



Model R-C2a/b
(Machine Code: B022/B027)
SERVICE MANUAL

August 10th, 2001
Subject to change

IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the copier and peripherals, make sure that the copier power cord is unplugged.
2. The wall outlet should be near the copier 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. If a job has started before the copier completes the warm-up or initializing period, keep hands away from the mechanical and electrical components because the starts making copies as soon as the warm-up period is completed.
5. The inside and the metal parts of the fusing unit become extremely hot while the copier is operating. Be careful to avoid touching those components with your bare hands.

HEALTH SAFETY CONDITIONS

Toner is non-toxic, but if you get it 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.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate the toner cassettes. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of toner cassettes in accordance with local regulations. (This is a non-toxic unit.)
3. Dispose of replaced parts in accordance with local regulations.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.
2. The NVRAM on the Controller board has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.
3. The danger of explosion exists if batteries on the FCU, MBU and JBIG are incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

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 FOR LASER UNIT

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

CAUTION MARKING:



LASER-4.WMF

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1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

- Configuration: Desktop
- Copy Process: Dry electrostatic transfer system
- Originals: Sheet/Book
- Original Size: Maximum A3/11" x 17"
- Copy Paper Size: Maximum
 A3/11" x 17"
 Minimum
 A5/8 1/2" x 5 1/2" lengthwise
 Custom sizes
 2nd paper tray
 Width: 100 ~ 297 mm (3.9" ~ 11.5")
 Length: 148 ~ 432 mm (5.8" ~ 17.0")
 By-pass tray (Option):
 Width: 90 ~ 305 mm (3.5" ~ 12.0")
 Length: 148 ~ 1,260 mm (5.8" ~ 49.6")
- Copy Paper Weight: Paper Tray:
 60 ~ 105 g/m², 16 ~ 28 lb (1st paper tray)
 52 ~ 157 g/m², 16 ~ 43 lb (2nd paper tray)
 By-pass (Option):
 52 ~ 157 g/m², 16 ~ 42 lb
- Reproduction Ratios: 5 Enlargement and 7 Reduction

	A4/A3 Version	LT/DLT Version
Enlargement	400%	400%
	200%	200%
	141%	155%
	122%	129%
	115%	121%
Full Size	100%	100%
Reduction	93%	93%
	87%	85%
	82%	78%
	71%	73%
	65%	65%
	50%	50%
	25%	25%

Zoom: 25% to 400% in 1% steps (Platen mode)
 25% to 200% in 1% steps (ADF mode)

Power Source: 120 V, 60 Hz:
 More than 12 A (for North America)
 220 ~ 240 V, 50/60 Hz
 More than 7 A (for Europe/Asia)
 110 V, 50/60 Hz
 More than 13 A (for Taiwan)

Power Consumption:

	Mainframe Only		Full System	
	120 V	220 ~ 240 V	120 V	220 ~ 240 V
Maximum	Less than 1.44 kW	Less than 1.5 kW	Less than 1.44 kW	Less than 1.5 kW
Copying	Approx. 650 Wh	Approx. 650 Wh	Approx. 680 Wh	Approx. 680 Wh
Warm-up	Approx. 1.44 kW	Approx. 1.5 kW	Approx. 1.44 kW	Approx. 1.5 kW
Stand-by	Approx. 150 Wh	Approx. 150 Wh	Approx. 160 Wh	Approx. 160 Wh
Energy Saver / Auto Off	Less than 10 W	Less than 10 W	Less than 10 W	Less than 10 W

NOTE: 1) Full system: Mainframe + ADF + 1-bin Sorter + Paper Tray Unit + Duplex Unit + Bridge Unit + Finisher
 2) Without the optional heaters, fax unit, and printer controller

Noise Emission (Sound Power Level):

Stand-by (Mainframe only): US/Asia Model: 40 dB(A)
 Europe Model: 40 dB(A)

Operating (Mainframe only): US/Asia Model: 63 dB(A)
 Europe Model: 63 dB(A)

Operating (Full System): 68.5 dB(A)

NOTE: 1) The above measurements were made in accordance with ISO 7779.
 2) Full System: Mainframe + ADF + 1-bin Sorter + Paper Tray Unit + Duplex Unit + Bridge Unit + Finisher

Dimensions (W x D x H): 550 x 604 x 709 mm (21.7" x 23.8" x 28.0")

NOTE: Measurement Conditions

- 1) With the paper tray unit or LCT
- 2) Without the ADF

Weight: Less than 55 kg (121.3lb)

Copying Speed (copies/minute):

Russian-C2A	A4 sideways/ 11" x 8 1/2"	A3/11" x 17"
Non-memory copy mode	22	13
Memory copy mode	22	13

Russian-C2B	A4 sideways/ 11" x 8 1/2"	A3/11" x 17"
Non-memory copy mode	27	15
Memory copy mode	27	15

NOTE: Measurement Conditions

- 1) Not APS mode
- 2) A4/LT copying
- 3) Full size

Warm-up Time: Less than 10 seconds (20°C, 68°F) from when the operation switch is turned on.

Less than 15 seconds (20°C, 68°F) from when the main switch is turned on.

First Copy Time: Less than 4.9 s (A4), less than 5.0 s (LT)

NOTE: Measurement Conditions

- 1) When the polygonal mirror motor is spinning.
- 2) From the 1st paper tray
- 3) Not APS mode
- 4) Full size

Copy Number Input: Ten-key pad, 1 to 99 (count up or count down)

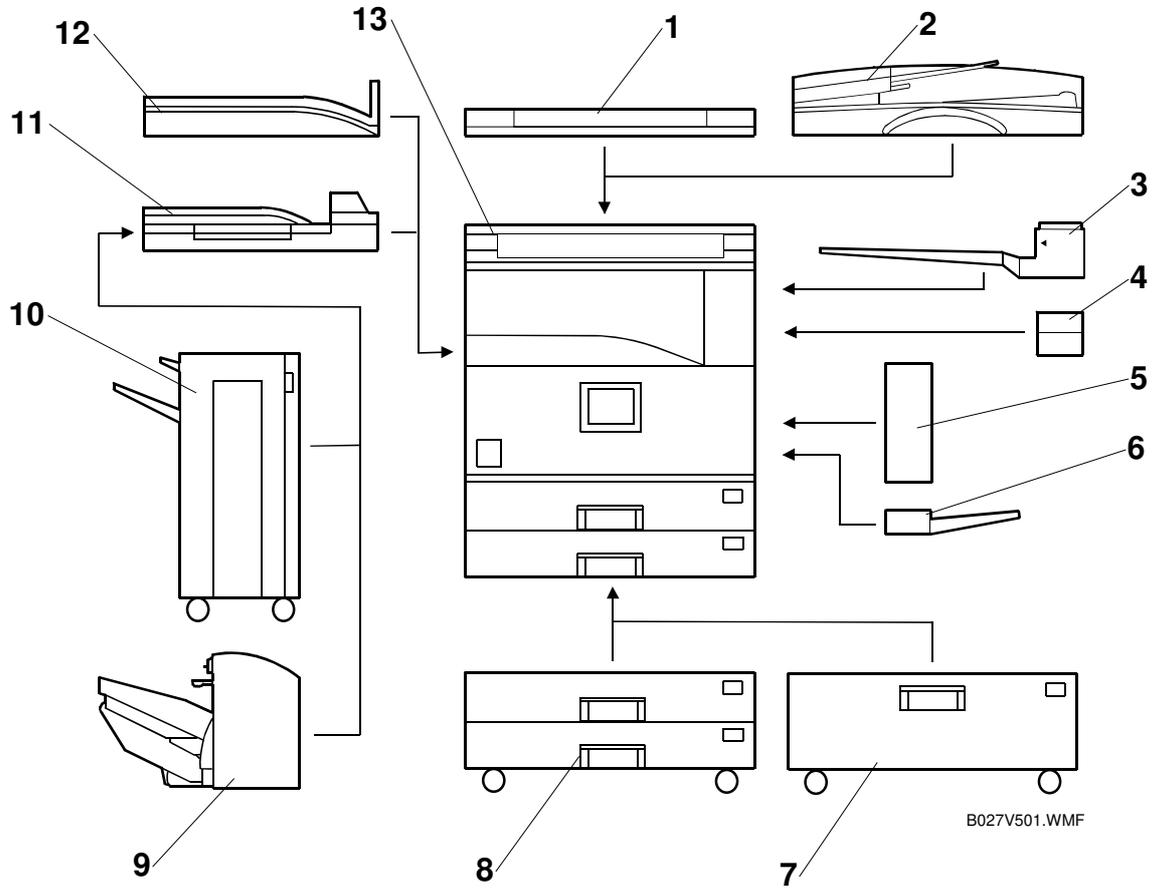
Manual Image Density: 7 steps

Paper Tray Capacity:	Paper Tray: 500 sheets x 2 (Special paper in the 2nd paper tray: 50 sheets) Paper Tray Unit (Option): 500 sheets x 2 LCT (Option): 1000 sheets x 2 By-pass Tray (Option): 100 sheets (A4, B5, A5, B6, 8 1/2" x 11", 5 1/2" x 8 1/2") 10 sheets (A3, B4, 11" x 17", 8 1/2" x 13") 1 sheets (non-standard sizes) NOTE: Copy paper weight: 80g/m ² (20 lb)
Toner Replenishment:	Cartridge exchange (360 g/cartridge)
Toner Yield:	11 k copies (A4 sideways, 6% full black, 1 to 1 copying, ADS mode)
Copy Tray Capacity:	Copy Tray: 500 sheets (without 1-bin tray) 250 sheets (with 1-bin tray)
Memory Capacity:	Standard 32 MB , Optional memory either 32 MB or 64MB

1.2 MACHINE CONFIGURATION

1.2.1 SYSTEM COMPONENTS

Overall Information



Version	Item	Machine Code	No.	Comments
Copier	Copier(R-C2a)	B022	13	
	Copier(R-C2b)	B027	13	
	ARDF (Optional)	B386	2	1), and new features added
	Platen Cover (Optional)	B406	1	Common with K-C1
	Paper Tray Unit-2 tray (Optional)	B390	8	1) and 2)
	LCT (Optional)	B391	7	1) and 2)
	1-bin Tray (Optional)	B413	3	1)
	Shift Tray (Optional)	B459	12	1)
	Duplex Unit (Optional)	B414	5	1) and 2)
	By-pass Tray (Optional)	B415	6	1)
	Interchange Unit (Optional)	B416	4	1)
	Bridge Unit (Optional)	B417	11	1) and 2)
	1000-sheet finisher (Optional)	B408	10	New option
	500-sheet finisher (Optional)	B442	9	1) The components are the same as the 500-finisher for Russian-P2
	User Account Enhance Unit (Optional)	B443		Common with A-C2
	HDD (Optional)	B420		
	Memory – 32 MB (Optional)	G578		Common with A-C2
Memory – 64 MB (Optional)	G579		Common with A-C2	
Key Counter Bracket (Optional)	B452		1)	
Fax	Fax Controller (Optional)	B418		
	G3 Interface Unit (Optional)	B448		
	ISDN (Optional)	B449		
	Fax Function Expander (Optional)	A892		Common with R-C1
	Handset (Optional)	B433		Common with Kir-C
Printer / Scanner	Printer Unit (Optional)	B461		
	Printer/Scanner Unit (Optional)	B453		
	PS3 (Optional)	B462		
	NIB (Optional)	G335		
	IEEE1394 (Optional)	G590		Common with A-C2

Comments:

The following are the differences between Russian-C1 and this machine.

- 1) New color for the exterior cover
- 2) The drive motor and the control board have been changed so they will be compatible with R-C2c (32 cpm machine)

1.2.2 INSTALLABLE OPTION TABLE

Copier options

No.	Option	Russian-C2A/C2B	Note
1	ARDF (Optional)	○	Install either no. 1 or 2.
2	Platen Cover (Optional)	○	Install either no. 1 or 2.
3	Paper Tray Unit – two-tray (Optional)	○	Install either no. 3 or 4.
4	LCT (Optional)	○	Install either no. 3 or 4.
5	1-bin Tray (Optional)	△	Requires no.9.
6	Shift Tray (Optional)	○	Install either no. 6 or 10.
7	Duplex Unit (Optional)	△	Requires no.9.
8	By-pass Tray (Optional)	○	
9	Interchange Unit (Optional)	○	
10	Bridge Unit (Optional)	△	No. 10 requires no.11 or 12. Install either no. 6 or 10.
11	1000-sheet Finisher (Optional)	△	Install either no. 11 or 12 Requires no.10, and either no.3 or 4
12	500-sheet Finisher (Option)	△	Install either no. 11 or 12 Requires no.10, and either no.3 or 4
13	Memory 32 MB/ 64 MB (Optional)	○	
14	Key Counter Bracket	○	

○ = Available △ = Requires another option

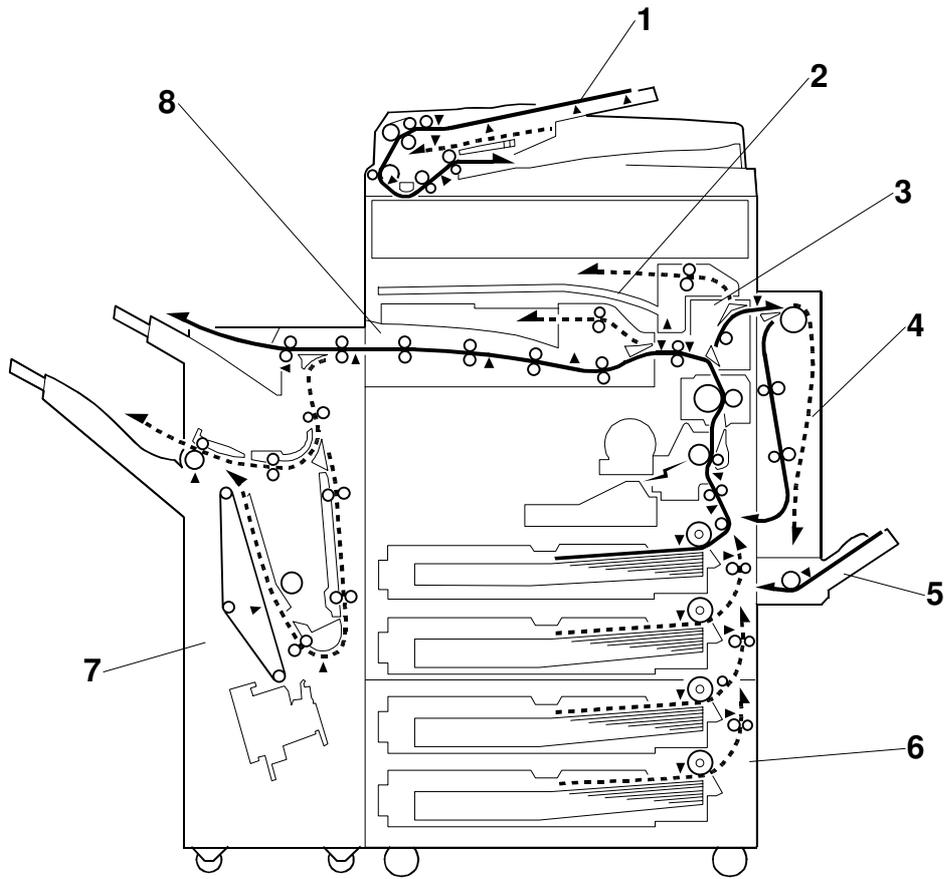
Fax option

All options for the fax unit are available when the fax unit has been installed.

Printer/scanner options

1. The NIB and IEEE1394 cannot both be installed at the same time.
2. The printer/scanner option requires the NIB and 64MB memory options.
3. The printer option requires the 64MB memory option.

1.3 PAPER PATH

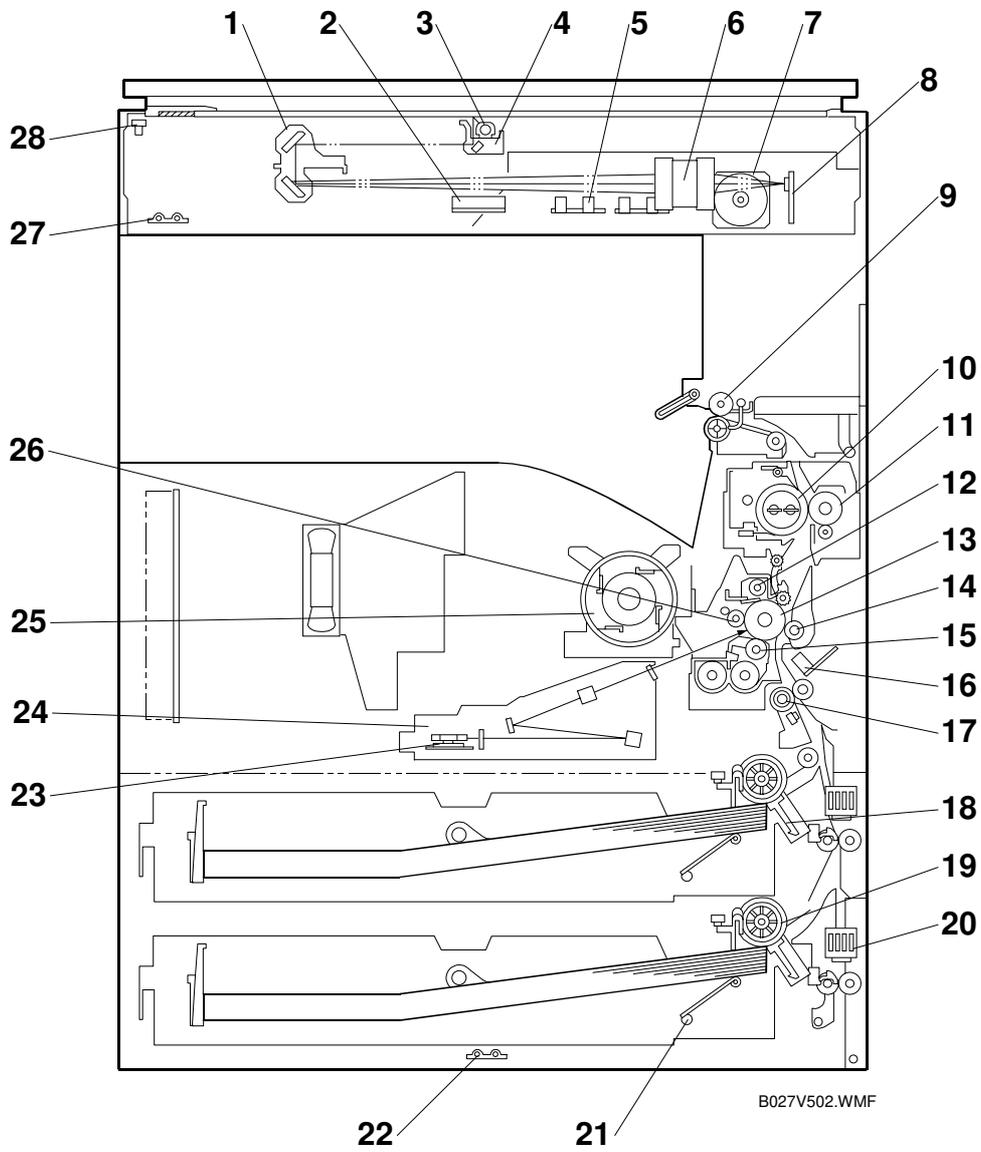


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- 1. Optional ADF
- 2. Optional 1-bin Tray
- 3. Optional Interchange Unit
- 4. Optional Duplex Unit
- 5. Optional By-pass Feed Tray
- 6. Optional Paper Tray Unit
- 7. Optional 1000-sheet Finisher
- 8. Optional Bridge Unit

1.4 MECHANICAL COMPONENT LAYOUT

Overall Information



1. 2nd scanner
2. Original width sensor
3. Exposure lamp
4. 1st scanner
5. Original length sensor
6. Lens
7. Scanner motor
8. SBU board
9. Exit roller
10. Fusing hot roller
11. Fusing pressure roller
12. Cleaning unit
13. OPC drum
14. Transfer roller
15. Development roller
16. ID sensor
17. Registration roller
18. Friction pad
19. Paper feed roller
20. Paper size sensor
21. Bottom plate
22. Tray heater
23. Polygon mirror motor
24. Laser unit
25. Toner supply bottle holder
26. Drum charge roller
27. Anti-condensation heater
28. Scanner home position sensor

1.5 ELECTRICAL COMPONENT DESCRIPTIONS

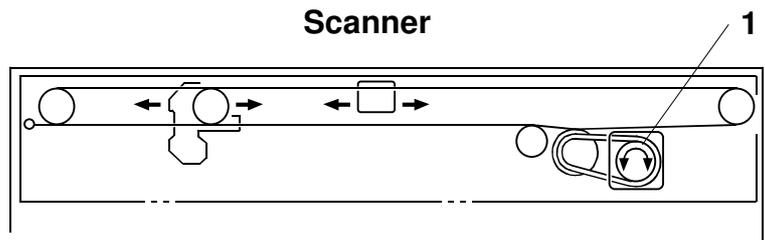
Refer to the electrical component layout on the reverse side of the point-to-point diagram for the location of the components.

Symbol	Name	Function
Motors		
M1	Scanner	Drives the 1st and 2nd scanners.
M2	Polygonal Mirror	Turns the polygonal mirror.
M3	Main	Drives the main unit components.
M4	Exhaust Fan	Removes heat from around the fusing unit.
M5	Upper Paper Lift	Raises the bottom plate in the 1st paper tray.
M6	Lower Paper Lift	Raises the bottom plate in the 2nd paper tray.
M7	Toner Supply	Rotates the toner bottle to supply toner to the development unit.
Magnetic Clutches		
MC1	Upper Paper Feed	Starts paper feed from the 1st paper tray.
MC2	Lower Paper Feed	Starts paper feed from the 2nd paper tray.
MC3	Upper Relay	Drives the upper relay rollers.
MC4	Lower Relay	Drives the lower relay rollers.
MC4	Registration	Drives the registration rollers.
Switches		
SW1	Main	Provides power to the machine. If this is off, there is no power supplied to the machine.
SW2	Right Upper Cover	Detects whether the right upper cover is open or not.
SW3	Right Cover	Cuts the +5VLD and +24V dc power line and detects whether the right cover is open or not.
SW4	Right Lower Cover	Detects whether the right lower cover is open or not.
SW5	Upper Paper Size	Determines what size of paper is in the upper paper tray.
SW6	Lower Paper Size	Determines what size of paper is in the lower paper tray.
SW7	New PCU Detect	Detects when a new PCU is installed.
SW8	Front Cover Safety	Cuts the +5VLD and +24V dc power line and detects whether the front cover is open or not.
SW9	Operation	Provides power for machine operation. The machine still has power if this switch is off.
Sensors		
S1	Scanner HP	Informs the CPU when the 1st and 2nd scanners are at home position.
S2	Platen Cover	Informs the CPU that the platen cover is in the up or down position (related to the APS/ARE functions).
S3	Original Width	Detects original width. This is one of the APS (Auto Paper Select) sensors.
S4	Original Length 1	Detects original length. This is one of the APS (Auto Paper Select) sensors.

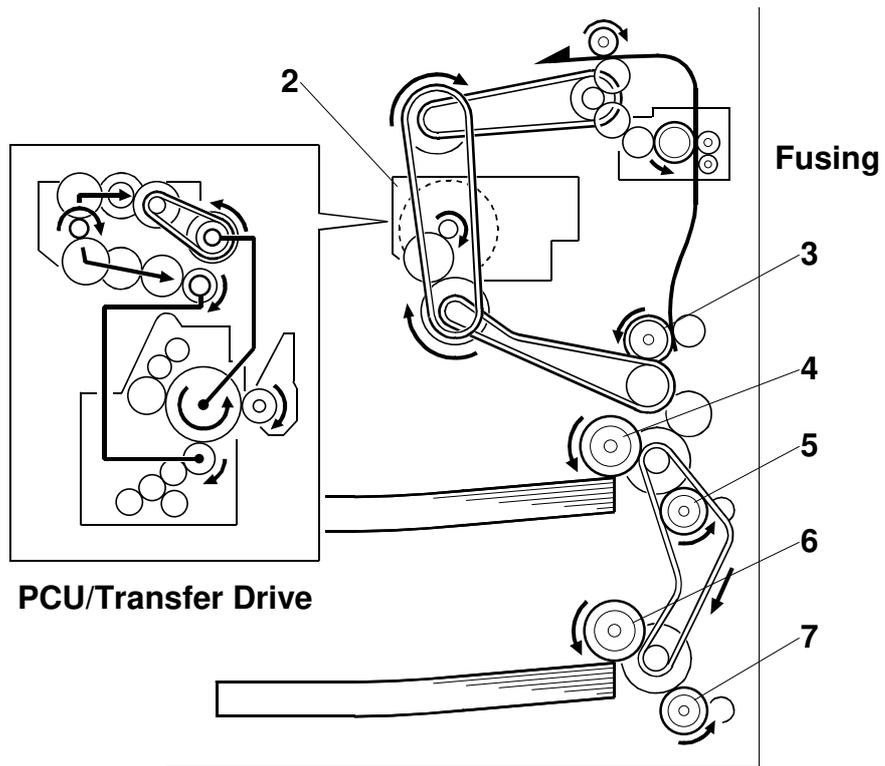
Symbol	Name	Function
S5	Original Length 2	Detects original length. This is one of the APS (Auto Paper Select) sensors.
S6	Toner Density (TD)	Detects the amount of toner inside the development unit.
S7	1st Paper End	Informs the CPU when the 1st paper tray runs out of paper.
S8	2nd Paper End	Informs the CPU when the 2nd paper tray runs out of paper.
S9	Image Density (ID)	Detects the density of various patterns and the reflectivity of the drum for process control.
S10	Paper Overflow	Detects paper overflow in the built-in copy tray.
S11	Paper Exit	Detects misfeeds.
S12	Upper Relay	Detects misfeeds.
S13	Lower Relay	Detects misfeeds.
S14	Registration	Detects misfeeds and controls registration clutch off-on timing.
S15	1st Paper Lift	Detects when the paper in the 1st paper tray is at the feed height.
S16	2nd Paper Lift	Detects when the paper in the 2nd paper tray is at the feed height.
S17	1st Paper Height – 1	Detects the amount of paper in the 1st paper tray.
S18	1st Paper Height – 2	Detects the amount of paper in the 1st paper tray.
S19	2nd Paper Height – 1	Detects the amount of paper in the 2nd paper tray.
S20	2nd Paper Height – 2	Detects the amount of paper in the 2nd paper tray.
PCBs		
PCB1	Controller	Controls all applications both directly and through other control boards.
PCB2	PSU (Power Supply Unit)	Provides dc power to the system and ac power to the fusing lamp and heaters.
PCB3	SBCU (Scanner & Base Engine Control Unit)	Controls the fusing lamp and the mechanical parts of the machine.
PCB4	SBU (Sensor Board Unit)	Contains the CCD, and outputs a video signal to the BICU board.
PCB5	Lamp Stabilizer	Stabilizes the power to the exposure lamp.
PCB6	LDD (Laser Diode Driver)	Controls the laser diode.
PCB7	Operation Panel	Controls the operation panel.
PCB8	High Voltage Supply	Supplies high voltage to the drum charge roller, development roller, and transfer roller.
PCB9	Memory (Option)	Expands the memory capacity for the copier, printer, and scanner features.
PCB10	IPU (Image Processing Unit)	Performs the image processing functions.
Solenoids		
SOL1	Fusing Drive Release	Releases the drive for the fusing unit.
Lamps		
L1	Exposure Lamp	Applies high intensity light to the original for exposure.

Symbol	Name	Function
L2	Main Fusing Lamp	Heats the center of the hot roller.
L3	Secondary Fusing Lamp	Heats both ends of the hot roller.
L4	Quenching Lamp	Neutralizes any charge remaining on the drum surface after cleaning.
Heaters		
H1	Anti-condensation (Option)	Turns on when the main power switch is off to prevent moisture from forming on the optics.
H2	Tray (Option)	Turns on when the main power switch is off to prevent moisture from forming around the paper trays.
Others		
TS1	Fusing Thermostats	Opens the fusing lamp circuit if the fusing unit overheats.
TH1	Fusing Thermistors	Detects the temperature of the hot roller.
LSD 1	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.
CO1	Mechanical Counter	Keeps track of the total number of prints made.
CO2	Key Counter (Option)	Used for control of authorized use. If this feature is enabled for copying, copying will be impossible until it is installed.

1.6 DRIVE LAYOUT



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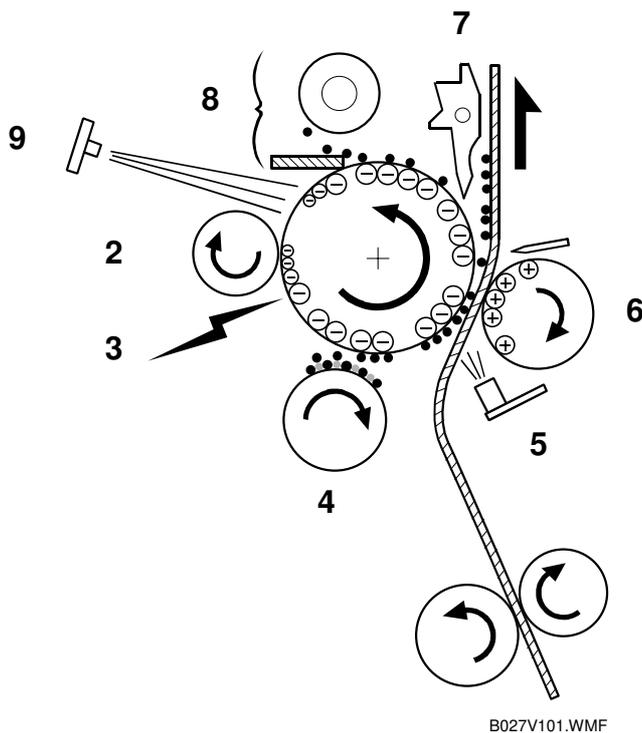
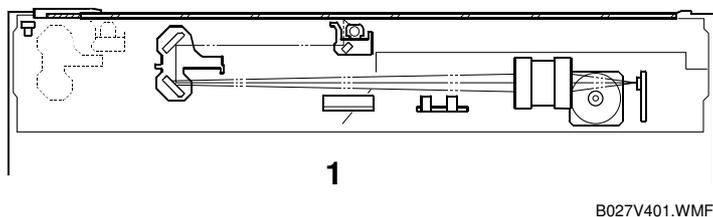


B027V302.WMF

1. Scanner Drive Motor
2. Main Motor
3. Registration Clutch
4. Upper Paper Feed Clutch
5. Upper Transport Clutch
6. Lower Paper Feed Clutch
7. Lower Transport Clutch

1.7 COPY PROCESS

1.7.1 OVERVIEW



1. EXPOSURE

A xenon lamp exposes the original. Light reflected from the original passes to the CCD, where it is converted into an analog data signal. This data is converted to a digital signal, processed and stored in the memory. At the time of printing, the data is retrieved and sent to the laser diode. For multi-copy runs, the original is scanned once only and stored to the memory.

2. DRUM CHARGE

In the dark, the charge roller gives a negative charge to the organic photoconductive (OPC) drum. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

3. LASER EXPOSURE

The processed data scanned from the original is retrieved from the memory and transferred to the drum by a laser beam, which forms an electrical latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the BICU board.

4. DEVELOPMENT

The magnetic developer brush on the development rollers comes in contact with the latent image on the drum surface. Toner particles are electrostatically attached to the areas of the drum surface where the laser reduced the negative charge on the drum.

5. ID SENSOR

The laser forms a sensor pattern on the drum surface. The ID sensor measures the reflectivity of the pattern. The output signal is one of the factors used for toner supply control. Also, the ID sensor measures the reflectivity of the drum surface. The output signal is used for charge roller voltage control.

6. IMAGE TRANSFER

Paper is fed to the area between the drum surface and the transfer roller at the proper time for aligning the copy paper and the developed image on the drum surface. Then, the transfer roller applies a high positive charge to the reverse side of the paper. This positive charge pulls the toner particles from the drum surface onto the paper. At the same time, the paper is electrostatically attracted to the transfer roller.

7. PAPER SEPARATION

Paper separates from the drum as a result of the electrostatic attraction between the paper and the transfer roller. The discharge plate helps separate the paper from the drum.

8. CLEANING

The cleaning blade removes any toner remaining on the drum surface after the image transfers to the paper.

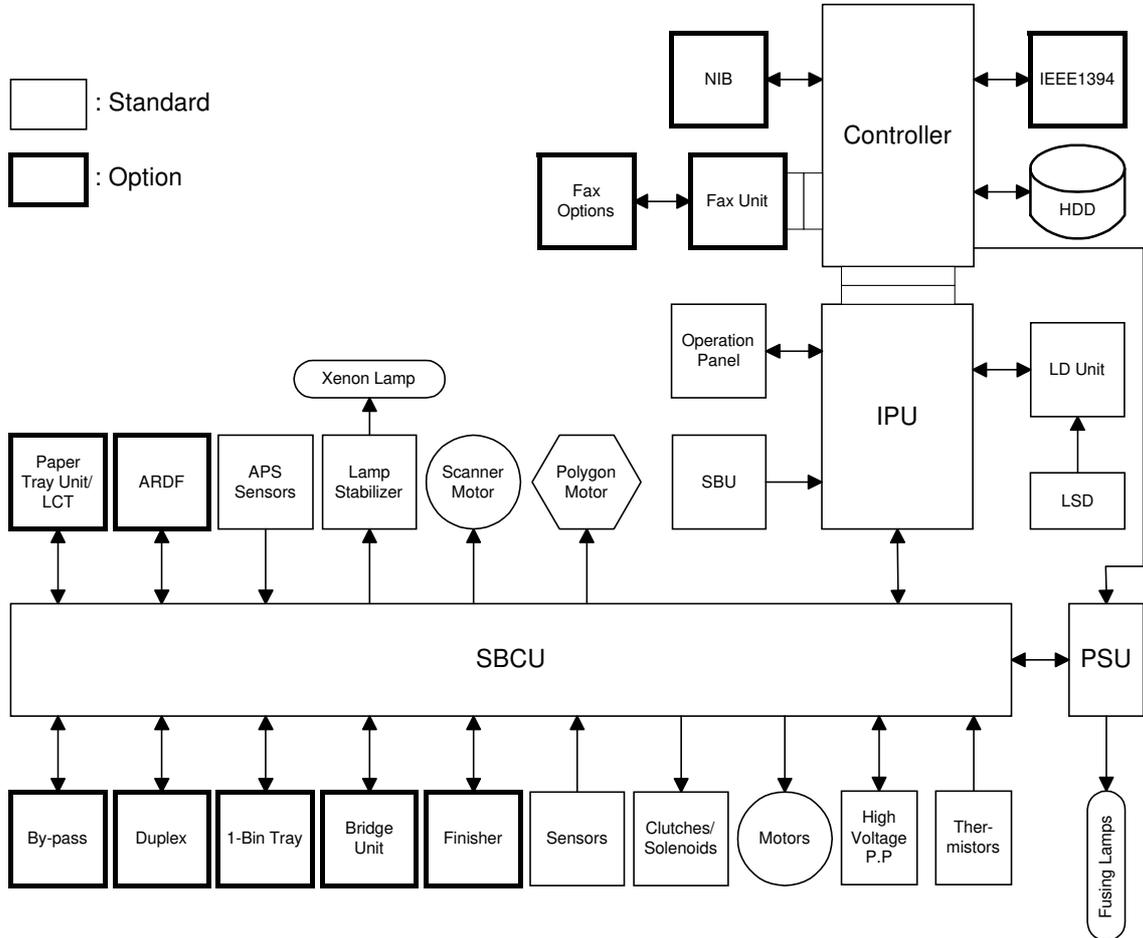
9. QUENCHING

The light from the quenching lamp electrically neutralizes the charge on the drum surface.

1.8 BOARD STRUCTURE

1.8.1 OVERVIEW

Overall Information



B027V500.WMF

This machine uses the GW (Ground Work) architecture, which allows the copier to be expanded as an MFP by installing simple modular components (ROM DIMMs) on the controller board.

