

Model J-P2
(Machine Code: G080)

SERVICE MANUAL

IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the printer power cord is unplugged.
2. The wall outlet should be near the printer and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
4. The printer drives some of its components when it completes the warm-up period. Be careful to keep hands away from the mechanical and electrical components as the printer starts operation.
5. The inside and the metal parts of the fusing unit become extremely hot while the printer is operating. Be careful to avoid touching those components with your bare hands.

HEALTH SAFETY CONDITIONS

Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The printer and its peripherals must be serviced by a customer service representative who has completed the training course on those models.
2. The NVRAM module (option) installed on the controller has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.
3. The optional fax and memory expansion units contain lithium batteries, which can explode if replaced incorrectly. Replace only with the same or an equivalent type recommended by the manufacturer. Do not recharge or burn the batteries. Used batteries must be handled in accordance with local regulations.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, the maintenance unit which includes developer or the organic photoconductor in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.
5. Dispose of used fusing oil in accordance with local regulations.

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.

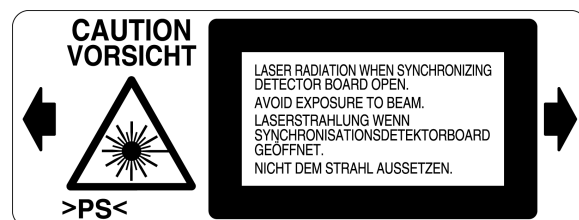
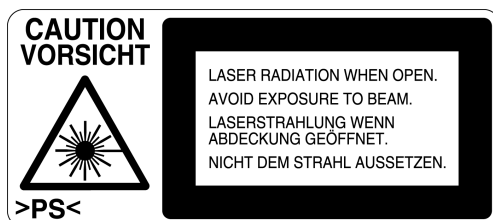
WARNING

Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

WARNING

WARNING: Turn off the main switch before attempting any of the procedures in the Laser Optics Housing Unit section. Laser beams can seriously damage your eyes.

CAUTION MARKING:



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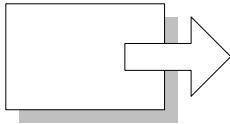
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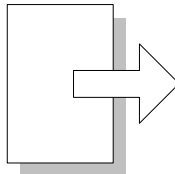
Symbols and Abbreviations

This manual uses the symbols and abbreviations shown below.

Symbol	Meaning
	"See," "Refer to"
	Clip ring
	Screw
	Connector
SEF	Short Edge Feed
LEF	Long Edge Feed



Short Edge Feed (SEF)



Long Edge Feed (LEF)

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1. INSTALLATION

1.1 INSTALLATION REQUIREMENTS

1.1.1 ENVIRONMENT



1. Temperature Range: 10°C to 32°C (50°F to 89.6°F)
2. Humidity Range: 15% to 80% RH
3. Ambient Illumination: Less than 2,000 lux (do not expose to direct sunlight)
4. Ventilation: 3 times/hr/person or more
5. Avoid exposing the machine to sudden temperature changes, which include:
 - 1) Direct cool air from an air conditioner
 - 2) Direct heat from a heater
6. Avoid installing the machine in areas that might be exposed to corrosive gas.
7. Install the machine at a location lower than 2,500 m (8,200 ft.) above sea level.
8. Install the machine on a strong, level base. (Inclination on any side must be no more than 5 mm.)
9. Avoid installing the machine in areas that may be subjected to strong vibration.

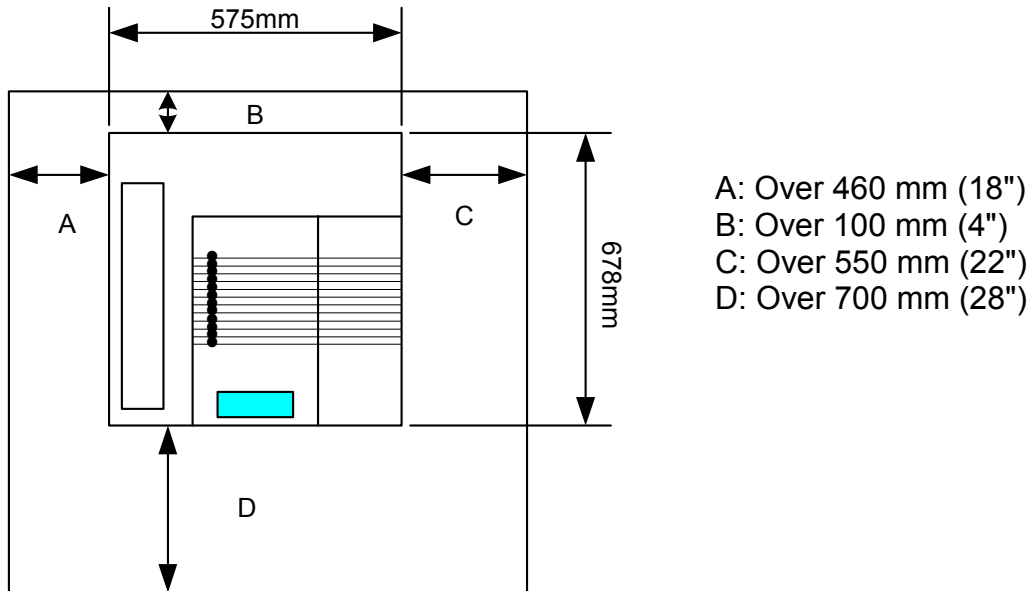
1.1.2 MACHINE LEVEL

- Front to back: Within 5 mm (0.2")
Right to left: Within 5 mm (0.2")

1.1.3 MACHINE SPACE REQUIREMENT

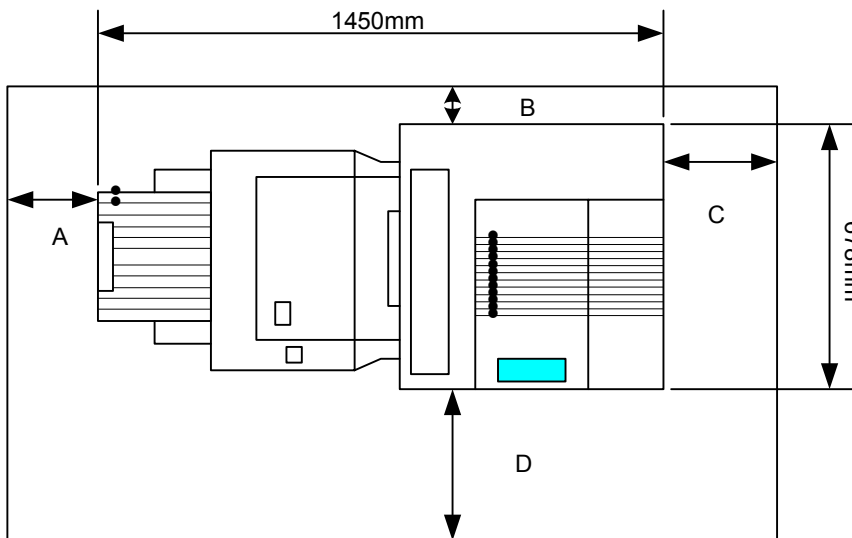
Place the machine near the power source, providing clearance as shown.

Main Unit



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Main Unit and Finisher

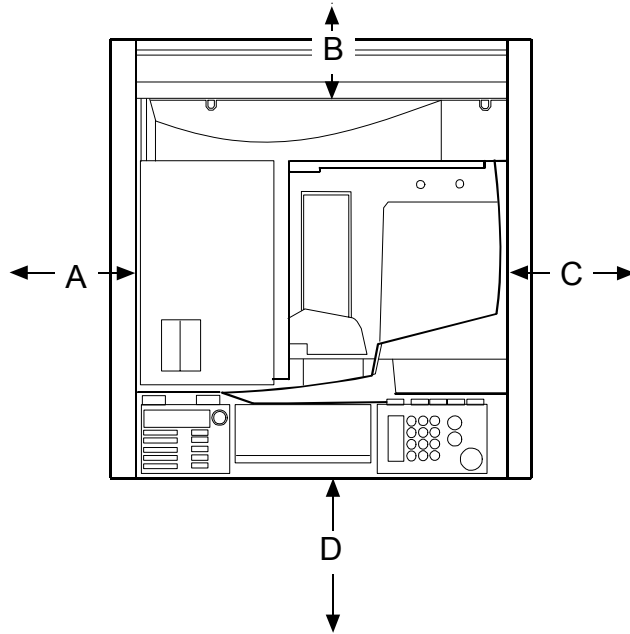


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A: Over 460 mm (18")
 B: Over 100 mm (4")

C: Over 550 mm (22")
 D: Over 700 mm (28")

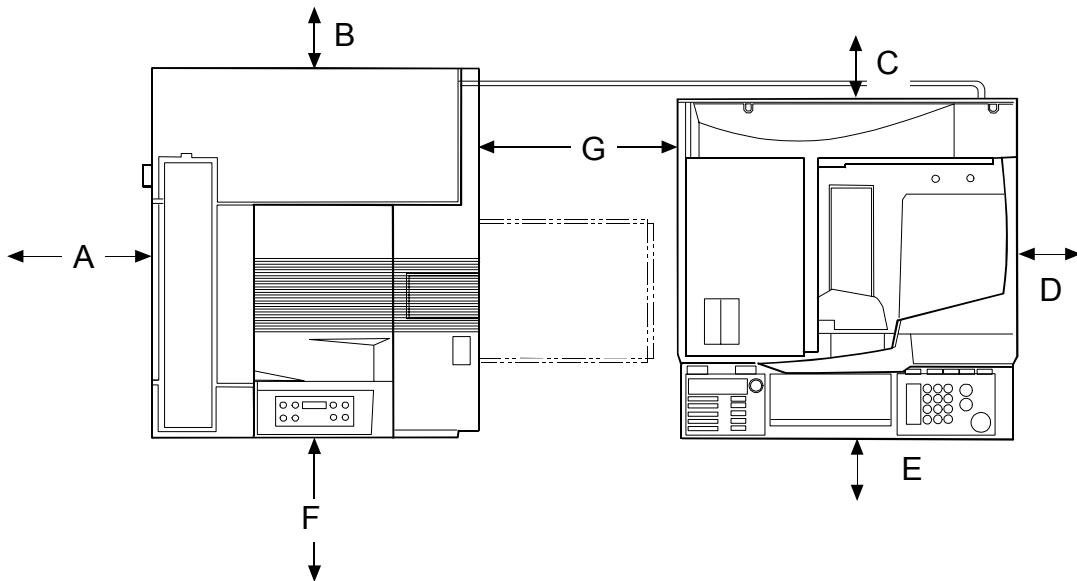
CF Expander with Rack



- A: Over 460 mm (18.1")
from the printer mainframe
- B: Over 100 mm (3.9")
from the printer mainframe
- C: Over 550 mm (21.7")
from the printer mainframe
- D: Over 700 mm (27.6")
from the printer mainframe

G3671901.WMF

CF Expander without Rack



- A: Over 460 mm (18")
- B: Over 100 mm (4")
- C: Over 100 mm (4")
- D: Over 100 mm (4")

- E: Over 100 mm (4")
- F: Over 700 mm (28")
- G: Over 450 mm (17.7")

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1.1.4 POWER REQUIREMENTS

⚠ CAUTION

- 1. Insert firmly the plug in the outlet.**
- 2. Avoid using an outlet extension plug or cord.**
- 3. Ground the machine.**

1. Input voltage level: 120 V, 60 Hz: More than 10 A
220 V ~ 240 V, 50 Hz/60 Hz: More than 6 A
2. Permissible voltage fluctuation: $\pm 10\%$
3. Do not put or place anything on the power cord.

1.2 OPTIONAL UNIT COMBINATIONS

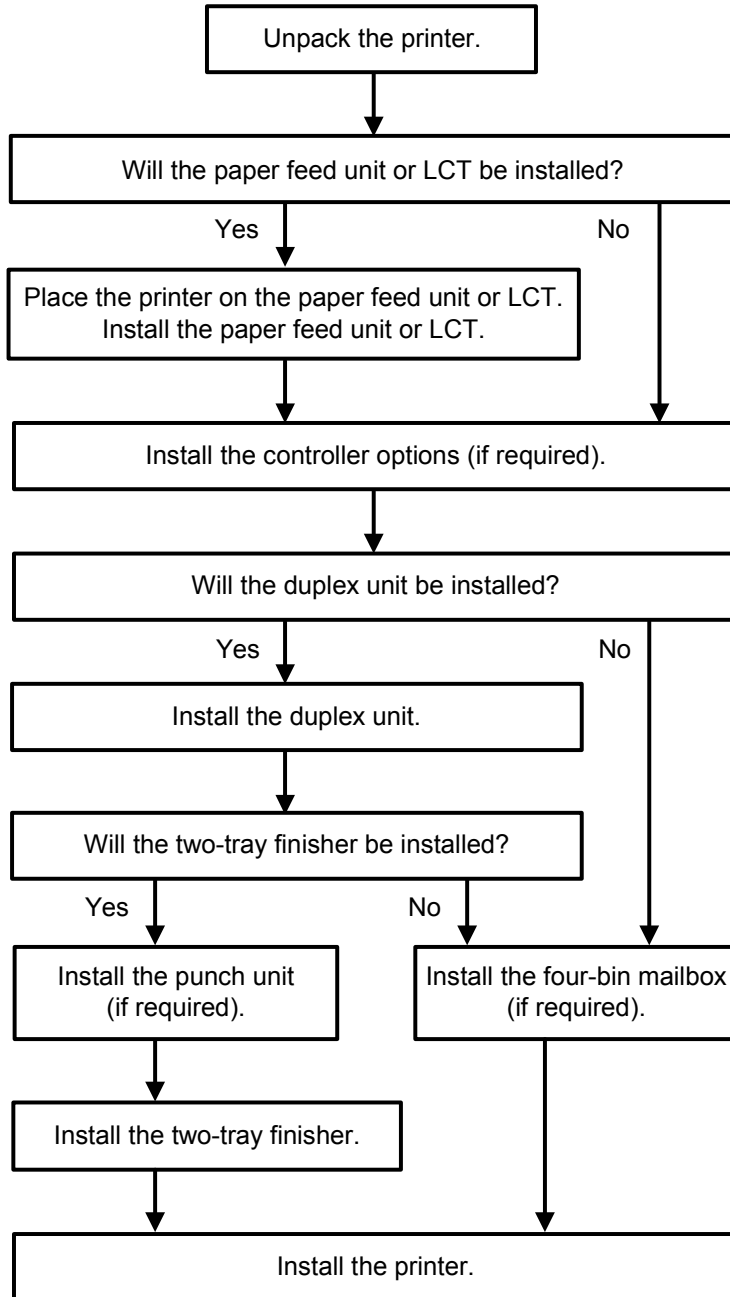
Item No.	Options	Alternative	Required	Remarks
1	PFU (1 Tray)	Items 2, 3		
2	PFU (2 Trays)	Items 1, 3		
3	LCT	Items 1, 2		
4	Two-tray finisher	Item 6, 20	<ul style="list-style-type: none"> • Item 7 • Item 8 (Total 128 MB needed), 9, or 16 • Item 1, 2, or 3 	
5	3 types of punch kit		Item 4	
6	Four-bin mailbox	Items 4, 5, 15, 20		
7	Duplex unit			
8	3 types of memory DIMMs			
9	20 GB HDD			
10	IEEE 1394	Items 11, 12, 13		
11	IEEE 802.11b	Items 10, 12, 13		
12	USB	Items 10, 11, 13		
13	Bluetooth	Items 10, 11, 12		
14	NVRAM			
15	CF expander	Item 6	Item 18 or 19	Item 16 and item 17 are recommended. See note 2.
16	40GB HDD			Option for item 15
17	Rack		Item 1, 2, or 3	Option for item 15
18	ARDF	Item 19		Option for item 15
19	Platen cover	Item 18		Option for item 15
20	Multi-bin output tray	Item 4, 5, 6	Item 7	Option for item 15
21	Fax unit			Option for item 15
22	G3 additional unit	Item 23		Option for item 21
23	G4 unit	Item 22		Option for item 21
24	JBIG			Option for item 21
25	Handset			Option for item 21 (U.S. model only)

NOTE: 1) Two memory DIMMs (up to 384 MB) can be installed.
 2) If the 40GB HDD is not installed, some copier functions such as duplex copying and sorting, and document server functions cannot be used.

1.3 INSTALLATION FLOW CHART

The following flow chart shows how to install the optional units more efficiently.

Without Optional CF Expander

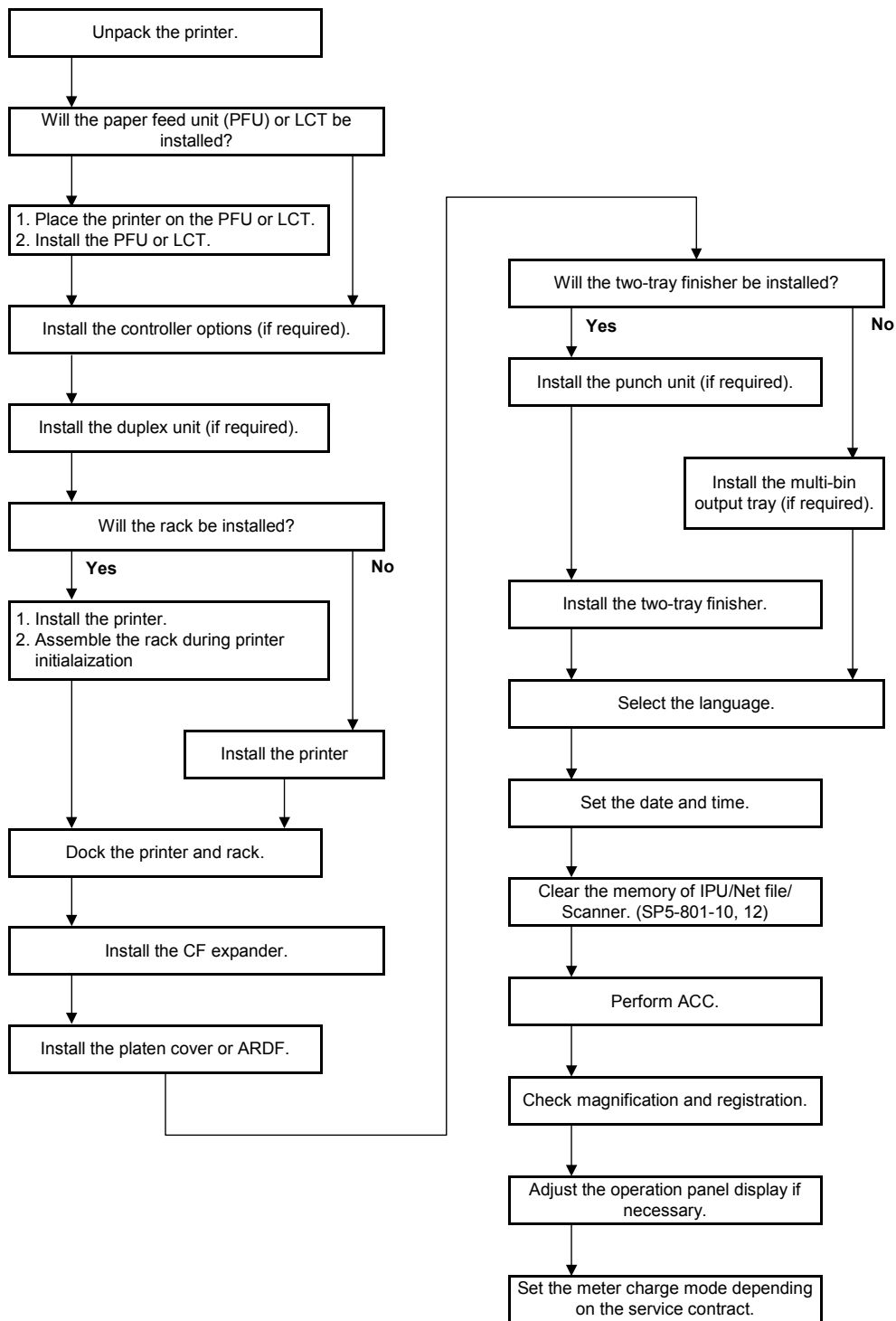


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Two-tray Finisher: Needs the duplex unit, HDD or at least 128 MB of memory, and a paper tray unit or LCT.
 Punch Unit: Needs the finisher.

With Optional CF Expander

Installation



G080I906.WMF

NOTE: Install the fax unit after making sure that the CF expander works properly.
(☛ “1. Installation” in the service manual for the fax option)

1.4 MACHINE INSTALLATION



Refer to the Operating Instructions. If the customer has made a service contract, change the settings of the following SP mode menus in accordance with it.

- NOTE:**
- 1) The meter charge mode must be enabled for any meter click counter contract (☛ SP5-930-1).
 - 2) One of the counter methods (developments/prints) must be selected in accordance with the contract (☛ SP5-045-1).
 - 3) The default of the meter-charge mode is "off."
 - 4) The meter-charge counter cannot be reset.

Item	SP No.	Function	Default
Meter charge	SP5-930-1	<p>Specifies whether the meter charge mode is enabled or disabled.</p> <p>Meter charge mode enabled:</p> <ul style="list-style-type: none"> • The Counter menu appears immediately after the Menu key is pressed. • The counter type selected by the counting method (SP5-045-1) can be displayed with the Counter menu. • The counter values can also be printed with the Counter menu. • The selected counter starts from a negative number. • When the ACS mode is on, a monochrome page is counted as such even if it follows a color page. <p>Meter charge mode disabled:</p> <ul style="list-style-type: none"> • The Counter menu is not displayed. • The total counter starts from 0. • When the ACS mode is on, a monochrome page is counted as a color page if it follows a color page. <p>NOTE: The menu items, "Show Counter" and "Print," appear in the UP mode after the meter charge mode (SP5-930-1) is enabled or the optional CF expander is installed. (These menu items always appear after the CF expander is installed.)</p>	"OFF"
Counting method	SP5-045-1	<p>Specifies whether the counting method used in meter charge mode is based on developments or prints.</p> <p>Important: This SP can only be done before the negative counters are reset with SP7-825-001.</p>	"0": Developments
A3/11" x 17" double counting	SP5-104-1	<p>Specifies whether the counter is doubled for A3/11" x 17" paper.</p>	"No": Single counting

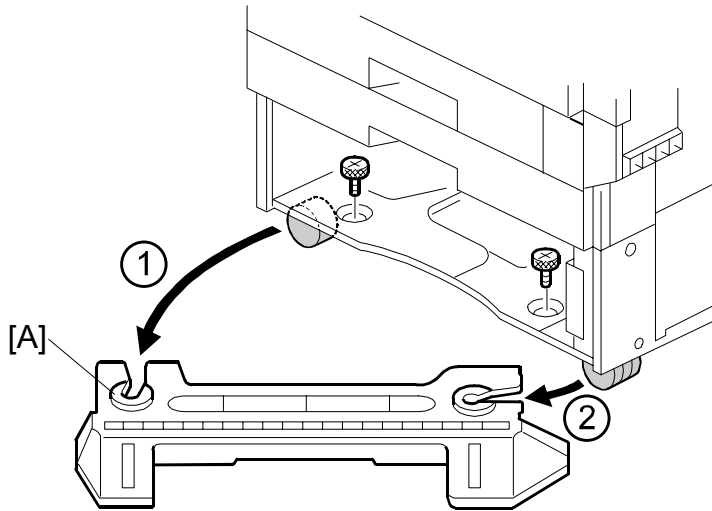
Item	SP No.	Function	Default
PM warning display 1	SP5-930-3	Specifies whether the PM warning for the PCUs, development units, and fusing unit is displayed when the replacement time arrives. Click 1: Displayed Click 2: Not displayed	"Click 1"
PM warning display 2	SP5-930-4 to SP5-930-5	Specifies whether the PM warnings for the paper feed roller, transfer unit, and transfer cleaning unit are displayed.	"No Alert": Not displayed
Fax No. setting	SP5-812-2	Programs the service station fax number. The number is printed on the counter list when the meter charge mode is selected, so that the user can fax the counter data to the service station.	
Counter reset	SP7-825-1	Resets the counters to "0." Important: This must be done at installation after all the above settings have been finished. The negative counters used in the meter charge mode will be reset to zero.	



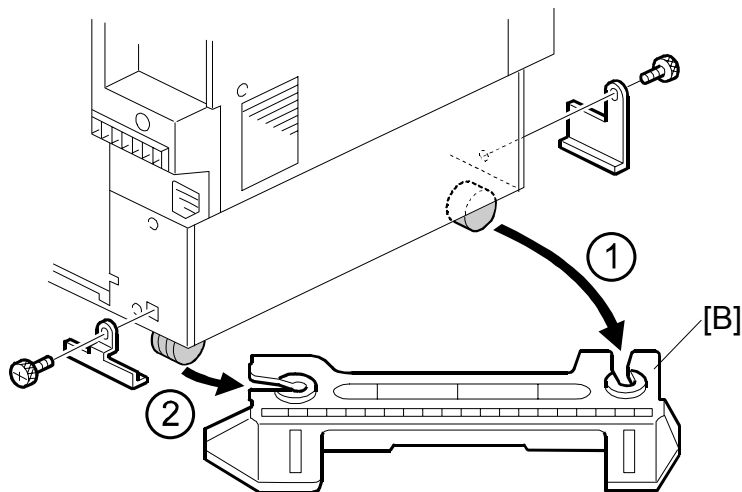
1.5 NOTES FOR TRANSPORTING THE MACHINE

1.5.1 MACHINE STANDS

If it is difficult to slide the machine across the floor after installing the optional paper feed unit or LCT, remove the two stands with the following procedure.



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G080I911.WMF

1. Remove all trays in the optional paper feed unit or LCT.
2. Remove the front stand [A] (⚙ x 2).
3. Remove the rear stand [B] (⚙ x 2, 2 brackets).

CAUTION: Reinstall the two stands in their original positions, or the machine might tip over when drawing out the paper trays and so on.

1.5.2 MACHINE BODY

⚠ CAUTION

Fix the transfer belt in its position before moving the machine, otherwise the transfer belt and the black PCU may be damaged.

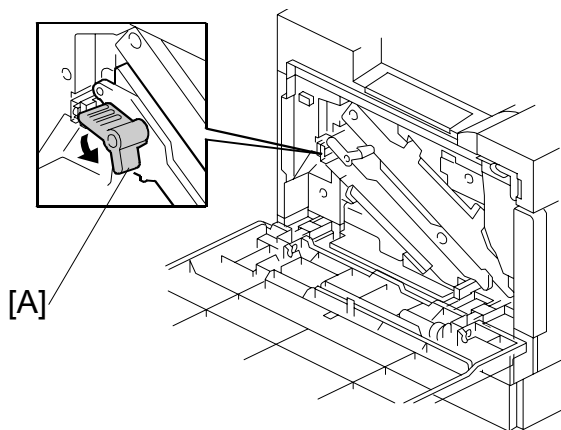
Installation

Before transporting the machine for both short and long hauls, return it to its original condition.

1. Remove the toner cartridges to prevent toner from flowing into the toner supply tube due to vibrations experienced during transport. This may cause the tube to be clogged with toner.
2. Put air packing into the toner cartridge holder to shield the toner supply entrance. This prevents toner from flowing out to the toner cartridge holder.
3. Set the lock pin (which comes with the machine) in the transfer belt unit.

NOTE: The lower end of the transfer belt moves. The surfaces of the belt and PCU may be damaged by the friction between them if you transport the machine without locking the belt.

4. Make sure there is no paper left in the paper trays and fix down the bottom plates with a sheet of paper and tape.
5. Empty out the waste toner bottle and attach securing tape to prevent the bottle from coming out.
6. Empty out the waste oil bottle and attach securing tape to prevent the bottle from coming out.



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7. Turn the release lever [A] counterclockwise to its lowermost position. (The lever does not stay in this position if you do not hold it.) Stick the lever in this position with tape.

NOTE: The release lever lifts the transfer belt up and presses it against the black PCU. The surfaces of the belt and PCU may be damaged by the friction between them if you transport the machine with the two units in this position.

8. Attach shipping tape to the covers and doors, or shrink-wrap the machine tightly.

NOTE: 1) If pre-installing machines for some test prints at a service depot, use a jig oil supply unit, and not the oil supply unit enclosed as an accessory.

This is because the toner supply system uses a touch-and-release mechanism, which can cause the unit to move freely up and down during transport if shipping the mainframe with the oil supply unit installed. This in turn may cause damage to the white holder on the fusing unit. However if simply moving the machine from floor to floor, the oil supply unit can be left installed.

- 2) If shipping a used machine to a new location, dispose of the used oil supply unit and install a new one because of the reason explained above. This is not necessary when simply moving the machine from floor to floor.
- 3) Whenever having moved the machine to a new location, be sure to perform Auto Adjust (User Program mode) or forced Line Position Adjustment (SP5-993-002) to optimize color line alignment.
- 4) Make sure that the side fences in the trays are properly positioned to prevent color shifting.

1.6 OPTIONAL UNIT INSTALLATION

1.6.1 LIST OF OPTIONS

The available printer options are listed below. Installation is explained in the Operating Instructions. This list does not include the CF expander and its options.

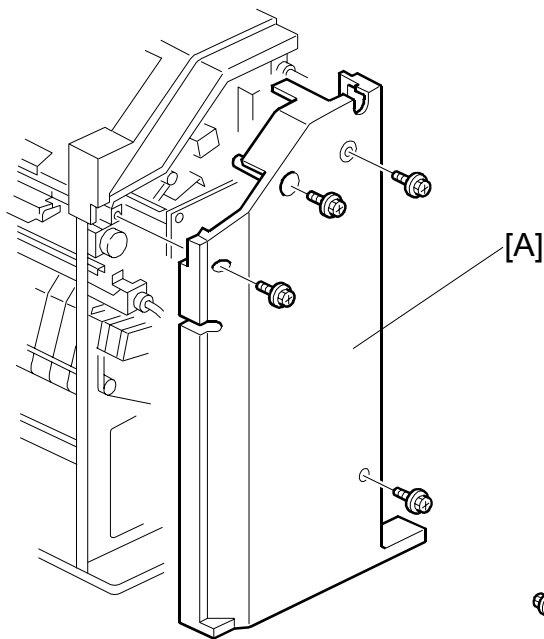
- Paper Feed Unit (500 sheets x 1)
- Paper Feed Unit (500 sheets x 2)
- Large Capacity Tray
- Two-tray Finisher
- Four-bin Mailbox
- DIMM Memory (64/128/256 MB)
- IEEE1394
- IEEE 802.11b
- USB
- Bluetooth
- 20GB HDD
- NVRAM

1.6.2 PUNCH UNIT INSTALLATION

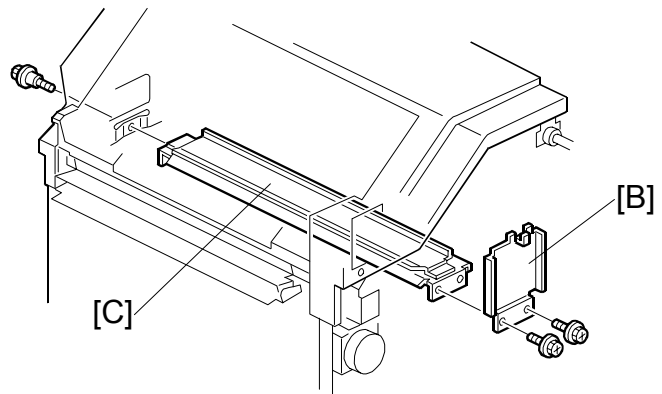
Accessory Check

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

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)	1
8. Tapping screw.....	1
9. Tapping screw.....	2

Installation Procedure

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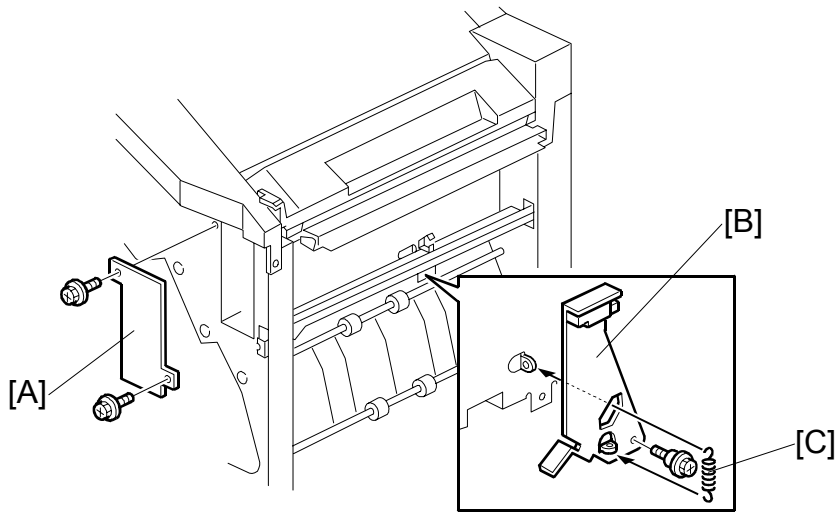


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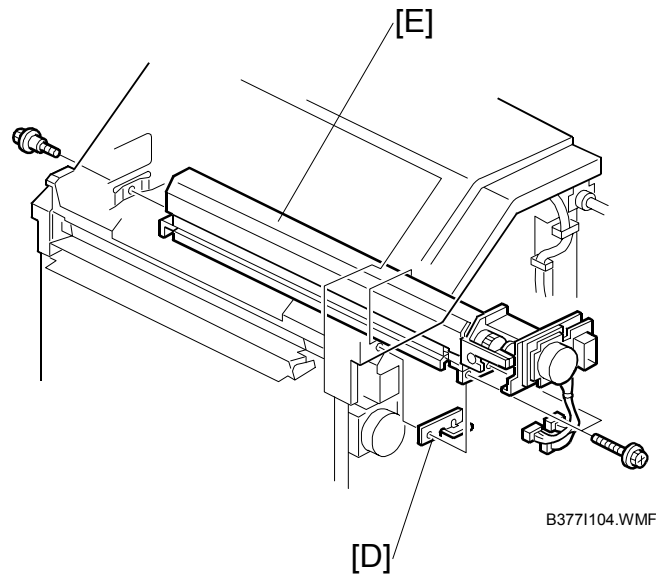
⚠ CAUTION

Switch off the main machine and unplug its power cord. If the two-tray finisher has been 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 [A] (⚙ x 4).
3. Remove the bracket [B] (⚙ x 2) and paper guide [C] (stepped ⚙ x 1).

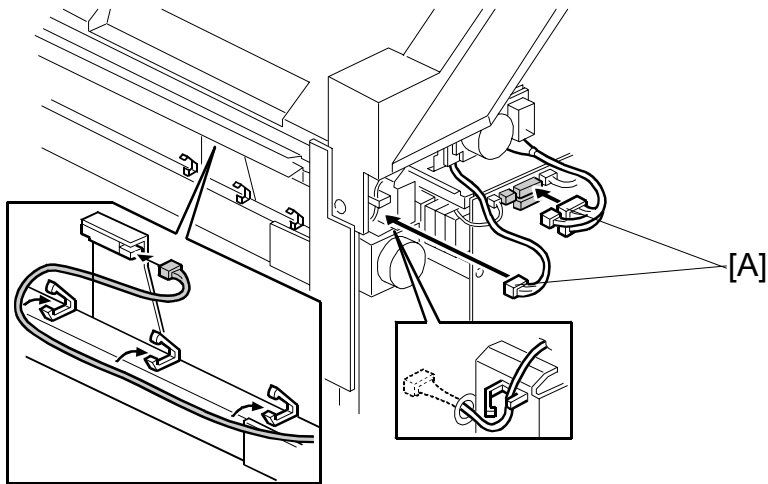


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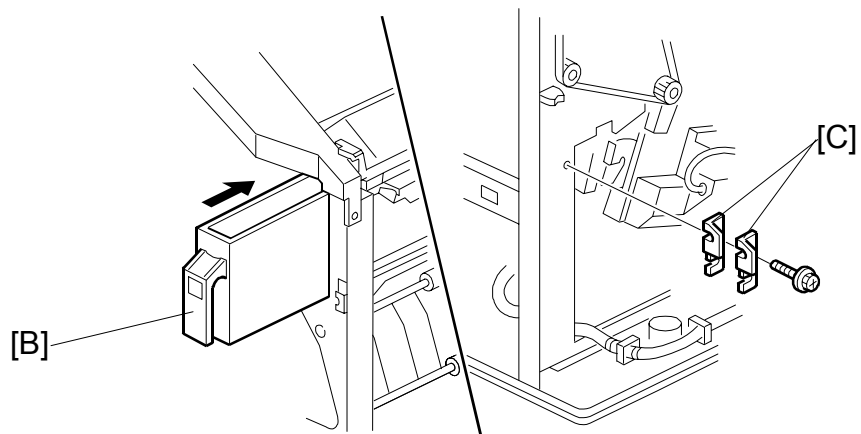


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4. Remove the hopper cover [A] (⚙ x 2).
5. Install the sensor bracket [B] (stepped ⚙ x 1).
6. Install the spring [C].
7. Install the 2 mm spacer [D].
8. Install the punch unit [E] (⚙ x 2, stepped ⚙ x 1).



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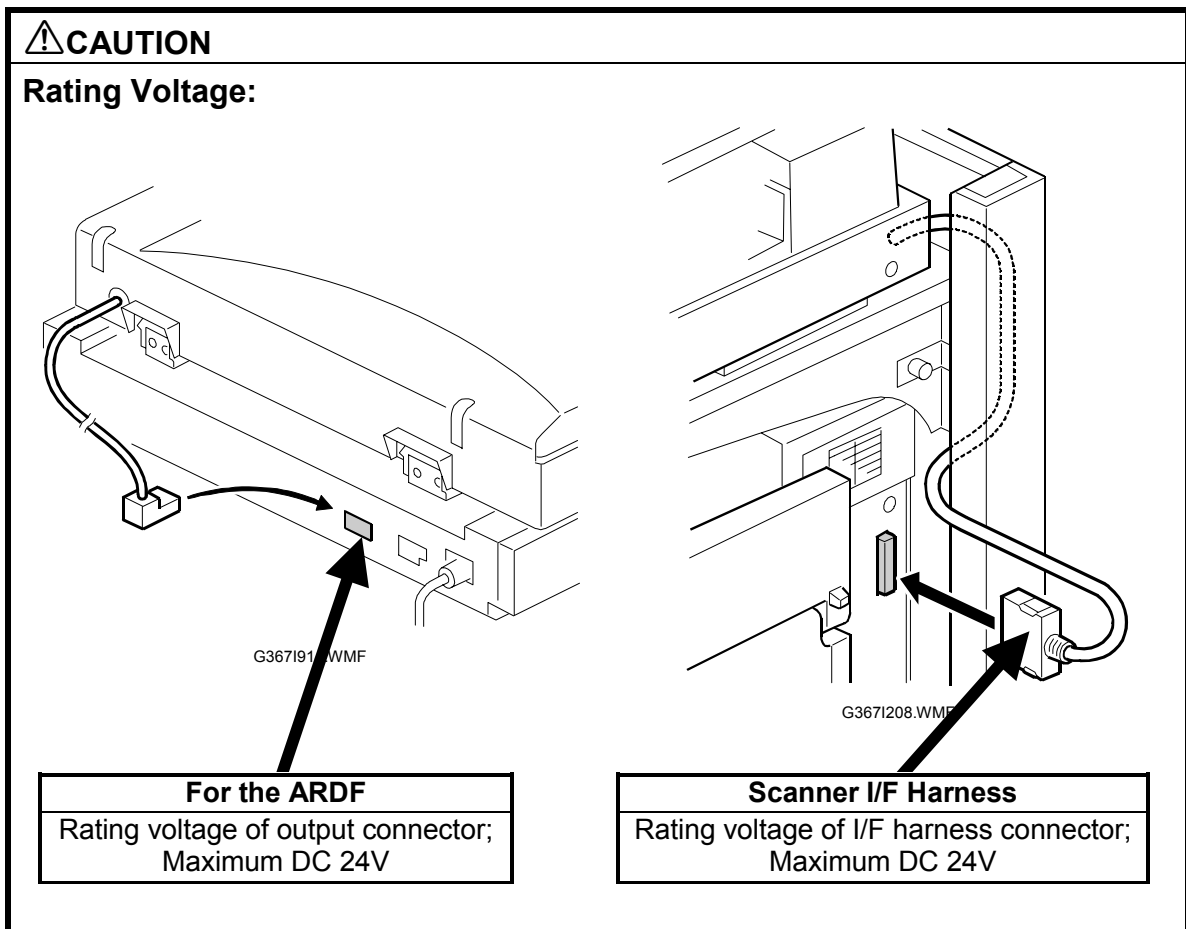


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9. Connect the harnesses [A] and clamp them as shown.
10. Slide in the hopper [B].
11. Fasten the two 1-mm spacers [C] to the rear frame for future adjustment.
NOTE: The spacers are used to adjust the horizontal positioning of the punch holes.
12. Reassemble the finisher and check the punch operation.

1.6.3 CF EXPANDER RACK

- NOTE:**
- 1) Section 1.6.4 shows the procedure for installing the Copier Feature Expander in a machine equipped with the optional rack. Before installing the CF expander, you must install the rack.
 - 2) For the printer mainframe and printer option installation procedures, please refer to the Operating Instructions "Set-up Guide."
 - 3) To avoid a possible build-up of ozone, make sure to install the machine in a room that is well ventilated.



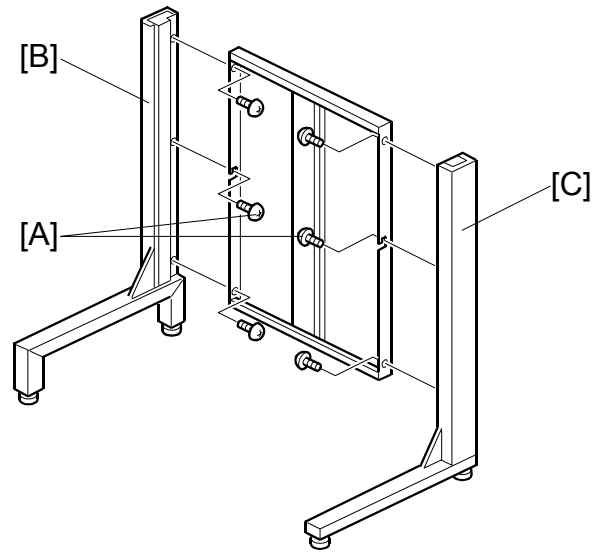
Accessories Check List



Description	Q'ty
1. Left Side Stand	1
2. Right Side Stand	1
3. Table Board	1
4. Backboard	1
5. Left Arm	1
6. Right Arm	1
7. Left Securing Bracket	1
8. Right Securing Bracket	1
9. Grounding Wire	2
10. Grounding Bracket	1
11. Large Thumb Screw	4
12. Small Thumb Screw	4
13. Spacer	2
14. Screw (M6 x 10)	14
15. Screw (M4 x 6)	4
16. Washer	4
17. Spring Washer	4
18. Clamp	1

Assembling the Rack

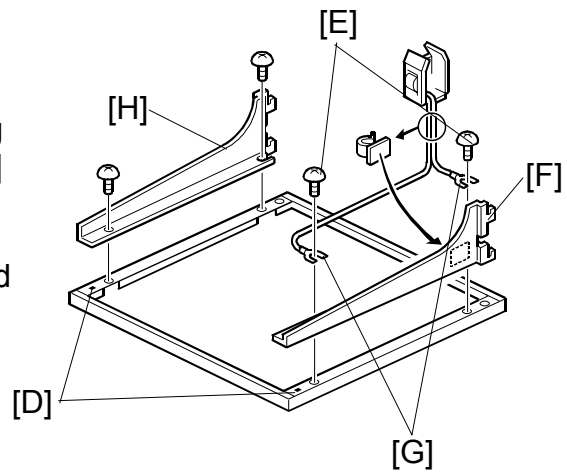
1. Insert a screw [A] about half way into the center holes of both the left [B] and right [C] side stands.
2. Hook the center part of the backboard onto the 2 screws.
3. Making sure that the two side stands are parallel, insert the remaining screws, then tighten all 6 screws.



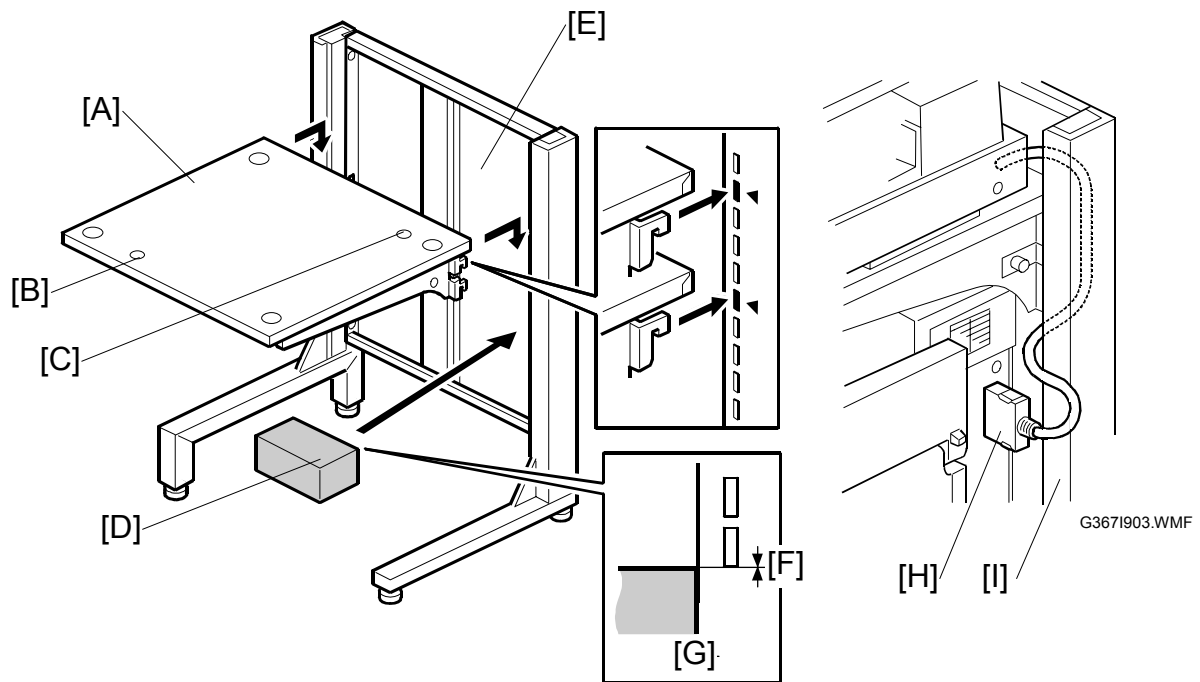
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4. With the 2 square holes [D] in the table board in front of you as shown, attach the left [E] and right [F] arms. When attaching the right arm, secure the ground wires [G] with screws [H] as shown.

NOTE: Please make sure to orient the table with the square holes toward you.



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5. Set the table board [A] on the stand as shown.

NOTE: 1) Make sure that the screw holes for the scanner unit are positioned at the right rear [C] and left front [B] of the table board.

- 2) Recommended attachment positions for the table board:

- Machine with Two-tray Paper Supply Unit & LCT: 2nd hole from the top
- Machine with One-tray Paper Supply Unit: 6th hole from the top

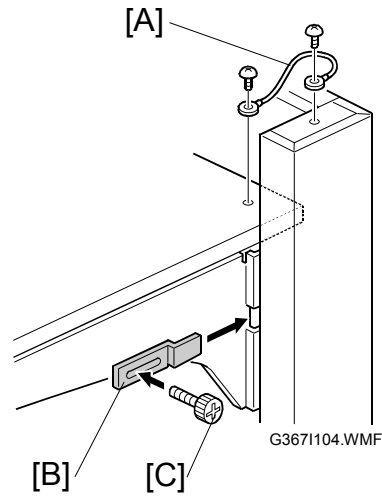
- 3) When attaching the table board at a position lower than the recommended one, make sure the upper right cover can be opened and the toner cartridges (especially black) can be replaced. When attaching the table board below the recommended position, it is necessary to shift the printer mainframe 10 cm (3.9") toward the front so that the upper right cover can be opened for toner replenishment.

6. Align the cushion [D] (enclosed as accessories for the optional CF Expander) as follows and attach it to the backboard [E]:

- Align the top side with the bottom end of the lowermost slot of the right side stand [F].
- Align the right side with the left side of the right side stand [G].

NOTE: The cushion prevents the right side stand [I] from damaging the scanner cable [H]. The cushion can be ineffective if attached to an incorrect position.

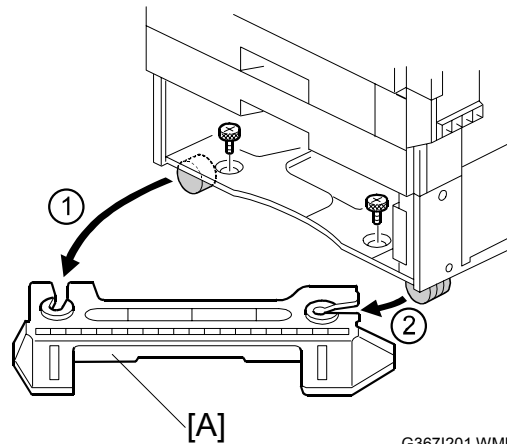
7. Secure the two grounding wires [A] (⌀ x 2 each). There is a wire at the left side and one at the right side.
8. Attach the securing brackets [B] to the left and right arms as shown (1 thumb screw [C] for each).



Docking the Rack and Printer Mainframe

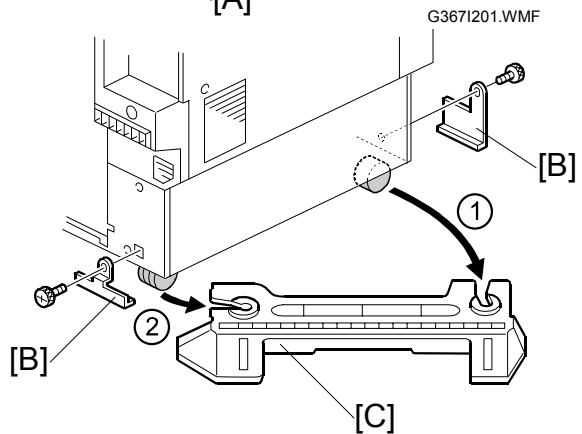
NOTE: If the Finisher is going to be installed, the mounting bracket of the rail should be attached *after* docking the mainframe with the rack. In addition, the Finisher should be attached after docking is complete.

1. Remove the paper tray and front stand [A] from the paper feed unit as shown (⌀ x 2).



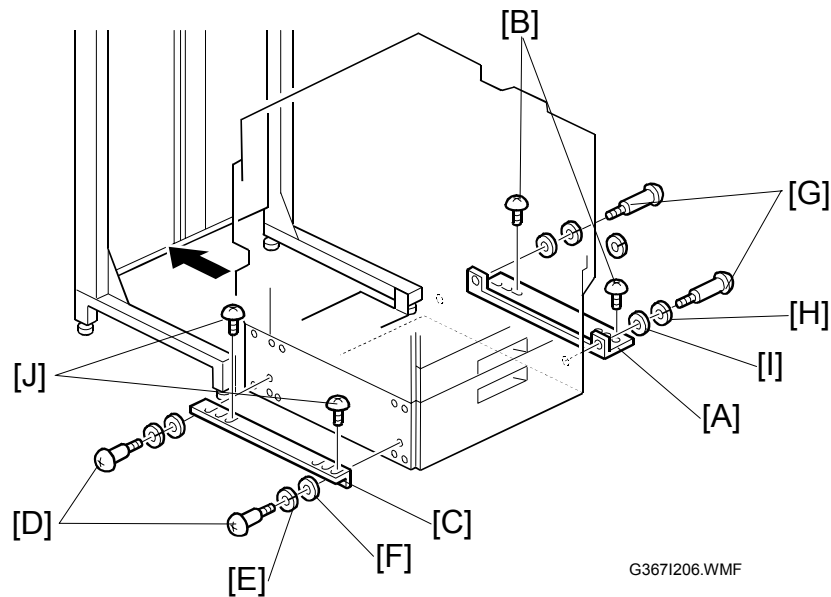
2. Remove the brackets [B] and rear stand [C] (⌀ x 1 for each).
3. Reinsert the paper tray.

NOTE: Since the front and rear stands will no longer be necessary, dispose of them according to local regulations.



4. Place the assembled rack down in the area where the mainframe is to be installed.
5. Adjust the height of the side stand legs for stabilization if necessary.

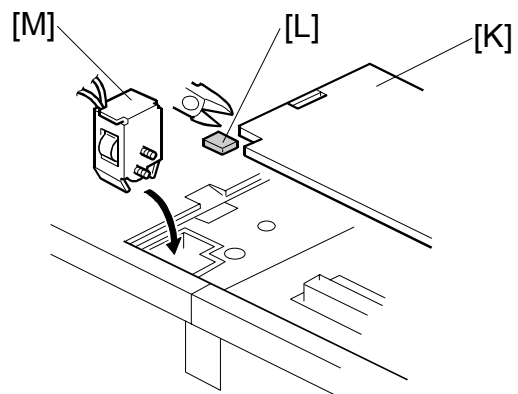
CAUTION: The stand is designed to support objects placed on the table only after the rack and mainframe have been docked. Therefore, use caution in handling the assembled stand before docking, as it is relatively unstable.



6. Attach the right bridging bracket [A] to the rack's right stand (2 screws [B]).
7. Attach the left bridging bracket [C] to the lower left corner of the paper feed unit (2 stepped screws [D], 2 spring washers [E] and 2 washers [F]).
8. Insert the printer in between the racks as shown and set it to the desired position.
9. Secure the right bridging bracket [A] to the paper feed unit (2 stepped screws [G], 2 spring washers [H] and 2 washers [I]).
10. Secure the left bridging bracket [C] to the rack's left stand (2 x [J]).

11. Remove the mailbox upper cover [K]. With a pair of pliers, remove the small square cutout [L] in the corner of the cover with a pair of pliers.



Then, set the grounding bracket [M] in the machine as shown and reattach the upper cover.



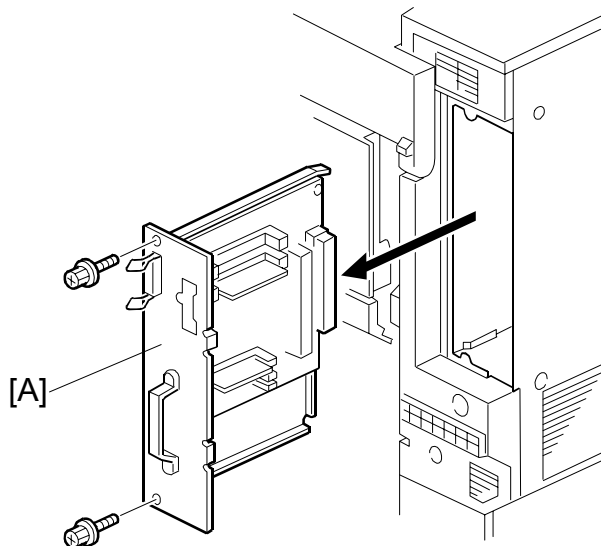
1.6.4 CF EXPANDER

NOTE: This section shows the procedure for installing the Copier Feature Expander in a machine equipped with the optional rack. For the procedure for installing the rack, see section 1.6.3.

Accessories Check List

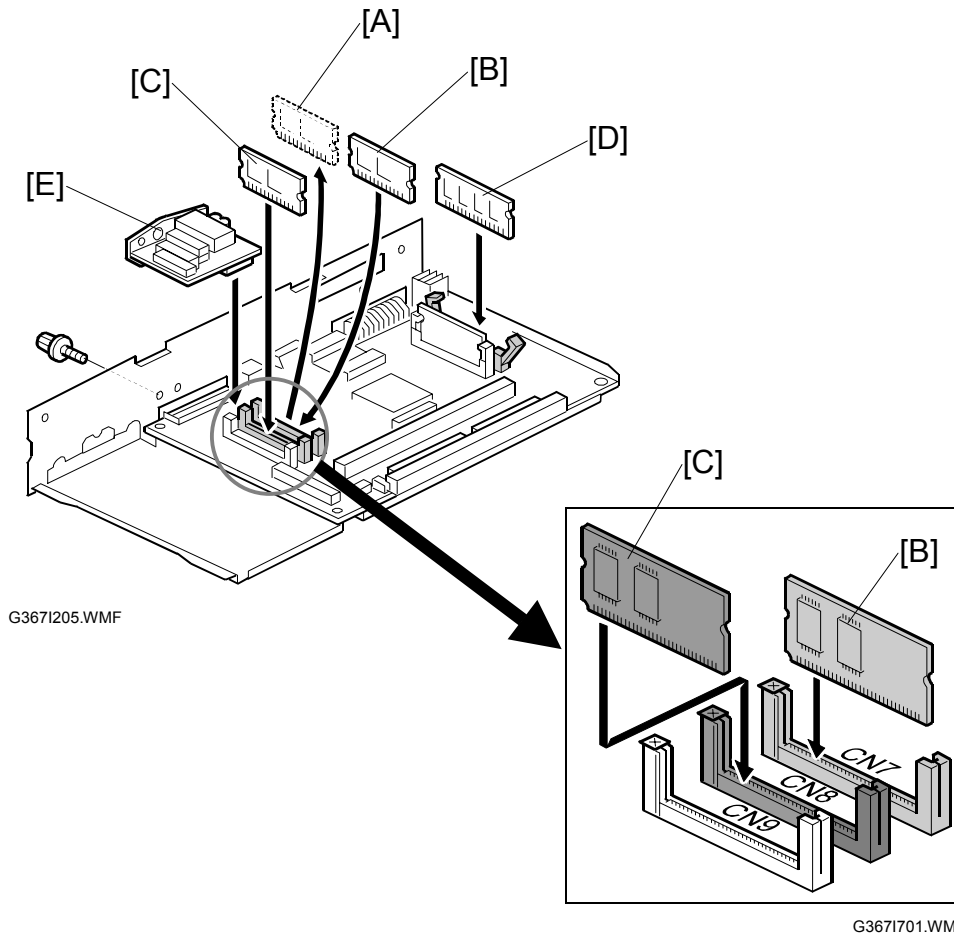
Description	Q'ty
1. Scanner Unit	1
2. Main Switch Cover	1
3. Screw (M3 x 6)	3
4. Screw (M3 x 6)	2
5. IPU Board	1
6. NVRAM Board	1
 7. DIMM #1 (SYSTEM)	1
8. DIMM #2 (PRT/SCN)	1
9. 128 MB DIMM (for 230V only).....	1
10. Pad.....	1
 11. Power Strip (for 230V only)	1
12. Cushion.....	1

CF Expander Installation



G3671203.WMF

1. Remove the controller board ( x 2) [A].



2. Replace the printer module [A] in the upper slot with DIMM #1 (SYSTEM) [B].
3. Insert DIMM #2 (PRT/SCN) [C] into the center slot.
4. Insert the 128MB memory [D].

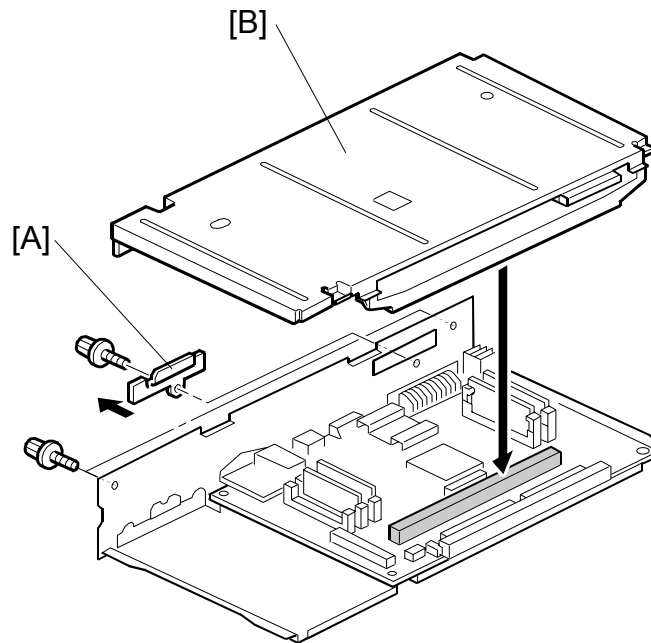
NOTE: 1) It is not necessary to install the additional memory if the present memory is 192MB or more.

2) Make sure that the modules are firmly set in their slots. If they are not, this will cause SC997.

5. Attach the NVRAM board [E] (⚙ x 1).

NOTE: 1) It is not necessary to install this NVRAM board in machines that already contain the optional User Account Enhancement Unit Type C.

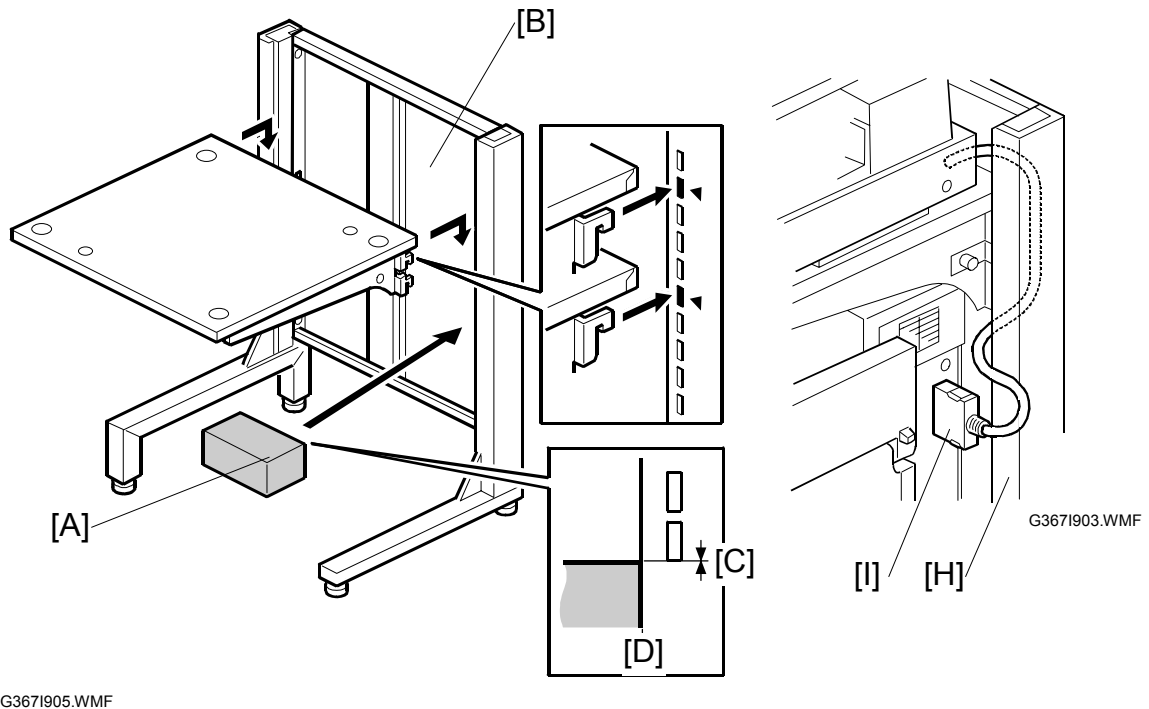
2) If replacing the Unit Type C with the NVRAM board, be sure to back up and re-enter the User Code data using SmartNetMonitor for Admin.



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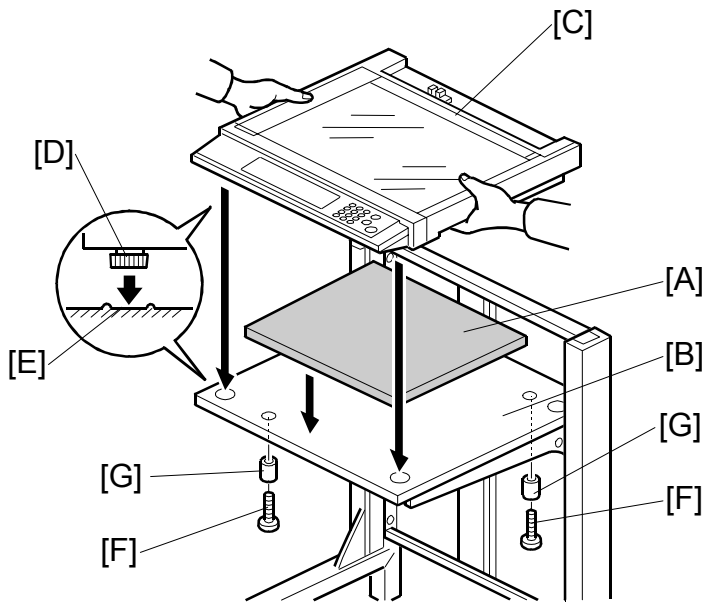
6. Remove the scanner connector cover [A].
7. Install the IPU board [B] (⌀ x 2).
8. Reinsert the controller into the printer using the 2 screws (M3 x 6) enclosed as accessories instead of the original screws.

NOTE: Make sure that the IPU board is firmly connected to the controller board. If it is not, this will cause SC990.

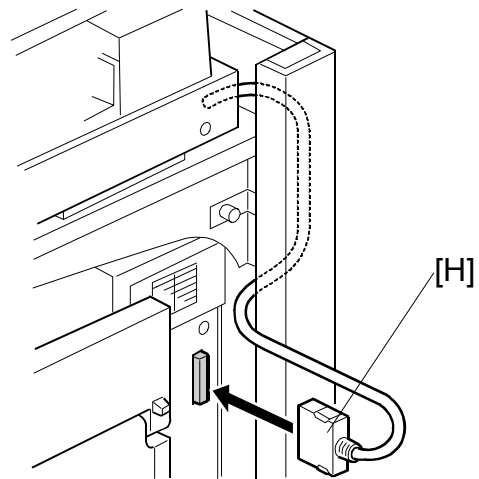


9. Align the cushion [A] as follows and attach it to the backboard [B]:
- Align the top side with the bottom end of the lowermost slot of the right side stand [C].
 - Align the right side with the left side of the right side stand [D].

NOTE: The cushion prevents the right side stand [H] from damaging the scanner cable [I]. The cushion can be ineffective if attached to an incorrect position.

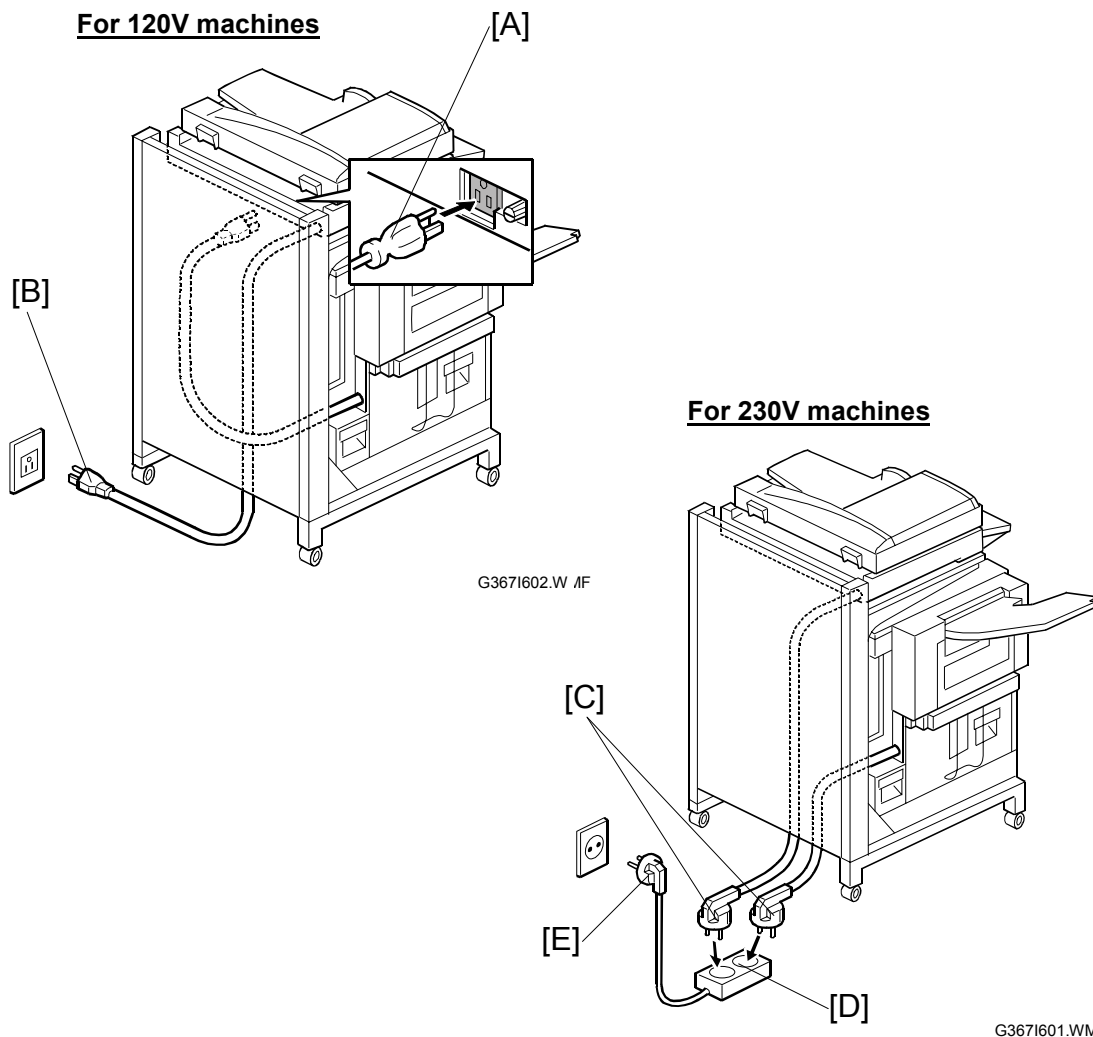


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G3671208.WMF

10. Place the pad [A] on the table board [B].
11. Place the scanner unit [C] on the table board so that the scanner unit legs [D] line up with the indents [E] in the table as shown.
12. Secure the scanner unit in place (2 [F] and spacers [G] enclosed as accessories for the optional rack).
13. Remove the shipping tape from the scanner cables.
14. Lead the scanner cable [H] along the inside of the rack as shown, then connect it to the IPU board on the controller frame.



15. For 120V machines:

Connect the printer power cord [A] to the output port on the scanner, then plug the scanner power cord [B] into the power outlet.

For 230V machines:

Connect the power cords [C] from both the printer and scanner to the power strip [D] enclosed as an accessory. Then, plug the power cord [E] into the power outlet.

16. Attach the printer main switch cover.

NOTE: Make sure that the wall outlet is near the machine and freely accessible, so that in the event of an emergency the cord can be easily unplugged.

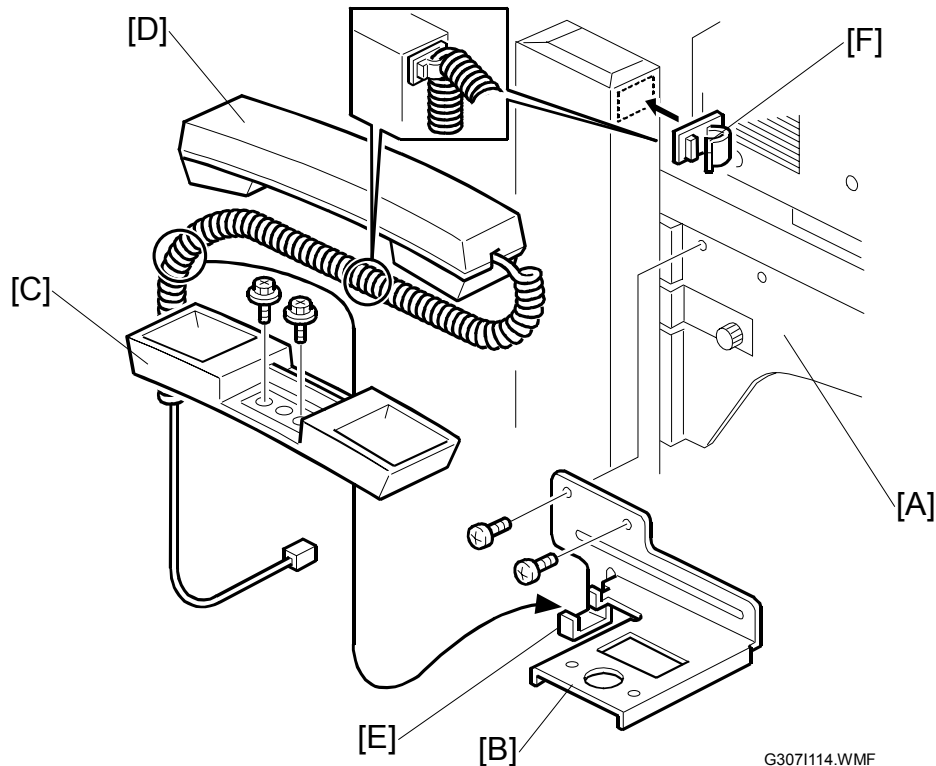
For 230V machines:

In addition, make sure that the power strip is also freely accessible, so that in the event of an emergency the power cords from the machines can be easily unplugged.



17. Select the language in the UP mode.
18. Set the date and time.
19. Enter SP Mode.
20. Clear the scanner application settings by using SP5-801-9.
21. Clear the IPU settings by using SP5-801-12.
22. Exit SP mode and turn the main power off/on.
23. Perform Auto Color Calibration (ACC).
24. Make some test copies in the following modes using a C4 Test Chart.
 - Full color in Text Mode
 - B&W in Text Mode
25. Check the test copies to make sure each of the following is within standard values, making any necessary adjustments. (☛ 3.3 Image Adjustment)
 - Leading edge registration
 - Side-to-side registration
 - Scanner sub-scan magnification
 - Scanner leading edge registration
 - Scanner side-to-side registration
 - ARDF side-to-side registration
 - ARDF sheet through registration
26. If necessary, perform the touch panel position adjustment. (☛ 3.6 Others)
27. If the customer has a service contract, change the meter charge SP mode settings accordingly.

1.6.5 INSTALLING THE HANDSET



G3071114.WMF

NOTE: The optional handset is for the U.S. model only.

1. Remove the thumb screw [A] on the left spacer.
2. Install the handset bracket [B] on the left arm (⌀ x 2, 1 thumb screw).
3. Install the handset holder [C] on the bracket ((⌀ x 2).
4. Place the handset [D] with the handset cord resting on the cord holder [E] of the bracket.
5. Attach the cord holder [F] (enclosed as accessories for the optional fax unit) to the uppermost end of the front side of the left side stand.

NOTE: Attached to this position, the cord holder prevents the duplex unit and the upper left cover from catching the handset cord when they are closed. The holder can be ineffective if attached to a lower position.




6. Connect the handset cord to the jack.

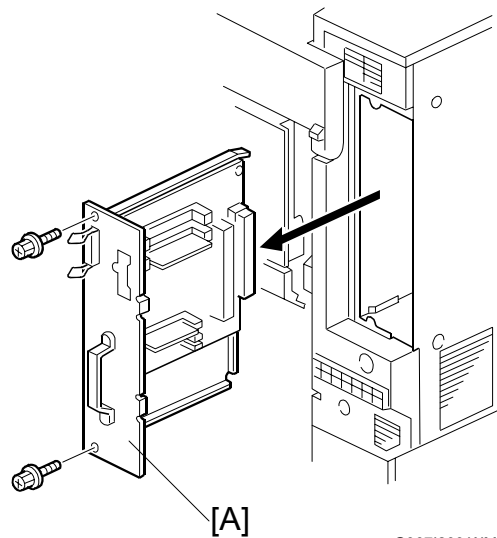
1.6.6 40GB HDD

Accessories Check List

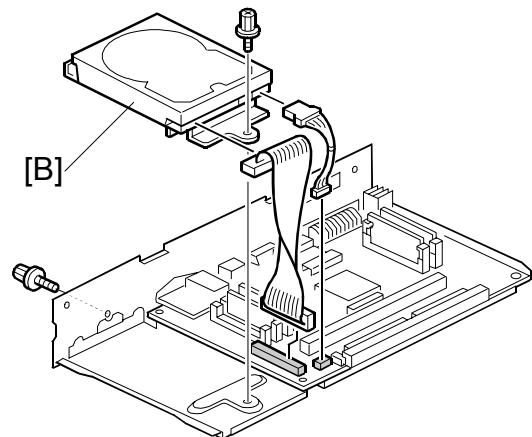
Description	Q'ty
1. 40GB HDD	1
2. Power Cable	1
3. Harness.....	1
4. Screw (M3 x 6).....	2
5. Key Top (Document Server)	1

40 GB HDD Installation

- Remove the controller board [A] (( x 2).
- Mount the 40GB HDD [B] on the controller ( x 2,  x 2).
NOTE: If the CF expander has already been installed, remove the IPU board first, then install the HDD.
- Reinsert the controller in the printer using the 2 screws (M3 x 6) enclosed in the CF expander, instead of the original screws.
NOTE: When installing the HDD and CF expander simultaneously, be sure to install both before performing the next step.
- Make sure that the power cords are properly plugged in, then turn on the main switch. Format the HDD according to the instructions displayed on the touch panel. Print the configuration page and confirm that the HDD has been properly installed.



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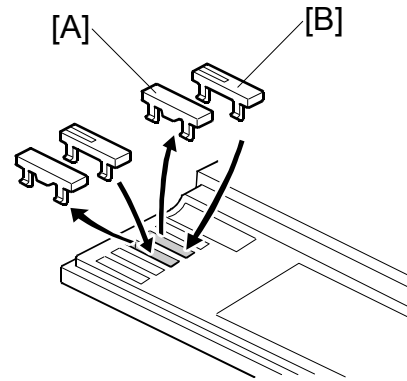


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17 January, 2003

OPTIONAL UNIT INSTALLATION

5. Remove the cover key top [A] and replace it with the document box key top [B].



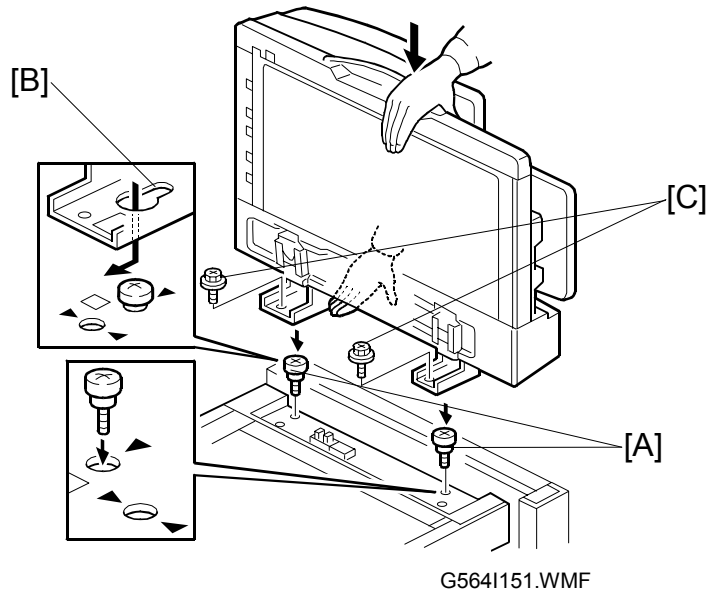
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Installation

1.6.7 ARDF

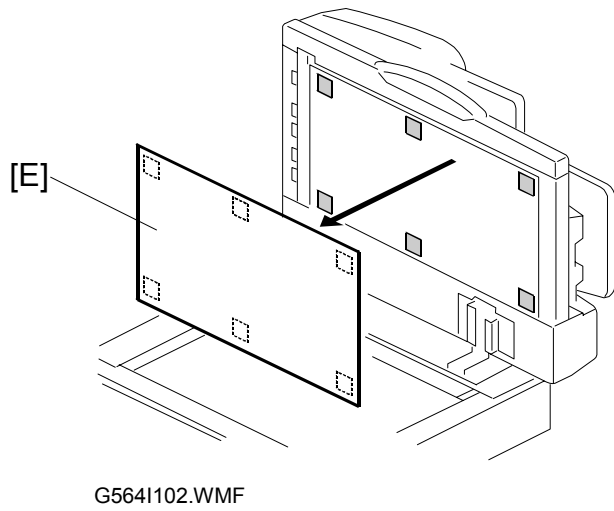
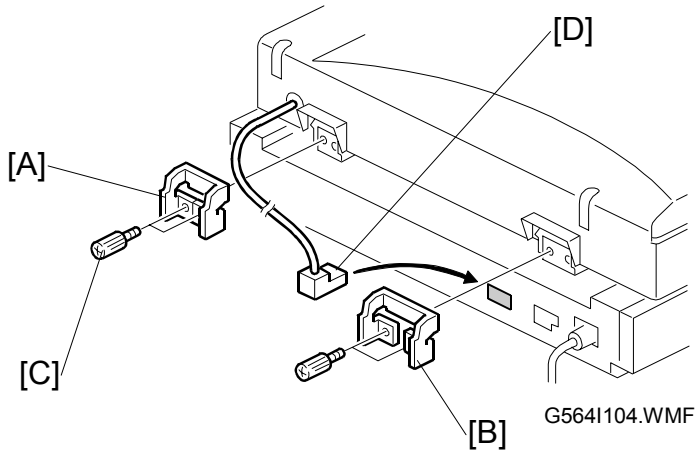
Accessories Check List

Description	Q'ty
1. Stepped Screw	2
2. Screw (M4 x 10)	2
3. Knob Screw	4
4. Attention Decal – Scanner	1
5. Attention Decal – Top Cover	1
6. Installation Procedure	1

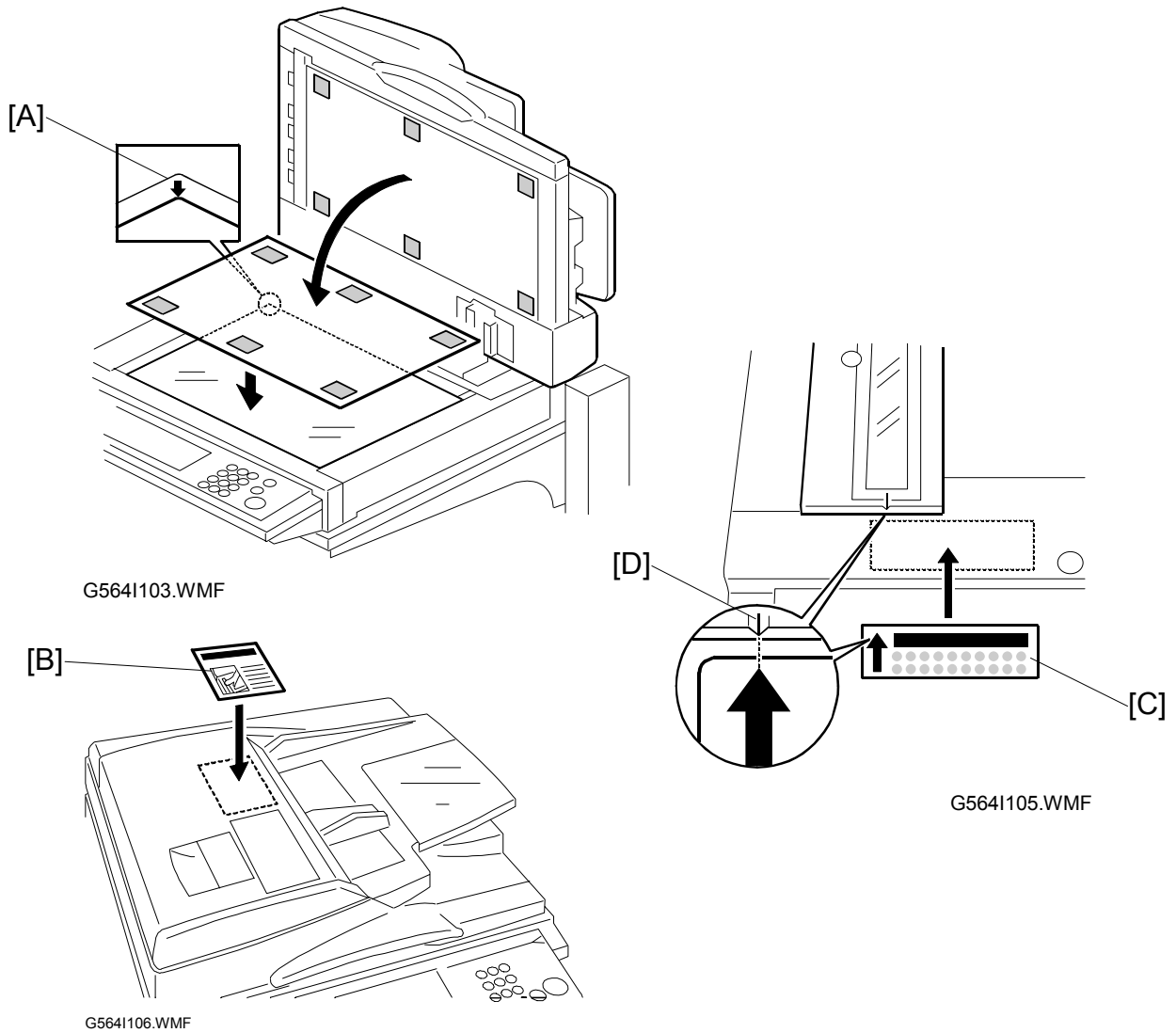


ARDF Installation

1. Attach and tighten [A] (⌀ x 2 stud).
2. Mount the ARDF by aligning the screw keyholes [B] in the ARDF support plate over the stud screws, and slide the ARDF toward the front of the machine.
NOTE: To avoid damaging the ARDF, hold it as shown in the illustration.
3. Secure the ARDF (⌀ x 2 [C]).



4. Attach the left [A] and right [B] stopper brackets with knob screws [C] (🔩 x 4).
5. Connect the I/F cable [D] (🔌 x 1) to the main machine.
6. Peel off the platen sheet [E] and place it on the exposure glass.



7. Line up the rear left corner of the platen sheet flush against corner [A] on the exposure glass.
8. Close the ARDF.
9. Attach the decal [B] to the top cover as shown, choosing the language most suitable for the machine installed.
10. Attach the decal [C] to the cover so that the arrow on the decal lines up with the groove [D] of the left scale as shown. As with step 9, choose the language most suitable for the machine installed.
11. Check the ARDF operation and copy quality. Be sure to check and adjust the registration for the ARDF with the SP modes.

1.6.8 MULTI-BIN OUTPUT TRAY

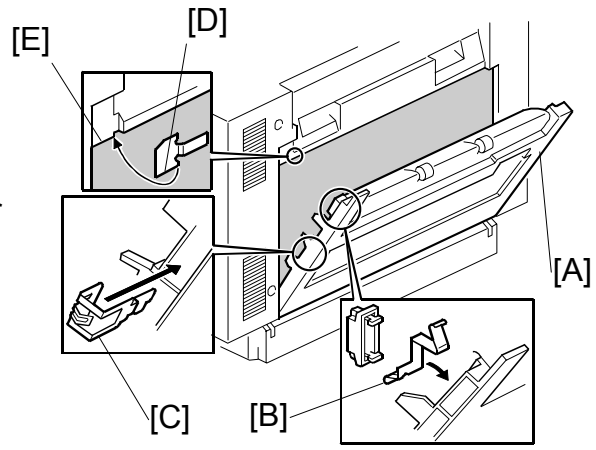
Accessories Check List

Description	Q'ty
1. Front Tray Holder	1
2. Rear Tray Holder	1
3. Tray	2
4. Screw (3 x 1 4)	4
5. Discharge Brush	2
6. Ground Plate for Left Cover	1
7. Ground Plate for Upper Exit	1
8. Ground Plate for Lower Exit	1

Installing the Multi-Bin Output Tray

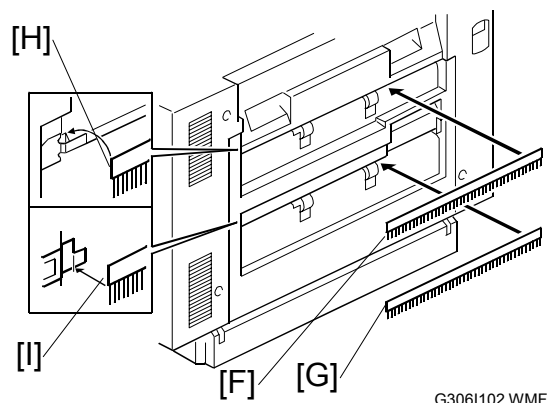
NOTE: Before installing the multi-bin output tray, install the duplex unit.

1. Open the left cover [A] of the duplex unit.
2. Install the ground plate [B] behind the magnet.
3. Install the ground plate [C] on the rear of the left cover.
4. Attach the ground plate to the top cover, aligning the bottom edges of the plate [D] and cover [E].



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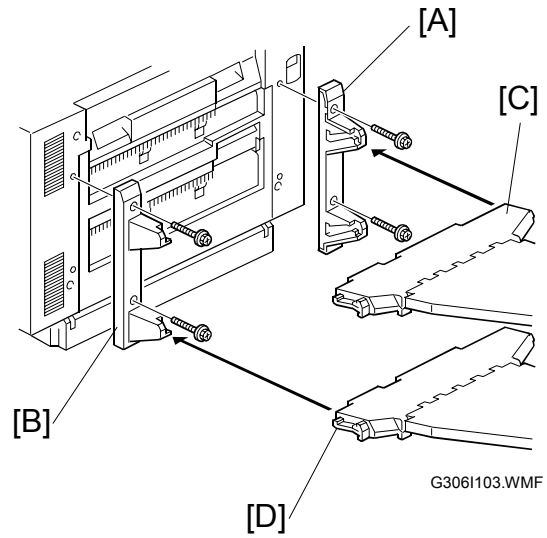
5. Attach the discharge brushes [F][G] to the upper edges of the paper exits, so that the ends of the brushes [H][I] touch the ground plates [C][D] respectively.
- NOTE:** Make sure the brushes do not obstruct paper coming from the exits.



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6. Install the front [A] and rear [B] tray holders on the top cover (⌀ x 2 for each).
7. Install the upper [C] and lower [D] trays.
8. Turn the main switch on; select the SP mode menu, SP6-901-1; and change the multi-bin output tray setting.

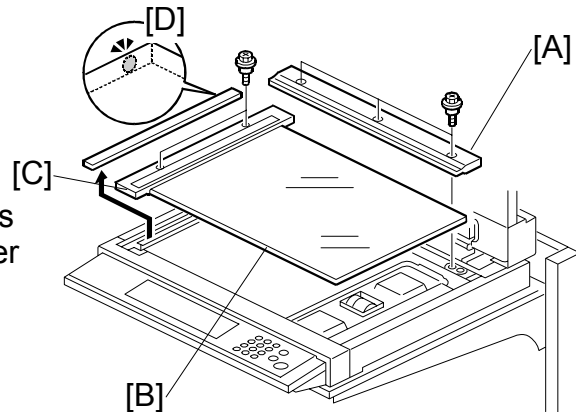
NOTE: The multi-bin output tray is not automatically recognized by the printer mainframe. The multi-bin output tray cannot be used until you have changed this SP mode setting.



1.6.9 ANTI-CONDENSATION HEATER

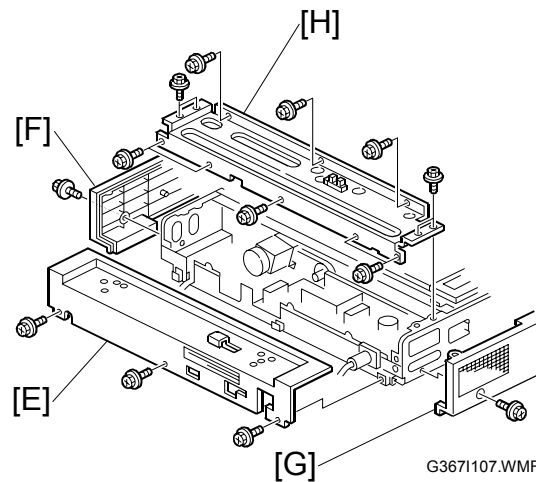
1. Remove the rear scale [A] (⚙ x 3).
2. Remove the exposure glass [B] with the left scale [C] (⚙ x 2).

NOTE: You do not have to remove the ADF exposure glass. If the glass is removed, position the glass marker [D] at the rear-left corner when reattaching.



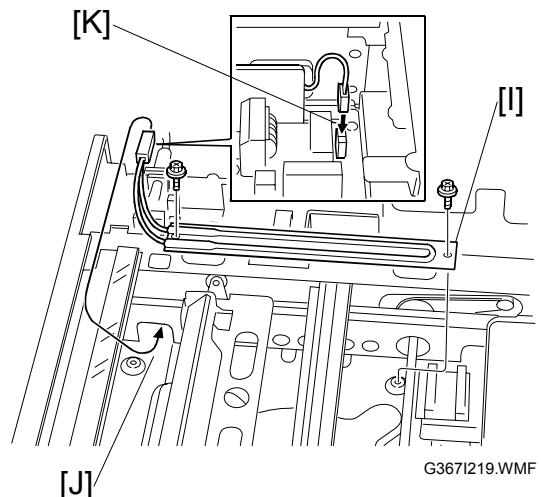
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3. Remove the rear cover [E] (⚙ x 3).
4. Remove the right cover [F] (⚙ x 3).
5. Remove the left cover [G] (⚙ x 3).
6. Remove the rear frame [H] (⚙ x 12, ⚙ x 2).



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7. Install the anti-condensation heater [I] in the rear-left corner of the scanner unit (⚙ x 2).
8. Pass the cable through the opening [J] in the rear rail and connect it to the connector [K] at the front-left corner of the power supply unit.
9. Reassemble the scanner unit.



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2. PREVENTIVE MAINTENANCE

2.1 USER MAINTENANCE

The following maintenance kits are available for the customer to do PM.

Type A	Color (C/M/Y) PCU	50KP
Type B	Color (C/M/Y) Development Unit	100KP
Type C	Fusing Unit	100KP
Type D	Black Development Unit / Dust Filter	100KP
Type E	Waste Toner Bottle	50KP
Type F	Black PCU	50KP
Type G	Oil Supply Unit	30KP
Type H	Paper Feed Rollers	150KP

Chart: A4 (LT)/5%

Mode: 5 prints/job

Environment: Normal temperature and humidity

Yield may change depending on circumstances and print conditions.

When the machine's default settings are used, an error message is displayed when a maintenance counter reaches the value in the PM table below, except for the items in maintenance kit H.

NOTE: To have the machine display the message for maintenance kit H also, set SP5-930-4 to 1.

After the user replaces the items in a maintenance kit, the machine automatically resets the counter for this maintenance kit, except for the items in kit H.

NOTE: Except for the items in kit H, the machine can automatically detect when new items have been installed.

The machine stops when the counters for parts in maintenance kits E and G reach the replacement value in the following table.

NOTE: To have the machine display the alert only for maintenance kits E and G, set SP5-930-3 to 0.

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect

Main Unit

Item	30K	50K	100K	150K	EM	Remarks
Black PCU		R				Included in maintenance kit F
Color (Y/M/C) PCU		R				Included in maintenance kit A
Black Development Unit			R			Included in maintenance kit D
Color (C/M/Y) Development Unit			R			Included in maintenance kit B
Fusing Unit			R			Included in maintenance kit C
Oil Supply Unit	R					Included in maintenance kit G
Waste Toner Bottle		R				Included in maintenance kit E
Dust Filter			R			Included in maintenance kit D
Pick-up Roller				R		Included in maintenance kit H
Feed Roller				R		Included in maintenance kit H
Separation Roller				R		Included in maintenance kit H

Punch Kit

Item	10K				EM	Remarks
Chads	I					Discard chads.

2.2 SERVICE MAINTENANCE

NOTE: After replacing the transfer unit and the transfer cleaning unit, make sure to reset the maintenance counter using SP7-804-16 and SP7-804-17 respectively.

After replacing paper feed rollers, reset the maintenance counters for these also: By-pass tray (7-804-10), Tray 1 (7-804-11), Tray 2 (7-804-12), Tray 3/LCT (7-804-13), Tray 4 (7-804-14)

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect

Main unit

Item	100K	150K	500K	1,000K	3,000K	EM	Remarks
Transfer Unit				R			
Transfer Cleaning Unit			R				
By-pass Feed Roller		R					
By-pass Pick-up Roller		R					
By-pass Separation Roller		R					
Waste Oil Bottle					R		

One-tray Paper Feed Unit (500 sheets x 1)

Item	100K	150K	500K	1,000K	3,000K	EM	Remarks
Relay Roller						C	Damp cloth
Bottom Plate Pad						C	Damp cloth

Two-tray Paper Feed Unit (500 sheets x 2)

Item	100K	150K	500K	1,000K	3,000K	EM	Remarks
Relay Roller						C	Damp cloth
Bottom Plate Pad						C	Damp cloth

LCT (2000 sheets)

Item	100K	150K	500K	1,000K	3,000K	EM	Remarks
Relay Roller						C	Damp cloth
Bottom Plate Pad						C	Damp cloth

Two-tray Finisher

Items	100K	150K	500K	1,000K	3,000K	EM	Remarks
Rollers						C	Damp cloth
Discharge Brush						C	Dry cloth
Sensors						C	Blower brush
Jogger Fences						I	Replace if required.

Four-bin Mailbox

Item	100K	150K	500K	1,000K	3,000K	EM	Remarks
Rollers						C	Damp cloth
Tray Paper Sensors						C	Blower blush or dry cloth

CF Expander

Item	20k	50k	100k	1000k	EM	Remarks
1st Mirror					C	Optics cloth
2nd Mirror					C	Optics cloth
3rd Mirror					C	Optics cloth
APS Sensor					C	Dry cloth
Xenon Exposure Lamp					C	Dry cloth
Exposure Glass (Sheet through)					C	Dry cloth or alcohol

ARDF

Item	400k				EM	Remarks
Pick-up Roller	R				C	Damp cloth or alcohol
Feed Belt	R				C	Damp cloth or alcohol
Separation Roller	R				C	Damp cloth or alcohol
Sensors	C				C	Blower brush
Platen Sheet Cover					C	Damp cloth or alcohol. Replace platen sheet if required.
White Plate					C	Dry or damp cloth
Drive Gear	L					Grease, G501


NOTE: 400k copies (= 80k originals x 5 copies/original)


3. REPLACEMENT AND ADJUSTMENT

CAUTION

Turn off the main switch and unplug the machine before beginning any of the procedures in this section.

NOTE: This manual uses the following symbols.

 : See or refer to

 : Screw

 : Connector

 : Clip ring

 : E ring

3.1 SPECIAL TOOLS

Part Number	Part Name	Q'ty
N8036701	Flash Memory Card - 4MB	1
G0219350	Loop-back connector - Parallel	1
C4019503	20X Magnification Scope	1

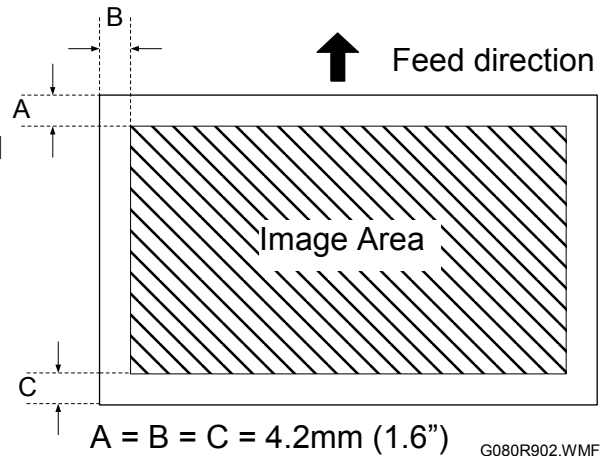
Replacement
Adjustment

3.2 IMAGE ADJUSTMENT

3.2.1 REGISTRATION

Image Area

The image area shown in the illustration must be guaranteed. So make sure that the registration is adjusted within the adjustment standard range as described below.



Leading Edge

Adjusts the leading edge registration for each paper type and process line speed.

Side to Side

Adjusts the side to side registration for each paper feed station.

NOTE: The side to side registration for the optional paper feed unit, LCT, and duplex unit can be adjusted with SP mode or with the user tools (Maintenance menu).

Adjustment Standard

- Leading edge (sub-scan direction): 3 ± 0 mm
- Side to side (main-scan direction): 2 ± 0 mm

Paper Registration Standard

The registration in both main- and sub-scan directions may fluctuate within the following tolerance.

1st side

- Sub-scan direction: 0 ± 1.5 mm
- Main-scan direction: 0 ± 2 mm

2nd side in duplex

- Sub-scan direction: 0 ± 3 mm
- Main-scan direction: 0 ± 4 mm

Adjustment Procedure

1. Enter SP mode and access SP5-997.
2. Print out the pattern (14: 1-dot trimming pattern) with SP5-997.
NOTE: Registration may change slightly print by print as shown above.
 Therefore print a few pages of the trimming pattern for step 3 and 4, and average the leading edge and side-to-side registration values and adjust each SP mode.
3. Perform the leading edge registration adjustment.
 - 1) Check the leading edge registration and adjust it with SP1-001.
 - 2) Select the adjustment conditions (paper type and process line speed).
 - 3) Input the value then press the [Escape] key.
 - 4) Check the leading edge adjustment by generating the trim pattern.
4. Perform the side to side registration adjustment.
 - 1) Check the side to side registration and adjust it with SP1-002.
 - 2) Select the adjustment conditions (paper feed station).
 - 3) Input the value then press the [Escape] key.
 - 4) Check the side to side adjustment by generating the trim pattern.

3.2.2 COLOR REGISTRATION

Line Position Adjustment

Normally, the automatic line position adjustment is executed under a specified condition to optimize the color prints. If color registration shifts, execute "Auto Adjust" with the user tools (Maintenance menu – Color registration) or SP5-993-2 to do the forced line position adjustment. In addition, it is recommended to perform the line position adjustment under the following conditions:

- After transporting or moving the printer (If printers are pre-installed at the workshop and transported to the user location, forced line position adjustment should be done after printer installation is completed at the user location.)
- When opening the drum positioning plate
- When removing or replacing the motors, clutches, and/or gears related to the drum/development/transfer sections
- When removing or replacing the transfer belt or laser optical housing unit

Adjustment of Line Speed for Thick Paper

You must adjust the line speed of the fusing unit (the speed of development motor-K) under the following conditions:

- The color registration shifts more on the trailing edge than on the leading edge.
- This problem has not been solved by the line position adjustment.

Use the following user tool for this adjustment:

- Menu/Maintenance/Color Regist./Fuser Adjust/Thick paper

3.2.3 PRINTER GAMMA

NOTE: Normally, the printer gamma is enough to adjust the color balance to achieve the optimum print output. The gamma correction is only required for fine-tuning to meet the user requirements.

Adjustment Overview

Make the gradation scales on the printout smooth from the highlight to the shadow density. Adjust the CMY gradation scale at the top of the chart by balancing the density of the C, M, and Y gradation scales – the CMY gray scale should change smoothly from minimum to maximum, and there should be no coloration.

For each color, you can adjust 15 points between 0 (lowest density) and 255 (highest density).

The gradation scales marked “Default Value” are printed according to the default gamma settings. The gamma adjustment changes the densities at the adjustable points in the gradation scale. The gradation scale marked “Current Value” shows the current settings.

During the adjustment procedure, compare the “Current Value” gradation scale with the “Default Value” Select the density for each of the 15 adjustable points, excluding points 0 and 255, from the “Default Value” gradation scale.

The NVRAM holds three printer gamma settings, those saved this time (Current), those saved in the preceding adjustment (Previous), and the factory settings (Factory).

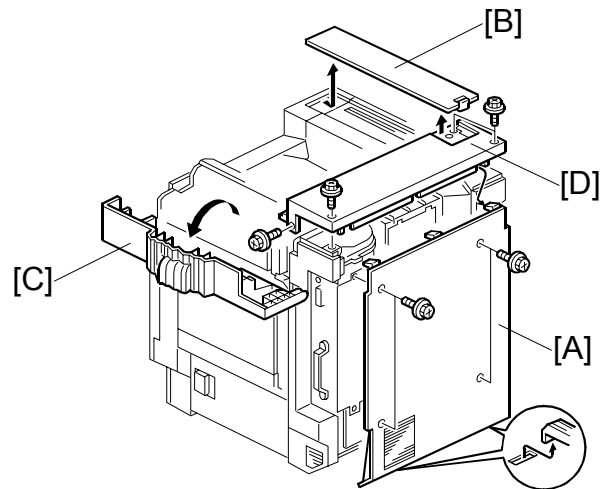
Adjustment Procedure

1. Enter SP mode.
2. Select “1. Service”
3. Select “Data Recall” and load the settings that will serve as the base for the adjustment.
4. Select “Mode Selection”, and select the print mode that you are going to adjust.
5. To review the image quality for these settings, choose “Test Page” to print out a color calibration test sheet.
6. Select “Gamma Adj.”
7. Adjust the color density at each of the 15 points for a color (CMY and K).
8. When the density setting is complete for all colors, print out a color calibration test sheet again and make sure that the gradation scale for each printed color is smooth and that the CMY gradation scale is gray. Repeat the adjustment if there is an anomaly.
9. If the adjustment results prove satisfactory, execute “Data Save.”

3.3 EXTERIOR COVERS

3.3.1 REAR COVER AND UPPER REAR COVER

1. Rear cover [A] (⚙️ x 4, 2 hooks)
2. Remove the optional mailbox if it is installed.
3. Upper exit cover [B] (1 hook) if the optional mailbox is not installed.
4. Open the upper right cover [C].
5. Upper rear cover [D] (⚙️ x 4)

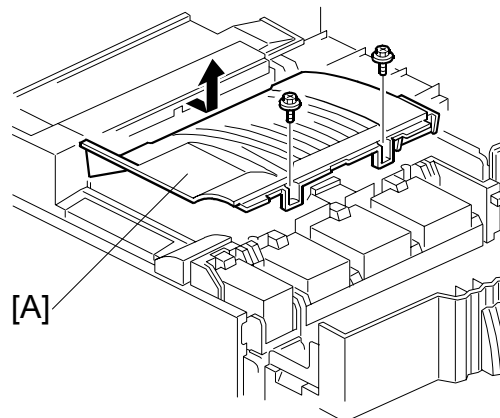


Replacement
Adjustment

G080R903.WMF

3.3.2 PAPER EXIT TRAY

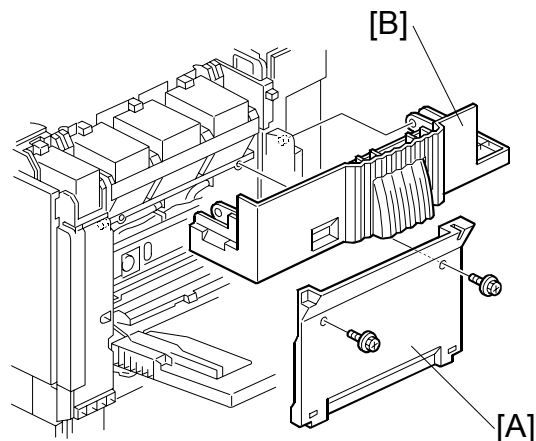
1. Paper exit tray [A] (⚙️ x 2)



G080R904.WMF

3.3.3 UPPER RIGHT COVER

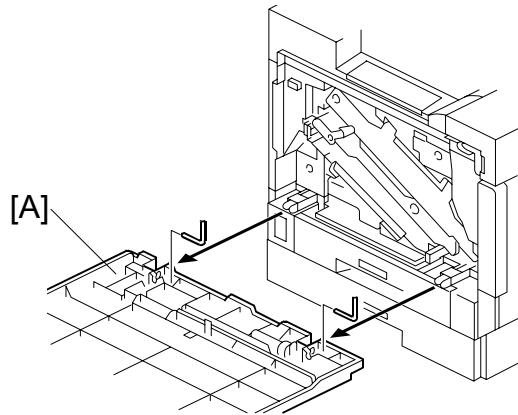
1. Right cover [A] (⚙️ x 2)
NOTE: To remove the right cover, open the upper right cover.
2. Upper right cover [B]



G080R905.WMF

3.3.4 FRONT COVER

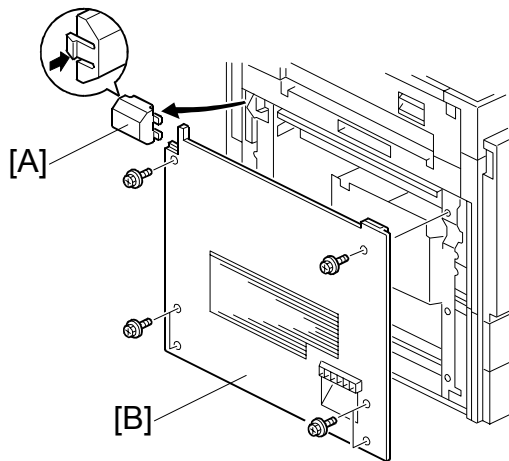
1. Front cover [A] (2 pins)



G080R906.WMF

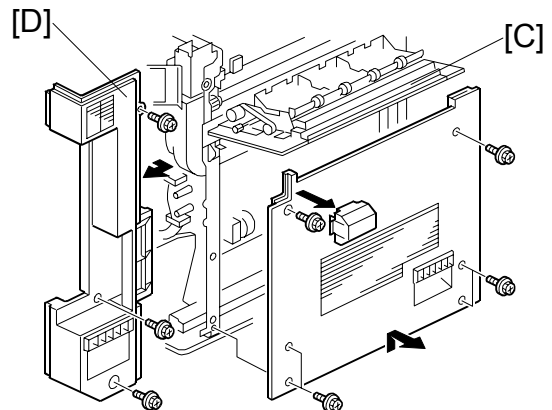
3.3.5 LEFT COVER AND REAR LEFT COVER

1. Remove the optional finisher from the printer if it is installed.
2. Remove the optional duplex inverter unit if it is installed.
3. Connector cover [A] if the optional duplex unit is not installed
4. Left cover [B] (⚙ x 6)



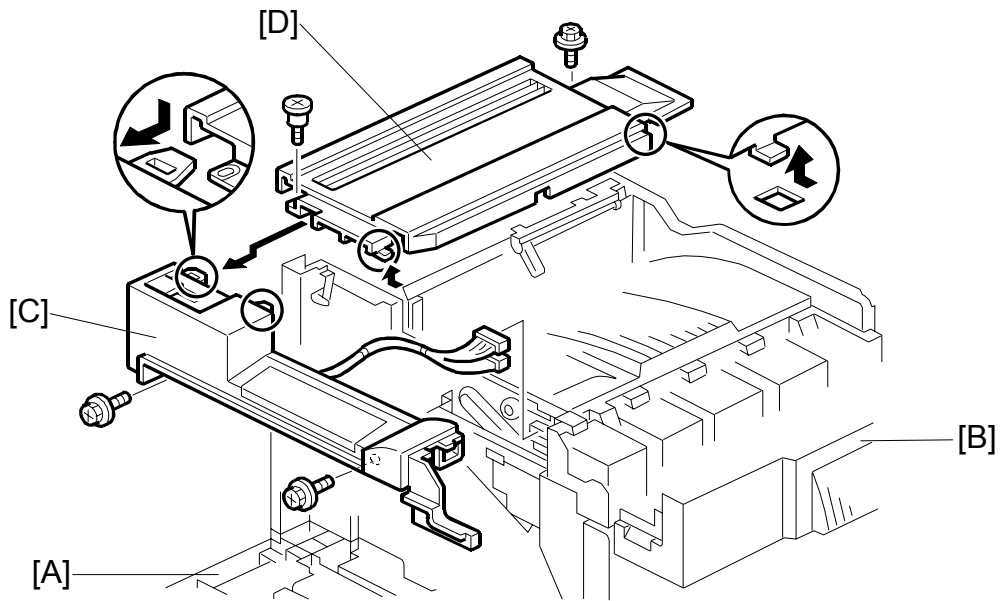
G080R907.WMFFF

5. Open the left door [C].
6. Rear left cover [D] (⚙ x 3)



G080R908.WMF

3.3.6 UPPER LEFT COVER AND OPERATION PANEL



G080R909.WMF

Replacement
Adjustment

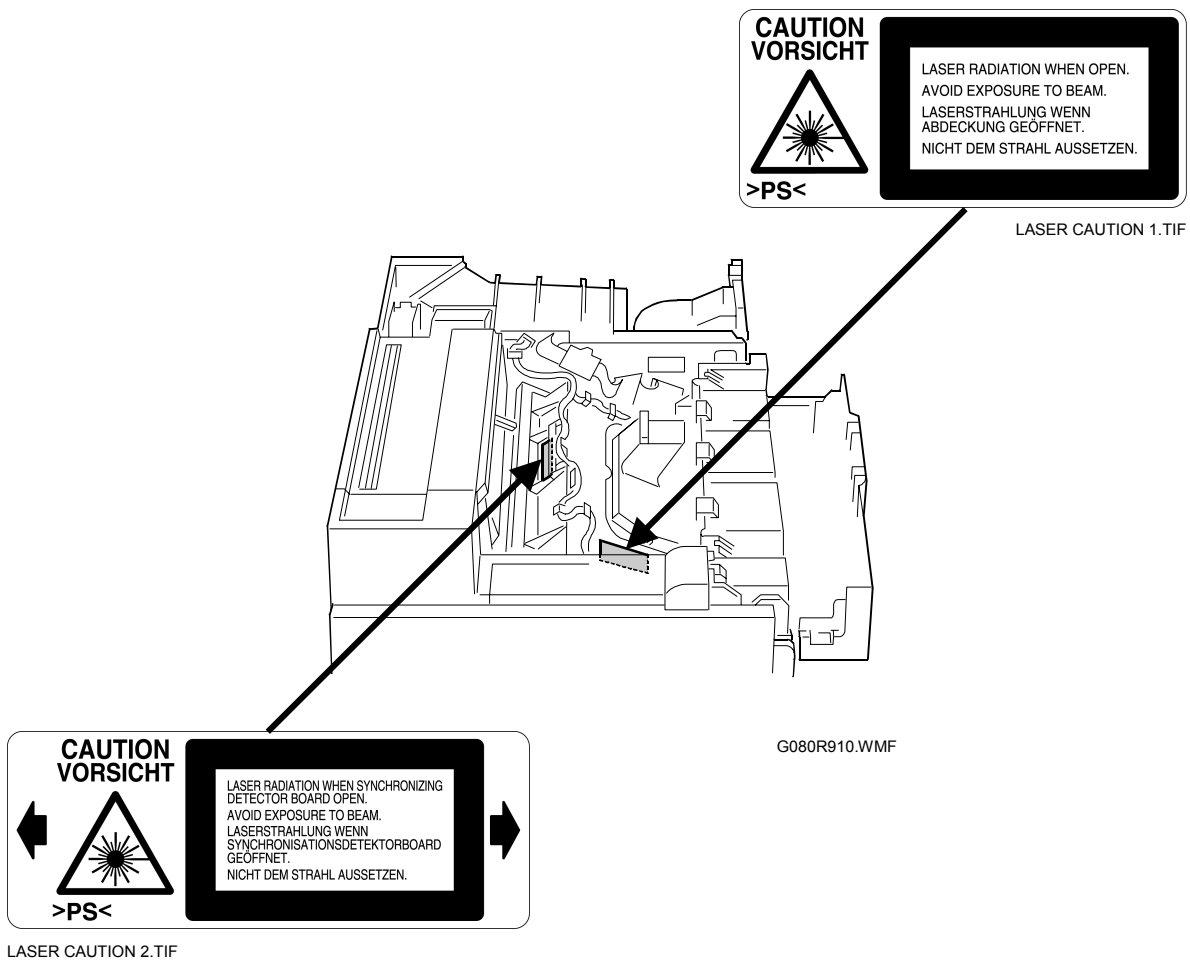
1. Open the front cover [A].
2. Open the upper right cover [B].
3. Operation panel [C] (⚙️ x 2, 📏 x 3, 2 hooks)
4. Upper left cover [D] (⚙️ x 1, Shoulder-screw x 1, 2 hooks)

3.4 LASER OPTICS

⚠ WARNING
Turn off the main switch and unplug the machine before beginning any of the procedures in this section. Laser beams can cause serious eye injury.

