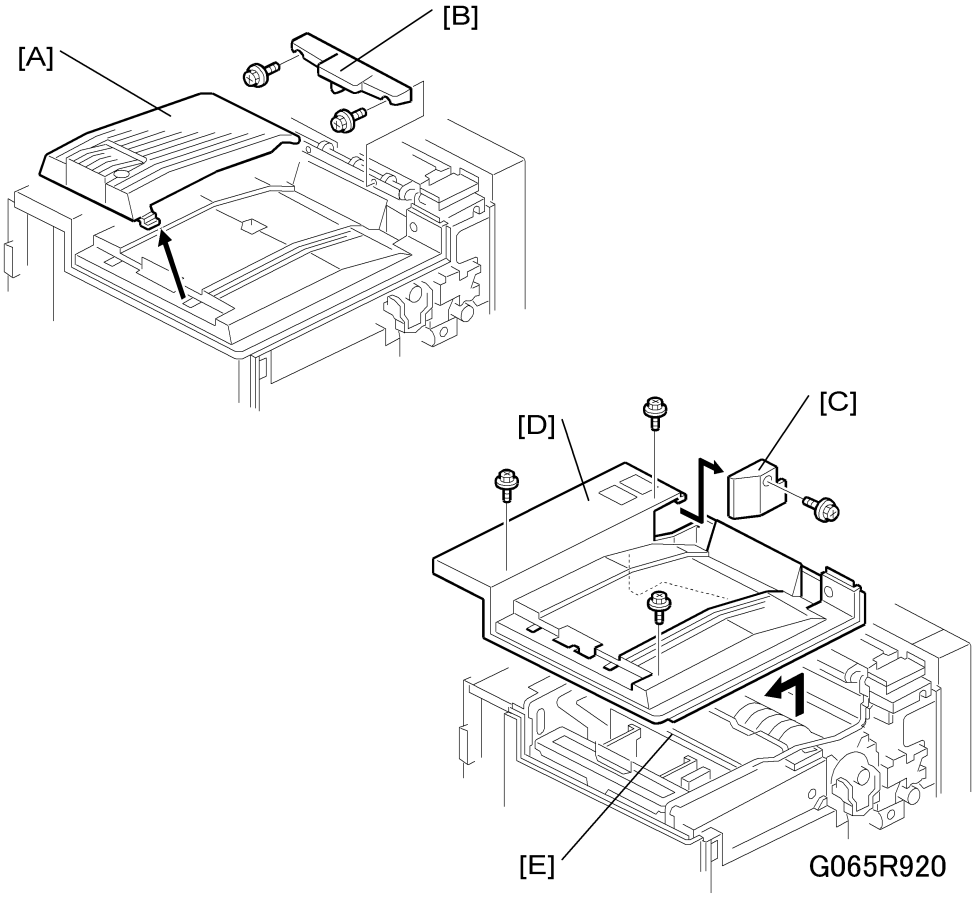
2. **After removing the screws, slide cover [B] forward to remove it.**

   Before re-installing the cover, open the duplex unit and carefully insert the brackets on the bottom of the cover into the slots [C].

3. **Operation panel [D] (x 2, x 2)**

   Turn over the fusing unit cover and pull off the operation panel to expose the connector.

Paper Output Tray



No Bridge Unit Installed

1. Sub copy tray [A]
2. Paper sensor ass'y [B] (x 2)
3. Cover [C] (x 1)
4. Paper output tray [D] (x 3)

5. If the duct on the bottom of the paper output tray base hangs up on the vertical support [E] below, reach under and pull the duct up over the support.

Bridge Unit Installed

1. Bridge unit [A] (x 2, x 2)
2. Paper output tray [B] (x 3)
3. If the duct on the bottom of the paper output tray base hangs up on the vertical support [E] below, reach under and pull the duct up over the support.

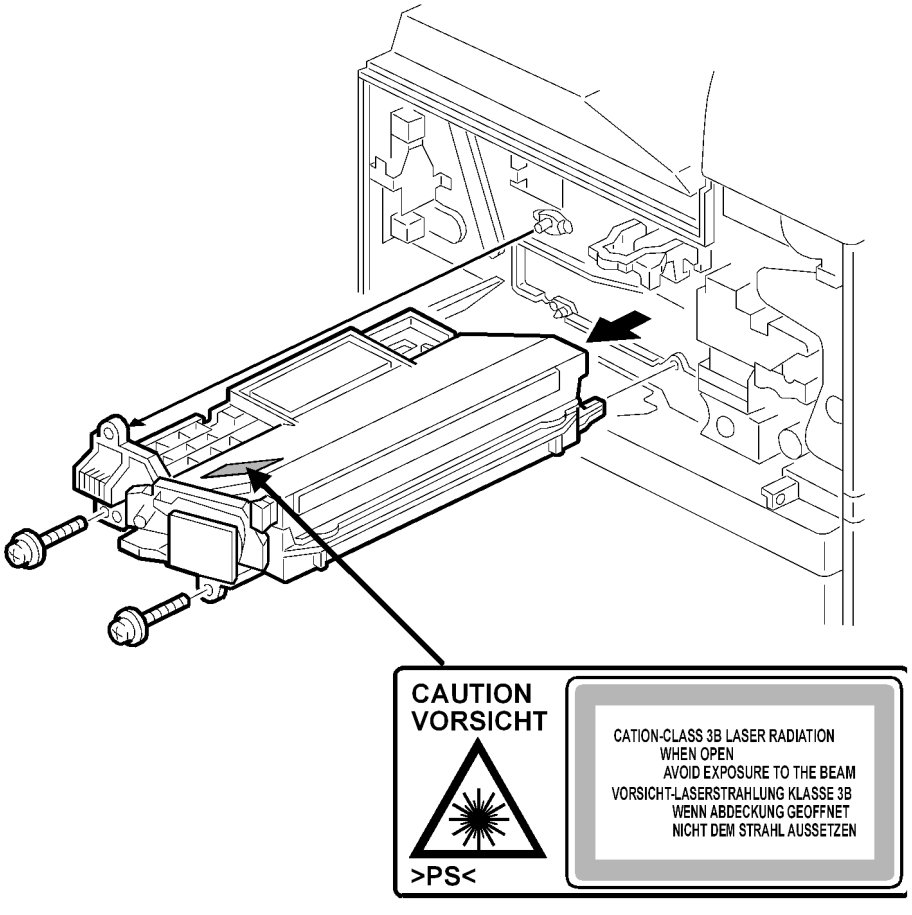
Laser Unit

⚠CAUTION

- Turn off the power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage the eyes.

Caution Decal Locations

Two caution decals are located in the laser section as shown below.

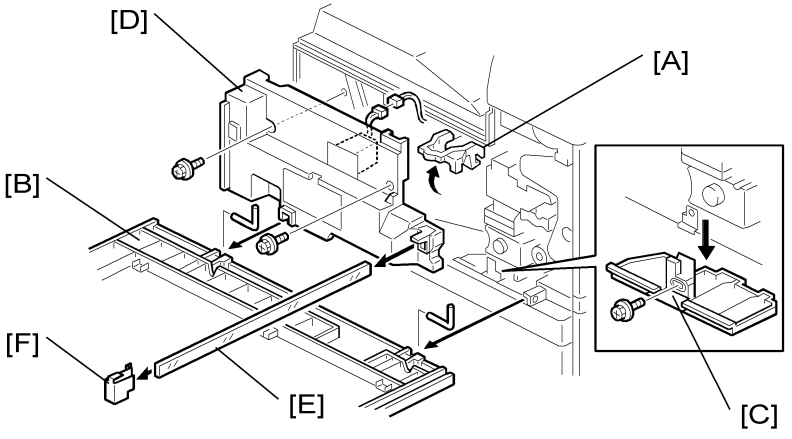


B195R500

Laser Unit Removal

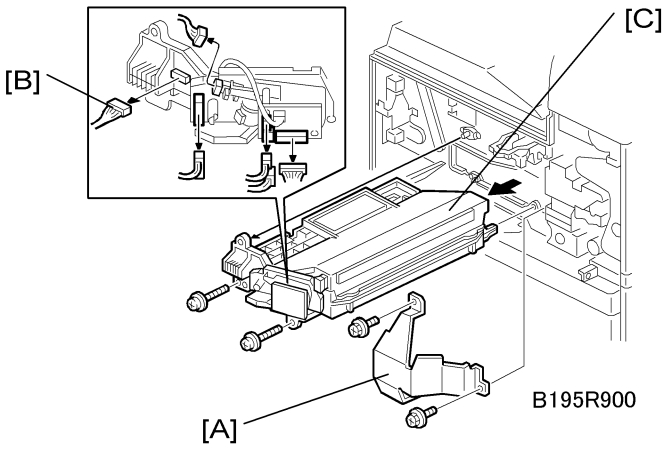
⚠CAUTION

- Turn off the power switch and unplug the machine before attempting this procedure. Laser beams can seriously damage your eyes.



B195R211

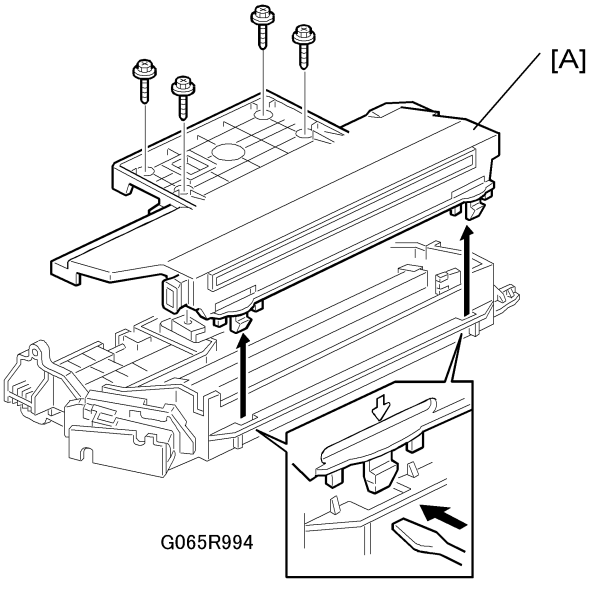
1. Open the front door.
2. Raise the toner bottle holder handle [A].
3. Remove front door [B] (Pins x2)
4. Remove toner collection plate [C] (x).
5. Remove inner cover [D] (x 2, x 1)
6. While pressing in the top leaf on the left side, remove the shield glass cover [E].
7. The shield glass cover holds the shield glass firmly in place and prevents it from accidental removal.
8. When re-attaching the shield glass cover, the top leaf lies on top of the plastic form.
9. Shield glass clip [F]



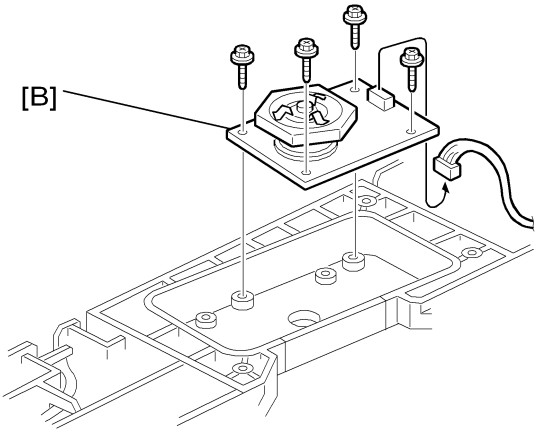
10. Shield plate [A] (x 2)
11. While holding the LD board securely, disconnect the laser unit [B] (x 6, Flat film cable x1)
12. Hold the laser unit [C] by its casing, slide it out of the machine (x 2)

Polygon Mirror Motor

1. Laser unit (See 'Laser Unit')



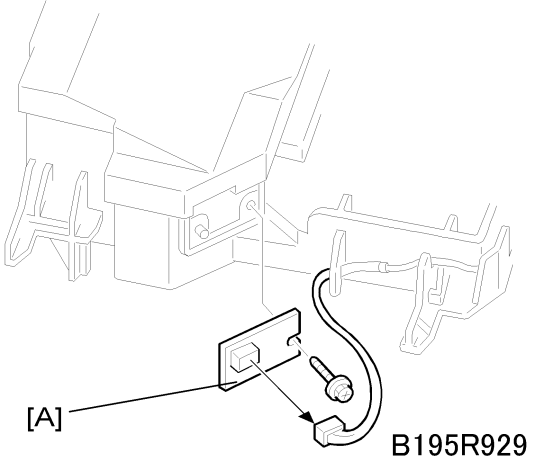
2. Laser unit cover [A] (x 4, Hooks x 2)



B195R923

3. Polygon mirror motor [B] (x 4, x 1)
4. After replacing the motor, do the image adjustment. (See 'Copy Adjustments: Printing/ Scanning'.

Laser Synchronization Detector



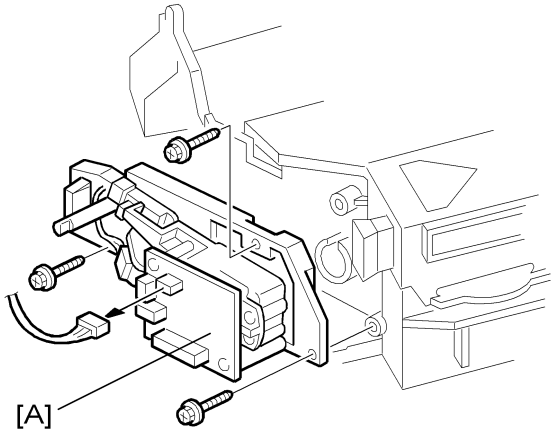
B195R929

1. Laser unit (See 'Laser Unit')
2. Laser synchronization detector [A] (x1, x1).

LD Unit

LD Unit Replacement

1. **Laser unit (See 'Laser Unit')**



B195R513

2. **LD unit [A] (x 3, x 1)**

Note

- To avoid damaging the LD board, hold it securely when disconnecting the connectors. Hold the laser unit casing.

3. **After replacing the LD board, do SP 2-109 to adjust the laser beam pitch (described below).**

Laser Beam Pitch Adjustment

After replacing the LD board, do the laser beam pitch adjustment. There are two procedures: one for 400 dpi, and one for 600 dpi. These use the following SPs.

SP2110	Test Mode Dpi (0: 400 dpi, 8: 600 dpi)
SP2109-01	LD Beam Pitch Adjustment – 400 dpi
SP2109-02	LD Beam Pitch Adjustment – 600 dpi
SP2109-03	LD Beam Pitch Adjustment – 400 dpi Initial Setting
SP2109-04	LD Beam Pitch Adjustment – 600 dpi Initial Setting

1. **If you do not have an SMC Report for reference, do SP5990-002 to print the SMC Report so you can look up and match the SP numbers below with the correct name.**
2. **Set SP2110 to "0" (for 400 dpi), or to "8" (for 600 dpi).**
3. **Execute SP2109-08 to reset all the beam pitch data.**
4. **Do SP2109-001 and enter "144".**

   Important

   - **The "144" entry is only a starting point for the adjustment.**
5. **Do SP2109-003 (400 dpi Initial Setting) if you entered "0" in Step 2.**

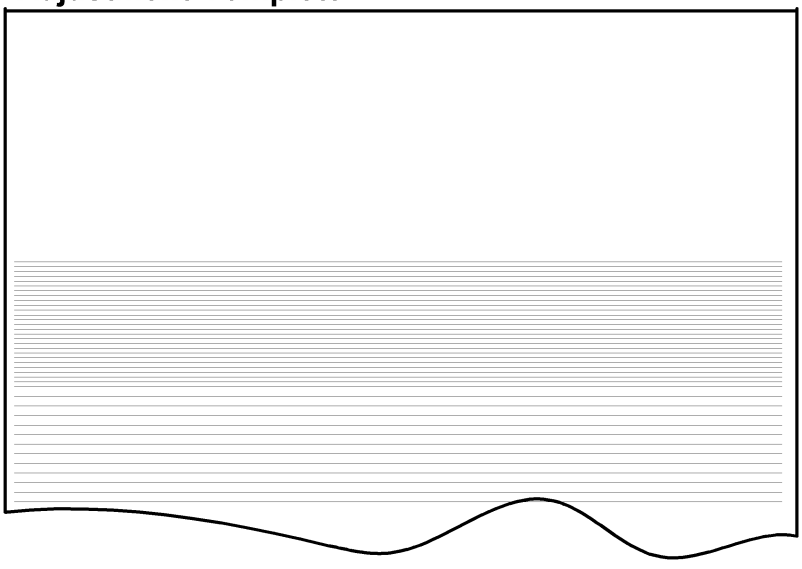
   -or-

   Do 2109-004 (600 dpi Initial Setting) if you entered "8" in Step 2.
6. **Do SP2902 to print Test Pattern 12.**
7. **On the test pattern write 144, the value of SP2109-01.**
8. **Repeat Steps 2 to 7 and change the value of SP2109-001 for every execution (48, 96, 192, 240).**
9. **Check these test patterns. If the laser beam pitch is not correct, the image looks like a black vertical stripe pattern (see the diagrams below).**

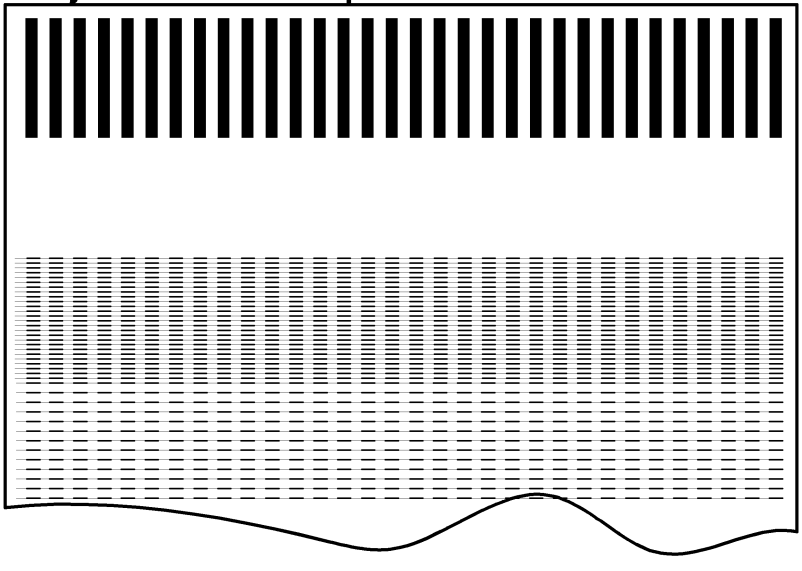
   For example, if the pattern made with the value "192" has fewer obvious stripes than the other print-outs, the correct value is near 192.
10. **Do Steps 2 to 7 to adjust the laser beam pitch position until thin lines are of uniform thickness (no stripes should appear on the printout).**
11. **In Step 4, input a value estimated to be correct (e.g., if 192 was the closest, try 182), then do Steps 5 and 6, then if necessary go back to Step 3 and try another value.**

    After adjusting the laser beam pitch for 400 dpi, adjust it for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi). Laser beam pitch for 600 dpi should be 24 ~ 48 more than for 400 dpi.

Adjustment Complete



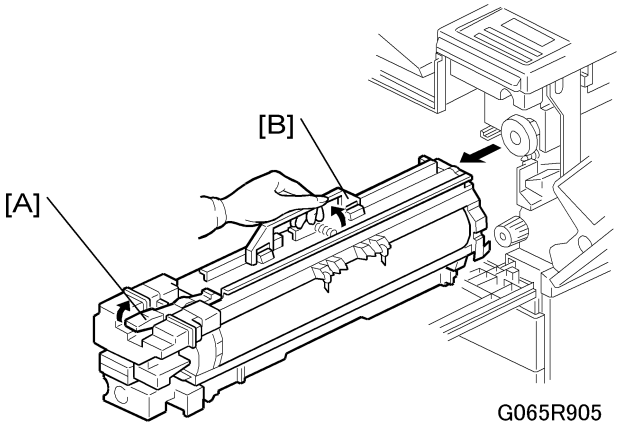
Adjustment Not Complete



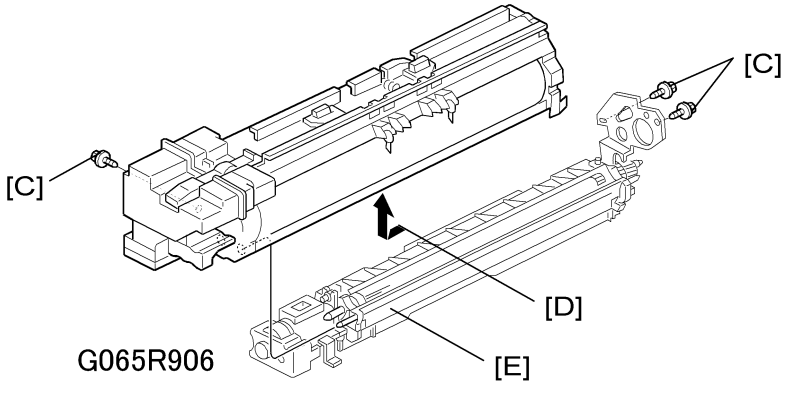
B195R552a

PCDU

Photoconductor Cleaning/Development Unit



1. Open the front door.
2. Lower the by-pass tray, open the duplex unit, and open the transfer unit right cover.
3. Release the PCDU lock [A].
4. Hold the PCDU by the handle [B] and pull out slowly.



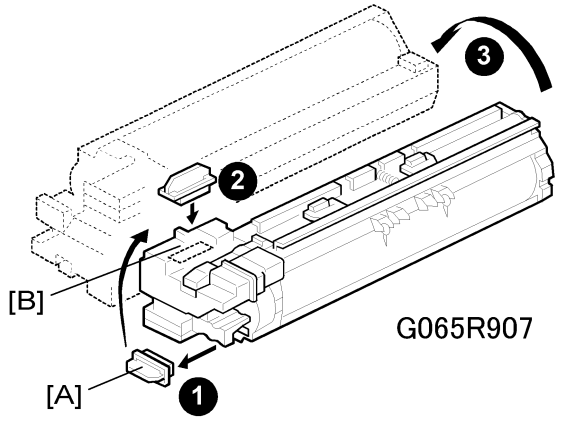
5. Remove the screws [C] (x 3).
6. Pull the PCU horizontally then up [D] to separate it from the development unit [E].
7. Cover the drum with a clean sheet of paper to protect it from exposure to light.

- Reinstallation -

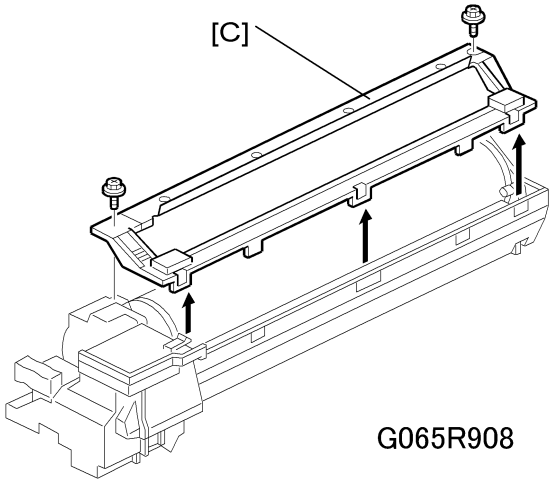
1. **With the PCU slightly offset, set it on top of the development unit, then carefully slide it horizontally to ensure that the end of the toner supply shutter at the toner supply port opens.**
2. **Check the exposed spring on the back of the PCDU.**
   - If the spring is spread open, the supply port is open.
   - If the spring is not open, the supply port is shut. Slide the PCU back and engage it correctly.
   - If the supply port remains closed, no toner will reach the drum.

Drum

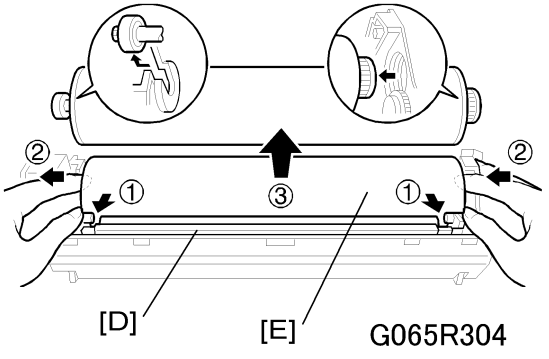
1. **Remove the PCDU (See "PCDU")**
2. **Never touch the drum surface with bare hands.**



3. **Remove the toner cap [A] and use it to cover the toner port [B].**



4. **Turn the PCU upside down and remove the lower cover [C] (x 2, pawls x 3)**



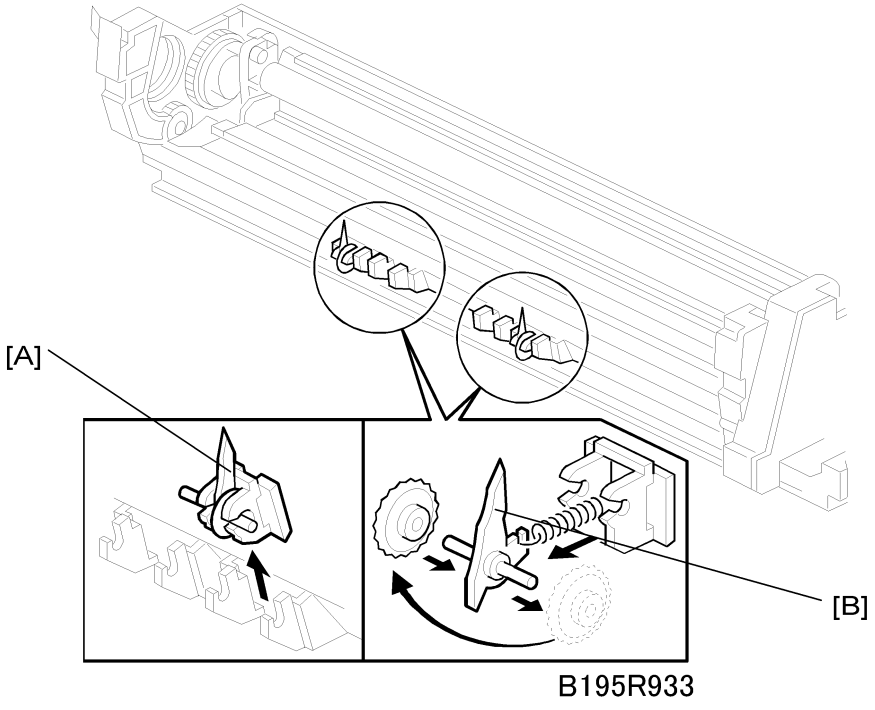
5. **Press at ① to release the charge roller [D], release the charge roller ②, press the drum [E] to the front, and then remove the drum ③.**

- SP Adjustments -

Charge Roller Bias Adjustment	2001-01	Set to the standard value to ensure carrier is not attracted to the drum.
ID Sensor Initial Setting	3001-02	Initializes the ID sensor.
Image Transfer Current – Image Face	2301 01	Set to the default settings.
Image Transfer Current – Image Back	2301 02	
Image Transfer Current – Lead Edge Face	2301 03	
Image Transfer Current – Image Face By-pass	2301 04	

Pick-Off Pawls

1. **Remove the drum. (See 'Drum'.)**



2. **Pawl assembly [A]**
3. **Pick-off pawl [B] (spring x 1, spur x 1)**

- Pick-off pawl position adjustment -

If the pick-off pawl has marked the drum with a line, the pick-off pawl position can be adjusted using either method:

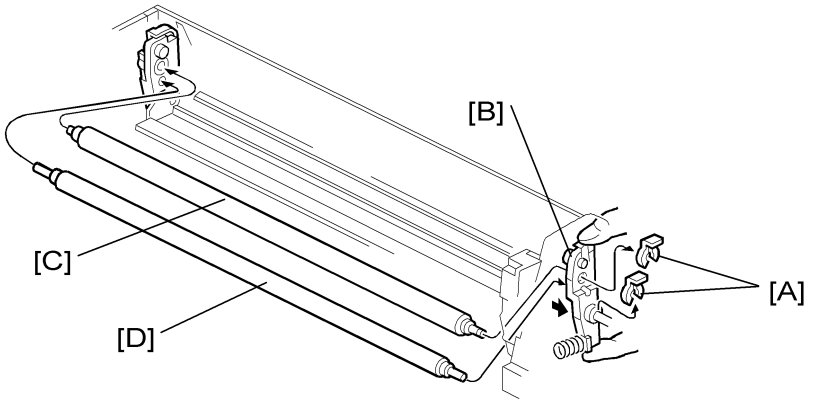
- Changing the spur position.
- Changing the pick-off pawl assembly position

⚠CAUTION

- After re-assembly, make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (See 'Drum'.)

Charge Roller and Cleaning Roller

1. **Remove the drum. (See 'Drum'.)**



2. **Two snap rings [A] (x 2).**
3. **Charge roller holder [B]**
4. **Charge roller [C]**

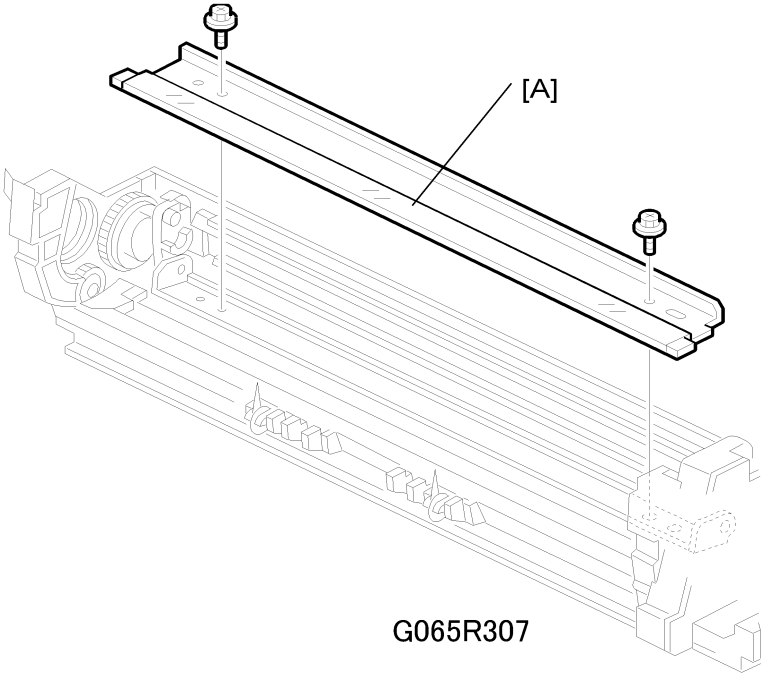
Important

- **Do not touch the charge roller.**

5. **Cleaning roller [D].**
6. **SP Adjustment:**

Charge Roller Bias Adjustment	2001-01	Set to the standard value (–1,480 V) to ensure carrier is not attracted to the drum.
ID Sensor Pattern	2001-02	-200 V
Image Transfer Current - Image Face	2301 01	Set to the default settings.
Image Transfer Current - Image Back	2301 02	
Image Transfer Current - Lead Edge Face	2301 03	
Image Transfer Current - Image Face By-pass	2301 04	
Image Transfer Current - Lead Face By-pass	2301-05	

Drum Cleaning Blade

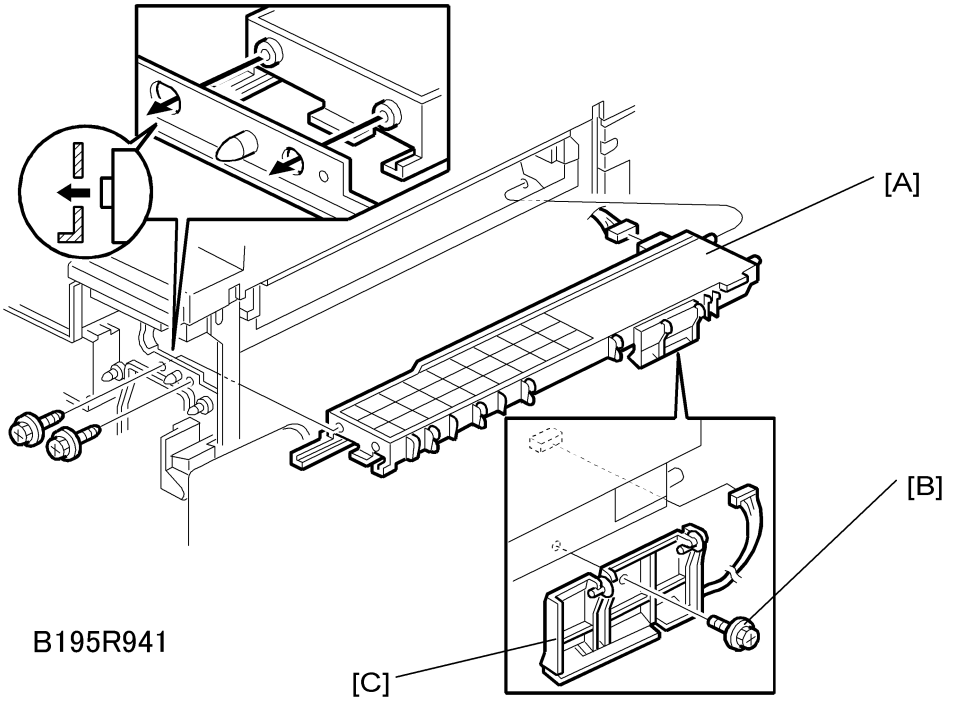


1. **Remove the drum. (See "Drum")**
2. **Remove the charge roller. (See "Charge Roller")**
3. **Remove the drum cleaning blade [A] (x 2).**

ID Sensor

Remove:

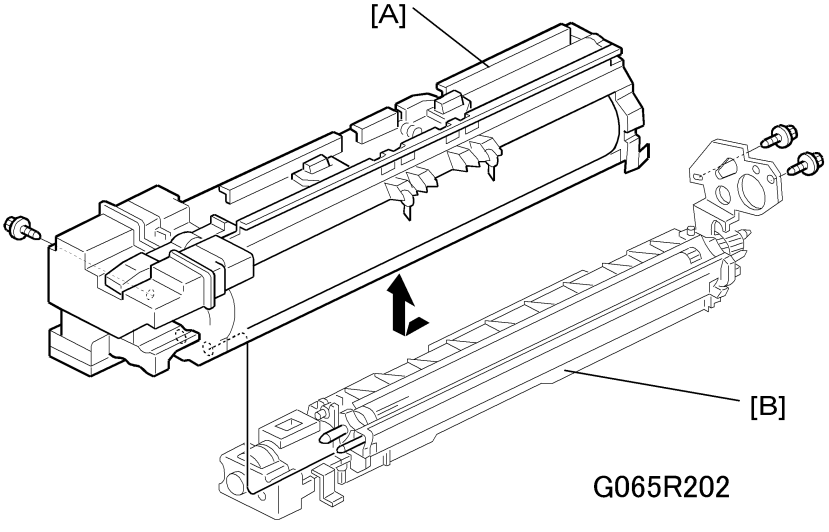
- PCU (See 'PCU'.)
- Fusing unit (See "Fusing Unit'.)
- Development unit (See 'Development – Development Unit'.)



1. Remove the PCU rail [A] (x2, x1)
2. Remove the ID sensor bracket [B] (x1, x1)
3. Remove the ID sensor [C] (x1)
4. Do SP3-001-2 to initialize the ID sensor.

Development

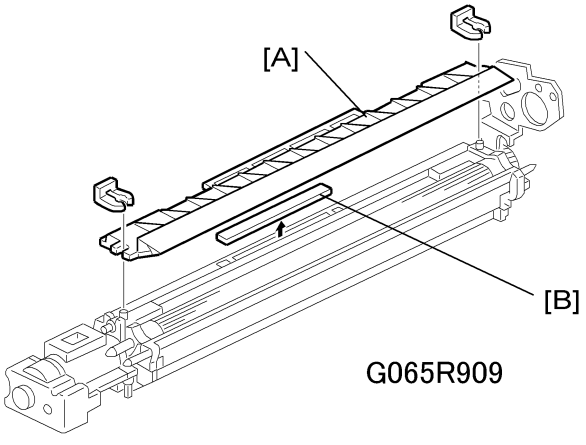
Development Unit



1. PCDU. (See "PCDU")
2. Spread paper on a clean flat surface that is free of pins, paper clips, staples, screws or any other metal objects.
3. Separate the PCU [A] and development unit [B] (x 3).
4. Set the development unit on the spread paper, and cover the exposed drum with a clean piece of paper.
5. SP adjustment if you are temporarily installing a used development unit for test purposes:

Vref Manual Set	SP2220	Set TD Sensor reference voltage to 4.0 V.
TD Manual Set – Initial Vt	SP2802-01	Adjusts TD sensor output.

Development Filter

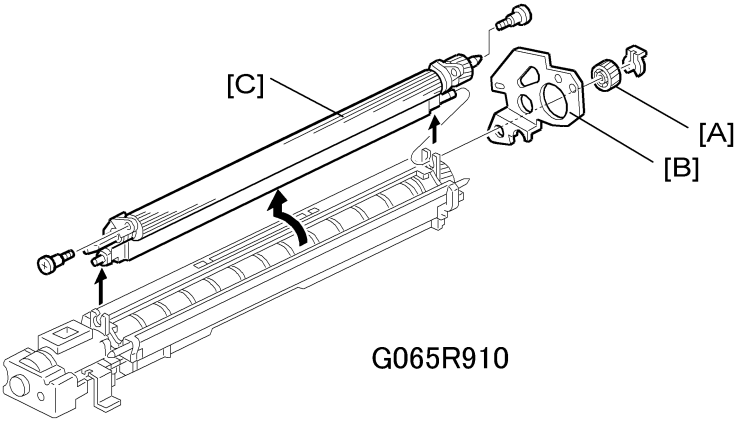


1. Development unit (See 'Development Unit'.)
2. Upper development cover [A] (x2)
3. Development filter [B]

Note

- Make sure that the surface with the red mark is facing up.

Development Roller



1. Development unit (See 'Development Unit'.)
2. Upper development cover (See 'Development Filter')
3. Gear [A] (x1)

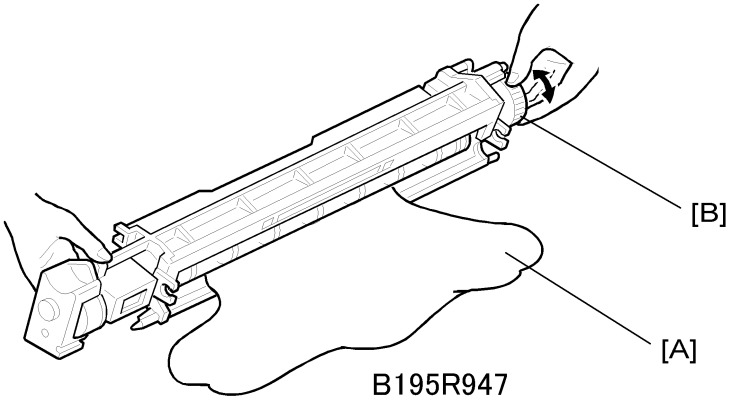
4. **Joint bracket [B].**
5. **Development roller [C] (x2)**

Note

- Work carefully to avoid scratching or nicking the development roller.

Developer

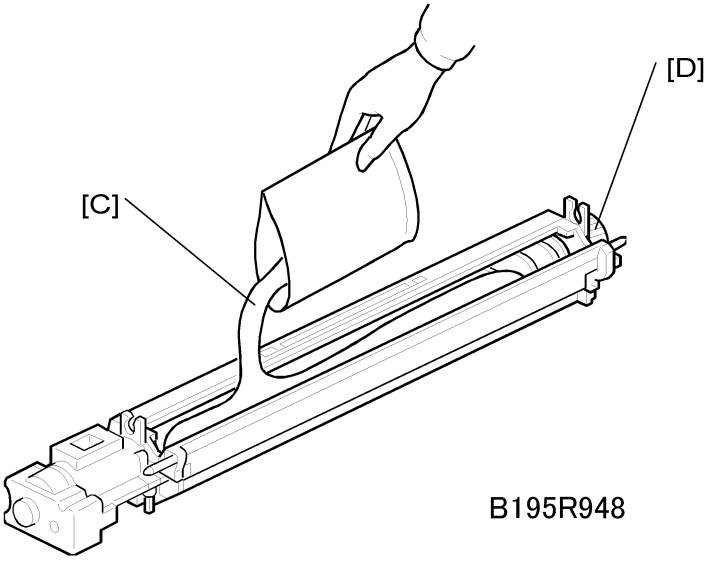
1. **Development unit (See 'Development Unit'.)**
2. **Remove the development roller (See 'Development Roller'.)**



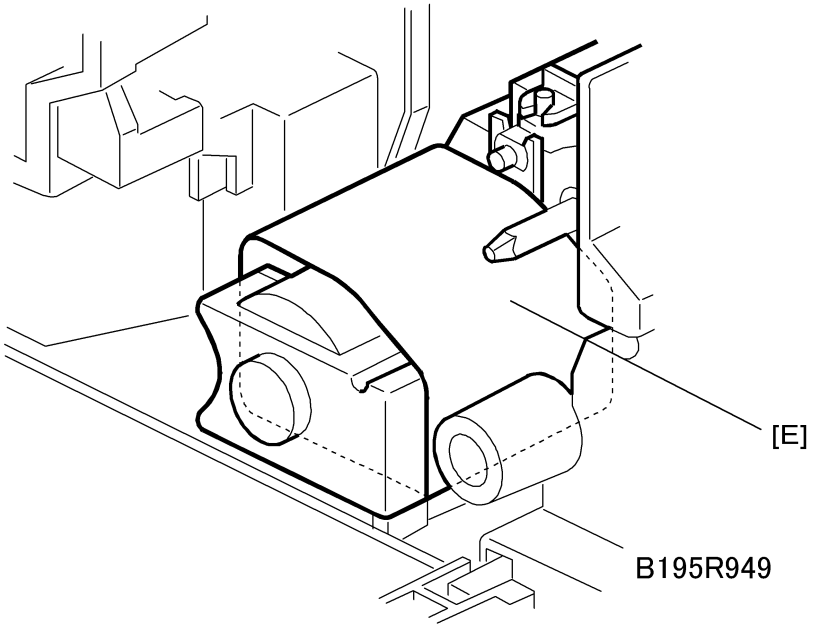
3. **Tip out the old developer [A].**
4. **Turn drive gear [B] to ensure that no developer remains in the unit or on the development roller.**

Note

- Dispose of the used developer in accordance with local regulations. Work carefully to avoid scratching or nicking the development roller.



5. Pour approximately 1/3 of the developer [C] evenly along the length of the development unit.
6. Rotate the drive gear [D] to work the developer into the unit. Repeat [C] and [D] until all toner is in the unit and level with the edges.
7. Reassemble the development unit



8. Cover the toner entrance hole with a piece of paper [E].

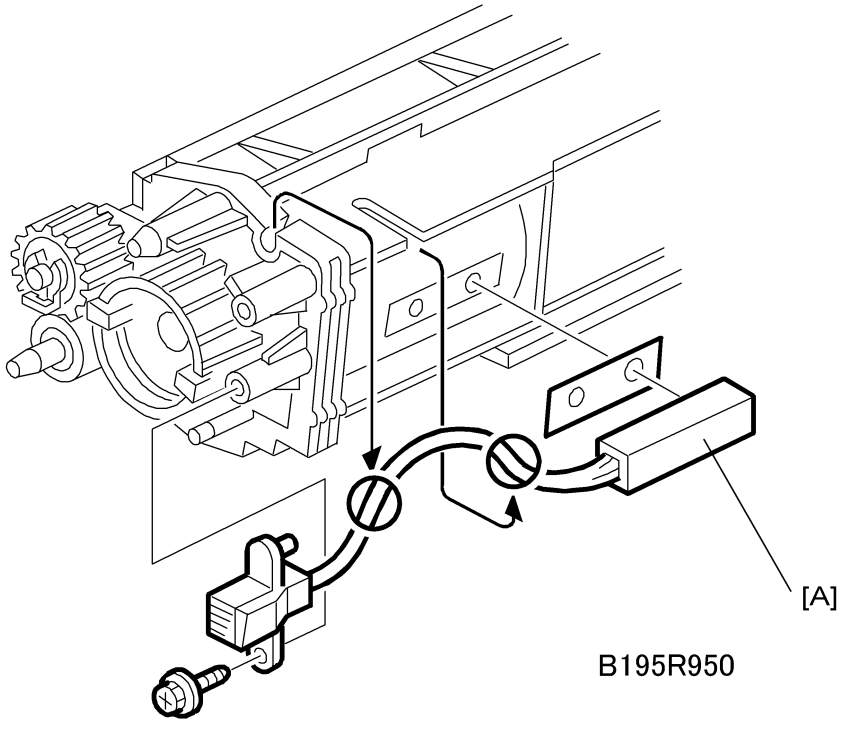
Note

- When performing this setting, cover the toner entrance hole with a piece of paper. This prevents used toner falling from the PCU into the development unit during the TD sensor initial setting and interfering with the Vref setting (toner density reference voltage).

9. **Install the development unit in the machine.**
10. **Turn on the power switch, make sure that the machine has warmed up, then do the TD sensor initial setting using SP 2-801.**
11. **After performing the TD sensor initial setting, remove the sheet [E] from the development unit.**

TD Sensor

1. **Remove the development unit. (See 'Development Unit'.)**
2. **Empty all developer from the development unit**



3. **TD sensor [A] (x1)**

Note

- The TD sensor is attached to the casing with double-sided tape. Pry it off with the flat head of a screwdriver. Use fresh double-sided tape to re-attach the sensor.

4. **Pour new developer into the development unit and do the TD sensor initial setting using SP2-801.**

Note

- When performing the TD sensor initial setting, cover the toner entrance hole with a piece of paper.

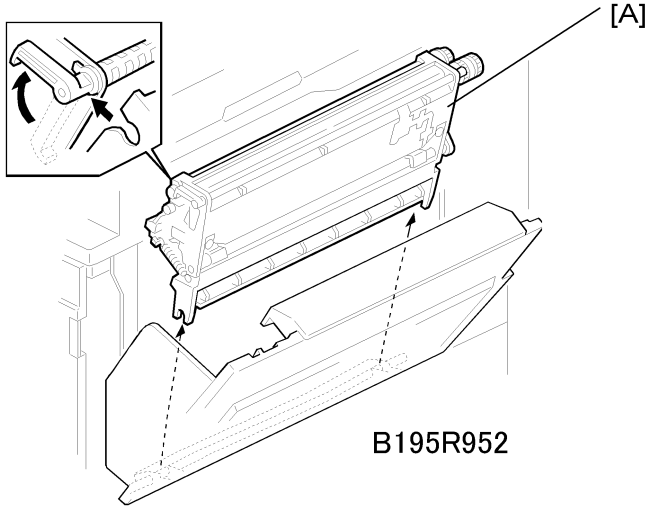
Transfer Unit

Transfer Belt Unit

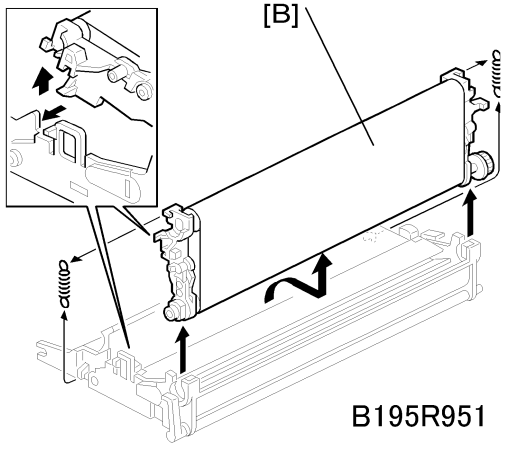
Note

- To avoid exposing the PCU drum to strong light, cover it with paper if the right cover will be open for a long period.

1. **Lower the by-pass tray, open the duplex unit, and open the right cover.**



2. **Transfer unit [A] (Hook x1)**



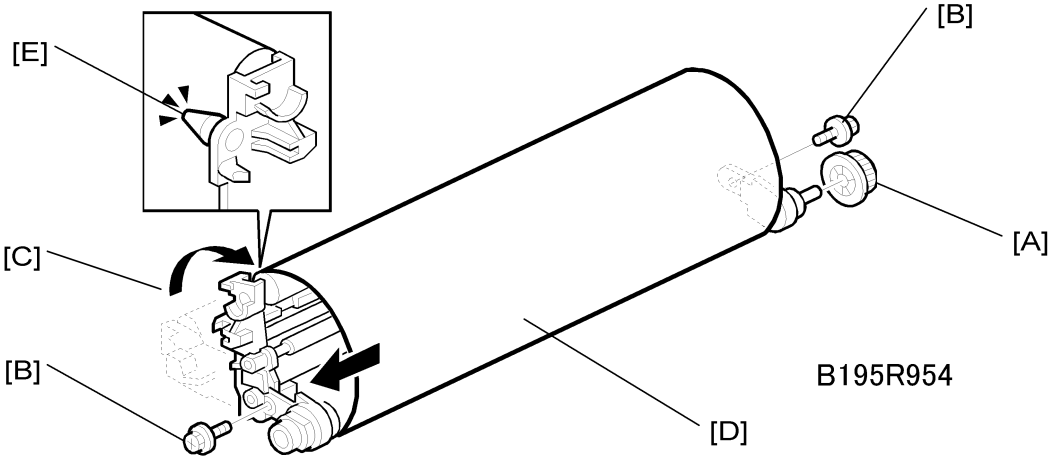
3. **Transfer belt [B] (springs x2, Hook x1)**

Note

- Avoid touching the transfer belt surface.

Transfer Belt

1. **Remove the transfer belt unit. (See 'Transfer Belt Unit'.)**

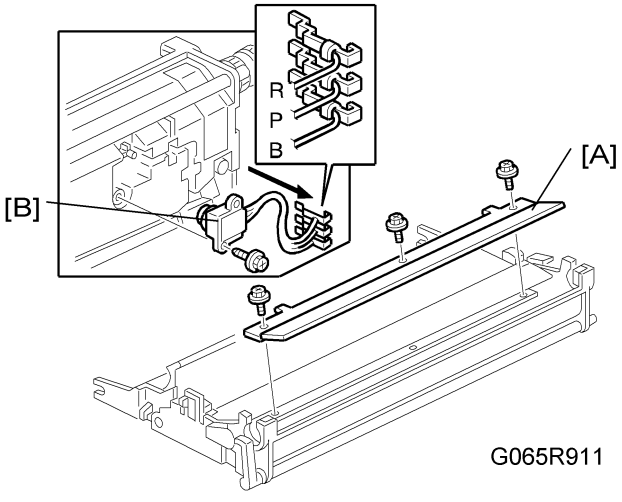


1. **Belt drive gear [A]**
2. **Set screws [B] (x2)**
3. **Lay on a flat, clean surface and fold the unit to release the tension on the belt [C].**
4. **Transfer belt [D]**

Note

- Avoid touching the transfer belt surface.
- Before installing the new transfer belt, clean all the rollers and shafts with alcohol to prevent the belt from slipping.
- When reinstalling the transfer belt, make sure that the belt is under the pin [E].
- To avoid damaging the transfer belt during installation, manually turn the rollers and make sure that the new transfer belt is not running over the edges of any of the rollers.

Transfer Belt Cleaning Blade and Toner Overflow Sensor



Transfer Belt Cleaning Blade

1. Transfer belt unit. (See 'Transfer Belt Unit'.)
2. Transfer belt. (See 'Transfer Belt'.)
3. Transfer belt cleaning blade [A] (x3)

Note

- Avoid touching the edge of the new blade. Check the new blade for dust or damage.

Toner Overflow Sensor

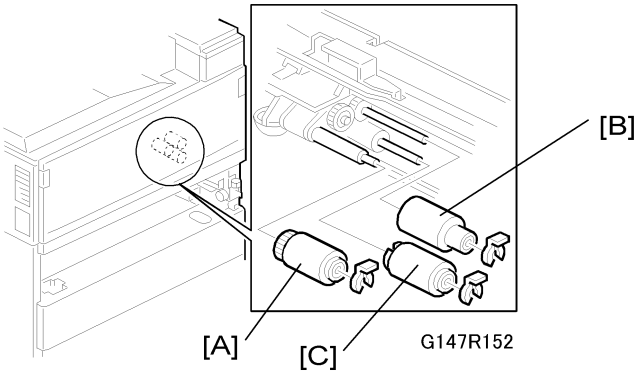
1. Transfer belt unit. (See 'Transfer Belt Unit'.)
2. Transfer belt. (See 'Transfer Belt'.)
3. Transfer belt cleaning blade [A] (x3); see the illustration above
4. Turn over the transfer unit and empty the used toner in the transfer unit.
5. Toner overflow sensor [B] (x1, x3)

Note

- Re-install the color-coded wires in the correct order. R: Red, Br: Brown, Bl: Blue

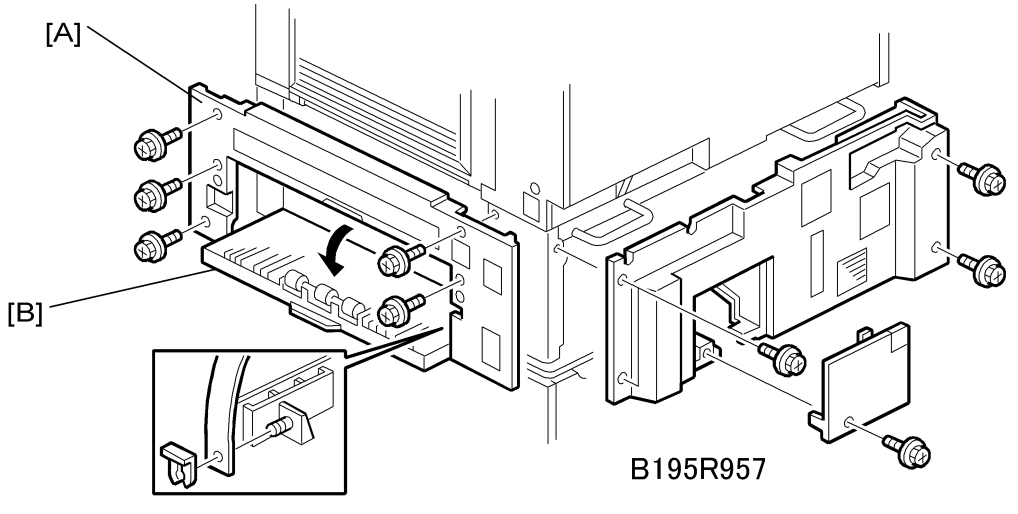
Paper Feed

Pick-Up, Separation, and Feed Rollers



1. Paper tray
2. Pick-up roller [A] (x 1)
3. Feed roller [B] (x 1)
4. Separation roller [C] (x 1)

Lower Right Cover



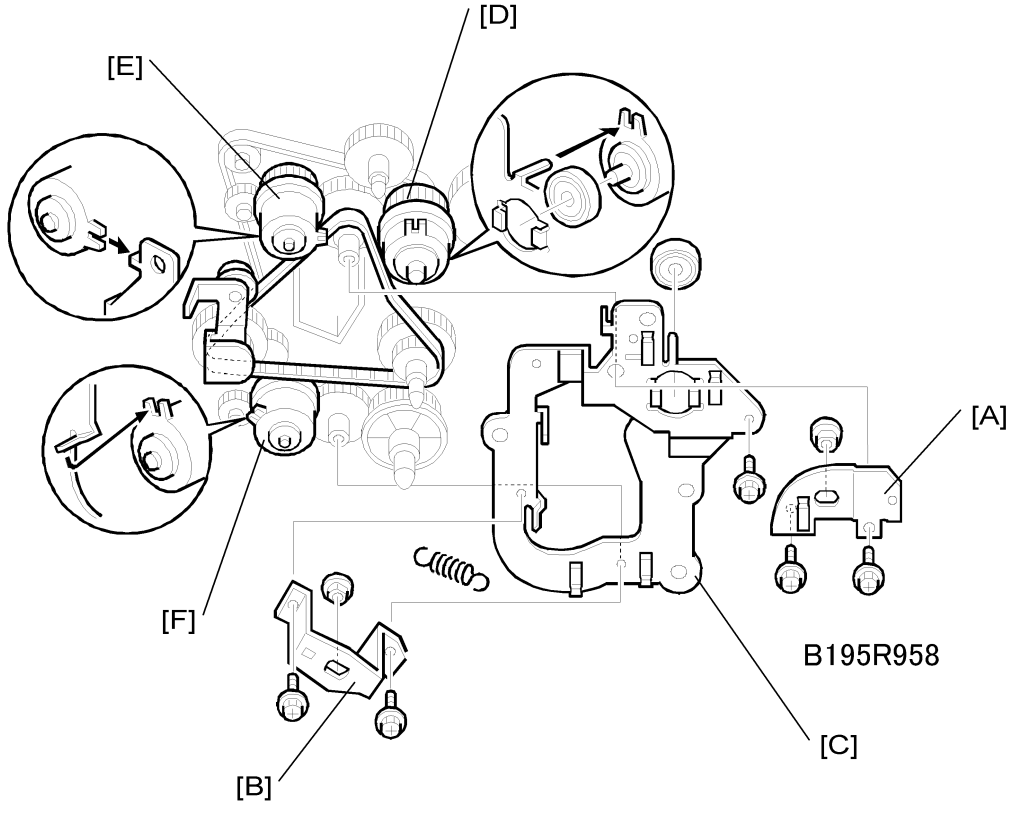
1. Duplex unit (See 'Covers and Common Units – Duplex Unit')

2. By-pass tray (See 'Covers and Common Units – By-pass Tray Unit')
3. LCT (if installed)
4. Lower right cover [A] (x5)
5. Vertical transport cover [B]

Note

- Push the cover completely to the left and then press in on the right tab to release the peg from the hole.