1. **Controller (Main Board)**

Controls the memory and all peripheral devices.

2. **SBCU (Scanner & Base Engine Control Unit)**

This is the scanner and engine control board. It controls the following functions:

- Engine sequence
- Timing control for peripherals
- Operation control
- Drive control for the sensors, motors, and solenoids of the printer and scanner
- High voltage supply board control
- Serial interfaces with peripherals
- Fusing control

3. **IPU (Image Processing Board)**

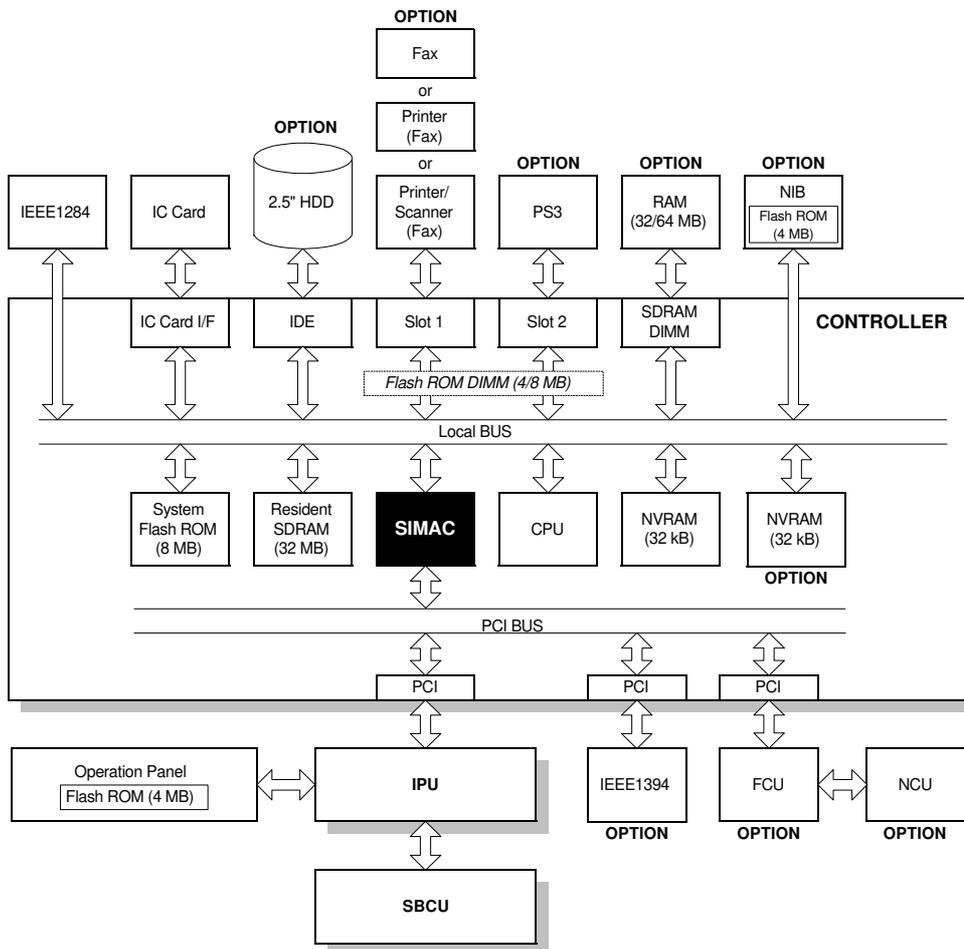
This is the scanned image processing board. It controls the following functions.

- Image processing control
- Video control

4. **SBU (Sensor Board Unit)**

The SBU deals with the analog signals from the CCD and converts them into digital signals.

1.8.2 CONTROLLER



B027V503.WMF

The controller employs GW (Ground Work) architecture, which allows the board to control all applications, including copier, printer, scanner, and fax applications. To add the optional printer, scanner, or fax applications, ROM DIMMs must be installed on the controller. The fax option, however, requires FCU and NCU installation also.

The following systems and application software can be downloaded from the controller's IC Card slot.

- Controller (System OS/Copier)
- Operation panel
- SBCU (engine control)
- Printer
- Scanner
- Fax
- PostScript 3
- NIB
- FCU

For details about how to download software from an IC card, see "Software Download" in 4.3. Program Download.

1. **CPU.** QED RM5231. Clock frequency: 200 MHz.
2. **SIMAC ASIC.** This is a dedicated chip developed for use with GW architecture. The CPU and memory I/F employ a 100 MHz bus (32 bit). These components perform CPU and I/F control and also control all of the following functions: memory, local bus, interrupts, PCI bus, video data, HDD, network, operation panel, IEEE1284, and image processing.
3. **SDRAM.** This is a 32 MB RAM chip, expandable with a 32 MB or 64 MB SDRAM.
4. **System Flash ROM.** 8 MB Flash ROM for the system OS and copier application.
5. **Flash ROM DIMM Slots.** Two slots are provided for two ROM DIMMs (4 MB or 8MB). Expansion slots provided for the optional printer, scanner, facsimile, and PostScript 3 applications.
6. **NVRAM.** 32 KB of NVRAM are provided for the system. The NVRAM stores many settings, including OS system log information, copier calendar, current system settings, user accounts (max. 100) and all settings for the fax, printer, scanner, and network. The NVRAM also has an RTC (Real Time Clock) for time management.

NOTE: Optional NVRAM, which can store up to 400 user accounts, can be installed on the controller.

7. **HDD.** A 2.5" HDD (more than 6 GB) can be connected using an IDE I/F. The hard disk is partitioned as shown below.

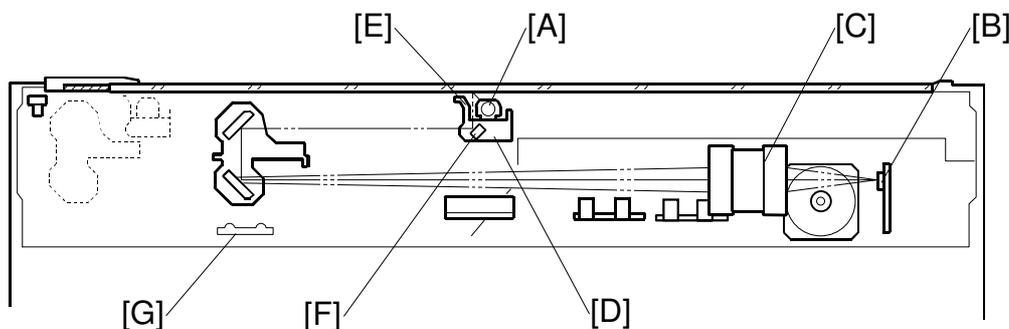
Partition	Size	Function	Power OFF	Comment
File System 1	500MB	Downloaded fonts, forms.	Remains	
File System 2	200MB	Job spooling area.	Erased	
File System 3	1500MB	Work data area	Remains	Used for document server application.
Image TMP	900MB	Collation, sample print, locked print.	Erased	Commonly used area for applications. Stores copy, printer, fax, and scanner data. Storage capacity: About 9000 pages (3,000 files)
Image LS* ¹	1640MB	Document server, local storage archive	Remains	
Image Area Management	20MB	Stores image area information	Remains	
Job Log	10MB	Job log.	Remains	
Total	4.8GB		Remains	

¹ When an application uses an image page, first it uses the Image LS area. If this area is in use and not available, then it uses the Image TMP area.

2. DETAILED SECTION DESCRIPTIONS

2.1 SCANNING

2.1.1 OVERVIEW



B027D556.WMF

Detailed
Descriptions

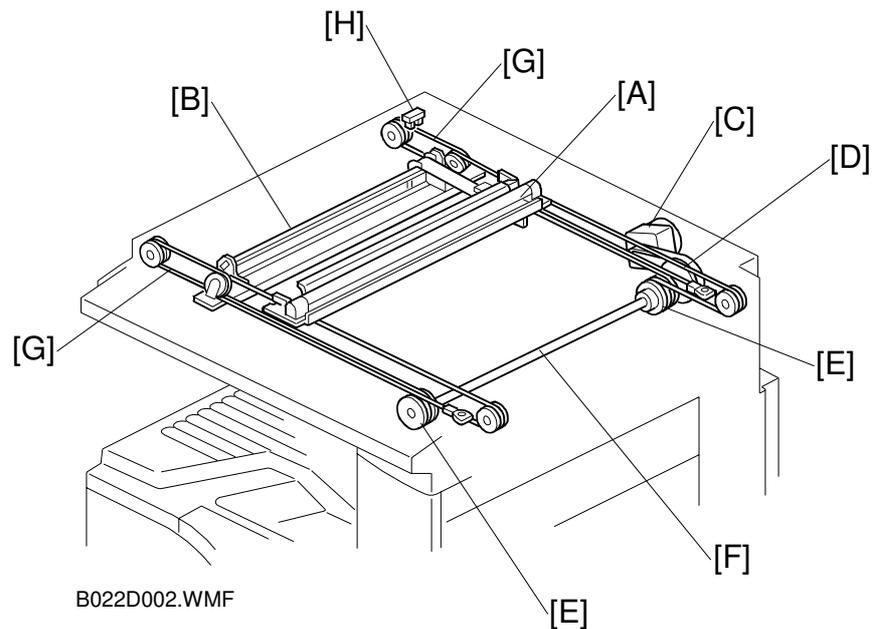
The original is illuminated by the exposure lamp (a xenon lamp in this model) [A]. The image is reflected onto a CCD (charge coupled device) [B] via the 1st, 2nd, 3rd mirrors, and lens [C].

The 1st scanner [D] consists of the exposure lamp, a reflector [E], and the 1st mirror [F].

A lamp stabilizer energizes the exposure lamp. The light reflected by the reflector is of almost equal intensity, to reduce shadows on pasted originals.

An optics anti-condensation heater [G] is available as an option. It can be installed on the left side of the scanner. It turns on whenever the power cord is plugged in.

2.1.2 SCANNER DRIVE



A stepper motor drives the scanner. The 1st and 2nd scanners [A,B] are driven by the scanner drive motor [C] through the timing belt [D], scanner drive pulley [E], scanner drive shaft [F], and two scanner wires [G].

- Book mode -

The scanner drive board controls and operates the scanner drive motor. In full size mode, the 1st scanner speed is **150 mm/s** during scanning. The 2nd scanner speed is half that of the 1st scanner.

In reduction or enlargement mode, the scanning speed depends on the magnification ratio. The returning speed is always the same, whether in full size or magnification mode. The image length change in the sub scan direction is done by changing the scanner drive motor speed, and in the main scan direction it is done by image processing on the **IPU board**.

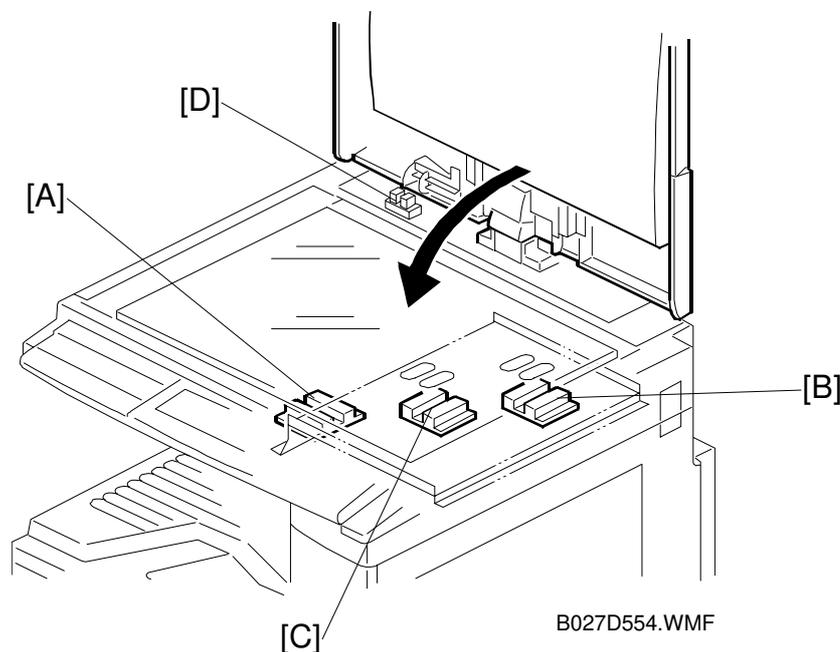
Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using **SP4009**. Magnification in the main scan direction can be adjusted using **SP4008**.

- ADF mode -

The scanners are always kept at their home position (the scanner H.P sensor [H] detects the 1st scanner) to scan the original. The ADF motor feeds the original through the ADF. In reduction/enlargement mode, the image length change in the sub-scan direction is done by changing the ADF motor speed. Magnification in the main scan direction is done in the **IPU board**, like for book mode.

Magnification in the sub-scan direction can be adjusted by changing the ADF motor speed using **SP6006**. In the main scan direction, it can be adjusted with **SP4008**, like for book mode.

2.1.3 ORIGINAL SIZE DETECTION IN PLATEN MODE

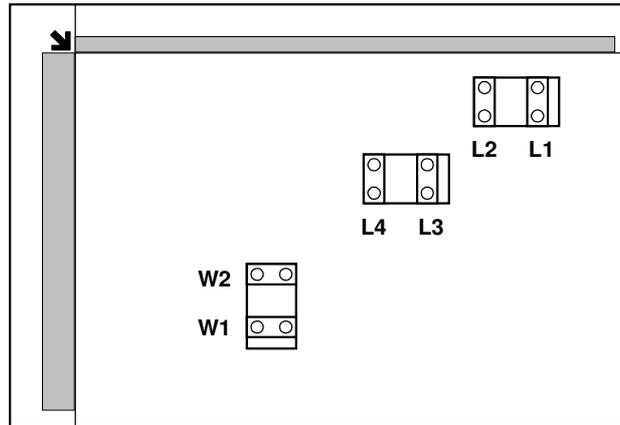


Detailed
Descriptions

In the optics cavity for original size detection, there are four reflective sensors in the 115V machines ([A] and [B]), and six reflective sensors in the 230V machines. The original width sensors [A] detect the original width, and the original length sensors [B] and [C] detect the original length. These are the APS (Auto Paper Select) sensors. Each APS sensor is a reflective photosensor.

While the main switch is on, these sensors are active and the original size data is always sent to the CPU. However, the CPU checks the data only when the platen cover sensor [D] is activated. This is when the platen is positioned about 15 cm above the exposure glass, for example while it is being closed. The CPU can recognize the original size from the combination of on/off signals from the APS sensors.

If the copy is made with the platen fully open, the CPU decides the original size from the sensor outputs when the Start key is pressed.



B027D555.WMF

Original Size		Length Sensor				Width Sensor	
A4/A3 version	LT/DLT version	L4	L3	L2	L1	W2	W1
A3	11" x 17"	O	O	O	O	O	O
B4	10" x 14"	O	O	O	O	O	X
Foolscap	8.5" x 13"	O	O	O	X	X	X
A4-L	8.5" x 11"	O	O	X	X	X	X
B5-L		O	X	X	X	X	X
A4-S	11" x 8.5"	X	X	X	X	O	O
B5-S		X	X	X	X	O	X
A5-L, A5-S		X	X	X	X	X	X

NOTE: 1) L: Lengthwise, S: Sideways, O: High (paper present), X: Low
 2) The length sensors L3 and L4 are used only for 230V machines.

For other combinations, "CANNOT DETECT ORIG. SIZE" will be indicated on the operation panel display (if SP 4-303 is kept at the default setting).

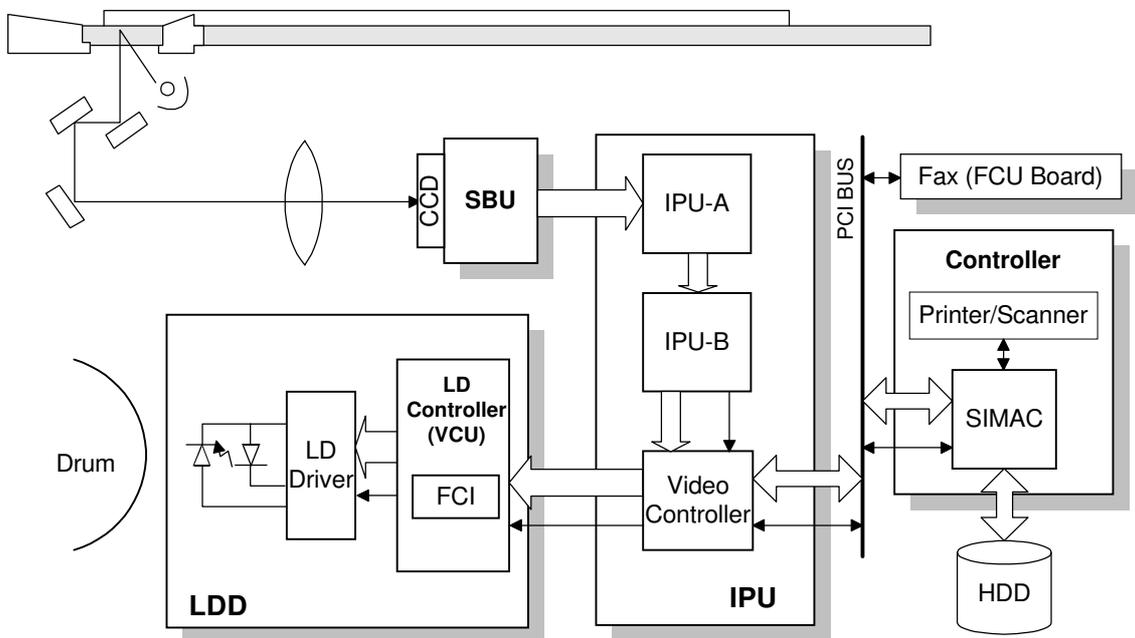
The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine's productivity.

However, if the by-pass feeder is used, note that the machine assumes that the copy paper is lengthwise. For example, if A4 sideways paper is placed on the by-pass tray, the machine assumes it is A3 paper and scans the full A3 area for the first copy of each page of the original, disregarding the original size sensors. However, for each page, the data signal to the laser diode is stopped to match the copy paper length detected by the registration sensor.

Original size detection using the ADF is described in the manual for the ADF.

2.2 IMAGE PROCESSING

2.2.1 OVERVIEW



Detailed Descriptions

B027D504.WMF

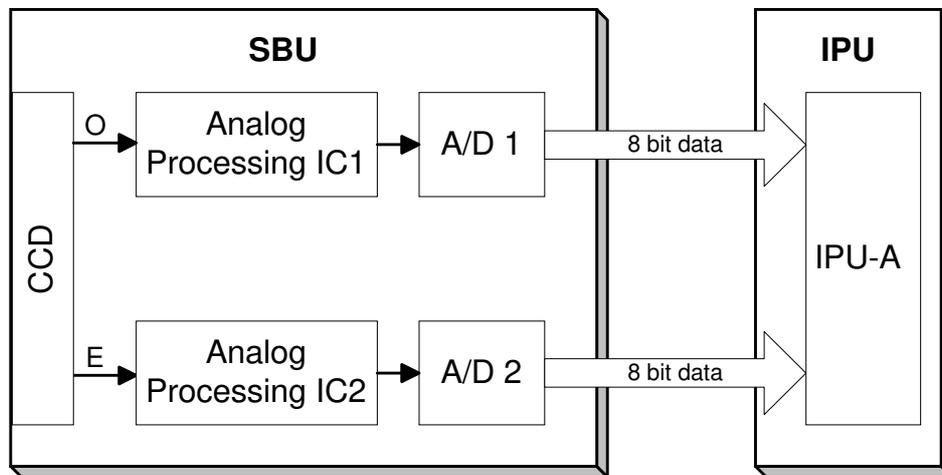
The CCD generates an analog video signal. The SBU (Sensor Board Unit) converts the analog signal to an 8-bit digital signal, then it sends the digital signal to the IPU (Image Processing Unit) board.

The IPU board performs the image processing, such as auto shading, filtering, magnification, gradation processing.

The SIMAC on the controller board performs the image editing, such as image repeat, double copy.

Finally, the IPU board sends the video data to the LD drive board.

2.2.2 SBU (SENSOR BOARD UNIT)



B027D505.WMF

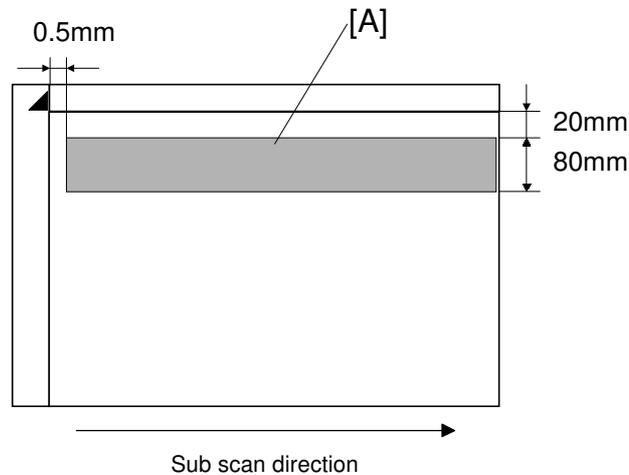
The CCD converts the light reflected from the original into an analog signal. The CCD line has 7,450 pixels and the resolution is 600 dpi (23.6 lines/mm).

The CCD has two output lines, for odd and even pixels, to the analog processing IC. The analog processing IC performs the following operations on the signals from the CCD:

1. Z/C (Zero Clamp):
Adjusts the black level reference for even pixels to match the odd pixels.
2. Signal Amplification:
The analog signal is amplified by operational amplifiers in the AGC circuit.
3. Auto Gain Control
Adjusts the gain curve for the scanned image density.

After the above processing, the analog signals are converted to 8-bit signals by the A/D converter. This will give a value for each pixel on a scale of 256 grades. Then, the digitized image data goes to the [IPU board](#).

2.2.3 AUTO IMAGE DENSITY



B027D552.WMF

Detailed
Descriptions

ADS prevents the background of an original from appearing on copies.

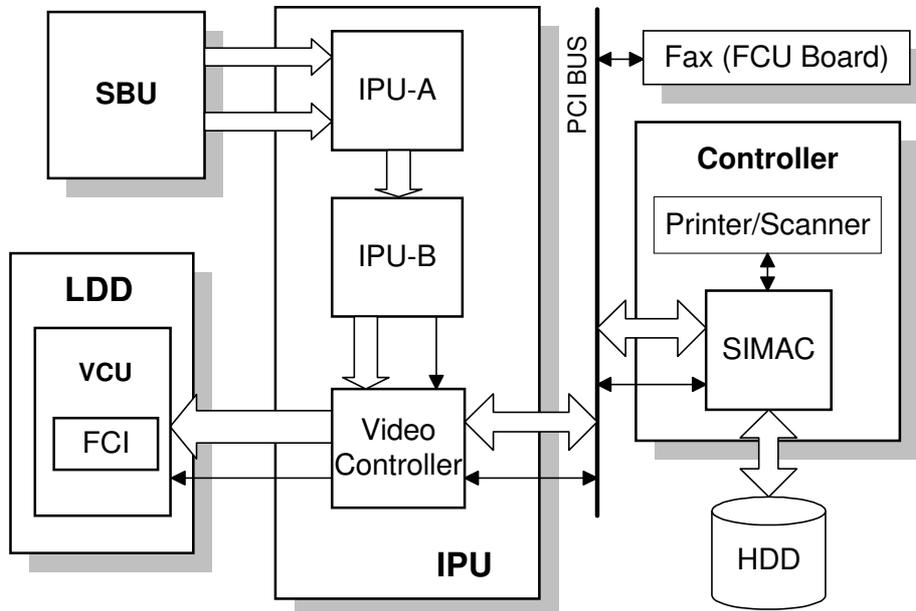
The copier scans the auto image density detection area [A] as shown in the diagram. This corresponds to a few mm at one end of the main scan line. As the scanner scans down the page, the SBU detects the peak white level for each scan line. The IPU performs the ADS function in accordance with the peak white level.

When an original with a gray background is scanned, the density of the gray area is the peak white level density. Therefore, the original background will not appear on copies. Because peak level data is taken for each scan line, ADS corrects for any changes in background density down the page.

As with previous digital copiers, the user can select manual image density when selecting auto image density mode, and the machine will use both settings when processing the original.

2.2.4 IPU (IMAGE PROCESSING UNIT)

Overview



B027D507.WMF

The image data from the SBU goes to the IPU (Image Processing Unit) ICs on the SBCU board, which carry out the following processes on the image data.

IPU-A

- Auto shading
- Pre-filtering
- Magnification
- Test pattern generation

IPU-B

- Filtering (MTF and smoothing)
- ID gamma correction
- Grayscale processing
- Binary picture processing
- Error diffusion
- Dithering

Video Controller

- Video path control

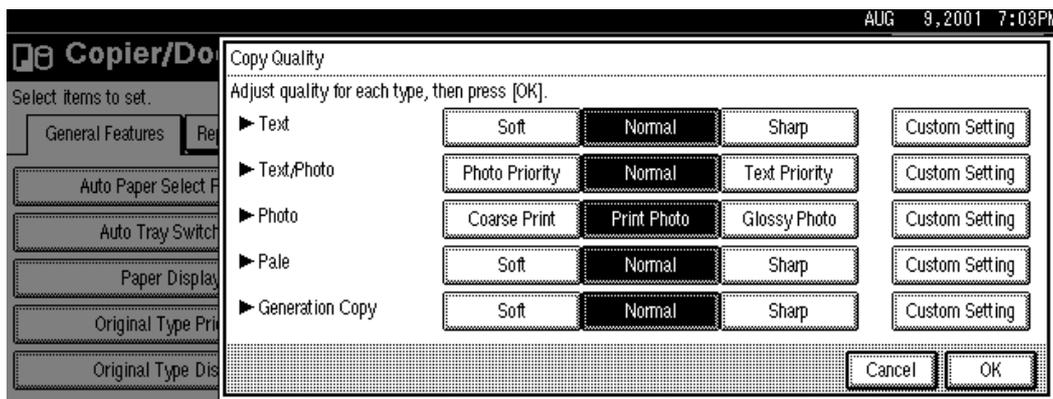
The image data then goes to the LD driver (LDD).

Image Processing Modes

The user can select one of the following modes with the User Tools screen: Text, Text/Photo, Photo, Pale, Generation. Each of these modes has a range of different settings (e.g. Soft, Normal, Sharp, etc). For each mode, a Custom Setting option is also available. This Custom Setting holds the values selected with the SP modes, which can be adjusted to meet special requirements that cannot be covered by the standard settings.

To display this screen, press User Tools/Counter , press Copier/Document Server Settings, press the General Features tab, and then press Copy Quality.

Detailed Descriptions



B027D800.WMF

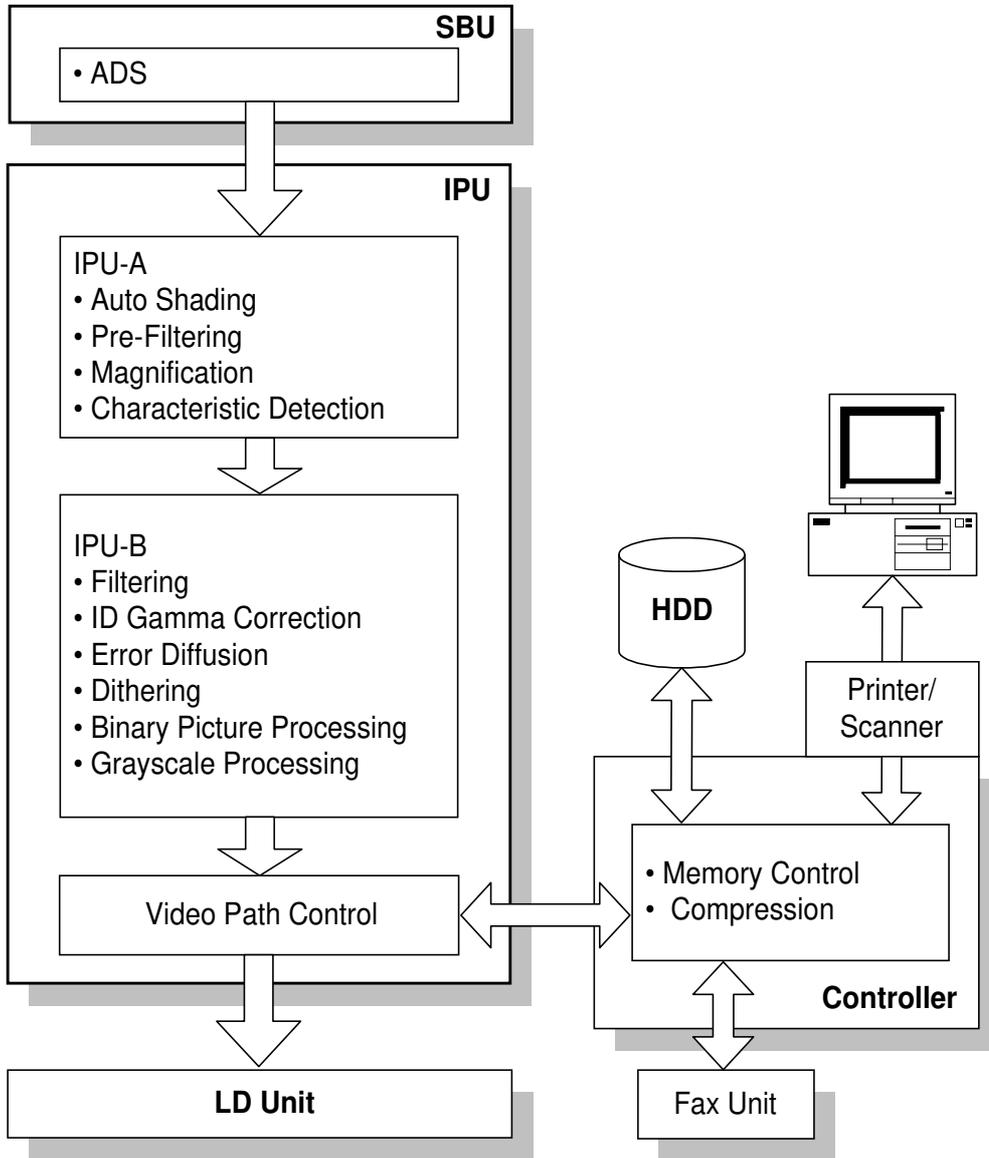
Mode	Function
Text	Best reproduction of text and sharp lines. Ignores background texture. (☛ p.2-11 Text Mode)
Text/Photo	Good reproduction of mixed text and photographs with accurate grayscaling, better than that achieved in the Text mode. (☛ p.2-13 Text/Photo Mode)
Photo	Best possible reproduction of photographs. (☛ p.2-12 Photo Mode)
Pale	Reproduction similar to text mode, but of lower contrast. Ideal for copying thin originals. (☛ p.2-14 Pale Mode)
Generation Copy	Attempts to achieve the best reproduction of copied originals that are faded because they are copies of copies. (☛ p.2-15 Generation Copy)

In addition, there are two main image processing modes: grayscale processing and binary picture processing. When no optional hard disk has been installed, the machine uses binary picture processing. However, when the optional hard disk has been installed, the machine uses grayscale processing. The user or technician cannot select the mode.

Image Processing Path

Overview

This diagram shows the various stages of the image process and where they are done.



B027D559.WMF

SP Modes for Each Image Processing Step

The following tables show which settings and SP modes are used for each image processing step.

Text Mode

		Text Mode			
		Soft	Normal	Sharp	Custom Setting
ADS (SBU)		As selected at the operation panel			
Shading Correction	~34%	Enabled			
	35%~				
Small Smoothing Filter	~34%	Three-line filter			
	35%~	One-line filter			
Main Scan Magnification	~34%	Enabled			
	35%~				
Mirroring	~34%	Enabled only in the ADF mode			
	35%~				
Characteristic Detection	~34%	None			
	35%~	Weak	Middle	Strong	4-903-2 ~ 4
MTF/Smoothing Filter	~34%	MTF (Weak)	MTF (Medium)	MTF (Strong)	4-903-1
	35%~	Character (Weak)	Character (Medium)	Character (Strong)	4-903-2 ~ 4
Independent Dot Erase	~34%	None			4-904-1
	35%~	None			
Background Erase	~34%	None			4-904-6
	35%~	None			
γ Correction	~34%	Text			4-904-11
	35%~	Character (Text)			
Gradation	~34%	Normal error diffusion		Binary picture processing	4-903-1
	35%~	Character error diffusion		Binary picture processing	4-903-2 ~ 4
Line Width Correction	~34%	2-907-1			
	35%~				

Detailed Descriptions

Photo Mode

		Photo Mode			
		Coarse Print	Print Photo	Glossy Photo	Custom Setting
ADS (SBU)		As selected at the operation panel			
Shading Correction	~34%	Enabled			
	35%~				
Small Smoothing Filter	~34%	Three-line filter			
	35%~	One-line filter			
Main Scan Magnification	~34%	Enabled			
	35%~				
Mirroring	~34%	Enabled only in the ADF mode			
	35%~				
Characteristic Detection	~34%	None			
	35%~	None			4-903-6 ~ 8
MTF/Smoothing Filter	~34%	Character	Smoothing		4-903-5
	35%~	Smoothing		Character	4-903-6 ~ 8
Independent Dot Erase	~34%	None			4-904-2
	35%~	None			
Background Erase	~34%	None			4-904-7
	35%~	None			
γ Correction	~34%	Dither (16x16)	Dither (8x8)	Dither (Character)	4-904-12
	35%~				
Gradation	~34%	Dither (16x16)	Dither (8x8)	Normal error diffusion	4-903-5
	35%~			Character error diffusion	4-903-6 ~ 8
Line Width Correction	~34%	2-907-2			
	35%~				

Text/Photo Mode

		Text/Photo Mode			
		Photo priority	Normal	Text Priority	Custom Setting
ADS (SBU)		As selected at the operation panel			
Shading Correction	~34%	Enabled			
	35%~				
Small Smoothing Filter	~34%	Three-line filter			
	35%~	One-line filter			
Main Scan Magnification	~34%	Enabled			
	35%~				
Mirroring	~34%	Enabled only in the ADF mode			
	35%~				
Characteristic Detection	~34%	None			
	35%~	Strong	Middle	Weak	4-903-10 ~ 12
MTF/Smoothing Filter	~34%	MTF (Weak)	MTF (Medium)	MTF (Strong)	4-903-9
	35%~	Character (Weak)	Character (Medium)	Character (Strong)	4-903-10 ~ 12
Independent Dot Erase	~34%	None			4-904-3
	35%~	None			
Background Erase	~34%	None			4-904-8
	35%~	None			
γ Correction	~34%	Text/Photo			4-904-13
	35%~	Character (Text/Photo)			
Gradation	~34%	Normal error diffusion			
	35%~	Character error diffusion			
Line Width Correction	~34%	2-907-3			
	35%~				

Detailed Descriptions

Pale Mode

		Pale Mode			
		Photo priority	Normal	Text Priority	Custom Setting
ADS (SBU)		As selected at the operation panel			
Shading Correction	~34%	Enabled			
	35%~				
Small Smoothing Filter	~34%	Three-line filter			
	35%~	One-line filter			
Main Scan Magnification	~34%	Enabled			
	35%~				
Mirroring	~34%	Enabled only in the ADF mode			
	35%~				
Characteristic Detection	~34%	None			
	35%~	Weak	Middle	Strong	4-903-14 ~ 16
MTF/Smoothing Filter	~34%	MTF (Weak)	MTF (Medium)	MTF (Strong)	4-903-13
	35%~	Character (Weak)	Character (Medium)	Character (Strong)	4-903-14 ~ 16
Independent Dot Erase	~34%	None			
	35%~	None			
Background Erase	~34%	None			
	35%~	None			
γ Correction	~34%	Pale			
	35%~	Character (Pale)			
Gradation	~34%	Normal error diffusion			
	35%~	Character error diffusion			
Line Width Correction	~34%	2-907-4			
	35%~				

Generation Copy

		Generation Copy Mode			
		Photo priority	Normal	Text Priority	Custom Setting
ADS (SBU)		As selected at the operation panel			
Shading Correction	~34%	Enabled			
	35%~				
Small Smoothing Filter	~34%	Three-line filter			
	35%~	One-line filter			
Main Scan Magnification	~34%	Enabled			
	35%~				
Mirroring	~34%	Enabled only in the ADF mode			
	35%~				
Characteristic Detection	~34%	None			
	35%~	Weak	Middle	Strong	4-903-18 ~ 20
MTF/Smoothing Filter	~34%	MTF (Weak)	MTF (Medium)	MTF (Strong)	4-903-17
	35%~	Character (Weak)	Character (Medium)	Character (Strong)	4-903-18 ~ 20
Independent Dot Erase	~34%	Weak			4-904-5
	35%~	Weak			
Background Erase	~34%	Weak			4-904-10
	35%~	Weak			
γ Correction	~34%	Generation copy			4-904-15
	35%~	Character (Generation copy)			
Gradation	~34%	Normal error diffusion			
	35%~	Character error diffusion			
Line Width Correction	~34%	2-907-5			
	35%~				

Detailed Descriptions

Auto Shading

Auto shading does two things.