3.4.1 CAUTION DECAL LOCATIONS

Caution decals are placed as shown below.



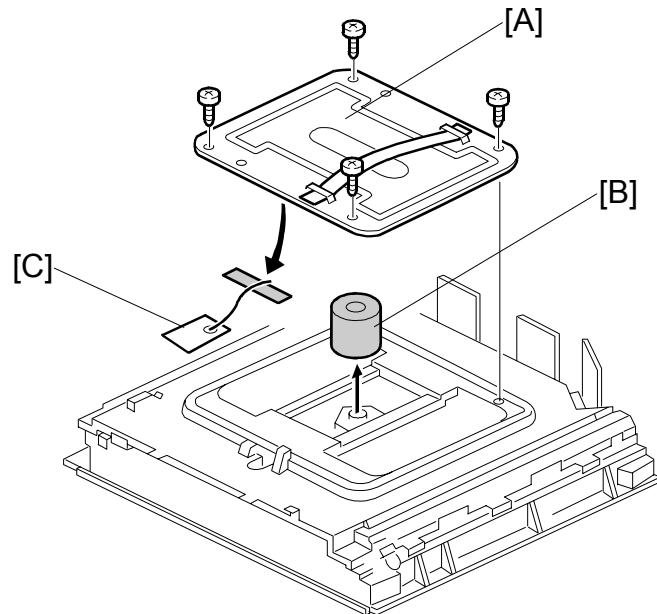
⚠ WARNING
Be sure to turn off the main switch and disconnect the power plug from the power outlet before beginning any disassembly or adjustment of the laser unit. This printer uses a class IIIb laser beam with a wavelength of 655 nm and an output of 7 mW. The laser can cause serious eye injury.

3.4.2 LASER OPTICS HOUSING UNIT

CAUTION: Before installing a new laser optics housing unit, remove the sponge padding and the tag from the new unit.

Steps 1 through 4 refer to the procedure for a newly supplied unit that replaces the old one.

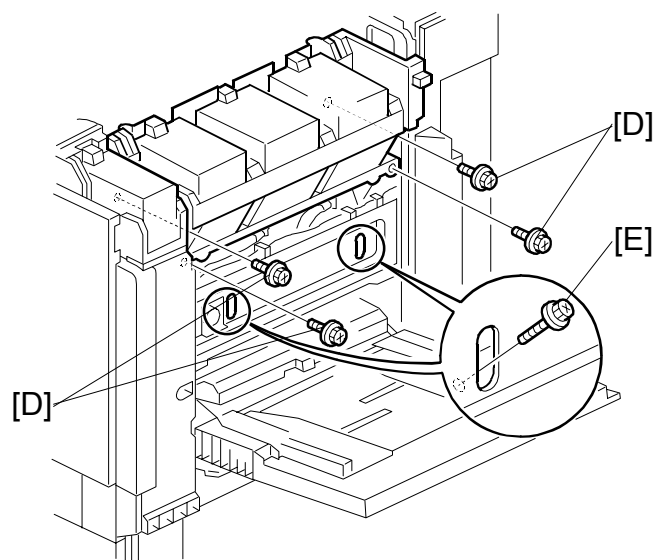
1. Top cover of the laser optics housing unit [A] (⚙ x 4)
2. Sponge padding [B]
3. Tag [C]
4. Reinstall the top cover.



Replacement
Adjustment

G080R757.WMF

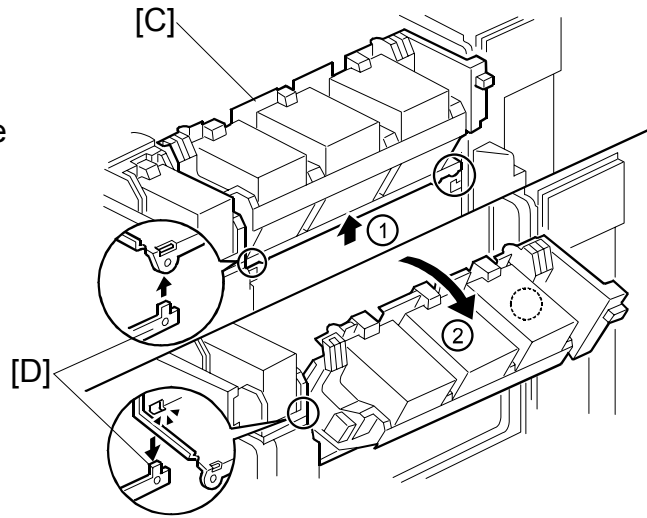
5. Rear cover (☛ 3.3)
6. Upper rear cover (☛ 3.3)
7. Paper exit tray (☛ 3.3)
8. Right cover (☛ 3.3)
9. Securing screws for the toner supply unit [D] (⚙ x 4)
10. Securing screws for the laser optics housing unit [E]



G080R911.WMF

11. Hold the toner supply unit [C] up ①. Then, lower the unit ②.

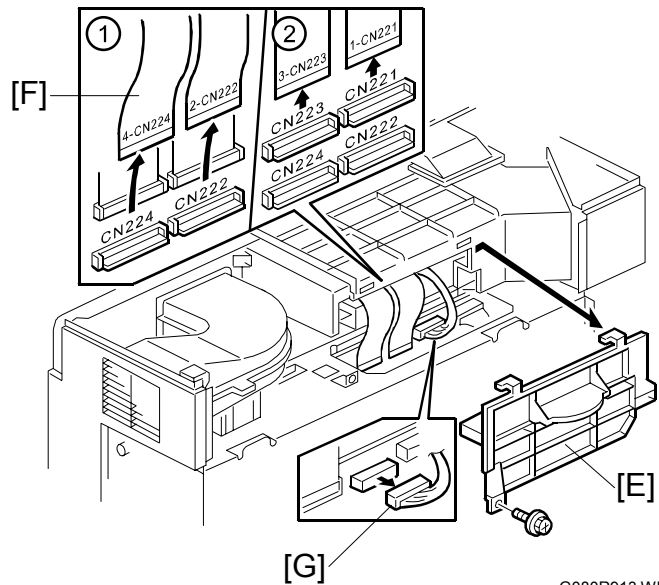
NOTE: The pin [D] for the front and rear shafts holds the toner supply unit.



G080R912.WMF



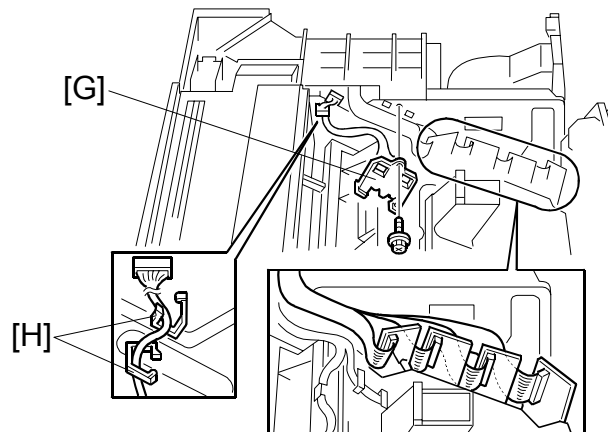
12. Connector cover [E] (⌀ x 1)
 13. Four flat cables [F]
 14. Connector [G]



G080R913.WMF

15. Flat cable bracket [G] (⚙️ x 1)

16. Cable (clamps [H])



G080R914.WMF

Replacement
Adjustment

17. Duct [I]

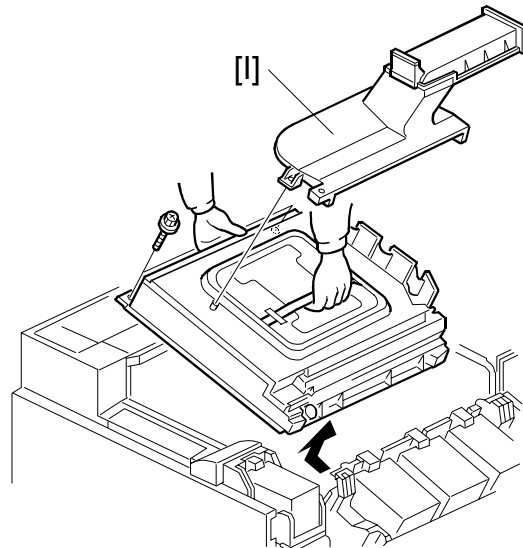
18. Laser optics housing unit (⚙️ x 2)

NOTE: Hold the unit with both hands and slowly lift up.

19. After reinstalling the laser optics housing unit, do some adjustments (👁️ the procedures on the following page).

NOTE: When pulling the laser optics housing unit up, make sure that the flat cables from the laser diode board are not caught by the brackets. If you roughly remove the unit without paying attention to this point, the cables will be caught by the bracket and the laser diode board may be damaged.

To ensure that the unit is removed carefully, remove the unit by placing a sheet of paper between the laser optic housing unit and the machine rear frame, in order to prevent the cables from being caught by the brackets.



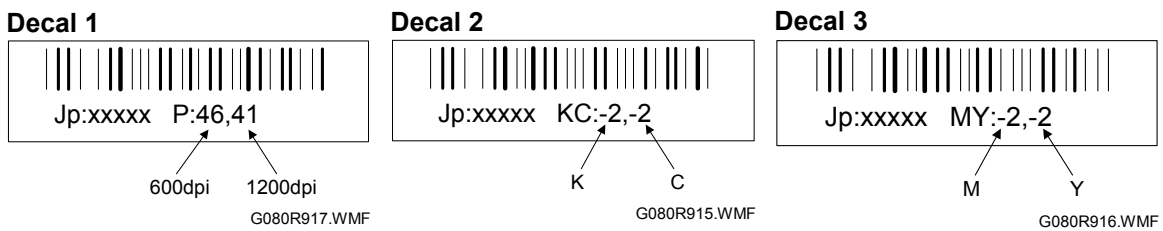
G080R209.WMF

After installing the laser optics housing unit, do forced line position adjustment (SP5-993-002 or “Maintenance – Color Registration - Auto Adjust” in User Program mode).

Adjustments after Replacing the Laser Optics Housing Unit

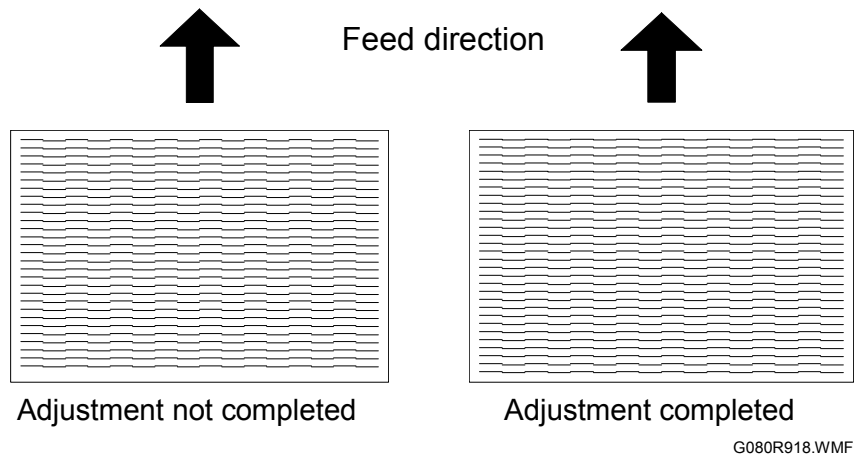
1. Enter SP mode.
2. Input the values printed on three decals on the new laser optics housing unit into the following SPs. Each decal contains two values.

	Value on the left	Value on the right	Function
Decal 1	SP2-109-3	SP2-109-2	Laser beam pitch
Decal 2	Not used	Not used	Main-scan registration correction for black and cyan
Decal 3	Not used	Not used	Main-scan registration correction for magenta and yellow



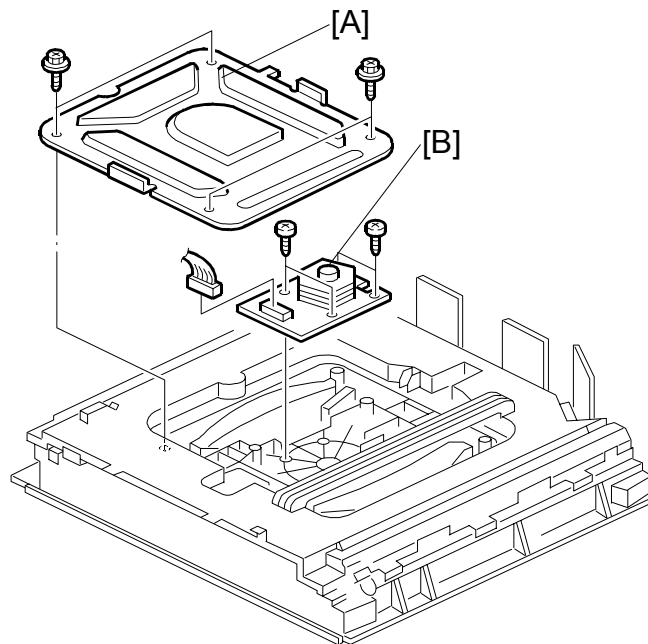
NOTE: The values on decals 2 and 3 do not need to be input, as the machine performs the main scan registration correction for each color during automatic line position adjustment.

3. Print out the following test pattern (17: cross-stitch main-scan) with SP5-997.
4. Check these test patterns. If the laser beam pitch is not correct, vertical black strips seem to appear.
 - Cross-stitch pattern: The thin lines should be of uniform thickness (no striping effect should appear on the printout).
5. Adjust the laser beam pitch values in SP2-109-2 and -3 until the printout is correct, as shown below.



6. Execute SP5-993-2 or “Auto Adjust” with the Maintenance menu in the user tools.

3.4.3 POLYGON MIRROR MOTOR

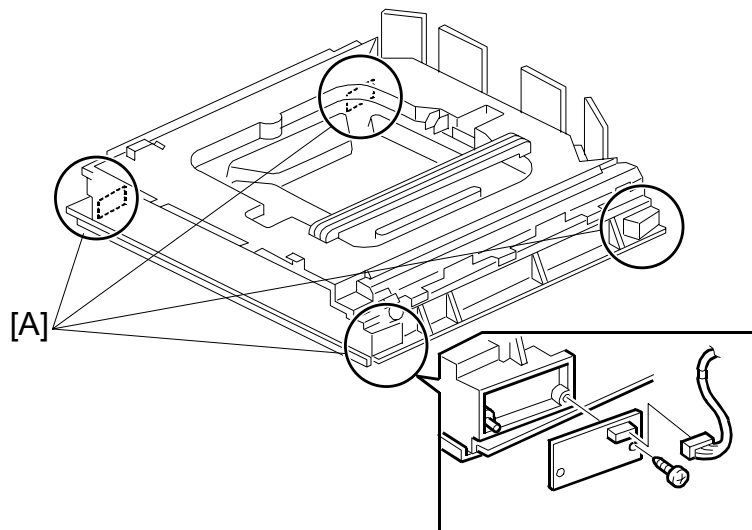


Replacement
Adjustment

G080R919.WMF

1. Laser optics housing unit (☛ 3.4.2)
2. Cover [A] (🔩 x 4)
3. Polygon mirror motor [B] (🔩 x 4, 📏 x 1)

3.4.4 LASER SYNCHRONIZING DETECTOR BOARDS



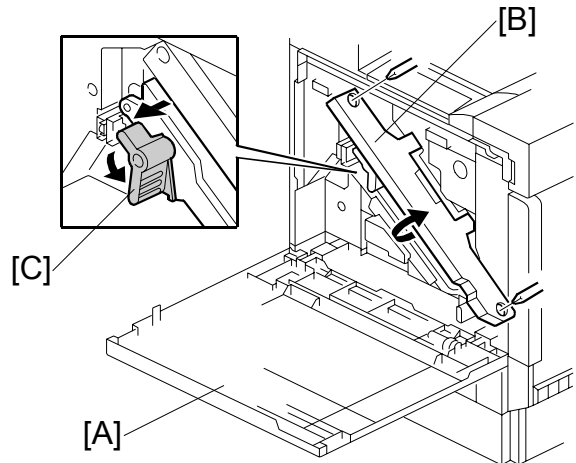
G080R920.WMF

1. Laser optics housing unit (☛ 3.4.2)
2. Synchronizing detector boards [A] (🔩 x 1, 📏 x 1)

3.5 PCU AND DEVELOPMENT UNIT

NOTE: Do not touch the PCU development drum. Do not let any metal object touch the PCU development sleeve.

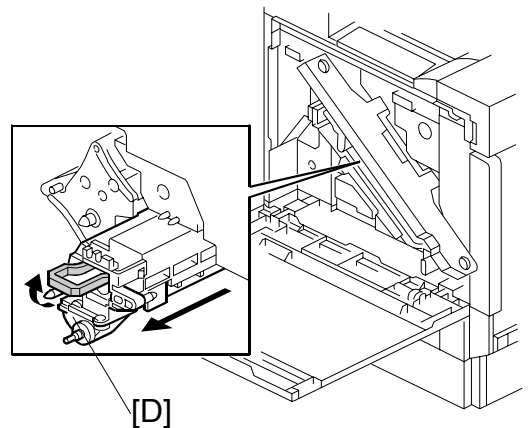
1. Open the front cover [A].
2. To raise the drum positioning plate [B], loosen the 2 screws.
3. Turn the release lever [C] counter-clockwise.



G080R921.WMF

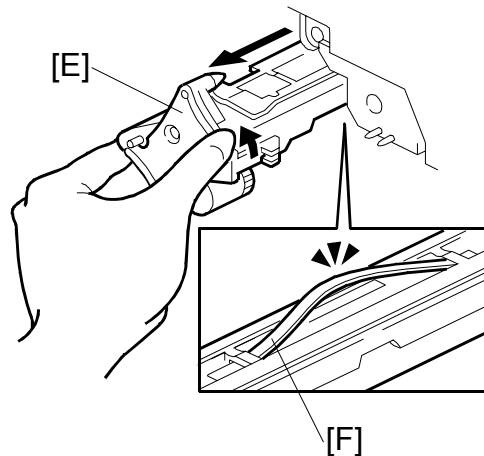
4. Pull the required development unit [D] out.
5. Install a new development unit.
6. Check that the development units are installed in the proper color order (black → yellow → cyan → magenta moving from left to right).

NOTE: When the main switch is turned on, the newly installed development units are automatically initialized.



G080R922.WMF

7. Release the lever and pull the PCU [E] out until the handle appears.
8. Grasp the handle [F] and pull the PCU out of the machine.



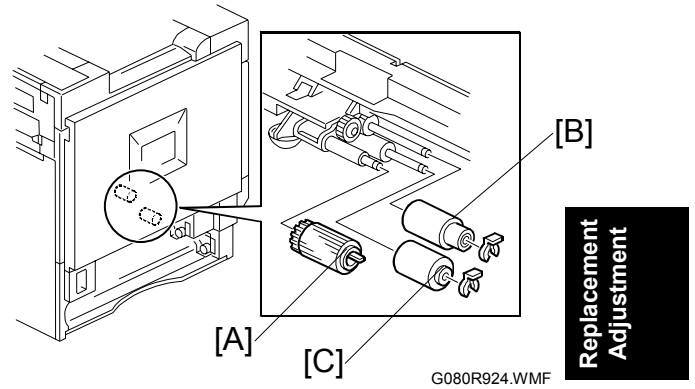
G080R923.WMF

3.6 PAPER FEED

3.6.1 PICK-UP, FEED, AND SEPARATION ROLLERS

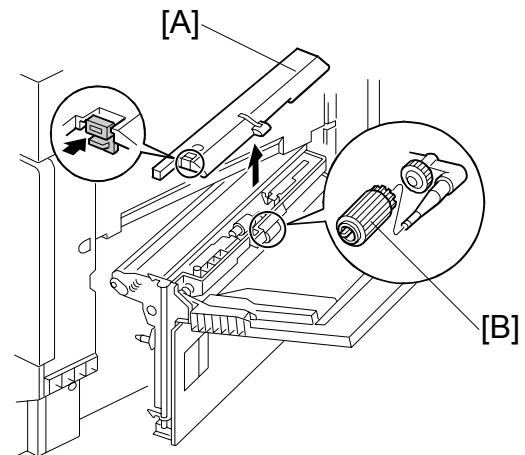
Tray 1 and Tray 2

1. Tray 1 and Tray 2
2. Pick-up roller [A] (1 hook)
3. Feed roller [B] (⌀ x 1)
4. Separation roller [C] (⌀ x 1)

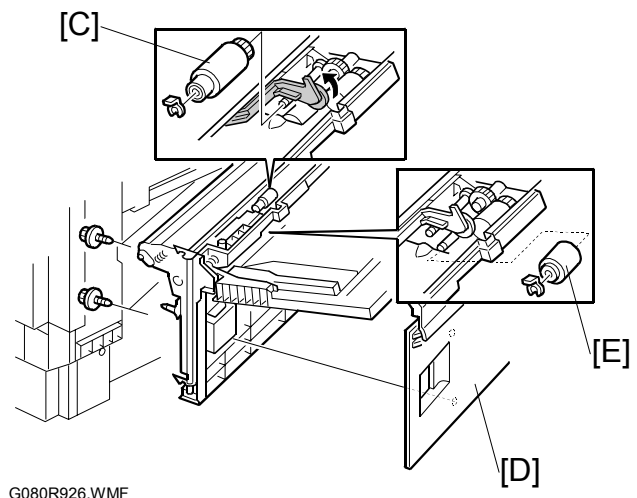


By-pass Tray

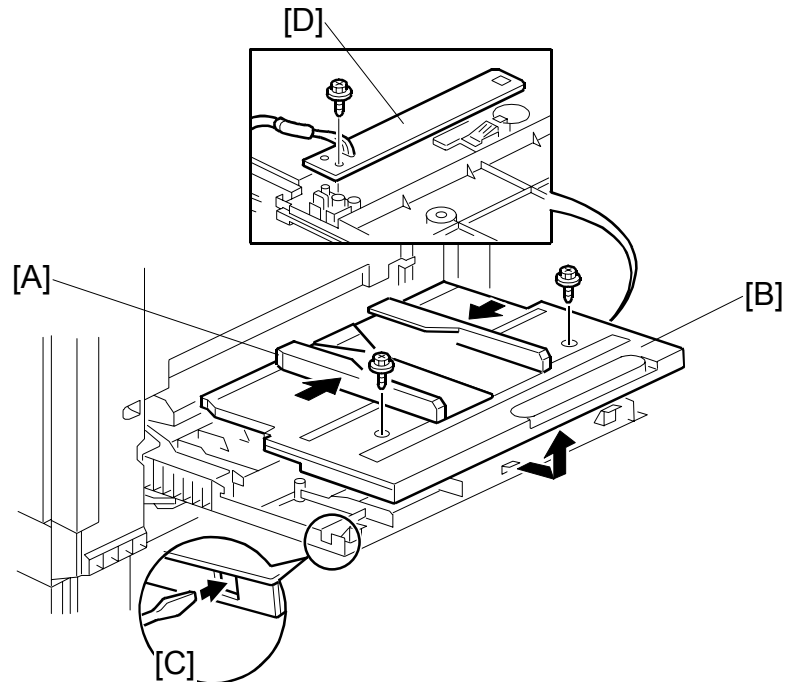
1. Open the right door.
2. By-pass tray cover [A] (1 hook, ⌀ x 1)
3. Raise the paper end sensor actuator.
4. Pick-up roller [B] (1 hook)



5. Feed roller [C] (⌀ x 1)
6. Vertical transport cover [D] (⌀ x 4)
NOTE: Remove the right rear cover (● 3.6.4) if you want to have easier access to the four screws.
7. Separation roller [E] (⌀ x 1)

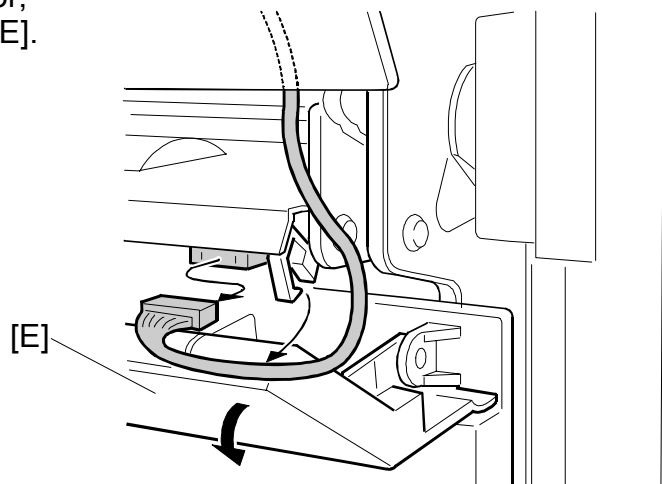


3.6.2 PAPER WIDTH DETECTION BOARD



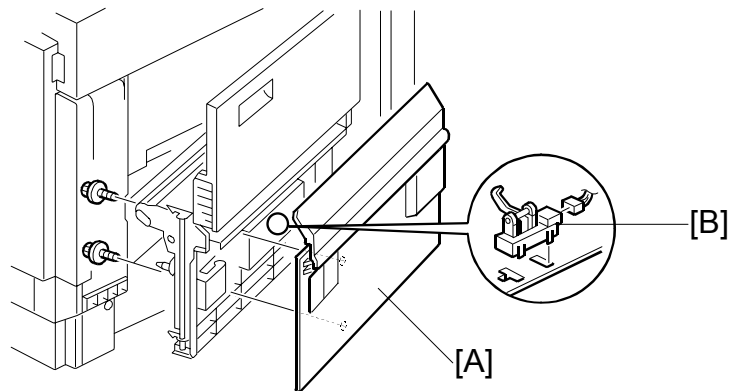
G080R753.WMF

1. Open the by-pass tray.
2. Center the side fences [A].
3. By-pass tray cover [B] (🔩 x 2, 2 hooks)
NOTE: There is a square opening [C] on each side of the tray. Insert a screwdriver into each of the openings.
4. Paper width detection board [D] (🔩 x 1)
NOTE: To remove the connector, open the bottom cover [E].



G080R755.WMF

3.6.3 VERTICAL TRANSPORT SENSOR

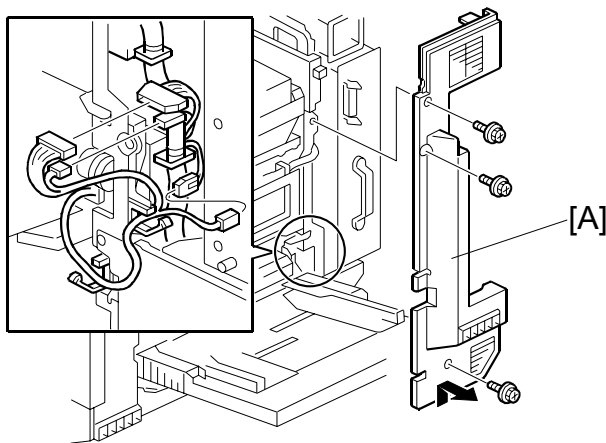


G080R752.WMF

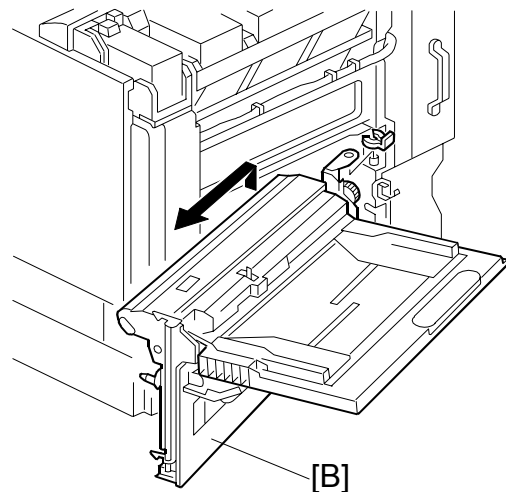
1. Open the right door.
2. Vertical transport cover [A] (⚙ x 4)
NOTE: Remove the right rear cover (➡ 3.6.4) if you want to have easier access to the four screws.
3. Vertical transport sensor [B] (🔌 x 1)

 Replacement
Adjustment

3.6.4 RIGHT DOOR UNIT



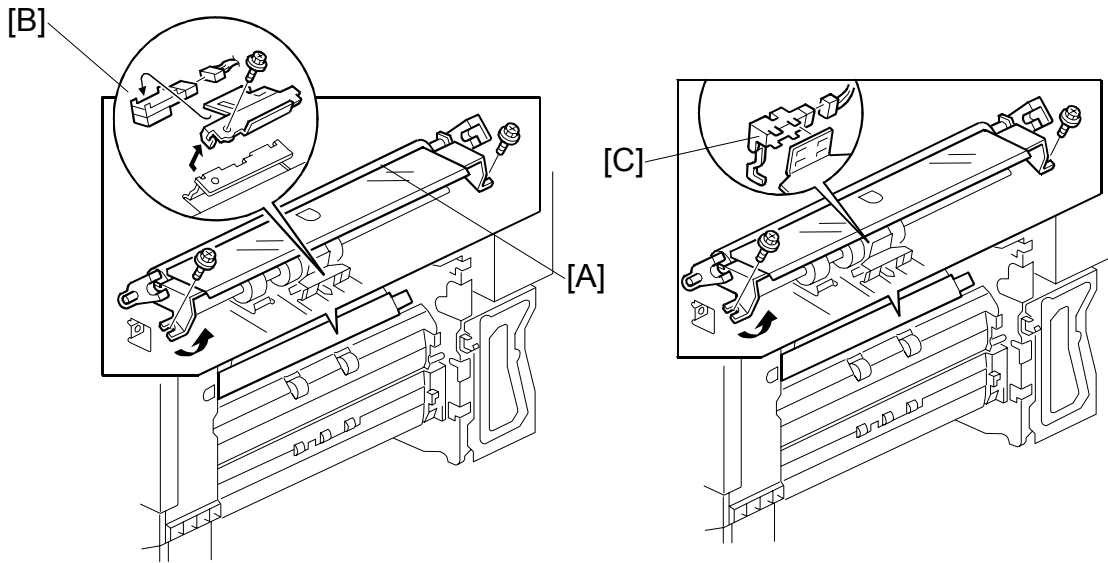
G080R927.WMF



G080R928.WMF

1. Rear cover (➡ 3.3)
2. Upper rear cover (➡ 3.3)
3. Upper right cover (➡ 3.3)
4. Right rear cover [A] (⚙ x 4)
5. Open the right door.
6. Lift the vertical transport unit [B] to remove it from its hinges (🔌 x 3, 🌀 x 1).

3.6.5 REGISTRATION SENSOR AND RELAY SENSORS



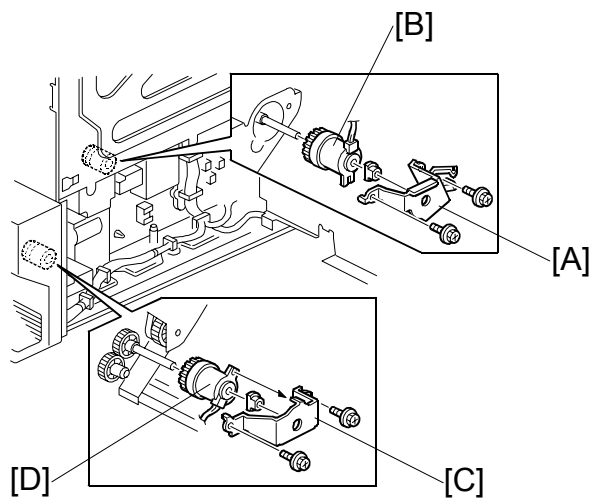
G080R751.WMF

G080R929.WMF

1. Right door unit (☛ 3.6.4)
2. Registration guide [A] (🔩 x 2)
3. Registration sensor [B] (🔩 x 2, 📏 x 1)
4. Relay sensor [C] (📏 x 1)

3.6.6 PAPER FEED CLUTCHES

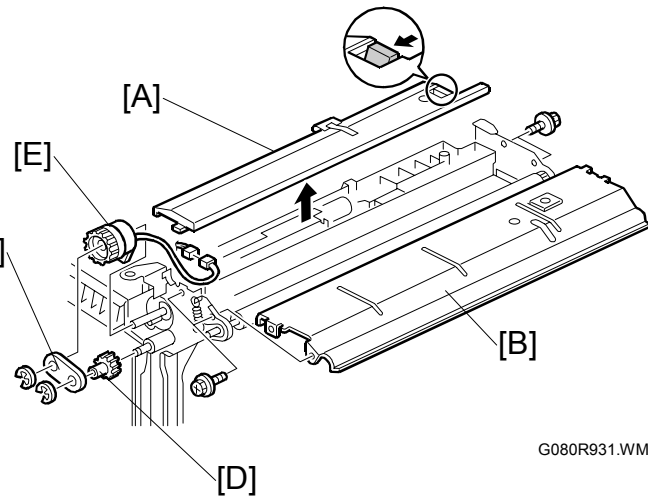
1. Paper trays
2. Rear cover (☛ 3.3)
3. Swing out the high voltage supply unit (☛ 3.10.2).
4. Clutch holder [A] (🔩 x 2, 1 bearing)
5. Paper feed clutch for tray 1 [B] (📏 x 1)
6. Clutch holder [C] (🔩 x 2, 1 bearing)
7. Paper feed clutch for tray 2 [D] (📏 x 1)



G080R930.WMF

3.6.7 BY-PASS FEED CLUTCH

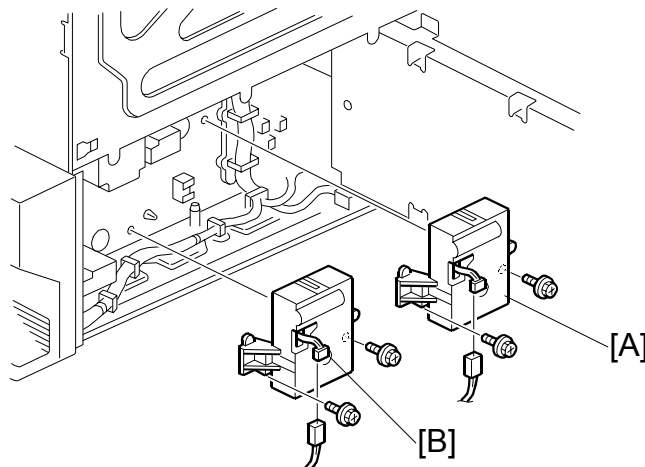
1. Right door unit (☛ 3.6.4)
2. By-pass tray cover [A]
(🔩 x 1, 1 hook)
3. Loosen the screw on the right door latch.
4. Turn the latch in the opposite [C] direction.
5. Upper guide plate [B] (🔩 x 4)
6. Support plate [C] (🔩 x 2)
7. Relay gear [D] (1 hook)
8. By-pass feed clutch [E] (🔩 x 1)



G080R931.WMF

Replacement
Adjustment

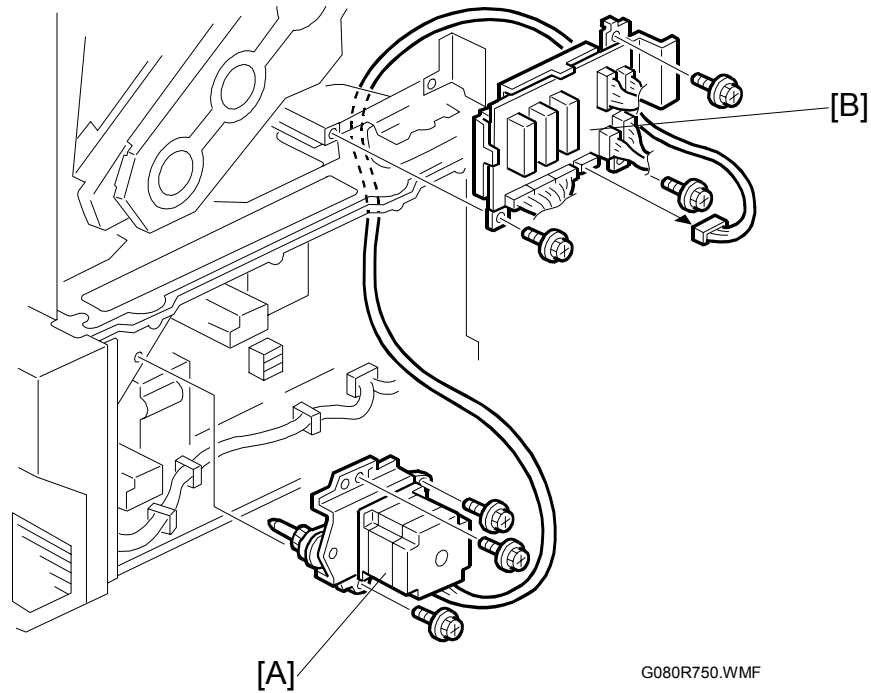
3.6.8 TRAY LIFT MOTOR



G080R932.WMF

1. Rear cover (☛ 3.3)
2. Swing out the high voltage supply unit. (☛ 3.10.2)
3. Tray lift motors (tray 1 [A], tray 2 [B]) (🔩 x 2, 🌀 x 1)

3.6.9 PAPER FEED MOTOR

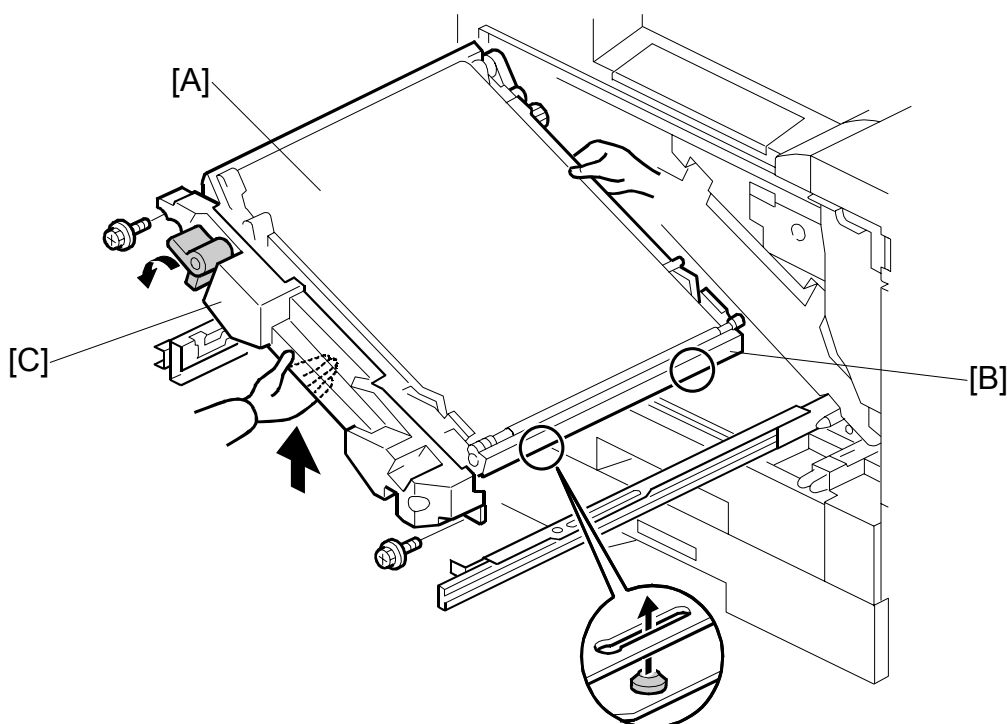


1. Rear cover (☛ 3.3)
2. Swing out the high voltage supply unit. (☛ 3.10.2)
3. Paper feed motor [A] (⚙ x 3, 📡 x 1)
NOTE: The connector is CN604 on the driver board [B].

3.7 TRANSFER AND PAPER TRANSPORT UNIT

3.7.1 TRANSFER UNIT

- NOTE:** 1) When removing or installing the transfer unit, grasp the central areas of the front and rear frame. Do not touch the transfer belt [A]. Do not damage the entrance mylar [B].
- 2) Remove the duplex feed unit (if it is installed) before replacing the transfer unit.
- 3) After replacing the transfer unit, reset the maintenance counter, SP7-804-16, and conduct the output check, SP5-804-74.



G080R737.WMF

1. Turn the release lever counterclockwise. (☛ 3.5)
2. Pull out the transfer unit [C] until the entire unit is visible (☛ x 2).
3. Grasp the transfer unit grips as shown above. Lift the unit to remove it.

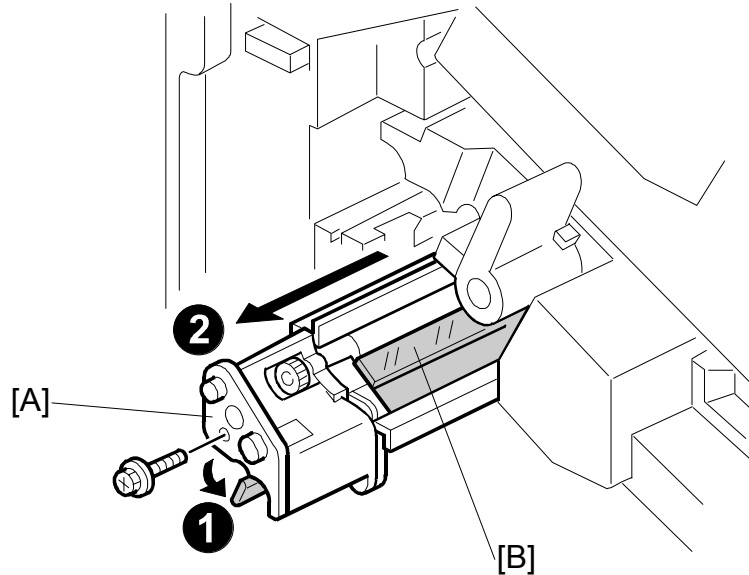
NOTE: Grasp the front grip. Use caution not to damage the actuator on the rear.

After replacing the transfer unit:

- Perform forced line position adjustment (SP5-993-002 or “Maintenance menu – Color Registration - Auto Adjust” in User Program mode).
- Print the 1-dot grid pattern on A3/11" x 17" paper and check the color shift level (☛ 4.4.3).

3.7.2 TRANSFER BELT CLEANING UNIT

NOTE: After replacing the transfer belt cleaning unit, reset the maintenance counter, SP7-804-17.



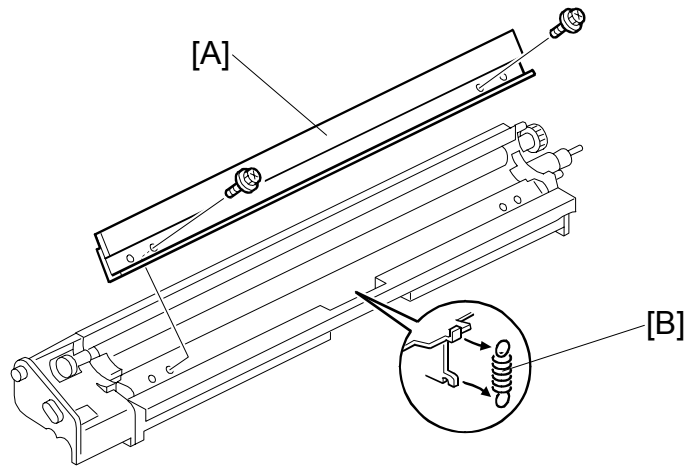
G080R739.WMF

While pushing the lever, pull out the transfer belt cleaning unit [A] (🔧 x 1).

NOTE: 1) The blade [B] may damage the belt if you do not keep pushing the lever.
2) When reassembling, check that the transfer unit release lever is put back to the original position (👉 3.5).

After replacing the transfer belt cleaning unit, perform forced line position adjustment (SP5-993-002 or “Maintenance menu – Color registration - Auto Adjust” in User Program mode).

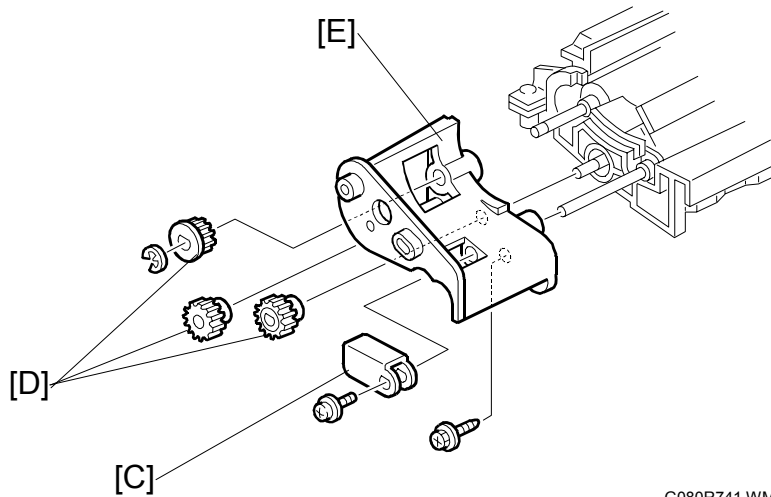
3.7.3 CLEANING BLADE AND CLEANING ROLLER



G080R740.WMF

Replacement
Adjustment

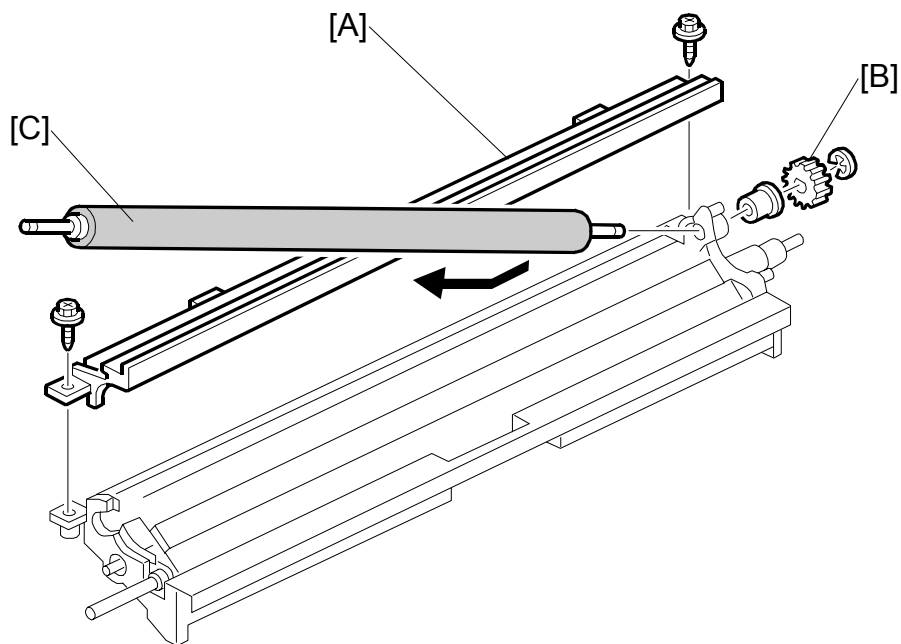
1. Transfer belt cleaning unit (☛ 3.7.2)
2. Cleaning blade [A] (🔩 x 2)
3. Tension spring [B]



G080R741.WMF



4. Lever [C] (🔩 x 1)
5. 3 gears [D] (⊙ x 1)
6. Gear box [E] (🔩 x 1)



G080R742.WMF

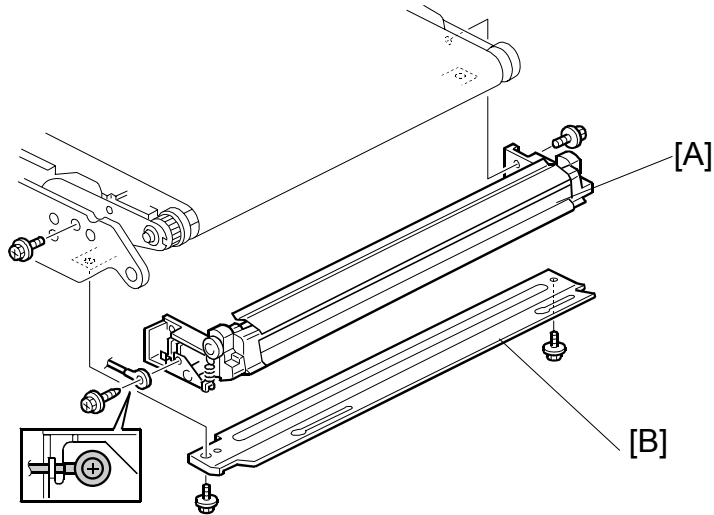
7. Roller cover [A] (⌀ x 2)
8. Cleaning brush gear [B] (Ⓒ x 1)
9. Cleaning brush [C] (Bushing x 1)



After replacing the cleaning blade, perform forced line position adjustment (SP5-993-002 or “Maintenance menu – Color registration - Auto Adjust” in User Program mode).

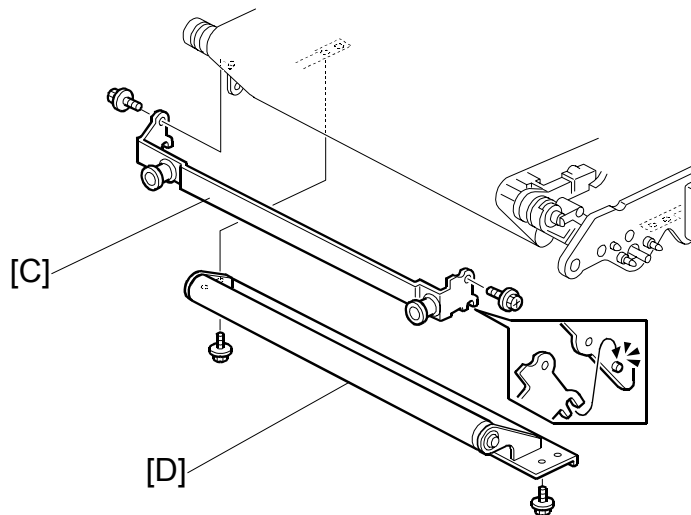
3.7.4 TRANSFER BELT

NOTE: Do not touch the transfer belt during handling. When replacing the belt, hold the belt at its end.



G080R744.WMF

1. Transfer unit (☛ 3.7.1)
2. Transfer belt cleaning unit (☛ 3.7.2)
3. Transfer entrance guide [A] (🔩 x 3)
4. Right bracket [B] (🔩 x 2)

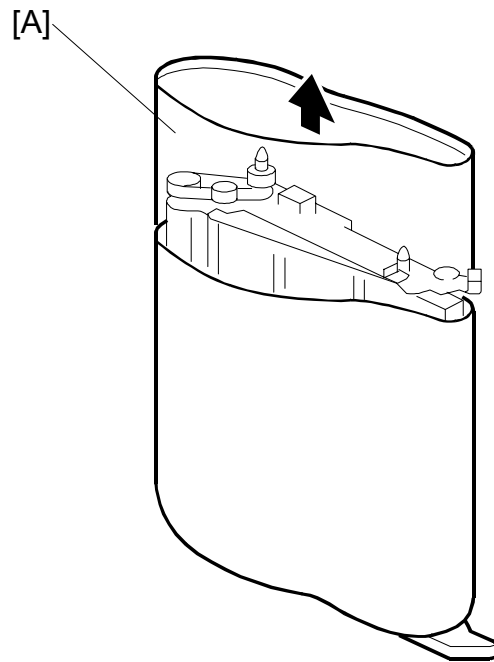


G080R745.WMF

5. Left bracket [C] (🔩 x 2)
6. Tension roller [D] (🔩 x 2)



Replacement
Adjustment



G080R933.WMF

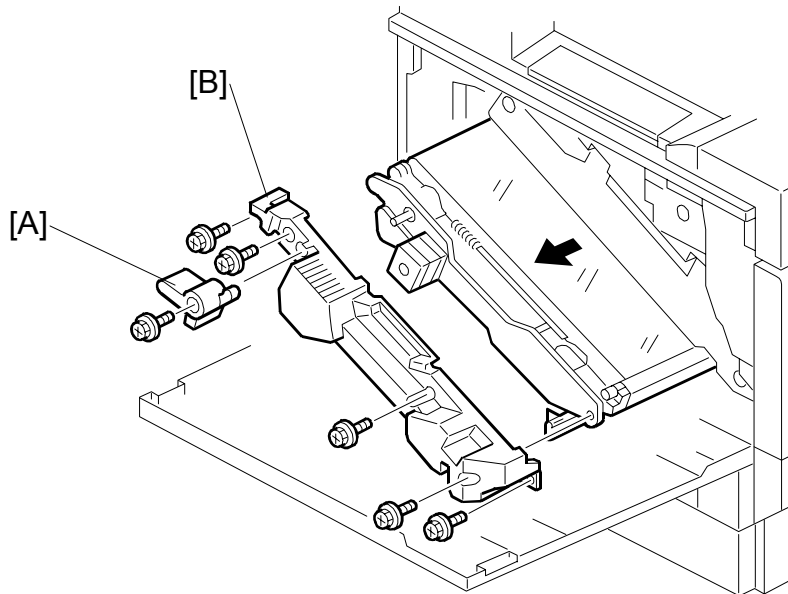
7. Lay the transfer unit on its side. Grasp the upper end of the transfer belt and pull the transfer belt [A] up and out.



- NOTE:** 1) If the transfer charge brushes are dirty, clean them with a vacuum cleaner.
2) If the drive rollers are dirty, clean them with a damp cloth.

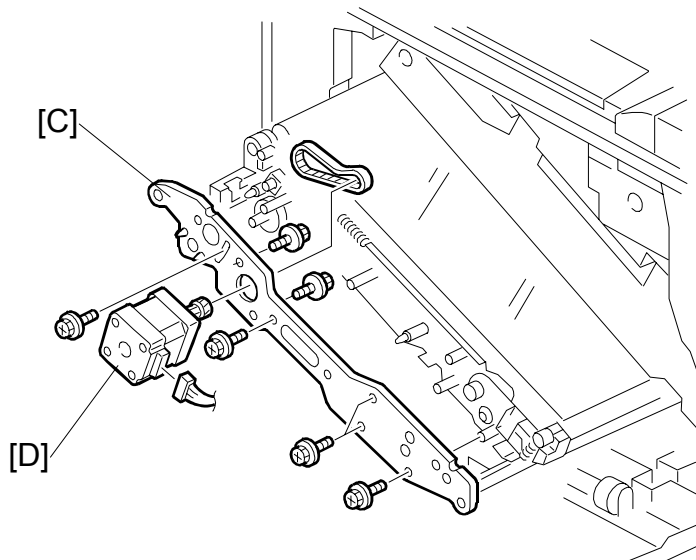
After replacing the transfer belt, perform forced line position adjustment (SP5-993-002 or "Maintenance menu – Color registration - Auto Adjust" in User Program mode).

3.7.5 TRANSFER UNIT DRIVE MOTOR



G080R738.WMF

1. Pull out the transfer unit (☛ 3.7.1).
2. Transfer belt cleaning unit (☛ 3.7.2)
3. Release lever [A] (🔧 x 1)
4. Front cover [B] (🔧 x 3)

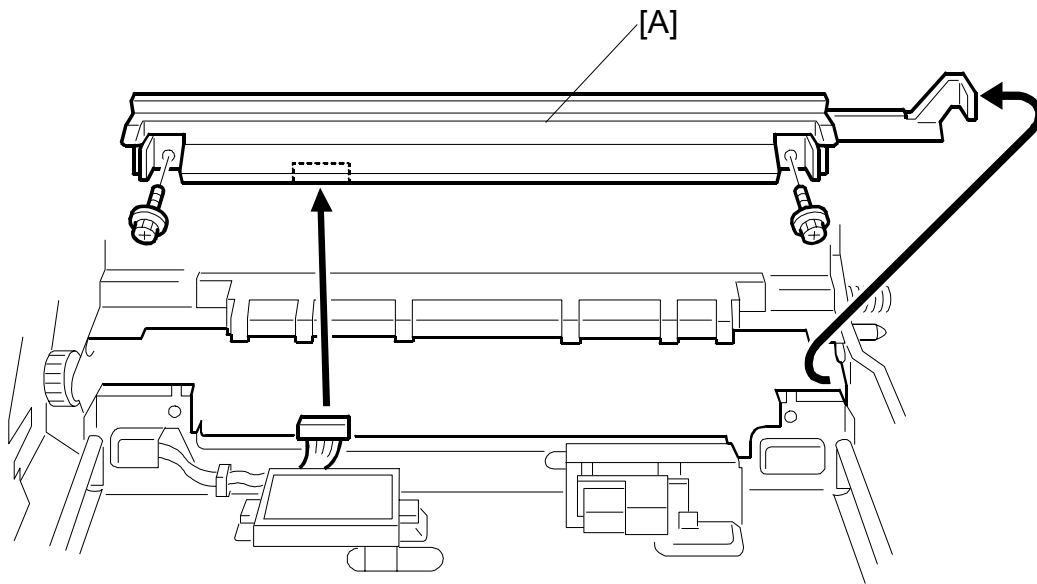


G080R743.WMF

5. Front plate [C] (🔧 x 5, Timing belt x 1)
6. Transfer unit drive motor [D] (🔧 x 2, ⚙️ x 1)

Replacement
Adjustment

3.8 ID SENSORS



G080R756.WMF

CAUTION: Use caution not to damage the black PCU when removing and installing the ID sensor bracket.

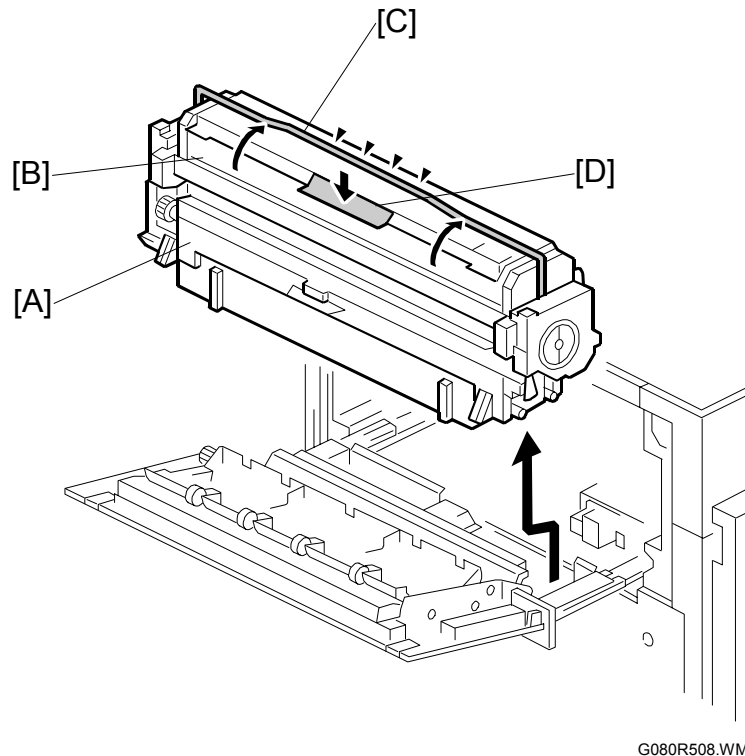
1. Pull out the transfer unit until the entire unit is visible (☛ 3.7.1).
2. Fusing unit (☛ 3.9.1)
3. ID sensor bracket [A] (🔩 x 2, 📏 x 1)

3.9 FUSING

⚠ CAUTION

1. Be careful when handling the fusing unit. It is very hot.
2. Take care not to spill silicone oil.

3.9.1 FUSING UNIT



Replacement
Adjustment

CAUTION: Do not tilt the fusing unit [A] while handling it. The oil supply unit [B] can fall off the fusing unit after the grip [C] is released from the oil supply unit.

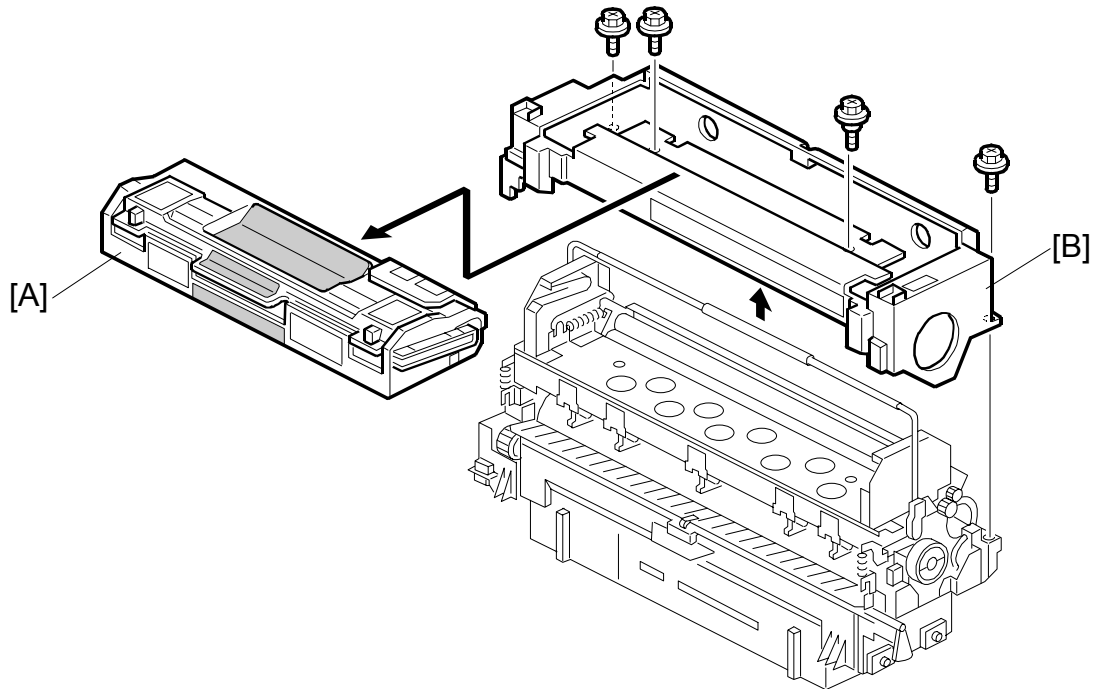
1. Detach the finisher from the printer if it is installed.
2. Open the duplex inverter unit if it is installed.
3. Push the heat insulator [D]. The grip [C] is released from the oil supply unit.
4. Fusing unit [A]

After replacing the fusing unit, if the customer uses thick paper, make some test prints on a sample of the paper used by the customer. If there are any color registration problems, adjust the line speed for thick paper with the following user tool:

- Menu/Maintenance/Color Regist./Fuser Adjust/Thick paper

Refer to Maintenance Guide of the Operating Instructions for how to adjust this (section 2. Cleaning and Adjusting the Printer - Adjusting the Color Registration).

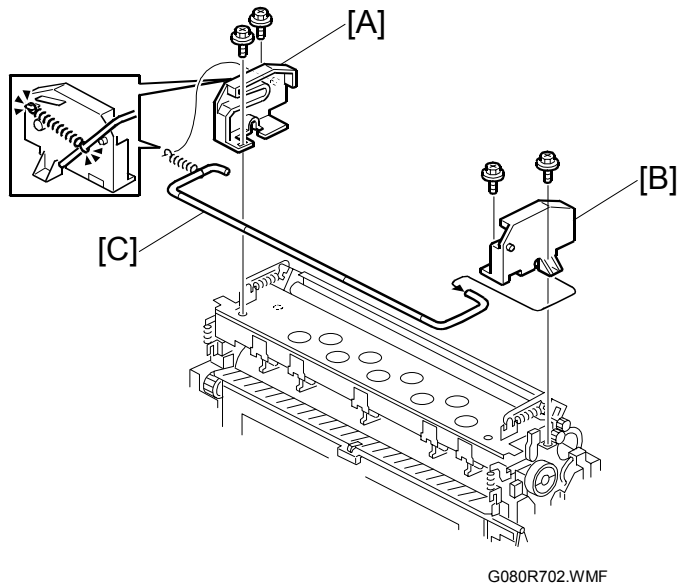
3.9.2 OIL SUPPLY UNIT AND UPPER COVER



G080R701.WMF

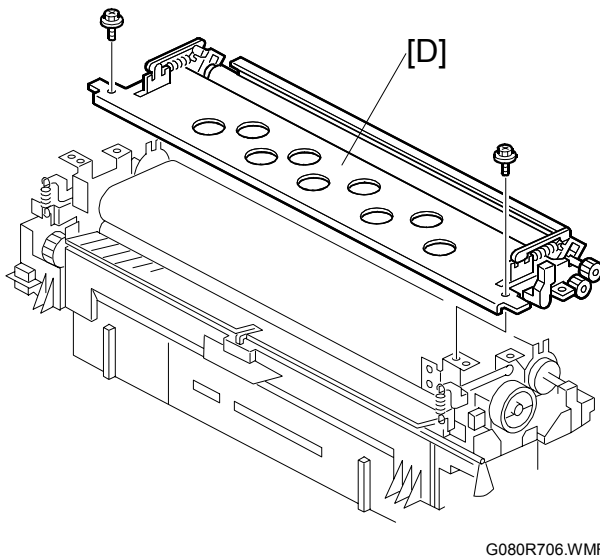
1. Detach the finisher from the printer if it is installed.
2. Open the duplex inverter unit if it is installed.
3. Fusing unit (☛ 3.9.1)
4. Oil supply unit [A]
5. Upper cover [B] (🔩 x 4)

3.9.3 CLEANING UNIT



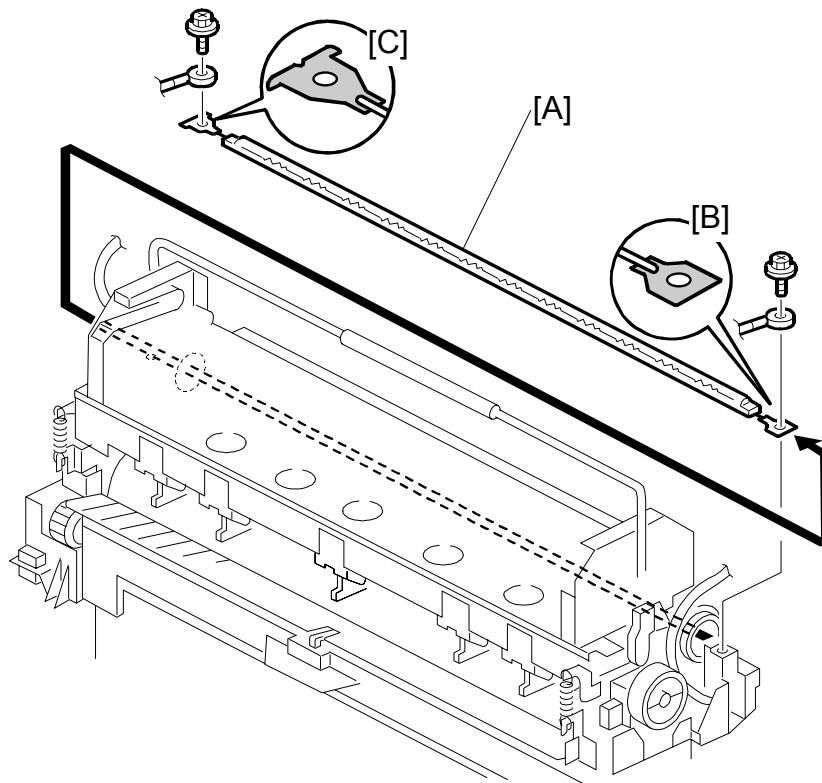
Replacement
Adjustment

1. Upper cover (☛ 3.9.2)
2. 2 handle guides [A][B] (⚙ x 2 for each)
3. Handle [C] (Spring x 1)



4. Cleaning unit [D] (⚙ x 2)

3.9.4 HEATING ROLLER LAMP

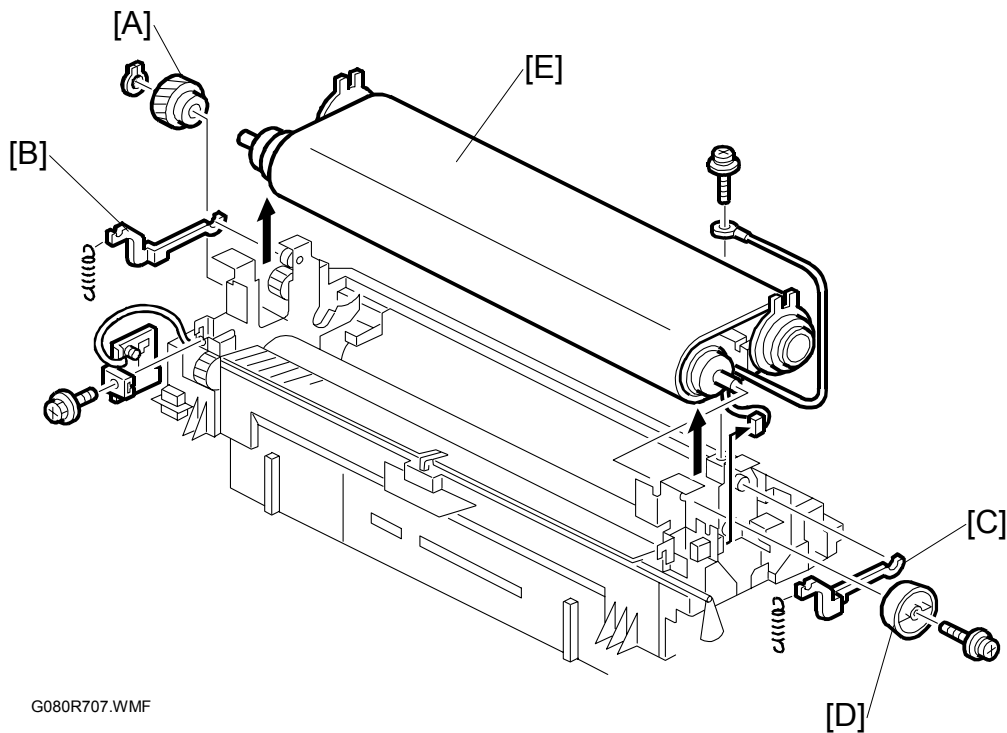


G080R705.WMF

1. Upper cover (☛ 3.9.2)
2. Heating roller lamp [A] (🔩 x 2)

NOTE: When reinstalling, make sure the front [B] and rear [C] ends of the lamp are on the correct terminals.

3.9.5 FUSING BELT UNIT

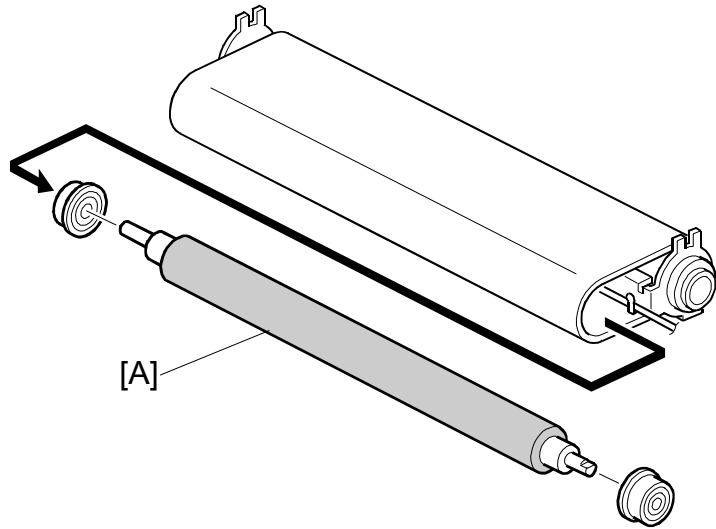


G080R707.WMF

1. Cleaning unit (☛ 3.9.3)
2. Heating roller lamp (☛ 3.9.4)
3. Upper paper guide plate (☛ 3.9.8)
4. Pressure roller gear [A] (C ring x 1)
5. 2 pressure brackets [B][C] (Spring x 1 for each)
6. Knob [D] (☛ x 1)
7. Fusing belt unit [E] (☛ x 1, ☛ x 1)

Replacement
Adjustment

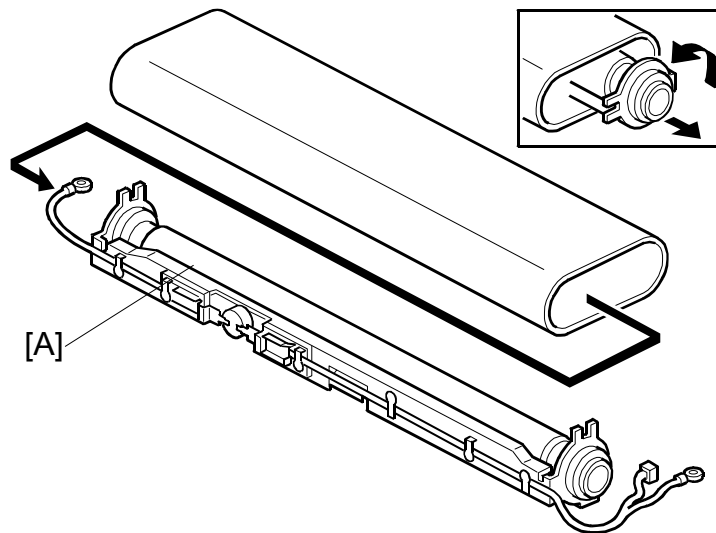
3.9.6 HOT ROLLER



G080R708.WMF

1. Fusing belt unit (☛ 3.9.5)
2. Hot roller [A] (Bushing x 2)

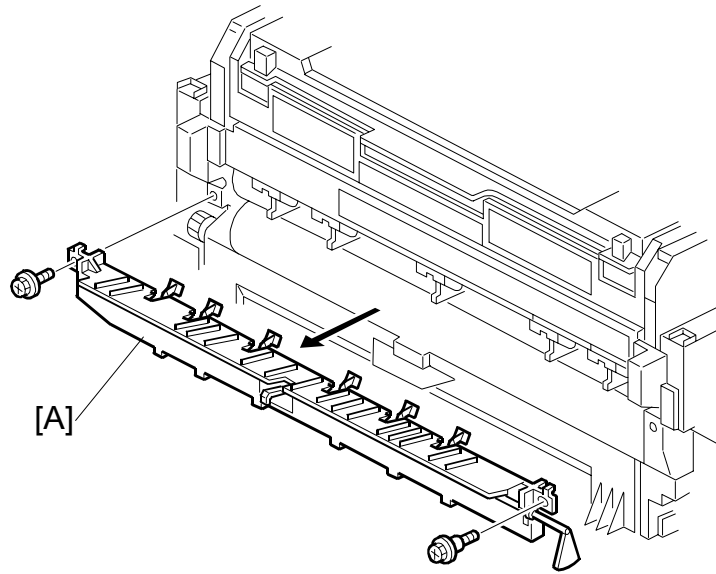
3.9.7 HEATING ROLLER



G080R709.WMF

1. Pressure roller (☛ 3.9.6)
2. Heating roller [A]

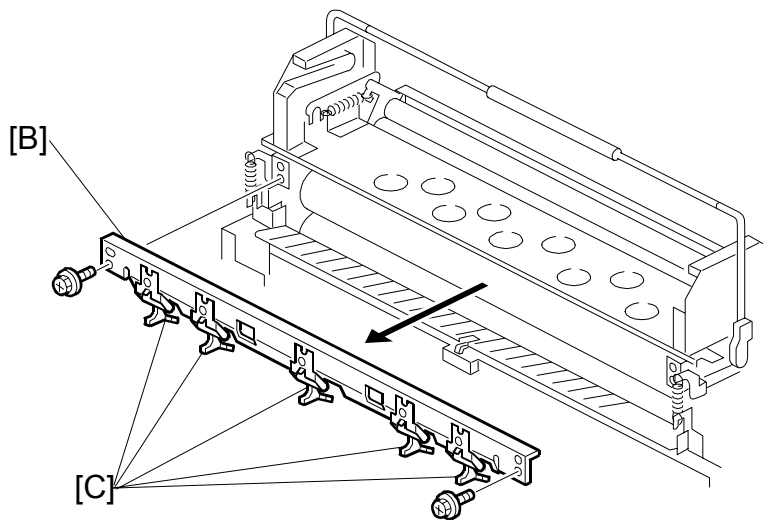
3.9.8 PAPER GUIDE PLATES AND STRIPPER PAWLS



G080R703.WMF

Replacement
Adjustment

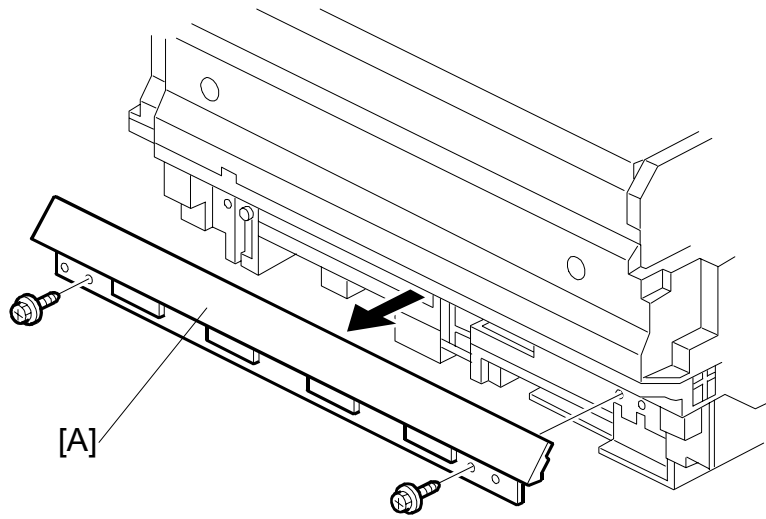
1. Upper cover (☛ 3.9.2)
2. Lower paper guide plate [A] (☛ x 2)



G080R704.WMF

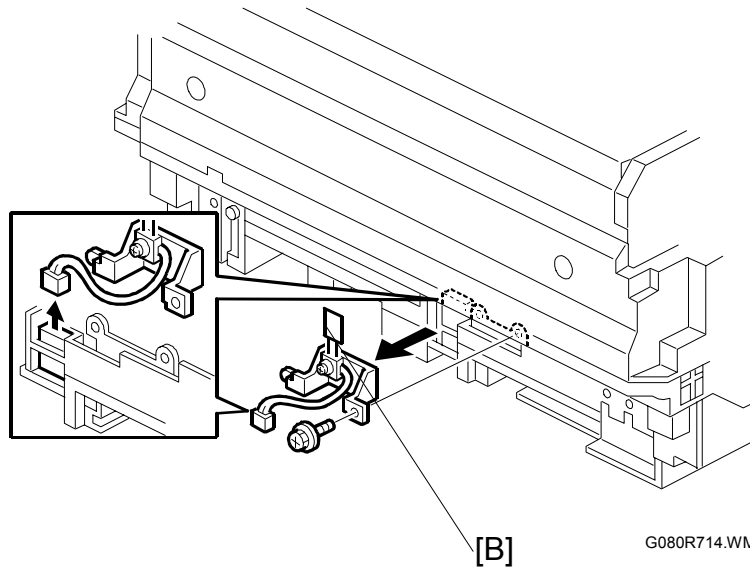
3. Upper paper guide plate [B] (☛ x 2)
4. 5 stripper pawls [C]

3.9.9 THERMISTOR AND FUSE



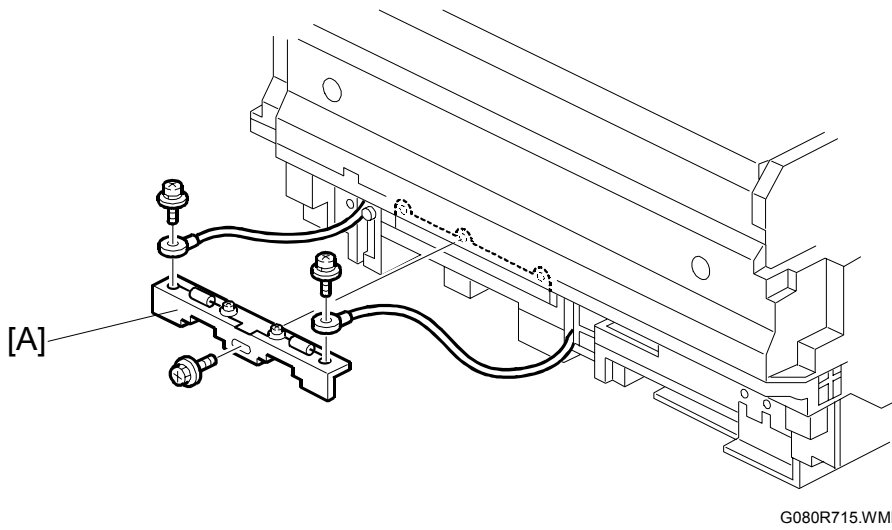
G080R713.WMF

1. Lower right cover [A] (🔩 x 2)



G080R714.WMF

2. Thermistor [B] (🔩 x 1, 📏 x 1)

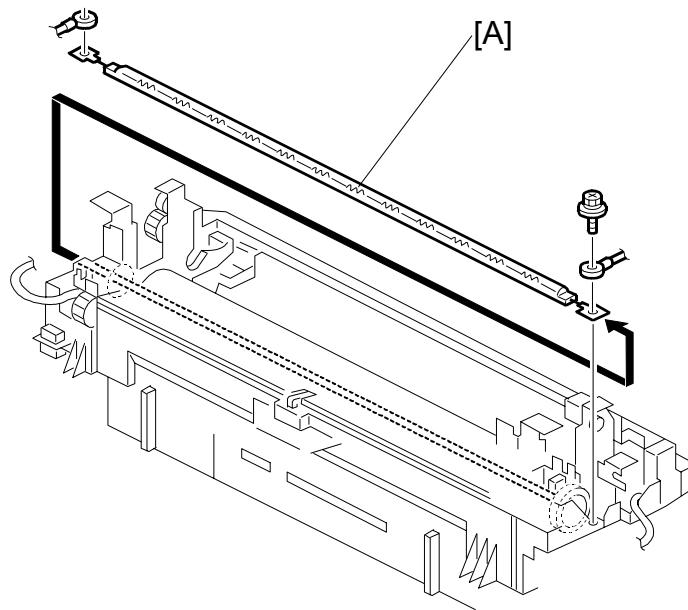


G080R715.WMF

Replacement
Adjustment

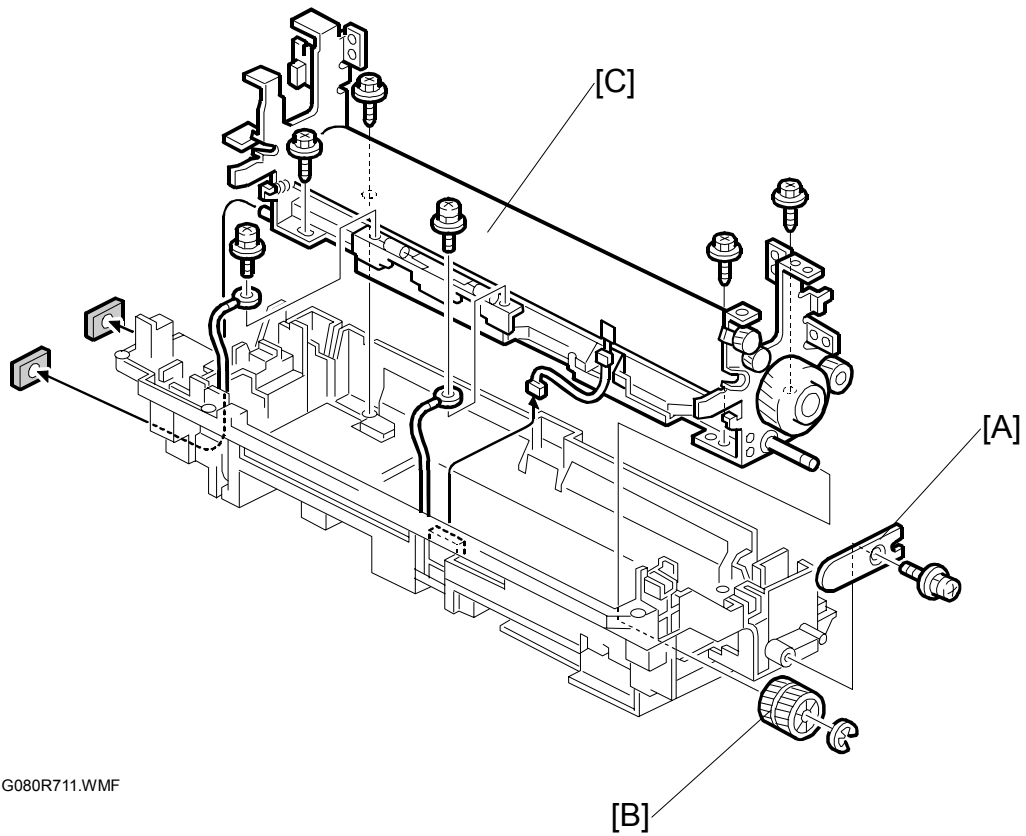
3. Fuse [A] (🔩 x 3)

3.9.10 PRESSURE ROLLER FUSING LAMP



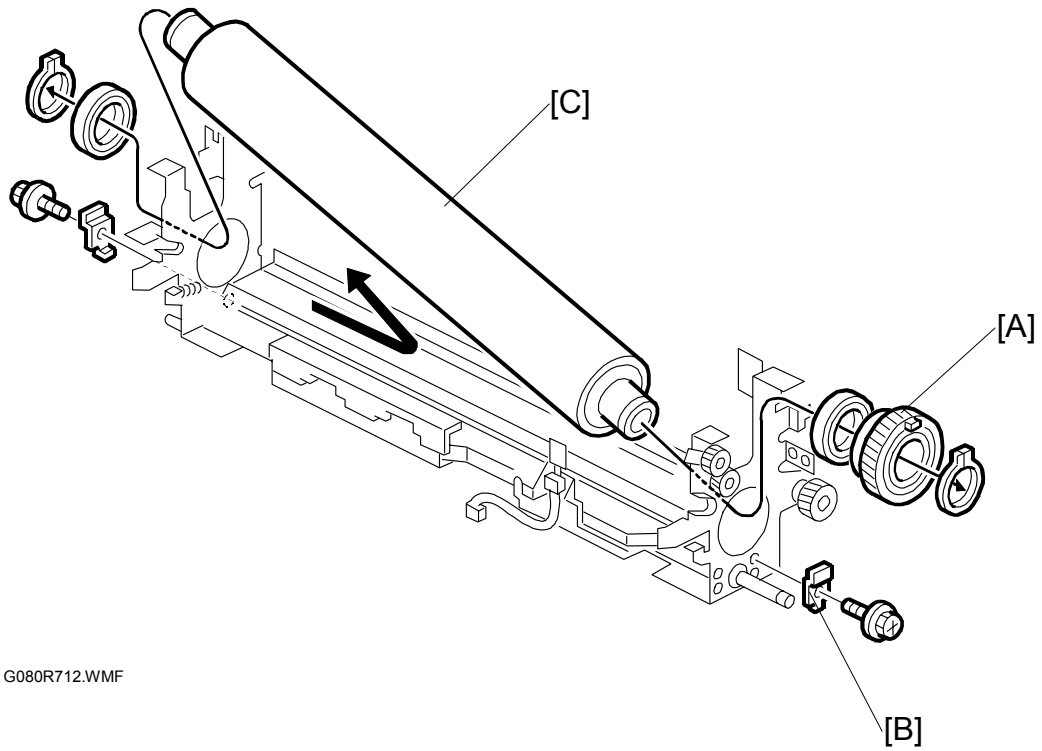
G080R710.WMF

1. Fusing belt unit (👉 3.9.5)
2. Pressure roller fusing lamp [A] (🔩 x 2)

3.9.11 PRESSURE ROLLER

G080R711.WMF

1. Pressure roller fusing lamp (☛ 3.9.10)
2. Lower paper guide plate (☛ 3.9.8)
3. Drive gear holder [A] (🔩 x 1)
4. Drive gear [B] (Ⓒ x 1)
5. Lower right cover (☛ 3.9.9)
6. Pressure roller unit [C] (🔩 x 5, 🛠️ x 2)



Replacement
Adjustment

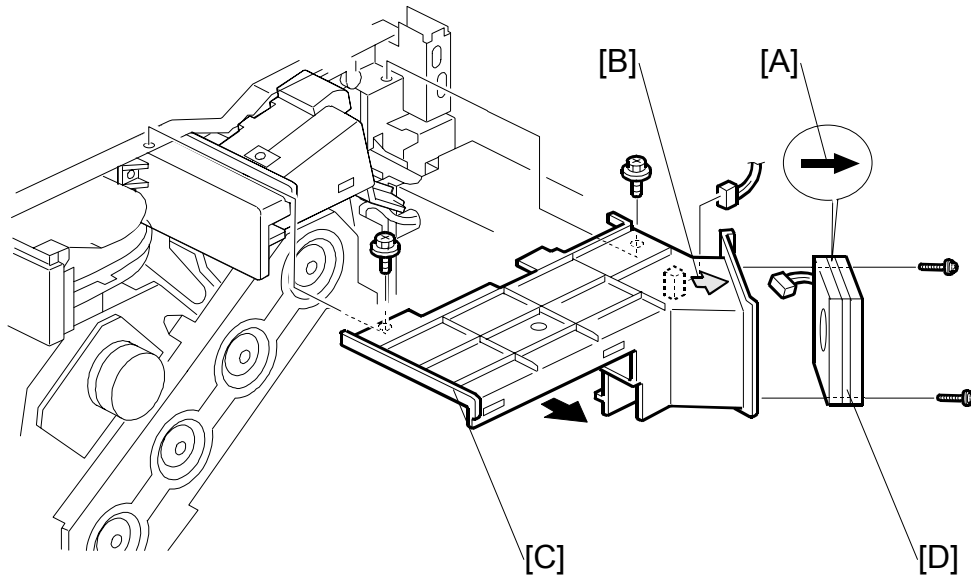
G080R712.WMF

7. Pressure roller gear [A] (C ring x 1, Bushing x 1)
8. Pressure roller holder [B] (⚙ x 1)
9. Pressure roller [C] (C ring x 1)

3.9.12 FUSING UNIT FAN

⚠ CAUTION

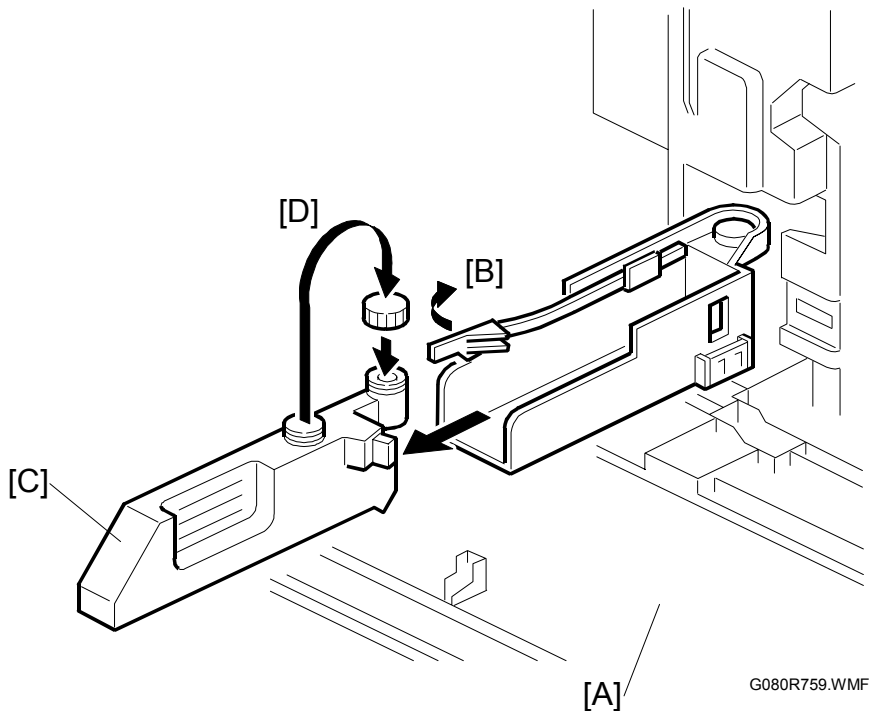
When reinstalling, make sure the fan faces to the correct direction. The arrow on the fan [A] and the arrow on the duct [B] must face to the same direction.



G080R901.WMF

1. Rear cover (☛ 3.3)
2. Upper rear cover (☛ 3.3)
3. Left cover (☛ 3.3)
4. Rear left cover (☛ 3.3)
5. Connector cover (on the top of the controller box) (☛ 3.10.1)
6. Fusing fan duct [C] (🔩 x 2, 🛠 x 1)
7. Fusing fan [D] (🔩 x 2, 🛠 x 1)

3.9.13 WASTE OIL BOTTLE

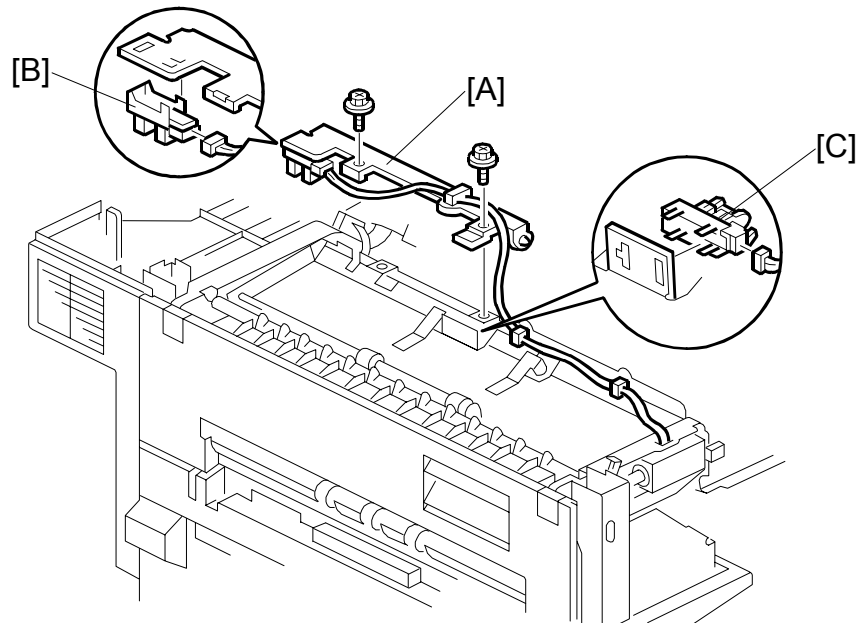


Replacement
Adjustment

1. Open the front cover [A].
2. Release the hook [B].
3. Waste oil bottle [C]
4. Close the bottle with the lid [D].
5. Dispose of the bottle (with waste oil in it) in accordance with your local regulations.

NOTE: 1) The messages, "Waste Oil Bottle is Almost Full" and "Waste Oil Bottle is Full", are cleared when the front cover is closed. You do not need to turn the main switch off and on.

2) The message, "Reset Waste Oil Bottle correctly", indicates that the bottle is not in position. Check that the bottle is correctly reinstalled if this message is displayed.

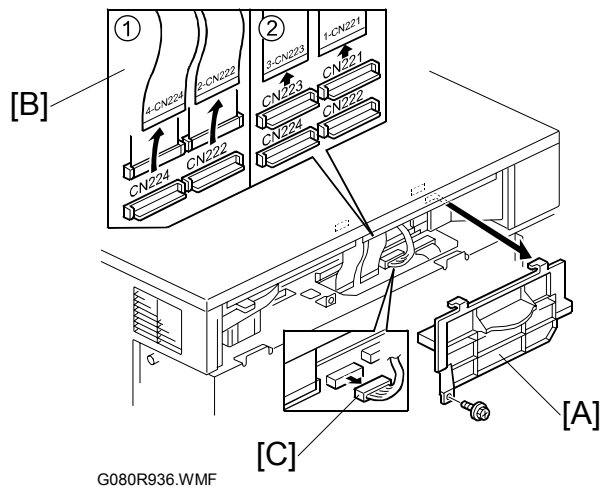
3.9.14 PAPER EXIT

G080R934.WMF

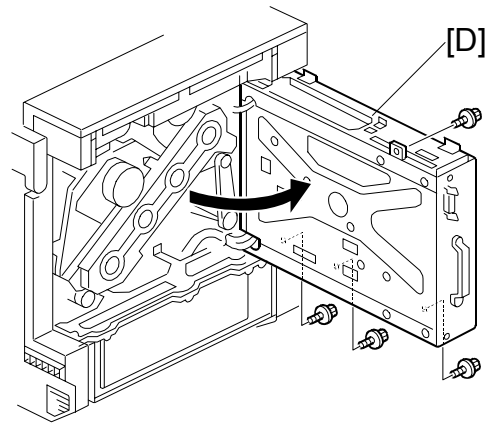
1. Paper exit cover (☛ 3.3)
2. Exit upper limit sensor cover [A] (🔩 x 2)
3. Exit upper limit sensor [B]
4. Paper exit sensor [C]

3.10 ELECTRICAL COMPONENTS

3.10.1 MOVING THE CONTROLLER BOX OUT OF THE WAY



G080R936.WMF



G080R935.WMF

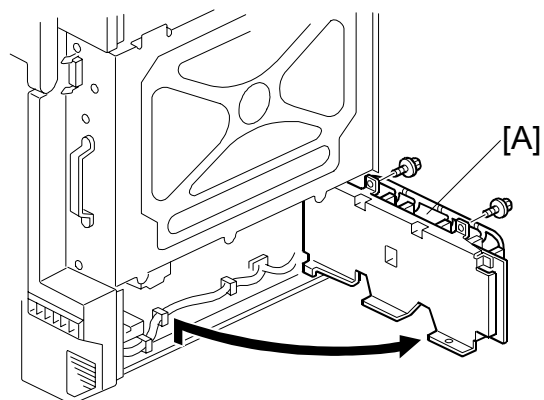
Replacement
Adjustment

1. Rear cover (☛ 3.3)
2. Connector cover [A] (☛ x 1)
3. Four flat cables [B]
4. Connector [C]
5. Swing out the controller box [D] (☛ x 4).

NOTE: When the controller box is swung out, free-run tests can still be done. However, because the LD cables are disconnected, no output appears.

3.10.2 MOVING THE HIGH VOLTAGE SUPPLY UNIT - C, B OUT OF THE WAY

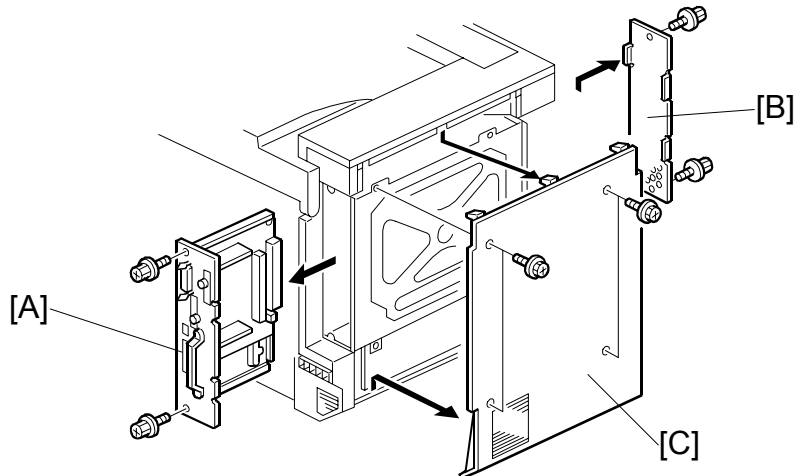
1. Rear cover (☛ 3.3)
2. Swing out the high voltage supply unit [A] (☛ x 2).



G080R937.WMF

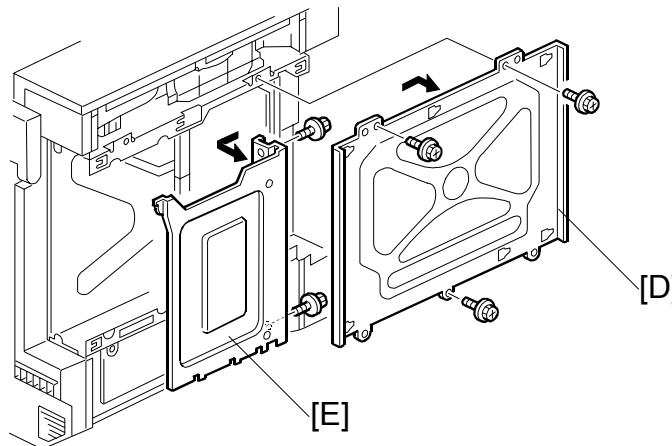
3.10.3 CONTROLLER AND BCU

- NOTE:** 1) Before replacing the BCU or controller, print out the SMC reports (“SP Mode Data” and “Logging Data”).
- 2) After replacing the BCU or controller, remove the NVRAM on the old board and install it on the new board.



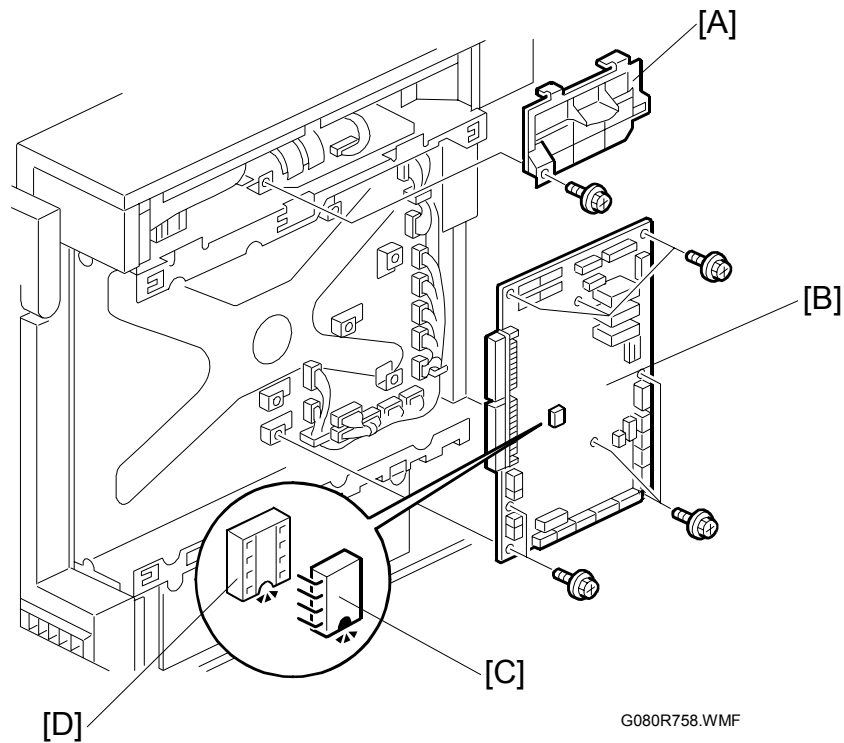
G080R938.WMF

1. Controller [A] (⚙ x 2)
2. Option bracket [B] (⚙ x 2)
3. Rear cover [C] (⚙3.3)



G080R939.WMF

4. Cover bracket [D] (⚙ x 3)
5. Inner bracket [E] (⚙ x 2)



G080R758.WMF

Replacement
Adjustment

6. Connector cover [A] (🔩 x 1)
7. BCU [B] (🔩 x 8, Flat cable x 4, 📏 x 18)

CAUTION: 1) When handling NVRAMs, keep them away from any objects that can cause static electricity. The data in NVRAMs may be corrupted by static electricity.

- 2) Make sure the NVRAM is correctly installed on the board. A half-disk [C] is engraved on one side of the NVRAM, while a guide mark [D] is on one side of the NVRAM slot. Install the NVRAM so that the half-disk and the guide mark are on the same side.

NOTE: 1) Before replacing the NVRAM, make sure the SMC reports (“SP Mode Data” and “Logging Data”) has been printed out.

- 2) After replacing the BCU or controller, remove the NVRAM on the old board and install it on the new board. If the NVRAM on the old board is defective, replace the NVRAM (👉 3.10.4).

3.10.4 NVRAM REPLACEMENT PROCEDURE

Make sure you have the SMC report (factory settings) that comes with the printer before beginning the following procedure.

NVRAM for BCU

1. Enter SP mode and print out the SMC reports (“SP Mode Data” and “Logging Data”) with SP5-990 if possible.
2. Upload the NVRAM data if possible.
3. Turn off the main switch and unplug the power cord.
4. Replace the NVRAM on the BCU and reassemble the machine.
5. Download the NVRAM data if possible.
6. Contact your supervisor to enter the machine’s device number and destination code.
NOTE: SC999 or “Fusing Unit Setting Error” may be displayed until the machine’s device number and destination code are programmed properly.
7. Turn the main switch off/on.
8. If the NVRAM data can be downloaded, the following steps are not required.
9. Execute the RAM clear for engine settings with SP5-998-1.
10. Reset the settings for meter charge with SP5-930-1 to -5.
11. Enter the SP mode changes that were previously made at the factory and the field.
12. Replace all maintenance kits with new ones.

NVRAM for Controller

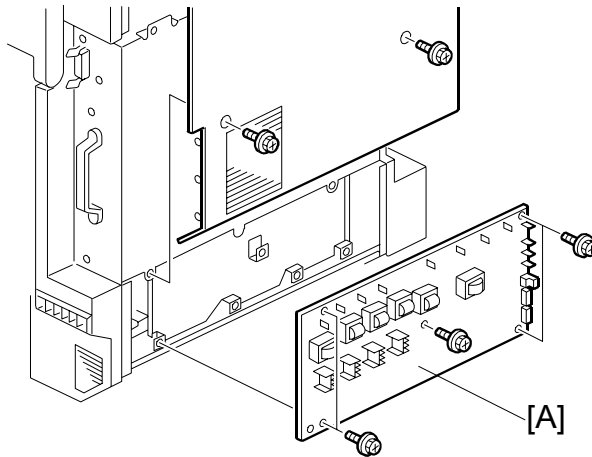
1. Enter SP mode and print out the SMC reports (“SP Mode Data” and “Logging Data”) with SP5-990 if possible.
2. Upload the NVRAM data if possible.
3. Turn off the main switch and unplug the power cord.
4. Replace the NVRAM on the controller and reassemble the machine.
5. Download the NVRAM data if possible. If it can be done, the following steps are not required.
6. Execute the RAM clear for controller settings and counters with SP5-801-3, SP5-801-8, SP5-801-11, and SP7-808-1.
7. Reset the settings of meter charge with SP5-045-1, SP5-104-1, and SP5-812-2 if the meter charge mode (SP5-930-1) is enabled.
8. Reset the total counter to 0 (SP 7-825-1) if meter charge mode (SP 5-930-1) is enabled.

9. Enter the SP mode changes that were previously made at the factory and the field.

NVRAMs for both BCU and Controller

1. Enter SP mode and print out the SMC reports (“SP Mode Data” and “Logging Data”) with SP5-990 if possible.
2. Upload the NVRAM data if possible.
3. Turn off the main switch and unplug the power cord.
4. Replace the NVRAM on the BCU and the controller, and reassemble the machine.
5. Download the NVRAM data if possible.
6. Contact your supervisor to enter the machine’s device number and destination code.
NOTE: SC999 or “Fusing Unit Setting Error” may be displayed until the machine’s device number and destination code is programmed properly.
7. Turn the main switch off/on.
8. If downloading the NVRAM data can be done, the following steps are not required.
9. Execute the RAM clear with SP5-998-1, SP5-801-3, SP5-801-8, SP5-801-11, and SP7-808-1.
10. Reset the settings for meter charge with SP5-930-1 to -5, SP5-045-1, SP5-104-1, and SP5-812-2.
11. Reset the total counter to 0 (SP 7-825-1) if meter charge mode (SP 5-930-1) is enabled.
12. Enter the SP mode changes that were previously made at the factory and the field.
13. Replace all maintenance kits with new ones.

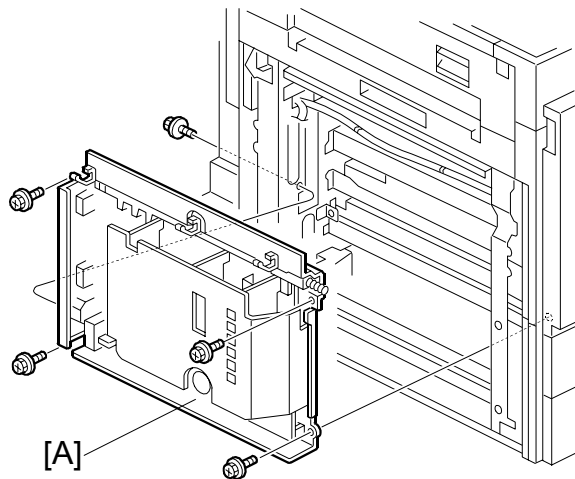
3.10.5 REMOVING THE HIGH VOLTAGE SUPPLY BOARD - C, B



G080R940.WMF

1. Rear cover (☛ 3.3)
2. High voltage supply board [A] (⚙ x 6, 🛠 x 12)

3.10.6 PSU

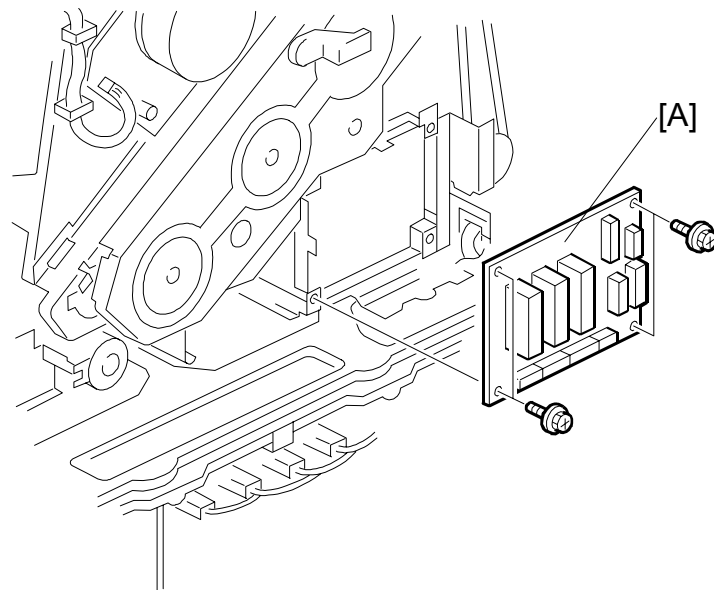


G080R941.WMF

1. Left cover (☛3.3)
2. PSU [A] (⚙ x 5, 🛠 x 11)

NOTE: Check that the interlock switches on the PSU work normally after reinstalling the PSU (open/close the left and front doors).