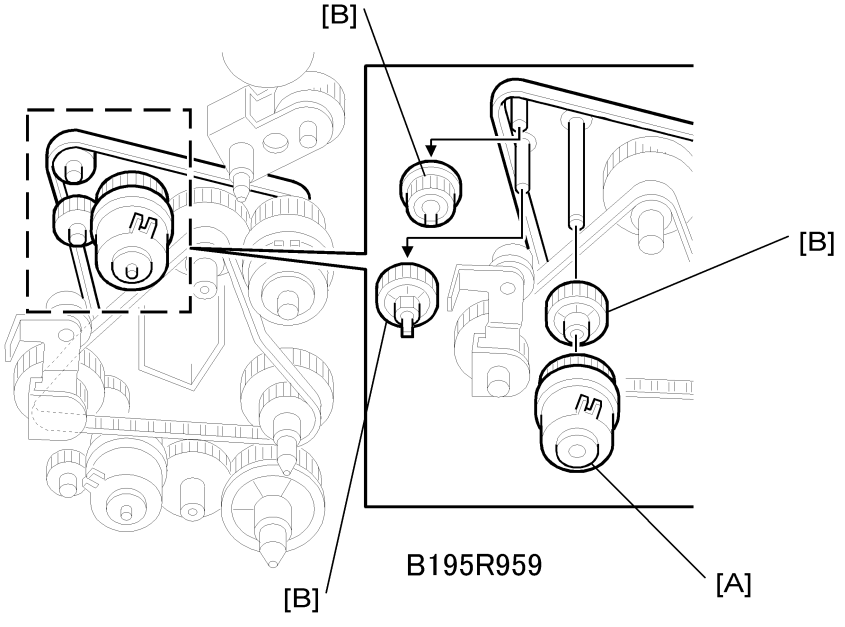
Relay/Upper Paper Feed and Lower Paper Feed Clutches



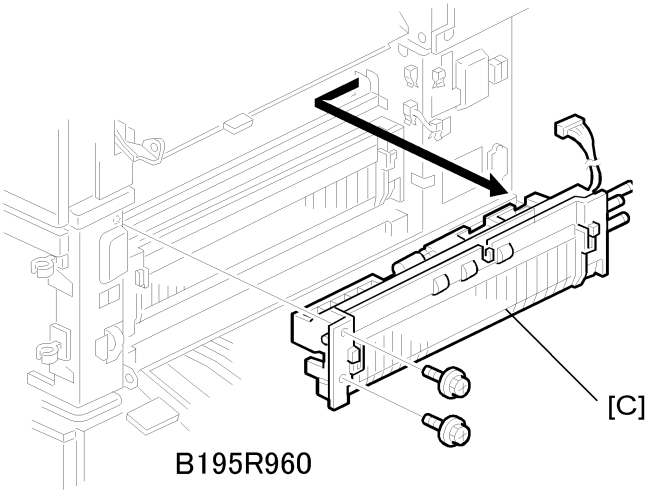
1. Rear lower cover (See 'Covers and Common Units – Rear Covers')
2. Remove the IOB. (See 'Printed Circuit Boards – IOB')
3. First paper feed clutch bracket [A] (x2, bushing x1)
4. Second paper feed clutch bracket [B] (x2, bushing x1)
5. Drive bracket [C] (x1, spring x1, bearing x1)

6. Relay clutch [D] (x1)
7. Upper paper feed clutch [E] (x1)
8. Lower paper feed clutch [F] (x1)

Upper Paper Feed Unit for Tray 1

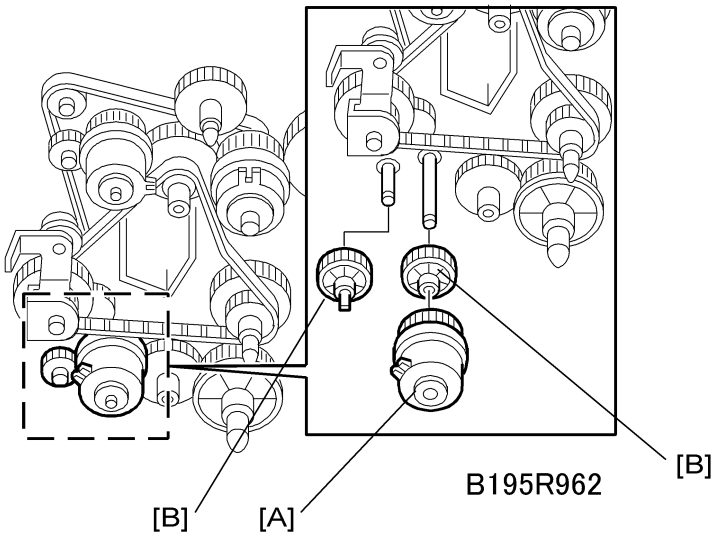


1. Upper paper tray
2. Lower right cover. (See 'Lower Right Cover'.)
3. Right upper cover (See 'Covers and Common Units – Right Upper Cover'.)
4. Upper paper feed clutch [A] (See 'Relay/Upper Paper Feed And Lower Paper Feed Clutches'.)
5. 3 relay gears [B]

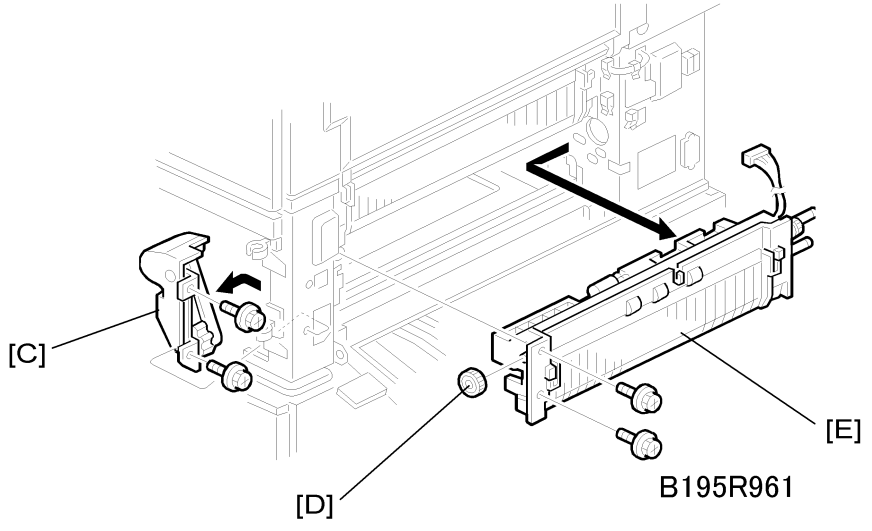


6. Upper paper feed unit [C] (x2, x1)

Lower Paper Feed Unit For Tray 2

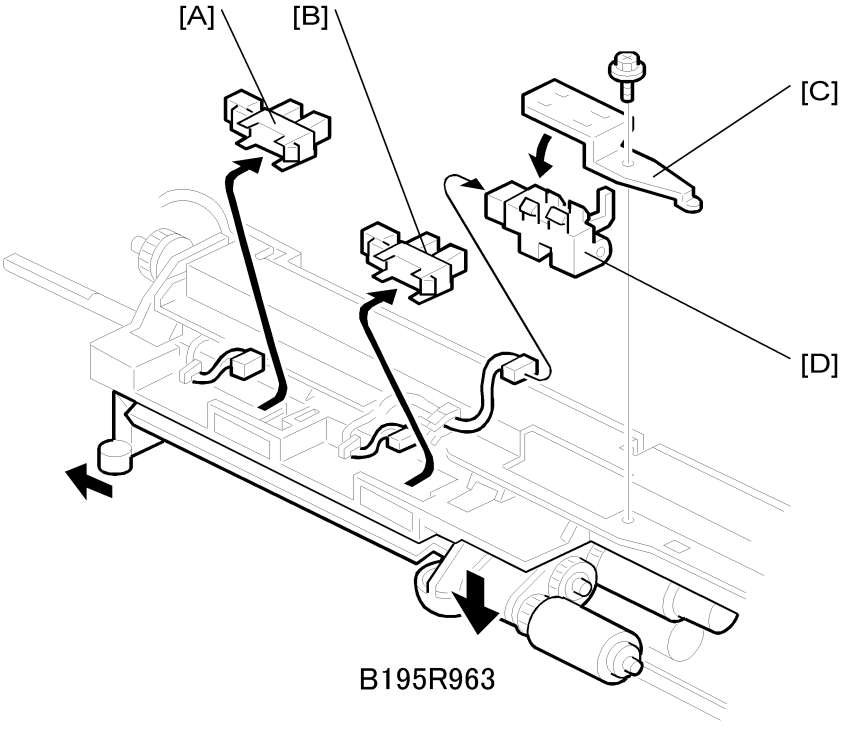


1. Lower the paper trays
2. Lower right cover. (See 'Lower Right Cover'.)
3. Lower paper feed clutch [A] (See 'Relay/Upper Paper Feed And Lower Paper Feed Clutches'.)
4. Relay gears [B] (x3)



5. Cover [C] (x2)
6. Gear [D] (x1)
7. Lower paper feed unit [E] (x2, x1)

Paper End/Paper Height/Relay Sensors

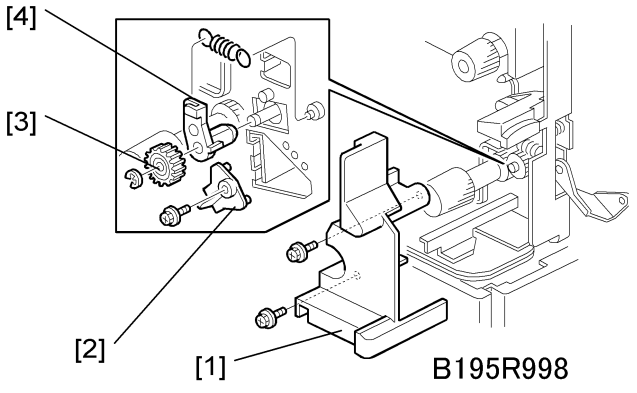


1. **Remove the appropriate paper feed unit. (See 'Upper Paper Feed Unit' or 'Lower Paper Feed Unit'.)**
2. **Paper height sensor [A] (x1)**
3. **Paper end sensor [B] (x1).**
4. **Relay sensor bracket [C] (x1, x1)**
5. **Relay sensor [D]**

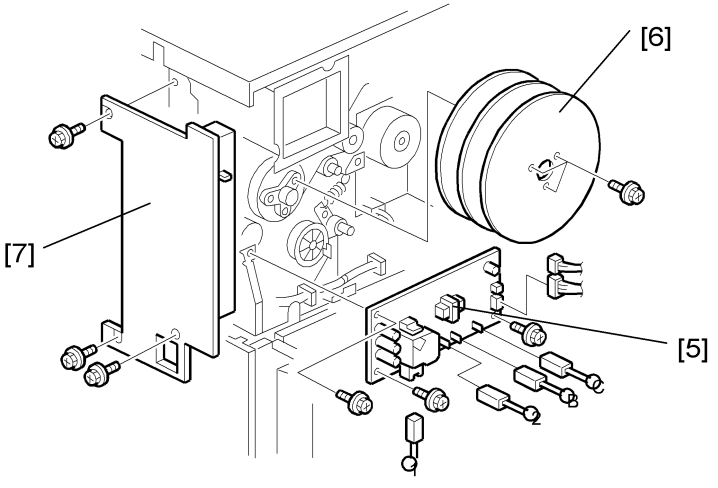
Registration Sensor

1. **Remove:**
   - Front door (See 'Covers and Common Units – Front Door'.)
   - Rear upper cover (See 'Covers and Common Units – Rear Covers'.)
   - Right upper cover (See 'Covers and Common Units – Right Upper Cover'.)
   - Transfer belt unit (See 'Transfer Unit'.)
   - PCU (See 'Photoconductor Unit'.)

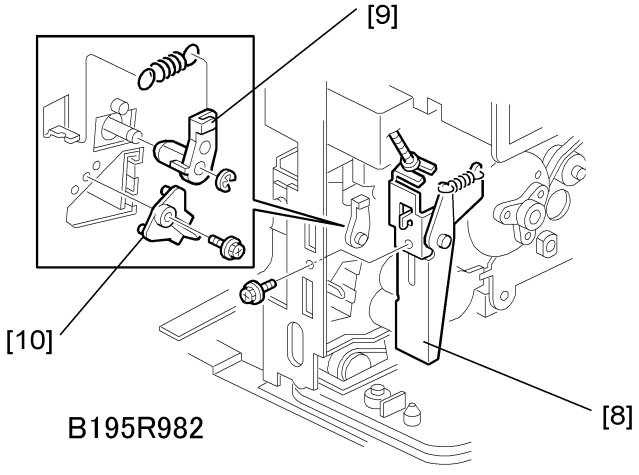
- Development unit (See 'Development'.)



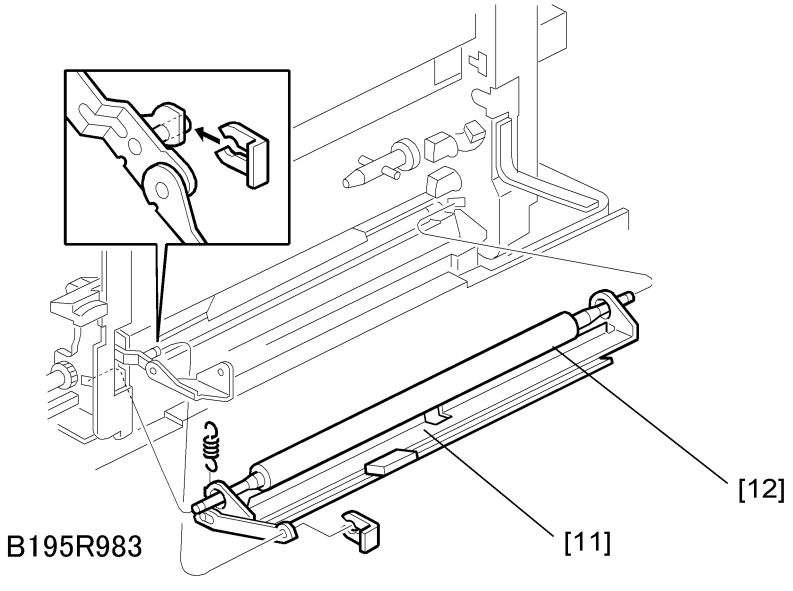
2. **Inner cover [1] (x2)**
3. **Front registration holder [2] (x1)**
4. **Front registration roller gear [3] (x1)**
5. **Registration roller bushing [4] (spring x 1)**



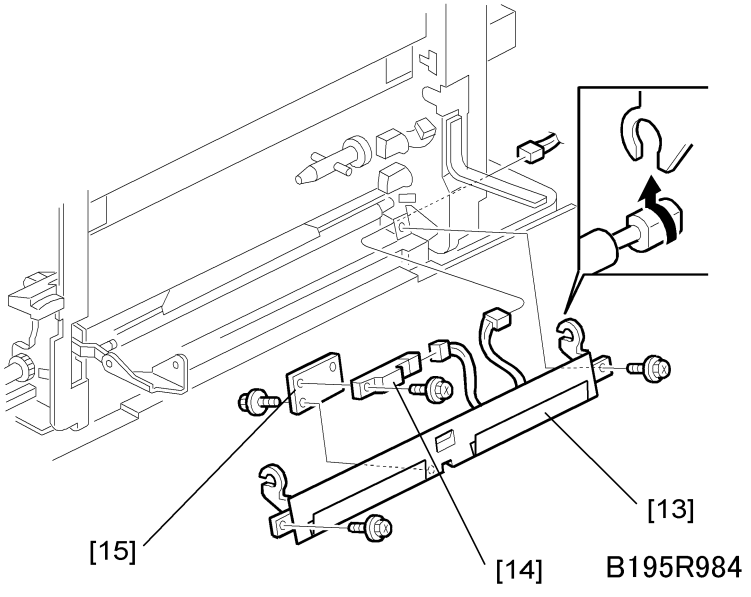
6. **High voltage power supply board [5] (x3, x6)**
7. **Flywheels [6] (x3)**
8. **Right rear cover [7] (x3)**



9. Right cover switch bracket [8] (x1)
10. Rear registration holder [9] (x1)
11. Registration roller bushing [10] (x1, spring x1)

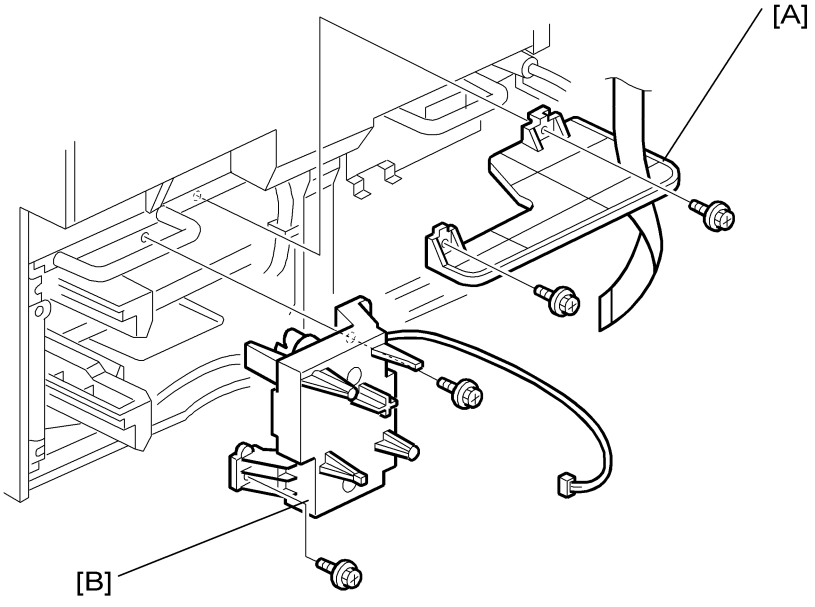


12. Guide plate [11] and registration roller [12] (spring x1, x 1)



13. Registration guide plate [13] (x2, x1)
14. Sensor bracket [14] (x1)
15. Registration sensor [15] (x1, x1)

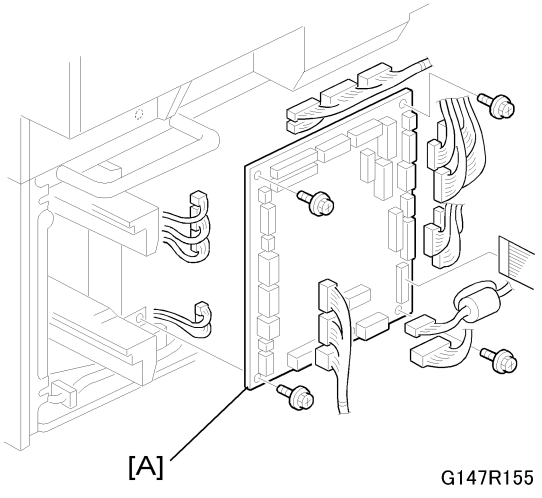
Tray Lift Motor



B195R964

1. Rear lower cover (See 'Covers and Common Units – Rear Covers'.)
2. Remove the IOB (See 'Printed Circuit Boards – IOB'.)
3. Bracket [A] (x2, x1)
4. Tray lift motor [B] (x2)

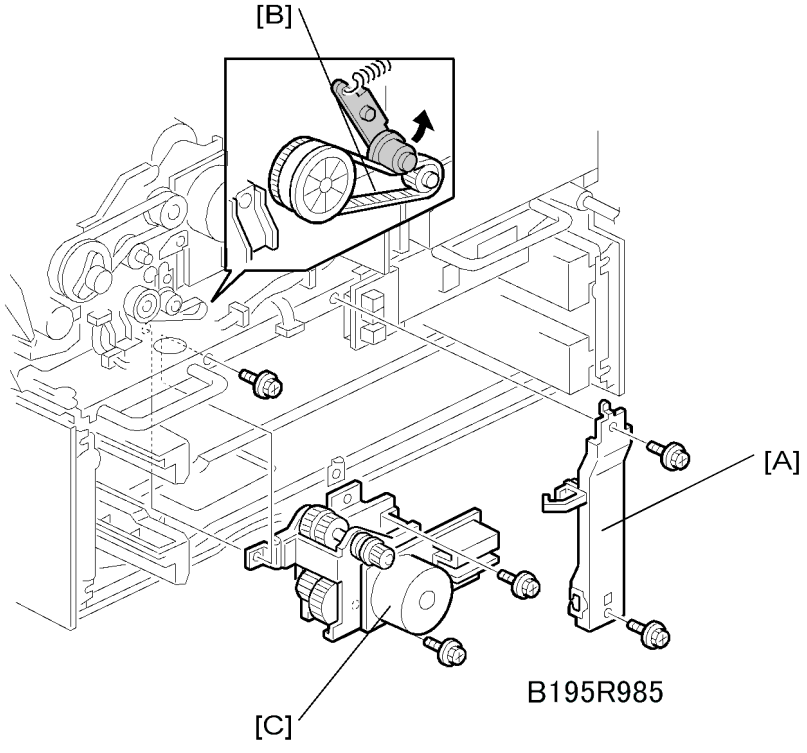
Feed/Development Motor



Remove: See "IOB"

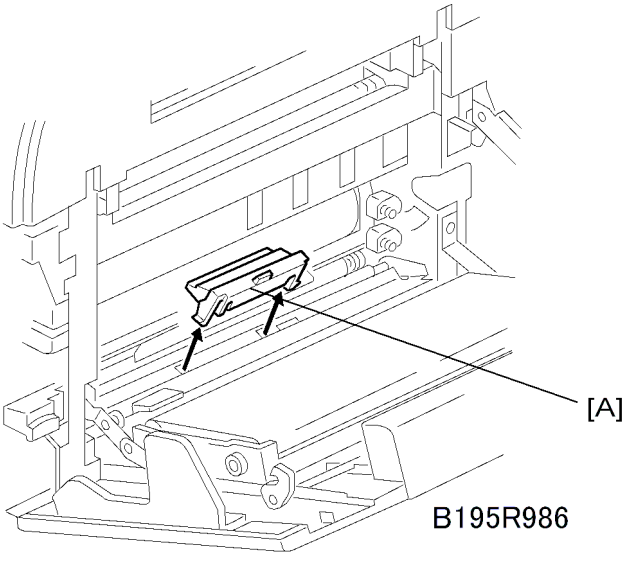
- Center plate of rear lower cover (x1, x1)
- Rear lower cover (x4)

1. **Remove the IOB [A] (x4, x24)**



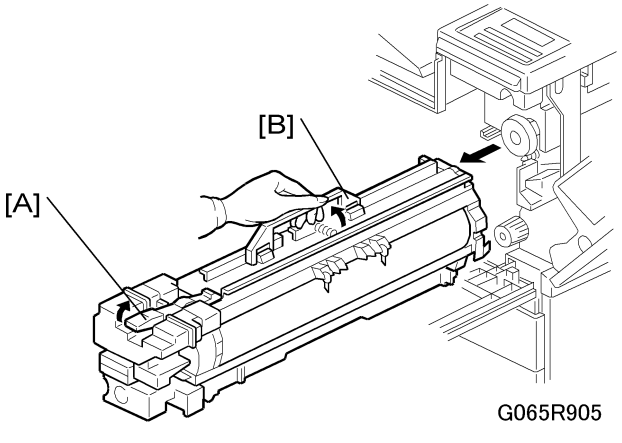
2. Rear lower cover (x4) (See 'Covers and Common Units – Rear Covers'.)
3. Rear upper cover (x4) (See 'Covers and Common Units – Rear Covers'.)
4. Tray lift motor (See 'Tray Lift Motor'.)
5. Support [A] (x2, harnesses x2)
6. Timing belt [B] (Raise arm to release tension on belt.)
7. Feed/development motor [C] (x3, x2)

Idle Roller Dust Blade



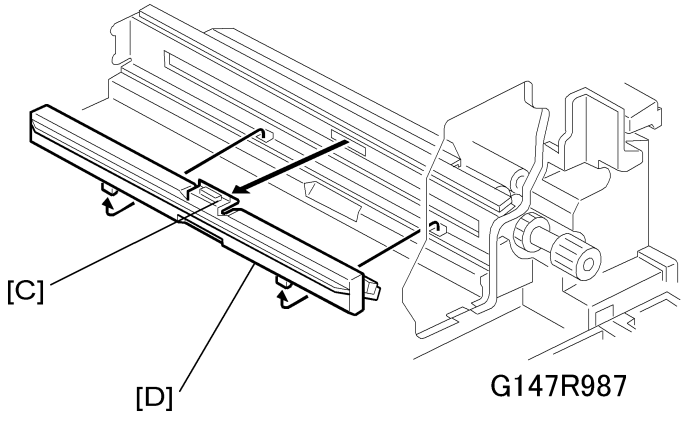
1. Open the duplex unit and right door.
2. Detach the dust blade [A].
3. Spread some paper on a flat surface. Tap the dust blade gently to remove paper dust collected in its dust box.

Registration Roller Dust Blade



1. Open the front door.
2. Lower the by-pass tray, open the duplex unit, and open the transfer unit right cover.

3. Release the PCU lock [A].
4. Hold the PCU by the handle [B] and pull out slowly.



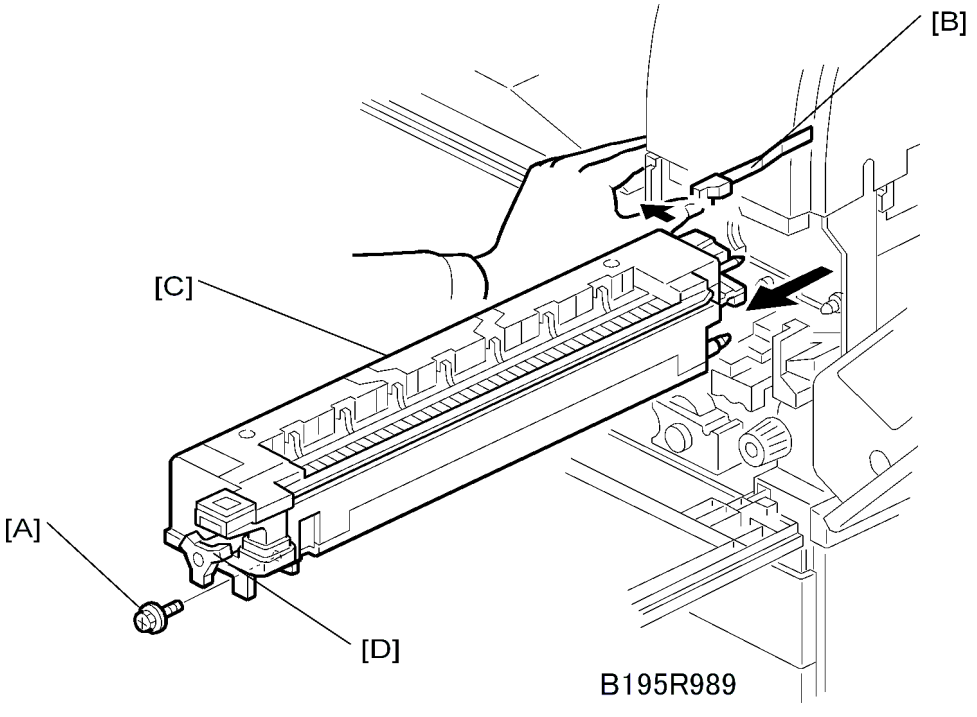
5. Press the top of the blade [C] to unlock it and open it to the left.
6. Remove the dust blade [D] from the machine.

Fusing Unit

⚠CAUTION

- Allow time for the unit to cool before doing the following procedure.

Fusing Unit Removal

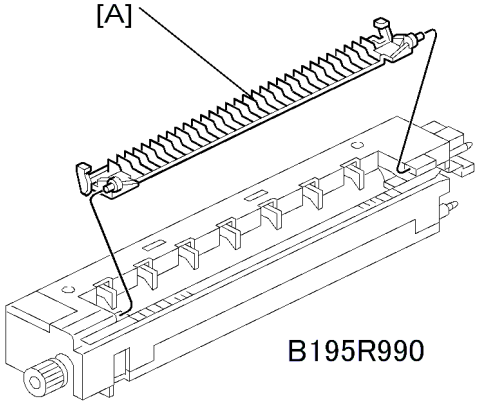


1. **Open the front door, duplex unit, and right door.**
2. **Remove set screw [A] (x 1)**
3. **Fusing unit release lever [B]**
4. **Slide out the fusing unit [C]**

Note

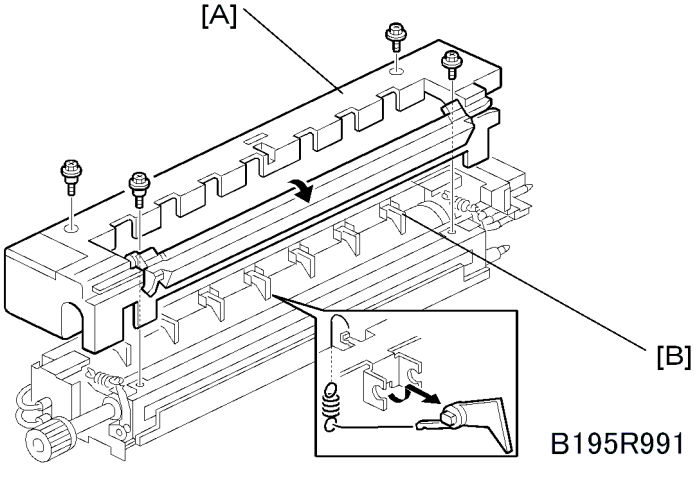
- The large knob [D] is provided to make it easier to turn the hot roller in order to remove jams.

Fusing Unit Exit Guide



1. Fusing unit (See 'Fusing Unit Removal'.)
2. Exit guide [A]. Press the guide to the left and then press on the right end to release the peg from the hole.

Hot Roller Strippers



1. Fusing unit (See 'Fusing Unit Removal'.)
2. Fusing unit cover [A] (x4)

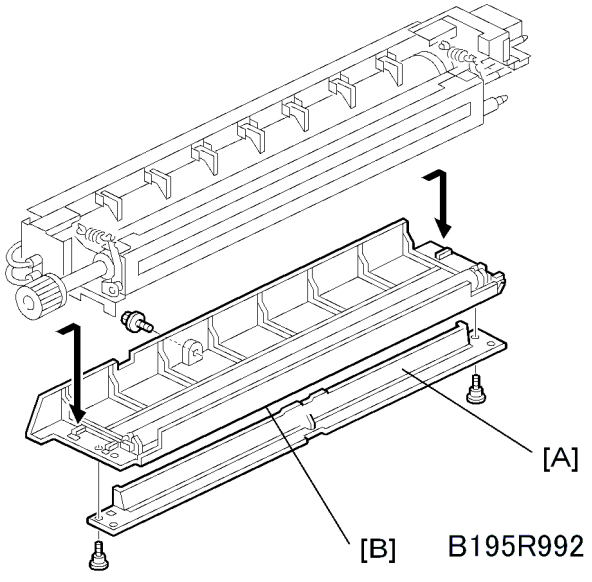
Note

- Note the positioning of the step screws x2 and the set screws x2.

3. Hot roller strippers x7 and springs x7

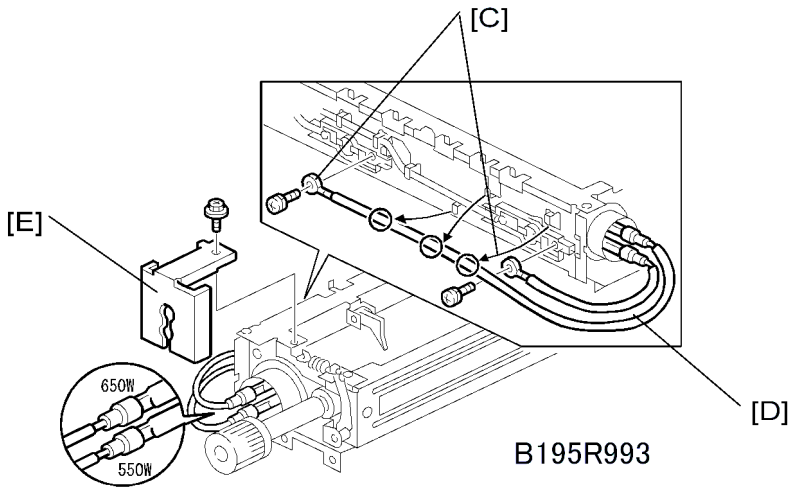
Fusing Lamps

1. Fusing unit (See 'Fusing Unit Removal'.)
2. Fusing unit upper cover (See 'Hot Roller Strippers'.)



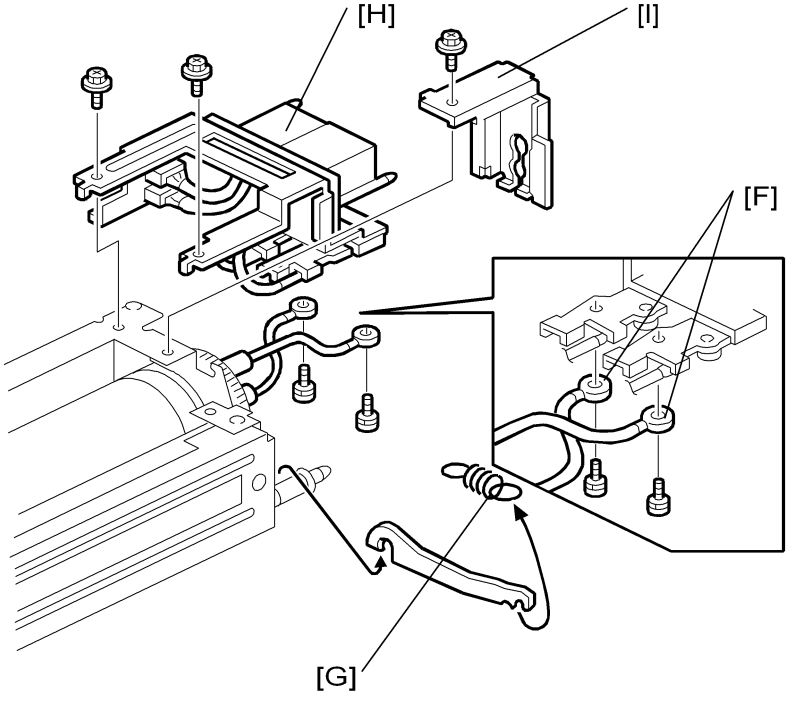
3. Fusing entrance guide [A] (x2)
4. Fusing unit lower cover [B] (x1)

Left side



5. Two terminals [C] (x2)
6. Center fusing lamp lead [D] (Clamps x3)
7. Bracket [E] (x1)

Right side



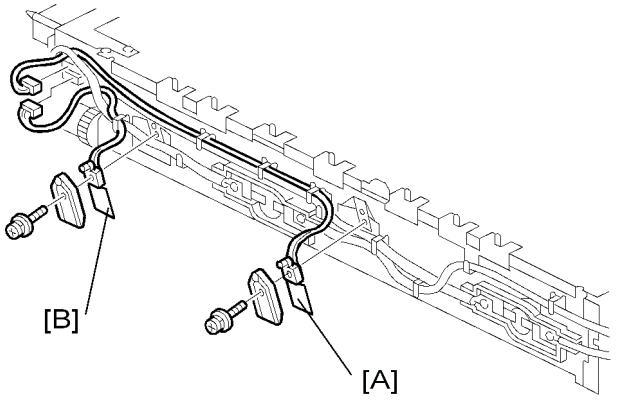
8. Two terminals [F] (x2)
9. Spring [G]
10. Connector bracket [H] (x2)
11. Bracket [I] (x2)
12. Remove both fusing lamps.

Important

- To avoid breaking the fusing lamps, handle them with care.
- Avoid touching the lamps with bare hands.
- Note the top/bottom positioning of the fusing lamps as you remove them. The sizes of the holes in the holder match the sizes of the ends of the 650 W lamp (red) and 650 W lamp (brown).

Thermistors and Thermostats

1. Fusing unit (See 'Fusing Unit Removal'.)
2. Fusing unit upper cover (See 'Hot Roller Strippers'.
3. Fusing unit lower cover. (See 'Fusing Lamps'.)

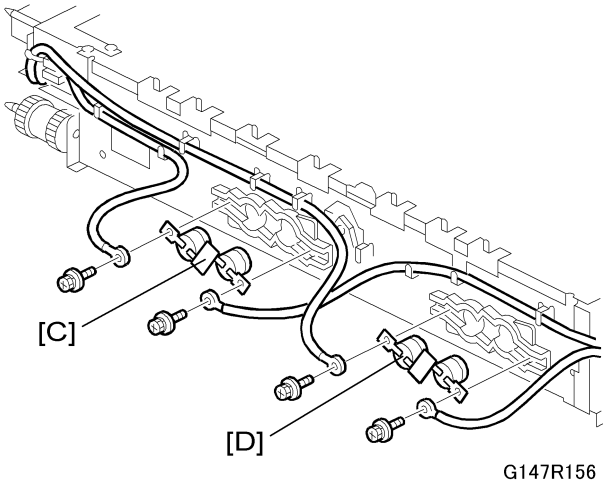


B195R995

4. Center thermistor [A] (x1, x1, holder x1)
5. End thermistor [B] (x1, x1, holder x1)

CAUTION

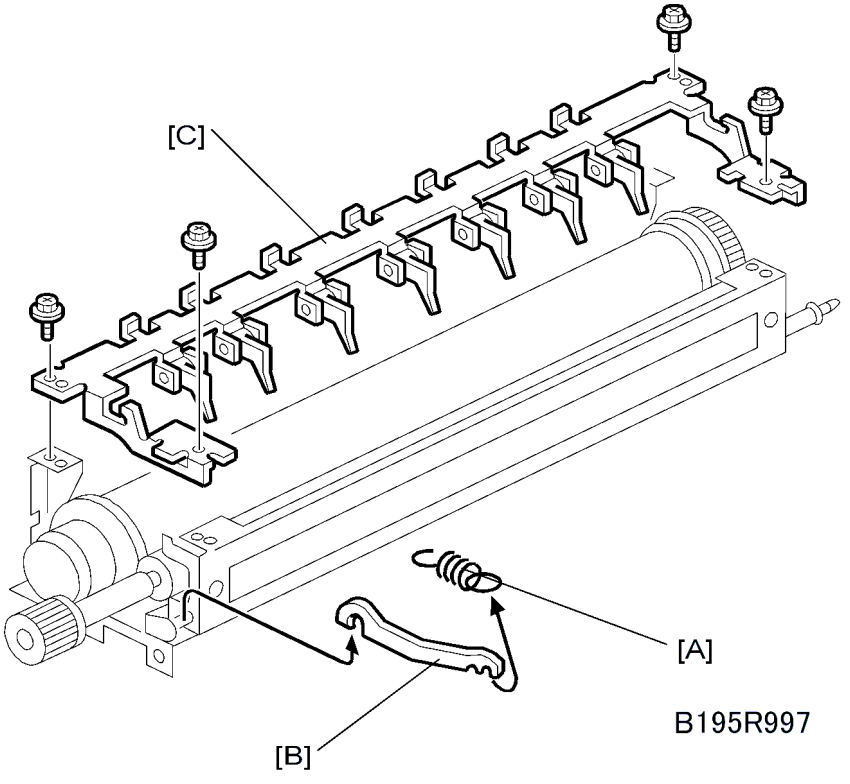
- The thermistors are thinly coated and extremely fragile. Handle with care to avoid damaging them. They should be replaced every 150K.



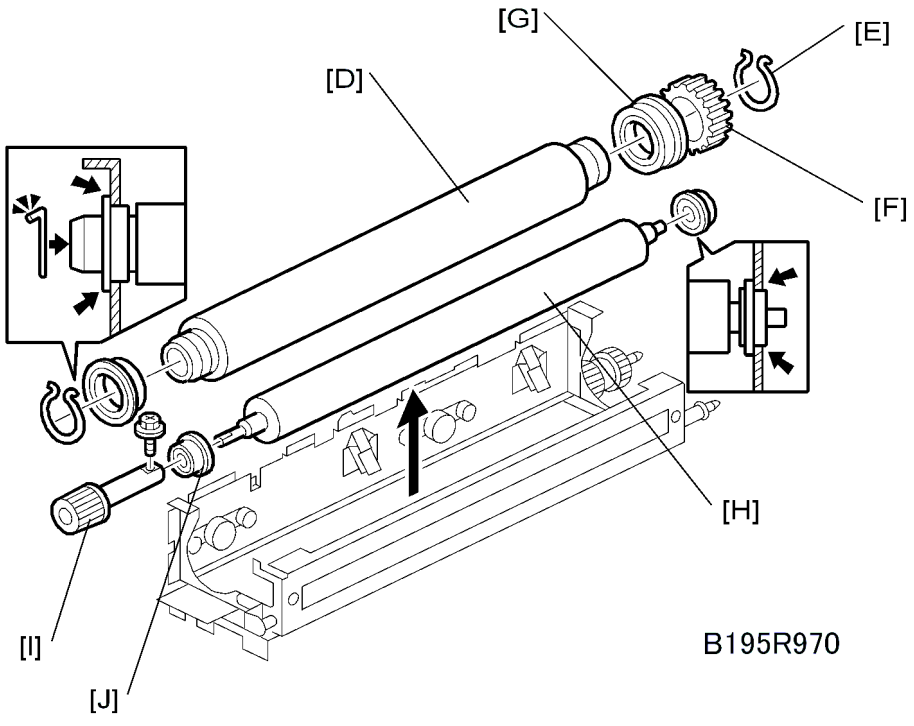
6. Center thermostat [C] (x2)
7. End thermostat [D] (x2)

Hot Roller/Pressure Roller

1. Fusing unit (See 'Fusing Unit Removal'.)
2. Fusing unit upper cover (See 'Hot Roller Strippers'.
3. Fusing unit lower cover. (See 'Fusing Lamps'.)
4. Fusing lamps. (See 'Fusing Lamps'.)



5. Springs x2 [A] (both sides)
6. Arms x2 [B] (both sides)
7. Pawl bracket [C] (x4)



8. **Hot roller [D]**

⚠CAUTION

- The hot roller is easily damaged. Always handle it carefully.

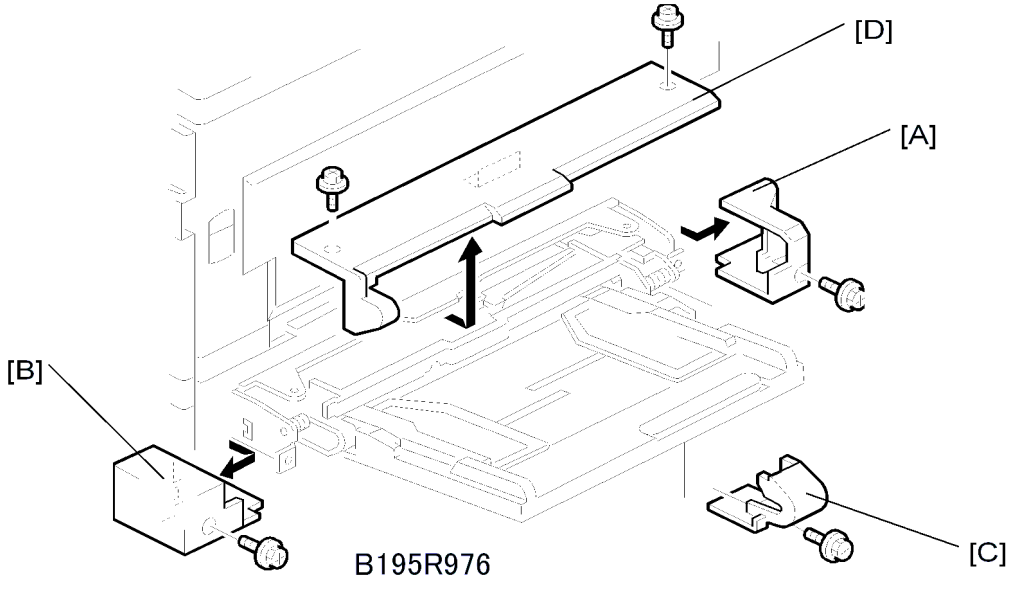
9. **C-rings x2 [E] (both ends)**
10. **Drive gear [F]**
11. **Bushings x2 [G] (both ends)**
12. **Pressure roller [H]**
13. **Fusing knob [I] (x1)**
14. **Bushings x2 [J] (both ends)**

Note

- Before installing the new hot roller, peel off 3 cm (1 inch) from both ends of the protective sheet on the new roller.
- Never touch the surface of the rollers.
- Work carefully to avoid damaging the surface of the hot roller.
- The standard pressure roller spring position is the upper position.
- When reinstalling the hot roller assembly and pressure roller assembly, make sure that the flange position of the bushings is as shown.

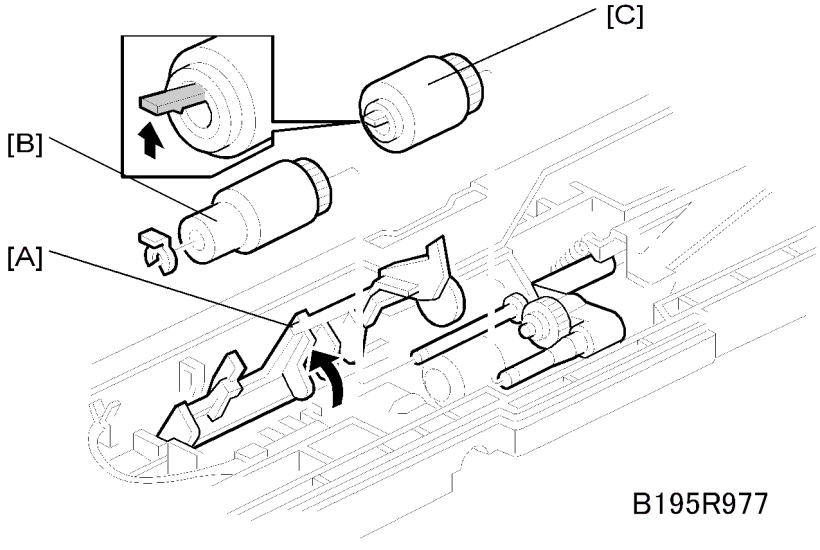
By-Pass Tray

Covers



1. Rear cover [A] (x 1)
2. Front cover [B] (x 1)
3. Hinge cover [C] (x 1)
4. Upper cover [D] (x 2)
5. Close the duplex unit and pull out the upper cover.

By-Pass Paper Feed and Pick-Up Roller Replacement

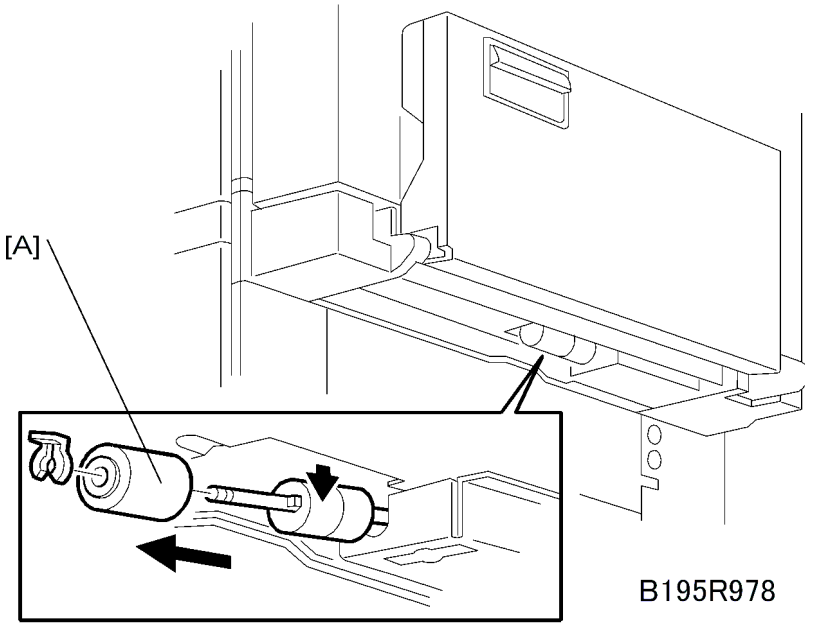


1. **Upper cover (See 'Covers'.)**
2. **Lift up paper end feeler [A] to lock the feeler in position.**

   Note

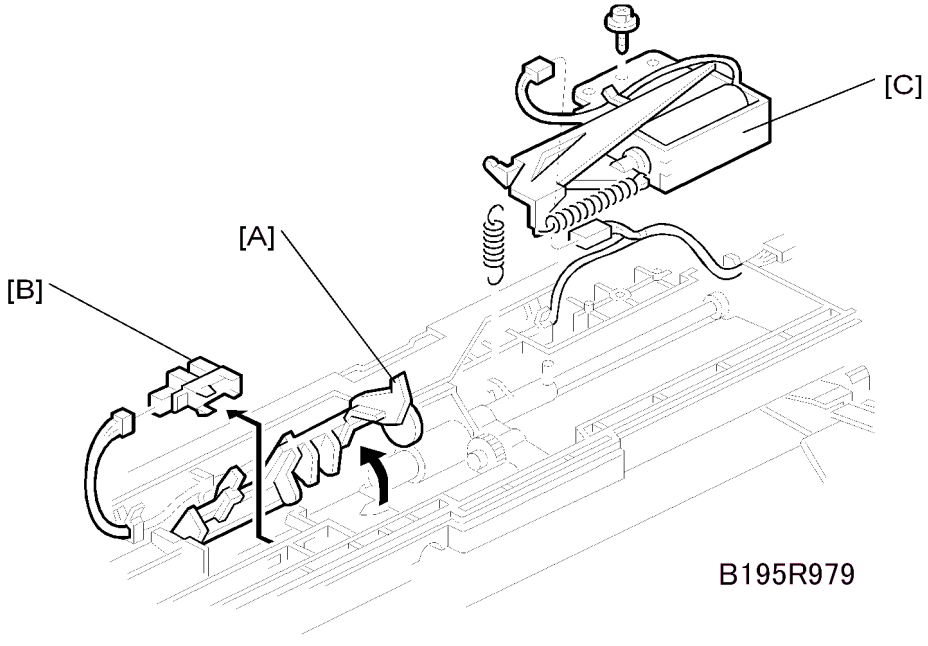
   - Before reinstalling the upper cover, return the paper end feeler to its original position.
3. **Replace the paper feed roller [B] (x1)**
4. **Replace the pick-up roller [C].**

By-Pass Separation Roller



1. Close the by-pass table.
2. Remove the separation roller [A] from the bottom (x1)

Paper End Sensor, Pick-Up Solenoid



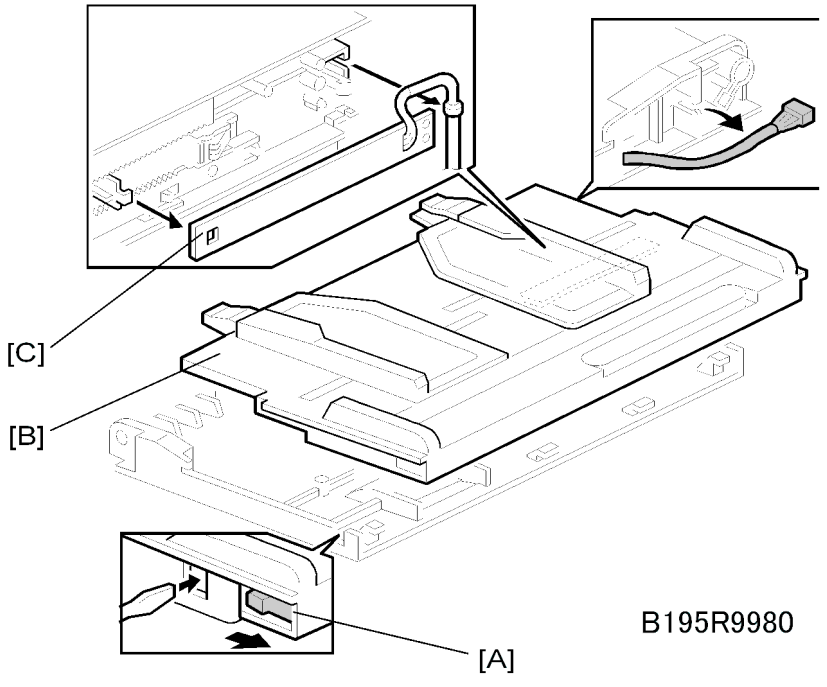
1. **Upper cover (See 'Covers'.)**
2. **Lift the paper end feeler [A].**

Note

- Before reinstalling the upper cover, return the paper end feeler to its original position.

3. **Replace the paper end sensor [B] (x1).**
4. **Pick-up solenoid [C] (x1, x1, spring x1)**

Paper Size Sensor Board

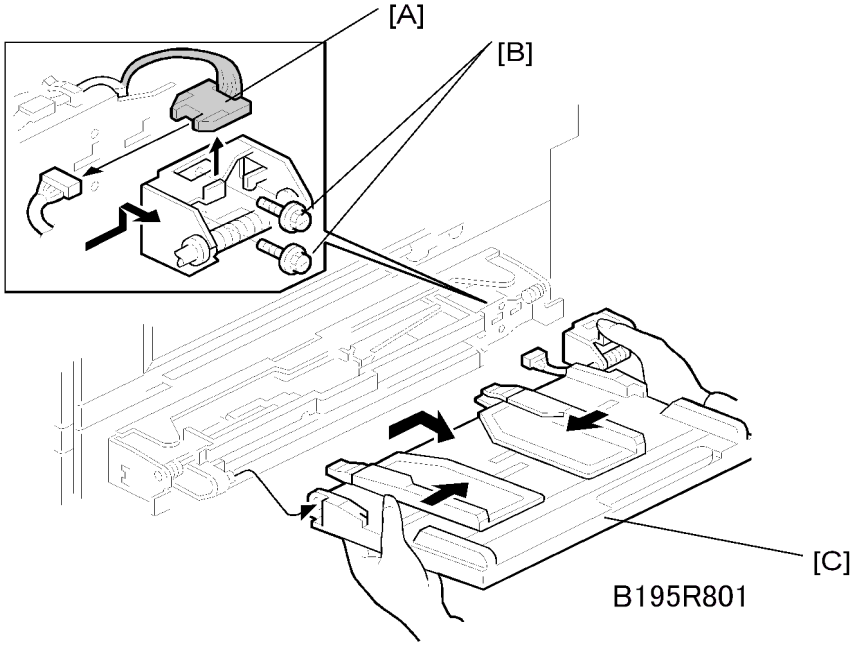


1. **Hook [A]**
2. **Paper tray [B] (x1).**
3. **Size sensor board [C].**

Note

- To avoid breaking the hook of the paper size sensor board, handle it carefully during removal.

By-Pass Table Removal



Note

- The entire by-pass tray unit can be removed, not just the table. (See 'Covers and Common Units – By-Pass Tray Unit'.)

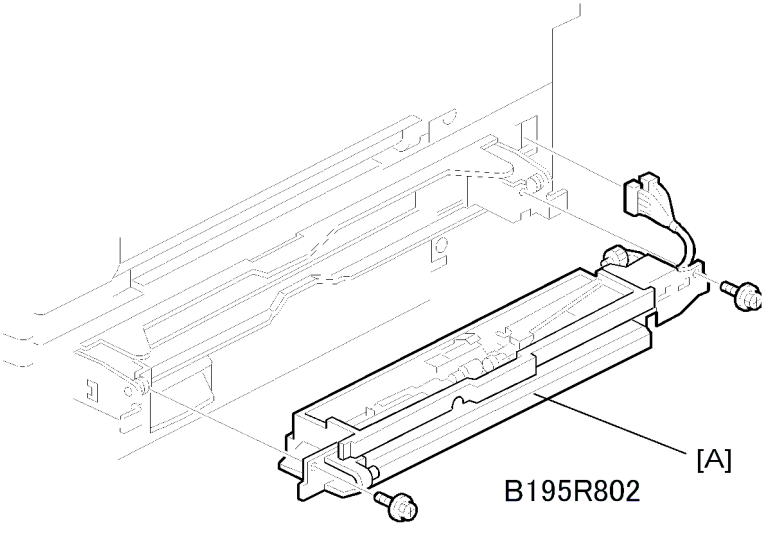
1. **Hinge cover (See 'Covers'.)**
2. **Harness [A] (x1).**
3. **Screws [B] (x2)**
4. **By-pass table [C].**

CAUTION

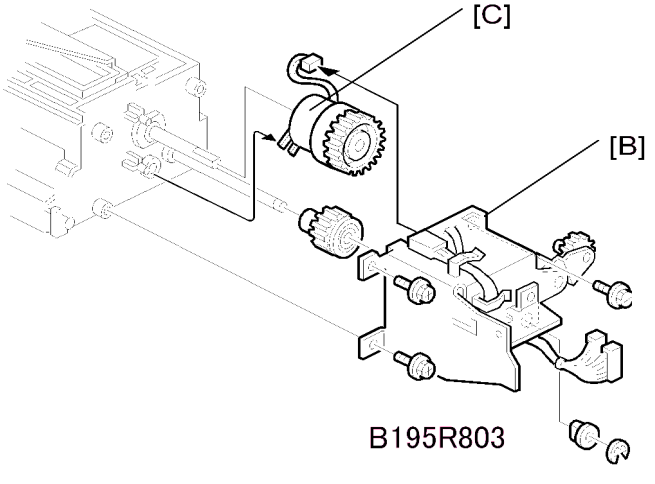
- To relieve pressure on the spring during removal, depress it as shown in the illustration.

Paper Feed Clutch

1. **By-pass tray.**



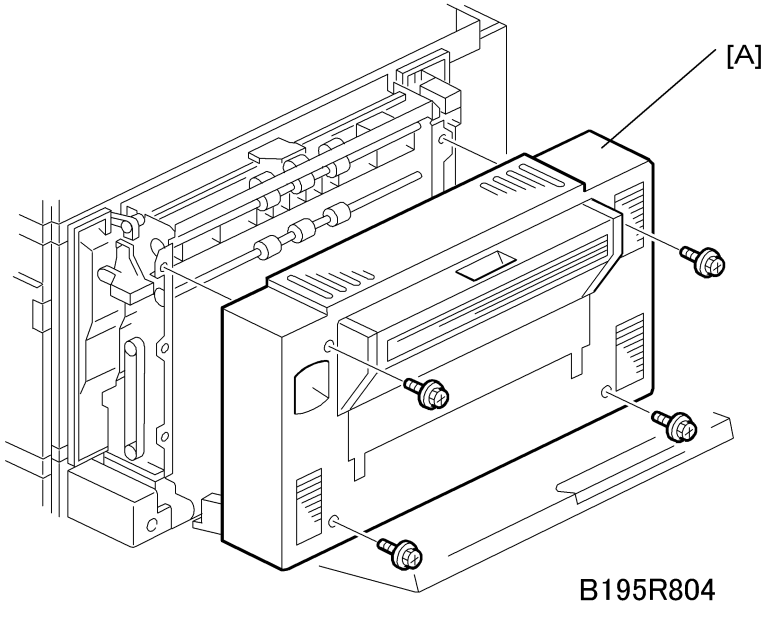
2. Paper feed unit [A] (x2, x2)



3. Rear bracket [B] (x4, x1, bushing x1)
4. Paper feed clutch [C] (x1)

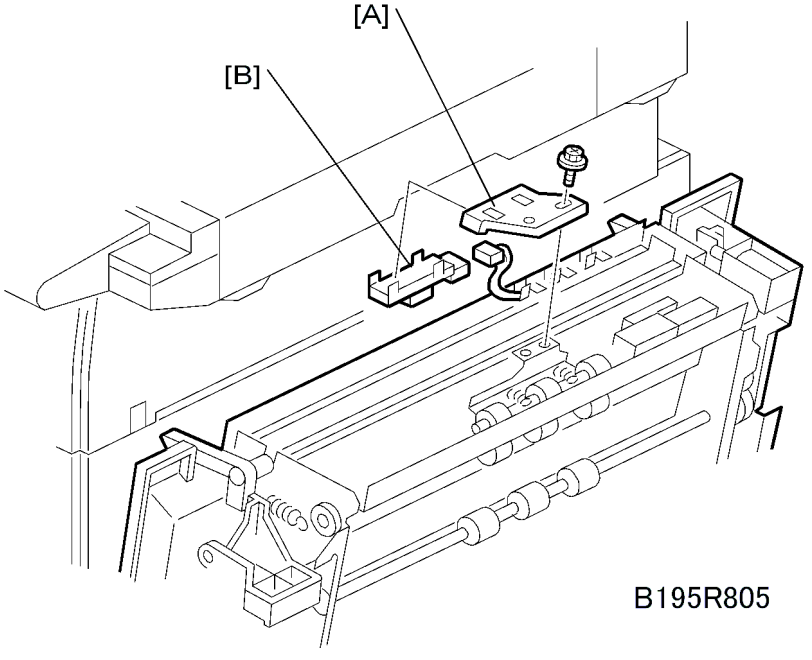
Duplex Unit

Duplex Cover Removal



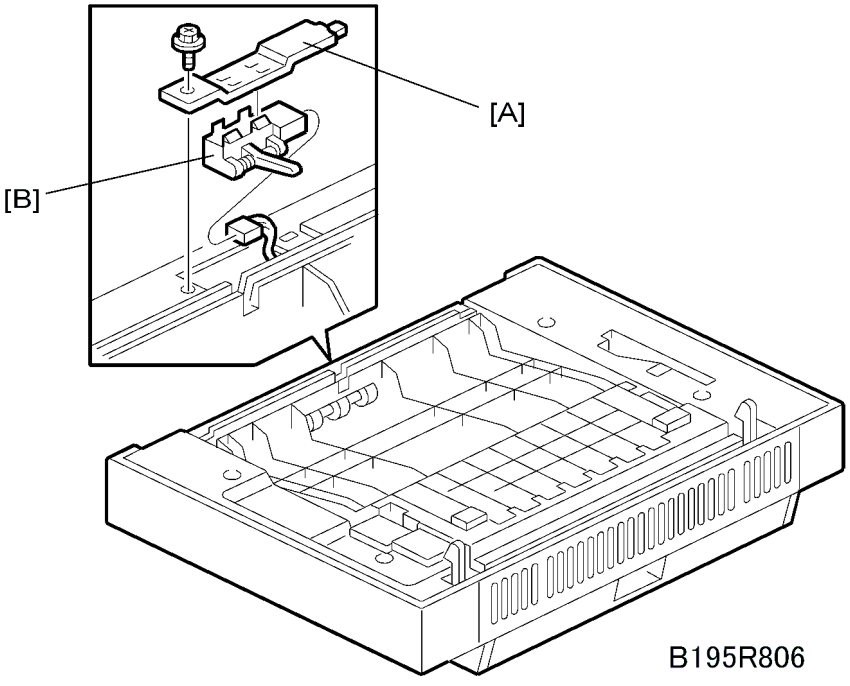
1. Duplex unit cover [A] (x4)

Duplex Entrance Sensor



1. Duplex unit cover (See 'Duplex Cover Removal'.)
2. Sensor holder [A] (x1)
3. Entrance sensor [B] (x1)

Duplex Exit Sensor

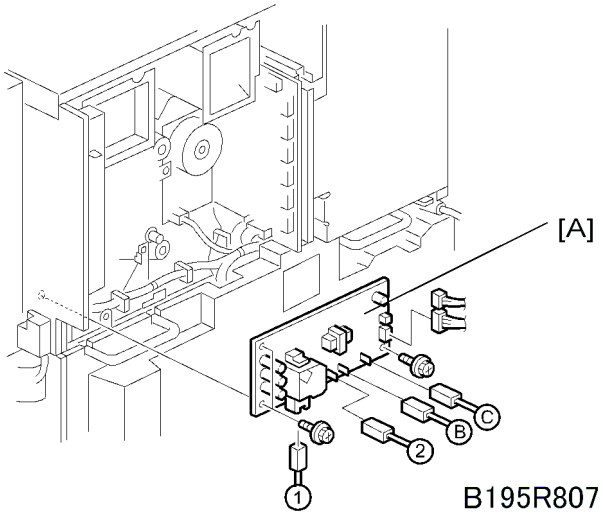


1. Duplex unit (See 'Covers and Common Units – Duplex Unit'.)
2. Sensor bracket [A] (x1)
3. Exit sensor [B] (x1)

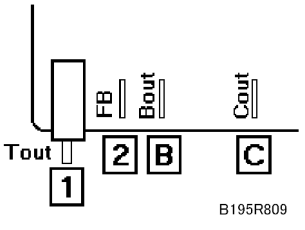
Drive Mechanisms

Registration Clutch, Transfer Belt Contact Clutch

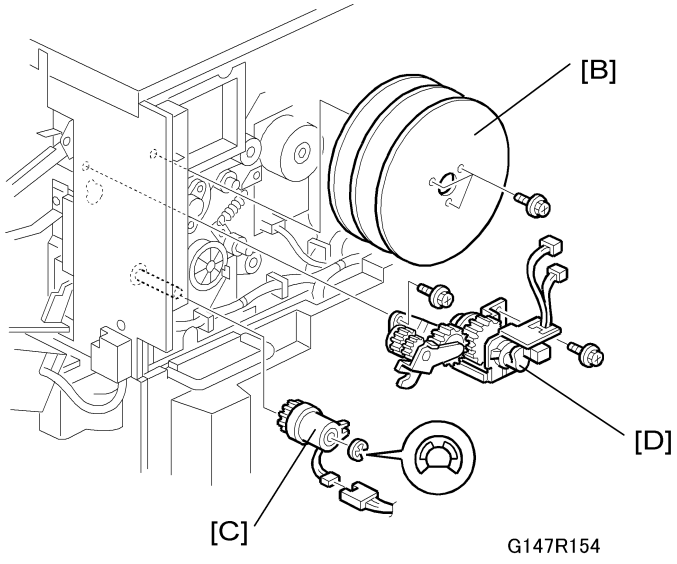
1. Rear upper cover (x 2) (See 'Covers and Common Units – Rear Covers')



2. High voltage supply board [A] (x 6, x 3)



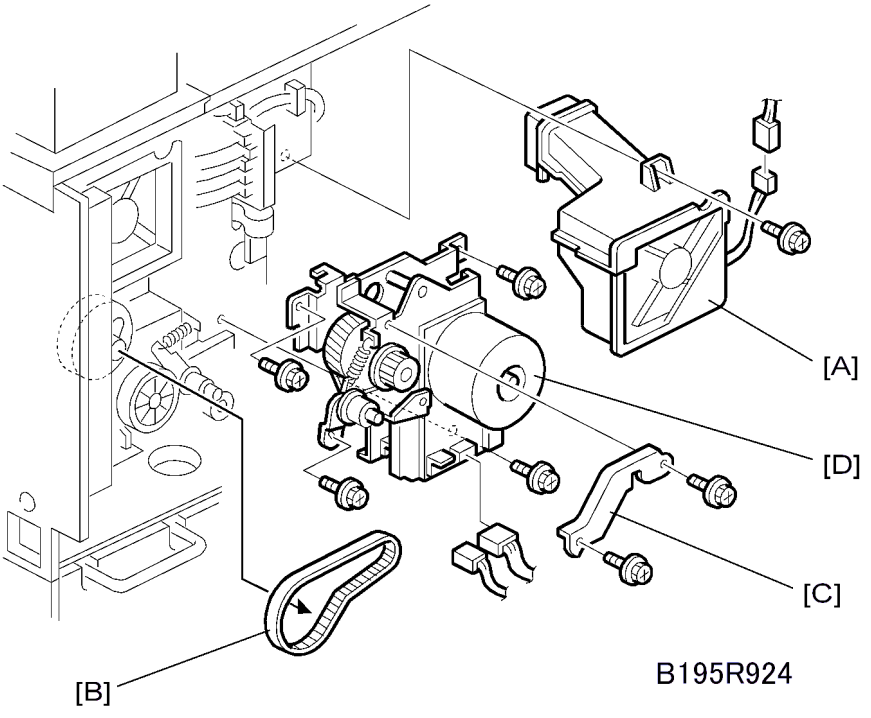
3. Make sure that you re-connect the wires in the correct order. They are labeled: 1 > 2 > B > C



4. **Flywheels [B] (x 3)**
5. **Registration clutch [C] (x1, x 1)**
6. **Transfer belt contact clutch [D] (x 2, x 2)**

Main Motor

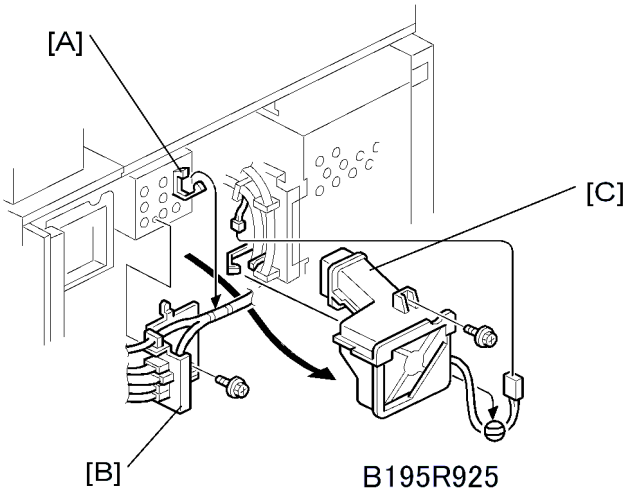
1. **Remove:**
   - Rear upper cover (See 'Covers and Common Units – Rear Covers'.)
   - High voltage power supply, flywheel (See 'Registration Clutch, Transfer Belt Contact Clutch'.)