- Zeroes the black level for each scan line of data.
- Corrects for variations in white level across the main scan.

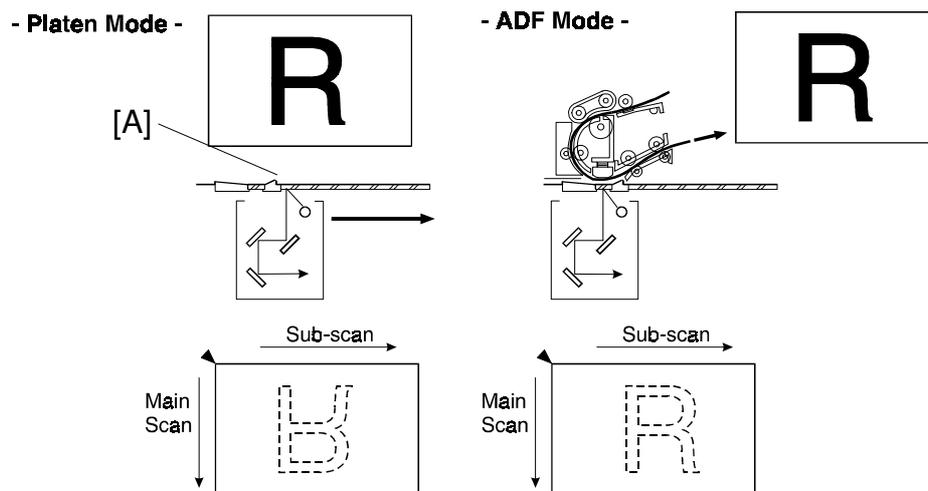
Pre-Filtering

Pre-filter smoothes mainly parallel lines in the main scan direction and extended lines in the sub-scan direction. This reduces moiré and spurious noise in images.

Main Scan Magnification/Reduction

Changing the scanner speed enables reduction and enlargement in the sub-scan direction. However, the IPU-A chip handles reduction and enlargement in the main scan direction. The processing for main scan magnification/reduction is the same as in the previous digital machines.

Mirroring for ADF Mode



B027D564.WMF

When making a copy using the ADF, the magnification circuit creates a mirror image. This is because the scanning starting position in the main scan direction is at the other end of the scan line in ADF mode (compared with platen mode). In platen mode, the original is placed face down on the exposure glass, and the corner at [A] is at the start of the main scan. The scanner moves down the page. In ADF mode, the ADF feeds the leading edge of the original to the DF exposure glass, and the opposite top corner of the original is at the main scan start position.

To create the mirror image, the IPU-A stores each line in a LIFO (Last In First Out) memory.

Characteristic Detection

This function uses software filters to detect edge areas, non-edge areas, and areas of shaded dot patterns.

The result determines the image processing that will be applied to each pixel.

Filtering

Overview

There are some software filters for enhancing the desired image qualities of the selected original mode. These filters are the MTF filter, the smoothing filter, characteristic filter, and independent dot erase.

Depending on the original mode and the reproduction ratio, the machine will use either MTF/smoothing, or the filter determined by characteristic detection.

If MTF/smoothing is used, it is applied to all areas of the original, regardless of whether they are edge areas, non-edge areas, or independent dots.

- The MTF filter emphasizes sharpness and is used in all original types except Photo mode.
- The smoothing filter is used in Photo mode.

If the characteristic filter is used, the filter for each pixel depends on the image data type that was detected by characteristic detection.

MTF Filter

An MTF filter is used for all original types except Photo mode.

When the reproduction ratio is less than 35%, this filter is applied to all image data pixels, regardless of whether they are in an edge area or non-edge area.

When the reproduction ratio is 35% or more, the type of MTF filter used for each pixel depends on the results of characteristic detection.

Smoothing Filter

A smoothing filter is used in Photo mode instead of MTF. It is applied to all image data pixels, regardless of whether they are in an edge area or non-edge area.

With some combinations of reproduction ratio and image mode, the type of smoothing used for each pixel depends on the results of characteristic detection (see the Photo mode table in SP Modes for Each Processing Step).

Characteristic Filter

A characteristic filter is applied instead of MTF, smoothing, and ID gamma correction with some combinations of original type and reproduction ratio. See the 'SP Modes for Each Processing Step' section.

For example, In text mode, for the 'Normal' original type, if the reproduction ratio is less than 35%, MTF (medium) is used for all pixels in the image. However, if the reproduction ratio is 35% or more, the 'medium' characteristic filter is used, and the processing depends on whether the pixel was in an edge area, a non-edge area, or in an area shaded using a dot pattern.

Each characteristic filter consists of a combination of the following features: MTF, smoothing, error diffusion, dithering, ID gamma correction. For each of these features, the machine chooses from two types when making up a characteristic filter.

Independent Dot Erase

Independent dot erase removes unwanted dots from the image.

Independent dot erase is enabled only for Generation Copy mode (according to the default settings). However, for the "Custom Setting" original modes, independent dot detection can be enabled and adjusted with SP4-904-2~4. With a larger SP setting, more dots are detected as independent dots and erased, even if the dot density is high. However, dots in mesh-like images may be mistakenly detected as independent dots.

Background Erase

By default, this process is disabled in all original modes. However, it can be enabled with SP mode.

Usually, dirty background is erased using the Auto Image Density (ADS) function. However, sometimes, dirty background areas will still appear. These can be erased with this function.

The threshold level for erasing can be changed with SP4-904-6~10.

ID Gamma (γ) Correction

The machine automatically selects the most appropriate ID gamma correction based on the selected original type.

Also, for certain combinations of reproduction ratio and original type, characteristic detection is used. In this case, the machine can use one of two gamma correction tables. The one that is used is decided separately for each pixel, and depends on the results of characteristic detection.

Gradation Processing

Overview

There are four types of gradation processing:

- Grayscale processing: This has 4 output levels for each pixel.
- Binary picture processing: This has only two output levels (black and white).
- Error diffusion: There are two error diffusion processing types (normal and characteristic detection)
- Dithering: There are two dithering processing types (normal and characteristic detection).

Grayscale Processing

In this machine, the 8-bit image data is converted into 2-bit data. This produces up to 4 image density levels for each pixel.

To realize this, this machine uses a form of pulse width modulation. In this machine, pulse width modulation consists of the following processes:

- Laser diode pulse positioning
- Laser diode power/pulse width modulation

Laser diode power and pulse width modulation is done by the laser diode drive board (LDD). Briefly, the width of the laser pulse for a pixel depends on the output level (image density level: from 0 to 255) required for the pixel.

Note that although the LDD can create 256 levels per pixel, the machine only uses [8 of these](#), and only four are used for any one job. A gamma table determines which four output levels are used. The gamma table is different for each original type setting.

Binary Picture Processing

The 8-bit image data is converted into 1-bit data (black and white image data).

Error Diffusion

The error diffusion process reduces the difference in contrast between light and dark areas of a halftone image. Each pixel is corrected using the difference between it and the surrounding pixels. The corrected pixels are compared with an error diffusion matrix.

[There are two types of error diffusion processing: One is 'normal'. The other is part of the characteristic detection process, in which the error diffusion method is determined separately for each pixel. The error diffusion type \(normal or characteristic\) depends on the reproduction ratio and the original type \(refer to the SP Modes for Each Image Processing Step tables\).](#)

Dithering

Each pixel is compared with the pixel in the same position in a dither matrix. Several matrixes are available, to increase or decrease the detail on the copy.

Line width correction

This function is effective [in all original modes](#).

Usually, lines will bulge in the main scan direction as a result of the negative/positive development system that is used in this model. So, pixels on edges between black and white areas are compared with adjacent pixels, and if the pixel is on a line, the line thickness will be reduced.

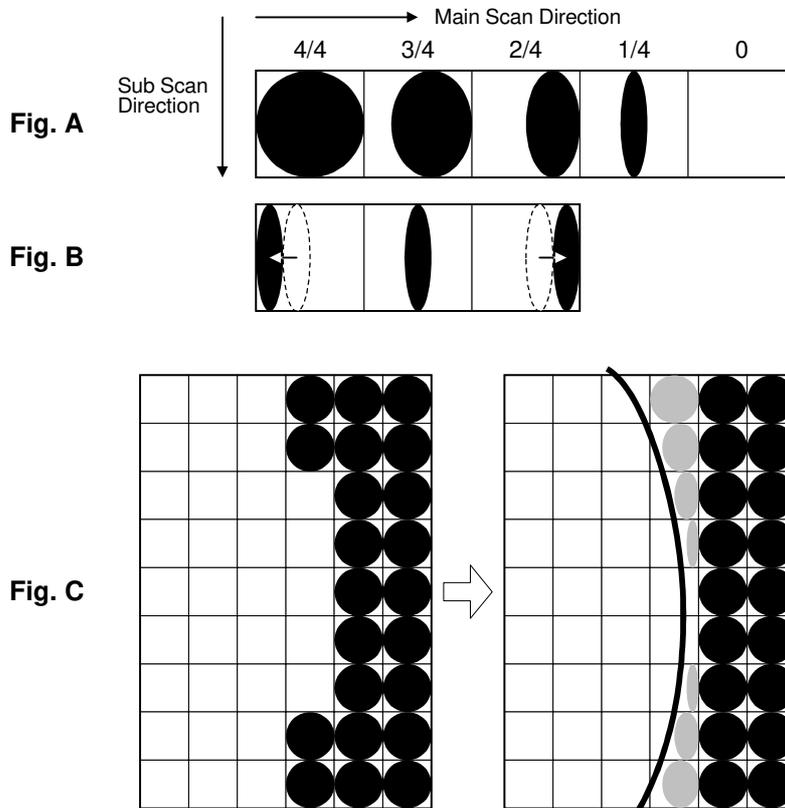
Line width correction is done in the [VCU chip on the LDD board](#).

The line width correction type can be selected with [SP2-907](#).

2.2.5 VIDEO CONTROL UNIT (VCU)

Fine Character and Image (FCI)

The FCI circuit performs image smoothing.



B027D574.WMF

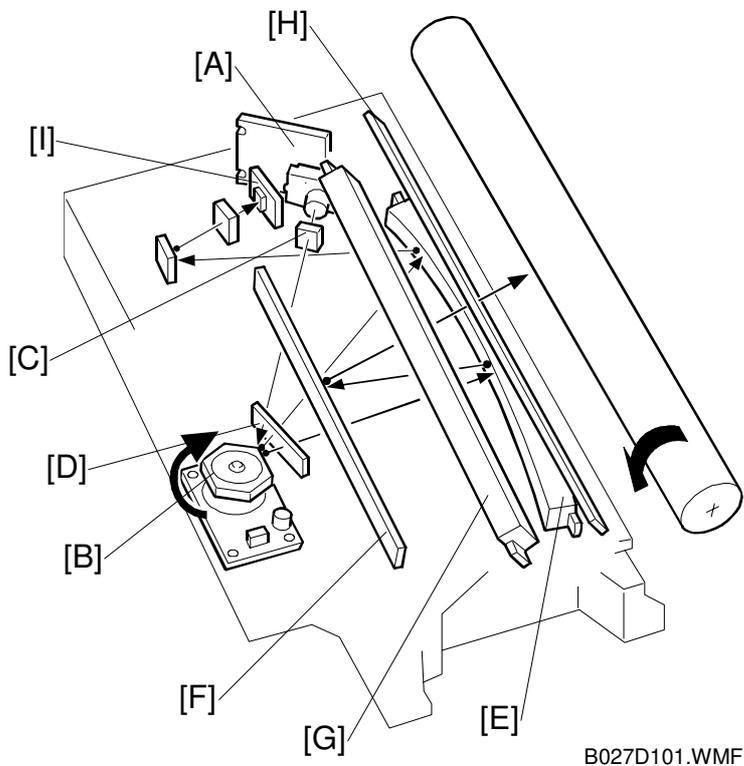
Usually, binary picture processing generates jagged edges on characters, as shown in the above illustration. These are reduced using edge smoothing. The FCI changes the laser pulse duration and position for certain pixels.

Fig. A shows the four possible pulse durations, and Fig. B shows how the laser pulse can be in one of three positions within the pixel. Fig. C shows an example of how edge smoothing is used.

[This function only affects the received image for fax mode and for printer mode, even if copy mode is also using binary picture processing.](#)

2.3 LASER EXPOSURE

2.3.1 OVERVIEW



Detailed
Descriptions

The optical path from the laser diode to the drum is shown above.

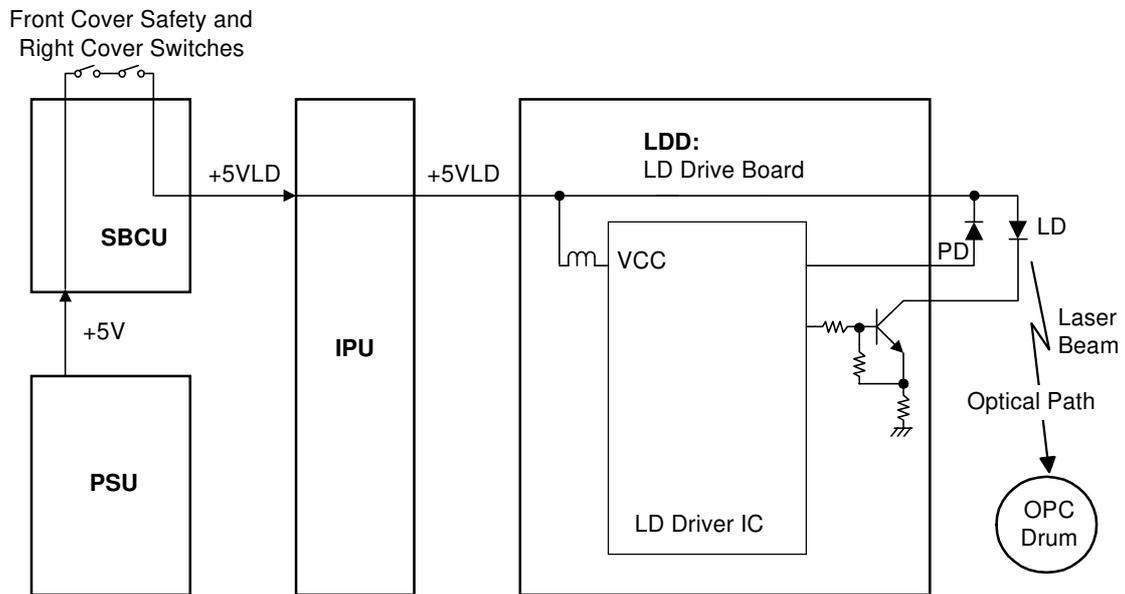
The LD unit [A] outputs a laser beam to the polygon mirror [B] through the cylindrical lens [C]. The shield glass [D] prevents dust from reaching the polygon mirror.

Each surface of the polygon mirror reflects one full main scan line. The laser beam goes to the F-theta mirror [E], mirror [F], and BTL (barrel toroidal lens) [G]. Then the laser beam goes to the drum through the toner shield glass [H].

The laser synchronizing detector [I] determines the main scan starting position.

The speed of the polygon mirror motor is 28,818.9 rpm for 600 dpi.

2.3.3 LD SAFETY SWITCH



Detailed Descriptions

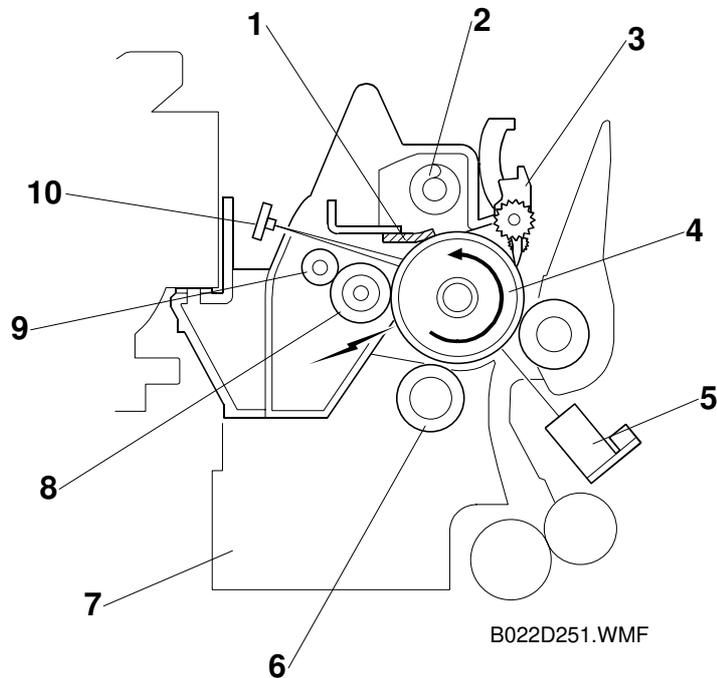
B027D500.WMF

To ensure technician and user safety and to prevent the laser beam from inadvertently switching on during servicing, safety switches are located at the front and right covers. The switches are installed on the +5VLD line coming from the power supply unit through the **SBCU** and **IPU** boards.

When the front cover or the right cover is opened, the power supply to the laser diode is interrupted.

2.4 PHOTOCONDUCTOR UNIT (PCU)

2.4.1 OVERVIEW



The PCU consists of the components shown in the above illustration. An organic photoconductor (OPC) drum (diameter: 30 mm) is used in this machine.

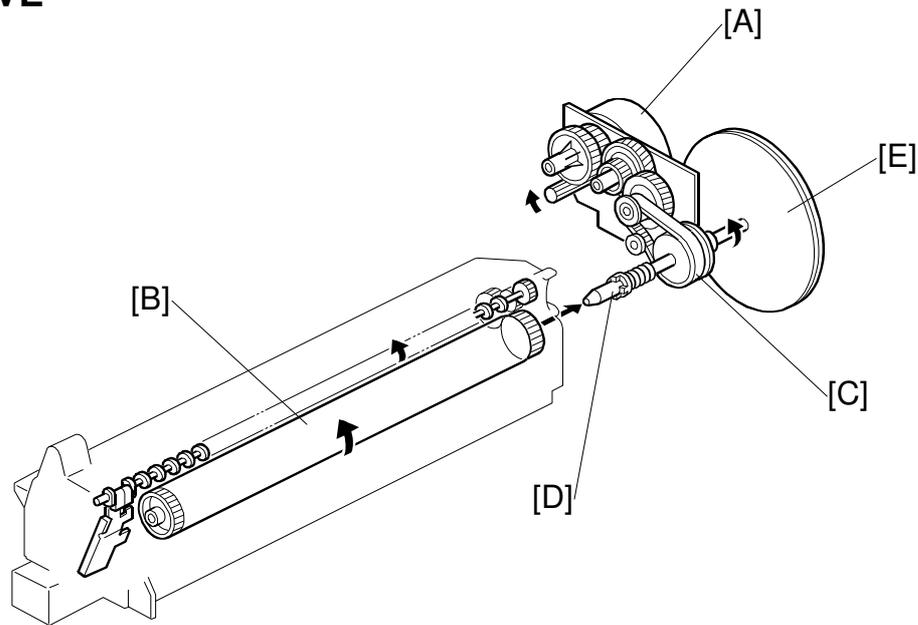
- | | |
|--------------------------|----------------------------------|
| 1. Cleaning Blade | 6. Development Roller |
| 2. Toner Collection Coil | 7. Development Unit |
| 3. Pick-off Pawl | 8. Charge Roller |
| 4. OPC Drum | 9. Charge Roller Cleaning Roller |
| 5. ID Sensor (see note) | 10. Quenching Lamp (see note) |

NOTE: These parts are not included in the PCU.

The machine informs the user when the PCU life has finished. However, the user can continue to make copies.

SP5-912 can be used to enable or disable this warning message, and to change the default replacement interval (the default is 60k).

2.4.2 DRIVE

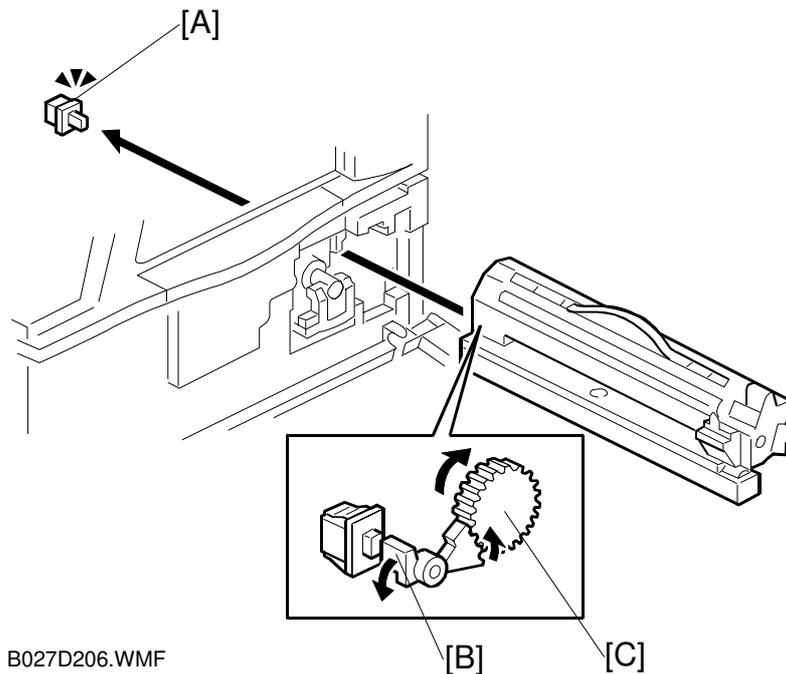


B027D202.WMF

The main motor [A] drives the drum [B] through a series of gears, a timing belt [C], and the drum drive shaft [D]. The main motor assembly includes a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range.

The fly-wheel [E] on the end of the drum drive shaft stabilizes the rotation speed (this prevents banding and jitter from appearing on copies).

2.4.3 NEW PCU DETECTION



B027D206.WMF

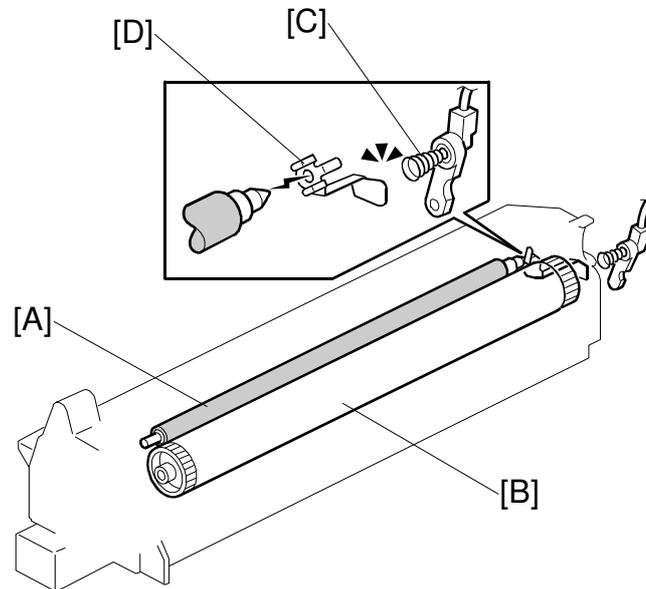
The new PCU detect switch [A] detects when a new PCU is installed. Each PCU has an actuator [B]. When a new PCU is installed in the machine, the actuator [B] pushes the new PCU detect switch. The actuator is a sector gear, and this gear engages with the drum gear [C]. When the drum rotates, the actuator is released from the drum gear. The actuator drops away from the new PCU detect switch and remains in this "down" position for the duration of the PCU's life.

The machine recognizes when a new PCU has been installed in the machine because the actuator of the new PCU contacts the new PCU detect switch. After the front cover and right cover are closed, the machine then performs the TD sensor initial setting procedure automatically (for about 45 seconds). During this time, the drum rotates and the actuator drops away from the sensor.

Also, while the machine performs the TD sensor initial setting, the machine makes an ID sensor pattern on the drum. This checks whether the developer has fallen into the development unit (in other words, it checks whether the technician remembered to remove the developer seal from the PCU at machine installation). If the machine does not detect the ID sensor pattern, SC 392 will be generated.

2.5 DRUM CHARGE

2.5.1 OVERVIEW



B027D203.WMF

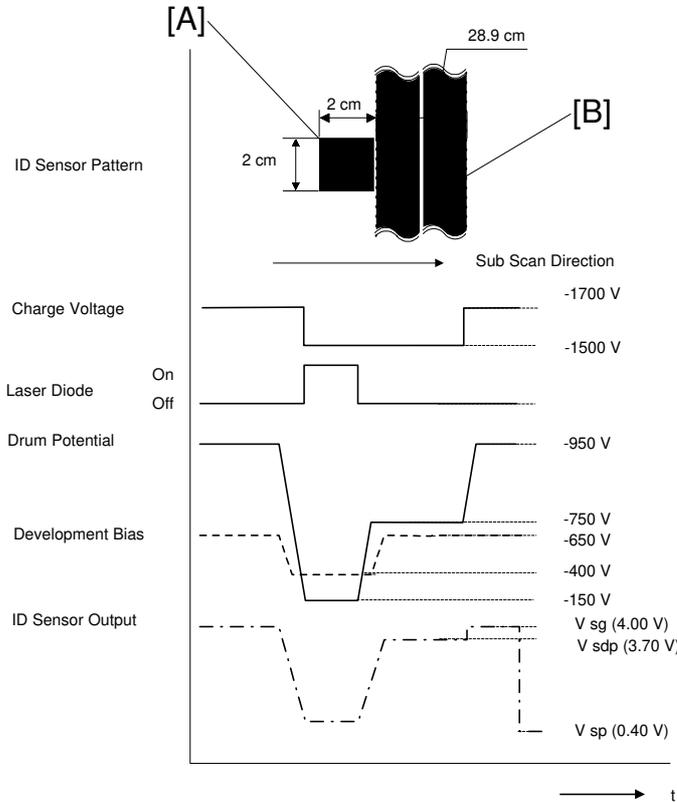
Detailed
Descriptions

This copier uses a drum charge roller to charge the drum. The drum charge roller [A] always contacts the surface of the drum [B] to give it a negative charge of -900V .

The high voltage supply board gives a negative dc voltage to the drum charge roller through the spring [C] and terminal plate [D].

2.5.1 CHARGE ROLLER VOLTAGE CORRECTION

Correction for Environmental Conditions



B027D508.WMF

With a drum charge roller system, the voltage transferred from roller to drum varies with the temperature and humidity around the drum charge roller. The lower the temperature or humidity is, the higher the applied voltage required.

To compensate, the machine uses the ID sensor to measure the effects of current environmental conditions. For this measurement, the process control parameters are balanced so that any small change in drum potential caused by environmental effects is reflected in a change in the amount of toner transferred to the drum.

This measurement is made immediately after the ID sensor pattern for toner density control. Immediately after making ID sensor pattern [A], the charge roller voltage stays on, but the development bias goes up to **-650V**; as a result the drum potential is reduced to **-750V**. The laser diode is not switched on, and the drum potential is now slightly higher than the development bias, so only a very small amount of toner transfers to the drum. The ID sensor measures the density of this pattern [B], and the output voltage is known as Vsdp. This voltage is compared with Vsg (read from the bare drum at the same time).

If the humidity drops, the drum potential goes up (to a higher –ve voltage) even if the charge roller voltage supply stays the same (efficiency of voltage transfer is higher with lower humidity). As a result, less toner is transferred to ID sensor pattern [B]. If the sensor output reaches a certain point, the drum charge voltage will be reduced.

To determine whether to change the drum charge roller voltage, the machine compares V_{sdp} with V_{sg} .

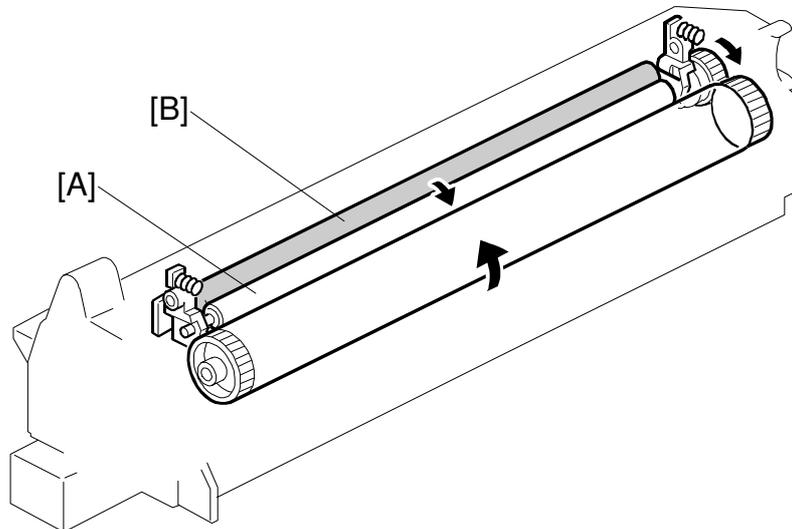
- $V_{sdp} / V_{sg} > 0.95$ = Reduce the magnitude of the drum charge voltage by 50 V
- $V_{sdp} / V_{sg} < 0.90$ = Increase the magnitude of the drum charge voltage by 50 V

2.5.2 ID SENSOR PATTERN PRODUCTION TIMING

The ID sensor pattern is made in the following conditions:

- During warming up at power on
- If the machine starts warming up after a certain time (default: 30 minutes) has passed since entering night mode or low power mode
The 30-minute interval can be changed using [SP2995-1](#).
- At the end of a job, if an ID sensor pattern has not been made for a certain number of sheets (default: 0 sheets = disabled)
The number of sheets can be changed using [SP2995-2](#).

2.5.3 DRUM CHARGE ROLLER CLEANING

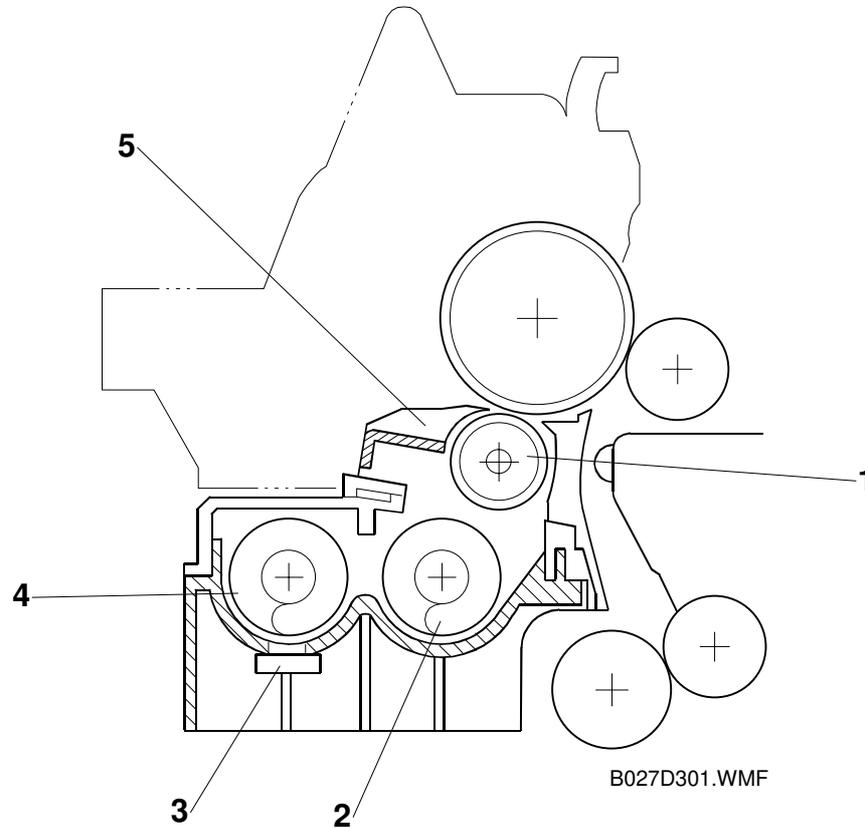


B022D252.WMF

Because the drum charge roller [A] always contacts the drum, it gets dirty easily. So, the [charge roller cleaning roller](#) [B] also contacts the drum charge roller all the time to clean the surface of the drum charge roller.

2.6 DEVELOPMENT

2.6.1 OVERVIEW

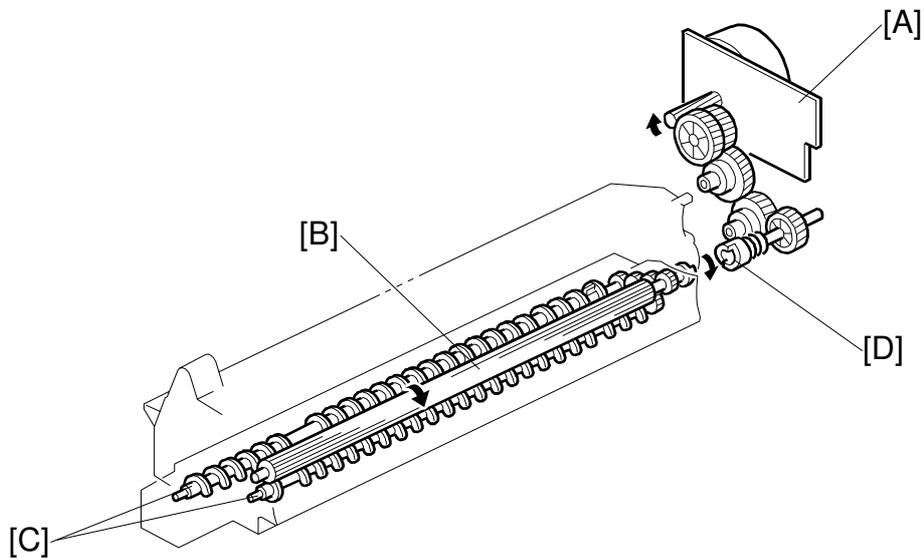


The development unit consists of the following parts.

1. Development roller
2. Mixing auger 2
3. TD sensor
4. Mixing auger 1
5. Doctor blade

This machine uses a single-roller development system. Two mixing augers mix the developer. The toner density (TD) sensor and image density (ID) sensor (see the illustration in the PCU section) are used to control toner density.