3.10.7 DRIVER BOARD



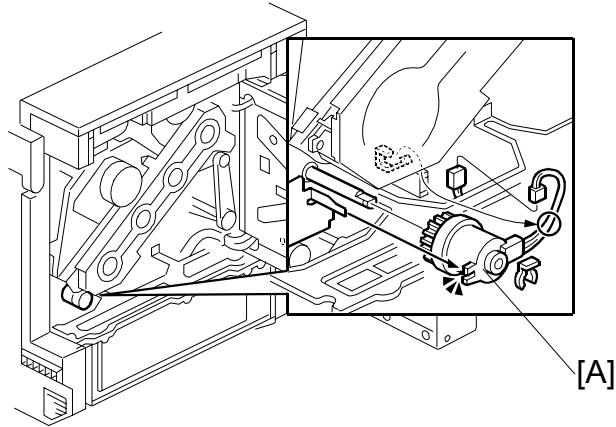
Replacement
Adjustment

G080R749.WMF

1. Rear cover (☛ 3.3)
2. Swing out the controller box (☛ 3.10.1).
3. Driver board [A] (☛ x 8, ☛ x 4)

3.11 DRIVE UNIT

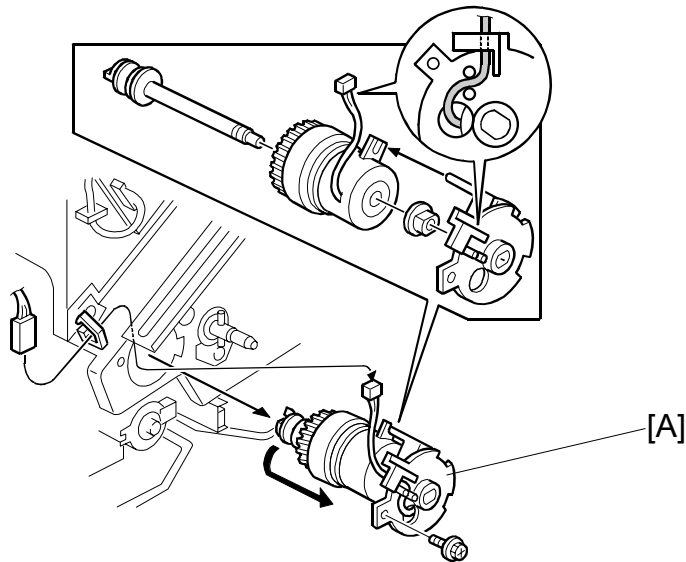
3.11.1 REGISTRATION CLUTCH



G080R942.WMF

1. Rear cover (☛ 3.3)
2. Swing out the controller box (☛ 3.10.1).
3. Registration clutch [A] (☞ x 1, ☞ x 1)

3.11.2 DEVELOPMENT CLUTCHES

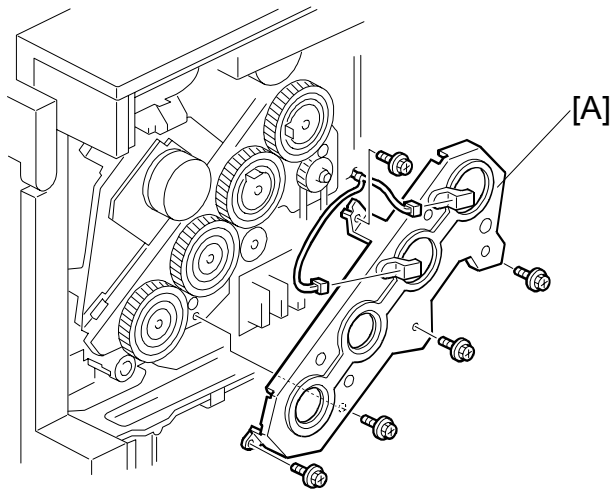


G080R943.WMF

1. Rear cover (☛ 3.3)
2. Swing out the controller box (☛ 3.10.1).
3. Development clutch [A] (☞ x 1, ☞ x 1)

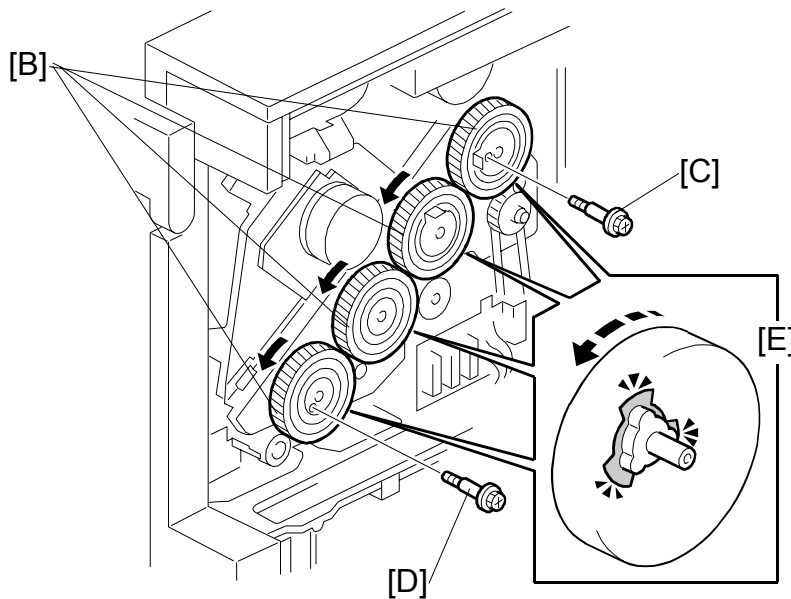


3.11.3 DEVELOPMENT MOTOR - CMY



G080R746.WMF

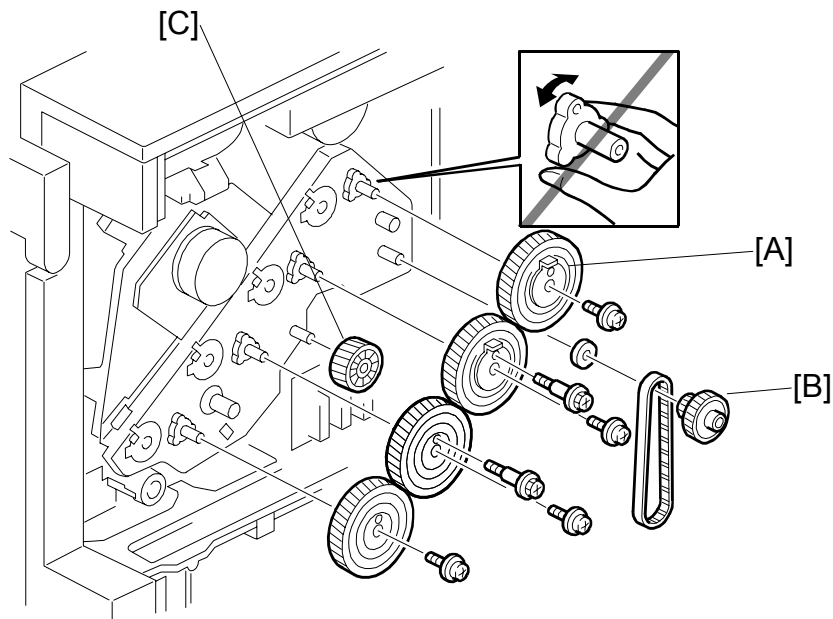
1. Rear cover (☛ 3.3)
2. Swing out the controller box (☛ 3.10.1).
3. Drum gear cover [A] (☛ x 2, ☛ x 5)



G080R747.WMF

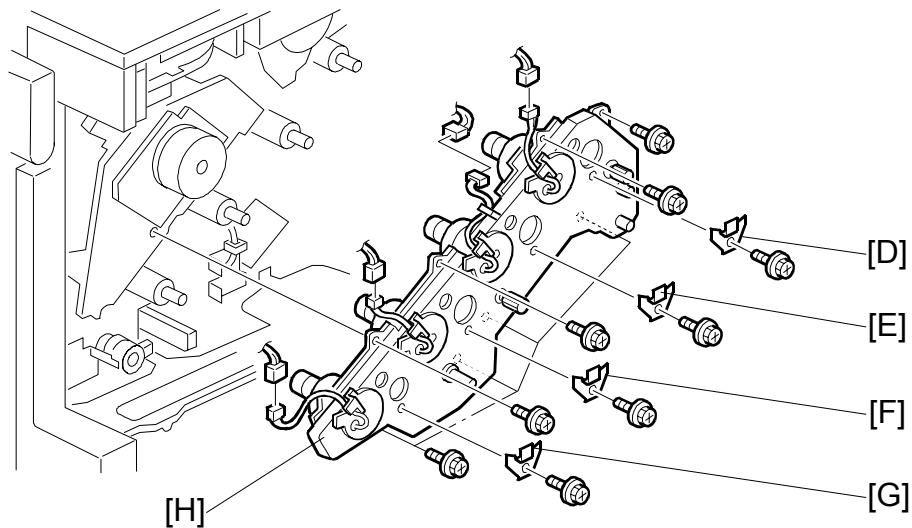
4. Turn the drum gears [B] counterclockwise, so the shoulder screws [C][D] are in the three, seven, or eleven o'clock position.

NOTE: By doing that, you can align the three corners of each drum-gear shaft to the three openings on the development-clutch securing plate [E].



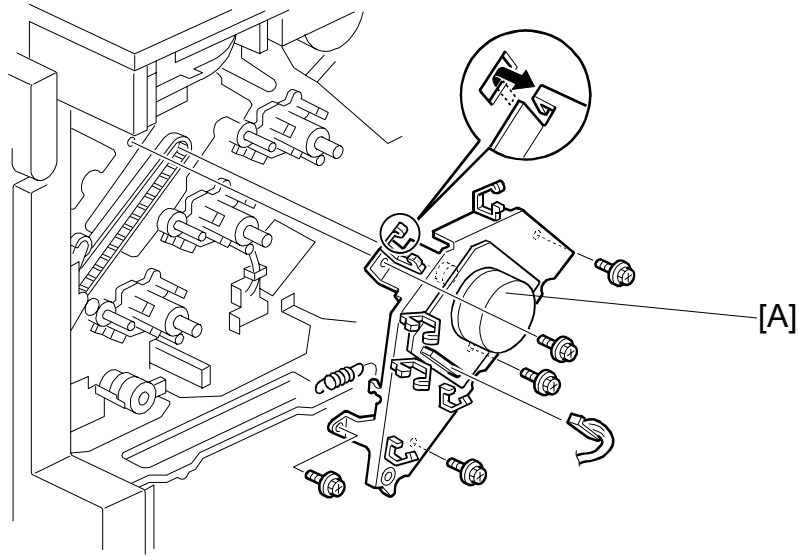
G080R748.WMF

5. 4 drum gears [A] (⌘ x 2 for each)
NOTE: 1) Do not move the drum-gear shafts after removing the drum gears.
 2) The print quality may be affected if any of the teeth on the drum gears are damaged. Make sure they are intact.
6. Timing belt gear [B] (Timing belt x 1, Bushing x 1)
7. Idle gear [C]



G080R944.WMF

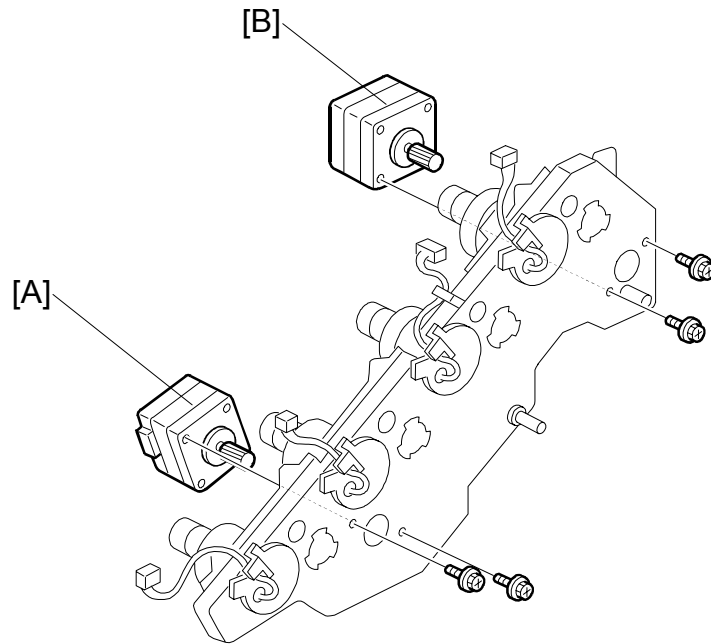
8. 4 gear drive holders [D]~[G] (⌘ x 1 for each)
9. Development clutch securing plate [H] (⌘ x 8, ≡ x 6)
NOTE: Two of the six connectors are on the rear side.



Replacement
Adjustment

G080R945.WMF

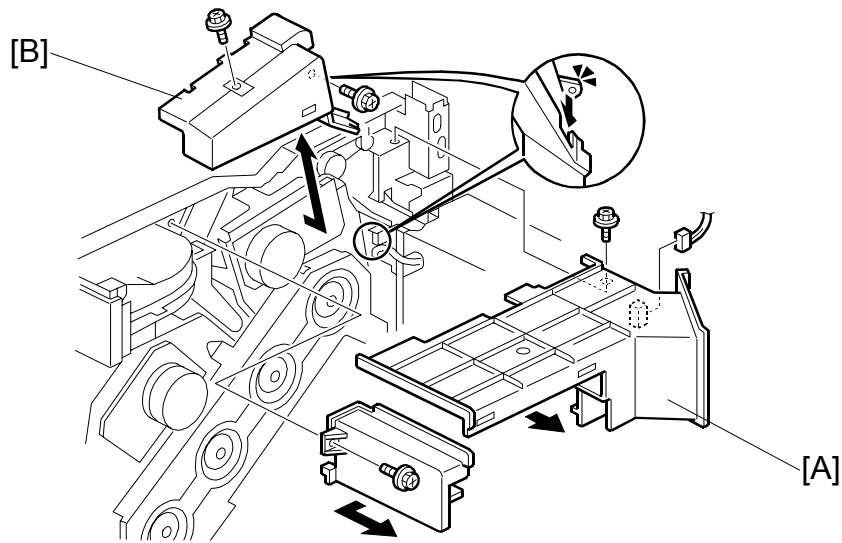
10. Development drive motor - CMY [A] (⚙ x 5, ⚙ x 1, Spring x 1)

3.11.4 DRUM DRIVE MOTOR - CMY AND DRUM DRIVE MOTOR - K

G080R754.WMF

1. Rear cover (☛ 3.3)
2. Development clutch securing plate (☛ 3.11.3)
3. Drum drive motor - CMY [A] (☛ x 2)
4. Drum drive motor - K [B] (☛ x 2)

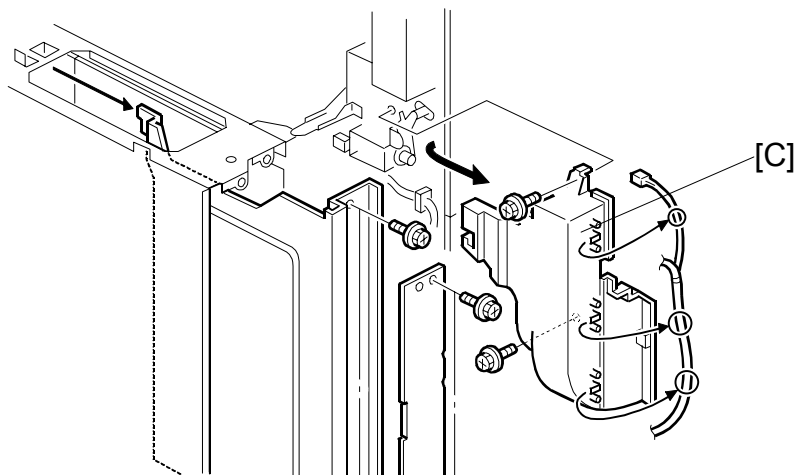
3.11.5 DEVELOPMENT DRIVE MOTOR - K



Replacement
Adjustment

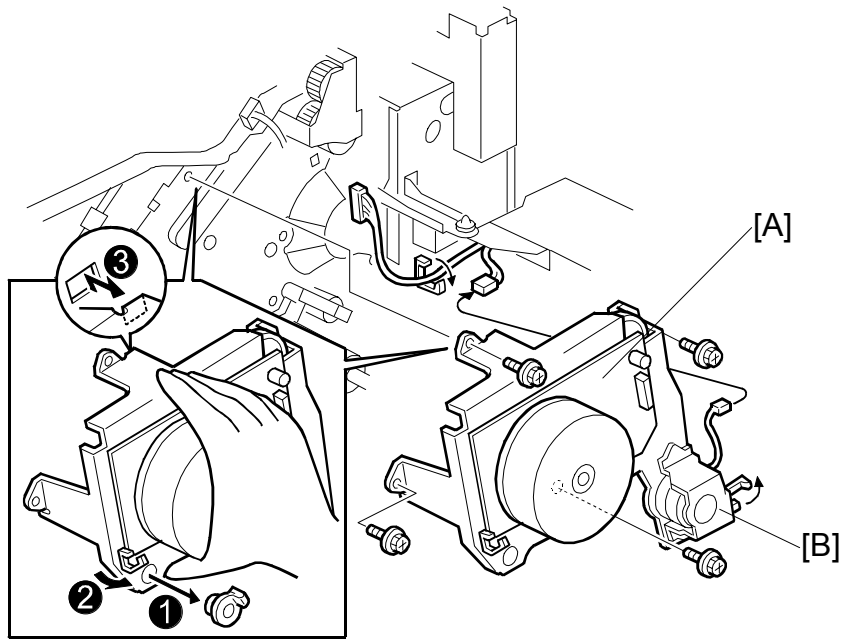
G080R946.WMF

1. Rear cover (☛ 3.3)
2. Upper rear cover (☛ 3.3)
3. Left cover (☛ 3.3)
4. Rear left cover (☛ 3.3)
5. Connector cover (on the top of the controller box) (☛3.10.1)
6. Fusing fan duct [A] (🔩 x 2, 📏 x 1)
7. Four flat cables and connector (going over the upper duct) (☛3.10.1)
8. Upper duct [B] (🔩 x 2)



G080R947.WMF

9. Inner bracket (in the controller box) (☛ 3.10.3)
10. Solenoid cover [C] (🔩 x 2)



G080R721.WMF

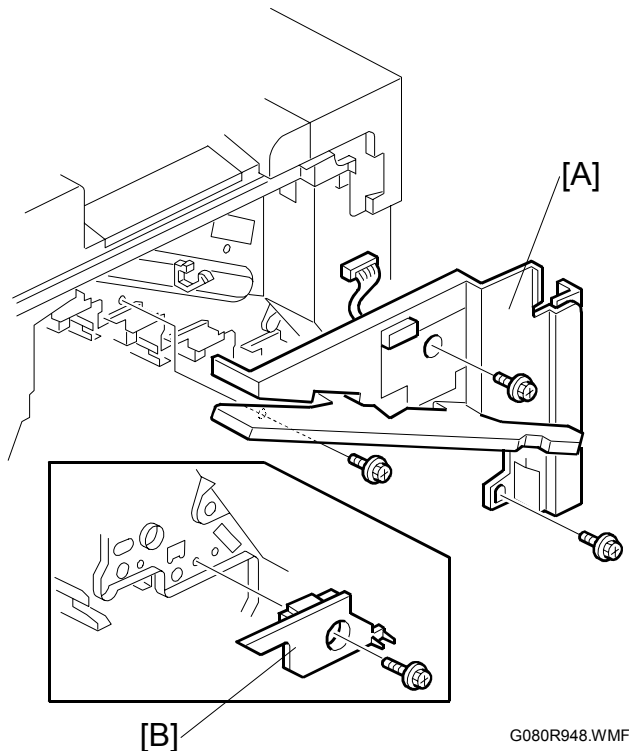
11. Development clutch securing plate (☛ 3.11.3)

12. Development drive motor – K [B] with the fusing clutch [A] (☛ x 4, ☛ x 2)

3.12 TONER SUPPLY UNIT

- CAUTION:** 1) Do not touch the PCU development drums or the transfer belt. Do not let any metal object touch the PCU development sleeves.
2) Having removed the PCUs, cover them with paper or cloth. Keep them in a dark place.

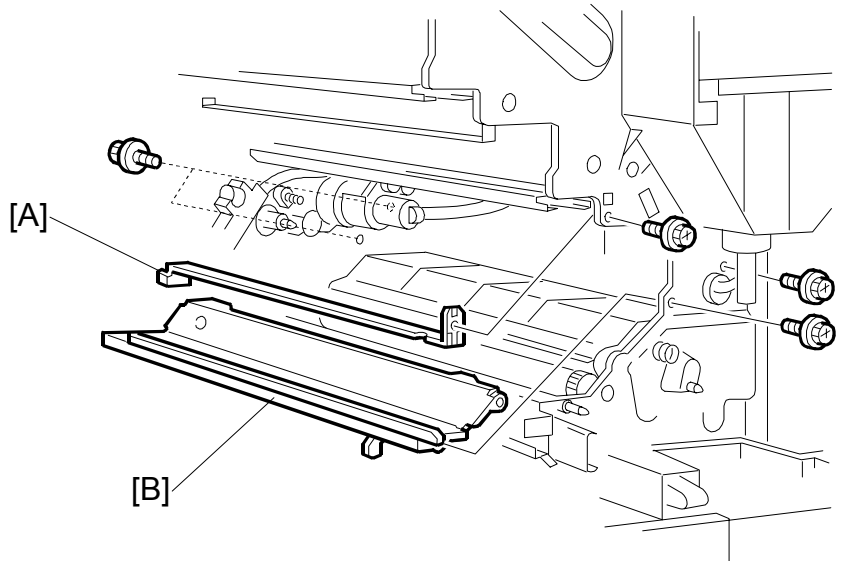
M Toner Supply Unit



G080R948.WMF

Replacement
Adjustment

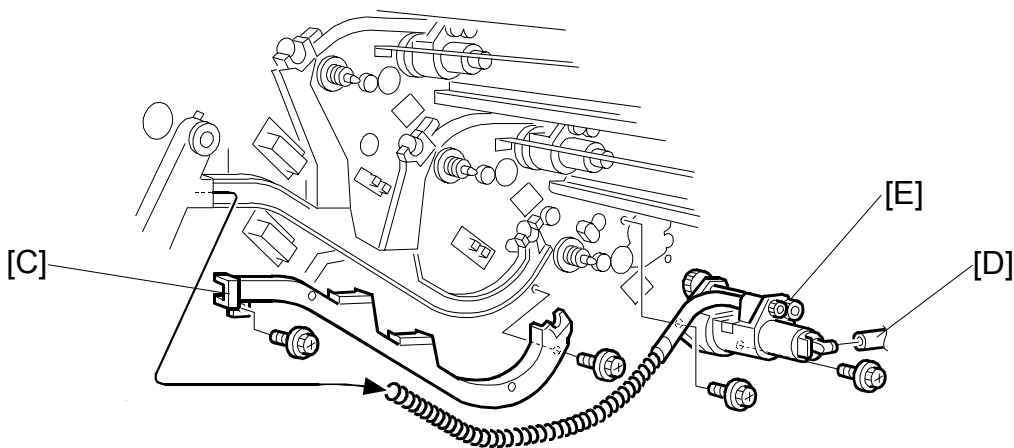
1. Front cover (☛ 3.3.4)
2. All development units and PCUs (☛ 3.5)
3. Transfer unit (☛ 3.7.1)
4. Right, rear, and upper rear covers (☛ 3.3)
5. Paper exit tray (☛ 3.3.2)
6. Laser optics housing unit (☛ 3.4.2)
7. Development clutch securing plate (☛ 3.11.3)
8. Right inner cover with the drum positioning plate [A] (☛ x 3, ☛ x 1)
9. M development unit plate [B] (☛ x 1)



G080R949.WMF

10. Development unit left guide [A] (🔩 x 1)

11. Registration upper stay [B] (🔩 x 4)



G080R950.WMF

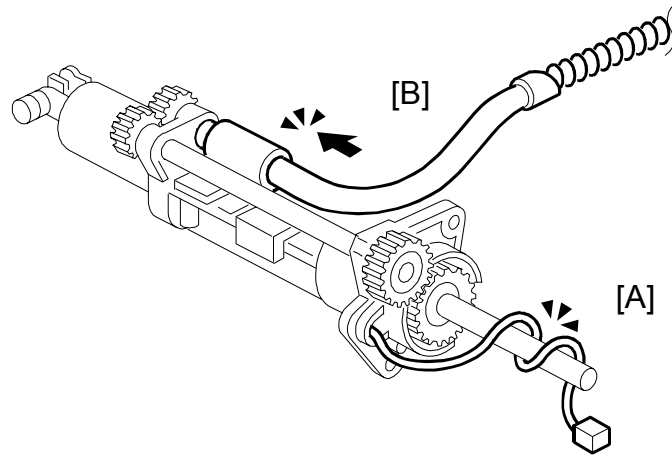
CAUTION: 1) When you remove the toner path cover and a toner supply pipe, the toner spills out. Before removing them, place some paper or cloth beneath the toner supply unit and waste toner collection path.
 2) After removing a pipe, close it with a paper clip or tape.

12. Toner path cover [C] (🔩 x 2)

13. Toner supply pipe [D]

14. Toner supply unit [E] (🔩 x 2, 📎 x 1)

Reinstalling the M Toner Supply Unit

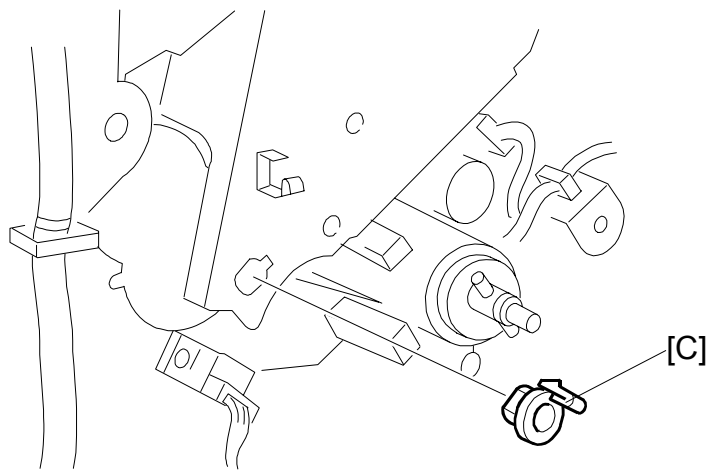


G080R951.WMF

Replacement
Adjustment

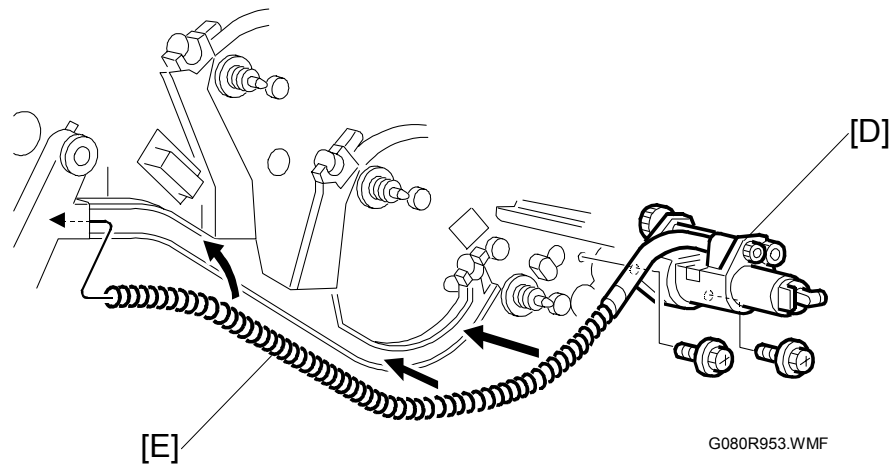
1. Wind the harness [A] on the shaft.
2. Insert the toner collection pipe [B].

NOTE: Check that the pipe does not come off the unit.



G080R952.WMF

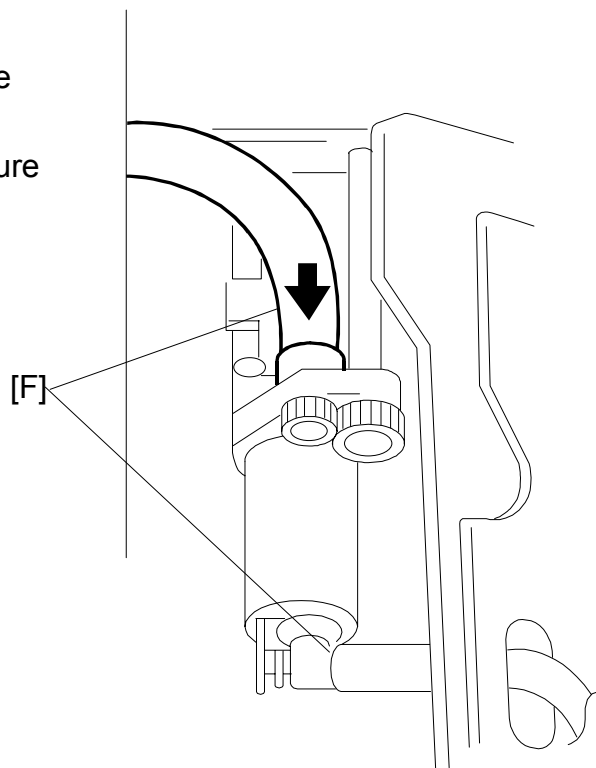
3. Remove the toner supply unit bushing [C].



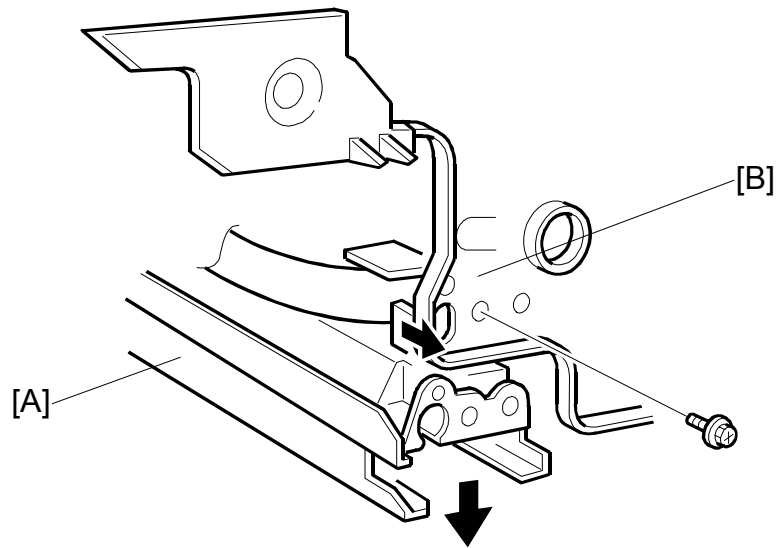
G080R953.WMF

4. Install the unit [D] and secure it with the screws.
5. Unwind the harness and connect it.
6. Install the bushing.
7. Connect the toner supply pipe and the waste toner collection pipe [E].

8. Check that the pipes [F] do not come off the unit.
9. Attach the toner path cover and secure it with screws.
10. Reassemble the machine.



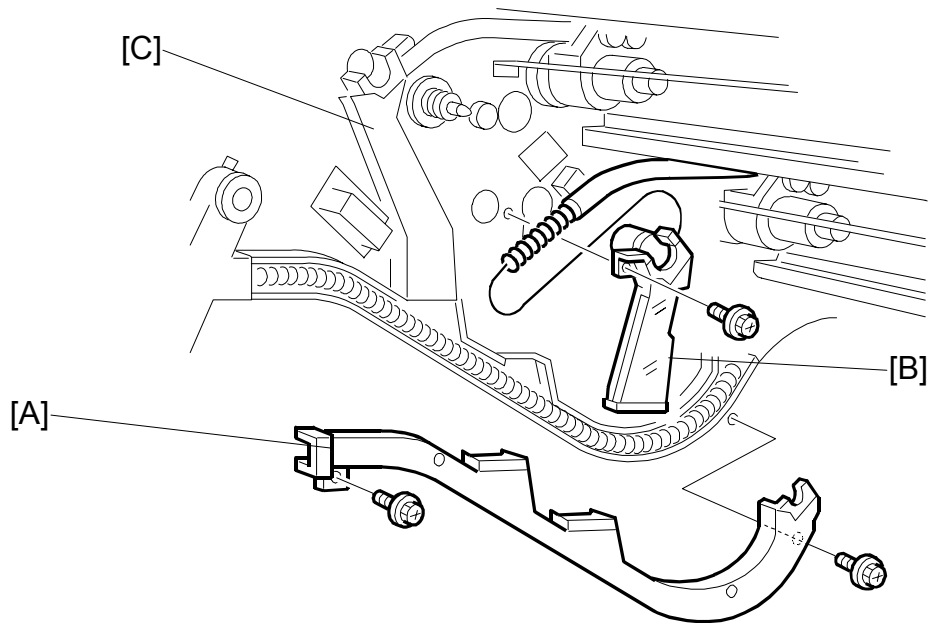
G080R954.WMF

C and Y Toner Supply Units

G080R955.WMF

**Replacement
Adjustment**

1. Development drive motor - CMY (☛ 3.11.3)
2. Development unit plates (☛ M Toner Supply Unit)
NOTE: To replace the C toner supply unit, remove the C and M development unit plates. To replace the Y toner supply unit, remove the Y and C development plates.
3. Development unit left guide (☛ M Toner Supply Unit)
4. PCU 3C guide rail [A] (⚙ x 2)
NOTE: 1) To replace the C toner supply unit, remove the M PCU guide. To replace the Y toner supply unit, remove the C PCU guide.
 2) Pull the front plate [B] slightly.



G080R956.WMF

5. Toner path cover [A] (🔩 x 2)
6. Branch toner path covers [B][C] (🔩 x 1)
NOTE: To replace the C toner supply unit, remove the cover on the right-hand side [B]. To replace the Y toner supply unit, remove the cover on the left-hand side [C].
7. Toner supply pipe and toner supply unit (👉 M Toner Supply Unit)

K Toner Supply Unit

1. K and Y development unit plates (👉 M Toner Supply Unit)
2. Development unit left guide (👉 M Toner Supply Unit)
3. PCU 3C guide rail (👉 C and Y Toner Supply Units)
NOTE: Remove the Y PCU guide.
4. Toner supply unit (👉 M Toner Supply Unit)

4. TROUBLESHOOTING

4.1 PROCESS CONTROL ERROR CONDITIONS

4.1.1 DEVELOPER INITIALIZATION RESULT

SP-3-005-006 (Developer Initialization Result)

No.	Result	Description	Possible Causes	Action
0	Not performed	Developer initialization is not performed.	When initializing only the black developer, the initialization result becomes "1000".	<p>When done in SP mode, do the developer initialization again. If the result is the same, reinstall the engine main firmware.</p> <p>When done at unit replacement:</p> <ul style="list-style-type: none"> • Check if a new unit is installed • Check if the unit detection system is working • Check if SP2-223-001 (auto initialization at unit replacement) is enabled.
1	Successfully completed	Developer initialization is successfully completed.	-	-
2	Forced termination	Developer initialization was forcibly terminated.	A cover was opened or the main switch was turned off during the initialization.	<p>When done in SP mode, do the developer initialization again. If the result is the same, reinstall the engine main firmware.</p> <p>When done at unit replacement, turn the main switch off and on.</p>
3	Vt error	Vt is less than 0.5V and "Reset development unit" is displayed.	<ol style="list-style-type: none"> 1. Check if the drum stay is properly set and secured. 2. Check if the development unit is properly set. 3. If the problem is still the same, check the following: <ul style="list-style-type: none"> • Poor connection of connectors • TD sensor defective • Harness damage • BCU board failure • Firmware problem (engine main or MUSIC) 	

Trouble-
shooting

No.	Result	Description	Possible Causes	Action
8	Toner supply error	During toner fill-up mode, Vt does not reach the target value.	1. Check if the toner cartridge is properly set. 2. Check if the amount of toner left in the toner cartridge is insufficient. 3. Check if toner is coagulated. (If yes, shake the toner cartridge well.) 4. Check if the connectors of the following parts are properly set, and/or replace the parts. Toner attraction pump / Air Pump / Valves 5. Check if the toner supply tube is bent, caught, or damaged.	
9	Failure	Vt cannot be adjusted within $3.0 \pm 0.1V$. SC370 - 373 will be displayed. Turning the main switch off and on clears this SC code.	1. Shielding tape is not removed. 2. Development unit is not firmly installed, causing poor connection of the TD sensor connector. 3. TD sensor defective.	1. Remove the shielding tape to supply developer to the unit. 2. Reinstall the development unit. 3. Replace the development unit.

NOTE: When the machine detects new development units, it automatically starts developer initialization. If an error other than Error 8 occurs, developer initialization is automatically resumed by opening and closing the front door or turning the main switch off and on.

4.1.2 PROCESS CONTROL SELF-CHECK RESULT

SP3-975-001 (Process Control Self-check Result)

No.	Result	Description	Possible Causes	Action
0	Not performed	Process control self-check is not done.	-	Do the process control self-check again.
1	Successfully completed	Process control self-check successfully completed.	-	-
2	ID sensor adjustment error	Vsg cannot be adjusted within $4.0 \pm 0.5V$.	1. Dirty ID sensor (toner, dust, or foreign material)	1. Clean the ID sensor.
			2. Dirty transfer belt	2. Check the belt cleaning, and clean or replace the transfer belt.
			3. Scratched or damaged transfer belt	3. Replace the transfer belt.
			4. Defective ID sensor	4. Replace the ID sensor.
3	Vmin error	Vmin is not within the specified range.	Vmin is calculated during the self-check. Even when the calculated Vmin value is out of the specified range, an optimum value is automatically used instead. Therefore, this error code does not usually occur. If no problem is observed with image density and/or development gamma, nothing needs to be done. If an image problem such as low image density is observed, check the following points: Transfer belt / Belt guide plate / ID sensor	
4	Sampling data error	Not enough data can be sampled.	1. ID sensor pattern density is too high or low. 2. Residual image on transfer belt 3. Toner dropped from development unit 4. Scratched or damaged transfer belt	1. Check the image development process and correct toner density if necessary. 2. Check the transfer belt cleaning unit. 3. Clean the development unit and correct toner density. 4. Replace the transfer belt.
5	Gamma error	Gamma is out of range. $0.3 > \text{Gamma}$, or $6.0 < \text{Gamma}$		
6	Vk error	Vk is out of range. $-150 > V_k$ or $150 < V_k$		
7	Vt error	Vt is out of range. $0.5 > V_t$ or $4.8 < V_t$	1. Development unit not properly installed.	1. Check.
			2. Toner density is too low or high.	2. Check and/or correct toner density.
			3. TD sensor defective.	3. Replace development unit.
8	Sampling data error during LD power correction	Not enough data can be sampled during the LD power correction (if SP3-125-002 is set to "2").	See the possible causes and action for error codes 4, 5, and 6.	
9	Forced termination	Process control self-check was forcibly terminated.	A cover was opened or the main switch was turned off during the self-check.	Do the process control self-check again.

4.1.3 LINE POSITION ADJUSTMENT RESULT

SP5-993-007 (Line Position Adjustment Result)

No.	Result	Description	Note
01	Successfully completed	Data sampling was correctly done and line position adjustment was successfully completed.	
02	Out of adjustment range (over ± 2 mm)	The calculated result for line position correction is greater than ± 2 mm.	
03	Calculation Error	Distance between the lines is greater than ± 2 mm.	
04	Sampling Error	Data sampling cannot be done properly.	
05	Descending slope error	The ascending or descending slope of the ID sensor signal wave is out of specification.	(See Note 1)
06	Ascending slope error		(See Note 1)
07	Pattern lines mismatch (less than 64 lines)	The detected number of pattern lines is less than 64.	(See Note 1)
08	Sampling time-out	Data sampling cannot be done within the allocated time.	
09	Sampling start error	The start mark cannot be detected within the allocated time.	
10	Pattern length mismatch	The pattern length is shorter or longer than specified.	(See Note 1)
11	Pattern lines mismatch (over 64 lines)	The detected number of pattern lines is over 64.	
12	Magnification mismatch	The calculated magnification value does not match any data in the laser power frequency adjustment data table.	
13	Toner condition	The machine is in the toner near-end or toner end condition.	
17	Not executed	The machine is not ready to do the line position adjustment manually from the user menu.	
18	Potential control error	Line position adjustment cannot be done due to failed potential control.	

Note 1: Concerning the error codes (05, 06, 07 or 10) which stop sampling data when either the front, center, or rear ID sensor detect an error, the machine may display the error code for both ID sensors in some cases.

Possible causes of errors in the line position adjustment

	Possible Cause	Possible Error Code	Action
1	The pattern does not reach the proper density.	04, 05, 06, 07, 08, 09, 10	1. Clean the ID sensors.
	1. Dirty ID sensor (toner, dust, or foreign material)		2. Correct the toner density.
	2. Incorrect toner density Low: ID sensor cannot detect the pattern lines. High: Lines may be partially blank due to improper toner density and/or paper transfer current.		3. Correct the transfer current.
2	3. Incorrect transfer current	02, 03, 04, 05, 06, 10, 11, 12	1. Replace PCU
	The ID sensors are affected by electrical noise or dirt/damage on the transfer belt.		2. Replace transfer belt
	1. Scratched or damaged OPC drum		3. Clean or replace transfer belt
	2. Scratched or damaged transfer belt		4. Fix the high voltage leak
	3. Dirty transfer belt		5. Check transfer belt cleaning and clean the belt
	4. High voltage leak in transfer unit		6. Clean the development unit and adjust the toner density
	5. Residual image on transfer belt		7. Clean the development unit and adjust the toner density
3	6. Toner dropped from development unit	All error codes	Check all units and high voltage cable connectors.
	7. Carrier dropped from development unit		
4	The transfer belt is covered with toner.	09, 04	Check all units and high voltage cable connectors.
	Development does not work properly.		
5	None of the patterns are developed.	07, 08	Check all units and high voltage cable connectors.
	Development does not work properly.		
6	Some of the patterns are not developed;	13	Replenish toner.
	The machine is not in the condition to execute the line position adjustment;		Wait until machine becomes the ready condition from the energy saver or auto off mode.
	The machine is in the toner near end or end condition.		Fix the problem causing the potential control error.
	The machine is not ready to do the line position adjustment manually from the user menu.		
7	Line position adjustment cannot be done due to failed potential control.	17	
	The MUSIC CPU is abnormal (1)	18	
	No error code is displayed. However, the machine keeps displaying "execution" on the screen. In addition, the green LED on the BICU stays on or off under the following condition.	-	1. Fix the bias leak and/or replace PCU
	1. The MUSIC CPU resets due to electrical noise generated by a high voltage leak on a damaged OPC drum.		

	Possible Cause	Possible Error Code	Action
8	<p>The MUSIC CPU is abnormal (2)</p> <p>No error code is displayed. However, the machine keeps displaying "execution" on the screen.</p> <p>The green LED on the BICU keeps blinking faintly (this is normal) even under one of the following conditions.</p> <ol style="list-style-type: none"> 1. Poor connection between the toner cartridge detection board and the memory chip on the toner cartridge 2. The memory chip on the toner cartridge fails. 	-	<ol style="list-style-type: none"> 1. Check the connection between the detection board and memory chip. 2. Replace the toner cartridge.

4.2 SERVICE CALL CONDITIONS

4.2.1 SUMMARY

There are 2 levels of service call conditions.

Level	Definition	Reset Procedure
A	Fusing unit SCs displayed on the operation panel. The machine is disabled. The user cannot reset the SC.	Turn the main switch off then on before entering SP mode. Reset the SC (set SP5-810 to 1), then turn the main switch off then on again.
B	Turning the operation switch or main power switch off then on resets the SC. Displayed on the operation panel. Re-displayed if they occurred after the main power switch is turned on again.	Turn the operation switch or main power switch off and on.

All SCs are logged.

- The number of SC codes detected can be checked with SP7-902.
- Printing logging data (SP5-990-004) in SP mode can check the latest 10 SC codes detected and total counters when the SC code is detected.

NOTE: 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.

SC Classification

SC codes are classified by section as shown in the following table:

Class 1	Section	SC Code	Detailed section
1XX	Scanning	190 -	Unique for a specific model
2XX	Laser exposure	200 -	Polygon motor
		220 -	Synchronization control
		230 -	FGATE signal related
		240 -	LD control
		260 -	Magnification
		280 -	Unique for a specific model
3XX	Image development 1	300 -	Charge
		330 -	Drum potential
		350 -	Development
		380 -	Unique for a specific model
4XX	Image development 2	400 -	Image transfer
		420 -	Paper separation
		430 -	Cleaning
		440 -	Around drum
		460 -	Unit
		480 -	Others
5XX	Paper feed / Fusing	500 -	Paper feed
		515 -	Duplex
		520 -	Paper transport

Class 1	Section	SC Code	Detailed section
5XX	Paper feed / Fusing	530 -	Fan motor
		540 -	Fusing
		560 -	Others
		570 -	Unique for a specific model
6XX	Communication	600 -	Electrical counters
		620 -	Mechanical counters
		630 -	Account control
		640 -	CSS
		650 -	Network
		670 -	Internal data processing
		680 -	Unique for a specific model
7XX	Peripherals	700 -	Original handling
		710 -	
		730 -	Mail box
		740 -	Finisher
		750 -	Stapler (1)
		760 -	Stapler (2)
8XX	Controller	780 -	Unique for a specific model
		800 -	Error after ready condition
		820 -	Diagnostics error
		860 -	Hard disk
9XX	Others	880 -	Unique for a specific model
		900 -	Counter
		920 -	Memory
		990 -	Others

4.3 SC TABLE

NOTE: "CF" in the SC number column indicates a code related to the CF expander.



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 101 (CF)	Exposure lamp error	<ul style="list-style-type: none"> The standard white level is not properly detected when scanning the shading plate. (The shading data peak does not reach the specified threshold.) 	<ul style="list-style-type: none"> Exposure lamp defective Lamp stabilizer defective Exposure lamp connector defective Standard white plate dirty Scanner mirror or scanner lens out of position or dirty SBU defective 		<ol style="list-style-type: none"> Turn the main switch off and on. Turn the power key off and on. Check and clean the scanner mirror(s) and scanner lens. Check and clean the shading plate. Replace the exposure lamp. Replace the lamp stabilizer. Replace the scanner mirror(s) or scanner lens. Replace the SBU. 	B
SC 120 (CF)	Scanner home position error 1	<ul style="list-style-type: none"> The scanner home position sensor does not detect the on condition during scanning. 	<ul style="list-style-type: none"> Scanner PSU or SBU defective Scanner motor defective Harness between scanner PSU and scanner motor disconnected Scanner HP sensor defective Harness between SBU and HP sensor disconnected Scanner wire, timing belt, pulley, or carriage defective 	SC 121 and 122	<ol style="list-style-type: none"> Turn the main switch off and on. Check the cable connection between the scanner PSU and scanner motor. Check the cable connection between the SBU and HP sensor. Replace the SBU or scanner PSU. Replace the scanner motor. Replace the HP sensor. Replace the scanner wire, timing belt, pulley, or carriage. 	B

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 121 (CF)	Scanner home position error 2	<ul style="list-style-type: none"> • The scanner home position sensor does not detect the off condition during scanning. 	<ul style="list-style-type: none"> • Scanner PSU or SBU defective • Scanner motor defective • Harness between scanner PSU and scanner motor disconnected • Scanner HP sensor defective • Harness between SBU and HP sensor disconnected • Scanner wire, timing belt, pulley, or carriage defective 	SC 120 and 122	<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connection between the scanner PSU and scanner motor. 3. Check the cable connection between the SBU and HP sensor. 4. Replace the SBU or scanner PSU. 5. Replace the scanner motor. 6. Replace the HP sensor. 7. Replace the scanner wire, timing belt, pulley, or carriage. 	B
SC 122 (CF)	Scanner home position error 3	<ul style="list-style-type: none"> • The scanner home position sensor does not detect the home position during initialization. 	<ul style="list-style-type: none"> • Scanner PSU or SBU defective • Scanner motor defective • Harness between scanner PSU and scanner motor disconnected • Scanner HP sensor defective • Harness between SBU and HP sensor disconnected • Scanner wire, timing belt, pulley, or carriage defective 	SC 120 and 121	<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connection between the scanner PSU and scanner motor. 3. Check the cable connection between the SBU and HP sensor. 4. Replace the SBU or scanner PSU. 5. Replace the scanner motor. 6. Replace the HP sensor. 7. Replace the scanner wire, timing belt, pulley, or carriage. 	B



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 142 (CF)	White level detection error	<ul style="list-style-type: none"> The white level cannot be adjusted within the target during auto gain control. 	<ul style="list-style-type: none"> Dirty exposure glass or optics section SBU board defective IPU board defective Exposure lamp defective Lamp stabilizer defective 		<ol style="list-style-type: none"> Turn on the main switch off and on. Clean the exposure glass, white plate, mirrors, and lens. Check if the exposure lamp is lit during initialization. Check the harness connection between SBU and IPU. Replace the exposure lamp. Replace the SBU board. Replace the IPU board 	B
SC 161 (CF)	IDU error	<ul style="list-style-type: none"> After the command is written into the DFID self-diagnosis startup register, the correct value is not stored in the register in the specified duration. NOTE: This error is detected when the main switch is turned on. After the negate interruption of FGATE occurs, IDU is not recognized in the specified duration. NOTE: This error is detected during scanning operations. 	<ul style="list-style-type: none"> IPU board defective (defective connection between ASIC and DFID, or Defective LSYNC) 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the IPU board. 	B
SC 195	Serial Number Mismatch	<ul style="list-style-type: none"> Serial number stored in the memory does not consist of the correct code. 	<ul style="list-style-type: none"> NVRAM defective BCU replaced without original NVRAM 		<p>Open the front cover and turn on the main switch. Check the serial number with SP5-811-002. If the stored serial number is incorrect, contact your product specialist for details of how to solve the problem.</p>	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 201	Polygon motor error	<ul style="list-style-type: none"> • The polygon mirror motor does not reach the targeted operating speed within 15 seconds after turning on. • The lock signal does not become high within 15 seconds after turning off the polygon motor. • The lock signal does not become low within 0.2 second after the polygon motor reaches the targeted operating speed. 	<ul style="list-style-type: none"> • Polygon mirror motor error • Abnormal GAVD behavior • Cable disconnection 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cables. 3. Replace the polygon motor. 	
SC 220	Synch. detection signal error 1 220-001: Y 220-002: M 220-003: C 220-004: K0 220-005: K1	The front (for K&Y) or rear (for C&M) laser synchronizing detector board, which is used to determine the start timing of laser writing, does not send a signal while the polygon motor is operating normally and the LD is on.	<ul style="list-style-type: none"> • Disconnection of the cable between front (K&Y) or rear (C&M) synchronizing detector board and the LD unit • Incorrect installation of front (K&Y) or rear (C&M) synchronizing detector board (the beam does not target the photo detector.) • Defective LD unit • Defective BCU • Defective +5VLD circuit 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connection between front (for K&Y) or rear (for C&M) synchronizing detector board and the LD unit. 3. Check or reinstall the front (for K&Y) or rear (for C&M) synchronizing detector board. 4. Replace the front (for K&Y) or rear (for C&M) synchronizing detector board. 5. Replace the laser optics housing unit. 6. Replace the BCU. 7. Replace the PSU. 	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 221	Synch. detection signal error 2 221-001: Y 221-002: M 221-003: C 221-004: K	<p>Main scan length detection is not properly completed ten consecutive times.</p> <p>The front (for C&M) or rear (for K&Y) laser synchronizing detector boards are used for the main scan length detection, which automatically corrects the main-scan magnification.</p>	<ul style="list-style-type: none"> • Damaged or disconnected cable between front (C&M) or rear (K&Y) laser synchronizing detector board and the LD unit • Incorrect installation of front (C&M) or rear (K&Y) synchronizing detector board (the beam does not target the photo detector.) • Defective front (C&M) or rear (K&Y) synchronizing detector board • Defective LD unit 		<p>After doing any of the following, print ten jobs or more to see if the same SC code is displayed:</p> <ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check or replace the cable connecting front (for C&M) or rear (for K&Y) synchronizing detector board and the LD unit. 3. Check or reinstall the front (for C&M) or rear (for K&Y) synchronizing detector board. 4. Replace the front (for C&M) or rear (for K&Y) synchronizing detector board. 5. Replace the laser optics housing unit. 6. Replace the BCU. <p>If a synch. detector board cannot be replaced, do the following as a temporary measure:</p> <ul style="list-style-type: none"> • Disable main scan length detection (SP 2-919-001) 	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 230	FGATE error 230-001: Y 230-002: M 230-003: C 230-004: K	<p>The BCU generates the FGATE signal based on the registration sensor ON timing. Then, it sends the signal to the LD units. The LD units send a feedback signal to the BCU. When the LD units start emitting laser beams, the feedback signal changes from High to Low.</p> <p>The SC code is generated when the BCU receives no feedback signal (stays High) from the LD unit 1 second after paper reaches the position where the laser should start writing.</p>	<ul style="list-style-type: none"> • Poor connection between BCU and LD units • Defective BCU • Defective LD unit 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cables between the LD units and the BCU. 3. Replace the laser optics housing unit. 4. Replace the BCU. 	
SC 231	FGATE timeout 231-001: Y 231-002: M 231-003: C 231-004: K	<p>When LD units emit laser beams to print a job, the feedback signal stays Low and becomes High after laser exposure for a page is completed. The SC code is detected in the following cases:</p> <ul style="list-style-type: none"> • When the feedback signal stays Low 7 seconds after completing the laser exposure, or • When the feedback signal stays Low until the laser exposure timing for the next page in multi-page print mode. 	<ul style="list-style-type: none"> • Poor connection between BCU and LD units • Defective BCU • Defective LD unit 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cables between the LD units and the BCU. 3. Replace the laser optics housing unit. 4. Replace the BCU. 	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 240	LD over 240-001: Y 240-002: M 240-003: C 240-004: K	The power supply for the LD unit exceeds 67 mA.	<ul style="list-style-type: none"> • LD worn out (current/light output characteristics have changed.) • LD broken (short circuit) 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Replace the laser optics housing unit. 	
SC 260	LD HP sensor not switched on (for K only)	During homing, it takes more than five seconds to switch the HP sensor on (the sensor actuator does not cover the sensor).	<ul style="list-style-type: none"> • Defective motor • Defective sensor • Mechanical problem when switching the actuator • Brown fuse (FU81) on the Power supply unit 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the sensor actuator position of the LD positioning motor. 3. Replace the LD positioning motor. 4. Replace the LD home position sensor. 5. Check and/or replace the PSU. 	
SC 261	LD HP sensor not switched off (for K only)	After the laser beam pitch was changed, it takes more than five seconds for the HP sensor to switch off.	<ul style="list-style-type: none"> • Defective motor • Defective sensor • Mechanical problem when switching the actuator • Brown fuse (FU81) on the Power supply unit 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the sensor actuator position of the LD positioning motor. 3. Replace the LD positioning motor. 4. Replace the LD home position sensor. 5. Check and/or replace the PSU. 	



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 285	Line position adjustment (MUSIC) error	Line position adjustment fails three consecutive times.	<ul style="list-style-type: none"> • Pattern sampling error due to insufficient image density of patterns used for the adjustment • Inconsistency in the sampling line position adjustment pattern due to dust on the pattern, damage to the OPC drum, damage or toner dropped on the transfer belt, or a dirty or defective ID sensor 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check and fix the problem that causes low image density. . 3. Clean or replace the transfer belt and/or the ID sensor. 4. Replace the PCU or clean the development unit that causes toner to drop on the transfer belt. 	
SC 370	TD sensor [K]: Adjustment error	During the developer initialization, the output value of the TD sensor is without the adjustment range ($3.0 \pm 0.1V$).	<ul style="list-style-type: none"> • Poor connection (TD sensor outputs is less than 0.5V.) • Defective TD sensor 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Reset the related color development unit. 3. Replace the related color development unit. 	
SC 371	TD sensor [Y]: Adjustment error					
SC 372	TD sensor [C]: Adjustment error					
SC 373	TD sensor [M] : Adjustment error					
SC 374	Vt error [K]	During the image development, Vt value is less than 0.5V.	<ul style="list-style-type: none"> • Poor connection (TD sensor outputs is less than 0.5V.) • Defective TD sensor 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Reset the related color development unit. 3. Replace the related color development unit. 	
SC 375	Vt error [Y]					
SC 376	Vt error [C]					
SC 377	Vt error [M]					

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 380	Black development motor error	When the motor speed is within the target level, the motor sends a lock signal (High to Low at CN214-5) to the BCU. SC380 is detected under the following conditions: <ul style="list-style-type: none"> • The Lock signal stays High 2 seconds after the motor turns on. • The Lock signal stays Low 2 seconds after the motor turns off. • The Lock signal stays High for more than 2 seconds while the motor is on. 	<ul style="list-style-type: none"> • Defective motor • Defective BCU 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Replace the motor. 3. Replace the BCU. 	
SC 381	Color development motor error					
SC 385	ID sensor VSG adjustment error	Vsg is the out of adjustment range during a process control self-check. Adjustment range: $4.0 \pm 0.5V$	<ul style="list-style-type: none"> • Defective ID sensor • Dirty ID sensor • ID sensor disconnected • Dirty drum (cleaning incomplete) 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Clean the ID sensor and adjacent parts. 3. Check the drum cleaning condition. 4. Check the ID sensor connector. 5. Replace the ID sensor. 	
SC 386	Development gamma error K	Any of the following conditions happens three consecutive times: <ul style="list-style-type: none"> • When the development gamma is out of the following range: $0.3 \leq \gamma \leq 6.0$ • When V_k is out of the following range: $-150V \leq V_k \leq 150V$ • Development gamma calculation error 	<ul style="list-style-type: none"> • Unsuitable toner density • Toner supply mechanism problem • Laser exposure problem • Image transfer problem 		<ol style="list-style-type: none"> 1. Turn the main switch off and on . 2. Check the process control self-check result (SP3-975). If the result is not "1", fix the problem according to the table in section 4.1.2. 3. Print a full color image by disabling SC detection (SP5-809-001) and check if the image quality is OK. If the image quality is not OK, fix the problem. Then, enable the SC detection again. 	
SC 387	Development gamma error Y					
SC 388	Development gamma error C					
SC 389	Development gamma error M					



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 390	Development Bias output error	<p>The high voltage supply board (C/B) monitors the circuit and detects abnormal conditions such as a voltage leak or no output condition. If this happens, the high voltage supply board sends an error signal (High to Low at CN204-A18) to the BCU.</p> <p>The BCU monitors this signal every 2 ms and generates this SC code when the error condition occurs 250 consecutive times.</p>	<ul style="list-style-type: none"> • Loose connection • Defective power pack C/B output • Damaged cable • Defective development unit • Defective BCU 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check if the harness and cables are properly connected. 3. Disconnect the high voltage supply cables from the bias terminals on the high voltage supply board C/B. Measure the DC voltage using a multi-meter. <ul style="list-style-type: none"> • Replace the high voltage supply board if no voltage is supplied. 4. If the result is OK at step 2, check if the high voltage supply cable or development unit is grounded. <ul style="list-style-type: none"> • Replace the high voltage supply cable if it damages. • Replace the development unit if it damages. 5. Check the PWM signals are sent to the high voltage supplied board from the BCU. Replace the BCU or harness between the BCU and high voltage supply board if the voltage is 0. 	
SC 391-01	Charge AC: output error 391-01: K 391-02: Y 391-03: M 391-04: C	<p>The high voltage supply board sends the feedback signal (CN228-2 to 5; MCYK). The BCU monitors these feedback signals every 8 ms. If the average of the sampled data is not within the control target 30 consecutive times, this SC code is generated.</p>	<ul style="list-style-type: none"> • Power pack disconnected • Charge receptacle or terminal • Defective PCU bias input terminal • Incorrect power pack B/C output • Damaged cable • Defective BCU 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the connector. 3. Check the PCU charge voltage input (the spring/conducting shaft) or replace the PCU. 4. Replace the power pack B/C. 5. Replace the cable. 6. Replace the BCU. 	



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 392-001	Air pump motor error 391-001: MY 391-002: CK	Three consecutive errors are detected in motor-driver-signal samples. The samples are collected every 0.01 second.	<ul style="list-style-type: none"> • Damaged cable • Short circuit • Defective motor 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Replace the air pump. 3. Check the circuit. 	
SC 440-001	Drum motor error 440-001: Black 440-002: Color	No drum gear position sensor signal is detected within 0.7 second (185 mm/s), 1.0 second (125 mm/s), or 2.0 seconds (62.5 mm/s).	<ul style="list-style-type: none"> • Defective PCU • Defective drum motor • Defective drum gear position sensor 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check and/or replace the PCU. 3. Check and/or replace the sensor. 	
SC 460-001	Thermistor 1 error (open circuit)	When the temperature detected by thermistor 1, which is at the left (fusing unit) side of the laser optics unit, is less than -30°C for 10 seconds consecutively, the BCU determines that the circuit is opened and displays this SC code.	<ul style="list-style-type: none"> • Thermistor 1 defective • Cable connection error • BCU defect 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connections. 3. Replace the thermistor. 4. Replace the BCU. 	
SC 460-002	Thermistor 1 error (short circuit)	When the temperature detected by the thermistor 1, which is at the left (fusing unit) side of the laser optics unit, is higher than 70°C for 10 seconds consecutively, the BCU determines that the circuit is shorted and displays this SC code	<ul style="list-style-type: none"> • Thermistor 1 defective • Cable connection error • BCU defect 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connections. 3. Replace the thermistor. 4. Replace the BCU. 	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 461-001	Thermistor 2 error (open circuit)	When the temperature detected by the thermistor 2, which is at the right (paper feed section) side of the laser optics unit, is less than -30°C for 10 seconds consecutively, the BCU determines that the circuit is opened and displays this SC code.	<ul style="list-style-type: none"> • Thermistor 2 defective • Cable connection error • BCU defect 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connections. 3. Replace the thermistor. 4. Replace the BCU. 	
SC 461-002	Thermistor 2 error (short circuit)	When the temperature detected by the thermistor 2, which is at the right (paper feed section) side of the laser optics unit, is higher than 70°C for 10 seconds consecutively, the BCU determines that the circuit is shorted and displays this SC code	<ul style="list-style-type: none"> • Thermistor 2 defective • Cable connection error • BCU defect 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connections. 3. Replace the thermistor. 4. Replace the BCU. 	
SC 471	Transfer belt H.P. error	The transfer belt HP sensor signal does not change from Low to High (home position) or vice versa 1 second after the transfer belt contact motor turns on.	<ul style="list-style-type: none"> • Transfer belt unit not set properly • Defective transfer belt H.P. sensor and/or transfer belt sensor • Defective transfer belt contact motor • Transfer belt unit problem 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Reset the transfer belt unit. 3. Clean or replace the transfer belt sensor. 4. Replace the transfer belt contact motor. 5. Check the contact and release mechanism of the transfer belt unit. 	



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 490	Transfer bias / paper attraction roller bias leak error	<p>The high voltage supply board - Transfer monitors the circuit and detects current leaks. If this happens, the high voltage supply board sends a SC signal (High to Low at CN213-8) to the BCU.</p> <p>The BCU monitors this signal every 2 ms and generates this SC code when the error condition occurs 250 consecutive times.</p>	<ul style="list-style-type: none"> • Defective high voltage supply board - Transfer • Damaged transfer belt • Transfer unit • Damaged high voltage supply cables • Damaged cables between the BCU and high voltage supply board • Defective BCU 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the transfer unit and replace the belt and/or the transfer unit if any damage is found. 3. Replace the high voltage supply board - Transfer. 4. Check and/or replace the high voltage supply cables. 5. Check and/or replace the dc cables between the BCU and high voltage supply board. 6. Replace the BCU. 	
SC 501	Paper Tray 1 error	<p>When the tray lift motor is turned on, if the upper limit is not detected within 10 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated.</p>	<ul style="list-style-type: none"> • Defective paper lift sensor • Defective tray lift motor • Defective bottom plate lift mechanism 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check if the bottom plate smoothly moves up and down manually. 3. Check and/or replace the paper lift sensor. 4. Check and/or replace the tray lift motor. 	
SC 502	Paper Tray 2 error					

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 503-01	Tray 3 error (Paper Feed Unit or LCT)	<p>For the paper feed unit: When the tray lift motor is turned on, if the upper limit is not detected within 18 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated.</p> <p>For the LCT: This SC is generated under the following conditions:</p> <ul style="list-style-type: none"> • If the upper or lower limit is not detected within 15 seconds when the tray lift motor is turned on to lift up or lower the tray • If the paper stack is not transported within a specific number of pulses after the tray motor and stack transport clutch turn on to transport the paper stack • If the end fence home position sensor stays ON for a specific number of pulses after the tray motor and stack transport clutch turn on to transport the paper stack. 	<p>For the paper feed unit:</p> <ul style="list-style-type: none"> • Defective tray lift motor or connector disconnection • Defective lift sensor or connector disconnection <p>For the LCT:</p> <ul style="list-style-type: none"> • Defective stack transport clutch or connector disconnection • Defective tray motor or connector disconnection • Defective end fence home position sensor or connector disconnection • Defective upper limit sensor or connector disconnection • Defective tray lift motor or connector disconnection 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connections. 3. Check and/or replace the defective component. 	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 503-02	Tray 3 error (Paper Feed Unit or LCT)	<ul style="list-style-type: none"> • If the following condition occurs 3 consecutive times, this SC is generated. <p>For the paper feed unit: When the main switch is turned or when the tray is set and if the upper limit is already detected, the lift motor turns on to lower the bottom plate until the lift sensor goes off. If the motor turns on for 7 seconds or more, the machine asks the user to reset the tray.</p> <p>For the LCT: When the main switch is turned on or when the LCT is set, if the end fence is not in the home position (home position sensor ON), the tray lift motor stops.</p>	<p>For the paper feed unit:</p> <ul style="list-style-type: none"> • Defective tray lift motor or connector disconnection • Defective lift sensor or connector disconnection <p>For the LCT:</p> <ul style="list-style-type: none"> • Defective stack transport clutch or connector disconnection • Defective tray motor or connector disconnection • Defective end fence home position sensor or connector disconnection 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connections. 3. Check and/or replace the defective component. 	
SC 504-01	Tray 4 error (3 Tray Paper Feed Unit)	<p>When the tray lift motor is turned on, if the upper limit is not detected within 18 seconds, the machine asks the user to reset the tray. If this condition occurs three consecutive times, the SC is generated.</p>	<ul style="list-style-type: none"> • Defective tray lift motor or connector disconnection • Defective lift sensor or connector disconnection 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connections. 3. Check and/or replace the defective component. 	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 504-02	Tray 4 error (3 Tray Paper Feed Unit)	When the main switch is turned or when the tray is set and if the upper limit is already detected, the lift motor turns on to lower the bottom plate until the lift sensor goes off. If the motor turns on for 7 seconds or more, the machine asks the user to reset the tray. If this condition occurs 3 consecutive times, this SC is generated.	<ul style="list-style-type: none"> Defective tray lift motor or connector disconnection Defective lift sensor or connector disconnection 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the cable connections. Check and/or replace the defective component. 	
SC 530	Fusing fan motor error	The BCU does not receive the lock signal (CN210-B5) 5 seconds after turning on the fusing fan.	<ul style="list-style-type: none"> Defective fusing fan motor or connector disconnection Defective BCU 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the connector and/or replace the fusing fan motor. Replace the BCU. 	
SC 541	Heating roller thermistor error	The temperature measured by the heating roller thermistor does not reach 7 °C for ten seconds.	<ul style="list-style-type: none"> Loose connection of the heating roller thermistor Defective heating roller thermistor Defective BCU 		<ol style="list-style-type: none"> Check if the heating roller thermistor is firmly connected. Replace the fusing unit. Replace the BCU. 	A
SC 542	Heating roller warm-up error	After the main switch is turned on or the cover is closed, the heating roller temperature does not reach the ready temperature within 60 seconds during fusing unit warm-up.	<ul style="list-style-type: none"> Heating roller fusing lamp broken Defective heating roller thermistor Defective BCU 		<ol style="list-style-type: none"> Check if the heating roller thermistor is firmly connected. Replace the fusing unit. Replace the BCU. 	A
SC 543	Heating roller fusing lamp overheat	The detected fusing temperature stays at 200°C or more for five seconds.	<ul style="list-style-type: none"> Defective PSU Defective BCU 		<ol style="list-style-type: none"> Replace the PSU. Replace the BCU. 	A



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 544	Heating roller fusing lamp high temperature error	During stand-by mode or a print job, the detected heating roller temperature stays at 210 °C or more for 0.1 second.	<ul style="list-style-type: none"> Defective heating roller thermistor Defective PSU Defective BCU 		<ol style="list-style-type: none"> Replace the fusing unit. Replace the PSU. Replace the BCU. 	A
SC 545	Heating roller fusing lamp consecutive full power	When the fusing unit is not running in the Ready condition, the heating roller fusing lamp keeps on with full power for 30 consecutive seconds.	<ul style="list-style-type: none"> Heating roller thermistor out of position 		<ol style="list-style-type: none"> Replace the fusing unit. 	A
SC 546	Heating roller fusing lamp temperature fluctuation	The heating roller temperature changes by $\pm 20^{\circ}\text{C}$ or more in one second. This occurs three times in one minute or two consecutive times.	<ul style="list-style-type: none"> Loose connection of the thermistor Loose connection between the fusing unit and main frame 		<ol style="list-style-type: none"> Check if the fusing unit is properly set and connected to the main frame. Check if the heating roller thermistor connector is firmly connected. Replace the fusing unit. 	A
SC 551	Pressure roller thermistor error	The measured pressure roller temperature does not reach 7°C for 30 seconds.	<ul style="list-style-type: none"> Loose connection of pressure roller thermistor Defective pressure roller thermistor Defective BCU 		<ol style="list-style-type: none"> Check that the pressure roller thermistor is firmly connected. Replace the fusing unit. Replace the BCU. 	A
SC 552	Pressure roller warm-up error	After the main switch is turned on or the door is closed, the pressure roller temperature does not reach the ready temperature within 150 seconds during fusing unit warm-up.	<ul style="list-style-type: none"> Pressure roller fusing lamp broken Defective pressure roller thermistor Defective BCU 		<ol style="list-style-type: none"> Check if the pressure roller thermistor is firmly connected. Replace the fusing unit. Replace the BCU. 	A
SC 553	Pressure roller fusing lamp overheat	The detected pressure roller temperature stays at 200°C or more for five seconds.	<ul style="list-style-type: none"> Defective PSU Defective BCU 		<ol style="list-style-type: none"> Replace the fusing unit. Replace the PSU. Replace the BCU. 	A



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 554	Pressure roller fusing lamp low temperature error	During stand-by mode or printing, the detected pressure roller temperature stays at 50°C or less for five seconds.	<ul style="list-style-type: none"> Loose connection between the fusing unit and the machine Defective pressure roller thermistor Defective PSU Defective BCU 		<ol style="list-style-type: none"> Check the connection between the fusing unit and main frame. Replace the fusing unit. Replace the PSU. Replace the BCU. 	A
SC 555	Pressure roller fusing lamp consecutive full power	When the fusing unit is not running in the Ready condition, the pressure roller fusing lamp keeps ON with full power for 100 consecutive seconds.	<ul style="list-style-type: none"> Pressure roller thermistor out of position 		<ol style="list-style-type: none"> Replace the fusing unit. 	A
SC 556	Pressure roller fusing lamp temperature fluctuation	The pressure roller temperature changes by ±20°C or more in one second. This occurs three times in one minute or two consecutive times.	<ul style="list-style-type: none"> Loose connection of the pressure roller thermistor Loose connection between the fusing unit and main frame 		<ol style="list-style-type: none"> Check if the fusing unit is properly set and connected to the main frame. Check if the pressure roller thermistor connector is firmly connected. Replace the fusing unit. 	A
SC 560	Zero cross error	When the main switch is turned on, the machine checks how many zero-cross signals are generated during 500 ms. If the number of zero-cross signal generated is either more than 66 or less than 45 and when this condition is detected 10 consecutive times, this code is displayed.	<ul style="list-style-type: none"> Electrical noise in the supply from the power cord 		<ol style="list-style-type: none"> Replace the PSU. 	A

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 620 (CF)	ARDF communication error	<ul style="list-style-type: none"> After the ARDF is detected, the break signal occurs or communication timeout occurs. 	<ul style="list-style-type: none"> Incorrect installation of ARDF ARDF defective IPU board defective External noise 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the cable connection of the ARDF. Shut out the external noise. Replace the ARDF. Replace the IPU board. 	B
SC 621	Finisher/mailbox communication error	While the BCU communicates with an optional unit, an SC code is displayed if one of following conditions occurs.	<ul style="list-style-type: none"> Cable problems BCU problems PSU problems in the machine Main board problems in the peripherals 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the cables of peripherals are properly connected. Replace the PSU if no power is supplied to peripherals. Replace the BCU or main board of peripherals. 	
SC 622	Bank communication error	1. The BCU receives a signal which is generated by the peripherals only just after the main switch is turned on.				
SC 623	Duplex unit communication error	2. When the BCU does not receive an OK signal from a peripheral 100ms after sending a command to it. The BCU resends the command. The BCU does not receive an OK signal after sending the command 3 times.	<ul style="list-style-type: none"> Cable problems BCU problems PSU problems in the machine Duplex control board problem 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the cable of the duplex inverter unit is properly connected. Replace the PSU if no power is supplied to the peripherals. Replace the duplex control board in the inverter unit. 	
SC 640	BCU - Controller communication error (check sum error)	The check sum of the interface between the BCU and controller is not the same.	<ul style="list-style-type: none"> Defective controller Defective PCU 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the controller. Replace the BCU. 	CTL
SC 641	BCU – Controller communication error (no response)	The controller does not receive any response from the BCU three consecutive times when sending a signal every 100ms.	<ul style="list-style-type: none"> Loose connection Defective controller Defective BCU 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the connection between the BCU and controller. Replace the controller. Replace the BCU. 	CTL



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 642 (CF)	Communication timeout error between controller and operation panel	<ul style="list-style-type: none"> The operation panel does not respond to the frame sent from the controller. 	<ul style="list-style-type: none"> Controller defective Operation panel defective External noise Harness between controller and operation panel disconnected 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the cable connection between the controller and the operation panel. Shut out the external noise. Replace the controller. Replace the operation panel. 	B
SC 670	No response from BCU at power on	When the main power is turned on or the machine starts warming up from energy-saving mode, the controller does not receive a command signal from the BCU.	<ul style="list-style-type: none"> Loose connection Defective controller Defective BCU 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the connection between the BCU and controller. Replace the controller. Replace the BCU. 	CTL
SC 672 (CF)	Controller-to-operation panel communication error at startup	<ul style="list-style-type: none"> After the machine is powered on, the communication between the controller and the operation panel is not established, or communication with controller is interrupted after a normal startup. After startup reset of the operation panel, the attention code or the attention acknowledge code is not sent from the controller. After the controller issues a command to check the communication line with the controller at 30-second intervals, the controller fails to respond twice. 	<ul style="list-style-type: none"> Controller stalled Controller board installed incorrectly Controller board defective Operation panel connector loose or defective 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the condition of the controller board. Check the condition of the operation panel. Replace the controller board. Replace the operation panel. 	B

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 680	BCU/ MUSIC communication error	After the engine CPU sends a message, the Music CPU does not respond within five seconds three consecutive times.	<ul style="list-style-type: none"> • Toner cartridge memory chip loose connection • Memory chip problem • Memory chip cable wiring problem 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check if the toner cartridge is installed correctly. 3. Replace the toner cartridge. 4. Check if the harnesses are not damaged. 5. Replace the BCU. 	
SC 685 (CF)	SBU-IPU communication error	<ul style="list-style-type: none"> • During data transfer, a checksum error occurs. • During any operation except initialization, the SBU sends a hardware-reset acknowledgement to the IPU. 	<ul style="list-style-type: none"> • Scanner unit cable connector loose • SBU board defective • IPU board defective • External noise 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Shut out the external noise. 3. Check the cable connection of the scanner unit. 4. Replace the SBU board. 5. Replace the IPU board. 	B
SC 686 (CF)	BCU-IPU communication error	<ul style="list-style-type: none"> • After the machine is powered on or recovering from the power save mode, timeout occurs during BCU communication. • The break signal is received after the communication is normally established with the BCU. • Timeout occurs while the communication with the BCU is retried after a communication error. 	<ul style="list-style-type: none"> • Board connector between BCU and controller loose • Board connector between controller and bridge board loose • Board connector between bridge board and IPU loose • BCU board defective • IPU board defective • Controller board defective • Bridge board defective 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check the cable connection between the board connector and BCU. 3. Check the cable connection between controller and bridge board. 4. Check the cable connection between bridge board and IPU. 5. Replace the BCU board. 6. Replace the IPU board. 7. Replace the controller board. 8. Replace the bridge board. 	B
SC 687	Memory address command error	The BCU does not receive a memory address command from the controller 60 seconds after paper is in the position for registration.	<ul style="list-style-type: none"> • Loose connection • Defective controller • Defective BCU 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Check if the controller is firmly connected to the BCU. 3. Replace the controller. 4. Replace the BCU. 	



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 690-001	GAVD I2C communication error 690-001: Y 690-002: M 690-003: C 690-004: K	<ul style="list-style-type: none"> The I2C bus device ID is not identified during initialization. A device-status error occurs during I2C bus communication. The I2C bus communication is not established due to an error other than a buffer shortage. 	<ul style="list-style-type: none"> Loose connection Defective BCU Defective LD controller board 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the cable connection. Replace the laser optics housing unit. Replace the BCU board. 	
SC 691 (CF)	Scanner startup error	<ul style="list-style-type: none"> After the machine is powered on or recovering from the power save mode, the scanner ready signal is not verified. 	<ul style="list-style-type: none"> Board connector between controller and bridge board loose Board connector between bridge board and IPU loose IPU board defective Controller board defective Bridge board defective 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the cable connection between controller and bridge board. Check the cable connection between bridge board and IPU. Replace the IPU board. Replace the controller board. Replace the bridge board. 	B
SC 700 (CF)	ARDF original pick-up malfunction	<ul style="list-style-type: none"> After the pick-up motor is turned on, the original stopper HP sensor is not activated. 	<ul style="list-style-type: none"> Original stopper HP sensor defective Pick-up motor defective (not rotating) Timing belt out of position ARDF main board defective 	SC 701	<ol style="list-style-type: none"> Turn the main switch off and on. Replace the HP sensor. Turn the main switch off and on. Replace the pick-up motor. Replace the control board. 	B



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 701 (CF)	ARDF original pick-up/paper lift mechanism malfunction	<ul style="list-style-type: none"> The original pick-up HP sensor is not activated after the pick-up motor is turned on. 	<ul style="list-style-type: none"> Original pick-up HP sensor defective Pick-up motor defective ARDF main board defective 	SC 700	<ol style="list-style-type: none"> Turn the main switch off and on. Replace the pick-up motor. Replace the control board. Replace the HP sensor. 	B
SC 722	Finisher jogger motor error	<ul style="list-style-type: none"> The jogger fences of the finisher do not return to home position within a specific time. The finisher jogger motor does not leave home position within a given time. 	<ul style="list-style-type: none"> Defective jogger H.P. sensor Loose connection Defective jogger motor 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the connection of jogger H.P. sensor and jogger motor connectors Replace the jogger H.P. sensor. Replace the jogger motor. 	
SC 724	Finisher staple hammer motor error	Stapling does not finish within 150 ms after the staple hammer motor turns on.	<ul style="list-style-type: none"> Staple jam Loose connection Overload caused by stapling too many pages Defective staple hammer motor 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the staple hammer motor connector is properly connected. Check if the staple jam occurs. Replace the staple hammer motor. 	
SC 725	Finisher stack feed-out motor error	The stack feed-out belt H.P. sensor does not activate within a specified time after the stack feed-out motor turns on.	<ul style="list-style-type: none"> Defective stack feed-out H.P. sensor Loose connection Stack feed-out motor overload Defective stack feed-out motor 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the connectors of the stack feed-out H.P. sensor and motor are properly connected. Replace the stack feed-out H.P. sensor. Replace the stack feed-out motor. 	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 726	Finisher shift tray 1 lift motor error	<ul style="list-style-type: none"> The upper stack height 1 sensor is activated consecutively (detecting paper) for 15 seconds after the shift tray starts moving up. The upper stack height sensor 1 is deactivated consecutively (not detecting paper) for 15 seconds after the shift tray starts moving down. When the upper tray moves from lower paper exit to the upper paper exit, the upper stack height 1 sensor is activated. 	<ul style="list-style-type: none"> Loose connection Defective upper stack height 1 sensor Defective shift tray 1 lift motor Motor overload 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the connectors of the sensor and motor are properly connected. Replace the upper stack height 1 sensor. Replace the shift tray 1 lift motor. 	
SC 727	Finisher stapler rotation motor error	The stapler cannot return to its home position within a specified time after the stapler rotation motor starts rotating.	<ul style="list-style-type: none"> Loose connection Defective stapler rotation motor Motor overload 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the stapler rotation motor connector is properly connected. Replace the stapler rotation motor. 	
SC 729	Finisher punch motor error	The punch home position is not detected within 250 ms after the punch clutch turns on.	<ul style="list-style-type: none"> Loose connection Defective punch H.P. sensor Defective punch clutch Defective punch hole motor 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the connectors of sensor, clutch and/or motor are properly connected. Replace the punch H.P. sensor. Replace the punch clutch. Replace the punch hole motor. 	
SC 730	Finisher stapler motor error	The stapler home position is not detected within a specified time after the staple motor turns on.	<ul style="list-style-type: none"> Loose connection Defective stapler H.P. sensor Defective stapler motor 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the connectors of the sensor and motor are properly connected. Replace the stapler H.P. sensor. Replace the stapler motor. 	

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 731	Finisher exit guide plate motor error	The exit guide plate open sensor is not activated within a specified time after the exit guide plate motor turns on.	<ul style="list-style-type: none"> Loose connection Defective exit guide plate open sensor Defective exit guide plate motor 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the connectors of the sensor and motor are properly connected. Replace the exit guide plate open sensor. Replace the exit guide plate motor. 	
SC 732	Finisher tray 1 shift motor error	Tray 1 home position is not detected within a specified time after the tray 1 shift motor turns on.	<ul style="list-style-type: none"> Loose connection Defective tray shift 1 sensor Defective tray 1 shift motor 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the connectors of the sensor and motor are properly connected. Replace the tray shift 1 sensor. Replace the tray 1 shift motor. 	
SC 733	Finisher tray 2 lift motor error	<ul style="list-style-type: none"> The lower stack height 1 sensor is activated consecutively (detecting paper) for 15 seconds after the shift tray starts moving up. The lower stack height sensor 1 is deactivated consecutively (not detecting paper) for 15 seconds after the shift tray starts moving down. 	<ul style="list-style-type: none"> Loose connection Defective lower stack height 1 sensor Defective tray 2 lift motor Motor overload 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the connectors of the sensor and motor are properly connected. Replace the lower stack height 1 sensor. Replace the tray 2 lift motor. 	
SC 734	Finisher tray 2 shift motor error	Tray 2 home position is not detected within a specified time after the tray 2 shift motor turns on.	<ul style="list-style-type: none"> Loose connection Defective tray shift 2 sensor Defective tray 2 shift motor 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the connectors of the sensor and motor are properly connected. Replace the tray shift 2 sensor. Replace the tray 2 shift motor. 	



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 804 (CF)	Video input incomplete (K)	<ul style="list-style-type: none"> The scanner is requested to transfer video data, but does not issue the video transmission end command within the defined time. 	<ul style="list-style-type: none"> Board connector between controller and bridge board loose Board connector between bridge board and IPU loose IPU board defective Controller board defective Bridge board defective 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the cable connection between controller and bridge board. Check the cable connection between bridge board and IPU. Replace the IPU board. Replace the controller board. Replace the bridge board. 	B
SC 805 (CF)	Video input incomplete (Y)					
SC 806 (CF)	Video input incomplete (M)					
SC 807 (CF)	Video input incomplete (C)					
SC 808 (CF)	Video input incomplete (R)					
SC 809 (CF)	Video input incomplete (G)					
SC 810 (CF)	Video input incomplete (B)					
SC 818	Watch-dog error	While the system program is running, other processes do not operate at all.	<ul style="list-style-type: none"> Defective controller Software error 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the controller. See NOTE 1 at the end of the SC table 	CTL
SC 819	Fatal error					
[696E]	Process error	System completely down	<ul style="list-style-type: none"> Defective RAM DIMM Defective ROM DIMM Defective controller Software error 		<ol style="list-style-type: none"> Turn the main switch off and on. Check and/or replace the RAM DIMM. Check and/or replace the ROM DIMM. Replace the controller. See NOTE at the end of the SC table. 	CTL
[766D]	Memory error	Unexpected system memory size				



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC820	Self-diagnostics error: CPU [XXXX]: Detailed error code					
[0001] to [06FF]	CPU error	During the self-diagnostic, the controller CPU detects an error. There are 47 types of error code (0001 to 4005) depending on the cause of the error. The CPU detects an error and displays the specific error code with the program address where the error occurs).	<ul style="list-style-type: none"> • System firmware problem • Defective controller 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Reinstall the controller system firmware. 3. Replace the controller. <p>When the problem cannot be fixed with the above procedure, the following information displayed on the screen needs to be fed back to a technical support center.</p> <ul style="list-style-type: none"> • SC code • Detailed error code • Program address 	CTL
[0702] [0709] [070A]	CPU/Memory Error		<ul style="list-style-type: none"> • System firmware problem • Defective RAM-DIMM • Defective controller 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Reinstall the controller system software. 3. Replace the RAM-DIMM. 4. Replace the controller. 	CTL
[0801] to [4005]	CPU error	Same as [0001]				CTL
SC 821 [0D05]	Self-diagnosis error: ASIC	The CPU checks if the ASIC timer works properly compared with the CPU timer. If the ASIC timer does not function in the specified range, this SC code is displayed.	<ul style="list-style-type: none"> • System firmware problem • Defective RAM-DIMM • Defective controller 		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. Reinstall the controller system firmware. 3. Replace the RAM-DIMM. 4. Replace the controller board. 	CTL

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC822	Self-diagnostic error: HDD (Hard Disk Drive) [XXXX]: Detailed error code					
[3003]	Timeout error	When the main switch is turned on or starting the self-diagnostic, the HDD stays busy for the specified time or more.	<ul style="list-style-type: none"> Loose connection Defective HDD Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Check that the HDD is properly connected to the controller. Replace the HDD. Replace the controller. 	CTL
[3004]	Command error					
SC 823	Self-diagnostic error: NIB [XXXX]: Detailed error code					
[6101]	MAC address check sum error	The result of the MAC address check sum does not match the check sum stored in ROM.	<ul style="list-style-type: none"> Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the controller. 	CTL
[6104]	PHY IC error	The PHY IC on the controller cannot be properly recognized.				
[6105]	PHY IC loop-back error	An error occurred during the loop-back test for the PHY IC on the controller.				
SC 824 [1401]	Self-diagnosis error: Standard NVRAM	The controller cannot recognize the standard NVRAM installed or detects that the NVRAM is defective.	<ul style="list-style-type: none"> Loose connection Defective standard NVRAM Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the standard NVRAM is firmly inserted into the socket. Replace the NVRAM. Replace the controller. 	CTL
SC 826 (CF)	Self-diagnostic Error: RTC/ Optional NVRAM	<ul style="list-style-type: none"> An RTC device is recognized, and the difference between the RTC device and the CPU exceeds the defined limit. No RTC device is recognized. 	<ul style="list-style-type: none"> RTC defective NVRAM without RTC installed Backup battery discharged 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the NVRAM with another NVRAM with an RTC device. 	B



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 827	Self-diagnostic error: Standard SRAM DIMM [XXXX]: Detailed error code					
[0201]	Verification error	Error detected during a write/verify check for the standard RAM (SRAM DIMM).	<ul style="list-style-type: none"> Loose connection Defective SRAM DIMM Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the SRAM DIMM. Replace the controller. 	CTL
SC 828	Self-diagnostic error : ROM [XXXX]: Detailed error code					
[0101]	Check sum error 1	The boot monitor and OS program stored in the ROM DIMM is checked. If the check sum of the program is incorrect, this SC code is displayed.	<ul style="list-style-type: none"> Defective ROM DIMM Defective controller 		<ol style="list-style-type: none"> Turn the main switch on and off. Replace the ROM DIMM Replace the controller. 	CTL
[0104]	Check sum error 2	All areas of the ROM DIMM are checked. If the check sum of all programs stored in the ROM DIMM is incorrect, this SC code is displayed.				
[0105]	ROM error	The ROM DIMM is not of the recognized type.				
SC829	Self-diagnosis error: optional RAM [XXXX]: Detailed error code					
[0302]	Composition error (Slot 0)	The result of checking the composition data of the RAM in Slot 0 (CN5) on the controller is incorrect.	<ul style="list-style-type: none"> Not specified RAM DIMM installed Defective RAM DIMM 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the RAM DIMM. Replace the controller board. 	CTL
[0401]	Verification error (Slot 1)	The data stored in the RAM in Slot 1 does not match the data when reading.				
[0402]	Composition error (Slot 1)	The result of checking the composition data of the RAM in Slot 1 (CN6) on the controller is incorrect.				

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 833 [0F21]	Self-diagnostic error: I/F error	The controller detects that the BCU is not properly connected.	<ul style="list-style-type: none"> Loose connection Defective controller Defective BCU 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the connection between the BCU and controller. Replace the controller. Replace the BCU. 	CTL
SC 835	Self-diagnosis error: Centronics interface [XXXX]: Detailed error code					
[1102]	Verification error	The controller detects that the loop-back connector is not properly connected.	<ul style="list-style-type: none"> Loose connection Defective loop-back connector Defective Centronics connector Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the connection between the Centronics connector and loop-back connector. Reconnect the loop-back connector. Replace the controller. 	CTL
[110C]	DMA verification error	A DMA data abnormality is detected even when the loop-back connector is properly set.				
[1120]	Loop-back connector error	The loop-back connector is not set when starting the detailed self-diagnostics.				
SC 836 [1601]	Self-diagnosis error: Font ROM (standard)	The data in the font ROM (standard ROM-DIMM) is damaged. .	<ul style="list-style-type: none"> Defective standard ROM-DIMM 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the standard ROM-DIMM. 	CTL
SC 837 [1602]	Self-diagnosis error: Font ROM (option)	The data in the font ROM (optional ROM-DIMM) is damaged.	<ul style="list-style-type: none"> Defective optional ROM-DIMM 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the optional ROM-DIMM. 	CTL
SC 850	Network interface error	The network is unusable.	<ul style="list-style-type: none"> Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the controller. 	CTL
SC 851	IEEE1394 interface error	The 1394 interface is unusable.	<ul style="list-style-type: none"> Defective IEEE1394 Defective controller. 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the IEEE1394 interface board. Replace the controller. 	CTL
SC 853	Wireless LAN card not detected	The wireless LAN card is not detected before communication is established, though the wireless LAN board is detected.	<ul style="list-style-type: none"> Loose connection 	SC 854	<ol style="list-style-type: none"> Check the connection. 	



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 854	Wireless LAN card not detected	The wireless LAN card is not detected after communication is established, though the wireless LAN board is detected.	<ul style="list-style-type: none"> Loose connection 	SC 853	1. Check the connection.	
SC 855	Wireless LAN card error	An error is detected in the wireless LAN card.	<ul style="list-style-type: none"> Loose connection Defective wireless LAN card 		<ol style="list-style-type: none"> Check the connection. Replace the wireless LAN card. 	
SC 856	Wireless LAN card error	An error is detected in the wireless LAN board.	<ul style="list-style-type: none"> Defective wireless LAN board Loose connection 		<ol style="list-style-type: none"> Check the connection. Replace the wireless LAN board. 	
SC 857	USB interface error	The USB interface cannot be used due to a driver error.	<ul style="list-style-type: none"> Defective USB driver Loose connection 		<ol style="list-style-type: none"> Check the connection. Replace the controller. 	
SC 860	HDD: Initialization error	The controller detects that the hard disk fails.	<ul style="list-style-type: none"> HDD not initialized Defective HDD 		<ol style="list-style-type: none"> Turn the main switch off and on. Reformat the HDD. Replace the HDD. 	CTL
SC 861	HDD: Reboot error	The HDD does not become ready within 30 seconds after the power is supplied to the HDD.	<ul style="list-style-type: none"> Loose connection Defective cables Defective HDD Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the connection between the HDD and controller. Check and replace the cables. Replace the HDD. Replace the controller. 	CTL
SC 863	HDD: Read error	The data stored in the HDD cannot be read correctly.	<ul style="list-style-type: none"> Defective HDD Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the HDD. Replace the controller. 	CTL
SC 864	HDD: CRC error	While reading data from the HDD or storing data in the HDD, data transmission fails.	<ul style="list-style-type: none"> Defective HDD 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the HDD. 	CTL
SC 865	HDD: Access error	An error is detected while operating the HDD.	<ul style="list-style-type: none"> Defective HDD 		<ol style="list-style-type: none"> Turn the main switch off and on. Replace the HDD. 	CTL



SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 900	Electric counter error	Abnormal data is stored in the counters.	<ul style="list-style-type: none"> Defective NVRAM Defective controller 		<ol style="list-style-type: none"> Turn the main switch off and on. Check the connection between the NVRAM and controller. Replace the NVRAM. Replace the controller. 	CTL
SC 990	Software performance error	The software makes an unexpected operation.	<ul style="list-style-type: none"> Defective software Defective controller Software error 		<ol style="list-style-type: none"> Turn the main switch off and on. Reinstall the controller and/or engine main firmware. See NOTE 1 at the end of the SC table. 	CTL
SC 997 (CF)	Application function selection error	<ul style="list-style-type: none"> The application selected by the operation panel key does not start or ends abnormally. 	<ul style="list-style-type: none"> Software (including the software configuration) defective An option required by the application (RAM, DIMM, board) is not installed 	SC 998	<ol style="list-style-type: none"> Check the devices necessary for the application program. If necessary devices have not been installed, install them. Check that application programs are correctly configured. Take necessary countermeasures specific to the application program. If the logs can be displayed on the operation panel, see the logs. 	B
SC 998	Application start error	No applications start within 60 seconds after the power is turned on.	<ul style="list-style-type: none"> Loose connection of RAM-DIMM, ROM-DIMM Defective controller Software problem 		<ol style="list-style-type: none"> Turn the main switch off and on. Check if the RAM-DIMM and ROM-DIMM are properly connected. Reinstall the controller system firmware. Replace the controller. 	CTL

SC No.	Item	Definition	Possible Cause	Related SCs	Troubleshooting Procedure	Type
SC 999 (CF)	Program download error	<ul style="list-style-type: none"> • The download (program, print data, language data) from the IC card does not execute normally. 	<ul style="list-style-type: none"> • Board installed incorrectly • Engine board defective • IC card defective • Incorrect IC card used (machine type/model, card version) • NVRAM defective • Loss of power during downloading <p>NOTE 1: This error is not logged because the error occurs in the download mode (different from the normal operation mode).</p> <p>NOTE 2: If the machine loses power while downloading, or if the download does not normally end for some other reason, this could damage the controller board or the target PCB of the downloading and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced.</p>		<ol style="list-style-type: none"> 1. Turn the main switch off and on. 2. If you can download necessary programs, do it by using an appropriate card. 3. If you cannot download necessary programs, use the special card and tool for downloading or replace the board having been used for the unsuccessful downloading. 	B

NOTE 1: If a problem always occurs in a specific condition (for example. printer driver setting, image file), the problem may be caused by a software error. In this case, the following data and information needs to be sent back to your product specialist.

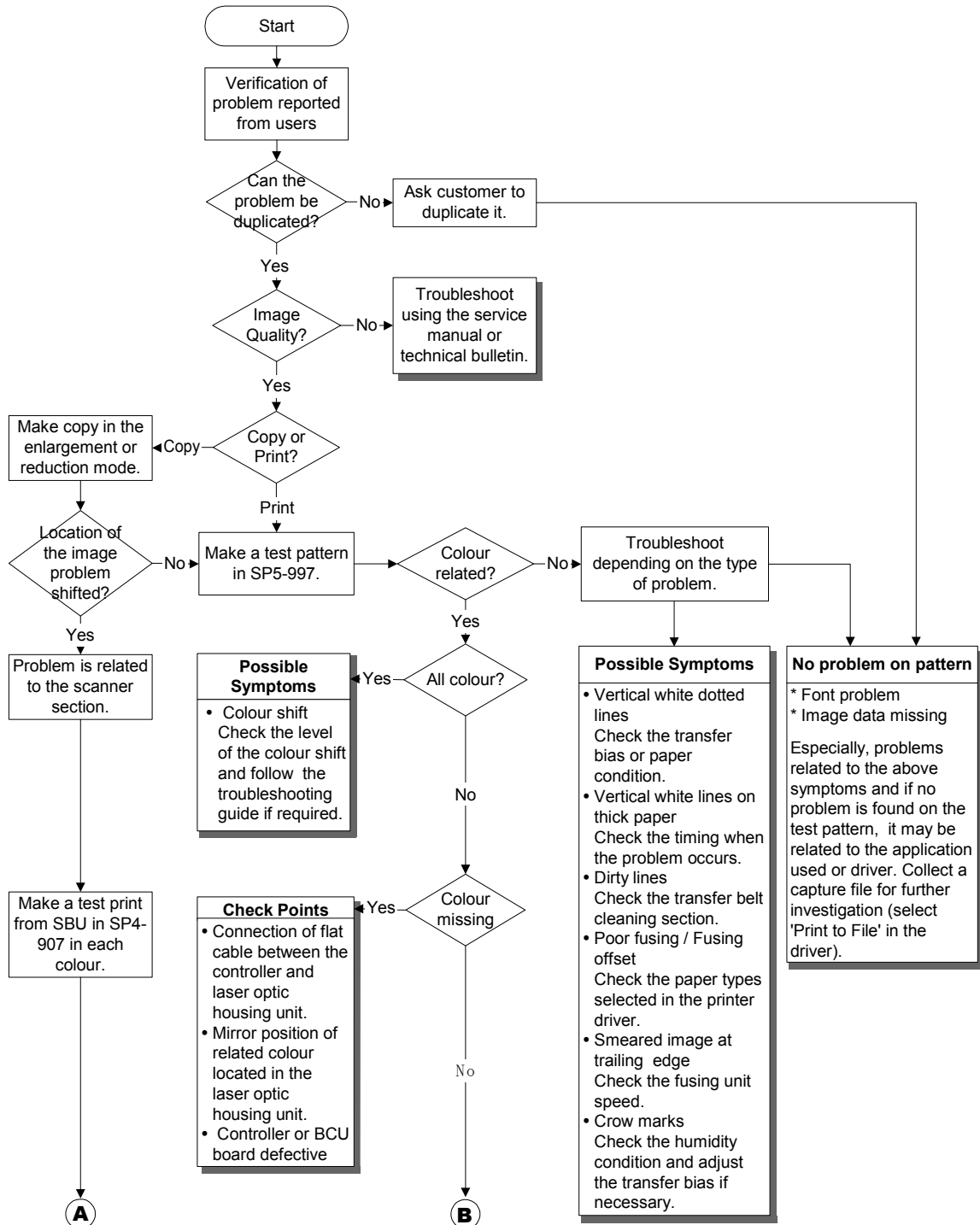
- Symptom / Possible Causes / Action taken
- Summary sheet (SP mode '1 Service/Printer SP', SP1-004 [Print Summary])
- SMC - All (SP5-990-002)
- SMC - Logging (SP5-990-004)
- Printer driver settings used when the problem occurs
- All data displayed on the screen (SC code, error code, and program address where the problem is logged.)
- Image file which causes the problem, if possible

4.4 TROUBLESHOOTING GUIDE

4.4.1 IMAGE QUALITY

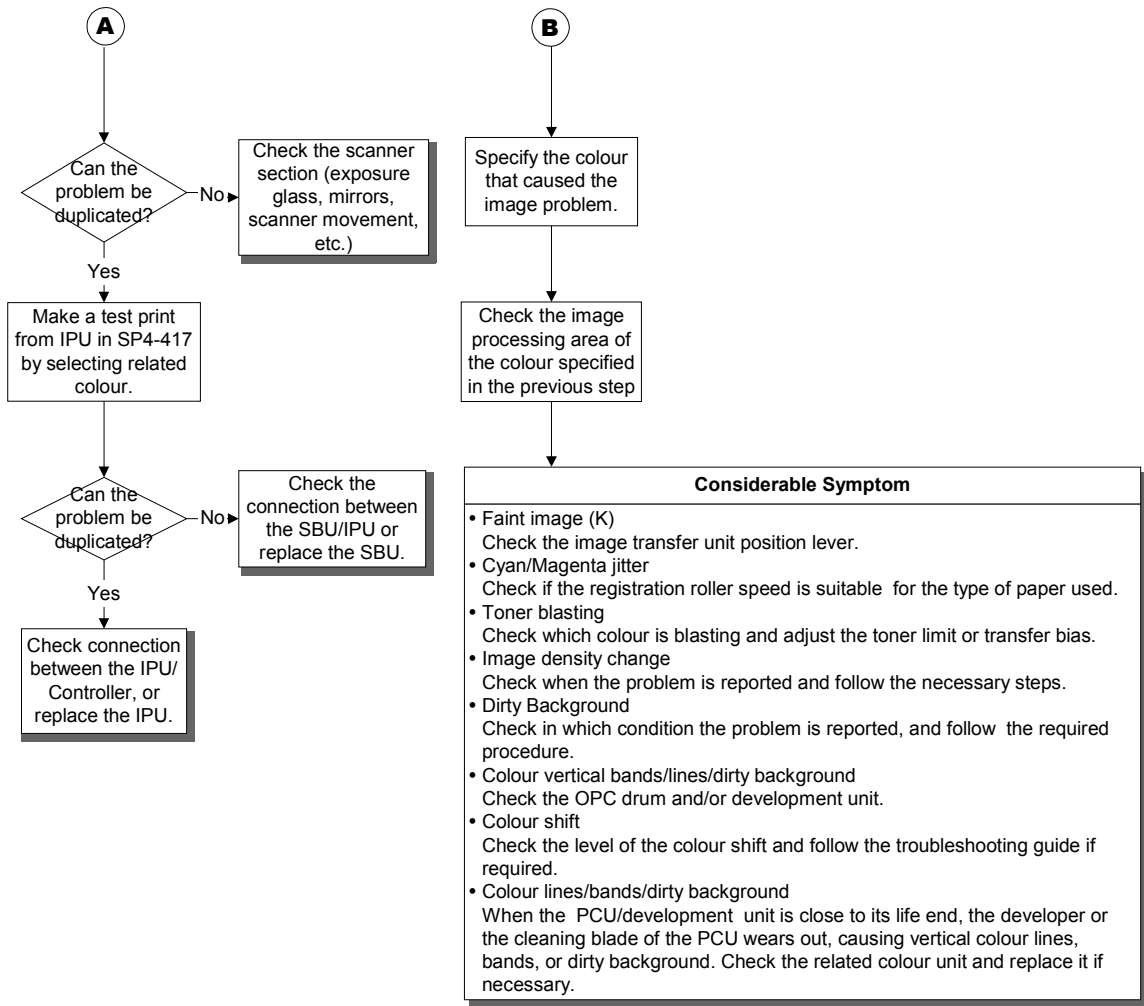
Work-flow

The following work-flow shows the basic troubleshooting steps for the considerable image quality problems on this product.



G080T912.WMF

(From previous page)



G080T913.WMF

Detailed Explanation

The table below shows the troubleshooting procedure for the considerable image problems.

Subject	Symptom	Cause	Action
Symptoms not related to color			
Vertical white dotted lines	If the paper transfer bias is excessive for the paper type used in the low humidity condition, vertical white dotted lines may appear.	In the low humidity condition, the electrical resistance of paper tends to increase. Excessive paper transfer bias may cause electrical leak, causing vertical white lines.	<ul style="list-style-type: none"> • Check if the optional heater has been installed in the paper tray and it is activated. • Customize (decrease) the paper transfer current for the related mode (SP2-301).
Vertical white lines	In high temperature and humidity conditions, vertical white lines may appear in halftone areas on thick paper after multiple prints of the same image.	In this condition, the drum sensitivity tends to drop. Since the image transfer efficiency differs between plain and thick paper, sensitivity drop may cause changes in image transfer efficiency on thick paper, causing vertical white lines.	The drum sensitivity recovers, and this symptom disappears after waiting for about 5 minutes after this symptom has been observed.
Dirty lines/bands or background on 2nd side		The cleaning blade of the transfer belt cleaning may be worn away or damaged when the transfer belt cleaning unit becomes close to its life (500KP).	Check and replace the transfer belt-cleaning unit.
Poor fusing / Fusing offset		The type of paper selected in the printer driver does not match the paper type used for printing, causing the fusing temperature not to be controlled for the paper used.	Please instruct users to select the correct paper type in the printer driver.
Smeared image	When making prints of an original with a solid image near the trailing, a smeared image may appear.	The paper's trailing edge tends to flip up and come very close to the fusing belt after it passes the paper transfer unit. The static electricity built up on the fusing belt may cause toner to move, resulting in the smeared image. This is most noticeable with 600x600dpi printing.	Please instruct users to select 1200x600 or 1200x1200dpi.

Subject	Symptom	Cause	Action
Crow marks	When making duplex prints in low temperature and humidity conditions, crow marks may appear on black images, especially in halftone areas on the 2 nd side.	A charge is applied to the paper at each color station in order to attract each toner onto the paper. Therefore, the initial toner colors will receive multiple charging as they pass each station, which increases the attractive force between the toner and paper. Since black is the last toner to be applied, the attractive force between it and the paper is lowest. Black toner moves on the paper during transport to the fusing section, due to discharge from the toner to the surrounding guide plates.	Using SP2-301 (Transfer Current), increase the paper transfer current for black in the mode in which the problem occurs. NOTE: White dotted lines may appear on outputs if the transfer current is increased too much. Therefore, after adjusting the transfer current, it is necessary to check the results by making a solid or halftone image in duplex mode.
Symptoms related to color			
Faint image (black)	Only black becomes lighter.	The transfer belt position is not in the correct position.	Check the transfer belt unit position and/or the transfer belt unit release lever.
Magenta and/or cyan jitter	Magenta jitter may appear at 67 mm and/or cyan jitter at 165 mm from the trailing edge.	If the registration roller speed is too fast for the paper types used, the shock when the trailing edge has just passed the registration roller generates vibration, causing the jitter. This may appear especially when using thick paper because of its stiffness.	Adjust the registration roller speed depending on the paper types and/or mode selected. SP1-004-4: Normal paper (1200 dpi) SP1-004-5: Normal paper (600 dpi) SP1-005-3: Thick paper (1200 dpi) If SP1-005-3 cannot improve the level even when setting it to "-1.0", follow the procedure below. 1. Set SP1-005-3 to "-1.0". 2. Print the samples by adjusting SP1-004-4 from 100% (-0.2% to -0.8%). After adjusting SP1-004-4, check the image quality also with normal paper in the 1200 dpi mode. Readjust it so that the image quality level is acceptable for both thick and normal paper if necessary.

Subject	Symptom	Cause	Action
Toner blasting (1)	Toner may blast, causing smeared text characters and/or lines in 2C or process black mode (depending on the PDL setting or type of paper used.)	An excessive amount of toner is used for development.	<p>Change the toner limit setting in SP mode.</p> <ul style="list-style-type: none"> • If toner blasted images appear for text or lines in 2C, decrease the setting for Text from 190% to 150 - 170%. • If toner blasted images for text and lines recognized as pure image data (i.e. not processed as text/line data), decrease the setting for Photo from 260% to 170 - 190%. <p>NOTE: If the toner limit is lowered too much, it may cause the density of shadow areas to be not smooth.</p>
Toner blasting (2)	Black toner may blast on the 2nd side of paper under the low temperature.	Black toner moves on the paper during transport to the fusing section, due to discharge from the toner to the surrounding guide plates.	<p>Increase the paper transfer current in SP data from the default setting to a recommended value depending on the mode selected as shown below.</p> <p>SP2-301-3 ([K] 125mm/sec): "16" to "21" SP2-301-4 ([K] 180mm/sec): "27" to "32" SP2-301-16 ([FC, K] 125mm/sec): "9" to "13" SP2-301-17 ([FC, K] 180mm/sec): "15" to "20"</p> <p>NOTE: If the toner limit is lowered too much, it may cause the density of shadow areas to be not smooth.</p>
Image density change (1)	When the machine is tuned on in the morning (having been unused for a while), the ID of the initial outputs may be relatively low or high, in which case the machine needs to compensate by raising or lowering the ID during machine operation.	When the machine is off, the environmental conditions can begin to affect the machine's development capability. When the main switch is tuned on, the machine starts a process control self-check and adjusts the development parameters to achieve the proper development potential gap without adjusting the toner concentration. Over the course of the print operation, the ID will then get closer and closer to the target level.	<p>If this is often pointed out by users who are very particular about image density, turn on Auto TD Adjustment (SP3-125-003) as a solution.</p> <p>NOTE: It takes about 5 minutes to complete the self-check.</p>

Subject	Symptom	Cause	Action
Image density change (2)	Image density is too low or high.	If the machine has never been turned off and Energy Saver 2 (Auto Off mode) is disabled, the machine has never performed the initial process control self-check, causing the image density to become low or high.	<p>Change the settings of the following SP modes:</p> <p>SP3-906-003 Non-use Time 1 0 (Default) to 500</p> <p>SP3-906-004 Non-use Time 2 30 (Default) to 480</p> <ul style="list-style-type: none"> • If Energy Saver 1 is activated (Default: Off), the non-use time process control self-check will not function. Therefore, make sure that Energy Saver 1 is Off (SP5-101-3 or UP mode). • With the above setting, the self-check automatically starts after 500 prints and after no prints have been made for 480 minutes (8 hours). Based on the average daily printing volume of 500 prints, self-check would be performed first thing every morning. These settings are suitable for machines, which are used during the day and then kept On in Ready status throughout the night. Therefore, this SP mode should be set based on the particular way the customer uses the printer.
Dirty background	Dirty background may continuously appear on the left side (relative to paper feed) under very low temperature and humidity conditions.	When the developer has deteriorated or when prints are made in a very low humidity condition, dirty background may appear continuously.	<p>Perform forced toner refresh mode (SP3-921-001 or 002).</p> <p>The machine automatically does this in the following sequence. (It takes about 20 minutes to complete this mode.)</p> <ol style="list-style-type: none"> 1. Consumes toner in the development unit without toner supply until toner end is detected. 2. Starts toner recovery mode. 3. Starts process control self-check. <p>NOTE: It takes about 20 minutes to complete this mode, to prevent carrier flowing out.</p>

Subject	Symptom	Cause	Action
Color Shift	Color shift level is out of the adjustment standard.	The adjustment standard on this product is "maximum 180 μm ". The color shift level may change depending on a type of paper used.	Check the level of the color shifts reported from user and follow the troubleshooting procedure described in section 4- if necessary.
Color missing	Color(s) is missing on the outputs.	<ul style="list-style-type: none"> • The position of 3rd mirror moves due to the rough transportation of service part; and then, becomes out of position. • Flat cable(s) is not properly connected to the BCU board. 	<ul style="list-style-type: none"> • When replacing the laser optic housing unit due to any reason, make a color demo page in the UP mode. If color(s) is missing, open the unit and reposition the mirror(s). • Reconnect the flat cable(s) firmly.

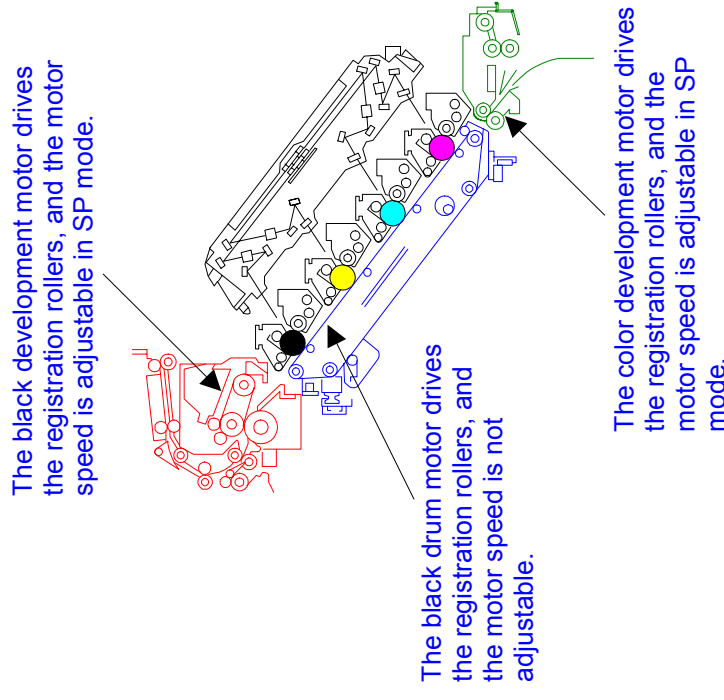
4.4.2 COLOR SHIFT

The following briefly explain the factors causing color shifts and what to do on the machine to correct it:

- Temperature change causes the optical components in the laser optics housing unit to contract, causing the main scan magnification to change. To correct the line position, the machine automatically does the line position adjustment when the temperature changes by 5°C since the last position adjustment. If the line position adjustment functions properly, no color shift occurs. If the line position adjustment fails (result: SP5-993-007), color lines may shift anywhere on the outputs.
- The process speed at each stage (registration roller, transfer belt, and fusing belt/roller) affects the paper transport speed. If the paper transport speed changes during image transfer of a color, the color line being transferred shifts with respect to the color line already transferred to the paper. The registration roller speed (adjusted by color development motor speed) and fusing belt/roller speed (adjusted by black development motor speed) are adjusted by the manufacturer.

Paper speed may slightly change due to the type of paper used or after replacing the parts related to the drive sections of the registration section, transport unit, and fusing unit. (After replacing the fusing unit, the speed adjustment should be done in the User Program mode.) Also, the position where color shift occurs depends on which section starts moving at the incorrect speed.

- Paper skew directly affects the color shift between the front and rear sides. There are several factors. One of them is the position of the side fences.



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As explained on the previous page, there are several types of color shift problem. The following table shows the symptoms, factors, action required, and the page to see for details.

	Symptom	Factors	Action Required	Refer to #
1	Color shift on entire image in main-scan and/or sub-scan directions	<ul style="list-style-type: none"> Line position adjustment does not function properly. Transfer belt unit has just been replaced. 	<ul style="list-style-type: none"> Check the result of the line position adjustment (SP5-993-007) and solve the problem if an error was detected. Check which color lines are shifted from black line and adjust the SP modes for registration and magnification. 	Page 4-4 Main-scan Page 4-56/57 Sub-scan Page 4-54/55 Transfer Unit Page 4-60
2	Color shifts only at the leading edge area (sometimes causing shock jitter, magenta or cyan lines)	Registration roller speed is not appropriate.	Adjust the color development motor speed (SP1-004-4, 5, and SP1-005-003) depending on the process speed.	Page 4-54
3	Color shifts only at the trailing edge area	Fusing belt/roller speed is not appropriate.	Adjust the black development motor speed (SP1-004-001, 002, and 007, or "Fuser Adjust" in the User Program mode) depending on the process speed.	Page 4-54
4	Color shifts between the front and rear sides	Paper skew on transfer belt <ul style="list-style-type: none"> Side fences are not properly set. Pressure between the paper attraction roller and transfer belt is not even at the front and rear sides. 	Reposition the side fences. Reposition the paper attraction roller unit.	Page 4-57

Adjustment Standard: Max. 180 μ m

As a machine capability, the maximum amount of color shift is 180 μ m. Adjusting the SP modes (motor speed, registration, and magnification) can improve the color shifts level; however, there is a limit.