2. **Remove the main cooling fan [A] (x 2)**
3. **Timing belt [B] x 1**
4. **Bracket [C] (x 3)**
5. **Main motor [D] (x 2, x 3)**

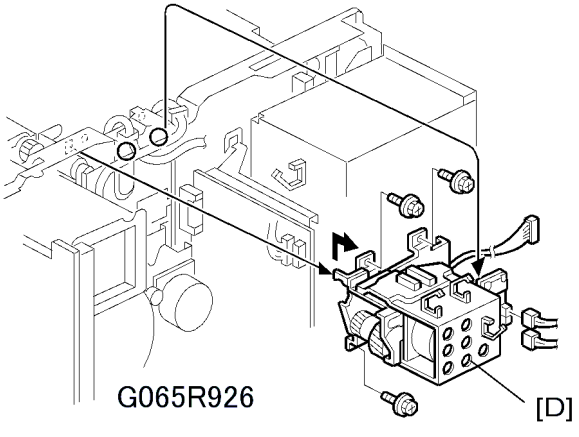
Fusing/Exit Motor

1. **Remove:**
   - Rear upper cover (See 'Covers and Common Units – Rear Covers')
   - Fusing unit cover (See 'Fusing Unit – Hot Roller Strippers'.) (Do not disconnect.)
   - Paper output tray

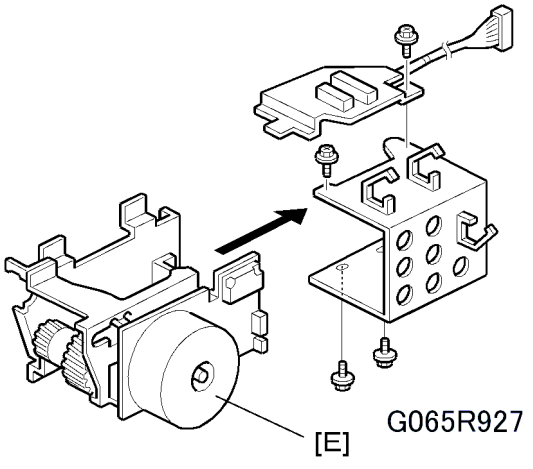


2. Remove:

- [A]: Harness clamps (x 3)
- [B]: Connector bracket (x 1, x 1)
- [C]: Main fan (x 1, x 1)



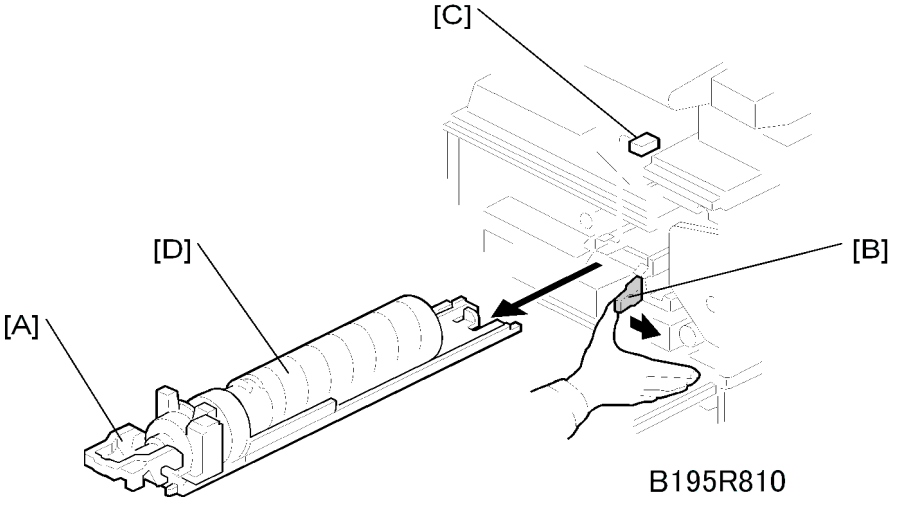
- [D]: Motor assembly (x 4, x 2)



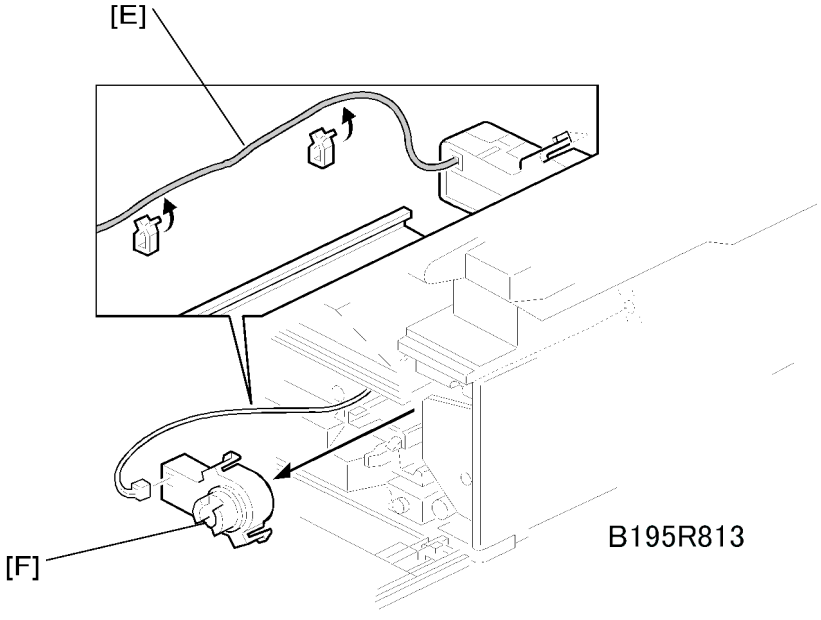
- [E]: Fusing/exit motor (x 4)

Toner Supply Motor

1. **Open the front door**



2. **Raise holder handle [A]**
3. **Push the holder lever [B] to the right**
4. **Stopper [C]**
5. **Toner bottle holder and bottle [D]**



6. **Motor harness [E] (clamps x 2)**
7. **Toner supply motor [F] (hooks x 2, x 1)**

Note

- Press both sides of the motor to release it.

Boards

NVRAM

The following data cannot be downloaded from the SD card.

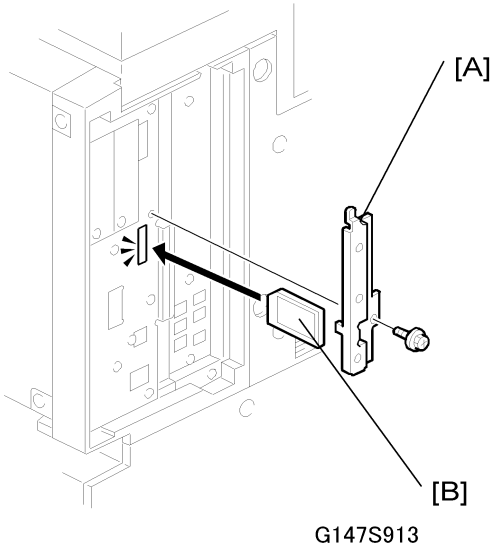
- Total count categories (SP7002*** Copy Counter)
- C/O, P/O Counter (SP7006*** C/O, P/O Count Display)
- Duplex, A3/DLT/Over 420 mm, Staple and Scanner application scanning counters (system settings).

Important

- **Do not remove the NVRAM until you have uploaded its contents.**
- **Always touch a metal surface to discharge any static on your hands before you touch the controller board.**
- **Work carefully when removing the NVRAM to avoid damaging other components on the controller board or short circuiting the pins of other chips.**

Uploading NVRAM Data (SP5-824)

1. **Turn off the main power switch.**



G147S913

2. **Remove the SD card cover [A].**
3. **Insert the SD card [B] into SD card slot C3.**
4. **Turn on the main switch.**

5. To enter the SP mode, press △▽ together (5 seconds), release, then press [#Enter].
6. Select SP5824.

SP5824 NVRAMUpload

7. Push [#Enter].
8. When the message prompts you to execute, push [#Enter].

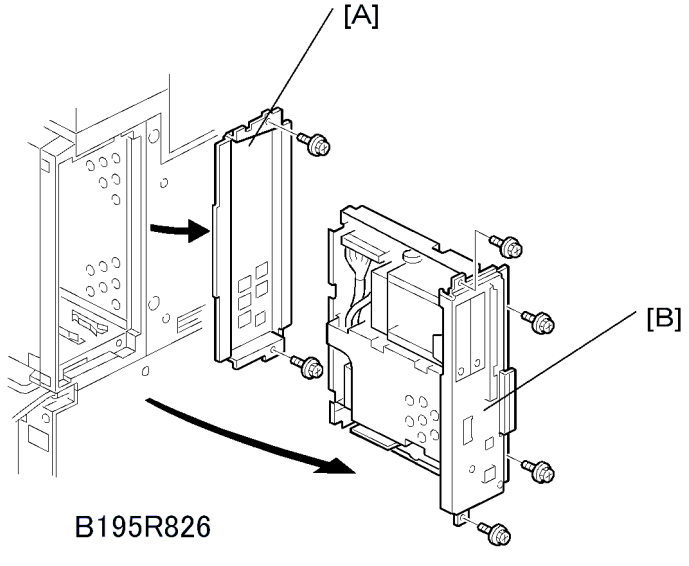
<NVRAMUpload> Processing

<NVRAMUpload> result = OK

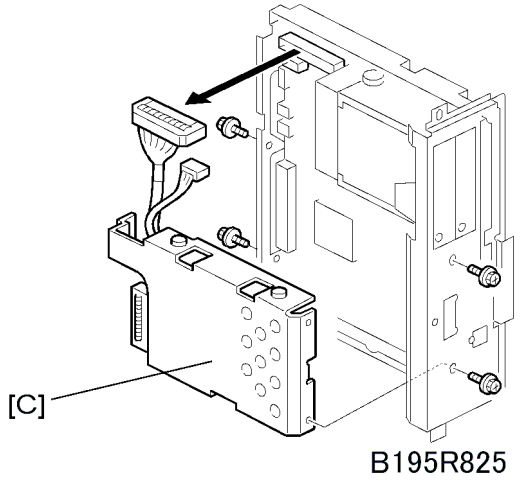
9. Remove the SD card.
10. Switch the machine off and on.

Replacing NVRAM

1. Remove the controller cover (x 2). (See 'Covers and Common Units – Rear Covers')

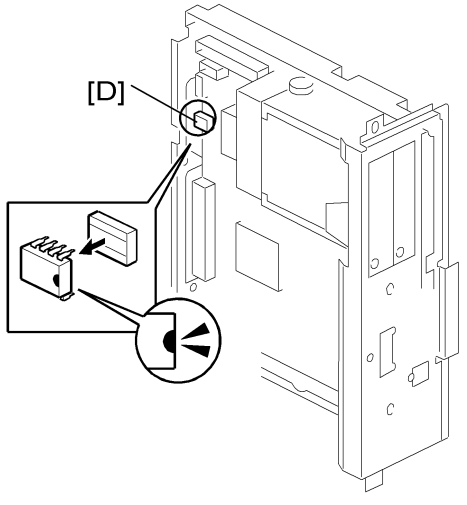


2. Controller board faceplate [A] (x 2).
3. Controller board [B] (x 4)



B195R825

4. HDD unit bracket [C] (x 4, x 2)



G147R151

5. Remove the NVRAM [D] from the controller board and replace it with the new chip.

Important

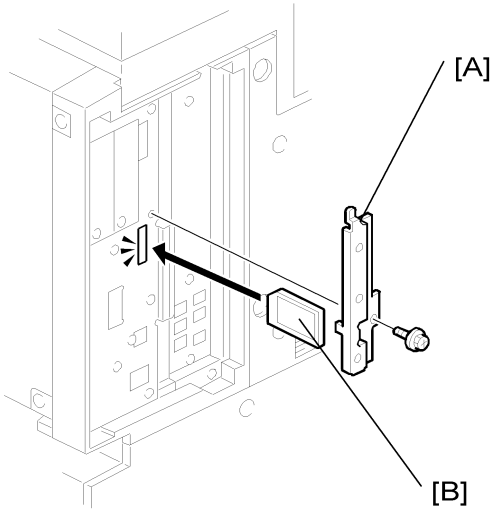
- Make sure that the notch of the new NVRAM is aligned properly as shown above before you try to install it.

Downloading NVRAM Data (SP5825)

The following data are not downloaded from the SD card:

- C/O, P/O Counter (SP7-006-** C/O, P/O Count Display)
- Duplex, A3/DLT/Over 420 mm.

1. **Turn off the main switch.**



G147S913

2. **Remove the SD card cover [A].**
3. **Plug the SD card [B] into SD card slot C3..**
4. **Turn on the main switch.**
5. **To enter the SP mode, press △▽ together (5 seconds), release, then press [#Enter].**
6. **Select SP5824.**

SP5825 NVRAMDownload

7. **Push [#Enter].**
8. **When the message prompts you to execute, push [#Enter].**

<NVRAMDownload> Processing

<NVRAMDownload> result = OK

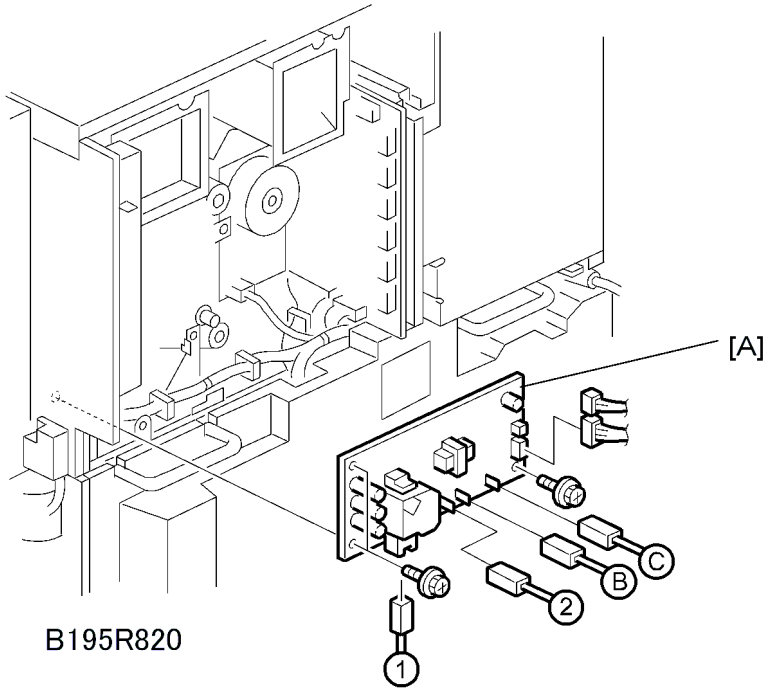
9. **Remove the SD card.**
10. **Switch the machine off and on.**

Note

- If the SD card is not installed properly, a message will tell you that downloading cannot proceed.

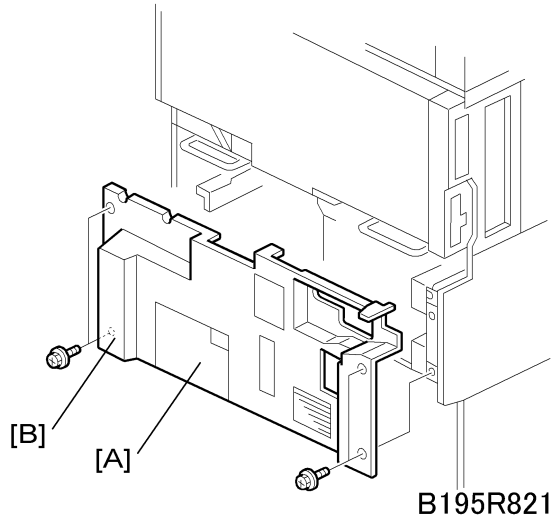
- If the correct SD card for the NVRAM data is not inserted in the SD card slot, after you press [#Enter] a message will tell you that downloading cannot proceed.

HVPS

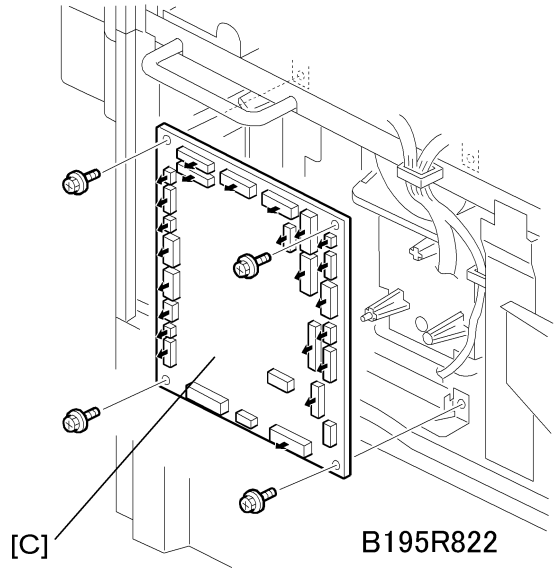


1. **Rear upper cover (See 'Covers and Common Units – Rear Covers')**
2. **High voltage power supply [A] (x3, x6)**

IOB

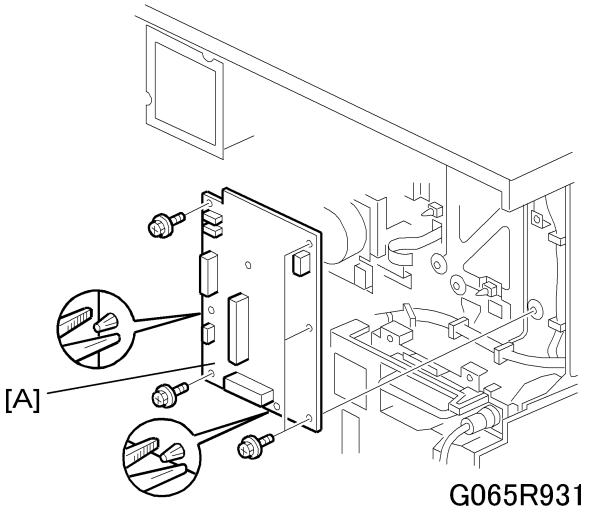


1. Remove the center plate [A] (x1, x1)
2. Remove the rear lower cover [B] (x 4).



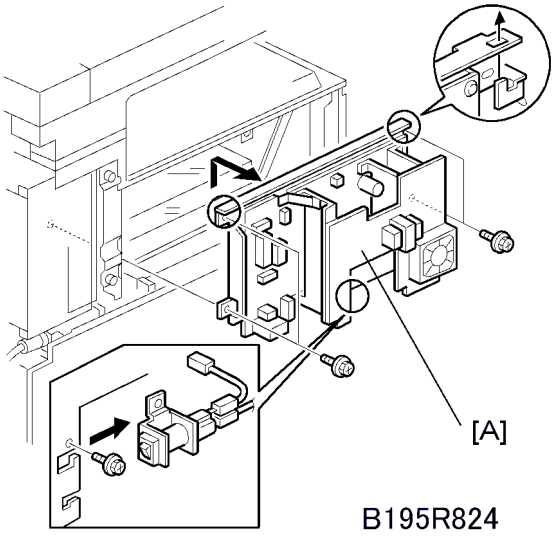
3. Remove the IOB [C] (x 24, x 4).

BICU Board



1. IOB (See 'IOB')
2. BICU board [A] (x 5, x all)

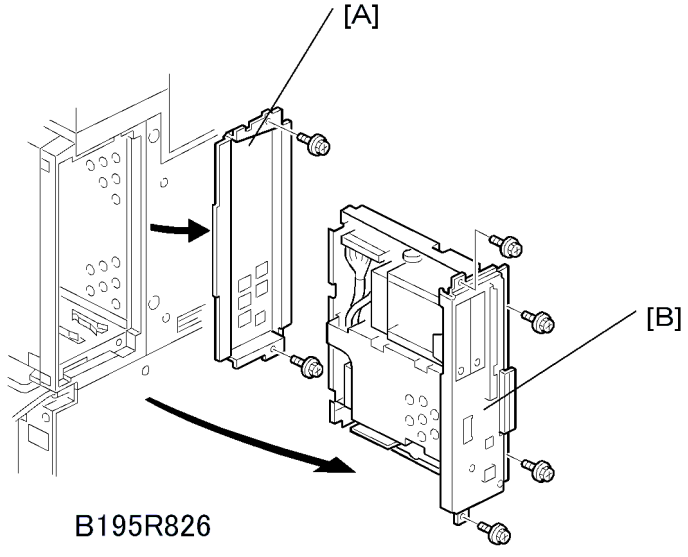
PSU



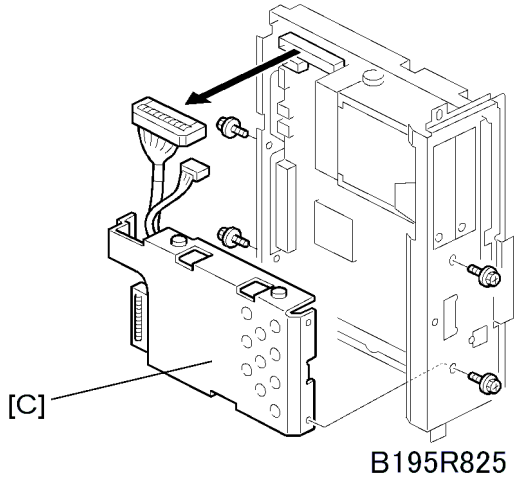
1. Left cover (See 'Covers and Common Units – Left Cover')
2. PSU [A] (x4, x all)

HDD and Controller Board

1. **Remove the controller cover (x 2). (See 'Covers and Common Units – Rear Covers')**



2. **Controller board faceplate [A] (x 2).**
3. **Controller board [B] (x 4)**



4. **HDD unit bracket [C] (x 4, x 2)**
5. **Format the HDD.**
   - Push [Menu], then push ▽ to select "Maintenance" and press [#Enter].
   - Push ▽ to select "HD Format" then press [#Enter].

HD Format
Press # to start

- Press [#Enter].

Formatting...

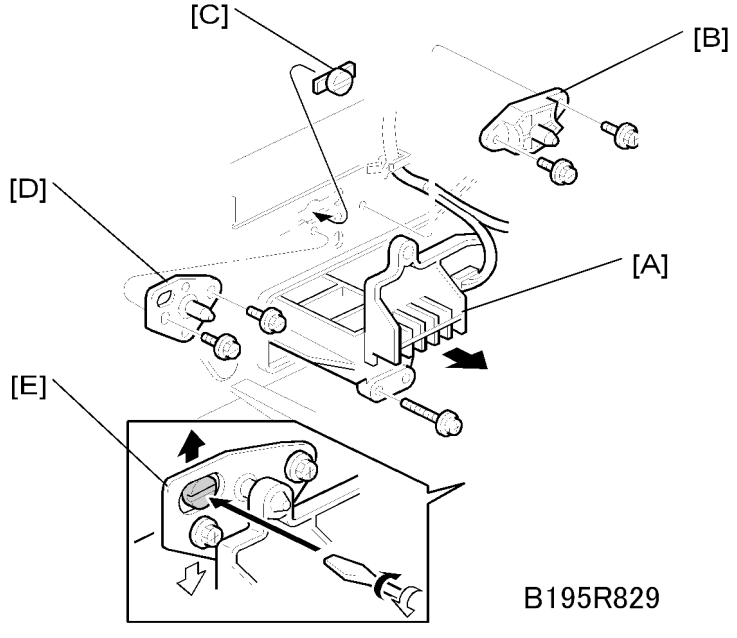
Completed
Restart printer

- Turn the main power switch off/on.

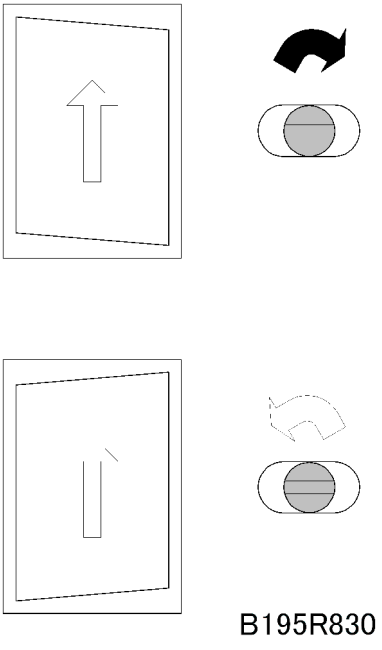
Parallelogram Image Adjustment

Do the following procedure if a parallelogram prints while adjusting the printing registration or printing margin using the trim pattern.

The following procedure should be done after adjusting the side-to-side registration for each paper tray station. Use SP2902-010 (Print T Pattern – Trim Area) to determine whether a parallelogram image appears. If the parallelogram pattern appears, perform the following procedure.



1. **Laser unit [A]**
2. **Bracket [B] (x2)**
3. **Install adjustment cam [C] (P/N: A2309003)**
4. **Secure positioning pin [D] (P/N A2309004) with the two screws removed with the bracket [B]. Do not tighten the screws at this time.**
5. **To adjust the position of the laser unit [E]**



B195R830

6. Adjust the laser unit position by turning the adjustment cam. (See the illustration above.)
7. Tighten the adjustment bracket.
8. Print the trim pattern again with SP2902-010 to check the image. If the results are not satisfactory, repeat this procedure until the pattern is perfectly rectangular.

4. Troubleshooting

Service Call Conditions

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	To prevent damage to the machine, the main machine cannot be operated until the SC has been reset by a service representative (see the note below).	Enter SP mode, and then turn the power switch off and on.
B	SCs that disable only the features that use the defective item. Although these SCs are not shown to the user under normal conditions, they are displayed on the operation panel only when the defective feature is selected.	Turn the operation switch or main switch off and on.
C	The SC history is updated. The machine can be operated as usual.	The SC will not be displayed. Only the SC history is updated.
D	Turning the main switch off then on resets SCs displayed on the operation panel. These are re-displayed if the error occurs again.	Turn the operation switch off and on.

SC Code Descriptions

Important

- **If a problem concerns a circuit board, disconnect and reconnect the connectors and then test the machine. Often a loose or disconnected harness is the cause of the problem. Always do this before you decide to replace the PCB.**
- **If a motor lock error occurs, check the mechanical load before you decide to replace the motor or sensors.**
- **When a Level "A" or "B" SC occurs while in an SP mode, the machine cannot display the SC number. If this occurs, check the SC number after leaving the SP mode.**
- **The machine reboots automatically when the machine issues a Level "D" SC code. This is done for Level "D" SC codes only.**

⚠CAUTION

- Never turn off the power switch when the power LED is lit or flashing.

Note

- The power LED lights or flashes while machine is communicating with the network server, or while the machine is accessing the hard disk or memory.

302	D	Charge roller current leak Charge leak detected when charge was applied to the charge roller. The upper limit of PWM duty was detected (65%) for 60 ms.	• Charge roller damaged • HVPS pack defective • PCU harness defective or disconnected

304	D	Charge roller current correction error The charge roller bias correction was done twice but maximum charge was not detected even after the maximum charge roller bias (–2kV) was applied to the roller.	• Charge roller defective due to excessive wear

321	D	F-Gate error No laser signal. The laser write signal (F-GATE) did not go to LOW within 60 sec. after the copy paper reached the registration sensor.	• BICU board defective • PCI harness between the controller board and the BICU defective or disconnected

322	D	Synchronization error The synchronization signal was not issued within 500 ms after the LD fired while the polygon motor was turning at the prescribed number of revolutions.	• Laser synchronization board connectors or harness loose, disconnected, or damaged • Laser synchronization board defective or out of position • LD drive board defective

323	D	LD drive current too high The LD drive board output to the LD exceeded 100 mA .	• LD unit defective (not enough power, due to aging) • Poor connection between the LD unit and the BICU board • BICU defective

327	D	LD unit home position error 1	• LD unit HP sensor/harness defective

		The LD unit home position sensor did not detect the ON condition when the LD unit moved to its home position.	• LD unit home position sensor defective • LD positioning motor connector or harness loose, broken, defective • LD unit or LD unit motor blocked • LD unit motor defective

328	D	LD unit home position error 2 The LD unit home position sensor did not detect the OFF condition when the LD unit moved from its home position.	• LD unit HP sensor/harness defective • LD unit home position sensor defective • LD positioning motor connector or harness loose, broken, defective • LD unit or LD unit motor blocked • LD unit motor defective

329	D	LD unit beam pitch adjusted incorrectly The LD unit HP sensor did not detect the ON condition while changing the LD unit position to correct the LD position or change the resolution (dpi).	• After initialization of the SP modes, SP2-109-3 or SP2-109-4 did not execute. • If this SC code appears at power on or during a print job, do these two SP codes then turn the main power off/on. • If executing these two SP codes does not solve the problem, check the LD unit drive mechanism (the harness of the LD board or other object could be blocking the LD drive mechanism, preventing adjustment of the pitch). • Do SP 5801, then do SP2109 3 and SP2109 4 again.

335	D	Polygon motor error 1: On timeout The XSCRDY signal did not go LOW (Active) within 10 sec. after the polygon motor was turned on.	• Polygon motor drive board I/F harness loose, disconnected, or damaged • Polygon motor drive board defective • Polygon motor defective

336	D	Polygon motor error 2: Off timeout The XSCRDY signal did not go HIGH (Inactive) within 3 sec. after the polygon motor was turned off.	• Polygon motor drive board I/F harness loose, disconnected, or damaged • Polygon motor drive board defective

			• Polygon motor defective

337	D	Polygon motor error 3: XSCRDY signal error The XSCRDY signal did not go HIGH (Inactive) after the polygon motor had been rotating normally for 200 ms.	• Polygon motor drive board I/F harness loose, disconnected, or damaged • Polygon motor drive board defective • Polygon motor defective

338	D	Polygonal Mirror Motor Error 4: Unstable Timeout The XSCRDY signal was detected LOW) (Active) after the polygonal mirror motor switched on, but the signal was not detected LOW after 1 sec., and was not detected after another 500 ms.	• I/F harness of the polygonal mirror motor disconnected or defective. • Polygonal mirror motor or polygonal mirror motor drive board defective.

350	D	ID sensor pattern test error One of the following ID sensor output voltages was detected twice consecutively when checking the ID sensor pattern. 1. Vsp greater/equal 2.5V 2. Vsg less than/equal 2.5V 3. Vsp = 0V 4. Vsg = 0V	• ID sensor defective • ID sensor harness or connector loose, broken, defective • IOB defective • HVPS board defective • ID sensor dirty

351	D	ID sensor Vsg measurement error When the ID sensor was checked twice, the ID sensor output voltage was 5.0V while the PWM signal input to the ID sensor was 0.	• ID sensor connector or harness loose, broken, or defective • ID sensor defective • IOB defective • HVPS defective • ID sensor dirty

352	D	ID sensor pattern edge detection error	• ID sensor connector or harness loose, broken, or defective

		The ID sensor pattern edge voltage was not equal to 2.5 V and two samplings within 800 ms.	• ID sensor defective • IOB defective • HVPS defective • ID sensor dirty

353	D	ID sensor, LED current abnormal at initialization One of the following ID sensor output voltages is detected at ID sensor initialization. • Vsg less than 4.0V when the maximum PWM input (255) was applied to the ID sensor. • Vsg exceeded 4.0V when the minimum PWM input (0) is applied to the ID sensor.	• ID sensor connector or harness loose, broken, or defective • ID sensor defective • IOB defective • HVPS defective • ID sensor dirty

354	D	ID sensor timeout abnormal at adjustment Vsg fell out of the adjustment target range (4.0 ± 0.2V) at the start of Vsg checking after 20 sec.	• ID sensor connector or harness loose, broken, or defective • ID sensor defective • IOB defective • HVPS defective • ID sensor dirty

390	D	TD sensor error: Abnormal measurement The TD sensor output voltage was less than 0.5V, or more than 4.8V 10 consecutive times during copying. -or- The output was less than 2.5V after a new PCDU was installed.	• TD sensor connector or harness loose, broken, defective • TD sensor defective • IOB) defective • Toner supply defective (confirm that the toner seal strip has been removed from toner cartridge)

391	D	TD sensor error: Auto adjust error During automatic adjustment of the TD sensor, output voltage was less than 1.8V, or	• TD sensor connector or harness loose, broken, defective • TD sensor defective • IOB defective

		more than 4.8V during TD sensor initial setting.	• Toner supply defective (confirm that the toner seal strip has been removed from toner cartridge)

395	D	Development output abnormal A development bias leak signal was detected. High voltage output to the development unit exceeded the upper limit (65%) for 60 ms.	• Poor connection at the development bias terminal • HVPS connectors or harnesses loose, broken, defective • HVPS defective

401	D	Transfer roller leak detected A transfer roller current leak signal is detected.	• HVPS board defective • Poor cable connection or defective cable • Transfer connector defective

402	D	Transfer roller open error The transfer roller current feedback signal is not detected.	• HVPS defective • Transfer connector cable defective • Transfer connector defective • Poor PCU connection

403	D	Transfer belt position sensor error The transfer belt position sensor did not activate after the transfer belt contact clutch was switched on twice and rotated once.	• Main motor malfunction • Transfer belt contact clutch defective • Transfer belt position sensor harness or connector loose, broken, defective • Transfer belt position sensor defective

405	D	Transfer belt error The transfer belt did not move away from the drum during the ID sensor pattern check.	• Main motor malfunction • Transfer belt contact clutch defective • Transfer belt position sensor harness or connector loose, broken, defective • Transfer belt position sensor defective

440	D	Main motor error A main motor lock signal was not detected within 2 sec. after the main motor turned on.	• Main motor overload • Main motor drive board defective

442	D	New PCU error The new unit detection sensor switched ON for 2 sec. to detect a new PCU while the main motor was operating but the sensor did not go OFF.	• New unit detection sensor defective • New PCU defective **Note**: Normally the new unit detection sensor goes on after a new PCU is installed and then goes off after the ID sensor and TD sensor have been initialized.

450	D	Feed Development Motor Error The PLL lock signal remained LOW for 2 s while the feed development motor was operating.	• Motor lock caused by overload. • Motor drive board defective.

490	D	Exhaust fan motor lock An exhaust fan motor lock signal was not detected within 5 sec. after the exhaust fan motor turned on.	• Fan motor overloaded due to an obstruction • Exhaust fan motor connector or harness loose, broken, defective

492	D	PCB cooling fan motor lock A lock signal for the PCB cooling fan motor lock signal was not detected within 5 seconds after the cooling fan motor turned on.	• Fan motor overloaded due to an obstruction. • Fan motor connector or harness loose, broken, defective

501	B	1st tray lift malfunction The paper height sensor did not activate after the tray lift motor was on for 10 sec. **Note**: Normally, if the power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper height sensor should de-activate within 5 sec. after the paper bottom plate starts to drop. If it does not deactivate within 5 sec. after four attempts, a message will prompt the user to reset Tray 1. After two attempts to release the error by re-setting the paper tray, if this does not solve the problem then this SC is displayed.	• Lift motor connector or harness loose, broken, defective. • Lift motor defective • Height sensor connector or harness loose, broken, defective • Height sensor defective • Loose paper or other obstruction between the tray and motor

		• Pick-up solenoid connector or harness loose, broken, or defective • Pick-up solenoid defective

502	B	2nd tray lift malfunction
		The paper height sensor did not activate after the tray lift motor was on for 10 sec. **Note**: Normally, if the power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper height sensor should de-activate within 5 sec. after the paper bottom plate starts to drop. If it does not deactivate within 5 sec. after four attempts, a message will prompt the user to reset Tray 1. After two attempts to release the error by re-setting the paper tray, if this does not solve the problem then this SC is displayed.
		• Lift motor connector or harness loose, broken, defective. • Lift motor defective • Height sensor connector or harness loose, broken, defective • Height sensor defective • Loose paper or other obstruction between the tray and motor • Pick-up solenoid connector or harness loose, broken, or defective • Pick-up solenoid defective

503	B	3rd tray lift malfunction (optional paper tray unit)
		The paper height sensor is not activated after the tray lift motor has been on for 13 seconds. Note: Normally, if the power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper height sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s after four attempts, the tray lift motor halts. After two attempts to re-set the paper tray, if this does not solve the problem, then this SC is displayed and tray control halts.
		• Lift motor connector or harness loose, broken, defective. • Lift motor defective • Height sensor connector or harness loose, broken, defective • Height sensor defective

504	B	4th tray lift malfunction (optional paper tray unit)
		The paper height sensor is not activated after the tray lift motor has been on for 13 seconds.

		Note: Normally, if the power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper height sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s after four attempts, the tray lift motor halts. After two attempts to re-set the paper tray, if this does not solve the problem, then this SC is displayed and tray control halts.	
		• Lift motor connector or harness loose, broken, defective. • Lift motor defective • Height sensor connector or harness loose, broken, defective • Height sensor defective	

506	B	Paper tray unit motor lock (optional paper tray)	• Paper tray unit main motor connector or harness loose, broken, defective • Motor overload due to an obstruction • Motor defective
		A main motor lock was detected for more than 50 ms during rotation of the motor in either the 3rd or 4th tray of the optional paper feed unit.	

507	B	LCT main motor lock	• LCT main motor connector or harness loose, broken, defective • Motor overload due to an obstruction • LCT main motor defective
		A main motor lock signal was detected for more than 50 ms during rotation if the LCT motor.	

510	B	LCT tray malfunction
		One of the following has occurred: 1. The LCT lift sensor did not activate within 18 sec. after the LCT lift motor turned on. 2. The LCT lower limit sensor did not activate within 18 sec. after the LCT lift motor turned on. 3. The LCT lift sensor was already activated when the LCT lift motor turned on. 4. After the paper end sensor was actuated while the tray was being raised, the upper limit sensor did not actuate within 2.5 sec. In this case, a message is displayed to remind the user to set the paper and tray control halts. The display is reset by opening and closing the LCT door. 5. This SC code is issued if problem "4" occurs 3 times.

			• LCT lift motor connector or harness loose, broken, or defective, or LCT lift motor defective • Upper limit sensor connector or harness loose, broken, or defective, or sensor is defective. • Pick-up solenoid connector or harness loose, broken, or defective or solenoid is defective • Paper end sensor connector or harness loose, broken, or defective, or sensor is defective

520	D	Fusing/Feed-Out Motor Error	
		The PLL lock signal remains LOW for 2 s while the feed development motor is operating.	• Motor overload due to an obstruction • Motor drive board defective.

541	A	Fusing thermistor open	• Fusing thermistor disconnected • Fusing thermistor connector defective • Fusing thermistor damaged, warped, or out of position • Input voltage less than 15% of the standard input voltage
		After the hot roller center thermistor temperature reached 45°C (113°F), the center fusing temperature failed to reach 60°C (140°F) within 2 sec. for 5 counts at 0.1 sec. intervals. -or- After the hot roller end temperature thermistor reached 45°C (113°F), the end fusing temperature failed to reach 57°C (135°F) within 2 sec. for 5 counts at 0.1 sec. intervals.	

542	A	Fusing temperature warm-up error	• Fusing lamp connector or harnesses loose, broken or defective • Poor fusing unit drawer connector loose • Thermistor warped, broken, or out of position • Thermostat has tripped • PSU defective • BICU defective
		The fusing temperature did not reach the fusing reload temperature of 45°C (113°F) within 26 sec.	

543	A	Fusing overheat error (software detection) A fusing temperature of over 230°C (446°F) is detected for 5 seconds by the fusing thermistors at the center or at either end of the hot roller.	• Check harnesses and connectors of PSU, IOB, BICU • PSU defective • IOB defective • BICU defective • Fusing thermistor defective or wrong type

544	A	Fusing overheat error (hardware circuit detection) The dual monitoring circuitry of the BICU detected temperature above 250°C (482°F) and tripped the relay circuit off.	• Check harnesses and connectors of PSU, IOB, BICU • PSU defective • IOB defective • BICU defective • Fusing thermistor defective or wrong type

545	A	Fusing lamp remains on After warm-up the fusing lamp remained at full power for 10 sec. (center) and 15 sec. (ends) without the hot roller rotating.	• One or both thermistors out of position.

547	D	Zero cross signal error One of the following occurred: 1. The fusing relay remained off for 50 ms after power on and continued to remain off after the after 3 attempts to detect the zero-cross signal. 2. During 11 zero-cross signal detections, two zero-cross signal detections were below 44 Hz. 3. The zero-cross signal could not be detected within 3 sec. after the fusing relay switched on.	• PSU defective • Noise on the ac power line

548	A	Fusing unit installation error	• Fusing unit is not installed

		The machine cannot detect the fusing unit when the front cover and right cover are closed.	• Fusing unit connection loose

557	C	Zero-cross frequency over The applied power ac frequency was detected less than 66 Hz more than 10 times, or less than 44 Hz one time.	• Noise on the ac power line

559	A	Fusing unit jam The fusing exit sensor detected a fusing unit paper late jam three times. The paper was late and the fusing exit sensor could not detect the paper three times.	• Remove the paper that is stopped in the fusing unit. • Check that the fusing unit is clean and has no obstacles in the paper feed path. • If the error persists, replace the fusing unit

Note

- SC559 code does not operate until SP1109 has been set to "1" (ON). This sets the machine to count the number of occurrences of paper late jams in the fusing unit. The default setting is "0" (OFF).
- SC559 is issued after the third occurrence of a paper late jam in the fusing unit. Once this SC has been issued, the machine cannot be used until the service technician removes the cause of the jam and restores it to normal operation.
- The jam counter is reset after a sheet of paper successfully passes the fusing exit sensor after the cause of the jam has been removed.

620	D	Communication timeout error between BICU and finisher The BICU did receive a response within 100 ms after 3 attempts after sending data to the finisher.	• Serial line connecting BICU and finisher unstable • External noise • BICU board and finisher main board connection defective or loose • Finisher main board defective • BICU board defective

621	D	Communication timeout error between BICU and finisher	• Serial line connecting BICU and finisher unstable • External noise

		A break (low) signal was received from the finisher.	• BICU board and finisher main board connection defective or loose • Finisher main board defective • BICU board defective

623	D	Communication timeout error between BICU and paper tray unit The BICU cannot receive a response within 100 ms after 3 attempts after sending data to the paper tray unit.	• Serial line connecting BICU and paper tray unit unstable • External noise • BICU board and paper tray main board connection defective or loose • Paper tray main board defective • BICU board defective

624	D	Communication break error between BICU and paper tray unit The BICU cannot communicate with the paper tray unit due to receiving a break signal.	• Serial line connecting BICU and paper tray unit unstable • External noise • BICU board and paper tray unit connection defective • Optional paper tray unit interface board defective • BICU board defective

626	D	Communication timeout error between BICU and LCT The BICU cannot receive a response within 100 ms after 3 attempts after attempting to communicate with the LCT.	• Serial line connecting BICU and LCT unit unstable • External noise • BICU board and LCT main board connection defective or loose • LCT interface board defective • BICU board defective

627	D	Communication break error between BICU and LCT The BICU cannot communicate with the LCT unit due to receiving a break signal.	• Serial line connecting BICU and LCT unit unstable • External noise • BICU board and LCT main board connection defective or loose

			• LCT interface board defective • BICU board defective

670	D	Engine startup error	
		The BICU failed to respond with the prescribed time when the machine was turned on.	• Connections between BICU and controller board are loose, disconnected, or damaged • Replace the BICU • Replace the controller board

672	D	Controller startup error	
		• After power on, the line between the controller and the operation panel did not open for normal operation. • After normal startup, communication with the controller stopped.	• Controller stalled • Controller installed incorrectly • Controller board defective • Operation panel harness disconnected or defective

692	D	GAVD block 12C bus error	
		The I2C bus of the BICU is defective	• Replace BICU

722	B	Finisher jogger motor error	• Jogger motor connector or harness loose, broken, defective • Jogger motor defective • Jogger HP sensor connector or harness loose, broken, defective • Jogger HP sensor defective
		The finisher jogger HP sensor did not return to the home position, or move out of the home position, within 1.25 sec. Staple mode cannot be used.	

724	B	Finisher staple hammer motor error	• Staple jam • Stapler overload caused by trying to staple too many sheets • Staple hammer motor connector or harness loose, broken, defective • Staple hammer motor defective
		Stapling does not finish within 150 ms after the staple hammer motor turned on. Staple mode cannot be used.	

725	B	Finisher stack feed-out motor error The stack feed-out belt HP sensor did not activate within 4550 pulses after the stack feed-out motor turned on. Staple mode cannot be used.	• Stack feed-out HP sensor defective • Stack feed-out motor overload • Stack feed-out motor defective

726	D	Finisher shift tray 1 lift motor error Tray shift does not finish within 15 sec. after the shift motor turned on, or the stack height sensor does not activate within 15 sec. after the shift tray lift motor turned on.	• Shift tray lift motor connector or harness loose, broken, defective • Shift tray lift motor overload due to an obstruction • Shift tray lift motor defective

727	B	Finisher stapler rotation motor error Stapler rotation does not finish within 1100 pulses after the staple rotation motor turned on, or the stapler does not return to its home position within 1100 pulses after stapling finished.	• Stapler rotation motor connector or harness loose, broken, defective • Motor overloaded due to an obstruction • Motor defective

729	B	Finisher punch motor error After the punch motor is turned on, the punch HP sensor does not activate within 250 ms.	• Punch motor harness or connector loose, broken, defective • Punch motor defective or overloaded due to obstruction • Punch HP sensor connector or harness loose, broken, defective • Punch HP sensor defective

730	B	Finisher stapler positioning motor error After the stapler motor turned on, the stapler did not return to its home position within 5357 pulses, or the stapler HP sensor does not activate within 5357 pulses after the stapler motor turned on.	• Stapler positioning motor connector or harness loose, broken, defective • Stapler positioning motor defective or overloaded due to an obstruction • Stapler HP sensor connector or harness loose, broken, defective • Stapler HP sensor defective

731	D	Finisher exit guide motor error After the finisher exit guide motor turned on, the exit guide sensor did not activate within 800 ms.	• Finisher exit guide motor defective harness or connector loose, broken, defective • Finisher exit guide motor defective • Finisher exit guide sensor defective

732	D	Finisher upper tray shift motor error The upper tray did not reach its home position within 1.25 sec. after the upper tray shift motor turned on.	• Upper tray shift motor connector or harness loose, broken, defective • Upper tray shift motor defective or overloaded due to an obstruction • Upper tray shift sensor connector or harness loose, broken, defective • Upper tray shift sensor defective

733	D	Finisher lower tray lift motor error The stack height sensor did not activate within 15 sec. after the lower tray lift motor turned on.
		• Lower tray lift motor connector or harness loose, broken, defective • Lower tray lift motor defective or overloaded due to an obstruction • Upper stack height sensor connector or harness loose, broken, defective • Upper stack height sensor defective • Lower tray lower limit sensor connector or harness loose broken, defective • Lower tray lower limit sensor defective

734	D	Finisher lower tray shift motor error The lower tray did not reach the home position within 1.25 sec. after the lower tray shift motor turned on.	• Lower tray shift motor connector or harness loose, broken, defective • Lower tray shift motor defective or overloaded due to an obstruction • Lower tray shift sensor harness or connector loose, broken, defective • Lower tray shift sensor defective

818	C	Watchdog error

		The bus is being held by another device, or a CPU-device infinite loop has occurred. A module that the watchdog is monitoring has not closed properly at the conclusion of its task, or the module cannot continue processing.	• System program defective; switch off/on, or change the controller firmware if the problem cannot be solved • Controller board defective • Controller option malfunction

819	C	Fatal kernel error		
		Due to a control error, a RAM overflow occurred during system processing. One of the following messages was displayed on the operation panel.		• System program defective • Controller board defective • Optional board defective • Replace controller firmware
		0x696e	"init died"	
		0x766d	"vm_pageout: VM is full"	
		4361	Cache Error	
		Other		

For more details about this SC code error, execute SP5990 to print an SMC report so you can read the error code. The error code is not displayed on the operation panel.

820	D	Self-Diagnostic Error: CPU The central processing unit returned an unexpected error during the self-diagnostic test.	• Controller board defective • Firmware defective • Update firmware **Note**: This SC also logs one of 47 hex codes (0001 to 4005). However, the recovery procedure is the same in each case.

821	D	Self-diagnostic error 2: ASIC The Write & Verify check of the ASIC returned an error. **Note**: The main ASIC module on the controller board controls the bus of the ROM device.	• Replace the controller board

Note

- For more details about this SC code error, execute SP5990 to print an SMC report so you can read the error code. The error code is not displayed on the operation panel.

822	B	Self-diagnostic error 3: HDD		
		3003	The check that is done when the HDD is installed revealed the following: • HDD device busy for over 31 sec. After a diagnostic command is set for the HDD, but the device remains busy for over 6 sec.	• HDD defective • HDD harness disconnected, defective • Controller board defective
		3004	No response to the self-diagnostic command from the ASIC to the HDDs	• HDD defective

823	B	Self-diagnostic Error: NIC	• Network interface board defective (replace the controller board) • Controller board defective
		The network interface board returned an error during the self-diagnostic test.	

824	D	Self-diagnostic error 4: NVRAM	
		One or more of the following conditions exist: • NVRAM not present. • NVRAM damaged • NVRAM socket damaged	• NVRAM defective • Controller board defective • NVRAM backup battery exhausted • NVRAM socket damaged **Note**: In every case, the controller board must be replaced.

826	D	Self-diagnostic Error: NVRAM/Optional NVRAM	• Make sure NVRAM is seated correctly in its socket • Replace the NVRAM on the controller board
		The NVRAM or optional NVRAM returned an error during the self-diagnostic test.	

827	D	Self-diagnostic Error: RAM	• Update controller firmware again • Replace RAM DIMM
		The resident RAM returned a verify error during the self-diagnostic test.	

828	D	Self-diagnostic error 7: ROM	
		Measuring the CRC for the boot monitor and operating system program results in an error. A check of the CRC value for ROMFS of the entire ROM area results in an error.	• Software defective • Controller board defective • ROM defective

829	B	Self-diagnostic Error: Optional RAM	• Replace the optional memory board • Controller board defective
		The optional RAM returned an error during the self-diagnostic test.	

838	D	Self-diagnostic Error: Clock Generator	• Replace the controller board
		A verify error occurred when setting data was read from the clock generator via the I2C bus.	

850	B	Net I/F error	
		• Duplicate IP addresses. • Illegal IP address. • Driver unstable and cannot be used on the network.	• IP address setting incorrect • Ethernet board defective • Controller board defective

853	B	Wireless LAN (802.11b) Error 1	
		During machine start-up, the machine can get access to the board that holds the wireless LAN, but not to the wireless LAN card.	• Wireless LAN card missing (was removed)

854	B	Wireless LAN (802.11b) Error 2	
		During machine operation, the machine can get access to the board that holds the wireless LAN, but not to the wireless LAN card.	• Wireless LAN card missing (was removed)

855	B	Wireless LAN (802.11b) error 3

		An error was detected on the wireless LAN card.	• Wireless LAN card defective • Wireless LAN card connection incorrect

856	B	Wireless LAN (802.11b)error 4	
		An error was detected on the wireless LAN card.	• Wireless LAN card defective • PCI connector (to the mother board) loose

857	B	USB I/F Error	
		The USB driver is not stable and caused an error.	• Bad USB card connection • Replace the controller board

860	B	HDD startup error at power on	
		HDD is connected but a driver error is detected. The driver does not respond with the status of the HDD within 30 s.	• HDD is not initialized • Level data is corrupted • HDD is defective

861	B	HDD re-try failure	
		At power on with the HDD detected, power supply to the HDD is interrupted, after the HDD is awakened from the sleep mode, the HDD is not ready within 30 s.	• Harness between HDD and board disconnected, defective • HDD power connector disconnected • HDD defective • Controller board defective

863	D	HDD data read failure	
		The data written to the HDD cannot be read normally, due to bad sectors generated during operation.	• HDD defective **Note**: If the bad sectors are generated at the image partition, the bad sector information is written to NVRAM, and the next time the HDD is accessed, these bad sectors will not be accessed for read/write operation.

864	D	HDD data CRC error

		During HDD operation, the HDD cannot respond to an CRC error query. Data transfer did not execute normally while data was being written to the HDD.	• HDD defective

865	D	HDD access error	
		HDD responded to an error during operation for a condition other than those for SC863, SC864.	• HDD defective.

866	B	SD card error 1: Confirmation	
		The machine detects an electronic license error in the application on the SD card in the controller slot immediately after the machine is turned on. The program on the SD card contains electronic confirmation license data. If the program does not contain this license data, or if the result of the check shows that the license data in the program on the SD card is incorrect, then the checked program cannot execute and this SC code is displayed.	
		• Program missing from the SD card • Download the correct program for the machine to the SD card	

867	D	SD card error 2: SD card removed	
		The SD card in the boot slot when the machine was turned on was removed while the machine was on.	• Insert the SD card, then turn the machine off and on.

868	D	SD card error 3: SC card access	
		An error occurred while an SD card was used.	• SD card not inserted correctly • SD card defective • Controller board defective • If you want to try to reformat the SC card, use SD Formatter Ver 1.1.

870	B	Address book data error

		Address book data on the hard disk was detected as abnormal when it was accessed from either the operation panel or the network. The address book data cannot be read from the HDD or SD card where it is stored, or the data read from the media is defective.	• Software defective. Turn the machine off/on. If this is not the solution for the problem, then replace the controller firmware. • HDD defective.
		More Details • Do SP5846 050 (UCS Settings – Initialize all Directory Info.) to reset all address book data. • Reset the user information with SP5832 006 (HDD Formatting– User Information). • Replace the HDDs. • Boot the machine from the SD card.	

872	B	HDD mail receive data error	
		The machine detected that the HDD was not operating correctly at power on. The machine detected that the HDD was not operating correctly (could neither read nor write) while processing incoming email	• HDD defective • Machine was turned off while the HDD was being accessed. • Do SP5832 007 to format the mail RX data on the HDD.

873	B	HDD mail send data error	
		An error was detected on the HDD immediately after the machine was turned on, or power was turned off while the machine used the HDD.	• Do SP5832-007 (Format HDD – Mail TX Data) to initialize the HDD. • Replace the HDD

874	D	Delete All error 1: HDD	
		A data error was detected for the HDD/NVRAM after the Delete All option was used. The source of this error is the Data Overwrite Security Unit B735 running from an SD card.	• Turn the main switch off/on and try the operation again. • Install the Data Overwrite Security Unit again. For more, see section "1. Installation".

			• HDD defective

875	D	Delete All error 2: Data area	
		An error occurred while the machine deleted data from the HDD. The source of this error is the Data Overwrite Security Unit B735 running from an SD card.	• Turn the main switch off/on and try the operation again.

876	D	Log data abnormal	• Software error. Update the firmware • NVRAM defective • HDD defective
		An error was detected in the handling of the log data at power on or during machine operation. This can be caused by switching the machine off while it is operating.	

900	D	Electrical total counter error	
		The total counter contains something that is not a number.	• NVRAM incorrect type • NVRAM defective • NVRAM data scrambled • Unexpected error from external source

901	D	SC901 Mechanical total count error	• Mechanical total counter defective
		The IO board cannot receive the mechanical total count data.	

920	B	Printer error	
		An internal application error was detected and operation cannot continue.	• Software defective; turn the machine off/on, or change the controller firmware • Insufficient memory

921	B	Printer font error	
		When the software application started, the printer did not detect a font on the SD card that it can use.	• The fonts on the SD card are not fonts that can be used with the printer

925	B	Net File function error	
		The NetFile file management on the HDD cannot be used, or a NetFile management file is corrupted and operation cannot continue. The HDDs are defective and they cannot be debugged or partitioned, so the Scan Router functions (delivery of received faxes, document capture, etc.), Web services, and other network functions cannot be used. HDD status codes are displayed below the SC code:	• Refer to the four procedures below (Recovery from SC 925).

Here is a list of HDD status codes:

Display	Meaning
(-1)	HDD not connected
(-2)	HDD not ready
(-3)	No label
(-4)	Partition type incorrect
(-5)	Error returned during label read or check
(-6)	Error returned during label read or check
(-7)	"filesystem" repair failed
(-8)	"filesystem" mount failed
(-9)	Drive does not answer command
(-10)	Internal kernel error
(-11)	Size of drive is too small
(-12)	Specified partition does not exist
(-13)	Device file does not exist

- Recovery from SC 925 -

Procedure 1

If the machine shows SC codes for HDD errors (SC860 ~ SC865) with SC 925, do the recovery procedures for SC860 ~ SC865.

Procedure 2

If the machine does not show one of the five HDD errors (SC860 ~ SC865), turn the machine power off and on. If this is not the solution for the problem, then initialize the NetFile partition on the HDD with SP5832-011 (HDD Formatting – Ridoc I/F).

NetFiles: Jobs printed from the document server using a PC and DeskTopBinder

Before you initialize the NetFile partition on the HDD, tell the customer that:

- Received faxes on the delivery server will be erased
- All captured documents will be erased
- DeskTopBinder/Print Job Manager/Desk Top Editor job history will be erased
- Documents on the document server, and scanned documents, will not be erased.
- The first time that the network gets access to the machine, the management information must be configured again (this will use a lot of time).