2.6.2 DRIVE

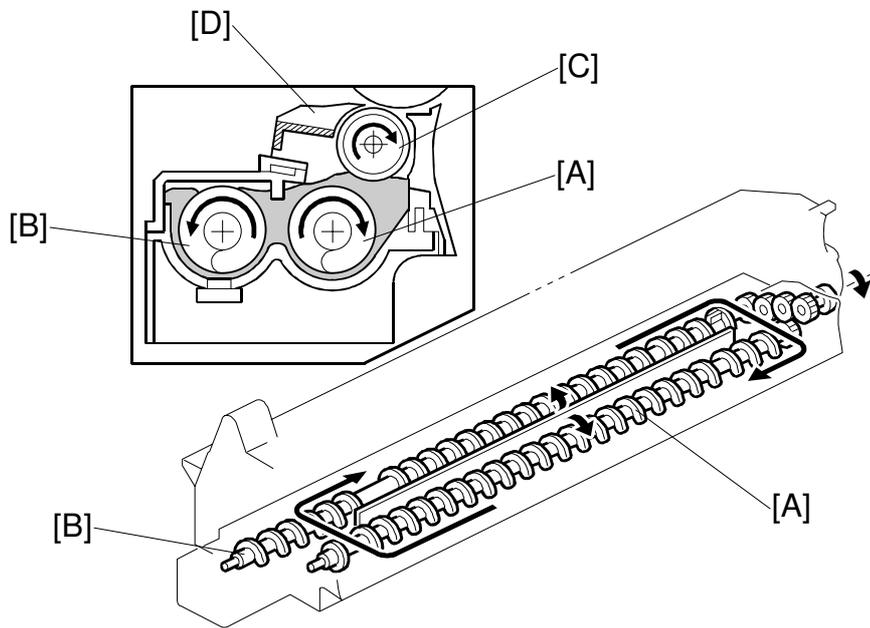


B027D304.WMF

The main motor [A] drives the development roller [B] and mixing augers [C] through a train of gears and the development drive shaft [D]. When the PCU is pushed in, the development drive shaft engages the development roller gear.

The development drive gears (except for the gears in the development unit) are helical gears. These gears are quieter than normal gears.

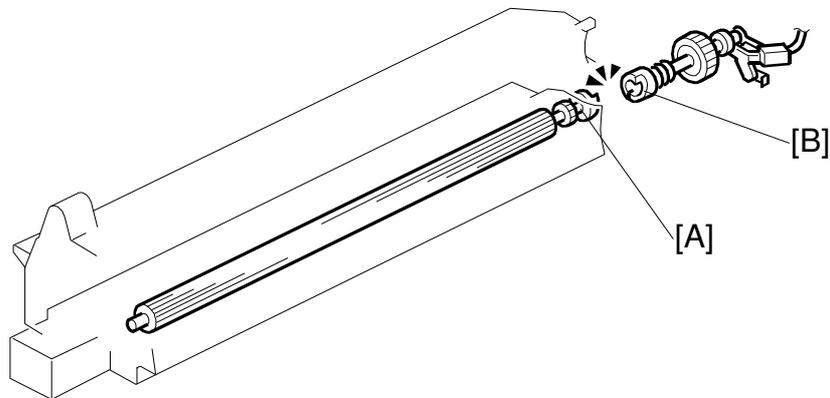
2.6.3 DEVELOPER MIXING

Detailed
Descriptions

B027D302.WMF

This copier uses 2 mixing augers, [A] and [B], to keep the developer evenly mixed. Mixing auger 2 [A] transports excess developer, scraped off the development roller [C] by the doctor blade [D], towards the front of the machine. Mixing auger 1 [B] returns the excess developer, along with new toner, to the rear of the mixing assembly. Here the developer is reapplied to the development roller.

2.6.4 DEVELOPMENT BIAS



B027D303.WMF

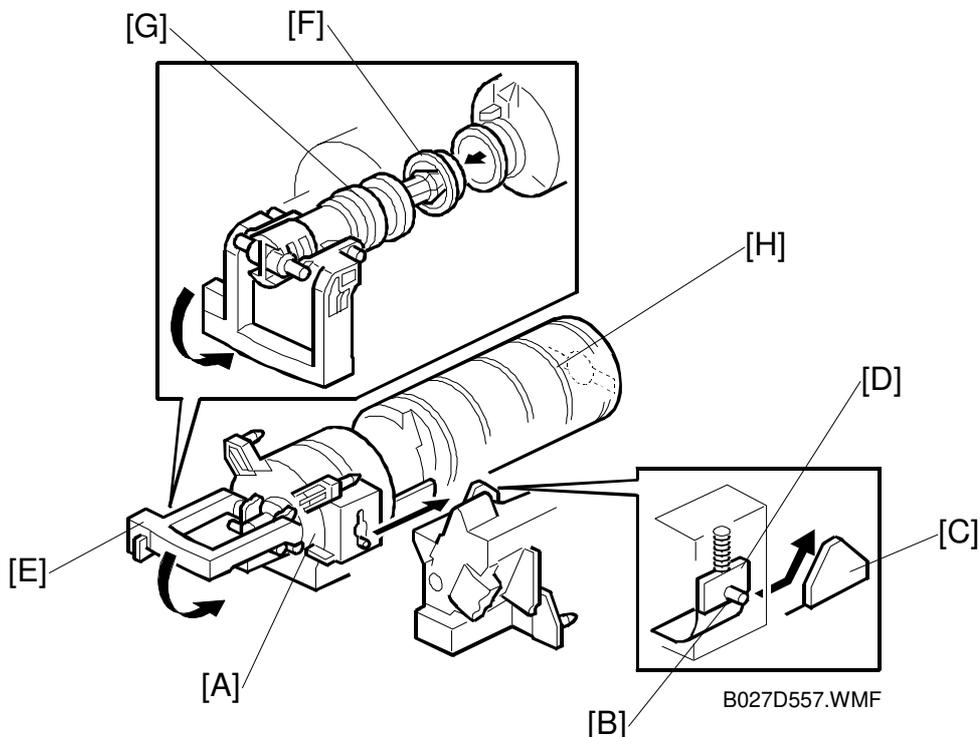
This machine uses a negative-positive development system, in which black areas of the latent image are at a low negative charge (about -150 ± 50 V) and white areas are at a high negative charge (about -950 V).

To attract negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board applies a bias of -650 volts to the development rollers throughout the image development process. The bias is applied to the development roller shaft [A] through the drive shaft [B].

The development bias voltage (-650 V) can be adjusted with SP2-201-1.

2.6.5 TONER SUPPLY

Toner bottle replenishment mechanism



Detailed
Descriptions

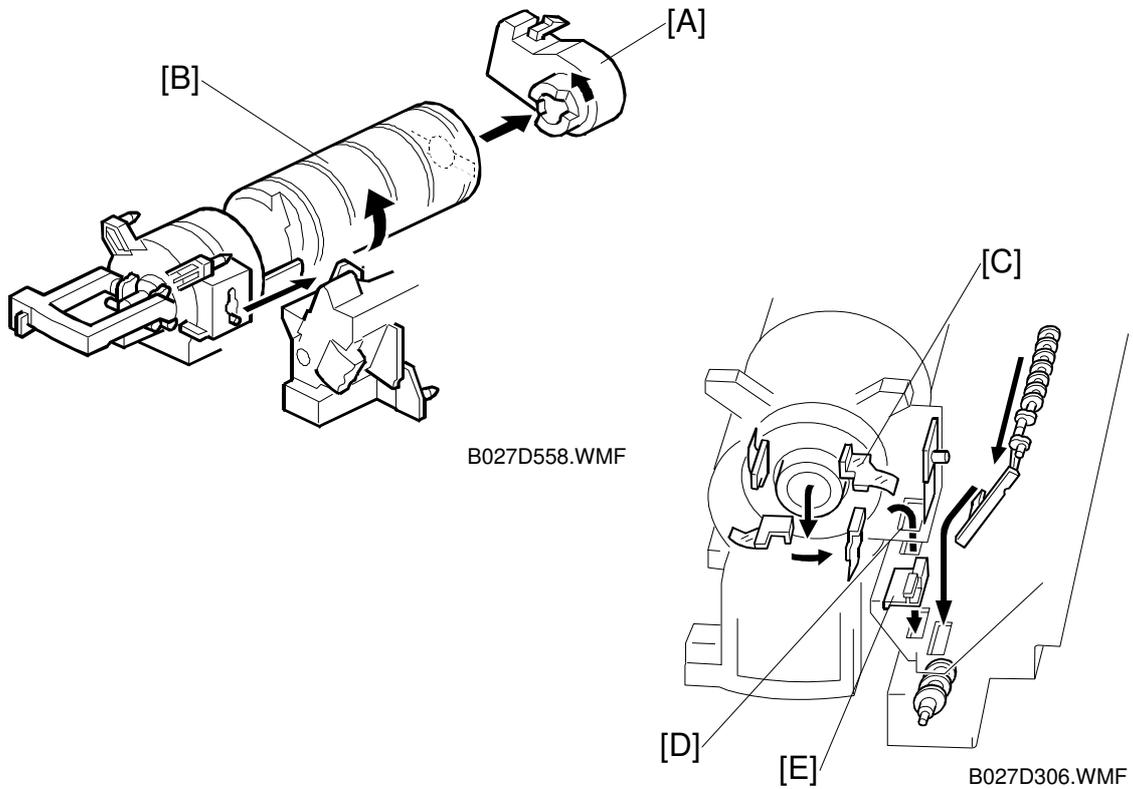
When a toner bottle is placed in the bottle holder unit [A] and the unit is pushed in completely, pin [B] moves against the side [C] of the PCU, and the toner shutter [D] is pulled out to open the bottle. When the toner bottle holder lever [E] is put back in the original position, the cap [F] on the toner bottle is pulled away and kept in place by the chuck [G].

The toner supply mechanism transports toner from the bottle to the development unit. The toner bottle has a spiral groove [H] that helps move toner to the development unit.

When the bottle holder unit is pulled out to add a new toner bottle, the following happens automatically to prevent toner from scattering.

- The chuck releases the toner bottle cap into its proper position.
- The toner shutter shuts to block the opening as a result of pressure from a spring.

Toner supply mechanism



The toner supply motor [A] drives the toner bottle [B] and the mylar blades [C]. First, the toner falls down into the toner bottle holder. The toner supply mylar blades transfer the toner to the slit [D]. When the PCU is installed in the machine, the shutter [E] above the PCU is opened by the machine frame. Then the toner falls down into the development unit through the slit and the shutter.

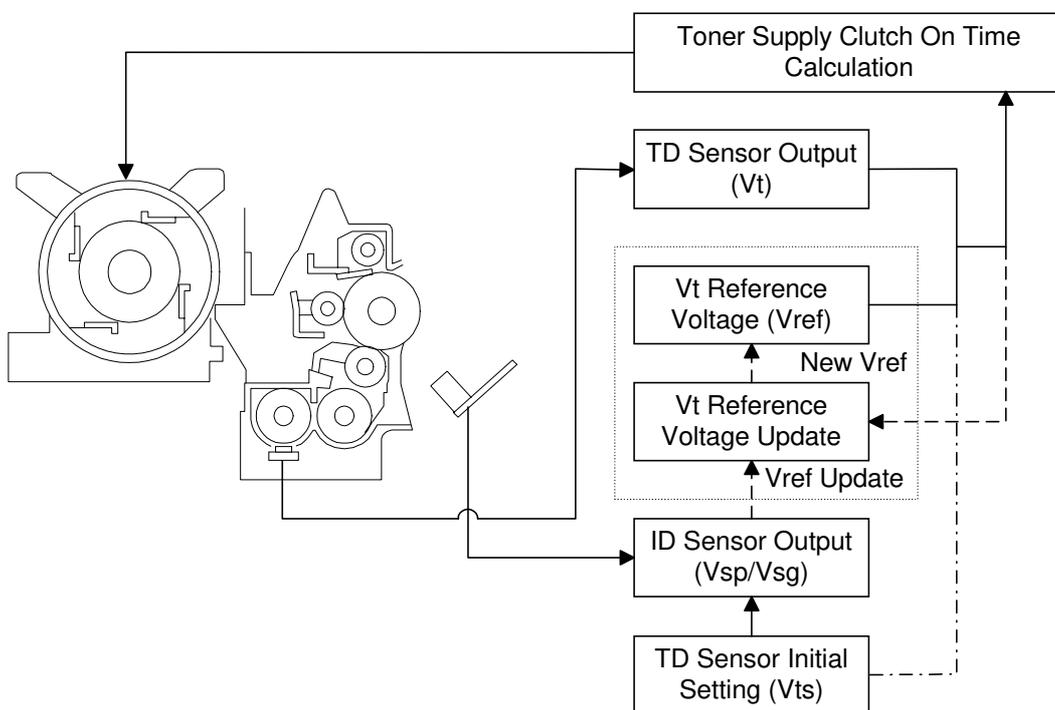
2.6.6 TONER DENSITY CONTROL

Overview

There are four modes for controlling toner supply as shown in the following tables. The mode can be changed with by SP2-921. The factory setting is sensor control 1 mode.

Basically, toner density is controlled using the standard TD sensor voltage (V_t), toner supply reference voltage (V_{ref}), actual TD sensor output voltage (V_t), and ID sensor output data (V_{sp}/V_{sg}).

Detailed Descriptions



B027D517.WMF

There are four toner density control modes as follows.

Mode	Sensor control 1 (SP2-921, "0"): Normally use this setting only
Toner supply decision	Compare V_t with a reference voltage (V_{ts} or V_{ref})
Toner control process	Toner is supplied to the development unit when V_t is higher than the reference voltage (V_{ts} or V_{ref}). This mode keeps the V_{ref} value for use the next toner density control. V_{ts} is used for the first toner density control after a new PCU has been installed, until it has been corrected with the ID sensor output. V_{ref} is used after V_{ts} has been corrected with the ID sensor output voltage (corrected during the first toner density control for a new PCU).
Toner supply amount	Varies
Toner end detection	Performed

Mode	Sensor control 2 (SP2-921, "1"): For designer's use only; do not use in the field
Toner supply decision	Compare V_t with a reference voltage (V_{ts})
Toner control process	This toner control process is the same as sensor control 1 mode. However, the reference voltage used is always V_{ts} .
Toner supply amount	Varies
Toner end detection	Performed

Mode	Fixed control 1 (SP2-921, "2"): For designer's use only; do not use in the field
Toner supply decision	Compare V_t with a reference voltage (V_{ts} or V_{ref})
Toner control process	This toner control process is the same as sensor control 1 mode.
Toner supply amount	Fixed (SP2-925)
Toner end detection	Performed

Mode	Fixed control 2 (SP2-921, "3"): Use temporarily if the TD sensor needs to be replaced
Toner supply decision	None
Toner control process	Toner is supplied every printed page regardless of V_t .
Toner supply amount	Fixed (SP2-925)
Toner end detection	Not performed

Toner density sensor initial setting

The TD sensor initial setting procedure is performed automatically when the new PCU is installed in the machine. During TD sensor initial setting, the TD sensor is set so that the TD sensor output to the value of SP2-926 (default: 2.5V). This value will be used as the standard reference voltage (Vts) of the TD sensor.

Toner density measurement

Toner density in the developer is detected once every copy cycle. The sensor output voltage (Vt) during the detection cycle is compared with the standard reference voltage (Vts) or the toner supply reference voltage (Vref).

Vsp/Vsg detection

The ID sensor detects the following voltages.

- Vsg: The ID sensor output when checking the drum surface
- Vsp: The ID sensor output when checking the ID sensor pattern
- At the end of a job, if an ID sensor pattern has not been made for a certain number of sheets (default: 0 sheets = disabled)
The number of sheets can be changed using SP2-995-2.

In this way, the reflectivity of both the drum surface and the pattern on the drum are checked. This compensates for any variations in the reflectivity of the pattern on the drum or the reflectivity of the drum surface.

The ID sensor pattern is made on the drum by charge roller and laser diode.

Vsp/Vsg is not detected every page or job; it is detected at the following times to decide Vref.

- During warming up at power on
- If the machine starts warming up after a certain time (default: 30 minutes) has passed since entering night mode or low power mode

The 30-minute interval can be changed using SP2-995.

Toner supply reference voltage (Vref) determination

The toner supply reference voltage (Vref) is the threshold voltage for the toner supply determination. Vref is determined using the following data:

- ID sensor output (Vsp/Vsg)
- (Vts or the current Vref) - Vt

Toner supply determination

The reference voltage (Vts or Vref) is the threshold voltage for determining whether or not to supply toner. If Vt becomes greater than the reference voltage, the machine supplies additional toner.

Toner Supply Motor On Time Determinations

For fixed control mode, the toner supply motor on time is specified by the setting of SP2-925, and does not vary. The default setting is 200 ms for each copy. The toner supply motor on time for each value of SP2-925 is as follows.

Value of SP2-925	Motor On Time (t = 200 ms)
0	t
1	2t
2	4t
3	8t
4	12t
5	16t
6	Continuously
7	Not supplied

For sensor control modes 1 and 2, the toner supply motor on time is decided by the following factors.

- ΔVt (= $Vt - (Vref \text{ or } Vts)$)
- TD sensor sensitivity (coefficient: S, value is 0.3)

There are seven levels for toner supply motor on time as shown below.

Level	Decision	Motor On Time (seconds)
1	$0 < \Delta Vt \leq S/16$	t (0.6)
2	$S/16 < \Delta Vt \leq S/8$	t x 2 (1.2)
3	$S/8 < \Delta Vt \leq S/4$	t x 4 (2.4)
4	$S/4 < \Delta Vt \leq S/2$	t x 8 (4.8)
5	$S/2 < \Delta Vt \leq 4S/5$	t x 16 (9.6)
6	$4S/5 < \Delta Vt \leq S$ (near-end)	T (30); see note 3
7	$S < \Delta Vt$ (toner end)	T (30); see note 3

- NOTE:**
- 1) The value of "t" can be changed using SP2-922 (default: 0.6 second)
 - 2) The value of "T" can be changed using SP2-923 (default: 30 seconds)
 - 3) T (30) means that toner is supplied intermittently in a half duty cycle (1.5 s on, 1.5 s off) for 30 seconds

2.6.7 TONER SUPPLY IN ABNORMAL SENSOR CONDITIONS

ID sensor

Readings are abnormal if any of the following conditions occur:

- $V_{sg} \leq 2.5V$
- $V_{sg} < 3.5V$ when maximum power (254) is applied
- $V_{sp} \geq 2.5V$
- $(V_{sg} - V_{sp}) < 1.0V$
- ID sensor power required to make the standard output reaches the maximum value (254)

The above ID sensor values can be checked using SP2-220.

When this is detected, the machine changes the value of V_{ref} to [the previous value](#) then does the toner density control process (in a similar way to sensor control mode 2).

No SC code is generated if the ID sensor is defective.

TD Sensor

The TD sensor is checked every copy. If the readings from TD sensor become abnormal, the machine changes the toner density control mode to fixed supply mode 2, and the toner supply amount per page is always 200 ms, regardless of the value of SP2-925. Then at the end of a job (if the optional fax unit is installed), or 100 copies after the TD sensor error was detected (if no fax unit is installed), an SC code is generated (SC390) and the machine must be repaired. The 100-copy threshold can be adjusted with SP 2-992.

2.6.8 TONER NEAR END/END DETECTION AND RECOVERY

The toner near end and end conditions are detected using the V_t and V_{ref} values, in a similar way to toner density control.

This is done in all toner supply modes except for fixed mode 2, when toner end is not detected.

Toner Near End Detection

If V_t is at level 6 (see the table on the previous page) five times consecutively, the machine enters the toner near end condition and the toner end indicator starts blinking. Then the machine supplies toner for a certain time, which depends on the setting of SP 2-923 (see the previous page).

Toner Near End Recovery

If the machine detects " $S/2 < \Delta Vt \leq 4S/5$ " twice consecutively when in one of the following situations, the machine leaves the toner near end condition.

- While in the toner recovery cycle (supplying toner on and off for 30 s – see the previous page) after the machine has detected a toner near end condition.
- During copying in the toner near end condition.
- If the front cover is opened and closed for more than 10 seconds while a toner near end condition exists.

Toner End Detection

There are two situations for entering the toner end condition.

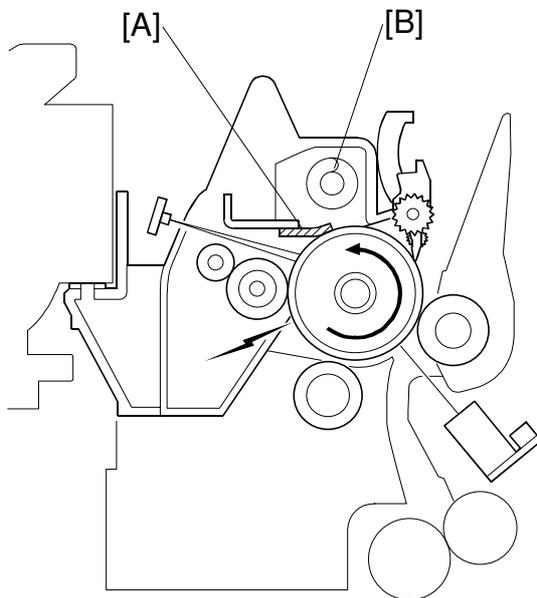
- When Vt is level 7 three times consecutively, the machine enters the toner end condition.
- When " $4S/5 < \Delta Vt \leq S$ " is detected in the toner near end condition, then 50 copies can be made after this condition (the number of copies between this condition and toner end can be changed using SP2-213).

Toner End Recovery

If the front cover is opened and closed for 10 seconds while a toner end condition exists and the toner bottle is replaced, the machine attempts to recover using the same procedure as for toner near end/end detection.

2.7 DRUM CLEANING AND TONER RECYCLING

2.7.1 DRUM CLEANING



B022D251.WMF

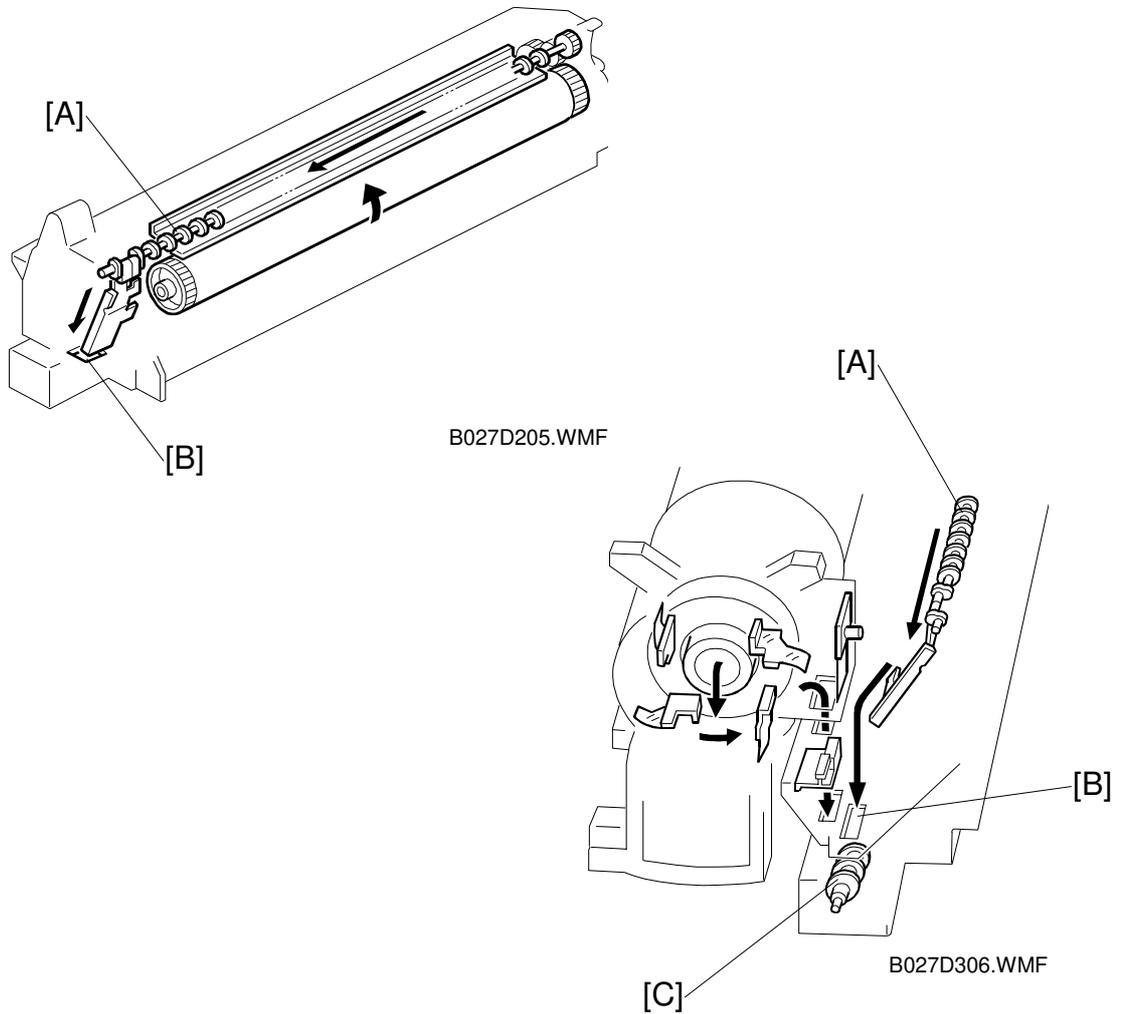
The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. This model uses a counter blade system.

The cleaning blade scrapes off toner remaining on the drum. When toner builds up in the cleaning unit, toner at the top of the pile is removed by the toner collection coil [B].

To remove the toner and other particles that are accumulated at the edge of the cleaning blade, the drum turns in reverse for about 5 mm at the end of every copy job. [This feature is controlled with SP 2-998.](#)

[In addition, cleaning is done in the middle of a job if 100 sheets have been made since the previous cleaning. This feature is controlled with SP 2-211.](#)

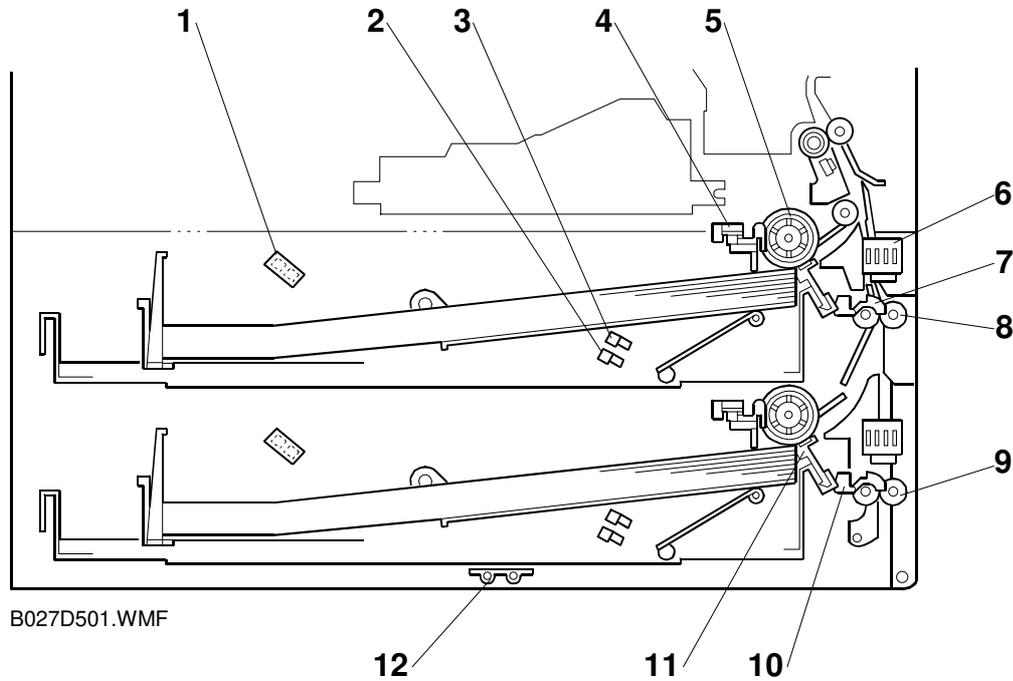
2.7.2 TONER RECYCLING



Toner picked up by the toner collection coil [A], is transported to the opening [B] in the side of the PCU. Then, this toner falls into the development unit with new toner coming from the toner bottle and it is all mixed together by mixing auger 1 [C] and used again.

2.8 PAPER FEED

2.8.1 OVERVIEW



There are two paper trays, each of which can hold 500 sheets.

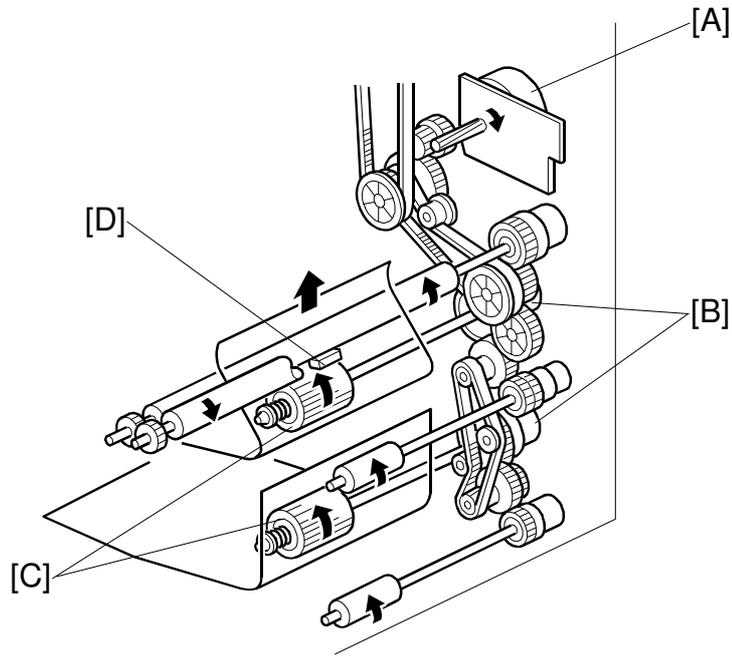
The paper tray feed stations use a friction pad system.

The two relay sensors are used for paper jam detection.

The components of the paper feed station are as follows.

- | | |
|---------------------------|--------------------------|
| 1. Paper Lift Sensor | 7. Upper Relay Sensor |
| 2. Paper Height –1 Sensor | 8. Upper Relay Roller |
| 3. Paper Height –2 Sensor | 9. Lower Relay Roller |
| 4. Paper End Sensor | 10. Lower Relay Sensor |
| 5. Paper Feed Roller | 11. Friction Pad |
| 6. Paper Size Sensor | 12. Tray Heater (Option) |

2.8.2 PAPER FEED DRIVE MECHANISM

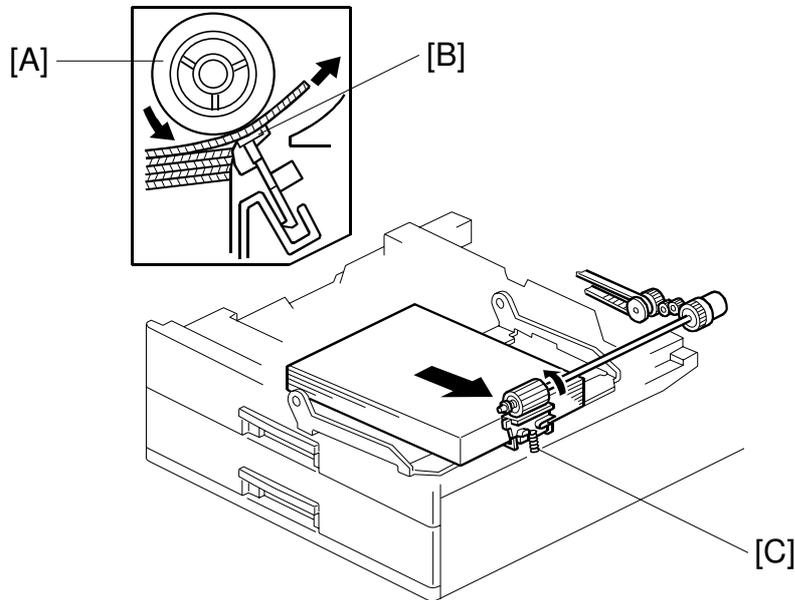


B027D702.WMF

The main motor [A] drives the pick-up and feed mechanism of both the first and second paper trays. The paper feed clutches [B] transfer drive from this motor to the paper feed rollers [C].

When the paper feed clutch turns on, the feed rollers start to feed the paper. The paper feed clutch stays on until shortly after the registration sensor [D] has been activated.

2.8.3 PAPER FEED AND SEPARATION MECHANISM



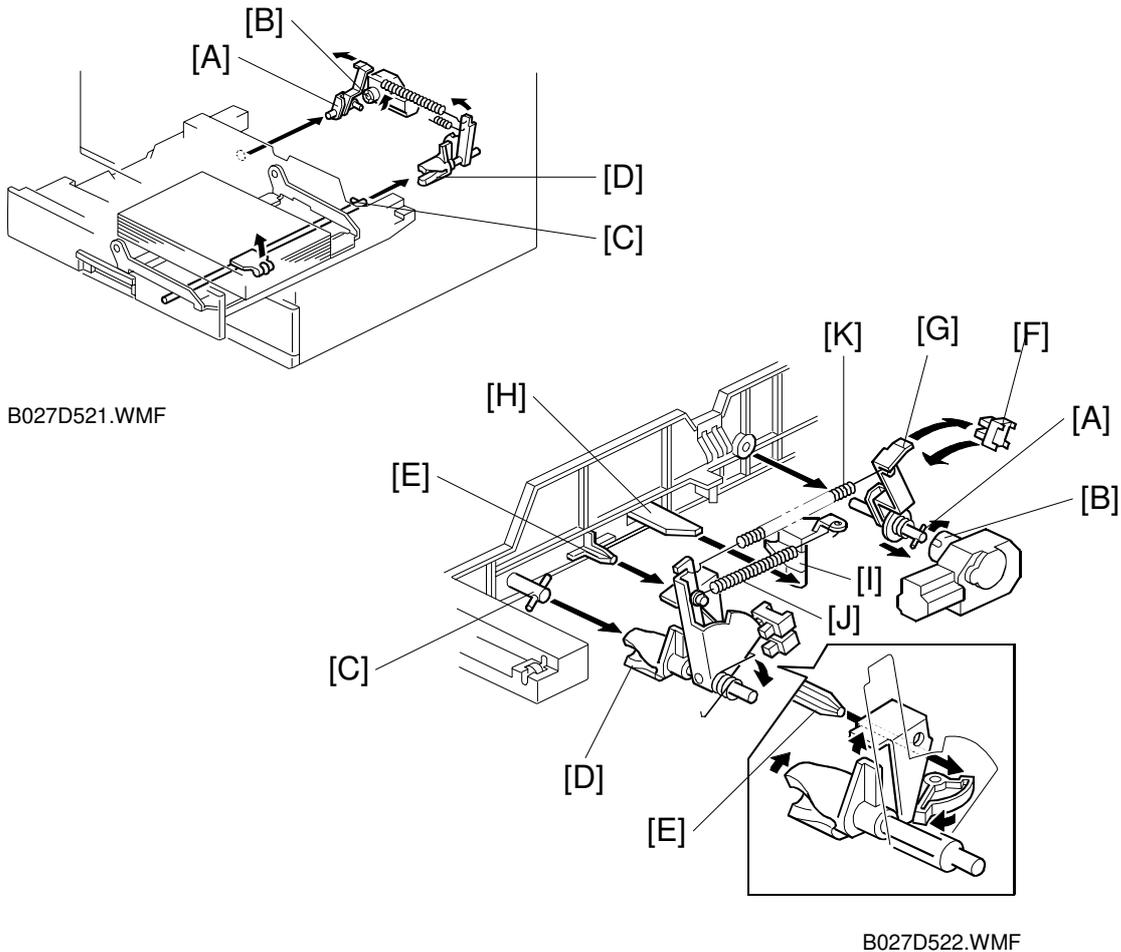
Detailed
Descriptions

B027D104.WMF

The paper feed roller [A] drives the top sheet of paper from the paper tray to the copier. The friction pad [B] allows only one sheet to feed at a time. The friction pad applies pressure to the feed roller with a spring [C].

The friction pad pressure cannot be adjusted.

2.8.4 PAPER LIFT MECHANISM



The paper size switch detects when the tray is pushed in.

When the paper tray is pushed into the machine, the pin [A] for the lift motor pressure shaft engages the lift motor coupling [B] and the pin [C] for the bottom plate lift shaft in the tray engages the bottom plate pressure lever coupling [D]. The pin [E] on the rear of the tray pushes the lock lever so that the lift motor can lift the bottom plate pressure lever.