Preparation

When color shift is reported, the following procedure should be done before adjusting the machine and/or SP modes.

NOTE: The line position adjustment cannot correct the color shift if the gap between the color lines is 2 mm or greater. In this case, restore the factory settings in the following SP modes and perform the line position adjustment. Then, follow the troubleshooting procedure if required.

- Main-scan Registration SP2-909-01 to 04
- Sub-scan Registration SP2-916-01 to 10
- Main-scan Magnification SP2-103-55 to 59

1. Print out the SMC sheets (SP5-990-002).
2. Do the forced line position adjustment (SP5-993-002 or 'Auto Adjust' in the User Program mode).
NOTE: Make sure that the result (SP5-993-007) is "0101". If not, solve the problem by referring to pages 4-2 and 4-3.
3. Print a 1-dot grid pattern using A3/11" x 17" paper. Refer to the following table for the detailed SP mode settings.

Mode	SP5-997 (Test Pattern) Setting				
	Tray selection	Pattern	Color mode	Resolution	Paper size (By-pass)
Normal, color, 600 dpi	2	05	Full Color	600x600	—
Normal, color, 1200 dpi	2	05	Full Color	1200x1200	—
Thick paper	0	05	Full Color	1200x1200	A3 / 11x17

NOTE: When making prints on thick paper from the by-pass tray, the type of paper should be selected in the User Program mode. Any adjustment needs to be done by using the type of paper that the customer normally uses.

4. Check the tendency of color shift in the grid pattern printed in step 3. Sometimes, a magnification scope must be used to measure the amount of color shift between colors.
5. Take the required action explained in each section depending on the type of color shift.
6. Do the 'Auto Adjust' in the User Program mode after the adjustment is done in step 5, and check the result.
7. Repeat steps 3 to 6 until the color shift is acceptable.

Direction	Area	Symptom	Possible Cause	Action Required		Procedure / Remarks	
				Output Mode	SP Mode		
Sub-scan	Leading edge	Color shift, especially 100 mm from the leading edge. (Refer to pattern 1 on page 4-57 for the symptom.)	Registration roller speed is not suitable for the paper used.	Normal Paper 1200 dpi	SP1-004-004	Check the magenta line position against the black line. If the registration roller is too fast or slow, the magenta line appears above or below the black line. Above: Speed is too fast: Decrease speed Below: Speed is too slow: Increase Speed When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this until the shift between magenta and black is minimized. NOTE: If the registration roller is too fast, magenta jitter may appear at 67 mm and/or cyan jitter at 165 mm from the trailing edge. This is caused by the mechanical shock when the trailing edge of the paper passes the registration rollers.	
				Normal Paper 600 dpi	SP1-004-005		
				Thick Paper 1200 dpi (by-pass feed)	SP1-005-003		
	Trailing edge	Trailing edge	Color shift, especially 100 mm from the trailing edge. (Refer to pattern 2 on page 4-57 for the symptom.)	Fusing roller speed is not suitable for the paper used.	Normal Paper 1200 dpi	SP1-004-001	Check the magenta line position against the black line. If the fusing roller is too fast or slow, the magenta line appears above or below the black line. Above: Speed is too fast: Decrease speed Below: Speed is too slow: Increase Speed When adjusting the speed, change the setting in 0.1 steps, and check the result by printing the grid pattern. Then, repeat this step until the shift between magenta and black is minimized. NOTE: Fusing roller speed can be adjusted with 'Custom Adjust' in Fuser Adjust in the User Program Mode, instead of with SP mode.
					Normal Paper 600 dpi	SP1-004-002	
					Thick Paper 1200 dpi (by-pass feed)	SP1-004-007	

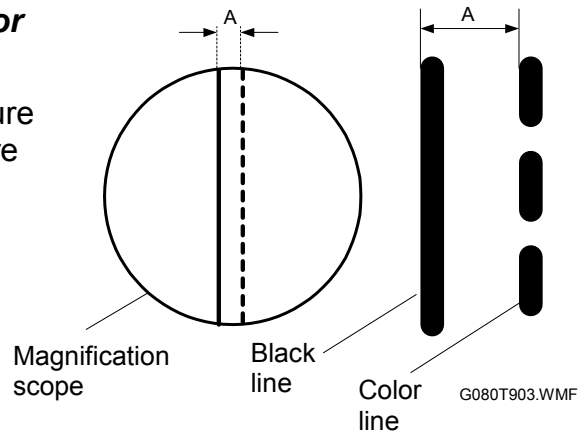
Direction	Area	Symptom	Possible Cause	Action Required		Procedure / Remarks
				Output Mode	SP Mode	
Sub-scan	Entire image	Color shift on the entire image, and the amount of shift from leading to trailing edge is almost the same.	SP mode setting is not suitable for the paper used.	Normal Paper 600 dpi	SP5-993-016 (Y) SP5-993-017 (M) SP5-993-018 (C)	Measure the gap between the black line and other colors (YMC) using a magnification scope. Convert the measured value from [μm] to [dots] with the following formula. Then, add or subtract the calculated dot value in the SP mode. Correction [dots] = Measured value [μm] / 21.2 or 42.4 600 dpi mode: 1 dot = 42.4 μm 1200 dpi mode: 1 dot = 21.2 μm If color (YMC) has shifted up in relation to black, add the above value to the current value. If color (YMC) has shifted down in relation to black, subtract the above value from the current value. Examples <ul style="list-style-type: none"> • If the magenta line has shifted up in relation to black by 40μm in 600dpi mode, add 1 to the current setting of SP5-993-017. Correction [dots] = +(40/42.4) = Approx. +1 • If the magenta line has shifted down in relation to black by 70μm in 600dpi mode, subtract 2 from the current setting of SP5-993-17. Correction [dots] = -(70/42.4) = Approx. -2
				Normal Paper 1200 dpi	SP5-993-019 (Y) SP5-993-020 (M) SP5-993-021 (C)	

Direction	Area	Symptom	Possible Cause	Action Required		Procedure / Remarks
				Output Mode	SP Mode	
Main-scan	Entire image	Color shifts on the entire image, and the amount of shift differs at front, center, and rear. (Refer to pattern 3 on page 4-45 for the symptom.)	Main-scan magnification is not correctly adjusted.	-	SP5-993-013 (Y) SP5-993-014 (M) SP5-993-015 (C)	<p>Measure the gap between the black line and other colors (YMC) using a magnification scope. Convert the measured value [mm] to [%] with the following formula. Then, add or subtract the calculated value in the SP mode</p> <p>Correction [%] = Measured value [mm] / 287 x 10000</p> <p>If the color line is enlarged in relation to black, add the correction value to the current setting.</p> <p>If the color line is reduced in relation to black, subtract the correction value from the current setting.</p> <p>NOTE: Line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode) should be done to check the result after changing the main-scan magnification data. This is because the changes will affect the line position adjustment.</p> <p>Examples</p> <ul style="list-style-type: none"> • If the magenta line is enlarged by 0.1mm in relation to the black line, add "4" to the current setting of SP5-993-014. Correction [%] = (0.1/287) x 10000 = Approx. +4 • If the magenta line is reduced by 0.05 mm in relation to the black line, subtract "2" from the current setting of SP5-993-014. Correction [%] = -(0.05/287) x 10000 = Approx. -2

Direction	Area	Symptom	Possible Cause	Action Required		Procedure / Remarks
				Output Mode	SP Mode	
Main-scan	Entire image	Color shifts on the entire image and amount of shifts is almost the same at front, center, and rear sides. (Refer to pattern 4 on page 4-45 for the symptom.)	Main-scan registration is not correctly adjusted.	-	SP5-993-010 (Y) SP5-993-011 (M) SP5-993-012 (C)	<p>Measure the gap between the black line and other colors (YMC) using a magnification scope. Convert the measured value [μm] to [dots] with the following formula. Then, add or subtract the calculated dot value in the SP mode.</p> <p>Correction [dots] = Measured value [μm] / 21.2</p> <p>If color (YMC) has shifted to the left in relation to black, add the above value to the current setting.</p> <p>If color (YMC) has shifted to the right in relation to black, subtract the above value from the current setting.</p> <p>Examples</p> <ul style="list-style-type: none"> If the magenta line has shifted to the left by 40μm, add 4 to the current setting of SP5-993-011 Correction [dots] = +(40/21.2) = Approx. +2 If the magenta line has shifted to the right by 70μm, subtract 3 from the current setting of SP5-993-011. Correction [dots] = -(70/21.2) = Approx. -3
	Front or rear	The amount of color shift at the front and rear sides becomes gradually bigger toward the trailing edge.	<ul style="list-style-type: none"> Side fence position Transfer belt position 	-	-	<ul style="list-style-type: none"> Check if the side fences of the paper trays are properly positioned. If there is clearance between the paper and the side fences, this causes paper to skew during paper transport. Check if the transfer belt is in correct position, if the tension springs are properly set, or if the paper attraction roller is properly installed.. (☛ 3.7.4 Transfer Belt)

How to measure the gap between color lines

When using a magnification scope, measure the gap [A] between the two lines. Measure from the same place on each line. For example (see the illustration), measure between the left edges of the lines.

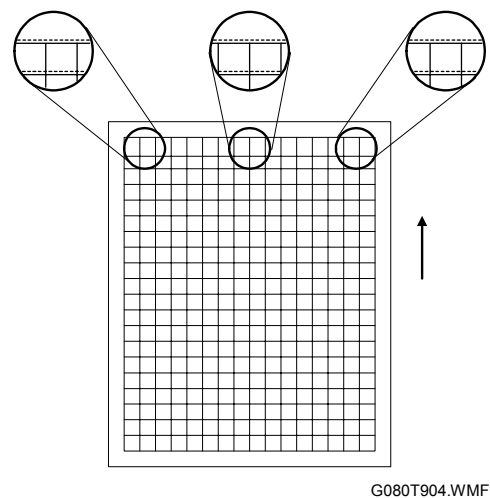


Pattern 1

Color shift in the sub-scan direction at the leading edge

This illustration shows that the colored (dotted) line is above the black line. This means that the registration roller speed is too high for the paper used. Therefore, the registration roller speed needs to be reduced by decreasing the setting (percentage) of SP1-004-004, 005, and SP1-005-003 depending on the mode selected.

- SP1-004-004 Normal paper, Color mode, 1200 dpi (62.5 mm/s)
- SP1-004-005 Normal Paper, Color mode, 600 dpi (125 mm/s)
- SP1-005-003 Thick Paper (62.5 mm/s)

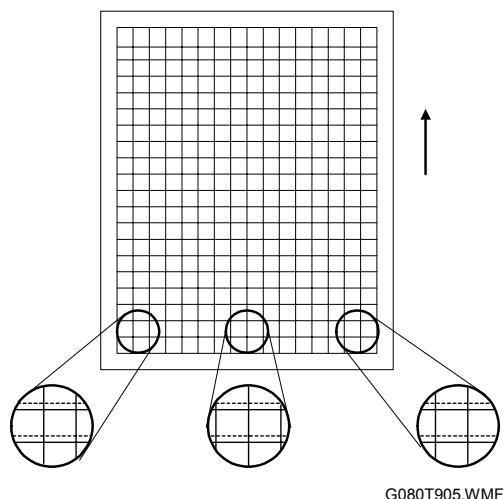


Pattern 2

Color shift in the sub-scan direction at the trailing edge

This illustration shows that the colored (dotted) line is above the black line. This means that the fusing roller speed is too high for the paper used. Therefore, the fusing roller speed needs to be slower by decreasing the setting (percentage) of SP1-004-001, 002, or 007 depending on the mode selected.

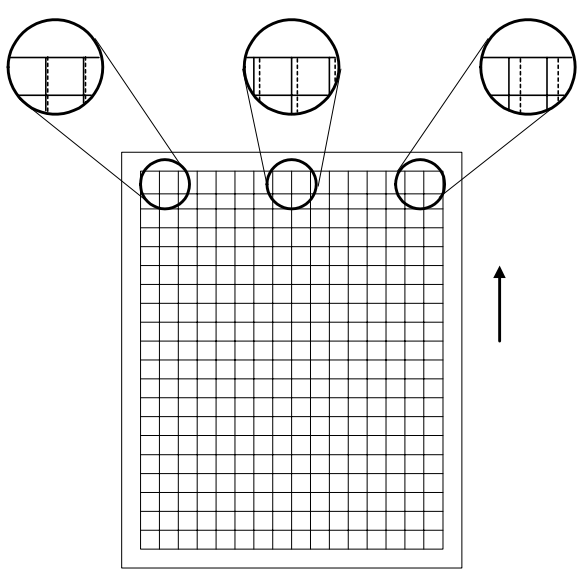
- SP1-004-001 Normal paper, Color mode, 1200 dpi (62.5 mm/s)
- SP1-004-002 Normal Paper, Color mode, 600 dpi (125 mm/s)
- SP1-004-007 Thick Paper (62.5 mm/s)



Pattern 3

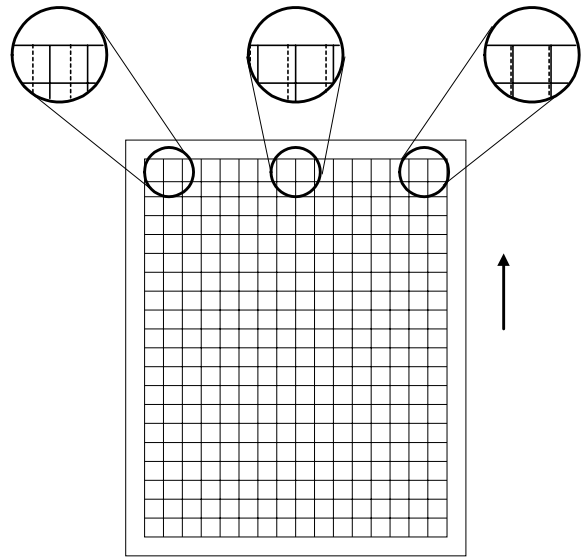
Color shift (magnification change) in the main-scan direction

Fig. 1 and 2 show that the colored (dotted line) has shifted away from the black line and the amount of shift differs at the front, center, and rear. Both Fig. 1 and Fig. 2 show the color grid is larger than the black grid. Yellow becomes larger from left to right in Fig. 1, but cyan and magenta become larger from right to left. This is because the laser writing direction for B&Y is different from C&M.



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Fig. 1 (Yellow)



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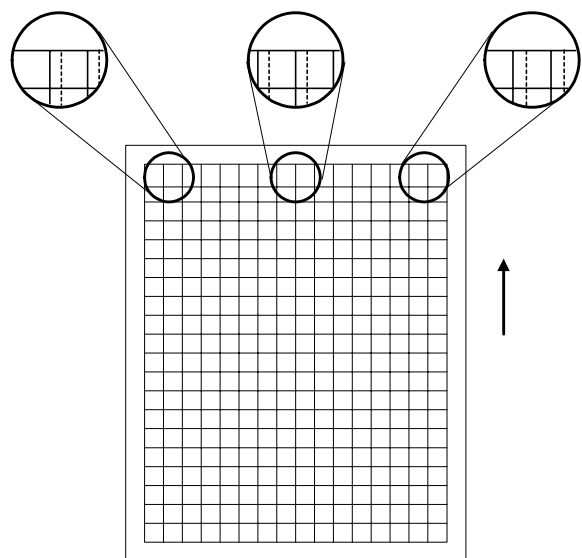
Fig. 2 (Cyan & Magenta)

Trouble-
shooting

Pattern 4

Color shift (registration) in the main-scan direction

Colored line shifts in the main-scan direction and the amount of shift is the same at left, center, and right. This is caused by incorrect color registration.



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4.4.3 COLOR SHIFT AFTER TRANSFER UNIT REPLACEMENT

If the color shift level is not within the target range (max 180 μ m) after replacing the transfer unit and performing the forced line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program Mode), follow the procedure explained below.

Check the color shift level

1. Make sure that OPC Refresh (SP3-920-005) has been done.
2. Print out the SMC sheets (SP5-990-002).
3. Print a 1-dot grid pattern using A3/11" x 17" paper. Refer to the following table for detailed SP mode settings.

Mode	SP5-997 (Test Pattern) Setting				
	Tray selection	Pattern	Color mode	Resolution	Paper size (By-pass)
Normal, color, 600 dpi	2	05	Full Color	600x600	—
Normal, color, 1200 dpi	2	05	Full Color	1200x1200	—

NOTE: Any adjustment needs to be done by using the paper type which the customer normally uses.

4. Check the tendency of color shift in the grid pattern printed in step 3. Sometimes, a magnification scope must be used to measure the amount of color shift between colors.
5. If the result is not within the target, go to the next step.

Fusing/ Registration Roller Speed Adjustment

SP mode (sub-scan registration) reset

1. Make sure that the SMC sheets (SP5-990-002) have been printed out.
2. Reset the setting of SP5-993-016 to 021 to "0".

Transfer belt aging

1. Remove all PCUs. Place them on clean sheets of paper and cover the drums with a few sheets of paper to prevent the drums from light fatigue. Then, secure the drum positioning plate (2 screws) and return the transfer unit release lever to the original position.
2. Perform the transfer belt idling with SP5-804-074 (Drum M H CW) for about 3 minutes. (This is to stabilize the transfer belt side-to-side movement.)
3. Reinstall the PCUs.
4. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
5. Print a 1-dot grid pattern using A3/11" x 17" paper in 600 dpi mode.
6. If the color shift in the main-scan direction is not within the adjustment standard, follow the troubleshooting guide.

Fusing roller speed adjustment

1. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
2. Print a 1-dot grid pattern for each of the following modes using A3/11" x 17" paper.
 - (1) Normal, 600 dpi
 - (2) Normal, 1200 dpi
 - (3) Thick, 1200 dpi
3. If the color has shifted within 100 mm from the trailing edge, follow the troubleshooting procedure (Sub-scan/Trailing edge).

NOTE: Instead of steps 2 to 3, you can adjust the fusing roller speed in the User Program mode (Maintenance/Color Regist/Fuser Adjust/Thick Paper).

Registration roller speed adjustment (for color mode)

1. Perform the line position adjustment (SP5-993-002 or 'Auto Adjust' in User Program mode).
2. Print a 1-dot grid pattern for each of the following modes using A3/11" x 17" paper.
 - (1) Normal, 600 dpi
 - (2) Normal, 1200 dpi
3. If the color has shifted within 100 mm from the leading edge, follow the troubleshooting procedure (Sub-scan/Leading edge).

NOTE: The registration roller speed for by-pass paper feed is the same as for normal 1200 dpi mode.

Line position fine adjustment for sub-scan

1. Print a 1-dot grid pattern each for each of the following modes using A3/11" x 17" paper.

Mode	SP5-997 (Test Pattern) Setting				
	Tray selection	Pattern	Color mode	Resolution	Paper size (By-pass)
Normal, color, 600 dpi	2	05	Full Color	600x600	-
Normal, color, 1200 dpi	2	05	Full Color	1200x1200	-
Thick paper	0	05	Full Color	1200x1200	A3 / 11x17

2. Check if there is any color which has shifted from the black line by the same amount all the way down the page from leading to trailing edge. If there is, follow the troubleshooting procedure (Sub-scan/Whole image).

Registration roller speed adjustment (For B&W mode)

1. Input the following values in the SP modes.

SP1-004-006 = (Value of SP1-004-005)

SP1-005-002 = (Value of SP1-004-005) – 0.2%

2. Print a 2-dot pattern (pattern 12) using A3/11" x 17" paper.

Mode	SP5-997 (Test Pattern) Setting				
	Tray selection	Pattern	Single Color	Color Mode	Resolution
Normal color 600 dpi	2	12	6 (Black)	Single Color	600x600

3. Depending on the paper used, a horizontal band may appear at 60 mm (2.76") from the leading edge on A3 (11" x 17") paper. If the horizontal band is observed on the 2-dot pattern, decrease the setting of SP1-004-006 in 0.1% steps until the problem is solved.

4.4.4 BLACK OVER PRINT

Black Over Print prevents unexpected white lines from appearing when black letters or lines are printed with color background. You can enable or disable this feature from the printer driver (default: disabled).

When it is enabled, Black Over Print has the following unpleasant side effects:

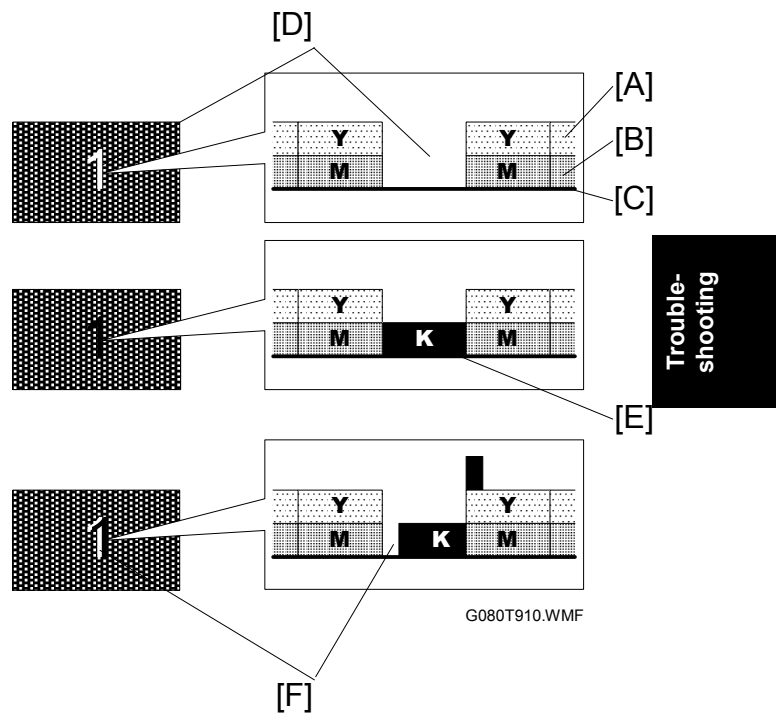
- Crispness may deteriorate because the black toner spreads out.
- More toner is consumed.
- The background color may be seen through black letters or lines.

Black Over Print Disabled

Black lines and color background are printed as follows:

1. The color toner (for example, magenta [B] and yellow [A] toner) is transferred on the paper [C]. Some space [D] is left blank for the black toner.
2. The black toner [E] is transferred in the blank space.

If the line position of the black toner is not correct, an unexpected white line [F] appears.

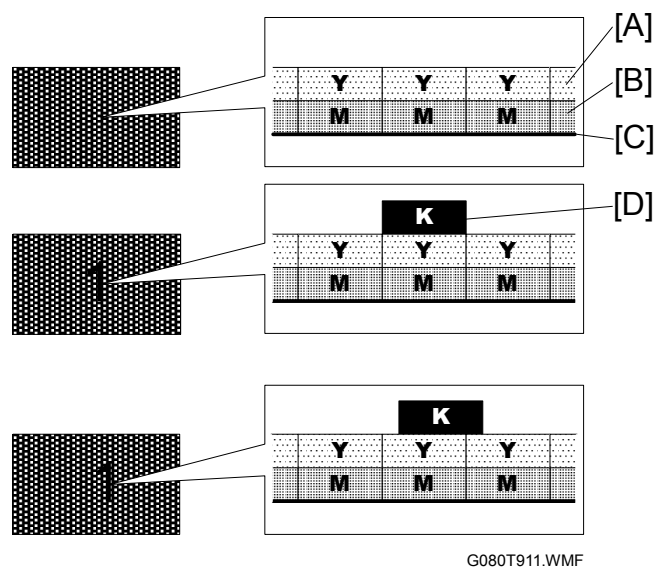


Black Over Print Enabled

Black lines and color background are printed as follows:

1. The color toner (for example, magenta [B] and yellow [A] toner) is transferred on the paper [C].
2. The black toner [D] is transferred on the color toner.

Even if the line position of the black toner is not correct, an unexpected white line does not appear.



4.5 ELECTRICAL COMPONENT DEFECTS

4.5.1 SENSORS

Component	CN	Condition	Symptom
LD H.P. sensor	220-B12	Open	SC261
		Shorted	SC260
TD sensor	K: 210-A3 C: 210-B9 M: 209-A19 Y: 210-A9	Open	SC370/371/372/373
		Shorted	SC370/371/372/373 or SC374/375/376/377
Transfer belt sensor	210-A12	Open	SC471
		Shorted	
		Shorted	
ID sensor	Rear: 215-12 Center: 215-13, 16 Front: 215-17	Open	SC385
		Shorted	
Paper end sensor	Tray1: 205-A5 Tray2: 205-B7 By-pass: 209-A15	Open	The Paper End indicator lights even if paper is placed in the paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the paper tray.
Paper lift sensor	Tray1: 205-A2 Tray2: 205-B4	Open	The bottom plate of the paper feed unit is not lifted up.
		Shorted	SC501/502
Relay sensor	205-A8	Open	Paper Jam is detected whenever a print is made.
		Shorted	Paper Jam is detected even if there is no paper.
Vertical transport sensor	208-B11	Open	Paper Jam is detected whenever a print is made.
		Shorted	Paper Jam is detected even if there is no paper.
Registration sensor	209-B2	Open	Paper Jam is detected whenever a print is made.
		Shorted	Paper Jam is detected even if there is no paper.
Fusing exit sensor	212-A7	Open	Paper Jam is detected whenever a print is made.
		Shorted	Paper Jam is detected even if there is no paper.
Paper exit sensor	212-B4	Open	Paper Jam is detected whenever a print is made.
		Shorted	Paper Jam is detected even if there is no paper.
Paper overflow sensor	212-A2	Open	The paper overflow message is not displayed even when a paper overflow condition exists, causing paper jam.
		Shorted	The paper overflow message is displayed.

Component	CN	Condition	Symptom
Toner end sensor	K: 209-A2 Y: 206-A7 C: 206-A4 M: 206-A1	Open	Toner near end may not be detected even when the toner near end condition is satisfied.
		Shorted	Toner near end may be detected even when the toner near end condition is not satisfied.
Drum gear position sensor	K: 213-13 CMY: 210-B12	Open	SC440
		Shorted	
Waste oil sensor	212-A13	Open	Waste oil near full message is displayed.
		Shorted	Waste oil near full message is not displayed even when a waste oil near full condition exists, causing a waste oil leak.
Waste oil bottle set sensor	212-A16	Open	The message "Reset waste oil bottle correctly" is displayed even when it is set correctly.
		Shorted	The message "Reset waste oil bottle correctly" is not displayed even when it is not set correctly.
Waste toner sensor	213-A4	Open	Waste toner near full message is displayed, even when a waste toner near full condition does not exist.
		Shorted	Waste toner near full message is not displayed even when a waste toner near full condition exists, causing waste toner leak.

Trouble-shooting

NOTE: The CN numbers are the connector numbers on the BCU.

4.6 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom when turning on the main switch
	115 V	220 - 240 V	
Power Supply Unit			
FU1	15A/125V	—	No response (No power is supplied to the electrical components.)
CB1	—	8A/250V	
FU2	10A/125V	5 A/250V	No response (No DC power is supplied to the electrical components.)
FU81	3.15 A/250 V	3.15A/250V	Only 12V DC power is not supplied. SC260 or SC261 may occur. (This fuse is directly soldered on the PSU.)

4.7 LEDS (BCU)

LED	Status	
	Blinking	Stays OFF or ON
LED1 (RED)	The Main CPU functions correctly.	The Main CPU does not function properly.
LED (Green)	The MUSIC CPU functions correctly.	The MUSIC CPU does not function properly.

5. SERVICE TABLES

5.1 SERVICE PROGRAM MODE

CAUTION

Before accessing the service menu, do the following:

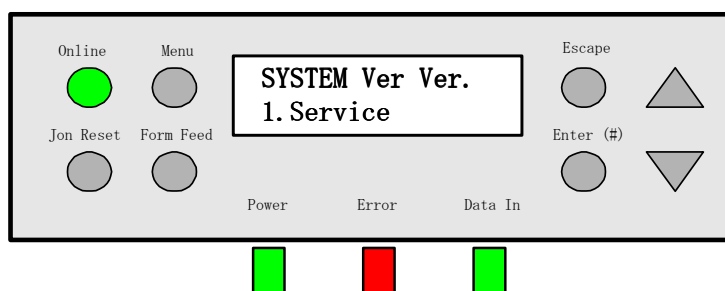
Confirm that there is no print data in the printer buffer (the Data In LED must not be lit or blinking).

If there is some data in the buffer, wait until all data has been printed.

NOTE: For the machine with the optional CF expander, see section 5.2.

5.1.1 ENABLING AND DISABLING SERVICE PROGRAM MODE

NOTE: The Service Program Mode is for use by service representatives only, so that they can properly maintain product quality. If this mode is used by anyone other than service representatives for any reason, data might be deleted or settings might be changed. In such case, product quality cannot be guaranteed any more.



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Service
Tables

Entering the Service Program Mode

There are two ways to enter the Service Program Mode.

Method 1: Turn the machine on while pressing the On Line key and Escape key together until the above message in the illustration appears on the display.

NOTE: If you switch the machine off, any jobs stored on the hard disk using the sample print and protected print features will be deleted.
Check first with the user tools to see if there are any jobs stored with these features
(Menu key - Sample Print, or Protected Print).

Method 2: Press the Up/Down arrow keys together for about 5 seconds, then press the Enter key.

The above message shown in the illustration appears on the display.

NOTE: The machine automatically goes off line when you enter the service program mode.

Accessing the Required Program

Use the “Up/Down arrow” keys to scroll through the menu listing.

1. Service: Controller service modes
2. Engine: Engine service modes
3. End: Exit service mode

To select an item, press the Enter key. Then a sub-menu will appear.

Scroll through the sub menu items using the Up/Down arrow keys.

To go back to a higher level, press the Escape key.

Inputting a Value or Setting for a Service Program

Enter the required program mode as explained above. The setting appearing on the display is the current setting.

Select the required setting using the Up/Down arrow keys, then press the Enter key. The previous value remains if the Enter key is not pressed.

Exiting Service Program Mode

Select “3. End” from the main menu of the service program mode, then press the “Enter” key.

NOTE: To make the following settings effective, you must turn the main switch off and on after exiting the service program mode.

SP Modes Related to the Engine	SP Modes Related to the Controller
SP2-208-009	SP5-009-001
SP2-213-001	SP5-961-001
SP2-224-001 to 004	SP5-824-001
SP5-905-007	SP5-825-001
SP5-930-001 to 005	
SP5-994-001 and 002	

NOTE: If the settings of SP modes 5-993-013 to 015 are changed, these changes will affect the next line position adjustment.

5.1.2 REMARKS

Display on the Control Panel Screen

Since the maximum number of characters which can be displayed on the control panel screen is limited (14 characters), the description of SP modes displayed on the screen needs to be abbreviated. The following are the major abbreviations used for the SP modes for which the full description is over 14 characters.

Paper Type

N: Normal paper

TH: Thick paper

Color Mode [Color]

[K]: Black in B&W mode

[Y], [M], or [C]: Yellow, Magenta, or Cyan in Full Color mode

[YMC]: Only for Yellow, Magenta, and Cyan

[FC]: Full Color mode

[FC, K], [FC, Y], [FC, M], or [FC, C]: Black, Yellow, Magenta, or Cyan in full color mode

Paper Feed Station

P: Paper tray

B: By-pass table

Fusing Section

H: Heating roller

P: Pressure roller

Print Mode

S: Simplex

D: Duplex

Process Speed

62.5, 125, 185

As shown in the following table, the process speed (mm/s) depends on the print mode (B&W or Color), resolution, and/or type of paper selected. Some SP mode settings depend on the process speed.

Mode	Resolution (dpi)	Line speed (mm/s)	Print speed (ppm)
B/W	600 x 600	185	38
	1,200 x 600		
Color	1,200 x 1,200	125	28
	600 x 600	125	28
	1,200 x 600		
OHP/Thick	1,200 x 1,200	62.5	14
	600 x 600		
	1,200 x 600		

Others

The following symbols are used in the SP mode tables.

FA: Factory setting

(Data may be adjusted from the default setting at the factory. Refer to the factory setting sheets enclosed, which is located underneath the jammed paper removal decal.)

DFU: Design/Factory Use only

Do not touch the SP mode in the field.

CF: Copier Feature (CF) Expander Unit

SP modes with "CF" can be seen on the screen when the CF expander unit is installed.

"P" in the right hand side of the mode number column means that this SP mode relates to the Printer Controller. If "P" is not in the column, this SP mode relates to the Printer Engine.

A sharp (#) to the right hand side of the mode number column means that the main switch must be turned off and on to effect the setting change.

An asterisk (*) to the right hand side of the mode number column means that this mode is stored in the EEPROM (Engine) or NVRAM (Printer Controller). If you do a RAM clear, this SP mode will be reset to the default value. "BCU", "CTL", "SBU", and "NV" indicate which NVRAM contains the data.

- BCU: NVRAM on the BCU board
- CTL: NVRAM on the controller board
- SBU: NVRAM on the SBU board (this NVRAM cannot be removed in the field)
- NV: NVRAM on the NVRAM expansion board (user account enhancement kit)

The settings of each SP mode are explained in the right-hand column of the SP table in the following manner.

[Adjustable range / Default setting / Step] Alphanumeric

NOTE: If "Alphanumeric" is written to the right of the bracket as shown above, the setting of the SP mode is displayed on the screen using alphanumeric characters instead of only numbers. However, the settings in the bracket in the SP mode table are explained by using only the numbers.

5.2 SERVICE PROGRAM MODE – CF CONFIGURATION

⚠ CAUTION

Before accessing the service menu, do the following:

Confirm that there is no print data in the printer buffer (the Data In LED must not be lit or blinking).

If there is some data in the buffer, wait until all data has been printed.

5.2.1 ENABLING AND DISABLING SERVICE PROGRAM MODE

Entering SP Mode

1. Press the Clear Mode key.
2. Use the keypad to enter “107”.
3. Hold down Clear/Stop for at least 3 seconds.
4. Enter the Service Mode.

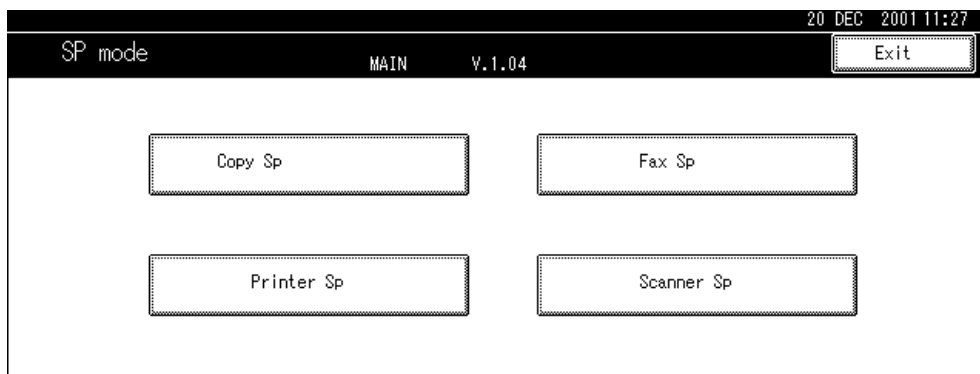
Exiting SP Mode

5. Press Exit twice to return to the copy window.

5.2.2 TYPES OF SP MODES

Copy SP	SP modes related to the engine functions
Printer SP	SP modes related to the controller functions
Scanner SP	SP modes related to the scanner functions
Fax SP	SP modes related to the fax functions

After accessing the SP mode, select one of the Service Program modes (Copy, Printer, Scanner, or Fax) from the touch panel as shown in the diagram below. This section explains the functions of the Printer/Copy/Scanner SP modes. Please refer to the Fax service manual for the Fax SP modes.

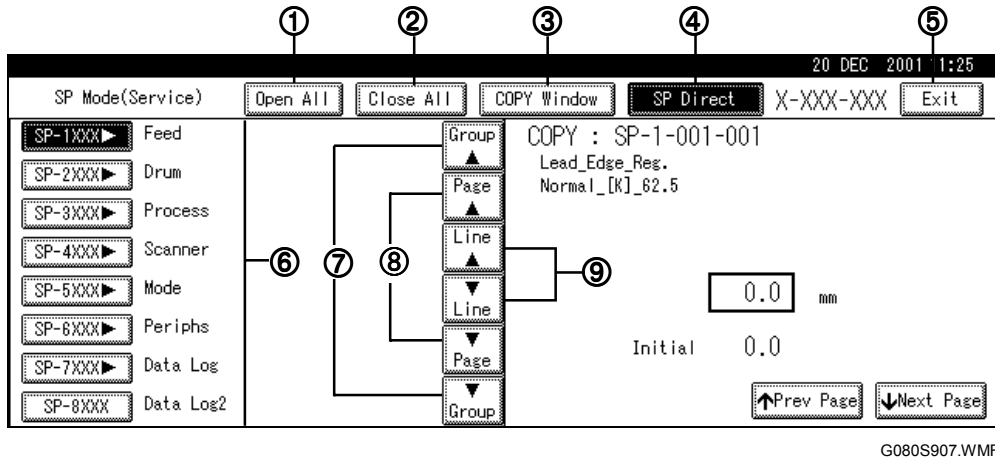


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Service Tables

SP Mode Button Summary

Here is a short summary of the touch-panel buttons.



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- ① Opens all SP groups and sublevels.
- ② Closes all open groups and sublevels and restores the initial SP mode display.
- ③ Opens the copy window (copy mode) so you can make test copies. To return to the SP mode screen, press SP Mode (highlighted) in the copy window.
- ④ Enter the SP code directly with the number keys if you know the SP number and then press (#). (The required SP Mode number will be highlighted when pressing (#). If not, just press the required SP Mode number.)
- ⑤ Press twice to leave the SP mode and return to the copy window to resume normal operation.
- ⑥ Press any Class 1 number to open a list of Class 2 SP modes.
- ⑦ Press to scroll the display to the previous or next group.
- ⑧ Press to scroll to the previous or next display in segments the size of the screen display (page).
- ⑨ Press to scroll the display to the previous or next line, line by line.
- ⑩ Press to move the highlight on the left to the previous or next selection in the list.

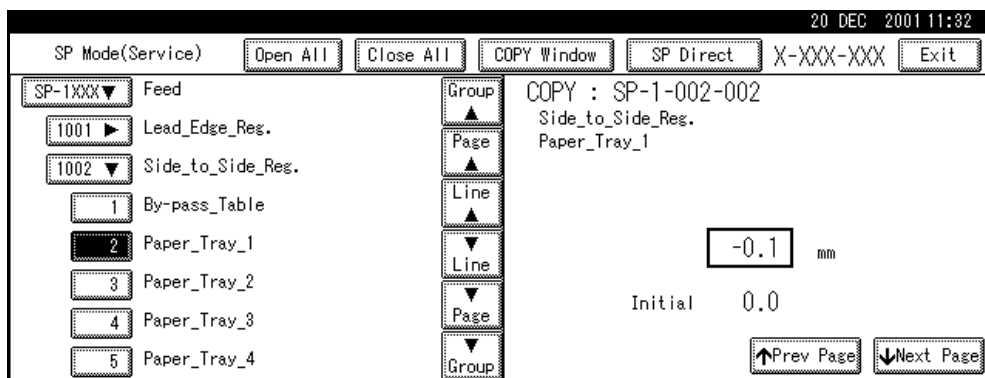
Switching Between SP Mode and Copy Mode for Test Printing

- 1) In the SP mode, select the test print and then press Copy Window.
- 2) Use the copy window (copier mode), to select the appropriate settings (paper size, etc.) for the test print.
- 3) Press Start (Ⓢ) to execute the test print.
- 4) Press SP Mode (highlighted) to return to the SP mode screen and repeat from step 1.

Selecting the Program Number

Program numbers have two or three levels.

1. Before you begin, refer to the Service Tables to find the SP that you want to adjust. (☛ 5.3, 5.4, or 5.5)
2. Press the Group number on the left side SP Mode window that contains the SP that you want to adjust.
3. Use the scrolling buttons in the center of the SP mode window to display the SP number that you want to open, and then press that number to expand the list.
4. Use the center touch-panel buttons to scroll to the number and title of the item that you want to set and press. The small entry box on the right is activated and displays the default or the current setting below.



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NOTE: Refer to the Service Tables for the range of allowed settings. (☛ 5.3, 5.4, or 5.5)

5. To enter a setting:
 - Press (⊕/⊖) to toggle between plus and minus and then use the keypad to enter the appropriate number. The number you enter writes over the previous setting.
 - Press (#) to enter the setting. (If you enter a number that is out of range, the key press is ignored.)
 - When you are prompted to complete the selection, press “Yes”.
6. If you need to perform a test print, press Copy Window to open the copy window and select the settings for the test print. Press Start (Ⓢ), and then press SP Mode (highlighted) in the copy window to return to the SP mode display.
7. When you are finished, press Exit twice to return to the copy window.

Exiting Service Mode

Press the Exit key on the touch-panel.

NOTE: To make the following settings effective, you must turn the main switch off and on after exiting service mode.

SP Modes Related to the Engine	SP Modes Related to the Controller
SP2-208-009	SP5-009-001
SP2-213-001	SP5-302-002
SP2-224-001 to 004	SP5-801-003 to 013
SP5-930-001 to 005	SP5-824-001
SP5-994-001 and 002	SP5-825-001
SP5-998-001	SP5-832-001 to 004
	SP5-961-001

NOTE: If the settings of SP modes 5-993-013 to 015 are changed, these changes will affect the next line position adjustment.

5.2.3 REMARKS***Display on the Control Panel Screen***

Since the maximum number of characters which can be displayed on the control panel screen is limited (20 characters), the description of SP modes displayed on the screen needs to be abbreviated (☛ 5.1.2).

The process speed (mm/s) depends on the print mode (B&W or Color), resolution, and/or type of paper selected. Some SP mode settings depend on the process speed (☛ 5.1.2).

Others

Some symbols are used in the SP mode tables (☛ 5.1.2).

5.3 PRINTER CONTROLLER SERVICE MODE

5.3.1 SERVICE MODE MENU

The printer controller service mode is displayed as follows:

- “1. Service” Without the optional CF expander
- “Printer SP” With the optional CF expander

1	Mode No. (Class 1 and 2)		Function / [Setting]
001	[Bit Switch]		
	1	Bit Switch 1	*CTL
	2	Bit Switch 2	
	3	Bit Switch 3	
	4	Bit Switch 4	
	5	Bit Switch 5	
	6	Bit Switch 6	
	7	Bit Switch 7	
	8	Bit Switch 8	
003	[Clear Setting]		
	1	Clear Setting	
	2	Clear CSS Counter	CF
004	[Print Summary]		
	1	Print Summary	
005	[Disp. Version]		
	1	Disp. Version	
101	[ToneCtlSet]		
	1	Tone (Factory)	*CTL
	2	Tone (Prev.)	
	3	Tone (Current)	
	4	ACC	CF
102	[ToneCtlSet]		
	1	*1200x1200Photo	
	2	600x600Text	
	3	1200x600Text	
	4	600x600Photo	
	5	1200x600Photo	
103	[PrnColorSheet]		
	1	ToneCtlSheet	
	2	ColorChart	
104	[ToneCtlValue]		
	1	Black 1	*CTL
	21	Cyan 1	
	41	Magenta 1	
	61	Yellow 1	
	2	Black 2	*CTL
	22	Cyan 2	
	42	Magenta 2	
	62	Yellow 2	
	3	Black 3	*CTL
	23	Cyan 3	
43	Magenta 3		
63	Yellow 3		

1	Mode No. (Class 1 and 2)		Function / [Setting]				
104	4	Black 4	*CTL	[0 to 255 / <u>64</u> / 1/step]			
	24	Cyan 4					
	44	Magenta 4					
	64	Yellow 4					
	5	Black 5	*CTL	[0 to 255 / <u>80</u> / 1/step]			
	25	Cyan 5					
	45	Magenta 5					
	65	Yellow 5					
	6	Black 6	*CTL	[0 to 255 / <u>96</u> / 1/step]			
	26	Cyan 6					
	46	Magenta 6					
	66	Yellow 6					
	7	Black 7	*CTL	[0 to 255 / <u>112</u> / 1/step]			
	27	Cyan 7					
	47	Magenta 7					
	67	Yellow 7					
	8	Black 8	*CTL	[0 to 255 / <u>128</u> / 1/step]			
	28	Cyan 8					
	48	Magenta 8					
	68	Yellow 8					
	9	Black 9	*CTL	[0 to 255 / <u>144</u> / 1/step]			
	29	Cyan 9					
	49	Magenta 9					
	69	Yellow 9					
	10	Black 10	*CTL	[0 to 255 / <u>160</u> / 1/step]			
	30	Cyan 10					
	50	Magenta 10					
	70	Yellow 10					
	11	Black 11	*CTL	[0 to 255 / <u>176</u> / 1/step]			
	31	Cyan 11					
	51	Magenta 11					
	71	Yellow 11					
	12	Black 12	*CTL	[0 to 255 / <u>192</u> / 1/step]			
	32	Cyan 12					
	52	Magenta 12					
	72	Yellow 12					
	13	Black 13	*CTL	[0 to 255 / <u>208</u> / 1/step]			
	33	Cyan 13					
	53	Magenta 13					
	73	Yellow 13					
	14	Black 14	*CTL	[0 to 255 / <u>224</u> / 1/step]			
	34	Cyan 14					
	54	Magenta 14					
	74	Yellow 14					
	15	Black 15	*CTL	[0 to 255 / <u>240</u> / 1/step]			
	35	Cyan 15					
	55	Magenta 15					
	75	Yellow 15					
	104	[Gamma Adjustment]		* CTL CF	Adjusts the printer gamma for the mode selected in the "Mode Selection" menu.		
		1	Black: Highlight				[0 to 30 / <u>15</u> / 1/step]
		2	Black: Shadow				
		3	Black: Middle				
		4	Black: IDmax				
	21	Cyan: Highlight					

1	Mode No. (Class 1 and 2)		Function / [Setting]
104	22	Cyan: Shadow	* CTL CF Adjusts the printer gamma for the mode selected in the "Mode Selection" menu. [0 to 30 / <u>15</u> / 1/step]
	23	Cyan: Middle	
	24	Cyan: IDmax	
	41	Magenta: Highlight	
	42	Magenta: Shadow	
	43	Magenta: Middle	
	44	Magenta: IDmax	
	61	Yellow: Highlight	
	62	Yellow: Shadow	
	63	Yellow: Middle	
	64	Yellow: IDmax	
105	[ToneCtlSave]		Stores the print gamma adjusted with the "Gamma Adj." menu item as the current setting. Before the machine stores the new "current setting", it moves the data currently stored as the 'current setting' to the "previous setting" memory storage location.
	1	ToneCtlSave	
106	[Toner Limit]		Adjusts the maximum toner amount for image development. [100 to 400 / <u>260</u> / 1 %/step] [100 to 400 / <u>190</u> / 1 %/step]
	1	TonerLimitPhot	
	2	TonerLimitText	
107	FactoryTestPrt		Prints the test page to check the color balance before shipment. DFU
	1	600 x 600 2 bit	

5.3.2 BIT SWITCH PROGRAMMING

NOTE: Currently, the bit switches are not being used.

1. Enter the SP mode, select "Service Menu", then press [Enter] twice.

```
<Service>
Bit Switch >>
```

2. Select #1, #2, #3, or #4 for the desired bit switch, then press [Enter].

```
Bit Switch
Bit switch 1
```

- [▲] [▼]: Move to the next switch.

3. Adjust the bit switch using the following keys.

- [▲] [▼]: Move to the next bit.
- [Escape]: Exit without saving changes.
- [Enter]: Exit and save changes.

```
Sw#1 00000000
bit0 _
```

NOTE: The left digit on the display is bit 7 and the right digit is bit 0.

4. Press [Enter] to save changes and exit.

5.4 PRINTER ENGINE SERVICE MODE

5.4.1 SERVICE MODE TABLE

The printer engine service mode is displayed as follows:

- “2. Engine” Without the optional CF expander
- “Copy SP” With the optional CF expander

SP1-XXX (Feed)

1	Mode No. (Class 1, 2, and 3)	Function / [Setting]
001	[Lead Edge Reg.] Leading Edge Registration (Paper Type, [Color], Process Speed), Paper Type -> N: Normal, OHP, TH: Thick	
	1	N [K] 62.5 *BCU
	2	N [K] 125 *BCU
	3	N [K] 185 *BCU
	4	N [FC] 62.5 *BCU
	5	N [FC] 125 *BCU
	6	TH [K] *BCU
	7	TH [FC] *BCU
	8	OHP [K] *BCU
	9	OHP [FC] *BCU
002	[S-to-S Reg.] Side-to-Side Registration	
	1	By-pass Table *BCU
	2	Paper Tray 1 *BCU
	3	Paper Tray 2 *BCU
	4	Paper Tray 3 *BCU
	5	Paper Tray 4 *BCU
	6	Duplex *BCU
003	[Paper Buckle] Paper Buckle (Paper Tray or By-pass, Paper Type, Process Speed), Paper Type: N: Normal, TH: Thick	
	1	P 62.5 *BCU
	2	P 125 *BCU
	3	P 185 *BCU
	4	B N 62.5 *BCU
	5	B N 125 *BCU
	6	B N 185 *BCU
	7	B TH *BCU
	8	B OHP *BCU

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
004	[Dev. Mt Speed] Development Drive Motor Speed ([Color], Process Speed, Paper Type), Paper Type -> N: Normal, TH: Thick			
	1	[K] 62.5 N	*BCU	Adjusts the development drive motor speed for correcting color shifts at the leading edge or trailing edge area.
	2	[K] 125	*BCU	
	3	[K] 185	*BCU	
			Black Motor [K]: Adjusts fusing roller speed for the trailing edge area.	
			Color Motor [YMC]: Adjusts registration roller speed for the leading edge area.	
			[96.0 to 104.0 / <u>100.0</u> / 0.1 %/step]	
			NOTE:	
			<ul style="list-style-type: none"> • SP1-004-002 and 005 is for color mode. Fine adjustment for B&W mode can be done with SP1-005-001 and 002. • SP1-004-004 is for normal paper. Fine adjustment for thick paper can be done with SP1-005-003. 	
	4	[YMC] 62.5	*BCU	[96.00 to 104.00 / 100.00 / 0.05 %/step]
	5	[YMC] 125	*BCU	
	6	[YMC] 185	*BCU	
	7	[K] 62.5 TH	*BCU	[96.0 to 104.0 / <u>100.0</u> / 0.1 %/step]
005	[Dev. Mt Speed2] Development Drive Motor Speed 2 ([Color], Process Speed, Paper Type), Paper Type -> TH: Thick			
	1	[K]	*BCU	Adjusts the black development drive motor speed for the B&W 125mm/s process speed. The value stored in this SP mode is different from SP1-004-002 (see the note for SP 1-004). At the 125mm/s process speed, the transfer unit position for B&W is different than for color mode. The transfer unit position affects the paper transport quality, causing the paper to flip up at the fusing section if the same speed as color mode is used for B&W mode. To minimize the occurrence of paper flipping up, which causes smeared images in the trailing area, this SP mode can change the motor speed in B&W mode. [-0.2 to +1.0 / <u>+0.2</u> / 0.1 %/step]
	2	[YMC]	*BCU	Adjusts the color development drive motor speed for the B&W 125mm/s process speed. The value stored in this SP mode is different from SP1-004-005 (see the note for SP 1-004). At the 125mm/s process speed, the transfer unit position for B&W is different than for color mode. The transfer unit position affects the paper transport speed slightly. This SP mode can adjust the motor speed for B&W mode. [-1.00 to 1.00 / <u>0</u> / 0.05 %/step] FA

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]
005	3	[YMC] TH	*BCU Adjust the color development drive motor speed for thick paper in by-pass mode. The value stored in this SP mode is different from SP1-004-004 (see the note for SP 1-004). Normal and thick paper are different types of paper, and this sometime causes color shift due to paper slippage. This SP mode can change the motor speed for thick paper. [-0.30 to 0.30 / 0 / 0.05 %/step]
006	[Dev. Mt Speed3] Development Drive Motor Speed 3 ([Color], Process Speed, Paper Type), Paper Type -> SP: Special		
	1	[K] 62.5 SP	*BCU Adjusts the development motor speed for special paper.
	2	[K] 125 SP	*BCU
			[-4.0 to 4.0 / 0 / 0.1 %/step]
	3	[YMC] 62.5 SP	*BCU
	4	[YMC] 125 SP	*BCU
		[-4.00 to 4.00 / -0.1 / 0.05 %/step]	
007	[Dev. Mt Speed4] Development Drive Motor Speed 4		
	1	[CL] Mail TH	*BCU Adjusts the development motor speed for postcards. [-1.00 to 0.00 / -0.40 / 0.05%/step]
008	[Drum STM Speed] Drum STM Speed Adjustment		
	1	62.5	*BCU Adjusts the drum speed of each line-speed mode (62.5 mm/s and 125 mm/s); this adjusts drum speed but not transfer belt speed. [0 to 6 / 2 / 1 /step] DFU
	2	125	*BCU [0 to 6 / 2 / 1 /step] DFU
104	[Fusing Cont.] Fusing Control		
	1	Control Method	*BCU Selects the fusing control method. [0 or 1 / 0 / -] Alphanumeric 0: ON/OFF Control 1: Phase Control NOTE: This mode can be used only for N. America models.
	25	Process Speed	*BCU Selects the power-on default target fusing operation temperature. The target operating fusing temperature depends on the process speed. When the machine is switched on, it starts warming up for the process speed specified in this SP mode. [0 to 4 / 4 / 1/step] Alphanumeric 0: Color 62.5 mm/s (temperature specified by SP 1-105-8 and 19) 1: Color 125 mm/s (temperature specified by SP 1-105-9 and 20) 2: Thick / OHP (temperature specified by SP 1-105-13 and 28) 3: K 125 mm/s (temperature specified by SP 1-105-4 and 15) 4: K 185 mm/s (temperature specified by SP 1-105-5 and 16)





1	Mode No. (Class 1, 2, and 3)	Function / [Setting]	
105	[Fusing Temp.] Fusing Temperature (Heating or Pressure roller: Paper Type, [Color], Simplex/Duplex, Process Speed) Paper Type -> N: Normal, OHP. TH: Thick, SP: Special Some settings of fusing temperature depend on the destination (US or Europe/Asia). US: Setting for US, EU: Setting for Europe/Asia		
	1 H: Ready	*BCU	Sets the heating roller temperature for the printing ready condition. After the main switch has been turned on, the machine enters the print ready condition when the heating roller temperature reaches the temperature specified in this SP mode. When the machine is in the recovery mode from the energy saver or auto off mode, the machine becomes ready when both heating and pressure roller temperatures reach the specified temperature. Ready temperature = (Target temperature specified in SP1-104-25 or 105-3 to 28) – Temperature specified in this SP mode. [10 to 100 / 10 / 1°C/step]
	2 P: Ready	*BCU	Sets the pressure roller temperature for the printing ready condition. Ready temperature = (Target temperature specified in SP1-104-25 or 105-3 to 28) – Temperature specified in this SP mode [10 to 100 / NA: 10, EU: 20 / 1°C/step]
The following SPs set the target operating temperatures of the heating and pressure rollers in various modes. (The default settings are different for N. America and Eur./Asia)			
	4 H:N [K] S 125	*BCU	[100 to 190 / NA: 170, EU: 175 / 5°C/step]
	5 H:N [K] S 185	*BCU	[100 to 190 / 180 / 5°C/step]
	6 H:N [K] D 125	*BCU	[100 to 190 / NA: 160, EU: 165 / 5°C/step]
	7 H:N [K] D 185	*BCU	[100 to 190 / NA: 170, EU: 175 / 5°C/step]
	8 H:N[FC] S 62.5	*BCU	[100 to 190 / NA: 145, EU: 150 / 5°C/step]
	9 H:N[FC] S 125	*BCU	[100 to 190 / 180 / 5°C/step]
	10 H:N[FC] D 62.5	*BCU	[100 to 190 / NA: 140, EU: 145 / 5°C/step]
	11 H:N[FC] D 125	*BCU	[100 to 190 / NA: 160, EU: 170 / 5°C/step]
	13 H:OHP	*BCU	[100 to 190 / 165 / 5°C/step]
	15 P:N [K] S 125	*BCU	[0 to 190 / NA: 145, EU: 155 / 5°C/step]
	16 P:N [K] S 185	*BCU	[0 to 190 / NA: 150, EU: 160 / 5°C/step]
	17 P:N [K] D 125	*BCU	[0 to 190 / NA: 135, EU: 145 / 5°C/step]
	18 P:N [K] D 185	*BCU	[0 to 190 / NA: 140, EU: 155 / 5°C/step]
	19 P:N[FC] S 62.5	*BCU	[0 to 190 / NA: 125, EU: 130 / 5°C/step]
	20 P:N[FC] S 125	*BCU	[0 to 190 / 160 / 5°C/step]
	21 P:N[FC] D 62.5	*BCU	[0 to 190 / NA: 120, EU: 125 / 5°C/step]
	22 P:N[FC] D 125	*BCU	[0 to 190 / NA: 135, EU: 150 / 5°C/step]
	24 P:OHP	*BCU	[0 to 190 / 150 / 5°C/step]
	26 H:TH	*BCU	[0 to 190 / 175 / 5°C/step]
	28 P:TH	*BCU	[0 to 190 / 155 / 5°C/step]
	29 H:Envelop	*BCU	[0 to 190 / 175 / 5°C/step]
	30 P:Envelop	*BCU	[0 to 190 / 155 / 5°C/step]

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]
105	31	H: Offset Temp	*BCU Sets the heating roller temperature for the printing start condition when changing the process speed. Fusing temperature must be decreased when the machine changes to a process speed that is slower than the current process speed (for example, when the speed changes from 185 mm/s to 62.5 mm/s). The machine idles while reducing the fusing temperature. When the fusing temperature becomes lower than the ready temperature, the machine starts printing. Ready Temperature = Target temperature + Temperature specified in this SP mode. [1 to 20 / 5 / 1°C/step]
	32	P: Offset Temp	*BCU Sets the pressure roller temperature for the printing start condition when changing the process speed. [1 to 20 / 10 / 1°C/step]
	33	H:SP 62.5	*BCU [-20 to +30 / +10 / 1°C/step]
	34	H:SP 125	*BCU [-20 to +30 / +10 / 1°C/step]
	35	H:SP 185	*BCU [-20 to +30 / +10 / 1°C/step]
	36	P:SP 62.5	*BCU [-20 to +30 / +10 / 1°C/step]
	37	P:SP 125	*BCU [-20 to +30 / +10 / 1°C/step]
	38	P:SP 185	*BCU [-20 to +30 / +20 / 1°C/step]
106	[Temp. Display] Fusing Temperature Display (Heating or Pressure)		
	1	H Roller	Displays the current temperature of the heating and pressure rollers. [0 to 200 / - / 5°C/step]
	2	P Roller	
902	[Paper Size] Tray Paper Size		
	1	Tray 1 A4/LT	*BCU Specifies the paper size for tray 1. [0 or 1 / 0 / -] Alphanumeric 0: A4 sideways, 1: LT sideways Tray 1 can only use these two sizes. US: 1 FA
	2	Tray 2 B4/LG	*BCU Specifies the paper size for tray 2. [0 or 1 / 0 / -] Alphanumeric 0: B4 lengthwise, 1: LG lengthwise This specifies which size is detected for a sensor output of 1101 (see section 6 for details). US: 1 FA
	3	Tray 2 A4/LT	*BCU Specifies the paper size for tray 2. [0 or 1 / 0 / -] Alphanumeric 0: A4 lengthwise, 1: LT lengthwise This specifies which size is detected for a sensor output of 0110 (see section 6 for details). US: 1 FA
	4	Tray 2 B5/LT	*BCU Specifies the paper size for tray 2. [0 or 1 / 0 / -] Alphanumeric 0: LT, 1: B5 lengthwise This specifies which size is detected for a sensor output of 1011 (see section 6 for details).

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
910	[Idling Time] (Fusing Idling Time)			
	1	Idling Time	*BCU	<p>Specifies the timer for deciding whether to do fusing idling when receiving a print command.</p> <p>When receiving a new job within the time specified in this SP mode after the last job is completed, fusing idling is not done because the fusing section was already warmed up during the last job.</p> <p>[0 to 180 / <u>1</u> / 1 minute/step] DFU</p>
912	[Machine Temp.] Machine Temperature Correction Th: Threshold, Heating or Pressure roller			
	<p>Corrects the fusing temperature depending on the temperature inside the machine. If the temperature inside the machine is too high or low, this may cause hot or cold offset image at the fusing section. To avoid the offset image, the fusing temperature is corrected depending on the temperature inside machine, which is monitored by the thermistor located on the right side of the laser optics housing unit.</p> <p>If the temperature inside the machine is detected as high or low (based on the settings of SP1-912-001 or 002), the fusing temperature is decreased or increased by the temperature specified in SP1-912-003 to 006.</p> <p>Also see SP 1-917-1.</p>			
	1	Th:High Temp	*BCU	<p>Sets the threshold for entering the high temperature condition.</p> <p>[0 to 50 / <u>30</u> / 1°C/step]</p>
	2	Th:Low Temp	*BCU	<p>Sets the threshold for entering the low temperature condition.</p> <p>[0 to 50 / <u>17</u> / 1°C/step]</p>
	3	H:High Temp	*BCU	<p>Sets the fusing temperature decrease for the high temperature condition.</p> <p>[0 to 15 / <u>0</u> / 1°C/step]</p>
	4	P:High Temp	*BCU	<p>[0 to 15 / <u>0</u> / 1°C/step]</p>
	5	H:Low Temp	*BCU	<p>Sets the fusing temperature increase for the low temperature condition.</p> <p>[0 to 15 / <u>5</u> / 1°C/step]</p>
	6	P:Low Temp	*BCU	<p>[0 to 15 / <u>5</u> / 1°C/step]</p>
913	[Temp. Cor. 1] Fusing Temperature Correction (Correction Timing)			
	1	Mode 1 185	*BCU	<p>Specifies the number of sheets to determine whether or not to apply the fusing temperature correction.</p> <p>[1 to 255 / <u>5</u> / 1 sheet/step]</p> <p>During a multi print job, the fusing temperature tends to slightly overshoot around the 10th sheet and then stabilize. Temperature overshooting may cause the glossiness to increase.</p> <p>To minimize the overshooting, both fusing and pressure roller temperatures are decreased by the amount specified in SP1-914 at the number of sheets specified in this SP mode, until the end of the job.</p> <p>The temperatures are decreased in two steps.</p> <p>Example: 125 mm/s line speed First step (also called 'Mode 1'): After 5 sheets (SP 1-913-2), temperature drops by 5C (SP 1-914-2).</p>
	2	Mode 1 125		
	3	Mode 1 62.5		

1	Mode No. (Class 1, 2, and 3)			Function / [Setting]
913	4	Mode 1 OHP narrow	*	914-2).
				Second step (also called 'Mode 2'): After 20 sheets (SP 1-913-7), temperature drops by 10C (SP 1-914-7).
				Narrow: LT/A4 SEF width or less
				Wide: Wider than LT/A4 SEF
				[1 to 255 / <u>5</u> / 1 sheet/step]
				[1 to 255 / <u>10</u> / 1 sheet/step]
				[1 to 255 / <u>20</u> / 1 sheet/step]
	5	Mode 1 185 wide		[1 to 255 / <u>10</u> / 1 sheet/step]
	6	Mode 2 185		[1 to 255 / <u>20</u> / 1 sheet/step]
	7	Mode 2 125		[1 to 255 / <u>20</u> / 1 sheet/step]
	8	Mode 2 62.5		[1 to 255 / <u>20</u> / 1 sheet/step]
	9	Mode 2 185 narrow		[1 to 255 / <u>10</u> / 1 sheet/step]
	10	Mode 2 185 wide		[1 to 255 / <u>20</u> / 1 sheet/step]
	[Temp. Cor. 2] Fusing Temperature Correction (Temperature Setting)			
914	1	Temp 1 185	*BCU	Specifies the temperature to be subtracted from the targeted temperatures specified in SP1-105-4 to-24.
				Narrow: LT/A4 SEF width or less
				Wide: Wider than LT/A4 SEF
				[0 to 20 / <u>0</u> / 5°C /step]
				[0 to 20 / <u>5</u> / 5°C /step]
				[0 to 20 / <u>0</u> / 5°C /step]
				[0 to 20 / <u>5</u> / 5°C /step]
				[0 to 20 / <u>5</u> / 5°C /step]
				[0 to 20 / <u>10</u> / 5°C /step]
				[0 to 20 / <u>10</u> / 5°C /step]
	[Stand-by Time]			
915	1	Job Receiving	*BCU	Specifies the time to shift the machine into the stand-by mode when not receiving a print start command after receiving a print preparation command.
				[0 to 180 / <u>60</u> / 10 seconds/step]
	2	Job End	*BCU	Specifies the time to shift the machine into the stand-by mode after the last job is completed.
				[0 to 180 / <u>30</u> / 10 seconds/step]
				0: The machine does not shift to the stand-by mode.
				0: The machine does not shift to the stand-by mode.
	[Idling Mode]			
916	1	Mode Set	*BCU	Executes the extra idling operation after the fusing unit becomes ready just after the main switch has been turned on.
				[0 to 1 / <u>0</u> / 1 /step]
	2	Idling Time	*BCU	Specifies how long the extra idling operation is executed.
				[10 to 120 / <u>30</u> / 10 sec/step]

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]
916	3	PreJob Mode	*BCU Executes the extra idling operation after the fusing unit becomes ready when a print job arrives at the printer. [0 to 1 / <u>0</u> / 1 /step] 0: Off 1: On
	4	Idling Time SP185	*BCU Specifies how long the extra idling operation is executed when special paper is used and the line speed is 185 mm/s. [0 to 360 / <u>0</u> / 1 sec/step]
917	[Env Condition] Environmental Condition Control Interval		
	1	Time	*BCU Specifies the interval for the environmental condition control. [0 to 23.5 / <u>1.0</u> / 0.5 hour/step] SP1-917-1 specifies the constant T in the following process: <ol style="list-style-type: none"> 1. When the main switch is turned on, the controller checks the temperature of the pressure roller, and resumes or restarts a timer (see step 3). 2. When the timer reaches T, the controller checks the temperature of the pressure roller. <ul style="list-style-type: none"> • If the temperature is 60°C or higher, the controller does not execute the machine temperature corrections to be conducted under the low temperature conditions (SP1-912). The controller clears the timer to zero, then restarts it. • If the temperature is less than 60°C, the controller executes the corrections above. The controller clears the timer to zero, then restarts it. • If the main switch is turned off, the controller stops the timer, but does not clear it. 3. When the main switch is turned on, the controller checks the temperature of the pressure roller. <ul style="list-style-type: none"> • If the temperature is 60°C or higher, the controller resume the timer (the timer is not cleared to zero). • If the temperature is less than 60°C, the controller clears the timer to zero, then restarts it. Summary: At 1 hour after switching on, if the pressure roller temperature is more than 60°C, then SP 1-912 is not effective.

1	Mode No. (Class 1, 2, and 3)	Function / [Setting]	
996	[OHP/TH Fusing] OHP/Thick Paper Fusing Temperature Correction (Heating or Pressure Roller)		
Specifies the temperature for starting a print job. The fusing section is already warmed up when the last print job was completed. If prints are made on OHP or thick paper at this time, the fusing temperature tends to be higher than the target, causing exit roller marks or a paper jam in the fusing section. To prevent this, the print job will not start if the heating and pressure roller temperatures are higher than the following: (Target temperature specified by SP1-105-12, -13, -23, -24) - (Temperature specified by this SP mode (default: 5°C for heating roller, 10°C for pressure roller))			
4	H:Print Temp	*BCU	[0 to 20 / 0 / 1°C /step]
5	P:Print Temp	*BCU	[0 to 20 / 0 / 1°C /step]
6	PreJob Mode	*BCU	This SP enables or disables the 30-second fusing unit idling at the start of an OHP print job. When enabled, idling is done even if the machine is in the ready condition. [0 to 1 / 0 / 1 /step] 0: Off 1: On

SP2-XXX (Drum)

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
001	[Charge Bias] Charge Roller Bias (DC or AC component: [Color], Process Speed) U: Upper, L: Lower		
	1	DC:[K]	*BCU
	2	DC:[Y]	*BCU
	3	DC:[M]	*BCU
	4	DC:[C]	*BCU
			Adjusts the DC component of the charge roller bias in the various print modes. Charge bias (DC component) is automatically adjusted during process control; therefore, adjusting these settings does not effect while process control mode (SP3-125 Default: ON) is activated. When deactivating process control mode with SP3-125, the values in these SP modes are used for printing. [300 to 1000 / <u>700</u> / 10 volts/step] DFU
	5	AC:[K] 62.5	<ul style="list-style-type: none"> Displays the AC component of the charge roller bias adjusted during machine initialization or process control self-check. Sets AC bias in the various print modes for test purposes. <p>If the optimum AC bias cannot be selected because of the upper and lower limits (SP2-001-10 and 11 for K, SP 2-001-21 and 22 for YMC), this may cause white spots on images and black spots on background. (In particular, spots may appear if the room temperature is very low.) Check the printouts after changing the AC bias with these SP modes (SP2-001-12 to 20) and exiting SP mode. If increasing or decreasing the AC bias for relevant color solves the spot problem, shift the AC upper and lower limits (SP2-001-10 and 11 for K, SP 2-001-21 and 22 for YMC) by the value increased or decreased during the test. NOTE: The AC upper and lower limits have been optimized by the manufacturer; therefore, these settings should not be adjusted in the field. [0 to 255 / <u>40</u> / 1/step] DFU</p>
	6	AC:[K] 125	[0 to 255 / <u>71</u> / 1/step] DFU
	7	AC:[K] 185	[0 to 255 / <u>159</u> / 1/step] DFU
	8	AC:[Y] 62.5	[0 to 255 / <u>40</u> / 1/step] DFU
	9	AC:[Y] 125	[0 to 255 / <u>71</u> / 1/step] DFU
	10	AC:[M] 62.5	[0 to 255 / <u>40</u> / 1/step] DFU
	11	AC:[M] 125	[0 to 255 / <u>71</u> / 1/step] DFU
	12	AC:[C] 62.5	[0 to 255 / <u>40</u> / 1/step] DFU
	13	AC:[C] 125	[0 to 255 / <u>71</u> / 1/step] DFU
	14	AC Target [K]	*BCU Sets the upper limit of the AC component adjustable range for black. During machine initialization and process control self-check, the AC component of the charge roller bias is automatically adjusted within the range specified by SP2-001-014 through 017. [0 to 255 / <u>86</u> / 1/step] DFU
	15	AC Target [Y]	*BCU [0 to 255 / <u>83</u> / 1/step] DFU
	16	AC Target [M]	*BCU [0 to 255 / <u>83</u> / 1/step] DFU
	17	AC Target [C]	*BCU [0 to 255 / <u>86</u> / 1/step] DFU

2	Mode No. (Class 1, 2, and 3)	Function / [Setting]		
103	[LD Control] LD Power Control ([Color Mode, Color], Process Speed, K or C olor mode) P: Power, M: Magnification			
	Adjusts the laser power by changing the current applied to LD. Laser power is automatically adjusted during process control; therefore, adjusting these data has no effect while Process Control (SP3-125 Default : ON) is activated. After deactivating Process Control with SP3-125, the values in these SP modes are used for printing.			
	1	P:[K] 62.5 C	*BCU	[0 to 1023 / 576 / 1/step] DFU
	2	P:[K] 125 C	*BCU	[0 to 1023 / 640 / 1/step] DFU
	4	P:[Y] 62.5 C	*BCU	[0 to 1023 / 576 / 1/step] DFU
	5	P:[Y] 125 C	*BCU	[0 to 1023 / 640 / 1/step] DFU
	7	P:[M] 62.5 C	*BCU	[0 to 1023 / 576 / 1/step] DFU
	8	P:[M] 125 C	*BCU	[0 to 1023 / 640 / 1/step] DFU
	10	P:[C] 62.5 C	*BCU	[0 to 1023 / 576 / 1/step] DFU
	11	P:[C] 125 C	*BCU	[0 to 1023 / 640 / 1/step] DFU
	13	P:[K] 62.5 K	*BCU	[0 to 1023 / 576 / 1/step] DFU
	14	P:[K] 125 K	*BCU	[0 to 1023 / 576 / 1/step] DFU
	15	P:[K] 185 K	*BCU	[0 to 1023 / 601 / 1/step] DFU
	26	P:[0 1] 125 K	*BCU	[0 to 1023 / 576 / 1/step] DFU
	27	P:[0 1] 185 K	*BCU	[0 to 1023 / 601 / 1/step] DFU
	Main Scan Magnification ([Color], Laser Exposure Frequency)			
	55	M:[K] 64.3MHz	*BCU	Displays the result of the latest line position adjustment. Changing this affects the main scan magnification; however, this will be automatically corrected at the next line position adjustment. If a fine adjustment is required, it can be done with SP5-993-013 to 015 (this affects the way that the adjustment is done, and will be effective from the next line position adjustment). [0 to 280 / 140 / 1 dot/step] 1 dot = 20μ DFU NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001.
	56	M:[Y] 64.3MHz	*BCU	
	57	M:[M] 64.3MHz	*BCU	
	58	M:[C] 64.3MHz	*BCU	
	59	M:[K] 47.6MHz	*BCU	
	LD Power Control for CF ([Color Mode, Color])			
	101	CF:[K,K] 1	* BCU CF	[0 to 1023 / 604 / 1/step] DFU
	102	CF:[K,K] 2		[0 to 1023 / 604 / 1/step] DFU
	103	CF:[FC,K]		[0 to 1023 / 720 / 1/step] DFU
	104	CF:[FC,Y]		[0 to 1023 / 720 / 1/step] DFU
	105	CF:[FC,M]		[0 to 1023 / 720 / 1/step] DFU
106	CF:[FC,C]	[0 to 1023 / 720 / 1/step] DFU		
107	CF:[K] OHP/TH	[0 to 1023 / 590 / 1/step] DFU		
108	CF:[Y] OHP/TH	[0 to 1023 / 590 / 1/step] DFU		
109	CF:[M] OHP/TH	[0 to 1023 / 590 / 1/step] DFU		
110	CF:[C] OHP/TH	[0 to 1023 / 590 / 1/step] DFU		
109	[LD Beam Pitch] LD Beam Pitch			
	Sets the beam pitch for black in 1200 dpi or 600 dpi mode. NOTE: After replacing the laser optics housing unit, the data printed on the decal attached to the new unit must be input with this SP mode.			
	2	Pitch 1200	*BCU	[0 to 255 / 50 / 50 pulse/step] FA
3	Pitch 600	*BCU	[0 to 255 / 42 / 50 pulse/step] FA	

2	Mode No. (Class 1, 2, and 3)			Function / [Setting]
109	5	Display 1200		[0 to 255 / - / 1 pulse/step]
	6	Display 600		[0 to 255 / - / 1 pulse/step]
112	[Polygon OFF 1] Polygon Mirror Motor OFF Timing			
	1	Warming-up	*BCU	The polygon mirror motor turns off if the machine receives no print start command for the time specified in this SP mode after receiving the print preparation command. [0 to 60 / <u>10</u> / 1 second/step] 0: Not turned off except for Energy Saver mode
	2	Job End	*BCU	The polygon mirror motor turns off if the machine receives no print job for the time specified in this SP mode after the previous job was completed. [0 to 60 / <u>10</u> / 1 second/step] 0: Not turned off except for Energy Saver mode
113	[Polygon OFF 2] Polygon Mirror Motor OFF			
	1	Polygon OFF 2		The polygon mirror motor does not turn on until the printer enters the ready condition even after receiving the print start command. [0 or 1 / <u>0</u> / 1 /step] 0: Enable, 1: Disable NOTE: When a user complains about high frequency noise, enabling this mode can minimize the noise.
201	[Dev. Bias] Development Bias ([Color], Process Speed)			
	1	[K] 62.5	*BCU	Adjusts the development bias.
	2	[K] 125	*BCU	Development bias is automatically adjusted during process control; therefore, adjusting these settings has no effect while Process Control (SP3-125
	3	[K] 185	*BCU	Default: ON) is activated.
	4	[Y] 62.5	*BCU	After deactivating Process Control with SP3-125,
	5	[Y] 125	*BCU	the values in these SP modes are used for
	6	[M] 62.5	*BCU	printing.
	7	[M] 125	*BCU	[200 to 800 / <u>500</u> / 10 V/step] DFU
	8	[C] 62.5	*BCU	
9	[C] 125	*BCU		
207	[Forced Toner] Forced Toner Supply ([Color])			
	1	[K]		Forces toner to be supplied to the development unit.
	2	[Y]		[0 or 1 / <u>0</u> / 1 /step]
	3	[M]		0: Not execute
	4	[C]		1: Execute
				The toner supply clutch turns on for 0.7 s and off for 1.3 s.
208	[Toner Mode] Toner Supply Method ([Color])			
	1	[K]	*BCU	Selects the toner supply method.
	2	[Y]	*BCU	[0 to 2 / <u>1</u> / 1/step] Alphanumeric
	3	[M]	*BCU	0: Fixed supply (with the supply rates stored with
	4	[C]	*BCU	SP2-208-5 to 8)
				1: Fuzzy control supply
				2: Proportional control supply (using the Vref
				values stored with SP2-224-5 to 8)
5	Fixed Rate [K]	*BCU	Sets the toner supply rate used when the toner	
6	Fixed Rate [Y]	*BCU	supply method (SP2-208-1 to 4) is set to '0' (fixed	
7	Fixed Rate [M]	*BCU	supply mode).	
8	Fixed Rate [C]	*BCU	[0 to 100 / <u>5</u> / 1%/step]	

2	Mode No. (Class 1, 2, and 3)			Function / [Setting]
208	9	Upper Limit	*BCU #	<p>Specifies the maximum possible toner supply, expressed as a percentage of the maximum amount of toner that can possibly be supplied for a sheet of paper.</p> <p>If too much toner is supplied to the development unit especially for black or in the low humidity condition, this may cause dirty background due to insufficient agitation. This SP mode limits the maximum possible toner supply for black and only in the low humidity condition for color.</p> <p>[0 to 100 / <u>63</u> / 1 %/step] DFU</p> <p>NOTE: The main switch must be turned off and on to effect the setting change.</p>
	10	LowCoverage[K]	*BCU	<p>Adjusts the toner supply amount (fixed rate) when making multiple prints of pages with low image ratio (coverage).</p> <p>When printing with a low image ratio, toner concentration is controlled only with Vt outputs since pixel count is not done for low image ratios. This may cause the attraction force between toner and carrier to increase, resulting in low image density on outputs. To prevent this, the machine counts the number of pixels and supplies a fixed amount of toner if the accumulated number of pixels becomes greater than the specified level.</p> <p>[0 to 100 / <u>0</u> / 1 %/step] DFU</p>
	11	LowCoverage[Y]		
	12	LowCoverage[M]		
	13	LowCoverage[C]		
	14	Vt Coeff[Bk]	*BCU	<p>Specifies each constant to adjust the toner supply amount. The optimum value is specified before shipment.</p> <p>[0 to 10.0 / <u>0.3</u> / 0.1 %/step] DFU</p>
	15	Vt Coeff[Y]		
	16	Vt Coeff[M]		
	17	Vt Coeff[C]		
	18	Img Coeff[Bk]	*BCU	<p>Specifies each constant to adjust the toner supply amount. The optimum value is specified before shipment.</p> <p>[0 to 10.0 / <u>0.7</u> / 0.1 %/step] DFU</p>
	19	Img Coeff[Y]		
	20	Img Coeff[M]		
	21	Img Coeff[C]		
	22	ImgCrctCoef[Bk]	*BCU	<p>Specifies each constant to adjust the toner supply amount. The optimum value is specified before shipment.</p> <p>[0 to 10.0 / <u>0.1</u> / 0.1 %/step] DFU</p>
	23	ImgCrctCoef[Y]		
24	ImgCrctCoef[M]			
25	ImgCrctCoef[C]			
210	[Toner Counter] Toner Supply Counter ([Color])			<p>Displays the total time that the toner supply clutch has been on.</p> <p>This data is stored in the memory chip on each toner cartridge.</p> <p>[0 to 5000 / <u>0</u> / 1 second/step]</p>
	5	[K]	*BCU	
	6	[Y]	*BCU	
	7	[M]	*BCU	
	8	[C]	*BCU	
212	[Toner Near/End] Toner Near End / End Detection Threshold ([Color])			<p>When the amount of toner amount left in the cartridge becomes less than this value, the machine starts monitoring the Vt values for toner near end detection.</p> <p>[0 to 1000 / <u>100</u> / 10 g/step]</p>
	1	Start [K]	*BCU	
	2	Start [YMC]	*BCU	

2	Mode No. (Class 1, 2, and 3)			Function / [Setting]
212	5	Near [K]	*BCU	Specifies the threshold for toner near-end detection. The machine detects toner near-end when the following happens 10 times consecutively. $V_t > V_{ref} + \text{Threshold}$ [0 to 5.0 / 0.4 / 0.1 V/step]
	6	Near [YMC]	*BCU	
	7	End [K]	*BCU	Specifies the threshold for toner end detection. The machine detects toner end when the following happens 10 times consecutively. Then, the machine stops printing, even during a print job. $V_t > V_{ref} + \text{Threshold}$ [0 to 5.0 / 0.5 / 0.1 V/step]
	8	End [YMC]	*BCU	
	9	Pixel [K]	*BCU	Specifies the number of sheets with full image coverage that can be printed after toner near-end has been detected. When near-end is detected, the pixels in the images are counted. The machine detects toner end when the following happens, and the machine stops printing even during a print job. $\text{Pixel count} = 5 \text{ A4/LT sheets with full image coverage}$ [0 to 255 / 50 / 1 sheet/step] NOTE: The setting of SP2-212-11 has priority for deciding when to stop printing.
	10	Pixel [YMC]	*BCU	
	11	Min. Print	*BCU	Specifies the minimum number of sheets that can be printed after toner near-end has been detected. However, when the following happens 10 consecutive times, the machine stops printing even during a print job or if this guaranteed minimum has not been met. $V_t > \text{Current } V_{ref} \text{ value} + 1.2V \text{ or } V_t > 4.8V$ [0 to 50 / 10 / 1 sheet/step]
	12	sensor avg [K]	*BCU	Displays the average signal value of the toner end sensor. Printed images can be weak when the value is larger. [0 to 1 / 0 / 0.01/step] Each toner sensor detects the toner that is falling through the toner path beneath the toner cartridge. Each sensor outputs "0" when it detects toner in the toner path, or outputs "1" when it does not detect toner. The signal is "1" if toner is not passing through the path even though the toner cartridge contains toner. These signals, "0" and "1", are periodically checked and used to calculate the signal average. When enough toner is in the cartridge, the signal average is a smaller value ("0" or its vicinity). When toner is insufficient, the average is a larger value ("1" or its vicinity).
	13	sensor avg [Y]		
	14	sensor avg [M]		
	15	sensor avg [C]		

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
213	[T End ON/OFF] Toner End Detection ON/OFF		
	1	T End ON/OFF	<p>*BCU #</p> <p>Enables or disables toner near-end and end detection (if disabled, the toner supply clutch on time is still counted). [0 to 2 / <u>1</u> / 1 /step] Alphanumeric, DFU 0: Both sensors disabled 1: Both sensors enabled 2: Toner end sensor disabled and TD sensor enabled</p> <p>Use this SP only when tests are necessary under the toner end or toner near end condition. Specify the default value after the tests.</p> <p>NOTE: The main switch must be turned off and on to effect the setting change.</p>
223	[TD Vcnt] TD Sensor Vcnt Control		
	1	Initialization	<p>*BCU</p> <p>Enables or disables the Vcnt Auto Adjustment when detecting a new development unit. When the machine detects a new development unit, developer initialization automatically starts. During the developer initialization, Vcnt is automatically adjusted so that Vt is within 3.0 ± 0.1V. [0 or 1 / <u>1</u> / -] Alphanumeric, DFU 0: Disabled 1: Enabled</p>
	2	Humidity	<p>*BCU</p> <p>Enables or disables the Humidity Auto Correction. This corrects the Vcnt value for the current humidity. This correction is applied to both the Vcnt values automatically adjusted during developer initialization and manually adjusted with SP2-224-1 to 4. If this correction does not work well under certain environmental conditions or due to a defective humidity sensor, deactivate the Humidity Auto Correction and adjust the Vcnt value in SP2-224-1 to 4 (by trial and error). [0 or 1 / <u>1</u> / -] Alphanumeric 0: Disabled 1: Enabled</p>
	3	Toner Fill Up	<p>*BCU</p> <p>Activates or deactivates the Toner Fill Up mode, which fills up the toner supply tube with toner during developer initialization. This function is required only at machine installation. Although the default is "0", the factory setting is "1". After toner fill-up occurs during machine installation, the setting is changed to "0" automatically. [0 or 1 / <u>0</u> / -] Alphanumeric, DFU 0: Deactivate 1: Activate</p>

2	Mode No. (Class 1, 2, and 3)	Function / [Setting]	
224	[Vcnt / Vref] Vcnt / Vref ([Color]) Adjusts the Vcnt value manually. The value in this SP mode is effective until after the next process control self-check. To always use this value for some reason, select proportional control supply mode with SP2-208-1 to 4. 1 Vcnt [K] 2 Vcnt [Y] 3 Vcnt [M] 4 Vcnt [C]	*BCU #	[0 to 22.0 / <u>10.0</u> / 0.1 V/step] NOTE: The main switch must be turned off and on to effect the setting change.
224	Adjusts the Vref value manually. The value in this SP mode is effective until the next process control self-check. To always use this value for some reason, select proportional control supply mode with SP2-208-1 to 4. 5 Vref [K] 6 Vref [Y] 7 Vref [M] 8 Vref [C]	*BCU	[0 to 5.0 / <u>2.8</u> / 0.1 V/step]
301	[Transfer Cur.] Transfer Current ([Color Mode, Color], Paper Tray or By-pass, Simplex or Duplex, Process Speed) Paper Type -> TH: Thick Paper, SP: Special Paper Adjusts the transfer current for each color and each print mode. NOTE: If the transfer current is increased too much, image offset may occur especially in halftone areas. 1 [K]P S 125 2 [K]P S 185 3 [K]P D 125 4 [K]P D 185 5 [K]B S 62.5 6 [K]B S 125 7 [K]B S 185 8 [FC,K]P S 62.5 9 [FC,K]P S 125 10 [FC,Y]P S 62.5 11 [FC,Y]P S 125 12 [FC,M]P S 62.5 13 [FC,M]P S 125 14 [FC,C]P S 62.5 15 [FC,C]P S 125 16 [FC,K]P D 62.5 17 [FC,K]P D 125 18 [FC,Y]P D 62.5 19 [FC,Y]P D 125 20 [FC,M]P D 62.5 21 [FC,M]P D 125 22 [FC,C]P D 62.5 23 [FC,C]P D 125 24 [FC,K]B S 62.5 25 [FC,K]B S 125 26 [FC,Y]B S 62.5 27 [FC,Y]B S 125 28 [FC,M]B S 62.5 29 [FC,M]B S 125	*BCU	[0 to 50 / <u>15</u> / 1 μ A/step] [0 to 50 / <u>22</u> / 1 μ A/step] [0 to 50 / <u>16</u> / 1 μ A/step] [0 to 50 / <u>27</u> / 1 μ A/step] [0 to 50 / <u>5</u> / 1 μ A/step] [0 to 50 / <u>15</u> / 1 μ A/step] [0 to 50 / <u>22</u> / 1 μ A/step] [0 to 50 / <u>6</u> / 1 μ A/step] [0 to 50 / <u>13</u> / 1 μ A/step] [0 to 50 / <u>6</u> / 1 μ A/step] [0 to 50 / <u>10</u> / 1 μ A/step] [0 to 50 / <u>6</u> / 1 μ A/step] [0 to 50 / <u>10</u> / 1 μ A/step] [0 to 50 / <u>6</u> / 1 μ A/step] [0 to 50 / <u>10</u> / 1 μ A/step] [0 to 50 / <u>9</u> / 1 μ A/step] [0 to 50 / <u>15</u> / 1 μ A/step] [0 to 50 / <u>7</u> / 1 μ A/step] [0 to 50 / <u>10</u> / 1 μ A/step] [0 to 50 / <u>7</u> / 1 μ A/step] [0 to 50 / <u>10</u> / 1 μ A/step] [0 to 50 / <u>7</u> / 1 μ A/step] [0 to 50 / <u>10</u> / 1 μ A/step] [0 to 50 / <u>6</u> / 1 μ A/step] [0 to 50 / <u>13</u> / 1 μ A/step] [0 to 50 / <u>6</u> / 1 μ A/step] [0 to 50 / <u>10</u> / 1 μ A/step] [0 to 50 / <u>6</u> / 1 μ A/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
301	30	[FC,C]B S 62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	31	[FC,C]B S 125	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
	32	[K]OHP 62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	33	[FC,K]OHP 62.5	*BCU	[0 to 50 / <u>8</u> / 1 μ A/step]
	34	[FC,Y]OHP 62.5	*BCU	[0 to 50 / <u>8</u> / 1 μ A/step]
	35	[FC,M]OHP 62.5	*BCU	[0 to 50 / <u>4</u> / 1 μ A/step]
	36	[FC,C]OHP 62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	37	[K]TH R62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	38	[FC,K]TH R62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	39	[FC,Y]TH R62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	40	[FC,M]TH R62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	41	[FC,C]TH R62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	42	[K]SP S62.5	*BCU	[0 to 50 / <u>8</u> / 1 μ A/step]
	43	[K]SP S125	*BCU	[0 to 50 / <u>15</u> / 1 μ A/step]
	44	[K]SP S185	*BCU	[0 to 50 / <u>22</u> / 1 μ A/step]
	45	[FC,K]SP S62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	46	[FC,Y]SP S62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	47	[FC,M]SP 62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	48	[FC,C]SP 62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	49	[FC,K]SP 125	*BCU	[0 to 50 / <u>13</u> / 1 μ A/step]
	50	[FC,Y]SP 125	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
	51	[FC,M]SP 125	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
	52	[FC,C]SP 125	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
	57	[K]TH S62.5	*BCU	[0 to 50 / <u>6</u> / 1 μ A/step]
	58	[FC,K]TH S62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	59	[FC,Y]TH S62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	60	[FC,M]TH S62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	61	[FC,C]TH S62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	62	[K]SP D62.5	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
	63	[K]SP D125	*BCU	[0 to 50 / <u>16</u> / 1 μ A/step]
	64	[K]SP D185	*BCU	[0 to 50 / <u>27</u> / 1 μ A/step]
	65	[FC,K]SP D62.5	*BCU	[0 to 50 / <u>9</u> / 1 μ A/step]
	66	[FC,Y]SP D62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	67	[FC,M]SP D62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	68	[FC,C]SP D62.5	*BCU	[0 to 50 / <u>7</u> / 1 μ A/step]
	69	[FC,K]SP D125	*BCU	[0 to 50 / <u>15</u> / 1 μ A/step]
	70	[FC,Y]SP D125	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
	71	[FC,M]SP D125	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
	72	[FC,C]SP D125	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
309	[Cur.Paper Size] Transfer Current - Paper Size Correction Paper Type -> N: Normal, TH: Thick, OHP			
	Corrects the transfer current for paper size. When small paper is used for printing, the transfer current flows to the drum at the non image areas where the transfer belt touches the OPC drum. This may cause an abnormal image due to insufficient current at the image areas. NOTE: Increase only when an abnormal image (insufficient image transfer) occurs on a small paper size. However, increasing the current too much may cause image offset.			
	5	N LT SEF	*BCU	[1.0 to 4.0 / <u>1.4</u> / 0.1/step]
	6	N A5 SEF	*BCU	[1.0 to 4.0 / <u>1.8</u> / 0.1/step]
	7	TH LT SEF	*BCU	[1.0 to 4.0 / <u>1.2</u> / 0.1/step]
	8	TH A5 SEF	*BCU	[1.0 to 4.0 / <u>1.4</u> / 0.1/step]

2	Mode No. (Class 1, 2, and 3)			Function / [Setting]
309	9	OHP LT SEF	*BCU	[1.0 to 4.0 / <u>1.4</u> / 0.1/step]
	10	OHP A5 SEF	*BCU	[1.0 to 4.0 / <u>4.0</u> / 0.1/step]
402	[Transfer Ctrl] Transfer Control			
	1	C Mode Posit	*BCU	Adjusts the transfer belt position for color printing. [0 to 500 / <u>170</u> / 10/step] DFU SP2-402-1 is valid only when auto correct (SP2-402-2) is disabled (☛ 6.7.5).
	2	Auto Correct	*BCU	Enable or disable the auto-adjustment of the transfer belt position. [0 to 1 / <u>1</u> / 1/step] DFU 0: Disabled 1: Enabled <ul style="list-style-type: none"> • When SP2-402-2 is enabled, the transfer belt position for color printing is decided in accordance with the result of the initialization processing (☛ 6.7.5). • SP2-402-2 validates the setting of SP2-402-1, but does not affect the setting of SP2-402-3.
	3	Bk Mode Posit	*BCU	Adjusts the transfer belt position for monochrome printing. [0 to 500 / <u>130</u> / 10/step] DFU SP2-402-3 is always valid regardless of the setting in SP2-402-2.
801	[PA Roller Cur.] Paper Attraction Roller Current ([Color], Simplex or Duplex, Process Speed): Current Adjustment (Paper or By-pass): Paper Size Correction			
Adjusts the paper attraction roller current for color printing. If paper misfeeds occur at the transfer unit in color mode, check and/or adjust the paper attraction roller current. NOTE: The magenta development section is close to the paper attraction roller. Decreasing the current may not cause paper misfeed. If the current is increased too much, the following image problems may occur depending on the humidity. <u>High humidity:</u> Insufficient image transfer in magenta due to current flow to the magenta OPC drum <u>Low humidity:</u> Offset image in magenta halftone areas due to paper charged positive too much When adjusting the current with this SP mode, the value should be lower than transfer current.				
	6	[FC] S 62.5	*BCU	[0 to 50 / <u>1</u> / 1 μ A/step]
	7	[FC] S 125	*BCU	[0 to 50 / <u>1</u> / 1 μ A/step]
	8	[FC] D 62.5	*BCU	[0 to 50 / <u>5</u> / 1 μ A/step]
	9	[FC] D 125	*BCU	[0 to 50 / <u>10</u> / 1 μ A/step]
	14	[K] B TH S	*BCU	[10 to 30 / <u>5</u> / 0.1/step]
	15	[FC] B TH S	*BCU	[10 to 30 / <u>1</u> / 0.1/step]
	16	[K] B OHP	*BCU	[10 to 30 / <u>5</u> / 0.1/step]
	17	[FC] B OHP	*BCU	[10 to 30 / <u>1</u> / 0.1/step]
	18	[K] B TH D	*BCU	[10 to 30 / <u>5</u> / 0.1/step]
	19	[FC] B TH D	*BCU	[10 to 30 / <u>1</u> / 0.1/step]
	20	[K] SP S	*BCU	[10 to 30 / <u>8</u> / 0.1/step]
	21	[K] SP D	*BCU	[10 to 30 / <u>12</u> / 0.1/step]
	22	[FC] SP S 62.5	*BCU	[10 to 30 / <u>1</u> / 0.1/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
801	23	[FC] SP S 125	*BCU	[10 to 30 / <u>1</u> / 0.1/step]
	24	[FC] SP D 62.5	*BCU	[10 to 30 / <u>1</u> / 0.1/step]
	25	[FC] SP D 125	*BCU	[10 to 30 / <u>1</u> / 0.1/step]
802	<p>[PA Cur. Size] Paper Attraction Roller Current - Paper Size Correction Paper Type -> N: Normal, TH: Thick, OHP</p>			
	<p>Adjusts the correction, depending on the paper size. When small-width paper is used for printing, the paper attraction roller current flows to the non-image areas of OPC drum where the transfer belt touches the drum. This may cause paper misfeed due to insufficient current. To increase the current by 1.5 times, set the SP mode to "15". NOTE: Adjust only when a paper misfeed occurs with a small paper size. Increasing the current too much may cause image offset in magenta halftone areas.</p>			
	1	N LT SEF	*BCU	[10 to 40 / <u>15</u> / 0.1/step]
	2	N A5 SEF	*BCU	[10 to 40 / <u>20</u> / 0.1/step]
	3	TH LT SEF	*BCU	[10 to 40 / <u>15</u> / 0.1/step]
	4	TH A5 SEF	*BCU	[10 to 40 / <u>20</u> / 0.1/step]
	5	OHP LT SEF	*BCU	[10 to 40 / <u>24</u> / 0.1/step]
	6	OHP A5 SEF	*BCU	[10 to 40 / <u>40</u> / 0.1/step]
908	<p>[Mirror Motor] Mirror Positioning Motor ([Color])</p>			
	<p>Displays the result of the latest line position adjustment. Changing this affects the mirror position, which corrects the optically skewed image; however, this will be automatically corrected at the next line position adjustment. NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001.</p>			
	2	[C]	*BCU	[-128 to 127 / <u>0</u> / 1 pulse/step] DFU
	3	[M]	*BCU	
	4	[Y]	*BCU	
909	<p>[Main-scan Reg.] Main-scan Registration ([Color])</p>			
	<p>Displays the result of the latest line position adjustment. Changing this affects the main scan registration; however, this will be automatically corrected at the next line position adjustment. If a fine adjustment is required, it can be done with SP5-993-010 to 012 (this affects the way that the adjustment is done, and will be effective from the next line position adjustment. NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. 1 dot = 20μ</p>			
	1	[Y]	*BCU	[-500 to 500 / <u>0</u> / 1 dot/step] DFU
	2	[M]	*BCU	
	3	[C]	*BCU	
4	[K]	*BCU		
916	<p>[Sub-scan Reg.] Sub-scan Registration ([Color Mode, Color], Resolution)</p>			
	<p>Displays the result of the latest line position adjustment. Changing this affects the sub scan registration; however, this will be automatically corrected at the next line position adjustment. If a fine adjustment is required, it can be done with SP5-993-016 to 021 (this affects the way that the adjustment is done, and will be effective from the next line position adjustment. NOTE: If the line position adjustment does not work properly, the line position can be adjusted manually with this SP mode as a temporary measure. In this case, the line position adjustment needs to be disabled with SP5-993-001. 600 dpi: 1 dot = 40μ, 1200dpi: 1 dot = 20μ</p>			
1	[K] 1200	*BCU	[0 to 20000 / <u>7510</u> / 1 dot] DFU	

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
916	2	[FC,K] 1200	*BCU	[0 to 20000 / <u>15038</u> / 1 dot] DFU
	3	[FC,Y] 1200	*BCU	[0 to 20000 / <u>10402</u> / 1 dot] DFU
	4	[FC,M] 1200	*BCU	[0 to 20000 / <u>1136</u> / 1 dot] DFU
	5	[FC,C] 1200	*BCU	[0 to 20000 / <u>5762</u> / 1 dot] DFU
	6	[K] 600	*BCU	[0 to 20000 / <u>3755</u> / 1 dot] DFU
	7	[FC,K] 600	*BCU	[0 to 20000 / <u>7519</u> / 1 dot] DFU
	8	[FC,Y] 600	*BCU	[0 to 20000 / <u>5201</u> / 1 dot] DFU
	9	[FC,M] 600	*BCU	[0 to 20000 / <u>568</u> / 1 dot] DFU
	10	[FC,C] 600	*BCU	[0 to 20000 / <u>2881</u> / 1 dot] DFU
	919	[MScan Lgth Det] Main-scan Length Detection		
1		MScan Lgth D	*BCU	Enables or disables the main-scan length detection. [0 or 1 / <u>1</u> / -] Alphanumeric 0: Disable 1: Enable
994	[MScan Reg Cor] Main-scan Registration Correction ([Color]) Not used. DFU			
	1	[Y]	*BCU	[-128 to 127 / <u>0</u> / 1 dot/step] DFU
	2	[M]	*BCU	[-128 to 127 / <u>1</u> / 1 dot/step] DFU
	3	[C]	*BCU	[-128 to 127 / <u>1</u> / 1 dot/step] DFU
	4	[K]	*BCU	[-128 to 127 / <u>0</u> / 1 dot/step] DFU
995	[Motor Reset] Mirror Positioning Motor Reset			
	1	Motor Reset	*BCU	Rotates the mirror position motors (CMY) by 250 pulses clockwise; then by 125 pulses counterclockwise. This moves the mirrors back to the initial position. Then, the settings of SP2-908-002 to 004 are reset to 0. When the line position adjustment fails, it is one of possible causes when the mirror position motor locks. Performing this SP mode can move the mirrors back to the original position if it locks. Then, do the forced line position adjustment (SP5-993-002).

SP3-XXX (Process)

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
005	[TD Initial] TD Sensor Initialization ([Color])		
	1	[K]	Initializes the developer. DFU Press the Enter key to execute the initialization after the machine asks "Execute?".
	2	[Y]	
	3	[M]	
	4	[C]	
	5	[All Color]	
	6	Result	*BCU Displays the developer initialization result. [1 to 9 / - / -] 1: Success 2 to 9: Failure All colors are displayed. Values is displayed in the order K Y C M. e.g., 1 1 2 1: Initialization of Cyan failed but the others succeeded See the troubleshooting section for details.
006	[Vcnt Initial] Vcnt Initial Setting Display ([Color])		
	1	[K]	*BCU Displays the initial Vcnt value.
	2	[Y]	*BCU [0 to 240 / <u>100</u> / 0.1/step]
	3	[M]	*BCU
	4	[C]	*BCU
007	[Vcnt Current] Vcnt Current Value Display ([Color])		
	1	[K]	*BCU Displays the current Vcnt value.
	2	[Y]	*BCU [0 to 240 / - / 0.1/step]
	3	[M]	*BCU
	4	[C]	*BCU
008	[Humidity]		
	1	Humidity	*BCU Displays the humidity measured by the humidity/temperature sensor. [0 to 100 / - / 1/step]
107	[Vsg Display] Vsg Display (Front or Rear)		
	1	Vsg F	*BCU Displays the Vsg value of the front ID sensor. [0.00 to 5.00 / - / 0.01V/step] Vsg is normally 4.0 ± 0.5 V. If Vsg is out of the adjustment range and this is detected 3 times consecutively, it leads to SC385.
	2	LED Current F	*BCU Displays the ID sensor LED current adjusted during Vsg adjustment. [0 to 1023 / - / 1]
	3	Vsg C	*BCU Displays the Vsg value of the center ID sensor. [0.00 to 5.00 / - / 0.01V/step] Vsg is normally 4.0 ± 0.5 V. If Vsg is out of the adjustment range and this is detected 3 times consecutively, it leads to SC385.
	4	LED Current C	*BCU Displays the ID sensor LED current adjusted during Vsg adjustment. [0 to 1025 / - / 1]
	5	Vsg R	*BCU Displays the Vsg value of the rear ID sensor. [0.00 to 5.00 / - / 0.01V/step] Vsg is normally 4.0 ± 0.5 V. If Vsg is out of the adjustment range and this is detected 3 times consecutively, it leads to SC385.