Procedure 3

If "Procedure 2" is not the solution for the problem, do SP5832-001 (HDD Formatting – All), then turn the machine power off and on.

SP5832-001 erases all document and address book data on the hard disks. Ask the customer before you do this SP code.

Procedure 4

If "Procedure 3" is not the solution for the problem, replace the HDD.

951	D	F-gate assert error at write request After the IPU receives an F-gate signal, it receives another F-gate signal.	• Software defective • BICU defective
954	D	Printer setting error The IPU does not respond with the settings that are required to start image processing by the printer.	• Software defective
955	D	Memory setting error The IPU does not respond with the settings that are required to start image processing using the memory.	• Software defective

980	D	NVRAM Error		
		A critical SP code setting is not within range. If the machine is allowed to operate in this condition, this could lead to toner overflow and damage the machine.	• See description below this table.	
		SP Code	**Acceptable Range**	**SP Code**
		SP2005 004 Charge Roller Adjustment 2	-1000 to -2000 V	SP2005 004 Charge Roller Adjustment 2
		SP2802 001 TD Sensor Manual Setting VTS	1.00 to 5.00 V	SP2802 001 TD Sensor Manual Setting VTS
		SP2802 002 TD Sensor Manual Setting VTMAX	1.00 to 5.00 V	SP2802 002 TD Sensor Manual Setting VTMAX
		SP2802 003 TD Sensor Manual Setting VTMIN	1.00 to 5.00 V	SP2802 003 TD Sensor Manual Setting VTMIN
		SP9503 004 DFU	51 to 255	SP9503 004 DFU
		SP9508 001 DFU	51 to 255	SP9508 001 DFU
		SP9508 002 DFU	51 to 255	SP9508 002 DFU
		SP9517 002 DFU	401 to 802	SP9517 002 DFU

- Recovery from SC980 -

Continued use of the machine with one or more of the SP codes listed above out of range could lead to toner overflow or other problems that could cause damage to the machine.

1. Enter the SP mode and check the setting of SP2802 001, 002, 003.
2. If these SP codes are within range, turn the machine power off and on.
   - or -
   If one or more of these SP codes is out of range, do SP2801 001 (TD Sensor Initial Setting) then turn the machine power off and on.
3. Enter the SP mode and do SP5990 001 (SMC Printout – SP Mode Data List).
4. Check the following SP codes and confirm that their settings are within range.

SP No.	Name	Range
2005 004	Charge Roller Voltage Adjustment 2	-1000 to -2000 V
SP2802 001	TD Sensor Manual Setting – VTS	1.00 to 5.00 V

SP No.	Name	Range
SP2802 002	TD Sensor Manual Setting – VTMAX	
SP2802 003	TD Sensor Manual Setting – VTMIN	

984	D	Print image data transfer error The image transfer from the controller to the engine via the PCI bus does not end within 15 s after starting.	• Controller board defective • BICU defective • Connectors between BICU and controller loose or defective

986	D	Software write parameter setting error An unstable area at the storage destination in the settings table is set NULL for the parameter received by the write module.	• Software defective

990	D	Software error 1	
		The software performs an unexpected function and the program cannot continue.	• Software defective, re-boot *1

991	C	Software error 2	
		The software performs an unexpected function. However, unlike SC990, recovery processing allows the program to continue.	• Software defective, re-boot *1

*1: There are two possible methods to get more details about SC990 and SC991:

1. Execute SP7403 or print an SMC Report (SP5990) to read the history of the 10 most recent logged errors.
2. If you press the zero key on the operation panel with the SP selection menu displayed, you will see detailed information about the recently logged SC990 or SC991, including the software file name, line number, and so on.

The first method in the above list is the recommended method, because another SC could write over the information for the previous SC.

992	D	Software error 3: Undefined	
		An error not controlled by the system occurred (the error does not come under any other SC code).	• Software defective • Turn the machine power off and on. The machine cannot be used until this error is corrected.

995	D	Machine Type Information Error	• Replace the controller board with the correct board.
		After the machine is powered on, a mismatch is detected between the CPM information sent from the controller to the engine.	

997	B	Software Error 4: Cannot select application function	
		An application does not start after the user pushed the correct key on the operation panel.	• Software bug • A RAM or DIMM option necessary for the application is not installed or not installed correctly.

998	D	Software Error 5: Application cannot start	
		Register processing does not operate for an application within 60 s after the machine power is turned on. No applications start correctly, and all end abnormally.	• Software bug • A RAM or DIMM option necessary for the application is not installed or not installed correctly.

999	D	Program download error
		The download (program, print data, language data) from the IC card does not execute normally.
		• Board installed incorrectly • BICU defective • IC card defective • NVRAM defective • Loss of power during downloading Primarily intended for operating in the download mode, logging is not performed with SC999.

		If the machine loses power while downloading, or if for some other reason the download does not end normally, this could damage the controller board or the PCB targeted for the download and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced.

Electrical Component Defects

Sensors

Component	CN	Condition	Symptom
LD Unit Home Position	204-B2 (IOB)	Open	SC328 is displayed when the laser beam pitch is changed.
		Shorted	SC327 is displayed when the laser beam pitch is changed.
Toner Density (TD)	222-11 (IOB)	Open	The Add Toner indicator blinks even if there is toner in the development unit.
		Shorted	SC390 is displayed.
Paper Exit	202-B2 (IOB)	Open	The Paper Jam indicator lights whenever a print is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Registration	224-B2 (IOB)	Open	The Paper Jam indicator lights even if there is no paper.
		Shorted	The Paper Jam indicator lights whenever a print is made.
Image Density (ID)	203-5 (IOB)	Open	SC352 is displayed after printing.
		Shorted	SC350 is displayed after printing.
Upper Paper Height	220-2 (IOB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC501 will be displayed.
		Shorted	SC501 is displayed.
Lower Paper Height	214-2 (IOB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC502 will be displayed.
		Shorted	SC502 is displayed.

Upper Paper End	220-8 (IOB)	Open	The Paper End indicator lights even if paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the upper paper tray.
Lower Paper End	214-8 (IOB)	Open	The Paper End indicator lights even if paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the lower paper tray.
Upper Relay	220-5 (IOB)	Open	The Paper Jam indicator lights whenever a print is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Lower Relay	214-5 (IOB)	Open	The Paper Jam indicator lights whenever a print is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Transfer Belt Position	202-A10 (IOB)	Open	No symptom
		Shorted	SC403 is displayed

Switches

Component	CN	Condition	Symptom
Right Lower Cover	216-4 (IOB)	Open	"Doors/Covers Open" is displayed even if the right lower cover is closed.
		Shorted	LCD goes blank when the lower cover is opened.
Main	102-1~4 (PSU) 107-1	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Front Cover Safety	107-1 (PSU)	Open	"Doors/Covers Open" is displayed even if the front cover is closed.

		Shorted	"Doors/Covers" Open is not displayed even if the front cover is opened.

Blown Fuse Conditions (PSU)

Fuse	Rating		Symptom at Power On
	115V	210~230V	
FU1	6.3 A/125 V	6.3 A/250 V	"Doors/Covers Open" is displayed
FU2	6.3 A/125 V	6.3 A/250 V	"Doors/Covers Open" for the finisher is displayed
FU3	6.3 A/125 V	4 A/250 V	Paper end condition
FU4	6.3 A/125 V	6.3 A/250 V	SC121 is displayed
FU5	6.3 A/125 V	6.3 A/250 V	SC302, or SC403, or SC405 displayed
FU101	15 A/125 V	—	No response
FU102	10 A/12 5V	5 A/250 V	No response
FU103	2 A/125 V	1 A/250 V	Normal operation (optional heaters do not work)

BICU LEDs

Number	Monitored Signal
LED101	Monitors whether the program is working normally or not. The LED blinks in normal conditions.
LED102	Flashes during program downloading.

Controller Board Test Points

No.	Monitored Signal
TP1	GND
TP2	—

TP3	GND
TP4	—
TP5	—
TP6	GND
TP7	+3.3 VCG
TP8	DB0 RXD
TP9	DB0 TXD
TP10	GND
TP11	+5 VE
TP12	GND
TP13	+5 V
TP14	+5 VE
TP15	GND
TP16	R.FGATE
TP17	W.FGATE
TP18	+2.5 V
TP19	+1.65 VCP
TP20	+3.3 V

5. Service Tables

Service Program Mode Operation

General Notes

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

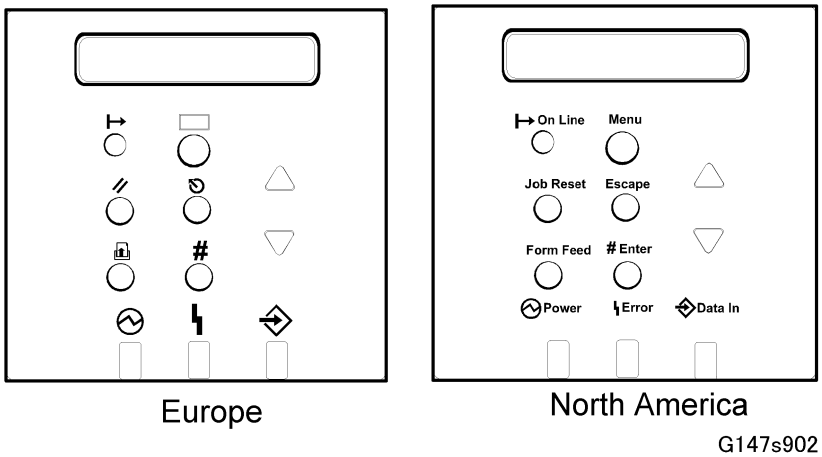
⚠CAUTION

- Never turn off the power switch when the power LED is lit or flashing.

Note

- The power LED lights or flashes while the machine is communicating with the network server, or while the machine is accessing the hard disk or memory

Entering and Leaving the Service Program Mode



1. **To set the printer in the service mode:**

   If the printer is off, press and hold down [Online] and [Escape] then switch the printer on. Release the buttons when you see "1. Service" in the LCD.

   -or-

   If the printer is on, press and hold down △ and ▽ for over 5 seconds and release.

   Press[#Enter]. You will see "1. Service" in the LCD. The printer is in the service mode.

2. **Press △ or ▽ to display the menu titles.**

1.Service	Controller service settings.
2.Engine	Engine service settings.
3.End	Leave the SP mode and return to normal operation.

1. **With the item that you want to open displayed in the LCD, press[#Enter].**
2. **Press △ or ▽ to display all the menus on the same level, then press [#Enter] to open the submenus.**
3. **Push [Escape] to the highest level, or push △ or ▽ to display "3.End" then press [#Enter].**

Printer Controller Service Mode

Controller Service Mode Menus

The controller service mode menu (1.Service) is the first item on the menu.

Item	What It Does
Bit Switch	Adjusts the bit switch settings.
Clear Setting	Initializes the settings for the "System" menu of the user mode.
Print Summary	Prints a summary of all the controller settings.
Display Version	Displays the current version number of the controller firmware.

Bit Switch Programming

1. **Enter the SP mode, select "1.Service", and press [#Enter] twice**

   SP1001-001
   Bit Switch 1 Set

2. **Press △ or ▽ to select the bit switch setting to change.**

   SP1001-002
   Bit Switch 2 Set

3. **Press [#Enter].**

   Sw#2 00000000

bit0 _

4. **Select the "0" or "1" for each position. The leftmost digit is 7 and the rightmost is 0.**
   - Press △ or ▽ to move the cursor to the right or left to position the it at the digit to change.
   - Press [#Enter] then press △ or ▽ to toggle the digit between "1" and "0".
   - With the digit for entry displayed on the second line, press [#Enter]. The selected digit is entered into the position above.
   - Repeat this procedure to set all the digits.
5. **When you are finished, press [Escape] to return to the previous level. The new settings for the bit switch are now stored.**

Printer Controller Bit Switch Settings

Position:	7	6	5	4	3	2	1	0
Display:	0	0	0	0	0	0	0	0

Bit Switch 1	Default	Do not change these settings.
0	0	
1	0	
2	1	
3	0	
4	0	
5	0	
6	0	
7	0	
Bit Switch 2	All "0"	
Bit Switch 3	All "0"	
Bit Switch 4	All "0"	

Printer Engine Service Mode

The Printer Engine Service mode is used to check electrical data, change modes, and adjust values.

Here is a quick summary of how to enter and use the Printer Engine Service mode to change the settings listed in the Service Program Mode Tables.

1. **Press △ and ▽ together, hold down for over 5 seconds, release and then press [#Enter].**
2. **Press △ or ▽ to display "2.Engine".**
3. **Press [#Enter].**
4. **Press △ or ▽ to display the SP code groups.**

1. Feed	SP1000
2. Drum	SP2000
3. Process	SP3000
5. Mode	SP5000
6. Periphs	SP6000
7. Data Log	SP7000
8. Data Log2	SP8000
9. Etc.	SP9000

1. **Press △ or ▽ to select the group, and then press [#Enter].**

   Note

   - The 2-line display is rotational. If you press △ with "1.Feed" displayed, the display will jump to "9. Etc.", the last selection. Similarly, if you press △ with "9.Etc" displayed, the display will jump to "1.Feed", the first selection.

2. **While referring to the Service Program Mode Tables, press △ or ▽ to select the SP that you want to change, and then press [#Enter].**

   Note

   - If you see > or >> to the right of a selection name, this means a menu sublevel exists.

3. **Follow one of the procedures below to change a setting.**

   To change a single-digit number setting:

   - Press [#Enter]. A number replaces the cursor.
   - Press △ or ▽ to increase or decrease the number.
   - Press [#Enter]. The number selected on the 2nd line replaces the number above.

- Press to return to the previous level.

To change a multiple-digit number setting

- Press △ or ▽ to move the cursor to the digit that you want to change.
- Press [#Enter]. A number replaces the cursor.
- Press △ or ▽ to increase or decrease the number.
- Press [#Enter]. The number selected on the 2nd line replaces the number above.
- Repeat the procedure to enter numbers for the other digits.
- Press #(Escape) to return to the previous level.

To select an item from a list

- The current selection is marked with a large asterisk ().
- Press △ or ▽ to display on the 2nd line the item to select.
- With the item that you want to select displayed on the second line, press [#Enter]. The selected item is marked with an asterisk.
- Press [Escape] to return to the previous level.

Leaving the SP Mode

1. **When you are finished with SP selection, press [Escape] until you see "2.Engine".**
2. **Press ▽ to display "3.End".**
3. **Press [#Enter] to display "Offline".**
4. **Press [Online] to set the printer online.**

Note

- Powering the printer off and on leaves the SP mode, and returns the printer online in normal operation mode.

Service Program Mode Tables

Service Table Key

Notation	What it means
[range / default / step]	Example: [–9 ~ +9 / +3.0 / 0.1 mm step]. The setting can be adjusted in the range ±9, value reset to +3.0 after an NVRAM reset, and the value can be changed in 0.1 mm steps with each key press.
italics	Comments added for reference.
DFU	Denotes "Design or Factory Use". Do not change this value.
Japan Only	The feature or item is for Japan only. Do not change this value.
NIA	No Information Available (April 2006)

Service Tables

SP1-xxx: Feed

1001	Subscan Reg Adj	Leading Edge Registration
	Adjusts the printing leading edge registration using the trimming area pattern (SP2-902-3, No. 10). [+9 ~ –9 / 3.0 / 0.1 mm] Use [./] to toggle between + and – before entering the value. Specification: 3 ±2 mm	

1002	Side-to-Side Reg	Side-to-Side Registration
	Adjusts the printing side-to-side registration from the 3rd paper feed station using the trimming area pattern (SP2-902-3, No.10). Tray 3, Tray 4 are for the optional Paper Feed Unit. Use the [./] key to toggle between + and – before entering the value. Specification: 2 ±1.5 mm	
001	Tray-1	[–9 ~ +9/ +3.0 mm / 0.1 mm step]
002	Tray-2	[–9 ~ +9/ +3.0 mm / 0.1 mm step]
003	Tray-3	[–9~ +9/ +2.0 mm / 0.1 mm/step]

004	Tray-4	[–9~ +9/ +2.0 mm / 0.1 mm/step]
005	Duplex Tray	[–9 ~ +9/ +0.0 mm / 0.1 mm/step]
006	Bypass Tray	[–9 ~ +9/ +3.0 mm / 0.1 mm/step]
007	LCT	[–9 ~ +9/ +1.5 mm / 0.1 mm/step]

1003	Regis Buckle Adj	Registration Buckle Adjustment
	Adjusts the relay clutch timing at registration. Relay clutch timing determines the amount of paper buckle at registration. (A "+" setting causes more buckling.)	
001	Trays 2,3,4, LCT	[–9 ~+9 / 0 /1 mm step]
002	Duplex Tray	
003	Bypass Tray	
004	Tray-1	[–9 ~+9 / 1 /1 mm step]
005	By-pass Thick	[–9 ~+9 / -2 /1 mm step]

1007	By-pass SizeDisp **DFU**	By-pass Feed Paper Size Display
	Displays the paper width sensor data for the by-pass feed table. The detected paper size display is shown as bit settings in an 8-digit display. (7)1110 0000(0)	

1012	Exit Jct. SOLs	Exit Junction Solenoid Start Timing
	Adjusts the timing of the solenoids at the entrance and exit of the paper exit section to accommodate the increased speed of the duplex unit. This SP has been added to compensate for the increased operation speed of the duplex unit for this machine. Increase the value if the leading edges are jamming. Decrease the value if trailing edges are bending at the entrance	
001	Exit Start SOL	[200 ~ 450 ms / 300 ms /10 ms]
002	Exit End SOL	[200 ~ 450 ms / 370 ms /10 ms]

1103	Fusing Idling

	Switches fusing idling on/off. When on, printing will not start until enough time has elapsed so the hot roller can reach optimum temperature. This ensures even heat on the hot roller. Switch on if fusing on the 1st and 2nd copies is incomplete (this may occur if the room is cold.) You must switch SP1103-1 ON before you set the fusing interval with SP1103-2.	
001	0:OFF 1:ON	0 = Off, 1 = On
002	Interval(s)	[0 ~ 60 sec. / 30 sec. / 1 sec.]

1104	Fusing T Ctrl	Fusing Temperature Control
	Selects the fusing temperature control method. After changing this setting, be sure the power the machine off and on again with the power switch to enable the new setting. [0~1 / 0 / 1] 0: Normal (ON/OFF control). Allows full application from ac power supply to bring the hot roller up to the target fusing temperature then shuts off. Determines the on time from the present temperature (detected by the thermistor on the hot roller) and the temperature of 1 cycle before. 1: Phase (hysterisis) control. Sets the upper and lower limits for the temperature; at the lower temperature the fusing lamp is on and at the higher temperature the fusing lamp is off. Change this setting to "0" only if the user has excessive electrical noise or interference on the power supply line. Such interference can cause voltage to drop when power is applied using the ON/OFF control method. Interference can be caused by the general poor quality of the power supply lines, or if the machine is sharing a power supply with other electrical devices such as fluorescent lights. Before changing this setting, make sure that the machine is connected to a power supply not shared by other electrical equipment. **Note**: Selecting Phase control ("1") could cause the fusing temperature control board to emit low pitched noise.	

1105	Fusing T Adj.	Fusing Temperature Adjustment	
	Allows adjustment of the hot roller temperature at the center and ends of the roller for the quality or thickness of the paper. The hot roller in this machine has two fusing lamps: one heats the center of the roller, and the other heats both ends. Each fusing lamp can be adjusted separately. Use SP1105-03, 04 to adjust for feeding standard paper from the by-pass tray, and use SP1105-07, 08 to adjust for feeding thick paper from the by-pass tray.		
001	Center	[120°C ~ 200°C / **180**°C / 1°C step]	
002	Ends	[120°C ~ 200°C / **185**°C / 1°C step]	

003	Ctr (Bypass)	[120°C ~ 220°C / **190**°C / 1°C step]
004	Ends (By-pass)	[120°C ~ 220°C / **190**°C / 1°C step]
005	Ctr (Reload)	Adjusts the temperature for re-heating the center of the hot roller: Reload Temp. = Fusing. Temp – SP Value [0°C ~ 60°C / **30**°C / 1°C step] When the fusing temperature exceeds this setting, the machine can operate. Do not set a reload temperature (Spec. Temp – SP Value) higher than the SP1105-02 setting.
006	Ends (Reload)	Adjusts the temperature for re-heating the ends of the hot roller: Reload Temp. = Fusing. Temp – SP Value [0°C ~ 60°C / **30**°C / 1°C step] When the fusing temperature exceeds this setting, the machine can operate. Do not set a reload temperature (Spec. Temp – SP Value) higher than the SP1105-02 setting.
007	Ctr (Bypass) T	Adjusts the temperature of the center of the hot roller for feeding thick paper with the by-pass tray. [120°C ~ 220°C / 200°C / 1°C step]
008	End (Bypass) T	Adjusts the temperature of the ends of the hot roller for feeding thick paper with the by-pass tray. [120°C ~ 220°C / **200**°C / 1°C step]
009	Ctr (Thick)	Adjusts the temperature for re-heating the center of the hot roller for feeding thick paper: Reload Temp. = Fusing. Temp – SP Value [0°C ~ 60°C / **5**°C / 1°C step] When the fusing temperature exceeds this setting, the machine can operate. Do not set a reload temperature (Spec. Temp – SP Value) higher than the SP1105-02 setting.
010	Ends (Thick)	Adjusts the temperature for re-heating the ends of the hot roller for feeding thick paper: Reload Temp. = Fusing. Temp – SP Value

		[0°C ~ 60°C / **5**°C / 1°C step] When the fusing temperature exceeds this setting, the machine can operate. Do not set a reload temperature (Spec. Temp – SP Value) higher than the SP1105-02 setting.

1106	Fusing T Disp.	Fusing Temperature Display
001	Roller Center	Displays the fusing temperature for the center of the hot roller.
002	Roller Ends	Displays the fusing temperature for the ends of the hot roller.
003	I/O Board Temp.	Displays in the internal temperature of the machine when it was powered on.

1109	Nip Band Check	Fusing Nip Band Check
	This SP sets the machine in the nip band width check mode. The nip width should be 7 mm. You can increase it by changing the position of the pressure springs (there are two positions only). If you cannot adjust to the correct value, replace the pressure roller. [*0=Off, 1=On] Important! After checking the nip band width, switch off SP1109. If this SP remains on, this will cause paper to jam in the fusing unit (SC559).	

1111 *	Switchback Timing	Paper Reverse Timing Duplex
	[+5 ~ –5 / 0 mm / 1 mm step] Adjusts the reverse timing of paper in the duplex unit (stopping the rotation of the reverse roller after the trailing edge of the paper passes the duplex entrance sensor). Adjust the timing if paper frequently jams at the inverter gate in the duplex unit.	

1159	Fusing Jam SC Set
	This SP setting determines whether SC559 is issued after three paper late jams occur in the fusing unit. After this SP code is turned on, a counter monitors the number of paper late jams that occur in the fusing unit. After the 3rd occurrence of a fusing jam, SP559 is issued and the machine cannot be used until the service technician releases the error. **Note**: Switching the machine off/on does not reset this jam counter. The counter is reset after the cause of the jam has been removed and a sheet of paper successfully passes the fusing exit sensor.

	[0~1/0/1] 0:OFF, 1:ON

SP2-xxx: Drum

2001	Charge Roll Bias	Charge Roller Bias Adjustment
001	Image Pattern	Adjusts the voltage applied to the charge roller for the image area to maintain a charge of –800 V on the OPC drum surface. [–1,000 ~ –2,000 / –1570 V / 10 V step]
002	ID Sensor Patt.	Adjusts the voltage applied to the charge roller when making the ID sensor pattern (for charge roller voltage correction). The actual charge roller voltage is this value plus the value of SP2001-01. [0 ~ 700 / -200 V / 10 V step] The default is adjusted automatically based on the number of prints. 00 K ~ 10 K: 200 V 10 K ~ 50 K: 230 V 50 K ~ 150 K: 340 V

2101	Prt Erase Margin	Printing Erase Margin
	Adjusts the leading edge (top), trailing edge (bottom), left, and right margins.	
001	Leading Edge	[0 ~ 9.0 / 3 / 0.1 mm step] Specification: ±2 mm
002	Trailing Edge	
003	Right Edge	[0 ~ 9.0 / 2 / 0.1 mm step] Specification: ±1.5 mm
004	Left Edge	
005	Trailing Edge Back	Adjusts the trailing edge erase margin on the reverse side of duplex prints. [0 ~ 4.0 / 1.2 / 0.1 mm step] Recommended: 2 ±1.5 mm
006	Back Side Right	Adjusts the right side erase margin in the reverse side of duplex prints. [0 ~ 4.0 / 0.3 / 0.1 mm step] Recommend: 2 ±1.5 mm

007	Back Side Left	Adjusts the left side erase margin in the reverse side of duplex prints. [0 ~ 4.0 / 0.3 / 0.1 mm step] Recommended: 2 +2.5/–1.5 mm

2103	LD Power Adj **DFU**	LD Power Adjustment
	Adjusts the intensity of the laser for the printer. These adjustments can be done to compensate for reduced OPC drum sensitivity as it reaches the end of its service life.	
001	LD1 Prt Ctrl	(–30 ~ +64 / –20 /1 LSB step) Approx. 50/128 = 0.4%
002	LD2 Prt Ctrl	
003	LD1 Printer	(–30 ~ +79 / –5 /1 LSB step) Approx. 50/128 = 0.4%
004	LD2 Printer	
005	LD1AdjStart/End	This SP enables the adjustments done for SP2103 001, 003. [0~1/0/1]
006	LD2AdjStart/End	This SP enables the adjustments done for SP2103 002, 004. [0~1/0/1]

2109	LD Pitch Adj	LD Beam Pitch Adjustment
	Adjusts the beam gap for the dual beam system. After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode to adjust the laser beam pitch. This adjustment is performed by specifying the number of pulses to the stepper motor that will adjust the angle of rotation of the LD unit from the home position.	
001	400 dpi	[400 dpi: [8~ 262 / 144 / 4 pulse step]
	Adjusts the laser beam pitch value for 400 dpi resolution. After replacing the LD unit or replacing or clearing NVRAM, use this SP and SP2-109-3 to adjust the laser beam pitch.	
002	600 dpi	[600 dpi: [30 ~ 284 / 168/ 4 pulse step]
	Adjusts the laser beam pitch value for 600 dpi resolution. After replacing the LD unit or replacing or clearing NVRAM, use this SP and SP2-109-4 to adjust the laser beam pitch.	

003	400dpi Init Set	400 dpi Initial Setting
	Initializes the laser beam pitch for 400 dpi using the value for SP2-109-1. After entering a value for SP2-109-1, this SP must be used.	
004	600dpi Init Set	600 dpi Initial Setting
	Initializes the laser beam pitch for 600 dpi using the value for SP2-109-2. After entering a value for SP2-109-2, this SP must be used.	
005	Auto Int Set	Auto Pitch Adjustment Interval
	[50 ~ 65535 / 1000 / 1 step] Sets the interval for automatic laser beam pitch adjustment. When the number of times that the resolution has been changed reaches this value, the laser unit position is automatically corrected.	
006	LD Unit Position	Current LD Unit Position
	Displays the current LD unit position (number of pulses from home position). If this is different from the value of 2-109-1 or 2-109-2, LD unit positioning has failed.	
007	Pitch Change Cnt	Beam Pitch Change Counter
	Displays how many times the LD unit position has been changed (how many times the resolution has changed.) When the laser beam pitch adjustment is done, this counter is reset to zero.	
008	Pitch Data Reset	Beam Pitch Data Reset
	Resets the values of SP2-109-6 and SP2-109-7. After replacing the LD unit, this SP mode must be performed. See the LD Unit Removal Procedure.	

2110	Test Mode dpi **DFU**	
	[See below / 8/ 0 ~ 18] Sets the resolution (dpi). Any setting other than 0, 4, or 8 will cause an error.	
	0 = 400 x 400 dpi	
	4= 300 x 300 dpi	
	8= 600 x 600 dpi	

2112	Polyg MO Off T.	Polygon Motor Off Timer
	[0 ~ 60 s / 10 s / 5 s step] Input the time that the polygon motor is to switch off after the printer has remained idle for the specified time and entered the standby mode. If set to zero, the polygon motor never switches off in standby mode. However, if the machine enters the energy saver mode, the polygon motor will ignore the zero setting and switch itself off.	

2201	Developer Bias	Development Bias Adjustment
001	Image Dev Bias	[-200 ~ -700 / -540 V / 10V step]
	Adjusts the development bias for copying. Use as a temporary measure to correct faint copies from an aging drum.	
002	ID Sensor Pattern	[- 200 ~ -700 / -380V / 10V step]
	Adjusts the development bias for the ID sensor pattern for VSP	

2207	Force Toner Supp	Forced Toner Supply
	Forces the toner bottle to supply toner at 1-second intervals for up to 30 seconds. To start, press [#Enter].	

2208	Toner Supp Mode	Toner Supply Mode
	[0: Sensor control, 1: Image pixel count Selects the toner mode. If you select 1, SP2-209-002 should be set to its default value. Use image pixel count modes only as a temporary measure if the ID or TD sensor is defective.	

2209	Toner Supp Rate	Toner Supply Rate
	[0 ~ 800 / 60 mg/s / 5 mg/s step] Sets the amount of toner supplied every second by the toner supply motor. The length of time the motor remains on is determined by the data from the TD sensor and ID sensor. Increasing this value reduces the toner supply clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.	

2210	ID Sensor	
001	Pattern Interval	
	Sets the interval between ID sensor pattern prints for toner control. This setting allows adjustment for customers who do not make many prints daily. Selecting zero cancels creation of the ID sensor pattern. [0 ~ 200 / 10 / 1 print step] The ID sensor reads the sensor pattern and outputs this reading as Vsp and sends it to the CPU where it is used to calculate Vref (Vsp/Vsg = Vref). If the total count exceeds 10 during a print job, for example "15", the pattern is created and read at completion of the print job.	
002	Large Job	
	Sets the interval between ID sensor pattern prints with the halftone pattern added. The ID sensor reads the halftone pattern and outputs it as Vsm to the CPU. The Vsm value is used in the calculation Vsm/Vsg to adjust the power to the LD. [2 ~ 999 / 200 / 1 print step] This SP executes at 200 prints (or at the adjusted count) regardless of whether the print job has completed. This method of adjusting the power output and the amount of light emitted by the LD ensures standard quality images by ensuring that prints do not become faint, slows the deterioration of the OPC drum over time, and reduces scatter.	

2213	Toner End Count	
	Selects the number of prints that can be printed once the machine has detected the toner near-end condition. [0 ~ 2 / 0 / 1 step] 0: 90 prints 1: No prints 2: 10 prints Select 1 or 2 if the customer normally makes prints of high density.	

2220	Vref Manual Set	Vref Manual Setting
	Adjusts the TD sensor reference voltage (Vref). Change this value after replacing the development unit with another development unit that contains toner. [1.00 ~ 5.00 V / 4.00V / 0.01 step]	

	(1) Check the value of SP2-220 in both the machine containing the test unit and the machine that you are going to move it to. (2) Install the test development unit, and then input the VREF for this unit into SP2-220. (3) After the test, put back the old development unit, and change SP2-220 back to the original value.

2223	Vt Display	Vt = Output Voltage of the TD Sensor
001	Vt Prev Copy	Vt of Previous Copy
	Displays the TD sensor output voltage for the immediately previous print.	
002	Vt Prev 10 Ave	Vt of Previous 10 Copies (Averaged)
	Displays the average of the most recent TD sensor outputs (from the previous 10 prints).	
003	Vt Change Rate	Vt Rate of Change
	Displays the rate of change in the TD sensor output.	
004	Vt Gain	Vt Gain
	Displays the GAIN value used to calculate the on time for the toner supply motor.	
005	Image Pixel Cnt	Image Pixel Count
	Displays the image pixel count.	

2301	Trans Curr Adj	Transfer Current Adjustment
	Adjusts the current applied to the transfer belt during printing the 5 phases listed below.	
001	Image Face	1st Side of Paper
	Printing the first side of the paper (image area). If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner. [20 ~ 100 µA / 45 / 1 µA step]	
002	Image Back	2nd Side of Paper
	Printing the second side of the paper (image area) during duplex printing. [20 ~ 100 µA / 40 / 1 µA step]	
003	Lead Edge Face	Leading Edge. Face

	Printing at leading edge of the paper. Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions. [20 ~ 100 µA / 45 / 1 µA step]	
004	Img Face Bypass	Image Face By-pass (By-pass Feed)
	Printing from the by-pass tray (image area). If the user normally feeds thicker paper from the bypass tray, use a higher setting. [20 ~ 100 µA / 45 / 1 µA step]	
005	Lead Face Bypass	Leading Edge By-pass Feed
	Printing at the leading edge of paper fed from the by-pass tray. Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions. [20 ~ 100 µA / 60 / 1 µA step]	

2309 *	Trans Curr Corr	Transfer Current Correction
01	a (Paper Lower Width)	
	Adjusts the lower paper width threshold for the transfer current, charge voltage, and development bias corrections. DFU Use this SP when an image problem (e.g., insufficient toner transfer) occurs with a small width paper. If the paper width is smaller than this value, the transfer current will be multiplied by the factor in SP2309-03 (paper tray) or SP2309-05 (by-pass). [0 ~ 297 / 150 / 1 mm step]	
02	b (Paper Upper Width)	
	Adjusts the upper paper width threshold for the transfer current, charge voltage, and development bias corrections. DFU As for SP2309-01, but the factors are in SP2309-04 (paper tray) and SP2309-06 (by-pass). [0 ~ 297 / 216 / 1 mm step]	
03	Alpha (Tray)	
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2309-01. DFU [1.0 ~ 3.0 / 1.2 / 0.1 mm step]	

04	Beta (Tray)	
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2309-02. DFU [1.0 ~ 3 / 1.2 / 0.1 mm step]	
05	Gamma (By-pass)	
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2309-01. DFU [1.0 ~ 3 / 1.5 / 0.1 mm step]	
06	Delta (By-pass)	
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2309-02. DFU [1.0 ~ 3 / 1.5 / 0.1 mm step]	

2801	TD Init. Setting	TD Sensor Initial Setting
	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 4.0 V. Press "Execute" to start. After finishing this, the TD sensor output voltage is displayed. Use this mode only after installing the machine, changing the TD sensor, or adding new developer.	

2802	TD Manual Set	TD Sensor Manual Setting
	Allows you to adjust the TD sensor output manually for the following.	
001	Initial Vt	[1.00 ~ 5.00V / 4.78V / 0.02V step]
	Adjusts the TD sensor output (VT). Change this value after replacing the development unit with another one that already contains toner. For example, when using a development unit from another machine for test purposes. To adjust VT, use a similar procedure as for SP2-220.	
002	Vt Max	[1.00 ~ 5.00V / 4.78V / 0.02V step]
	Adjusts the maximum value for SP2802 1.	
003	Vt Min	[1.00 ~ 5.00V / 1.00V / 0.02V step]
	Adjusts the minimum value for SP2802 1.	

2805	Init. Pro.Ctrl	Developer Initialization
	Performs the developer initialization. Press [#Enter] to start. This SP should be performed after doing SP2801-1 at installation and after replacing the drum.	

2902	Print T Pattern	Print Test Pattern
	Use this SP to select a print test pattern. After you select any pattern other than "0:None", this puts the printer in the Print Test Pattern mode. In the Print Test Pattern mode, the test pattern can be printed by doing SP5990 (Print Mode) which is normally used to print the SMC reports. For a more detailed description about how to print a test pattern, see "Test Pattern Printing" in Section "5. Service Tables".	

2909	Prt M Scan Mag.	Main Scan Magnification
	Adjusts the magnification in the main scan direction for print mode. Press [#Enter] to toggle between + and - values.	
002	Printer	[–2.0 ~ +2.0 / 0 / 0.1% step]

2911	T Current Timing	Transfer Current On/Off Timing
001	La (On Timing)	[–30 ~ +30 / 0 mm / 1 mm step]
	Adjusts the transfer current on timing at leading edge.	
002	Lb (Switch Timing)	[0 ~ +30 / 10 mm / 1 mm step]
	Adjusts the transfer current switch timing. This determines when the leading edge stops and the image area current begins (see SP2-301).	
003	Lc (Off Timing)	[–30 ~ +30 / – 5 mm / 1 mm step]
	Adjusts the transfer current off timing. (e.g. –5 mm is 5 mm after the trailing edge.)	

2912	Drum Rev Rot In	Drum Reverse Rotation Interval
	Adjusts the time the drum and belt are reversed in order to prevent paper dust and toner from collecting at the blade. DFU [0 ~ 10 /3 / 1 step] Example 1: If you enter 3, then: 3/2 = 2 (rounded up) x 10 + 10 = 30 ms Example 2: If you enter 10, then:	

	10/2 = 5 x 10 + 10 = 60. However, the limit is 50 ms so in this case, 60 ms is reduced to 50 ms.

2913	Tst Pattern Den	Print Density for Test Pattern
	[0 ~ 15 / 15 / 1] Sets the print density for the patterns printed with SP2-902-3.	

2914	Process Ctrl Set	Process Control Setting
001	C alpha	[0 ~ 400 / 150 / 10V step]
	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. Use this SP when an image problem (such as white spots at the center of black dots or breaks in thin black lines) occurs when paper with a small width is fed from the by-pass feed tray.	
002	C beta	[0 ~ 400 / 0 / 10V step]
	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.	
003	B gamma	[0 ~ 300 / 200 / 10V step]
	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.	
004	B delta	[0 ~ 300 / 50 / 10V step]
	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.	

2920	LD Off Check	DFU

2960	Toner Over Sens	Toner Overflow Sensor

	[0 = No, 1 = Yes] Selects whether or not the toner overflow sensor is activated.

2964	Transfer Cleaning Blade Forming	
	[0 ~ 30/ 3 / 1 sheets] Applies a pattern of toner to the transfer belt at a defined interval between sheets on the transfer belt in order to reduce friction between the belt surface and the cleaning blade. Under conditions of high temperature and high humidity, the density control feature may reduce the amount of toner, which also reduces the amount of toner on the surface of the transfer belt. With less toner on the belt, the friction between the belt and the blade increases, and could cause the blade to bend or scour the surface of the belt.	

2969	LD PWM Select	LD – PWM Selection
001	LD PWM Select	Printer Output LD – PWM Selection
	[1 ~ 5 / 1 / 1 step] Changes the LD power PWM control for printed copies. A smaller value produces a lighter image. Use this SP to adjust the image density for printing from a personal computer: 1:100% 2:87.5% 3:75% 4:62.5% 5:50%	
002	Fax Output	Fax Output LD – PWM Selection
	[1 ~ 5 / 1 / 1 step] Changes the LD power PWM control for printed fax messages. A smaller value produces a lighter image. Use this SP to adjust the image density for printing fax messages. 1:100% 2:87.5% 3:75% 4:62.5% 5:50%	

2971	Toner Full Cnt	Toner Full Sensor Count
	Counter that confirms that the contact of the waste toner full sensor is operating normally. Execution of SP5801 initializes this value by setting it to 0. **DFU**	

2972	Grayscale Limit	
	A new feature of this machine that controls the halftone density level to prevent deterioration of the OPC. The halftone density is detected by the ID sensor, and the machine adjusts the intensity of the LD beam according to the upper/lower limit setting.	
001	Grayscale Max	Grayscale Maximum - Upper Limit

	[0 ~ 100 / 85 / 1 step] Defines the upper limit for grayscale. A larger value allows a wider range of halftones at the pale end of the scale. If the image contains pale areas with fuzzy borders surrounded by dark areas, reduce this value to make the borders clearer.

002	Grayscale Min	Grayscale Minimum - Lower Limit
	[0 ~ 100 / 65 / 1 step] Defines the lower limit for grayscale. A smaller value allows a wider range of halftones at the dark end of the scale.	

2973	Gray Chk Int.	Grayscale Copy Interval Check
	[0 ~ 1000 / 100 / 10 step] Sets the halftone operation interval in order to prevent deterioration of the OPC. If the number of copies exceeds this setting, at the end of the job, or if the door is opened and closed, charge correction is executed.	

2974	Image Dens Adj	Image Density Adjustment
	[1 ~ 5 / 3 / 1 step] Adjusts image density. Changing this setting adjusts development bias and ID sensor output voltage that in turn raises or lowers image density.	

2975	Toner End Time	Toner End Detection ON Time
	[0 ~ 2,000 / 0 / 10 s step] Sets a time limit for issuing the toner near end warning on the operation panel. The time may need to be shorter for customers who run especially large print jobs (working at night, for example) to ensure earlier warning of the toner near end condition so toner out does not interrupt a long job. 0: Normal end detection (90 sheets after near-end detected (SP2213)	

2976	T Bottle On Cnt	Toner Bottle Total On Time
	[0 ~ 2,000,000 / 0 / 1 ms step] Displays the total ON time of the toner supply motor, calculated from when the toner bottle was replaced. Use this to check that the toner end count (SP2975) is working properly.	

	When SP2975 is set to any value other than "0", this value is displayed when it matches the setting of SP2975. When SP2975 is set to "0", SP2976 is disabled. SP2976 is automatically set to zero by toner end recovery.)

2980	Charge Counter
	[0 ~ 1000000 / 0 / 1 step] Sets the number of pages to print after toner and carrier initialization before the charge input is increased to compensate for deterioration over time in the polarity of the carrier. The strength in the polarity of the carrier in the toner will eventually decrease and cause lower charge output. Setting the charge output to increase after a specified number of copies can compensate for this effect.

2981	Polygon Mirror Rotation Switch DFU
	Switches the number revolutions per minute of the polygon mirror motor. 0: Rpm determined by engine 1: Rpm for 35 CPM (35 cpm) 2: Rpm for 45 CPM (45 cpm)

SP3-xxx: Process

3001	ID Sens Initial	ID Sensor Initial Setting
001	ID Sens PWM Set	ID Sensor PWM Setting
	[0 ~ 255 / 100 / 1 step] Allows you to reset the PWM of the ID sensor LED to avoid a service call error after clearing NVRAM or replacing the NVRAM. The PWM data is stored by executing SP-3001-2.	
002	Initial Setting	ID Sensor Initialization
	Performs the ID sensor initial setting. ID sensor output for the bare drum (VSG) is adjusted automatically to 4.0 ±0.2 V. Press "Execute" to start. Perform this setting after replacing or cleaning the ID sensor, replacing the drum, or clearing NVRAM.	

3103	ID Sens Out Disp	ID Sensor Output Display

	Presents on the display the current values of Vsg, Vsp, Vpdp, and grayscale control. If the ID sensor does not detect the ID pattern, "VSP = 5.0 V/VSG = 5.0 V" is displayed and an SC code is generated. If the ID sensor does not detect the bare area of the drum, "VSP = 0.0 V/VSG =0.0 V" is displayed and an SC code is generated.	
001	Vsg	Drum Surface Output
	[0V ~ 5.00V] Vsg is the ID sensor output after reading the bare drum surface. Normal display: 4±0.5 V SC350 (ID Sensor Pattern Test Error) is issued if this reading is abnormal.	
002	Vsp	ID Sensor Pattern Output
	[0V ~ 5.00V] Vsp is the ID sensor output after reading the ID sensor pattern: Normal display: 0.1 ~ 0.3 SC351 (ID Sensor Vsg Test Error) is issued if this reading is abnormal.	
003	Vpdp	Immediate Post-Pattern Output
	[0V ~ 5.00V] Vpdp is the ID sensor output immediately after Vsp output when the charge potential drops. This reading is used for design purposes to determine the development characteristics. DFU Normal display: 3.4 ~ 4.0 SC352 (ID Sensor Edge Detect Pattern Error) is issued if this reading is abnormal.	
004	Vsm/Vsg DFU	Grayscale Post-Pattern Output
	[0V ~ 5.00V] Vsm is the ID sensor output after reading the intermediate halftone pattern (grayscale) portion of the ID sensor pattern. Normal display: 65% ~ 85% (SP2972) **Note**: The addition of the intermediate halftone pattern to the ID sensor pattern and the Vpdp reading are features used by designers to check development characteristics.	

3905	Hot Roller Strip	Hot Roller Stripper Cleaning After Job

	Toner and carbon clinging to the hot roller strippers can cause poor print quality. To prevent this, toner and carbon are dislodged from the hot roller strippers by switching the fusing motor on/off after every print job. These SPs set up the operation of this feature.	
001	Number of Rotati	Number Rotations
	This SP sets the number of times the 1st Cleaning is done after the number of pages prescribed with SP3905 002 have been printed. [0~1/1/1] All fans remain on during cleaning and then switch off 60 sec. after the cleaning cycle ends. Raising this setting can increase wear on the hot roller and cleaning roller and shorten the service life of the hot roller.	
002	Number of Pages	
	This SP prescribes the number of pages to accumulate before the fusing motor is switched on/off (1 cycle). [0~5/5/13] Unless you change this setting, 15 sec. after a total of 5 pages have been printed (the accumulated total of one or more small jobs), or after a job of no more than 29 pages, the fusing motor will switch on for 15 sec. and then switch off. This 15 sec. off/15 sec. on at the end of a cleaning job is the 1st Cleaning.	
003	No. of addtnl. shee	Number additional sheets for 2nd hot roller stripper cleaning
	This SP prescribes the number of pages to print continuously before the fusing motor is switched on/off twice. [6 ~ 49 / 30 / 1] Unless you change this setting, 15 sec. after the end of every print job of 30 to 99 continuous pages, the 1st Cleaning will be done twice (fusing motor is switched on/off twice at 15 sec. intervals).	
004	No. of addtnl. shee	Number additional sheets for 3rd hot roller stripper cleaning
	This SP prescribes the number of pages to print continuously before the 1st Cleaning is done once at the end of the print job, pauses 45 sec., and then executes again. [50 ~ 999/ 100 / 1] Unless you change this setting, 15 sec. after the end of every print job of 100 to 999 continuous pages, the fusing motor will switch on for 15 sec., switch off for 4 sec. switch on for 15 sec. and then switch off. Switching the fusing motor on again for 15 sec. after 45 sec. have elapsed after the 1st Cleaning is called the 2nd Cleaning.	
005	No. times for 3r	No. of times for 3rd hot roller stripper cleaning

	This SP prescribes the number of times that the cleaning pattern of SP3905 004 is repeated for jobs that are longer than the number of pages prescribed by SP3905 004. [0~5/0/1] Unless you change this setting, the cleaning pattern of SP3904 (1st Cleaning, then the 2nd Cleaning after 35 sec.) is not repeated. If you change this setting to "1" for example, then the pattern will be repeated once.

006	Job/HR stripper	Job/hot roller stripper cleaning priority setting
	This SP setting determines whether cleaning is canceled if another job starts while cleaning is in progress. 0: New job priority (default) 1: Cleaning priority Setting this SP to "1" ensures that every cleaning cycle executes completely before another job is allowed to start.	

SP5-xxx: Mode

5024	mm/inch Display
	Selects whether mm or inches are used in the display. After selecting the number, you must turn the power switch off and on. Europe/Asia model: [0 = mm / 1 = inch] American model: [0 = mm / 1 = inch]

5037	Status Lamp Mode	Status Lamp Mode
	Determines whether the status lamp on the operation panel operates or not. If a customer finds the flashing of this lamp disturbing, use this SP to switch it off. [0~1/1/1] 0: Lamp operation off 1: Lamp operation on	

5051	TonerRefillDisp	Toner Refill Display
	Disables and enables the toner refill display. The display appears when the PCDU requires more toner. (Default: *Enable) *Enable, Disable	

5055	Display IP add	Display IP Address
	Switches the banner display of the IP address off and on. (Default: *Off) [OFF] ON For example, if this SP is switched on, the IP address will be displayed below "Ready" while the printer is in standby mode: **Ready** **169.254.187.055**	

5056	Coverage Counter
	[0~1/0/1] 0:Not Displayed 1:Displayed This SP switches the counter list for the system administrator on/off.

5104	Double Count	A3/DLT Double Count
	Specifies whether the counter is doubled for A3/DLT. “Yes” counts except from the bypass tray. When “Yes” is selected, A3 and DLT paper are counted twice, that is A4 x2 and LT x2 respectively.	

5131	PaperTypeSelect	Paper Size Type Selection
	0: Japan, 1: North America, 2: Europe Selects the paper size (type) for paper. (Default depends on DIP SW 101 setting.) After changing the setting, turn the machine off and on. If the paper size of the archive files stored on the HDD is different, abnormal copies could result.	

5150	Bypass Length Se	Bypass Length Setting
	Sets up the by-pass tray for long paper. [0~1/1] 0: Off 1: On. Sets the tray for feeding paper up to 600 mm long. If this SP is set to ‘on’, paper jams are not detected in the paper path.	

5179	By-pass Tray Pap	Bypass Paper Size Error
	This SP determines whether a paper size error prompt appears when the machine detects the wrong paper size for the job and jams during feed from the bypass tray.	

	[0~1/0/1] 0: Off 1: On

5302	Set Time **DFU**
	Sets the time clock for the local time. This setting is done at the factory before delivery. The setting is GMT expressed in minutes. [–1440~1440/1 min.] JA: +540 (Tokyo) NA: -300 (NY) EU: +6- (Paris) CH: +480 (Peking) TW: +480 (Taipei) AS: +480 (Hong Kong)

5307	Summer Time	
	Lets you set the machine to adjust its date and time automatically with the change to Daylight Savings time in the spring and back to normal time in the fall. This SP lets you set these items: - Day and time to go forward automatically in April. - Day and time to go back automatically in October. - Set the length of time to go forward and back automatically. The settings for 002 and 003 are done with 8-digit numbers:	
	Digits	**Meaning**
	1st, 2nd	Month. 4: April, 10: October (for months 1 to 9, the first digit of 0 cannot be input, so the eight-digit setting for 002 or 003 becomes a seven-digit setting)
	3rd	Day of the week. 0: Sunday, 1: Monday
	4th	The number of the week for the day selected at the 3rd digit. If "0" is selected for "Sunday", for example, and the selected Sunday is the start of the 2nd week, then input a "2" for this digit.
	5th, 6th	The time when the change occurs (24-hour as hex code). Example: 00:00 (Midnight) = 00, 01:00 (1 a.m.) = 01, and so on.
	7th	The number of hours to change the time. 1 hour: 1

	8th	If the time change is not a whole number (1.5 hours for example), digit 8should be 3 (30 minutes).
001	Setting	Enables/disables the settings for 002 and 003. [0~1/1] 0: Disable 1: Enable
002	Rule Set (Start)	The start of summer time.
004	Rule Set (End)	The end of summer time.

5404	UCodeCtrClr	User Code Count Clear
	Clears the counts for the user codes assigned by the key operator to restrict the use of the machine. Press [#Enter] to clear.	

5501	PM Alarm	
001	PM Alarm Level	[0~9999 / 0 / 1 step] 0: Alarm off 1~9999: Alarm goes off when Value (1~9999) ≥ PM counter
003	PCU Count	This SP sets the timing of the display warning for replacement of the PCU. When printing reaches this total, the replace PCU warning is issued. [0 ~ 150 / **150** / 1 step] 0: No alarm is issued For example, when the number of prints reaches 150,000 with the default setting of "150" in effect, (150 x 1,000) the warning is issued with the PM Counter Display (SP7803) after the number of prints exceeds 150,000.

5504	Jam Alarm **Japan Only**
	Sets the alarm to sound for the specified jam level (document misfeeds are not included). [0~3 / 3 / 1 step] 0: Zero (Off) 1: Low (2.5K jams) 2: Medium (3K jams)

	3: High (6K jams)

5505	Error Alarm
	Sets the error alarm level. **Japan only DFU** [0~255 / 50 / 100 copies per step]

5507	Supply Alarm	
001	Paper Supply Ala(rm)	0:Off 1:On Switches the control call on/off for the paper supply. **DFU** 0: Off, 1: On 0: No alarm. 1: Sets the alarm to sound for the specified number transfer sheets for each paper size (A3, A4, B4, B5, DLT, LG, LT, HLT)
002	Staple Supply Al(arm)	0:Off 1:On Switches the control call on/off for the stapler installed in the finisher. **DFU** 0: Off, 1: On 0: No alarm 1: Alarm goes off for every 1K of staples used.
003	Toner Supply Ala(rm)	(0:Off, 1:On) Switches the control call on/off for the toner end. **DFU** 0: Off, 1: On If you select "1" the alarm will sound when the machine detects toner end.
004	MaintenaceKit A(larm	Switches the alarm for the maintenance kit on/off. [*OFF, On]
128	Interval: Others	The "Paper Supply Call Level: nn" SPs specify the paper control call interval for the referenced paper sizes. **DFU** [00250 ~ 10000 / 1000 / 1 Step]
132	Interval: A3	
133	Interval: A4	
134	Interval: A5	
141	Interval: B4	

142	Interval: B5	
160	Interval: DLT	
164	Interval: LG	
166	Interval: LT	
172	Interval: HLT	

5515	SC Call Setting **Japan Only**	
	With NRS (New Remote Service) in use, these SP codes can be set to issue an SC call when an SC error occurs. If this SP is switched off, the SC call is not issued when an SC error occurs.	
001	SC Call Setting	[0~1/**1**/1] 0: Off 1: On
002	Service Parts Ne(ar End)	
003	Service Parts E(nd)	
004	User Call	
005	Not Used	[0~1/**1**/1]
006	Communication Te(st)	
007	Machine Informat(ion)	
008	Alarm Notic	
009	Non Genuine Ton(er)	
010	Supply Automatic	[0~1/**0**/1]
011	Supply Management (Report)	

5793	ECS Debug SW	ECS Debug Switch **DFU**

5801	Memory Clear	
	Resets NVRAM data to the default settings. Before executing any of these SP codes, print an SMC Report.	
001	All	Initializes items below.

002	Clear Engine	Initializes all registration settings for the engine and copy process settings.
003	SCS	Initializes default system settings, SCS (System Control Service) settings, operation display coordinates, and ROM update information.
004	IMH	Initializes the image file system. (IMH: Image Memory Handler)
05	MCS	Initializes the automatic delete time setting for stored documents. (MCS: Memory Control Service)
008	PRT	Initializes the printer defaults, programs registered, the printer SP bit switches, and the printer CSS counter.
010	WebService	Deletes the Netfile (NFA) management files and thumbnails, and initializes the Job login ID. Netfiles: Jobs to be printed from the document server using a PC and the DeskTopBinder software
011	NCS	Initializes the system defaults and interface settings (IP addresses also), the SmartDeviceMonitor for Admin settings, WebStatusMonitor settings, and the TELNET settings. (NCS: Network Control Service)
014	DCS Setting	Initializes the DCS (Delivery Control Service) settings.
015	Clear UCS Setting	Initializes the UCS (User Information Control Service) settings.
016	MIRS Setting	Initializes the MIRS (Machine Information Report Service) settings.
017	CCS	Initializes the CCS (Certification and Charge-control Service) settings.
018	SRM	Initializes the SRM (System Resource Manager) settings.
019	LCS Clear	Initializes the LCS (Log Count Service) settings.

5802	Printer Free Run	[Disable] [Enable]
	Performs a free run. The printer prints the number of blank prints requested for testing. [0 ~ 1 /**0** / 1 step]	

	0:Free run mode off. 1:Free run mode on.

5803	Input Check
	Displays the signals received from sensors and switches. (See "Input Check")

5804	Output Check
	Turns on the electrical components individually for test purposes. (See "Output Check")

5807	Option Connect Chk	Option Connection Check
002	Bank (Paper Tray Unit)	Execution will return either a "1" or "0": 0: Device not connected correctly. 1: Device connected correctly.
003	LCT	
004	Fin (Finisher)	

5811	MachineNo. Setting	Machine Number Code Setting **DFU**
	This SP presents the screen used to enter the 11-digit number of the machine. The allowed entries are "A" to "Z" and "0" to "9". The setting is done at the factory, and should not be changed in the field.	
001	Code Set	
003	ID2 Code Display	

5812	Tel. No. Setting	
001	Service	Inputs the telephone number of the CE (displayed when a service call condition occurs.)
002	FAX TEL No.	Use this to input the fax number of the CE printed on the Counter Report (UP mode). **Not Used**

5816	Remote Service
001	I/F Setting
	Turns the remote diagnostics off and on.

	[0~2/1] 0: Remote diagnostics off. 1: Serial (CSS or NRS) remote diagnostics on. 2: Network remote diagnostics.	
002	CE Call	
	Lets the service technician start or end the remote machine check with CSS or NRS; to do this, push the center report key	
003	Function Flag	
	Enables and disables remote diagnosis over the NRS network. [0~1/1] 0: Disables remote diagnosis over the network. 1: Enables remote diagnosis over the network.	
007	SSL Disable	
	Controls if RCG (Remote Communication Gate) confirmation is done by SSL during an RCG send for the NRS over a network interface. [0~1/1] 0: Yes. SSL not used. 1: No. SSL used.	
008	RCG Connect Time	RCG Connect Timeout
	Sets the length of time (seconds) for the time-out when the RCG (Remote Communication Gate) connects during a call via the NRS network. [1~90/1 sec.]	
009	RCG Write Timeou	RCG Write to Timeout
	Sets the length of time (seconds) for the time-out when sent data is written to the RCG during a call over the NRS network. [0~100/1 sec.]	
010	RCG Read Timeout	
	Sets the length of time (seconds) for the timeout when sent data is written from the RCG during a call over the NRS network. [0~100/1 sec.]	

011	Port 80 Enable	
	Controls if permission is given to get access to the SOAP method over Port 80 on the NRS network. [0~1/1] 0: No. Access denied 1: Yes. Access granted.	
021	RCG – C Registed	
	This SP displays the Cumin installation end flag. 1: Installation completed 2: Installation not completed	
022	RCG – C Registed Det	RCG – C Registered Detail
	This SP displays the Cumin installation status. 0: Basil not registered 1: Basil registered 2: Device registered	
023	Connect Type (N/M)	
	This SP displays and selects the Cumin connection method. 0: Internet connection 1: Dial-up connection	
061	Cert. Expire Timing **DFU**	
	Proximity of the expiration of the certification.	
062	Use Proxy	
	This SP setting determines if the proxy server is used when the machine communicates with the service center.	
067	CERT: Up State	
	Displays the status of the certification update.	
	0	The certification used by Cumin is set correctly.
	1	The certification request (setAuthKey) for update has been received from the GW URL and certification is presently being updated.

	2	The certification update is completed and the GW URL is being notified of the successful update.
	3	The certification update failed, and the GW URL is being notified of the failed update.
	4	The period of the certification has expired and new request for an update is being sent to the GW URL.
	11	A rescue update for certification has been issued and a rescue certification setting is in progress for the rescue GW connection.
	12	The rescue certification setting is completed and the GW URL is being notified of the certification update request.
	13	The notification of the request for certification update has completed successfully, and the system is waiting for the certification update request from the rescue GW URL.
	14	The notification of the certification request has been received from the rescue GW controller, and the certification is being stored.
	15	The certification has been stored, and the GW URL is being notified of the successful completion of this event.
	16	The storing of the certification has failed, and the GW URL is being notified of the failure of this event.
	17	The certification update request has been received from the GW URL, the GW URL was notified of the results of the update after it was completed, but an certification error has been received, and the rescue certification is being recorded.
	18	The rescue certification of No. 17 has been recorded, and the GW URL is being notified of the failure of the certification update.
068	CERT: Error	
	Displays a number code that describes the reason for the request for update of the certification.	
	0	Normal. There is no request for certification update in progress.
	1	Request for certification update in progress. The current certification has expired.
	2	An SSL error notification has been issued. Issued after the certification has expired.
	3	Notification of shift from a common authentication to an individual certification.
	4	Notification of a common certification without ID2.
	5	Notification that no certification was issued.