The lift motor turns on, and turns clockwise as shown in the diagram. The main pressure spring [K] pulls the bottom plate pressure lever, and this lifts the tray bottom plate.

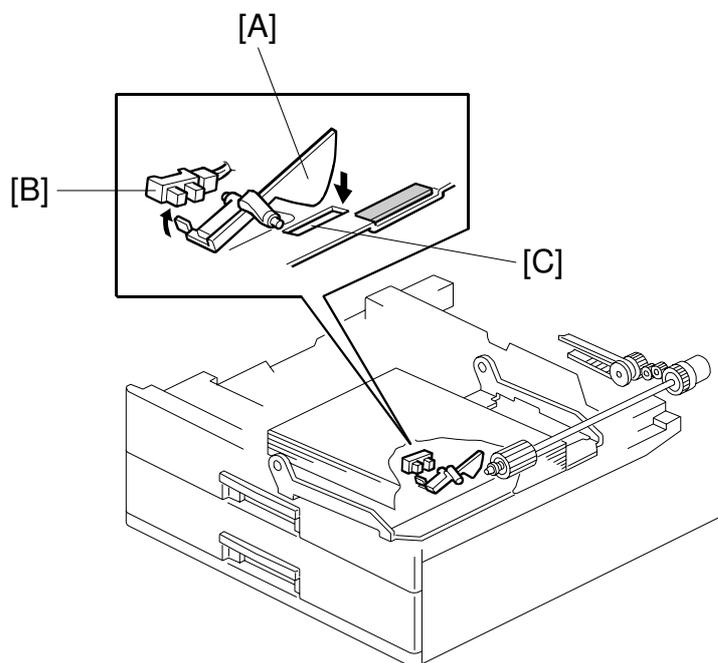
When the top of the stack touches the feed roller, the motor cannot pull up the plate any more, so it pulls the actuator [G] into the lift sensor [F]. Then the lift motor stops. The pressure of the feed roller on the paper is now too high, so the lift motor reverses a certain time (200 ms or 600 ms), depending on the paper size, to reduce this pressure. For smaller paper, it reverses the larger amount (600 ms) to reduce the pressure more.

NOTE: The relationship between the bottom plate pressure adjustment, paper size thresholds, and the related SP modes is explained in “Bottom Plate Pressure Adjustment for Paper Size”.

For A4-width paper or wider, a projection [H] on the side fence engages the secondary pressure spring [J] through a lever [I]. Then, the secondary pressure spring [J] applies paper feed pressure in addition to the main pressure spring [K], to ensure that extra pressure is applied to wider paper.

When the paper tray is pulled out, the pins [A, C] disengage from the couplings [B, D], and the bottom plate drops. To make it easier to push the tray in, the lift motor rotates backwards 1.7 seconds to return the bottom plate pressure lever coupling [D] to the original position. The amount of reverse can be adjusted with SP 1-912.

2.8.5 PAPER END DETECTION



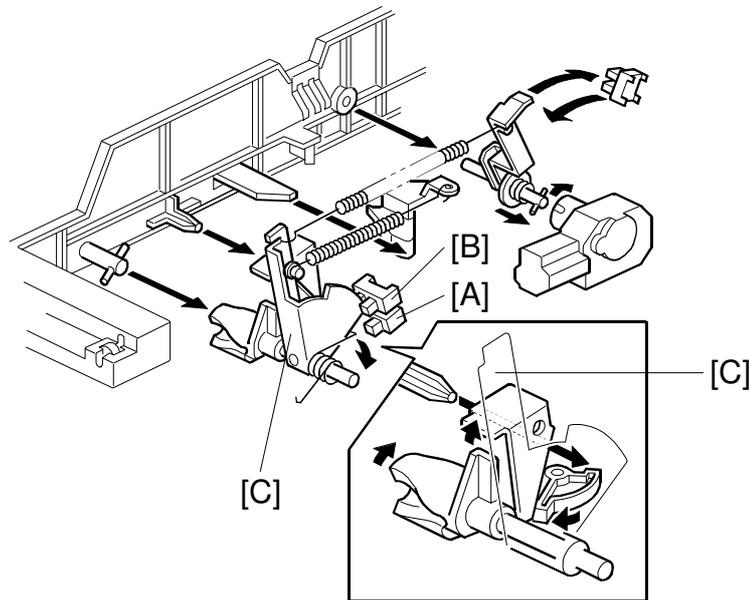
B027D520.WMF

If there is some paper in the paper tray, the paper stack raises the paper end feeler [A] and the paper end sensor [B] is deactivated.

When the paper tray runs out of paper, the paper end feeler drops into the cutout [C] in the tray bottom plate and the paper end sensor is activated.

When the paper tray is drawn out with no paper in the tray, the shape of the paper end feeler causes it to lift up.

2.8.6 PAPER HEIGHT DETECTION



B027D522.WMF

The amount of paper in the tray is detected by the combination of on/off signals from two paper height sensors [A] and [B]. The paper amount is displayed on the LCD.

When the amount of paper decreases, the bottom plate pressure lever [C] moves the actuator up.

The following combination of sensor signals is sent to the copier.

Amount of Paper	Paper Height Sensor 1	Paper Height Sensor 2
Near End	OFF	ON
30%	ON	ON
70%	ON	OFF
100%	OFF	OFF

When the tray contains paper of a small width, the paper feed pressure may become too low when the thickness of the remaining stack of paper has decreased. The lift motor rotates forward 400 ms after the sensor detects a certain amount of paper remaining in the tray to increase paper feed pressure, simulating the pressure generated by a full tray.

NOTE: The relationship between the bottom plate re-adjustment timing, paper size threshold, and the related SP modes is explained in “Bottom Plate Pressure Adjustment for Paper Size”.

2.8.7 FEED PRESSURE ADJUSTMENT FOR PAPER SIZE

Overview

For the friction pad system, the pressure from the top of the stack against the feed roller is very important for paper feed quality from the paper tray. If the pressure is high, double feed may occur. On the other hand, if the pressure is low, non-feed may occur. Because of this, the pressure must be varied depending on the paper size, paper weight, and amount of paper remaining in the tray. To achieve this, the pressure for each paper tray can be adjusted using SP mode.

Paper Size Thresholds

The upward pressure from the bottom plate spring is always the same. However, downward pressure from the stack on the bottom plate depends on the paper size. Because of this, for a smaller paper size, the pressure of the top of the stack against the feed roller is more than normal (because of the smaller downward pressure from the stack), so adjustment may be necessary.

Using the following SP modes, either two or three paper size ranges can be specified. Using other SP modes (explained later), the pressure can be adjusted separately for each of these ranges to deal with any feed problems that have been occurring.

Paper Size	Normal	Small Size	Middle Size
	Greater than HLT/A5 (default setting)	HLT/A5 or smaller (default setting)	None (default setting)
1st paper tray	---	SP1908-8	SP1908-9
2nd paper tray	---	SP1909-8	SP1909-9
3rd paper tray	---	SP1910-8	SP1910-9
4th paper tray	---	SP1911-8	SP1911-9

Paper Size Ranges

For Three Size Ranges

Small paper size range: Paper sizes equal to the 'Small' SP mode value, or smaller.

Middle paper size range: Paper sizes greater than the small paper size, up to and including the middle paper size specified by the 'Middle' SP mode.

Normal paper size range: Paper sizes greater than the 'Middle' SP mode.

For Two Size Ranges

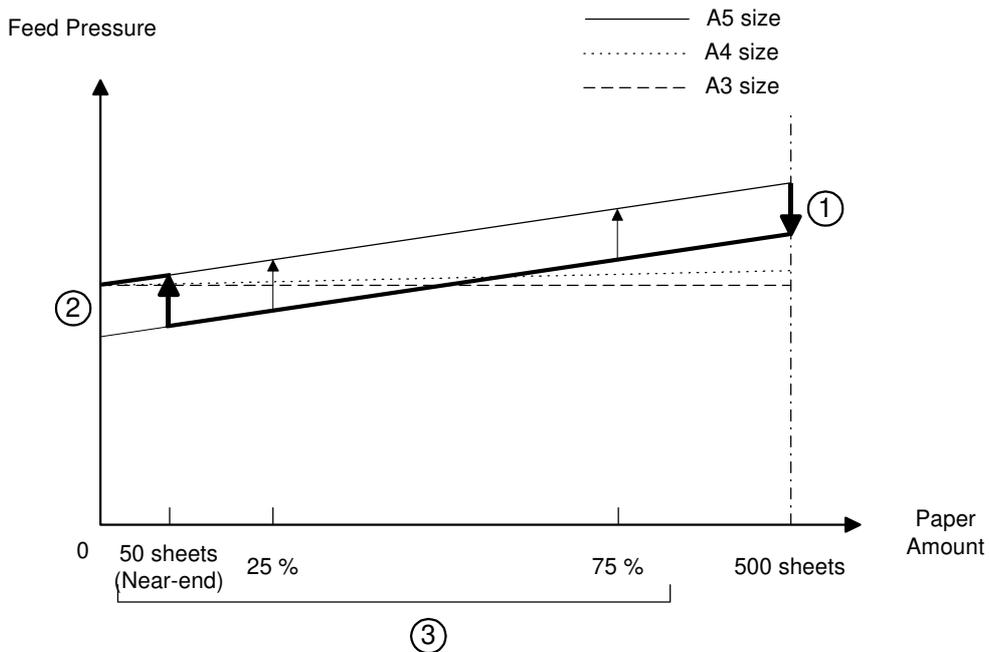
Small paper size range: Paper sizes equal to the 'Small' SP mode value, or smaller.

Normal paper size range: Paper sizes greater than the 'Small' SP mode.

Feed Pressure Adjustment

The pressure can be adjusted to solve a paper feed problem. This adjusts the amount of lift motor reverse just after the lift sensor is activated when lifting the stack to the paper feed position. To apply less pressure to the top of the stack, the amount of reverse should be increased.

Effect of the Amount of Remaining Paper



B027D518.WMF

From tray full to paper near-end

The pressure between the top of the stack and the fed roller also depends on the amount of remaining paper, especially for small paper sizes, as shown in the above graph. The pressure for A5 changes significantly between stack heights of 500 sheets and 50 sheets, but not much for A4 or A3 paper.

For 500 sheets of A5, the pressure is too high. To counter this, the lift motor reverses 600 ms (① in the graph), as explained in the previous section. The SP modes in the following table are for solving feed problems that occur when the tray is between full and near-end.

Paper Size	Normal	Small Size	Middle Size
	Greater than HLT/A5 (default setting)	HLT/A5 or smaller (default setting)	None (default setting)
1st paper tray	SP1908-1	SP1908-2	SP1908-3
2nd paper tray	SP1909-1	SP1909-2	SP1909-3
3rd paper tray	SP1910-1	SP1910-2	SP1910-3
4th paper tray	SP1911-1	SP1911-2	SP1911-3
Default (all trays)	200 ms	600 ms	200 ms (default: not used)

From paper near end to paper end

When paper is used up, the pressure on the bottom plate reduces, so the upward pressure increases, causing the pressure of the feed roller against the top of the stack to increase.

However, for small paper sizes, because of the previous correction (600 ms reverse rotation of the lift motor), the pressure between the feed roller and the top of the stack becomes too small at some point as paper is used up, and this could cause paper feed problems. This condition is more significant for smaller paper sizes, such as A5, as shown in the diagram.

If a paper feed problem occurs when the stack is partly used up, the pressure can be re-adjusted (② in the graph) using the following SP modes. The default is set for 50 sheets (at the near-end point)

The lift motor rotates forward for the time specified by the SP mode to increase the pressure.

Paper Size	Small Size	Middle Size
	HLT/A5 or smaller (default setting)	None (default setting)
1st paper tray	SP1908-4	SP1908-5
2nd paper tray	SP1909-4	SP1909-5
3rd paper tray	SP1910-4	SP1910-5
4th paper tray	SP1911-4	SP1911-5
Default (all trays)	400 ms	300 ms (default: not used)

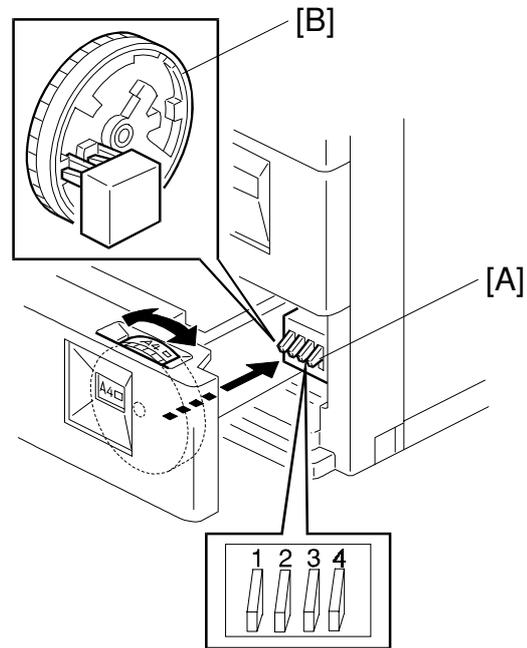
Also, the point at which this adjustment is applied (near-end [50 sheets], 25% full, 75% full) can be selected (③ in the graph) using the following SP modes.

Paper Size	Small Size	Middle Size
	HLT/A5 or smaller (default setting)	None (default setting)
1st paper tray	SP1908-6	SP1908-7
2nd paper tray	SP1909-6	SP1909-7
3rd paper tray	SP1910-6	SP1910-7
4th paper tray	SP1911-6	SP1911-7
Default (all trays)	Near-end	Near-end (default: not used)

2.8.8 PAPER SIZE DETECTION

Size \ SW	1	2	3	4
A3	○	○	○	○
A4 Sideways	●	●	○	●
A4 Lengthwise	●	●	○	○
A5 Lengthwise, 8 1/2" x 14"	○	○	●	●
B4, 11" x 17"	●	○	●	○
B5 Sideways, 11" x 8 1/2"	●	○	○	○
B5 Lengthwise, 8 1/2" x 11"	○	●	●	●
* (Asterisk)	○	●	○	●

●: ON (Not pushed)
○: OFF (Pushed)



B027D523.WMF

There are four paper size microswitches [A] on the front right plate of the paper tray unit. The switches are actuated by a paper size actuator [B] behind the paper size indicator plate, which is on the front right of the tray.

Each paper size has its own actuator, with a unique combination of notches. To determine which size has been installed, the CPU reads which microswitches the actuator has switched off.

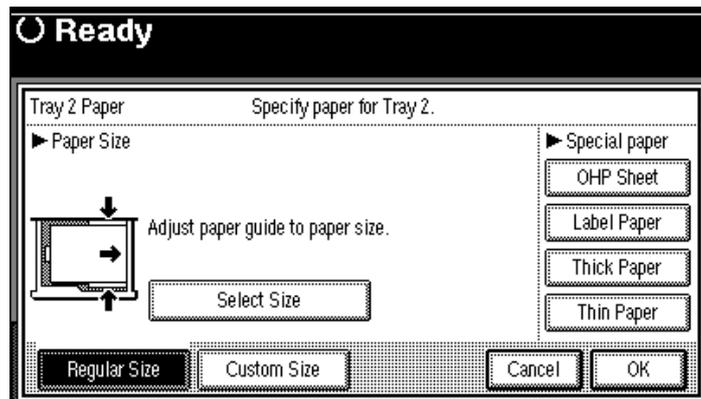
The CPU disables paper feed from a tray if the paper size cannot be detected. If the paper size actuator is broken, or if there is no tray installed, the Add Paper indicator will light.

When the paper size actuator is at the "*" mark, the paper tray can be set up to accommodate one of a wider range of paper sizes by using user tools. If the paper size for this position is changed without changing the user tool setting, a paper jam will result.

2.8.9 SPECIAL PAPER SETTING

Only the 2nd tray can feed special paper such as thick paper or envelopes. The special paper type can be selected either by using the UP mode or with the following operation.

- Select the 2nd tray then press the $\#$ key.



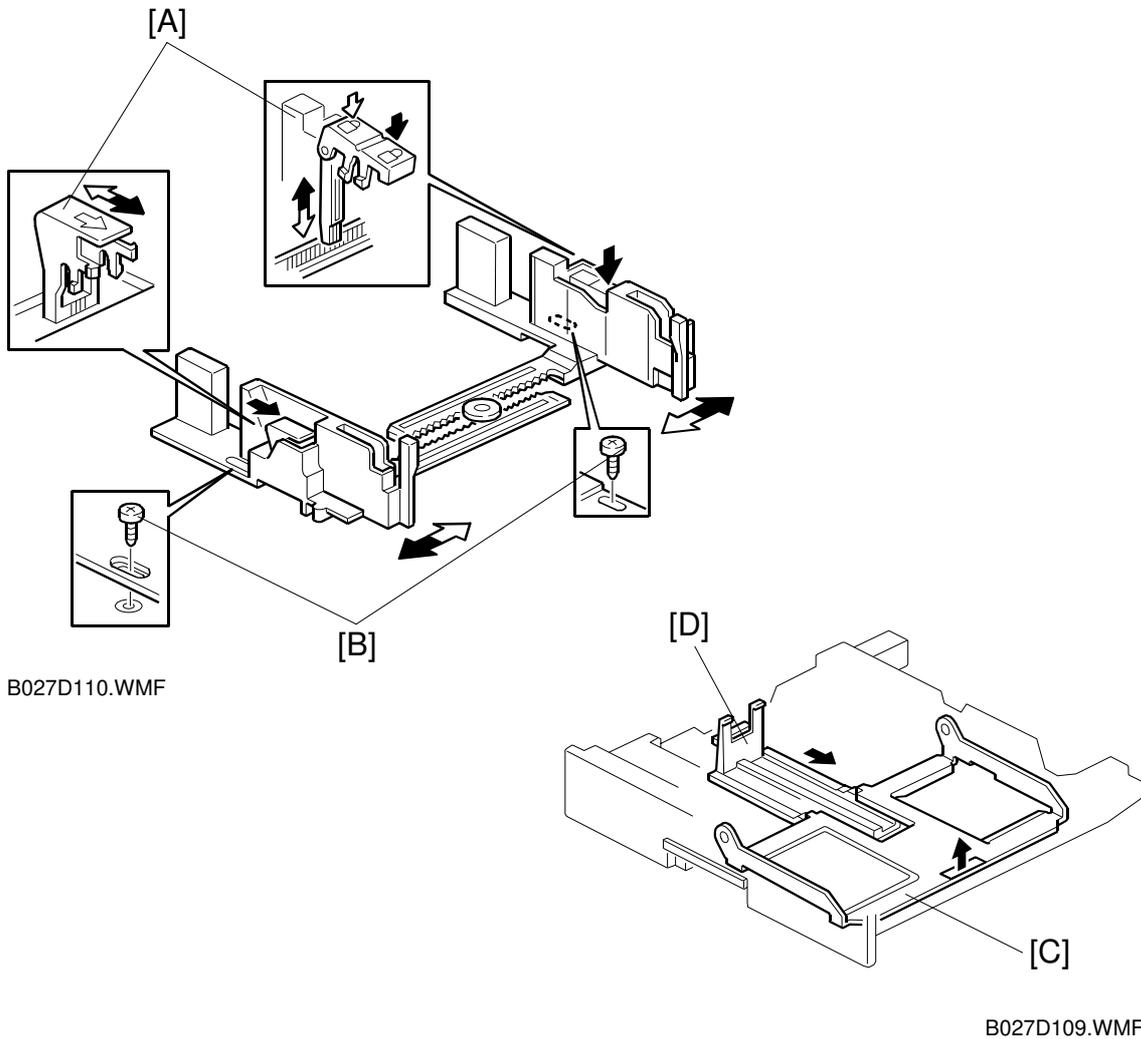
B027D590.WMF

After selecting the special paper type, the fusing temperature and transfer roller current will be changed as follows.

1. Fusing temperature (when thick paper is selected):
Current operation temperature + 15 °C
2. Transfer roller current:
 - A3 width (11"): 14 μ A
 - B4 width (10"): 15 μ A
 - A4 width (8.5"): 17 μ A
 - A5 width (5.5"): 20 μ A

Note that for the by-pass tray, the fusing and transfer conditions for special paper are also applied if the user uses thick (non-standard) mode.

2.8.10 SIDE AND END FENCES



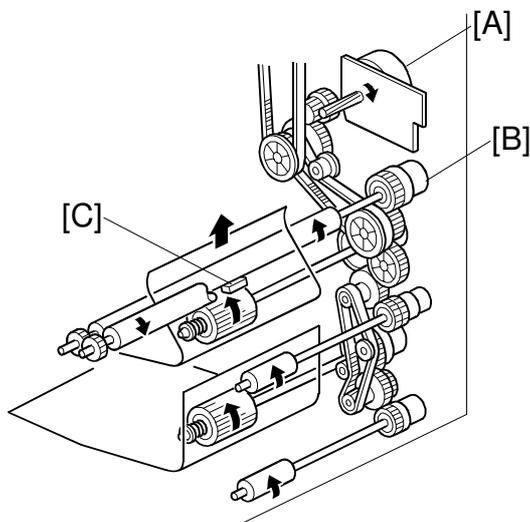
Side Fences

If the tray is full of paper and it is pushed in strongly, the fences may deform or bend. This may cause the paper to skew or the side-to-side registration to be incorrect. To correct this, each side fence has a stopper [A] attached to it. Each side fence can be secured with a screw [B], for customers who do not want to change the paper size.

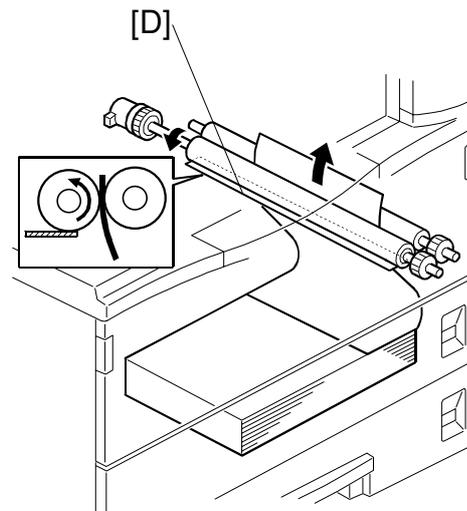
End Fence

As the amount of paper in the tray decreases, the bottom plate [C] lifts up gradually. The end fence [D] is connected to the bottom plate. When the tray bottom plate rises, the end fence moves forward and pushes the back of the paper stack to keep it squared up.

2.8.11 PAPER REGISTRATION



B027D702.WMF



B022D704.WMF

The drive from the main motor [A] is transmitted to the registration roller through the registration clutch gear [B].

The registration sensor [C] is used for correcting paper skew and for detecting paper misfeeds.

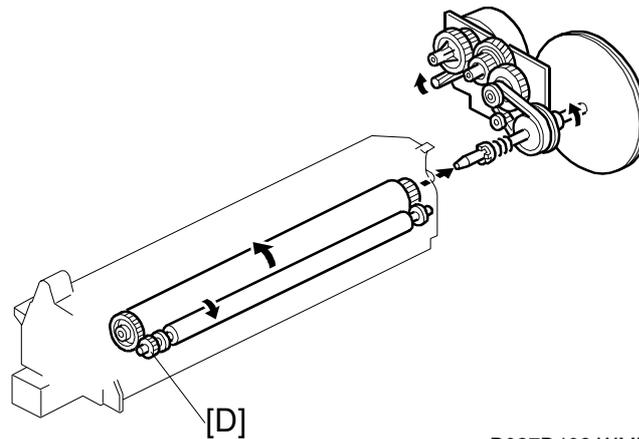
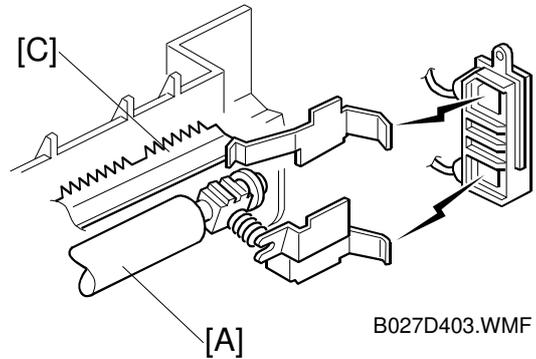
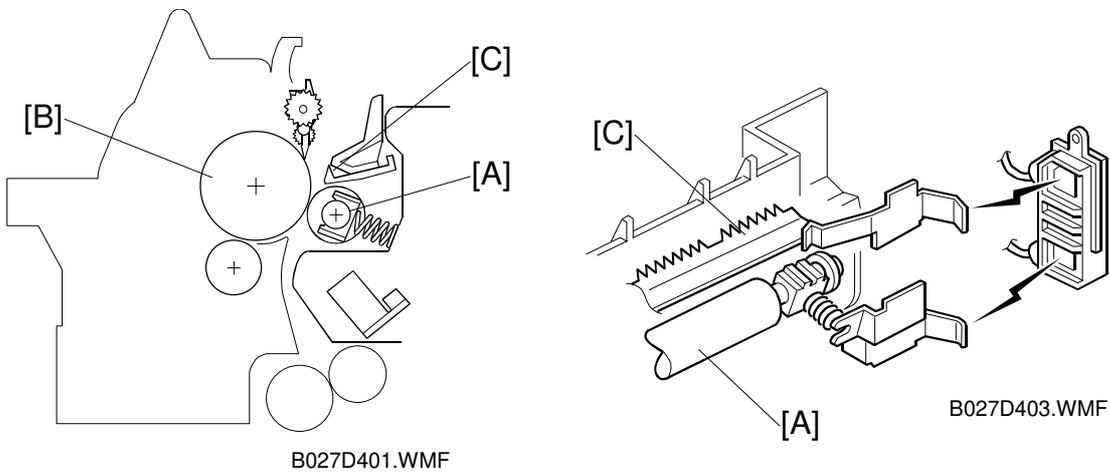
The [cleaning mylar](#) [D] contacts the registration roller. It removes paper dust from the registration roller so that this dust will not transfer into the development unit through the drum cleaning unit.

The amount of paper buckle at the registration roller to correct skew can be adjusted with SP 1003.

If jams frequently occur after registration, the paper feed clutch can be re-energized so that the feed roller can assist the registration roller to re-start paper feed. This may be needed when feeding thicker paper. This adjustment is made with SP 1903; it can be adjusted separately for tray 1 and the by-pass feeder, so place the problem paper type in one of these and adjust SP 1-903 for that tray only.

2.9 IMAGE TRANSFER AND PAPER SEPARATION

2.9.1 OVERVIEW



The machine uses a transfer roller [A], which touches the surface of the drum [B]. The high voltage supply board supplies a positive current to the transfer roller, which attracts the toner from the drum onto the paper. The current depends on the paper width, paper type, and paper feed tray.

The curvature of the drum and the discharge plate [C] help the paper to separate from the drum. The high voltage supply board also supplies a negative dc voltage to the discharge plate.

Drive from the drum through a gear [D] turns the transfer roller

2.9.2 IMAGE TRANSFER CURRENT TIMING

There are two transfer current levels: low transfer current level and high transfer current level. The image transfer procedure is as follows:

1. When the CPU receives the image writing start signal, the CPU instructs the high voltage supply board to supply +10 μ A (low transfer current level) to the roller. This prevents any positively charged toner on the drum surface from transferring to the transfer roller.
2. At a certain time after the low transfer current has been supplied to the roller, an appropriate current is applied to the roller to transfer the toner to the paper.
3. After the trailing edge of the paper has passed through the roller, transfer current turns off. In multiple copy mode, the transfer current shifts again to the low transfer current.

Detailed
Descriptions

The transfer current (high transfer current level) depends on the paper feed station, paper width, and the temperature in the machine.

Example: Temperature = 15°C ~ 24°C

Paper Width	Paper Tray / By-pass Tray (Normal)	Duplex (2nd Side)	By-pass Tray (Thick) / 2nd Paper Tray (Special Paper)
A3/11" x 17", A4/8 1/2 x 11"sideways	14 μ A	10 μ A	14 μ A
B4	13 μ A	12 μ A	15 μ A
A4/11" x 8 1/2 lengthwise, A5/5 1/2 x 8 1/2 sidewise	13 μ A	16 μ A	17 μ A
A5/8 1/2 x 5 1/2 lengthwise and less	16 μ A	16 μ A	20 μ A

The transfer current can be adjusted using SP2301, except for the low transfer current.

Be careful when increasing the transfer current. This might cause a ghosting effect, in which part of the image at the top of the page is repeated lower down the page at a lower density. It may also damage the OPC drum in the worst case.

2.9.3 TRANSFER ROLLER CLEANING

If the paper size is smaller than the image, or if a paper jam occurs during printing, toner may be transferred to the roller surface. To prevent the toner from transferring to the back side of the printouts, the transfer roller requires cleaning before the next printing run.

During transfer roller cleaning, the high voltage supply unit supplies a negative cleaning current ($-4 \mu\text{A}$) to the transfer roller. Any negatively charged toner on the transfer roller is then transferred back to the drum. Then a positive cleaning current ($+10 \mu\text{A}$) is applied to the transfer roller to push back to the drum any positively charged toner on the transfer roller.

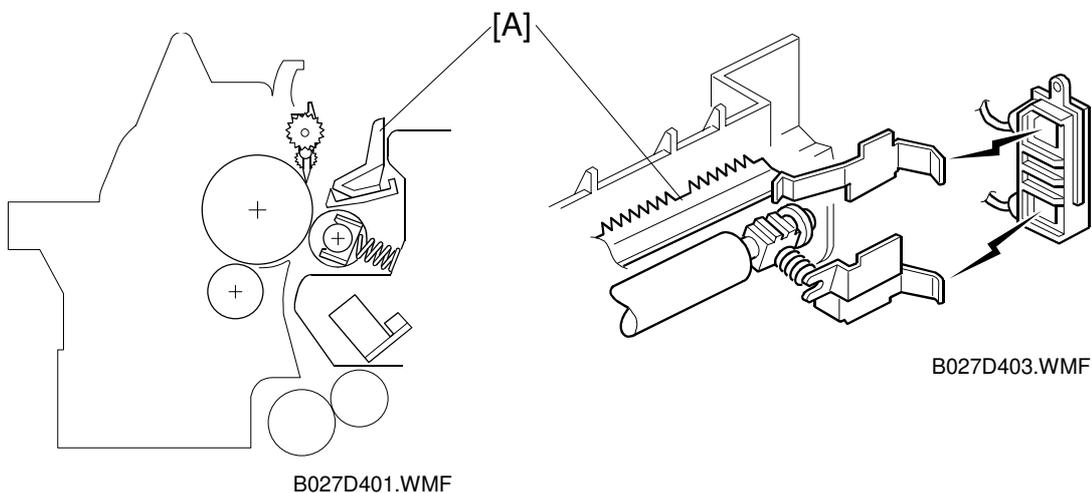
The machine goes through the cleaning mode in the following conditions:

- Before starting the printing job (only if enabled with SP2-996; note that the default setting is off)
- Just after the power is switched on.
- After a copy jam has been cleared

The transfer roller cleaning function is done.

Also, the transfer roller cleaning current can be adjusted using SP2-301-4.

2.9.4 PAPER SEPARATION MECHANISM

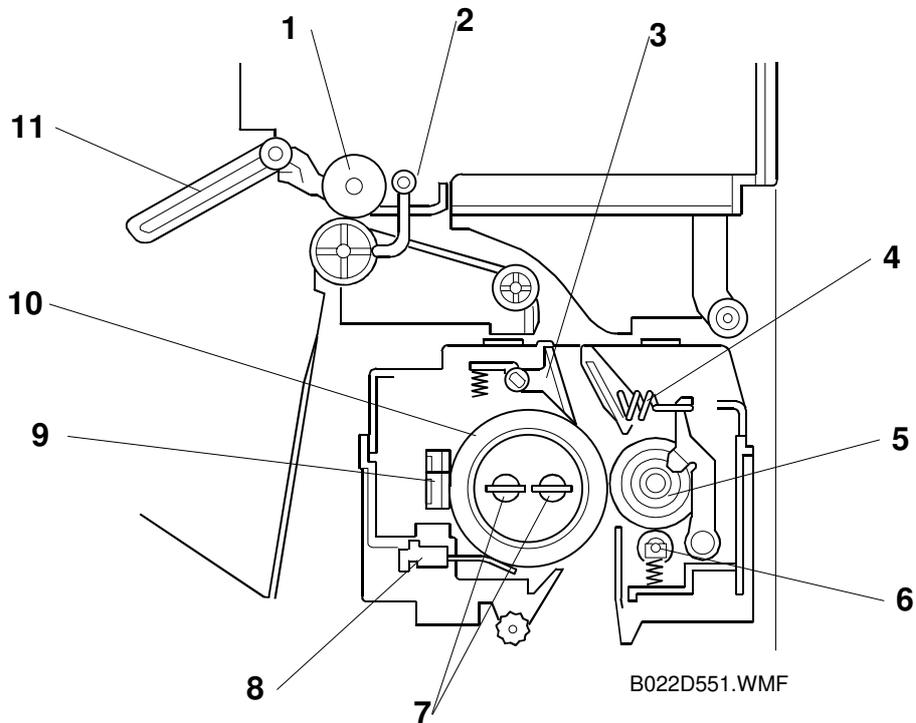


The discharge plate [A] and the drum curvature of the drum help the paper to separate away from the drum. The high voltage supply board applies a constant dc voltage, -1.8 kV (when feeding from a paper tray) or -2.1 kV (from the duplex unit) to the discharge plate.

The discharge plate voltage can be adjusted using SP2-901.

2.10 IMAGE FUSING AND PAPER EXIT

2.10.1 OVERVIEW

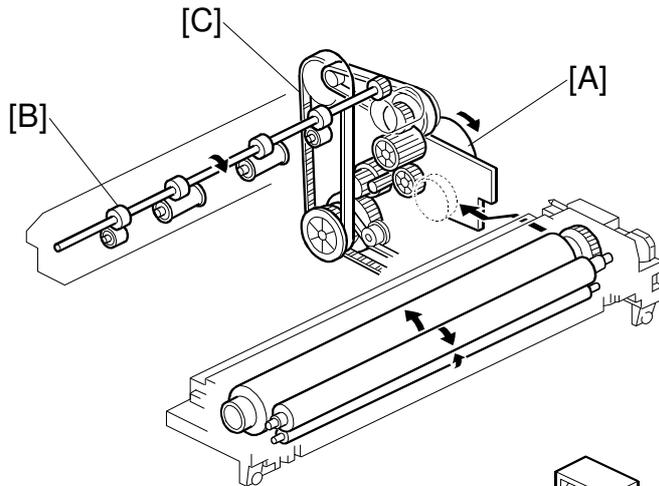


Detailed
Descriptions

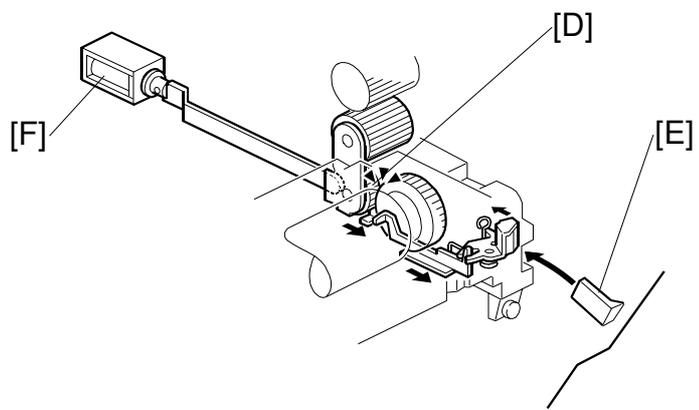
The fusing unit and paper exit area consist of the following parts.