3		Mode No. (Class 1, 2, and 3)		Function / [Setting]
107	6	LED Current R	*BCU	Displays the ID sensor LED current adjusted during Vsg adjustment. [0 to 1025 / - / 1]
	7	Vsg avg bk	*BCU	Displays the average black Vsg value of the center ID sensor. [0.00 to 5.00 / - / 0.01V/step]
120	[Dev. g Target] Development Gamma Target ([Color])			
	Adjusts the development gamma by changing the Vref value used for toner density control. Vref is automatically corrected so that the gamma measured during the process control self-check becomes "the value set with this SP mode ± 0.15"			
	1	[K]	*BCU	[100 to 300 / <u>190</u> / 1 mg/cm ² /KV / step] DFU
	2	[Y]	*BCU	[100 to 300 / <u>165</u> / 1 mg/cm ² /KV / step] DFU
	3	[M]	*BCU	
	4	[C]	*BCU	
121	[Dev. g Display] Development Gamma Display ([Color])			
	Displays the development gamma measured during the process control self-check.			
	1	[K]	*BCU	[0 to 10000 / - / 1 mg/cm ² /KV / step]
	2	[Y]	*BCU	Normal Range: 1.00 to 2.00
	3	[M]	*BCU	
	4	[C]	*BCU	
122	[Vk Display] Vk Display ([Color])			
	1	[K]	*BCU	Displays the current Vk value.
	2	[Y]	*BCU	[-255 to 255 / - / 1 V/step]
	3	[M]	*BCU	Normal Range: -50 to 50
	4	[C]	*BCU	
123	[Vref Display] Current Vref Display ([Color])			
	1	[K]	*BCU	Displays the current Vref value.
	2	[Y]	*BCU	[0.0 to 5.0 / - / 0.1V/step]
	3	[M]	*BCU	
	4	[C]	*BCU	
125	[Process Contr.] Process Control			
	1	ON/OFF	*BCU	Enables or disables process control. [0 or 1 / <u>1</u> / 1/step] Alphanumeric 0: OFF (Use the fixed values for VD, VL and VB set with SP2-001, SP2-103, and SP2-201.) 1: ON
	2	LD Control	*BCU	Selects the LD control mode. [0 to 2 / <u>1</u> / 1/step] Alphanumeric 0: Fixed (at the value in SP2-103) 1: Controlled by process control 2: Controlled by LD power selection

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
125	3	Auto TD Adj.	<p>*BCU</p> <p>Specifies when to perform the Auto Toner Density Adjustment. When performing the Auto Toner Density Adjustment, the machine supplies or consumes toner so that the development gamma is within ± 0.15 of the gamma target. [0 to 3 / <u>0</u> / 1/step] Alphanumeric 0: Disable 1: Initial & Non-use self-check 2: Job end & Non-use self-check 3: Initial & Job end & Non-use self-check <i>Change if the customer complains of toner density fluctuations. Before changing the setting away from 0, check whether the forced TD adjustment (3-126-2) is effective. If the problem is persistent, then change to 1, 2, or 3. However, the machine takes several minutes to do this adjustment.</i></p>
4	4	ACC	<p>*BCU CF</p> <p>Enables or disables the process control self-check before printing the ACC pattern. [0 to 2 / <u>2</u> / 1/step] 0: Disable 1: Process Control Self-check 2: Auto TD Adjustment & Process Control Self-check</p> <p>NOTE: If color balance changes during multi-copy runs after ACC is performed, select 1 or 2. Setting 2 can precisely adjust the image density; however, it takes about 6 minutes. Select 1 or 2 depending on the customer's requirement.</p>
5	5	TD Adj. Cndtn	<p>*BCU</p> <p>Specifies whether temperature and humidity are taken into account when deciding the timing of the auto toner density adjustment (described in SP 3-125-3). Timing for the auto toner density adjustment is determined by the setting of SP3-125-003. In addition, if SP 3-125-5 is set to 1, the auto toner density adjustment is done when the temperature and humidity meet specified conditions (same conditions as used for transfer current correction). [0 to 1 / <u>1</u> / 1/step] 0: No 1: Yes</p> <p>Specify "1" when both temperature and humidity are both high or low.</p>
6	6	TD Adj. Times	<p>*BCU</p> <p>Limits the number of auto toner density adjustments. [1 to 3 / <u>3</u> / 1/step]</p> <p>The auto toner density adjustment consists of three steps: detecting the development gamma, supplying or consuming toner, and detecting the development gamma again. When these three steps are all complete, it means a single auto toner density adjustment is complete.</p>

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
126	[Forced SelfChk] Forced Self-check		
	1	Forced SelfChk	Performs a forced process control self-check.
	2	Forced TD Adj.	Performs a forced auto toner density adjustment.
902	[Pntr. Display] Pointer Table Display ([Color])		
	1	Printer [K]	Displays the number in the pointer table that was selected during the latest process control self-check. [1 to 30 / - / 1/step]
	2	Printer [Y]	
	3	Printer [M]	
	4	Printer [C]	
	5	CF [K]	
	6	CF [Y]	
	7	CF [M]	
	8	CF [C]	
903	[M/A Target] M/A Target ([Color])		
	Adjusts the M/A (M ass per A rea, mg/cm ²) value used during the process control self-check. Adjusting this changes the development bias. This causes the solid ID to increase or decrease. If developer capability causes an ID problem, toner density needs to be adjusted with SP3-120-1 to 4, depending on the color.		
	1	Printer [K]	[0 to 1.50 / <u>0.65</u> / 0.05 mg/cm ² /step] DFU
	2	Printer [Y]	
	3	Printer [M]	
	4	Printer [C]	
	5	CF [K]	
	6	CF [Y]	
	7	CF [M]	
	8	CF [C]	
904	[M/A for LD] M/A Target for LD Correction ([Color])		
	Adjusts the M/A value used during the LD correction mode. This value is effective when SP3-125-2 "LD Control Selection" is set to "2". Adjusting this data effects the image reproduction especially in highlight areas.		
	1	Printer [K]	[0 to 1.00 / <u>0.10</u> / 0.01 mg/cm ² /step] DFU
	2	Printer [Y]	
	3	Printer [M]	
	4	Printer [C]	
	5	CF [K]	
	6	CF [Y]	
	7	CF [M]	
	8	CF [C]	
905	[M/A Target]		
	1	Intrvl [K]	Adjusts the target amount of each toner on paper sheets. [0 to 1.50 / <u>0.30</u> / 0.01 mg/cm ² /step] DFU
	2	Intrvl [Y]	
	3	Intrvl [M]	
	4	Intrvl [C]	
	These values are optimized before shipment. Do not change the values. Changing these values does not affect toner density on paper sheets.		
	5	Intrvl [K]	Displays the amount of each toner on the paper. [0 to 1.500 / - / 0.01 mg/cm ² /step]
	6	Intrvl [Y]	
	7	Intrvl [M]	

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
905	8	Intrvl [C]	<p>*BCU A problem may have occurred in the printer engine if the value is high or low (i.e., if the difference between SP3-905-1/2/3/4 and SP3-5/6/7/8 is larger than $\pm 0.03 \text{ mg/cm}^2$).</p> <p>Possible problems: Defective TD sensor, defective ID sensor, toner near-end (if the value is lower than the target), defective toner supply mechanism</p>
906	[PC SelfChk] Process Control Self-checks		
	1	Job End	<p>*BCU Specifies the execution timing of the job end process control self-check. [0 to 999 / <u>200</u> / 1 print/step] The job end process control self-check is automatically done after a job is completed when 200 prints have been made since the last self-check. The counter for the job end process control self-check resets when one of the following process control self-checks is done.</p> <ul style="list-style-type: none"> • Initial • Interval: Interrupt • Non-use Time • During Toner End <p>When K prints are made, the number of prints is calculated with the K coefficient in SP3-906-5.</p>
	2	Interrupt	<p>*BCU Specifies the execution timing of the interrupt process control self-check. [0 to 999 / <u>0</u> / 1 print/step] The interrupt process control self-check is automatically done if the number of prints in the job exceeds the number set in this SP mode. When the print job is completed, the counter is reset, even if the interrupt self check did not occur. When K prints are made, the number of prints is calculated with the K coefficient in SP3-906-5.</p>
	3	Non-use Time 1	<p>*BCU Specifies the executing timing of the non-use time process control self-check. [0 to 999 / <u>0</u> / 1 print/step] 0: Disable The non-use time process control self-check is automatically done after the number of prints set with this SP mode have been made and no prints have been made for the time set with SP mode 3-906-4 since the last print job. If the conditions are met, the self-check will be done after the print job is completed. The counter is reset when the initial process control self-checks is done or when a print is made.</p>
	4	Non-use Time 2	<p>*BCU Specifies the executing timing of the non-use time process control self-check. [0 to 2550 / <u>480</u> / 10 minutes/step] 0: Disable</p>

3	Mode No. (Class 1, 2, and 3)			Function / [Setting]
906	5	K Coefficient	*BCU	Sets the coefficient to calculate the counter value for black-and-white prints. [0 to 1.00 / <u>1.00</u> / 0.01/step] DFU With the default setting (100), counters used for process control count up by 1 when 1 black-and-white print has been made.
910	[Vmin Display] Vmin Display ([Color])			
	1	[K]	*BCU	Displays the current Vmin value for K [0 to 2.00 / <u>0</u> / 0.01/step]
	2	[Color]	*BCU	Displays the lowest current Vmin value for the colors (CMY). [0 to 2.00 / <u>0</u> / 0.01/step]
911	[Vt Display Cur] Vt Current Display ([Color])			
	1	[K]	*BCU	Displays the current Vt value. [0.0 to 5.0 / - / 0.1V/step]
	2	[Y]	*BCU	
	3	[M]	*BCU	
	4	[C]	*BCU	
912	[Vt Display Ave] Vt Average Display ([Color])			
	1	[K]	*BCU	Displays the average Vt value. [0.0 to 5.0 / - / 0.1V/step]
	2	[Y]	*BCU	
	3	[M]	*BCU	
	4	[C]	*BCU	
913	[T. Supply Time] Toner Supply Time Display ([Color])			
	1	[K]	*BCU	Displays the toner supply clutch on time for the most recent page. [0 to 5000 / - / 10 ms/step]
	2	[Y]	*BCU	
	3	[M]	*BCU	
	4	[C]	*BCU	
920	[OPC Refresh]			
	1	Temperature	*BCU	This SP determines the temperature threshold for determining whether refresh mode is done just after the machine is switched on. The charge roller generates NOx (nitrogen oxides), and these contaminate the OPC drum surface and may cause a smeared image. Just after the main switch is turned on, if the temperature measured by both the thermistor located at the right side on the laser optics housing unit and the temperature/humidity sensor is greater than the temperature specified in this SP mode, refresh mode is done before initial process control. During refresh mode, toner is developed on the OPC with 50V development potential and cleaned to remove NOx. This cycle is repeated a few times. [10 to 30 / <u>25</u> / 1°C /step]
	2	Humidity	*BCU	This SP determines the humidity threshold for determining whether refresh mode is done just after the machine is switched on. Just after the main switch is turned on, if the humidity measured by the temperature/humidity sensor is greater than the humidity specified in this SP mode, refresh mode is done before the initial process control self-check. [10 to 90 / <u>75</u> / 1%/step]

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
920	3	Prints	*BCU Specifies how often refresh mode is done. When the total number of prints since the last refresh mode exceeds the number specified in this SP mode, refresh mode is done before the job end process control self-check. [10 to 2550 / <u>200</u> / 10 prints/step]
	4	Mode Set	*BCU Enables/disables refresh mode. [0 to 2 / <u>2</u> / 1/step] Alphanumeric 0: Disabled 1: Done at power on and toner end recovery 2: Done at power on, toner end recovery, and after the specified number of prints. NOTE: Refresh mode is done during the toner end recovery self-check after a new toner cartridge is installed.
	5	Forced	Executes a forced refresh mode. Use this mode when the image is smeared. It takes about 1 minute. Also use after replacing the components of the transfer unit (see section 3).
	6	Auto Tnr Ref (Auto Toner Refresh)	*BCU Performs a toner refresh during the OPC refresh mode by changing the development bias from 50V to 400V. [0 or 1 / <u>1</u> / -] 0: Disabled 1: Enabled Enable this SP mode when dirty background and/or firefly spots appear intermittently on prints with a low image area ratio. While making prints with a low image area ratio, developer is agitated with less toner supplied. This may cause the toner-carrier attraction force to increase or toner to coagulate. This sometimes causes firefly spots or dirty background when a large amount of toner is supplied. NOTE: When enabling this SP mode, the following SP modes should be changed. SP3-906-001 Job End Process Control Self-check 200 (Default) -> 100 SP3-920-003 OPC Refresh Mode / Prints 200 (Default) -> 100



3	Mode No. (Class 1, 2, and 3)		Function / [Setting]									
921	<p>[Forced Tnr Ref] Forced Toner Refresh</p> <p>Perform forced toner refresh mode.</p> <p>When the developer has deteriorated or when prints are made in a very low humidity condition, dirty background may appear continuously.</p> <p>When this kind of dirty background appears, check whether or not the development gamma is within the target (SP3-120 and 121). If the development gamma is not within the target, do this SP mode.</p> <p>The machine automatically does the toner refresh mode in the following sequence.</p> <ol style="list-style-type: none"> 1. Consumes toner in the development unit without toner supply until toner end is detected 2. Starts toner recovery mode. 3. Starts process control self-check. <p>NOTE: If toner is drastically consumed for a short time, this may cause carrier to flow out. To prevent this, toner is consumed over a long period of time. (It takes about 20 minutes to complete this toner refresh mode).</p> <table border="1"> <tr> <td>1</td> <td>Bk</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>All Color</td> <td></td> <td></td> </tr> </table>				1	Bk			2	All Color		
1	Bk											
2	All Color											
922	<table border="1"> <tr> <td>1</td> <td>Mode Set</td> </tr> </table>	1	Mode Set	*BCU	<p>Specifies when the OPC refresh is executed for CMY drums, which forcibly creates a temporary 15mm-wide toner line on the drum surface by applying the development bias (200V) and turning on the development clutch at the end of a job.</p> <p>Note that this OPC refresh is a separate process from the one controlled by SP 3-920 and 3-921.</p> <p>[0 ~ 2 / 1 / 1 /step]</p> <p>0: Disable (OPC refresh is not executed.)</p> <p>1: Low coverage (OPC refresh is executed after an output of low coverage ratio.)</p> <p>2: Every time (OPC refresh is executed after every job.)</p>							
1	Mode Set											
975	<p>[P Ctrl Result] Process Control Self-check Result</p>											
	<table border="1"> <tr> <td>1</td> <td>P Ctrl Result</td> </tr> </table>	1	P Ctrl Result	*BCU	<p>Displays the result of the latest process control self-check.</p> <p>[0 to 9999 / - / 1/step]</p> <p>All colors are displayed. The results are displayed in the order "K Y C M"</p> <p>e.g., 1 1 9 1: The self-check for Cyan failed but the others were successful</p> <p>See the troubleshooting section for details.</p>							
1	P Ctrl Result											

SP4-XXX (Scanner)

4	Mode No. (Class 1, 2, and 3)		Function / [Setting]
008	[SubScanMagnification] Sub-scan Magnification Adjustment		
1	SubScanMagnification	* SBU CF	Adjusts the sub-scan magnification by changing the scanner motor speed. [-1.0 to 1.0 / 0 / 0.1%/step] FA
010	[Leading Edge Reg.] Leading Edge Registration Adjustment		
1	Leading Edge Reg.	* SBU CF	Adjusts the leading edge registration by changing the scanning start timing in the sub-scan direction. [-3.0 to 3.0 / 0 / 0.1 mm/step] FA
011	[Side-to-Side Reg.] Side-to-Side registration Adjustment		
1	Side-to-Side Reg.	* SBU CF	Adjusts the side-to-side registration by changing the scanning start timing in the main scan direction. [-6.0 to 6.0 / 0 / 0.1 mm/step] FA
012	[Blank Margin] Blank Margin Adjustment		
1	Leading Edge	*	Sets the blank margin at each side for erasing the original shadow caused by the gap between the original and the scale. [0 to 3.0 / 0 / 0.1 mm/step] FA
2	Trailing Edge	NV	
3	Left	CF	
4	Right		
013	[Scanner Free Run]		
1	Lamp: OFF	CF	Performs the scanner free run with the exposure lamp on or off in the following mode. Full color mode / Full Size / A3 or DLT
2	Lamp: ON		
017	[Scan Operation]		
1	Shading ON	CF	Makes one scan with generating an F-Gate signal and shading on or off in the following mode. Full color mode / Full Size / A3 or DLT Uses this SP mode to check if the F-Gate signal is properly generated (F-Gate tells the engine to start printing data).
2	Shading OFF		
205	[Black ADS Level]		
1	Black ADS Level	* SBU CF	Specifies the level for deleting the background density in ADS mode. [0 to 128 / 70 / 1/step]
301	[APS Operation Check]		
1	APS Operation Check	CF	Displays a code that represents the original size detected by the original sensors. (See Input Check Table.)
303	[APS A5size Check]		
1	APS A5size Check	* SBU CF	Specifies the result of the detection when the outputs from the original sensors are all OFF. [0 or 1 / 0 / -] 0: No original 1: A5 Lengthwise

4	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
417	[IPU Test Pattern]			
	1	IPU Test Pattern	CF	Selects the IPU test pattern. [0 to 16 / <u>0</u> / 1/step] 0: Scanned image 1: Grid pattern 2: Slant grid pattern 3: Gradation main scan1 4: Gradation sub scan1 5: Gradation RBGYMCK 6: UCR pattern 7: Color patch 16 (1) 8: Color patch 16 (2) 9: Color patch 64 10: Grid pattern YMCK 11: Color patch YMCK 12: Gray pattern (1) 13: Gray pattern (2) 14: Gradation main scan2 15: Scanned + Grid pattern 16: Scanned + Gray scale
440	[Saturation Adj.] Saturation Adjustment			
	1	Saturation Adj.	* NV CF	Adjusts the level of saturation for copying. [0 to 5 / <u>3</u> / 1/step] 0: High 1: Lowest 2: Lower 3: Default 4: Higher 5: Highest
628	[R Gain Display] Gain Adjustment Red			
	1	R EVEN	CF	Displays the gain value of the amplifiers on the scanner SBU for Red.
	2	R ODD		
629	[G Gain Display] Gain Adjustment Green			
	1	G EVEN	CF	Displays the gain value of the amplifiers on the scanner SBU for Green.
	2	G ODD		
630	[B Gain Display] Gain Adjustment Blue			
	1	B EVEN	CF	Displays the gain value of the amplifiers on the scanner SBU for Blue.
	2	B ODD		
685	[Reference Adj.: R] Reference Adjustment Red			
	1	Reference Adj.: R	* SBU CF	Sets the reference voltage for the A/D converters on the scanner IPU for Red. [0 to 255 / <u>136</u> / 1/step] DFU
686	[Reference Adj.: G] Reference Adjustment Green			
	1	Reference Adj.: G	* SBU CF	Sets the reference voltage for the A/D converters on the scanner IPU for Green. [0 to 255 / <u>136</u> / 1/step] DFU
687	[Reference Adj.: B] Reference Adjustment Blue			
	1	Reference Adj.: B	* SBU CF	Sets the reference voltage for the A/D converters on the scanner IPU for Blue. [0 to 255 / <u>136</u> / 1/step] DFU

4	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
688	[DF: Density Adj.] DF Density Adjustment			
	1	DF: Density Adj.	* SBU CF	Adjusts the white shading parameter when scanning an image with the ARDF. [83 to 100 / <u>86</u> / 1 %/ step] Adjusts the density level if the ID of outputs made in the DF and Platen mode is different.
800	[DF: Density Correction]			
	1	R	* SBU CF	Sets a coefficient to adjust the image density level when scanning an image with the ARDF. [-20 to 20 / <u>0</u> / 1/step] DFU
	2	G		
	3	B		
904	[Scanner IPU Test]			
	1	Test1: Register Access	CF	Performs a write and read check of the ASICs on the scanner IPU board and displays the result. 00: OK 11, 12, 13, 14, 15: NG
	2	Test2: Image Path		Performs an image path check on the scanner IPU board and displays the result. 00: OK 21, 22, 23, 24: NG
905	[Dither Selection]			
	1	Dither Selection	* NV CF	Changes the parameters for error diffusion. [0 to 255 / <u>0</u> / 1/step] DFU
907	[VPU Test Pattern]			
	1	Test Pattern: R	CF	Selects the test pattern generated by the scanner SBU board. [0 to 4 / <u>0</u> / 1 /step] 0: Default (Scanned Image) 1: Cyan pattern 2: White pattern 3: Cyan Pattern 16 steps 4: Line pattern
	2	Test Pattern: G		Selects the test pattern generated by the scanner SBU board. [0 to 4 / <u>0</u> / 1 /step] 0: Default (Scanned Image) 1: Magenta pattern 2: White pattern 3: Magenta Pattern 16 steps 4: Line pattern
	3	Test Pattern: B		Selects the test pattern generated by the scanner IPU board. [0 to 4 / <u>0</u> / 1 /step] 0: Default (Scanned Image) 1: Yellow pattern 2: White pattern 3: Yellow Pattern 16 steps 4: Line pattern
909	[Gamma [K] Photo (Mono)] Printer Gamma Adjustment for Black/Photo mode			
	1	Offset: Highlight	* NV CF	Adjusts the offset data of the printer gamma for black in B&W and Photo mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle		
	3	Offset: Shadow		
	4	Offset: IDmax		

4	Mode No. (Class 1, 2, and 3)			Function / [Setting]
909	5	Option: Highlight	* NV CF	Adjusts the option data of the printer gamma for black in the B&W and Photo mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle		
	7	Option: Shadow		
	8	Option: IDmax		
910	[Gamma [K] Letter] Printer Gamma Adjustment for Black/Letter mode			
	1	Offset: Highlight	* NV CF	Adjusts the offset data of the printer gamma for black in Letter mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle		
	3	Offset: Shadow		
	4	Offset: IDmax		
	5	Option: Highlight		Adjusts the option data of the printer gamma for black in Letter mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle		
	7	Option: Shadow		
8	Option: IDmax			
911	[Gamma [C] Letter] Printer Gamma Adjustment for Cyan/Letter mode			
	1	Offset: Highlight	* NV CF	Adjusts the offset data of the printer gamma for cyan in Letter mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle		
	3	Offset: Shadow		
	4	Offset: IDmax		
	5	Option: Highlight		Adjusts the option data of the printer gamma for cyan in Letter mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle		
	7	Option: Shadow		
8	Option: IDmax			
912	[Gamma [M] Letter] Printer Gamma Adjustment for Magenta/Letter mode			
	1	Offset: Highlight	* NV CF	Adjusts the offset data of the printer gamma for magenta in Letter mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle		
	3	Offset: Shadow		
	4	Offset: IDmax		
	5	Option: Highlight		Adjusts the option data of the printer gamma for magenta in Letter mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle		
	7	Option: Shadow		
8	Option: IDmax			
913	[Gamma [Y] Letter] Printer Gamma Adjustment for Yellow/Letter mode			
	1	Offset: Highlight	* NV CF	Adjusts the offset data of the printer gamma for yellow in Letter mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle		
	3	Offset: Shadow		
	4	Offset: IDmax		
	5	Option: Highlight		Adjusts the option data of the printer gamma for yellow in Letter mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle		
	7	Option: Shadow		
8	Option: IDmax			
914	[Gamma [K] Letter (Mono)] Printer Gamma Adjustment for Black/Letter mode			
	1	Offset: Highlight	* NV CF	Adjusts the offset data of the printer gamma for black in B&W and Letter mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle		
	3	Offset: Shadow		
	4	Offset: IDmax		
	5	Option: Highlight		Adjusts the option data of the printer gamma for black in B&W and Letter mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle		
	7	Option: Shadow		
8	Option: IDmax			

4	Mode No. (Class 1, 2, and 3)		Function / [Setting]
915	[Gamma [K] Photo] Printer Gamma Adjustment for Black/Photo mode		
	1	Offset: Highlight	* NV CF Adjusts the offset data of the printer gamma for black in Photo mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle	
	3	Offset: Shadow	
	4	Offset: IDmax	
	5	Option: Highlight	Adjusts the option data of the printer gamma for black in Photo mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle	
	7	Option: Shadow	
8	Option: IDmax		
916	[Gamma [C] Photo] Printer Gamma Adjustment for Cyan/Photo mode		
	1	Offset: Highlight	* NV CF Adjusts the offset data of the printer gamma for cyan in Photo mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle	
	3	Offset: Shadow	
	4	Offset: IDmax	
	5	Option: Highlight	Adjusts the option data of the printer gamma for cyan in Photo mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle	
	7	Option: Shadow	
8	Option: IDmax		
917	[Gamma [M] Photo] Printer Gamma Adjustment for Magenta/Photo mode		
	1	Offset: Highlight	* NV CF Adjusts the offset data of the printer gamma for magenta in Photo mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle	
	3	Offset: Shadow	
	4	Offset: IDmax	
	5	Option: Highlight	Adjusts the option data of the printer gamma for magenta in Photo mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle	
	7	Option: Shadow	
8	Option: IDmax		
918	[Gamma [Y] Photo] Printer Gamma Adjustment for Yellow/Photo mode		
	1	Offset: Highlight	* NV CF Adjusts the offset data of the printer gamma for yellow in Photo mode. [0 to 30 / <u>15</u> / 1 /step] See 'Replacement and Adjustment – Gamma Correction – Copy Mode' for how to use.
	2	Offset: Middle	
	3	Offset: Shadow	
	4	Offset: IDmax	
	5	Option: Highlight	Adjusts the option data of the printer gamma for yellow in Photo mode. [0 to 255 / <u>0</u> / 1 /step] DFU
	6	Option: Middle	
	7	Option: Shadow	
8	Option: IDmax		
932	[Dot Position Cor.] Main Scan Dot Position Correction		
	1	R: Left	* NV CF Corrects the left or right side alignment of the red or blue filter on the CCD. [0 to 9 / <u>5</u> / 1 /step] For details on this adjustment, see Replacement and Adjustment – Image Adjustment - Scanner
	2	R: Right	
	3	B: Left	
	4	B: Right	

SP5-XXX (Mode)

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]																																							
009	[Language]																																									
	1	Language	*CTL # Selects the language for the control panel. [0 to 16 / 2 / 1/step] <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Data</th> <th>Language</th> <th>Data</th> <th>Language</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>No language</td> <td style="text-align: center;">9</td> <td>Norwegian</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Japanese</td> <td style="text-align: center;">10</td> <td>Danish</td> </tr> <tr> <td style="text-align: center;">2</td> <td>English</td> <td style="text-align: center;">11</td> <td>Swedish</td> </tr> <tr> <td style="text-align: center;">3</td> <td>American</td> <td style="text-align: center;">12</td> <td>Polish</td> </tr> <tr> <td style="text-align: center;">4</td> <td>French</td> <td style="text-align: center;">13</td> <td>Portuguese</td> </tr> <tr> <td style="text-align: center;">5</td> <td>German</td> <td style="text-align: center;">14</td> <td>Hungarian</td> </tr> <tr> <td style="text-align: center;">6</td> <td>Italian</td> <td style="text-align: center;">15</td> <td>Czech</td> </tr> <tr> <td style="text-align: center;">7</td> <td>Spanish</td> <td style="text-align: center;">16</td> <td>Finnish</td> </tr> <tr> <td style="text-align: center;">8</td> <td>Dutch</td> <td></td> <td></td> </tr> </tbody> </table> <p>NOTE: When changing language, the main switch has to be turned off and on to initialize the system.</p>	Data	Language	Data	Language	0	No language	9	Norwegian	1	Japanese	10	Danish	2	English	11	Swedish	3	American	12	Polish	4	French	13	Portuguese	5	German	14	Hungarian	6	Italian	15	Czech	7	Spanish	16	Finnish	8	Dutch	
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024	mm/inch Display																																									
	1	mm/inch display	*CTL Display units (mm or inch) for custom paper sizes. 0: mm (Europe/Asia) 1: inch (USA)																																							
045	[Counter Method]																																									
	1	Counter Method	*CTL Selects the counting method if the meter charge mode is enabled with SP5-930-001. [0 or 1 / 0 / -] 0: Developments 1: Prints <p>NOTE: The counting method can be changed only once, regardless of whether the counter value is negative or positive.</p>																																							
046	[Rom Update] ROM Update Display																																									
	1	ROM Update	*CTL Enables or disables the ROM Update utility. When enabled, this utility will be displayed in the user program mode. [0 or 1 / 1 / -] DFU 0: Enable 1: Disable																																							
101	[Energy Saver]																																									
	3	Energy Saver 1	*CTL After the end of a job, the machine enters Energy Saver mode (level 1) when this timer runs out. [0 to 60 / 0 / 10 sec/step]																																							
	4	Energy Saver 2 (Auto OFF mode)	*CTL After the end of a job, the machine enters Energy Saver mode (level 2) when this timer runs out. [0 to 3600 / 3600 / 60 sec/step]																																							
104	[Double Count]																																									
	1	Double Count	*CTL Specifies whether the counter is double clicked for A3/DLT size prints. [0 or 1 / 0 / -] 0: Normal count 1: Double count																																							

Service Tables



5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
118	[Simplex Back Sheet Setting] DFU		
132	[Application Priority]		
	1	Application Priority	* CTL CF Selects which application has the first priority when jobs from different applications arrive simultaneously. [2 or 3 / <u>2</u> / -] 2: Job Queue 3: Copy application
302	[Set Time]		
	2	Set Time	* # CTL CF Adjusts the RTC (real time clock) time setting for the local time zone. [-1440 to 1440 / 60 / 1 min./step] Examples: For Japan (+9 GMT), enter 540 (9 hours x 60 min.) NA :-300 (New York) EU :+ 60 (Paris) CH :+480 (Peking) TW :+480 (Taipei) AS :+480 (Hong Kong)
305	[ES Level 2 Set]		
	1	ES Level 2 Set	*CTL Enables or disables Energy Saver Level 2 (Auto Off mode). [0 or 1 / <u>0</u> / -] 0: Enabled 1: Disabled
404	[UCodeCtrClr] Use Code Counter Clear		
	1	UCodeCtrClr	Clear all counters for users. [0 to 1 / <u>1</u> / 0/step] 0: Not executed 1: Executed
409	[Password]		
	1	Password Set	* Sets the password for the key operator.
	2	Access Area	CTL CF Specifies the parts of user program mode that can be accessed with the password. [0 to 2 / <u>0</u> / 1 /step] 0: None 1: Part of system settings 2: All features and system settings
610	[ACC Factory Setting]		
	4	Recall	CF Recalls the factory settings.
	5	Overwrite	Overwrites the current values onto the factory settings.
	6	Previous Setting	Recalls the previous settings.
611	[Toner Ratio in 2C]		
	1	B-C	* NV CF Adjusts the color balance of a single color (blue, green, or red) by changing the proportion of color toner (C, M, and/or Y). [0 to 100 / <u>90</u> / 1 %/step]
	2	B-M	[0 to 100 / <u>80</u> / 1 %/step]
	3	G-C	[0 to 100 / <u>90</u> / 1 %/step]
	4	G-Y	[0 to 100 / <u>80</u> / 1 %/step]
	5	R-M	[0 to 100 / <u>100</u> / 1 %/step]
	6	R-Y	[0 to 100 / <u>80</u> / 1 %/step]

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
801	[Memory Clear]		
	NOTE: For more information, see "NOTE 1" following this table.		
	3	SCS	Clears the system settings.
	4	IMH	CF Clears IMH data. DFU
	5	MCS	CF Clears MCS data. DFU
	6	Copy Application	CF Clears the copy application settings.
	7	Fax Application	CF Clears the fax application settings.
	8	Printer Application	Clears the printer application settings.
	9	Scanner Application	CF Clears the scanner application settings.
	10	Netfile Application	CF Delete the netfile application management files and thumbnails, and initializes the job login ID.
	11	NCS	Initializes the system default and interface settings (IP address also), SmartNetMonitor for Admin, WebStatusMonitor settings, and the TELNET settings.
	12	IPU	CF Clears the IPU settings
	13	R-FAX	CF Initializes the job login ID, SmartNetMonitor for Admin, job history, and local storage file numbers.
802	EngineFreeRun		
	1	EngineFreeRun	Performs a free run on the printer engine. NOTE: <ul style="list-style-type: none"> The machine starts free run in the same condition as the sequence of A4/LT printing from the 1st tray. Therefore, paper should be loaded in the 1st tray, but paper is not fed. The main switch has to be turned off and on after using the free run mode for a test.
803	[Input Check]		See section 5-3-2.
804	[Output Check]		See section 5-3-3.
808	[Destination] Destination Code Display		
	1	Destination	*BCU Displays the destination code.
809	[SC OFF] SC Detection ON/OFF		
	1	SC ON/OFF	*BCU Enable or disables the service call detection (SC codes will be ignored if disabling this SP mode). [0 or 1 / 0 / -] Alphanumeric 0: Enable 1: Disable
810	[SC Reset]		
	1	SC Reset	Resets a type A service call condition. NOTE: Turn the main switch off and on after resetting the SC code.
811	[SN Display] Serial Number Display		
	2	SN Display	*BCU Displays the machine serial number.
812	[FAX TEL No.]		
	1	Telephone	* CTL CF Sets the telephone number for a service representative. This number is printed on the Counter List, which can be printed with the user's "Counter" menu. This can be up to 20 characters (both numbers and alphabetic characters can be input).

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
812	2	FAX TEL No.	*CTL	Sets the fax or telephone number for a service representative. This number is printed on the Counter List, which can be printed with the user's "Counter" menu if the Meter Charge mode is selected with SP5-930-1. This can be up to 13 characters (both numbers and alphabetic characters can be input).
	3	Supply	*CTL	Use this to input the telephone number of your supplier for consumables. Enter the number and press #. <i>Press the \odot key to input a pause. Press the "Clear modes" key to delete the telephone number.</i>
	4	Operation	*CTL	Use this to input the telephone number of your sales agency. Enter the number and press #. <i>Press the \odot key to input a pause. Press the "Clear modes" key to delete the telephone number.</i>
816	[CSS Setting]			
	1	CSS Setting	*CTL	[0 to 1 / 0 / 1/step] DFU 0: Disable 1: Enable
821	[CSS-PI Device Co]			
	1	CSS-PI Device Co	*CTL	[0 to 4 / 0 / 1/step] DFU
824	[NVRAMUpload] NVRAM Upload			
	1	NvramUpload	#	Uploads the UP and SP mode data (except for counters and the serial number) from the NVRAM to a flash memory card. [0 to 1 / 0 / 1/step] 0: Not executed 1: Executed
825	[NVRAMDownload] NVRAM Download			
	1	NvramDownload	#	Downloads the UP and SP mode data from a flash memory card to the NVRAM [0 to 1 / 0 / 1/step] 0: Not executed 1: Executed
828	[Network] Job spool settings/ Interface selection for Ethernet and wireless LAN [Network Setting] (CF)			
	10	Version	*	Displays the version of NCS.
	11	Mac Address	CTL	Displays the Mac Address.
	12	Device Name	CF	Displays the device name.
	13	Comment		Displays the comment.
	15	Printer Server Name		Displays the print server name.
	16	File Server Name		Displays the file server name.
	17	NDS Context1:NW		Displays the NDS context.
	18	NDS Context2:NW		
	19	Work Group Name		Displays the workgroup name.
	20	Network Path Name:NB		Displays the network path name.

5	Mode No. (Class 1, 2, and 3)			Function / [Setting]
828	25	Software Switch	* CTL CF	Sets the reference for the network software.[00000000 to FFFFFFFFh / 00000000h / 1 hex unit/step]
	26	OperationMode:TCP/IP		Sets the TCP/IP operation mode for the network.[00000000 to FFFFFFFFh / 00000000h / 1 hex unit/step]
	27	SyslogServer Address		Sets the syslog server address for the network.[00000000 to FFFFFFFFh / 7F00001h / 1 hex unit/step]
	28	Timer Server Address		Sets the timer server address for the network.[00000000 to FFFFFFFFh / 00000000h / 1 hex unit/step]
	29	DNS Server Address		Sets the DNS server address for the network.[00000000 to FFFFFFFFh / 00000000h / 1 hex unit/step]
	30	Directprint Port No		Sets the directprint port number for the network.[1024 to 65535 / 9100 / 1/step]
	31	IPP Timeout		Sets the IPP timeout for the network.[30 to 65535 / 900 / 1/step]
	32	IPX Address: NW		Sets the IPX Address.
	33	Remote Printer No:NW		Sets the remote printer number for the network.[0 to 254 / 0 / 1/step]
	34	Software Switch: NW		Sets the software switch for the network.[0000 to FFFFh / 0003h / 1 hex unit/step]
	35	Trans.Protocol PS NW		Sets the print server transport protocol for the network.0001h: TCP & IPX0100h: TCP& IPX (Priority: IPX)0102h: TCP Only (Priority: TCP)0001h: IPX Only
	36	AppleTalk Module		Sets the AppleTalk module for the network.2: EtherTalk Phase2
	37	Net No: AT		Sets the NetNo of the AppleTalk network.
	38	Object Name: AT		Sets the object name of the AppleTalk Network.
	39	Apple Talk Type		Sets the AppleTalk type for the network.
	40	Working Zone: AT		Sets the AppleTalk working zone for the network.
	47	Job Analysis Timeout		Sets the Centronics job analysis timeout for the network. [0 to 4200 / <u>3</u> / 1 sec/step]
	48	Job Timeout		Sets the Centronics job timeout for the network. [0 to 4200 / <u>0</u> / 1 sec/step]
	49	Noise Cancel		Sets the noise cancel level for the network. [4 to 7 / <u>4</u> / 1 clock/step]
	50	1284 Compatibility		Switches Centronics IEEE1284 compatibility on/off for the network. [0 or 1 / <u>1</u> / -] 0: Disabled, 1: Enabled <i>Selecting "0" disables bi-directional data transmission.</i>
	51	Data Transfer		Sets the Centronics transfer speed for the network. [0 or 1 / <u>1</u> / -] 0: Slow, 1: Fast <i>If you select "0" there will be a 120 μs delay from the STP signal to the data transfer. (With 1: Fast there is no delay.)</i>



5		Mode No. (Class 1, 2, and 3)		Function / [Setting]
828	52	ECP	* CTL CF	Switches the ECP setting for Centronics off/on. [0 or 1 / <u>1</u> / -] 0: Disabled, 1: Enabled <i>With "1" selected, SP5-828-050 must be enabled for 1284 mode compatibility.</i>
	53	Transmission Speed		Selects the Ethernet transmission speed. [0 to 3 / <u>0</u> / 1 /step] 0: Auto 1: 10Base-T 2: 100Base-TX 3: Auto
	66	HD job Clear	*CTL	Treatment of the job when a spooled job exists at power on. 0: Data is cleared 1: Automatically printed
	67	Job Spool (LPR)	*CTL	Job spool on/off (LPR). 0: Job spool off 1: Job spool on
	68	Job Spool (Protocol)	*CTL	Job spool on/off (IPP). 0: Job spool off 1: Job spool on
	74	Delete Password	*CTL	Deletes passwords.
	80	Host Name (Ethernet)	*CTL	Specifies the host name.
832	[HDD Init.] HDD Initialization			
	1	HDD Init./ALL (CF)		Initializes the hard disk. Use this SP mode only if there is a hard disk error.
	2	IMF	CF	
	3	NFA	CF	
	4	Job Log	CF	
	5	Printer Fonts	CF	
	9	Debug	CF	DFU
833	[JobLog ON/OFF]			
	7	JobLog ON/OFF	*CTL	Saves the result of the jobs in the job log. If this mode is enabled, the result is written on the HDD. If no HDD is installed, this feature is disabled even if this SP is set to 'enabled'. [0 or 1 / <u>0</u> / -] 0: Disabled 1: Enabled
839	[IEEE1394]			
	4	Device Name	*CTL	DFU
	7	Cycle Master		DFU
	8	BCR mode		DFU
	9	IRM 1394a Check		DFU
	10	Unique ID		DFU
	11	Logout		DFU
	12	Login		DFU
	13	Login MAX		DFU
840	[IEEE 802.11b]			
	4	Current SSID	*CTL	Enters a unique ID (up to 32 characters long) to identify the device when it is operating in an area with another wireless LAN network.

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
840	6	Channel Max	*CTL	Sets the maximum number of channels available for data transmission via the wireless LAN. The number of channels available varies according to location. The default settings are set for the maximum end of the range for each area. Adjust the upper 4 bits to set the maximum number of channels. DFU [1 to 11 or 13 / <u>1</u> / 1 /step] Europe/Asia: 1 to 13 USA: 1 to 11 Note: Do not change the setting
	7	Channel Min	*CTL	Sets the minimum number of channels available for data transmission via the wireless LAN. The number of channels available varies according to location. The default settings are set for the minimum end of the range for each area. Adjust the lower 4 bits to set the minimum number of channels. DFU [1 to 11 or 13 / <u>1</u> / 1 /step] Europe/Asia: 1 to 13 USA: 1 to 11 Note: Do not change the setting
	10	WEP key	*CTL	Enters the WEP key. The maximum number of characters is determined by SP5-840-20.
	11	WEP key number	*CTL	Selects the WEP key. [00~11 / 00 / 1 binary] 00: Key #1 01: Key #2 (Reserved) 10: Key #3 (Reserved) 11: Key #4 (Reserved)
	20	WEP mode	*CTL	Determines the operation mode of the WEP key. [0~1/0/1] 0: Max. 64-bit (10 characters) 1: Max. 128-bit (10, 26 characters) Displayed only when the option 801.11b for wireless LAN is installed.
841	[Supply Name Setting]			
	1	Black	*CTL	Specifies supply names. These appear on the screen when the user presses the Inquiry button in the user tools screen.
	2	Cyan	CF	
	3	Yellow		
	4	Magenta		
	5	StapleStd		
	7	OrgStamp		
844	[USB]			
	1	TransferRate	*CTL	Adjusts the USB transfer rate. [0 to 1 / <u>0</u> / 1/step] 0: Auto Change 1: Full speed
	2	Vendor ID	*CTL	Displays the vendor ID. DFU
	3	Product ID	*CTL	Displays the product ID. DFU
	4	DevReleaseNum	*CTL	Displays the development release version number. DFU

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]																																
851	[Bluetooth]																																		
	1	Bluetooth	*CTL Select the Bluetooth mode. [0 to 1 / 0 / 1/step] 0: Public 1: Private																																
852	[SMTP]																																		
	1	Server Name	Simple Mail Transfer Protocol. The protocol for communication between Internet main MTAs (Message Transfer Agents).																																
	2	Port Number	Sets the port number [0~65535 / 25 / 1]																																
856	[Remote Update]																																		
	2	Local Port	*CTL Allows the technician to upgrade the firmware using a parallel cable [0 to 1 / 0 / 1/step] 0: Disable 1: Enable																																
907	[Plug/Play] Plug & Play Name Selection																																		
	1	Plug/Play	*BCU Specifies the manufacturer and model name. [0 to 7 / 0 / 1/step] FA <table border="1"> <thead> <tr> <th></th> <th>MF</th> <th>Model Name</th> <th>NetBeui</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Ricoh</td> <td>Aficio CL7000</td> <td>Aficio CL7000</td> </tr> <tr> <td>1</td> <td>Ricoh</td> <td>Aficio CL7000</td> <td>Aficio CL7000</td> </tr> <tr> <td>2</td> <td>Savin</td> <td>CLP28</td> <td>CLP28</td> </tr> <tr> <td>3</td> <td>Gestetner</td> <td>DSc38u</td> <td>DSc38u</td> </tr> <tr> <td>4</td> <td>NRG</td> <td>DSc38u</td> <td>DSc38u</td> </tr> <tr> <td>5</td> <td>Infotec</td> <td>IPC2838</td> <td>IPC2838</td> </tr> <tr> <td>6</td> <td>Lanier</td> <td>LP138c</td> <td>LP138c</td> </tr> </tbody> </table>		MF	Model Name	NetBeui	0	Ricoh	Aficio CL7000	Aficio CL7000	1	Ricoh	Aficio CL7000	Aficio CL7000	2	Savin	CLP28	CLP28	3	Gestetner	DSc38u	DSc38u	4	NRG	DSc38u	DSc38u	5	Infotec	IPC2838	IPC2838	6	Lanier	LP138c	LP138c
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4	NRG	DSc38u	DSc38u																																
5	Infotec	IPC2838	IPC2838																																
6	Lanier	LP138c	LP138c																																
919	[ACS Mode]																																		
	1	ACS Mode	* CTL CF Specifies how the machine makes copies of documents (job files) merged in the document server. [0 or 1 / 0 / -] 0: Normal 1: Performance Normal: The transfer belt moves up and down depending on the color (color or B&W) of a document (a job file). Performance: The transfer belt moves up for a color copy and keeps the same position until all the merged files have been output, even if next job is a B&W document, in order to increase copy performance.																																
930	[Meter Charge] Meter Charge Mode																																		
	1	ON/OFF	*BCU # Enables or disables the Meter Charge mode. When enabling the Meter Charge mode, the "Counter" menu is added to the user menu. [0 or 1 / 0 / -] Alphanumeric 0: OFF 1: ON																																

5		Mode No. (Class 1, 2, and 3)		Function / [Setting]																																																																					
930	3	Menu	*BCU #	<p>Selects the method for displaying the alert when the life of the parts in a maintenance kit has almost ended. [0 or 1 / <u>1</u> / -] Alphanumeric 0: Click 2 1: Click 1</p> <p>The following table shows the machine condition when the near end or end condition of each maintenance unit is detected. In this table, '-' means 'normal operation'</p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="3">Setting: 1 (Click 1)</th> <th colspan="3">Setting: 0 (Click 2)</th> </tr> <tr> <th>Near</th> <th>End</th> <th>Printing</th> <th>Near</th> <th>End</th> <th>Printing</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>-</td> <td>Alert</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>B</td> <td>-</td> <td>Alert</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>C</td> <td>-</td> <td>Alert</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>D</td> <td>-</td> <td>Alert</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>E</td> <td>Alert</td> <td>Alert</td> <td>Stop</td> <td>Alert</td> <td>Alert</td> <td>Stop</td> </tr> <tr> <td>F</td> <td>-</td> <td>Alert</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>G</td> <td>Alert</td> <td>Alert</td> <td>Stop</td> <td>Alert</td> <td>Alert</td> <td>Stop</td> </tr> <tr> <td>H</td> <td>-</td> <td>Note</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p>A: Color PCU B: Color Development Unit C: Fusing Unit D: Black Development Unit E: Waste Toner Bottle F: Black PCU G: Oil Supply Unit H: Paper Feed Rollers</p> <p>NOTE: SP5-930-004 allows the alert for the paper feed roller to be displayed.</p>		Setting: 1 (Click 1)			Setting: 0 (Click 2)			Near	End	Printing	Near	End	Printing	A	-	Alert	-	-	-	-	B	-	Alert	-	-	-	-	C	-	Alert	-	-	-	-	D	-	Alert	-	-	-	-	E	Alert	Alert	Stop	Alert	Alert	Stop	F	-	Alert	-	-	-	-	G	Alert	Alert	Stop	Alert	Alert	Stop	H	-	Note	-	-	-	-
	Setting: 1 (Click 1)			Setting: 0 (Click 2)																																																																					
	Near	End	Printing	Near	End	Printing																																																																			
A	-	Alert	-	-	-	-																																																																			
B	-	Alert	-	-	-	-																																																																			
C	-	Alert	-	-	-	-																																																																			
D	-	Alert	-	-	-	-																																																																			
E	Alert	Alert	Stop	Alert	Alert	Stop																																																																			
F	-	Alert	-	-	-	-																																																																			
G	Alert	Alert	Stop	Alert	Alert	Stop																																																																			
H	-	Note	-	-	-	-																																																																			
	4	Paper Feed	*BCU #	<p>Determines whether to display the alert when the life of the paper feed rollers is nearly ended. [0 or 1 / <u>0</u> / -] Alphanumeric 0: No Alert 1: Alert</p>																																																																					
	5	Paper Trans.	*BCU #	<p>Determines whether to display the alert when the life of the transfer unit or transfer belt cleaning unit is nearly ended. [0 or 1 / <u>0</u> / -] Alphanumeric 0: No Alert 1: Alert</p>																																																																					

Service Tables

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
961	[Finisher Stack] Finisher Maximum Stack			
	1	Finisher Stack	*BCU #	Enables or disables maximum stack mode for the lower shift tray only in staple mode. If this is enabled, the upper tray can be used for stacking 500 sheets but it stays at the upper exit (will not be used for stapling mode), and the lower tray is used for stacking up to 2,000 sheets. If this is disabled, the upper tray can be used for stacking 500 sheets and the lower tray for 1,500 sheets. [0 or 1 / 1 / -] 0: Disabled 1: Enabled NOTE: The main switch must be turned off and on to effect the setting change.
970	[DebugSerial]			
	1	DebugSerial	*CTL	[0 ~ 0xff / 0x00 / 0 /step] DFU
971	[Touch Panel Correction] Touch Panel Correction Log			
	1	Touch Panel Calibration	* CTL CF	Displays whether the touch panel has been calibrated after clearing all memory. [0 or 1 / 0 / -] 0: Not calibrated 1: Calibrated
974	[Cherry Server Setting]			
	1	Cherry Server Setting	* CTL CF	Specifies which version of ScanRouter, "Lite" or "Full", is installed. [0 or 1 / 0 / -] 0: Lite 1: Full
981	[CSS Setup Call]			
	1	CSS Setup Call		DFU
989	[Loop Back Test]			
	1	Duplex		Executes a communication test with peripherals by using a special tool (connector) which is unique for each peripheral. The machine checks if the communication with the peripherals is OK or NG; then displays the result. DFU
	3	Finisher		
	4	PSU		
990	[SP print mode]			
	1	SP all print		Prints out the SMC sheets.
	2	All		
	3	User Program	CF	
	4	Logging		
	5	Diagnosis Report	CF	
990	6	Non-Default		Prints out the SMC sheets.
	7	NIB Summary		
	8	Net File Log	CF	
	21	Copier User Program	CF	
	22	Scanner SP	CF	
	23	Scanner User Program	CF	

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
991	[Jam OFF/ON] Jam ON/OFF		
	1	Jam OFF/ON	Enables or disables jam detection. [0 or 1 / 0 / -] Alphanumeric 0: Enable 1: Disable
993	[Line Adj.] Line Adjustment		
	Line Positioning Adjustment ([Color])		
	M: Main-scan, S: Sub-scan, Reg.: Registration, Mag.: Magnification		
	For example: M Reg = Main scan registration		
	1	Mode Selection	*BCU Specifies when the automatic line position adjustment is done. [0 to 2 / 1 / 1/step] Alphanumeric 0: Never done 1: Done at a) all process control self checks except after toner end recovery and developer initialization, b) new PCU detected, and c) the temperature has changed by 5°C since the last adjustment 2: As for setting '1', except it is not done during self-checks. However, it is done at the initial process control self check. The size of the 5°C difference can be changed with SP5-993-3.
	2	Execute	Use to make a line position adjustment.
	3	Temperature	*BCU Specifies the temperature for starting the line positioning adjustment. [3 to 15 / 5 / 1°C] The line position adjustment automatically starts when the temperature differs by the amount specified in this SP mode from the temperature when the last adjustment was done. There are two thermistors on the laser optics-housing unit. The thermistor close to the fusing unit monitors the temperature for this adjustment.
	4	Interrupt	*BCU Enables or disables the line position adjustment during a print job when the temperature differs by the amount specified in SP5-993-003 from the temperature at the last adjustment. [0 or 1 / 1 / -] Alphanumeric 0: Disabled 1: Enabled
	5	Stand-by	*BCU Enables or disables the line position adjustment during stand-by mode when the temperature differs by the amount specified in SP5-993-003 from the temperature at the last adjustment. [0 or 1 / 0 / -] Alphanumeric 0: Disabled 1: Enabled
	6	Job Start	*BCU Enables or disables the line position adjustment just before starting a color print job when the temperature differs by the amount specified in SP5-993-003 from the temperature when the machine woke up from energy saver mode. [0 or 1 / 1 / -] 0: Disabled 1: Enabled

5		Mode No. (Class 1, 2, and 3)		Function / [Setting]
993	7	Result	*BCU	<p>Displays the result of the latest line position adjustment in 4 digits.</p> <p>First and second digits: Error detected on the rear ID sensor Third and fourth digits: Error detected on the center ID sensor Fifth and sixth digits: Error detected on the front ID sensor</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><Result> 0 1 0 1 0 1</p> </div> <p>The 6th digit ↑ ↑ The 1st digit</p> <p>Refer to the Troubleshooting section for more details about the two-digit codes.</p>
	8	Exe. Counter	*BCU	<p>Displays how many times the line position adjustment has been executed. Counts up by +1 normally. After a forced adjustment and a PCU replacement, it counts up +3 Also includes adjustments done at the factory.</p>
	9	Error Counter	*BCU	<p>Displays how many times errors have been detected during the line position adjustment.</p>
<p>The way that the auto line position adjustment is done can be adjusted using the following SP modes (SP5-993-010 to 021). These are coefficients used for the adjustment. Normally, do not change except if the automatic adjustment gives poor results immediately after installing a new optics housing unit. Change the value then do a forced line position adjustment (SP 5-993-2) to check the effects of the changes. Example: If magenta is always shifted one dot to the left, reduce 5-993-11 by 1.</p>				
	10	M Reg. [Y]	*BCU	A fine adjustment to the main-scan registration.
	11	M Reg. [M]	*BCU	[-128 to 127 / 0 / 1 dot/step] FA
	12	M Reg. [C]	*BCU	1 dot = 20μ
	13	M Mag. [Y]	*BCU	A fine adjustment to the main-scan magnification.
	14	M Mag. [M]	*BCU	[-100 to 100 / 0 / 0.01 %/step] FA
	15	M Mag. [C]	*BCU	NOTE: The setting changes in this SP mode will be affect the next line position adjustment.
	16	S Reg. 600[Y]	*BCU	A fine adjustment to the sub-scan registration for each color (color registration). [-128 to 127 / 0 / 1 dot/step] FA 600dpi: 1 dot = 40μ 1200 dpi: 1 dot = 20μ
	17	S Reg. 600[M]	*BCU	
	18	S Reg. 600[C]	*BCU	
	19	S Reg. 1200[Y]	*BCU	
	20	S Reg. 1200[M]	*BCU	
	21	S Reg. 1200[C]	*BCU	

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
993	22	Interrupt	*BCU	<p>Specifies the number of sheets to be printed before a line position adjustment is done during a print job. [10 to 250 / <u>100</u> / 10 sheets/step] SP 5-993-4 must be set to 'enabled'. When the temperature difference meets the conditions specified in SP5-993-3, the machine starts counting the number of prints in the job. The machine interrupts the print job and does the line position adjustment if the number of prints exceeds the number specified in this SP mode. If the counted number of prints does not exceed the number specified, the machine resets the counter, then continues to monitor the temperature and does the line position adjustment next time.</p>
	24	Mscan Lgth Det	*BCU	<p>Performs the main scan length detection when the polygon motor has operated consecutively for the time specified in this SP mode. [100 to 990 / <u>211</u> / 10 sec/step]</p>
	25	Drm Gear Phase	*BCU	<p>Adjusts the phases of the black drum gear and the color drum gear. [0 to 345 / <u>0</u> / 15 degrees/step] DFU</p>
	26	Initialization	*BCU	<p>Enables or disables the line position adjustment during initialization. [0 to 1 / <u>1</u> / 1/step] 0: Disable 1: Enable</p>
	27	Toner Refresh	*BCU	<p>Enables or disables the toner refreshing operation. [0 to 1 / <u>1</u> / 1/step] 0: Disable 1: Enable</p> <p>Repetitive line position adjustments can cause abnormal outputs such as white spots. To prevent this, toner is consumed and supplied after line position adjustment.</p>
994	[Unit Set] Maintenance Unit Detection ON/OFF			
	1	Dev/PCU	*BCU #	<p>Enables or disables PCU and development unit detection. [0 or 1 / <u>0</u> / -] Alphanumeric 0: Enable 1: Disable NOTE: If this mode is disabled, new unit detection also does not function. Use this mode as a temporary measure, only when the micro-switches are defective.</p>
	2	Oil Unit	*BCU #	<p>This is for the oil supply unit only, and not the fusing unit [0 or 1 / <u>0</u> / -] Alphanumeric 0: Enable 1: Disable NOTE: Use this mode as a temporary measure, only when the unit detection mechanism is defective.</p>

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
995	[ColorGapAdj2] Color Gap Adjustment 2			
	2	ManAdjust A	Adjusts the values of Manual Adjustments A through L. [-70 to 70 / <u>0</u> / 0.5/step] DFU	
	3	ManAdjust B		
	4	ManAdjust C		
	5	ManAdjust D		
	6	ManAdjust E		
	7	ManAdjust F		
	8	ManAdjust G		
	9	ManAdjust H		
	10	ManAdjust I		
	11	ManAdjust J		
	12	ManAdjust K		
	13	ManAdjust L		
	14	FusVelAdjust		Optimizes the line speed of the fusing unit by adjusting the speed of development motor-K. DFU
	15	FusVelChange		Changes the line speed of the fusing unit for outputting the Fuser Adjust Sheet. [0 to 7 / <u>0</u> / 1/step] DFU
	16	ResultSend	Stores the line speed in the NVRAM. DFU	
997	[Test Pattern]			
	1	IntTray	Selects the tray for making a test print. [0 to 4 / <u>1</u> / 1/step] 0: By-pass Table 1: Tray 1 2: Tray 2 3: Tray 3 4: Tray 4 NOTE: The machine makes a test pattern on the paper size loaded in the selected paper tray.	
	2	Pattern	Selects a test pattern. [0 to 23 / <u>0</u> / 1/step] 0: None 1: 1-dot sub-scan line 2: 2-dot sub-scan line 3: 1-dot main-scan line 4: 2-dot main-scan line 5: 1-dot grid pattern (fine) 6: 2-dot grid pattern (fine) 7: 1-dot grid pattern (rough) 8: 2-dot grid pattern (rough) 9: 1-dot slant grid pattern 10: 2-dot slant grid pattern 11: 1-dot pattern 12: 2-dot pattern 13: 4-dot pattern 14: 1-dot trimming pattern 15: 2-dot trimming pattern 16: Cross stitch: sub-scan 17: Cross stitch: main-scan 18: Belt pattern 19: Belt pattern (vertical) 20: Checkered Flag 21: Grey scale (vertical) 22: Grey scale (Horizontal) 23: Solid	

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
997	3	Color	Selects the color for making a test pattern. [0 to 6 / <u>6</u> / 1/step] Alphanumeric 0: Red 1: Green 2: Blue 3: Yellow 4: Magenta 5: Cyan 6: Black
	4	Mode	Selects the color mode for making a test print. [0 or 1 / <u>0</u> / 1/step] Alphanumeric 0: Full Color 1: Single Color
	5	Resolution	Selects the resolution for making a test print. [0 to 2 / <u>1</u> / 1/step] Alphanumeric 0: 600x600 1: 1200x600 2: 1200x1200
	6	MLT Paper Size	Selects the paper size for making a test pattern from the by-pass table. [0 to 3 / <u>0</u> / 1/step] Alphanumeric 0: A4 LEF 1: LT LEF 2: A3 3: DLT
	7	Print Exe	Prints the test pattern with the settings specified with SP5-997-001 to 006. NOTE: When exiting the SP mode, the test print mode is automatically canceled.
998	[Memory Clear 2]		
	NOTE: For more information, see "NOTE 1" following this table.		
	1	ENG Setting	Clears the engine settings except for counters.
	2	ENG Counter	Clears all counters.

Service Tables

SP6-XXX (Peripherals)

6	Mode No. (Class 1, 2, and 3)		Function / [Setting]																											
006	[DF Registration Adj.] DF Registration Adjustment																													
	1	Side-to-Side	* NV CF Adjusts the side-to-side and leading registration of originals with the ARDF. [-30 to 30 / 0 / 0.1 mm/step]																											
	2	Leading Edge																												
	3	Buckle: Duplex Front	Adjusts the amount of paper buckle to correct original skew for the front and rear sides. [-4.2 to 4.2 / 0 / 0.1 mm/step]																											
	4	Buckle: Duplex Rear																												
	5	Rear Edge Erase	Adjusts the erase margin at the original trailing edge. [-20 to 10 / 0 / 0.5 mm/step]																											
007	[ADF Input Check]																													
	1	Group 1	CF Displays the signals received from the sensors and switches of the ARDF. (See 5.4.2)																											
	2	Group 2																												
008	[ADF Output Check]																													
	1	Fee-in Motor Fwd.	CF Activates the electrical components for functional check. It is not possible to activate more than one component at the same time.																											
	2	Feed-in Motor Rev.																												
	3	Drive Motor Fwd.																												
	4	Reverse Motor Fwd.																												
	5	Reverse Motor Rev.																												
	6	Feed Clutch																												
	7	Inverter Solenoid																												
	8	Pick-up Motor Fwd.																												
	9	Pick-up Motor Rev.																												
009	[DF Free Run]																													
	1	Duplex Mode	CF Performs a DF free run in duplex mode or stamp mode.																											
	2	Stamp Mode																												
010	[Stamp Position Adj.] Fax Stamp Position Adjustment																													
	1	Stamp Position Adj.	* NV CF Adjusts the horizontal position of the stamp on the scanned originals. [-3.5 to 3.5 / 0 / 0.5 mm/step]																											
016	[Original Size Priority] Original Size Detection Priority																													
	1	Original Size Priority	* NV CF Specifies the original size for a size detected by the original sensor, since original sensors cannot recognize all sizes. [0 or 1 / 0 / -] 0: Setting 1 1: Setting 2 <table border="0" style="margin-left: 40px;"> <tr> <td></td> <td style="padding-left: 20px;">Setting 1</td> <td style="padding-left: 20px;">Setting 2</td> </tr> <tr> <td>Bit 7</td> <td>A4 (L)</td> <td>LT (L)</td> </tr> <tr> <td>Bit 6</td> <td>11" x 15"</td> <td>DLT (L)</td> </tr> <tr> <td>Bit 5</td> <td>DLT (L)</td> <td>11" x 15"</td> </tr> <tr> <td>Bit 4</td> <td>LT (S)</td> <td>US Exec (S)</td> </tr> <tr> <td>Bit 3</td> <td>LT (L)</td> <td>8" x 10" (L)</td> </tr> <tr> <td>Bit 2</td> <td>LG (L)</td> <td>F4 (L)</td> </tr> <tr> <td>Bit 1</td> <td>A4 (L)</td> <td>16K (L)</td> </tr> <tr> <td>Bit 0</td> <td>8K (L)</td> <td>DLT (L)</td> </tr> </table> Bits used for detection differ depending on destination as shown below. Bit 7 to 6: Only for Japan Bit 5 to 2: Only for US Bit 1 to 0: Only for EU/AA		Setting 1	Setting 2	Bit 7	A4 (L)	LT (L)	Bit 6	11" x 15"	DLT (L)	Bit 5	DLT (L)	11" x 15"	Bit 4	LT (S)	US Exec (S)	Bit 3	LT (L)	8" x 10" (L)	Bit 2	LG (L)	F4 (L)	Bit 1	A4 (L)	16K (L)	Bit 0	8K (L)	DLT (L)
	Setting 1	Setting 2																												
Bit 7	A4 (L)	LT (L)																												
Bit 6	11" x 15"	DLT (L)																												
Bit 5	DLT (L)	11" x 15"																												
Bit 4	LT (S)	US Exec (S)																												
Bit 3	LT (L)	8" x 10" (L)																												
Bit 2	LG (L)	F4 (L)																												
Bit 1	A4 (L)	16K (L)																												
Bit 0	8K (L)	DLT (L)																												

6	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
017	[DF Magnification Adj.] DF Magnification Adjustment			
	1	DF Magnification Adj.	* NV CF	Adjusts the magnification in the sub-scan direction for the ARDF. [-5.0 to 5.0 / 0 / 0.1 %/step]
110	[Punch] Punch Positioning			
	1	Punch 1	*BCU	Adjusts the punching position.
	2	Punch 2	*BCU	Punch 1 US: 2 punch holes Europe: 2 punch holes North Europe: 4 punch holes Punch 2 US: 3 punch holes Europe: 4 punch holes Increment: Holes move toward the paper center. Decrement: Holes move toward the paper edge. [-7.5 to 7.5 / 0 / 0.5 mm/step]
111	[Staple] Staple Position			
	1	Staple	*BCU	Adjusts the stapling position. Increment: Staple position moves toward the edge of paper. Decrement: Staple position moves toward the center of paper. [-3.5 to 3.5 / 0 / 0.5 mm/step] NOTE: Although the adjustable range is ± 3.5 mm, the stapling position can be changed only by 1.0 mm when stapling one position at the front or rear side even when the input value is more than 1.0.
901	[Multi Bin Set]			
	1	Multi Bin Set	* BCU CF	Specifies whether or not the optional multi-bin output tray is installed. When installing the multi-bin output tray, this SP mode should be set to "1". [0 or 1 / 0 / -] 0: Not installed 1: Installed

SP7-XXX (Data Log)

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
002	[Original Counters]		
	1	Total Counter	* CTL CF Displays the total original count (number of originals fed) for the selected mode.
	2	Copies	
	3	Fax	
	4	Document Box	
	5	Scanner	
	6	Others	
003	[M/C Counter] Meter Charge Counter (Print, Development)		
	1	P: Total	*CTL CF Displays the values of the color counters. [-9999 to 9999999 / 0 / 1/step]
	2	Copy: B&W	
	3	Copy: Single Color	
	4	Copy: Full Color	
	5	FAX: B&W	
	7	P: B&W	
	8	P: Full Color	
	10	D: Color	
	11	D: B&W	
	12	Copy: Single Color	Displays the values of the color counters.
	13	Copy: Twin Color	
	14	P: B&W: Contact	Displays the number of B&W prints made while the transfer belt contacted color PCUs in ACS mode.
	15	DocBox: B&W :Contact	
	20	P: Full Color	These SP modes are used for Japanese market only.
	21	P: B&W/Single	
	22	P: Single	
	23	P: B&W Total	This SP mode is print counters for the meter charge mode.
	24	Copy: Full Color	These SP modes are used for Japanese market only.
	25	P: Full Color	
	26	Copy: Color	These SP modes are print counters for the meter charge mode.
	27	Copy: B/W	
	28	P: Color	
	29	P: B&W	
	30	P: Color Total	
007	[Other Counter]		
	1	Duplex	*CTL Displays counter values. [0 to 9999999 / 0 / 1 sheet/step]
	2	A3/DLT/Over420	
	3	Staple	
101	[Size Counter] Paper Size Counter		
	4	A3	*CTL Displays the counter values for each paper size. [0 to 9999999 / 0 / 1 sheet/step]
	5	A4	
	6	A5	
	13	B4	
	14	B5	
	32	11 x 17	
	36	8 1/2 x 14	
	38	8 1/2 x 11	
	44	5 1/2 x 8 1/2	
	128	Others	

7	Mode No. (Class 1, 2, and 3)			Function / [Setting]
201	[Total Scan Counter]			
	1	Total Scan Counter	* CTL CF	Displays the total number of scans. [0 to 9999999 / 0 / 1 scan/step]
202	[DUnit Op Ctr] Development Unit Operation Counter			
	1	P: B&W	*CTL	Displays the number of prints or developments for each mode.
	2	P: Color		
	3	D: B&W		
	4	D: Color		
204	[Feed Counter] Paper Feed Section Counter			
	1	Tray 1	*CTL	Displays the number of sheets fed from each paper feed station. [0 to 9999999 / 0 / 1 sheet/step] NOTE: The LCT is counted as the 3rd feed station.
	2	Tray 2		
	3	Tray 3/LCT		
	4	Tray 4		
	5	By-pass		
	6	Duplex		
205	[ADF Total Counter]			
	1	ADF Total Counter	* CTL CF	Displays the total number of originals fed by the ARDF.
206	[Staple Counter]			
	1	Staple Counter	*CTL	Displays the number of stapler operations.
209	[Punch Counter]			
	1	Punch	*CTL	Displays the number of times hole punching has been done. [0 to 9999999 / 0 / 1/step]
301	[Copy Co.: Mag.] Copy Counter: Magnification			
	1	Reduce 25% <-->49%	* NV CF	Displays the number of copies made with each magnification ratio.
	2	Reduce 50% <-->99%		
	3	Full Size		
	4	Enlarge 101%<-->200%		
	5	Enlarge 201%<-->400%		
	6	Direct Mag.		
	7	Direct Size Mag.		
	8	Auto reduce/Enlarge		
304	[Copy Co.: Copy Mode] Copy Counter: Copy Mode			
	1	Text	* NV CF	Displays the total number of copies made in the copy mode by each operation mode.
	2	T/P (Glossy Photo)		
	3	T/P (Printed Photo)		
	4	T/P (Copied Photo)		
	5	Photo (Glossy Photo)		
	6	Photo (Printed Photo)		
	7	Photo (Copied Photo)		
	8	Generation Copy		
	9	Pale		
	10	Map		
	11	Punch		
	12	Repeat		
	13	Sort		
	14	Staple		
	15	Series		
	16	Erase		
	17	Duplex		
	18	ADF		

7		Mode No. (Class 1, 2, and 3)		Function / [Setting]
304	19	Double Copy	* NV CF	Displays the total number of copies made in the copy mode by each operation mode.
	20	Duplex Original		
	21	Interrupt Copy		
	22	Combined 1 Side		
	23	Combined 2 Side		
	26	Batch		
	27	SADF		
	28	Mixed Sizes		
	30	Cover Page		
	31	Chapter Page		
	32	Color Balance Adjust		
	33	Adjust Color		
	34	Copy Quality		
	35	Erase Color		
305	[Copy Co.: Set No.] Copy Counter: Set No.			Displays the total number of multiple copy jobs made in copy mode.
	1	1 to 1	* NV CF	
	2	1 to 2 <-> 5		
	3	1 to 6 <-> 10		
	4	1 to 11 <-> 20		
	5	1 to 21 <-> 50		
	6	1 to 51 <-> 100		
	7	1 to 101 <-> 300		
	8	1 to 301 <-> Over		
306	[Copy Co.: Job Mode] Copy Counter: Job Mode			Displays the total number of multiple copy jobs made in copy mode.
	1	Sort	* NV CF	
	2	Staple		
	3	Punch		
	4	Reverse Copy		
	5	Check Copy		
320	[DS Co.: Total Scan] DS Co. : Document Server Counter			Displays the original count stored on the document server.
	1	DS Co.: Total Scan	* NV CF	
321	[DS Co.: Scan Size] DS Co. : Document Server Counter			Displays the number of originals by paper size scanned into the document server.
	4	A3	* NV CF	
	5	A4		
	6	A5		
	13	B4		
	14	B5		
	32	DLT		
	36	LG		
	38	LT		
	44	HLT		
	128	Others		
323	[DS Co.: Copy Size] DS Co. : Document Server Counter			Displays the number of copies made from the document server and classed by paper size.
	5	A4 (Sideways)	* NV CF	
	6	A5 (Sideways)		
	14	B5 (Sideways)		
	38	LT (Sideways)		
	44	HLT (Sideways)		
	128	Others		
	132	A3 (Lengthwise)		
	133	A4 (Lengthwise)		
134	A5 (Lengthwise)			

7	Mode No. (Class 1, 2, and 3)			Function / [Setting]
323	141	B4 (Lengthwise)	* NV CF	Displays the number of copies made from the document server and classed by paper size.
	142	B5 (Lengthwise)		
	160	DLT (Lengthwise)		
	164	LG (Lengthwise)		
	166	LT (Lengthwise)		
	172	HLT (Lengthwise)		
324	[DS Co.: Job Mode] DS Co. : Document Server Counter			Displays the number of jobs made from the document server and classed by job counter.
	1	Duplex	* NV CF	
	2	Sort		
	3	Staple		
	4	Punch		
	5	Check Copy		
6	Print 1st Page			
325	[DS Co.: Page No.] DS Co. : Document Server Counter			Displays the number of copy jobs made from the document server and classed by the size of the job.
	1	1-page	* NV CF	
	2	2-page		
	3	3<->5 pages		
	4	6<->10 pages		
5	Over 11 pages			
326	[DS Co.: File No.] DS Co. : Document Server Counter			Displays the number of copy jobs made from the document server and classed by the size of the job.
	1	1-page	* NV CF	
	2	2-page		
	3	3<->5 pages		
4	6<->10 pages			
327	[DS Co.: Set No.] DS Co. : Document Server Counter			Displays the number of copy jobs made from the document server and classed by the set sizes.
	1	1 to 1	* NV CF	
	2	1 to 2 <-> 5		
	3	1 to 6 <-> 10		
	4	1 to 11 <-> 20		
	5	1 to 21 <-> 50		
	6	1 to 51 <-> 100		
	7	1 to 101 <-> 300		
8	1 to 301 <-> Over			
328	[DS Co.: Copy Mode] DS Co. : Document Server Counter			Displays the number of copies made from the document server, and classed by the copy mode selected.
	6	Punch	* NV CF	
	8	Sort		
	9	Staple		
	12	Duplex		
	25	Cover page		
26	Slip Sheet			
401	[SC Counter]			Displays the number of SC codes detected. [0 to 9999 / 0 / 1/step]
	1	SC Counter	*CTL	
403	[Latest10Sclog]			Logs the SC codes detected. The 10 most recently detected SC Codes are not displayed on the screen, but can be seen on the SMC (logging) outputs.
	1	Latest	* CTL CF	
	2	Latest -1		
	3	Latest -2		
	4	Latest -3		
	5	Latest -4		
	6	Latest -5		
	7	Latest -6		
	8	Latest -7		
	9	Latest -8		
10	Latest -9			

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
502	[Total Jam]			
	1	Total Jam	*CTL	Displays the total number of jams detected. [0 to 9999 / 0 / 1 sheet/step]
503	[Original Jam Counter]			
	1	Original Jam counter	* CTL CF	Displays the total number of original jams. [0 to 9999 / 0 / 1 original/step]
504	[Jam Location] D: Duplex, MB: Mail Box, F; Finisher, E: External, I: Internal ON: On check, OFF: Off Check			
	3	Tray 1:ON	*CTL	Displays the number of jams according to the location where jams were detected. NOTE: The LCT is counted as the 3rd feed station.
	4	Tray 2:ON		
	5	Tray 3/LCT:ON		
	6	Tray 4:ON		
	8	Regist.:ON		
	9	E Tray:ON		
	10	I Tray:ON		
	11	D:ON		
	12	D Exit 1:ON		
	13	D Exit 2:ON		
	14	D Exit 3:ON		
	15	D Feed: ON		
	20	MB Upper:ON		
	21	MB Lower:ON		
	51	Tray 1:OFF		
	52	Tray 2:OFF		
	53	Tray 3:OFF		
	54	Tray 4:OFF		
	61	Regist: OFF		
	63	E Tray:OFF		
	64	I Tray:OFF		
	65	D:OFF		
	66	D Exit 1:OFF		
	67	D Exit 2:OFF		
	68	D Exit 3:OFF		
	69	D Feed:OFF		
	100	F Entrance		
	101	F Shift Tray 1		
	102	F Shift Tray 2		
	103	F Staple		
	104	F Exit		
	105	F Drive		
	106	F Tray Up/Down		
	107	F Jogger		
	108	F Staple		
	109	F Exit		
	110	F Punch		
	111	F Jam Clear		
505	[Original Jam Detection]			
	1	At Power On	* CTL CF	Displays the total number of original jams by location.
	3	Skew Correction Sensor (On Check)		
	4	Interval Sensor (On Check)		

7		Mode No. (Class 1, 2, and 3)		Function / [Setting]
505	5	Registration Sensor (On Check)	* CTL CF	Displays the total number of original jams by location.
	6	Relay Sensor (On Check)		
	7	Inverter Sensor (On Check)		
	53	Skew Correction Sensor (Off Check)		
	54	Interval Sensor (Off Check)		
	55	Registration Sensor (Off Check)		
	56	Relay Sensor (Off Check)		
	57	Inverter Sensor (Off Check)		
506	[Jam Paper Size]		*CTL	Displays the number of jams according to the paper size. [0 to 9999 / <u>0</u> / 1 sheet/step]
	4	A3		
	5	A4		
	6	A5		
	13	B4		
	14	B5		
506	32	11 x 17	*CTL	Displays the number of jams according to the paper size. [0 to 9999 / <u>0</u> / 1 sheet/step]
	36	8 1/2 x 14		
	38	8 1/2 x 11		
	44	5 1/2 x 8 1/2		
	128	Others		
507	[Jam History]		*CTL	Displays the 10 most recently detected paper jams.
	1	Latest		
	2	Latest-1		
	3	Latest-2		
	4	Latest-3		
	5	Latest-4		
	6	Latest-5		
	7	Latest-6		
	8	Latest-7		
	9	Latest-8		
	10	Latest-9		
508	[Original Jam History]		* CTL CF	Displays the 10 most recently detected original jams.
	1	Latest		
	2	Latest-1		
	3	Latest-2		
	4	Latest-3		
	5	Latest-4		
	6	Latest-5		
	7	Latest-6		
	8	Latest-7		
	9	Latest-8		
	10	Latest-9		
801	[Firmware Version]		CF	Displays the version of each firmware
	255	Firmware Version		

Service Tables

7	Mode No. (Class 1, 2, and 3)	Function / [Setting]																																																							
803	[PM Counter] (Sheets or Rotations, Unit, [Color]) Dev.: Development Unit, PF: Paper Feed Rollers, Oil Supply: Oil Supply Unit, Fusing: Fusing Unit, Transfer: Transfer Unit	<table border="1"> <tr> <td>1</td> <td>S:PCU [K]</td> <td rowspan="16">*BCU</td> <td rowspan="16"> Displays the number of sheets printed for each current maintenance unit. [0 to 9999999 / 0 / 1 sheet/step] PM counters click up based on the number of A4 (LT) LEF size sheets printed. Therefore, the A3 (DLT) Double Count is activated. The Double Count cannot be deactivated. When a unit is replaced, the machine automatically detects that the new unit is installed. Then, the current PM counter value is automatically moved to the PM Counter - Previous (SP7-906-1 to 9) and is reset to "0". The total number of sheets printed with the last unit replaced can be checked with SP7-906-1 to 9. NOTE: The LCT is counted as the 3rd feed station. </td> </tr> <tr><td>2</td><td>S:PCU [Y]</td></tr> <tr><td>3</td><td>S:PCU [M]</td></tr> <tr><td>4</td><td>S:PCU [C]</td></tr> <tr><td>5</td><td>S:Dev. [K]</td></tr> <tr><td>6</td><td>S:Dev. [Y]</td></tr> <tr><td>7</td><td>S:Dev. [M]</td></tr> <tr><td>8</td><td>S:Dev. [C]</td></tr> <tr><td>9</td><td>S:Oil Supply</td></tr> <tr><td>10</td><td>PF By-pass</td></tr> <tr><td>11</td><td>PF Tray 1</td></tr> <tr><td>12</td><td>PF Tray 2</td></tr> <tr><td>13</td><td>PF Tray 3</td></tr> <tr><td>14</td><td>PF Tray 4</td></tr> <tr><td>15</td><td>S:Fusing</td></tr> <tr><td>16</td><td>S:Transfer</td></tr> </table>	1	S:PCU [K]	*BCU	Displays the number of sheets printed for each current maintenance unit. [0 to 9999999 / 0 / 1 sheet/step] PM counters click up based on the number of A4 (LT) LEF size sheets printed. Therefore, the A3 (DLT) Double Count is activated. The Double Count cannot be deactivated. When a unit is replaced, the machine automatically detects that the new unit is installed. Then, the current PM counter value is automatically moved to the PM Counter - Previous (SP7-906-1 to 9) and is reset to "0". The total number of sheets printed with the last unit replaced can be checked with SP7-906-1 to 9. NOTE: The LCT is counted as the 3rd feed station.	2	S:PCU [Y]	3	S:PCU [M]	4	S:PCU [C]	5	S:Dev. [K]	6	S:Dev. [Y]	7	S:Dev. [M]	8	S:Dev. [C]	9	S:Oil Supply	10	PF By-pass	11	PF Tray 1	12	PF Tray 2	13	PF Tray 3	14	PF Tray 4	15	S:Fusing	16	S:Transfer																					
1	S:PCU [K]	*BCU	Displays the number of sheets printed for each current maintenance unit. [0 to 9999999 / 0 / 1 sheet/step] PM counters click up based on the number of A4 (LT) LEF size sheets printed. Therefore, the A3 (DLT) Double Count is activated. The Double Count cannot be deactivated. When a unit is replaced, the machine automatically detects that the new unit is installed. Then, the current PM counter value is automatically moved to the PM Counter - Previous (SP7-906-1 to 9) and is reset to "0". The total number of sheets printed with the last unit replaced can be checked with SP7-906-1 to 9. NOTE: The LCT is counted as the 3rd feed station.																																																						
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16	S:Transfer																																																								
		Displays the number of revolutions of motors or clutches for each current maintenance unit. [0 to 9999999 / 0 / 1 revolution/step] When a unit is replaced, the machine automatically detects that the new unit is installed. Then, the current PM counter value is automatically moved to the PM Counter - Previous (SP7-906-10 to 20) and is reset to "0". The total number of revolutions made with the last unit replaced can be checked with SP7-906-10 to 20.																																																							
	<table border="1"> <tr><td>17</td><td>R:PCU [K]</td><td rowspan="16">*BCU</td><td>Target Revolution: 300,000</td></tr> <tr><td>18</td><td>R:PCU [Y]</td><td>Target Revolution: 319,000</td></tr> <tr><td>19</td><td>R:PCU [M]</td><td>Target Revolution: 319,000</td></tr> <tr><td>20</td><td>R:PCU [C]</td><td>Target Revolution: 319,000</td></tr> <tr><td>21</td><td>R:Dev. [K]</td><td>Target Revolution: 1,142,000</td></tr> <tr><td>22</td><td>R:Dev. [Y]</td><td>Target Revolution: 1,146,000</td></tr> <tr><td>23</td><td>R:Dev. [M]</td><td>Target Revolution: 1,146,000</td></tr> <tr><td>24</td><td>R:Dev. [C]</td><td>Target Revolution: 1,146,000</td></tr> <tr><td>25</td><td>R:Oil Supply</td><td>Target Revolution: 2,559,000</td></tr> <tr><td>26</td><td>R:Fusing</td><td>Target Revolution: 8,397,000</td></tr> <tr><td>27</td><td>R:Transfer</td><td></td></tr> <tr><td>28</td><td>S:Waste Toner</td><td></td></tr> <tr><td>29</td><td>S:Toner [K]</td><td rowspan="4"> Displays the number of sheets printed until the waste toner bottle becomes full or toner runs out. [0 to 9999999 / - / 1 sheet/step] </td></tr> <tr><td>30</td><td>S:Toner [Y]</td></tr> <tr><td>31</td><td>S:Toner [M]</td></tr> <tr><td>32</td><td>S:Toner [C]</td></tr> <tr><td>33</td><td>TonerSupply[K]</td><td rowspan="4"> Displays the total operating time for the toner attraction pump. [0 to 9999999 / - / 1 s/step] </td></tr> <tr><td>34</td><td>TonerSupply[Y]</td></tr> <tr><td>35</td><td>TonerSupply[M]</td></tr> <tr><td>36</td><td>TonerSupply[C]</td></tr> </table>	17	R:PCU [K]	*BCU	Target Revolution: 300,000	18	R:PCU [Y]	Target Revolution: 319,000	19	R:PCU [M]	Target Revolution: 319,000	20	R:PCU [C]	Target Revolution: 319,000	21	R:Dev. [K]	Target Revolution: 1,142,000	22	R:Dev. [Y]	Target Revolution: 1,146,000	23	R:Dev. [M]	Target Revolution: 1,146,000	24	R:Dev. [C]	Target Revolution: 1,146,000	25	R:Oil Supply	Target Revolution: 2,559,000	26	R:Fusing	Target Revolution: 8,397,000	27	R:Transfer		28	S:Waste Toner		29	S:Toner [K]	Displays the number of sheets printed until the waste toner bottle becomes full or toner runs out. [0 to 9999999 / - / 1 sheet/step]	30	S:Toner [Y]	31	S:Toner [M]	32	S:Toner [C]	33	TonerSupply[K]	Displays the total operating time for the toner attraction pump. [0 to 9999999 / - / 1 s/step]	34	TonerSupply[Y]	35	TonerSupply[M]	36	TonerSupply[C]	
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7	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
803	37	R(%): PCU [K]	*BCU Displays the value given by the following formula: (Current revolution ÷ Target revolution) × 100, where “Current revolution” is the current value for the counter of the part, and “Target revolution” is the values of SP7-803-17 through 27. This shows how much of the unit’s expected lifetime has been used up. The R% counter is based on rotations, not prints. If the number of rotations reaches the limit, the machine enters the end condition for that unit. If the print count lifetime is reached first, the machine also enters the end condition, even though the R% counter is still less than 100%. Oil supply unit: When the R% counter reaches 100%, it enters the near-end condition, not the end condition. The end condition occurs some number of rotations after this (not adjustable). NOTE: The machine internally adjusts or compensates as necessary, depending on conditions of machine usage. Due to this, at the oil supply unit near-end condition, the R% counter of the oil supply unit can be 100%, lower than 100%, or higher than 100%.	
	38	R(%): PCU [Y]		
	39	R(%): PCU [M]		
	40	R(%): PCU [C]		
	41	R(%): Dev [K]		
	42	R(%): Dev [Y]		
	43	R(%): Dev [M]		
	44	R(%): Dev [C]		
	45	R(%): Oil Spply		
	46	R(%): Fusing		
	47	S: Trans Cln		
	48	R: Trans Cln		
804	[PM Clear] PM Counter Clear			
	(Unit, [Color])			
	Dev.: Development Unit, PF: Paper Feed Rollers, Transfer: Transfer Unit			
		1	PCU [K]	Clears the PM counter. Press the Enter key after the machine asks “Execute?”. When a unit is replaced, the machine automatically detects that the new unit is installed. Then, the current PM counter value is automatically moved to the b PM Counter - Previous (SP7-906-1 to 25) and is reset to “0”. NOTE: The LCT is counted as the 3rd feed station.
		2	PCU [Y]	
		3	PCU [M]	
		4	PCU [C]	
		5	Dev. [K]	
		6	Dev. [Y]	
		7	Dev. [M]	
		8	Dev. [C]	
		9	Oil Supply	
		10	PF By-pass	
		11	PF Tray 1	
		12	PF Tray 2	
		13	PF Tray 3	
		14	PF Tray 4	
		15	Fusing	
		16	Transfer	
		17	Trans Cln	
	50	All		
807	[SC/Jam Clear] SC/Jam Counter Clear			
		1	SC/Jam Clear	

Service Tables

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]	
808	[Counter Clear] NOTE: For more information, see "NOTE 1" following this table.			
	1	Counter Clear		Clears all counters.
810	[Access Code Clear]			
	1	Access Code Clear	CF	Use to clear the access code if the customer forgets the code (password).
816	[Tray Clear] Paper Tray Counter Clear			
	1	Tray 1		Clears the counters (SP7-204) for the number of sheets fed from the paper feed stations. NOTE: The LCT is counted as the 3rd feed station.
	2	Tray 2		
	3	Tray 3/LCT		
	4	Tray 4		
	5	BypassTray		
	6	Duplex		
822	[Co. Clear: Mag.] Counter Clear :Magnification			
	1	Co. Clear: Mag.	CF	Clear the copy counters classed by magnification mode (SP7-301).
825	[Counter Reset]			
	1	Counter Reset		Rests the total counter values to "0". NOTE: This SP mode can be done only once, while the counter values are less than 0.
832	[Diag. Result] Diagnostic Result			
	1	Diag. Result	*CTL	Displays the result of the diagnostics.
833	[Coverage] Pixel Coverage Ratio			
	1	Last [K]	*BCU	Displays the image coverage ratio for each color of the last output. [0 to 100.00 / - / 0.01 %/step] This SP mode displays the "coverage ratio" of the output, i.e. the ratio of the total pixel area of the image data to the total printable area on the paper. Note that 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 involved include: the type, total image area and image density of the original, toner concentration and developer potential.
	2	Last [C]		
	3	Last [M]		
	4	Last [Y]		
	5	Average [K]		Displays accumulated average value of image coverage ratio for each color. [0 to 100.00 / - / 0.01 %/step] <u>SP 7-833-5 to -8 vs SP 7-908-1 to -4</u> The averages for K (SP 7-833-5 and SP 7-908-1) are the same. For CMY, SP 7-908 does not include black-and-white pages in the middle of a colour job. However, SP 7-833 does include these pages in the average. As a result, the readings of SP 7-833 will be lower, because these averages include pages for which there is zero for CMY, but the averages calculated for SP 7-908 do not include these pages.
	6	Average [C]		
	7	Average [M]		
	8	Average [Y]		

7	Mode No. (Class 1, 2, and 3)			Function / [Setting]
833	11	Toner [K]	*BCU	Displays the total number of toner cartridges replaced. [0 to 65535 / - / 1 cartridge/step] SP7-833-11 to 14 are same as SP7-908-5 to 8.
	12	Toner [C]		
	13	Toner [M]		
	14	Toner [Y]		
837	[Co. Clear: Copy: Copy Mode] Counter Clear: Copy: Copy Mode			
	1	Co. Clear: Copy Mode	CF	Clears the copy counter classed by copy mode (SP7-304).
838	[Co. Clear: Copy: Set No.] Counter Clear: Copy: Set No.			
	1	Co. Clear: Set No.	CF	Clears the copy counters classed by set number (SP7-305).
839	[Co. Clear: Copy: Job Mode] Counter Clear: Copy: Job Mode			
	1	Co. Clear: Job Mode	CF	Clears the copy counters classed by job mode (SP7-306).
840	[Co. Clear: DS: Total Scan] Counter Clear: DS: Total Scan			
	1	Co. Clear: Total Scan	CF	Clears the counter of total scans for the document server (SP7-320).
841	[Co. Clear: DS: Scan Size] Counter Clear: DS: Scan Size			
	1	Co. Clear: Scan Size	CF	Clears the counters classed by the original size scanned for the document server (SP7-321).
842	[Co. Clear: DS: Copy Size] Counter Clear: DS: Copy Size			
	1	Co. Clear: Copy Size	CF	Clears the counters classed by the size of copies made from the document server (SP7-323).
843	[Co. Clear: DS: Job Mode] Counter Clear: DS: Job Mode			
	1	Co. Clear: DS: Job Mode	CF	Clears the counters classed by the job mode of copies made from the document server (SP7-324).
844	[Co. Clear: DS: Page No.] Counter Clear: DS: Page No.			
	1	Co. Clear: DS: Page No.	CF	Clears the counters classed by the job size of copies made from the document server (SP7-325).
845	[Co. Clear: DS: File No.] Counter Clear: DS: File No.			
	1	Co. Clear: DS: File No.	CF	Clears the counters classed by the file number of copies made from the document server (SP7-326).
846	[Co. Clear: DS: Set No.] Counter Clear: DS: Set No.			
	1	Co. Clear: DS: Set No.	CF	Clears the counters classed by the set number of copies made from the document server (SP7-327).
847	[Co. Clear: DS: Copy Mode] Counter Clear: DS: Copy Mode			
	1	Co. Clear: DS: Copy Mode	CF	Clears the counters classed by the mode of copies made from the document server (SP7-328).
848	[Co. Clear: All] Counter Clear All			
	1	Co. Clear All	CF	Clears all counters of copies made in copy mode and from the document server. SP7-301, 304, 305, 306, 320, 321, 323, 324, 325, 326, 327, and 328
901	[Assert Info]			
	1	File Name		Records the location where a problem is detected in the program. The data stored in this SP is used for problem analysis. DFU
	2	# of Lines		
	3	Location		

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
905	[Alert Display]		
	10	Wst Oil: Full	* BCU Specifies the number of revolutions the development drive motor-K can make after the message, "Waste Oil Bottle is Almost Full", is displayed. [232 to 464 / 232 / 1 kilo-revolutions/step] The machine stops after the motor has made the specified number of revolutions. This SP specifies the interval from near end to end for the waste oil bottle. 232k revolutions equals 2.5k prints. If it is set to 464, the end condition is 5.0k prints after near end.
	14	Oil: Alert: Page	* BCU Specifies the number of sheets the machine can output after the oil supply reaches the near-end condition. [25.0 to 27.5 / 27.5 / 0.1 kilo-sheets/step]
906	[PMCounter-PREV] PM Counter - Previous		
	(Sheets or Rotations, Unit, [Color]), Dev.: Development Unit		
	1	S:PCU [K]	*BCU Displays the number of sheets printed with the previous maintenance units. [0 to 9999999 / 0 / 1 sheet/step]
	2	S:PCU [Y]	
	3	S:PCU [M]	
	4	S:PCU [C]	
	5	S:Dev. [K]	
	6	S:Dev. [Y]	
	7	S:Dev. [M]	
	8	S:Dev. [C]	
	9	S:Oil Supply	
	10	S:Fusing	
	11	R:PCU [K]	Displays the number of revolutions for motors or clutches in the previous maintenance units. [0 to 9999999 / 0 / 1 revolution/step]
	12	R:PCU [Y]	
	13	R:PCU [M]	
	14	R:PCU [C]	
	15	R:Dev. [K]	
	16	R:Dev. [Y]	
	17	R:Dev. [M]	
	18	R:Dev. [C]	
	19	R:Oil Supply	
	20	R:Fusing	
	21	S:Waste Toner	Displays the number of sheets printed with the previous maintenance unit or toner cartridge. [0 to 9999999 / 0 / 1 sheet/step]
	22	S:Toner [K]	
	23	S:Toner [Y]	
	24	S:Toner [M]	
	25	S:Toner [C]	
	26	R(%): PCU [K]	Displays the value given by the following formula: (Current count ÷ Yield count) x 100, where "Current count" is the current values in the counter for the part, and "Yield count" is the recommended yield. [0 to 999 / 0 / 1 %/step]
	27	R(%): PCU [Y]	
	28	R(%): PCU [M]	
	29	R(%): PCU [C]	
	30	R(%): Dev [K]	
	31	R(%): Dev [Y]	
	32	R(%): Dev [M]	
	33	R(%): Dev [C]	
34	R(%): Oil Spply		
35	R(%): Fusing		

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
907	[Check Sum]		
	1	Engine Main	*BCU Displays the check sum of the firmware.
	2	Engine MUSIC	
908	[New Coverage] Pixel Coverage Ratio		
	1	Average [K]	*BCU This SP mode displays the "coverage ratio" of the
	2	Average [C]	output, i.e. the ratio of the total pixel area of the
	3	Average [M]	image data to the total printable area on the
	4	Average [Y]	paper. Note that 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 involved include: the type, total image area and image density of the original, toner concentration and developer potential. [0 to 999.99 / 0 / 0.01 %/step] <u>SP 7-833-5 to -8 vs SP 7-908-1 to -4</u> The averages for K (SP 7-833-5 and SP 7-908-1) are the same. For CMY, SP 7-908 does not include black-and-white pages in the middle of a colour job. However, SP 7-833 does include these pages in the average. As a result, the readings of SP 7-833 will be lower, because these averages include pages for which there is zero for CMY, but the averages calculated for SP 7-908 do not include these pages.
	5	Toner [K]	*BCU SP7-833-11 to 14 are same as SP7-908-5 to 8.
	6	Toner [C]	*BCU
	7	Toner [M]	*BCU [0 to 65535 / 0 / 0.01 %/step]
	8	Toner [Y]	*BCU
910	[Firmware PN] Firmware Part Number		
	1	Controller	*CTL Displays the part number of the firmware.
	2	Engine	
	7	Finisher	
	9	PFU	
	11	Mail Box	
	13	Duplex	
	14	MUSIC	
	18	NIB	
	21	DSP MUSIC	
	131	Bluetooth	
	150	RPCS	
	151	PS	
	152	RPDL	
	153	R98	
	154	R16	
	155	RPGL	
	156	R55	
	157	RTIFF	
	158	PCL	
	159	PCLXL	
	160	MSIS	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
910	161 200 204 209 210	MSIS (OPTION) Factory Printer Test MIB	*CTL Displays the part number of the firmware.
911	[Firmware Ver.]		
	1 2 7 9 11 13 14 18 21 131 150 151 152 153 154 155 156 157 158 159 160 161 200 204 209 210	Controller Engine Finisher PFU Mail Box Duplex MUSIC NIB DSP MUSIC Bluetooth RPCS PS RPDL R98 R16 RPGL R55 RTIFF PCL PCLXL MSIS MSIS (OPTION) Factory Printer Test MIB	*CTL Displays the firmware version.

NOTE: Memory Clear (SP5-801 & 7-808)

The following tables list the items that are cleared. The serial number information, meter charge setting (SP5-930), and meter charge counters (SP7-003) are not cleared.

5	Mode No. (Class 1, 2, and 3)		SP Modes or User Setting to be cleared	
801	[Memory Clear]			
	3	SCS	SP5-009, 101, 104, 305, 812, 833, 961, and 970 SP7-101, 204, 209, 401, 502, 504, 506, and 507	
	4	IMH	No SP modes are cleared. But, all files stored in the HDD are cleared.	
	5	MCS	No SP modes are cleared.	
	6	Copier application	Initializes all copier application settings.	
	7	Fax application	Initializes the fax reset time, job login ID, all TX/RX settings, local storage file numbers, and off-hook timer.	
	8	Printer application	The following service settings: <ul style="list-style-type: none"> • Bit switches • Gamma settings (User & Service) • Toner Limit The following user settings: <ul style="list-style-type: none"> • Tray Priority • Menu Protect • System Setting except for setting of Energy Saver • I/F Setup (I/O Buffer and I/O Timeout) • PCL Menu 	
	9	Scanner application	Initializes the scanner defaults for the scanner and all the scanner SP modes.	
	10	Netfile application	Deletes the network file application management files and thumbnails, and initializes the job login ID.	
	11	NCS	All setting of Network Setup (User Menu)	
	12	IPU	CF	Clears the IPU settings
	13	R-Fax	CF	Initializes the job login ID, SmartNetMonitor for Admin, job history, and local storage file numbers.
	998	1	ENG Setting	All engine related SP modes except for the following: <ul style="list-style-type: none"> • Serial number information • SP modes related to meter charge • Counters and logging data
2		ENG Counter	All counters and logging data related to engine	

7	Mode No. (Class 1, 2, and 3)		SP Modes or User Setting to be cleared
808	[Counter Clear]		
	1	Counter Clear	SP7-101, 204, 209, 502, 504, 506, and 507

5.4.2 INPUT CHECK TABLE

When entering the Input Check mode, 8 digits display the result for a section. Each digit corresponds to a different device as shown in the table.

Bit No.	7	6	5	4	3	2	1	0
Result	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1

SP5-803 -XXX	Bit	Description	Reading	
			0	1
1	Paper Tray 1			
	0	Paper End Sensor	Paper end	Paper detected
	1	Paper Lift Sensor	Deactivated	Activated (Actuator not inside sensor)
	2	Paper Height Sensor 1	See Table 1.	
	3	Paper Height Sensor 2		
4	Tray Set	Not set	Set	
2	Paper Tray 2			
	0	Paper End Sensor	Paper end	Paper detected
	1	Paper Lift Sensor	Deactivated	Activated (Actuator not inside sensor)
	2	Paper Height Sensor 1	See Table 1. 1: Activated (Actuator inside sensor)	
	3	Paper Height Sensor 2		
	4	Paper Size Switch 1	See Table 2. 1: Pushed	
	5	Paper Size Switch 2		
6	Paper Size Switch 3			
7	Paper Size Switch 4			
3	By-pass Table			
	0	Paper End Sensor	Paper end	Paper detected
	1	Paper Size 1	See Table 3.	
	2	Paper Size 2		
	3	Paper Size 3		
4	Paper Size 4			
4	Doors			
	0	Front Door Switch	Opened	Closed
	1	Left Door Switch	Opened	Closed
	2	Right Door Switch	Opened	Closed
	3	Vertical Transport Switch	Opened	Closed
	4	Duplex Inverter Unit Switch	Opened	Closed
5	Right Door Switch (LCT/PFU)	Opened	Closed	
5	Paper Feed			
	0	Relay Sensor	Paper not detected	Paper detected
	1	Vertical Transport Sensor	Paper not detected	Paper detected
	2	Upper Relay Sensor (PFU)	Paper not detected	Paper detected
	3	Lower Relay Sensor (PFU)	Paper not detected	Paper detected
	4	Registration Sensor	Paper not detected	Paper detected
	5	Duplex Inverter Sensor	Paper not detected	Paper detected
6	Duplex Feed Sensor	Paper not detected	Paper detected	

SP5-803 -XXX	Bit	Description	Reading	
			0	1
6	Paper Exit			
	0	Fusing Exit Sensor	Paper not detected	Paper detected
	1	Paper Exit Sensor	Paper not detected	Paper detected
	2	Duplex Exit Sensor 1	Paper not detected	Paper detected
	3	Duplex Exit Sensor 2	Paper not detected	Paper detected
	4	Duplex Exit Sensor 3	Paper not detected	Paper detected
	5	Exit Upper Limit Sensor	Not full	Full
7	Fusing Unit			
	0	Fusing Unit (Set)	Not set	Set
	1	Fusing Unit (New)	0 to 1 : New unit installed	
	2	Oil Supply Unit (Set)	Set	Not set
	3	Oil Supply Unit (New)	1 to 0 : New unit installed	
	4	European Version	US	Europe
	5	Waste Oil Bottle Set Sensor	Not Set	Set
	6	Waste Oil Sensor	Not full	Full
8	Motor Lock			
	0	Development Drive Motor - CMY	Not locked	Locked
	1	Development Drive Motor - K	Not locked	Locked
	2	Fusing Fan Motor	Not locked	Locked
	3	Air Pump Motor - MY	Not locked	Locked
	4	Air Pump Motor - CK	Not locked	Locked
9	Dev. Unit/ PCU			
	0	Development Unit - K	Not set	Set
	1	Development Unit - C	Not set	Set
	2	Development Unit - M	Not set	Set
	3	Development Unit - Y	Not set	Set
	4	PCU - K	Not set	Set
	5	PCU - C	Not set	Set
	6	PCU - M	Not set	Set
	7	PCU - Y	Not set	Set
10	Toner End Sens			
	0	Black Toner	Not end	End
	1	Cyan Toner	Not end	End
	2	Magenta Toner	Not end	End
	3	Yellow Toner	Not end	End
13	Others			
	0	LD H.P. Sensor	Not H.P.	H.P.
	1	Transfer Belt Sensor	Not contact	Contact
	2	-	-	-
	3	Used Toner Sensor	Not full	Full
	4	Used Toner Bottle Set Sensor	Not set	Set
	5	Drum Gear Position Sensor - K	Deactivated	Activated (Actuator inside sensor)
6	Drum Gear Position Sensor - CMY	Deactivated	Activated (Actuator inside sensor)	

SP5-803 -XXX	Bit	Description	Reading	
			0	1
15	Mail Box 1			
	0	Tray 1 Paper Overflow Sensor	Not full	Full
	1	Tray 1 Paper Sensor	Paper not detected	Paper detected
	2	Tray 2 Paper Overflow Sensor	Not full	Full
	3	Tray 2 Paper Sensor	Paper not detected	Paper detected
	4	Tray 3 Paper Overflow Sensor	Not full	Full
	5	Tray 3 Paper Sensor	Paper not detected	Paper detected
	6	Tray 4 Paper Overflow Sensor	Not full	Full
16	Mail Box 2			
	0	Vertical Transport Sensor 1	Paper not detected	Paper detected
	1	Vertical Transport Sensor 2	Paper not detected	Paper detected
	2	Door Safety Switch	Opened	Closed

ARDF Input Check: SP6-007

NOTE: The functions are available when the optional CF expander is installed.

SP6-007 -XXX	Bit	Description	Reading	
			0	1
1	7	Original width sensor 4	Paper not detected	Paper detected
	6	Original width sensor 3	Paper not detected	Paper detected
	5	Original width sensor 2	Paper not detected	Paper detected
	4	Original width sensor 1	Paper not detected	Paper detected
	3	Skew correction sensor	Paper not detected	Paper detected
	2	Original set sensor	Paper not detected	Paper detected
	1	Original length sensor 1	Paper not detected	Paper detected
	0	Original length sensor 2	Paper not detected	Paper detected
2	7	Original stopper HP sensor	Original stopper up	Original stopper down
	6	Pick-up HP sensor	Cover closed	Cover opened
	5	Top cover Sensor	Cover closed	Cover opened
	4	Lift sensor	Pick-up roller up	Pick-up roller down
	3	Inverter sensor	Paper not detected	Paper detected
	2	Exit sensor	Paper not detected	Paper detected
	1	Registration sensor	Paper not detected	Paper detected
	0	Interval Sensor	Paper not detected	Paper detected

Table 1: Paper Height Sensor

Low: Deactivated, High: Activated (actuator inside sensor)

Remaining paper	Paper height sensor 1	Paper height sensor 2
Full	Low	Low
Nearly full	Low	High
Near end	High	High
Almost empty	High	Low

Table 2: Paper Size Switch (Tray 2)

0: Not pushed, 1: pushed

Models		Switch Location			
North America	Europe/Asia	1	2	3	4
11" x 17" SEF	11" x 17" SEF	0	1	0	0
A3 SEF	A3 SEF	1	0	1	0
8 1/2" x 14" SEF ^{*1}	B4 SEF ^{*1}	1	1	0	1
8 1/2" x 11" SEF ^{*2}	A4 SEF ^{*2}	0	1	1	0
11" x 8 1/2" LEF ^{*3}	11" x 8 1/2" LEF ^{*3}	1	0	1	1
A4 LEF	A4 LEF	0	1	0	1
B5 LEF	B5 LEF	0	0	1	0
A5 LEF	A5 LEF	0	0	0	1

NOTES:

^{*1}: The machine detects either 8 1/2" x 14" SEF or B4 SEF, depending on the setting of SP 1-902-2

^{*2}: The machine detects either 8 1/2" x 11" SEF or A4 SEF, depending on the setting of SP 1-902-3

^{*3}: The machine detects either 11" x 8 1/2" LEF or B5 SEF, depending on the setting of SP 1-902-4

Table 3: Paper Size (By-pass Table)

Models		Bit No.			
North America	Europe/Asia	4	3	2	1
11" x 17" SEF	11" x 17" SEF	0	0	1	1
A3 SEF	A3 SEF	0	0	0	1
-	B4 SEF	0	0	1	0
8 1/2" x 11" SEF	A4 SEF	0	1	1	0
8" x 13" SEF	F SEF	0	1	0	0
-	A5 SEF	1	1	0	0
5 1/2" x 18 1/2" SEF	B6 SEF	1	0	0	0
Post Card	Post Card	0	0	0	0

Service
Tables**Table 4: Original Size Detection**

NOTE: The functions are available when the optional CF expander is installed.

Original Size		Length Sensor			Width Sensor		SP4-301 display
A4/A3 version	LT/DLT version	L3	L2	L1	W2	W1	
A3	11" x 17"	O	O	O	O	O	132
B4	10" x 14"	O	O	O	X	O	141
F4	8.5" x 14" (8" x 13")	O	O	O	X	X	165
A4-L	8.5" x 11"	X	O	O	X	X	133
B5-L		X	X	O	X	X	142
A4-S	11" x 8.5"	X	X	X	O	O	5
B5-S		X	X	X	X	O	14
A5-L, A5-S	5.5" x 8.5", 8.5" x 5.5"	X	X	X	X	X	128

5.4.3 OUTPUT CHECK TABLE

CH: Charge
 PF: Paper Feed
 TS: Toner Supply
 CW: Clockwise
 CCW: Counterclockwise
 MB: 4-bin Mailbox
 DI: Duplex Inverter

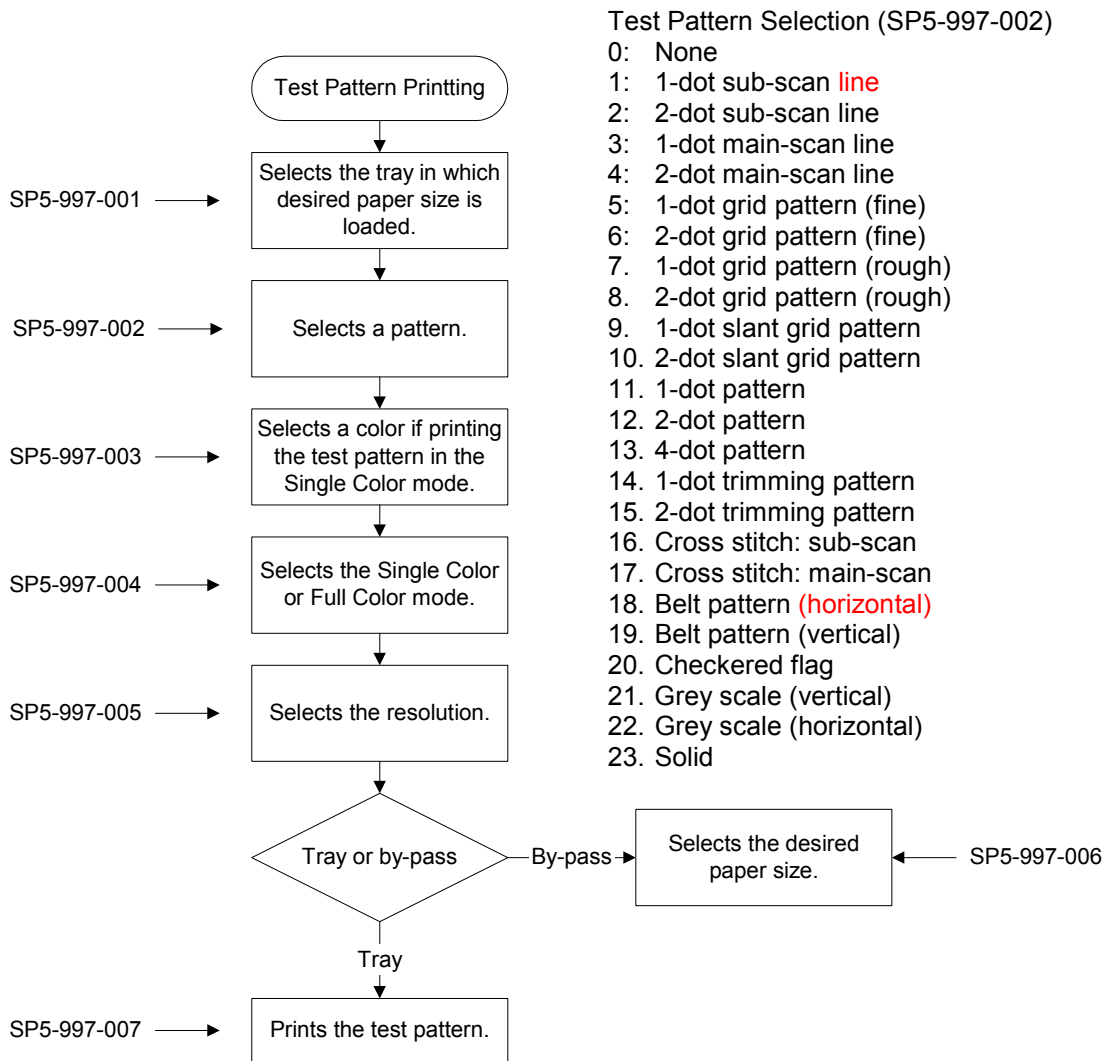
SP5-804-XXX		Description
1	Lift M UP (1)	Tray 1 Lift Motor / UP
2	Lift M DOWN(1)	Tray 1 Lift Motor / DOWN
3	Lift M UP(2)	Tray 2 Lift Motor / UP
4	Lift M DOWN(2)	Tray 2 Lift Motor / DOWN
5	By-pass CL	By-pass Feed Clutch
6	Pick-up SOL	Pick-up Solenoid
7	PF CL (1)	Paper Feed Clutch - Tray 1
8	PF CL (2)	Paper Feed Clutch - Tray 2
9	PF GRP SOL	Grip Roller Release Solenoid
10	Regist CL	Registration Clutch
11	Junction SOL	Exit Junction Gate Solenoid
12	Oil Supply SOL	Oil Supply Unit Solenoid
13	Fusing CL	Fusing Clutch
19	K Dev CL	Development Unit Clutch - K
20	C Dev CL	Development Unit Clutch - C
21	M Dev CL	Development Unit Clutch - M
22	Y Dev CL	Development Unit Clutch - Y
23	K Dev M H	Development Motor - K / High Speed
24	K Dev M M	Development Motor - K / Middle Speed
25	K Dev M L	Development Motor - K / Low Speed
26	K Dev M Card	Black Development Motor - Thick paper
27	FC Dev M H	Color Development Motor - 185mm/s
28	FC Dev M M	Color Development Motor - 125mm/s
29	FC Dev M L	Color Development Motor - 62.5mm/s
30	TS CL [Y]	Toner Supply Clutch for Yellow
31	TS CL [M]	Toner Supply Clutch for Magenta
32	TS CL [C]	Toner Supply Clutch for Cyan
33	TS CL [K]	Toner Supply Clutch for Black
34	Valve SOL [K]	Air Flow Valve solenoid for Black
35	Valve SOL [C]	Air Flow Valve solenoid for Cyan
36	Valve SOL [M]	Air Flow Valve solenoid for Magenta
37	Valve SOL [Y]	Air Flow Valve solenoid for Yellow
38	Toner Sply Mt1	Toner Supply Motor 1 - yellow and magenta
39	Toner Sply Mt2	Toner Supply Motor 2 - cyan and black
40	Air Supply [Y]	Air Pump Motor and Valve for Yellow
41	Air Supply [M]	Air Pump Motor and Valve for Magenta
42	Air Supply [C]	Air Pump Motor and Valve for Cyan
43	Air Supply [K]	Air Pump Motor and Valve for Black
44	T End Sens [Y]	Toner End Sensor - Y

SP5-804-XXX		Description
45	T End Sens [M]	Toner End Sensor - M
46	T End Sens [C]	Toner End Sensor - C
47	T End Sens [K]	Toner End Sensor - K
50	PSU Fan	PSU Cooling Fan Motor
51	Fusing Fan H	Fusing Fan Motor / High Speed
52	Fusing Fan L	Fusing Fan Motor / Low Speed
53	M Fan	Laser Optics Housing Unit Cooling Fan
54	Belt M CW	Transfer Belt Contact Motor / Clockwise
55	Belt M CCW	Transfer Belt Contact Motor / Counterclockwise
56	Belt M Break	Transfer Belt Contact Motor / Break
57	Fusing Relay	Fusing Relay
58	Heat Lamp	Heating Roller Fusing Lamp
59	Pressure Lamp	Pressure Roller Fusing Lamp
65	Drum M L CW	Drum Drive Motors (K & CMY) / Low Speed / Clockwise
66	Drum M M CW	Drum Drive Motors (K & CMY) / Middle Speed / Clockwise
67	Drum M H CW	Drum Drive Motors (K & CMY) / High Speed / Clockwise
76	PF M L CW	Paper Feed Motor / Low Speed / Clockwise
77	PF M M CW	Paper Feed Motor / Middle Speed / Clockwise
78	PF M H CW	Paper Feed Motor / High Speed / Clockwise
79	PF M Feed	Paper Feed Motor / Feed Speed / Clockwise
80	By-Pass M L CW	Paper Feed Motor / Low Speed / Clockwise
81	By-Pass M C CW	Paper Feed Motor / Thick paper or OHP mode / Clockwise
82	By-Pass M M CW	Paper Feed Motor / Middle Speed / Clockwise
89	CH DC [Y]	Charge DC Bias for Yellow / 125 mm/s
90	CH DC [M]	Charge DC Bias for Magenta / 125 mm/s
91	CH DC [C]	Charge DC Bias for Cyan / 125 mm/s
92	CH DC [K]	Charge DC Bias for Black / 125 mm/s
93	CH AC [FC] 62.5	Charger AC / Full Color / 62.5 mm/s
94	CH AC [K] 62.5	Charger AC / Black / 62.5 mm/s
95	CH AC [FC] 125	Charger AC / Full Color / 125 mm/s
96	CH AC [K] 125	Charger AC / Black / 125 mm/s
97	CH AC [FC] 185	Charger AC / Full Color / 185 mm/s
98	CH AC [K] 185	Charger AC / Black / 185 mm/s
99	Dev DC [Y]	Development DC Bias for Yellow
100	Dev DC [M]	Development DC Bias for Magenta
101	Dev DC [C]	Development DC Bias for Cyan
102	Dev DC [K]	Development DC Bias for Black
103	Dev AC [FC] 62.5	Development AC Bias for Color - 62.5 mm/s
104	Dev AC [K] 62.5	Development AC Bias for Black - 62.5 mm/s
105	Dev AC [FC] 125	Development AC Bias for Color - 125 mm/s
106	Dev AC [K] 125	Development AC Bias for Black - 125 mm/s
107	Dev AC [FC] 185	Development AC Bias for Color - 185 mm/s
108	Dev AC [K] 185	Development AC Bias for Black - 185 mm/s
109	Transfer [Y]	Transfer Current for Yellow
110	Transfer [M]	Transfer Current for Magenta
111	Transfer [C]	Transfer Current for Cyan

SP5-804-XXX		Description
112	Transfer [K]	Transfer Current for Black
113	Cleaning Bias	Transfer Belt Cleaning Roller Bias
114	PA Roller Bias+	Paper Attraction Roller Bias
115	PA Roller Bias-	Paper Attraction Roller Bias
116	DevAC TRG [FC]	Development AC Trigger for Color
117	DevAC TRG [K]	Development AC Trigger for Black
118	DevPWM TRG [K]	Development PWM Trigger for Black
119	DevPWM TRG [C]	Development PWM Trigger for Cyan
120	DevPWM TRG [M]	Development PWM Trigger for Magenta
121	DevPWM TRG [Y]	Development PWM Trigger for Yellow
122	CHdcPWM TRG [K]	Charge DC PWM Trigger for Black
123	CHdcPWM TRG [C]	Charge DC PWM Trigger for Cyan
124	CHdcPWM TRG [M]	Charge DC PWM Trigger for Magenta
125	CHdcPWM TRG [Y]	Charge DC PWM Trigger for Yellow
126	CHac1 TRG [FC]	Charge AC1 Trigger for Color
127	Chac2 TRG [FC]	Charge AC2 Trigger for Color
128	Chac3 TRG [FC]	Charge AC3 Trigger for Color
129	CHac1 TRG [K]	Charge AC1 Trigger for Black
130	Chac2 TRG [K]	Charge AC2 Trigger for Black
131	Chac3 TRG [K]	Charge AC3 Trigger for Black
132	ID Sensor LED	ID Sensor LED
133	TD Vcnt	TD Sensor / Vcnt
134	Memory Chip	Memory Chip / Power (5V) Supply
141	Polygon M 29	Polygon Motor / 29.528
142	Polygon M 21	Polygon Motor / 21.850
143	LD FC[K]62.5	LD Power for Black in Color Mode / 62.5
144	LD FC[K]125	LD Power for Black in Color Mode / 125
145	LD FC[Y]62.5	LD Power for Yellow in Color Mode / 62.5
146	LD FC[Y]125	LD Power for Yellow in Color Mode / 125
147	LD FC[M]62.5	LD Power for Magenta in Color Mode / 62.5
148	LD FC[M]125	LD Power for Magenta in Color Mode / 125
149	LD FC[C]62.5	LD Power for Cyan in Color Mode / 62.5
150	LD FC[C]125	LD Power for Cyan in Color Mode / 125
151	LD1 [K] 62.5	LD1 Power for Black / 62.5
152	LD1 [K] 125	LD1 Power for Black / 125
153	LD1 [K] 185	LD1 Power for Black / 185
154	LD2 [K] 62.5	LD2 Power for Black / 62.5
155	LD2 [K] 125	LD2 Power for Black / 125
156	LD2 [K] 185	LD2 Power for Black / 185
157	LD [K]62.5	LD Power for Black / 62.5
158	LD [K]125	LD Power for Black / 125
159	LD [K]185	LD Power for Black / 185
165	PSU M	Optional Paper Feed Unit (PSU: Paper Supply Unit) / Motor
166	PF CL PFU (1)	Paper Feed Clutch / Optional Paper Feed Unit / Tray 1
167	PF CL PFU (2)	Paper Feed Clutch / Optional Paper Feed Unit / Tray 2
168	Pick-up SOL PSU	Pick-up Solenoid / Optional Paper Feed Unit (PSU: Paper Supply Unit)

SP5-804-XXX		Description
170	MB M	4-bin Mailbox Main Motor
171	MB SOL1	4-bin Mailbox Junction Gate Solenoid 1
172	MB SOL2	4-bin Mailbox Junction Gate Solenoid 2
173	MB SOL3	4-bin Mailbox Junction Gate Solenoid 3
174	MB Gate SOL	4-bin Mailbox Junction Gate Solenoid
176	Duplex SOL	Duplex Junction Gate Solenoid
177	DI M1 62.5CCW	Duplex Inverter Motor 1 / 62.5 / Counterclockwise
178	DI M1 65CCW	Duplex Inverter Motor 1 / 65 / Counterclockwise
179	DI M1 125CCW	Duplex Inverter Motor 1 / 125 / Counterclockwise
180	DI M1 130CCW	Duplex Inverter Motor 1 / 130 / Counterclockwise
181	DI M1 185CCW	Duplex Inverter Motor 1 / 185 / Counterclockwise
182	DI M1 193CCW	Duplex Inverter Motor 1 / 193 / Counterclockwise
183	DI M1 370CCW	Duplex Inverter Motor 1 / 370 / Counterclockwise
184	DI M1 370CW	Duplex Inverter Motor 1 / 370 / Clockwise
185	DI M1 450CW	Duplex Inverter Motor 1 / 450 / Clockwise
186	DI M2 62.5CCW	Duplex Inverter Motor 2 / 62.5 / Counterclockwise
187	DI M2 65CCW	Duplex Inverter Motor 2 / 65 / Counterclockwise
188	DI M2 125CCW	Duplex Inverter Motor 2 / 125 / Counterclockwise
189	DI M2 130CCW	Duplex Inverter Motor 2 / 130 / Counterclockwise
190	DI M2 185CCW	Duplex Inverter Motor 2 / 185 / Counterclockwise
191	DI M2 193CCW	Duplex Inverter Motor 2 / 193 / Counterclockwise
192	DI M2 370CCW	Duplex Inverter Motor 2 / 370 / Counterclockwise
193	DI M2 370CW	Duplex Inverter Motor 2 / 370 / Clockwise
194	DI M2 450CW	Duplex Inverter Motor 2 / 450 / Clockwise
195	DI M2 OFF	Duplex Inverter Motor 2 / OFF
196	DI M12 62.5CCW	Duplex Inverter Motor 1&2 / 62.5 / Counterclockwise
197	DI M12 65CCW	Duplex Inverter Motor 1&2 / 65 / Counterclockwise
198	DI M12 125CCW	Duplex Inverter Motor 1&2 / 125 / Counterclockwise
199	DI M12 130CCW	Duplex Inverter Motor 1&2 / 130 / Counterclockwise
200	DI M12 185CCW	Duplex Inverter Motor 1&2 / 180 / Counterclockwise
201	DI M12 193CCW	Duplex Inverter Motor 1&2 / 193 / Counterclockwise
202	DI M12 370CCW	Duplex Inverter Motor 1&2 / 370 / Counterclockwise
203	DI M12 370CW	Duplex Inverter Motor 1&2 / 370 / Clockwise
204	DI M12 450CW	Duplex Inverter Motor 1&2 / 450 / Clockwise
205	PF M 125CCW	Duplex Feed Motor / 125 / Counterclockwise
206	PF M 230CCW	Duplex Feed Motor / 230 / Counterclockwise
207	PF M 370CCW	Duplex Feed Motor / 370 / Counterclockwise

5.4.4 TEST PATTERN (SP5-997)



G080S903.WMF

5.5 SCANNER SP

5.5.1 SP MODES

SP1-xxx (System and Others)

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]
001	[System]		
	1	Model Name	* NV CF
	2	Scanner Firmware Version	
	3	Scanner Firmware Number	
	4	Detail Model Name	
Displays the model name.			
Displays the scanner firmware version.			
Displays the firmware's part number.			
Displays the detail model name.			
002	[Error Log Display]		
	1	Error Log Display	* NV CF
Displays the error log data.			
003	[FTP Port Number]		
	1	FTP Port Number	* NV CF
Changes the FTP port number. <i>After changing this value, do the following:</i>			
1. Run the Registry Editor			
2. Access /HKEY_LOCAL_MACHINE/SOFTWARE/ Ricoh/NetworkScanner			
3. Change the value of 'PortNo' to this SP mode's value			
[0 to 65535 / 3670 / 1/step]			
004	[Compression Type]		
	1	Compression Type	* NV CF
Selects the compression type for binary picture processing.			
[1 to 3 / 3 / 1/step]			
1: MH, 2: MR, 3: MMR			
005	[Erase margin]		
	1	Erase Margin	* NV CF
Creates an erase margin for all edges of the scanned image.			
<i>If the machine has scanned the edge of the original, create a margin.</i>			
[0 to 5 / 0 / 1 mm/step]			
006	[Auto Reset Timer]		
	1	Auto Reset Timer	* NV CF
Adjusts the auto reset timer for the scanner function.			
<i>If this is "0", the auto reset function is disabled.</i>			
[0 to 99 / 60 / 1 sec/step]			