	6	Notification that GW URL does not exist.
069	CERT: Up ID	
	The ID of the request for certification.	
083	Firmware Up Status	
	Displays the status of the firmware update.	
084	Non-HDD Firm Up	
	This setting determines if the firmware can be updated, even without the HDD installed.	
085	Firm Up User Che	Firmware Up User Check
	This SP setting determines if the operator can confirm the previous version of the firmware before the firmware update execution. If the option to confirm the previous version is selected, a notification is sent to the system manager and the firmware update is done with the firmware files from the URL.	
086	Firmware Size	
	Allows the service technician to confirm the size of the firmware data files during the firmware update execution.	
087	CERT: Macro Ver	CERT: Macro Version
	Displays the macro version of the NRS certification	
088	CERT: PAC Ver	CERT: PAC Version
	Displays the PAC version of the NRS certification.	
089	CERT: ID2Code	
	Displays ID2 for the NRS certification. Spaces are displayed as underscores (_). Asteriskes (****) indicate that no NRS certification exists.	
090	CERT: Subject	
	Displays the common name of the NRS certification subject. CN = the following 17 bytes. Spaces are displayed as underscores (_). Asteriskes (****) indicate that no DESS exists.	
091	CERT: SerialNo.	CERT: Serial Number
	Displays serial number for the NRS certification. Asteriskes (****) indicate that no DESS exists.	
092	CERT: Issuer	

	Displays the common name of the issuer of the NRS certification. CN = the following 30 bytes. Asteriskes (****) indicate that no DESS exists.	
093	CERT: Valid Start	
	Displays the start time of the period for which the current NRS certification is enabled.	
094	CERT: Valid End	
	Displays the end time of the period for which the current NRS certification is enabled.	
099	DebugRescueGWURL	
	This SP allows viewing and setting the path for the Rescue G/W URL. However, if SP5816-036 with its factory default setting, the machine connects to the Rescue GW selection specified in the Rescue Certification. This SP is used to specify a Rescue G/W setting other than that specified by the default.	
200	Manual Polling	
	NIA	
201	Regist: Status	
	Displays a number that indicates the status of the NRS service device.	
	0	Neither the NRS device nor Cumin device are set.
	1	The Cumin device is being set. Only Box registration is completed. In this status the Basil unit cannot answer a polling request.
	2	The Cumin device is set. In this status the Basil unit cannot answer a polling request.
	3	The NRS device is being set. In this status the Cumin device cannot be set.
	4	The NRS module has not started.
202	Letter Number	
	Allows entry of the number of the request needed for the Cumin device.	
203	Confirm Execute	
	Executes the inquiry request to the NRS GW URL.	
204	Confirm Result	
	Displays a number that indicates the result of the inquiry executed with SP5816 203.	
	0	Succeeded

	1	Inquiry number error
	2	Registration in progress
	3	Proxy error (proxy enabled)
	4	Proxy error (proxy disabled)
	5	Proxy error (Illegal user name or password)
	6	Communication error
	7	Certification update error
	8	Other error
	9	Inquiry executing
205	Confirm Place	
	Displays the result of the notification sent to the device from the GW URL in answer to the inquiry request. Displayed only when the result is registered at the GW URL.	
206	Register Execute	
	Executes Cumin Registration.	
207	Register Result	
	Displays a number that indicates the registration result.	
	0	Succeeded
	2	Registration in progress
	3	Proxy error (proxy enabled)
	4	Proxy error (proxy disabled)
	5	Proxy error (Illegal user name or password)
	6	Communication error
	7	Certification update error
	8	Other error
	9	Registration executing
208	Error Code	

	Displays a number that describes the error code that was issued when either SP5816 204 or SP5816 207 was executed.		
	Cause	**Code**	**Meaning**
	Illegal Modem Parameter	-11001	Chat parameter error
		-11002	Chat execution error
		-11003	Unexpected error
	Operation Error, Incorrect Setting	-12002	Inquiry, registration attempted without acquiring device status.
		-12003	Attempted registration without execution of an inquiry and no previous registration.
		-12004	Attempted setting with illegal entries for certification and ID2.
	Error Caused by Response from GW URL	-2385	Attempted dial up overseas without the correct international prefix for the telephone number.
		-2387	Not supported at the Service Center
		-2389	Database out of service
		-2390	Program out of service
		-2391	Two registrations for same device
		-2392	Parameter error
		-2393	Basil not managed
		-2394	Device not managed
		-2395	Box ID for Basil is illegal
		-2396	Device ID for Basil is illegal
		-2397	Incorrect ID2 format
		-2398	Incorrect request number format
209	Instl Clear		
	NIA		
250	CommLog Print		

	Prints the communication log.

5821	Remote Service A	Remote Service Address **Japan Only**
001	CSS-PI Device C(ode)	Sets the PI device code. After you change this setting, you must turn the machine off and on.
002	RCG IP Address	Sets the IP address of the RCG (Remote Communication Gate) destination for call processing at the remote service center. [00000000h~FFFFFFFFh/1]

5824	NVRAM Upload
	Uploads the UP and SP mode data (except for counters and the serial number) from NVRAM on the control board to an SD card Note: While using this SP mode, always keep the front cover open. This prevents a software module accessing the NVRAM during the upload.

5825	NVRAM Download
	Downloads data from an SD card to the NVRAM in the machine. After downloading is completed, remove the card and turn the machine power off and on.

5828	Network	
	This machine supports both Internet Protocols IPv4 and IPv6. IPv6 is the next generation protocol designed by the IETF to replace IPV4. IPv6 adds many improvements such as routing and network auto-configuration.	
001	IPv4 Address	This SP allows you to confirm and reset the IPv4 address for Ethernet and a wireless LAN (802.11b): aaa.bbb.ccc.ddd For example, if the 8-bit entry is "192.168.000.001" this is read "0C0A80001h"
002	IPv4 Subnet Mask	This SP allows you to confirm and reset the IPv4 subnet mask for Ethernet and a wireless LAN (802.11b): aaa.bbb.ccc.ddd

		For example, if the 8-bit entry is "255.255.255.00" this is read "FFFFFF00h".
003	IPv4 DefaultGate	This SP allows you to confirm and reset the IPv4 default gateway used by the network for Ethernet and wireless LAN (802.11b): aaa.bbb.ccc.ddd For example, if the 8-bit entry is "192.169.000.001" this is read "0C0A80001h"
006	DHCP	This SP code allows you confirm and change the setting that determines whether the IP address is used with DHCP on an Ethernet or wireless (802.11b) LAN network. [0~1/1/0] 0: Not used (manual setting) 1: Used
021	ActIPv4Add	This SP allows you to confirm the IPv4 address that was used when the machine started up with DHCP. For example, if the the setting of the the IPv4 address is "0C0A80001h " this is displayed as "192.169.000.001".
022	ActIPv4 SbNet	This SP allows you to confirm the IPv4 subnet mask setting that was used when the machine started up with DHCP. For example, if the setting for the IPv4 subnet mask is "FFFFFF00H" this is displayed as "255.255.255.000"
023	ActIPv4GateW	This SP allows you to confirm the IPv4 default gateway setting that was used when the machine started up with DHCP. For example, if the setting for the IPv4 gateway is "0C0A80001h" this is displayed as "192.168.000.001".
050	1284 Compatible	Enables and disables bi-directional communication on the parallel connection between the machine and a computer. [0~1/1] 0:Off 1: On
052	ECP	Disables and enables the ECP feature (1284 Mode) for data transfer. [0~1/1] 0: Disabled 1: Enabled

<table>
<tr><td>065</td><td>Job Spool</td><td colspan="4">Switches job spooling spooling on and off.
0: No spooling 1: Spooling enabled</td></tr>
<tr><td>066</td><td>HD Job Clear</td><td colspan="4">This SP determines whether the job interrupted at power off is resumed at the next power on. This SP operates only when SP5828 065 is set to 1.
1: Resumes printing spooled jog.
0: Clears spooled job.</td></tr>
<tr><td rowspan="5">069</td><td rowspan="5">JobSpool Protocol</td><td colspan="4">This SP determines whether job spooling is enabled or dis-pabled for each protocol. This is a 8-bit setting.</td></tr>
<tr><td>0</td><td>LPR</td><td>4</td><td>BMLinks (Japan Only)</td></tr>
<tr><td>1</td><td>FTP (Not Used)</td><td>5</td><td>DIPRINT</td></tr>
<tr><td>2</td><td>IPP</td><td>6</td><td>Reserved (Not Used)</td></tr>
<tr><td>3</td><td>SMB</td><td>7</td><td>Reserved (Not Used)</td></tr>
<tr><td>090</td><td>TELNET</td><td colspan="4">Disables or enables Telnet operation. If this SP is disabled, the Telnet port is closed.
[0~1/1]
0: Disable
1: Enable</td></tr>
<tr><td>091</td><td>Web</td><td colspan="4">Disables or enables the Web operation.
[0~1/1]
0: Disable
1: Enable</td></tr>
<tr><td>145</td><td>ActIPv6LinkLocal</td><td colspan="4">This is the IPv6 local address referenced on the Ethernet or wireless LAN (802.11b) in the format:
"Link-Local address" + "Prefix Length"
The IPv6 address consists of a total 128 bits configured in 8 blocks of 16 bits each. These notations can be abbreviated. See "Note: IPV6 Addresses " below this table.</td></tr>
<tr><td>147</td><td>ActIPv6Sttles1</td><td colspan="4" rowspan="3">These SPs are the IPv6 stateless addresses (1 to 5) referenced on the Ethernet or wireless LAN (802.11b) in the format:
"Stateless Address" + "Prefix Length"</td></tr>
<tr><td>149</td><td>ActIPv6Sttles2</td></tr>
<tr><td>151</td><td>ActIPv6Sttles3</td></tr>
</table>

153	ActIPv6Sttles4	The IPv6 address consists of a total 128 bits configured in 8 blocks of 16 bits each.
155	ActIPv6Sttles5	
156	IPv6 Manual Address	This SP is the IPv6 manually set address referenced on the Ethernet or wireless LAN (802.11b) in the format: "Manual Set Address" + "Prefix Length" The IPv6 address consists of a total 128 bits configured in 8 blocks of 16 bits each. These notations can be abbreviated. See "Note: IPV6 Addresses" below this table.
158	IPv6 Gateway	This SP is the IPv6 gateway address referenced on the Ethernet or wireless LAN (802.11b). The IPv6 address consists of a total 128 bits configured in 8 blocks of 16 bits each. These notations can be abbreviated. See "Note: IPV6 Addresses " below this table.
161	IPv6StatelessAut	This SP allows you to confirm or set the setting for the stateless automatic setting function used by either the Ethernet or Wireless LAN (802.11b).

Note: IPV6 Addresses

Ethernet and the Wireless LAN (802.11b) reference the IPV6 "Link-Local address + Prefix Length". The IPV6 address consists of 128 bits divided into 8 blocks of 16 bits:

aaaa:bbbb:cccc:dddd:eeee:ffff:gggg:hhhh:

The prefix length is inserted at the 17th byte (Prefix Range: 0x0~0x80). The initial setting is 0x40(64).

For example, the data

2001123456789012abcdef012345678940h

is expressed:

2001:1234:5678:9012:abcd:ef01:2345:6789: prefixlen 64

However, the actual IPV6 address display is abbreviated according to the following rules.

- Rules for Abbreviating IPV6 Addresses -

1. The IPV6 address is expressed in hexadecimal delmited by colons (:) with the following characters:
   0123456789abcdefABCDEF
2. A colon is inserted as a delimiter every 4th hexadecimal character.
   fe80:0000:0000:0000:0207:40ff:0000:340e
3. The notations can be abbreviated by elminating zeros where the MSB and digits following the MSB are zero. The example in "2" above, then, becomes:

fe80:0:0:0207:40ff:0:340e

4. Sections where only zeros exist can be abbreviated with double colons (::). This abbreviation can be done also where succeeding sections contain only zeros (but this can be done only at one point in the address). The example in "2" and "3" above then becomes:

   fe80::207:40ff:0:340e (only the first null sets zero digits are abbreviated as "::")

   -or-

   fe80:0:0:0:207:40ff::340e (only the last null set before "340e" is abbreviated as "::")

5832	HDD Init.	Format HDD
	Press [#Enter] to initialize the HDD. After formatting is complete, turn the machine power off/on.	

5840	IEEE 802.11b
006	Channel Max
	Sets the maximum range of the bandwidth for the wireless LAN. This bandwidth setting varies for different countries. [1~14/1]
007	Channel Min
	Sets the minimum range of the bandwidth for operation of the wireless LAN. This bandwidth setting varies for different countries. [1~14/1]
011	WEP key number
	Determines how the initiator (SBP-2) handles subsequent login requests. [0~1/1] 0:If the initiator receives another login request while logging in, the request is refused. 1:If the initiator receives another login request while logging in, the request is refused and the initiator logs out. Note: Displayed only when the wireless LAN card is installed.

5842	NFA Analysis	Net File Application Analysis	
001	Setting 1		
	This is a debugging tool. It sets the debugging output mode of each Net File process.	Bit	Groups

	Bit SW 0011 1111 Note: The 7th bit (MSB) suppresses the debug level when set to OFF and outputs the debug level when set to ON. Bits 6-0 output when set to OFF (09 output the logs associated with the bits and suppress output when set to ON (1).	0	System & other groups (LSB)
		1	Capture related groups
		2	Certification related
		3	Address book related
		4	Machine management related
		5	Output related (printing, delivery server)
		6	Repository, FO document group related
002	Setting 2	Performs optional settings for the optional settings of each NFA process.	

5844	USB	
001	Transfer Rate	
	Sets the speed for USB data transmission. [Full Speed] [Auto Change]	
002	Vendor ID	
	Sets the vendor ID: Initial Setting: 0x05A Ricoh Company [0x0000~0xFFFF/1] DFU	
003	Product ID	
	Sets the product ID. [0x0000~0xFFFF/1] DFU	
004	DevReleaseNum	Device Release Number
	Sets the device release number of the BCD (binary coded decimal) display. [0000~9999/1] DFU Enter as a decimal number. NCS converts the number to hexadecimal number recognized as the BCD.	

5845	Delivery Srv	Delivery Server
	These are delivery server settings.	
003	Retry Interval	
	Sets the time interval before the machine tries again when it goes back to standby after an error occurs during an image transfer with the SMTP server. [60~900/1]	
004	No. of Retries	
	Sets the number of times the machine tries again before it returns to standby after an error occurs during an image transfer with the delivery or SMTP server. [0~99/1]	

5846	UCS Setting	
046	Init All Set&Dir	Initialize Address Book Seting and Directories
	The SP clears all the setting information managed in UCS and address book information (local, delivery, LDAP) and restores these settings to their default values. Use this SP to initial the account information (user codes and passwords) for system managers and users as well. **Note**: • Be sure to cycle the machine off and on after you execute this SP code. • Once this SP has been executed, a message on the screens of applications that use the address book will prompt users that the address book is being updated. This prevents the machine from issuing SC870. • The machine initializes to determine if the address book is stored on the HDD or on an SD card. In order for the machine to determine whether to recognize an address book on the HDD or the SD card, the machine must be cycled off and on once more to determine whether the machine should recognize the address book on the HDD or the SD card.	
047	Init Local AddrB	Initialize Local Address Book
	Clears all of the address information from the local address book of a machine managed with UCS.	
050	Init All Dir	Initialize All Address Book Directories
	Clears everything (including users codes) in the directory information managed by UCS. However, the accounts and passwords of the system administrators are not deleted.	
060	Search Option	

<table>
<tr><td></td><td colspan="3">This SP uses bit switches to set up the fuzzy search options for the UCS local address book.</td></tr>
<tr><td></td><td>Bit</td><td colspan="2">Meaning</td></tr>
<tr><td></td><td>0</td><td colspan="2">Checks both upper/lower case characters</td></tr>
<tr><td></td><td>1</td><td colspan="2" rowspan="3">Japan Only</td></tr>
<tr><td></td><td>2</td></tr>
<tr><td></td><td>3</td></tr>
<tr><td></td><td>4</td><td colspan="2">--- Not Used ---</td></tr>
<tr><td></td><td>5</td><td colspan="2">--- Not Used ---</td></tr>
<tr><td></td><td>6</td><td colspan="2">--- Not Used ---</td></tr>
<tr><td></td><td>7</td><td colspan="2">--- Not Used ---</td></tr>
<tr><td>062</td><td colspan="2">Complexity Opt1</td><td>Complexity Option 1</td></tr>
<tr><td></td><td colspan="3">Use this SP to set the conditions for password entry to access the local address book. Specifically, this SP limits the password entry to upper case and sets the length of the password.
[0~32/1]
Note:
• This SP does not normally require adjustment.
• This SP is enabled only after the system administrator has set up a group password policy to control access to the address book.</td></tr>
<tr><td>063</td><td colspan="2">Complexity Opt2</td><td>Complexity Option 2</td></tr>
<tr><td></td><td colspan="3">Use this SP to set the conditions for password entry to access the local address book. Specifically, this SP limits the password entry to lower case and defines the length of the password.
[0~32/1]
• This SP does not normally require adjustment.
• This SP is enabled only after the system administrator has set up a group password policy to control access to the address book.</td></tr>
<tr><td>064</td><td colspan="2">Complexity Opt3</td><td>Complexity Option 3</td></tr>
<tr><td></td><td colspan="3">Use this SP to set the conditions for password entry to access the local address book. Specifically, this SP limits the password entry to numbers and defines the length of the password.
[0~32/1]
• This SP does not normally require adjustment.</td></tr>
</table>

	• This SP is enabled only after the system administrator has set up a group password policy to control access to the address book.	
065	**Complexity Opt4**	Complexity Option 4
	Use this SP to set the conditions for password entry to access the local address book. Specifically, this SP limits the password entry to symbols and defines the length of the password. [0~32/1] Note: • This SP does not normally require adjustment. • This SP is enabled only after the system administrator has set up a group password policy to control access to the address book.	

5848	Web Service		
	5847 2 sets the 4-bit switch assignment for the access control setting. Setting of 0001 has no effect on access and delivery from Scan Router. 5847 100 sets the maximum size of images that can be downloaded. The default is equal to 1 gigabyte.		
004	ac:ud		Switches access control on and off. 0000: OFF, 0001: ON
009	ac:jc	Acc. Ctrl.: User Directory	
011	ac:dm		
210	Log Type: Job 1 **NIA**		
211	Log Type: Job 2 **NIA**		
212	Log Type: Access **NIA**		
213	Primary Srv **NIA**		
214	Secondary Srv **NIA**		
215	Start Time **NIA**		
216	Interval Time **NIA**		
217	Timing **NIA**		

5849	Installation Dat	Installation Date
	Displays or prints the installation date of the machine.	

001	Display	The "Counter Clear Day" has been changed to "Installation Date" or "Inst. Date".
003	Total Counter	Determines whether the installation date is printed on the printout for the total counter. [0~1/1] 0: No Print 1: Print

5851	Bluetooth Mode
	Sets the operation mode for the Bluetooth Unit. *Public Private Note: This printer does not support the use of Bluetooth at this time (April 2006)

5856	Remote ROM Update
	When set to "1" allows reception of firmware data via the local port (IEEE 1284) during a remote ROM update. This setting is reset to zero after the machine is cycled off and on. [0~1 / 0 / 1] 0: Not allowed 1: Allowed

5857	Save Debug Log
001	On/Off
	(1:ON 0:OFF) Switches on the debug log feature. The debug log cannot be captured until this feature is switched on. [0~1/1] 0: OFF 1: ON
002	Target
	(2: HDD 3: SD Card) Selects the destination where the debugging information generated by the event selected by SP5858 will be stored if an error is generated

	[2~3 /1] 2: HDD 3: SD Card	
005	Save to HDD	
	Specifies the decimal key number of the log to be written to the hard disk.	
006	Save to SD	
	Specifies the decimal key number of the log to be written to the SD Card.	
009	Copy HDD to SD (4 MB)	
	Takes the most recent 4 MB of the log written to the hard disk and copies them to the SD Card. A unique file name is generated to avoid overwriting existing file names on the SD Card. Up to 4MB can be copied to an SD Card. 4 MB segments can be copied one by one to each SD Card.	
010	Copy HDD to SD (Any)	
	Takes the log of the specified key from the log on the hard disk and copies it to the SD Card. A unique file name is generated to avoid overwriting existing file names on the SD Card. Up to 4 MB can be copied to an SD Card. 4 MB segments can be copied one by one to each SD Card. This SP does not execute if there is no log on the HDD with no key specified.	
011	Erase HDD Log	Erase Debug Data Log on HDD
	Erases all debug logs on the HDD	
012	Erase SD Log	Erase Debug Data Log on SD Card
	Erases all debug logs on the SD Card. If the card contains only debugging files generated by an event specified by SP5858, the files are erased when SP5857 010 or 011 is executed. To enable this SP, the machine must be cycled off and on.	
013	FreeSpaceonSD	Display Amount of Free Space on SD Card
	Displays the amount of space available on the SD card.	
014	Copy SD to SD (4MB)	
	Copies the last 4MB of the log (written directly to the card from shared memory) onto an SD card.	
015	Copy SD to SD (Any)	

	This SP copies the log on an SD card (the file that contains the information written directly from shared memory) to a log specified by key number.
016	Make HDD LogFile
	This SP creates a 32 MB file to store a log on the HDD.
017	Make SD LogFile
	This SP creates a 4 MB file to store a log on an SD card.

5858	DebugSaveWhen	
	These SPs select the content of the debugging information to be saved to the destination selected by SP5857 002. SP5858 3 stores one SC specified by number. Refer to Section 4 for a list of SC error codes.	
001	EngineSC Error	0:OFF 1:ON Stores SC codes generated by engine errors.
002	SystemSC Error	0:OFF 1:ON Stores SC codes generated by GW controller errors.
003	Any SC Error	0:OFF 1:ON [0~65535 / 0 / 1]
004	Jam	0:OFF 1:ON Stores jam errors.

5859	Debug Log Save Function	
001	Key 1	These SPs allow you to set up to 10 keys for log files for functions that use common memory on the controller board. [-9999999~9999999 / 0 / 1]
002	Key 2	
003	Key 3	
004	Key 4	
005	Key 5	
006	Key 6	
007	Key 7	

008	Key 8	
009	Key 9	
010	Key 10	

5860	SMTP/POP3/IMAP	SMTP/POP3/IMAP4
002	SMTP Svr Port No.	SMTP Server Port Number
	This SP sets the number of the SMTP server port. [1~65535/1]	
003	SMTP Auth	SMTP Certification
	This setting switches SMTP certification on and off for mail sending. 0: Off 1: On	
006	SMTP Auth Encryp	SMTP Certification Encryption
	This setting determines whether the password for SMTP certification is encrypted. 0: Automatic 1: No encryption done 2: Encryption done	
007	POP Before SMTP	
	This setting determines whether the transmission connects with the POP server first for certification before it connects to the SMTP server for sending. 0: No connection to POP server 1: Connection to POP server	
008	POP to SMTP Wait	Standby Wait Time After POP3 Certification
	This SP sets the amount of time to allow for the connection to the SMTP server after the transmission has connected to the POP server and been certified during the execution of POP Before SMTP. [0~10000/300/1]	
009	Rcv Protocol	Receive (RX) Protocol
	This SP specifies POP3 protocol or switches off receiving. 0: No receiving	

	1: POP3 protocol	
013	POP Auth Encrypt	POP3/IMAP4 Certification Encryption
	This SP specifies whether password encryption is done for POP3/IMAP4 certification. 0: Automatic 1: No encryption done 2: Encryption done	
014	POP Srv Port No	POP3 Server Port Number
	This SP sets the number of the POP3 server port. [1~65535/110/1]	
015	IMAP Srv Port No	IMAP4 Server Port Number
	This SP sets the number of the IMAP4 server port. [1~65535/143/1]	
016	SMTP Rcv Port No	SMTP RX Port Number
	This SP sets the number of the port that receives SMTP mail. [1~65535/25/1]	
017	Receive Interval	Mail RX Interval
	This SP sets the timing for mail received at regular intervals. [2~1440/15/1 min.] Note: Setting this SP to "0" switches off receiving mail at timed intervals.	
019	Mail Keep Sett.	Server Mail Storage Setting
	This SP setting determines whether received mail is stored on the server. 0: Received mail not stored 1: All received mail stored 2: Stores only mail that generated errors during receiving	
020	ParMail RecTOut	Partial Mail Receive Timeout
	[1~168/72/1] Sets the amount of time to wait before saving a mail that breaks up during reception. The received mail is discarded if the remaining portion of the mail is not received during this prescribed time.	
021	MDN Res RF2298	MDN Response RFC2298Compliance

	Determines whether RFC2298compliance is switched on for MDN reply mail. [0~1/1] 0: No 1: Yes	
022	SMTPAut FieldRep	SMTP Auth. From Field Replacement
	Determines whether the FROM item of the mail header is switched to the validated account after the SMTP server is validated. [0~1/1] 0: No. "From" item not switched. 1: Yes. "From" item switched.	
025	SMTP Auth Direct Sending	
	Occasionally, all SMTP certifications may fail with SP5860 006 set to "2" to enable encryption during SMTP certification for the SMTP server. This can occur if the SMTP server does not meet RFC standards. In such cases you can use this SP to set the SMTP certification method directly. However, this SP can be used only after SP5860 003 has been set to "1" (On). Bit0: LOGIN Bit1: PLAIN Bit2: CRAM_MD5 Bit3: DIGEST_MD5 Bit4 to Bit 7: Not Used	

5866	E-Mail Report	
	This SP controls operation of the email notification function.	
001	E-Mail Validity	Disables and re-enables the email notification feature. [0~1/0/1] 0: Enable 1: Disable
005	Add DateField	Disables and re-enables the addition of a date field to the email notification. [0~1/0/1]

5869	RAM Disk Setting	Use RAM Disk

	This SP determines whether the RAM disk is used for either the mail function or PDL Storage. [0~1/0/1] 0:Used 1:Not used	
001	Mail Function	
002	PDL Storage	Sets the amount of RAM disk used for PDL storage. The size of the RAM disk may need adjustment, depending on the amount of memory in the machine. [0~255/4/1]

5870	Common Key Info W	Common Key Information Writing
	Writes to flash ROM the common proof for validating the device for NRS specifications.	
001	Writing	These SPs are for future use and currently are not used.
003	Initialize	

5873	SDCardAppliMove	Move Application on SD Card to Another SD Card
	Allows you to move applications from one SD card another. For more, see "Merging Applications on One SD Card"	
001	Move Exec	Executes the move from one SD card to another.
002	Undo Exec	This is an undo function. It cancels the previous execution.

5876	Security Clear **DFU**	
	This SP code clears all security data, only security data in the NCS area, or only security data in the UCS area.	
001	All Clear	
011	Clear NCS Sec.	
015	Clr UCS Sercurity	

5878	Option Setup	Data Overwrite Security (DOS) Setup
	Press [#Enter] to initialize the Data Overwrite Security option. For more, see "MFP Controller Options" in Section "1. Installation".	

5886	ROM Update	
	The setting of this SP allows or prohibits updating the ROM. *0:YES, 1:NO	

5907	Plug/Play	Plug & Play Maker/Model Name
	Selects the brand name and the production name for Windows Plug & Play. This information is stored in the NVRAM. If the NVRAM is defective, these names should be registered again.	

5915	MechCountDetect	Mechanical Counter Detection
	0: Not detected, 1: Detected, 2: Unknown Confirms that the mechanical counter inside the inner cover is connected.	

5930	Meter Charge
	This SP operates a "meter click charge" that maintains a total counter for the PCU, fusing unit, and other components. When this SP is switched on, the use of the PCU, for example, is not monitored by the engine but the engine counter continues to operate.

5961	Finisher Stack	Finisher Paper Stack to Shift Tray?
	0: OFF, 1: ON Selects whether or not all stapled copies are sent to Shift Tray 1 when the Two-Tray finisher is installed.	

5990	SP Print Mode	SMC Print
	In the SP mode, press Copy Window to move to the copy screen, select the paper size, then press Start. Select A4/LT (Sideways) or larger to ensure that all the information prints. Press SP Window to return to the SP mode, select the desired print, and press Execute.	
001	All (Data List)	All (Data List)
002	SP (Mode Data Li)	SP (Mode Data List)
004	Logging Data	Logging Data
005	Diagnostic Repor	Diagnostic Report
006	Non-Default	Non-Default (Prints only SPs set to values other than defaults.)

007	NIB Summary	NIB (Network Interface Board) Summary

SP6-xxx: Peripherals

6105	Staple Adj	Staple Position Adjustment
	[–3.5~+3.5 / 0.0 / 0.5 mm step] Adjusts the staple position in the main scan direction when using the two-tray finisher.	

6113	Punch Pos Adj	Punch Hole Position Adjustment
	Adjusts the punch hole position. SP6113 1: 2-hole punches for Japan, North America, Europe, and 4-hole punches for Northern Europe. SP6113 2: 3-hole punches for North America, and 4-hole punches for Europe.	
001	2-Hole	[–7.5~+7.5 / 0 / 0.5 mm steps]
002	3-Hole	[–7.5~+7.5 / 0 / 0.5 mm steps]

SP7-xxx: Data Log

7001	Main M Op Time	Main Motor Operation Time
	Display: 000 0000~999 9999 min The number of prints and drive time for drum revolutions can be obtained by counting the main motor revolution time. If the amount of time required for the drum to revolve to print 1 copy increases, this data combined with the number of copies can be used to analyze problems and could be useful for future product development.	

7401	SC Counter	Total SC Counter
	Displays the total number of service calls that have occurred. Display range: 0000~9999	

7403	Latest10SCLog	SC History (Latest 10 only)
001	Latest	Displays the most recent service calls successive groups of 10.
002	Latest 1	

003	Latest 2	
004	Latest 3	
005	Latest 4	
006	Latest 5	
007	Latest 6	
008	Latest 7	
009	Latest 8	
010	Latest 9	

7502	Total Jam	Total Paper Jam Counter
	Displays the total number of copy jams. Display range: 0000~9999	

7504	Total Jam by Location	
	Displays the list of possible locations where a jam could have occurred. Press the appropriate key to display the jam count for that location. These jams are caused by the failure of a sensor to activate. Note: In the table below, "ON" denotes a late error (the paper failed to arrive at the prescribed time), and "OFF" denotes a lag error (the paper failed to leave at the prescribed time).	
	Error	**Meaning**
001	At Power On	Power on
003	Tray 1: ON	Tray 1 Misfeed
004	Tray 2: ON	Tray 2 Misfeed
005	Tray 3: ON	Tray 3 Misfeed
006	Tray 4: ON	Tray 4 Misfeed
007	LCT: ON	LCT Tray Sensor
008	Feed Sensor 1:ON	Relay Sensor 1
009	Feed Sensor 2:ON	Relay Sensor 2

010	Feed Sensor 3:ON	Relay Sensor 3
013	Registration: ON	Registration Sensor:Paper Late
014	Fusing Sensor:ON	-
016	Exit Sensor:ON	-
017	Relay Exit:ON	-
018	Relay Feed:ON	-
019	Duplex: ON	Duplex Entrance Sensor
023	Duplex Exit: ON	Duplex Exit Sensor
025	Finisher Entrance	Finisher Entrance Sensor
026	Finisher Proof	Finisher Proof Tray
027	Finisher Shift Tray	Finisher Shift Tray
028	Finisher Staple	Finisher Staple Tray
029	Finisher Exit	Finisher Tray
057	LCT:OFF	LCT Tray Sensor- Paper Lag Error
058	Feed Sensor 1:OFF	-
059	Feed Sensor 2:OFF	-
060	Feed Sensor 3:OFF	-
061	Feed Sensor 4:OFF	-
063	Registration: OFF	Registration Sensor: Paper Lag
066	Exit Sensor:OFF	-
067	Relay Exit:OFF	-
068	Relay Feed:OFF	-
069	Duplex: OFF	Duplex Entrance Sensor: Paper Lag Error
073	Duplex Exit: OFF	Duplex Exit Sensor: Paper Lag Error

7506	Jam Count by Paper Size

	Displays the total number of jams by paper size.	
005	A4 LEF	Displays the total number of jams by paper size.
006	A5 LEF	
014	B5 LEF	
038	LT LEF	
044	HLT LEF	
132	A3 SEF	
133	A4 SEF	
134	A5 SEF	
141	B4 SEF	
142	B5 SEF	
160	DLT SEF	
164	LG SEF	
166	LT SEF	
172	HLT SEF	
255	Others	

7507	Jam History	
001	Latest	Displays the copy jam history (the most recent 10 jams) Sample Display: CODE:007 SIZE:05h TOTAL:0000334 DATE:Mon Mar 15 11:44:50 2000 where: CODE is the SP7504-** number (see above. SIZE is the ASAP paper size code in hex. TOTAL is the total jam error count
002	Latest 1	
003	Latest 2	
004	Latest 3	
005	Latest 4	
006	Latest 5	
007	Latest 6	
008	Latest 7	

009	Latest 8		DATE is the date the jams occurred.			
010	Latest 9					
-	Size	Code	Size	Code	Size	Code
-	A4 (S)	05	A3 (L)	84	DLT (L)	A0
-	A5 (S)	06	A4 (L)	85	LG (L)	A4
-	B5 (S)	0E	A5 (L)	86	LT (L)	A6
-	LT (S)	26	B4 (L)	8D	HLT (L)	AC
-	HLT (S)	2C	B5 (L)	8E	Others	FF

7803	PM Counter Displ	Displays the PM counter since the last PM.
	Displays the PM counter since the last PM and resets the counter for PCU replacement to zero. When the count exceeds the setting for SP5501-03, the PCU count warning for replacement is displayed.	
001	Paper	This count is for the number of pages that exit the machine. Range: 0~9 999 999
002	PCU	

7804	PM Counter Reset	Resets the PM counter. To reset, push [1].

7807	SC/Jam Counter Reset	Resets the SC and jam counters. To reset, push [1].
	This SP does not reset the jam history counters: SP7-507, SP7-508.	

7832	Diag. Result	
	This SP displays the results of the self-diagnostic test executed at start up, or executed manually by switching the machine off, holding down [Online] and [#Enter], and then switching the machine on.	

7833	Pixel Coverage R	Pixel Coverage Ratio
	Displays the coverage ratio of the output (the ratio of the total pixel area of the image data to the total printable area on the paper). This value is not directly proportional to the amount of toner consumed, although of course it is one factor that affects this amount. The other major factors include: the type, toner concentration, and development potential.	

001	Last Pages	Last Pages	0% to 100%.
002	Average Pages	Average Pages	0% to 100%.
003	Toner Bottle In	Toner Bottles In Use	0 to 65,535 copies
004	Copy Count: Prev	Print Count: Previous Toner Bottle	0 to 999,999 copies
005	Copy Count:Tone	Print Count: Toner Bottle Before Previous	0 to 999,999 copies

7834	Clear Pixel Cove	Clear Pixel Coverage Data
	These SPs clear the counters for the following items.	
001	Last & Average	-
002	Toner Bottle In	-
003	Page Counts (2P	-
004	Dot Coverage Clear	-

7836	Total Memory Size
	Displays the memory capacity of the controller system.

7901	Assert Info. . **DFU**	
001	File Name	Used for debugging.
002	# of Lines	
003	Location	

7910	ROM No	ROM Number				
7911	Firmware Ver.	Firmware Version				
-	Use these SP codes to display the ROM number (SP7910) and firmware version number (SP7911). This is the same information that appears under the "[ROM No./Firmware Version]" in the Self-Diagnostic Report printed with SP5990-005. Use these SP codes to display this information for quick reference or if you cannot print the report with SP5990-005.					
-	001	System	154	R16	182	FONT2

-	002	Engine	155	RPGL	183	FONT3
-	007	Finisher	156	R55	200	Factory
-	009	Bank (PTU)	157	RTIFF	202	Net File
-	010	LCT	158	PCL	204	Printer
-	018	NIB	159	PCXL	209	Test Suite
-	023	HDD Format Optio	160	MSIS	210	MIB
-	131	Bluetooth	161	MSIS(OPTION)	211	Web System
-	150	RPCS	162	PDF	213	SDK1
-	151	PS	163	BMLinks	214	SDK2
-	152	RPDL	180	FONT	215	SDK3
-	153	R98	181	FONT1	-	-

SP8XXX: Data Log 2

The SPs in this group are prefixed with a letter that indicates the mode of operation. The mode of operation is referred to as an 'application'. Before reading the Group 8 Service Table, make sure that you understand what these prefixes mean.

Prefix	Application	What It Means
T:	Total:	Grand total of the items counted for all applications (C, F, P, etc.).
P:	Print.	Totals (pages, jobs, etc.) executed for each application when the job was not stored on the document server.
L:	Local	Local storage (document server). Totals (jobs, pages, etc.) for the document server. The L: counters work differently case by case. Sometimes, they count jobs/pages stored on the document server; this can be in document server mode (from the document server window), or from another mode, such as from a printer driver. Sometimes, they include occasions when the user uses a file that is already on the document server. Each counter will be discussed case by case.
O:	Other	Other applications (external network applications, etc.). Refers to network applications such as Web Image Monitor. Utilities developed with the SDK (Software Development Kit) are also counted.

Group 8 SP codes are limited to 17 characters, forced by the necessity of displaying them on the small LCDs of printers and faxes that also use these SPs. Read over the list of abbreviations below and refer to it again if you see the name of an SP that you do not understand.

Note

- This is a complete list of abbreviations applies to all machines, including color copiers and printers. Therefore, not all of them are used in this manual.

Key for Abbreviations

Abbreviation	What It Means
/	"By", e.g. "T:Jobs/Apl" = Total Jobs "by" Application
>	More (2> "2 or more", 4> "4 or more"
AddBook	Address Book
Apl	Application
B/W	Black & White
Bk	Black
C	Cyan
ColCr	Color Create
ColMode	Color Mode
Comb	Combine
Comp	Compression
Deliv	Delivery
DesApl	Designated Application. The application (Copy, Fax, Scan, Print) used to store the job on the document server, for example.
Dev Counter	Development Count, no. of pages developed.
Dup, Duplex	Duplex, printing on both sides
Emul	Emulation
FC	Full Color
FIN	Post-print processing, i.e. finishing (punching, stapling, etc.)
Full Bleed	No Margins

Abbreviation	What It Means
GenCopy	Generation Copy Mode
GPC	Get Print Counter. For jobs 10 pages or less, this counter does not count up. For jobs larger than 10 pages, this counter counts up by the number that is in excess of 10 (e.g., for an 11-page job, the counter counts up 11-10 =1)
IFax	Internet Fax
ImgEdt	Image Edit performed on the original with the copier GUI, e.g. border removal, adding stamps, page numbers, etc.
K	Black (YMCK)
LS	Local Storage. Refers to the document server.
LSize	Large (paper) Size
Mag	Magnification
MC	One color (monochrome)
NRS	New Remote Service, which allows a service center to monitor machines remotely. "NRS" is used overseas, "CSS" is used in Japan.
Org	Original for scanning
OrgJam	Original Jam
Palm 2	Print Job Manager/Desk Top Editor: A pair of utilities that allows print jobs to be distributed evenly among the printers on the network, and allows files to moved around, combined, and converted to different formats.
PC	Personal Computer
PGS	Pages. A page is the total scanned surface of the original. Duplex pages count as two pages, and A3 simplex count as two pages if the A3/DLT counter SP is switched ON.
PJob	Print Jobs
Ppr	Paper
PrtJam	Printer (plotter) Jam
PrtPGS	Print Pages

Abbreviation	What It Means
R	Red (Toner Remaining). Applies to the wide format model A2 only. This machine is under development and currently not available.
Rez	Resolution
SC	Service Code (Error SC code displayed)
Scn	Scan
Sim, Simplex	Simplex, printing on 1 side.
S-to-Email	Scan-to-E-mail
SMC	SMC report printed with SP5990. All of the Group 8 counters are recorded in the SMC report.
Svr	Server
TonEnd	Toner End
TonSave	Toner Save
TXJob	Send, Transmission
YMC	Yellow, Magenta, Cyan
YMCK	Yellow, Magenta, Cyan, BlacK

Note

- All of the Group 8 SPs are reset with SP5 801 1 Memory All Clear.

8001	T:Total Jobs	These SPs count the number of times each application is used to do a job. [0~9999999/ 0 / 1]
8004	P:Total Jobs	

- These SPs reveal the number of times an application is used, not the number of pages processed.
- When an application is opened for image input or output, this counts as one job.
- Interrupted jobs (paper jams, etc.) are counted, even though they do not finish.
- Only jobs executed by the customer are counted. Jobs executed by the service technician using the SP modes are not counted.
- When a print job is stored on the document server, only the L: counter increments.
- When the user enters document server mode and prints data stored on the document server, only the L: counter increments.

- When an image received from Palm 2 is received and stored, the L: counter increments.

8021	T:Pjob/LS	These SPs reveal how files printed from the document server were stored on the document server originally. [0~9999999/ 0 / 1]
8024	P:Pjob/LS	
8027	O:Pjob/LS	

- When a job already on the document server is printed with another application, the L: counter increments.
- When images stored on the document server by a network application (including Palm 2), are printed with another application, the O: counter increments.

8031	T:Pjob/DesApl	These SPs reveal what applications were used to output documents from the document server. [0~9999999/ 0 / 1]
8034	P:Pjob/DesApl	
8037	O:Pjob/DesApl	

- When documents already stored on the document server are printed, the count for the application that started the print job is incremented.
- When the print job is started from a network application (DeskTopBinder, Web Image Monitor, etc.) the L: counter increments.

8061	T:FIN Jobs	[0~9999999/ 0 / 1]
	These SPs total the finishing methods. The finishing method is specified by the application.	
8064	P:FIN Jobs	[0~9999999/ 0 / 1]
	These SPs total finishing methods for print jobs only. The finishing method is specified by the application.	
8067	O:FIN Jobs	[0~9999999/ 0 / 1]
	These SPs total finishing methods for jobs executed by an external application over the network. The finishing method is specified by the application.	

806x 1	Sort	Number of jobs started in Sort mode. When a stored copy job is set for Sort and then stored on the document server, the L: counter increments. (See SP8066 1)
806x 2	Stack	Number of jobs started out of Sort mode.
806x 3	Staple	Number of jobs started in Staple mode.

806x 4	Booklet	Number of jobs started in Booklet mode. If the machine is in staple mode, the Staple counter also increments.
806x 5	Z-Fold	Number of jobs started In any mode other than the Booklet mode and set for folding (Z-fold).
806x 6	Punch	Number of jobs started in Punch mode. When Punch is set for a print job, the P: counter increments. (See SP8064 6.)
806x 7	Other	Reserved. Not used.

8071	T:Jobs/PGS		[0~9999999/ 0 / 1]
	These SPs count the number of jobs broken down by the number of pages in the job, regardless of which application was used.		
8074	P:Jobs/PGS		[0~9999999/ 0 / 1]
	These SPs count and calculate the number of print jobs by size based on the number of pages in the job.		
8077	O:Jobs/PGS		[0~9999999/ 0 / 1]
	These SPs count and calculate the number of "Other" application jobs (Web Image Monitor, Palm 2, etc.) by size based on the number of pages in the job.		
807x 1	1 Page	807x 8	21~50 Pages
807x 2	2 Pages	807x 9	51~100 Pages
807x 3	3 Pages	807x 10	101~300 Pages
807x 4	4 Pages	807x 11	301~500 Pages
807x 5	5 Pages	807x 12	501~700 Pages
807x 6	6~10 Pages	807x 13	701~1000 Pages
807x 7	11~20 Pages	807x 14	1001~ Pages

- Interrupted jobs (paper jam, etc.) are counted, even though they do not finish.
- If a job is paused and re-started, it counts as one job.
- If the finisher runs out of staples during a print and staple job, then the job is counted at the time the error occurs.

8381	T:Total PrtPGS	These SPs count the number of pages printed by the customer. The counter for the application used for storing the pages increments. [0~9999999/ **0** / 1] The L: counter counts the number of pages stored from within the document server mode screen at the operation panel. Pages stored with the Store File button from within the Copy mode screen go to the C: counter.
8384	P:Total PrtPGS	
8387	O:Total PrtPGS	

- When the A3/DLT double count function is switched on with SP5104, 1 A3/DLT page is counted as 2.
- When several documents are merged for a print job, the number of pages stored are counted for the application that stored them.
- These counters are used primarily to calculate charges on use of the machine, so the following pages are not counted as printed pages:
  - Blank pages in a duplex printing job.
  - Reports printed to confirm counts.
  - All reports done in the service mode (service summaries, engine maintenance reports, etc.)
  - Test prints for machine image adjustment.
  - Error notification reports.
  - Partially printed pages as the result of a jam.

8391	LSize PrtPGS	[0~9999999/ 0 / 1]
	These SPs count pages printed on paper sizes A3/DLT and larger.	

8411	Prints/Duplex	This SP counts the amount of paper (front/back counted as 1 page) used for duplex printing. Last pages printed only on one side are not counted. [0~9999999/ 0 / 1]

8421	T:PrtPGS/Dup Comb	[0~9999999/ 0 / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing. This is the total for all applications.	
8424	P:PrtPGS/Dup Comb	[0~9999999/ 0 / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing by the printer application.	

8427	O:PrtPGS/Dup Comb	[0~9999999/ 0 / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing by Other applications	
842x 1	Simplex> Duplex	-
842x 4	Simplex Combine	-
842x 5	Duplex Combine	-
842x 6	2>	2 pages on 1 side (2-Up)
842x 7	4>	4 pages on 1 side (4-Up)
842x 8	6>	6 pages on 1 side (6-Up)
842x 9	8>	8 pages on 1 side (8-Up)
842x 10	9>	9 pages on 1 side (9-Up)
842x 11	16>	16 pages on 1 side (16-Up)
842x 12	Booklet	-
842x 13	Magazine	-

- These counts are especially useful for customers who need to improve their compliance with ISO standards for the reduction of paper consumption.
- Pages that are only partially printed with the n-Up functions are counted as 1 page.

8431	T:PrtPGS/ImgEdt	[0~9999999/ 0 / 1]
	These SPs count the total number of pages output with the three features below, regardless of which application was used.	
8434	P:PrtPGS/ImgEdt	[0~9999999/ 0 / 1]
	These SPs count the total number of pages output with the three features below with the print application.	
8437	O:PrtPGS/ImgEdt	[0~9999999/ 0 / 1]
	These SPs count the total number of pages output with the three features below with Other applications.	
843x 1	Cover/Slip Sheet	Total number of covers or slip sheets inserted. The count for a cover printed on both sides counts 2.

843x 2	Series/Book	The number of pages printed in series (one side) or printed as a book with booklet right/left pagination.
843x 3	User Stamp	The number of pages printed where stamps were applied, including page numbering and date stamping.

8441	T:PrtPGS/Ppr Size	[0~9999999/ 0 / 1]
	These SPs count by print paper size the number of pages printed by all applications.	
8444	P:PrtPGS/Ppr Size	[0~9999999/ 0 / 1]
	These SPs count by print paper size the number of pages printed by the printer application.	
8447	O:PrtPGS/Ppr Size	[0~9999999/ 0 / 1]
	These SPs count by print paper size the number of pages printed by Other applications.	
844x 1	A3	-
844x 2	A4	
844x 3	A5	
844x 4	B4	
844x 5	B5	
844x 6	DLT	
844x 7	LG	
844x 8	LT	
844x 9	HLT	
844x 10	Full Bleed	
844x 254	Other (Standard)	
844x 255	Other (Custom)	

- These counters do not distinguish between LEF and SEF.

8451	PrtPGS/Ppr Tray	[0~9999999/ 0 / 1]
	These SPs count the number of sheets fed from each paper feed station.	
001	Bypass Tray	Bypass Tray
002	Tray 1	Main Machine
003	Tray 2	Main Machine
004	Tray 3	Paper Tray Unit (Option)
005	Tray 4	Paper Tray Unit (Option)
006	Tray 5	LCT (Option)
007	Tray 6	Currently not used.
008	Tray 7	
009	Tray 8	
010	Tray 9	

8461	T:PrtPGS/Ppr Type	[0~9999999/ 0 / 1]
	These SPs count by paper type the number pages printed by all applications. • These counters are not the same as the PM counter. The PM counter is based on feed timing to accurately measure the service life of the feed rollers. These counts are based on output timing. • Blank sheets (covers, chapter covers, slip sheets) are also counted. • During duplex printing, pages printed on both sides count as 1, and a page printed on one side counts as 1.	
8464	P:PrtPGS/Ppr Type	[0~9999999/ 0 / 1]
	These SPs count by paper type the number pages printed by the printer application.	
846x 1	Normal	
846x 2	Recycled	
846x 3	Special	
846x 4	Thick	
846x 5	Normal (Back)	

846x 6	Thick (Back)
846x 7	OHP
846x 8	Other

8471	PrtPGS/Mag	[0~9999999/ 0 / 1]
	These SPs count by magnification rate the number of pages printed. (The magnification settings are done in the printer driver.)	
001	~49%	
002	50%~99%	
003	100%	
004	101%~200%	
005	201% ~	

- Counts are done for magnification adjusted for pages, not only on the operation panel but performed remotely with an external network application capable of performing magnification adjustment as well.
- Magnification adjustments done with printer drivers with PC applications such as Excel are also counted.
- Magnification adjustments done for adjustments after they have been stored on the document server are not counted.
- Magnification adjustments performed automatically during Auto Reduce/Enlarge copying are counted.
- The magnification rates of blank cover sheets, slip sheets, etc. are automatically assigned a rate of 100%.

8481	T:PrtPGS/TonSave
8484	P:PrtPGS/TonSave
	These SPs count the number of pages printed with the Toner Save feature switched on. [0~9999999/ 0 / 1]

8511	T:PrtPGS/Emul	[0~9999999/ 0 / 1]
	These SPs count by printer emulation mode the total number of pages printed.	

8514	P:PrtPGS/Emul	[0~9999999/ 0 / 1]
	These SPs count by printer emulation mode the total number of pages printed.	
001	RPCS	-
002	RPDL	
003	PS3	
004	R98	
005	R16	
006	GL/GL2	
007	R55	
008	RTIFF	
009	PDF	
010	PCL5e/5c	
011	PCL XL	
012	IPDL-C	
013	BM-Links	**Japan Only**
014	Other	-

- SP8511 and SP8514 return the same results because they are both limited to the Print application.
- Print jobs output to the document server are not counted.

8521	T:PrtPGS/FIN	[0~9999999/ 0 / 1]
	These SPs count by finishing mode the total number of pages printed by all applications.	
8524	P:PrtPGS/FIN	[0~9999999/ 0 / 1]
	These SPs count by finishing mode the total number of pages printed by the Print application.	
852x 1	Sort	
852x 2	Stack	
852x 3	Staple	

852x 4	Booklet
852x 5	Z-Fold
852x 6	Punch
852x 7	Other

- If stapling is selected for finishing and the stack is too large for stapling, the unstapled pages are still counted.
- The counts for staple finishing are based on output to the staple tray, so jam recoveries are counted.

8531	Staples	This SP counts the number of staples used by the machine. [0~9999999/ 0 / 1]

8581	T:Counter	[0~9999999/ 0 / 1]
	These SPs count the total output broken down by color output, regardless of the application used. In addition to being displayed in the SMC Report, these counters are also displayed	

8591	O:Counter	[0~9999999/ 0 / 1]
	These SPs count the totals for A3/DLT paper used, number of duplex pages printed, and the number of staples used. These totals are for Other (O:) applications only.	
001	A3/DLT	-
002	Duplex	

8601	Coverage Counter	
	These counts correspond to the total counts recorded with the mechanical counter.	
001	Cvg: BW %	Coverage: BW Pages
011	Cvg: BW Pages	Coverage: BW Percent

8771	Dev Counter	[0~9999999/ 0 / 1]
	This SP counts the number of development roller rotations for development. frequency of use (number of rotations of the development rollers) for black.	

8781	Pixel Coverage Ratio	
	This SP displays the count for the number of toner bottles used. The count is done based on the assumption that one toner bottle yields about 1,000 printed pages.	

8801	Toner Remain	[0~100/ 0 / 1]
	This SP displays (as a percentage) the amount of toner remaining. This precise method of measuring remaining toner supply (1% steps) is better than other machines in the market that can only measure in increments of 10 (10% steps).	

8851	Toner Coverage 0-10%	[0~9999999]
	These SPs count the percentage of dot coverage for K toner.	
011	0~2%:BK	-
021	3~4%:BK	-
031	5~7%:BK	-
041	8~10%:BK	-

8861	Toner Coverage 11-20%	[0~9999999]
	This SP counts the number of prints that had a percentage of black dot coverage in the range 11-20%.	

8871	Toner Coverage 21-30%	[0~9999999]
	This SP counts the number of prints that had a percentage of black dot coverage in the range 21-30%.	

8881	Toner Coverage 31 -%	[0~9999999]
	This SP counts the number of prints that had a percentage of black dot coverage in the range above 31%.	

8891	Coverage Display (Current)	**DFU**
8901	Coverage Display (Previous)	**DFU**
8911	Coverage Display (Before Previous)	**DFU**

8921	Dot Coverage Count Total	-
	These counters count the percentage of dot coverage for K toner. (This machine uses only black toner)	
001	Coverage (%):BK	-
002	Coverage/P:BK	-

8941	Machine Status	[0~9999999/ 0 / 1]
	These SPs count the amount of time the machine spends in each operation mode. These SPs are useful for customers who need to investigate machine operation for improvement in their compliance with ISO Standards.	
001	Operation Time	Engine operation time. Does not include time while controller is saving data to HDD (while engine is not operating).
002	Standby Time	Engine not operating. Includes time while controller saves data to HDD. Does not include time spent in Energy Save mode.
003	Energy Save Time	Includes time while the machine is performing background printing.
004	Low Power Time	Includes time in Energy Save mode with Engine on. Includes time while machine is performing background printing.
005	Off Mode Time	Includes time while machine is performing background printing. Does not include time machine remains powered off with the power switches.
006	SC	Total down time due to SC errors.
007	PrtJam	Total down time due to paper jams during printing.
009	PM Unit End	Total down time due to toner end.

8999	Admin Counter	Machine Administration Counter
	This SP displays the counts for the items listed below. Use this SP as a quick reference to see the total counts of the corresponding SP codes listed below. Note: This machine supports K printing only, so the counts for 015 and 017 are identical.	
001	Total (SP8381 001)	Total output (sheets fed out from the machine).
012	A3/DLT (SP8391 001)	Total output for large size paper.

013	Duplex (SP8411 001)	Total output of duplexed sheets.
015	Cvg:BW% (SP8601 001)	Total output of K pages.
017	Cvg:BW Pages (SP8601 011)	Total output of K pages.

Test Pattern Printing

Test pattern printing is a two-step operation. First, you must do SP2902 to select the pattern that you want to print. If you select any pattern other than "0:None" under SP2902, this sets the printer in the Test Pattern Print mode. Second, you must do SP5990 005 to print the pattern.

- You can select any selection under SP5990 to print the selected pattern. However, SP5990 005 (Diagnostic Report) is recommended because it prints only one page. If you select "001", for example, several copies of the same pattern may print.
- The printer will remain in the Test Pattern Print mode until you leave the SP mode or the printer power is turned off and on. (If you leave and reenter SP mode or turn the printer off/on, this automatically reselects "0:None" for SP2902.)
- The normal SMC report lists done with SP5990 will not print until the printer has been released from the Test Pattern Print mode.

Selecting the Test Pattern

Do SP2902 to select the test pattern that you want to print.

1. **To enter the SP mode, press △▽ together (for 5 seconds), release, then press [#Enter].**

   ```
   System Ver.1.00
   1. Service
   ```

2. **Press ▽.**

   ```
   System Ver. 1.00
   2. Engine
   ```

3. **Press [#Enter].**

   ```
   <Engine>
   1. Feed
   ```

4. **Press ▽.**

   ```
   <Engine>
   2. Drum
   ```

5. **Press [#Enter].**

   ```
   SP2001>>
   Charge Roll Bias
   ```

6. **Press ▽ to display "Test T Pattern"**

SP2902 Print T Pattern

7. **Press [#Enter].**

<Print Pattern> *0:None

Note

- The asterisk (*) shows the current selection.

8. **Press ▽ to display the name of the pattern that you want to print.**

<Print Pattern> 5:Grid Pat. 1

9. **Press [#Enter] to mark the selection with an asterisk.**

<Print Pattern> *5:Grid Pat. 1

10. **Press [Escape] twice.**

<Engine> 2. Drum

The printer is now in the Test Pattern Print mode. To print the pattern, you must do SP5990.

Printing the Test Pattern

Do SP5990 to print the test pattern.

1. **After selecting the test pattern selected as described above, press △▽ to display "5. Mode2.**

<Engine> 5. Mode

2. **Push [#Enter].**

SP5024 mm/inch Display

3. **Push ▽ once.**

SP5990>>
Print Mode

4. **Push ▽ [#Enter].**

SP5990-001
All Data List

5. **Push ▽ to select "Diagnostic Report".**

SP5990-005
Diagnostic Repor

6. **Push [#Enter].**

Diagnostic Repor ex-
ecute?

7. **Push [#Enter] to print the pattern.**

Diagnostic Repor
Processing...

8. **You can repeat this procedure for as many test prints as you need.**

Note

- After you enter a Print Test Pattern number, the test pattern prints, and not the SMC Report. The machine will remain in this mode until you leave the Service Mode, or turn the printer off and on.
- After leaving the re-entering the Service Mode, or after turning the machine off and on, the SMC Report feature is restored to normal operation.

SP2902-03 Printing Test Patterns

No.	Test Pattern	No.	Test Pattern
0	*0:None	14	14:Black Band
1	1:Vert. Line 1	15	15:Ind. Pat. 4
2	2:Hori. Line 1	16	16:Hori. L1 Rev.
3	3:Vert. Line 2	17	17:Grid P1 Rev.
4	4:Hori. Line 2	18	18:Ind. P1 Rev.

No.	Test Pattern	No.	Test Pattern
5	5:Grid Pat. 1	19	19:Grayscale (H)
6	6:Ind. Pat. 1	20	20:Grayscale (V)
7	7:Ind. Pat. 2	21	21:Grayscale (VH)
8	8:Full Dot Pat.	22	22:Grayscale-Gr
9	9:Black Band	23	23:Grayscale HM
10	10:Trim Area	24	24:Grayscalel VM
11	11:Argyle Pat.	25	25:Grayscale VHM
12	12:Hound's Tooth	26	26:White Pat.
13	13:Checker Flag	27	27: Trim OR Dat

Input Check

Enter the SP mode and select SP5803.

1. **Press △▽ together (for 5 seconds), release, then press [#Enter].**

   System Ver.1.00
   1. Service

2. **Press ▽.**

   System Ver. 1.00
   2. Engine

3. **Press [#Enter].**

   <Engine>
   1. Feed

4. **Press ▽ to display "5. Mode".**

   <Engine>
   5. Mode

5. **Press [#Enter].**

   SP5024
   mm/inch Display

6. **Press ▽ to display "Input Check".**

   SP5803 >>
   Input Check

7. **Press [#Enter].**

   SP5803-001
   Paper Feed 1

8. **Press △ or ▽ to select the item to check.**

   SP5803-013
   Full Exit Tray 2

9. **Press [#Enter]. Refer to the table on the next page.**

Full Exit Tray 2
(7)00001010(0)

Number	Bit	Description	Reading	
			0	1
SP5803-001 Paper Feed 1 (Upper Tray)	7	Fusing Exit Sensor	Activated	Deactivated
	6	Paper Height Sensor 2	Activated	Deactivated
	5	Paper Height Sensor 1	Activated	Deactivated
	4	Not used	—	—
	3	Paper Size Sensor 4	Activated	Deactivated
	2	Paper Size Sensor 3	Activated	Deactivated
	1	Paper Size Sensor 2	Activated	Deactivated
	0	Paper Size Sensor 1	Activated	Deactivated
SP5803-002 Paper Feed 2 (Lower Tray)	7	Duplex Unit Set Sensor	Unit set	Unit not set
	6	Paper Height Sensor 2	Activated	Deactivated
	5	Paper Height Sensor 1	Activated	Deactivated
	4	Not used	—	—
	3	Paper Size Sensor 4	Activated	Deactivated
	2	Paper Size Sensor 3	Activated	Deactivated
	1	Paper Size Sensor 2	Activated	Deactivated
	0	Paper Size Sensor 1	Activated	Deactivated
SP5803-003 Regist/Others	7	Zero Cross Signal	Detected	Not detected
	6	Transfer Belt Position Sensor	Not present	Present
	5	Exhaust Fan Lock Signal	Not locked	Locked
	4	Cooling Fan Lock Signal	Not locked	Locked
	3	Main Motor Lock Signal	Not locked	Locked
	2	Toner Overflow Sensor	Tank not full	Tank full

Number	Bit	Description	Reading	
			0	1
	1	Cover Open	Cover closed	Cover opened
	0	Registration Sensor	Paper detected	Paper not detected
SP5803-004 By-pass Feed	7	Duplex reverse path door	Closed	Open
	6	Paper End Sensor	Paper detected	Paper not detected
	5	Not used	—	—
	4	Paper Size Sensor 4 - By-pass	Activated	Deactivated
	3	Paper Size Sensor 3 - By-pass	Activated	Deactivated
	2	Paper Size Sensor 2 - By-pass	Activated	Deactivated
	1	Paper Size Sensor 1 - By-pass	Activated	Deactivated
	0	Unit Set Signal	Yes	No
SP5803-005 Relay Unit	7	Not used	Yes	No
	6	Unit Set Signal	Connected	Not connected
	5	Paper Sensor	Paper detected	Paper not detected
	4	Relay Sensor	Paper detected	Paper not detected
	3	Exit Sensor	Paper detected	Paper not detected
	2	Left Cover Switch	Switch pressed (cover closed)	Switch not pressed
	1	Middle Cover Switch	Switch pressed (cover closed)	Switch not pressed
	0	Right Cover Switch	Switch pressed (cover closed)	Switch not pressed
SP5803-006 Unit Set	7	Feed Motor Lock	No	Yes
	6	F-Gate Signal	Active	Not active
	5	Height Sensor	Feed height	Not feed height
	4	Paper Exit Sensor	Paper detected	Paper not detected

Number	Bit	Description	Reading	
			0	1
	3	Fusing Unit	Detected	Not detected
	2	Total Counter	Not detected	Detected
	1	Key Counter	Detected	Not detected
	0	Key Card Present	Detected	Not detected
SP5803-007 Paper End	7	Front cover/open closed	Open	Closed
	6	Vertical feed path	Clear	Not clear
	5	2nd Tray Lift Sensor	Paper not at upper limit	Paper at upper limit
	4	1st Tray Lift Sensor	Paper not at upper limit	Paper at upper limit
	3	Lower Relay Sensor	Paper detected	Paper not detected
	2	Upper Relay Sensor	Paper detected	Paper not detected
	1	Lower Paper End Sensor	Paper not detected	Paper detected
	0	Upper Paper End Sensor	Paper not detected	Paper detected
SP5803-008 DIP Switch	7	Dip Switch - 8	On	Off
	6	Dip Switch - 7	On	Off
	5	Dip Switch - 6	On	Off
	4	Dip Switch - 5	On	Off
	3	Dip Switch - 4	On	Off
	2	Dip Switch - 3	On	Off
	1	Dip Switch - 2	On	Off
	0	Dip Switch - 1	On	Off
SP5803-009 Duplex Unit	7	Not used		

Number	Bit	Description	Reading	
			0	1
	6	Right cover open/closed	Closed	Open
	5	1-Bin Unit Set	Detected	Not detected
	4	LD, H.P. sensor	Positioned	Not positioned
	3	Exit Sensor (Jam)	Paper detected	Paper not detected
	2	Entrance Sensor (Jam)	Paper detected	Paper not detected
	1	Paper End Sensor	Paper detected	Paper not detected
	0	Duplex Unit Switch	Cover closed	Cover open

SP5803-010 Remainder Tray-1	7	Tray 4: Bit 1	**Bit 1**	**Bit 0**	**Capacity**
	8	Tray 4: Bit 0	1	1	Full
	5	Tray 3: Bit 1	1	0	50% or more
	4	Tray 3: Bit 0	0	1	10% or more
	3	Tray 2: Bit 1	0	0	Out of paper
	2	Tray 2: Bit 0	-	-	-
	1	Tray 1: Bit 1	-	-	-
	0	Tray 1: Bit 0	-	-	-

SP5803-011 Remainder Tray 2	7	By-pass Yes/No	**Bit 2**	**Bit 1**	**Bit 0**	**Capacity**
	6	Not used	1	1	1	Full
	5	Not used	1	0	0	80% or more
	4	Not used	0	1	1	50% or more
	3	Not used	0	1	0	30% or more
	2	LCT: Bit 2	0	0	0	10% or more
	1	LCT: Bit 1	-	-	-	Out of paper
	0	LCT: Bit 0	-	-	-	

Number	Bit	Description	Reading	
			0	
SP5803-012 Full Exit Tray 1	7	Not used	Not full or no tray	Full
	6	Not used	Not full or no tray	Full
	5	Not used	—	—
	4	Not used	Not full or no tray	Full
	3	Finisher: Shift Tray	Not full or no tray	Full
	2	Not used	—	—
	1	1-Bin Exit	Not full or no tray	Full
	0	Machine Exit	Not full or no tray	Full

Table 1: By-pass Feed Table Paper Size

Number	Bit 4	Bit 3	Bit 2	Bit 1	Paper Width
4: By-pass	1	1	1	1	Post Card
	1	1	1	0	B6 SEF
	1	1	0	1	B5 SEF
	1	1	0	0	A5 SEF/5.5"
	1	0	1	1	B4 SEF
	1	0	0	1	A4 SEF/8.5"/8"
	0	1	1	1	A3 SEF
	0	0	1	1	11" x 17"

Output Check

Important

- **Motors keep turning in this mode regardless of upper or lower limit sensor signals. To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.**

Enter the SP mode and select SP5804.