- | | |
|-------------------------|---------------------------|
| 1. Paper exit roller | 7. Two fusing lamps |
| 2. Fusing exit sensor | 8. Two thermistors |
| 3. Hot roller strippers | 9. Four thermostats |
| 4. Pressure spring | 10. Hot roller |
| 5. Pressure roller | 11. Paper overflow sensor |
| 6. Cleaning roller | |

2.10.2 FUSING DRIVE AND RELEASE MECHANISM



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B022D553.WMF



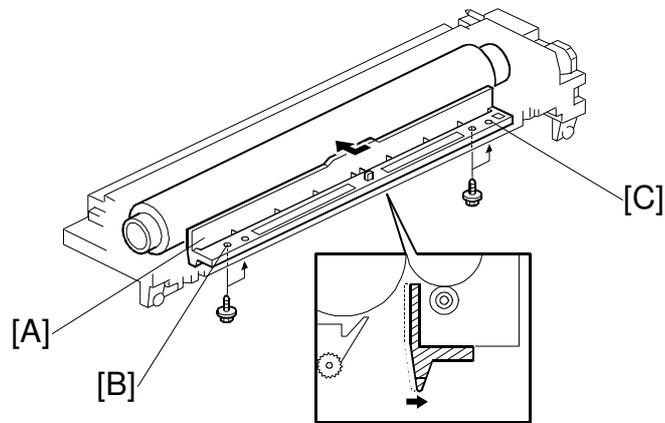
The main motor [A] drives the fusing unit through a gear train and drives the paper exit rollers [B] through a timing belt [C].

The fusing unit release mechanism automatically disengages the fusing unit drive gear [D] when the right cover [E] is opened. This allows the fusing unit drive gear to rotate freely so that misfed paper can easily be removed.

Also, the fusing drive is released by the fusing drive release solenoid [F]. To reduce the warming up time, the machine cuts the drive to the fusing unit during warming up. Just after the main switch is turned on, this solenoid is energized and the fusing unit drive gear [D] is disengaged.

However, the fusing unit drive is not released when the temperature is lower than 15°C.

2.10.3 FUSING ENTRANCE GUIDE SHIFT MECHANISM

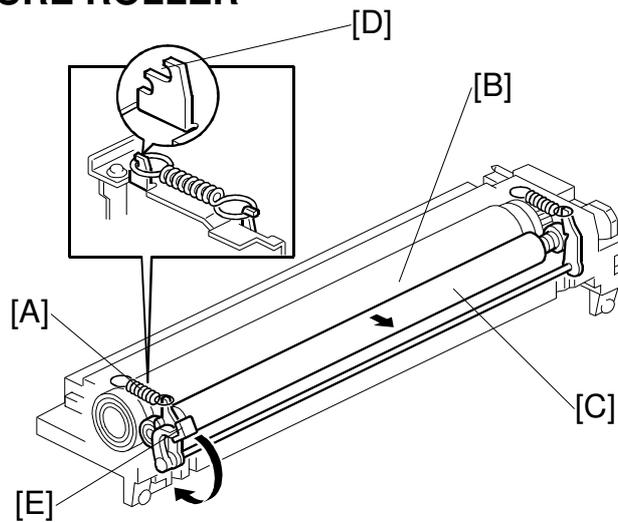


B027D566.WMF

The entrance guide [A] is adjustable for paper thickness to prevent creasing. The left screw holes [B] on each side are used as the default setting.

If creasing occurs frequently in the fusing unit, adjust the entrance guide to the right, by securing it with the other holes [C]. This allows more direct access to the gap between the hot roller and the pressure roller.

2.10.4 PRESSURE ROLLER



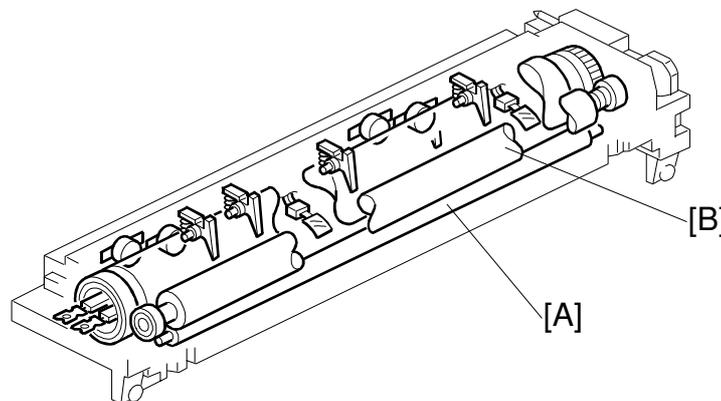
B027D562.WMF

The pressure springs [A] constantly apply pressure between the hot roller [B] and the pressure roller [C].

Applied pressure can be changed by adjusting the position of the pressure springs. The spring is positioned at the top [D] as the default setting.

The user moves lever [E] when using thicker copy paper or envelopes, to reduce the pressure between the hot and pressure rollers.

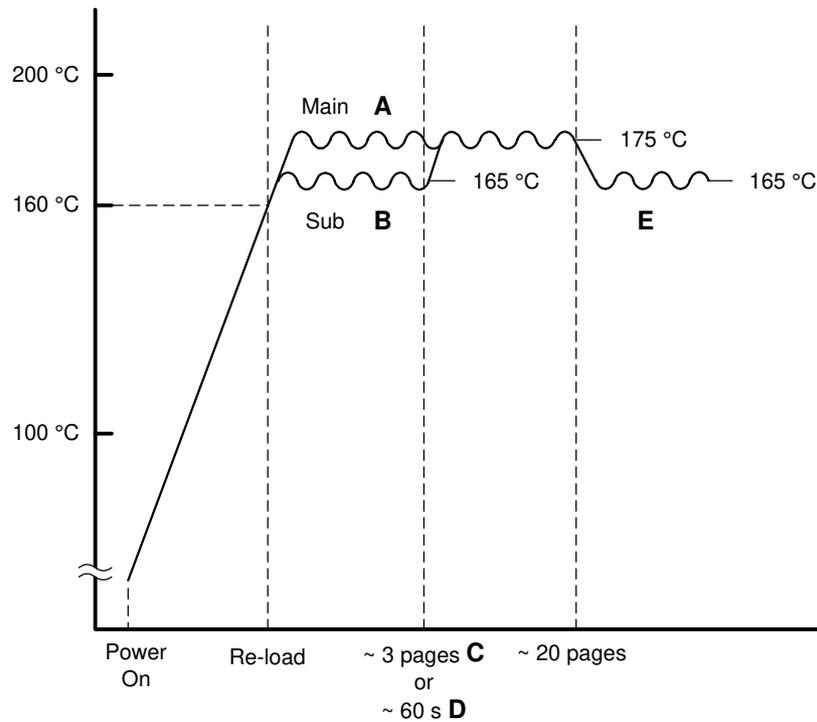
2.10.5 CLEANING MECHANISM



B022D552.WMF

The cleaning roller [A] is always in contact with the pressure roller [B]. It collects toner and paper dust adhered to the surface of the pressure roller.

2.10.6 FUSING TEMPERATURE CONTROL



B027D502.WMF

Detailed
Descriptions

Temperature Control

Just after the main power switch is turned on, the CPU turns on the fusing lamp to obtain a fusing temperature of 175°C (Main fusing lamp), 165°C (Sub fusing lamp) for the first 60s, or for the first three consecutive pages of printing, whichever comes first. After that, the machine keeps the fusing temperature at 175°C for the first 20 consecutive pages of printing. Then the fusing temperature is kept at 165°C.

The three-page and 60-second limits can be adjusted with SP1-105-8 and -9.

Note that the fusing temperature is higher if the user uses special paper in the 2nd tray or thick paper mode from the bypass tray (☞ 2.8.9).

Fusing Lamp Control

Turning on and off the fusing lamp power causes fluorescent light in the room to flicker. To reduce the flickering, use the following SP modes.

Fusing temperature detection cycle (SP mode 1-108)

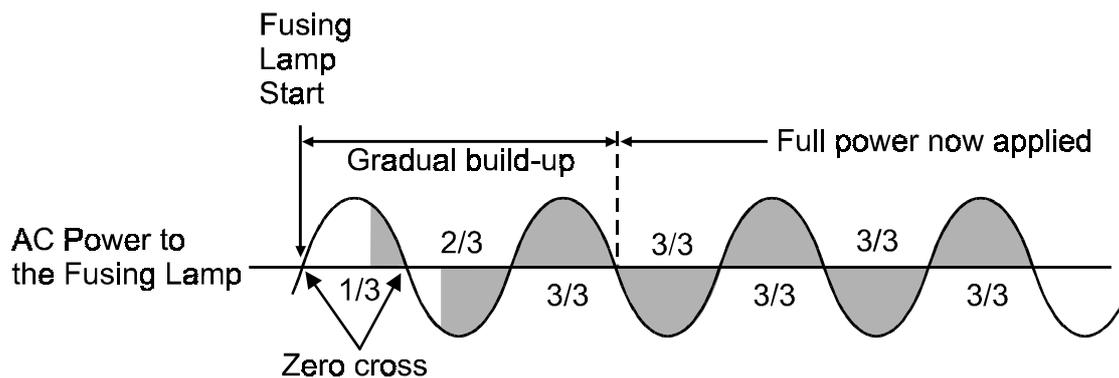
The CPU checks the output from the fusing thermistor once a second (default setting). The CPU compares the current and previous temperatures. Based on the result, it then decides how long the fusing lamp power should be on during the next one-second interval (also, if the current temperature is too high, the power will not be needed).

Starting and stopping the fusing lamp power every second causes fluorescent lighting in the room to flicker. To reduce this flickering, use SP1-108 to change the cycle from 1 second to 3 seconds.

Fusing soft-start

In addition, whenever the fusing lamp power switches on, full power is applied to the fusing lamp gradually, not all at once. This prevents the power in the room from dropping suddenly. This feature is known as "Soft Start". The machine does this by gradually allowing more power to the fusing lamp over a number of zero-cross cycles of the ac supply. The diagram below shows full power being applied gradually over the duration of 3 zero-cross cycles. Soft start occurs every time the fusing lamp power switches on (i.e., at some time during every second), not just at the start of the print job.

NOTE: This feature is effective to counter flickering lights. However, generated noise increases if the setting is changed from the default. If a radio or a TV is close by the machine, the noise may have some effect on the image or sound.



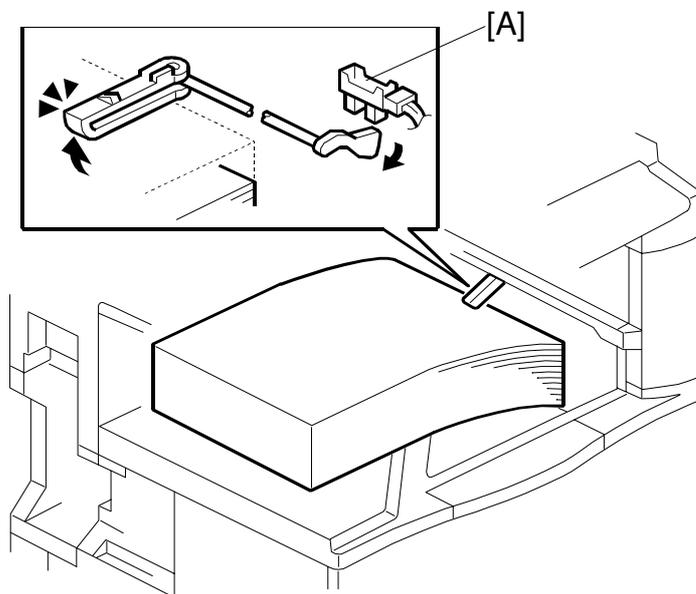
B027D512.WMF

2.10.7 OVERHEAT PROTECTION

If the hot roller temperature becomes higher than 231°C, the CPU cuts off the power to the fusing lamp. At the same time, SC543 is generated.

Even if the thermistor overheat protection fails, there are four thermostats in series with the common ground line of the fusing lamp. If the temperature of the thermostat reaches 210°C, one of the thermostats opens, removing power from the fusing lamp. At the same time, SC 542 is generated and the machine stops operating.

2.10.8 PAPER EXIT

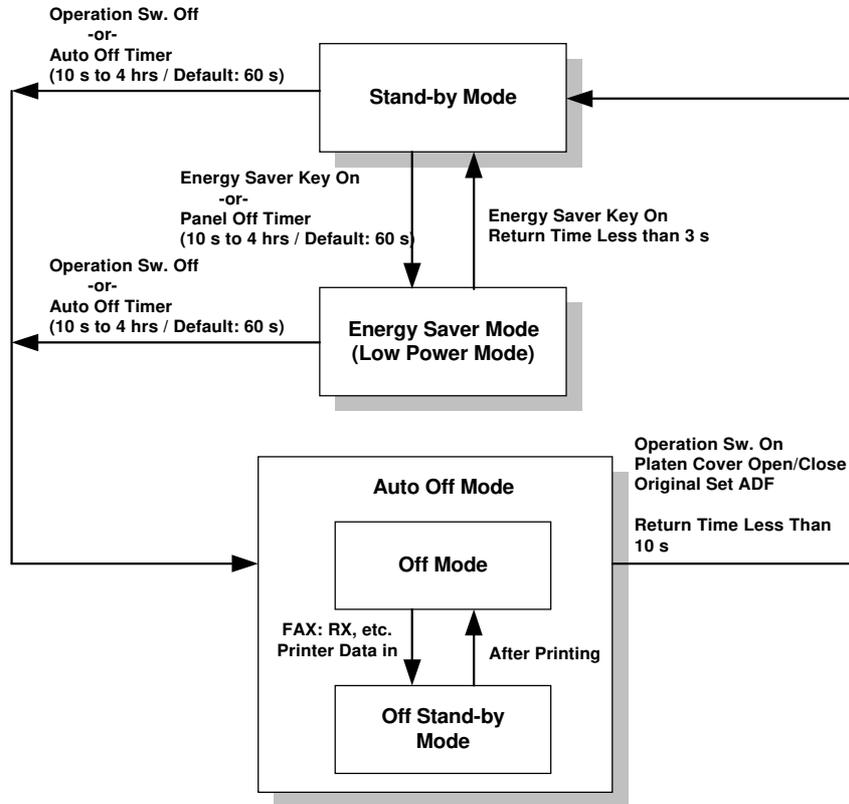


B027D601.WMF

The paper overflow detection sensor [A] is located at the paper exit section of the fusing unit. When this sensor is activated, the machine detects that the paper stack height exceeded a certain limit and stops printing.

2.11 ENERGY SAVER MODES

2.11.1 OVERVIEW



B027D503.WMF

When the machine is not being used, the energy saver function reduces power consumption by decreasing the fusing temperature.

This machine has two types of energy saver mode as follows.

- 1) Energy saver mode
- 2) Auto Off mode

These modes are controlled by the following UP and SP modes.

- Panel off timer (energy saver mode timer) : User Tools – System Settings – Timer Setting – Panel Off Timer
- Auto off timer: User Tools – System Settings – Timer Setting – Auto Off Timer
- Auto off disabling (SP mode): Set SP 5-305 to 1. This allows the user to disable auto off mode by setting the auto off timer to 0.

2.11.2 ENERGY SAVER MODE

Entering the energy saver mode

The operation manual uses the term 'panel off mode' for the timer.

The machine enters energy saver mode when one of the following is done.

- The panel off timer runs out
- The Clear Mode/Energy Saver Key is held down for one second

Note that the default setting of the panel off timer is 60 s, which is the same as the auto off timer. In this condition, if the machine is not touched for 60 s, it will go straight to auto off mode. If the user wants an energy saver mode and an auto off mode, the panel off timer must be set to a shorter value than the auto off timer,

What happens in energy saver mode

When the machine enters energy saver mode, the fusing lamp drops to a certain temperature, and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED.

If the CPU receives an image print out command from an application (e. g. to print incoming fax data or to print data from a PC), the fusing temperature rises to print the data.

Return to stand-by mode

If one of the following is done, the machine returns to stand-by mode:

- The Clear Mode/Energy Saver Mode key is pressed
- Any key on the operation panel or touch panel screen is pressed
- An original is placed in the ADF
- The ADF is lifted
- A sheet of paper is placed in the by-pass feed table

The recovery time from energy saver mode is about 3 s.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	+24V	System +5V
Energy Saver	On	On	150°C	On	On

2.11.3 AUTO OFF MODE

There are two Auto Off modes: Off Stand-by mode and Off mode. The difference between Off Stand-by mode and Off mode is the machine's condition when it enters Auto Off mode.

Entering off stand-by and off modes

The machine enters the Off Stand-by mode or Off mode when one of the following is done.

- The auto off timer runs out
- The operation switch is pressed to turn the power off

If one or more of the following conditions exists, the machine enters Off Stand-by mode. If none of these conditions exist, the machine enters Off Mode.

- Error or SC condition
- An optional G4 unit is installed
- Image data is stored in the memory
- During memory TX or polling RX
- The handset is off hook
- An original is in the ADF
- The ADF is open

Off Stand-by mode

The system +5V is still supplied to all components. When the machine detects a ringing signal or receives a stream of data for a print job, the +24V supply is activated and the machine automatically prints the incoming message or executes the print job.

Off Mode

The system +5V supply also turns off. However, +5VE (+5V for energy saver mode) is still activated. When the machine detects a ringing signal, off-hook signal, or receives a print job, the machine returns to the Off Stand-by mode and the system +5V and +24V supplies are activated.

Returning to stand-by mode

The machine returns to stand-by mode when the operation switch is pressed. The recovery time is about 10 s.

Mode	Operation Switch	Energy Saver Mode	Fusing Lamp	+24V	System +5V	Note
Off Stand-by	Off	Off	Off (On when printing)	On	On	
Off	Off	Off	Off	Off	Off	+5VE is supplied

3. INSTALLATION PROCEDURE

3.1 INSTALLATION REQUIREMENTS

3.1.1 ENVIRONMENT

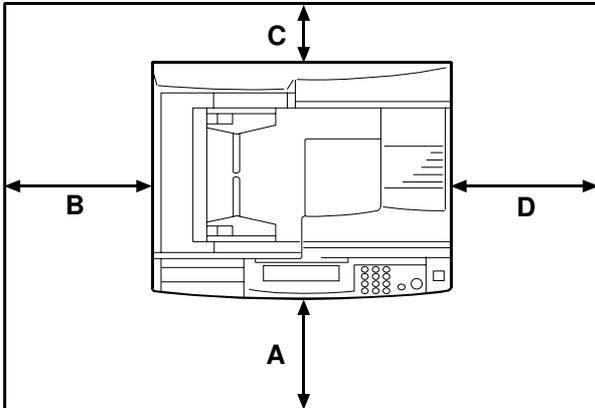
1. Temperature Range: 10°C to 32°C (50°F to 89.6°F)
2. Humidity Range: 15% to 80% RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m³/hr/person
5. Ambient Dust: Less than 0.10 mg/m³ (2.7 x 10⁻⁶ oz/yd³)
6. Avoid an area which is exposed to sudden temperature changes. This includes:
 - 1) Areas directly exposed to cool air from an air conditioner.
 - 2) Areas directly exposed to heat from a heater.
7. Do not place the machine in an area where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the copier on a strong and level base. (Inclination on any side should be no more than 5 mm.)
10. Do not place the machine where it may be subjected to strong vibrations.

3.1.2 MACHINE LEVEL

- Front to back: Within 5 mm (0.2") of level
Right to left: With in 5 mm (0.2") of level

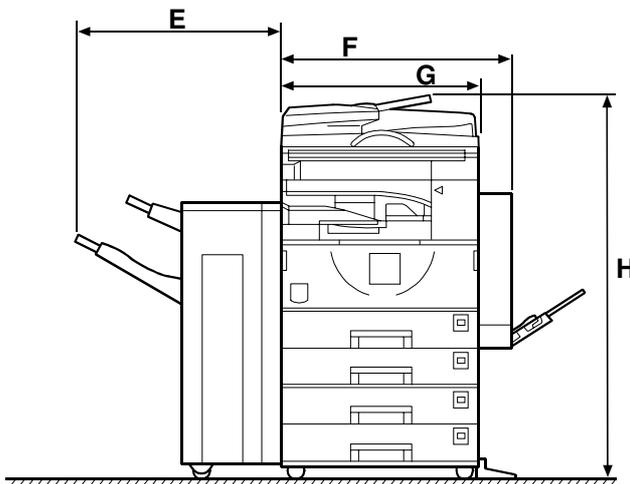
3.1.3 MINIMUM SPACE REQUIREMENTS

Place the copier near the power source, providing clearance as shown:



B0271201.WMF

- A: In Front: Over 750 mm (29.6")
- B: Left: Over 10 mm (4")
- C: To Rear: Over 10 mm (4")
- D: Right: Over 10 mm (4")



B0271202.WMF

- E: 620 mm (24.4")
- F: 640 mm (25.2")
- G: 550 mm (21.7")
- H: 1137 mm (44.8")

NOTE: The 750 mm recommended for the space at the front is only for pulling out the paper tray. If an operator stands at the front of the copier, more space is required.

3.1.4 POWER REQUIREMENTS

⚠ CAUTION

- 1. Make sure that the wall outlet is near the copier and easily accessible. Make sure the plug is firmly inserted in the outlet.**
- 2. Avoid multi-wiring.**
- 3. Be sure to ground the machine.**

1. Input voltage level: 120 V, 60 Hz: More than 12 A
220 V ~ 240 V, 50 Hz/60 Hz: More than 7 A
110V, 50 Hz/60 Hz: More than 13 A
2. Permissible voltage fluctuation: $\pm 10\%$
3. Do not set anything on the power cord.

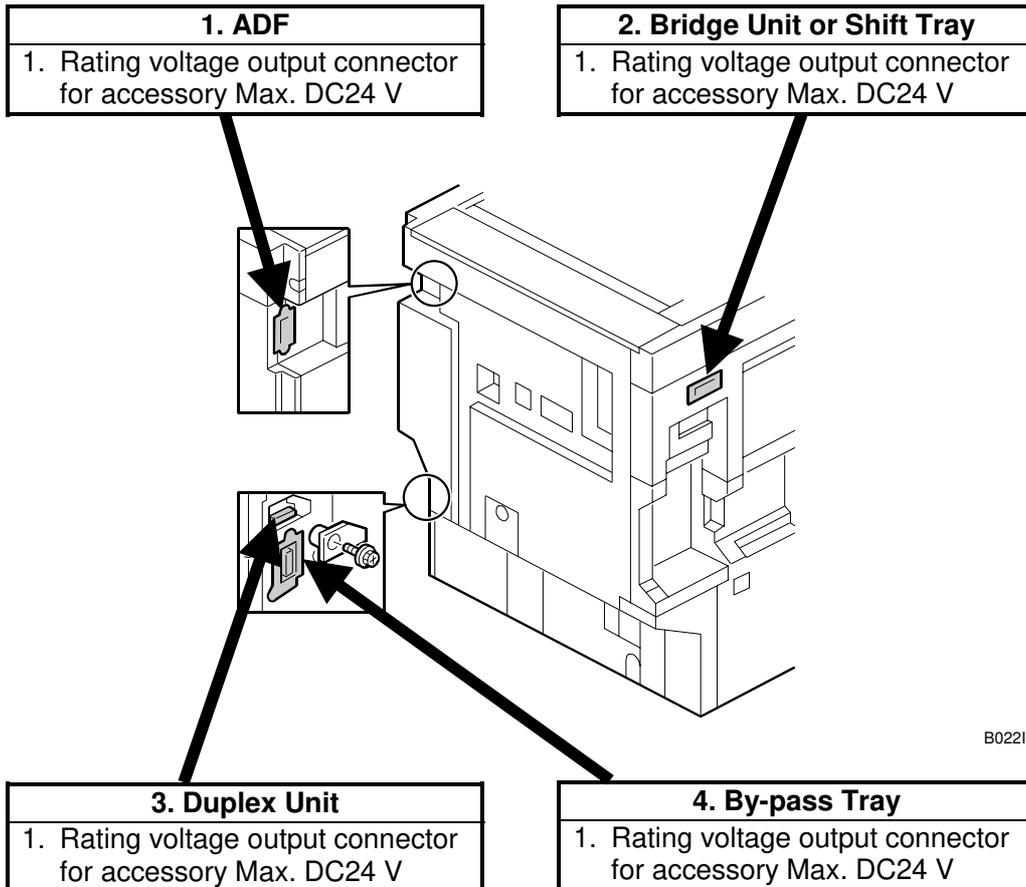
3.2 COPIER INSTALLATION

3.2.1 POWER SOCKETS FOR PERIPHERALS

⚠ CAUTION

Rating voltage for peripherals.

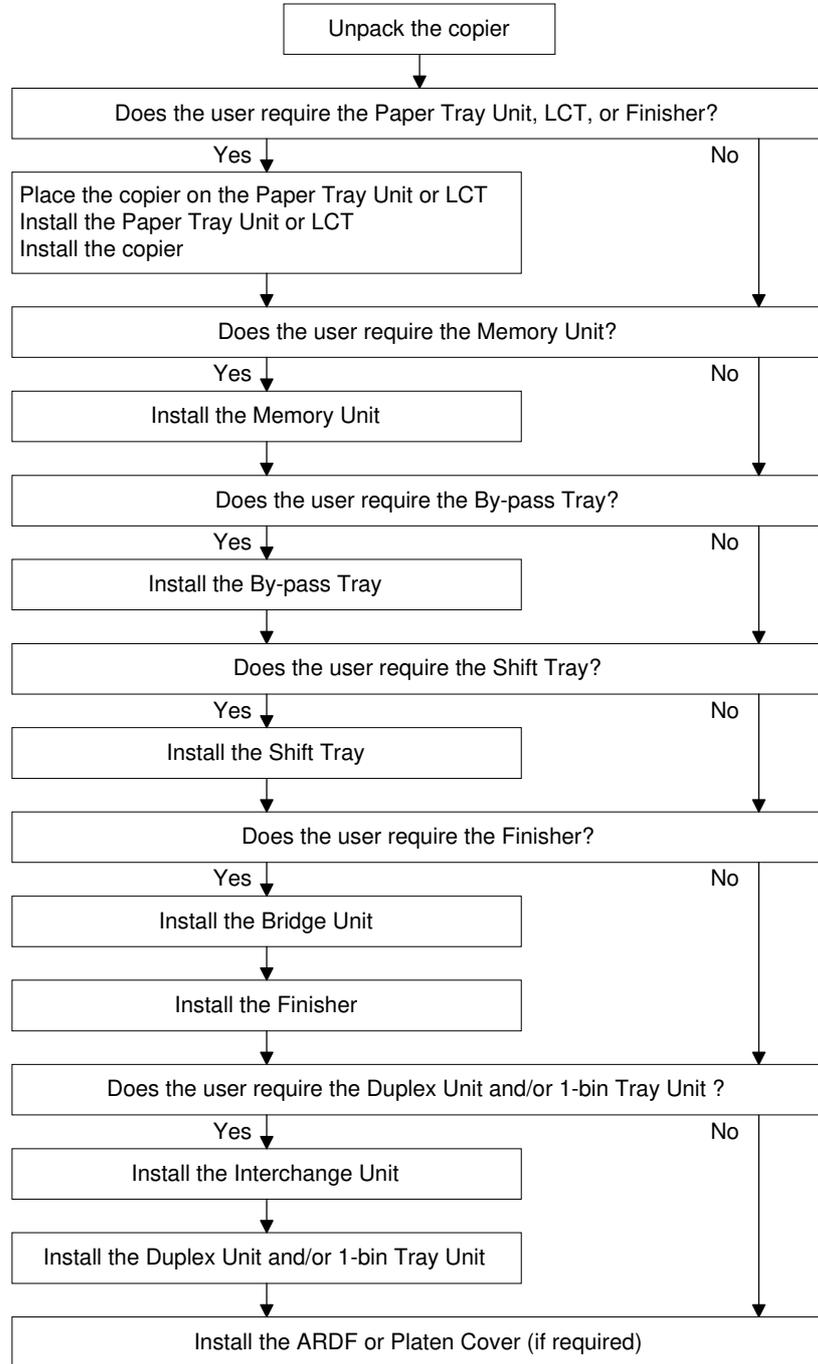
Make sure to plug the cables into the correct sockets.



B0221500.WMF

3.2.2 INSTALLATION FLOW CHART

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



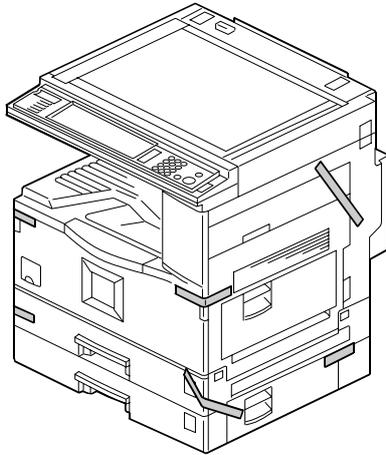
B0221513.WMF

3.2.3 ACCESSORY CHECK

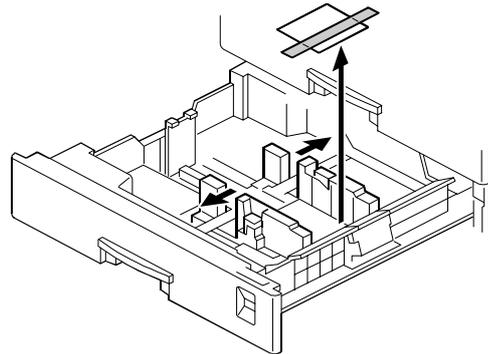
Check the quantity and condition of the accessories in the box against the following list:

No.	Description	Q'ty
1	Paper Tray Decal	1
2	Emblem	1
3	Model Name Decal	1
4	NECR	1
5	End Fence	1
6	HDD Caution Decal (-17, -57 only)	1
7	Operating Instructions – System Setting	1
8	Operating Instructions – Copy Reference	1

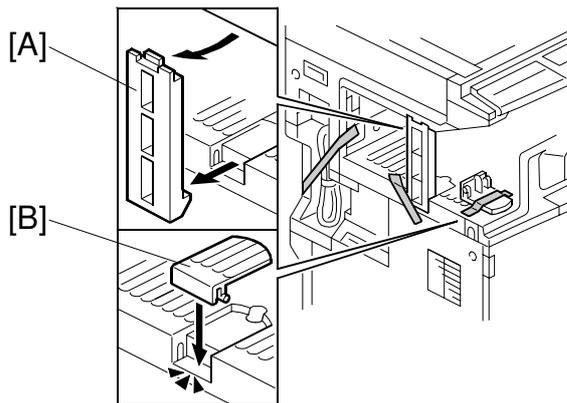
3.2.4 INSTALLATION PROCEDURE



B0221101.WMF



B0221502.WMF



B0221501.WMF

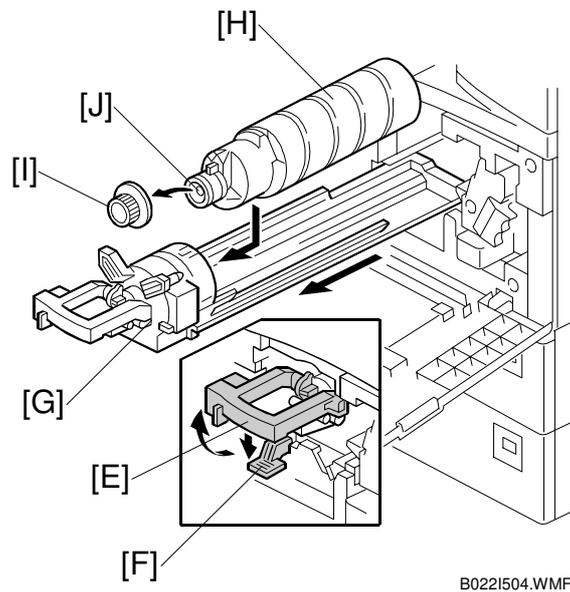
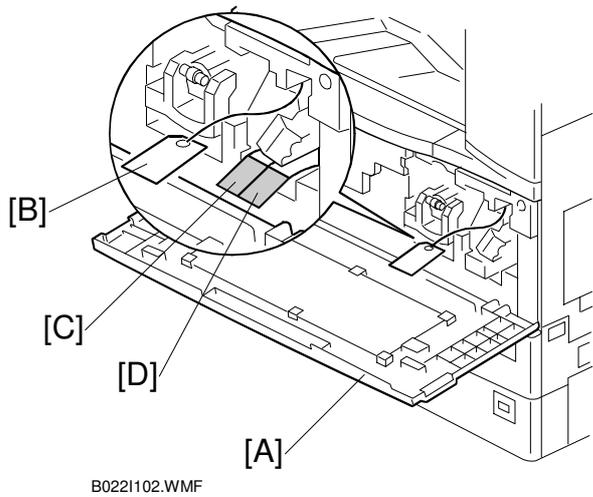
⚠ CAUTION

Unplug the machine power cord before starting the following procedure.

If the optional paper tray or the optional LCT is going to be installed now, put the copier on the paper tray unit or the LCT first, then install these options, then install the copier.

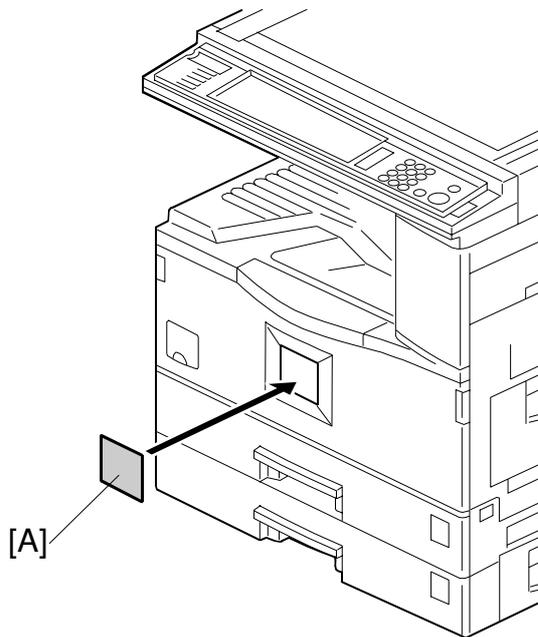
NOTE: Keep the shipping retainers after installing the machine. They will be reused if the machine is moved to another location in the future.

1. Remove the tapes and the shipping retainer [A] on the exterior of the copier.
2. Install the end fence [B].

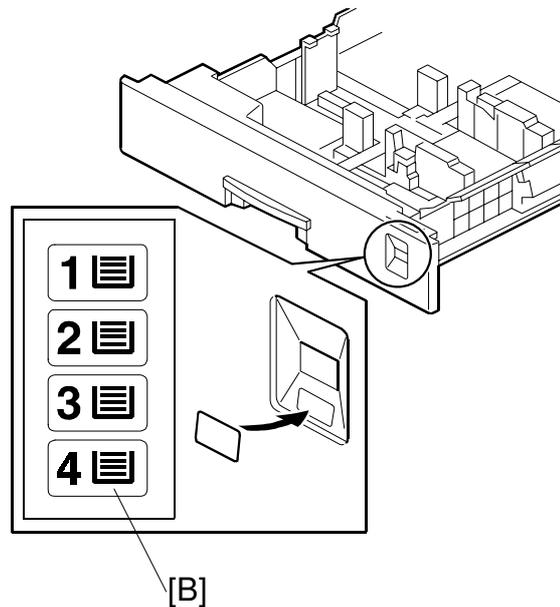


3. Open the front cover [A].
4. Remove the red tag [B] and toner seal [C], then peel the sealing tape [D] off to install the developer.
5. Raise the toner bottle holder lever [E], push lever [F] down, and pull the toner bottle holder [G] out.
6. Shake the toner bottle [H] well.
NOTE: Do not remove the toner bottle cap [I] until after shaking.
7. Unscrew the bottle cap [I] and insert the bottle into the holder.
NOTE: Do not touch the inner bottle cap [J].
8. Reposition the holder and press down the holder lever to secure the bottle.