SP2-XXX (Scanning-image quality)

2	Mode Number (Class 1, 2, and 3)		Function / [Setting]
002	[Text mode settings]		
	1	MTF Filter Coefficient (Main scan)	* NV CF Selects the MTF filter coefficient in the main scan direction for Text mode. <i>Select a higher number for a stronger filter. If this is "0", the MTF filter is not applied.</i> [0 to 15 / <u>7</u> / 1/step] DFU
	2	MTF Filter Coefficient (Sub scan)	As above, for sub scan [0 to 13 / <u>6</u> / 1/step] DFU
	3	Smoothing Filter	Selects the smoothing pattern for Text mode when using binary picture processing mode. <i>A larger value could cause moiré to appear in the image.</i> [0 to 7 / <u>0</u> / 1/step] DFU
	4	Scanner Gamma	Selects the scanner gamma type for Text mode when using binary picture processing mode. [0 to 6 / <u>4</u> / 1/step] DFU 0: Standard 1: Smooth 2: Clearly 3: Liner 4: Text image for the delivery function 5: Text/photo image for the delivery function 6: Photo image for the delivery function
	5	Notch No.7(Lighter): Brightness	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>104</u> / 1/step] DFU
	6	Notch No.7(Lighter): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	7	Notch No.7(Lighter): Threshold	[0 to 255 / <u>160</u> / 1/step] DFU
	8	Notch No.6: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	9	Notch No.6: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	10	Notch No.6: Threshold	[0 to 255 / <u>145</u> / 1/step] DFU
	11	Notch No.5: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	12	Notch No.5: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	13	Notch No.5: Threshold	[0 to 255 / <u>135</u> / 1/step] DFU
	14	Notch No.4(Middle): Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	15	Notch No. 4(Middle): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	16	Notch No. 4(Middle): Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	17	Notch No.3: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU

2	Mode Number (Class 1, 2, and 3)		Function / [Setting]	
002	18	Notch No.3: Contrast	* NV CF Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>128</u> / 1/step] DFU	
	19	Notch No.3: Threshold		[0 to 255 / <u>100</u> / 1/step] DFU
	20	Notch No.2: Brightness		[0 to 255 / <u>128</u> / 1/step] DFU
	21	Notch No.2: Contrast		[0 to 255 / <u>128</u> / 1/step] DFU
	22	Notch No.2: Threshold		[0 to 255 / <u>85</u> / 1/step] DFU
	23	Notch No.1(Darker): Brightness		[0 to 255 / <u>128</u> / 1/step] DFU
	24	Notch No. 1(Darker): Contrast		[0 to 255 / <u>128</u> / 1/step] DFU
	25	Notch No. 1(Darker): Threshold		[0 to 255 / <u>70</u> / 1/step] DFU
003	[Text/Photo mode settings]			
	1	MTF Filter Coefficient (Main scan)	* NV CF Selects the MTF filter coefficient in the main scan direction for Text/Photo mode. <i>Select a higher number for a stronger filter.</i> <i>If this is "0", the MTF filter is not applied.</i> [0 to 15 / <u>4</u> / 1/step] DFU	
	2	MTF Filter Coefficient (Sub scan)	As above, for sub scan [0-13 / <u>4</u> / 1/step] DFU	
	3	Smoothing Filter	Selects the smoothing pattern for Text/Photo mode when using binary picture processing mode. <i>A larger value could cause moiré to appear in the image.</i> [0 to 7 / <u>0</u> / 1/step] DFU	
	4	Scanner Gamma	Selects the scanner gamma type for Text/Photo mode when using binary picture processing mode. [0 to 6 / <u>5</u> / 1/step] DFU	
	5	Notch No.7(Lighter): Brightness	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>128</u> / 1/step] DFU	
	6	Notch No.7(Lighter): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
	7	Notch No.7(Lighter): Threshold	[0 to 255 / <u>160</u> / 1/step] DFU	
	8	Notch No.6: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU	
	9	Notch No.6: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
	10	Notch No.6: Threshold	[0 to 255 / <u>145</u> / 1/step] DFU	
	11	Notch No.5: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU	
	12	Notch No.5: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
	13	Notch No.5: Threshold	[0 to 255 / <u>135</u> / 1/step] DFU	
14	Notch No.4(Middle): Brightness	[0 to 255 / <u>128</u> / 1/step] DFU		

2	Mode Number (Class 1, 2, and 3)		Function / [Setting]
003	15	Notch No. 4(Middle): Contrast	* NV CF [0 to 255 / <u>128</u> / 1/step] DFU
	16	Notch No. 4(Middle): Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	17	Notch No.3: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	18	Notch No.3: Contrast	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>128</u> / 1/step] DFU
	19	Notch No.3: Threshold	[0 to 255 / <u>100</u> / 1/step] DFU
	20	Notch No.2: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	21	Notch No.2: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	22	Notch No.2: Threshold	[0 to 255 / <u>85</u> / 1/step] DFU
	23	Notch No.1(Darker): Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	24	Notch No. 1(Darker): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	25	Notch No. 1(Darker): Threshold	[0 to -255 / <u>70</u> / 1/step] DFU
004	[Photo mode settings]		
	1	MTF Filter Coefficient (Main scan)	* NV CF Selects the MTF filter coefficient in the main scan direction for Photo mode. <i>Select a higher number for a stronger filter.</i> <i>If this is "0", the MTF filter is not applied.</i> [0 to 15 / <u>0</u> / 1/step] DFU
	2	MTF Filter Coefficient (Sub scan)	As above, for sub scan [0 to 13 / <u>0</u> / 1/step] DFU
	3	Smoothing Filter	Selects the smoothing pattern for Photo mode when using binary picture processing mode. <i>A larger value could cause moiré to appear in the image.</i> [0 to 7 / <u>0</u> / 1/step] DFU
	4	Scanner Gamma	Selects the scanner gamma type for Photo mode when using binary picture processing mode. [0 to 6 / <u>6</u> / 1/step] DFU
	5	Dither Matrix Filter	Selects the dither matrix type for Photo mode when using binary picture processing mode. [1 to 26 / <u>4</u> / 1 step] DFU
	6	Notch No.7(Lighter): Brightness	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>128</u> / 1/step] DFU
	7	Notch No.7(Lighter): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	8	Notch No.7(Lighter): Threshold	[0 to 255 / <u>160</u> / 1/step] DFU
	9	Notch No.6: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
10	Notch No.6: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	

2	Mode Number (Class 1, 2, and 3)		Function / [Setting]
004	11	Notch No.6: Threshold	* NV CF [0 to 255 / <u>145</u> / 1/step] DFU
	12	Notch No.5: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	13	Notch No.5: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	14	Notch No.5: Threshold	[0 to 255 / <u>135</u> / 1/step] DFU
	15	Notch No.4(Middle): Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	16	Notch No. 4(Middle): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	17	Notch No. 4(Middle): Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	18	Notch No.3: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	19	Notch No.3: Contrast	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>128</u> / 1/step] DFU
	20	Notch No.3: Threshold	[0 to 255 / <u>100</u> / 1/step] DFU
	21	Notch No.2: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	22	Notch No.2: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	23	Notch No.2: Threshold	[0 to 255 / <u>85</u> / 1/step] DFU
	24	Notch No.1(Darker): Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
25	Notch No. 1(Darker): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
26	Notch No. 1(Darker): Threshold	[0 to 255 / <u>70</u> / 1/step] DFU	
005	[Gray – scale mode settings]		
	1	MTF Filter Coefficient (Main scan)	* NV CF Selects the MTF filter coefficient in the main scan direction when using grayscale processing mode. <i>Select a higher number for a stronger filter. If this is "0", the MTF filter is not applied</i> [0 to 15 / <u>0</u> / 1 step] DFU
	2	MTF Filter Coefficient (Sub scan)	As above, for sub scan [0 to 13 / <u>0</u> / 1 step] DFU
	3	Smoothing Filter	Selects the smoothing pattern when using grayscale processing mode. <i>A larger value could cause moiré to appear in the image.</i> [0 to 7 / <u>0</u> / 1/step] DFU
	4	Scanner Gamma	Selects the scanner gamma type when using grayscale processing mode. [0 to 6 / <u>3</u> / 1/step] DFU
	5	Notch No.7(Lighter): Brightness	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>128</u> / 1/step] DFU
	6	Notch No.7(Lighter): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU

2	Mode Number (Class 1, 2, and 3)		Function / [Setting]	
005	7	Notch No.7(Lighter): Threshold	* NV CF [0 to 255 / <u>160</u> / 1/step] DFU	
	8	Notch No.6: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU	
	9	Notch No.6: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
	10	Notch No.6: Threshold	[0 to 255 / <u>145</u> / 1/step] DFU	
	11	Notch No.5: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU	
	12	Notch No.5: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
	13	Notch No.5: Threshold	[0 to 255 / <u>135</u> / 1/step] DFU	
	14	Notch No.4(Middle): Brightness	[0 to 255 / <u>128</u> / 1/step] DFU	
	15	Notch No. 4(Middle): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
	16	Notch No. 4(Middle): Threshold	[0 to 255 / <u>128</u> / 1/step] DFU	
	17	Notch No.3: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU	
	18	Notch No.3: Contrast	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>128</u> / 1/step] DFU	
	19	Notch No.3: Threshold	[0 to 255 / <u>100</u> / 1/step] DFU	
	20	Notch No.2: Brightness	[0 to 255 / <u>128</u> / 1/step] DFU	
	21	Notch No.2: Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
	22	Notch No.2: Threshold	[0 to 255 / <u>85</u> / 1/step] DFU	
	23	Notch No.1(Darker): Brightness	[0 to 255 / <u>128</u> / 1/step] DFU	
	24	Notch No. 1(Darker): Contrast	[0 to 255 / <u>128</u> / 1/step] DFU	
	25	Notch No. 1(Darker): Threshold	[0 to 255 / <u>70</u> / 1/step] DFU	
	006	[Full Color settings]		
		1	MTF Filter Coefficient (Main scan)	* NV CF Selects the MTF filter coefficient in the main scan direction when using grayscale processing mode. <i>Select a higher number for a stronger filter.</i> <i>If this is "0", the MTF filter is not applied</i> [0 to 15 / <u>0</u> / 1/step] DFU
		2	MTF Filter Coefficient (Sub scan)	As above, for sub scan [0 to 13 / <u>0</u> / 1/step] DFU
		3	Smoothing Filter	Selects the smoothing pattern when using grayscale processing mode. <i>A larger value could cause moiré to appear in the image.</i> [0 to 7 / <u>0</u> / 1/step] DFU
		4	R-Gamma Curve	Adjusts the scanner gamma for RGB. [0 to 9 / <u>7</u> / 1 /step] DFU
		5	G-Gamma Curve	
6		B-Gamma Curve		

2	Mode Number (Class 1, 2, and 3)			Function / [Setting]
006	7	Notch No.7(Lighter): R - Brightness	* NV CF	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0 to 255 / <u>195</u> / 1/step] DFU
	8	Notch No.7(Lighter): G - Brightness		[0 to 255 / <u>194</u> / 1/step] DFU
	9	Notch No.7(Lighter): B - Brightness		[0 to 255 / <u>195</u> / 1/step] DFU
	10	Notch No.7(Lighter): R - Contrast		[0 to 255 / <u>185</u> / 1/step] DFU
	11	Notch No.7(Lighter): G - Contrast		[0 to 255 / <u>184</u> / 1/step] DFU
	12	Notch No.7(Lighter): B - Contrast		[0 to 255 / <u>185</u> / 1/step] DFU
	13	Notch No.7(Lighter): R - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	14	Notch No.7(Lighter): G - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	15	Notch No.7(Lighter): B - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	16	Notch No.6: R - Brightness		[0 to 255 / <u>177</u> / 1/step] DFU
	17	Notch No.6: G - Brightness		[0 to 255 / <u>174</u> / 1/step] DFU
	18	Notch No.6: B - Brightness		[0 to 255 / <u>177</u> / 1/step] DFU
	19	Notch No.6: R - Contrast		[0 to 255 / <u>168</u> / 1/step] DFU
	20	Notch No.6 G - Contrast		[0 to 255 / <u>164</u> / 1/step] DFU
	21	Notch No.6: B - Contrast		[0 to 255 / <u>168</u> / 1/step] DFU
	22	Notch No.6: R - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	23	Notch No.6: G - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	24	Notch No.6: B - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	25	Notch No.5: R - Brightness		[0 to 255 / <u>172</u> / 1/step] DFU
	26	Notch No.5: G - Brightness		[0 to 255 / <u>165</u> / 1/step] DFU
	27	Notch No.5: B - Brightness		[0 to 255 / <u>168</u> / 1/step] DFU
	28	Notch No.5: R - Contrast		[0 to 255 / <u>165</u> / 1/step] DFU
	29	Notch No.5 G - Contrast		[0 to 255 / <u>161</u> / 1/step] DFU
	30	Notch No.5: B - Contrast		[0 to 255 / <u>164</u> / 1/step] DFU
	31	Notch No.5: R - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU

2	Mode Number (Class 1, 2, and 3)		Function / [Setting]
006	32	Notch No.5: G - Threshold	* NV CF [0 to 255 / <u>128</u> / 1/step] DFU
	33	Notch No.5: B - Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	34	Notch No.4(Middle): R - Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	35	Notch No. 4(Middle): G - Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	36	Notch No. 4(Middle): B - Brightness	[0 to 255 / <u>128</u> / 1/step] DFU
	37	Notch No. 4(Middle): R - Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	38	Notch No. 4(Middle) G - Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	39	Notch No. 4(Middle): B - Contrast	[0 to 255 / <u>128</u> / 1/step] DFU
	40	Notch No. 4(Middle): R - Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	41	Notch No. 4(Middle): G - Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	42	Notch No. 4(Middle): B - Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	43	Notch No.3: R - Brightness	[0 to 255 / <u>125</u> / 1/step] DFU
	44	Notch No.3: G - Brightness	[0 to 255 / <u>127</u> / 1/step] DFU
	45	Notch No.3: B - Brightness	[0 to 255 / <u>127</u> / 1/step] DFU
	46	Notch No.3: R - Contrast	[0 to 255 / <u>136</u> / 1/step] DFU
	47	Notch No.3 G - Contrast	[0 to 255 / <u>134</u> / 1/step] DFU
	48	Notch No.3: B - Contrast	[0 to 255 / <u>134</u> / 1/step] DFU
	49	Notch No.3: R - Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	50	Notch No.3: G - Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	51	Notch No.3: B - Threshold	[0 to 255 / <u>128</u> / 1/step] DFU
	52	Notch No.2: R - Brightness	[0 to 255 / <u>124</u> / 1/step] DFU
	53	Notch No.2: G - Brightness	[0 to 255 / <u>126</u> / 1/step] DFU
	54	Notch No.2: B - Brightness	[0 to 255 / <u>126</u> / 1/step] DFU
	55	Notch No.2: R - Contrast	[0 to 255 / <u>140</u> / 1/step] DFU
	56	Notch No.2 G - Contrast	[0 to 255 / <u>138</u> / 1/step] DFU
	57	Notch No.2: B - Contrast	[0 to 255 / <u>138</u> / 1/step] DFU

2	Mode Number (Class 1, 2, and 3)			Function / [Setting]
006	58	Notch No.2: R - Threshold	* NV CF	[0 to 255 / <u>128</u> / 1/step] DFU
	59	Notch No.2: G - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	60	Notch No.2: B - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	61	Notch No.1(Darker): R - Brightness		[0 to 255 / <u>124</u> / 1/step] DFU
	62	Notch No. 1(Darker): G - Brightness		[0 to 255 / <u>125</u> / 1/step] DFU
	63	Notch No. 1(Darker): B - Brightness		[0 to 255 / <u>126</u> / 1/step] DFU
	64	Notch No. 1(Darker): R - Contrast		[0 to 255 / <u>144</u> / 1/step] DFU
	65	Notch No. 1(Darker) G - Contrast		[0 to 255 / <u>144</u> / 1/step] DFU
	66	Notch No. 1(Darker): B - Contrast		[0 to 255 / <u>142</u> / 1/step] DFU
	67	Notch No. 1(Darker): R - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	68	Notch No. 1(Darker): G - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
	69	Notch No. 1(Darker): B - Threshold		[0 to 255 / <u>128</u> / 1/step] DFU
007	[Compression ratio of gray-scale]			
	1	Compression ratio (Normal image)	* NV CF	Selects the compression ratio for grayscale processing mode (JPEG) for the three settings that can be selected at the operation panel. [5 to 95 / <u>50</u> / 1 /step]
	2	Compression ratio (High quality image)		[5 to 95 / <u>60</u> / 1 /step]
	3	Compression ratio (Low-quality image)		[5 to 95 / <u>40</u> / 1 /step]

SP8-XXX (Delivery)

8	Mode Number			Function and [Setting]
001	[Delivery]			
	1	Delivery Server IP Address	* NV CF	Sets the IP address for the delivery server. [000.000.000.000]
002	[Delivery Retry]			
	1	Delivery Re-try (Interval)	* NV CF	Sets the delivery re-try interval. [60-999 / <u>300</u> / 1 sec/step]
	2	Delivery Re-try (Number of re-try)		Sets the number of delivery re-tries. <i>If this is "0", the machine will not re-try to send an image to the delivery server.</i> [0-99 / <u>3</u> / 1 time/step]

8	Mode Number		Function and [Setting]	
003	[Ecabinet IP Address]			
	1	ECabinet IP Address	* NV CF	Sets the IP address for the eCabinet. [000.000.000.000]
004	[Display timer of N/W error]			
	1	Display timer of N/W error	* NV CF	Selects the length of time that the network error message for the scanner utilities is displayed. <i>If this is "0", the error message is displayed until the error is solved.</i> [0-999 / <u>300</u> / 1 sec/step]

SP9-XXX (Delivery)

9	Mode Number		Function and [Setting]	
001	Not used			

5.6 REBOOT / SYSTEM SETTING RESET



The features in this section, “Reboot / System Setting Reset,” are valid when the optional CF expander is installed.

5.6.1 SOFTWARE RESET

The software can be rebooted when the machine hangs up. Use the following procedure.

Turn the main power switch off and on.




-OR-

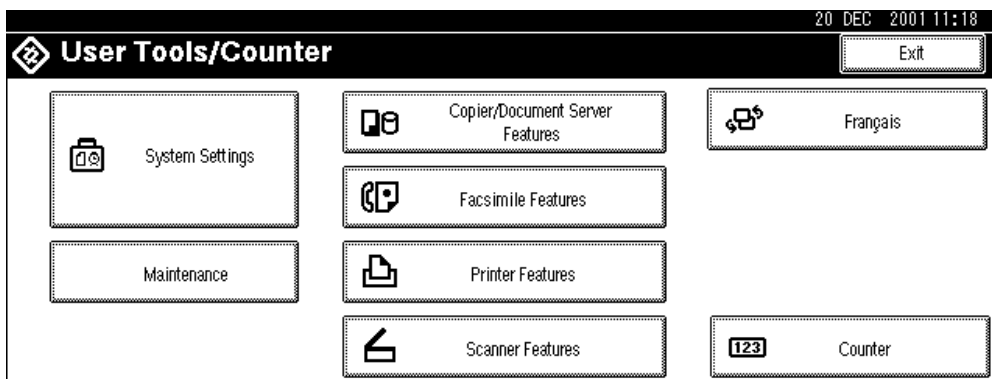
Press and hold down   together for over 10 seconds. When the machine beeps once, release both buttons. After “Now loading. Please wait” is displayed for a few seconds, the copy window will open. The machine is ready for normal operation.

5.6.2 SYSTEM SETTINGS AND COPY SETTING RESET

System Setting Reset

The system settings in the UP mode can be reset to their defaults. Use the following procedure.

1. Press User Tools/Counter .
2. Hold down  and then press System Settings.
NOTE: You must press  first.



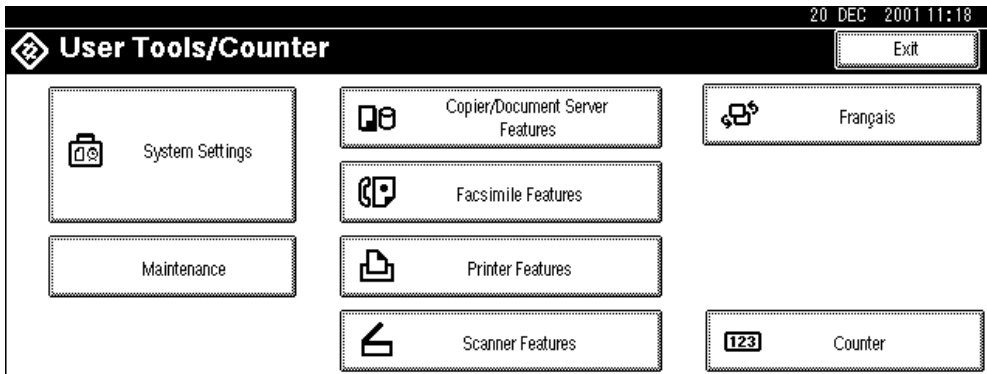
G080S503.WMF

3. When the message prompts you to confirm that you want to reset the system settings, press Yes.
4. When the message tells you that the settings have been reset, press Exit.

Copier Setting Reset

The copy settings in the UP mode can be reset to their defaults. Use the following procedure.

1. Press User Tools/Counter .
2. Hold down  and then press Copier/Document Server Settings.
NOTE: You must press  first.



G080S503.WMF

3. When the message prompts you to confirm that you want to reset the Copier Document Server settings, press "Yes".
4. When the message tells you that the settings have been reset, press "Exit".

5.7 FIRMWARE UPDATE

The features in this section, "Firmware Update," are valid when the optional CF expander is not installed.

5.7.1 TYPE OF FIRMWARE

There are four types of firmware as shown below.



Type of firmware	Function	Number of IC cards required	
Printer Engine	1. Main	Printer engine control	1 card
	2. MUSIC	Line position adjustment	1 card
	3. DSP	Line position adjustment	1 card
Printer Controller	4. System	Printer system firmware	2 cards
	5. NIB	NIB firmware	1 card

Refer to "5.4.3 Controller/Engine Firmware Upgrade" for the procedure.

NOTE: When upgrading all five types of firmware at the same time, you can upgrade them in any order.

However, when upgrading the controller system firmware, use the cards in the correct order (see below).

Two IC cards are needed to upgrade the controller system firmware. One IC card is for the operating system, and the other is for the printer application. Always upgrade the operating system first, then the printer application.

5.7.2 ERROR RECOVERY

Engine Firmware/Controller NIB Firmware

If a download attempt has failed, try downloading the new firmware again using the procedure described in section 5.4.3.

NOTE: When a download fails, the error is logged in the NVRAM on the controller and the machine asks you to insert the appropriate IC card.

Even after replacing the BCU board to fix the problem, the same message will continue to be displayed. Turning off and on the main switch while holding down the Menu and Enter keys clears the error condition logged in the NVRAM on the controller.

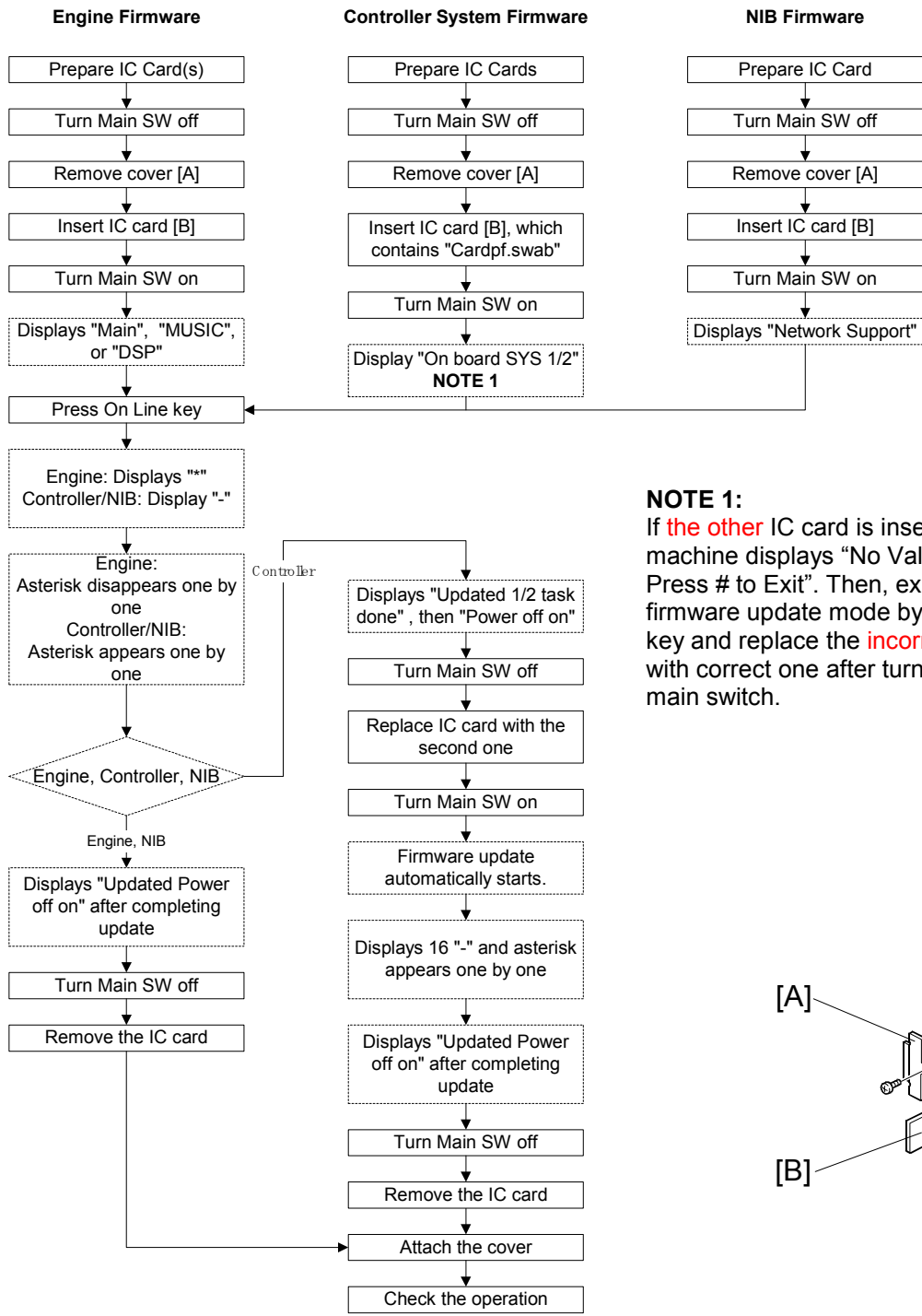
Controller System Firmware

If a download attempt has failed, you must boot up the machine from the IC card. To do this, DIP SW 1 on the controller board needs to be ON. The machine automatically starts upgrading the firmware.

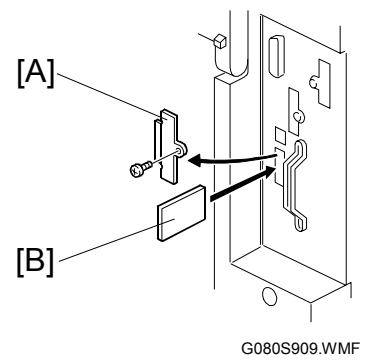
5.7.3 CONTROLLER/ENGINE FIRMWARE UPGRADE

⚠ CAUTION

- 1. Turn off the main switch whenever inserting or removing IC card.**
- 2. Do not turn off the machine while downloading the firmware.**



NOTE 1:
 If the **other** IC card is inserted first, machine displays "No Valid Data Press # to Exit". Then, exit the firmware update mode by the Enter key and replace the **incorrect** IC card with correct one after turning off the main switch.



5.8 FIRMWARE UPDATE – CF CONFIGURATION

The features in this section, “Firmware Update – CF Configuration,” are valid when the optional CF expander is installed.

5.8.1 TYPE OF FIRMWARE

There are 11 types of firmware as shown below.



Type of firmware	Function	Location of firmware	Message displayed
* Engine - Main	Printer engine control	BCU Flash ROM	Engine (1)
* Engine - Music	Line position adjustment	BCU MUSIC CPU	Music (1)
* Engine - DSP	Line position adjustment	BCU DSP CPU	DSP (1)
<ul style="list-style-type: none"> • System • Copier Application • Netfile Application 	3 different firmware (system and Copier and Netfile applications) is combined.	DIMM 1	Onboard Sys (2)
Printer Application	Feature application	DIMM 1	Onboard Printer (1)
Scanner Application	Feature application	DIMM 2	Onboard Scn (1)
Fax Application	Feature application	DIMM 2	Opt DIMM Fax (1)
* NIB	Network Interface	DIMM 2	Network Support (1)
Scanner IPU	Scanner control	IPU Flash ROM	Scanner IPU (1)
Operation Panel	Panel control	Operation Panel	Ope Panel. XX (1)
Fax FCU	Fax control	FCU	Jupi FCU (XXX)-1 (1)
Language (16 languages)	Language firmware Two languages can be selected from 16 languages.	Operation Panel	Download Language

Service Tables

* The firmware with an asterisk mark is used in both the printer (G080) version and CF (G080+G367) version. Other firmware is unique for the CF version. (For example, if you insert the IC card containing controller firmware for the printer version, “Download Error SC999” is displayed.

Refer to “5.4.3 Firmware Upgrade” for the procedure.

5.8.2 ERROR RECOVERY

If an error occurs during the firmware update, “NG!” or “ERR” is displayed. In this case, turn the main switch off and retry the firmware update after reinserting the IC card using the procedure described in section 5.6.3.

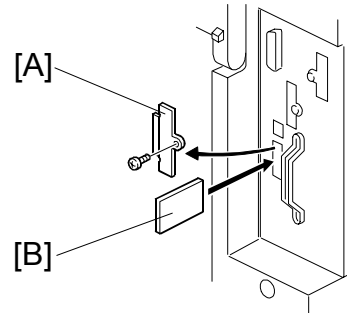
5.8.3 FIRMWARE UPGRADE

⚠ CAUTION

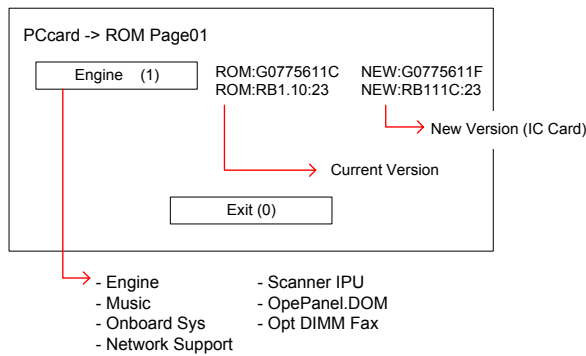
3. Turn off the main switch whenever inserting or removing an IC card.

4. Do not turn off the machine while downloading the firmware.

1. Make sure that the main switch is turned off.
2. Remove the IC card cover [A].
3. Fully insert the IC card [B] containing the required firmware into the IC card slot on the controller.
4. Turn on the main switch. The following message is displayed. Then, press the button where the firmware description is displayed.

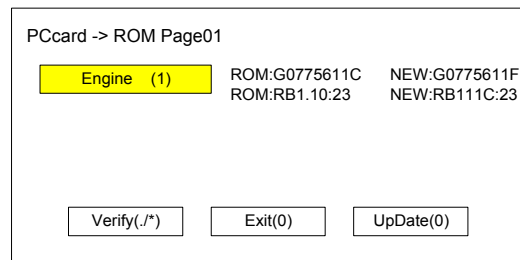


G080S912.WMF

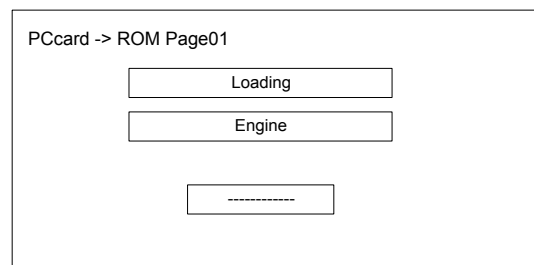


G080S511.WMF

5. Pressing the UpDate button starts updating the firmware. To indicate the progress, bars change to asterisks one by one.

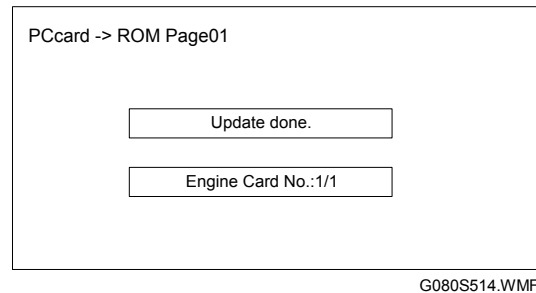


G080S512.WMF



G080S513.WMF

6. After the firmware update is completed, “Update done” or “Power Off On” is displayed. Then, turn off the main switch and remove the IC card.
7. If more firmware needs to be downloaded, make sure that the main switch is turned off and repeat steps 3 to 6.
8. When all firmware update is completed, remove the IC card while the machine power is off and reinstall the IC card cover.
9. Turn the main switch on and confirm that the machine starts normally.

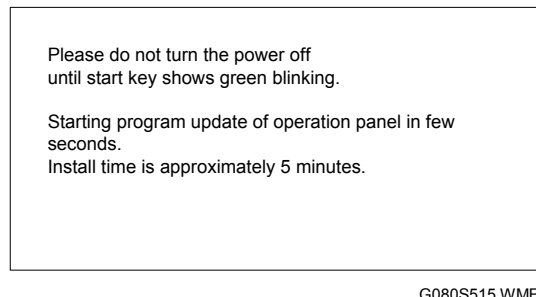


NOTE: Operation Panel Firmware Update

While the firmware of the operation panel has been updating, the operation panel cannot display anything (this is the normal condition for firmware update processing and completion).

The following message is displayed for 10 seconds after pressing the Up Date button, then the message disappears and firmware update starts.

You can check the firmware update processing and completion by watching the Start key.



Condition of the Start key

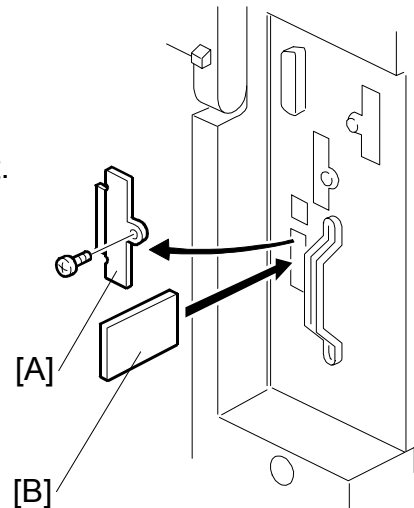
- When the above message disappears, the Start key starts blinking with red. This shows you that the machine has started the firmware update, and it takes about 5 minutes.
- When the firmware update is completed, the Start key starts blinking with green instead of red.

5.9 NVRAM DATA DOWNLOAD

After doing the memory all clear procedure, NVRAM data will be reset to their default settings. So, it is necessary to upload the NVRAM data before clearing the NVRAM, and to download the NVRAM data afterwards.

NVRAM Data Upload (SP5-824)

1. Turn off the main switch.
2. Remove the cover [A].
3. Insert the flash memory card [B] into the card slot.
4. Turn on the main switch.
5. Access the SP mode 5-824.
6. Select *EXECUTE* to download the NVRAM data.
7. Turn the main switch off, and then remove the card.



G080S910.WMF

NVRAM Data Download (SP5-825)

NOTE: This procedure downloads all the settings stored in the NVRAM except for the following items.

- Electrical Total Counter (SP7-003)
- Machine's Device Number
- C/O, P/O Counters (SP7-006)
- Duplex, A3/DLT/Over 420 mm, Staple and Scanner application scanning counters (SP7-007).
- Plug and Play brand name and production name settings (SP5-907)

1. Turn off the main switch.
2. Remove the flash memory card cover [A].
3. Insert the flash memory card [B] into the card slot.
4. Turn on the main switch.
5. Access the SP mode 5-825.
6. Select *EXECUTE* to download the NVRAM data.
7. Turn the main switch off, and then remove the card.

Note that the following errors may occur during downloading:

- If a card is not installed in the card slot and a message tells you that downloading cannot proceed, you cannot execute downloading, even by pressing *EXECUTE*.
- If the correct card for the NVRAM data is not inserted in the card slot, after you press *EXECUTE* a message will tell you that downloading cannot proceed because the card is abnormal and the execution halts.

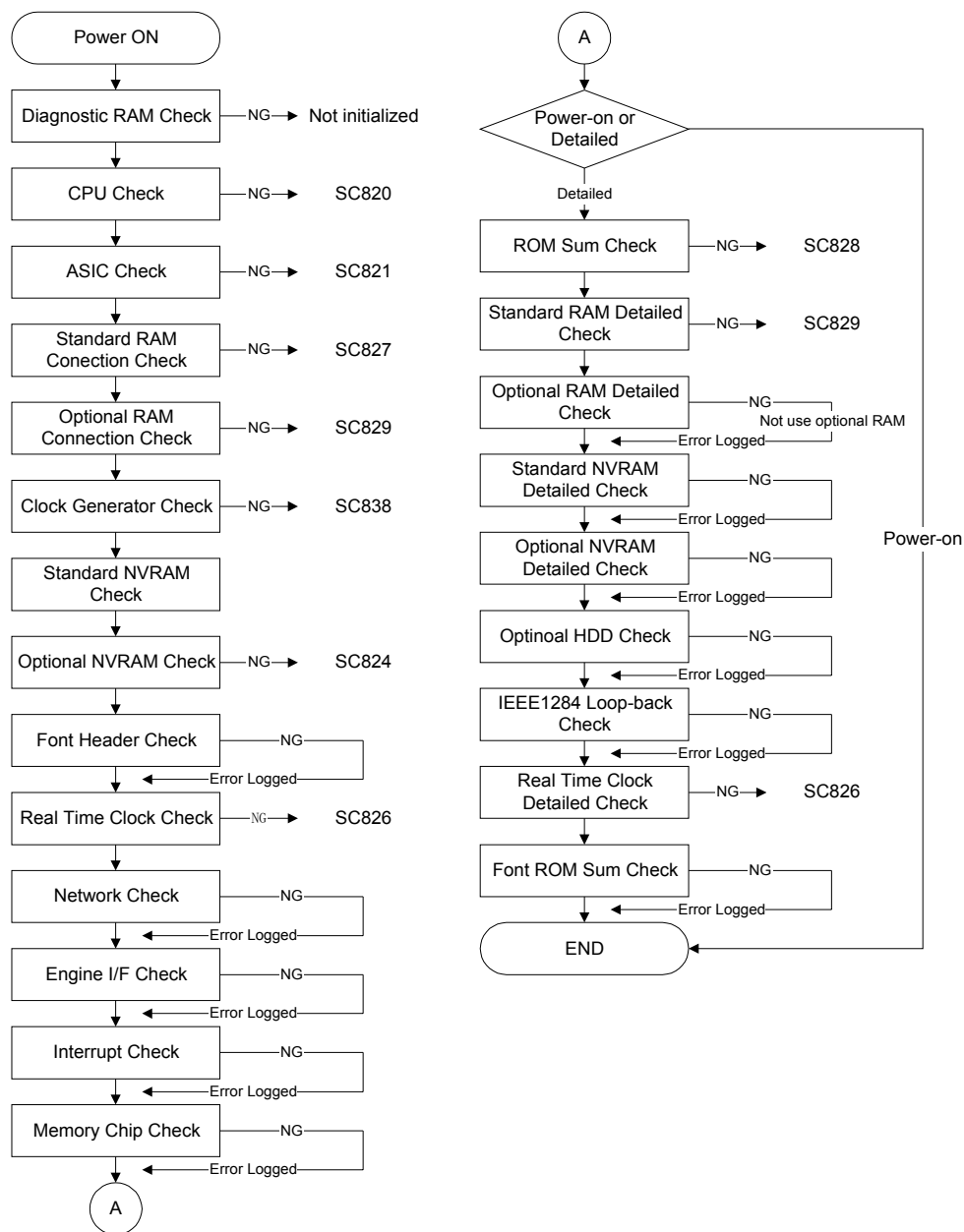
5.10 CONTROLLER SELF-DIAGNOSTICS

5.10.1 OVERVIEW

There are three types of self-diagnostics for the controller.

- Power-on self-diagnostics: The machine automatically starts the self-diagnostics just after the power has been turned on.
- Detailed self-diagnostics: The machine does the detailed self-diagnostics by using a loop-back connector (P/N G0219350)
- SC detection: The machine automatically detects SC conditions at power-on or during operation.

The following shows the workflow of the power-on and detailed self-diagnostics.



G080S911.WMF

Service Tables

5.10.2 DETAILED SELF-DIAGNOSTICS

Without Optional CF Expander

This detailed self-diagnostic test requires a loop-back connector (P/N: G0219350).

1. Turn off the machine and attach the loop-back connector to the parallel interface.
2. Turn on the machine while pressing the “On Line” key and “# Enter” key together.
3. The machine automatically starts the self-diagnostics and prints the diagnostic report after completing the test.
 - Refer to the diagnostics report for the detected errors. The errors detected during self-diagnostics can be checked with SP7-832-001 (Diag. Result).
 - Refer to section 4.2 for details about the error codes.

With Optional CF Expander

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. The following device is required in order to put the machine in the detailed self-diagnosis mode.

No.	Name
G0219350	Parallel Loopback Connector

Executing Detailed Self-Diagnosis

Follow this procedure to execute detailed self-diagnosis.

1. Switch off the machine, and connect the parallel loopback device to the Centronics I/F port.
2. Hold down $\text{\textcircled{\#}}$, press and hold down $\text{\textcircled{\times}}$, and then while pressing both keys at the same time, switch on the machine.

You will see “Now Loading” on the touch-panel, and then you will see the results of the test.

The machine automatically starts the self-diagnostics and prints the diagnostic report after completing the test.

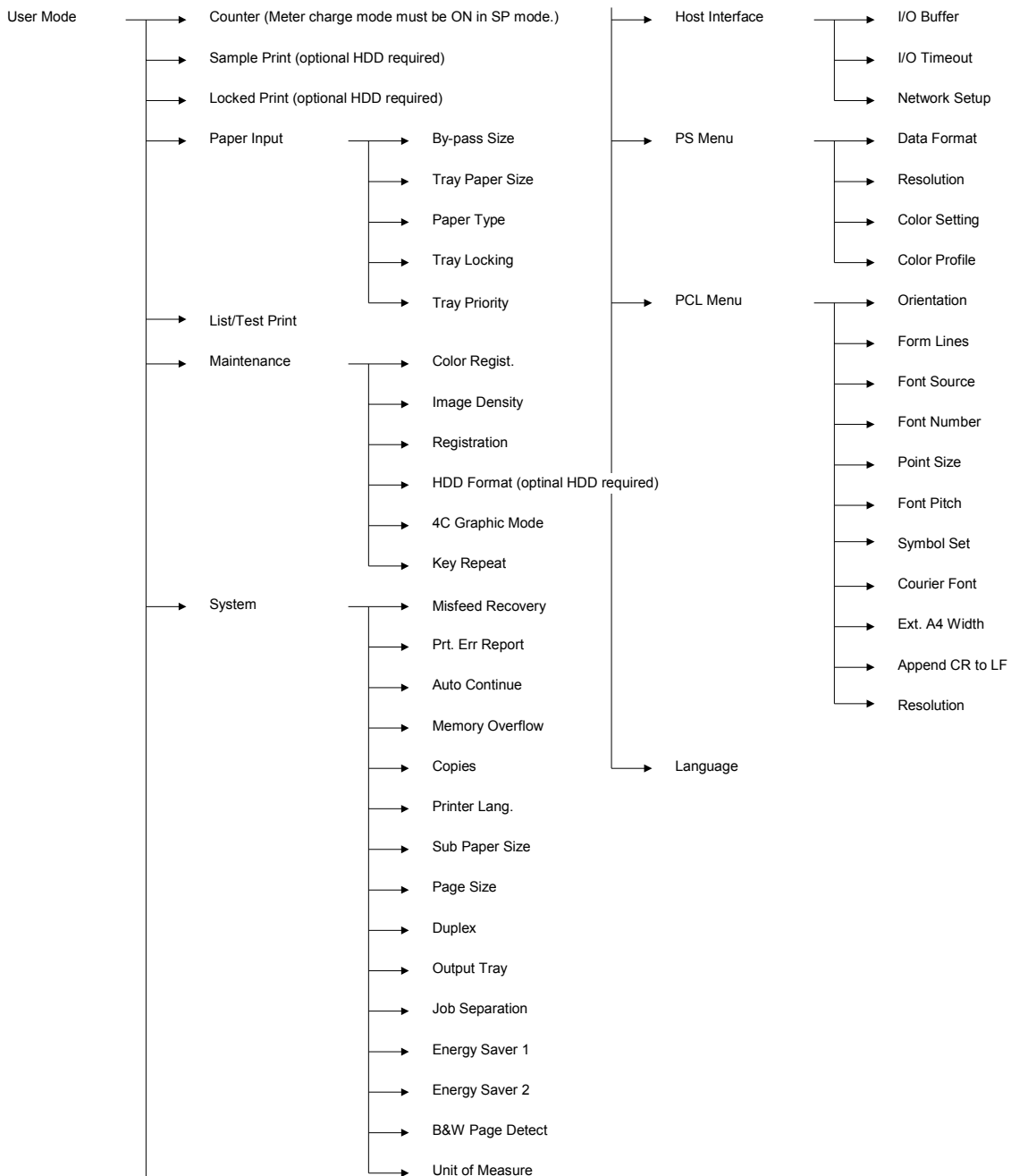
- Refer to the diagnostics report for the detected errors. The errors detected during self-diagnostics can be checked with SP7-832-001 (Diag. Result).
- Refer to section 4.2 for details about the error codes.

5.11 USER PROGRAM MODE

5.11.1 WITHOUT OPTIONAL CF EXPANDER

Press the “Menu” button and use the “Up/Down arrow” keys to scroll through the menu listing. To go back to a higher level, press the “Escape” key. After changing the settings, press the “On Line” key. The user menu list can be printed using “Menu List” in the “List/Test Print” user mode.

User Mode Tree




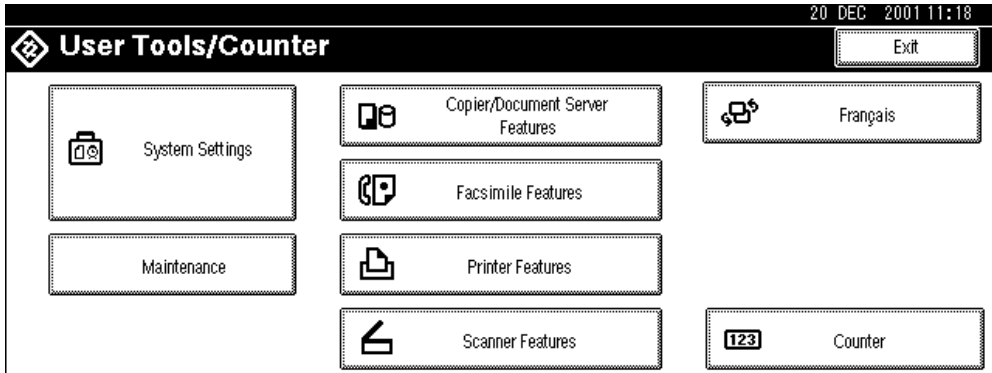
Service Tables

5.11.2 WITH OPTIONAL CF EXPANDER

The user program (UP) mode is accessed by users and operators, and by sales and service staff. UP mode is used to input the copier's default settings. The system/copier settings can be reset at any time by the user. (☛ 5.6)

UP Mode Initial Screen: User Tools/Counter Display

To enter the UP mode, press User Tools/Counter .

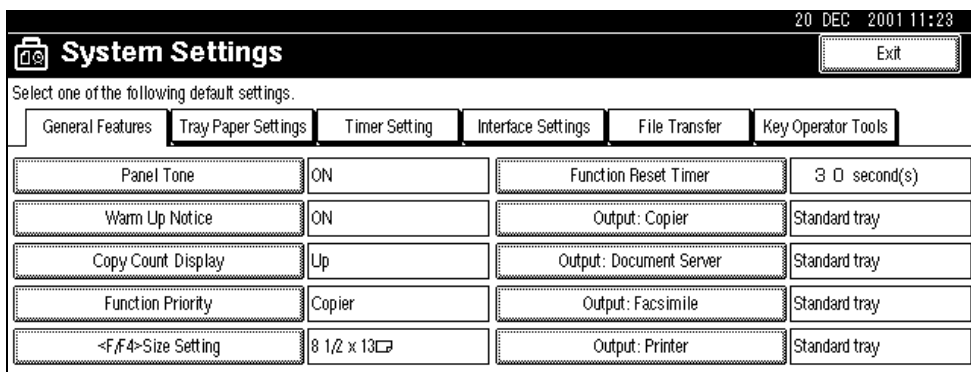


G080S503.WMF

System Settings

In the User Tools/Counter display, press System Settings.

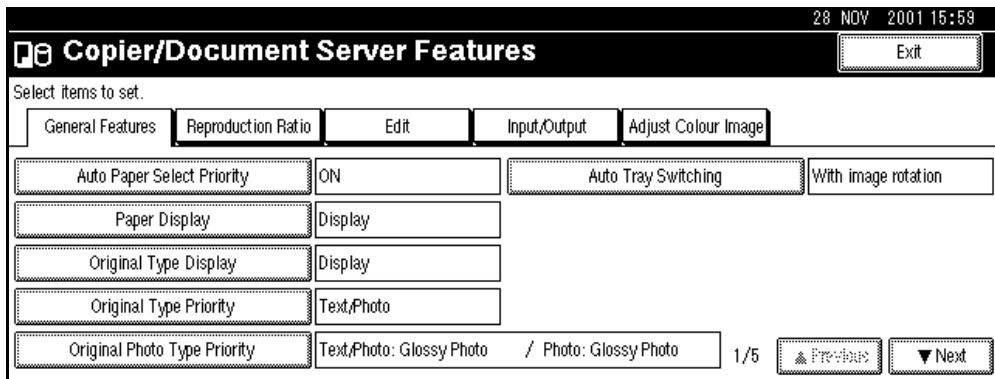
Click a tab to display the settings. If the Next button is lit in the lower right corner, press to display more options. Perform the settings, press Exit to return to the User Tools/Counter display, and then press exit to return to the copy window.



G080S504.WMF

Copier/Document Server Features

In the User/Tools Counter display, press Copy/Document Server Settings.

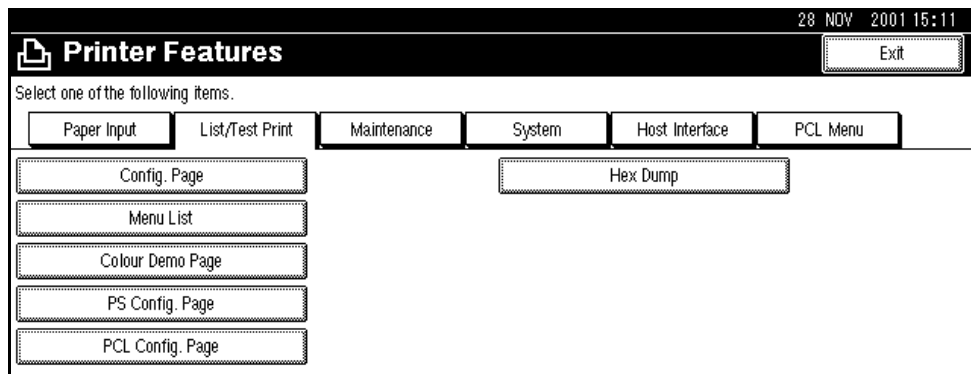


G080S505.WMF

Click a tab to display the settings. If the Next button is lit in the lower right corner, press to display more options. Perform the settings, press Exit to return to the User Tools/Counter display, and then press Exit to return to the copy window.

Printer, Facsimile, Scanner Settings

In the User/Tools Counter display, press Printer Settings, Facsimile, or Scanner Settings to open the appropriate screen and then click the tab to display more settings. The screen below shows the Printer Features screen.

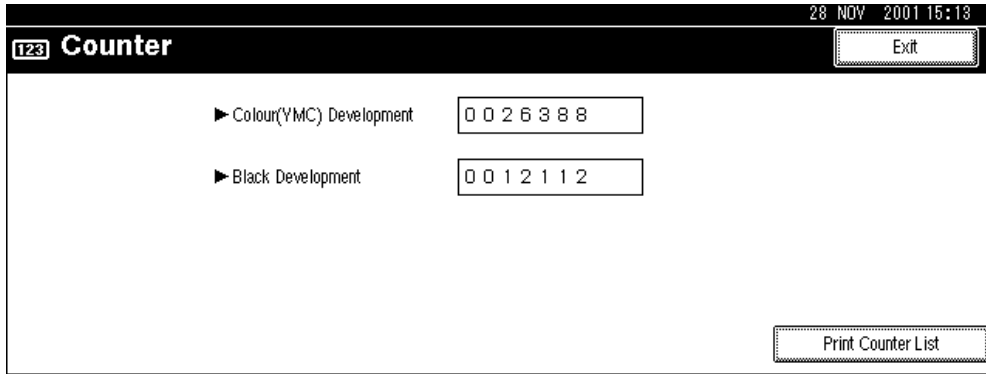


G080S506.WMF

Service Tables

Counter

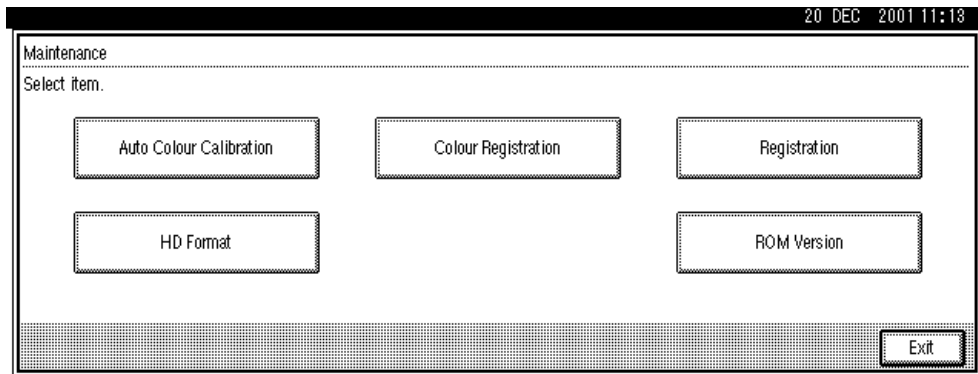
In the User/Tools Counter display, press Counter.



G080S507.WMF

Maintenance

In the User/Tools Counter display, press the Maintenance.



G080S508.WMF

5.12 DIP SWITCHES

Controller Board

DIP SW No.	OFF	ON
1	Boot-up from flash ROM	Boot-up from IC card
2 to 4	Factory Use Only: Keep these switches OFF.	

NOTE: If a download attempt failed, you must boot up the machine from the IC card. To do this, DIP SW 1 on the controller board needs to be ON.

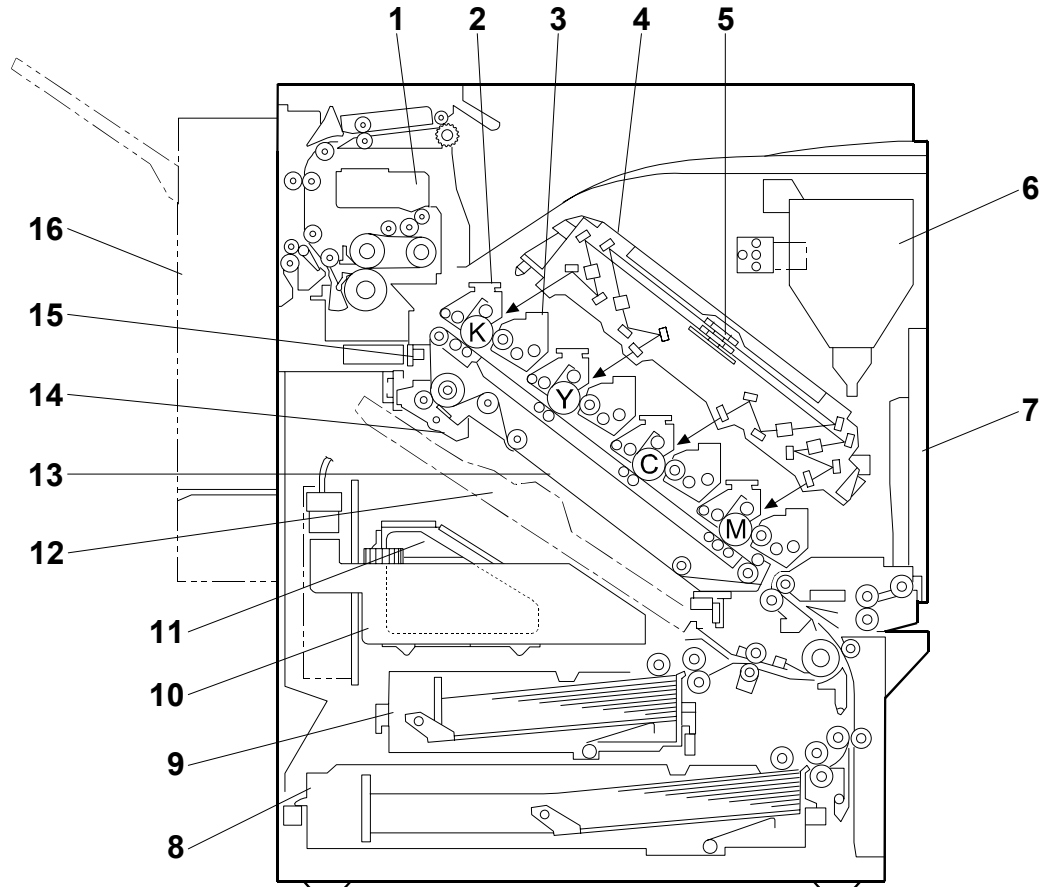
BCU Board

DIP SW No.	OFF	ON
1 to 3	Factory Use Only: Keep these switches OFF .	
4	Factory Use Only: Keep this switch ON .	

6. DETAILED SECTION DESCRIPTIONS

6.1 OVERVIEW

6.1.1 COMPONENT LAYOUT

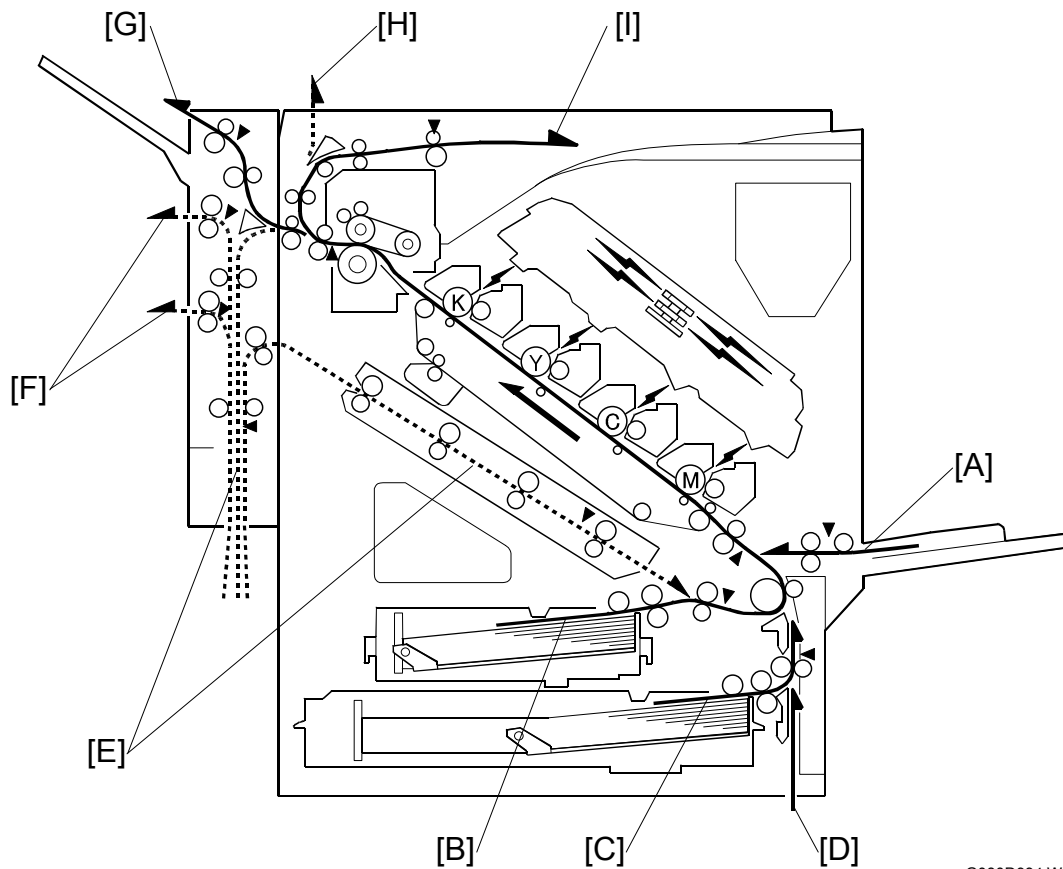


G080D933.WMF

Detailed
Descriptions

- | | |
|------------------------------|---------------------------------|
| 1. Fusing Unit | 9. Tray 1 |
| 2. PCU (one for each color) | 10. Waste Oil Bottle |
| 3. Development Unit | 11. Waste Toner Bottle |
| 4. Laser Optics Housing Unit | 12. Duplex Feed Unit |
| 5. Polygon Mirror Motor | 13. Transfer Unit |
| 6. Toner Cartridge | 14. Transfer Belt Cleaning Unit |
| 7. By-pass Feed Table | 15. ID Sensor |
| 8. Tray 2 | 16. Duplex Inverter Unit |

6.1.2 PAPER PATH



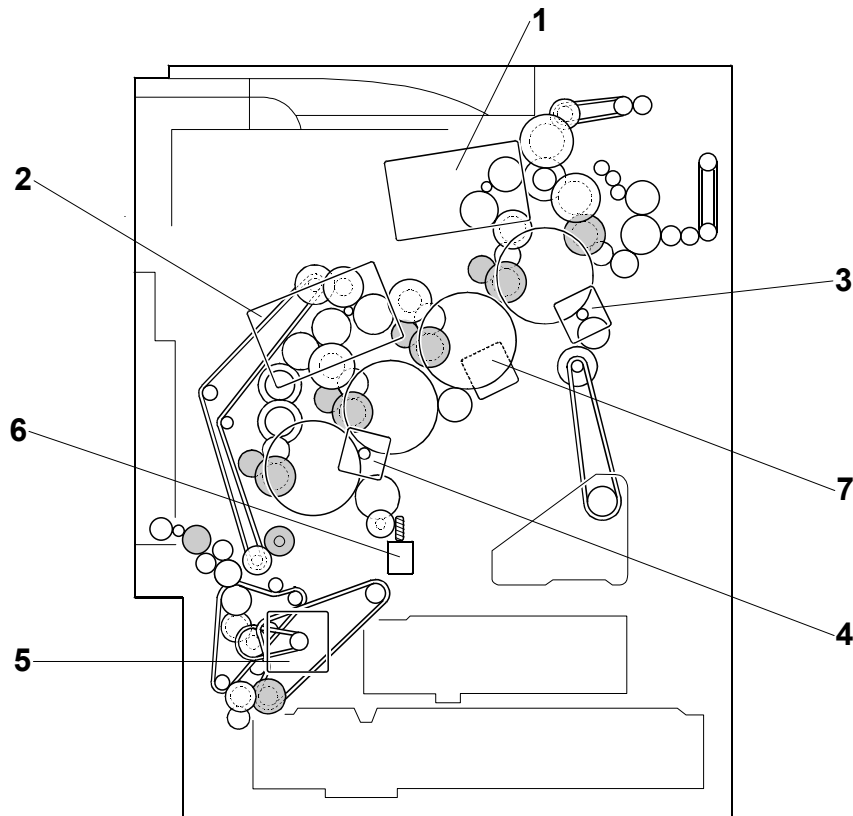
G080D934.WMF

- [A]: By-pass Feed Table
- [B]: Tray 1
- [C]: Tray 2
- [D]: Optional 1 Tray Paper Feed Unit, 2 Tray Paper Feed Unit, or LCT
- [E]: Optional Duplex Unit
- [F]: Optional Two-tray Finisher
- [G]: External Tray
- [H]: Optional Four-bin Mailbox
- [I]: Standard Tray (Internal Tray)

The two-tray finisher requires the duplex unit, and either the one-tray paper feed unit, two-tray paper feed unit, or LCT. It also requires the HDD or additional memory DIMM (total 128MB or more).

The duplex unit has two exits for the two-tray finisher. When the one-tray paper feed unit is installed, paper feeds out to the two-tray finisher from the upper exit. When the two-tray paper feed unit or LCT is installed, paper feeds out to the two-tray finisher from the lower exit.

6.1.3 DRIVE LAYOUT

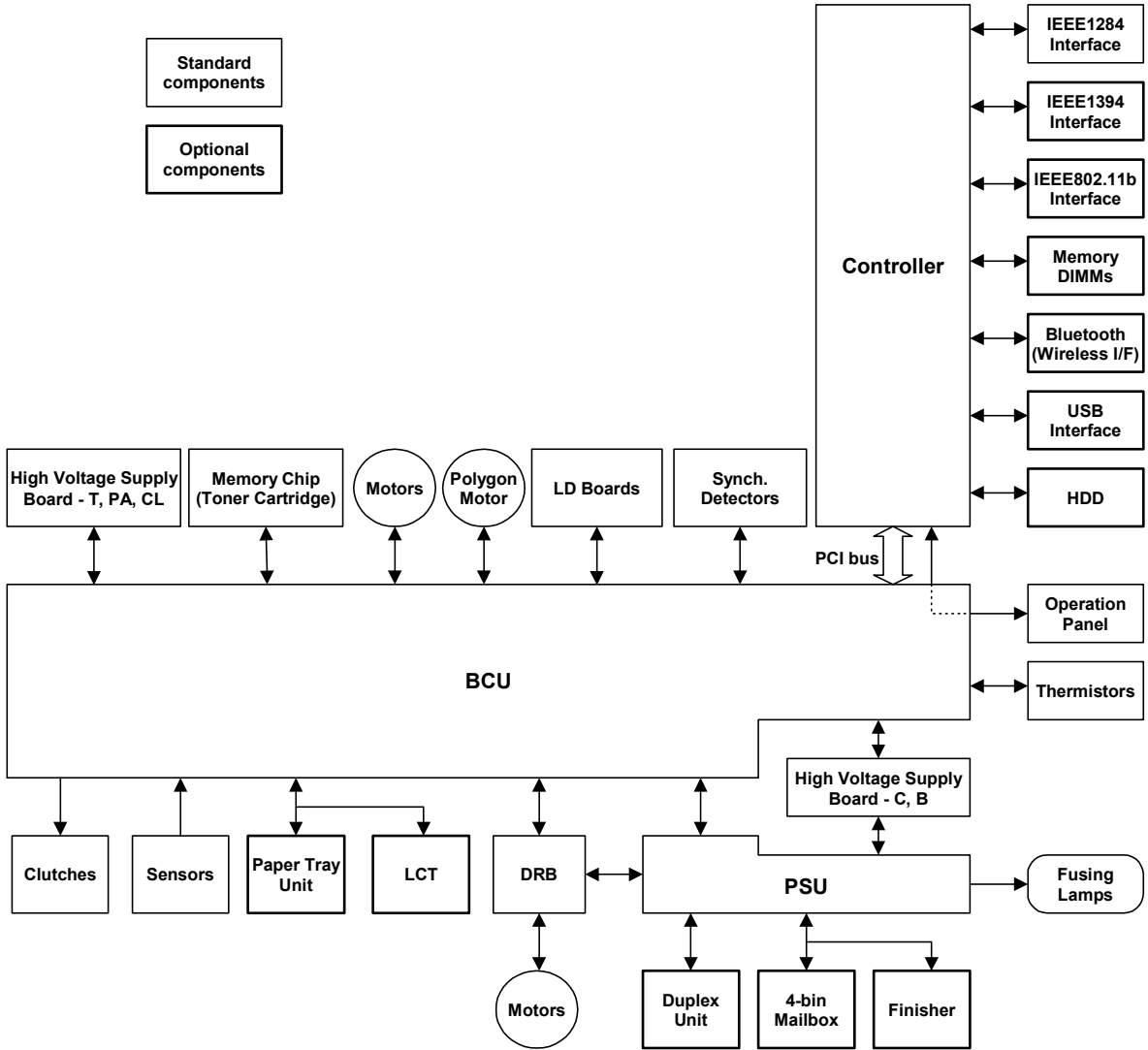


G080D935.WMF

1. **Development drive motor-K:**
This drives the development unit for black, the fusing unit, and the paper exit section.
2. **Development drive motor-CMY:**
This drives the color development units (magenta/cyan/yellow), the registration roller, and the waste toner collection coils from the PCUs.
3. **Drum drive motor-K:**
This drives the black PCU and the collection coil in the waste toner bottle.
4. **Drum drive motor-CMY:**
This drives the PCUs for magenta, cyan, and yellow.
5. **Paper feed motor:**
This drives the paper feed mechanisms (tray 1/tray 2/by-pass tray).
6. **Transfer belt contact motor:**
This moves the transfer belt into contact and away from the color PCUs.
7. **Transfer unit drive motor:**
This drives the transfer unit.

6.1.4 BOARD STRUCTURE

Overview



G080D901.WMF

The BCU controls all the mechanical components. The IEEE1394 interface board, IEEE802.11b interface board, Bluetooth (wireless LAN I/F) board, USB interface board, memory DIMM, and the HDD can be installed on the controller.

The controller connects to the BCU through a PCI bus.

Descriptions

BCU (Base Engine Control Unit):

The BCU has three CPUs (Main, MUSIC, and DSP). The CPUs control the following functions:

Main CPU

- Engine sequence
- Machine and printer engine operation
- Timing for peripherals
- High voltage supply, laser, and fusing
- Sensors, drive board, and solenoids
- Motors

MUSIC (Mirror Unit for Skew and Interval Correction) CPU

- TD sensor
- Line position adjustment
- Memory chip on the toner cartridge

DSP (Digital Signal Processor)

- Line position adjustment

Controller:

The controller handles the following functions:

- Printer-to-host interface
- Operation panel interface
- Network interface
- Interfacing and control of the optional USB, Bluetooth, IEEE1394, IEEE802.11b (wireless LAN), HDD, and DRAM DIMM

LD Drive Board:

This is the laser diode drive circuit board.

DRB:

The DRB (driver board) controls the paper feed motor, development motors (color/black), drum drive motors (color/black), transfer unit drive motor, and transfer voltage.

IEEE1394 Interface (Option):

This allows computers to connect to this printer using an IEEE1394 interface.

HDD Unit (Option):

The HDD unit stores the data for the following.

- Additional soft fonts
- Collation
- Locked print
- Sample print
- Downloading forms for form overlay

Memory DIMM (Standard: 64MB DRAM, Option: 64/128/256MB DRAM):

This is for additional printer processing memory, used for collation and for soft fonts.

Operation Panel Board:

Controls the display panel, the LED, and the keypad.

IEEE1284 Interface:

This is a parallel printer port.

USB:

Offers simple connectivity for computers, printers, keyboards, and other peripherals.

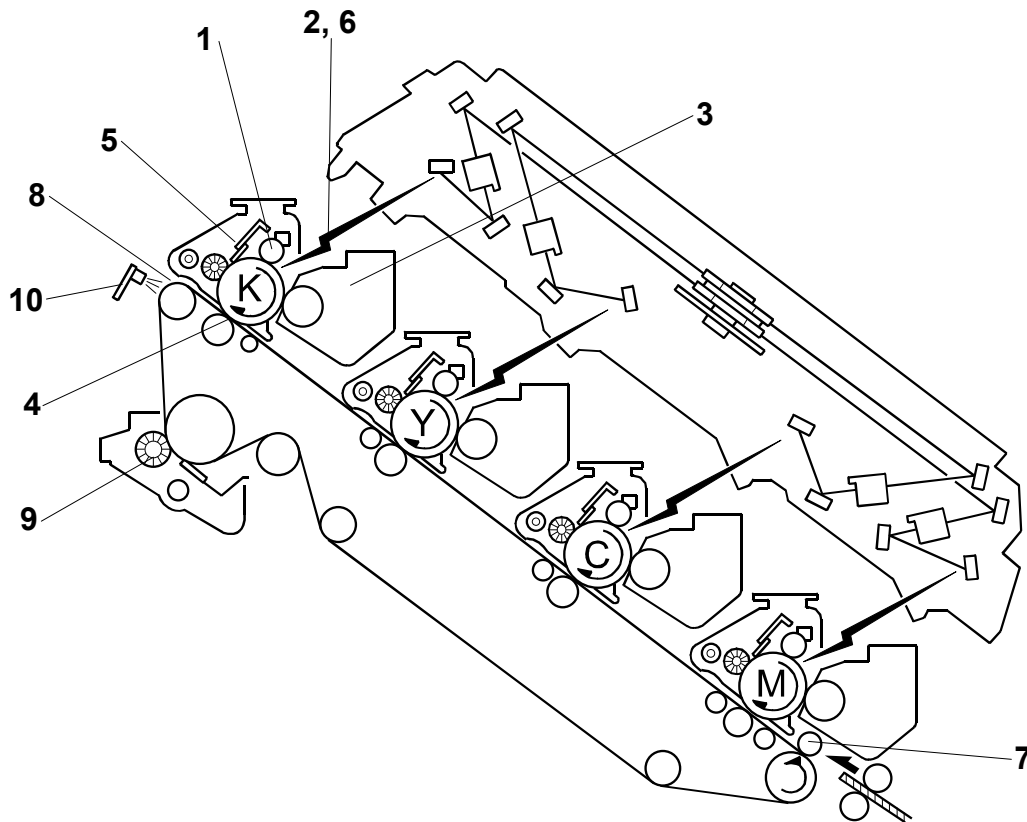
Bluetooth:

Provides radio links between mobile computers, mobile phones and other portable handheld devices.

IEEE802.11b (wireless LAN):

Uses radio frequency technology to transmit and receive data over the air and minimize the need for wired connections.

6.1.5 PRINTING PROCESS



G080D936.WMF

This machine uses four PCUs, four development units, and four laser beams for color printing. Each PCU consists of a drum, charge roller, cleaning brush, and blade. From the left, the PCU stations are black, yellow, cyan, and magenta.

A transfer belt feeds paper past the PCUs, and the toner image on each drum is transferred to the paper.

The paper path is inclined about 38 degrees to make the machine as compact as possible.

Drum charge:

The charge roller gives the drum a negative charge

Laser exposure:

The laser beam from the laser diode (LD) goes through the lens and mirrors and reaches the drum. The machine creates a latent image on the drum by turning the laser beam on and off.

Development:

The development roller carries negatively charged toner to the latent image on the drum surface. This machine uses four independent development units (one for each color).

Image transfer:

The charge applied to the transfer roller attracts the toner from the drum to the paper. Four toner images are super-imposed onto the paper.

Cleaning for OPC drum:

The cleaning brush and blade remove any toner remaining on the drum surface after image transfer to the paper.

Quenching for OPC drum:

Quenching is done by illuminating the whole area of the drum with the laser at the end of every job.

Paper attraction:

Paper is attracted to the transfer belt by the charge applied to the paper attraction roller.

Separation:

Paper separates from the transfer belt when the belt curves away from it.

Cleaning and quenching for transfer belt:

The cleaning brush and blade clean the belt surface. The grounding roller inside the transfer belt unit removes the remaining charge on the belt.

ID sensor:

The ID sensor board contains three ID sensors (one at the front, center, and rear). The ID sensor detects the density of the ID sensor pattern on the transfer belt. The ID sensor output is used for process control and for automatic line position, skew, and color registration adjustments for the latent image.

6.2 PROCESS CONTROL

6.2.1 OVERVIEW

This machine provides the following two forms of process control:

- Potential control
- Toner supply control

The process control facilities of this machine have the following features:

- Three ID (image density) sensors (front, center, and rear). Only the center ID sensor is used for process control. The front, center, and rear ID sensors are used for line positioning and other adjustments.
- TD (toner density) sensor.

6.2.2 POTENTIAL CONTROL

Overview

Potential control controls development to maintain the density of the toner images on the drums. It does this by compensating for variations in drum chargeability and toner density.

The machine uses the ID sensor to measure the reflectivity of the transfer belt and the density of a standard sensor pattern. This is done during the process control self check.

The machine determines the following depending on the ID sensor output and a reference table in memory.

- VD: Drum potential without exposure – to adjust this, the machine adjusts the charge roller voltage.
- VB: Development bias
- VL: Drum potential at the strongest exposure – to adjust this, the machine adjusts the laser power.

(In addition, VREF is corrected. This is used for toner supply control.)

This process controls the development potential so that the maximum amount of toner applied to the drum is constant. However, to control the development potential to improve reproduction of highlight parts of images, the laser power control method can be changed. This depends on the setting of SP3-125-2. The default setting is 1 (normal control method). To change to the highlight range control method, set this SP to 2.

If SP3-125-1 is set to 0 (Off), the machine does not do the potential control, but uses the development bias adjusted with SP2-201-1 to -9, the charge roller voltage adjusted with SP2-001-1 to -9, and the laser power selected with SP2-103-1 to -27. However, these SPs should normally not be adjusted in the field.

Process Control Self Check

This machine carries out potential control using a procedure called the process control self check. There are seven types of process control self check, categorized according to their execution timing.

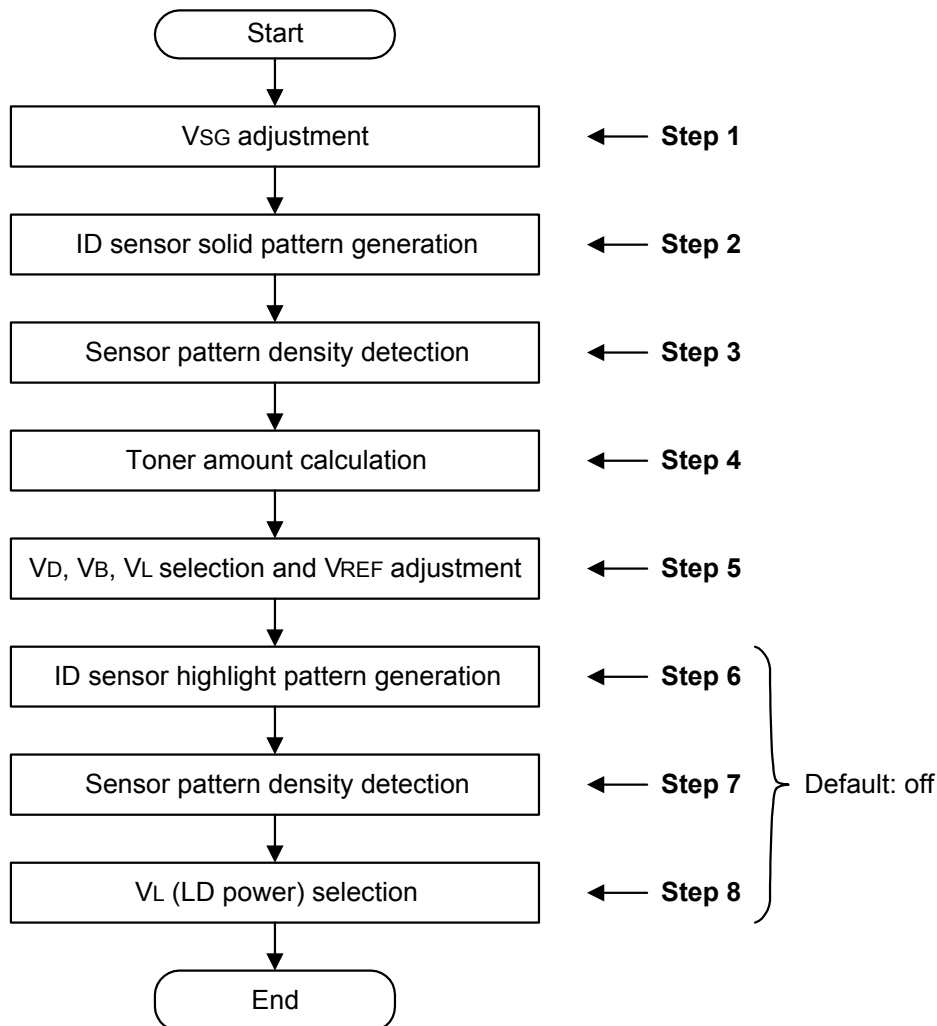
1. Forced
This is done when SP3-126-1 is used.
2. Initial
This starts automatically when the power is turned on or when recovering from energy saver mode, but only if the fusing unit pressure roller temperature is 60°C or less.
3. Interval: Job End
This starts automatically at the end of a print job when the total print counter for this feature exceeds 200 (this can be changed with SP3-906-1). After any process control is done (except for forced process control), the counters are reset to "0."
4. Interval: Interrupt (default: not done)
This interrupts printing and then starts automatically when the machine makes a certain number (A) of continuous color prints in the same job and the main scan length detection is executed. After it is completed, the machine continues to make prints.

The value A can be adjusted with SP3-906-2 (default: off).

At this time, only VREF is corrected. Potential control (VD, VB, VL correction) is not done.
5. Non-use Time (default: not done)
This starts before the next print job if the machine has no job for a certain time (M) after it makes more than a certain number (N) of prints.

M is adjusted with SP3-906-4 and N is adjusted with SP3-906-3.
6. After Toner End Recovery
This starts after recovery from a toner end condition.
7. After Developer Initialization
This starts after a developer initialization is done. Developer initialization occurs automatically after a new development unit has been installed.

6.2.3 PROCESS CONTROL SELF CHECK PROCEDURE



G080D937.WMF

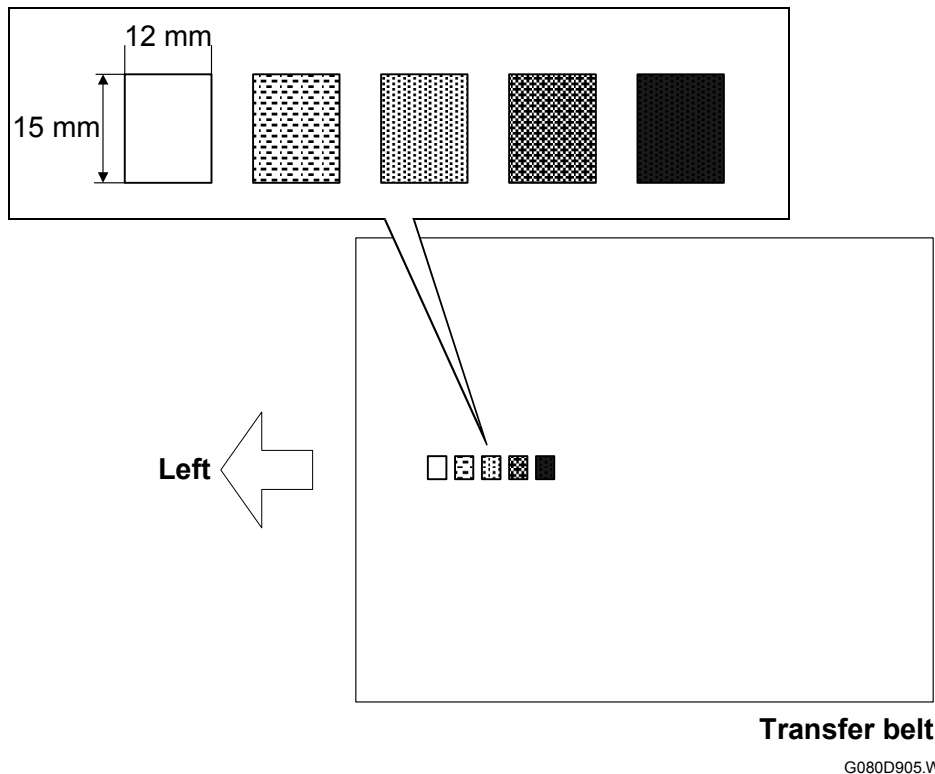
 Detailed
Descriptions

Step 1: VSG Adjustment

This machine uses three ID sensors (direct reflection type). They are located at the front, center, and rear of the transfer unit. Only the center ID sensor is used for process control. The ID sensor checks the bare transfer belt's reflectivity and the machine calibrates the ID sensor until its output (known as VSG) is as follows.

- $VSG = 4.0 \pm 0.5$ Volts

This calibration compensates for the transfer belt's condition and the ID sensor condition, such as dirt on the surface of the belt or ID sensor.

Step 2: ID Sensor Solid Pattern Generation

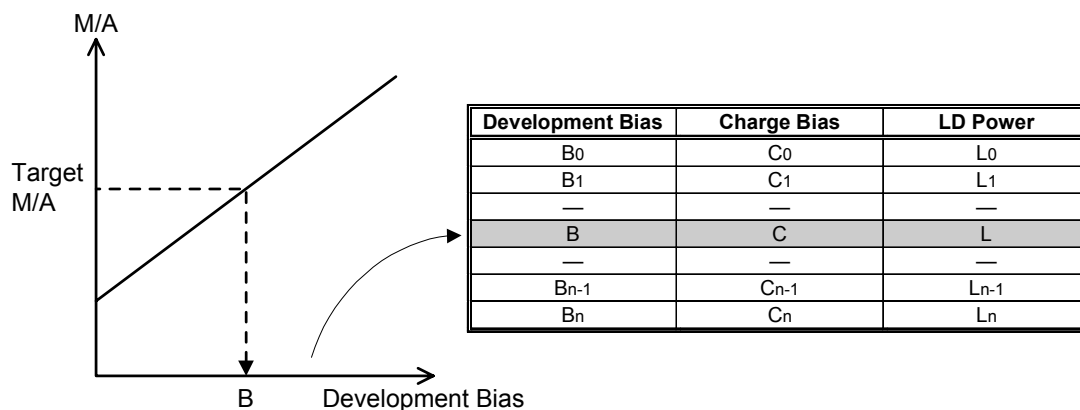
The machine agitates the developer for between 15 and 60 seconds until the fluctuation in TD sensor output becomes less than 0.3V, and then makes a 5-grade pattern on the transfer belt for each toner color. The pattern consists of 5 squares (the sequence is as follows: 5 black squares, 5 yellow squares, 5 cyan squares, and 5 magenta squares). Each of the squares is 12 mm x 15 mm, and is a solid-color square. They are made by changing the development bias and charge roller voltage. The difference between development bias and charge roller voltage is always the same.

Step 3: Sensor Pattern Detection

The ID sensor detects the densities of the 5 solid-color squares for each color. This data goes to memory.

Step 4: Toner Amount Calculation

The amount of toner on the transfer belt (M/A, mass per unit area, mg/cm^2) is calculated for each of the 5 grades of the sensor pattern from the ID sensor output value from each grade of the pattern.

Step 5: VD, VB, VL Selection and VREF Adjustment

G080D938.WMF

The machine determines the relationship between the amount of toner on the transfer belt and the development bias for each of the 5 grades. The machine now selects the development bias and charge roller voltages for the target M/A for each color by referring to a table in memory.

The way that the laser power (VL) is selected depends on the setting of SP3-125-2.

- If it is set to 0, the LD power is fixed at the value of SP2-103-1, to -27.
- If it is set to 1, LD power is selected using the same memory table as mentioned above.
- If it is set to 2, LD power is determined by ID sensor highlight pattern generation (steps 6 to 8 later in this procedure).

The machine also adjusts VREF (toner density target) at the same time so that the development gamma detected by process control will be the value stored in SP3-120-1 to -4 (do not adjust in the field unless advised to do so).

After that, the transfer belt cleaning unit cleans the transfer belt.

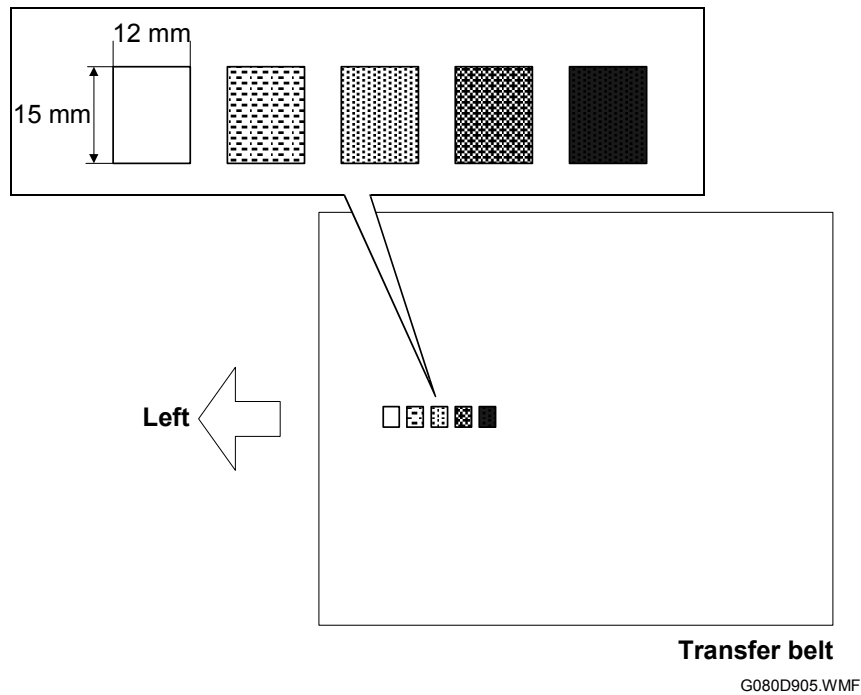
Allowable changes to VD, VB, and VL as a result of process control:

This depends on the process control type as follows.

- Forced : No limit
- Initial, After Developer Initialization: ± 80 volts
- Interval (Job End/ Non-use Time/ During Toner End Recovery): ± 40 volts
- Interval (Interrupt): Constant (The memory table is not used.)

Steps 6 to 8 are carried out only if SP3-125-2 is set to 2. (Default: Steps 6 to 8 are not used)

Step 6: ID Sensor Highlight Pattern Generation



The machine makes a 5-grade pattern on the transfer belt for each toner color. The pattern consists of 5 squares. Each of the squares is 12 mm x 15 mm, and is a dot-pattern squares (not solid-color squares like in the process of step 2). They are made using constant bias and charge roller voltages selected from one of the types mentioned above, and the various grades are made sby changing the LD power.

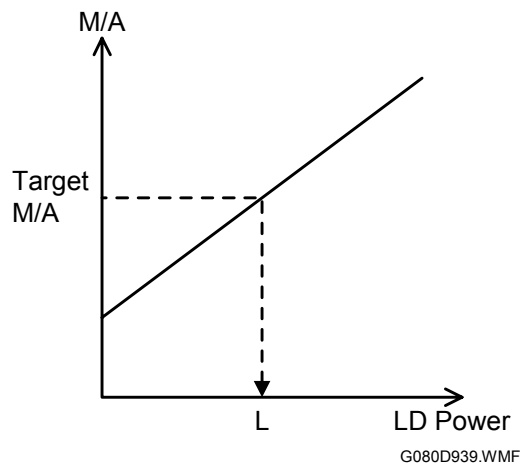
Step 7: Sensor Pattern Density Detection

The ID sensor detects the densities of the 5 dot-pattern squares for each color. This data goes to memory.

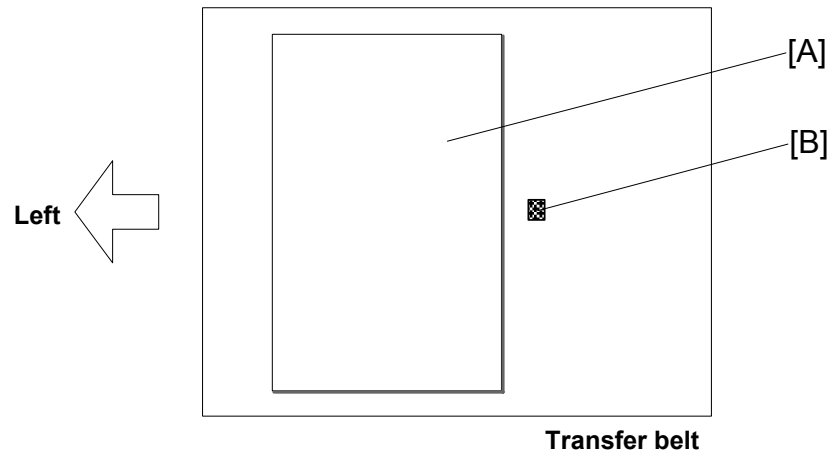
Step 8: VL (LD Power) Selection

The machine determines the relationship between the amount of toner on the transfer belt and the laser power for each of the 5 grades. The machine now selects the laser power to get the target M/A.

After that, the transfer belt cleaning unit cleans the transfer belt.



6.2.4 VREF COMPENSATION DURING A PRINT JOB



G080D986.WMF

Highlight Pattern

The M/A target (mass-per-area target) is the target toner amount in a given area. To adjust the toner amount, a highlight pattern [B] is created on the transfer belt at the following times during each print job.

Job	Interval	Color of highlight pattern
Black-and-white printing	After every four pages	Black
Color printing	After every one page	One of four colors

For color jobs, the order of pattern generation is $K \rightarrow Y \rightarrow M \rightarrow C \rightarrow K \rightarrow Y \rightarrow M \rightarrow C \dots$. The highlight pattern is created about 2 cm after the trailing edge of the paper [A].

Adjustment Process

The machine generates a highlight pattern (just one grade) of a specified density. The center ID sensor checks the density and the machine adjusts V_{REF} by comparing the reading with the target of each color (SP3-905-1 to 4).

6.2.5 TONER SUPPLY CONTROL

Overview

Toner supply control uses the following to determine the amount of toner to be supplied. This is done before every development for each color.

- Density of the toner in the developer (as detected by the TD sensor) - VREF, VT
- Pixel count

The image density is kept constant by adjusting the density of toner in the development unit, while accommodating to changes in the development conditions through the potential control mechanism. Environmental changes and the number of prints made are also used in the calculation.

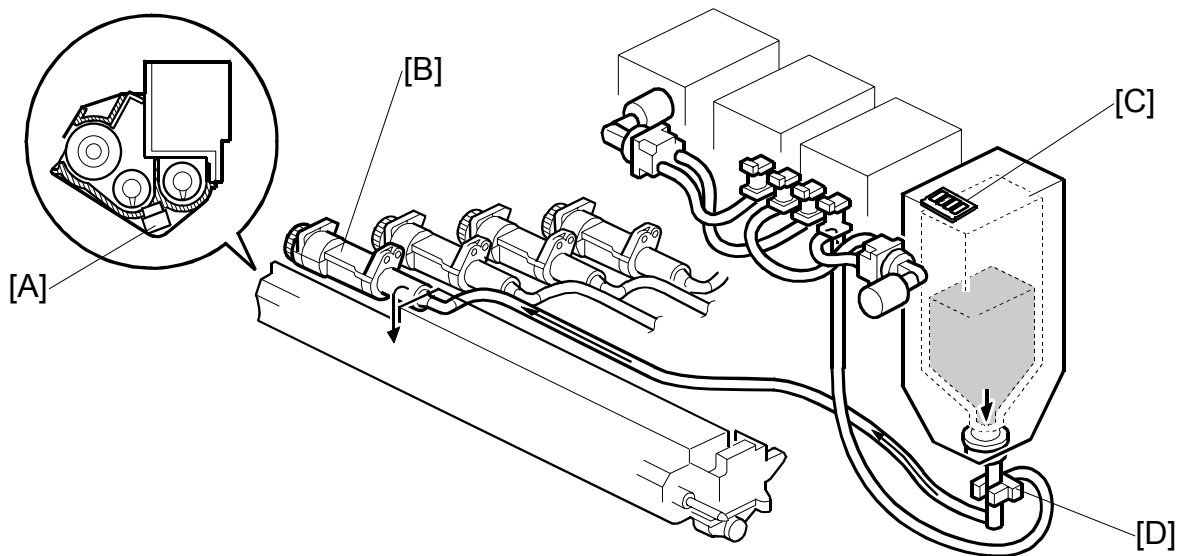
The amount of toner supplied is determined by the “on” time of the toner supply clutch. The total “on” time for each toner supply clutch is stored in the memory chip for the relevant toner cartridge. The amount of toner supplied also depends on the process line speed for the current job. The machine supplies the calculated amount of toner for each color.

Toner Supply Control Modes

This machine has three toner supply control modes. They are selected with SP2-208-1 to -4.

1. Fuzzy control mode
This is the default toner supply control mode. The TD sensor, ID sensor, and pixel count are used in this mode.
2. Proportional control mode
This mode is used when the ID sensor at the center becomes faulty. Only the TD sensor is used to control toner supply. The machine uses the VREF that is stored in SP2-224-5 to -8.
3. Fixed supply mode
This mode is used when the TD sensor becomes faulty. The amount of toner supply can be adjusted with SP2-208-5 to -8 if the image density is incorrect (the default setting is 5%).

6.2.6 TONER NEAR END/TONER END DETECTION



G080D913.WMF

Introduction

Toner Near End

To determine the toner near end status, the controller considers the following information:

- TD sensor [A] in the development unit
- Operation time counter of the toner attraction pump [B]
- Memory chip [C] on the toner cartridge
- Toner end sensor [D]

There are two different toner near-end detection procedures (after here, referred to as “Toner Near End Detection 1” and “Toner Near End Detection 2”). If either of these detect near end, the machine enters the near-end condition.

Toner End

To determine the toner end status, the controller considers the following information:

- TD sensor [A] in the development unit
- Pixel counter

Toner Near End Detection 1

The controller considers the information from the TD sensor.

- 1) The controller checks that the following condition is satisfied ten times consecutively:

$$V_{REF} + 0.4 V < V_T$$

NOTE: The condition can be adjusted with SP2-212.

- 2) If the above condition is satisfied, toner is supplied to the development unit. The message, "Loading Toner...", is displayed.

Loading Toner...

G080D914.WMF

- 3) The controller checks the above condition again.

- a) If the condition is satisfied, the controller decides that the machine is in the toner near end status. The message, "Toner is Almost Empty Xxxxx", is displayed; where "Xxxxx" indicates the color, such as cyan.

Toner is Almost
Empty: Cyan

G080D915.WMF

- b) If the condition is not satisfied, the controller decides that the machine is not in the toner near end status. The machine resumes its normal operation.

Toner Near End Detection 2

The controller considers the information from the operation time counter of the toner attraction pump, the memory chip on the toner bottle, and the toner end sensor.

- 1) To calculate the toner amount remaining in the toner cartridge, the controller considers the operation time counter of the toner attraction pump and the initial amount of the toner (recorded in the memory chip).
- 2) If the amount reaches the predefined weight (default: 100 g), the controller checks the signals from the toner end sensor.

NOTE: The weight can be adjusted with SP2-212-1 and -2.

- a) If the signals indicate the toner amount has fallen to a certain level (determined by SP 2-212-12 to -15), the controller decides that the machine is in the toner near end status. The message, "Toner is Almost Empty "Xxxxx", is displayed; where "Xxxxx" indicates the color, such as cyan.

Toner is Almost
Empty: Cyan

G080D915.WMF

- b) If the signals indicate the toner amount is not less than a certain level, the controller decides that the machine is not in the toner near end status. The machine resumes its normal operation.

Toner End Detection

The machine flags the toner end status when one of the conditions below is detected for a toner color. The message, "Add Toner Xxxxx", is displayed; where "Xxxxx" indicates the color, such as cyan.

Add Toner Cyan

G080D916.WMF

- $V_{REF} + 0.5 V < V_T$ (ten times consecutively)
- The pixel counter counts up the equivalent of 5 A4 sheets of pixels (100% coverage) since near-end was detected.

However, if fewer pages have been made since near-end than the number guaranteed with SP 2-212-11 (default: 10 pages), printing will continue.

NOTE: If one of the following conditions is detected 10 consecutive times, the machine flags a "toner end condition" regardless of the number of pages printed since near-end.

- $V_{REF} + 1.2 V < V_T$
- $V_T > 4.8 V$

After the machine detects toner end for black, it cannot print until the toner cartridge is replaced. If cyan, magenta, or yellow are in a toner end condition during standby mode, the machine can print with black and white only; color printing is disabled.

NOTE: If the yellow, cyan, or magenta toner ends during a color printing job, the job is suspended until toner is supplied. If new color toner is not installed, the user can print black-and-white jobs but not color jobs.

Toner End Recovery

The machine assumes that the toner cartridge has been replaced if either of the following occurs when the near-end or end status exists:

- The upper right cover is opened and closed.
- The main switch is turned off and on.

The machine then starts to supply toner to the development unit. After supplying toner, the machine clears the toner near-end or end status if the following conditions are detected.

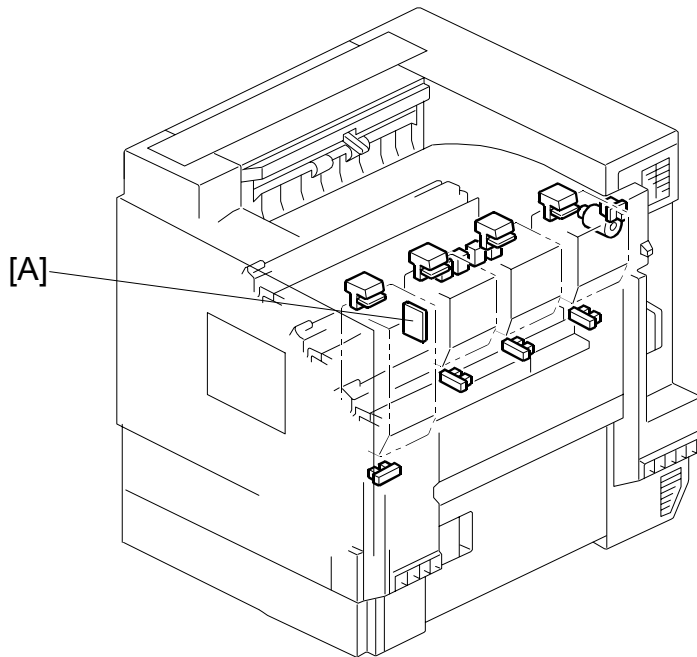
- $V_t [0] - V_t [3] > 0.5V$
- $V_t - V_{ref} > 0.3V$

6.2.7 DEVELOPER INITIALIZATION

When the machine detects that a new development unit has been installed, it initializes the developer.

To do this, the machine agitates the developer for about 100 seconds, and adjusts VCNT (control voltage for TD sensor) so that VT (TD sensor output) becomes 3.5 ± 0.1 volts. The machine stores this VT as VREF.

VCNT is corrected for the current humidity every print job. VCNT is also corrected for the total number of prints, to prevent the developer Q/M from varying.



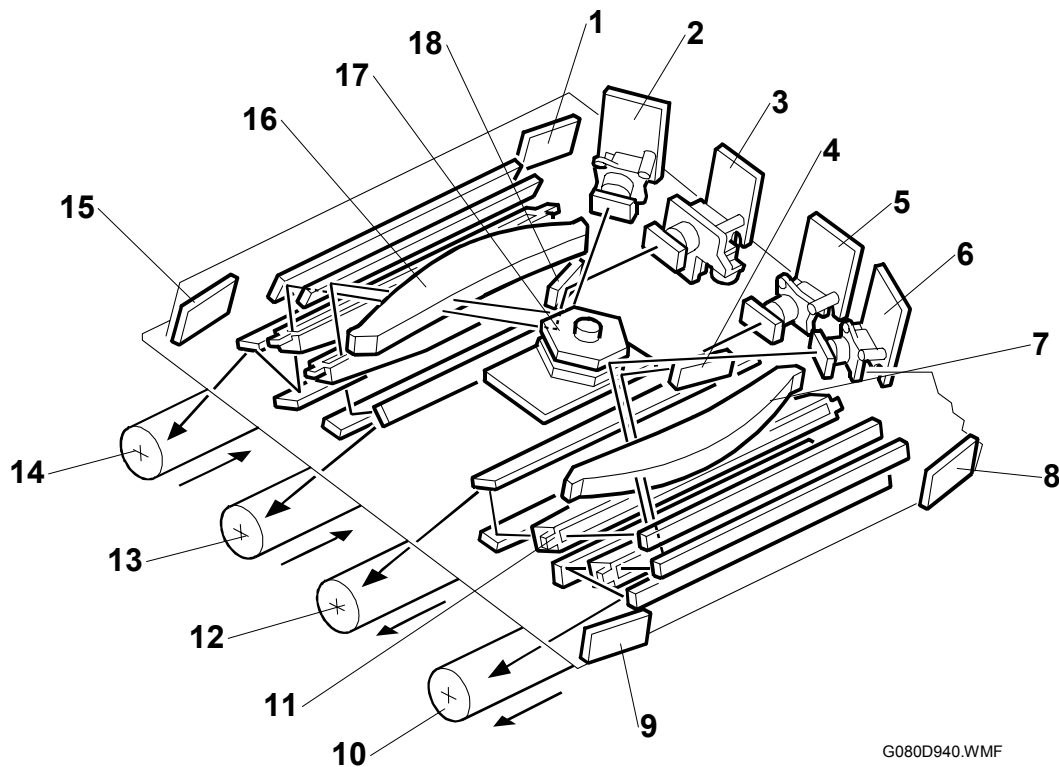
G080D922.WMF

If the humidity correction is giving poor results (for example, if the humidity sensor [A] is broken), it can be disabled with SP2-223-2. Then a value for VCNT must be input manually using SP2-224-1 to -4 (adjust by trial and error).

During developer initialization, the machine forcibly supplies toner because there is no toner inside the toner transport tube at installation. Then the machine does the process control self check.

6.3 LASER EXPOSURE

6.3.1 OVERVIEW



G080D940.WMF

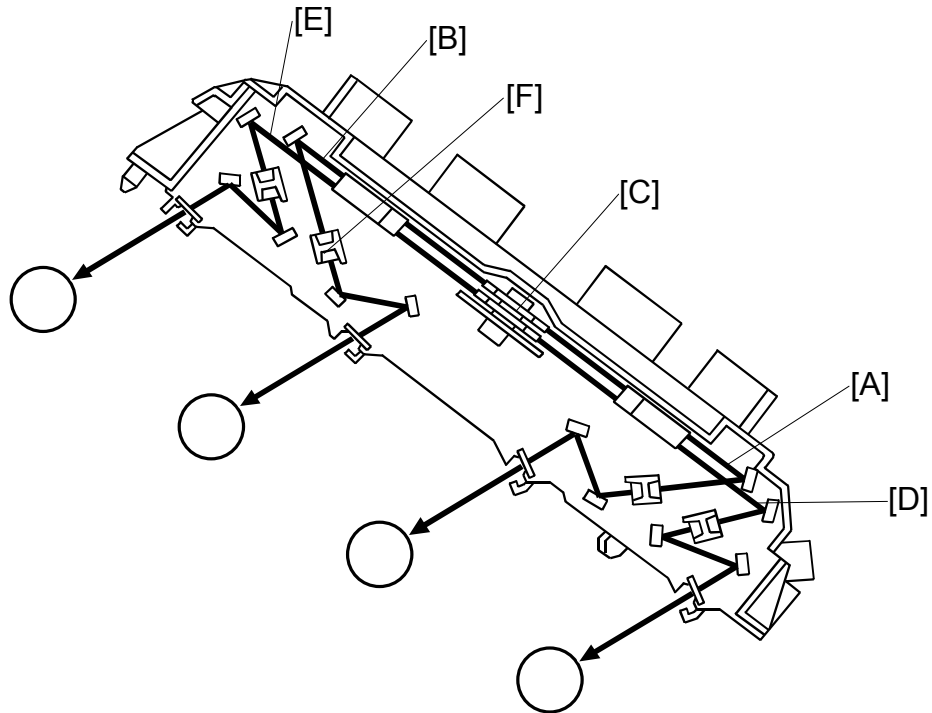
- | | |
|--|---|
| 1. Synchronizing detector board-Y, K-E | 10. OPC drum-M |
| 2. LD unit-Y | 11. WTL |
| 3. LD unit-K | 12. OPC drum-C |
| 4. LD Mirror-M | 13. OPC drum-Y |
| 5. LD unit-M | 14. OPC drum-K |
| 6. LD unit-C | 15. Synchronizing detector board-Y, K-S |
| 7. F-theta lens-M, C | 16. F-theta lens-Y, K |
| 8. Synchronizing detector board-M, C-S | 17. Polygon mirror motor |
| 9. Synchronizing detector board-M, C-E | 18. LD Mirror-K |

This machine uses four LD units and one polygon mirror motor to produce latent images on four OPC drums (one drum for each color toner).

There are two hexagonal mirrors. Each mirror reflects beams from two LD units. The LD unit for black has two laser diodes to do dual beam writing (this is only done for black-and-white printing; for full color printing, only one of the beams is used).

Laser exposure for magenta and cyan starts from the rear side of the drum, but for yellow and black it starts from the front side of the drum. This is because the units for magenta and cyan are on the other side of the polygon mirror from the units for yellow and black.

6.3.2 OPTICAL PATH



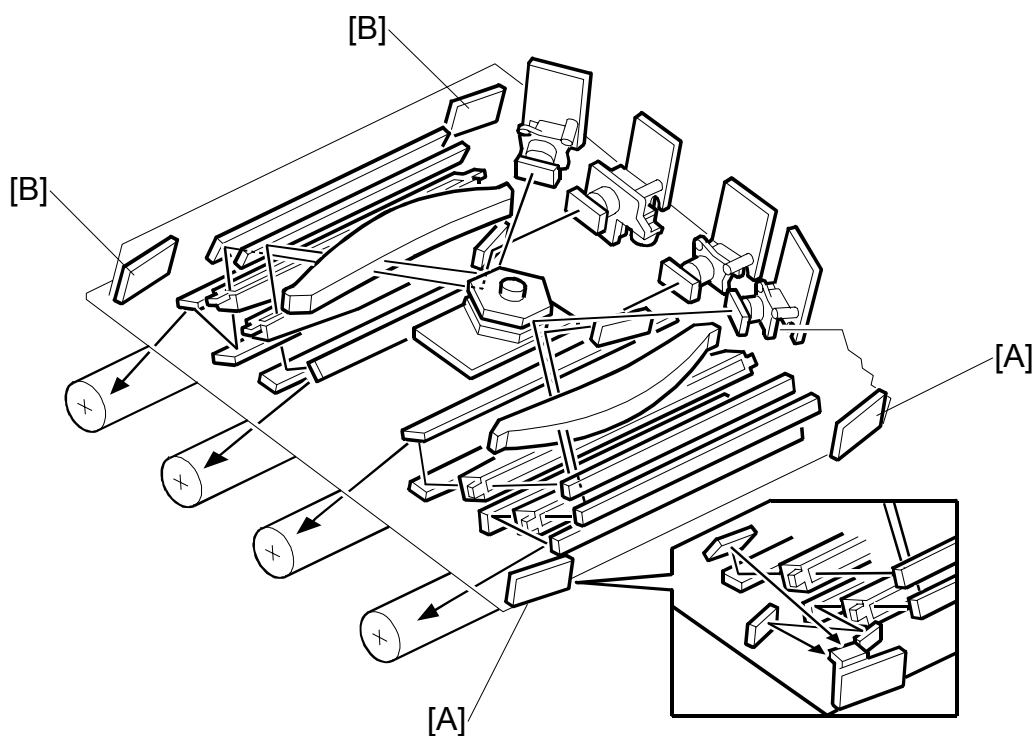
The laser beams for cyan [A] and yellow [B] are directed to the upper part of the polygon mirror [C], and those for magenta [D] and black [E] are directed to the lower part of the polygon mirror. The LD mirrors (see the previous page) deflect the laser beams for magenta and black towards the lower polygon mirror.

The WTL [F] corrects the main scan line; without this component, the line bends out towards the middle of the main scan. The central bend of the WTL is adjusted in the factory.

The speed of the polygon mirror depends on the selected mode (see below).

Mode	Resolution (dpi)	Polygon motor speed (rpm)	Process line speed (mm/s)	Print speed (ppm)	Remarks
B/W (except OHP/Thick paper)	600 x 600	21,850	185	38	Dual beam writing
	1,200 x 600				
Color (except OHP/Thick paper)	600 x 600	29,528	125	28	
	1,200 x 1,200				
OHP/Thick	600 x 600 1,200 x 600 1,200 x 1,200	29,528	62.5	10	

6.3.3 LASER SYNCHRONIZING DETECTOR



G080D942.WMF

Overview

The machine has four laser synchronizing detector boards (LSD), one at each corner of the laser optics housing unit.

Each pair of boards detects two colors. The machine recognizes each color from the time that they are detected. The two LSDs at the right [A] are used for magenta and cyan, and the two [B] at the left are used for yellow and black.

Detailed Descriptions

Main Scan Start Detection

For magenta and cyan, the LSD at the rear detects the start of the main scan. For yellow and black, the LSD at the front detects the start of the main scan.

Clock Frequency Adjustment

Each pair ensures that the number of laser clock pulses in the main scan is constant. If the count for one particular beam varies from normal, the LD clock frequency for that beam is adjusted.