1. **Press △▽ together (for 5 seconds), release, then press [#Enter].**

   System Ver.1.00
   1. Service

2. **Press ▽.**

   System Ver. 1.00
   2. Engine

3. **Press [#Enter].**

   <Engine>
   1. Feed

4. **Press ▽ to display "5. Mode".**

   <Engine>
   5. Mode

5. **Press [#Enter].**

   SP5024
   mm/inch Display

6. **Press ▽ repeatedly to display "Output Check".**

   SP5804 >>
   Output Check

7. **Press [#Enter].**

   SP5804-001
   1st.PaperFeedCl.

8. **Press △ or ▽ to display the item to check.**

   SP5804-027

Fuser Exit Motor

9. **Press [#Enter].**

<Fuser Exit Motor>

10. **Press [#Enter] to switch the component on, then press [#Enter] to switch it off.**

Fuser Exit Motor
Fuser Exit Motor

11. **Press [Escape], then repeat Steps 8 to 11 to check other items.**
12. **When you are finished, press [Escape] until you see "2.Engine", then select "3.End".**

SP5804 Output Check Table

No.	Operation Panel	More Detail
1	1stPaperFeedCl.	1st Paper Feed Clutch
2	2ndPaperFeedCl.	2nd Paper Feed Clutch
3	3rdPaperFeedCl.	3rd Paper Feed Clutch Paper Tray Unit
4	4thPaperFeed Cl.	4th Paper Feed Clutch Paper Tray Unit
5	By-pass Feed Cl.	By-pass Feed Clutch
6	LCT Paper Feed Cl.	LCT Paper Feed Clutch
11	1st. Paper Tray	1st. Paper Tray - Lift Motor
12	2nd. Paper Tray	2nd. Paper Tray - Lift Motor
13	By-pass Pickup	By-pass Pick-up Solenoid
14	LCT Pick-up Sol.	LCT Pick-up Solenoid
17	Transport Motor1	Transport Motor 1 - Finisher
18	Transport Motor2	Transport Motor 2 - Finisher
19	Exit Motor	Exit Motor 1 - Finisher
20	Staple Motor	Staple Motor 1 - Finisher
21	Punch Motor	Punch Motor 1 - Finisher
25	LCT Motor	LCT Motor

No.	Operation Panel	More Detail
26	Bank Motor	Bank Motor Paper Tray Unit
27	Fuser Exit Motor	Fusing/Exit Motor
28	Main Motor	Main Motor
29	DuplexTransportM	Duplex Transport (Motor)
30	DuplexInv(back)	Duplex Inverter Motor – Reverse
31	DuplexInv(forward)	Duplex Inverter Motor – Forward
32	Developer Motor	Development Motor
35	Bank Relay Cl.	Bank Relay Clutch
36	Relay Cl.	Relay Clutch
38	LCT Relay Cl.	LCT Relay Clutch
39	Registration Cl.	Registration Clutch
41	Exit J G Sol.(U)	Exit Junction Gate Solenoid - Upper Unit
42	Exit J G Sol.(L)	Duplex Junction Gate Solenoid - Lower Unit
45	Duplex J G Sol.	Duplex Junction Gate Solenoid
47	Relay J G Sol.	Relay Junction Gate Solenoid
50	Tray J G Sol.	Tray Junction Gate Solenoid
51	Staple J G Sol.	Stapler Junction Gate Solenoid
52	PositioningRoll	Positioning Roller Solenoid (Finishers)
55	Polygon Motor	Polygon Motor
56	TonerBottleMotor	Toner Supply Motor
57	Transfer Belt Cl.	Transfer Belt Clutch
62	Quenching Lamp	Quenching Lamp
63	Charge Bias	Charge Bias
67	Development Bias	Development Bias
69	Transfer Belt V	Transfer Belt (Bias)

No.	Operation Panel	More Detail
70	ID Sensor LED	ID Sensor LED
75	ExhaustFanMotor	Exhaust Fan Motor
76	CoolingFanMotor	Cooling Fan Motor
78	Relay Fan Motor	Bridge Unit Fan Motor
85	Total Counter	Total Counter
86	Not Used.	
87	PatLigh(Red)	Japan Only
88	PatLigh(Green)	
89	PatLigh(Buzzer)	
92	ShiftLiftMotor	Shift Lift Motor - Finisher
93	Jogger Motor	Jogger Motor - Finisher
94	StaplerUnitMotor	Stapler Unit Motor - Finisher
95	StackFeedOMotor	Stack Feed Out Motor - Finisher
96	Shift Motor	Shift Motor - Finisher
97	StaplerRotationM	Stapler Rotation Motor - Finisher

Memory Clear: SP5801

Executing Memory Clear resets all the settings stored in the NVRAM to their default settings, except the following:

SP5811-1:	Machine serial number
SP5907:	Plug & Play Brand Name and Production Name Setting

Important

- **This procedure restores all SP code settings to their factory default settings.**
- **Before clearing all settings in memory with SP5801, print an SMC report with SP5990. You may need this for reference to restore previously adjusted settings.**

1. **Push △ and ▽ together, hold down for over 5 seconds, release and then press [#Enter].**
2. **Press △ or ▽ to display "2.Engine".**
3. **Press [#Enter].**
4. **Press △ or ▽ to display "5.Mode" then press [#Enter].**
5. **Press △ or ▽ to display "SP5801/Memory Clear" then press [#Enter].**
6. **With "Clear All" displayed, press [#Enter], then press [#Enter] again to execute.**

```
<All>
result=OK
```

Here is a summary of all the settings.

No.	Item	What It Initializes
001	All	All items in this table
002	Clear Engine	All settings set for engine and processing
003	SCS	System Control Service (ROM update information)
004	IMH	Image Memory Handler
005	MCS	
008	PRT	Printer defaults
010	WebService	Netfile (NFA) management files, thumbnails, the Job login ID.

No.	Item	What It Initializes
011	NCS	Network Control Service. IP addresses, SmartNetMonitor for Admin., Web Status Monitor settings, TELNET settings
014	DCS Setting	DCS (Delivery Control Service) settings
015	Clean UCS Settings	User Information Control Service) settings
016	MIRS Settings	Machine Information Report Service settings
017	CCS	Certification and Charge-control Service settings.
018	SRM	System Resource Management settings
019	LCS	Log Count Service settings

7. **After clearing all settings, make sure that you do the following:**
    - Do the laser beam pitch adjustment (SP2109). See Section 3 "Laser Beam Pitch Adjustment".
    - Referring to the SMC Report, re-enter any values, which had been changed from their factory settings.
    - Execute SP3001-2 (ID Sensor Initial Setting).

SMC Report

1. **To enter the SP mode, push and hold down △▽ for 5 sec. then push [#Enter].**

   <Engine>
   1.Feed

2. **Press △ or ▽ until you see "5.Mode".**

   <Engine>
   5.Mode

3. **Press [#Enter].**

   SP5024
   mm/inch Display

4. **Press ▽ to select SP5990.**

   SP5990 >>
   SP Print Mode

5. **Press [#Enter].**

   SP5990-001
   All (Data List)

6. **Press △ or ▽ to select the report that you want to print.**

SP	Title	What It Prints	Length
001	All (Data List)	Prints all reports	14 pp.
002	SP (Mode Data List)	Prints all SP codes settings for SP Groups 1 to 5 with default and current settings.	3 pp.
004	Logging Data	Prints all SP Code settings for SP7000, SP800 only.	4 pp.
005	Diagnostic Report	Prints the Self-Diagnosis report (lists all firmware modules by name and version number).	1 pp.
006	Non-Default	Prints a list of commonly adjusted SP codes.	1 pp.
007	NIB Summary	Prints a current summary of all network settings.	5 pp.

7. **For example, to print the SP Mode Data List, press △ or ▽ to display "SP5990-002" and push [#Enter].**

<SP Mode Data L
execute?

8. **Press [#Enter].**

<SP Mode Data L
Processing

The report prints.

9. **Repeat from Step 6 to select and print any other report.**

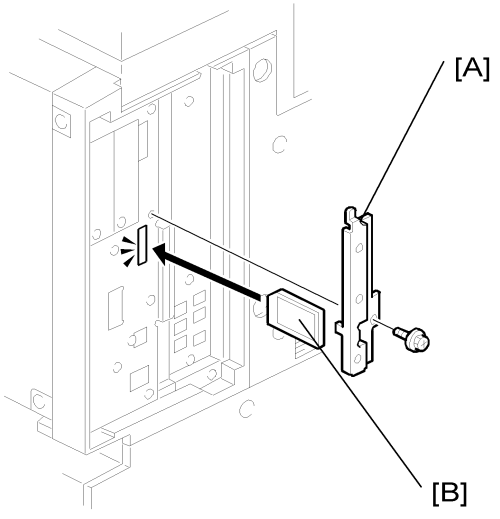
Updating the Firmware

⚠CAUTION

- Never switch off the power while downloading. Switching off the power while the new software is being downloaded can damage the boot files in the controller.

Setting the Machine in Firmware Update Mode

1. **Turn off the power switch.**



G147S913

2. **Remove the SD card [A] cover.**
3. **Insert the SD card [B] that contains the firmware in SD card slot C3.**
4. **Turn on the machine.**

RICOH Aficio SP 8100 DN

Wait about 60 sec. for the 'Power', 'Error', and 'Data In' LEDs on the operation panel to light, and for the first module selection to appear.

Web Support

Reviewing the Module Statuses

With the machine in the firmware update mode, follow this procedure to review the status of the firmware modules.

Web Support

1. **Push [Menu] to display the name of the first module.**

   ROM : G1475933
   NEW: G1475933

   - "ROM" is the name of the module in the machine.
   - "NEW" is the name of the module on the SD card.

2. **Push [Menu] again to display the version numbers of the modules.**

   ROM : 0.09
   NEW : 0.19

   - "ROM" is the version number of the module in the machine.
   - "NEW" is the version number of the module on the SD card.
   - If the "NEW" version number is higher than the "ROM" version number, the module must beupdated.

3. **Push [Menu] to return to the previous level.**

   Web Support

4. **Push ▽ to display the name of the next module, then push the [Menu] key again to review the module name and version number.**
5. **Repeat this procedure to review the version numbers of the modules: Web Support, Network Support, Onboard Sys, Onboard Prn, Engine, and NeworkDocBox.**

How to Update a Module

Follow this procedure to update a module.

Important

- **Only one module can be updated at a time. The machine power must be turned off and on after each module is updated.**

1. **Set the machine in the firmware update mode. (See "Setting the Machine in the Firmware Update Mode" above.)**

   Web Support

2. **Push △ or ▽ to select the module that you want to update (Web Support, Network Support, Onboard Sys, Onboard Prn, Engine, or NetworkDocBox).**

   Engine

3. **Push [#Enter]. An asterisk appears below the name of the module, to indicate that it is selected for update.**

   Engine
   *

Important

- Pushing [#Enter] toggles the asterisk on and off.
- Select only one module for the update. If you try to select another module, you will see the message "Cannot Select". This means another module has already been selected for update.
- The firmware modules must be updated one at a time.

4. **After selecting one module for updating, push ▽ to display "Update Data".**

   Update Data

5. **Push [#Enter] to start the update of the selected module.**

   Update Data
   _ _ _ _ _ _ _ _ _ _ _ _

   Asterisks replace the underscores in the progress line as the data updates.

   Update Data
   * * * _ _ _ _ _ _ _ _ _

   When the update is completed, you will see:

   Updated
   Power Off On

If firmware update does not complete successfully, try to update it again. If firmware update always fails, replace the controller board.

6. **Turn the machine off.**
7. **If you are finished, remove the SD card from the slot and turn the machine on.**

   -or-

   If you need to update another module, leave the SD card in place, turn the machine on again and repeat this procedure from Step 1.

   Here is a table that shows the approximate amount of time required to update each module after the update has started.

No.	Name	Time
1	Web Support	20 sec.
2	Network Support	40 sec.
3	Onboard Sys	90 sec.
4	Onboard Prn	50 sec.
5	Engine	7 min.
6	NetworkDocBox	10 sec.

Important

- **The "Engine" module is very large and very slow to start. You may not see the asterisks (*) display until about 60 sec. have elapsed. (Total time: approximately 7 min. to complete.)**

Printing the Self-Diagnosis Report

The Self-Diagnosis Report, printed with SP5990 (SP Print Mode), lists the current names and version numbers of the update modules.

1. **To enter the SP mode, push and hold down △▽ for 5 sec. then push [#Enter].**
2. **Push ▽ to display "2. Engine" then push [#Enter].**
3. **Push ▽ to display "5. Mode" then push [#Enter].**

   SP5024
   mm/inch Display

4. **Push ▽ once to select SP5990 then push [#Enter].**

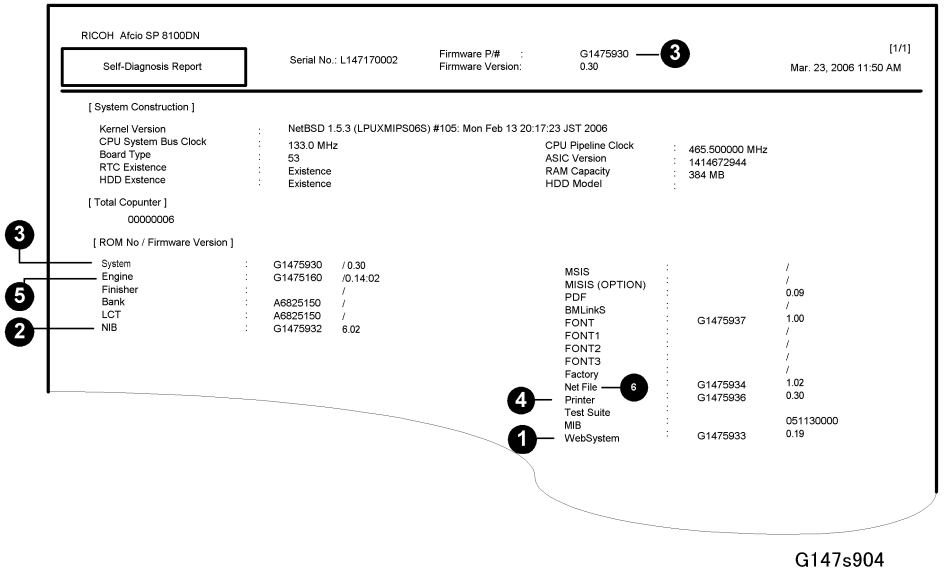
SP5990-001 All (Data List)

5. **Push ▽ three times to select SP5990-005 then push [#Enter].**

<Diagnostic Repo execute?

6. **Push [#Enter] to print the report.**

   The firmware module names and version numbers are listed in the report.



G147s904

The actual numbers will be different for your installation.

No.	Module Name on Operation Panel	Name/Ver. No. in Report	
		Name (Sample)	Ver. No. (Sample)
1	Web Support	G1475933	0.19
2	Network Support	G1475932	6.02
3	Onboard Sys	G1475930	0.30
4	Onboard Prn	G1475936	0.30
5	Engine	G1475160	0.14:02

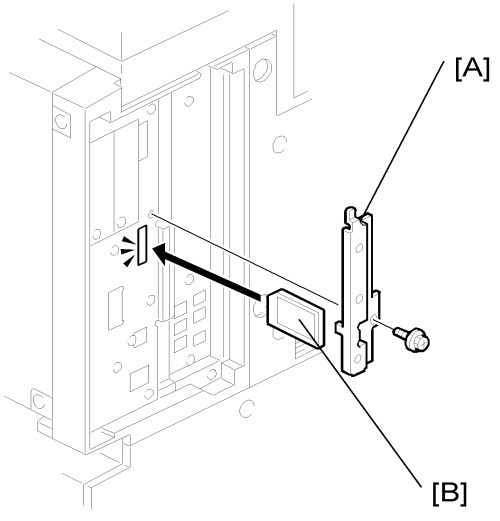
No.	Module Name on Operation Panel	Name/Ver. No. in Report	
		Name (Sample)	Ver. No. (Sample)
❻	NetworkDocBox	G1475934	1.02

Uploading/Downloading NVRAM data

The content of the NVRAM can be uploaded to and downloaded from an SD card.

Uploading NVRAM Data

1. **Turn off the power switch.**



G147S913

2. **Remove the SD card cover [A].**
3. **Insert the SD card [B] into SD card slot C3.**
4. **Turn on the machine.**
5. **To enter the SP mode, press △▽ together (for 5 seconds), release, then press [#Enter].**
6. **Select SP5824.**

SP5824 NVRAMUpload

7. **Push [#Enter].**
8. **When the message prompts you to execute, push [#Enter].**

<NVRAMUpload> Processing

<NVRAMUpload>

result = OK

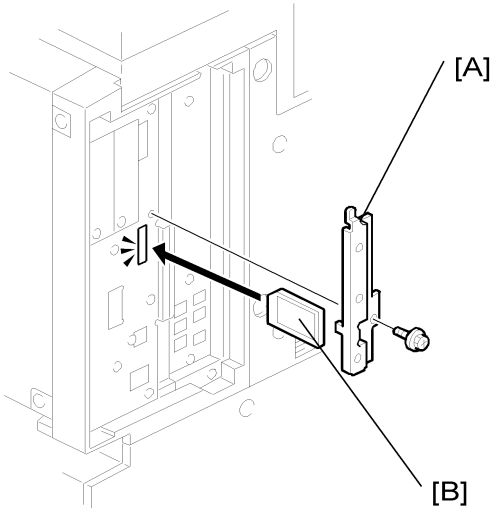
9. **Remove the SD card.**
10. **Switch the machine off and on.**

Downloading NVRAM Data

The following data are not downloaded from the SD card:

- C/O, P/O Counter (SP7-006-** C/O, P/O Count Display)
- Duplex, A3/DLT/Over 420 mm.

1. **Turn off the machine.**



G147S913

2. **Remove the SD card cover [A].**
3. **Plug the SD card [B] into SD card slot C3.**
4. **Turn on the machine.**
5. **To enter the SP mode, press △▽ together (for 5 seconds), release, then press [#Enter].**
6. **Select SP5824.**

SP5825
NVRAMDownload

7. **Push [#Enter].**
8. **When the message prompts you to execute, push [#Enter].**

```
<NVRAMDownload>
Processing
```

```
<NVRAMDownload>
result = OK
```

9. **Remove the SD card.**
10. **Switch the machine off and on.**

Note

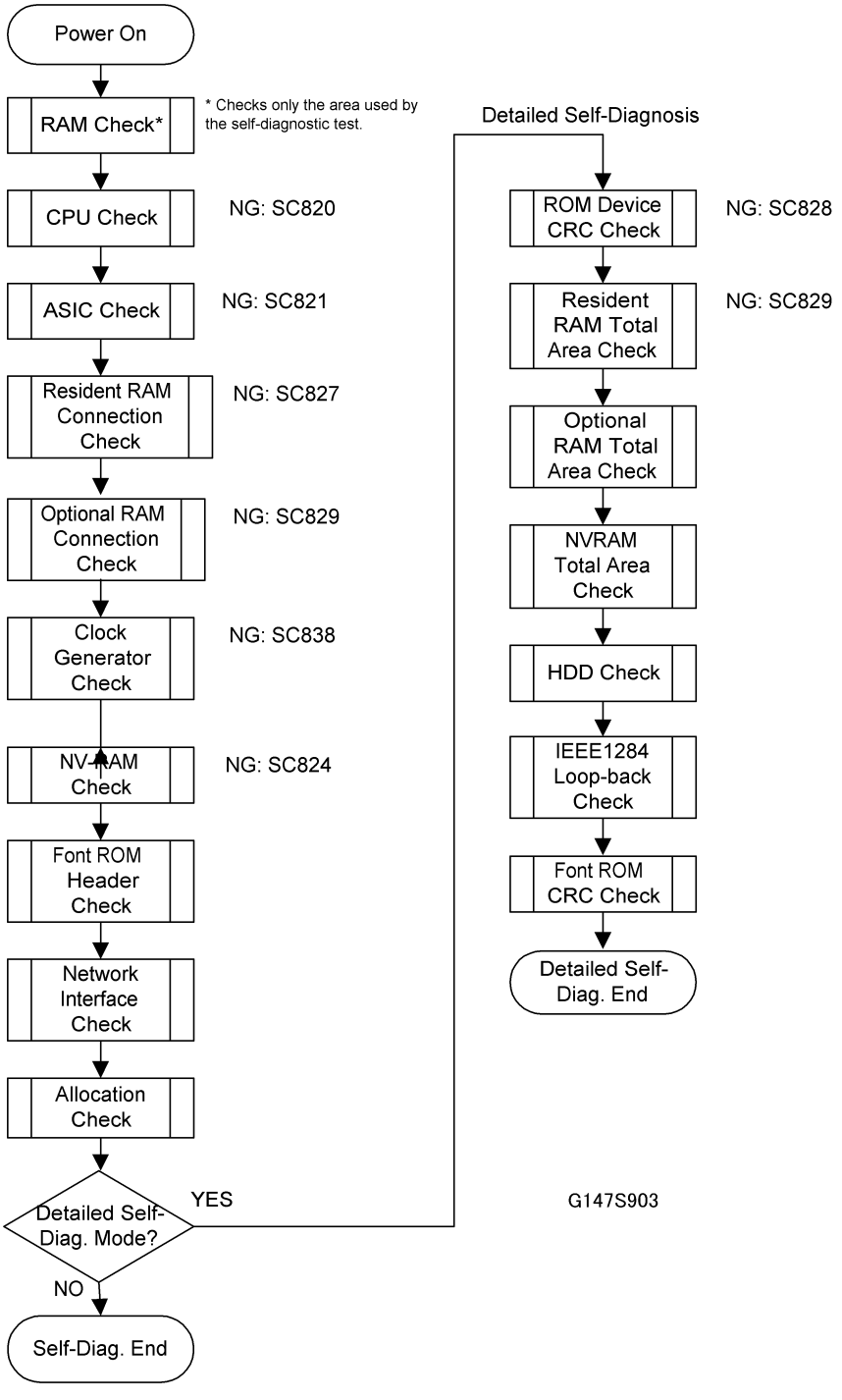
- If the SD card is not installed properly, a message will tell you that downloading cannot proceed.
- If the correct SD card for the NVRAM data is not inserted in the SD card slot, after you press [#Enter] a message will tell you that downloading cannot proceed.

Self-Diagnostic Mode

Self-Diagnostic Mode at Power On

As soon as the main machine is powered on, the controller waits for the initial settings of the copy engine to take effect and then starts an independent self-diagnostic test program. The self-diagnostic test follows the path of the flow chart shown below and checks the CPU, memory, HDD, and so on. An SC code is displayed in the touch panel if the self-diagnostic program detects any malfunction or abnormal condition.

Self-Diagnostic Test Flow



Detailed Self-Diagnostic Mode

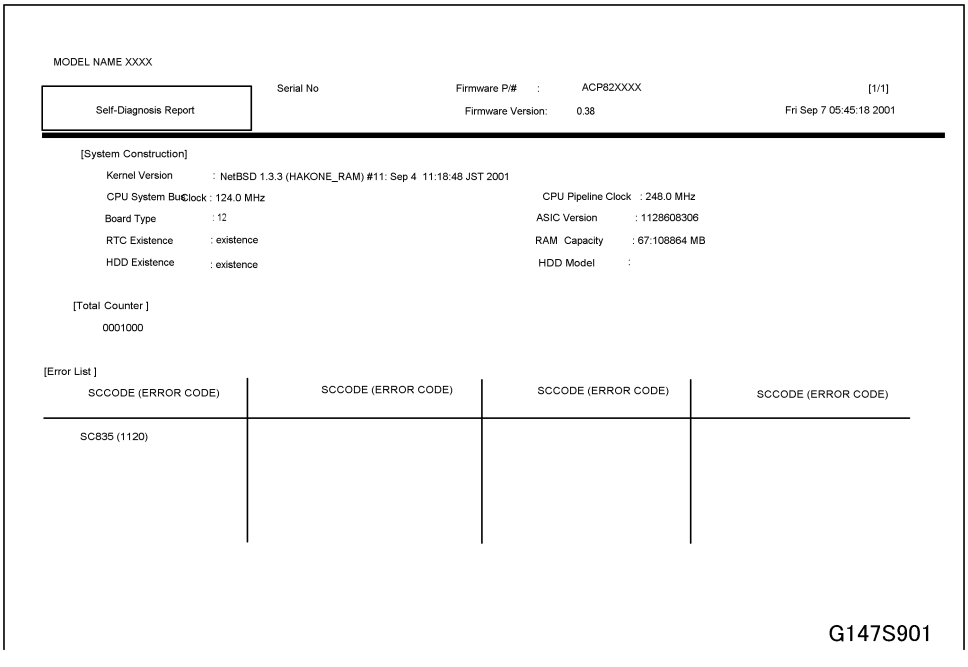
In addition to the self-diagnostic test initiated every time the main machine is powered on, you can set the machine in a more detailed diagnostic mode manually in order to test other components or conditions that are not tested during self-diagnosis after power on.

Follow this procedure to execute detailed self-diagnosis manually.

1. **Switch off the printer.**
2. **Press and hold down the [On line] and [#Enter] buttons together, then switch on the printer.**
3. **Release the buttons when you see:**

   DIAGNOSE
   0100

4. **The number will change automatically as the self-diagnostic test runs. After about 30 seconds, the initial display returns and a self-diagnostic report prints.**
5. **A report like the one below is printed every time a detailed self-diagnostic test is executed, whether errors were detected or not.**



DIP Switches

Controller: DIP SW2

DIP SW No.	ON	OFF
1	SD Card	System ROM Boot
2	Keep at "OFF"	
3		
4		

I/O Board: DIP SW101

DIP SW No.	Function	ON		OFF	
1	Not used.	Off (Do not change)			
2	Jam Detection (see Note)	Off		On	
3	SC Generation	Disabled		Enabled	
4	Not used	OFF (Do not change)			
5	Not used	OFF (Do not change)			
6 7	Destination	OFF Japan OFF	ON North America OFF	OFF Europe ON	ON Not used ON
8	Software Down-load	Software download from SD card for the engine.		Normal position.	

Note

- Disabling jam detection is effective only for the main machine (not for the options).

Using Debug Log

This machine provides a debug log feature that allows the service technician to save and retrieve error information for analysis.

Every time an error occurs, debug information is recorded in RAM but this information is lost when the machine is switched off and on.

To capture this debug information, the Save Debug Log feature provides two main features:

- Switching on the debug feature so error information is saved directly to the HDD for later retrieval.
- Copying the error information from the HDD to an SD card.

When a user is experiencing problems with the machine, follow the procedures below to set up the machine so the error information is saved automatically to the HDD. Then attempt to duplicate the problem so the error data will be stored.

Setting Up "Save Debug Log"

The debug information cannot be saved until the "Save Debug Log" function is switched on and a target is selected.

To Switch Debug Log On

1. **To enter the SP mode, press △▽ together (5s), release, then press [#Enter].**
2. **Select SP5857.**

   SP5857 >>
   Save Debug Log

3. **Push [#Enter].**

   SP5857-001
   On/Off

4. **Push [#Enter].**

   <On/Off>
   *OFF

5. **Push ▽.**

   <On/Off>

ON

6. **Push [#Enter].**

<On/Off>
*ON

7. **Push [Esc].**

SP5857-001
On/Off

8. **Do the next procedure to select the target.**

To Select the Target for the Debug Log File

You can select either the HDD (default) or the SD card as the target. This procedure shows you how to select the SD card.

1. **Push ▽.**

SP587-002
Target

2. **Push [#Enter].**

<Target>
*2:HDD

3. **Push ▽.**

<Target>
3:SD

4. **Push [#Enter].**

<Target>
*3:SD

5. **Push [Esc] twic.**

SP5857 >>
Save Debug Log

6. **Do the next procedure to select the events that you want to record in the debug log file.**

To Select Events

1. **Push ▽.**

SP5858 >> DebugSaveWhen

2. **Push [#Enter].**

SP5858-001 EngineSC Error

Here is a list of the events that you can select. Any number of events can be selected.

SP No.	Name	What It Does
SP5858-001	EngineSC Error	Saves error data when an engine-related SC code occurs.
SP5858-002	SystemSC Error	Saves error data when a controller-related SC Code occurs.
SP5858-003	Any SC Error	Saves error data only for the SC code that you specify by manually entering the SC code number.
SP5858-004	Jam	Saves error data for jams.

- Example 1: To Select Items 001, 002, or 004 -

1. **Push △ or ▽ to select 001, 002, or 003. This example shows the selection of 001.**

SP5858-001 EngineSC Error

2. **Push [#Enter].**

<EngineSC Error> *OFF

3. **Push ▽.**

<EngineSC Error> ON

4. **Push [#Enter].**

<EngineSC Error> *ON

5. **Push [Esc].**

SP5858-001 EngineSC Error

6. **Repeat this procedure to select either 002 or 004.**

5

- Example 2: To set an SC code with 003 -

This example shows you how to enter "672" for SC672.

Note

- For details about SC code numbers, please refer to the SC tables in Section "4. Troubleshooting".

1. **Select "SP5858-003".**

SP5858-003 Any SC Code

2. **Push [#Enter].**

0000000 _

3. **Push [#Enter] to toggle the on the number display in the 2nd line.**

0000000 0

4. **Push △ or ▽ to display "2".**

0000000 2

5. **Push [#Enter] to enter the "2" in the line above.**

```
0000002
_
```

6. **Push △ or ▽ to move the cursor to the next digit.**

```
. 0000002
_
```

7. **Repeat Steps 2 to 6 to enter the "7".**

```
. 0000072
_
```

8. **Repeat Steps 2 to 6 to enter the "6".**

```
. 0000672
_
```

9. **Push [Esc] twice.**

```
SP5858 >>
DebugSaveWhen
```

10. **Do the next procedure to select one or more memory modules for the debug error data recording.**

To select one or more memory modules for recording in the debug log file

1. **Select SP5859.**

```
SP5859 >>
LogSaveKey No.
```

2. **Push [#Enter].**

```
SP5859
Key 1
```

3. **Push [#Enter].**

```
0000000
_
```

Note

- The default settings for Keys 1 to 10 are all zero ("0").

4. **Select the number from the table below, then use these key presses to enter the number.**

```
0002222
_
```

Key Press	What It Does
△ or ▽	Moves the cursor to select the digit in the line above.
[#Enter]	Enters the number entry mode (displays a "0" at the cursor).
△ or ▽	Selects the number to enter at the digit position in the line above.
[#Enter]	Enters the selected number in the line above and exits the entry mode you can select the next position with △ or ▽

5. **Refer to the table below for the 4-digit numbers to enter for each key. (The acronyms in parentheses indicate the names of the modules.)**

4-Digit Entries for Keys 1 to 10

Key No.	Printer	Web
1	2222 (SCS)	
2	2223 (SRM)	
3	256 (IMH)	
4	1000 (ECS)	
5	1025 (MCS)	
6	4400 (GPS)	5682 (NFA)
7	4500 (PDL)	6600 (WebDB)
8	4600 (GPS-PM)	3300 (PTS)
9	2000 (NCS)	6666 (WebSys)
10	2224 (BICU)	2000 (NCS)

Key to Acronyms

Acronym	Meaning
ECS	Engine Control Service
GPS	GW Print Service
GSP-PM	GW Print Service – Print Module
IMH	Image Memory Handler
MCS	Memory Control Service
NCS	Network Control Service
NFA	Net File Application
PDL	Printer Design Language
PTS	Print Server
SCS	System Control Service
SRM	System Resource Management
WebDB	Web Document Box (Document Server)

The machine is now set to record the debugging information automatically on the SD card or HDD (the target selected with SP5857-002) for the events that you selected SP5858 and the memory modules selected with SP5859.

Please keep the following important points in mind when you are doing this setting:

- The initial settings are all zero.
- These settings remain in effect until you change them. Be sure to check all the settings, especially the settings for Keys 6 to 10. To switch off a key setting, enter a zero for that key.
- You can select any number of keys from 1 to 10 (or all) by entering the corresponding 4-digit numbers from the table.
- One area of the disk is reserved to store the debug log. The size of this area is limited to 4 MB.

Retrieving the Debug Log from the HDD

1. **Insert the SD card into service slot C3.**
2. **Enter the SP mode and execute SP5857 009 (HDD for SD (4MB)) to write the debugging data to the SD card.**
3. **Use a card reader to copy the file and send it for analysis to your local Ricoh representative by email, or just send the SD card by mail.**

More About Debug Log

SP5857-015: SD to SD (Any)

This SP copies the log on an SD card (the file that contains the information written directly from shared memory) to a log specified by key number. The copy operation is executed in the log directory of the SD card inserted in the same slot. (This function does not copy from one slot to another.)

Each SD card can hold up to 4 MB of file data. Unique file names are created for the data during the copy operation to prevent overwriting files of the same name. This means that log data from more than one machine can be copied onto the same SC card.

This command does not execute if there is no log on the HDD for the name of the specified key.

SP5857-016: Make HDD LogFile

This SP creates a 32 MB file to store a log on the HDD. However, this is not a completely empty file. The created file will hold the number "2225" as the SCS key number and other non-volatile information.

Even if this SP is not executed, a file is created on the HDD when the first log is stored on the HDD, but this operation takes time. This creates the possibility that the machine may be switched off and on before the log can be created completely.

If you execute this SP to create the log file beforehand, this will greatly reduce the amount of time required to acquire the log information and save onto the HDD. With the file already created on the HDD for the log file, the data only needs to be recorded; a new log file does not require creation.

To create a new log file, execute SP5857-011 to delete the debug log data from the HDD and then execute this SP (SP5857-016).

SP5857-017: Make SD Log File

This SP creates a 4 MB file to store a log on an SD card. However, this is not a completely empty file. The created file will hold the number "2225" as the SCS key number and other non-volatile information.

Even if this SP is not executed, a file is created on the SD card when the first log is stored on the SD card, but this operation takes time. This creates the possibility that the machine may be switched off and on before the log can be created completely.

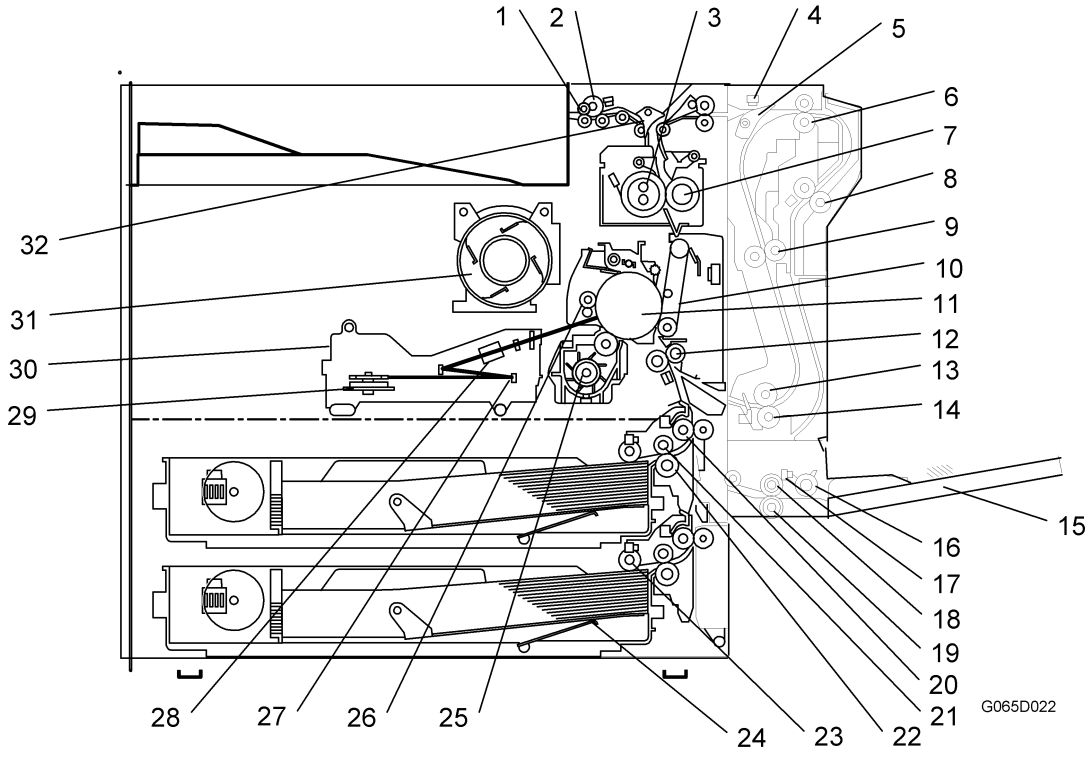
If you execute this SP to create the log file beforehand, this will greatly reduce the amount of time required to acquire the log information and save onto the SD card. With the file already created on the SD card for the log file, the data only needs to be recorded; a new log file does not require creation.

To create a new log file, execute SP5857-012 to delete the debug log data from the SD card and then execute this SP (SP5857-017).

6. Details

Machine Overview

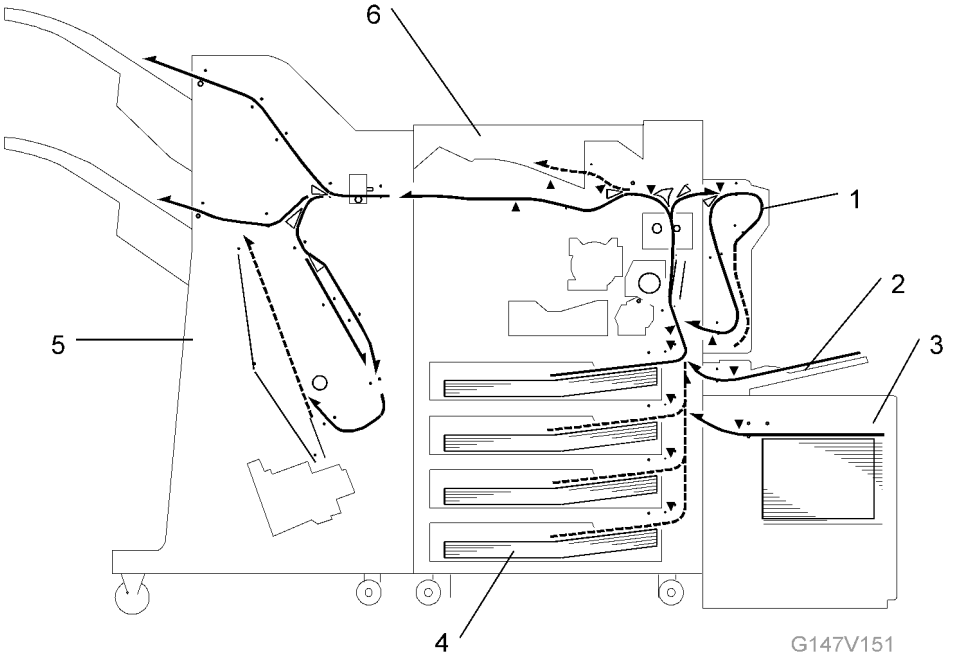
Component Layout



1	Exit Roller	17	By-pass Paper End Sensor
2	Paper Exit Sensor	18	By-pass Paper Feed Roller
3	Hot Roller	19	By-pass Separation Roller
4	Entrance Sensor	20	Upper Relay Roller
5	Inverter Gate	21	Feed Roller
6	Inverter Roller	22	Separation Roller
7	Pressure Roller	23	Pick-up Roller

8	Transfer Belt Cleaning Blade	24	Bottom Plate
9	Upper Transport Roller	25	Development Unit
10	Transfer Belt	26	Charge Roller
11	OPC Drum	27	Fθ Mirror
12	Registration Roller	28	Barrel Toroidal Lens (BTL)
13	Lower Transport Roller	29	Polygonal Mirror Motor
14	Duplex Exit Sensor	30	Laser Unit
15	By-pass Tray	31	Toner Bottle Holder
16	By-pass Pick-up Roller	32	Exit Junction Gate

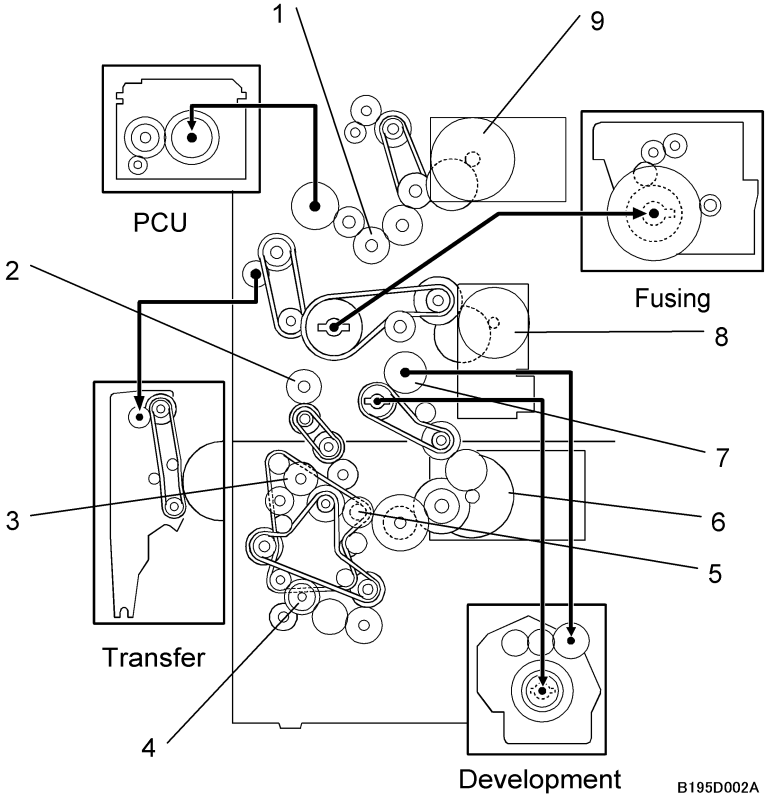
Paper Path



1	Duplex unit
2	By-pass tray

3	Large Capacity Tray (LCT)
4	Paper tray unit
5	Two-Tray Finisher
6	Bridge unit

Drive Layout

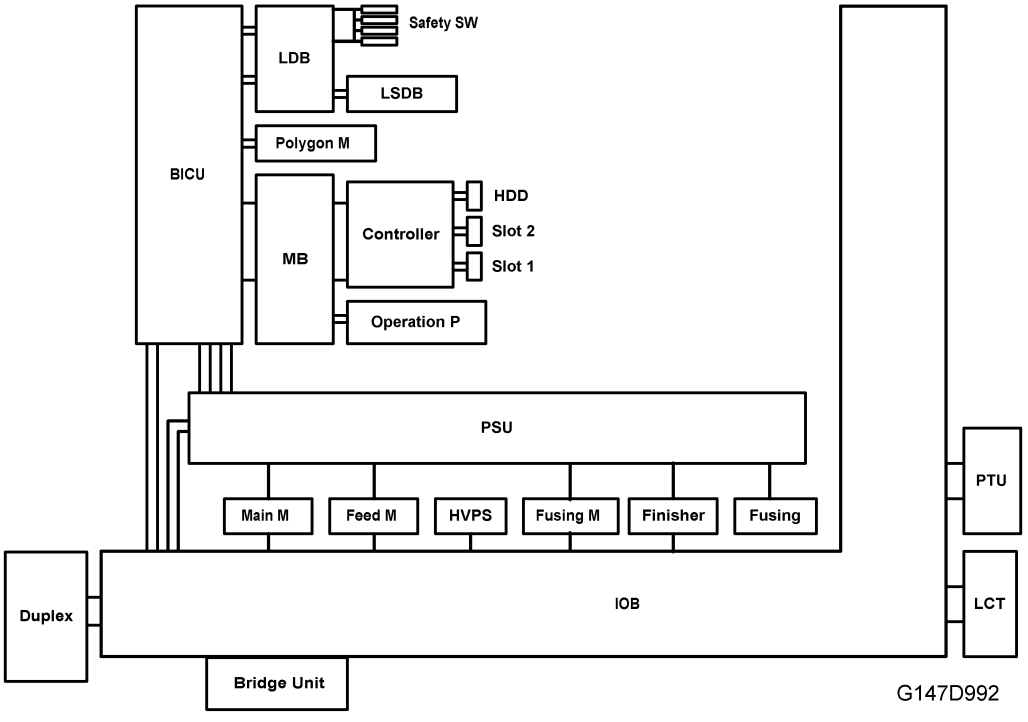


1	Transfer Belt Contact Clutch	6	Paper Feed/Development Motor
2	Registration Clutch	7	Development Clutch
3	Upper Paper Feed Clutch	8	Main Motor
4	Lower Paper Feed Clutch	9	Fusing/Exit Motor
5	Relay Clutch		

In this machine, the development unit is provided with its own motor, separate from the main motor.

Board Layout

Board Block Diagram



This machine employs the GW (Grand Workware) architecture, which allows the printer to be expanded by installing simple modular components (ROM DIMMs) in the controller board or installing optional boards in the two controller board slots.

Here is a brief summary of the boards and their functions. For more details, refer to the Point-to-Point diagram and list of components supplied with the printer.

BICU (Base Engine and Image Control Unit)

Controls all machine functions both directly and through other control boards.

LDB (Laser Diode Board)

Powers the laser diode. Output level is controlled to compensate for changes in temperature and humidity to maintain constant laser write intensity.

Controller

Controls memory and all peripheral devices. Two SD card slots are provided, one for servicing (firmware updates) and one for SD card options. In addition to the RAM and NVRAM, the NIC and USB functions are also built into this controller. The HDD unit is also attached to the controller board. The Controller Board has external slots to accommodate the following interfaces:

- IEEE1284 (Centronics)
- IEEE802.11b (Wireless LAN)
- Gigabit Ethernet Board

Mother Board
Interfaces the BICU and Controller. The operation panel connects directly to the Mother Board.

Operation Panel
Controls the LCD user interface and button controls.

PSU (Power Supply Unit)
Provides dc power to the printer system and ac power to the fusing lamp.

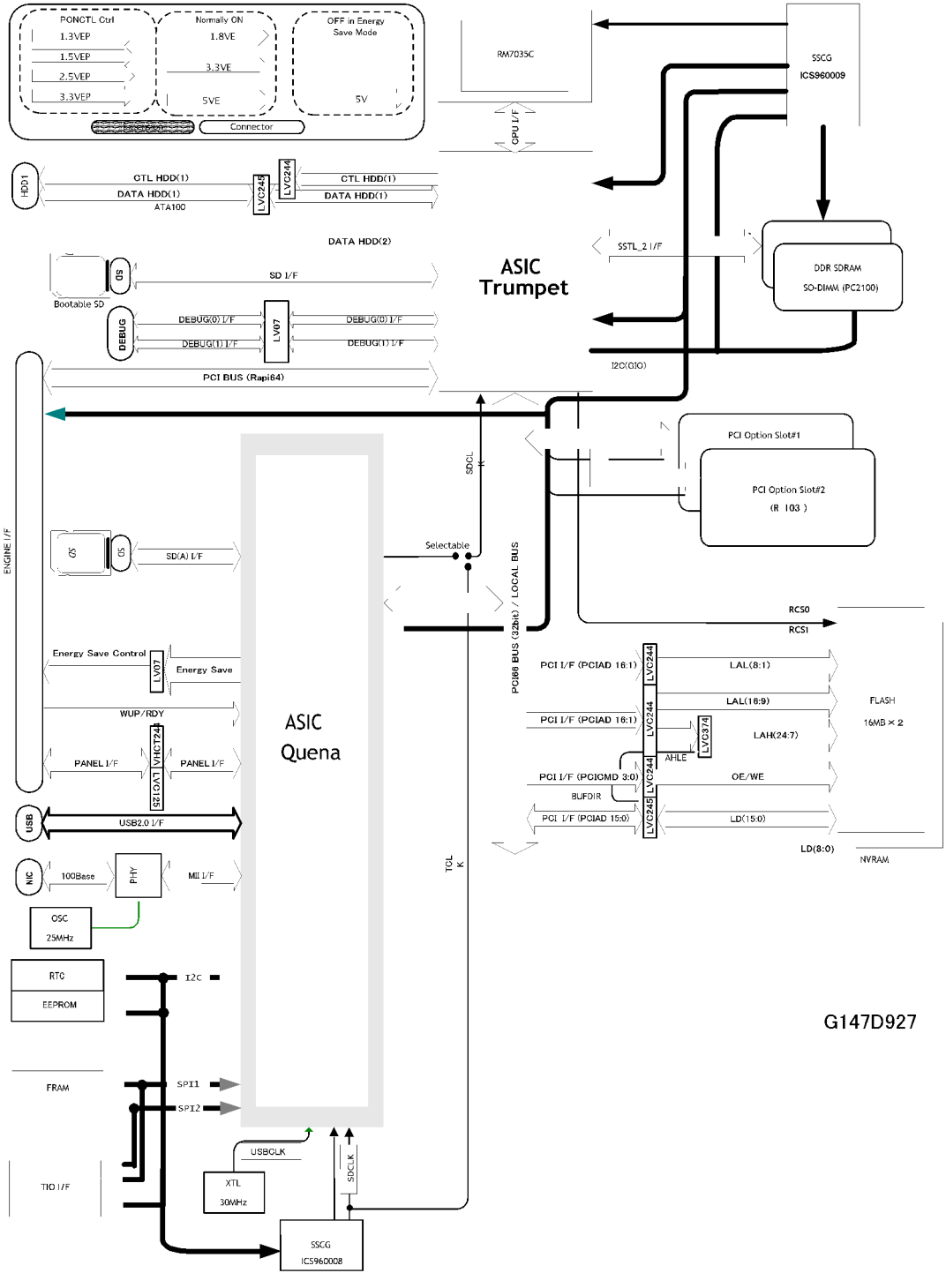
HVPS (High Voltage Power Supply)
Supplies high voltage to the drum charge roller, development roller, and transfer belt.

IOB (Input/Output Board)
Controls the mechanical parts of the printer, all the paper feed mechanisms, and fusing lamp power. Specifically, the IOB controls:

- All main drive sensors, motors, and solenoids.
- PWM (Pulse Width Modulation) of the HVPS.
- Serial interfaces of all peripherals.
- Fusing lamp operation

Duplex
Provides the system interface for all electronic components, i.e. sensors, switches, motors, and solenoids for the duplex unit.

Controller Block Diagram



The controller controls all applications. To add the optional applications, an SD card must be inserted in the SD card slot of the controller.

Trumpet ASIC: Contains the dedicated GW controller chips of the shared resources (the CPU, memory, and HDD hardware) for the printing function.

- CPU. The central processing unit that controls the operation of the controller board.
- HDD. The interface for connection of the flat film cable connection to the HDD unit.
- SD (Bootable C3). Service slot for firmware version updates, moving applications to other SD cards, and downloading/uploading NVRAM contents.
- DDR SDRAM. The image memory for the printer function where image compression, image rotation and other operations are done.

Quena ASIC: Controls the following functions: USB, Ethernet, PCI (optional boards for Wireless LAN, Centronics, and Gigabit Ethernet), debug serial, I2C, applications on SD cards mounted in an SD card slot, and the energy save features.

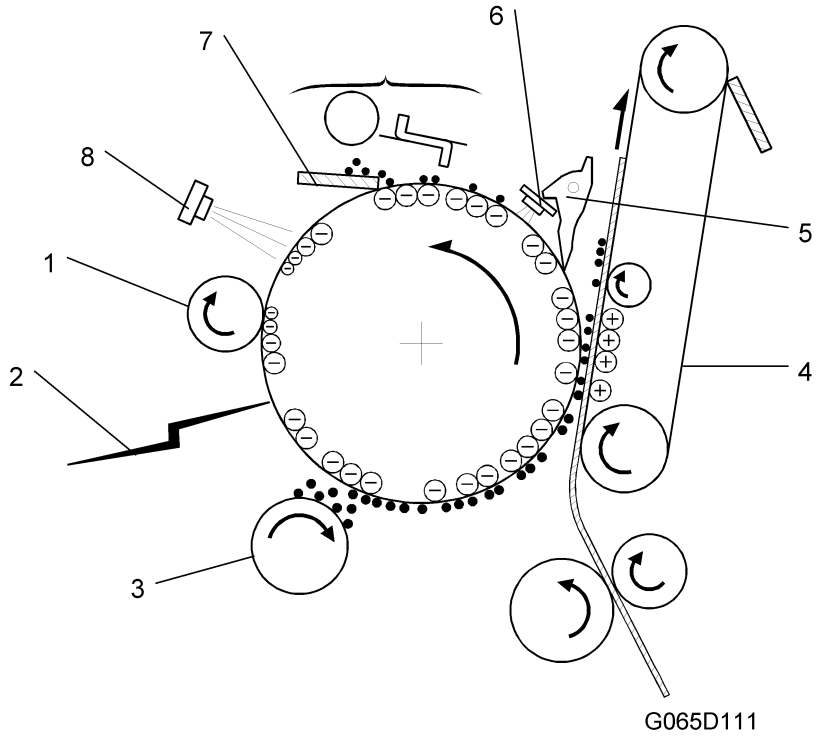
- SD. This is the interface for SD card slot.
- Board Option Slots 1, 2. Only one of the following options can be installed in either Slot 1 or Slot 2: IEEE1284 Interface Board (Centronics), IEEE802.11b G813 (Wireless LAN).
- Flash ROM. Stores the program. Maximum capacity: 32 MB.
- USB. Built into the controller. Provides the interface for USB 2.0 devices. Supports both low-speed and high-speed modes.
- NIB. The Ethernet interface connection. Network support is built-into the controller. EEPROM. Stores the data for the SP code settings.
- NVRAM. The memory that stores the system configuration and other information.
- HDD: A 3.5" HDD (more than 40 GB) can be connected using an IDE I/F. The hard disk is partitioned as shown below.

How 40 GB Is Partitioned on the HDD

Item	Use	Space	At Power OFF	Max. Files	Max. Pages
File Sys 1	Font download, form registration	500 MB	Saved	6600	---
File Sys 2	Job spooling	1 GB	---	5000	---
File Sys 3	Print time recording	500 MB	Erased	1000	---
Images Temp	Elec sorting	14 GB	Erased	30	1000
Images LS	Doc storage during printing	20 GB	Saved	1000	9000
Images Overlay	Image overlays	2 GB	Saved	100	100

Item	Use	Space	At Power OFF	Max. Files	Max. Pages
Job Log	Job log data	10 MB	Saved	---	---
Swap, Log	Swap, debug, debug log	364 MB	Saved	---	---
SDK	Used by SDK applications	1 GB	Saved	10000	---
SDK Log	SDK log data	200 MB	Saved	---	---
ROM Update Data	Used for updating ROM	30 MB	Saved	2	---
All Data Save	WPA public certification data, store other data	1 MB	Saved	256	---

Printing Process Overview



Drum Charge

The charge roller [1] gives a negative charge to the organic photoconductive (OPC) drum. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

Laser Exposure

The image data is projected onto the drum by two laser beams [2], which form an electrostatic latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, controlled by the BICU.

Development

The magnetic developer brush on the development roller [3] contacts the latent image on the drum. Toner particles are electrostatically attracted to the areas of the drum surface where the laser reduced the negative charge on the drum.

Image Transfer

Paper is fed into the area between the drum surface and the transfer belt [4] at the proper time to align it with the image on the drum. The transfer bias roller applies a high positive charge to the reverse side of the paper through the transfer belt. This positive charge pulls the toner particles from the drum surface onto the paper while the paper is electrostatically attracted to the transfer belt.

Separation

Paper separates from the drum as a result of the electrical attraction between the paper and the transfer belt. Pick-off pawls [5] help separate the paper from the drum.

ID Sensor

The ID sensor [6] measures the reflectivity of the pattern formed by the laser on the surface of the drum. This output signal is used for toner supply control and also measures the drum surface reflectivity, which is used for charge roller voltage control.

Cleaning

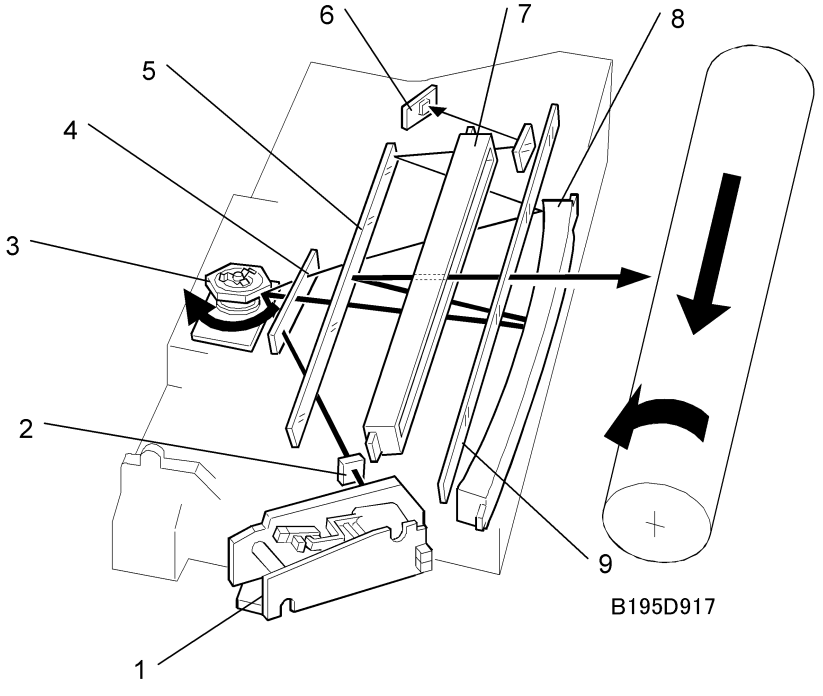
The drum cleaning blade [7] removes any toner remaining on the drum surface after the image is transferred to the paper.

Quenching

Finally, the light from the quenching lamp [8] electrically neutralizes the charge on the drum surface.

Laser Exposure

Laser Exposure Overview



1	LD unit	6	Synchronization detector
2	Cylindrical lens	7	BTL (Barrel Toroidal Lens)
3	Polygonal mirror	8	F-theta mirror
4	Shield glass	9	Toner shield glass
5	Mirror		

This machine uses two laser diodes to produce electrostatic images on an OPC drum. The laser diode unit converts image data from the BICU board into laser pulses, and the optical components direct these pulses to the drum. To produce a high quality copy image, these are 256 gradations for the laser power.