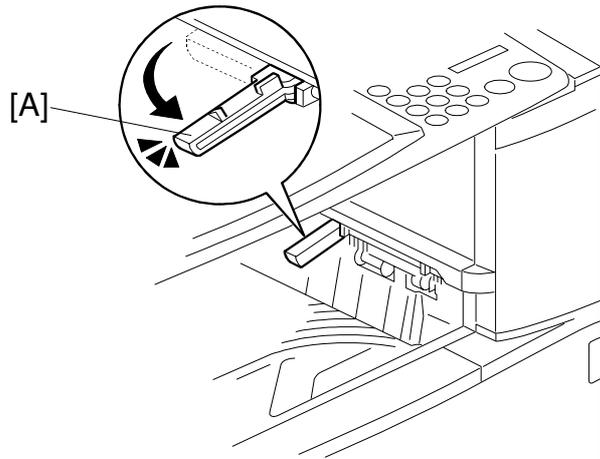


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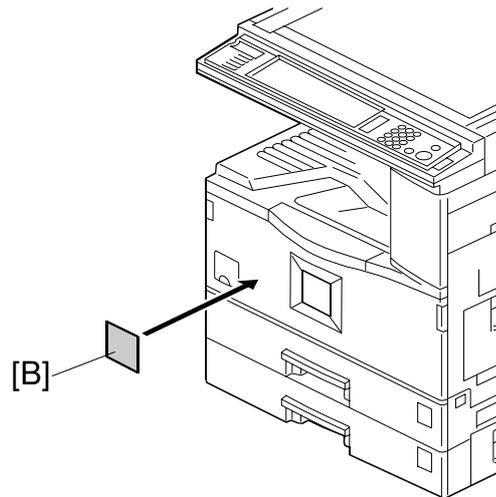


B0221503.WMF

9. Attach the appropriate emblem [A] to the front cover if the emblem is not attached to the front cover.
10. Pull the paper tray out and turn the paper size dial to select the appropriate size. Adjust the side guides and end guide to match the paper size.
NOTE: To move the side guides, first pull out the tray fully, then push down the green lock at the rear of the tray.
11. Attach the appropriate paper tray number decal [B] to the paper tray.
NOTE: Paper tray number decals are also used for the optional paper tray or the optional LCT. Keep any remaining decals for use with these optional units.



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B0271105.WMF

12. **If the optional bridge unit will not be installed:** Swing the sensor feeler [A] out.
13. Install the optional ARDF or the optional platen cover (see ARDF Installation or Platen Cover Installation).
14. Plug in the machine and turn the main power switch on. The machine automatically performs TD sensor initial setting (approximately 15 seconds).
15. Check the copy quality and copying functions.
-  16. Initialize the electrical total counter using SP7-825, depending on the service contract type.

HDD Caution Decal (for only -17, -57 models)

1. When installing the optional HDD, attach the HDD caution decal [B] to the front cover.

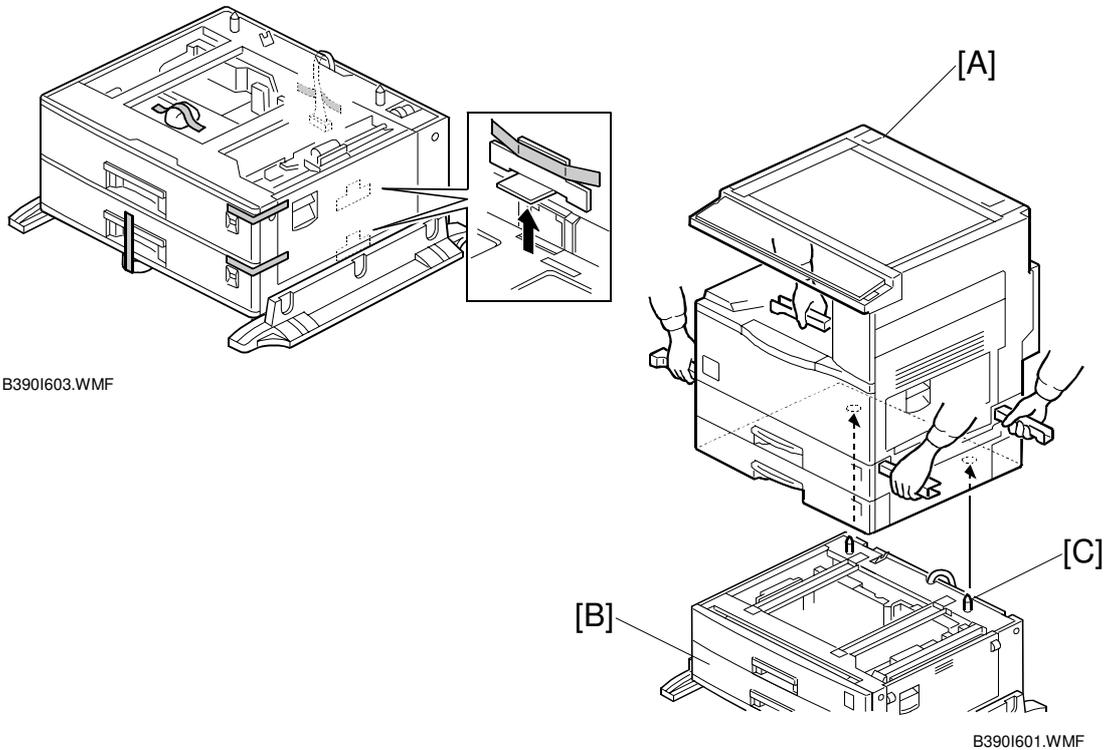
3.3 PAPER TRAY UNIT INSTALLATION

3.3.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Securing Bracket	2
2	Screw – M4x10	4

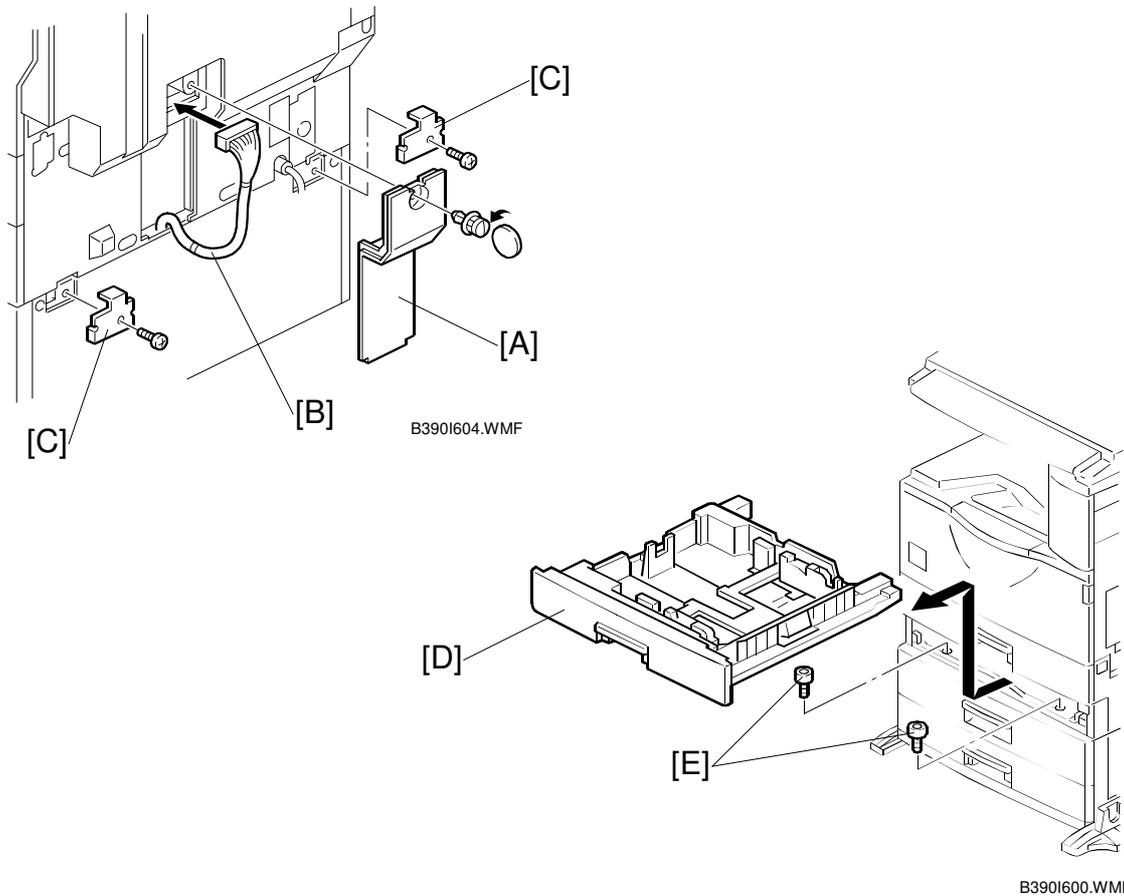
3.3.2 INSTALLATION PROCEDURE



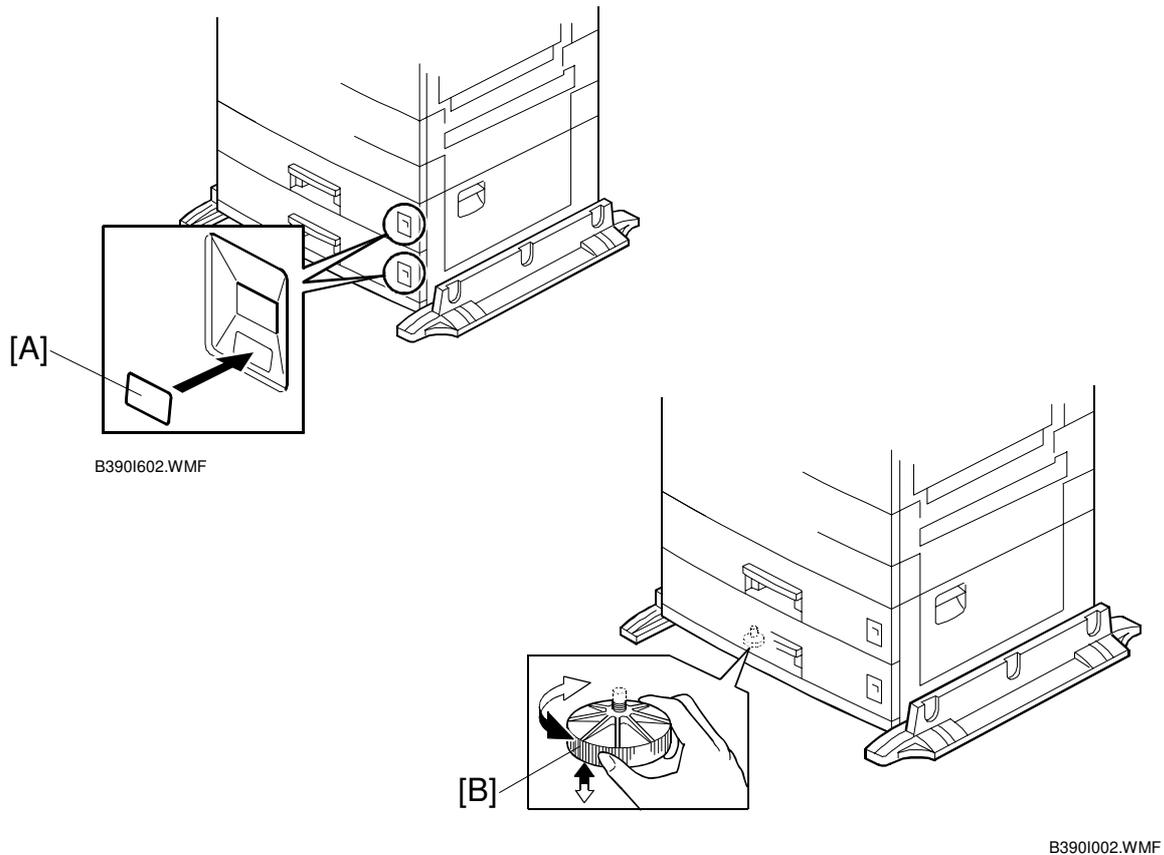
⚠ CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the strips of tape.
2. Set the copier [A] on the paper tray unit [B].
NOTE: When installing the copier, be careful not to pinch the cable [C].



3. Remove the connector cover [A] (1 screw).
4. Connect the cable [B] to the copier, as shown.
5. Attach a securing bracket [C] to each side of the paper tray unit, as shown (1 screw each).
6. Re-install the connector cover.
7. Remove the 2nd paper tray [D] and secure the paper tray unit with two screws [E].



8. Reinstall the 2nd paper tray and attach the appropriate paper tray number decal [A] to the paper tray.
NOTE: The paper tray number decal is in the accessory box for the main copier.
9. Rotate the adjuster [B] until the machine cannot be pushed across the floor.
10. Load paper into the paper trays and select the proper paper size.
11. Turn on the main switch.
12. Check the machine's operation and copy quality.

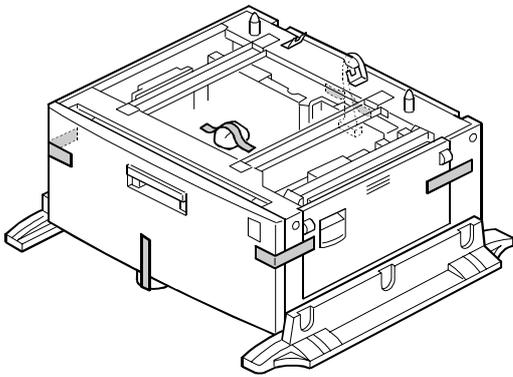
3.4 LCT INSTALLATION

3.4.1 ACCESSORY CHECK

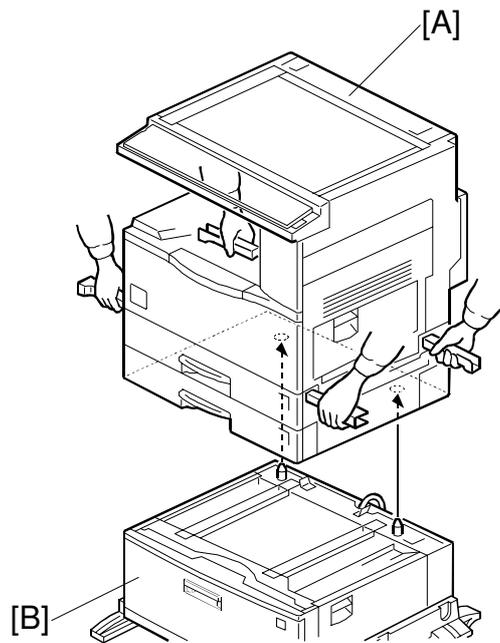
Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Securing Bracket	2
2	Screw – M4x10	4
3	Paper Size Decal	1

3.4.2 INSTALLATION PROCEDURE



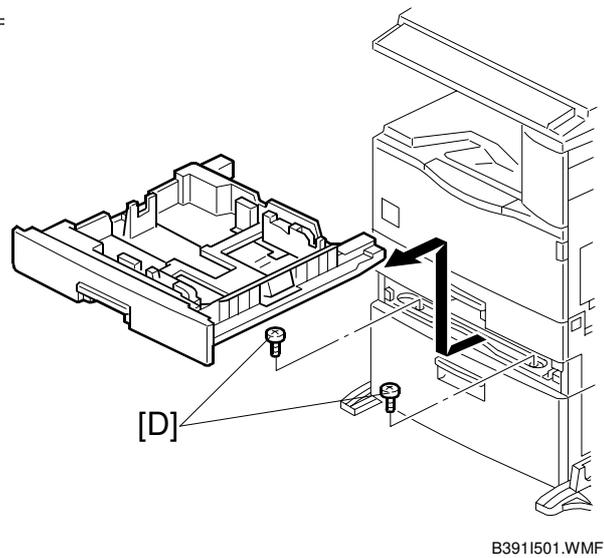
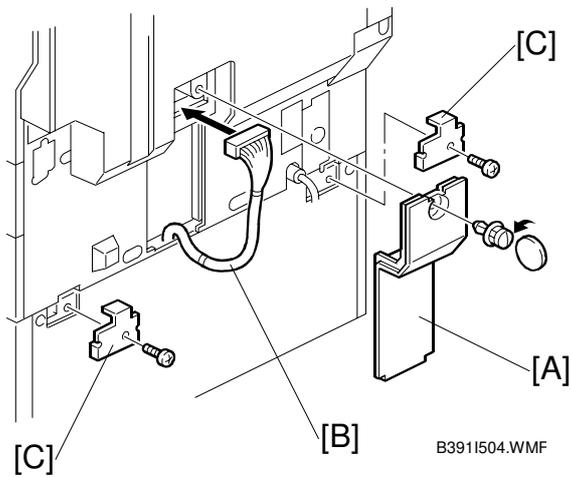
B3911500.WMF



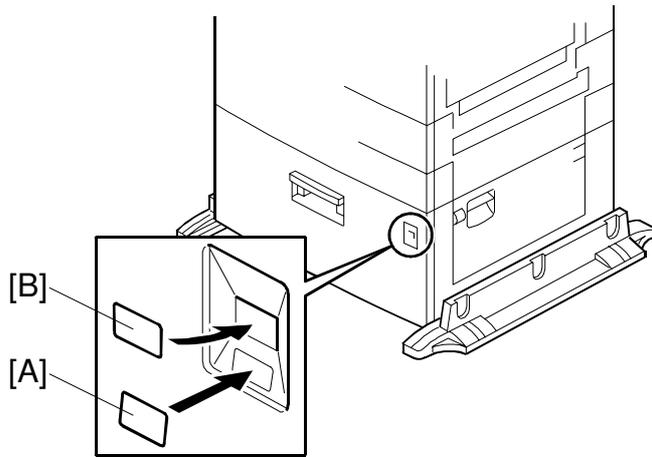
B3911505.WMF

⚠ CAUTION
Unplug the machine power cord before starting the following procedure.

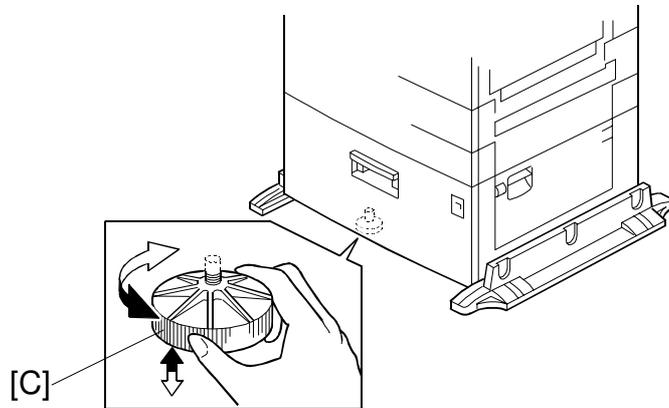
1. Remove the strips of tape.
2. Set the copier [A] on the LCT [B].
NOTE: When installing the copier, be careful not to pinch the cable [C].



3. Remove the connector cover [A] (1 screw).
4. Connect the cable [B] to the copier, as shown.
5. Attach a securing bracket [C] to each side of the LCT, as shown (1 screw each).
6. Re-install the connector cover.
7. Remove the 2nd paper tray and secure the LCT with two screws [D].



B3911502.WMF



B3911506.WMF

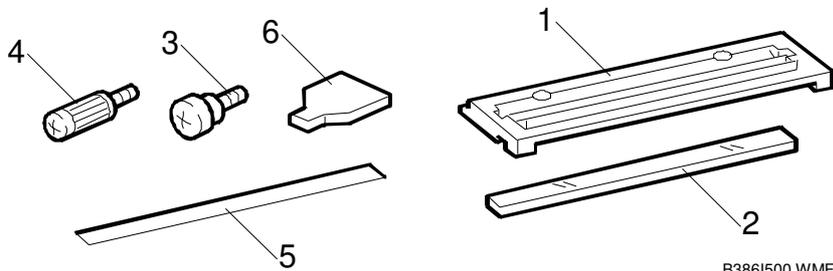
8. Load paper into the LCT.
9. Reinstall the 2nd paper tray and attach the appropriate paper tray number decal [A] and paper size decal [B] to the LCT.
NOTE: The paper tray number decal is in the accessory box for the main copier.
10. Rotate the adjuster [C] until the machine cannot be pushed across the floor.
11. Load paper into the paper tray and turn on the main switch.
12. Check the machine's operation and copy quality.

3.5 AUTO REVERSE DOCUMENT FEEDER INSTALLATION

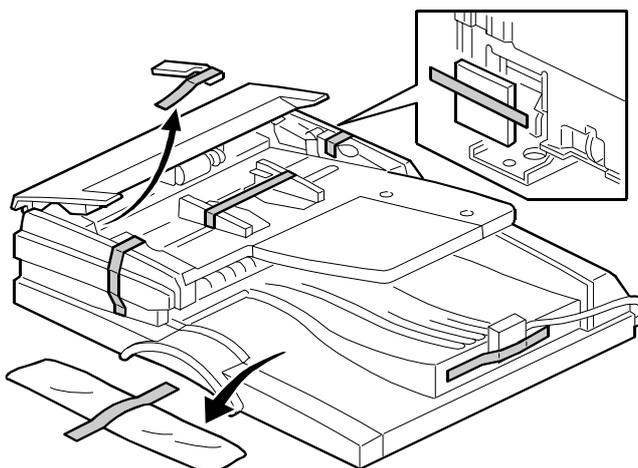
3.5.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Scale Guide	1
2	DF Exposure Glass	1
3	Stud Screw	2
4	Knob Screw	2
5	Original Size Decal	2
6	Screwdriver Tool	1

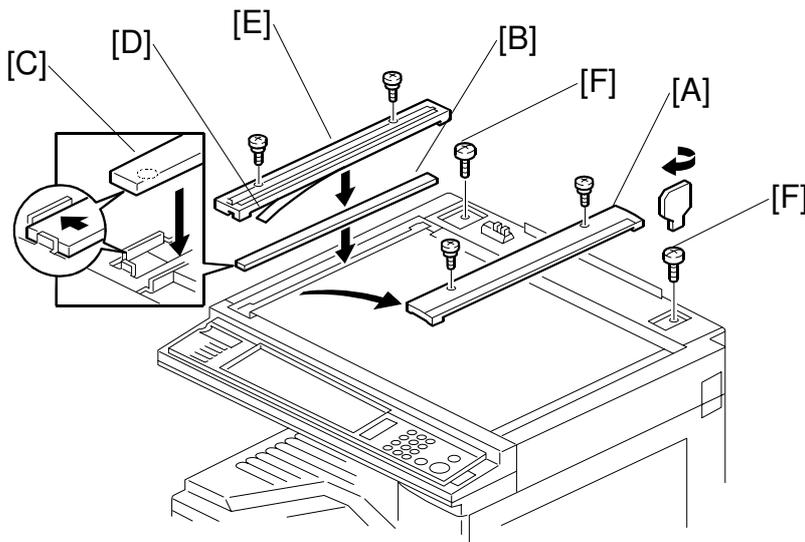


3.5.2 INSTALLATION PROCEDURE

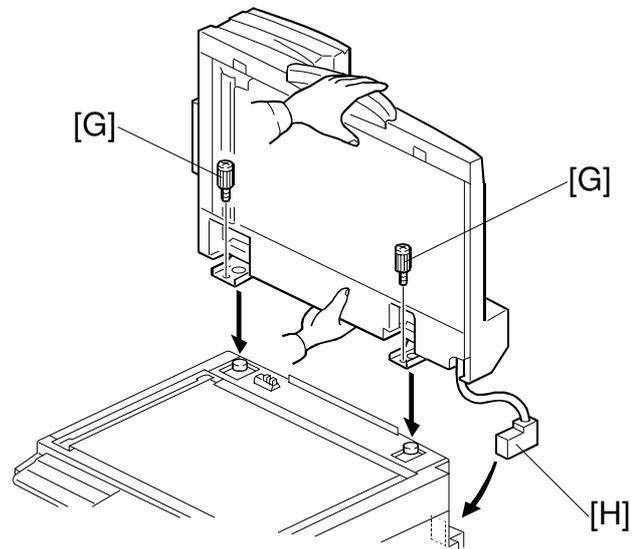


⚠ CAUTION
Unplug the copier power cord before starting the following procedure.

1. Remove the strips of tape.

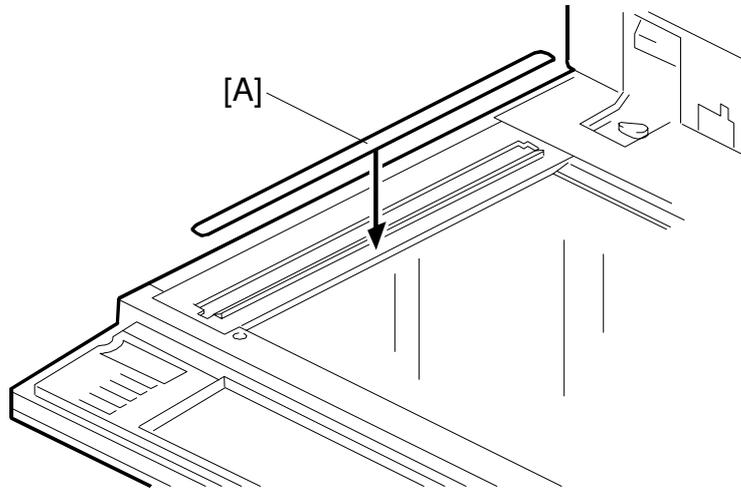


B3861103.WMF



B3861104.WMF

2. Remove the left scale [A] (2 screws).
3. Place the DF exposure glass [B] on the glass holder.
NOTE: When installing the DF exposure glass, make sure that the white point [C] is on the lower front side of the glass, as shown.
4. Peel off the backing [D] of the double-sided tape attached to the rear side of the scale guide [E], then install it (2 screws removed in step 2).
5. Install the two stud screws [F].
6. Mount the DF on the copier, then slide the DF to the front as shown.
7. Secure the DF unit with two screws [G].
8. Connect the cable [H] to the copier.



B3861501.WMF

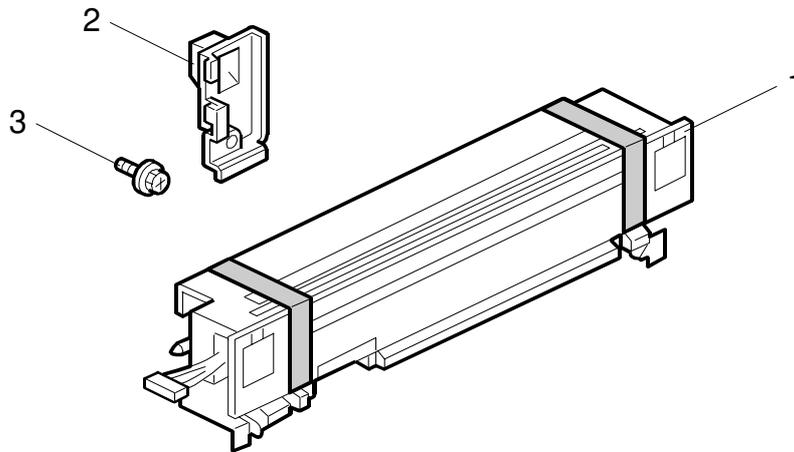
9. Attach the appropriate scale decal [A] as shown.
10. Turn the main power switch on. Then check if the document feeder works properly.
11. Make a full size copy. Then check to make sure the side-to-side and leading edge registrations are correct. If they are not, adjust the side-to-side and leading edge registrations (refer to the service manual).

3.6 INTERCHANGE UNIT INSTALLATION

3.6.1 COMPONENT CHECK

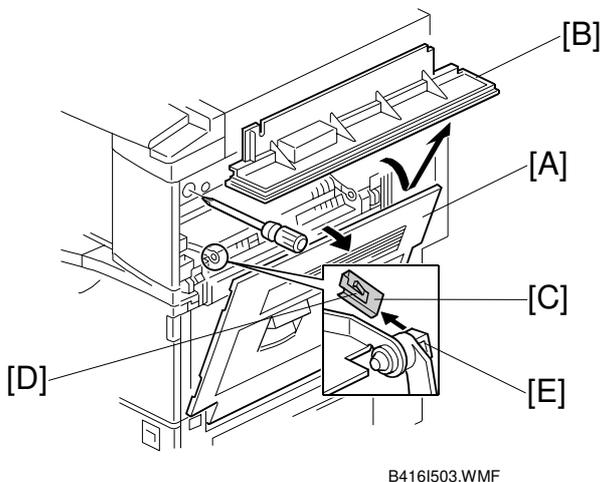
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	Interchange Unit	1
2	Connector Cover	1
3	Tapping Screw M3x8	1

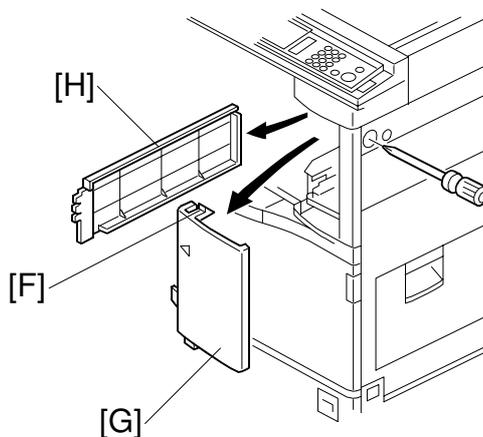


B416H101.WMF

3.6.2 INSTALLATION PROCEDURE



B416I503.WMF



B416I502.WMF

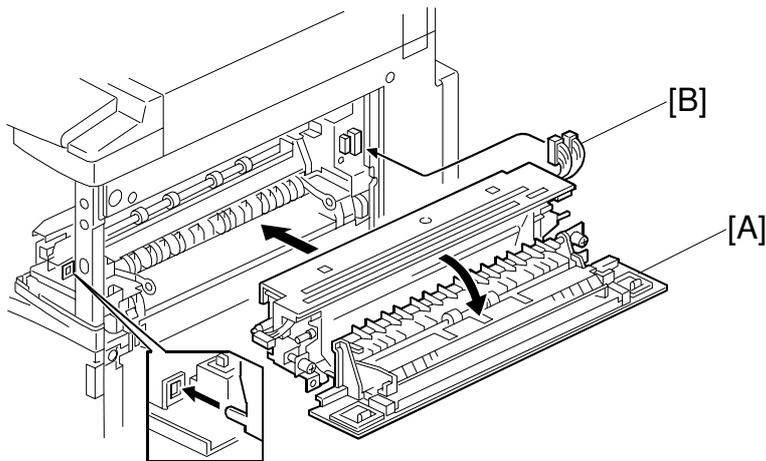
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

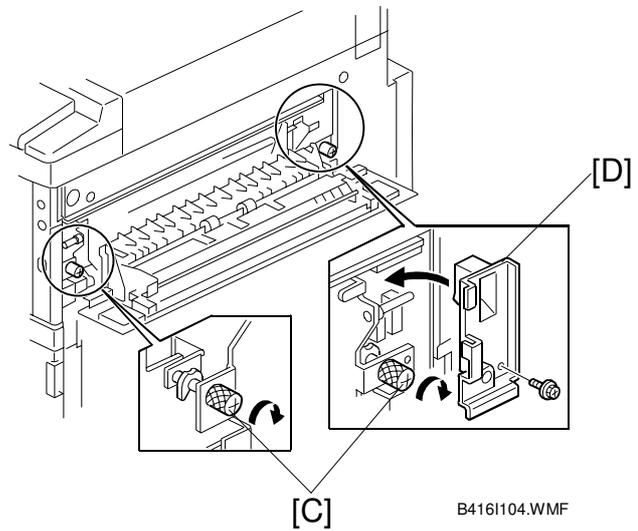
1. Remove all tapes.
2. Open the right cover [A] of the copier.
3. Open cover [B]
4. Remove the metal clip [C].
NOTE: To remove the clip, push the small tab [D] on the clip into the slot [E], then the clip can be removed.
5. Remove the cover [B].

If the optional 1-bin tray unit (B413) will be installed, do steps 6 and 7.

6. Loosen the screw, push down tab [F] with a screwdriver, and remove the front right cover [G].
7. Slide out the exit cover [H].



B4161103.WMF



B4161104.WMF

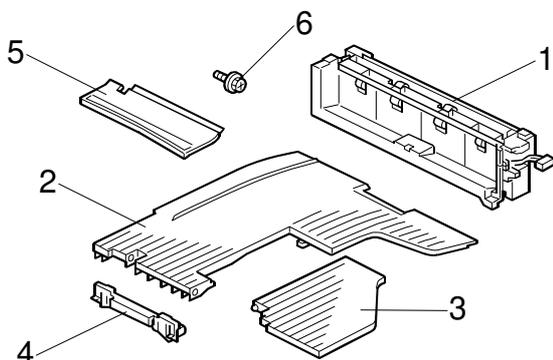
8. Open the cover [A] of the interchange unit.
9. Install the interchange unit (2 connectors) [B].
10. Secure the interchange unit with the knob screws [C].
11. Attach the connector cover [D] (1 screw).

3.7 1-BIN TRAY UNIT INSTALLATION

3.7.1 COMPONENT CHECK

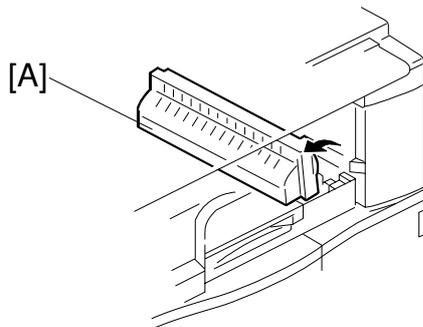
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	1-Bin Tray Unit	1
2	Tray	1
3	Sub-Tray	1
4	Tray Guide	1
5	Paper Guide	1
6	Tapping Screw M3x8	1



B4131101.WMF

3.7.2 INSTALLATION PROCEDURE



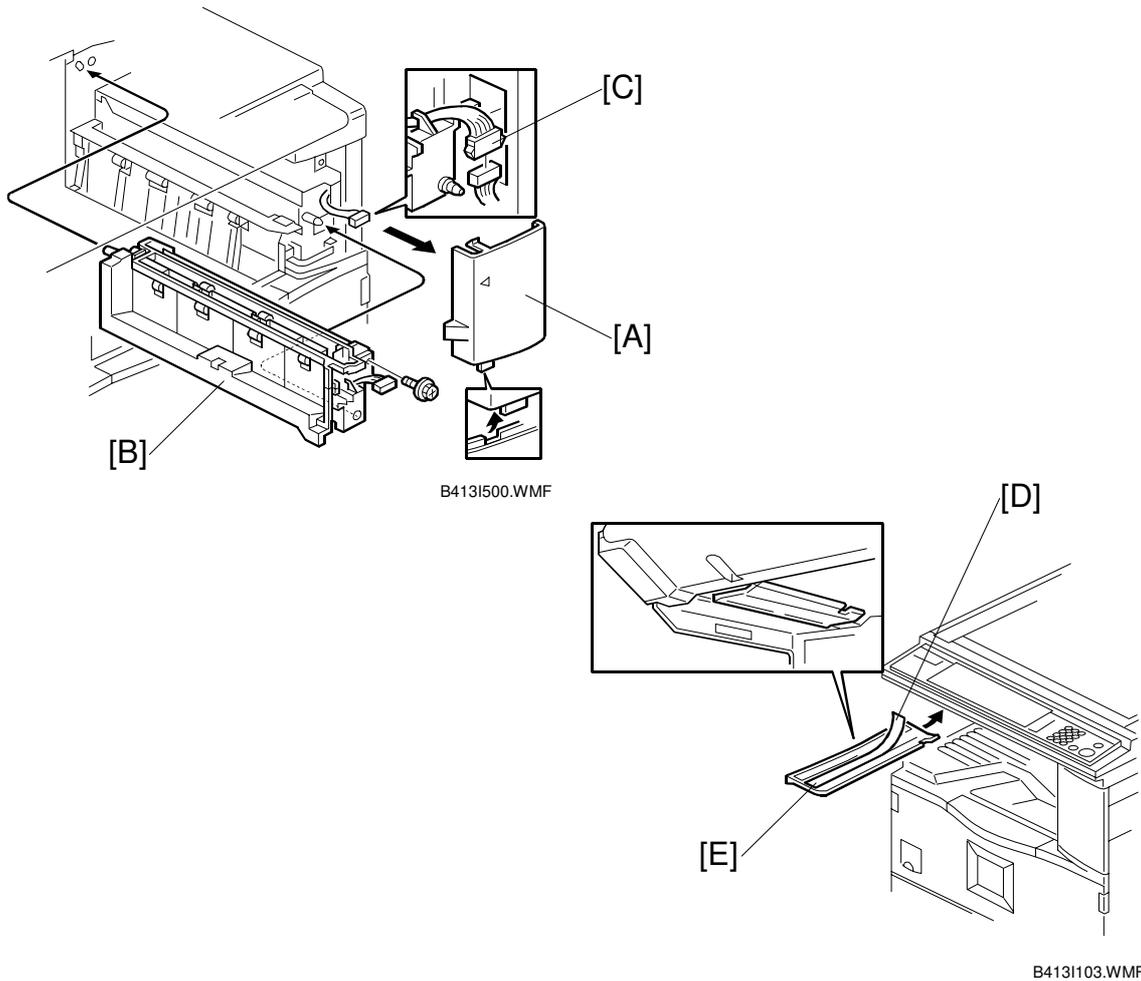
B4131501.WMF

⚠ CAUTION

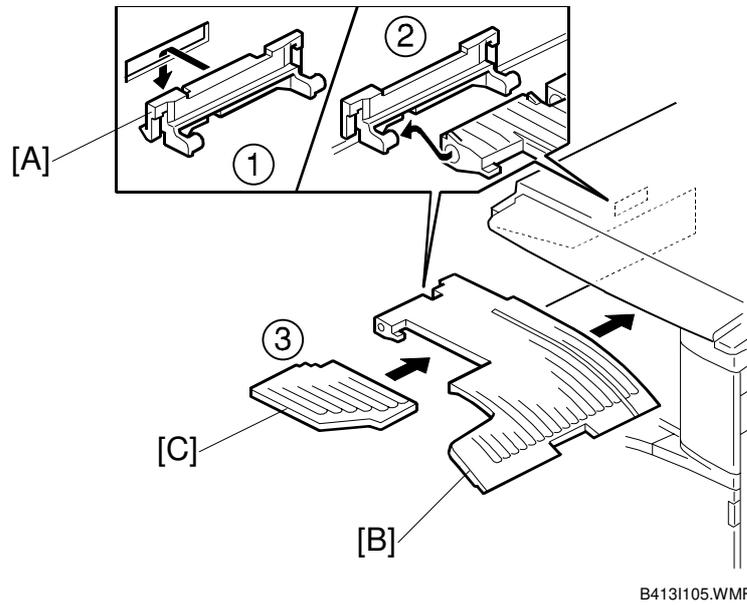
Unplug the copier power cord before starting the following procedure.