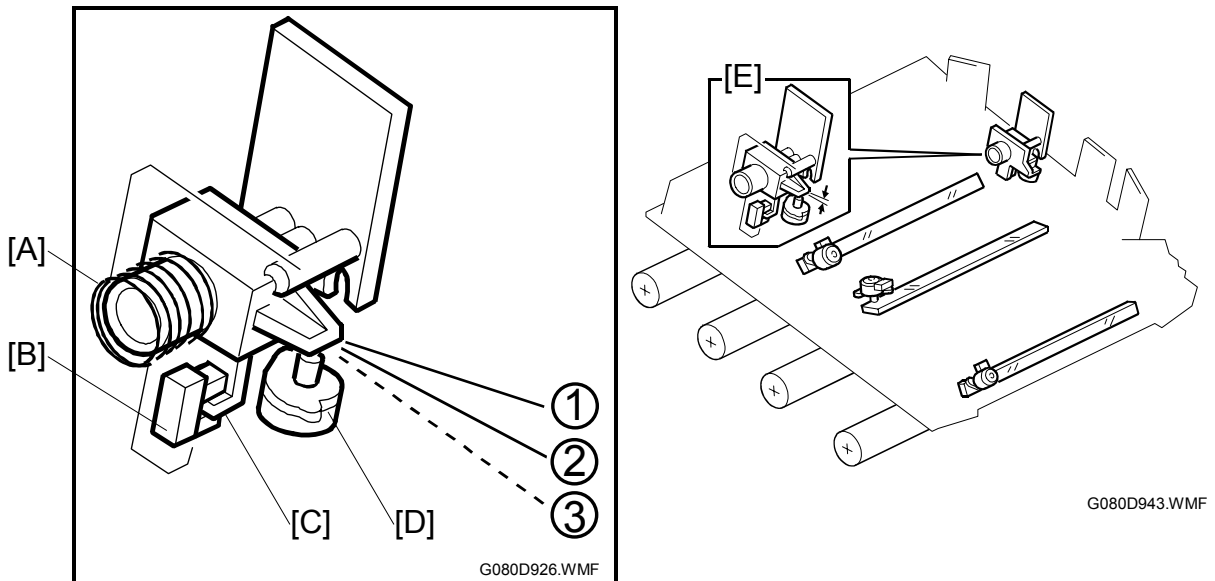
If the board at the end position is defective, this cannot be detected. In such case, you must disable the detection feature with SP2-919-1.

6.3.4 DUAL BEAM WRITING

Dual Beam Mechanism

The LD unit for black has two laser diodes. Each face of the polygon mirror writes two main scan lines. This only happens for black and white printing.

Laser Beam Pitch Change Mechanism



There is a spring [A] at the front end of the black LD unit [E], and there is a positioning motor [D] at the right end. The spring pushes the unit clockwise, while the motor pushes it counterclockwise. These two components drive the unit to one of the following three positions:

- 600-dpi position [①]
- 1,200-dpi position [②]
- Home position [③]

Before it is driven to the 600-dpi position or the 1,200-dpi position, the black LD unit is set to its home position. When driven from one position to another, the unit goes as follows:

- 600-dpi position → Home position → 1,200-dpi position
- 1,200-dpi position → Home position → 600-dpi position

The home position is detected by the home position sensor [B]. When the unit is in its home position, the actuator [C] is out of the sensor. The 600-dpi and 1,200-dpi positions are determined by the distance from the home position. The distance is calculated from the operation time of the LD positioning motor.

Printing Mode and Black LD Unit Position

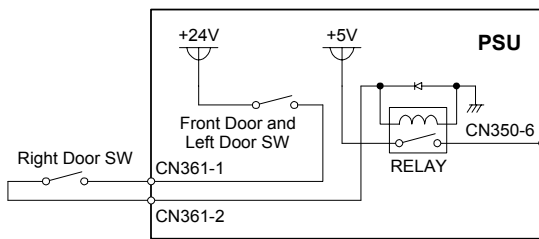
The machine changes the main scan resolution between 600 and 1,200 dpi for black and white printing by rotating the LD unit, except for OHP sheets and thick paper (remains at the 600 dpi position).

The table lists the printing modes and the positions of the black LD unit.

Mode		Position
Monochrome	600 dpi	600-dpi position
	1,200 dpi	1,200-dpi position
Color	600 dpi	600-dpi position
	1,200 dpi	600-dpi position

After the laser optics housing unit has been replaced, the beam pitch for 600 dpi and 1,200 dpi must be adjusted (SP2-109-2, -3).

6.3.5 LD SAFETY SWITCH



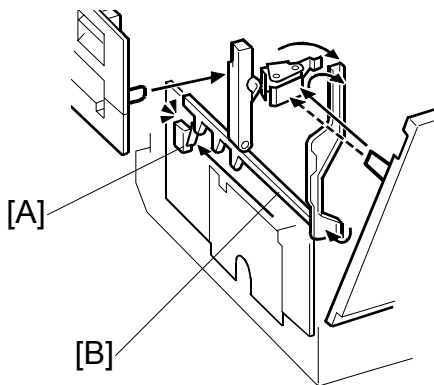
The relay on the PSU ensures technician and user safety and prevents the laser beam from inadvertently switching on during servicing. This relay turns off when the front cover, upper left cover, or right cover is opened, and cuts the power (+5V) supplied to the LD board for each color through the BCU.

Two safety switches are used to turn the relay off. One switch is used for the front cover and upper left cover. This safety switch is off when either the front cover or upper left cover is opened. The other safety switch is used for the right cover.

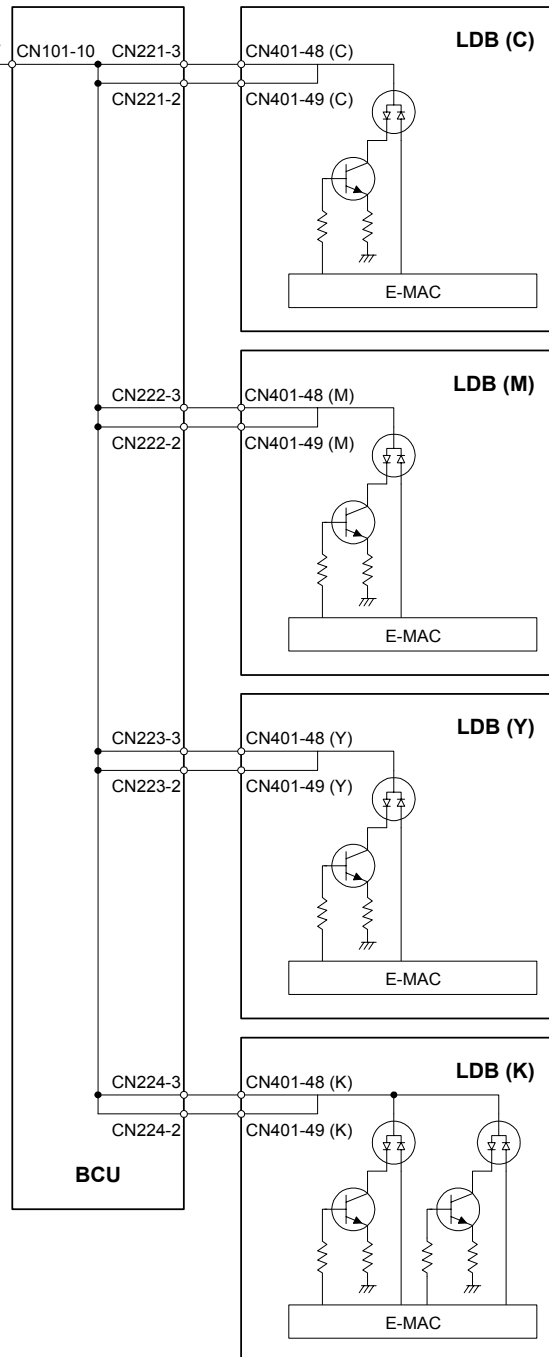
- E-MAC: Enhanced Modulation ASIC on CMOS
- LDB: LD Drive Board (included in the LD Unit)

Front and Left Door Switch

Micro switch [A] on the PSU is activated or deactivated by the actuator [B] when you close or open the front and left doors as shown.

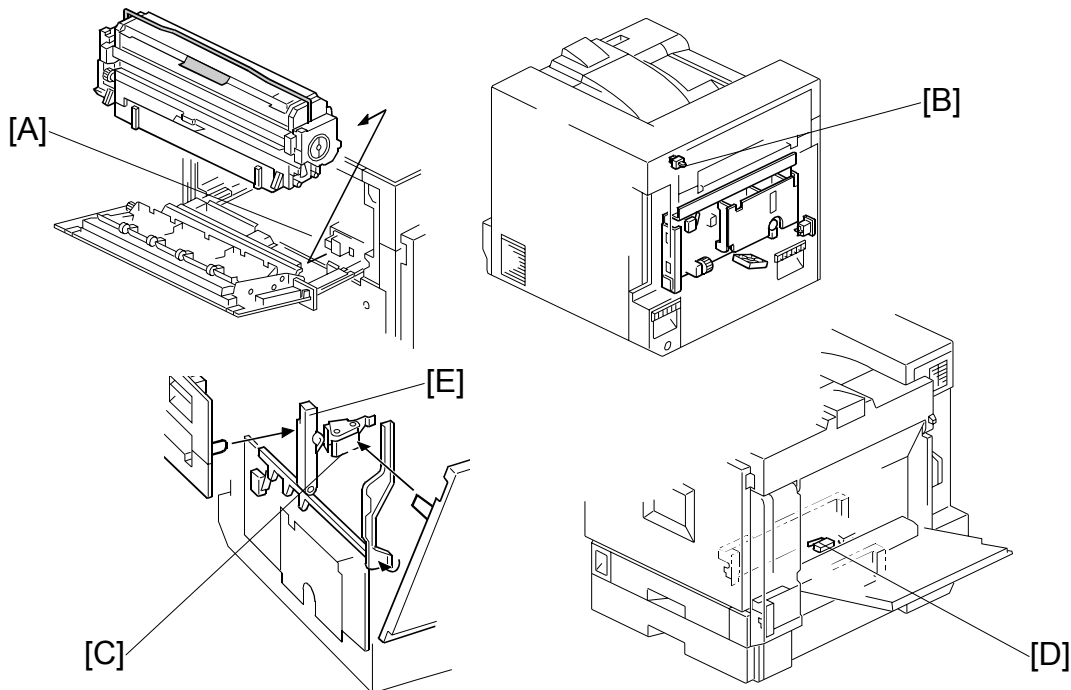


G080D945.WMF



G080D944.WMF

Error Messages



G080D920.WMF

Cooperating with other electrical components, the LD safety switches help display error messages related to external covers and doors. The table lists the error messages and their error conditions. Note that some messages take precedence over others.

Message	Condition			
	[A] Fusing unit link	[B] Upper left cover switch	[C] Front door switch	[D] Right door switch
Reset Fusing Unit Correctly	Open	(any)	(any)	(any)
Close Upper Left Cover	Connected	Open	(any)	(any)
Close Front Cover	Connected	Closed	Open	(any)
Close Right Cover	Connected	Closed	Closed	Open

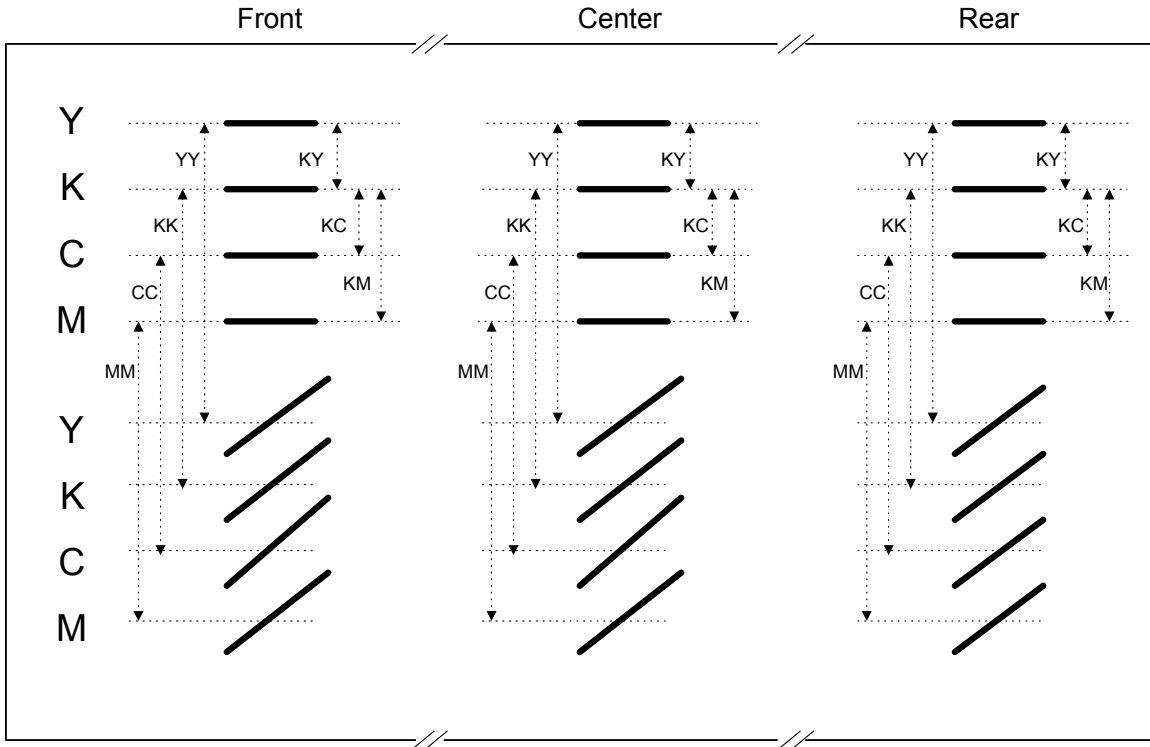
Detailed Descriptions

NOTE: 1) In the table, “any” indicates the condition does not affect the message.
 2) The left door switch [E] is closed when the upper left cover switch [B] is closed.

6.3.6 AUTOMATIC LINE POSITION ADJUSTMENT

Overview

YY, KK, CC, MM: Spaces between two lines of the same color
KY, KC, KM: Spaces between a black line and a color line



G080D921.WMF

During automatic line position adjustment, the line patterns above are created eight times on the transfer belt. The spaces between the lines (YY, KK, CC, MM, KY, KC, KM) are measured by the front, center, and rear ID sensors. The controller takes the average of the spaces, and adjusts the following positions and magnification:

- Sub scan line position for YCM
- Main scan line position for KYCM
- Magnification ratio for KYCM
- Skew for YCM

After the patterns are measured, the transfer belt cleaning unit cleans the transfer belt. If an error is detected three times consecutively, SC285 is generated.

Summary of Each Adjustment

Sub scan line position for YCM

The adjustment of the sub-scan line position for YCM is based on the line position for K (color registration). The machine measures the gaps between the lines of each color in the pattern on the transfer belt. If the gaps for a color are not correct, the machine moves the image of the color up or down the sub scan axis. To do this, it changes the laser write timing for that color.

Main scan line position for KYCM

If the machine detects that the image is out of position in the main scan direction, it changes the laser write start timing for each scan line.

Magnification adjustment for KYCM

If the machine detects that magnification adjustment is necessary, it changes the LD clock frequency for the required color.

Skew for YCM

The adjustment of the skew for YCM is based on the line position for K.

Adjustment Conditions

Line position adjustment timing depends on several SP mode settings. Among them, the mode selection, SP5-993-1, takes precedence over the others. The table below lists the conditions and the processes to be executed. Note that the adjustments of the sub-scan line position, main scan line position, and magnification are executed under the same conditions.

The numbers in the mode selection column indicate the setting of SP 5-993-1. For details, refer to the description for SP 5-993-1 in the SP table.

Mode selection	Condition		Setting	S-pos./ M-pos./ Magni.	Skew
1	Process control	Job End	SP3-906-1	✓	
		Interrupt	SP3-906-2	✓	
		Non-use Time 1, 2	SP3-906-3, 4	✓	
		Recovery (fusing temperature 60°C or lower)	None	✓	✓
1 or 2	Temperature difference	Interrupt	SP5-993-3, 4	✓	
		Standby	SP5-993-3, 5	✓	
		Job start	SP5-993-3, 6	✓	
		Interrupt	SP5-993-3, 4, 22	✓	
	Main scan length detection	SP5-993-24	✓*		
	Recovery (fusing temperature over 60°C)	SP5-993-26	✓		
	Replacement of development unit or PCU	None	✓	✓	
0, 1, or 2	Forced self check	SP5-993-2	✓	✓	

S-pos. : Sub-scan line position

✓ : Executed

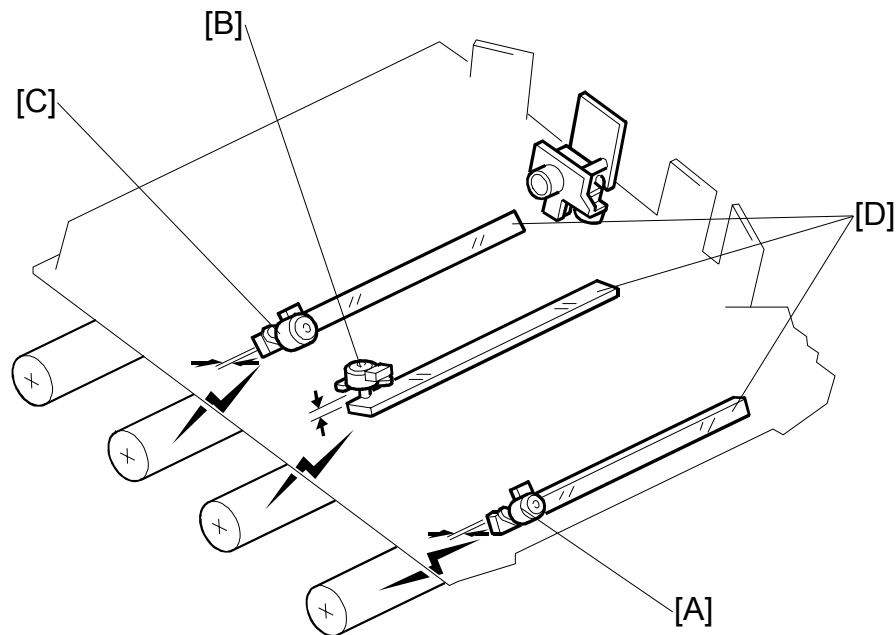
M-pos. : Main scan line position

✓* : Executed one time when the conditions are met twice

Magni. : Magnification

- NOTE:** 1) "Recovery" includes turning on the main switch.
 2) Fusing temperature is measured by the thermistor in the fusing unit. Other temperature is measured by the sensors on the laser optics housing unit.



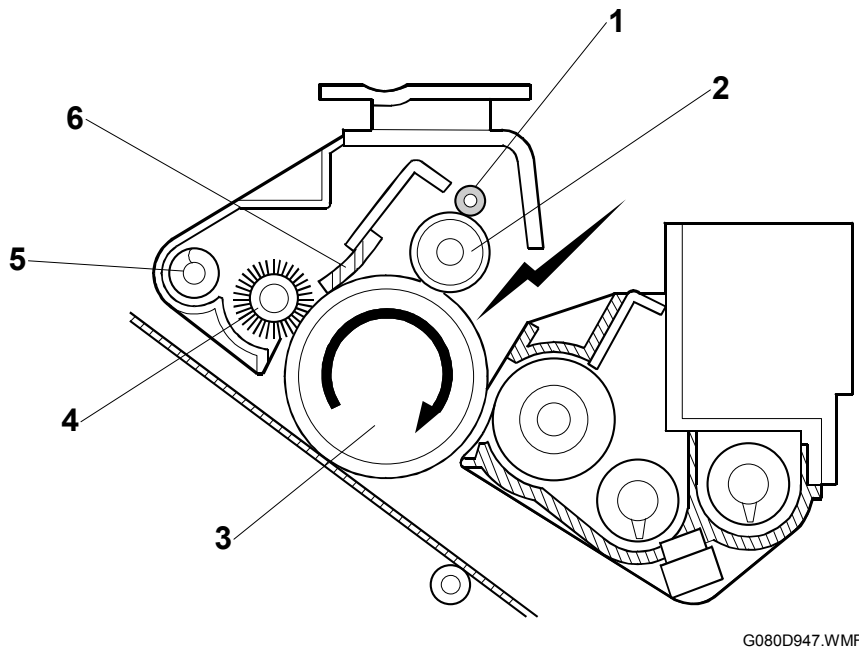
Main Scan Skew Adjustment

G080D946.WMF

The 3rd mirror positioning motors for magenta [A], cyan [B], and yellow [C] adjust the angle of the 3rd mirrors [B] respectively, based on the 3rd mirror position for black. This mechanism corrects main scan skew.

6.4 PHOTOCONDUCTOR UNIT

6.4.1 OVERVIEW



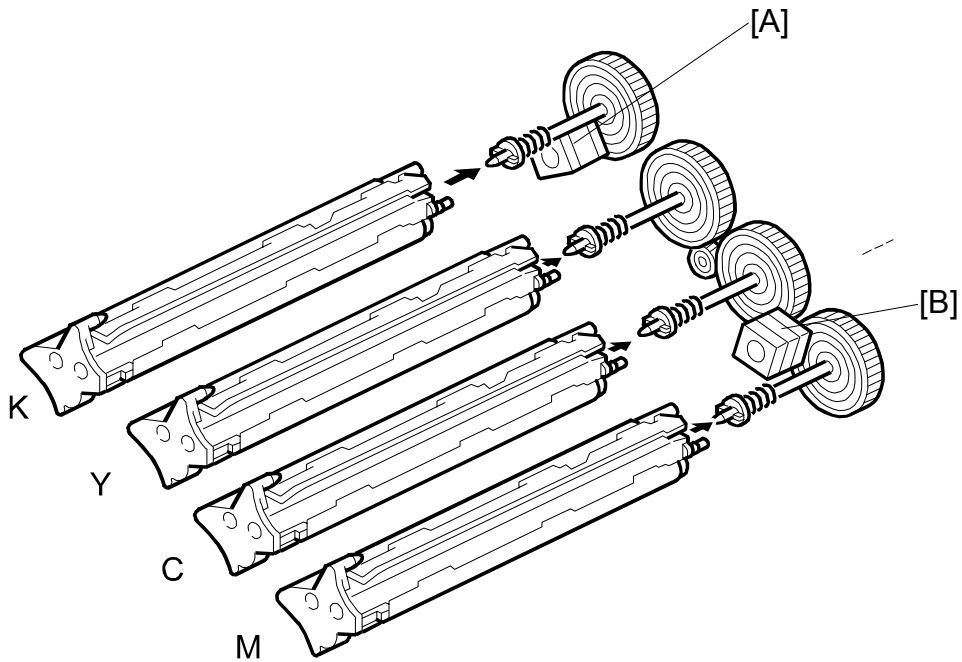
- | | |
|--------------------------------|---------------------------------|
| 1. Cleaning brush roller | 4. Cleaning brush |
| 2. Charge roller (non-contact) | 5. Waste toner collection auger |
| 3. OPC drum | 6. Cleaning blade |

This machine has four independent PCUs, one for each color. Each PCU consists of an OPC drum, non-contact charge roller, cleaning brush, and cleaning blade. The diameter of the drum is 30 mm (circumference: about 94.25 mm).

The photoconductor gap between a PCU and the corresponding development roller is determined by the drum positioning plate and the rear shaft, and is not adjustable in the field.

The push switches in the drum positioning plate detect when a new PCU has been installed.

6.4.2 DRIVE

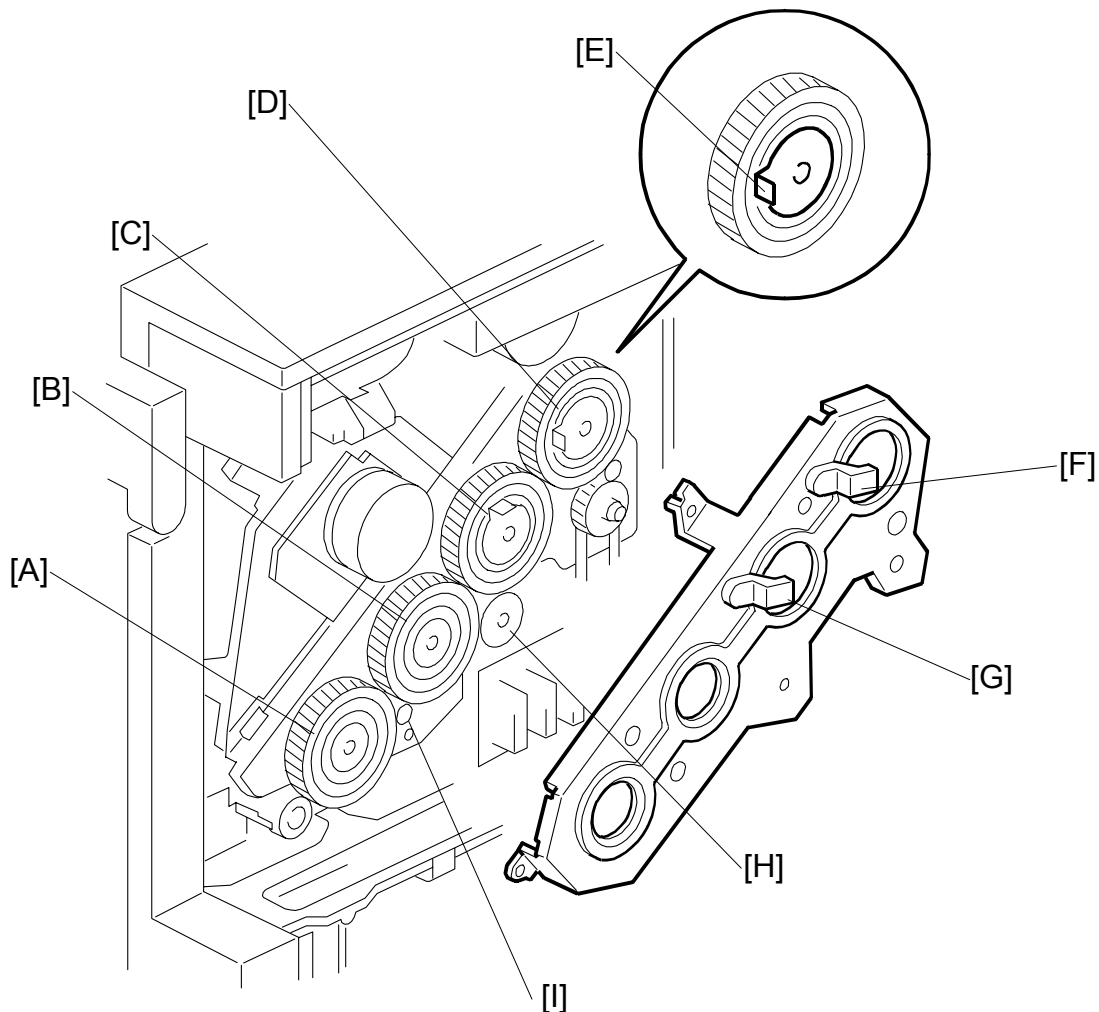


G080D927.WMF

The drum drive motor-K [A] drives the PCU for black.

The drum drive motor-CMY [B] drives the PCUs for magenta, cyan, and yellow. Using one motor to drive these three drums reduces CMY color misalignment.

6.4.3 DRUM GEAR POSITION SENSORS



G080D918.WMF

Mechanism

The machine uses these sensors to detect if the drum motors rotate. When it detects that the drum motor is not moving, SC440 appears. These sensors also help the machine to initialize the relative positions of the gears when turning on the main switch and initializing. This prevents phase fluctuation between printouts.

There is an interrupter [E] on each of the black [D] and yellow [C] drum gears. The drum gear position sensors [F][G] detect the positions of these interrupters respectively. The sensors check that the two interrupters are parallel. This mechanism makes sure that output quality does not vary. The cyan [B] and magenta [A] drum gears operate with the yellow drum gear because these three drum gears are linked through other gears [H][I].

In the ready status, the two interrupters stay in a parallel position. If they are not in a parallel position (as shown in the illustration), the machine adjusts the position of the black drum gear.

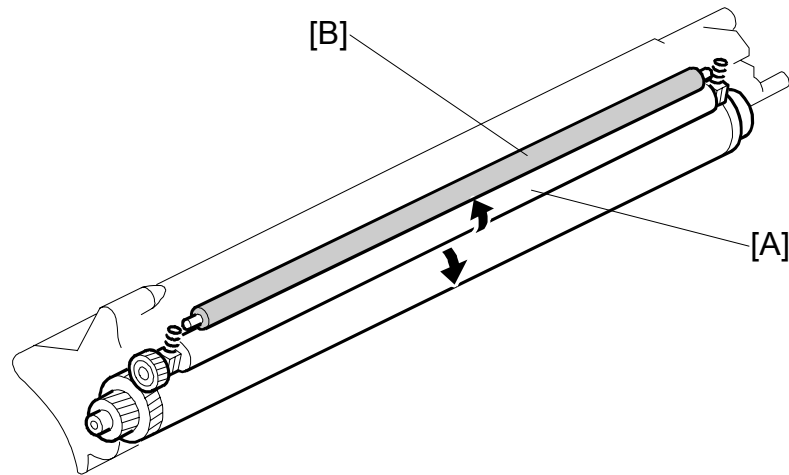
Initialization Process and SC Codes

When a drum gear position sensor has found an error, SC code 440-1 or 440-2 is displayed. The table lists the steps of the initialization process, possible errors, and corresponding SC codes.

	Initialization process	Possible error	SC code
Step 1	The four drums are simultaneously operated for seven seconds. The two drum position sensors detect the two drum gear interrupters several times.	The black drum gear interrupter is not detected.	440-1
		The yellow drum gear interrupter is not detected.	440-2
		Both black and yellow drum gear interrupters are not detected.	440-1
Step 2	The time lags between detection of the black drum gear interrupter and detection of the yellow drum gear interrupter are checked. The average time lag is calculated.		
Step 3	The black drum is operated. The position of the gear is adjusted according to the average time lag.	The black drum gear interrupter is not detected (●NOTE).	440-1

NOTE: If the connector of the black drum position sensor has been connected to the yellow drum position sensor (and the connector of the yellow drum position sensor, to the black drum position sensor), no error occurs in step 1 and step 2.

6.4.4 DRUM CHARGE AND QUENCHING



G080D948.WMF

This machine uses a non-contact charge roller [A] to reduce ozone. The non-contact charge roller gives the drum surface a negative charge. The high voltage supply board – C, B, which is located at the rear of the machine, applies a dc and ac voltage (at a constant current) to the roller. The ac voltage helps to ensure that the charge given to the drum is as uniform as possible.

The machine automatically controls the charge roller voltage if automatic process control is enabled (i.e., if SP3-125-1 is set to 0). However, if process control is switched off, (i.e., if SP3-125-1 is set to 1), the dc voltage is the value stored in SP2-001-1 to -9 (do not adjust in the field unless advised to do so).

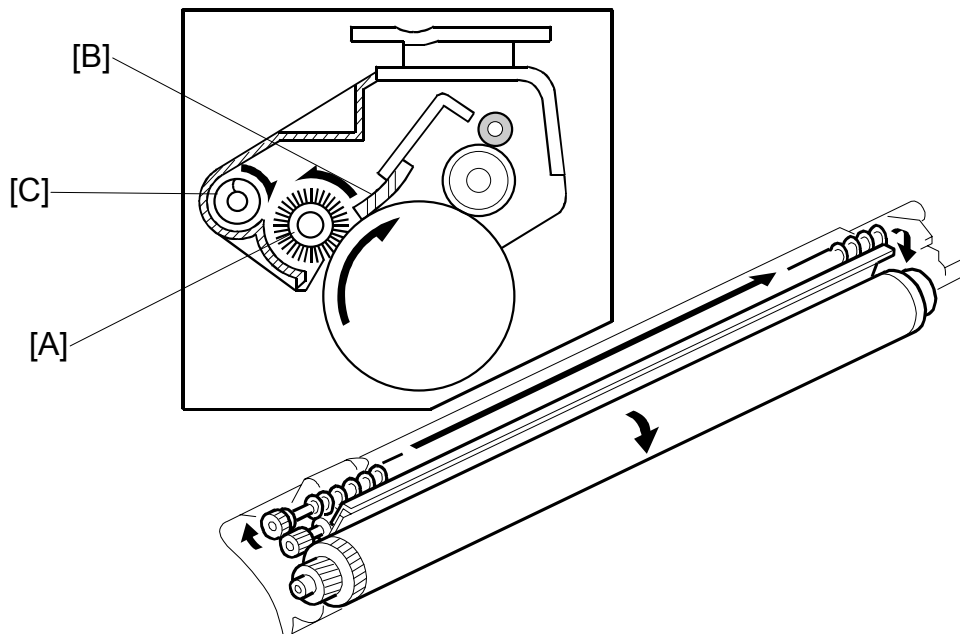
The diameter of the roller is 11.14 mm (circumference about 35 mm). The gap between a drum and the corresponding charge roller is about 50 μm .

The cleaning brush roller [B], which always contacts the charge roller, cleans the charge roller.

The charge roller can generate small amounts of nitrogen oxide gases (known as NO_x), which may be absorbed by the surface of the drum. This can cause unfocused copies. To avoid this, the film of NO_x is removed at power on, at the end of a job (if more than 200 prints), and when a toner cartridge has been replaced. SP3-920-1 to -4 determine when this procedure (known as “refresh mode”) is done. It can also be executed at any time (using SP3-920-5) if the prints are smeared.

Quenching is done by illuminating the whole area of the drum with the laser at the end of every job.

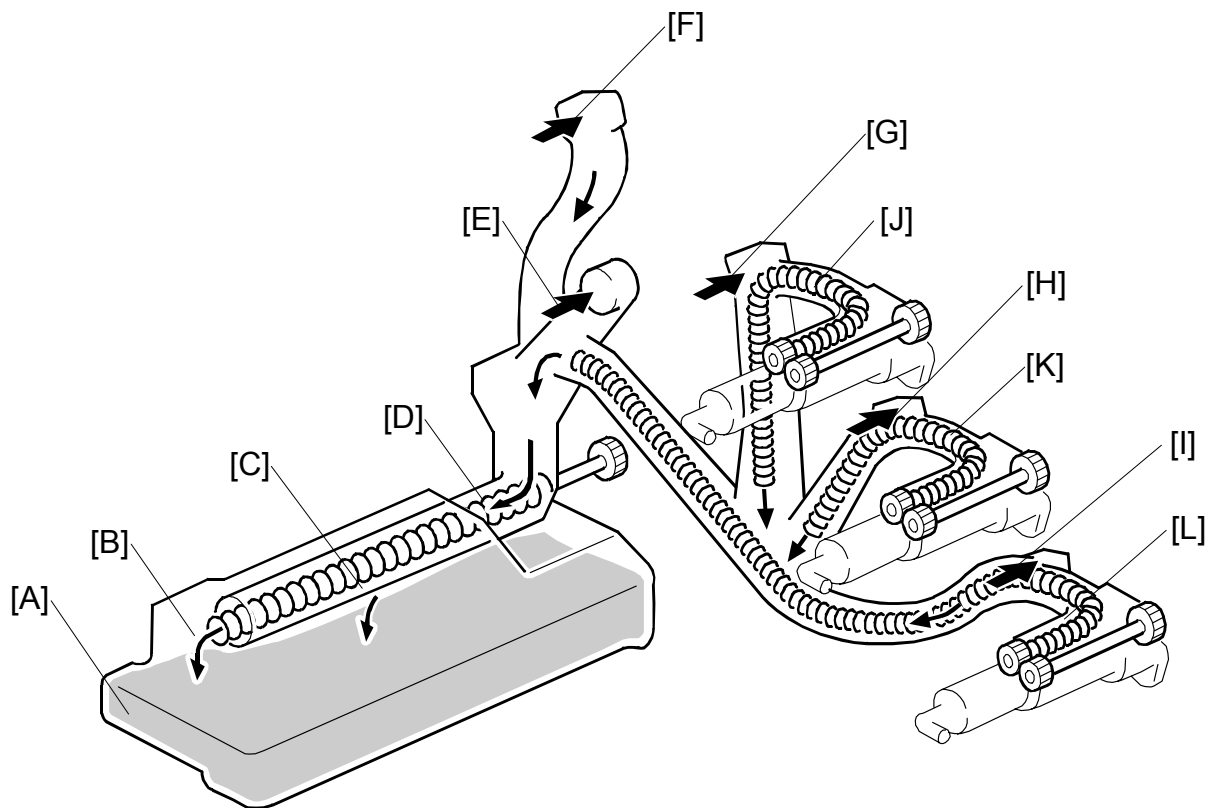
6.4.5 DRUM CLEANING



G080D949.WMF

The cleaning brush [A] spreads out the waste toner remaining on the drum. The cleaning blade [B] then scrapes it off. The toner collection auger [C] transports the toner towards the waste toner collection duct.

6.4.6 WASTE TONER COLLECTION



G080D950.WMF

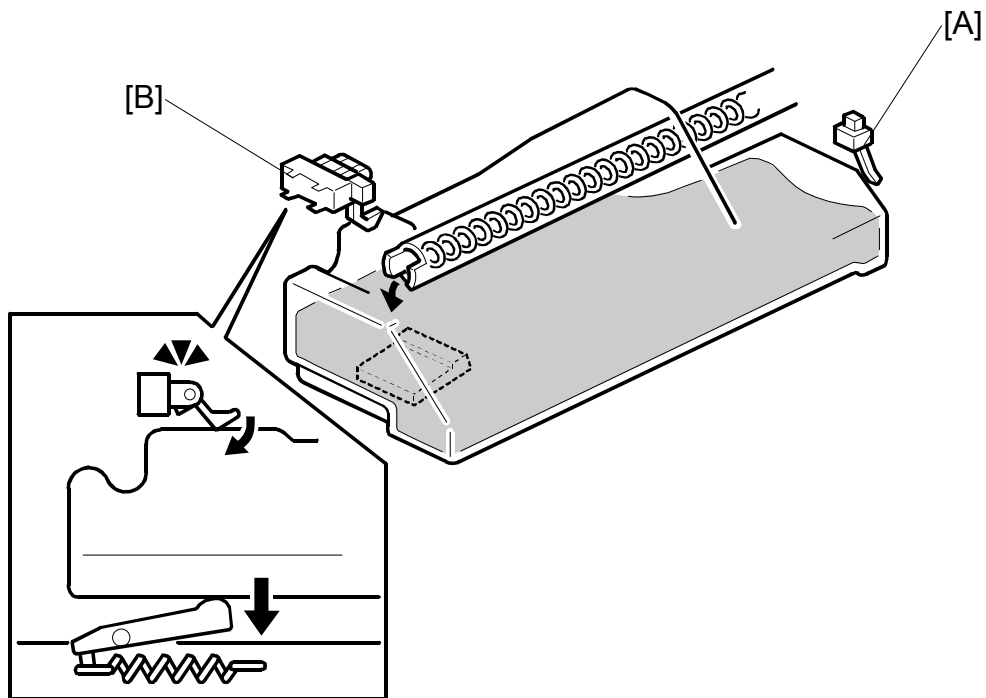
The waste toner from the collection augers in the four PCUs drops into the waste toner collection duct from the four openings [F][G][H][I] at the rear of the PCUs. The toner collection coils [J][K][L] in the duct transport this waste toner towards the waste toner bottle [A]. The coils [J][K][L] are driven by development drive motor-CMY.

NOTE: The openings and PCUs correspond as follows: black → [F], yellow → [G], cyan → [H], magenta → [I].

The waste toner from the transfer belt cleaning unit drops into the waste toner collection duct from another opening [E].

The end of the waste toner collection duct is in the waste toner bottle. There are two openings [B][C] and one collection coil [D] in this part of the duct. If the toner is unable to drop through the opening [C] in the middle of the bottle, it is transported to the end of the duct and drops into the bottle through the other opening [B]. This collection coil [D] is driven by drum drive motor-K.

6.4.7 WASTE TONER BOTTLE FULL DETECTION



G080D951.WMF

The waste toner bottle set switch [A] detects the bottle when it is placed in the machine.

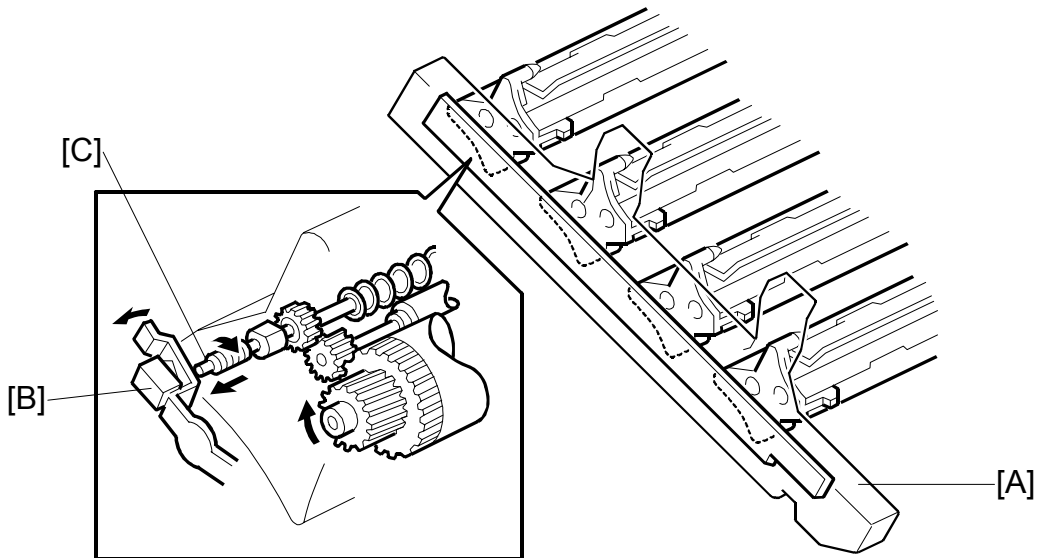
The waste toner sensor [B] detects the weight of the bottle and informs when it is almost full.

When the bottle contains a certain amount of waste toner, the sensor is deactivated. The machine detects that the waste toner bottle is almost full and displays "Waste Toner is Almost Full".

After that, the machine can print about 2,500 more sheets. After printing 2,500 sheets, it displays "Replace Waste Toner," and after the end of the job, the printer cannot be used until the bottle is replaced or emptied.

NOTE: The number of sheets is calculated on the assumption that the paper size is A4 and that the coverage ratio of each color is 5%.

6.4.8 PCU DETECTION (DEVELOPMENT UNIT DETECTION)



G080D952.WMF

Detection Pins

The drum positioning plate [A] contains eight push switches [B]. These detect when a new PCU or a new development unit has just been installed. They also detect if the PCUs and development units are in the machine.

Each PCU and each development unit includes a pin [C], which activates the switch when the drum positioning plate is closed. On a new unit, this pin does not activate the switch. When the unit is driven for the first time, the pin comes out and activates the switch.

Detection Process

After the machine is turned on or the front cover is closed, the machine checks each switch ("Result 1" in the table). Then the machine drives the PCUs and development units for 5 seconds and checks each switch again ("Result 2" in the table). The condition detected by the machine depends on the combination of results as shown in the table.

Result 1	Result 2	Detection	Action
OFF	OFF	The PCU or development unit is not placed in the machine, or the drum positioning plate is not secured by the two screws.	The machine displays an error message.
OFF	ON	A new PCU or development unit has just been installed.	The machine resets the counter for the PCU or development unit.
ON	ON	The current PCU or development unit is present.	The machine goes to the standby mode.

Error Message

PCU

When the machine cannot detect a PCU, it outputs the first message, "Reset PCU Correctly," and the second message, "Xxxx"; where "Xxxx" indicates a color, such as "Magenta". The operation panel displays the first message and the second message alternately. Each message is displayed for 3 seconds.

If two or more PCUs are not detected, the second message indicates those colors, such as "Yellow/Cyan" and "Yellow/Magenta Black."

Reset PCU
Correctly

G080D908.WMF

Magenta

G080D909.WMF

Yellow/Cyan

G080D910.WMF

Yellow/Magenta
Black

G080D911.WMF

Development Unit

The messages concerning development units are not displayed until all PCUs have been installed. If, for example, the machine cannot detect the cyan PCU and the yellow development unit, it displays the first message, "Reset PCU Correctly," and the second message, "Cyan."

When the machine detects all PCUs but does not detect a development unit, it outputs the first message, "Reset Develop. Unit Correctly", and the second message, "Xxxx"; where "Xxxx" indicates a color, such as "Magenta". The operation panel displays the first message and the second message alternately. Each message is displayed for 3 seconds.

If two or more development units are not detected, the second message indicates those colors, such as "Yellow/Cyan" and "Yellow/Magenta."

Reset Develop.
Unit Correctly

G080D912.WMF

Magenta

G080D909.WMF

Yellow/Cyan

G080D910.WMF

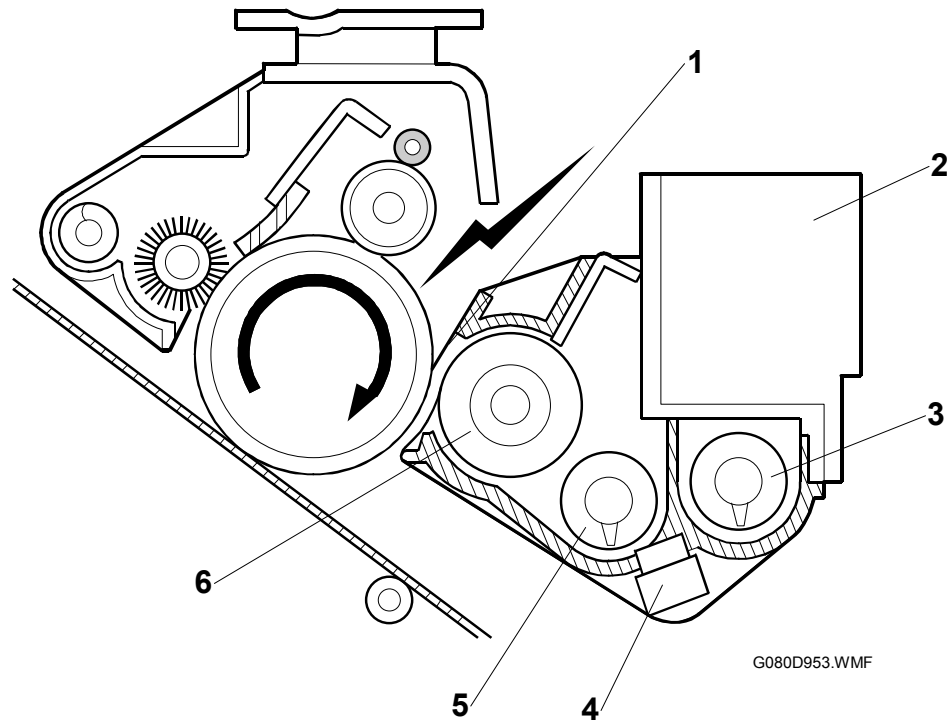
Yellow/Magenta
Black

G080D911.WMF

Detailed
Descriptions

6.5 DEVELOPMENT

6.5.1 OVERVIEW



- | | |
|-------------------------|------------------------|
| 1. Doctor blade | 4. TD sensor |
| 2. Developer hopper | 5. Mixing auger (left) |
| 3. Mixing auger (right) | 6. Development roller |

This machine has four independent development units, one for each color. Each contains 280 g of developer when new. The developer in each unit is supplied to the development roller by the two mixing augers and attracted onto the surface of the roller.

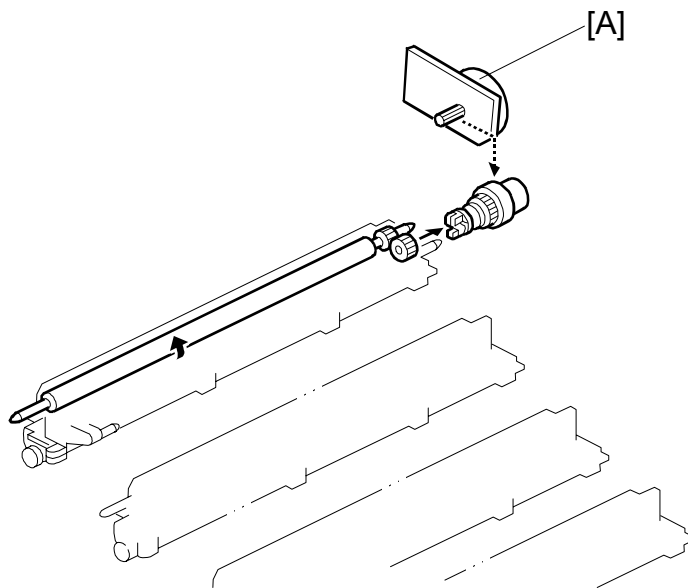
The photoconductor gap between PCU and development roller is determined by the drum positioning plate and the rear shaft, and is not adjustable in the field.

The push switches in the drum positioning plate detect a new development unit when it has been installed, and detect whether the development unit is in the machine.

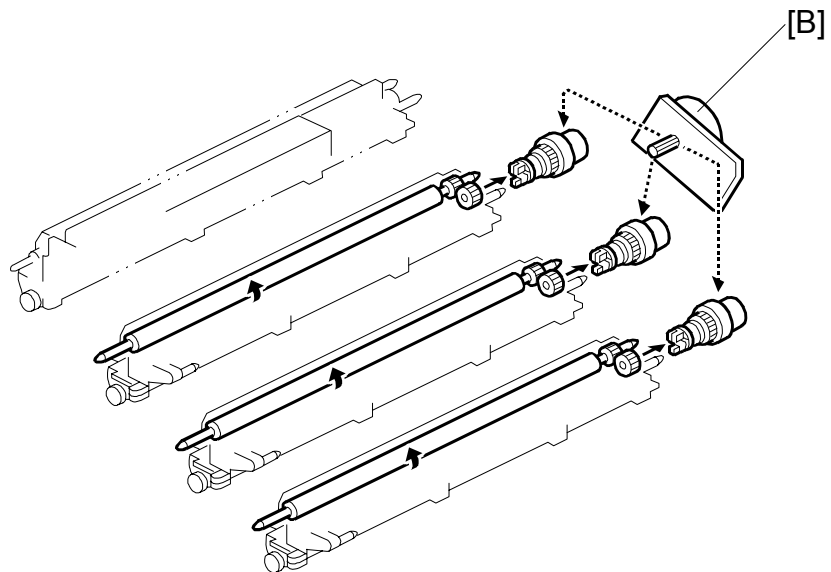
The TD sensor and center ID sensor control toner density. Each development unit has a TD sensor.

The diameter of the development roller is 18 mm (circumference about 56.5 mm).

6.5.2 DRIVE



G080D954.WMF



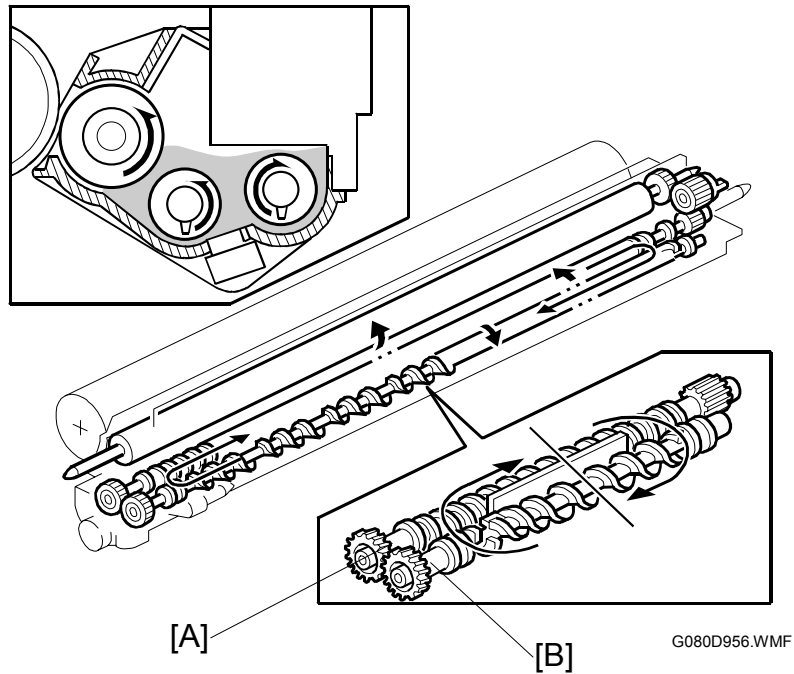
G080D955.WMF

Detailed
Descriptions

The development drive motor-K [A] drives the development roller for black through gears and a clutch. This motor also drives the fusing unit and paper exit rollers. The gear trains are indicated in the diagram by dotted lines.

The development drive motor-CMY [B] drives the development unit for magenta, cyan, and yellow through gears and clutches. This motor also drives the registration roller.

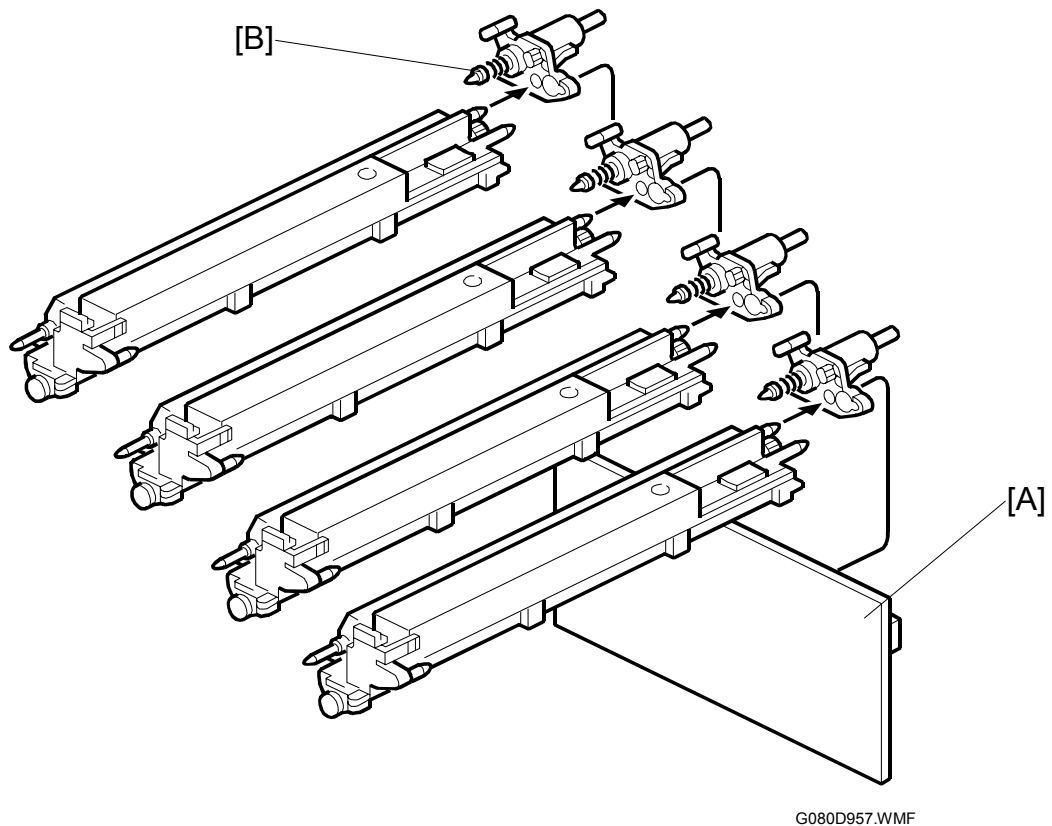
6.5.3 DEVELOPER AGITATION



Two mixing augers [A and B] circulate the developer forward and backward to agitate the developer.

This happens during the process control self check, during toner supply, and during development.

6.5.4 DEVELOPMENT BIAS



G080D957.WMF

The high voltage supply board [A] supplies development bias to the development roller via the receptacle [B] at the rear of each development unit.

There are both ac and dc bias voltages. The ac bias improves toner transfer to the drum.

The machine automatically controls the dc bias, if automatic process control is enabled (i.e., if SP3-125-1 is set to 0). However, if process control is switched off, (i.e., if SP3-125-1 is set to 1), the dc bias is the value stored in SP2-201-1 to -9 (do not adjust in the field unless advised to do so).

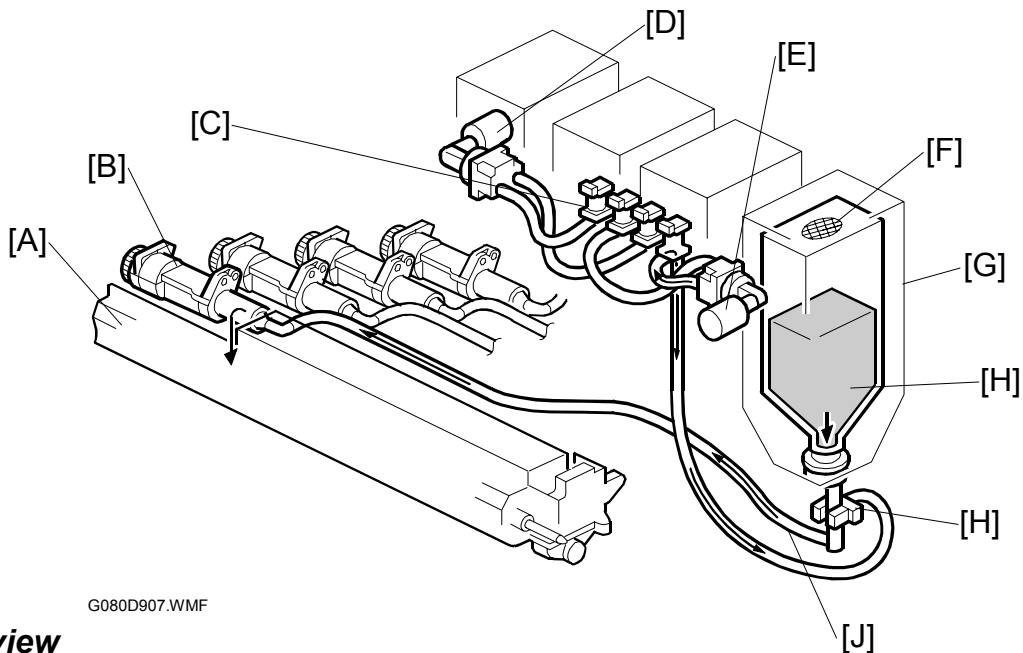
The ac bias cannot be adjusted.

Detailed
Descriptions

6.5.5 DEVELOPMENT UNIT DETECTION

This is the same as PCU detection. See “Photoconductor Unit – PCU Detection.”

6.5.6 TONER SUPPLY MECHANISM



Overview

The air transport system agitates the toner [H] in the toner cartridges [G]. Toner is transported to the development unit [A] by the toner attraction pump [B] (each cartridge has a separate pump). This provides a more stable way to transport fine powder than previous methods.

Toner Agitation and Attraction

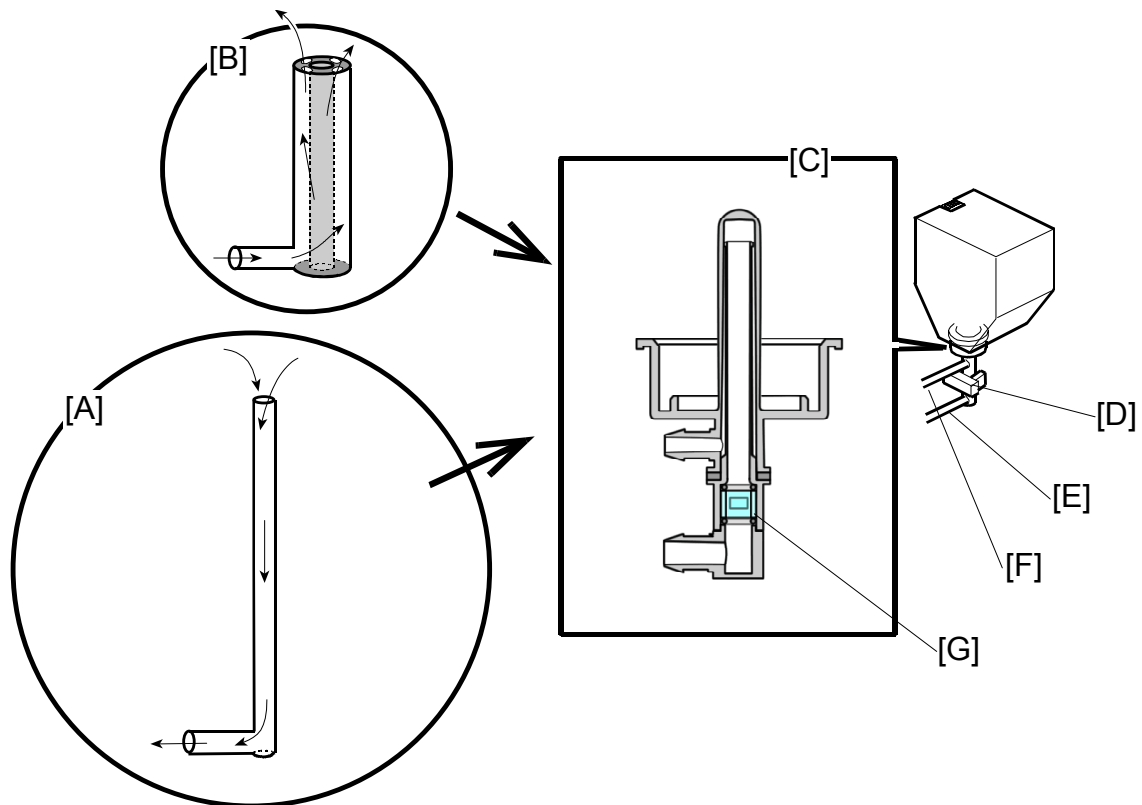
The rear air pump [D] supplies air to the yellow and magenta toner cartridges, while the front air pump [E] supplies air to the black and cyan toner cartridges. Air agitates all the toner in each cartridge. The pumps and four valves [C] control the air flow. Mixed with air, the toner passes part of the way along the transport tube [J] towards the toner attraction pump. This pump draws the toner the rest of the way (☛ Toner Transport).

The air pump turns on to supply air to the toner cartridges for one second under any of the following conditions:

- During normal operation, when the “on” time for a toner supply clutch reaches a certain value
- When forced toner supply (SP2-207) is done
- When forced toner density adjustment (SP3-126-2) is done
- At toner end recovery
- Developer initialization

The filter [F] on the inner package of the toner cartridge ensures that the internal pressure does not become too high.

Air Flow and Toner Flow



G080D928.VWMF

The air tube [F] and the toner tube [E] are connected to the joint [C] at the bottom of the toner cartridge holder. This joint contains an inner pipe [A] and an outer pipe [B]. These two pipes are L-shaped. The inner pipe goes through the outer pipe, and is longer than the other.

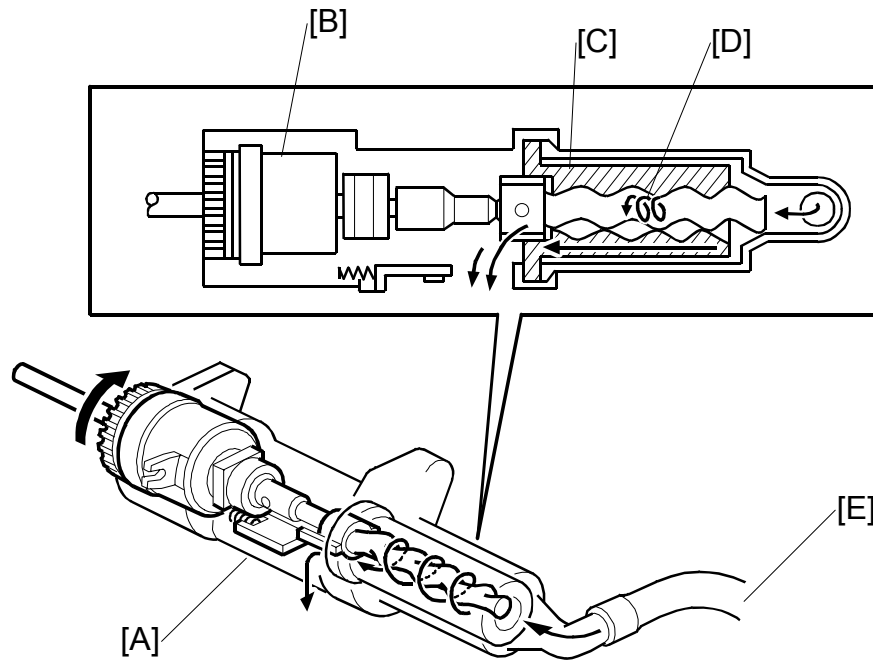
The toner goes through the inner pipe [A], and reaches the toner tube [E] at the bottom end of the pipe. On its way to the toner tube, the toner passes the sensor windows [G]. These windows are at the front side and the rear side of the pipe, and are transparent. The light emitted from the toner end sensor [D] goes through this area if the toner is not going through the pipe.

The air flow generated by the air pump goes through the outer pipe [B], and comes out of the four openings at the top end.

Toner Near End Detection

Toner end sensors [D] detect toner near end conditions (☛ 6.2.6).

Toner Transport



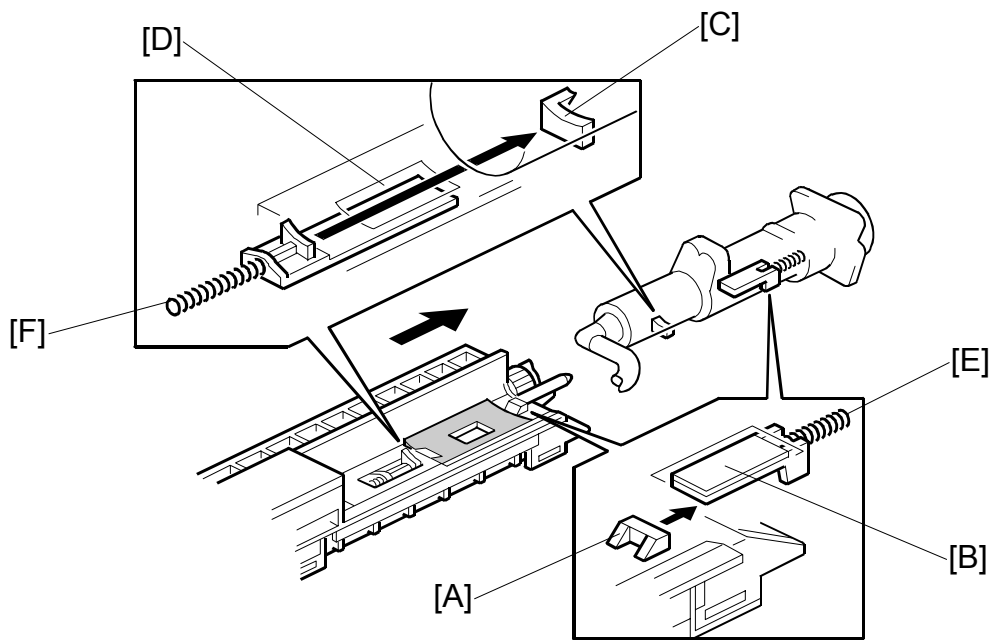
G080D958.WMF

Each toner attraction pump has the same mechanism. The pump (toner attraction pump) [A], which consists of the toner supply clutch [B], rubber tube [C], and rotor [D], attracts the toner in the toner transport tube [E] toward the development unit.

The toner supply clutch drives the rotor, which draws the toner in from the cartridge and passes it to the development unit. When supplying toner, the clutch is on for 0.7 second and off for 1.3 seconds. The clutch turns on and off as many times as necessary to supply the appropriate amount of toner. The amount of toner depends on the results of toner supply control.

Motor drive comes from the development drive motors.

Shutter Mechanism



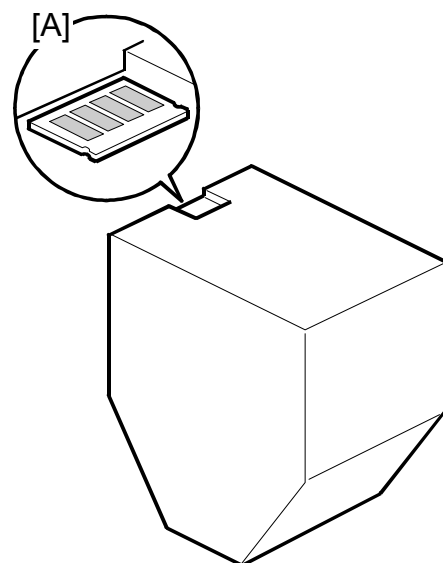
G080D959.WMF

The development unit and toner attraction pump each have a shutter mechanism. When the development unit is placed in the machine, the protrusion [A] on the development unit opens the shutter [B] in the pump, and the protrusion [C] on the pump opens the shutter [D] in the development unit. When both shutters are open, toner can enter the development unit from the toner attraction pump.

When the development unit is removed, the shutter spring [E and F] pulls and closes the shutter.

6.5.7 TONER CARTRIDGE DETECTION

The memory chip [A] on each toner cartridge stores the total “on” time of the toner supply clutch. This is used to calculate the amount of toner remaining in the toner cartridge. The chip is also used to detect whether the cartridge is installed (if the cartridge is not installed, the machine does not detect a signal from the memory chip).

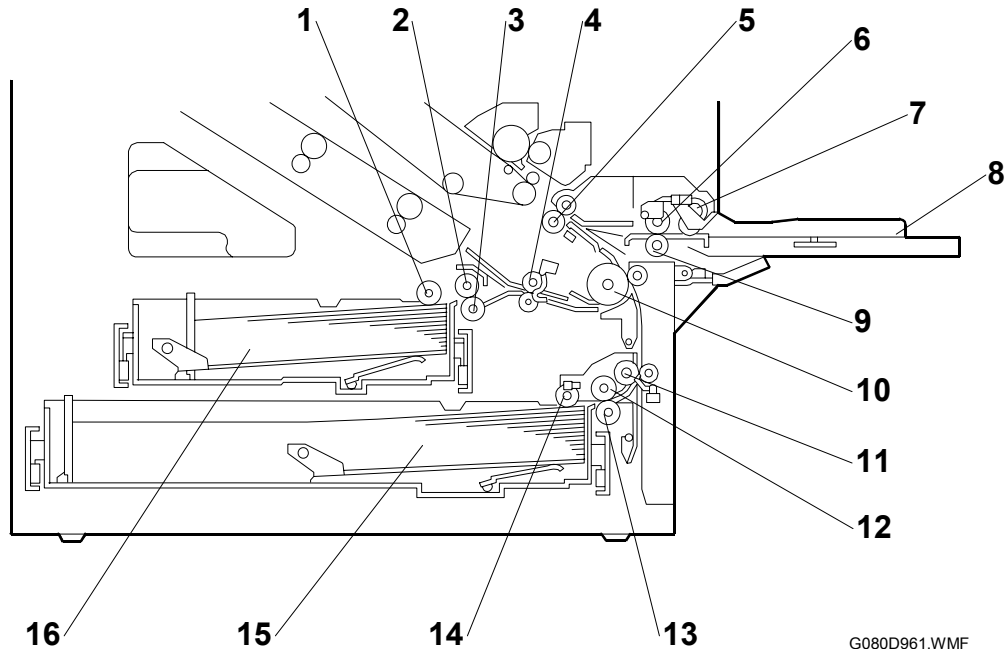


G080D960.WMF

Detailed Descriptions

6.6 PAPER FEED

6.6.1 OVERVIEW



G080D961.WMF

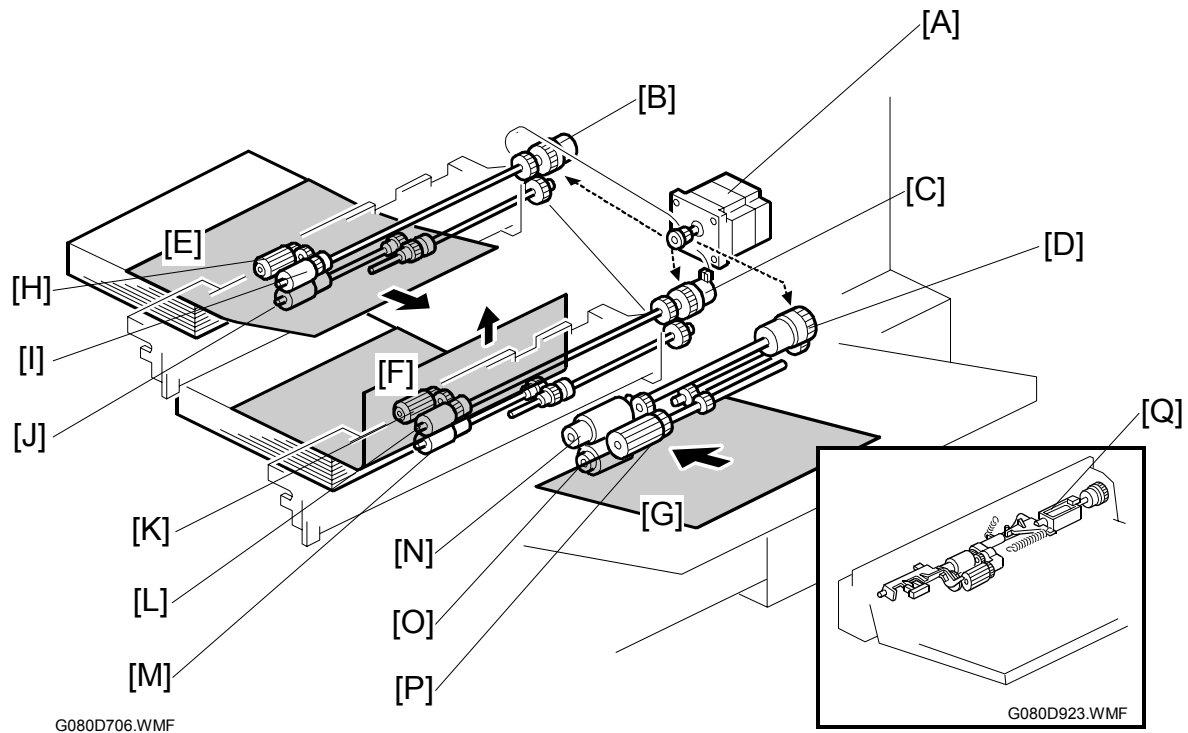
- | | |
|----------------------------------|-------------------------------------|
| 1. Pick-up roller - tray 1 | 9. Separation roller - By-pass feed |
| 2. Feed roller - tray 1 | 10. Transport roller |
| 3. Separation roller - tray 1 | 11. Vertical transport roller |
| 4. Relay roller | 12. Feed roller - tray 2 |
| 5. Registration roller | 13. Separation roller - tray 2 |
| 6. Feed roller - By-pass feed | 14. Pick-up roller - tray 2 |
| 7. Pick-up roller - By-pass feed | 15. Paper tray 2 |
| 8. By-pass feed table | 16. Paper tray 1 |

There are two paper trays (500 sheets each), and a by-pass feed table (100 sheets).

The paper feed mechanism uses an FRR system.

Tray 1 can only hold A4 or letter paper. Tray 2 can hold a range of sizes.

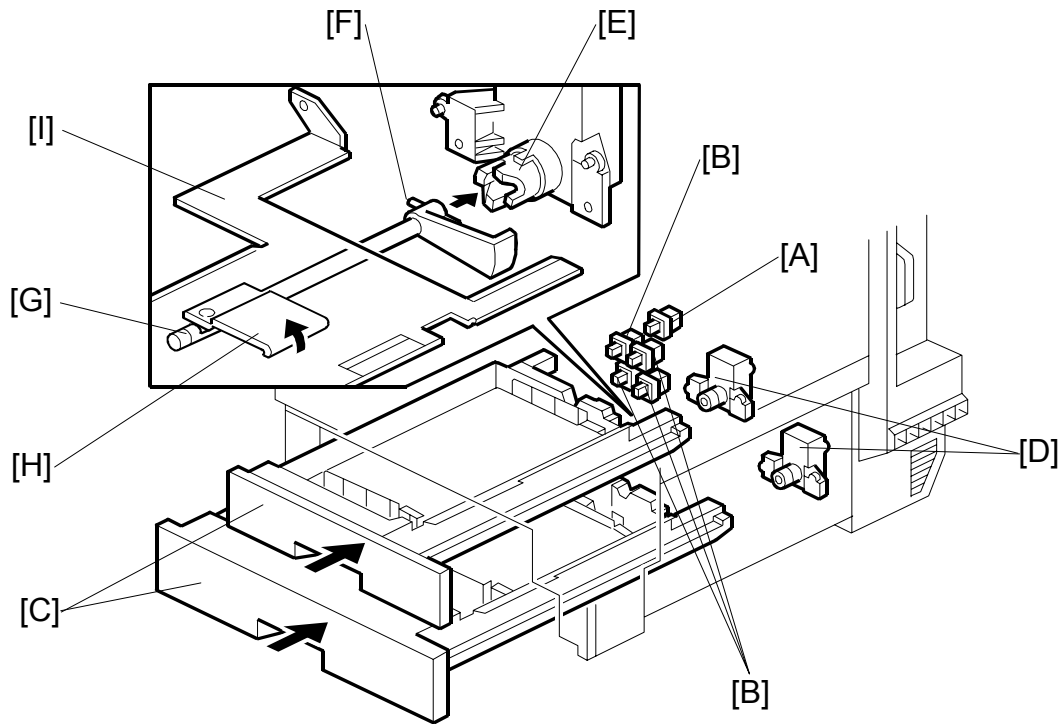
6.6.2 DRIVE – TRAY 1, TRAY 2, AND BY-PASS TRAY



The paper feed motor [A] drives the pick-up and feed mechanisms in tray 1 [E], tray 2 [F], and the by-pass tray [G], using clutches and complex trains of gears (the locations of the gear trains are indicated by dotted lines in the above diagram).

When tray 1 and tray 2 are inside the machine, their pick-up rollers [H][K] are always in contact with each top sheet of the paper stack. On the other hand, the pick-up roller [P] of the by-pass tray stays away until the by-pass pick-up solenoid [Q] turns on. When the paper feed clutch [B][C][D] turns on, the pick-up, feed [I][L][N], and separation [J][M][O] rollers start rotating to feed the paper. The paper feed clutch stays on until shortly after the registration sensor activates.

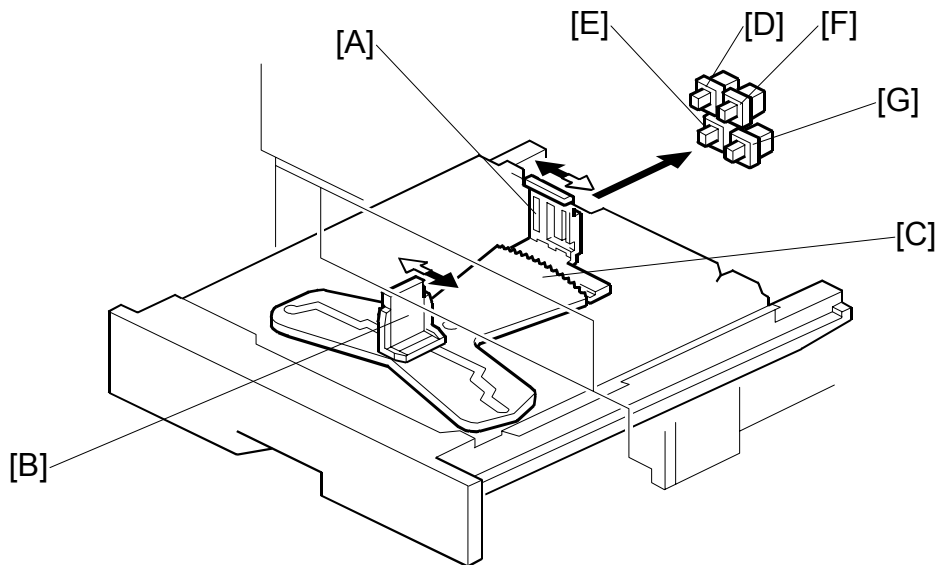
6.6.3 PAPER LIFT – TRAYS 1 & 2



G080D917.WMF

The tray 1 set switch [A] and tray 2 paper size switches [B] detect when the paper trays [C] are placed in the machine. When the machine detects that a tray has been placed in the machine, the tray lift motor [D] rotates and the coupling gear [E] on the tray lift motor engages the pin [F] on the lift arm shaft [G]. Then the tray lift arm [H] lifts the tray bottom plate [I] until the paper lift sensor for the tray detects that the top of the stack is at the paper feed position.

6.6.4 PAPER SIZE DETECTION – TRAYS 1 & 2



G080D962.WMF

For tray 1, there is no size switch. The paper size is fixed at either A4 or LT; this can be changed with SP1-902-1.

For tray 2, four paper size switches, working in combination, detect the paper size as shown in the table below. The actuators are on the side plate [A]. The side plate is moved by the end plate [B] through a cam [C].

1: Pushed

Models		Switch Location			
North America	Europe/Asia	1 [D]	2 [E]	3 [F]	4 [G]
11" x 17" SEF	11" x 17" SEF	0	1	0	0
A3 SEF	A3 SEF	1	0	1	0
8 1/2" x 14" SEF ^{*1}	B4 SEF ^{*1}	1	1	0	1
8 1/2" x 11" SEF ^{*2}	A4 SEF ^{*2}	0	1	1	0
11" x 8 1/2" LEF ^{*3}	11" x 8 1/2" LEF ^{*3}	1	0	1	1
A4 LEF	A4 LEF	0	1	0	1
B5 LEF	B5 LEF	0	0	1	0
A5 LEF	A5 LEF	0	0	0	1

Detailed Descriptions

NOTE:

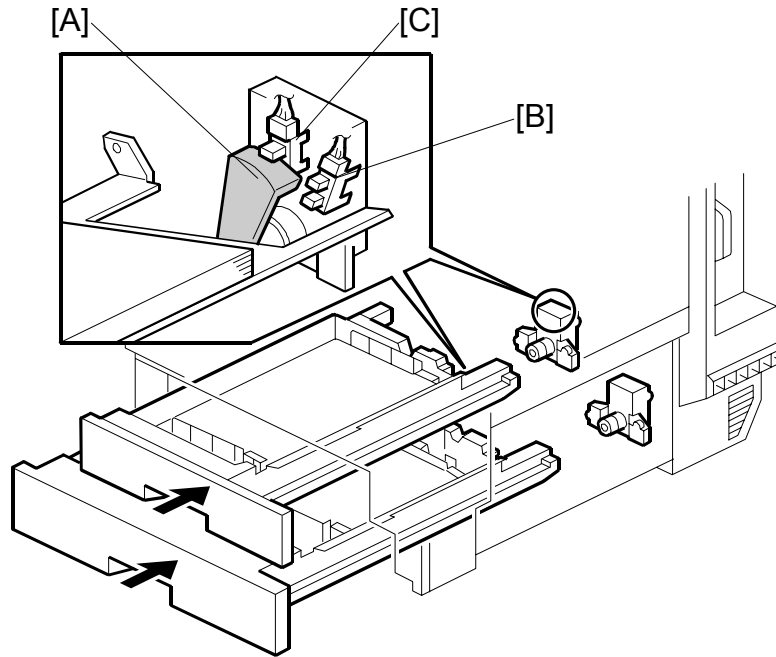
^{*1}: The machine detects either 8 1/2" x 14" SEF or B4 SEF, depending on the setting of SP 1-902-2

^{*2}: The machine detects either 8 1/2" x 11" SEF or A4 SEF, depending on the setting of SP 1-902-3

^{*3}: The machine detects either 11" x 8 1/2" LEF or B5 SEF, depending on the setting of SP 1-902-4

The machine disables paper feed from a tray if the paper size cannot be detected (if the paper size actuator is broken or no tray is installed).

6.6.5 PAPER HEIGHT DETECTION – TRAYS 1 & 2



G080D963.WMF

Two paper height sensors, working in combination, detect the amount of paper in the tray.

When the amount of paper decreases, the bottom plate pressure lever moves up and the actuator [A] (on the pressure lever drive shaft) rotates.

Remaining paper	Paper height sensor 2 [B]	Paper height sensor 1 [C]
Full	OFF	OFF
Nearly full	ON	OFF
Near end	ON	ON
Almost empty	OFF	ON

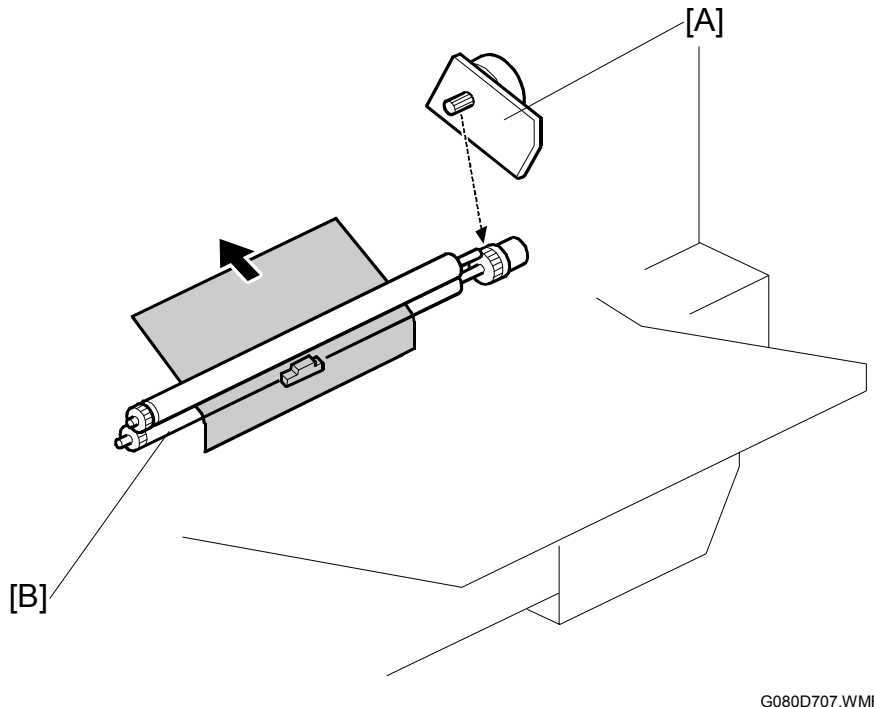
OFF: No actuator

6.6.6 PAPER END DETECTION – TRAYS 1 & 2

If there is some paper in the paper tray, the paper stack raises the paper end feeler and the paper end sensor deactivates.

When the paper tray runs out of paper, the paper end feeler drops into the cutout in the tray bottom plate, and this activates the paper end sensor.

6.6.7 REGISTRATION



G080D707.WMF

The development drive motor - CMY [A] drives the registration roller [B] using a clutch and a complex train of gears (the location of the gear train is indicated by dotted lines in the above diagram).

The machine makes a paper buckle at the registration roller to correct paper skew. The paper buckle can be adjusted with SP1-003-1 to - 8.

6.6.8 PAPER FEED LINE SPEED

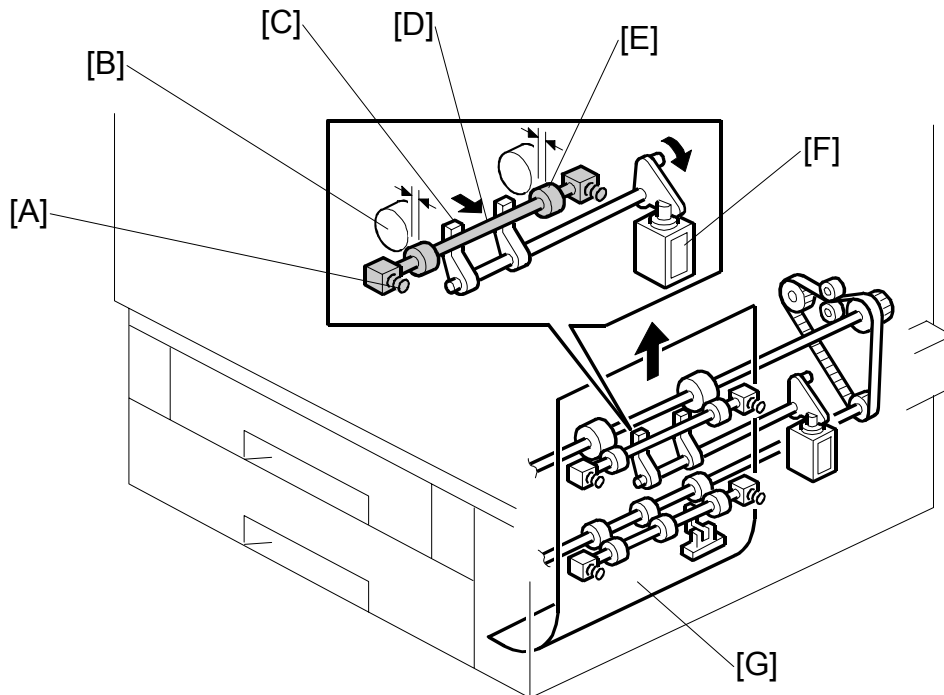
This machine has three process line speeds (for feed from registration roller to fusing unit) depending on the selected resolution

Mode	Resolution (dpi)	Line speed (mm/s)	Print speed (ppm)
B/W	600 x 600	185	38
	1,200 x 600		
Color	1,200 x 1,200	125	28
	600 x 600	125	28
	1,200 x 600		
OHP/Thick	1,200 x 1,200	62.5	14
	600 x 600	62.5	10
	1,200 x 600		
	1,200 x 1,200		

During a monochrome print job, the machine changes the line speed if there is a page with color in the middle of the job. However, it will not change the line speed if there is a monochrome page in the middle of a color print job.

	Line speed (mm/s)
Paper feed from tray to registration roller	230
Fusing, paper exit to standard tray, and mailbox	A bit slower than "Process line speed"
Duplex invert and feed	370
Finisher	450

6.6.9 GRIP ROLLER RELEASE MECHANISM



G080D714.WMF

The grip roller release mechanism reduces the pressure of the grip roller [E].

The grip roller transports a sheet of paper to the transfer unit. When the transfer unit starts to feed the leading edge of the paper [G], the trailing edge has still not reached the grip roller. So the paper is handled by the transfer unit and the grip roller at the same time. If the handling speeds are not the same, this may skew the paper. Longer paper sizes are more affected by the speed difference than shorter sizes. From the viewpoint of image crispness, multi-color images are more easily affected than mono-color images.

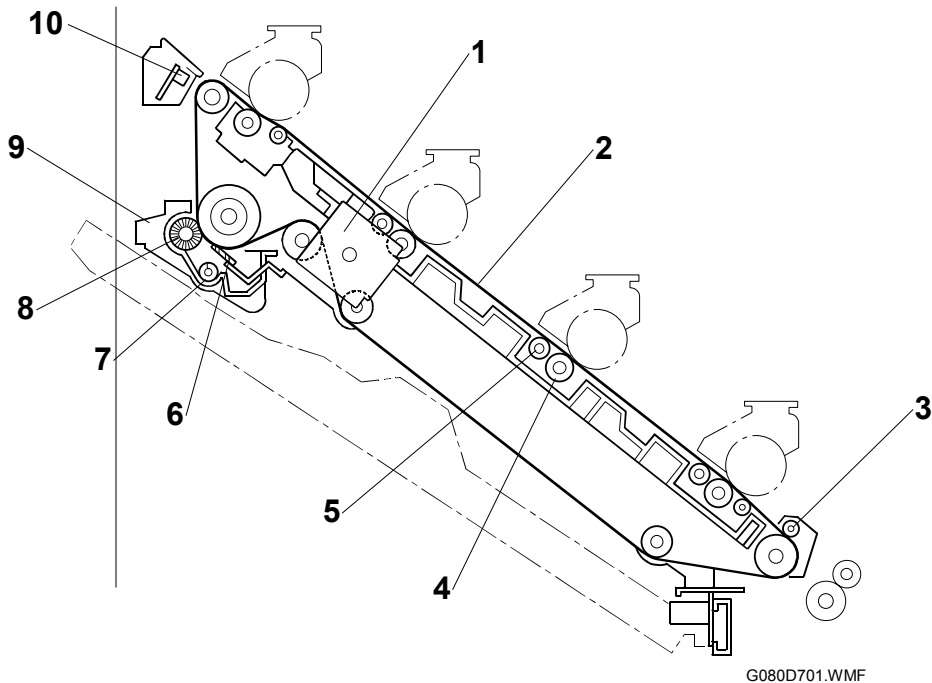
To solve this possible problem, the grip roller release mechanism is activated under the following conditions:

- 1) B4 paper or longer is being fed.
- 2) The machine is operating in the full-color mode.
- 3) The leading edge of the paper has been fed in the transfer unit.

The spring [A] is always pressing the grip roller against the transport roller [B]. When the above conditions are met, the solenoid [F] turns on, the lever [C] pushes the grip roller shaft [D], and the grip roller moves away from the paper.

6.7 IMAGE TRANSFER AND PAPER SEPARATION

6.7.1 OVERVIEW



- | | |
|------------------------------|---------------------------|
| 1. Transfer unit drive motor | 6. Cleaning blade |
| 2. Transfer belt | 7. Toner collection auger |
| 3. Paper attraction roller | 8. Cleaning brush |
| 4. Transfer roller | 9. Cleaning unit |
| 5. Back-up roller | 10. ID sensor |

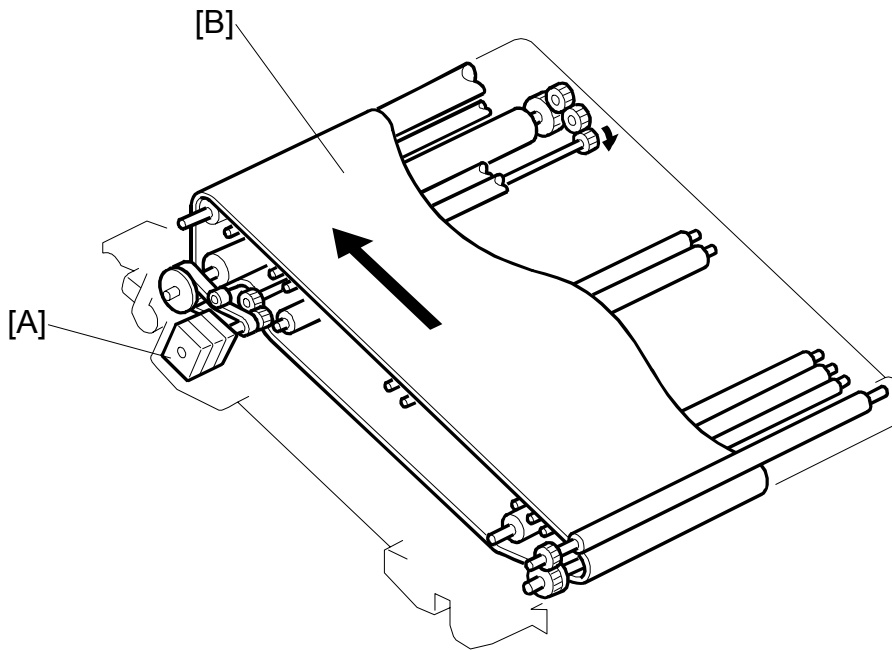
Paper is fed to the transfer belt before image transfer begins. The paper attraction roller charges the paper to ensure that the paper is attracted to the belt.

The magenta, cyan, yellow, and black color images transfer to the paper while the transfer belt feeds the paper past the drums towards the fusing unit. A positive charge is applied to the paper under the transfer belt, opposite each drum, to transfer the toner from the drums onto the paper. The back-up roller ensures that the contact area between the drum and belt is sufficient.

The cleaning unit in the transfer unit cleans the belt surface with the cleaning blade and brush. The waste toner collected from the belt is transported to the waste toner bottle.

There are three ID sensors (front, center, and rear). Only the center ID sensor detects the image density of the patterns generated on the transfer belt for process control. The other function of the ID sensors is for automatic line position adjustment. All ID sensors are used for this.

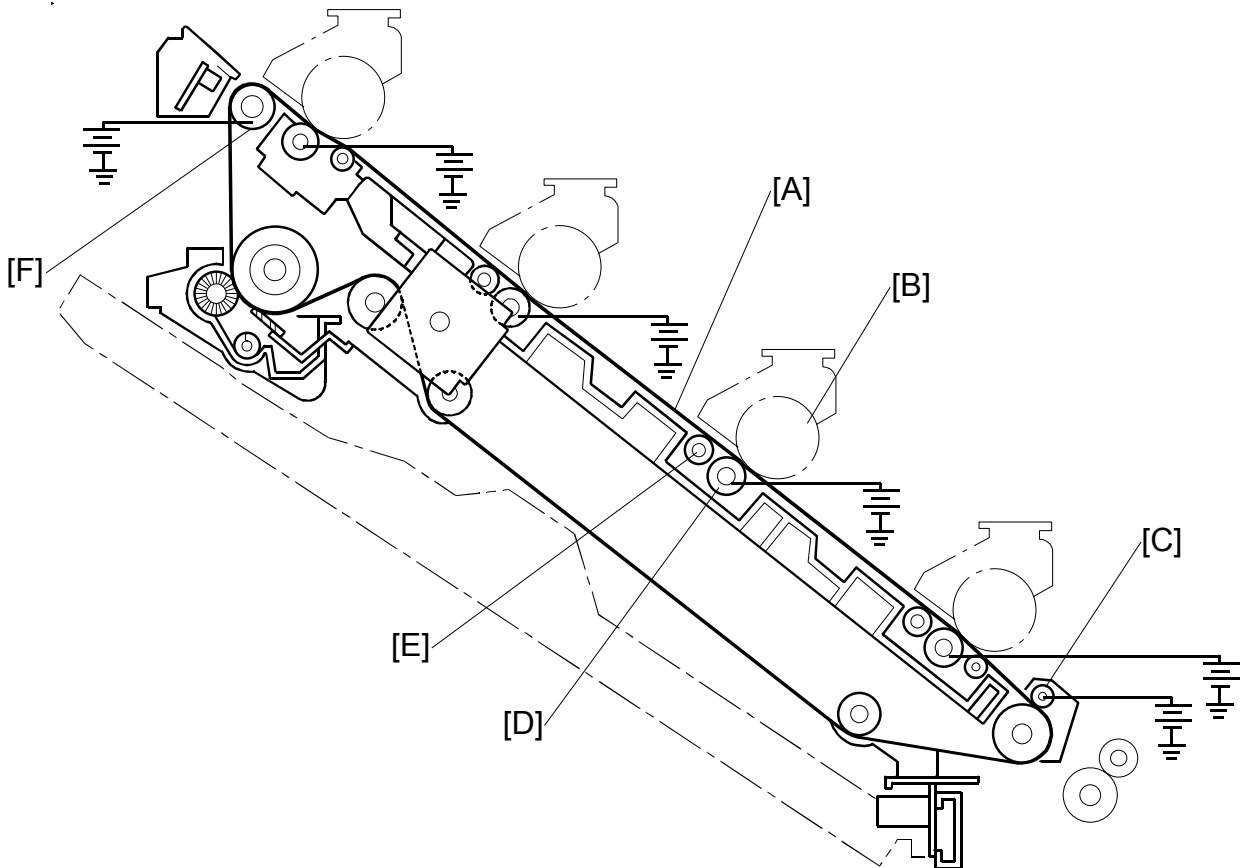
6.7.2 TRANSFER BELT DRIVE



G080D702.WMF

The transfer unit drive motor [A] drives the transfer belt [B] and the cleaning unit via the timing belt and gears. The speed of transfer belt drive depends on the process line speed.

6.7.3 TRANSFER CURRENT



G080D932.WMF

The transfer roller [D] applies a current to transfer the toner to the paper on the transfer belt [A]. The high voltage supply board – Transfer applies a current to the transfer roller and the paper attraction roller [C].

These currents are automatically corrected for paper size, temperature (measured by the thermistor on the right side of the laser optics housing unit), and humidity (measured by the humidity sensor).

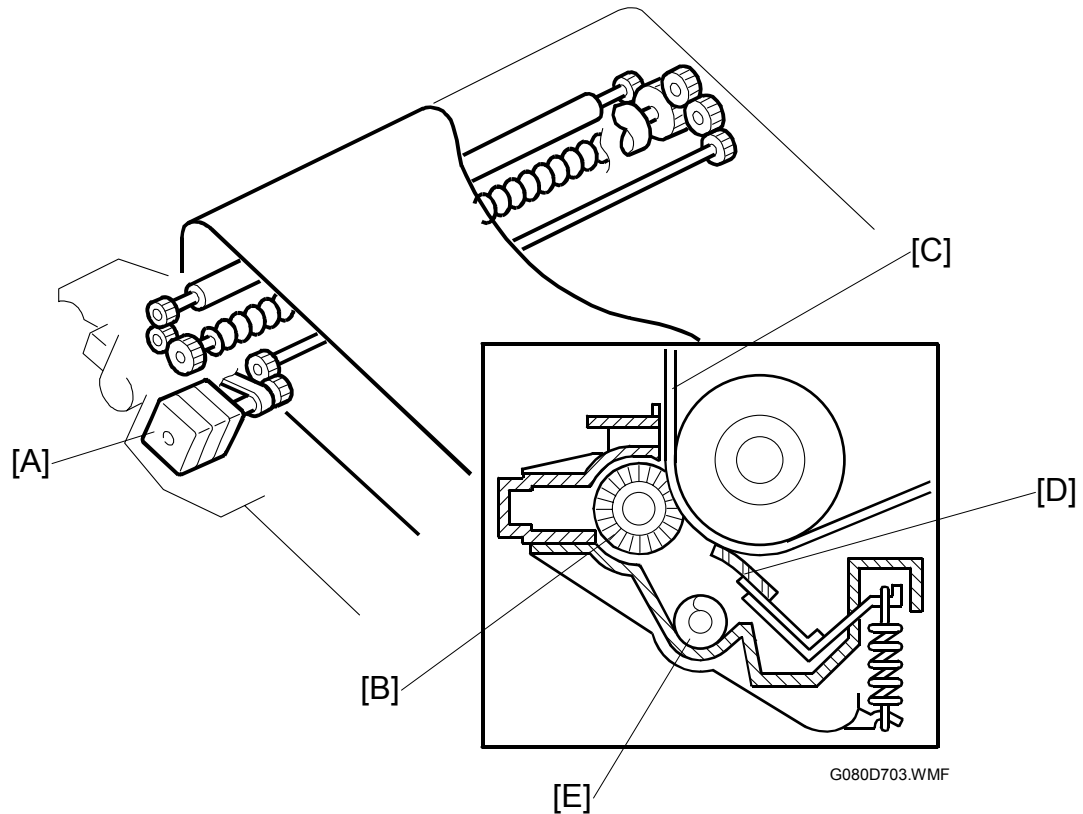
Available adjustments are summarized below.

- The transfer roller current for each printing mode (color or B/W, resolution, paper type) can be adjusted with SP2-301-1 to -56. The by-pass tray settings are used when the duplex unit has not been installed and the user is making duplex prints manually from the by-pass tray. There is a correction for narrow-width paper with SP2-309-1 to -4.
- The current for paper attraction can be adjusted with SP2-801-1 to -9. There is a correction for narrow-width paper with SP2-801-10 to -13.

The back-up roller [E] makes a wider contact area between the drum [B] and the belt. The transfer exit roller [F] is charged to 2 kV. The roller prevents the toner from being scattered while the paper is leaving the transfer unit.

The other rollers are grounded to neutralize the belt surface.

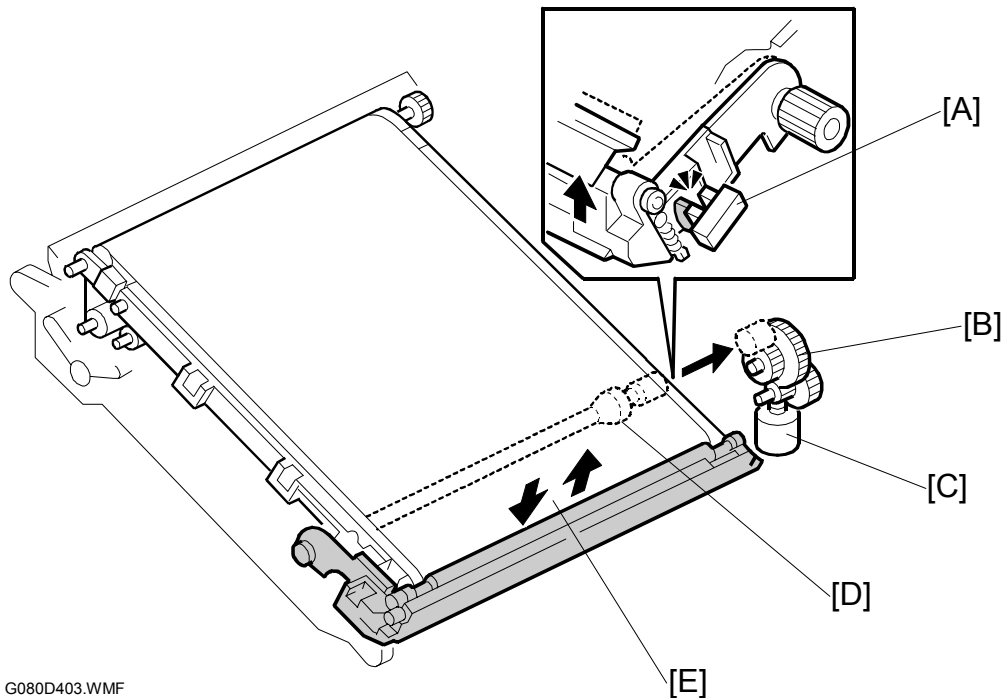
6.7.4 TRANSFER BELT CLEANING



The transfer belt cleaning unit removes toner (during printing) and the ID sensor patterns (during process control or automatic line position adjustment) on the belt. Belt cleaning is completed while the transfer belt makes one rotation. The transfer unit drive motor [A] drives the unit.

The cleaning brush [B] always contacts the transfer belt [C], and removes waste toner from the belt. The cleaning blade [D] in the cleaning unit scrapes the toner off the transfer belt. The toner collection auger [E] transports the toner towards the waste toner collection duct.

6.7.5 TRANSFER BELT CONTACT



G080D403.WMF

Mechanism

The transfer belt contact and release mechanism improves the lifetime of the transfer belt and drums.

The drum for black always contacts the belt, but the transfer belt moves away from the other drums during monochrome printing.

In the standby mode, the transfer belt contacts only the black drum. The transfer belt comes away from the black drum when you turn the release lever counterclockwise.

When the machine prints a color page, the machine waits until the previous page has gone through the transfer unit. Then the transfer belt contact motor [C] turns on and a cam [D] moves the lower end [E] of the transfer belt upward, so that it contacts the other three drums.

The machine does not release the transfer belt from the color drums during the job, even if a monochrome page comes again. This is because the total printing speed reduces if the transfer belt changes position often.

The belt comes away from the color drums if the job is interrupted by any error except a power failure.

NOTE: If a power failure occurs when the transfer belt is in contact with the drum, the belt stays in this position. To release the belt, swing out the controller box, and turn the drive gear [B] manually.

Transfer Belt Sensor

The transfer belt sensor [A] works as the detection sensor during machine initialization, and works as the position sensor during machine operations.

Before machine initialization, the lower end of the transfer belt is in the home position. When initialization starts, the transfer belt contact motor lifts the lower end until the actuator has passed the sensor, and lowers it to its home position. This action actuates the sensor in a certain pattern.

The table lists the sensor actuation patterns.

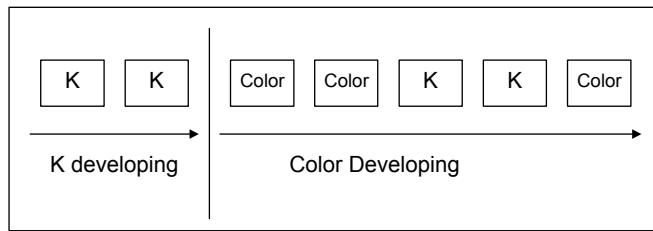
Machine status		Sensor pattern
Initialization		On → Off → On → Off → On
Operation	Standby (Default)	On
	B/W printing	On
	Color Printing	Off

On: The actuator is out of the sensor.

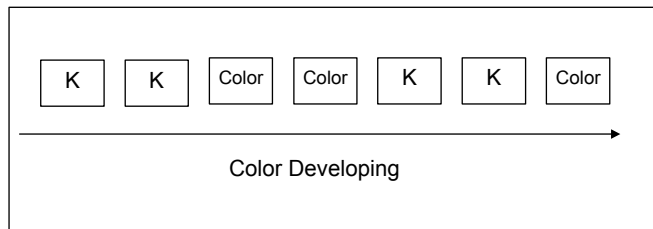
Off: The actuator is interrupting the sensor.

ACS (Auto Color Sensing) Mode

ACS: On



ACS: Off



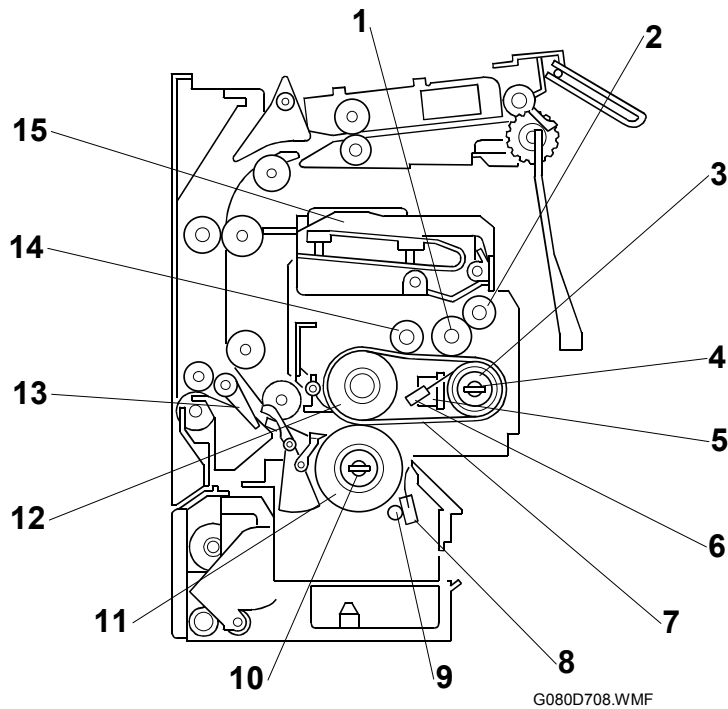
G080D964.WMF

The machine can print in the color or monochrome mode (selected with the printer driver). In color mode, ACS can be switched on or off with a user tool (default: on). If ACS is on, the transfer belt stays in the default position (against the K drum only) until a page with color data on it appears. The transfer belt then moves against all four drums and stays there until the end of the job, even if some K only pages appear.

If ACS is off and the color mode is selected, all data is printed with the transfer belt positioned against all four drums. The belt does not move even if a K only page appears, even if it is at the start of the job.

6.8 FUSING

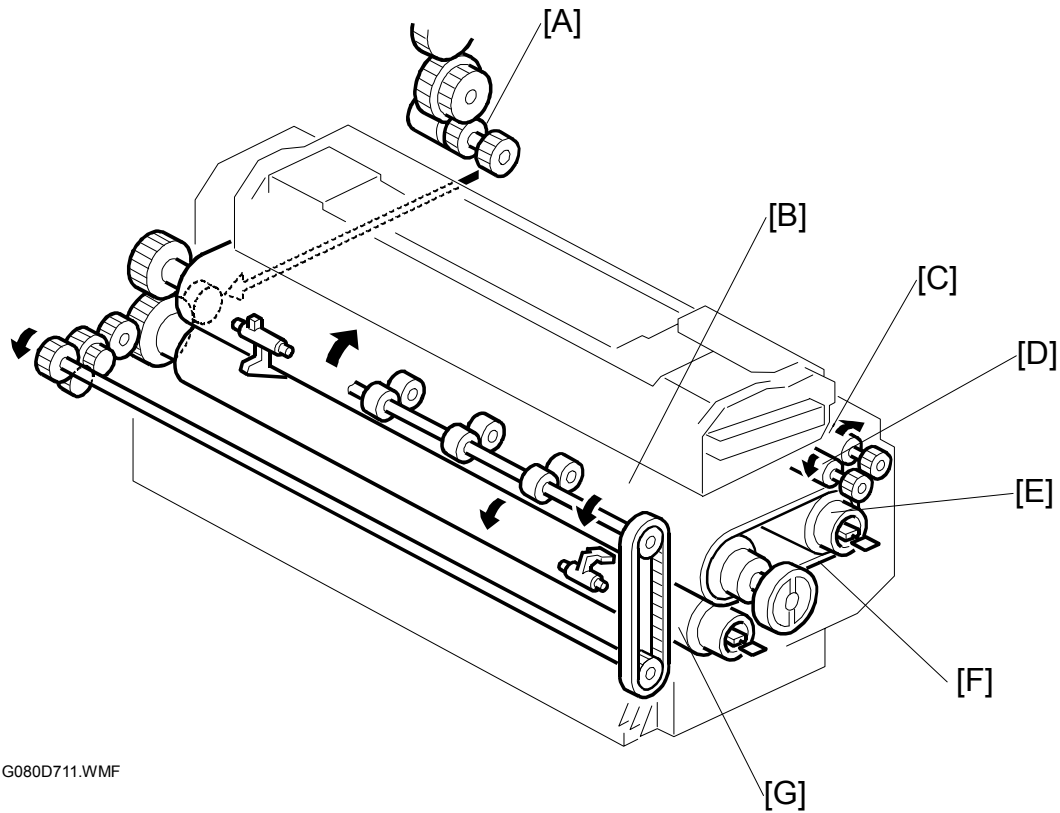
6.8.1 OVERVIEW



- | | |
|-------------------------------|---------------------------------|
| 1. Oiling roller | 9. Pressure roller thermo fuse |
| 2. Oil supply roller | 10. Pressure roller fusing lamp |
| 3. Heating roller | 11. Pressure roller |
| 4. Heating roller fusing lamp | 12. Hot roller |
| 5. Heating roller thermostat | 13. Junction gate |
| 6. Heating roller thermistor | 14. Cleaning roller |
| 7. Fusing belt | 15. Oil supply unit |
| 8. Pressure roller thermistor | |

- A belt fusing system is used. This has a faster warm-up time than a conventional hot and pressure roller system.
- The heating roller is made of aluminum to increase the temperature of the fusing belt quickly.
- The hot roller is made of sponge, which flattens slightly, also increasing the fusing nip. This roller does not contain a fusing lamp.
- Each of the heating and pressure rollers has a fusing lamp.
 - NA: 770W for the heating roller, 350W for the pressure roller
 - EU: 700W for the heating roller, 325W for the pressure roller
- The heating roller thermistor and pressure roller thermistor control the temperature of these lamps.
- Temperature is normally controlled by turning the fusing lamps on and off. To change between on/off control and phase control: SP1-104-1.
- The oil supply roller supplies oil to the fusing belt through the oiling roller. This mechanism spreads the oil on the fusing belt evenly.