The output path from the laser diode to the drum is shown above. The LD unit outputs two laser beams to the polygon mirror through the cylindrical lens and the shield glass.

Each surface of the polygon mirror reflects two full main scan lines. The laser beams go to the F-theta mirror, mirror, and BTL (barrel toroidal lens). Then these laser beams go to the drum through the toner shield glass. The laser synchronization detector determines the main scan starting position.

Note

- The front door and upper right door (transfer door) are equipped with safety switches that automatically shut down the laser unit when either door is opened.

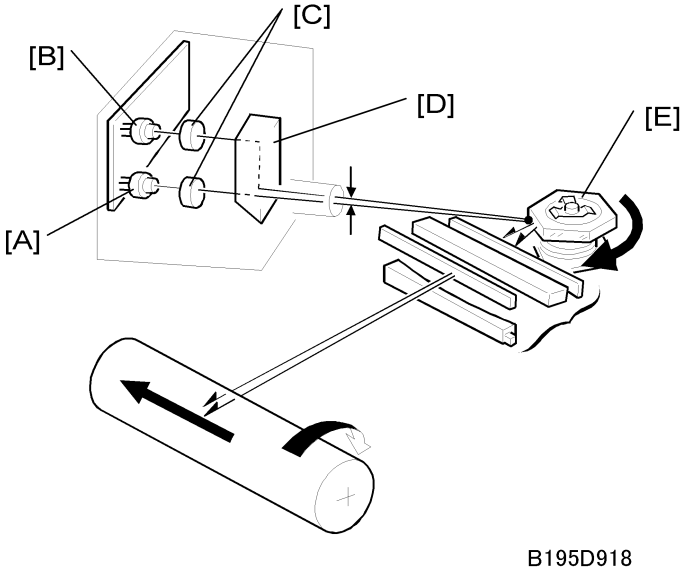
Auto Power Control (APC)

The LD driver on the LDDR drives the laser diode. Even if a constant electric current is applied to the laser diode, the intensity of the output light changes with the temperature. The intensity of the output decreases as the temperature increases.

In order to keep the output level constant, the LDDR monitors the electrical current passing through the photodiode (PD). Then it increases or decreases the current to the laser diode as necessary, comparing it with the reference level. This auto power control is done just after the machine is turned on and during printing while the laser diode is active.

The reference levels are adjusted on the production line. Do not touch the variable resistors on the LDDR in the field.

Dual-Beam Writing

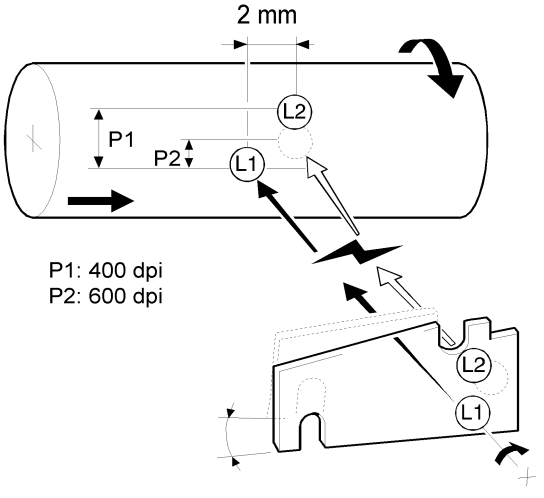


B195D918

This LD unit employs two laser diodes [A] (LD) and [B] (L2). Each face of the polygon mirror writes two main scan lines, and twelve main scans are produced when the polygon mirror rotates once. This reduces

polygon motor rotation speed, reduces noise generated by the polygon motor, and reduces the frequency of the image data clock.

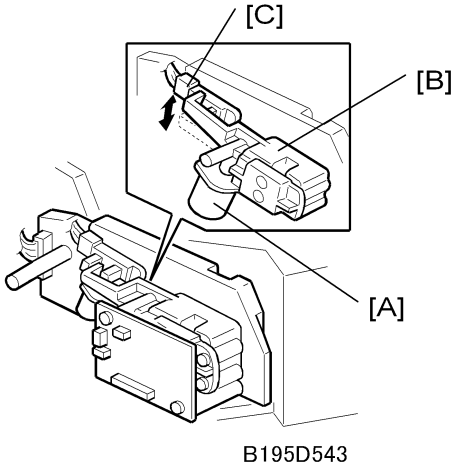
The two laser beams follow the path: collimating lenses [C] > prism [D] >polygon mirror [E].



B195D919

The two laser beams arrive on the drum surface about 2 mm apart in the main scan direction and about 0.06 mm apart (at 400 dpi) in the sub scan direction. The two-mm difference in the main scan direction allows the machine to detect the laser synchronization signal for each beam.

Laser Beam Pitch Change Mechanism



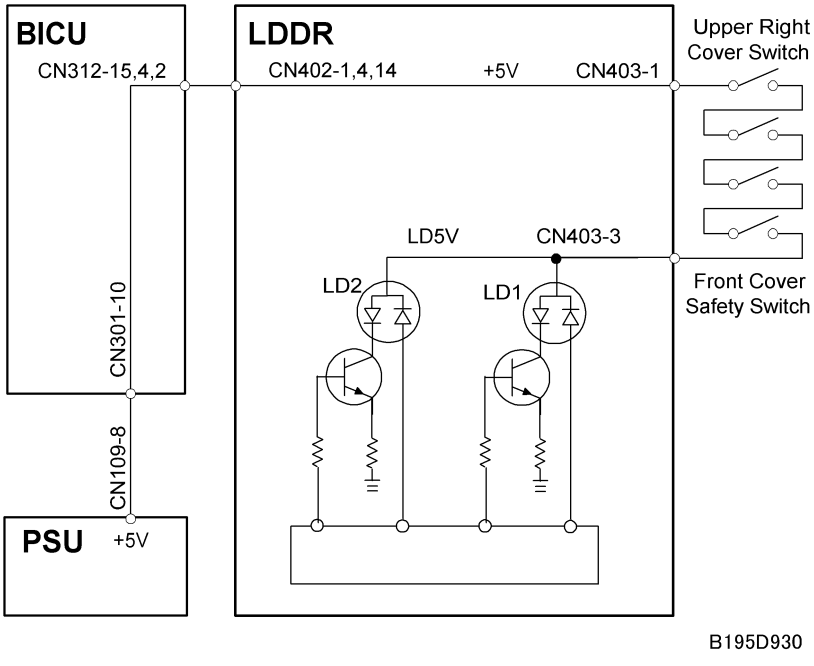
B195D543

When the LD positioning motor [A] turns, the metal block [B] in contact with the LD unit housing [C] moves up and down and changes the position of L2 (L1 does not move).

Both LD unit positions are at fixed distances from the LD unit home position sensor [D].

Usually, the LD unit moves directly to the proper position. However, when the number of times that the resolution has changed reaches the value of SP2109 05, the LD unit moves to the home position, and this re-calibrates the LD unit positioning mechanism.

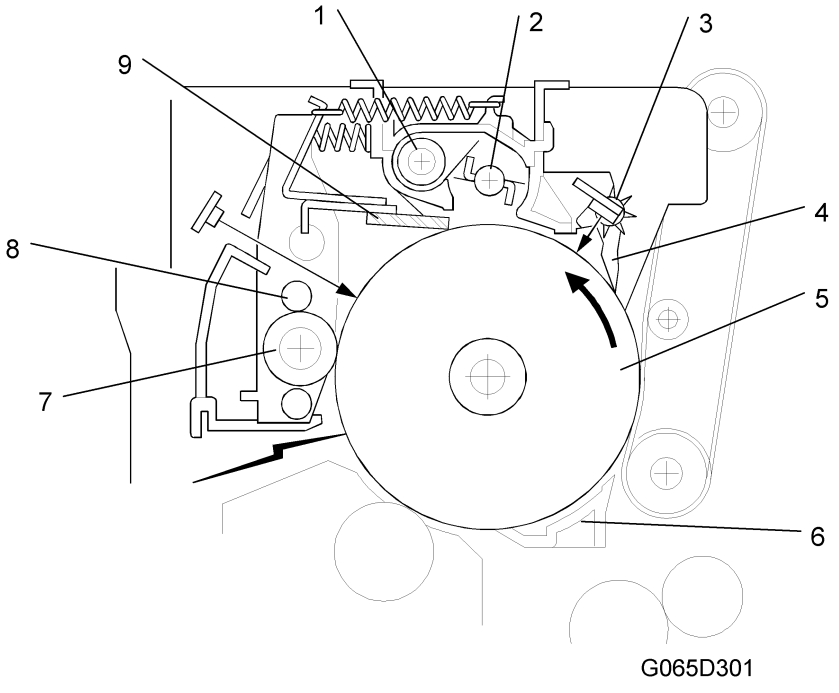
LD Safety Switches



To ensure personal safety and to prevent the laser beam from inadvertently switching on during servicing, power to the laser diode is switched off when the front cover or upper right cover is opened. Four safety switches are installed in series on the LD5 V line from the power supply unit (PSU) via the BICU board.

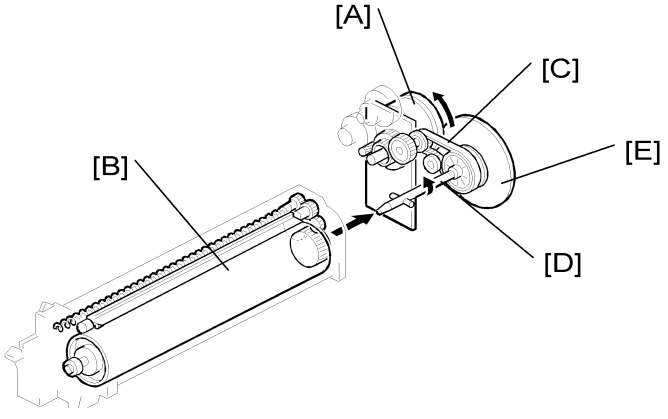
Photoconductor Unit (PCDU)

Overview of the PCDU



1	Toner Collection Coil	6	Transfer Entrance Guide
2	Toner Collection Plate	7	Charge Roller
3	Spur	8	Brush Roller
4	Pick off Pawl	9	Cleaning Blade
5	OPC Drum (ϕ60 mm)		

Drum Drive Mechanism

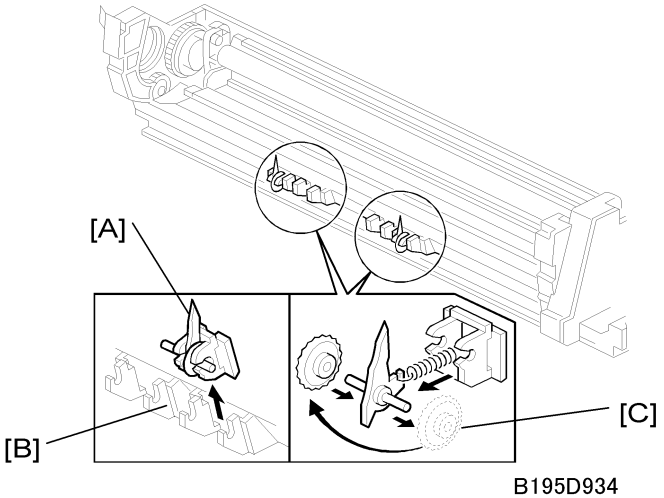


B195D933

The drive from the main motor [A] is transmitted to the drum [B] through a series of gears, a timing belt [C], and the drum drive shaft [D].

The main motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range. The flywheel [E] on the end of the drum drive shaft stabilizes the rotation speed (this prevents banding and jitter on copies).

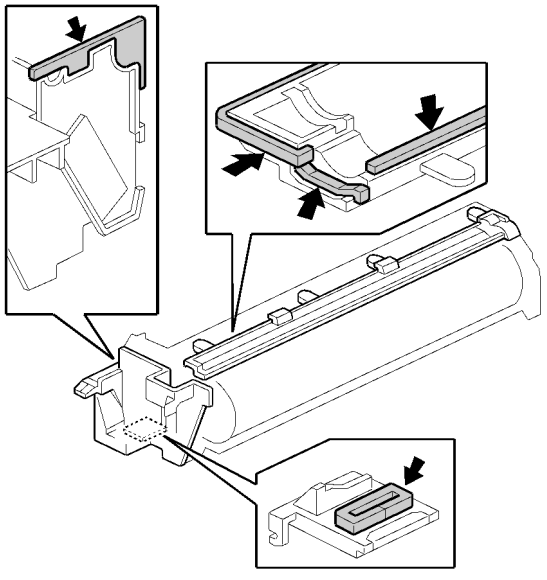
Drum Pawls



B195D934

The pick-off pawls [A], mounted in the holders [B] on the drum and in contact with the drum, strip paper from the drum if it has not yet separated. The gears [C] are removable, and the positions of the holders can be adjusted.

Drum Toner Seals

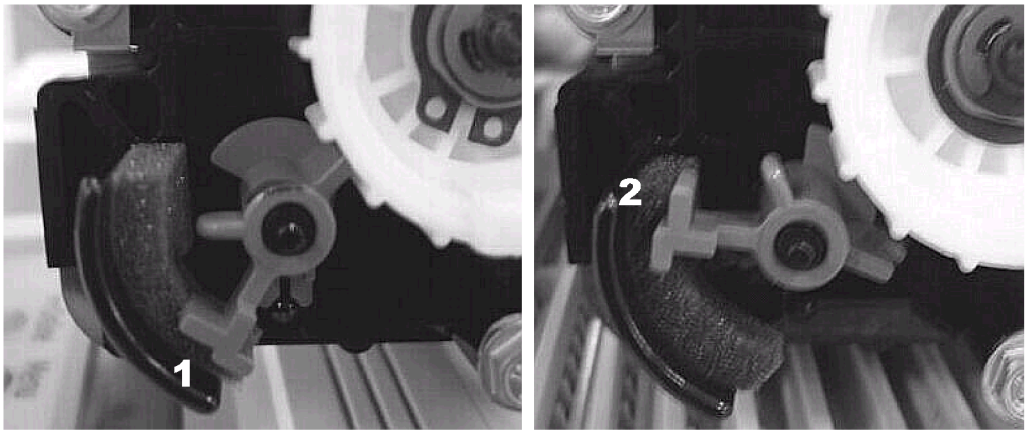


B195D935

Seals have been added to the structure of the PCU (photoconductor unit) to further prevent toner leakage.

New PCDU Unit Detection

New Unit Detection Mechanism



G147D991

This printer uses a push-switch to trigger the initialization of a new PCU.

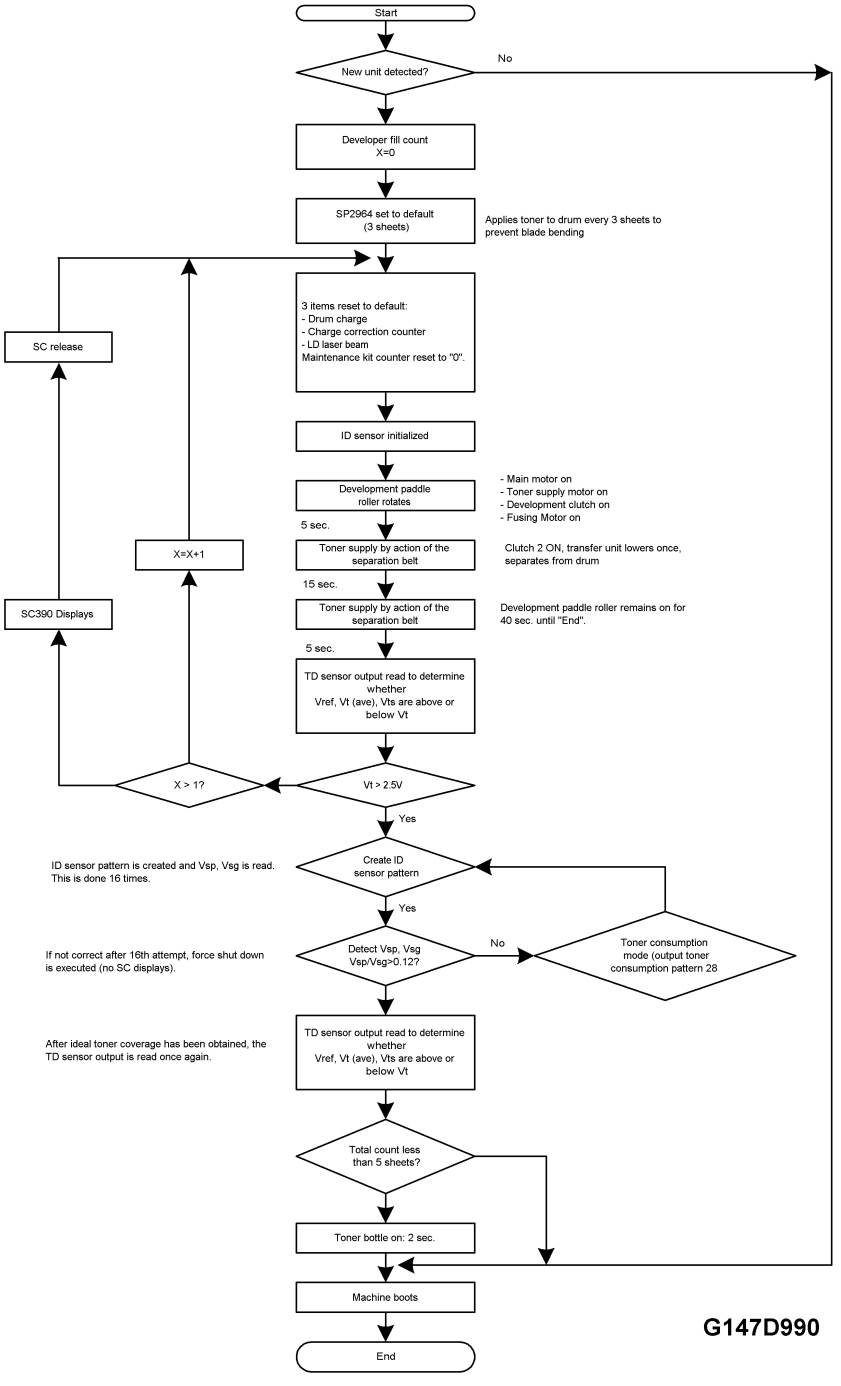
When the PCU is removed from the maintenance kit, the trip lever is in the down position [1]. After the new PCU is installed in the machine, the trip lever is forced into the up position [2]. This triggers the initialization procedure shown below (Please refer to the flow chart below, "What Happens When a New Unit Is Detected".)

This event is triggered only once after the new PCU is installed. The trip lever will remain in the up position for the remainder of the service life of the PCU, regardless of how many times the PCU is removed and reinstalled in the machine.

Important

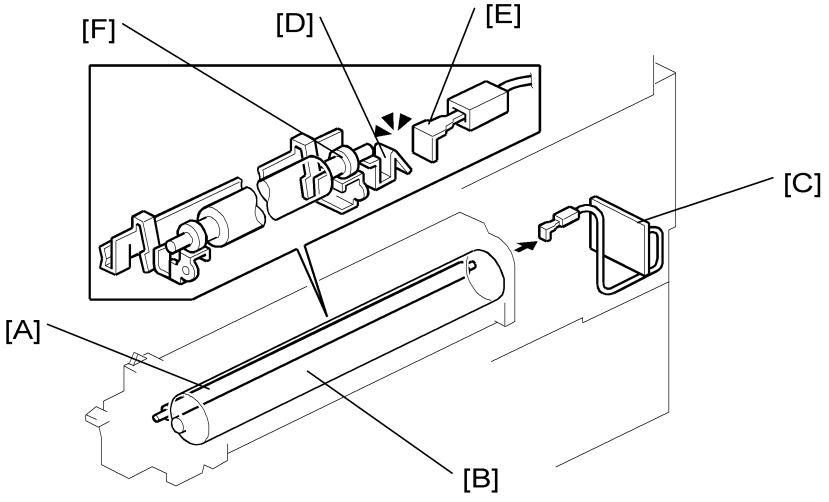
- **When a new PCU is removed from its box, handle it carefully to avoid hitting the trip lever and moving it accidentally out of its down position.**
- **If the trip lever on a new PCU is not down when the PCU is inserted in the machine for the first time, the machine will not detect the PCU as a new unit and the initialization sequence will not occur.**

What Happens When a New Unit Is Detected



Drum Charge

Overview of Drum Charge

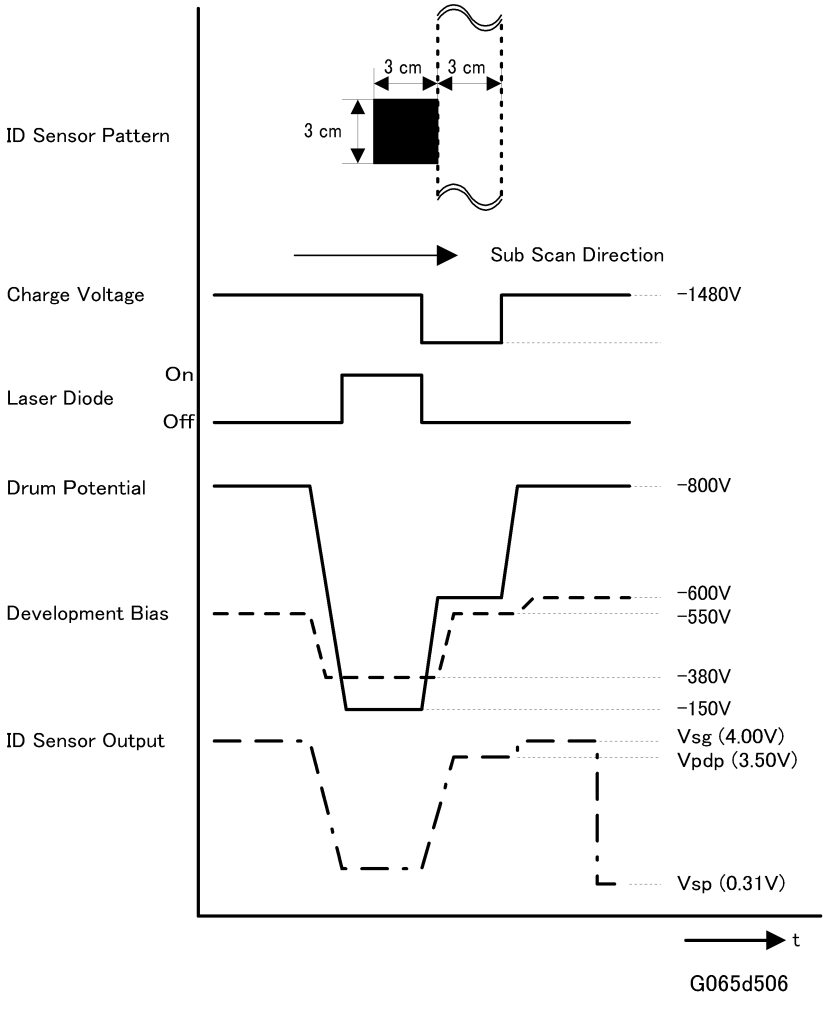


This machine uses a drum charge roller to charge the drum.

The drum charge roller [A] contacts the surface of the drum [B] to give it a negative charge. The high voltage supply board [C] supplies a negative dc voltage to the drum charge roller through the charge roller terminal [D], bias plate [E], and the rear roller bushing [F] to give the drum surface a negative charge of –800 V.

Charge Roller Voltage Correction

Correction for Environmental Conditions



The voltage transferred from roller to drum could vary with the temperature and humidity around the drum charge roller. The lower the temperature or humidity, the higher the applied voltage required.

The ID sensor measures the effects of ambient conditions, and any small change in drum potential caused by changes in temperature/humidity is reflected in the amount of toner transferred to the drum.

This measurement is done immediately after the ID sensor pattern for toner density control. After creating ID sensor pattern [A], another pattern [B] is made. To do this, the LD switches off, the charge roller voltage drops, and the drum potential is reduced to –600 V. At the same time, development bias returns to –550 V. The drum potential is now slightly higher than the development bias, so only a very small amount of toner

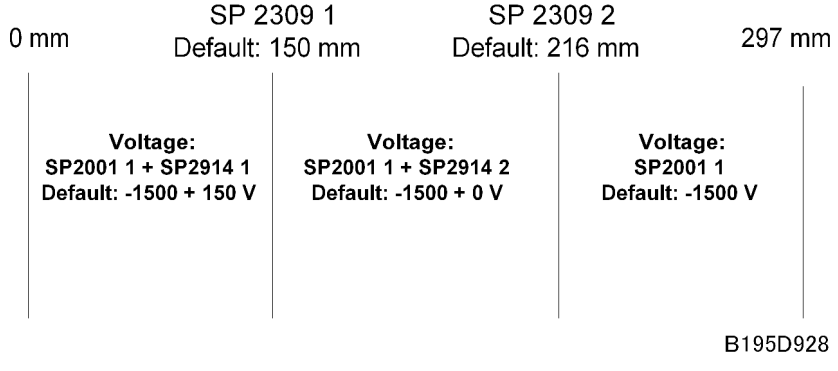
transfers to the drum. The ID sensor measures the density of pattern [B], and Vsdp, the output voltage, is compared with Vsg which was read from the bare drum at the same time.

Correction for Paper Width and Thickness (By-pass Tray only)

The by-pass tray can be used for non-standard paper narrower than sizes accepted by the paper trays. Thicker paper, OHP sheets, etc. can also be loaded in the by-pass tray but adjustments must be performed with the SP modes listed below in order to avoid jams and quality problems.

SP Mode	SP Name	
SP2001-01	Charge Roller Bias Adjustment	Default: –1,480 V
SP2001 02	ID Sensor Pattern	Default: -200 V
SP2309-01	Paper Lower Width [a]	Width limit. Default: 150 mm
SP2309-02	Paper Upper Width [b]	Width limit. Default: 216 mm
SP2914-01	Process Ctrl Set – C alpha	Adjust 10 V/step. Default: +150 V
SP2914-02	Process Ctrl Set – C beta	Adjust 10 V/step. Default: 0

The way that these SP modes are used is shown below.



For example, with the default settings, if the paper width fed from the by-pass tray is 100 mm, the charge roller voltage will be –1,480 + 150 V.

ID Sensor Pattern Production Timing

An ID sensor pattern is created on the drum:

- Every time the system is powered up
- After every 10 prints

- After 100 prints
- After 200 prints

After 10 prints

The ID sensor reads the sensor pattern and outputs this reading as Vsp and sends it to the CPU where it is used to calculate Vref (Vsp/Vsg = Vref).

- This number of prints can be adjusted with SP2210-01 (Pattern Interval – ID Sensor).
- When the number of prints exceeds 10 during a print job, the ID sensor pattern is not created and read until after the print job completes.

After every 100 prints

- This number of prints can be adjusted with SP2973-01.
- When the number of prints exceeds 100 during a print job, the ID sensor pattern is not created and read until after the print job completes.
- At this time, a halftone pattern is added to the standard ID sensor pattern. The reading from this pattern, Vsm, is used with Vsg (Vsm/Vsg) to calculate the value to be used to determine the amount of LD (laser diode) power adjustment required. This method improves consistent greyscale reproduction, slows the deterioration of the OPC drum, and reduces scatter.

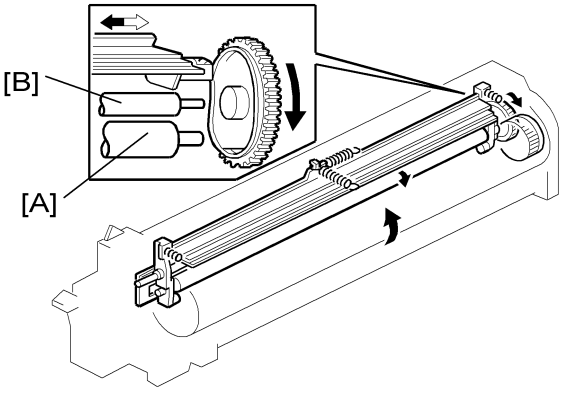
After every 200 prints

- The halftone pattern is added to the standard ID sensor pattern every 200 prints. This interval can be changed with SP2210-02 (Large Job).
- When 200 prints is reached, even if in the middle of a job, the ID sensor pattern will be made. For example, if the job contains 1,100 sheets, the ID sensor patterns will be made every 200 sheets, and at the end of the job.
- When the front door of the machine is opened and closed
- The halftone pattern is added to the standard ID sensor pattern at this time also.

The following SP codes are also used for grayscale control. Refer to the SP code table for full details.

SP Code	Name	What It Does
2973-01	Grayscale Copy Interval Check	Determines how often the halftone pattern is added to the standard ID sensor pattern. Default setting: 100
2972-01	Grayscale Upper Limit	Sets the upper limit for LD adjustment based on the Vsm/Vsg calculation.
2972-02	Grayscale Lower Limit	Sets the lower limit for LD adjustment based on the Vsm/Vsg calculation.
3103-04	Vsm/Vsg (Immediate Grayscale Post-Pattern Output)	Displays value used to determine the LD power adjustment (Normally, Vsm/Vsg = 65% ~ 85%)

Drum Charge Roller Cleaning



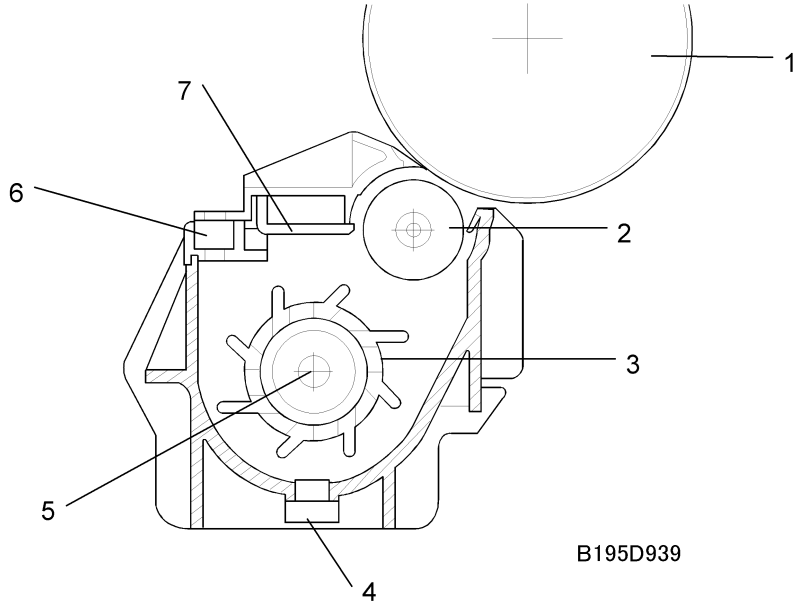
B195D938

The drum charge roller [A] (always in contact with the drum) becomes dirty easily.

The brush roller [B] remains in contact with the charger roller to clean the charge roller.

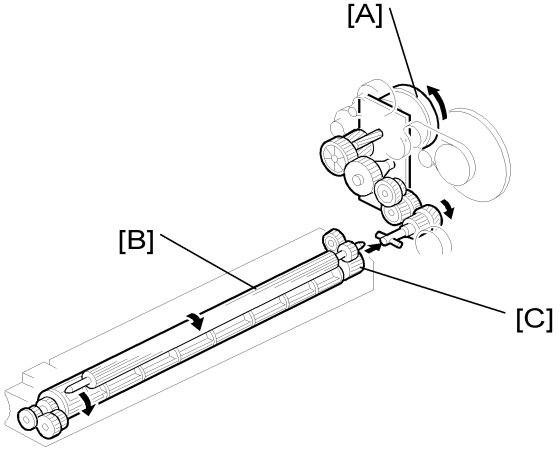
Development

Overview of Development



1	Drum	5	Mixing Auger
2	Development Roller	6	Development Filter
3	Paddle Roller	7	Doctor Blade
4	TD Sensor		

Drive Mechanism



B195D940

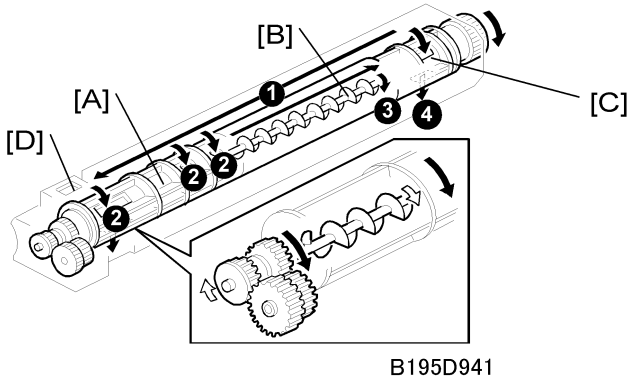
The feed/development motor [A] drives the development roller [B] through the gears and the paddle roller gear [C].

The drive shaft engages and disengages the paddle roller gear when the development unit is inserted into and removed from the machine.

Note

- The development drive gears are helical gears, quieter than normal gears.

Developer Mixing



B195D941

The dual mixing roller consists of the outer paddle [A] and the inner auger [B].

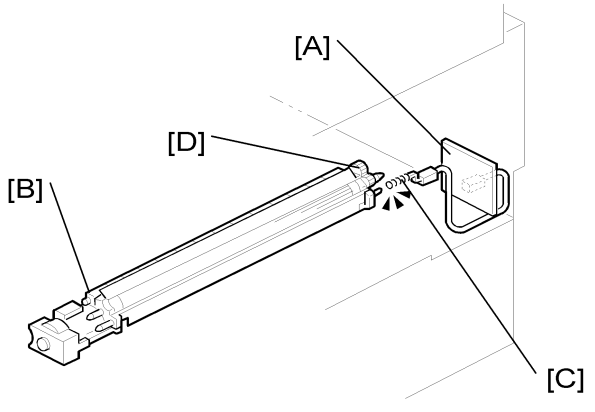
The outer paddle moves developer to the front ❶ and supplies it to the development roller. Developer that spills off by the doctor blade ❷ passes through the holes [C] in the outer paddle, and is transported to the rear ❸ by the inner auger.

While the dual mixing roller is moving the developer, some developer also passes back to the development unit through the holes in the bottom of the paddle roller ❹. New toner from the toner bottle and recycled toner from the toner collection coil both enter the development unit at [D].

Development Bias

Development Bias Mechanism

Black areas of the latent image are at a low negative charge (about 150 V) and white areas are at a high negative charge (about –950 V).



B195D942

To attract negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board [A] applies a bias of –540 volts to the development roller throughout the image development process. The bias is applied to the development roller shaft [B] through the bias terminal spring [C] and bias terminal [D].

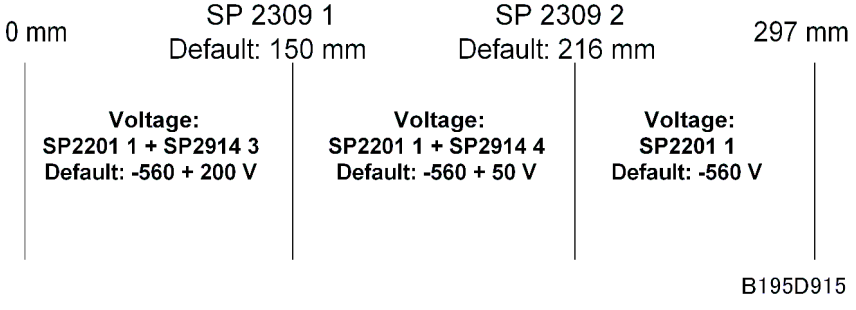
The development bias voltage (–540 V) can be adjusted with SP2201 (Development Bias).

Correction for Paper Width and Thickness (By-pass Tray only)

The by-pass tray can be used for non-standard paper narrow than sizes accepted by the paper trays. Thicker paper, OHP sheets, etc. can also be loaded in the by-pass tray but adjustments must be performed with the SP modes listed below in order to avoid jams and misfeeds.

SP Mode	SP Name	
SP2201-01	Developer Bias – Image Dev. Bias	Default: -540 V
SP2309-01	Paper Lower Width [a]	Width limit. Default: 150 mm
SP2309-02	Paper Upper Width [b]	Width limit. Default: 216 mm
SP2914-03	Process Ctrl Set – B gamma	Adjust 10 V/step. Default 200 V
SP2914-04	Process Ctrl Set – B delta	Adjust 10 V/step. Default 50 V

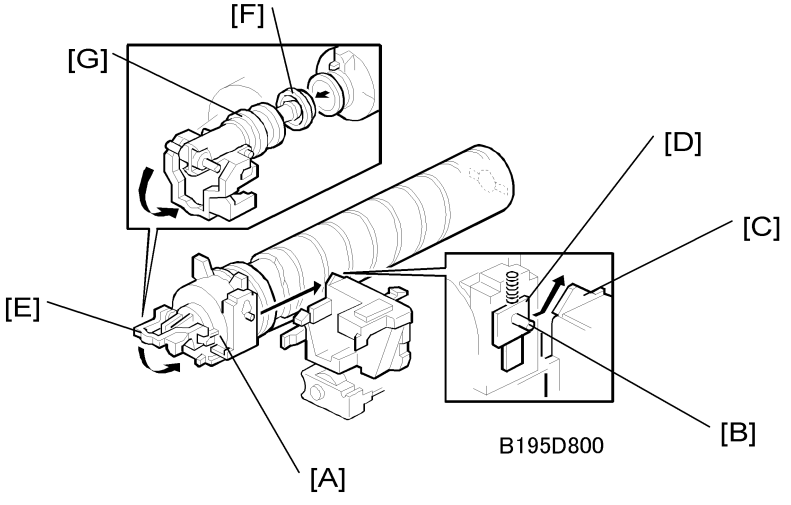
The way that these SP modes are used is shown below.



For example, with the default settings, if the paper width fed from the by-pass tray is 200 mm, the development bias voltage will be –540 + 50 V.

Toner Supply

Toner Bottle Replenishment Mechanism



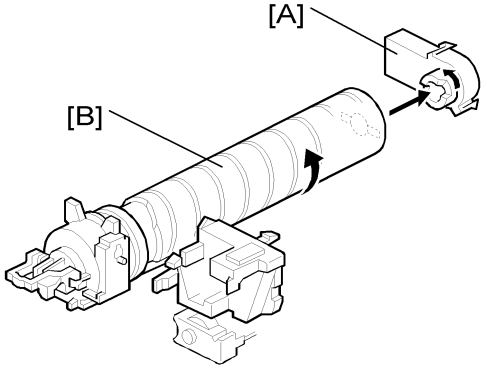
When the toner bottle is installed in the bottle holder [A], pin [B] slides up the side of the PCU [C], pulling out the toner shutter [D]. When the toner bottle holder lever [E] is returned to its original position, the cap [F] pulls away and is kept in place by the chuck [G].

The toner bottle holder lever [E] cannot be lowered:

- Until a toner bottle is installed in the holder. This prevents toner falling out of the holder unit as a result of lowering the handle with no toner bottle installed.
- Until the holder and bottle have been pushed into the machine completely and locked in place. Instruct the customer to always follow the bottle replacement instructions of the new decal attached to the toner bottle.

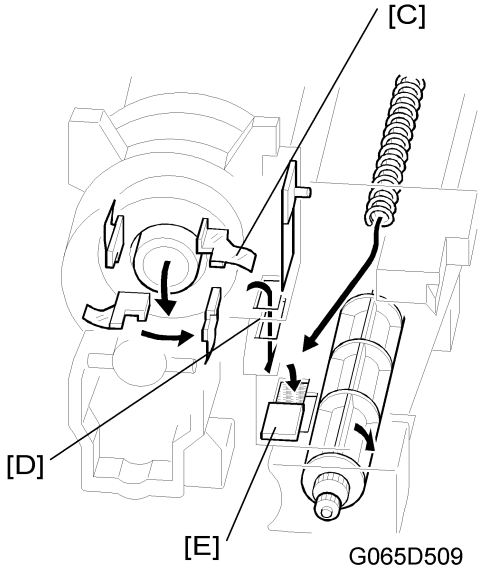
The toner bottle has a spiral groove which rotates the bottle to move toner to the development unit. When the bottle holder unit is pulled out, the chuck [G] releases the toner bottle cap and the toner shutter [D] closes and blocks the opening.

Toner Supply Mechanism



G065D545

The toner supply motor [A] rotates the toner bottle [B] and the mylar blades [C].



G065D509

Toner falls into the toner bottle holder, and the toner supply mylar blades [C] transfer the toner to slit [D]. Installing the PCU opens the shutter [E]. The toner falls into the development unit through the slit.

Toner Density Control

There are two modes for controlling and maintaining constant toner supply: sensor control (both direct and indirect) and image pixel count control. The mode can be changed with SP2208-01 (Toner Supply Mode).

Note

- The factory setting is sensor control mode. Image pixel count mode should only be used temporarily until a defective TD or ID sensor can be replaced.

Sensor Control Mode

In the sensor control mode, the amount of toner required to print the page is calculated by the CPU. The CPU adds up the image data value of each pixel and converts the sum to a value between 0 and 255. (255 would mean a completely black page.)

The machine must vary toner supply for each print in order to maintain the correct amount of toner in the developer and to account for changes in drum reflectivity due to changes in temperature and humidity. The CPU uses data from the TD sensor and ID sensor to determine whether or not the toner supply motor should be switched on and to calculate how long it should remain on in order to supply more toner to the mixture in the development unit.

TD Sensor

When new developer of standard toner concentration is installed, namely 20 g of toner per 500 g of developer (4.0% by weight), the TD sensor must be set to its initial setting of 4.0 V with SP2801. This initial setting is used as the toner supply reference voltage or Vref. For every print cycle, the TD sensor directly checks the toner density in the developer mixture, and after 10 copies these 10 readings are averaged and this value becomes TD sensor output voltage Vt (10).

The machine compares Vt (10) with Vref. If Vt (10) is greater than Vref, the toner concentration in the development unit judged to be low. When Vt (10) is detected to be greater than Vref 20 times, then this indicates that the toner concentration is consistently low, Vref is incremented by 0.1 V, and the conditions are checked again. The result of this check determines the value of K, the toner supply rate coefficient, which is one of the factors that is used in the toner supply motor on-time calculation.

ID Sensor

In addition to comparing Vt(10) from the TD sensor and Vref after every 10 copies, the ID sensor (located at the lower right area of the drum) checks both the reflectivity (Vsg) and the pattern on the drum (Vsp) created by the laser diodes and charge roller. If the reflected light is too strong, this indicates that toner is low and toner is added to the development unit. (The frequency of these checks can be adjusted with SP2210.).

Image Pixel Count Mode

This mode should only be used only as a temporary measure while waiting for replacement parts, such as a TD sensor. This mode controls the toner supply amount using the same method for determining the toner bottle motor on time. However, the values that were in effect when the toner density control mode was

changed over to image pixel count mode with SP2208-01 (Toner Supply Mode) remain in effect and cannot be changed.

Toner Near End/End Detection

Standard Method for Toner Near-End/End Condition Detection

The toner near-end condition is detected based on the Vt(10) output from the TD sensor.

- If the difference between Vref (toner supply reference voltage) and Vt (10) is less than or equal to –0.45, then toner concentration is judged as very low and K (the toner supply coefficient) is set to 0.25, the machine enters the toner near end condition and the machine switches on the toner supply motor.
- If a difference greater than –0.45 is detected, then toner concentration is judged as low but the machine does another test by comparing Vref and Vt (10).
- If the machine determines that Vt (10) is greater than Vref 40 times, the toner supply motor switches on and remains on for twice the time that Vt (10) was greater than Vref. If the toner concentration is still low, then the machine enters the toner near end condition.

The final toner end is detected using the ID sensor. If the ID sensor detects that the ID sensor pattern is very light (Vsp drops below 2.0 V), then the sensor triggers the toner end condition.

If Vsp is less than 2.0 V, the density of the ID sensor pattern is very light, so the machine detects the toner end condition. However, if Vsp remains higher than 2.0 V but 90 copies have been made after toner near end was determined, the machine enters the toner end condition.

Note

- The number of copies between toner near-end and toner end can be changed with SP2213. The default is 90 copies.

Adjustable Near-end Warning Method

By storing a value in SP2975, a near-end warning can be set up to appear on the LCD when the toner supply motor has rotated for a certain amount of time from after a new toner bottle was installed. This allows the user to be prepared much earlier than just 90 prints to change the bottle. Refer to the SP table for more.

Toner End Recovery

If the front door is opened and then closed while a toner near end/end condition exists, the machine will attempt to recover. When the front door is closed, the toner supply motor turns on to supply toner. The machine checks the TD sensor output 2 seconds after the main motor turns on (Vtp), and the sensor is checked again every 1 second (Vtp1)

The machine detects the toner concentration using Vref, Vt (10), Vtp, and Vtp1. If the toner concentration is still too low, the toner supply motor remains on for another 10 seconds while the machine checks Vt. If toner concentration is judged to be at the standard level, then the toner near end/end condition is cancelled and K (toner supply coefficient) is reset. If toner concentration has not reached the standard level, the toner supply motor rotates continuously until it does (maximum motor on time is 16 seconds) and then it will switch off.

Toner Supply with Abnormal Sensors

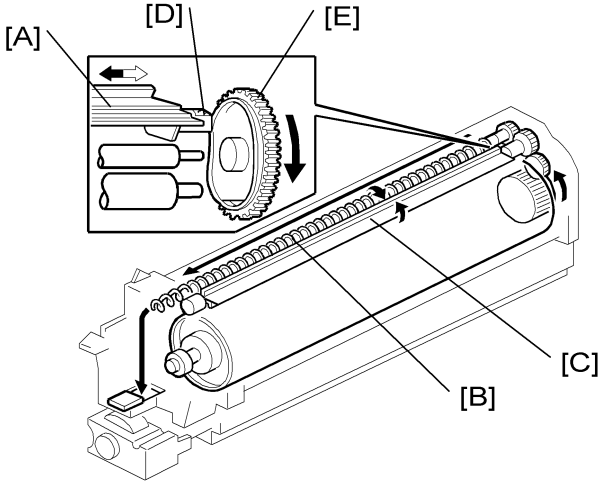
The TD sensor is checked every copy. If the readings from the TD sensor become abnormal during a copy job, the machine holds the GAIN factor constant (GAIN is normally calculated from TD sensor readings) to allow toner supply to vary with only pixel count for the rest of the copy job. Then at the end of the copy job, an SC code is generated and the machine must be repaired.

The ID sensor is checked every 10 copies. If readings become abnormal, an SC code is generated and the machine must be repaired. If this happens during a copy job, Vref is not changed, the copy job is allowed to finish, and then the SC code is generated.

If spare parts are not available, the technician can use SP2-208-1 (Toner Supply Mode) to temporarily put the machine in image pixel count mode. (See Section 5 Service Tables.)

Drum Cleaning and Toner Recycling

Drum Cleaning



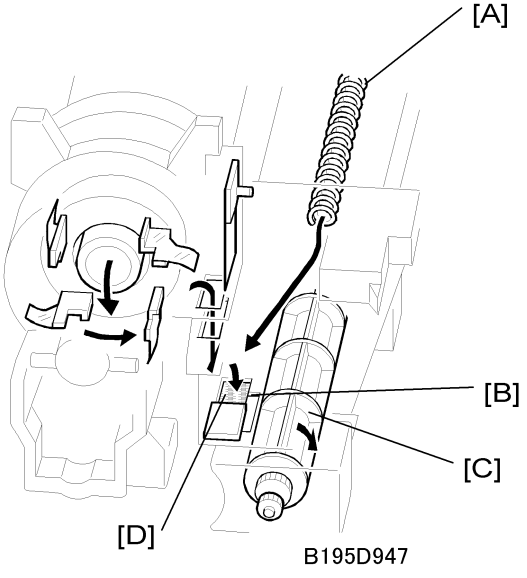
B195D946

This machine employs a counter blade system. After the image is transferred to paper, a cleaning blade [A] removes any toner remaining on the drum. The toner collection coil [B] carries excess toner to the toner collection plate [C].

The collar [D] on the cleaning blade bracket contacts the outer rim of cam gear [E], which moves the cleaning blade side to side. This side-to-side movement disperses accumulated toner to prevent early blade edge wear at one location.

The drum reverses about 5 mm after every print job to remove particles on the edge of the cleaning blade.

Toner Recycling



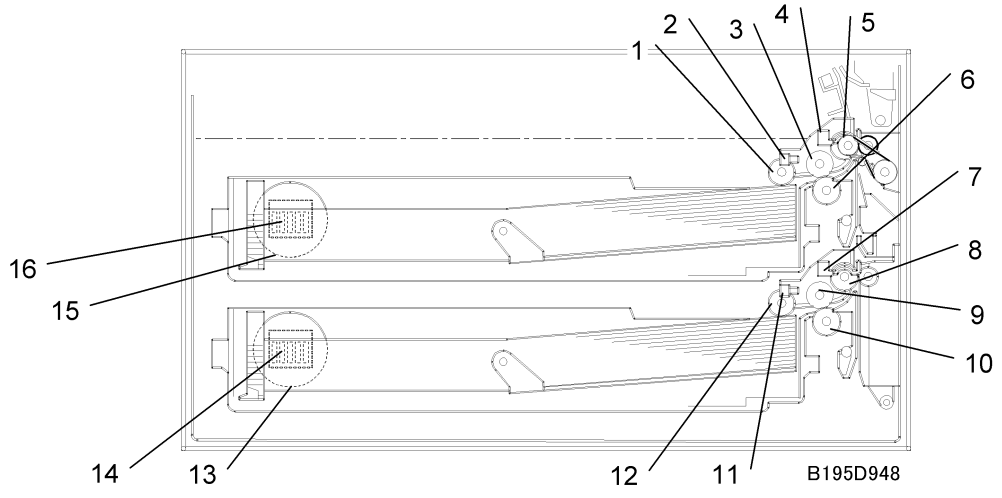
Toner collected by the toner collection coil [A] is transported to the opening [B]. This toner falls into the development unit with new toner coming from the toner bottle. The paddle roller [C] mixes the collected toner with the new toner.

Note

- A screen filter [D] has been added to strain out paper dust and other foreign matter.

Paper Feed

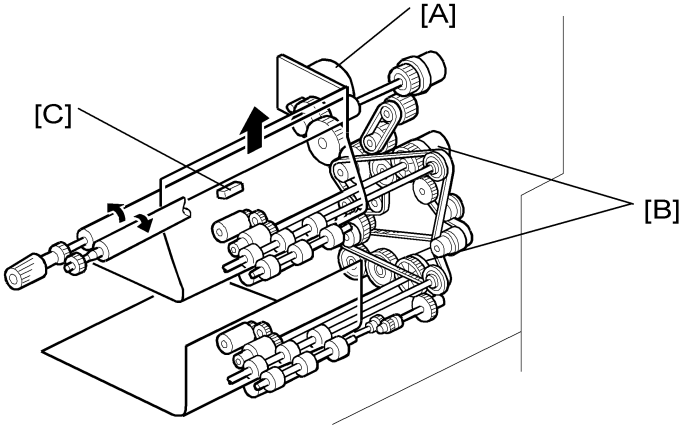
Overview of Paper Feed



1	Upper pick-up roller	9	Lower paper feed roller
2	Upper paper height sensor	10	Lower separation roller
3	Upper paper feed roller	11	Lower paper height sensor
4	Upper relay sensor	12	Lower pick-up roller
5	Upper relay roller	13	Lower paper size dial
6	Upper separation roller	14	Lower paper size switch
7	Lower relay sensor	15	Upper paper size dial
8	Lower relay roller	16	Upper paper size switch

Each paper tray, which employs the FRR system, can hold 500 sheets. Two relay sensors, positioned above each set of relay rollers, detect paper jams. A selection dial allows you to select the setting for the size of the paper loaded in the tray.

Paper Feed Drive

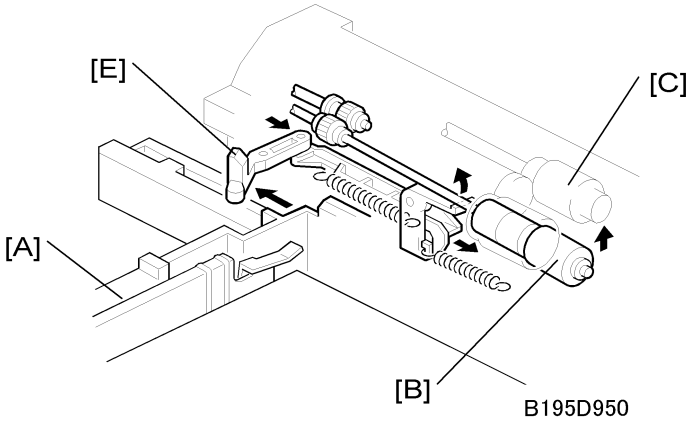


B195D949

The feed/development motor [A] drives the pick-up and feed mechanism of both the upper and second paper feed stations through gears and the paper feed clutches [B].

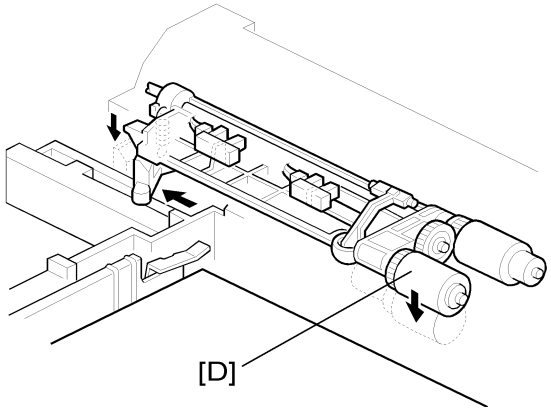
When the paper feed clutch turns on, the pick-up roller, paper feed roller, and separation roller start rotating to feed the paper. The paper feed clutch stays on until shortly after the registration sensor [C] actuates.

Pick-Up and Separation Roller Release Mechanism



B195D950

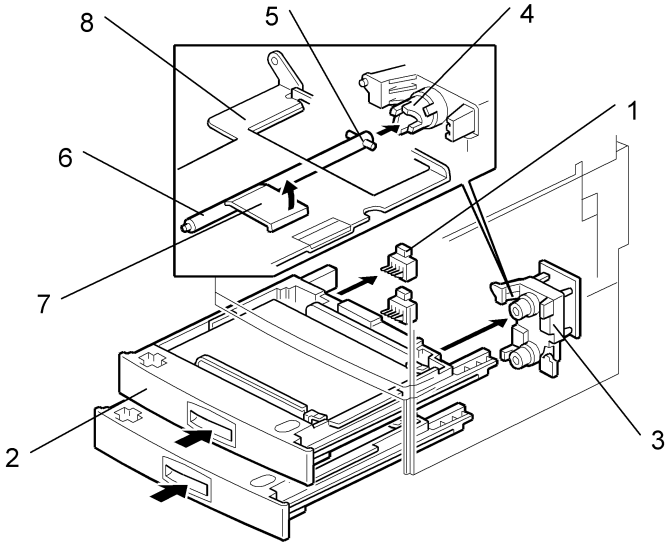
When the paper tray [A] is not inside the machine, the separation roller [B] is away from the paper feed roller [C] and the pick-up roller [D] stays in the upper position.



B195D951

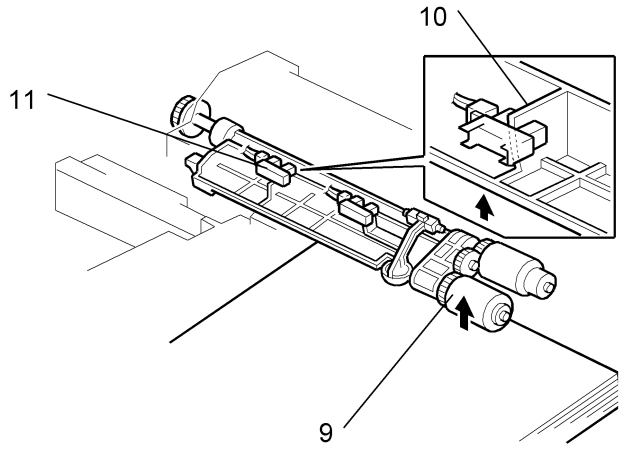
When the paper tray is set into the machine, it pushes the release lever [E]. This causes the pick-up roller [D] to go down and the separation roller [B] to move up and contact the paper feed roller.

Paper Lift



B195D952

The paper size switch [1] detects when the paper tray [2] is set in the machine, and the tray lift motor [3] rotates, and the coupling gear [4] on the tray lift motor engages the pin [5] on the lift arm shaft [6]. Then the tray lift arm [7] lifts the tray bottom plate [8].



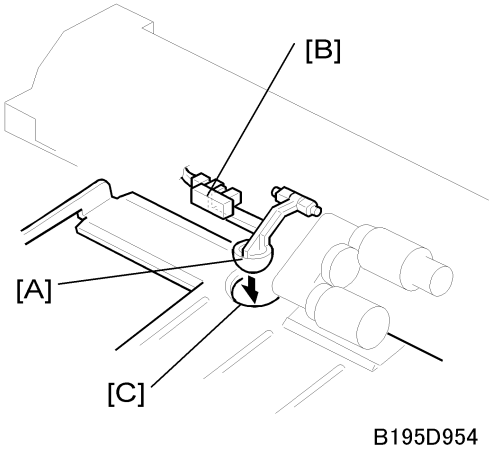
B195D953

When the paper tray is set in the machine, the pick-up roller [9] lowers. When the top sheet of paper reaches the proper height for paper feed, the paper pushes up the pick-up roller, and the actuator [10] on the pick-up roller supporter activates the paper height sensor [11] to stop the tray lift motor.

After several paper feed cycles, the paper level gradually lowers and the paper height sensor is de-activated. The tray lift motor turns on again until this sensor is activated again.

When the paper tray is removed from the machine, the tray lift motor coupling gear disengages the pin on the lift arm shaft, and the tray bottom plate then drops under its own weight.

Paper End Detection

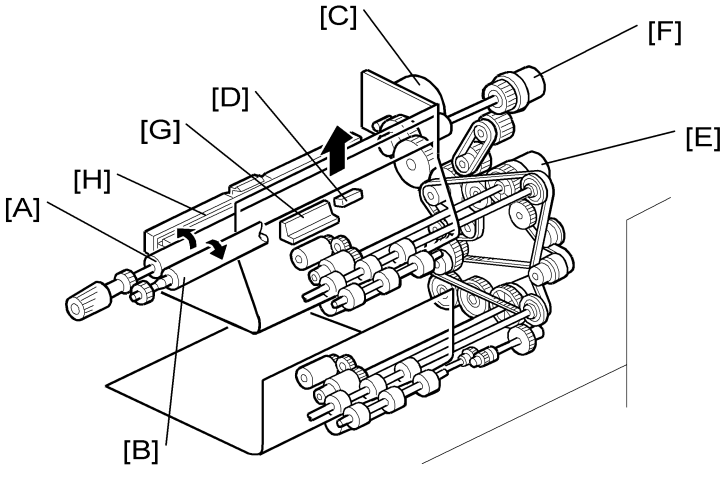


B195D954

If there is paper in the paper tray, the paper end feeler [A] is raised by the paper stack, and the paper end sensor [B] is deactivates.

When the paper tray runs out of paper, the paper end feeler drops into the cutout [C] in the tray bottom plate and the paper end sensor is activated.

Paper Registration



B195D955

The registration drive roller [A] and idle roller [B] correct the skew of the paper to ensure that the leading edge of the paper is positioned correctly at the drum. The paper feed/development motor [C] drives the registration mechanism.

The registration sensor [D] is just before the registration rollers. When the leading edge activates the registration sensor, the registration clutch is switched off and the registration rollers stop turning. However, the relay clutch [E] remains on slightly longer. This delay allows more time for the paper to press against the registration rollers and buckle slightly to correct any skew. The registration sensor also detects misfeeds.

Next, the registration clutch [F] and the relay clutch turn on at the correct time to align the paper with the image on the drum. The registration rollers then feed the paper to the image transfer section.

Two new dust blades have been added around the registration roller. The idle roller dust blade [G] cleans the registration idle roller. This dust blade has a small dust box that collects paper dust that must be emptied periodically.

The registration roller dust blade [H] cleans the registration roller. For details about how to remove and clean these new parts, see Section “3 Replacement and Adjustment”.

Paper Size Detection

The paper size switch includes four microswitches. Actuators behind the paper size dial actuate the sensors.

Each paper size has its own actuator, with a unique combination of notches. To determine the paper size, the CPU reads which switches the actuator has turned off.

The CPU disables paper feed from a tray if the paper size cannot be detected. If the paper size actuator is broken, or if there is no tray installed, the printer control board recognizes that the paper tray is not installed.

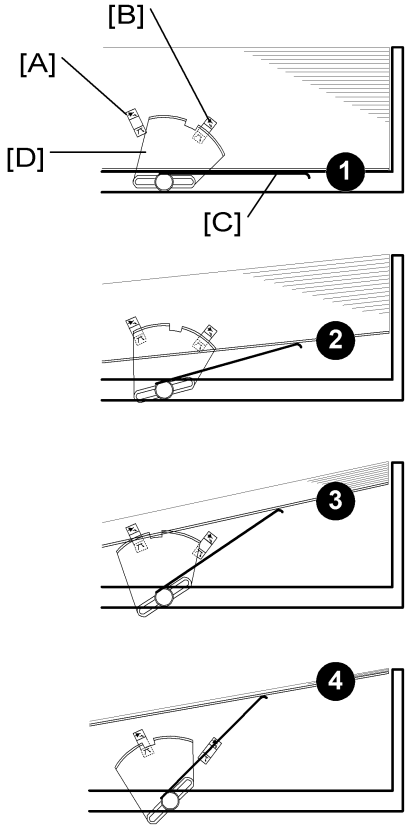
When the paper size actuator is at the "*" mark, the paper tray can be set up to accommodate one of a wider range of paper sizes by using a menu setting on the machine's operation panel.