6.8.2 FUSING UNIT DRIVE



G080D711.WMF

Belt and Rollers

Development drive motor-K drives the pressure roller [G], hot roller [B], oil supply roller [C], and oiling roller [D] through the gear train. The heating roller [E] is driven by the pressure with the fusing belt [F].

Fusing Clutch

The fusing clutch [A] turns off and cuts the drive power when the fusing unit does not need to operate. This mechanism prevents the belt and rollers from wearing and saves the fusing oil.

NOTE: The fusing clutch turns off when images and patterns are created on the transfer belt during process control and line position adjustment.

6.8.3 FUSING TEMPERATURE CONTROL

Fusing Temperatures

When the main switch turns on, the CPU turns on the fusing lamp. The lamp stays on until the thermistor detects the standby temperature. Then the CPU raises the temperature to the printing temperature.

The fusing temperature for each mode is as follows.



Mode	Resolution (dpi)	Temperature of Heating Roller	Temperature of Pressure Roller	Note
Energy saver level 1		100°C	130°C	
Standby mode		170°C	140°C	If SP1-104-025 is set to 4
Color	1200 x 1200	150°C	NA: 125°C EU: 130°C	
	1200 x 600 600 x 600	NA: 175°C EU: 180°C	NA: 145°C EU: 160°C	
Black and white	1200 x 1200	175°C	NA: 145°C EU: 155°C	
	1200 x 600 600 x 600	NA: 180°C EU: 180°C	NA: 150°C EU: 160°C	
OHP	All	165°C	150°C	
Thick	All	175°C	155°C	
Color (duplex)	1200 x 1200	145°C	NA: 120°C EU: 125°C	
	1200 x 600 600 x 600	NA: 165°C EU: 170°C	NA: 135°C EU: 150°C	
Black and white (duplex)	1200 x 1200	165°C	NA: 135°C EU: 145°C	
	1200 x 600 600 x 600	175°C	NA: 145°C EU: 155°C	

Detailed Descriptions

The heating and pressure roller temperatures for fusing are stored in SP1-105-4 to -28.

When the machine is switched on, the fusing lamp temperatures increase to those specified by SP1-104-25.

The print ready temperature is slightly less than the fusing temperature. The difference is specified by SP1-105-1 and -2.

Temperature Corrections

To prevent excessive glossiness caused by fusing temperature overshoot, the following SP modes are available:

- 1-913: Fusing temperature is reduced after this number of pages during the job.
- 1-914: This shows how much the temperature is reduced

If a job using OHP or thick paper starts while the fusing unit is still warm, the fusing temperature could be higher than the target for this type of paper, causing marks on the output. To prevent this problem, we have the following SP modes:

- 1-996-4, 5: These SPs specify a limit, above which printing will not start.

Overheat Protection



If the heating or pressure roller temperature becomes higher than 200°C, the CPU cuts off the power to the fusing lamp. SC543 for the heating roller or SC553 for the pressure roller is generated.

If thermistor overheat protection fails, there are the thermostat for the heating roller and two thermofuses for the pressure roller in series with the common ground line of the fusing lamp.

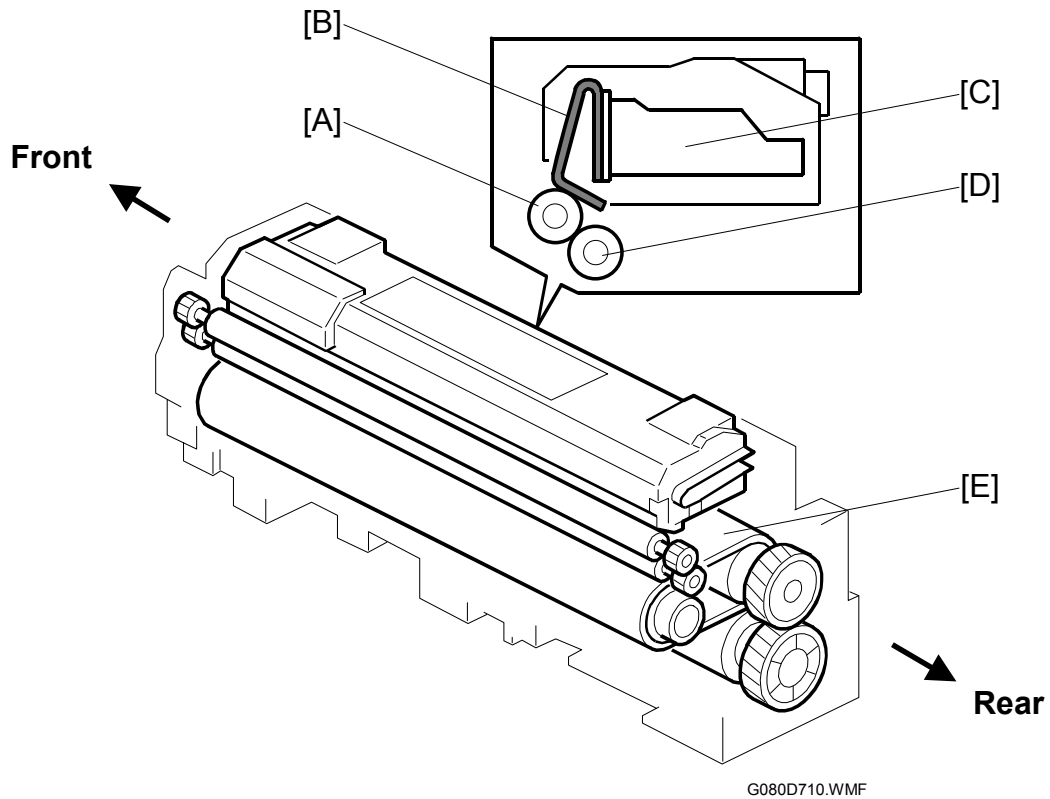
- If the thermostat temperature becomes higher than 215°C, the thermostat opens, removing power from the fusing lamp.
- If either of the two thermofuses temperature becomes higher than 126°C, the thermofuse opens, removing power from the fusing lamp.

NOTE: These thermofuses make a series circuit.

In either case, the machine stops operation.

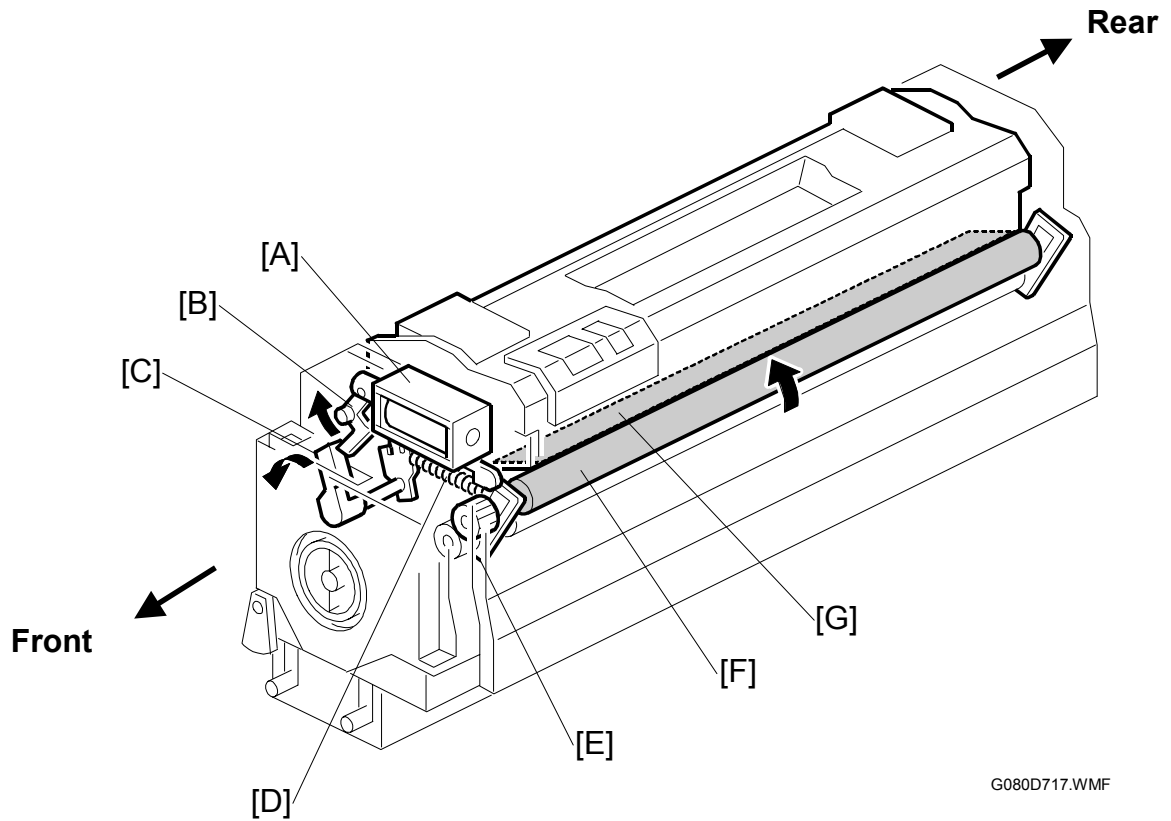
6.8.4 OIL SUPPLY AND CLEANING

Oil Supply Pad and Roller



The fusing oil makes it easier for paper to separate from the fusing belt and roller after fusing. The oil [C] from the oil supply pad [B] is supplied to the oil supply roller [A]. The oil supply roller rotates and supplies a bit of oil to the oiling roller [D]. The oiling roller applies the oil to the fusing belt [E].

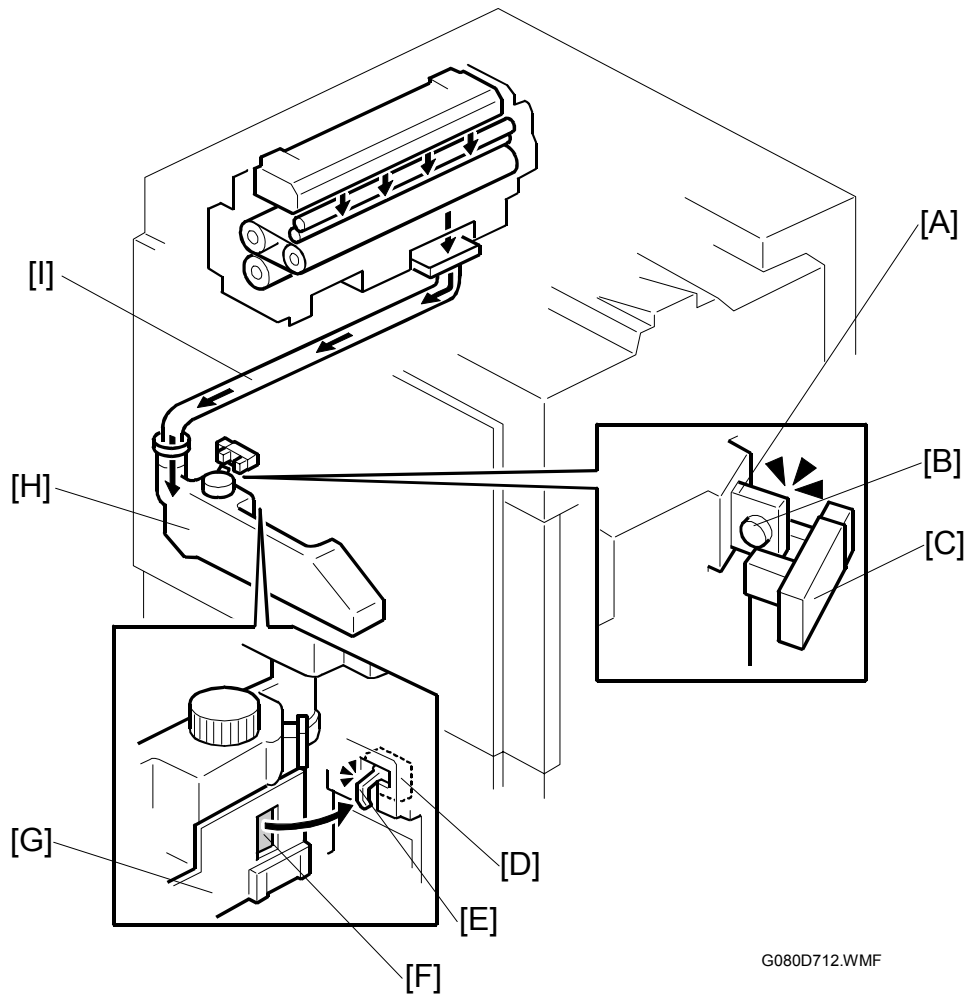
Oil Supply Mechanism



G080D717.WMF

When the solenoid [A] turns on, the solenoid lever [B] pushes the oil supply lever [C] on the fusing unit. The movement is transmitted by the link [D] and the bracket [E] to the oil supply roller [F]. The roller is lifted and touches the oil supply pad [G].

6.8.5 WASTE OIL



G080D712.WMF

Bottle Set Sensor

Excess fusing oil is collected in the waste oil bottle [H] through the pipe [I]. There is a feeler [E] behind the waste oil bottle holder [G]. The feeler is linked to the bottle set sensor [D]. The feeler is pushed when the bottle is in the holder and the holder is set in place.

- NOTE:** 1) The feeler goes through an opening [F] on the rear side of the holder. The bottle pushes the feeler directly.
2) The bottle set sensor is checked when the main switch is turned on or when the front or left door is opened and closed.

If the sensor does not detect the bottle, the message, "Reset Waste Oil Bottle correctly", is displayed. This message is cleared after the bottle is set and the front cover is closed (or the main switch is turned off and on). Just opening and closing a cover or door does not clear the message.

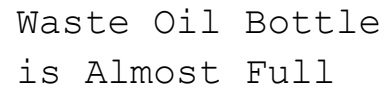
Reset Waste Oil
Bottle correctly

G080D925.WMF

Waste Oil Sensor

There is an enclosed area [A] on the rear left shoulder of the waste oil bottle. On the inside wall of this area are two pinholes, through which the waste oil can flow into the enclosed area. This enclosed area contains an actuator [B], which interrupts the waste oil sensor [C] if no oil is in the area.

When the amount of waste oil becomes large enough for the waste oil to flow into the area, the actuator floats on the oil. When the actuator leaves the waste oil sensor, the message, "Waste Oil Bottle is Almost Full," is displayed on the operation panel.

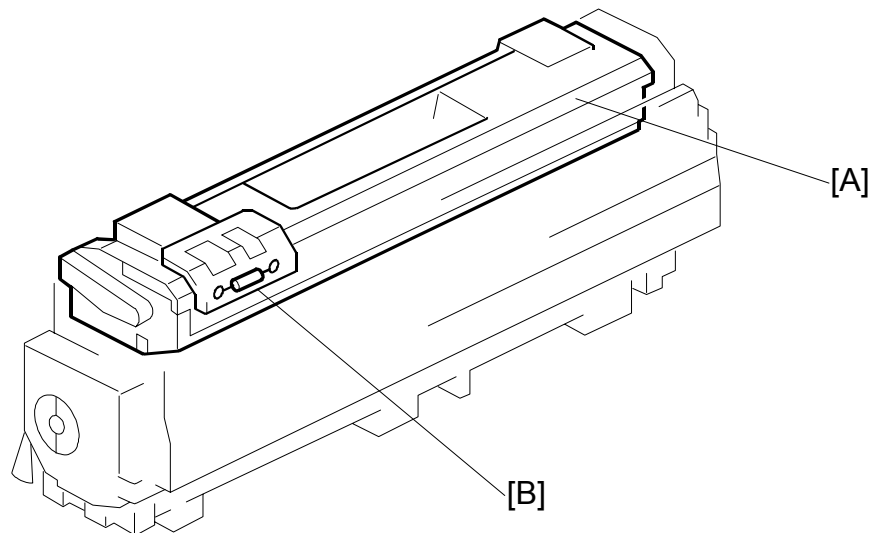


Waste Oil Bottle
is Almost Full

G080D919.WMF

After this message appears, the machine can operate until the number of rotations of development drive motor K reaches the value specified with SP7-905-010. When you dispose of the waste oil, the machine resumes its normal operations (no need to switch the machine off/on).

6.8.6 NEW FUSING OIL SUPPLY UNIT DETECTION

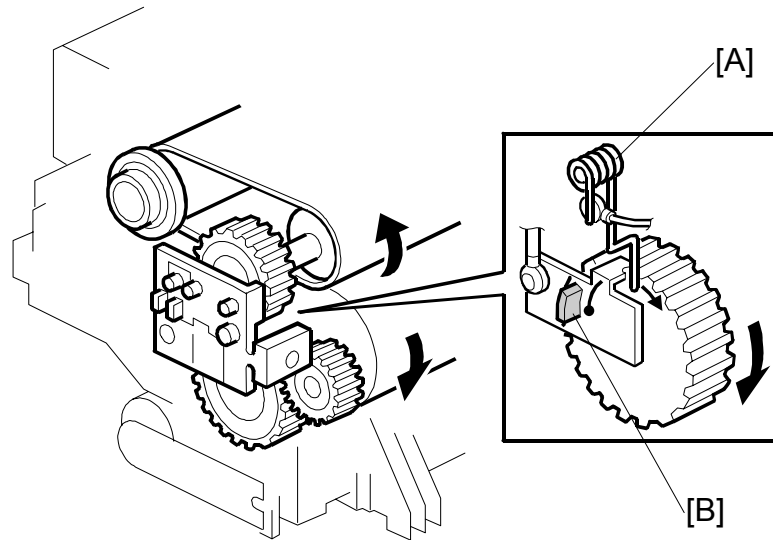


G080D507.WMF

The fusing oil supply unit [A] contains a fuse [B] in a circuit between the fusing unit and the BCU board. The fuse opens shortly after a new unit has been installed in the machine and the power is switched on. When the power is turned on or the left cover is closed, the BCU checks whether a new fusing oil supply unit is installed by checking the fuse condition. If the fusing oil supply unit has been replaced, the machine detects the new unit and automatically resets the counter for the unit.

Oil near-end is detected by counting the number of prints made. The machine indicates oil near-end 2,500 sheets before the life of the oil supply unit runs out. This timing can be changed with SP7-905-14.

6.8.7 NEW FUSING UNIT DETECTION



G080D965.WMF

The new fusing unit contains a spring [A] as part of a circuit connected to the BCU. After a new unit has been installed in the machine and the fusing pressure roller is driven for the first time, a pin [B] on the fusing pressure roller picks off the spring and the looped wire circuit opens.

When the power is turned on or the left cover is closed, the BCU checks whether the looped wire circuit is open or closed. If the fusing unit has just been replaced, the circuit is still closed, and the machine detects the new unit. It then automatically resets the counter for the unit.

The fusing unit's life is detected by counting the number of prints made. The machine indicates near-end 2,500 sheets before the life of the unit runs out. This timing can be changed with SP7-905-7.

6.8.8 ENERGY SAVER MODE

When the machine is not being used, the energy saver feature reduces power consumption by switching off the fusing lamps. This machine has two energy saver modes.

Level 1 Energy Saver Mode

The default of the level 1 energy saver mode is “Off.” If the user enables it, the level 1 energy saver mode starts 30 seconds after the machine has completed a print. In this mode, the fusing lamps are intermittently turned on and off to keep the heating roller at 100°C and pressure roller at 130°C.

The machine leaves this mode when one of the following happens:

- Print command received from a PC
- Any cover opened and closed
- Any operation panel key pressed

Level 2 Energy Saver Mode

The level 2 energy saver mode starts after the machine has been idle for a certain time. This time is specified by a user tool as listed below. During the level 2 energy saver mode, both lamps are off.

- Off (energy saver mode never activates)
- 5 minutes
- 15 minutes
- 30 minutes
- 45 minutes
- 60 minutes (default)

When the machine is in this mode, the machine turns off +24V, +12V, and +5V lines. However, only +5VE lines, for the controller and GAPCI (voltage monitoring ASIC) on the BCU, are still active.

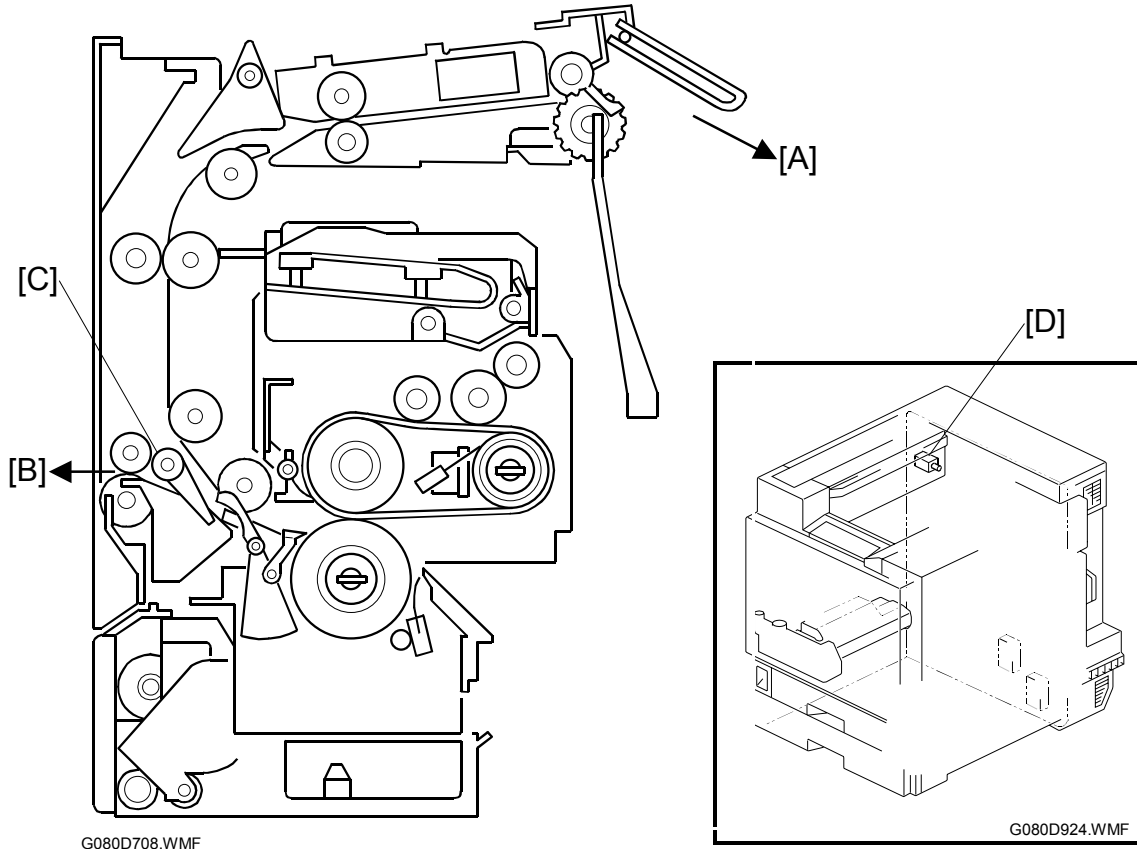
The machine leaves this energy saver mode when one of the following happens:

- Print command received from a PC
- Any operation panel key pressed

NOTE: The machine does not leave the level 2 energy saver mode when covers are opened and closed, because the CPU on the BCU is not active.

6.9 PAPER EXIT

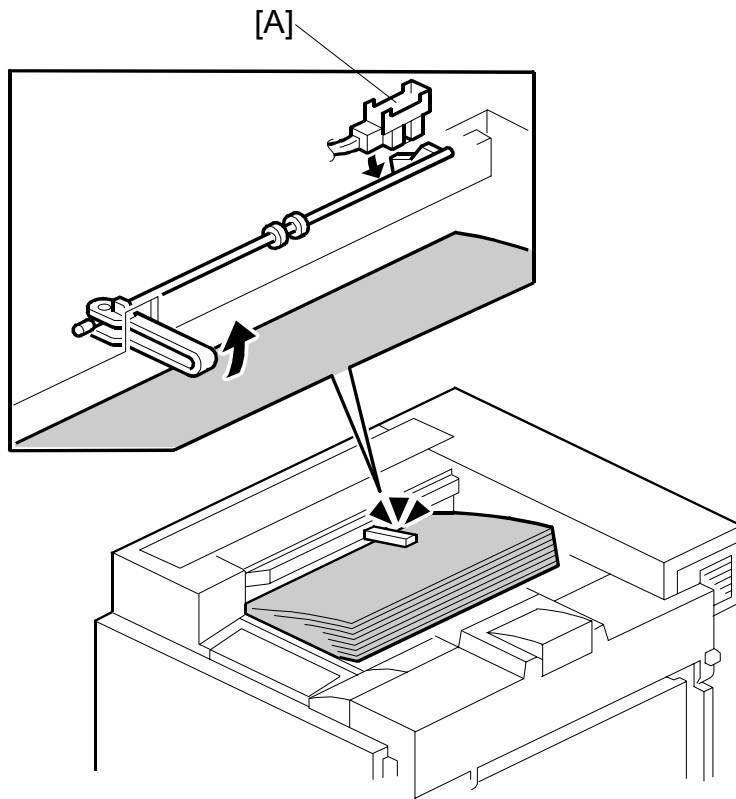
6.9.1 OVERVIEW



- [A]: To standard paper tray
- [B]: To external paper tray
- [C]: Junction gate
- [D]: Junction gate solenoid

- After fusing, the junction gate feeds paper to the standard paper tray or the external paper tray. The junction gate solenoid [D] controls the junction gate as follows:
 - To feed paper to the standard paper tray: The junction gate solenoid is off (default).
 - To feed paper to the external paper tray: The junction gate solenoid is on.
- Development drive motor-K drives the exit rollers.

6.9.2 PAPER OVERFLOW DETECTION



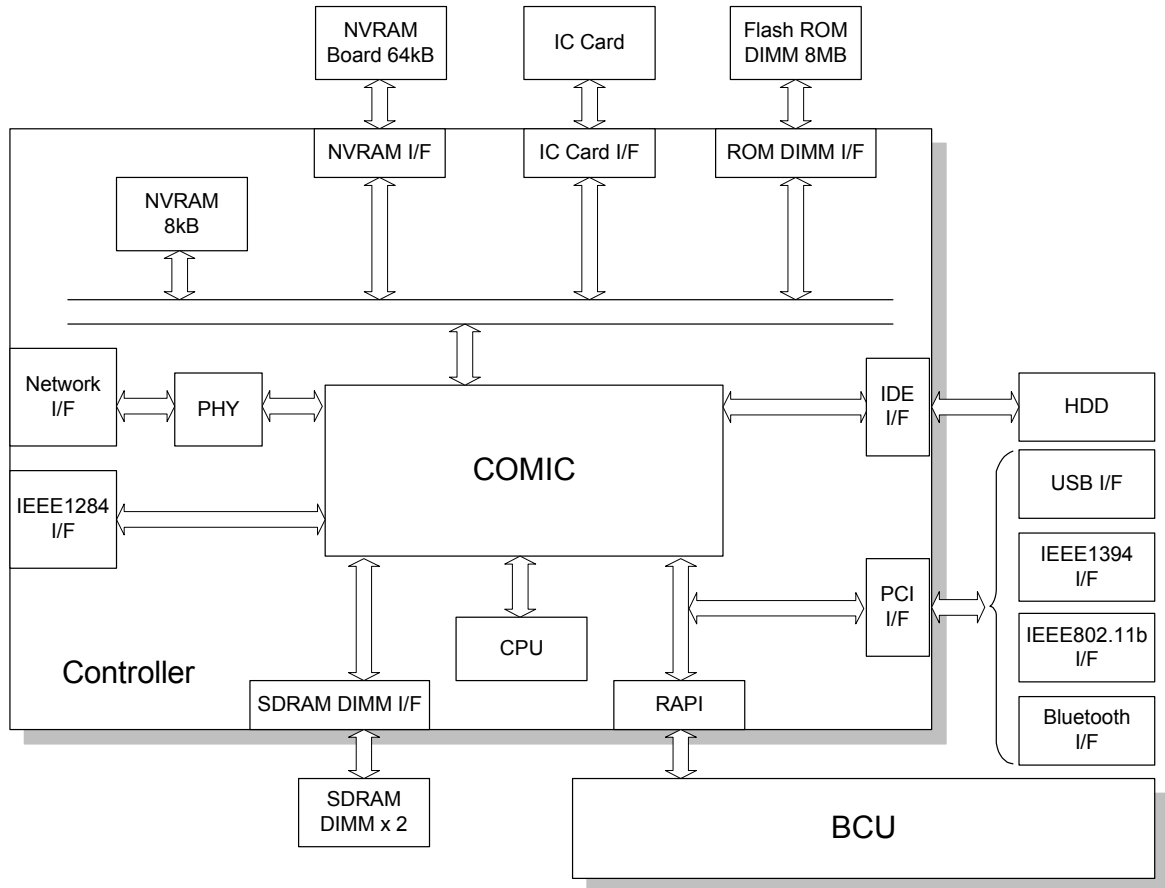
G080D966.WMF

When the paper overflow sensor [A] is activated, the machine detects that the paper stack height has exceeded a certain limit, and stops printing.

Detailed
Descriptions

6.10 CONTROLLER

6.10.1 OVERVIEW



G080D902.WMF

The controller uses GW (Grand Work) architecture.

CPU:

RM7000 (500 MHz)

COMIC (Color Model IC):

GW architecture ASIC. It uses a 122 MHz bus (64 bit) for interfacing with CPU and memory. It controls the interface with the CPU and also controls the following functions: memory, local bus, interrupts, PCI bus, video data, HDD, network, operation panel, IEEE1284, and image processing.

SDRAM DIMM (2 slots):

64 MB SDRAM (resident), expandable up to 384 MB with a 64 MB, 128 MB, or 256 MB SDRAM.

ROM DIMM (3 slots):

The DIMM installed in the machine includes 16 MB flash ROM programmed for system, printer, network, PCL5c, PS3, RPCS applications, and internal printer fonts. Currently the remaining two DIMM slots are not being used.

NVRAM:

8 kB NVRAM for storing the printer parameters and logged data

IEEE1284 Interface:

Supports compatible, nibble, and ECP modes

Network Interface:

100BASE-TX/10BASE-T

NVRAM board (option):

64 kB NVRAM used for storing a record of the number of pages printed under each "User Code."

USB Interface:

See the USB Interface section.

IEEE1394 Interface (option):

See the IEEE1394 Interface section.

IEEE 802.11b Interface (option):

See the IEEE 802.11b Interface section.

Bluetooth Interface (option):

See the Bluetooth Interface section.

HDD (option):

A 3.5" HDD (20.5 GB) can be connected using the IDE interface. The hard disk is partitioned as shown below. The sizes cannot be adjusted.

Partition	Size	Function	Comment
File System 1	500 MB	Downloaded fonts, forms.	Remain stored even after cycling power off/on.
Image TMP	9800 MB	Collation, sample print, locked print.	Commonly used area for applications, erased after power off.
Job Log	10 MB	Job log.	Remains stored even after cycling power off/on.

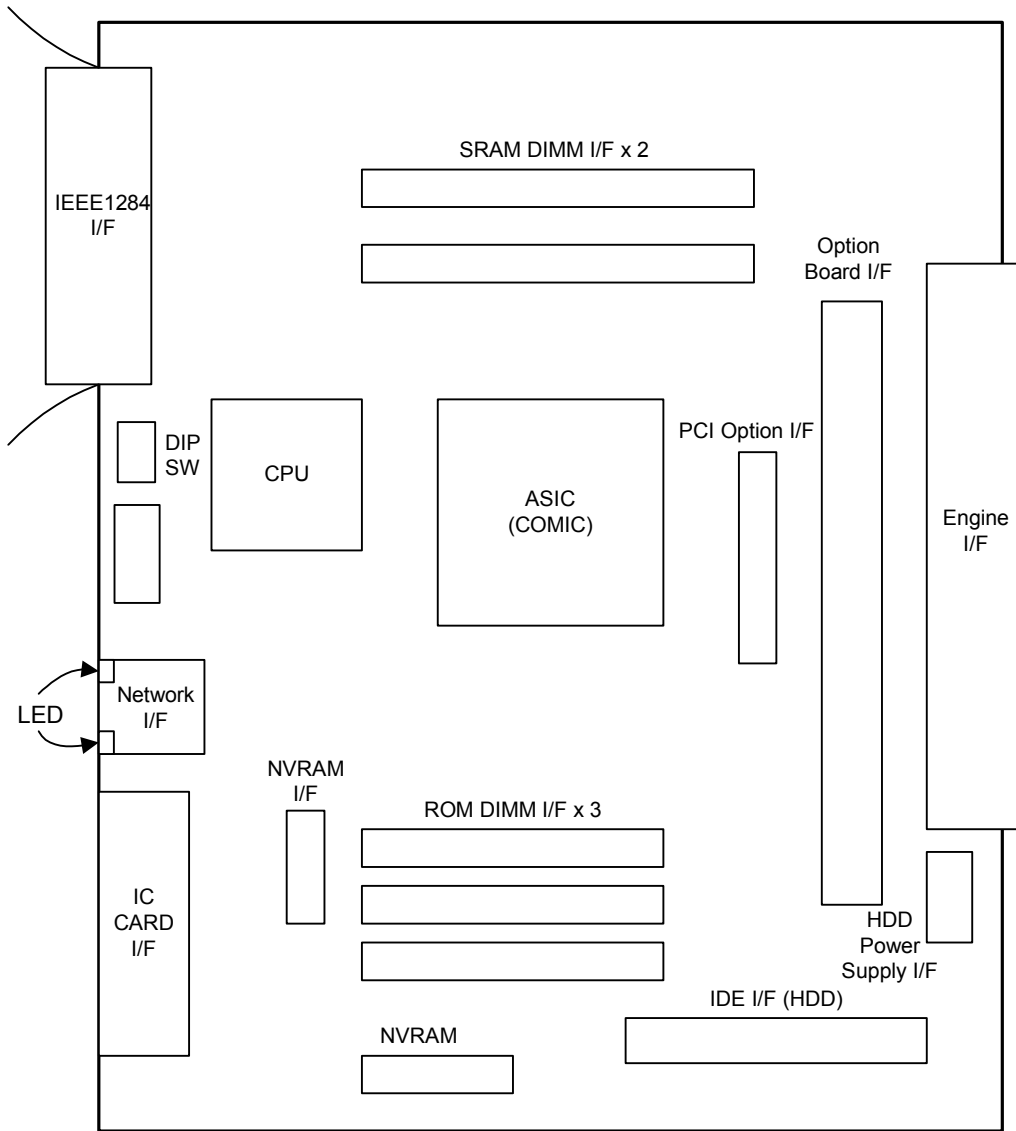
Detailed
Descriptions

The system and application software for the following boards can be downloaded from the Controller IC Card.

- Controller
- BCU (Main, MUSIC, and DSP)
- NIB

For details about downloading software from an IC card, see Service Tables – Firmware Update Procedure.

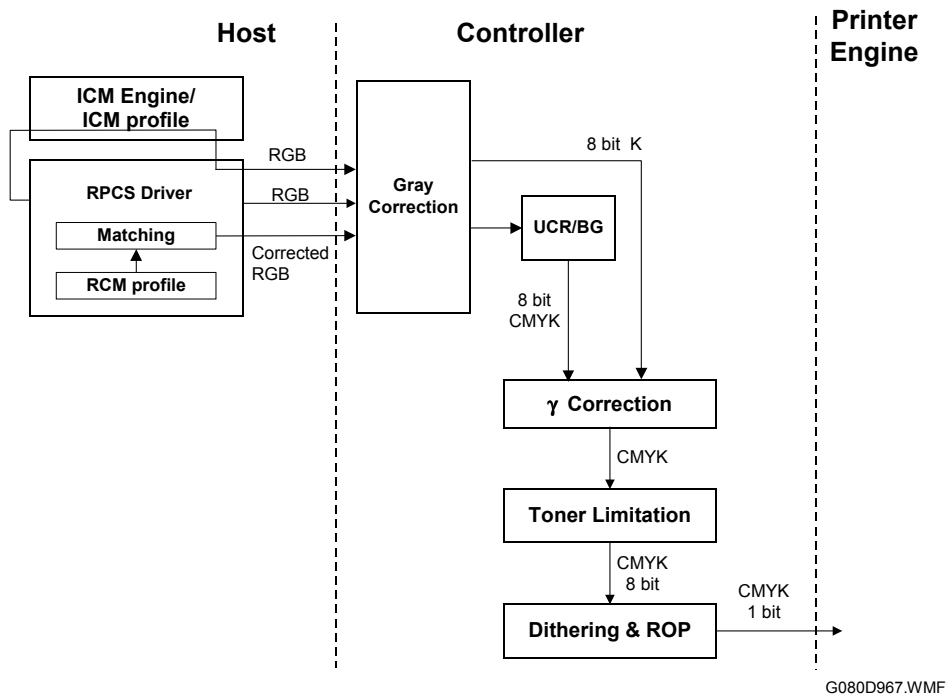
6.10.2 BOARD LAYOUT



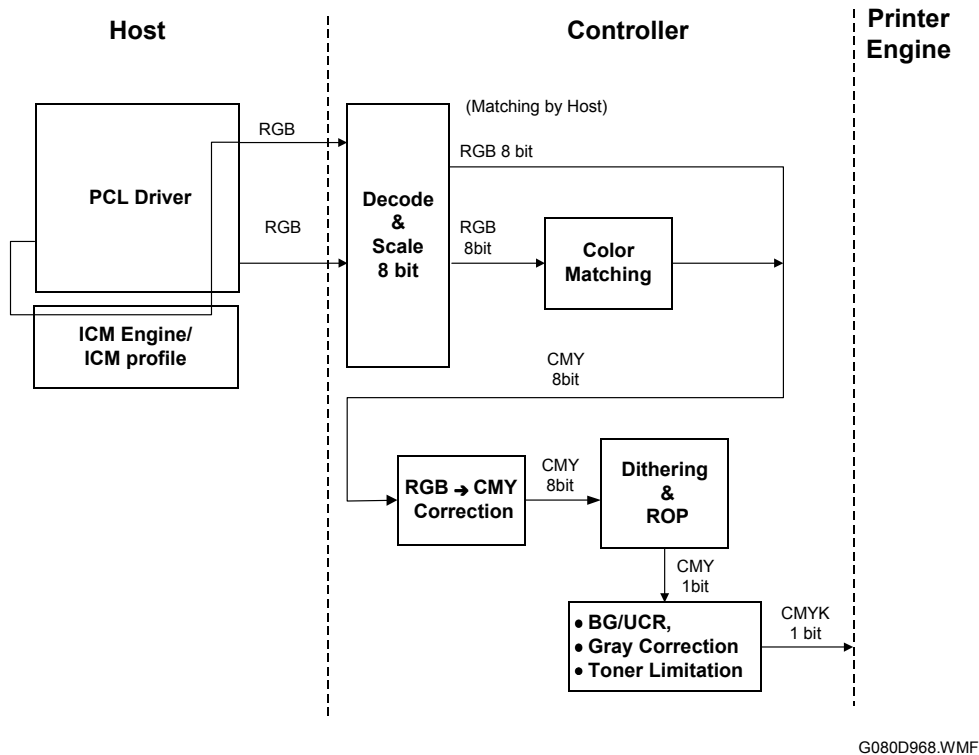
G080D904.WMF

6.10.3 PRINT DATA PROCESSING

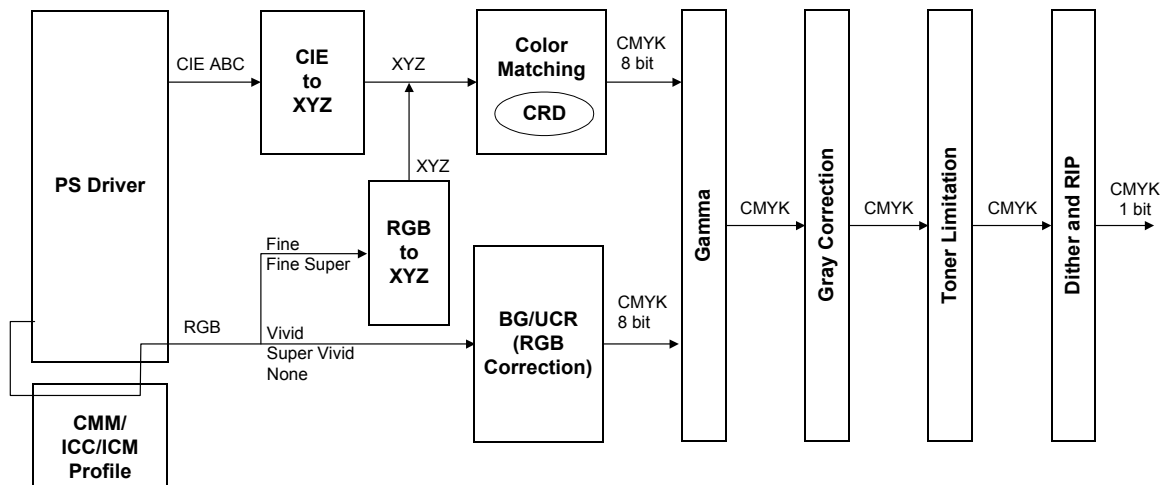
RPCS Driver



PCL5c Driver



Detailed Descriptions

PS3 Driver

G080D969.WMF

CMS (Color Management System)

CMS optimizes the color print quality using a color profile that is based on the characteristics of the printer. With RPCS, the color profile is applied by the driver. With PS3 and PCL5c, the color profile is applied in the matching/CRD module on the controller except when using CMM/ICC/ICM profiles.

CMS is not used when the color profile setting in the printer driver is set to "Off."

Gray Correction

Gray correction processes gray with the K or CMYK toner depending on the driver settings.

BG/UCR (Black Generation/Under Color Removal)

The RGB data is converted to CMYK data with BG/UCR. During CMYK conversion, some CMY data is replaced with K data by the BG/UCR algorithm.

Gamma Correction

The printer gamma can be adjusted with controller SP mode (Gamma Adj.). For CMYK, there are 15 points between 0 and 100%. The corrected gamma data is stored in NVRAM.

Toner Limitation

Toner limitation prevents toner from being scattered around text or printed lines.

Maximum values have been prepared independently for text and photo. They can be adjusted with controller SP mode (Toner Limit).

- Default: 190% for text, 260% for photo
- Adjustable range: 100% to 400%

Dither Processing and ROP/RIP

Dither patterns have been prepared for photo and text independently. Dithering converts 8-bit data to 1-bit data. However, these dither patterns create the illusion of 256 gradations for high quality prints. The optimum dither pattern is selected depending on the selected resolution.

RIP: Raster Image Processing

ROP: Raster Operation

6.10.4 CONTROLLER FUNCTIONS

Sample Print

This feature was formerly known as “Proof Print.” It requires installing an optional HDD. This function gives users a chance to check the print results before starting a multiple-set print run.

- The size of the hard disk partition for the sample print feature is 5.8 GB. This partition is also used by the collation and locked print features.
- The partition can hold up to 30 files, including files stored using locked print.
- The partition can hold a log containing up to 20 errors, excluding jobs stored using locked print.
- The maximum number of pages is 2,000, including jobs using locked print and collation.

Locked Print

This feature requires installing an optional HDD. Using this feature, the print job is stored in the machine but will not be printed until the user inputs an ID at the machine’s operation panel. This ID must match the ID that has been input with the printer driver.

- Stored data is automatically deleted after it is printed.
- Stored data can be manually deleted at the operation panel.
- The partition can hold up to 30 files, including files stored using sample print.
- The partition can hold a log containing up to 20 errors, excluding logs stored using locked print.
- The maximum number of pages is 2,000, including jobs using sample print and collation.
- Locked print uses the same hard disk partition as sample print and collation, which is 5.8 GB.

Paper Source Selection

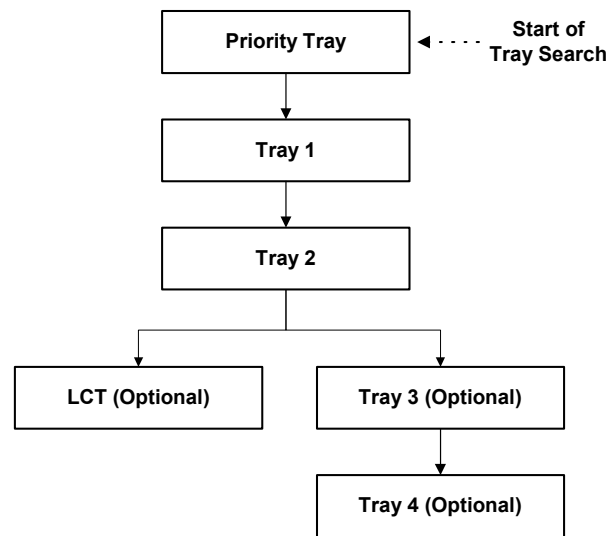
Tray Priority (Auto Tray Select)

The “Tray Priority” setting determines the start of the tray search when the user selects “Auto Tray Select” with the driver. The machine searches paper trays for the specified paper size and type.

When no tray contains paper that matches the paper size and type specified by the driver, the controller stops printing until the user loads the correct paper.

The “Tray Priority” setting can be specified in the “Paper Input” menu (Menu/ Paper Input/ Tray Priority).

NOTE: The by-pass feed table is not part of the tray search.



G080D906.WMF

Tray Locking

If “Tray Locking” is enabled for a tray, the controller skips the “locked” tray in the tray search process.

The “Tray Locking” setting can be specified in the “Paper Input” menu (Menu/ Paper Input/ Tray Locking).

NOTE: The by-pass feed table cannot be unlocked (Tray Locking is always enabled).

Manual Tray Select

If the selected tray does not have the paper size and type specified by the driver, the controller stops printing until the user loads the correct paper.

Auto Continue

Overview

When this function is enabled, the machine waits for a specified period (0, 1, 5, 10, 15 minutes) for the correct paper size and type to be set in the tray. If the timer runs out, the machine starts printing, even if there is no paper tray which matches the paper size and paper type specified by the driver.

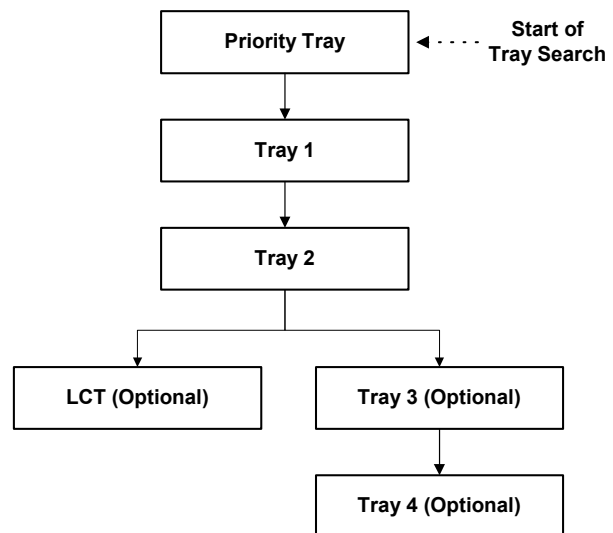
The machine searches for a paper tray in the following way:

- The interval can be set with the “System” menu in the User Tools (Menu/System/ Auto Continue).

NOTE: The default setting for this feature is “Off.”

Auto Tray Select

When there is no paper tray that matches the paper size and type specified by the driver, the machine searches for any tray that has paper, and prints from the first tray it finds. The start of the tray search is the tray selected as the priority tray.



G080D906.WMF

Manual Tray Select

The machine prints from the selected tray even if the paper size and type do not match the setting specified from the driver.

If “Auto Continue” is disabled, the machine waits until the user loads the correct paper in the tray.

Paper Output Tray

The output tray can be selected with the “Output Tray” setting in the “System” menu (Menu/ System/ Output Tray).

If a print job does not specify an output tray or if the driver specifies the default tray, the output tray selected with this user tool will be used.

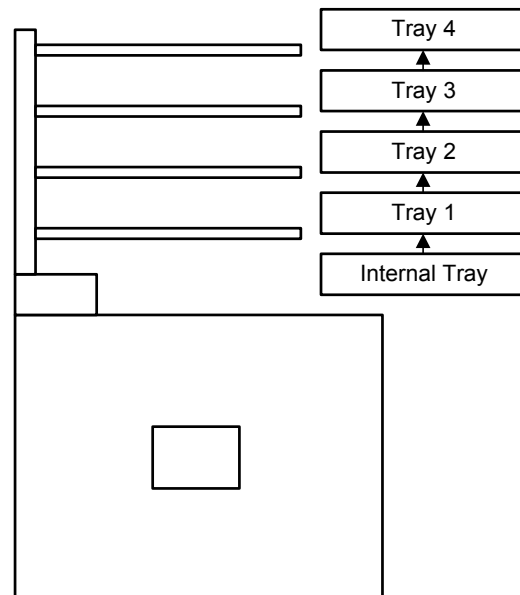
Output Tray Selected

- If the machine cannot print to the selected output tray, it prints to the default paper output tray.
- If paper overflow is detected at the selected output tray, the controller stops printing until the overflow detector goes off.

Sequential Stacking

When the 4-bin mailbox is installed, “Auto Tray SW” is selected as the output tray in the “System” menu, and “Printer Default” is specified as the output tray in the driver, the machine automatically sends the output to the lowest tray. When that tray fills up, the machine sends the output to the second lowest tray. When that tray also fills up, the machine sends the output to the third lowest tray sequentially. This feature is called “Sequential Stacking.”

- If a tray becomes full and paper is detected on the next tray, the machine displays an error and stops printing. When paper on the next tray is removed, the machine automatically resumes printing to the next tray.
- If all trays become full (overflow detected in all trays), the machine displays an error and stops printing. This time, all paper in all trays must be removed.

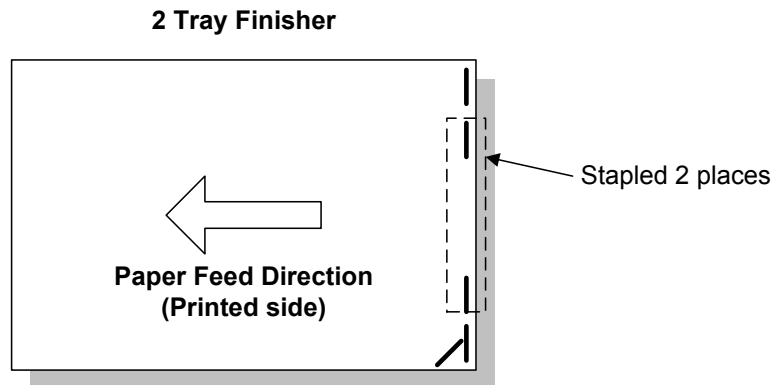


G080D970.WMF

Detailed
Descriptions

Stapling

Stapling is available when the two-tray finisher is installed. The finisher has the following stapling positions.



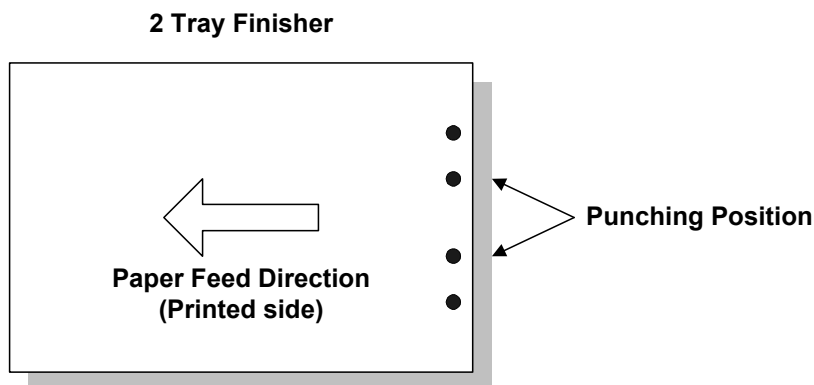
G080D971.WMF

- Depending on the paper orientation, the image may have to be rotated. The driver rotates the image. If the paper cannot be physically stapled as specified by the driver, it will not be stapled.
- There is a limit for the number of sheets which can be stapled. If a job has more than this number, it will not be stapled.
 For A3, 11" x 17", 8 1/2" x 14" paper: 30 sheets
 For 8 1/2" x 11", A4, B5 paper: 50 sheets

Punching

Punching is available only when the punch kit is installed with the two-tray finisher. The number of holes (2, 3, or 4 holes) depends on the type of punch kit.

- There is only one punch position available, so the relationship between the punching position and the printed image depends on the paper feed orientation and image rotation.



G080D972.WMF

6.11 HARD DISK

A 20GB hard disk is only used for printer functions. A 40GB hard disk is provided as an option for the copier feature expander. The hard disks are partitioned as listed in the table.



Partition	40GB HDD	20GB HDD	Function	Comment
Image Local Storage	17,700 MB	---	Document server	Remains stored even after cycling power off/on.
File System 1	500 MB	500 MB	Downloaded fonts, forms.	Remains stored even after cycling power off/on.
File System 2	1,000 MB	1,000 MB	Job spooling area	Erased after power off.
File System 3	2,000 MB	2,000 MB	Work data area	Remains stored even after cycling power off/on.
Image TMP	7,486 MB	7,486 MB	Commonly used area for applications	Erased after power off.
	7,200 MB	---	Copier application	Erased after power off.
	3,440 MB	3,440 MB	Printer application	Erased after power off.
	1,000 MB	---	Scanner application	Erased after power off.
Job Log	10 MB	10 MB	Job log	Remains stored even after cycling power off/on.

6.12 IEEE1394 INTERFACE

6.12.1 SPECIFICATIONS

Hardware Specification

Interface: IEEE1394 (6 pins)
 (non-power supply, cable power repeated-IEEE1394a-2000 compliant)
 Ports: 2 ports
 Data rates: 400Mbps/200Mbps/100Mbps

System Requirements

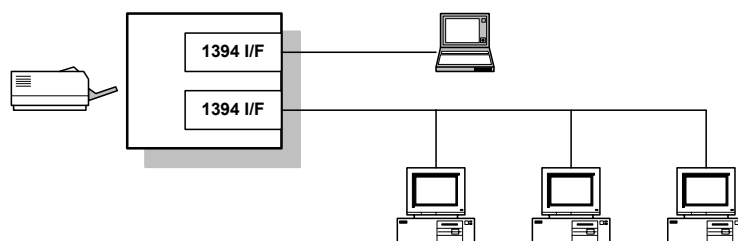
PC: IBM PC/AT with IEEE1394 port
 OS: MS Windows 2000 upgraded with service pack 1
 Cable length: 4.5m (15ft)

6.12.2 IEEE1394 SCSI PRINT

IEEE1394, also known as FireWire (a name patented by Apple), is an easy-to-use peer-to-peer networking technology allowing speeds of up to 400 Mbps.

The current standard contains the following features, which are supported in most devices:

- Hot swapping (cables can be connected and disconnected while the computer and other devices are switched on)
- Peer-to-peer networking (no hub required)
- No terminator or device ID is required, unlike SCSI
- Automatic configuration of devices upon start-up, or “plug and play.”
- Real-time data transfer at 100, 200, and 400 Mbps
- Common connectors for different devices

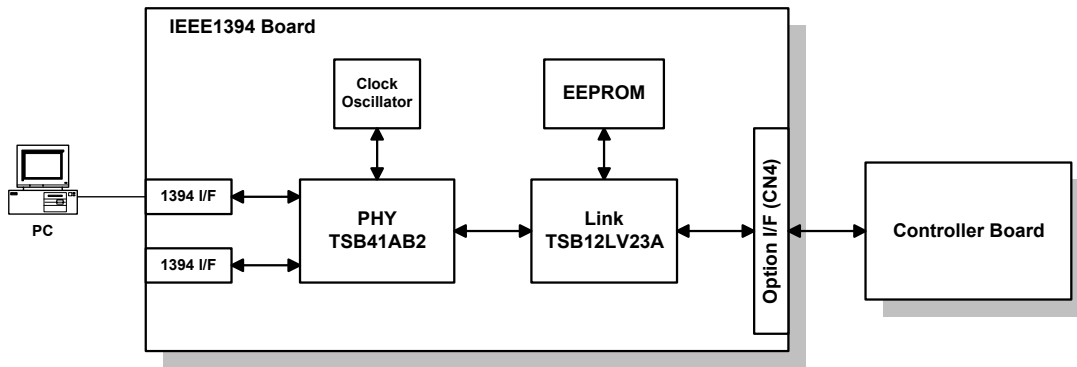


G080D973.WMF

The cable length is limited to 4.5 m (15ft). However, up to 16 cables and 63 devices can be connected to an IEEE1394 network.

IEEE1394 cables can be either 4-pin (data only) or 6-pin (data and power). IEEE1394 allows either 6-pin or 4-pin connectors. However, this machine only uses the 6-pin connectors. The machine has two 6-pin ports.

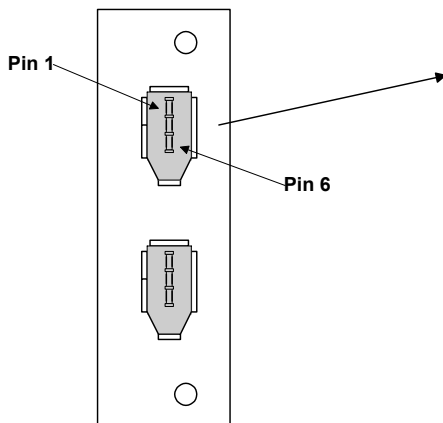
6.12.3 BLOCK DIAGRAM



G080D974.WMF

- PHY: Physical layer control device
- Link: Link layer control device
- EEPROM: 256-byte ROM

6.12.4 PIN ASSIGNMENT



G080D975.WMF

Pin assignment	
Pin 1	Pin 4
Pin 2	Pin 3
Pin 5	Pin 6

Pin No.	Signal Description
1	Cable Power
2	GND
3	Receive strobe
4	Transmit data
5	Receive data
6	Transmit strobe

Detailed Descriptions

6.12.5 REMARKS

Note the following points about this unit.

- The machine does not print reports specifically for IEEE1394. Print the Configuration Page during installation to check that the machine recognizes the card.
- There is no spooler or print queue. If a computer tries to print over the IEEE1394 while the printer is busy, the IEEE1394 interface card inside the printer will return a busy signal.
- After starting a job using IEEE1394, do not switch the printer off until the job has been completed. Although the printer may appear to be inactive, it may be in the middle of an IEEE1394 protocol exchange with the computer.
- When using IEEE1394, it is not possible to check the printer status from the computer with a utility such as Printer Manager for Client.

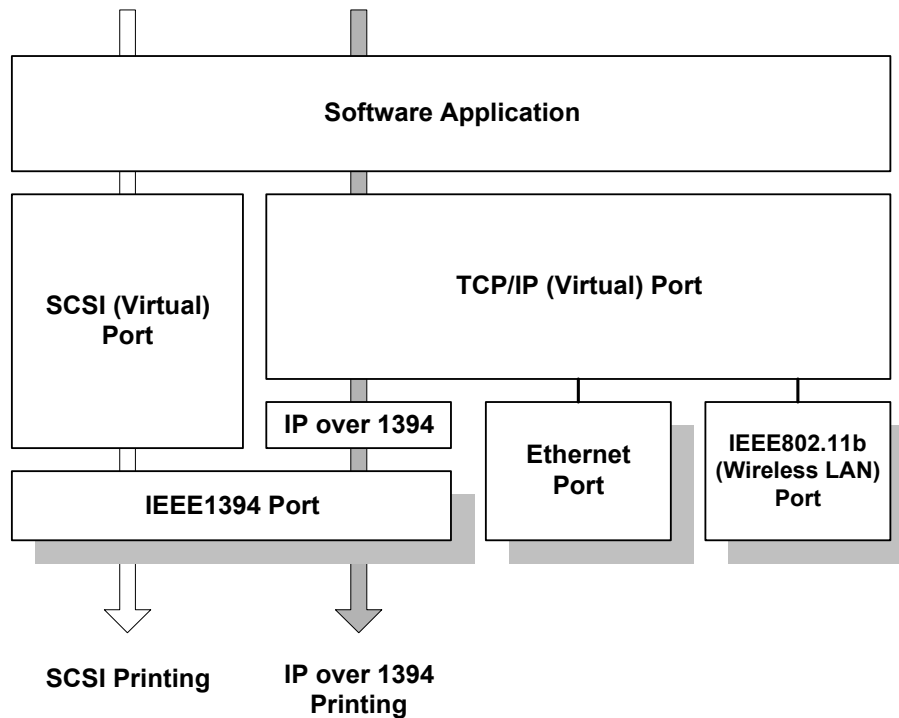
6.12.6 TROUBLESHOOTING NOTES

If there are problems printing using the IEEE1394 interface, check the following.

- Is the computer using Windows 2000 with service pack 1?
- Has the interface card been replaced recently? Each card has an individual address, similar to the MAC address in an Ethernet card. If the card was changed, the driver still looks for the old card. The new card is considered as another device and a new printer appears in Windows Control panel. The new card must be configured in the same way as the printer that was replaced (the old printer icon in Windows Control Panel should be deleted).
- Is there a loop somewhere in the network? An IEEE1394 network must be a chain or a branched chain. There can be no loops.
- Try to find out where in the chain the problem is occurring. Test the machine one-to-one with the computer to determine if the printer is defective (when the printer's interface cable is plugged in, the computer should see "Printer Ready"; when the cable is disconnected, the computer should see "Offline").

6.12.7 IP OVER 1394

In addition to IEEE1394 printing, this machine supports IEEE1394 printing by setting an IP address. This feature is called "IP over 1394." The former IEEE1394 printing without IP address is known as "SCSI printing."



G080D976.WMF

- NOTE:** 1) Windows XP is the only OS which supports IP over 1394. (Windows ME can also be used in combination with the SmartNet Monitor.)
- 2) Windows XP and 2000 supports IEEE1394 SCSI printing.

6.13 IEEE802.11B (WIRELESS LAN)

6.13.1 SPECIFICATIONS

A wireless LAN is a flexible data communication system used to extend or replace a wired LAN. Wireless LAN employs radio frequency technology to transmit and receive data over the air and minimize the need for wired connections.

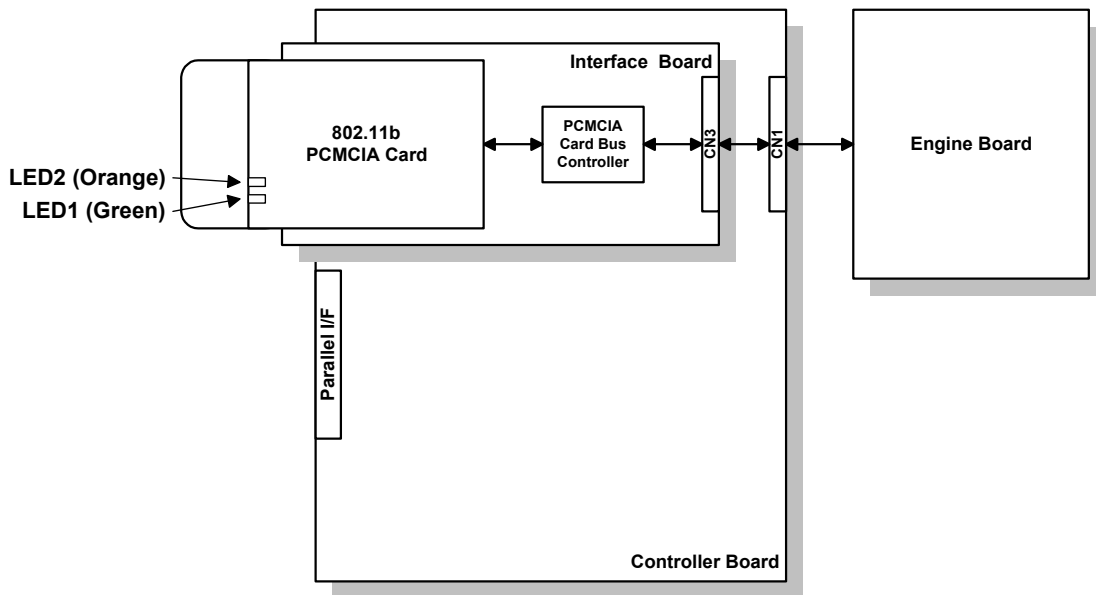
- With wireless LANs, users can access information on a network without looking for a place to plug into the network.
- Network managers can set up or expand networks without installing or moving wires.
- Most wireless LANs can be integrated into existing wired networks. Once installed, the network treats wireless nodes like any other physically wired network component.
- Flexibility and mobility make wireless LANs both effective extensions of and attractive alternatives to wired networks.

Standard applied: IEEE802.11b
Data transfer rates: 11 Mbps/5.5 Mbps/2 Mbps/1 Mbps (auto sense)
Network protocols: TCP/IP, Apple Talk, NetBEUI, IPX/SPX

Bandwidth: 2.4GHz
(divided over 14 channels, 2400 to 2497 MHz for each channel)

NOTE: The wireless LAN cannot be active at the same time as the Ethernet. The “LAN Type” setting in the Host Interface menu determines which LAN interface will be used.

6.13.2 BLOCK DIAGRAM



G080D977.WMF

LED Indicators

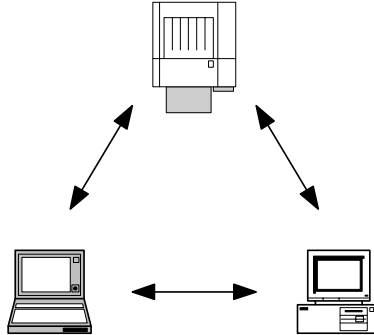
LED	DESCRIPTION	ON	OFF
LED1 (Green)	Link status	Link success	Link failure
LED2 (Orange)	Power distribution	Power on	Power off

Detailed Descriptions

6.13.3 TRANSMISSION MODE

The following transmission modes are provided for wireless communication.

Ad Hoc Mode



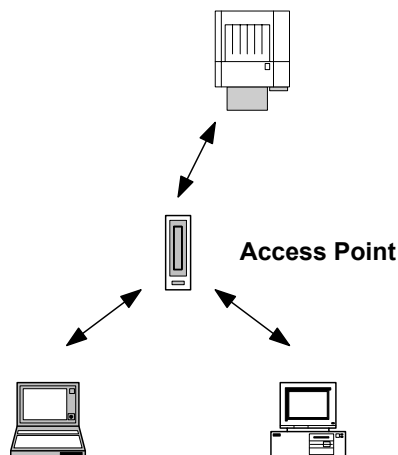
G080D978.WMF

Ad hoc mode allows communication between each device (station) in a simple peer-to-peer network. In this mode, all devices must use the same channel to communicate.

In this machine, the default transmission mode is ad hoc mode and the default channel is 11. First, set up the machine in ad hoc mode and program the necessary settings, even if the machine will be used in the infrastructure mode.

To switch between ad hoc and infrastructure modes, use the following user tool:
Host Interface Menu - IEEE802.11b - Comm Mode

Infrastructure Mode



G080D979.WMF

The infrastructure mode allows communication between each computer and the printer via an access point equipped with an antenna and wired into the network. This arrangement is used for topologies that are more complex.

- The wireless LAN client must use the same SSID (Service Set ID) as the access point in order to communicate.

6.13.4 SECURITY FEATURES

SSID (Service Set ID)

The SSID is used by the access point to recognize the client and allow access to the network. Only clients that share the same SSID with the access point can access the network.

NOTE: The SSID can be set using the web status monitor or telnet

Using the SSID in Ad hoc mode

When the SSID is used in ad hoc mode and nothing is set, the machine automatically uses "ASSID" as the SSID. In such a case, "ASSID" must also be set at the client.

NOTE: SSID in ad hoc mode is sometimes called "Network Name" in some devices.

Some devices automatically change from ad hoc mode to infrastructure mode when the same SSID is used in ad hoc mode and infrastructure mode. In such a case, to use the device in ad hoc mode, use a specified SSID in infrastructure mode and use "ASSID" in the ad hoc mode.

WEP (Wired Equivalent Privacy)

WEP is a coding system designed to protect wireless data transmission. In order to unlock encoded data, the same WEP key is required on the receiving side. There are 64 bit and 128 bit WEP keys. This machine supports both 64 and 128 bit WEP.

NOTE: The WEP key can be set using the web status monitor or telnet.

MAC Address

If the infrastructure mode is used, access to the network can also be limited at the access points using the MAC address. This setting may not be available with some types of access points.

6.13.5 TROUBLESHOOTING NOTES

Communication Status

Wireless LAN communication status can be checked with the UP mode “W.LAN Signal” in the Maintenance menu. This can also be checked using the Web Status Monitor or Telnet.

The status is described on a simple number scale.

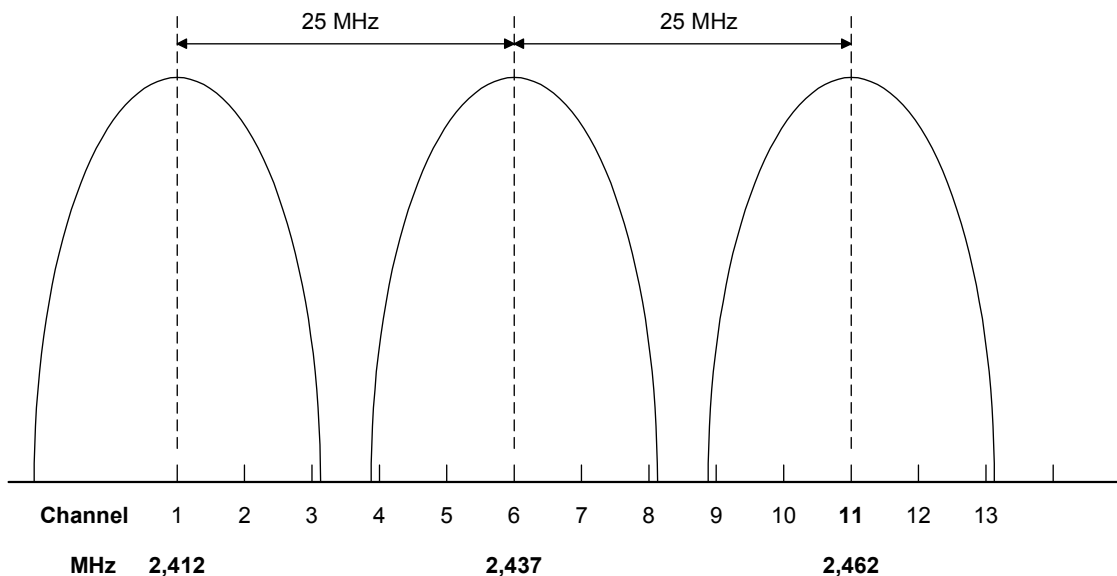
STATUS DISPLAY	COMMUNICATION STATUS
Good	76~100
Fair	41~75
Poor	21~40
Unavailable	0~20

NOTE: Communication status can be measured only when the infrastructure mode is being used.

Channel Settings

If a communication error occurs because of electrical noise such as interference with other electrical devices, etc., you may have to change the channel settings.

To avoid interference with neighboring channels, a separation of 3 channels is recommended. For example, if there are problems using channel 11 (default), try using channel 8.



G080D980.WMF

Troubleshooting steps

If there are problems using the wireless LAN, check the following.

- 1) Check the LED indicator on the wireless LAN card.
- 2) Check if "IEEE802.11b" is selected in the UP mode LAN Type in Network Setup in the Host Interface menu.
- 3) Check if the channel settings are correct.
- 4) Check if the SSID and WEP are correctly set.

If infrastructure mode is being used,

- 1) Check if the MAC address is properly set
- 2) Check the communication status.

If the communication status is poor, bring the machine closer to the access point. Additionally check for any obstructions between the machine and the access point. If the problem cannot be solved, try changing the channel setting.

6.14 BLUETOOTH (WIRELESS)

6.14.1 SPECIFICATIONS

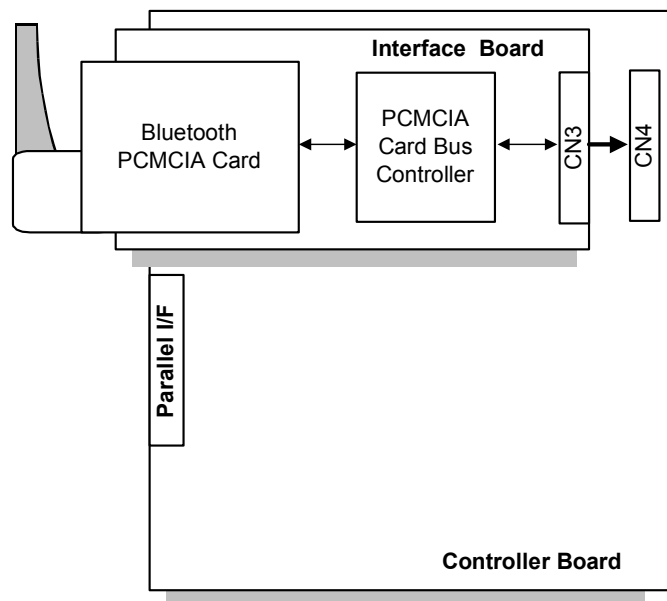
Bluetooth wireless provides radio links between mobile computers, mobile phones and other portable handheld devices.

Bluetooth contains the following features.

- Cheaper compared to the IEEE802.11b wireless LAN.
- Many protocols for infrared transmission (IrDA) can be used with Bluetooth.
- A Bluetooth device can connect to other Bluetooth devices without any settings.

Standard applied: Bluetooth 1.1 (Bluetooth Special Interest Group)
 Data transfer rates: 1 Mbps
 Bandwidth: 2.4GHz Frequency Hopping Spread Spectrum (FHSS)

6.14.2 BLOCK DIAGRAM



G080D981.WMF

6.14.3 COMMUNICATION USING BLUETOOTH

Piconet

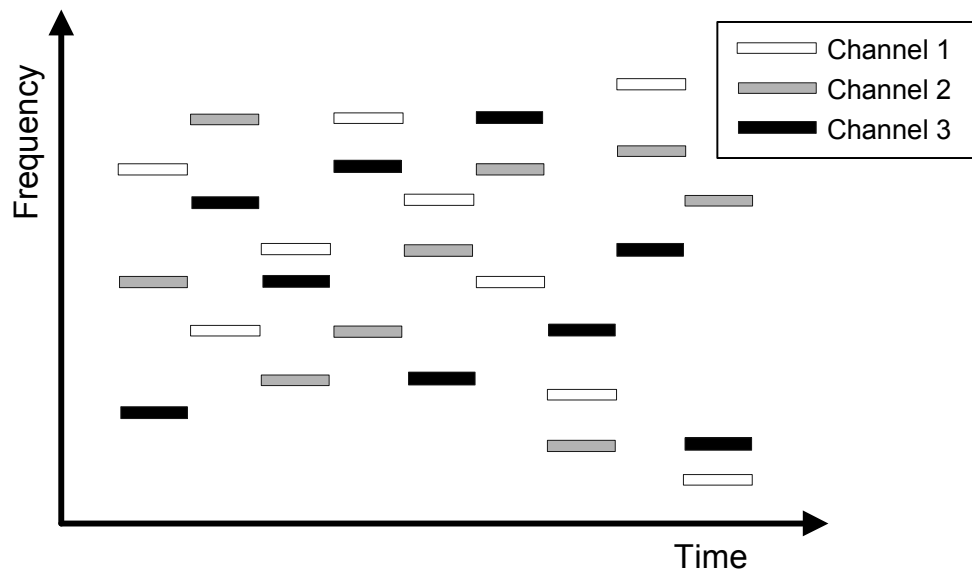
Bluetooth devices communicate with each other in the ad hoc mode. This network is called the "Piconet." The Piconet may contain a maximum of 8 Bluetooth devices.

There is one master device and can be seven slave devices in the Piconet. The master device controls the hopping frequency and timing, as well as storing the ID codes of the slave devices. The master and one of the slave devices can be swapped. Once the master device leaves the Piconet, a slave device becomes the new master.

Machines with the Bluetooth option are potential slave devices to connect to a PC.

Frequency Hopping Spread Spectrum (FHSS)

The Bluetooth device divides the band ranging from 2,402 to 2,480 MHz into 79 channels of the 1-MHz width, and changes the channel 1,600 times per second. The Bluetooth device can avoid interference from other Bluetooth devices in the LAN while they are using the same radio band.



Detailed
Descriptions

G080D903.WMF

Profiles

A Bluetooth device will not operate if it is close to another Bluetooth device. However, Bluetooth devices should support the protocols to communicate with each other. There are many types of Bluetooth and service protocols. These are listed below.

Here are 14 profiles for Bluetooth:

- Generic Access Profile
- Service Discovery Profile
- Cordless Telephony Profile
- Intercom Profile
- Serial Port Profile
- Headset Profile
- Dial-up Networking Profile
- Fax Profile
- LAN Access Profile
- Generic Object Exchange Profile
- Object Push Profile
- File Transfer Profile
- Synchronization Profile
- Hardcopy Cable Replacement Profile
- Basic Imaging Profile

The Serial Port Profile (SPP) and the Hardcopy Cable Replacement Profile (HCRP) are used for the printer products. SPP is used in place of the serial port, while HCRP is used in place of the parallel port.

This machine needs Adobe PS3 to use the Basic Imaging Profile (BIP).

6.14.4 SECURITY FEATURES

Public and Private Mode

The PC can browse Bluetooth devices. The machine's default is public mode. The PC cannot browse the machine if it has been changed to private mode.

PIN Code (Personal Identification Number)

When the PIN code is used, the PC connects to the device that sent the PIN code.

The PIN code is a 4-digit number. This machine uses the last four digits of the machine's serial number. It cannot be changed.

6.15 USB

6.15.1 SPECIFICATIONS



Data rates: 480 Mbps (high speed), 12 Mbps (full speed), 1.5 Mbps (low speed); High-speed mode is only supported by USB 2.0.

6.15.2 USB 1.1/2.0

USB (Universal Serial Bus) offers simple connectivity for computers, printers, keyboards, and other peripherals. In a USB environment, terminators, device IDs (like SCSI), and DIP switch settings are not necessary.

USB 1.1 contains the following features:

- Plug & Play
- Hot swapping (cables can be connected and disconnected while the computer and other devices are switched on)
- No terminator or device ID required
- Data rates of 12 Mbps (full speed), and 1.5 Mbps (low speed)
- Common connectors for different devices

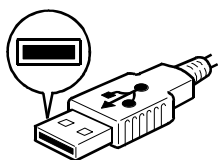
USB 2.0 is a successor to the USB 1.1 specification. It uses the same cables, connectors, and software interfaces. It provides an easy-to-use connection to a wide range of products with a maximum data rate of 480 Mbps (high speed).

Up to 127 devices can be connected and six cascade connections are allowed. Power is supplied from the computer, and the maximum cable length is 5 m.

6.15.3 USB CONNECTORS

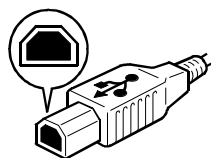
USB is a serial protocol and a physical link transmitting all data on a single pair of wires. Another pair provides power to downstream peripherals.

The USB standard specifies two types of connectors, type “A” connectors for upstream connection to the host system, and type “B” connectors for downstream connection to the USB device.



G080D983.WMF

Type “A” connector



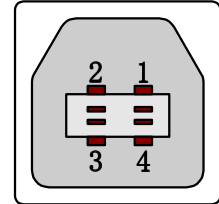
G080D982.WMF

Type “B” connector

6.15.4 PIN ASSIGNMENT

The controller has a type “B” receptacle (CN10).

Pin No.	Signal Description	Wiring Assignment
1	Power	Red
2	Data –	White
3	Data +	Green
4	Power GND	White



G080D985.WMF

6.15.5 REMARKS

- The machine does not print reports specifically for USB.
- Only one host computer is allowed for the USB connection.
- After starting a job using USB, do not switch the printer off until the job has been completed.

When a user cancels a print job and data transmitted to the printer has not been printed at the time of cancellation, the job will continue to print up to the page where the print job was cancelled

- When the controller board is replaced, the host computer will recognize the machine as a different device.

Related SP Mode

“USB Settings” in the printer engine service mode. Data rates can be adjusted to full speed fixed (12 Mbps). This switch may be used for troubleshooting if there is a data transfer error using the high-speed mode (480 Mbps).

Data rates can also be adjusted using the UP mode “USB Setting” in the Host Interface in the System menu.

This mode can be accessed only when the “Enter”, “Escape”, then “Menu” keys are pressed to enter the UP mode.

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Configuration: Desktop

Print Process: Dry electrostatic transfer system

Printer Languages: PCL5c
 Adobe PostScript 3
 RPCS (Refined Printing Command Stream)

Resolution: PCL5c:
 600 x 600 dpi, 300 x 300 dpi
 Adobe PostScript 3:
 1200 x 1200 dpi, 1200 x 600 dpi, 600 x 600 dpi
 RPCS:
 1200 x 1200 dpi, 1200 x 600 dpi, 600 x 600 dpi

Gradation 1 bit/pixel

Printing speed:

	Resolution	Plain paper	Thick/OHP
Monochrome	600 x 600 dpi	38 ppm	10 ppm
	1200 x 600 dpi	38 ppm	10 ppm
	1200 x 1200 dpi	28 ppm	10 ppm
Color	600 x 600 dpi	28 ppm	10 ppm
	1200 x 600 dpi	28 ppm	10 ppm
	1200 x 1200 dpi	14 ppm	10 ppm

Resident Fonts: PCL5c:
 35 Intelli fonts
 10 TrueType fonts
 1 bitmap font
 Adobe PostScript 3:
 136 fonts (24 Type 2 fonts, 112 Type 14 fonts)

Host Interfaces: Bi-directional IEEE1284 parallel x 1 Standard
 Ethernet (100 Base-TX/10 Base-T)..... Standard
 USB..... Optional
 IEEE1394..... Optional
 IEEE802.11b (Wireless LAN)..... Optional
 Bluetooth (Wireless)..... Optional

Network Protocols: TCP/IP, IPX/SPX, NetBEUI, AppleTalk

First Print Speed: Color: 9 seconds or less (from tray 1)
 Monochrome: 7 seconds or less (from tray 1)

Warm-up Time Less than 99 seconds (at 23°C/50%)



Print Paper Capacity: Standard tray: 500 sheets x 2
 (80 g/m², 20 lb) By-pass tray: 100 sheets
 Optional paper feed tray: 500 sheets x 1, 500 sheets x 2,
 Optional LCT: 2000 sheets

Print Paper Size: (Refer to "Supported Paper Sizes".)

	Minimum	Maximum
Tray 1	A4/8 1/2" x 11" (LEF)	
Tray 2	A5 (LEF)/8 1/2" x 11"	A3/11" x 17"
By-pass	90 x 148 mm	305 x 458 mm/12" x 18"
Optional Tray	A5 (LEF)/8 1/2" x 11"	A3/11" x 17"
LCT	A4/8 1/2" x 11" (LEF)	

Printing Paper Weight: Standard tray: 60 to 105 g/m² (16 to 28 lb.)
 Optional paper tray: 60 to 105 g/m² (16 to 28 lb.)
 By-pass tray: 60 to 163 g/m² (16 to 43 lb.)

Output Paper Capacity: Standard exit tray: 500 sheets (face down)
 External exit tray: 100 sheets (face up)

Memory: Standard 64 MB, up to 384 MB with optional DIMM

Power Source: 120 V, 60 Hz: More than 10 A (for North America)
 220 V – 240 V, 50/60 Hz: More than 6.0 A (for Europe)

Power Consumption:



	120V	230V
Maximum	1200 W or less	1300 W or less
Energy Saver	45 W or less	45 W or less

Noise Emission:
 (Sound Power Level)

	Mainframe Only	Full System
Printing	68 dB or less	72 dB or less
Stand-by	42 dB or less	
Low power mode	40 dB or less	

NOTE: The above measurements were made in accordance with Ricoh standard methodology.

Dimensions (W x D x H): 575 x 678 x 745 mm (22.6" x 26.7" x 29.3")

Weight: Less than 85 kg (187 lb.)

2. SUPPORTED PAPER SIZES

2.1 PAPER FEED

Paper	Size (W x L)	North America			Europe/Asia			By-pass Tray
		Tray 1	Tray 2/3/4	LCT	Tray 1	Tray 2/3/4	LCT	
A3 W	12" x 18"	N	N	N	N	N	N	Y [#]
A3 SEF	297 x 420 mm	N	Y	N	N	Y	N	Y [#]
A4 SEF	210 x 297 mm	N	Y [#] /Y [*]	N	N	Y	N	Y [#]
A4 LEF	297 x 210 mm	Y [*]	Y	Y [*]	Y	Y	Y	Y [#]
A5 SEF	148 x 210 mm	N	N	N	N	N	N	Y [#]
A5 LEF	210 x 148 mm	N	Y	N	N	Y	N	Y [#]
A6 SEF	105 x 148 mm	N	N	N	N	N	N	Y [#]
B4 SEF	257 x 364 mm	N	Y [#] /Y [*]	N	N	Y	N	Y [#]
B5 SEF	182 x 257 mm	N	Y [#] /Y [*]	N	N	Y [#] /Y [*]	N	Y [#]
B5 LEF	257 x 182 mm	N	Y	N	N	Y	N	Y [#]
B6 SEF	128 x 182 mm	N	N	N	N	N	N	Y [#]
Ledger	11" x 17"	N	Y	N	N	Y	N	Y [#]
Letter SEF	8.5" x 11"	N	Y	N	N	Y [#] /Y [*]	N	Y [#]
Letter LEF	11" x 8.5"	Y	Y	Y	Y [*]	Y	Y [*]	Y [#]
Legal SEF	8.5" x 14"	N	Y	N	N	Y [#] /Y [*]	N	Y [#]
Half Letter SEF	5.5" x 8.5"	N	N	N	N	N	N	Y [#]
Executive SEF	7.25" x 10.5"	N	Y [#]	N	N	Y [#]	N	Y [#]
Executive LEF	10.5" x 7.25"	N	N	N	N	N	N	Y [#]
F SEF	8" x 13"	N	Y [#]	N	N	Y [#]	N	Y [#]
Foolscap SEF	8.5" x 13"	N	Y [#]	N	N	Y [#]	N	Y [#]
Folio SEF	8.25" x 13"	N	Y [#]	N	N	Y [#]	N	Y [#]
8K	267 x 390 mm	N	Y [#]	N	N	Y [#]	N	Y [#]
16K SEF	195 x 267 mm	N	Y [#]	N	N	Y [#]	N	Y [#]
16K LEF	267 x 195 mm	N	Y [#]	N	N	Y [#]	N	Y [#]
Custom	Minimum: 90 x 148 mm Maximum: 305 x 458 mm	N	N	N	N	N	N	Y [#]
Com10 Env.	4.125" x 9.5"	N	N	N	N	N	N	Y [#]
Monarch Env.	3.875" x 7.5"	N	N	N	N	N	N	Y [#]
C6 Env.	114 x 162 mm	N	N	N	N	N	N	Y [#]
C5 Env.	162 x 229 mm	N	N	N	N	N	N	Y [#]
DL Env.	110 x 220 mm	N	N	N	N	N	N	Y [#]

Remarks:

Y	Supported: the sensor detects the paper size.
Y [#]	Supported: the user specifies the paper size.
Y [*]	Supported: depends on a technician adjustment
N	Not supported

2.2 PAPER EXIT

Paper	Size (W x L)	Internal Tray (Face Down)	External Tray (Face Up)	Finisher	4-bin Mailbox	Duplex
A3 W	12" x 18"	N	Y	N	N	N
A3 SEF	297 x 420 mm	Y	Y	Y	Y	Y
A4 SEF	210 x 297 mm	Y	Y	Y	Y	Y
A4 LEF	297 x 210 mm	Y	Y	Y	Y	Y
A5 SEF	148 x 210 mm	Y	Y	N	Y	N
A5 LEF	210 x 148 mm	Y	Y	Y	Y	Y
A6 SEF	105 x 148 mm	Y	Y	N	N	N
B4 SEF	257 x 364 mm	Y	Y	Y	Y	Y
B5 SEF	182 x 257 mm	Y	Y	Y	Y	Y
B5 LEF	257 x 182 mm	Y	Y	Y	Y	Y
B6 SEF	128 x 182 mm	Y	Y	N	N	N
Ledger	11" x 17"	Y	Y	Y	Y	Y
Letter SEF	8.5" x 11"	Y	Y	Y	Y	Y
Letter LEF	11" x 8.5"	Y	Y	Y	Y	Y
Legal SEF	8.5" x 14"	Y	Y	Y	Y	Y
Half Letter SEF	5.5" x 8.5"	Y	Y	N	Y	N
Executive SEF	7.25" x 10.5"	Y	Y	Y	Y	Y
Executive LEF	10.5" x 7.25"	Y	Y	N	N	N
F SEF	8" x 13"	Y	Y	Y	Y	Y
Foolscap SEF	8.5" x 13"	Y	Y	Y	N	Y
Folio SEF	8.25" x 13"	Y	Y	Y	N	Y
8K	267 x 390 mm	Y	Y	Y	N	Y
16K SEF	195 x 267 mm	Y	Y	Y	Y	Y
16K LEF	267 x 195 mm	Y	Y	Y	Y	Y
Custom	Minimum: 90 x 148 mm Maximum: 305 x 458 mm	Y	Y	N	Y	N
Com10 Env.	4.125" x 9.5"	N	Y	N	N	N
Monarch Env.	3.875" x 7.5"	N	Y	N	N	N
C6 Env.	114 x 162 mm	N	Y	N	N	N
C5 Env.	162 x 229 mm	N	Y	N	N	N
DL Env.	110 x 220 mm	N	Y	N	N	N

Remarks:

Y	Supported
N	Not supported

3. SOFTWARE ACCESSORIES

The printer drivers and utility software are provided on one CD-ROM. An auto-run installer allows you to select which components to install.

3.1 PRINTER DRIVERS

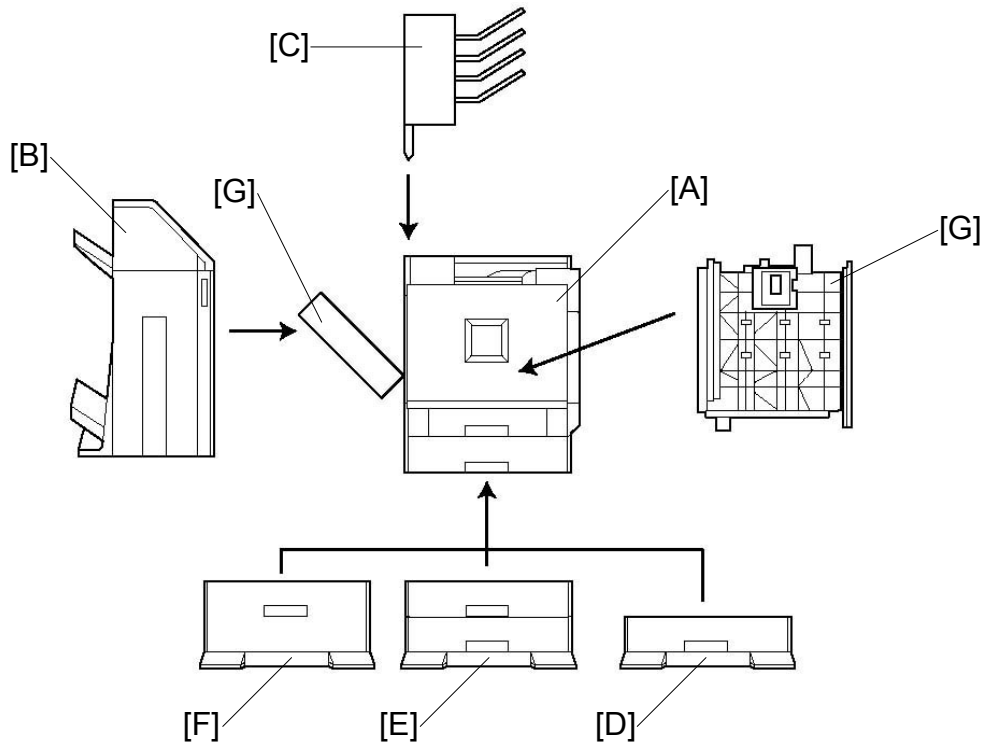
Printer Language	Windows 95/98/ME	Windows NT4.0	Windows 2000	Windows XP	Macintosh
PCL 5c	Yes	Yes	Yes	Yes	No
PS3	Yes	Yes	Yes	Yes	Yes
RPCS	Yes	Yes	Yes	Yes	No

- NOTE:**
- 1) The printer drivers for Windows NT 4.0 are only for the Intel x86 platform. There is no Windows NT 4.0 printer driver for the PowerPC, Alpha, or MIPS platforms.
 - 2) The PS3 drivers are all genuine AdobePS drivers, except for Windows 2000, which uses Microsoft PS. A PPD file for each operating system is provided with the driver.
 - 3) The PS3 driver for Macintosh supports Mac OS 8.6 or later versions.

3.2 UTILITY SOFTWARE

Software	Description
Agfa Font Manager 2000 (Win95/98/ME, 2000/XP, NT4)	A font management utility with screen fonts for the printer.
SmartNetMonitor for Admin (Win95/98/ME, 2000/XP, NT4)	A printer management utility for network administrators. NIB setup utilities are also available.
SmartNetMonitor for Client (Win95/98/ME, 2000/XP, NT4)	<ul style="list-style-type: none"> • A printer management utility for client users. • A utility for peer-to-peer printing over a NetBEUI or TCP/IP network. • A peer to peer print utility over a TCP/IP network. This provides the parallel printing and recovery printing features.
Printer Utility for Mac (Mac)	This software provides several convenient functions for printing from Macintosh clients.
IEEE1394 Utility (Win2000)	This utility solves problems with Windows 2000.
DeskTopBinder V2 Lite (Win95/98/ME, 2000/XP, NT4)	DeskTopBinder V2 Lite itself can be used as personal document management software and can manage both image data converted from paper documents and application files saved in each client's PC.

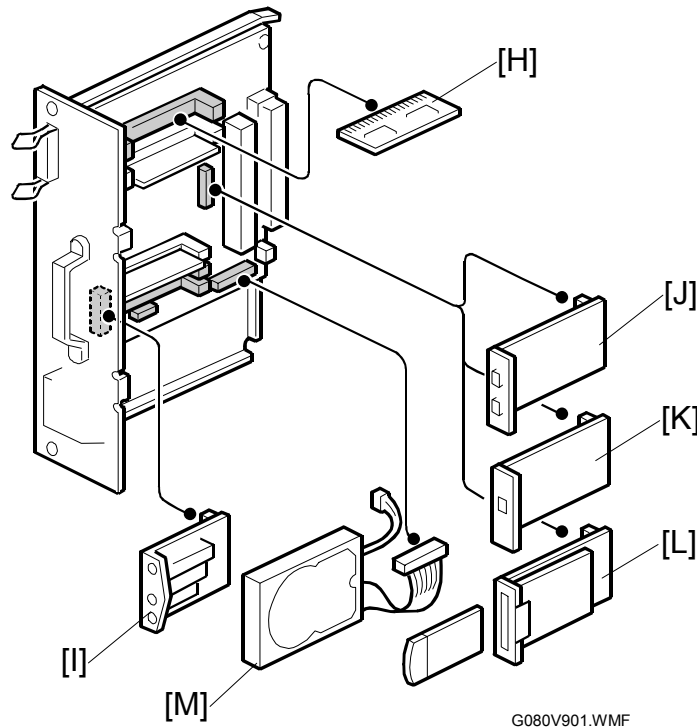
4. MACHINE CONFIGURATION



G080V902.WMF

Item	Machine Code	No.	Remarks
Main Unit	G080	A	
Options			
Finisher	G565	B	Requires the HDD or 128MB DIMM memory, duplex unit and one of the three paper feed options. Finisher and mailbox cannot both be installed.
Four-bin Mailbox	G566	C	Finisher and mailbox cannot both be installed.
Paper Feed Unit (500 x 1)	G567	D	Install any one of these three units.
Paper Feed Unit (500 x 2)	G568	E	
LCT	G569	F	
Duplex Unit	G348	G	
Punch Unit	B377		Requires the finisher

NOTE: All the above items are user installable except for the punch unit.



G080V901.WMF

Internal Options			
64MB DIMM Memory	G330	H	
128MB DIMM Memory	G331	H	
256MB DIMM Memory	G332	H	
NVRAM Memory	G364	I	
IEEE1394 I/F Board	G336	J	
IEEE802.11b	G628	K	
USB	B525	L	
Bluetooth	G354	L	
HDD Type 1	G370	M	
HDD Type 2	G371	M	
Others			
Maintenance Kit A	G211		Includes CMY PCUs.
Maintenance Kit B	G219		Includes CMY development units.
Maintenance Kit C	G209		Includes the fusing unit.
Maintenance Kit D	G220		Includes K development unit and dust filter.
Maintenance Kit E	G767		Includes the used toner bottle.
Maintenance Kit F	G212		Includes the K PCU.
Maintenance Kit G	G210		Includes the fusing oil supply unit.
Maintenance Kit H	G776		Includes the feed roller, pick-up roller, and separation roller.

Spec.

5. OPTIONAL EQUIPMENT

5.1 500-SHEET TRAY

Paper Size:	Maximum: A3/11" x 17" (SEF) Minimum: A5 (LEF)/8 1/2" x 11"
Paper Weight:	60 to 105 g/m ² (16 to 28 lb.)
Tray Capacity:	500 sheets (80 g/m ² , 20 lb.)
Paper Feed System:	FRR system
Paper Height Detection:	3 steps (100%, 50%, Near End)
Power Source:	DC 24V, 5V (from the main unit)
Power Consumption:	50 W
Dimensions (W x D x H):	540 x 600 x 172 mm (21.3" x 23.7" x 6.8")
Weight	18 kg (39.7 lb.)

5.2 1000-SHEET TRAY

Paper Size:	Maximum: A3/11" x 17" (SEF) Minimum: A5 (LEF)/8 1/2" x 11"
Paper Weight:	60 to 105 g/m ² (16 to 28 lb.)
Tray Capacity:	500 sheets x 2 (80 g/m ² , 20 lb.)
Paper Feed System:	FRR system
Paper Height Detection:	3 steps (100%, 50%, Near End)
Power Source:	DC 24V, 5V (from the main unit)
Power Consumption:	50 W
Dimensions (W x D x H):	540 x 600 x 270 mm (21.3" x 23.7" x 10.7")
Weight	25 kg (55.2 lb.)

5.3 2000-SHEET LARGE CAPACITY TRAY

Paper Size:	A4/8 1/2" x 11" (LEF)
Paper Weight:	60 to 105 g/m ² (16 to 28 lb.)
Tray Capacity:	2000 sheets (80 g/m ² , 20 lb.)
Paper Feed System:	FRR system
Paper Height Detection:	5 steps (100%, 75%, 50%, 25%, Near End)
Power Source:	DC 24V, 5V (from the main unit)
Power Consumption:	30 W
Dimensions (W x D x H):	540 x 600 x 270 mm (21.3" x 23.7" x 10.7")
Weight	25 kg (55.2 lb.)

5.4 TWO-TRAY FINISHER & PUNCH UNIT

Print Paper Size:	No punch mode: A3/11" x 17" to A5 (LEF)/8 1/2" x 11" Punch mode: 2 holes: A3/11" x 17" to A4/8 1/2" x 11" (SEF) A4/8 1/2" x 11" to A5 (LEF) 3 holes: A3, B4, 11" x 17" (SEF) A4, B5, 8 1/2" x 11" (LEF) 4 holes (Europe): A3, B4, 11" x 17" (SEF) A4, B5, 8 1/2" x 11" (LEF) 4 holes (North Europe): A3, B4, 11" x 17" (SEF) A4, B5, 8 1/2" x 11" (LEF) Staple mode: A3/11" x 17" to B5/8 1/2" x 11"
Paper Weight:	No punch mode: 60 to 105 g/m ² (16 to 28 lb.) Punch mode: 60 to 105 g/m ² (16 to 28 lb.) Staple mode: 64 to 90 g/m ² (17 to 23 lb.) Label/Thick paper/OHP cannot be stapled
Tray Capacity:	Upper tray: 500 sheets: A4, 8 1/2" x 11" , B5, A5 (LEF) 250 sheets: 11" x 17", A3, 8 1/2" x 14", B4 Lower tray (default mode – stapled output only goes to tray 2): 2000 sheets: A4, 8 1/2" x 11" (LEF) 750 sheets: A3, B4, A4, B5, 8 1/2" x 14", 11" x 17", 8 1/2" x 11" (SEF) 500 sheets: A5 (LEF) Lower tray (multi-tray staple mode – stapled output can go to either tray): 1500 sheets: A4, 8 1/2" x 11" (LEF) 750 sheets: A3, B4, A4, B5, 8 1/2" x 14", 11" x 17", 8 1/2" x 11" (SEF) 500 sheets: A5 (LEF)
Staple capacity:	Single size: 50 sheets: A4, 8 1/2" x 11" , B5 30 sheets: A3, B4, 8 1/2" x 14", 11" x 17" Mixed size: 30 sheets: A4 (LEF) & A3, B5 (LEF) & B4, 8 1/2" x 11" (LEF) & 11" x 17"
Staple position:	7 positions 1-staple: 4 positions (Top Left, Top Right, Top Left-Oblique, Top Right-Oblique) 2-staples: 3 positions (Left, Top, Right)

Staple replenishment:	Cartridge (5000 staples)
Power consumption:	48 W
Dimensions (W x D x H):	680 x 620 x 1030 mm (26.8" x 24.4" x 40.6")
Weight	Without punch unit: 53 kg (116.9 lb.) With punch unit: 55 Kg (121.3 lb.)

5.5 FOUR-BIN MAILBOX

Number of bins	4 bins
Stack Capacity:	125 sheets x 4 (80 g/m ² , 20 lb.)
Paper Size for Trays:	Maximum: A3/11" x 17" (SEF) Minimum: A5 (LEF)/8 1/2" x 11"
Print Paper Weight:	60 to 105 g/m ² (16 to 28 lb.)
Power Source:	DC 24V, 5V (from the main unit)
Power Consumption:	17 W
Dimensions (W x D x H):	540 x 600 x 400 mm (21.3" x 23.6" x 15.8") (when installed in the machine)
Weight	7 kg (15.5 lb.)

5.6 PRINTER WITH CF EXPANDER

GENERAL SPECIFICATIONS (COPY MODE)

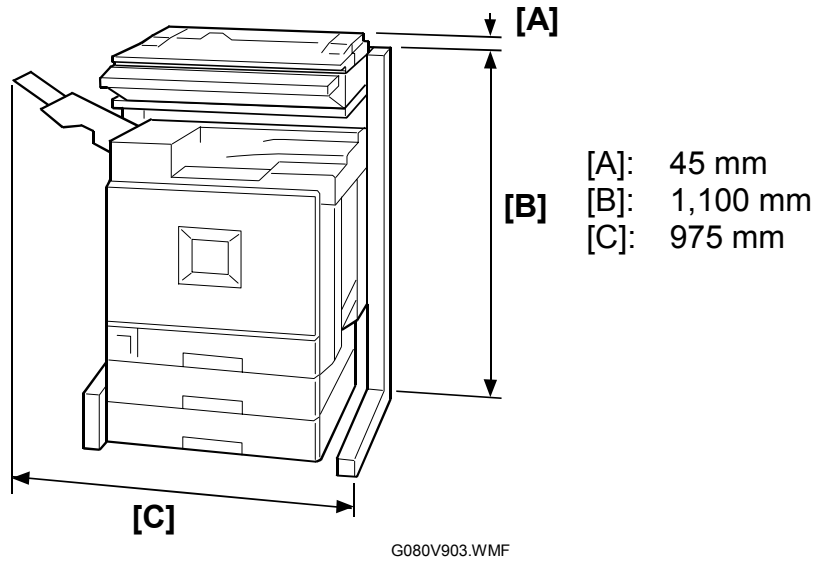
Configuration:	Add-on scanner for printer mainframe
Number of scans:	1
Resolution:	Scan: 600 dpi Print: 600 dpi
Gradation:	Scan: 8 bits/pixel Print: 2 bits/pixel
Original type:	Sheets, book, objects
Maximum original size:	A3/11" x 17"
Original reference position:	Left rear corner
Copy speed:	Normal: 28 cpm (color) or 38 cpm (black & white) OHP/thick: 10 cpm (color/black & white) ADF 1 to 1: 28 cpm (color) or 38 cpm (black & white)
First copy (normal mode):	Color: 10 seconds or less Black & white: 8 seconds or less
Warm-up time:	119 seconds or less (23°C, 50%)
Continuous copy:	Up to 99 sheets
Zoom:	Arbitrary: From 25 to 400% (1% step) Fixed:

North America	Europe
85%	82%
78%	75%
73%	71%
65%	65%
50%	50%
25%	25%
121%	115%
129%	122%
155%	141%
200%	200%
400%	400%

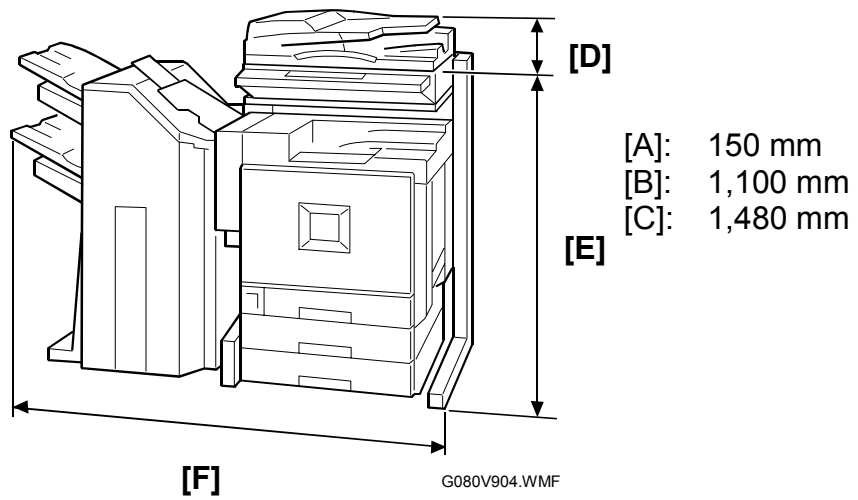


Power source:	System: 120 V, 60 Hz: 12 A (for North America) 220 - 240 V, 50/60 Hz: 8 A (for Europe/Asia) Scanner: 120 V, 60 Hz: 2 A (for North America) 220 - 240 V, 50/60 Hz: 1.1 A (for Europe/Asia)
Maximum power consumption (during copying):	System: 1,440 W or less Scanner: 240 W or less
Dimensions (W x D x H):	System: ● the next page Scanner: 570 x 757 x 100 mm (without platen cover or ARDF)
Weight:	Scanner: 15 kg or less
Radio interference	VCCI Class B
Noise emission	Operating: 72 dB or less Waiting: 45 dB or less Standing by: 40 dB or less

1) Printer mainframe with CF Expander, One-tray Paper Feed Unit, and Rack

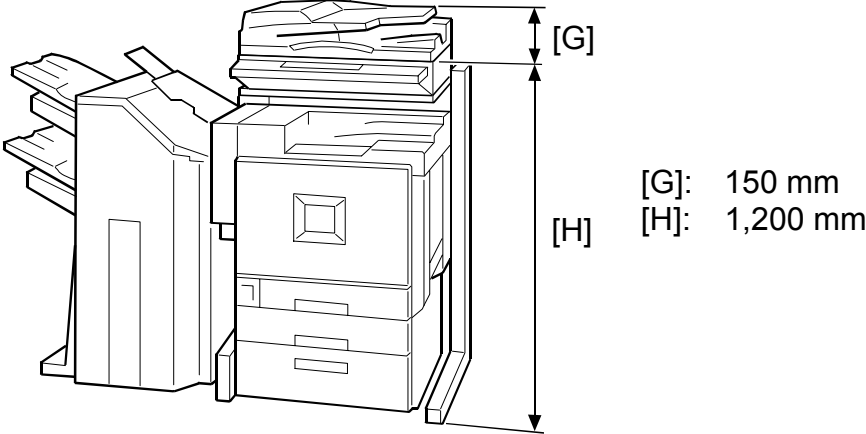


2) Printer mainframe with CF Expander, One-tray Paper Feed Unit, Duplex unit, Finisher, and Rack



Spec.

3) Printer mainframe with CF Expander, Large Capacity Tray (Two-tray Paper Feed Unit), Duplex unit, Finisher, and Rack



G080V905.WMF

GENERAL SPECIFICATIONS (SCANNER MODE)

Standard Scanner Resolution:	Main scan/Sub scan 600 dpi
Available scanning Resolution Range:	Twain Mode: 100 ~ 1200 dpi
	Delivery Mode: 100/200/300/400/600 dpi
Grayscales:	1 bit or 8 bits/pixel each for RGB
Scanning Throughput (ARDF mode):	Without 40GB HDD B/W: 21 spm (A4/81/2" x 11" SEF, 200 dpi, 1 bit) Color: 11 spm (A4/81/2" x 11" SEF, 200 dpi, 8 bits)
	With 40GB HDD B/W: 30 spm (A4/81/2" x 11" SEF, 200 dpi, 1 bit) Color: 20 spm (A4/81/2" x 11" SEF, 200 dpi, 8 bits)
Interface:	Ethernet (100 Base-TX/10 Base-T for TCP/IP)
Compression Method:	MH, MR, MMR (Binary Picture Processing) JPEG (Grayscale Processing)

PLATEN/ARDF ORIGINAL SIZE DETECTION

Size (width x length) [mm]	Platen		ARDF	
	Inches	Metric	Inches	Metric
A3 (297 x 420) L	No	Yes	Yes	Yes
B4 (257 x 364) L	No	Yes	No	Yes
A4 (210 x 297) L	No	Yes	No	Yes**
A4 (297 x 210) S	No	Yes	Yes	Yes
B5 (182 x 257) L	No	Yes	No	Yes
B5 (257 x 182) S	No	Yes	No	Yes
A5 (148 x 210) L	No	No*	No	Yes
A5 (210 x 148) S	No	No	No	Yes
B6 (128 x 182) L	No	No	No	Yes
B6 (182 x 128) S	No	No	No	Yes
11" x 17" (DLT)	Yes	No	Yes**	Yes**
11" x 15"	No	No	Yes**	No
10" x 14"	No	No	Yes	No
8.5" x 14" (LG)	Yes	No	Yes**	No
8.5" x 13" (F4)	No	No	Yes**	Yes
8.25" x 13"	No	No	No	No
8" x 13"(F)	No	Yes	No	No
8.5" x 11" (LT)	Yes	No	Yes**	No
11" x 8.5" (LT)	Yes	No	Yes**	No
8" x 10.5"	No	No	No	No
8" x 10"	No	No	Yes**	No
5.5" x 8.5" (HLT)	No*	No	Yes	No
8.5" x 5.5" (HLT)	No	No	Yes	No
8K (267 x 390)	No	No	No	Yes**
16K L (195 x 267)	No	No	No	Yes**
16K S (267 x 195)	No	No	No	Yes
7.25" x 10.5" (Executive)	No	No	Yes	No
10.5" x 7.25" (Executive)	No	No	Yes**	No

*: When the message "Cannot detect original size" appears, use SP4-303 to detect original sizes as A5 lengthwise/HLT.

** : The machine can detect the paper size depending on the setting of SP6-016-1.

SOFTWARE ACCESSORIES

SCANNER

The scanner driver and utility software are provided on one CD-ROM.

Scanner Drivers

- Network Twain Driver for Win95/98/ME/NT4.0/2000/XP

Scanner Utilities

- Scan Router V2 Lite (Cherry-Lite) for Win95/98/ME/NT4.0/2000/XP
- Desk Top Binder V2 Lite (Plumeria-Lite) for Win95/98/ME/NT4.0/2000/XP

OPTIONAL EQUIPMENT FOR CF EXPANDER

Rack

Dimensions (W × D × H): 675 mm x 758 mm x 1110 mm (26.6" x 29.8" x 43.7")

Weight: 30 kg

ARDF

Paper Size/Weight:

Simplex	Size	A3 to B6, DLT to HLT
	Weight	45 to 90 kg (11 to 34 lb.)
Duplex	Size	A3 to B5, DLT to HLT
	Weight	45 to 90 kg (14 to 28 lb.)

Table Capacity: 80 sheets (80 g/m², 20 lb)

Original Standard Position: Rear left corner

Separation: Feed belt and separation roller

Original Transport: Roller transport

Original Feed Order: From the top original

Supported Magnification Ratios:

Copy		50 to 200 %
Fax	Color	32.6 to 200 %
	Black & white	48.9 to 200 %

Power Source: DC 24V, 5V from the scanner unit

Power Consumption: 60 W or less

Dimensions (W × D × H): 570 mm x 518 mm x 150 mm (22.4" x 20.4" x 5.9")

Weight: 12 kg

Multi-bin Output Tray

Number of Bins 2

Paper Size Maximum: A3/11" x 17" (SEF)
 Minimum: A5 (LEF)/8 1/2" x 11"

Paper Weight 60 to 105 g/m² (16 to 28 lb.)

Stack Capacity (80 g/m², 20 lb.) Tray 1: 100 sheets
 Tray 2: 100 sheets (A4/smaller than 8 1/2" x 11")
 250 sheets (B4/8 1/2" x 14")

Printing Speed:

	Resolution	Printing Speed
Monochrome	600 x 600 dpi 1200 x 600 dpi Copy mode	26 ppm
	1200 x 1200 dpi	23 ppm
Color	600 x 600 dpi 1200 x 600 dpi Copy mode	23 ppm
	1200 x 1200 dpi	14 ppm