Models		Paper Size Switch			
North America	Europe/Asia	1	2	3	4
$8^1/_2$" x 13" Portrait	A3 Portrait	ON	ON	OFF	ON
A4 Landscape	A4 Landscape	ON	ON	ON	ON
A4 Portrait	A4 Portrait	ON	OFF	ON	ON
11" x 17" Portrait	A5 Portrait	OFF	OFF	ON	ON
$8^1/_2$" x 14" Portrait	8" x 13" Portrait	ON	OFF	OFF	OFF
$8^1/_2$" x 11" Portrait	$8^1/_2$" x 11" Portrait	ON	ON	OFF	OFF
$8^1/_2$" x 11" Landscape	$8^1/_2$" x 11" Landscape	ON	OFF	ON	OFF
*	*	ON	ON	ON	OFF

ON: Pushed, OFF: Not Pushed

Paper Height Detection

Two paper height sensors [A] and [B], working in combination, detect the amount of paper in the tray.



G065D707

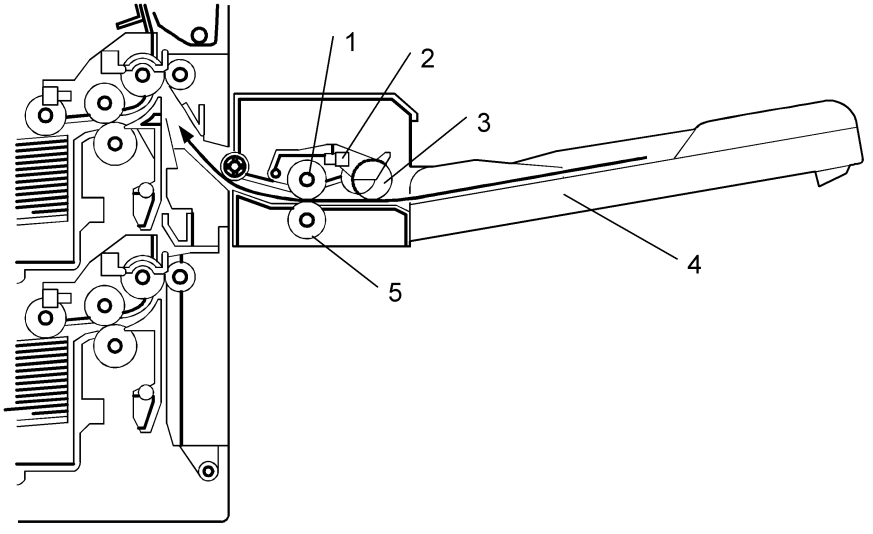
When the amount of paper decreases, the bottom plate pressure lever [C] moves up and the actuator [D] mounted on the same drive shaft as the pressure lever rotates.

The following combinations of sensor signals are sent to the printer controller.

Amount of Paper	Paper Height Sensor [A]	Paper Height Sensor [B]
❶ Full	OFF	ON
❷ Near Full	ON	ON
❸ Near End 1	ON	OFF
❹ Near End 2	OFF	OFF

By-Pass Tray

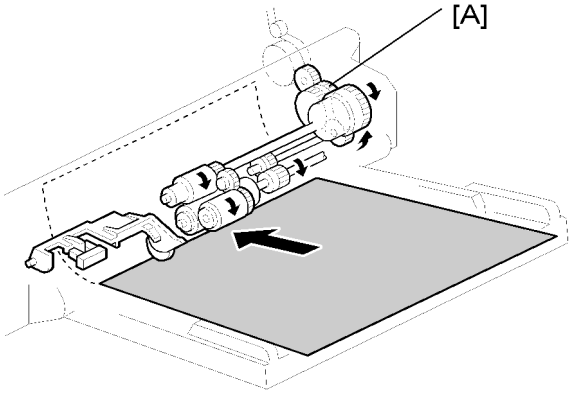
Overview of By-Pass Tray



B195D956

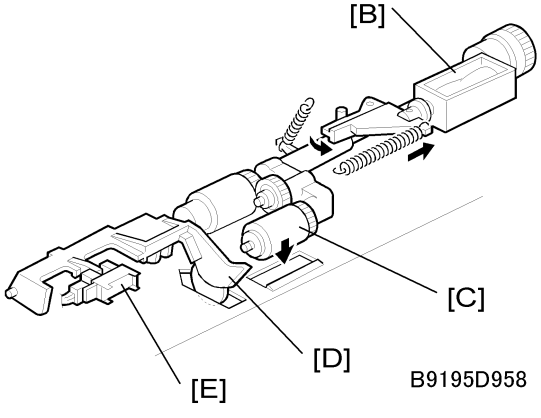
1	Paper feed roller
2	Paper end sensor
3	Pick-up roller
4	By-pass tray
5	Separation roller

By-Pass Tray Operation



B195D957

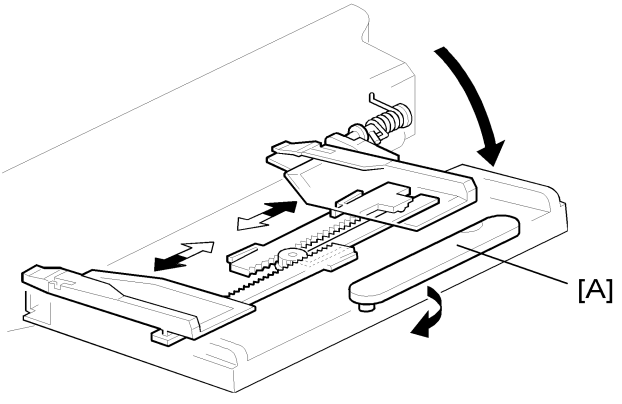
The by-pass unit is directly driven by the machine through gear [A].



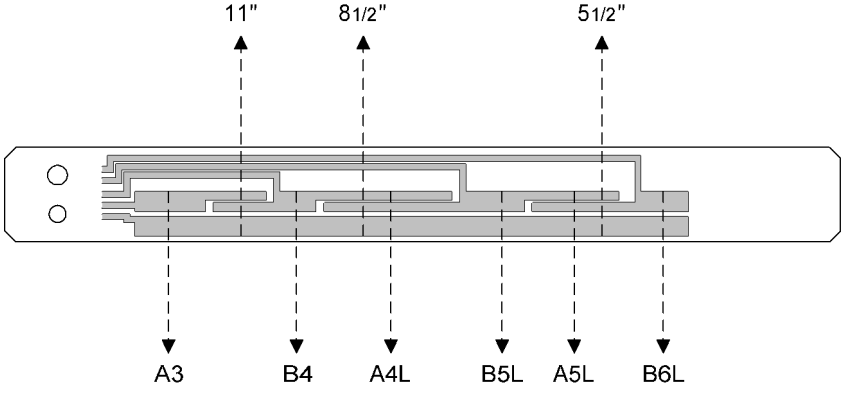
B9195D958

When the print key is pressed, the pick-up solenoid [B] turns on and the pick-up roller [C] moves onto the paper. When the by-pass tray runs out of paper, the paper end feeler [D] drops into the cutout in the by-pass tray and the paper end sensor [E] is activated.

By-Pass Paper Size Detection



B195D959



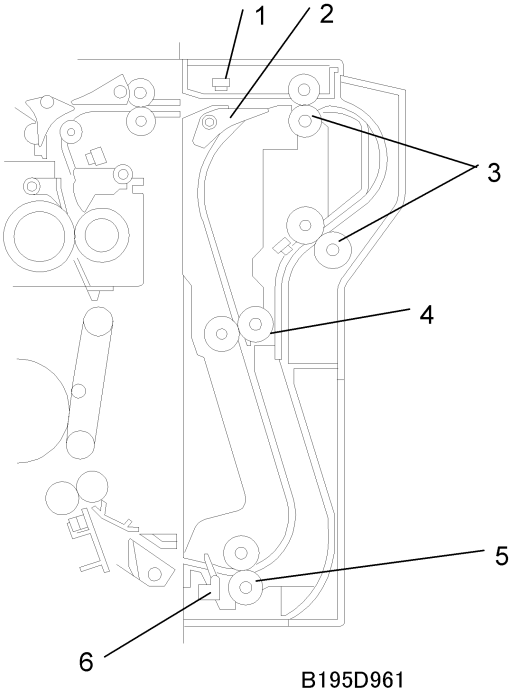
B195D960

The paper size sensor board [A] monitors the paper width.

The rear side fence is connected to the terminal plate. The pattern for each paper width is unique. Therefore, the machine determines which paper has been placed in the by-pass tray by the signal output from the board. However, the machine does not determine the paper length from the by-pass tray hardware.

Duplex Unit

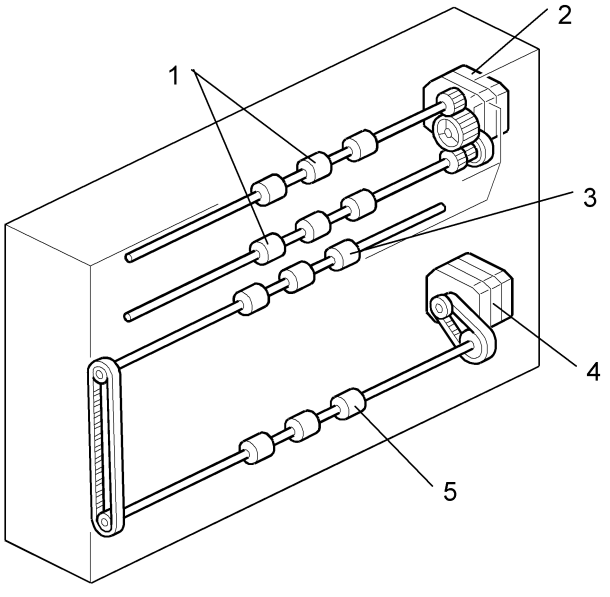
Overview of Duplex Unit



B195D961

1	Entrance sensor	4	Upper transport roller
2	Inverter gate	5	Lower transport roller
3	Inverter roller	6	Exit sensor

Duplex Drive Layout



B195D962

1	Inverter roller	4	Transport motor
2	Inverter motor	5	Lower transport roller
3	Upper transport roller		

Duplex Basic Operation

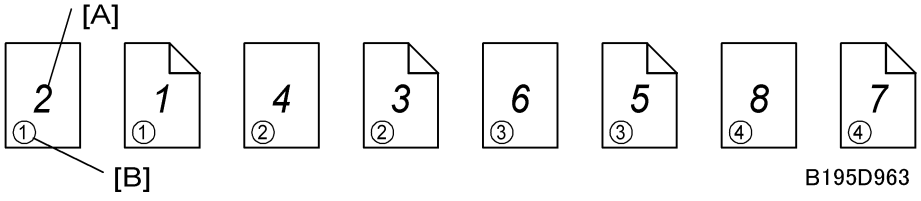
To increase the productivity of the duplex unit, copies are printed as follows.

Paper Length Longer than A4/LT SEF

The duplex unit can store only one sheet of copy paper.

- Example: 8 pages -

The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).

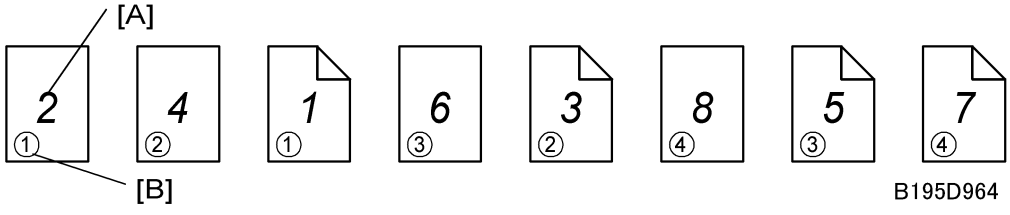


Paper Length Up to A4/LT SEF

The duplex unit can store two sheets of copy paper

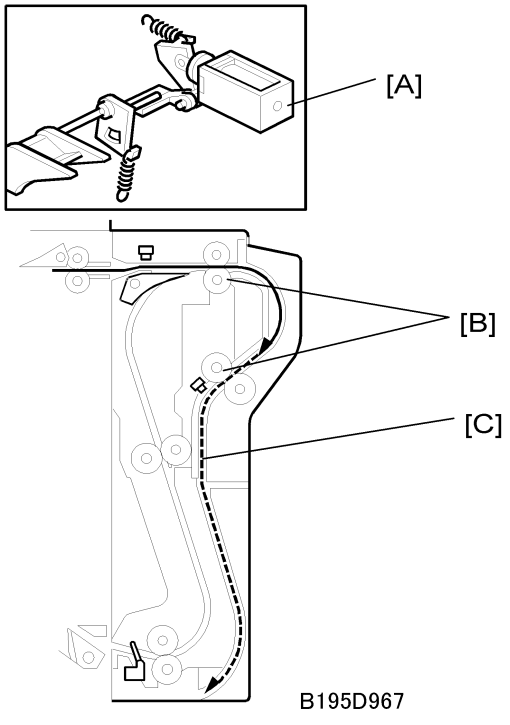
- Example: 8 pages -

The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).



Duplex Unit Feed In and Exit Mechanism

Paper Feed into Duplexer

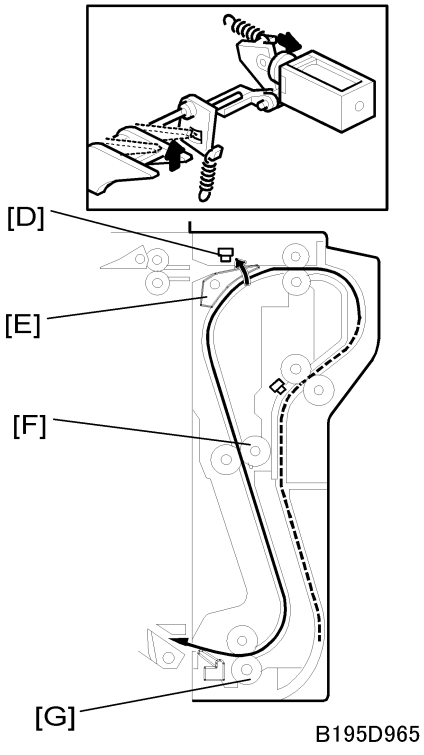


The inverter gate solenoid [A] stays off and the inverter rollers [B] rotate clockwise. A sheet of paper is sent to the inverter section [C].

Note

- The cover guide has been eliminated in order to accommodate paper sizes longer than A4/LT in the reverse feed path which has been lengthened in the design of this machine.

Paper Inversion and Exit from Duplexer

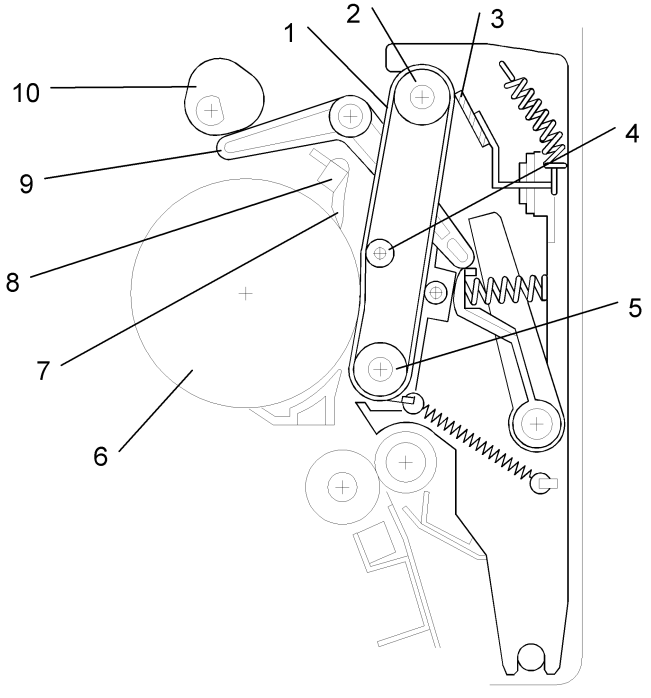


B195D965

The inverter gate solenoid turns on and the inverter motor turns on in reverse shortly after the trailing edge of the paper passes through the entrance sensor [D]. As a result, the inverter gate [E] is opened and the inverter roller rotates counterclockwise. The paper is sent to the machine through the upper and lower transport rollers [F, G].

Image Transfer and Paper Separation

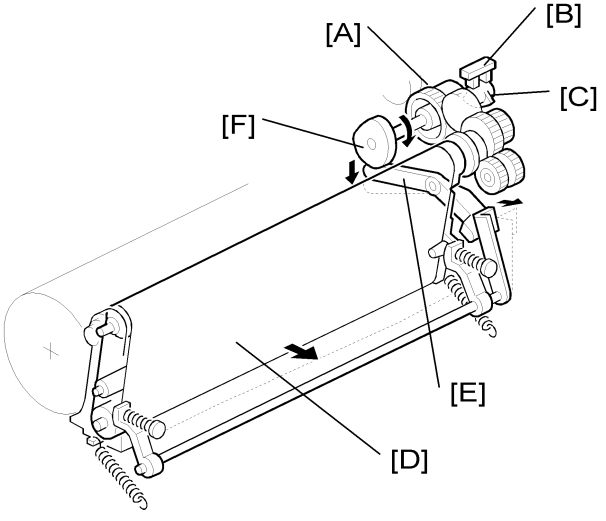
Overview of Transfer and Separation



B195D966

1	Transfer belt	6	OPC
2	Drive roller	7	Pick-off pawls
3	Transfer belt cleaning blade	8	ID sensor
4	Transfer roller	9	Contact lever
5	Idle roller	10	Transfer belt contact clutch/cam

Transfer Belt Drive Mechanism



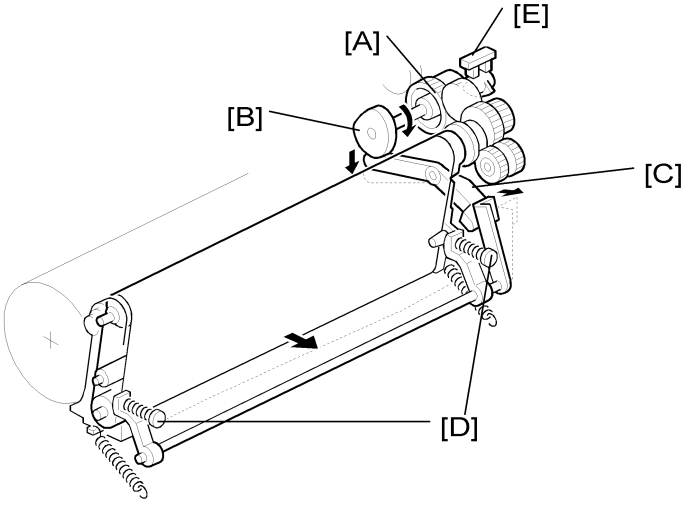
B195D968

After the main motor switches on during printing, the transfer belt contact clutch [A] switches on after a specified interval and the cam [F] makes a half-turn to raise the contact lever [E] and bring the transfer belt [D] into contact with the drum.

The actuator [C], on the same axis as the cam, and the transfer belt position sensor [B] detect whether the drum and transfer belt are in contact.

When the main motor is off, or when the ID sensor pattern is being measured, the transfer belt unit separates from the drum. The ID sensor pattern must not be transferred to the belt. Also, the transfer belt and drum must not remain in contact for too long, to prevent contamination of the drum with oil or other foreign material from the transfer belt.

Transfer Belt Unit Contact Mechanism

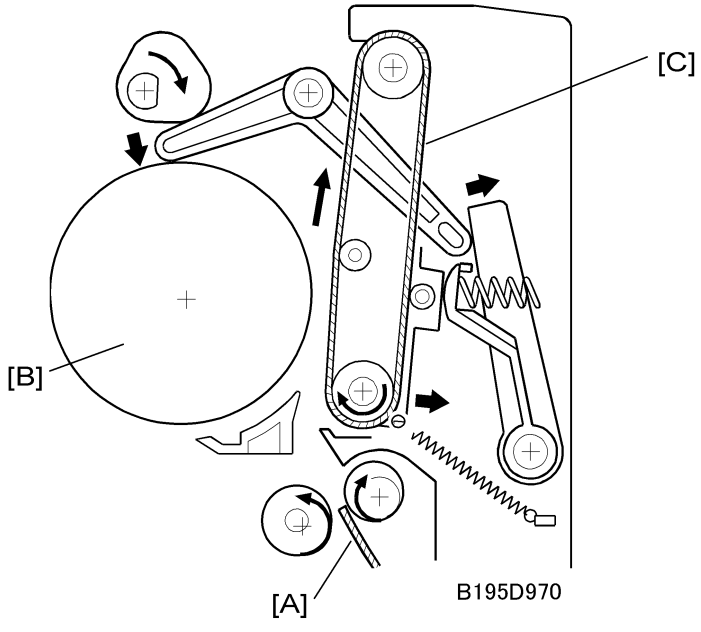


B195D969

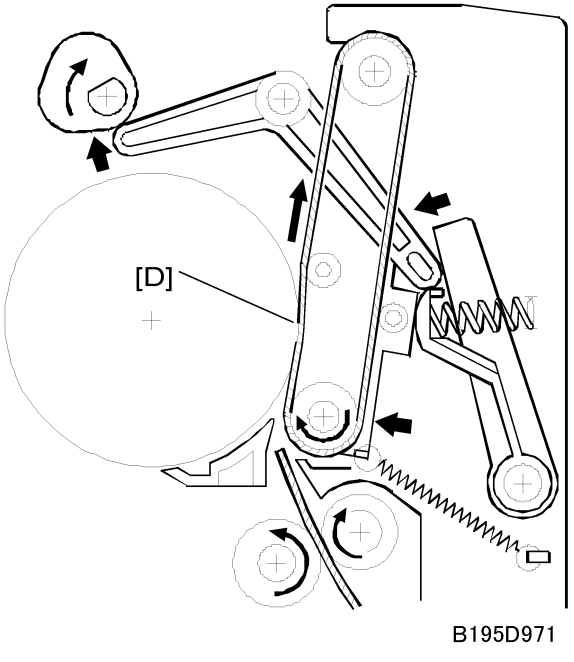
The belt contact and release mechanism consists of the belt contact clutch [A], cam [B], and contact lever [C]. The belt contact clutch turns on and the cam attached to the clutch rotates half a complete rotation. The contact lever, riding on the cam, is lifted up and the springs [D] push the belt into contact with the drum.

The transfer belt position sensor [E] detects the home position of the cam (this is when the belt is away from the drum). The belt must be released from the drum between copy jobs in order to prevent the ID sensor pattern from being rubbed off and to prevent contamination of the drum from the surface of the belt.

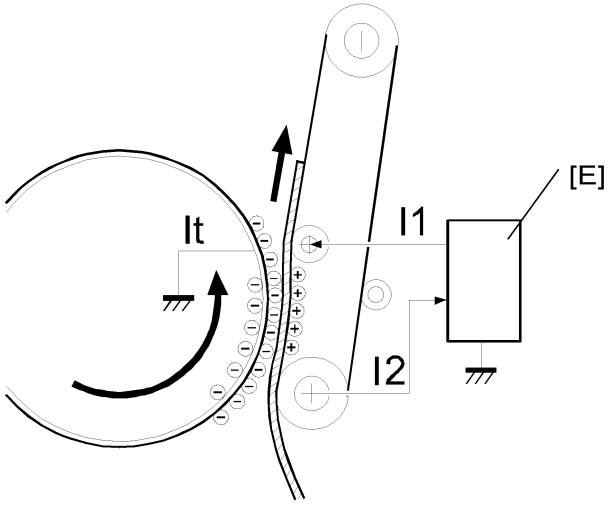
Image Transfer and Paper Separation Mechanism



When the registration clutch switches on to align the leading edge of the paper [A] with the image on the drum [B], the transfer belt is [C] is away from the drum.



At the designated time after the main motor switches on, the transfer belt contact clutch switches on and the transfer belt touches the drum at [D].



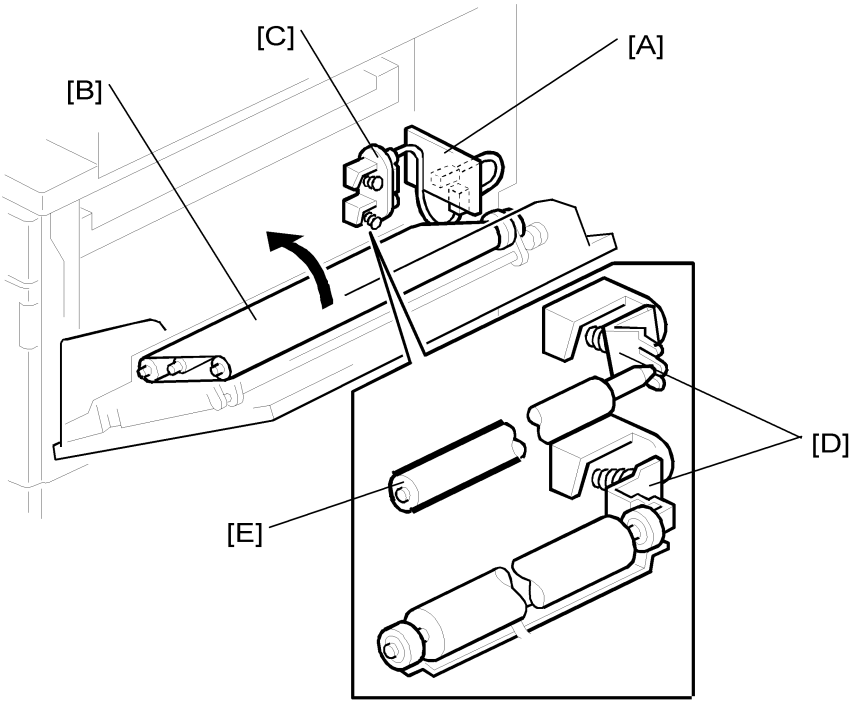
B195D972

When the paper enters the gap between the belt and the drum, the high voltage supply board [E] applies a high positive current to the belt to transfer the image to the paper.

After receiving the image from the drum, the paper is fed by the belt. The paper moves to the end of the transfer belt unit, where it separates from the belt as the belt curves away. Then the paper moves on to the fusing unit.

Transfer Belt Charge

Transfer Belt Charge Mechanism



The high voltage supply board [A] applies a positive current to the transfer belt [B] through the terminal block [C], terminal plate [D], and the bias roller [E].

The high voltage supply board adjusts the current to the roller to keep a small but constant current flow to ground through the belt, paper, and drum. If this current is not kept constant, efficiency of toner transfer and paper separation will vary with paper thickness, type, environmental condition, or changes in transfer belt surface resistance.

Correction for Paper Width and Thickness

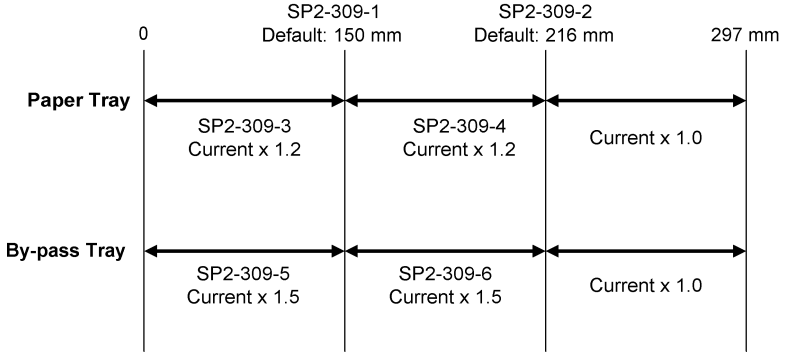
A range of SP modes is available in order to adjust the machine so it can handle papers of non-standard size and thickness.

For paper width, there are two thresholds. The factory settings are 150 mm (5.9") and 216 mm (8.5"). Below 216 mm, the transfer current can be increased. By default, the current is multiplied by 1.2 for the main machine paper trays. For paper widths below 150 mm, the transfer current can be set higher, but by default it is kept the same as the current for paper widths below 216 mm. The higher current allows for the

tendency of the current to flow directly from the transfer belt to the drum and not through the paper which could cause an insufficient amount of toner to transfer to narrow width paper.

Thick paper must be fed from the by-pass tray because SP modes are available only for the by-pass tray in order to accommodate thick paper. By default, the current for paper narrower than 216 mm is 1.5 times the normal current.

This illustration shows the SP modes, which control these currents. The base transfer current ('current' in the diagram) depends on SP 2-301. This is different for various parts of the image, and is different for the by-pass tray; see the next page for details.



Currents Applied to Leading Edge, Image Areas, and By-Pass Feed

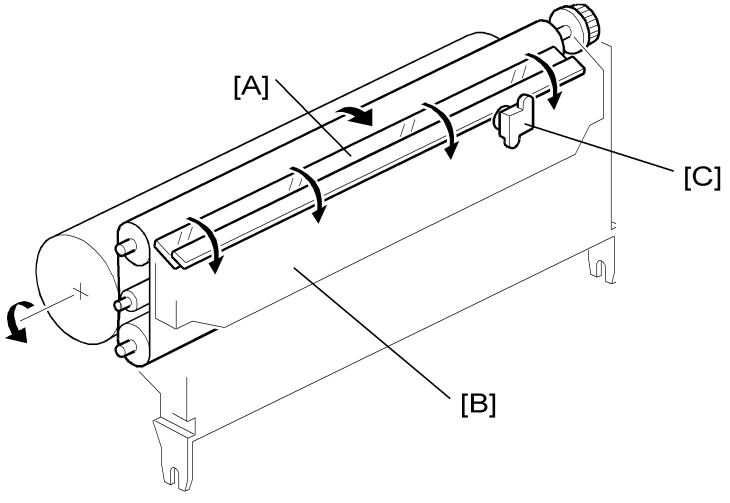
Transfer current can also be adjusted for the leading edge and the image area, and for by-pass feed. The timing for starting to apply leading edge current, for the switchover from leading edge current to image area current, and for switching off at the trailing edge can also be changed.

The table below lists the SP modes you can use to adjust these settings.

SP2-301: Transfer Current Adjustment		
Image areas	SP2-301-1	1st Side of Paper
	SP2-301-2	2nd Side of Paper
	SP2-301-4	By-pass Feed
Leading edge areas	SP2-301-3	Leading Edge
	SP2-301-5	Leading Edge By-pass Feed
SP2-911: Transfer Current Timing		
Timing	SP2-911-1	On Timing (at leading edge)

	SP2-911-2	Switch Timing (from leading edge to image area current
	SP2-911-3	Off Timing (at trailing edge)

Transfer Belt Cleaning Mechanism



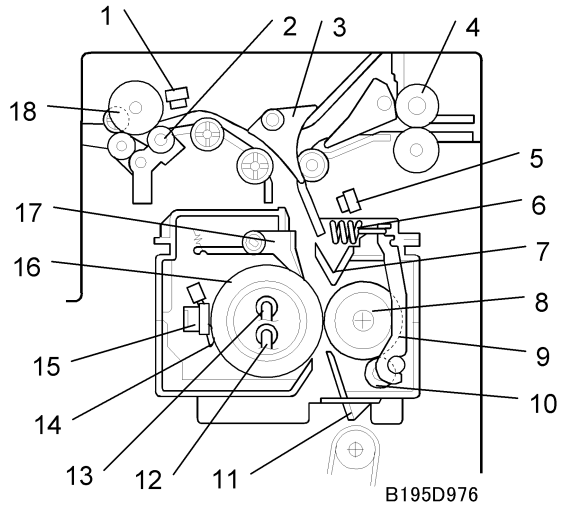
B195D975

The cleaning blade [A], always in contact with the transfer belt, scrapes off toner and paper dust remaining on the transfer belt.

Scraped off toner and paper dust falls into the toner collection tank [B] in the transfer belt unit. This toner is not recycled. When the toner overflow sensor [C] detects toner overflow, the toner overflow indicator lights. Up to 999 copies can be made before the toner overflow condition shuts down the machine.

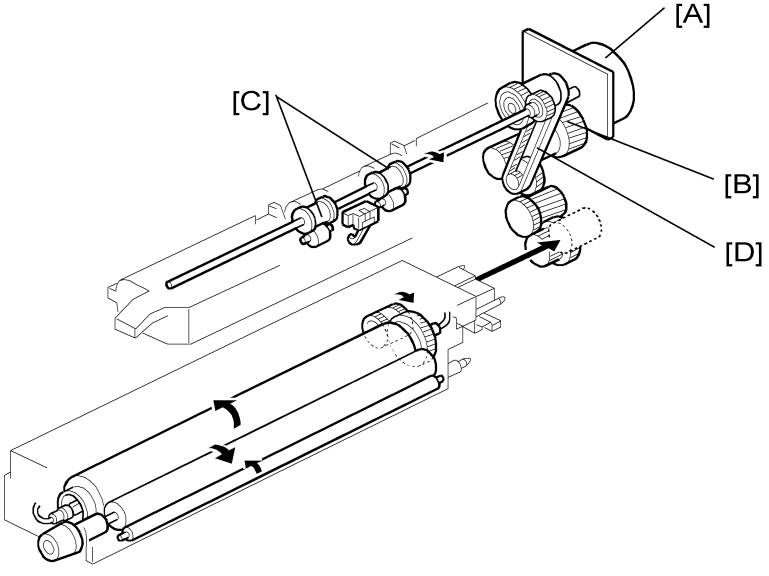
Image Fusing and Paper Exit

Overview Image Fusing and Paper Exit



1	Paper exit sensor	10	Cleaning roller
2	De-curler rollers	11	Entrance guide
3	Junction gate	12	Fusing lamp (center)
4	Idle roller (duplex unit)	13	Fusing lamp (ends)
5	Fusing unit exit sensor	14	Thermistors (center/end)
6	Spring	15	Thermostats (center/end)
7	Fusing exit guide plate	16	Hot roller
8	Pressure roller	17	Hot roller strippers
9	Pressure arm	18	Exit roller

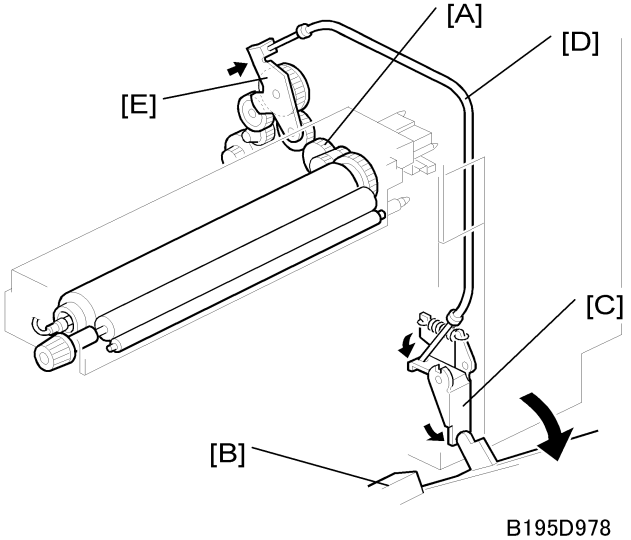
Fusing Drive



B195D603

The fusing exit motor [A] drives the fusing unit through the gears [B] and also drives the paper exit rollers [C] through a gear and a timing belt [D].

Fusing Drive Release Mechanism

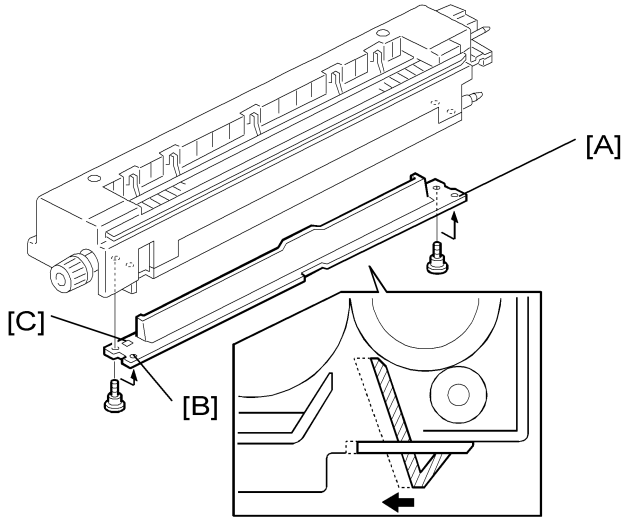


B195D978

The fusing unit drive release mechanism automatically disengages the fusing unit drive gear [A] when the right door [B] is opened.

When the right cover is opened, the actuator plate [C] pulls release wire [D]. The wire pulls the fusing drive gear bracket [E] and the fusing unit drive is disengaged.

Fusing Entrance Guide Shift Mechanism

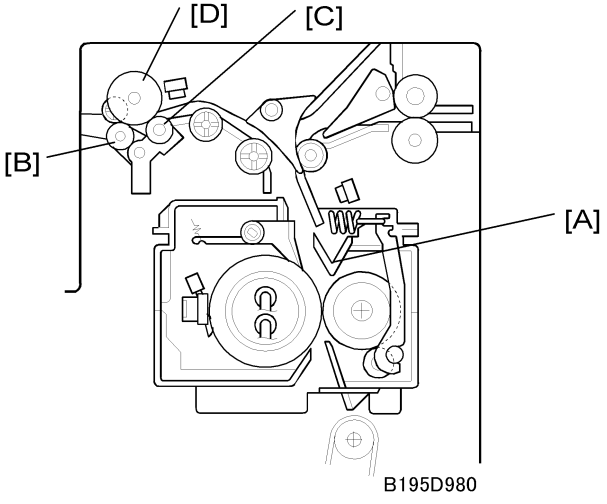


B195D979

The entrance guide [A] has two holes on each side to adjust for paper thickness to prevent creasing. Normally, the left screw hole [C] on each side is used.

For thin paper, use screw holes [B] to move the entrance guide to the left. This setting allows more direct access to the gap between the hot and pressure rollers, and prevents thin paper from buckling against the hot roller which can cause blurring at the leading edge of the copy.

Exit Guide Plate and De-Curler Rollers

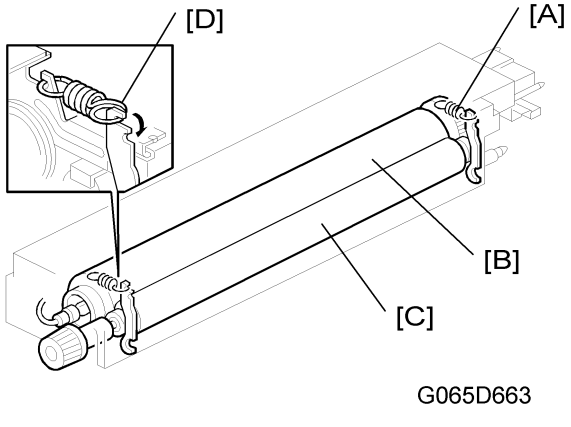


The exit guide plate [A] also functions as a pressure roller stripper. The exit guide plate can be moved in order to remove jammed paper.

Stacking has been improved by mounting a face-curl correction mechanism at the paper exit roller.

Two de-curler rollers [B] and [C] have been added under the exit roller [D] to correct the curl that paper acquires during transport through the fusing unit.

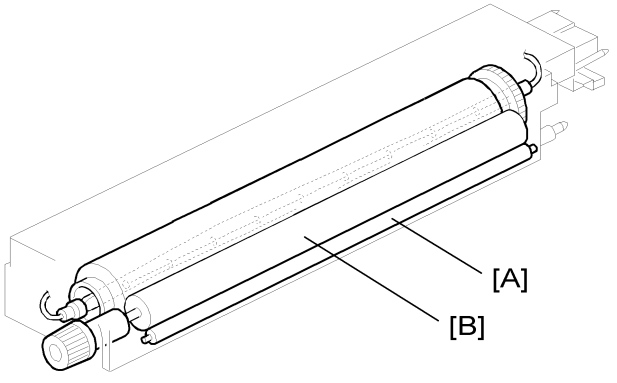
Pressure Roller



The pressure springs [A] apply constant pressure between the hot roller [B] and the pressure roller [C]. The applied pressure can be changed by adjusting the position of the pressure springs. The left position [D] is

the normal setting, and the right position [E] increases the pressure to prevent insufficient fusing by the fusing unit.

Cleaning Mechanism

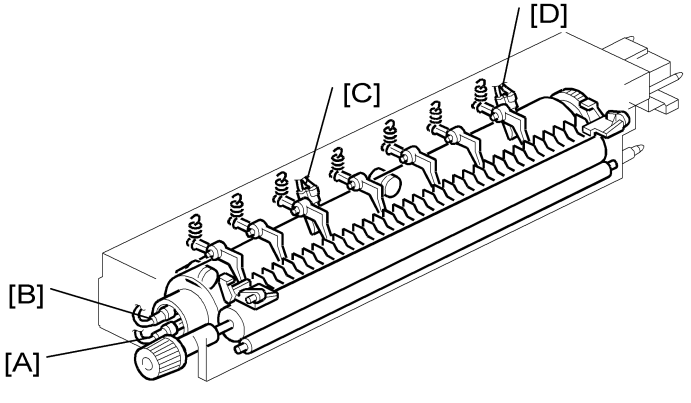


G065D515

The cleaning roller [A], in constant contact with the pressure roller [B], collects toner and paper dust from the surface of the pressure roller. Because the cleaning roller is metal, it can collect adhering matter better than the pressure roller, which is coated with Teflon.

Fusing Temperature

Fusing Temperature Components

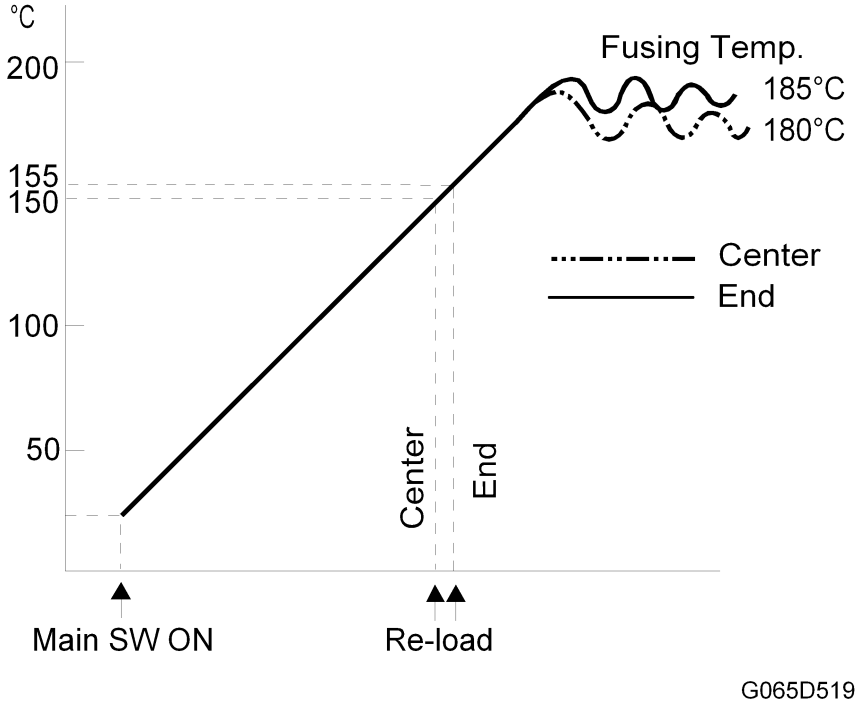


B195D985

The fusing unit has two fusing lamps: the first fusing lamp (center: 650W) [A] heats the center of the fusing roller, and the second fusing lamp (ends: 550W) [B] heats both ends of the hot roller. This arrangement ensures even heat on all surfaces of the roller.

In order to control the temperature of the roller, two high response thermistors are attached to the unit, one near the center [C] and one at the end [D] of the hot roller.

Fusing Temperature Control



There are two types of temperature control: On/off control (Default), and Phase control.

Either mode can be selected with SP1104 (Fusing Temperature Control).

After the machine is powered on, the CPU checks the ac frequency for 500 ms, in case phase control is selected later for the temperature control, and then switches on the fusing lamp.

As soon as both the center and end thermistors detect the print ready temperature (also known as the "re-load" temperature) , the machine can operate. The "reload" temperature is 30°C below the fusing temperature (this depends on SP1105-05, 06). As soon as the thermistors detect the fusing temperature, the CPU switches the lamps off but frequently switches on/off again in order to maintain the fusing temperature.

Fusing Idling Temperature

If copies are not sufficiently fused soon after the power switch is turned on, fusing idling should be enabled with SP1103-01.

When fusing idling is enabled, it is done when the temperature reaches the re-load temperature. The re-load temperature can be adjusted with SP1105-05, 06.

In the opposite case, even if fusing idling is disabled, it is done if the temperature at power-up ≤ 15°C

The fusing idling time is as follows.

Temperature at power-on	Fusing Idling Mode		
	0: Disabled	1: Enabled	SP1103-01
15°C or less	30 s	30 s	SP1103-02
Higher than 15°C	Not done	30 s	

Overheat Protection

If the hot roller temperature becomes greater than 250°C, the CPU cuts off the power to the fusing lamp, and SC543 (Fusing Overheat Error) will be displayed.

Even if the thermistor overheat protection fails, there is a thermostat in series with the common ground line of the fusing lamp. If the temperature of the thermostat reaches 210°C, the thermostat opens, removing power from the fusing lamp. At the same time, the machine stops operating. At this time, SC542 (Fusing Temperature Warm-up Error) will be displayed.

Energy Save Mode

If the printer remains idle for the selected time interval, the machine automatically enters the energy saver mode and switches off the fusing lamps to reduce power consumption.

The customer can select the idle time interval or switch the energy saver mode off. The Energy Saver selector setting is in the System menu, which can be accessed at the printer operation panel:

[Menu]> System> Energy Saver> E. Saver On/Off (*On)

[Menu]> System> Energy Saver> E. Save Timer (*1 minute)

[Menu]	Settings
Energy Saver On/Off	On (default)
Energy Saver Timer	*1 (default), 5, 15, 30, 45, 60 minutes

- After the machine remains idle for the specified time, the CPU switches off the fusing lamps.
- The machine leaves the energy saver mode and returns to normal operation when any key on the operation panel is pressed, when the printer receives a print job from the computer, or after the printer is switched off and on.
- The time from receiving the print start command to making the first print is longer than when powering up from normal standby mode.

For details, see the Operating Instructions.

7. Specifications

Printer

Printer Hardware Specifications

Configuration:	Desktop		
Print Process:	Laser beam scanning and electro-photographic printing Dual component development		
Printing Speed:	Max. 45 ppm, A4, $8^1/_2$" x 11", LEF, simplex/duplex		
	Printing Speed By Paper Size	A3/DLT	22 ppm
		B4	27 ppm
		LG	30 ppm
		A4/LT LEF	45 ppm
Parallel Interface:	I/F: 36-pin connector, standard Mode: IEEE 1284 compatible, ECP, Nibble		
Network:	Topology: Ethernet 10BASE-T/100BASE-TX Protocol: IPX/SPX, TCP/IP, AppleTalk, IPP, NetBEUI Cable: 10BASE-T/100BASE-TX shielded twisted pair		
Resolution:	600 dpi/400 dpi		
Printer Language:	PCL5e, PCLXL		
Resident Fonts:	PCL5e, PCL6: 35 Intellifonts, 10 TrueType, 1 Bitmap PostScript: 136 Adobe Type 1 Fonts International Font: 13		
Printing Paper Size:	Paper Cassettes: A3/DLT ~ A5 SEF/ HLT SEF By-pass Tray: A3/DLT ~ A6 SEF		
Grayscale:	Digital processing with smoothing		
Image Transfer Method:	Belt		
Paper Separation:	Curvature method (assisted by stripper pawls)		

Drum Charge:	Charge roller system		
Drum Cleaning:	Counter blade (x1)		
Drum Quenching:	QL LED		
Fusing Method:	Hot roller (fusing lamps x 2), pressure roller		
Exposure Method:	Dual laser beam system		
PCU (PCDU)	Combined unit (PCU + Development Unit)		
Development Method:	Dual component toner using 1-step SLIC development method (with toner recycling)		
Developer Density Control Method	TD sensor/ID sensor feedback		
Toner Supply:	Toner bottle with spiral grooves		
Power Source:	220 ~ 240 V, 50/60 Hz, 8 A or more 120 V, 60 Hz, 12 A or more		
Power Consumption		120 V (NA)	220 ~ 240 V (EU/ASIA)
	Maximum	1,400 W or less	1,450 W or less
	Printing	850 W or less	870 W or less
	Energy Saver	6 W or less	6 W or less
Sound Power Level	Printing	70 dB (A)	74 db (A)
	Standby	42 dB (A)	42 dB (A)

Note

- The above measurements were made in accordance with ISO 7779 at the operation position.
- "Full System" includes the printer with a finisher and large capacity tray (LCIT) installed.

Dimensions (W x D x H):	670 x 640 x 560 mm (26.4" x 25.2" x 22.0")	
With Optional LCIT	820 x 640 x 560 mm (32.3" x 25.2" x 22.0")	
Footprint (W x D)	Duplexer closed	670 x 650 mm (26.4 x 25.6 in.)
	Duplexer open	910 x 650 mm (36.8 x 25.6 in.)
	Bypass closed	670 x 650 mm (26.4 x 25.6 in.)

	Bypass tray open	850 x 650 mm (33.5 x 25.6 in.)	
	Bypass tray support extended	980 x 650 mm (38.6 x 25.6 in.)	
Temperature:	Operating: 10°~32°C (50°~89.6°F), 15%~80% rH (no condensation) Storage: 30°C ~ 40°C (22°~104°F), less than 80% rH (no condensation)		
Weight:	Less than 63 kg (138.9 lb.)		
Warm-up Time:	At power on	Less than 22 s at 20°C (68°F)	
	From Energy Save mode	Less than 15 s at 20°C (68°F)	
Paper Feed Method:	FRR method (paper trays and bypass tray)		
First Print:	Less than 6 sec. (A4 LEF, 1st feed)		
Paper Capacity:	500 sheets x 2		1000
	50 sheets (Bypass Tray) x 1		50
	Printer only		1050
	550 sheets (optional PTU) x2		1100
	1500 sheets (optional LCT)		1500
	With PTU and LCT (80g/m^2, 20 lb.)		3650
Duplexing:	A3/DLT ~ A5 SEF (inverter roller system) (Interleave processing A4 and below)		
Paper Output Tray Capacity:	500 sheets	A4 and smaller	
	250 sheets	B4 and larger	
Memory:	128 MB (standard), expandable up to 512 MB		

Supported Paper Sizes

Name	Feed	Size (W x L)	Paper Tray Unit		By-pass Tray		LCT	Duplex
			NA	EU	NA	EU	NA	EU
A3	SEF	297 x 420 mm	*	D	*	*	N	Y

Name	Feed	Size (W x L)	Paper Tray Unit		By-pass Tray		LCT	Duplex
			NA	EU	NA	EU	NA	EU
B4	SEF	257 x 364 mm	*	*	*	*	N	Y
A4	SEF	210 x 297 mm	D	D	*	*	N	Y
A4	LEF	297 x 210 mm	D	D	*	*	D	Y
B5	SEF	182 x 257 mm	*	*	*	*	N	Y
B5	LEF	257 x 182 mm	*	*	*	*	N	Y
A5	SEF	148 x 210 mm	*	D	*	*	N	Y
A5	LEF	210 x 148 mm	N	N	*	*	N	N
B6	SEF	128 x 182 mm	N	N	S	S	N	N
B6	LEF	182 x 128 mm	N	N	N	N	N	N
A6	SEF	105 x 148 mm	N	N	*	*	N	N
A6	LEF	148 x 105 mm	N	N	N	N	N	N
DLT	SEF	11 x 17 in.	D	*	*	*	N	Y
Legal	SEF	$8^1/_2$ x 14 in.	D	*	*	*	N	Y
Letter	SEF	$8^1/_2$ x 11 in.	D	D	*	*	N	Y
Letter	LEF	11 x $8^1/_2$ in.	D	D	*	*	D	Y
Half Letter	SEF	$5^1/_2$ x $8^1/_2$ in.	*	*	*	*	N	Y
Half Letter	LEF	$8^1/_2$ x $5^1/_2$ in.	N	N	N	N	N	N
Executive	SEF	$7^1/_2$ x $10^1/_2$ in.	*	*	*	*	N	Y
Executive	LEF	$10^1/_2$ x $7^1/_2$ in.	N	N	*	*	N	N
F/GL	SEF	8 x 13 in.	*	*	*	*	N	Y
Foolscap	SEF	$8^1/_2$ x 13 in.	D	*	*	*	N	Y
Folio	SEF	$8^1/_2$ x 13 in.	*	*	*	*	N	Y

Name	Feed	Size (W x L)	Paper Tray Unit		By-pass Tray		LCT	Duplex
			NA	EU	NA	EU	NA	EU
Com10	SEF	$4^1/_2$ x $9^1/_2$ in.	N	N	Y	Y	N	N
Monarch	SEF	3.875 x 7.5 in.	N	N	N	N	N	N
C6	SEF	114 x 162 mm	N	N	Y	Y	N	N
C5	SEF	162 x 229 mm	N	N	Y	Y	N	N
DL Env.	SEF	110 x 220 mm	N	N	Y	Y	N	N
Custom	SEF	100 ~ 297 mm	N	N	S	S	N	N
Custom	LEF	148 ~ 432 mm	N	N	S	S	N	N

Note

- D: Paper size specified with dial.
- *: Paper size specified from operation panel after dial is set to ✱.
- S: Paper size entered on operation panel.
- Y: Supported.
- N: Not supported.

Software Accessories

Printer drivers and utility software are provided on one CD-ROM. An automatic run installer allows you to select which components to install.

Printer Drivers

Printer Language	Windows			Macintosh
	95/98/Me	NT4.0	2000/XP/Server 2003	
RPCS	Yes	Yes	Yes	No
PCL 5e/PCL 6	Yes	Yes	Yes	No
PostScript	Yes	Yes	Yes	Yes

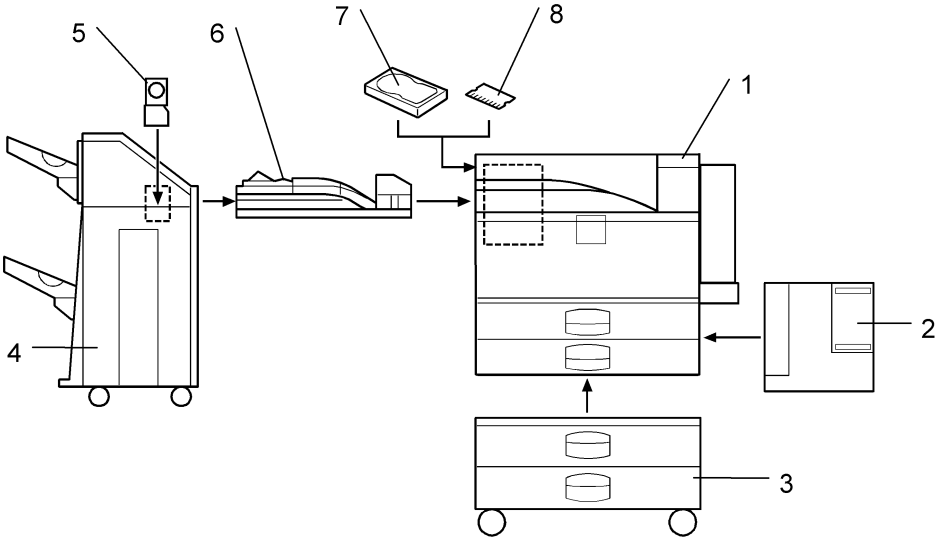
Note

- Windows NT 4.0 printer drivers are for the Intel x 86 platform. There is no Windows NT 4.0 printer driver for the PowerPC, Alpha, or MIPS platforms.
- PS3 drivers are all genuine Adobe PostScript drivers, excluding Windows 2000 which uses Microsoft PS. A PPD file for each operating system is provided with the driver.
- The PostScript driver for the Macintosh supports Mac OS 8.6 to OS 9.x, Mac OSX 10.1 or later.
- The supported Unix versions change from time to time, so please consult service support staff for the latest information.

Utility Software

Software	Description
Agfa Font Manager (Windows 95/98/Me/, NT40.0, 2000	Font management utility with screens fonts for printer.
DesktopBinderLite (Windows 95/98/Me, NT4.0, 2000 XP, Server 2003)	Utility for document management. Printer management utility for client users. Also includes peer-to-peer printing utility for parallel/recovery printing.
Printer Utility for Macintosh	Provides several convenient functions for printing from Macintosh clients.
SmartDeviceMonitor for Admin (Windows 95/98/Me, NT4.0, 2000, XP, Server 2003)	Printer management utility for administrators.

System Configuration



No.	Item	Machine Code
1	Printer	G147
2	LCIT RT45	B543
3	Paper Feed Unit PB 3020	G839
4	Finisher 3000 SR 3040	G838
5	Punch Unit Kit Type 1045	B377*1
6	Bridge Unit Type 2045*2	B538
7	HDD (option)	G841
8	Memory Unit Type D, E	B584 (128 MB), G818 (256 MB)

*1: 2/3-hole, 2/4-hole, 4-hole

*2: The Bridge Unit is required for the Finisher 3000.

Installable Option Table

Option	Comment
Bridge Unit Type 2045 (B538)	Required for Finisher 3000 (G838)
Finisher 3000 SR 3040 (B838)	Requires Bridge Unit (B538)
LCIT RT45 (B543)	Requires Paper Feed Unit G839
Paper Feed Unit PB 3020 (G839)	Required for LCIT RT45 (B543)

Please refer to the next section for more details about specifications for these options.

Option Specifications

Bridge Unit Type 2045 (B538)

Paper Size	Standard:	A6 Lengthwise (SEF) to A3, HLT to DLT
	Non-Standard:	Width: 100 to 305 mm Length: 148 to 432 mm
Paper Weight:	52 g/m^2 ~ 135 g/m^2 (16 lb. ~ 42 lb.)	

Finisher 3000 SR3040 (G838)

		Upper Tray	Lower Tray
Paper Size	Staple Mode Off	A3~A6, DLT~HLT	A3~A6, DLT~HLT
	Staple Mode On	---	A3~B5, DLT~LT
Paper Weight	Staple Mode Off	52~163 g/m^2 (14~43 lb.)	52~163 g/m^2 (14~43 lb.)
	Staple Mode On	---	64~90 g/m2 (14~43 lb.)
Tray Capacity (80 g/m^2 (20 lb.))	No Staple Mode	Upper Tray	Lower Tray
	3000	---	A4, LT SEF
	2200	---	A4, LT SEF
	750	---	A3, A$ LEF, B4, B5, DLT, LG, LT LEF, 12 x 18
	500	A4, LT, A5 SEF, B5	A5 SEF
	250	A3, B4, DLT, LG, 12x18	---
	100	A5 LEF, HLT	A5 LEF, HLT
	Staple Mode	Lower Tray Only	
		Pages/Set	Set

	A4, LT SEF	15~20	30~100
		2~14	100
	A4, LT LEF, B5	15~20	15~50
		2~14	50
	Other Sizes	15~30	25~50
	-	2~14	50
	Staple Limit	-	-
	A4, LT, smaller	30 sheets	50 sheets
	Larger than A4, LT	-	30 sheets
Staple Position	1 staple, 3 positions (front, rear, rear-oblique)		
Staple Supply	5000-staple cartridges		
Power Source	24V dc (from printer)		
Power Consumption	60 W		
Weight	53 kg (116.6 lb.)		
Dimensions (w x d x h)	680 x 620 x 1030 mm (26.8 x 24.4 x 40.6 in.))		

LCIT RT45 (B543)

Paper Size:	A4 sideways (LEF)/LT sideways (LEF)
Paper Weight:	60 g/m^2 ~ 105 g/m^2, 16 lb. ~ 28 lb.
Tray Capacity:	1500 sheets (80 g/m^2, 20 lb.)
Remaining Paper Detection:	5 steps (100%, 75%, 50%, 25%, Near end)
Power Source:	24 Vdc, 5 Vdc (from printer)
Power Consumption:	40 W
Weight:	17 kg (37.4)
Size (W x D x H):	390 mm x 500 mm x 390 mm (15.5" x 19.7" x 15.4")

Paper Feed Unit PB3020 (G839)

Paper Size:	A5 lengthwise (SEF) to A3 HLT lengthwise (SEF) to DLT
Paper Weight:	64 g/m^2 ~ 105 g/m^2 (20 lb. ~ 28 lb.)
Tray Capacity:	1100 sheets (550 x 2) (80 g/m^2, 20 lb.)
Paper Feed System:	FRR
Paper Height Detection:	4 steps (100%, 70%, 30%, Near end)
Power Source:	24 Vdc, 5 Vdc (from the printer)
Power Consumption:	50 W
Weight:	Less than 25 kg (55.1 lb.)
Size (W x D x H):	540 mm x 600 mm x 270 mm (21.3" x 23.6" x 10.6")

MEMO

MEMO

MEMO