NOTE: Before installing this 1-bin tray unit, the optional interchange unit (B416) must be installed.

1. Remove all tapes.
2. If the optional bridge unit has been installed, open the right jam removal cover [A] of the bridge unit.
If the optional bridge unit is not installed, skip this step.



3. If the front right cover [A] is installed, remove it.
4. Install the 1-bin tray unit [B] (1 screw).
5. Connect the connector [C].
6. Reinstall the front right cover.
7. Peel off the backing [D] of the double-sided tape attached to the paper guide [E]. Then attach the paper guide to the underside of the scanner unit as shown.



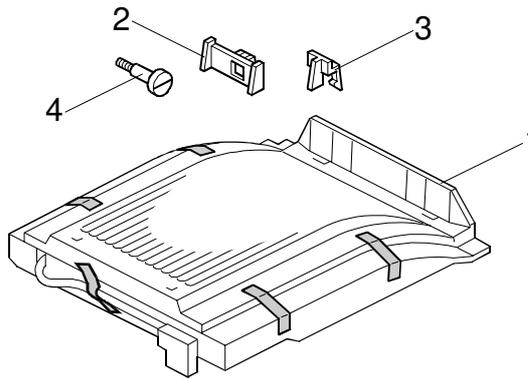
12. Install the tray guide [A].
13. Install the tray [B].
14. Install the sub-tray [C].
15. Turn on the main power switch and check the 1-bin tray unit operation.

3.8 SHIFT TRAY

3.8.1 COMPONENT CHECK

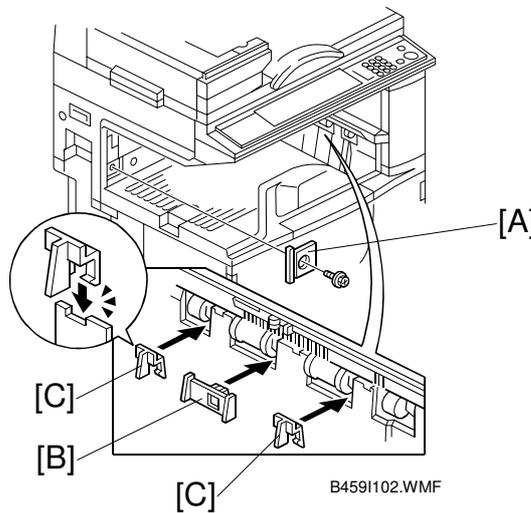
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	Shift Tray Unit	1
2	Paper Guide - Large	1
3	Paper Guide - Small	2
4	Stepped Screw	1



B459I101.WMF

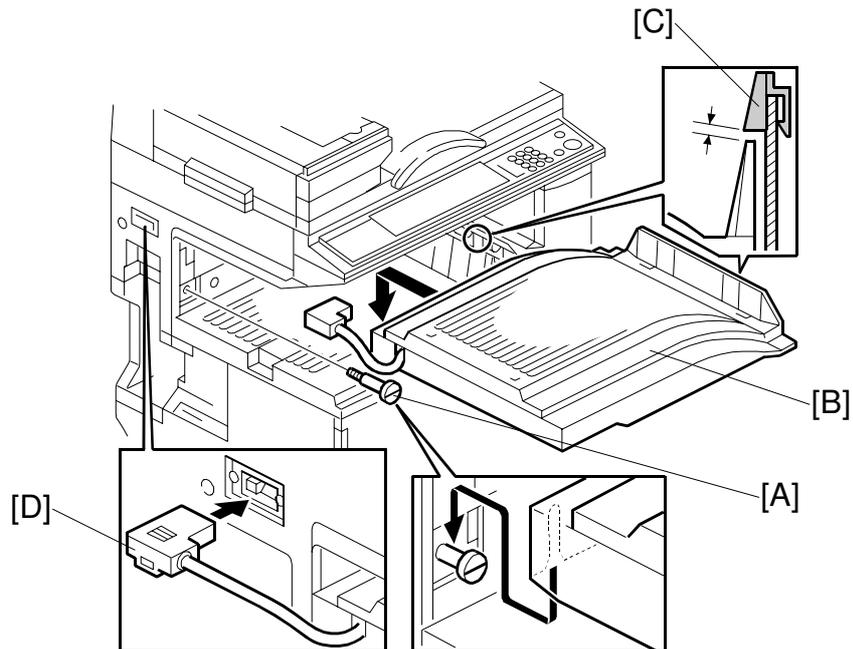
3.8.2 INSTALLATION PROCEDURE



B459I102.WMF

⚠ CAUTION
Unplug the copier power cord before starting the following procedure.

1. Remove all tapes.
2. Remove the plate [A] (1 screw).
3. Install the large paper guide [B] and two small paper guides [C], as shown.



B4591103.WMF

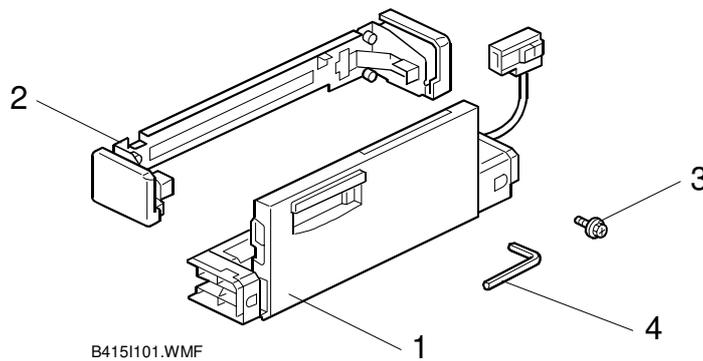
4. Install the stepped screw [A].
5. Install the shift tray unit [B], as shown.
 - NOTE:** 1) Set the shift tray on the stepped screw.
 - 2) The shift tray must be installed under the paper guide [C] installed in step 3.
6. Connect the cable [D] to the copier.
7. Turn on the main power switch. Then select the shift tray using the UP mode "2. Copier – 3. Input/Output – 6. Sort – Shift Sort".
8. Check the shift tray operation.

3.9 BY-PASS FEED UNIT INSTALLATION

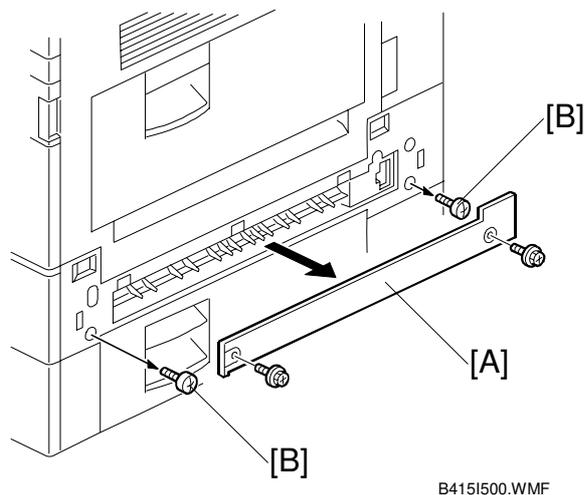
3.9.1 COMPONENTS CHECK

Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	By-pass Tray Unit	1
2	Unit Holder	1
3	Tapping Screw	2
4	Allen Key	1

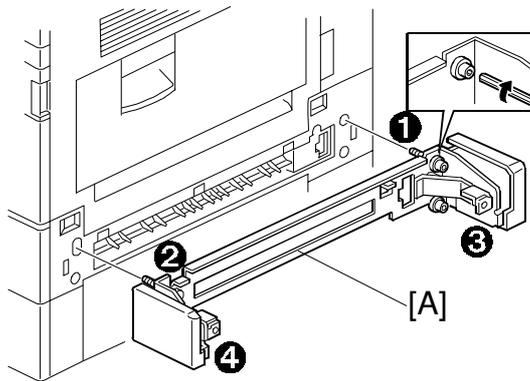


3.9.2 INSTALLATION PROCEDURE

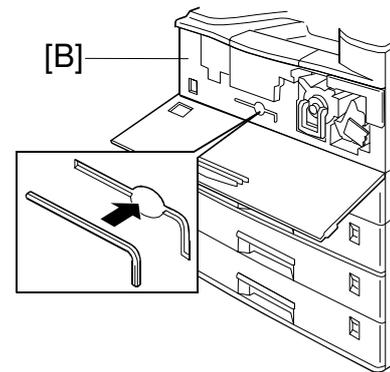


⚠ CAUTION
Unplug the copier power cord before starting the following procedure.

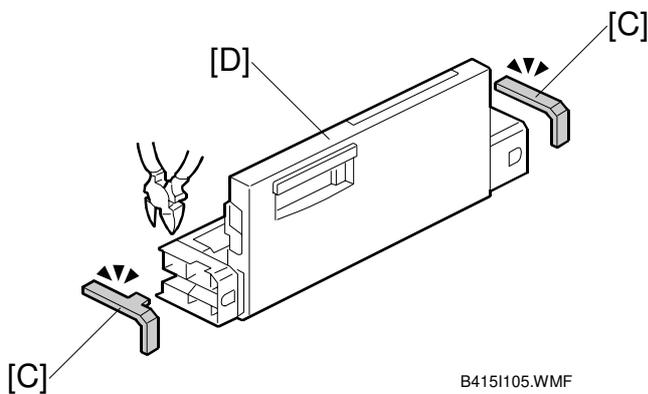
1. Remove all tapes.
2. Remove the entrance cover [A] (2 screws) and two screws [B].



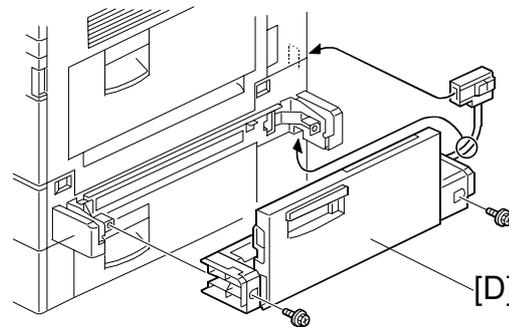
B4151501.WMF



B4151502.WMF



B4151105.WMF



B4151104.WMF

3. Install the unit holder [A] using the Allen key (4 set screws).

NOTE: 1) Make sure that the four screws are tightened in the proper order, as shown above. Otherwise, when the optional duplex unit (B414) is installed, it will not properly lock in place.

2) After securing the unit, store the Allen key in the inner cover [B] for future use.

4. **If the optional duplex unit (B414) will be installed:** Remove the indicated parts [C] of the by-pass tray unit [D].

5. Install the by-pass tray unit (2 screws, 1 connector).

6. Turn the main power switch on and check the by-pass tray function.

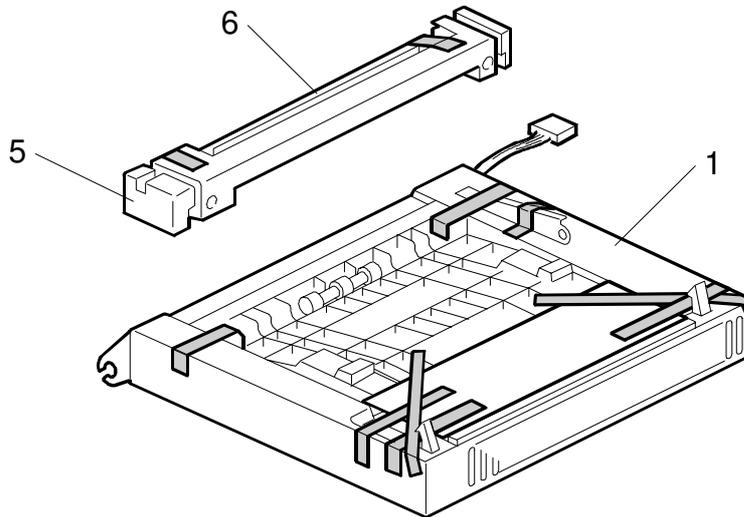
7. Make a copy from the by-pass tray. Then check the registration.

3.10 DUPLEX UNIT INSTALLATION

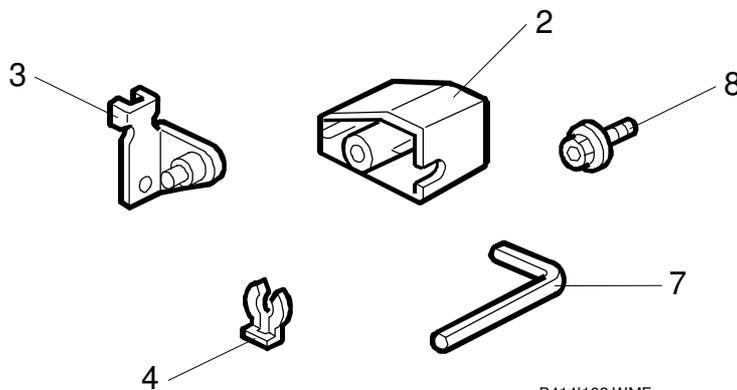
3.10.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Duplex Unit	1
2	Connector Cover	1
3	Bracket	1
4	Clip	1
5	Unit Holder	1
6	Unit Holder Cover	1
7	Allen Key	1
8	Tapping Screw - M3x8	4

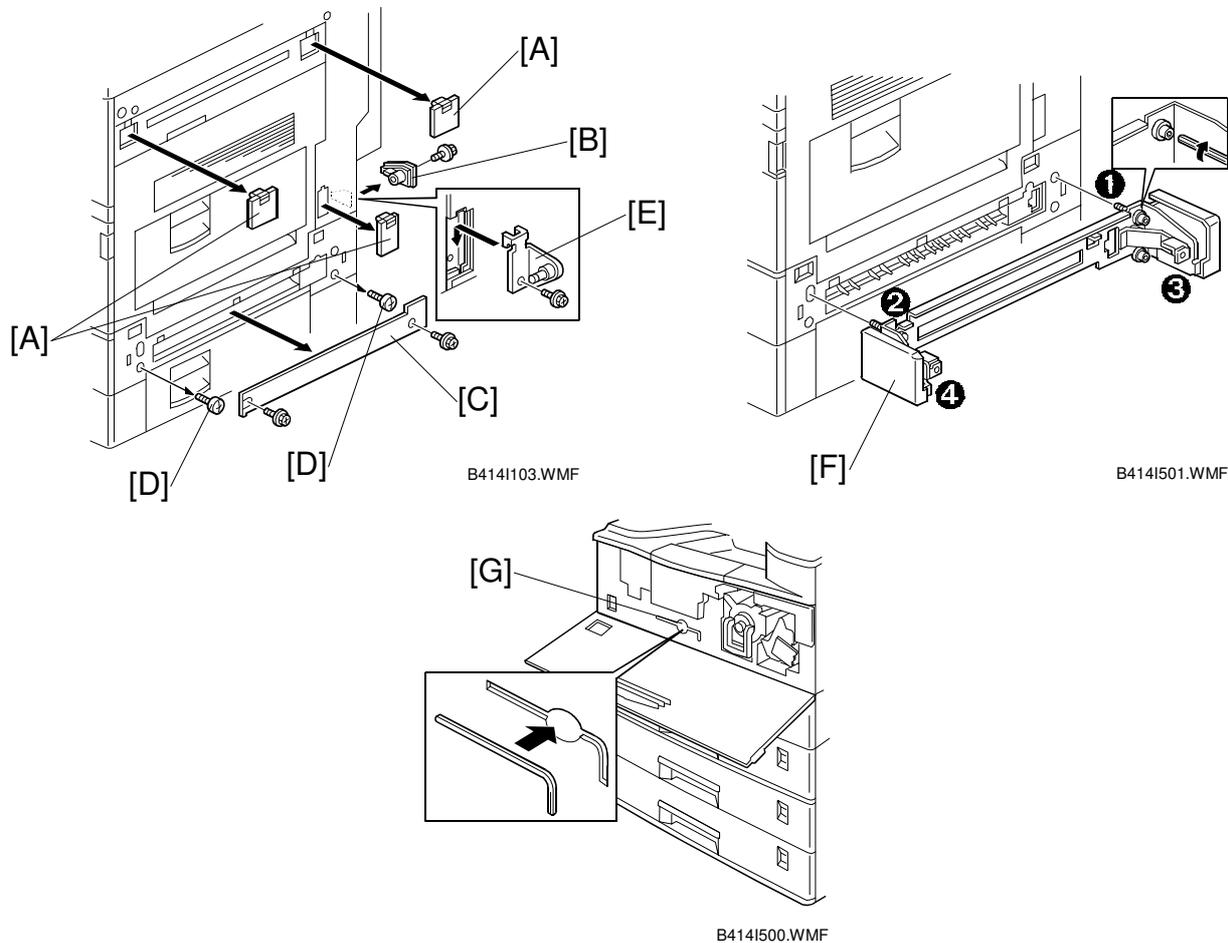


B414I101.WMF



B414I102.WMF

3.10.2 INSTALLATION PROCEDURE



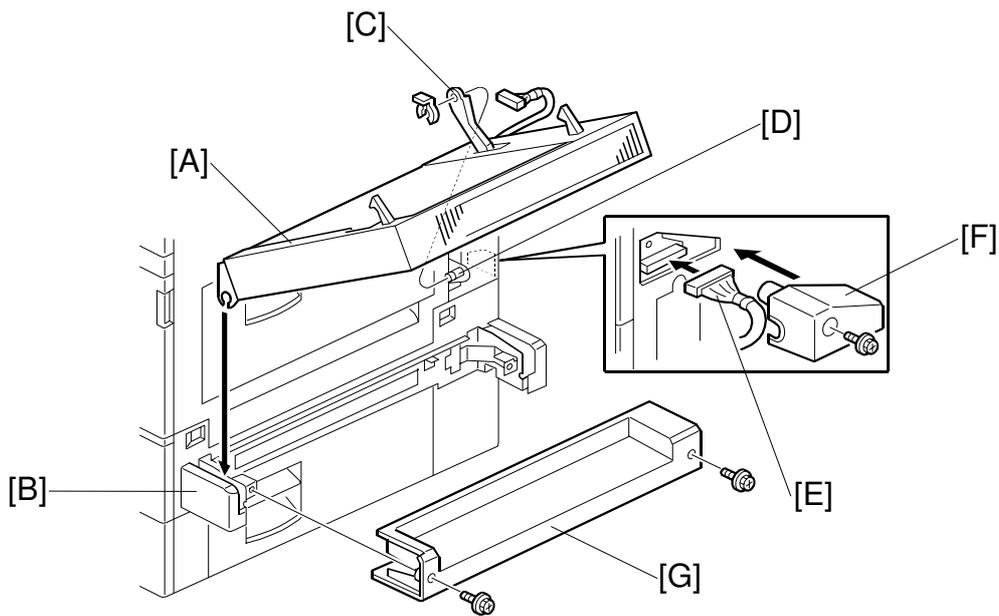
⚠ CAUTION

Unplug the copier power cord before starting the following procedure.

NOTE: Before installing the duplex unit, the optional interchange unit (B416) must be installed.

1. Remove all tapes.
2. Remove three covers [A].
3. Remove the connector cover [B] (1 screw), the entrance cover [C] (2 screws; if the by-pass tray has not been installed), and two screws [D].
4. Install the bracket [E] (1 screw).
5. **If the by-pass tray has already been installed, skip this step:** Install the unit holder [F] using the Allen key (4 set screws).

NOTE: 1) Make sure that the four screws are tightened in the proper order, as shown above. Otherwise, the duplex unit will not properly lock in place.
 2) After securing the unit, store the Allen key in the inner cover [G] for future use.



B4141104.WMF

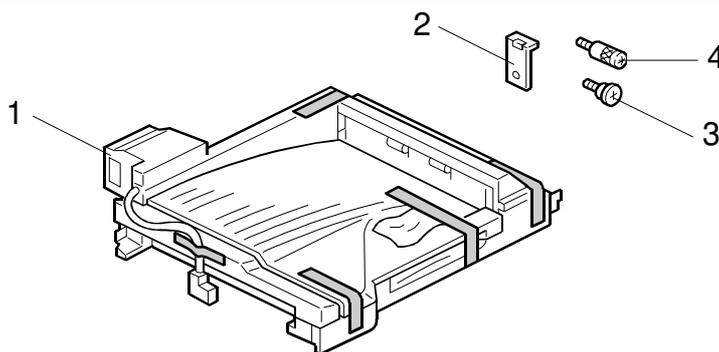
6. Set the duplex unit [A] on the unit holder [B] or on the by-pass tray unit if it has already been installed.
7. Attach the link [C] to the shaft [D] and secure it with the clip.
8. Connect the cable [E] and install the connector cover [F] (1 screw).
9. **If the by-pass tray has already been installed, skip this step:** Install the unit holder cover [G] (2 screws).
10. Turn on the main power switch and check the duplex unit function.

3.11 BRIDGE UNIT INSTALLATION

3.11.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

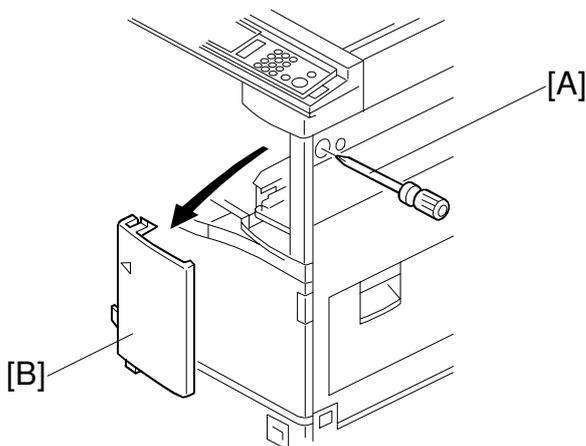
No.	Description	Q'ty
1	Bridge Unit	1
2	Securing Plate	1
3	Shoulder Screw	1
4	Knob Screw	1



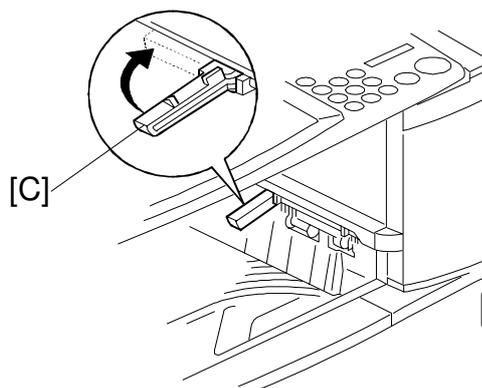
B4171101.WMF

3.11.2 INSTALLATION PROCEDURE

- For A265 and A267 copiers -



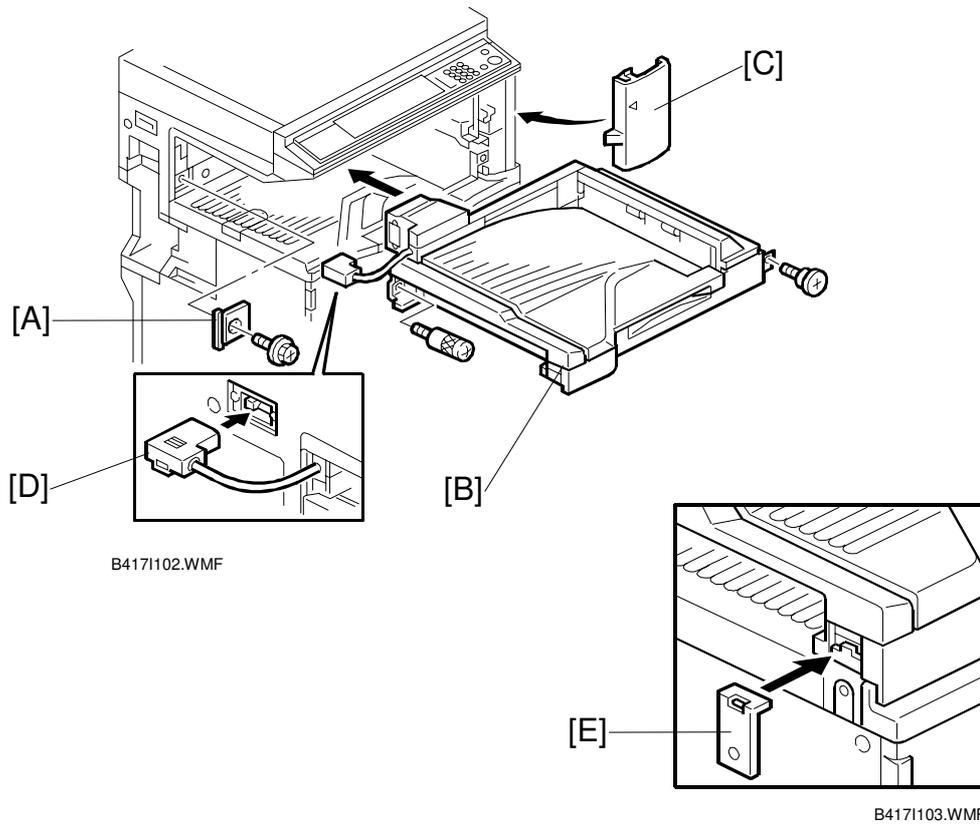
B4171501.WMF



B4171500.WMF

⚠ CAUTION
Unplug the copier power cord before starting the following procedure.

1. Remove all tapes.
2. Loosen the screw [A] and remove the front right cover [B].
3. If the sensor feeler [C] is out, fold it away into the machine.

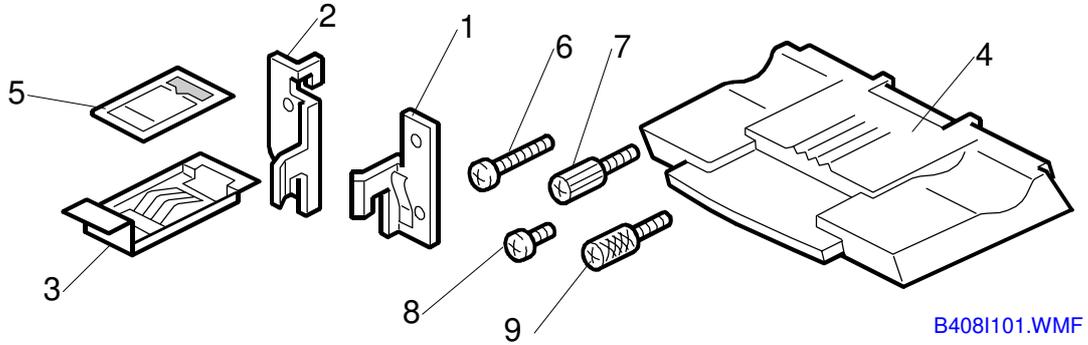


4. Remove the cover [A] (1 screw).
5. Install the bridge unit [B] (1 shoulder screw, 1 knob screw).
6. Reinstall the front right cover [C].
7. Connect the cable [D] to the main machine.
8. Attach the securing plate [E], as shown.
NOTE: Do not attach it with a screw; this is done when securing the front stand for the optional finisher.
9. Install the optional finisher (refer to the finisher installation procedure).

3.12 1,000-SHEET FINISHER INSTALLATION

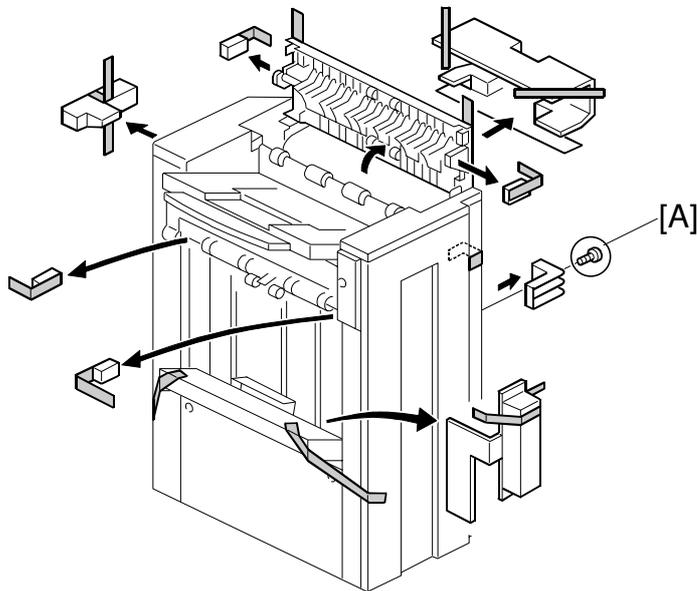
3.12.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

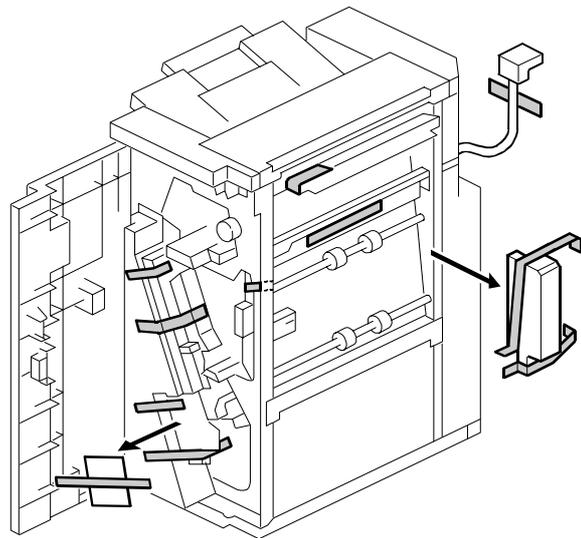


No.	Description	Q'ty
1	Front Joint Bracket	1
2	Rear Joint Bracket	1
3	Grounding Plate	1
4	Copy Tray	1
5	Staple Position Decal	1
6	Screw - M4x17	3
7	Knob Screw – M4x10	1
8	Screw - M3x8	1
9	Knob Screw – M3x8	1

3.12.2 INSTALLATION PROCEDURE



B4081102.WMF



B4081103.WMF

CAUTION

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

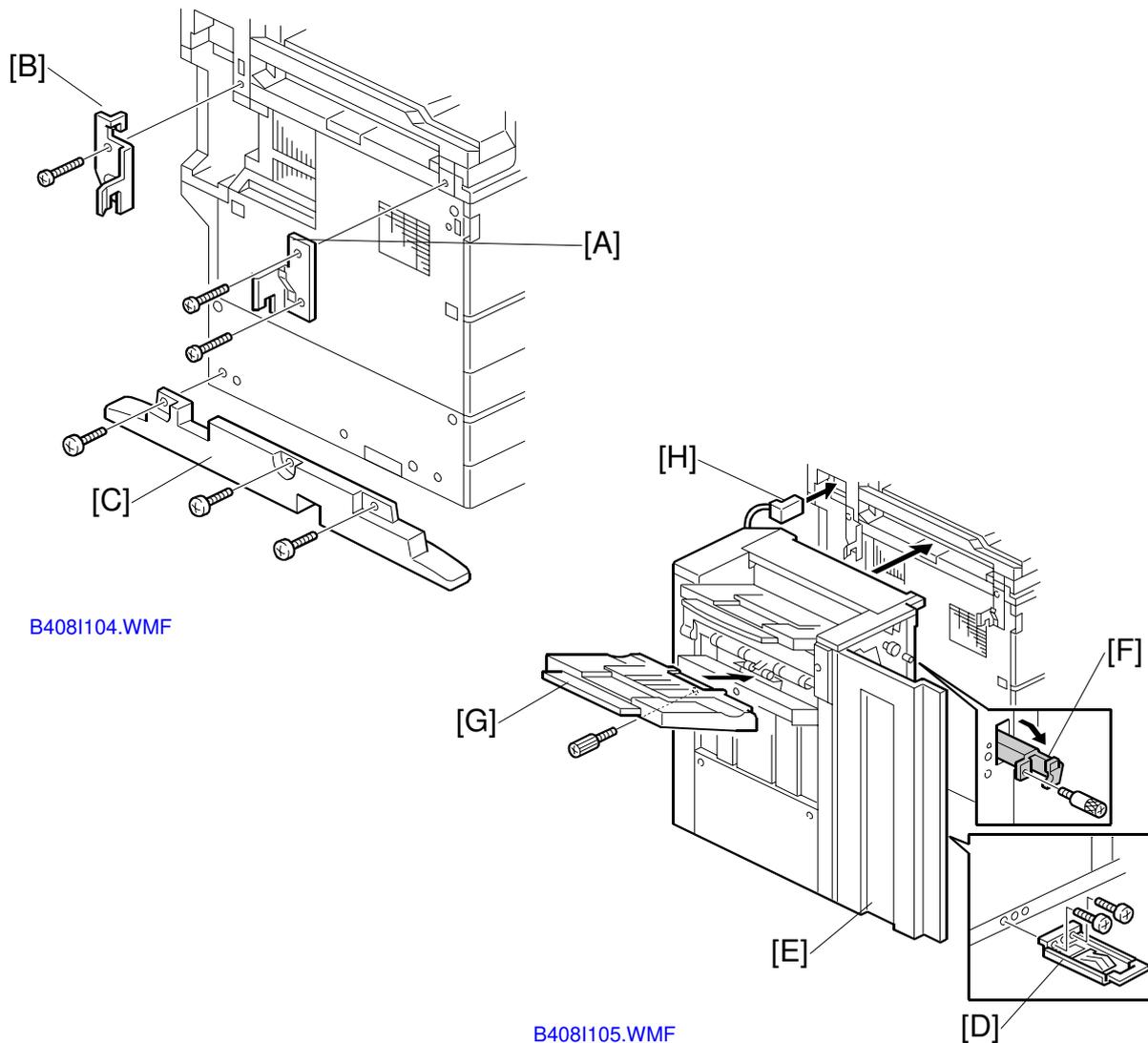
NOTE: If this finisher will be installed on the B022 or B027 copier, the following options must be installed before installing this finisher.

Bridge Unit (B417)

Paper Tray Unit (B390) or LCT (B391)

1. Unpack the finisher and remove the tapes.

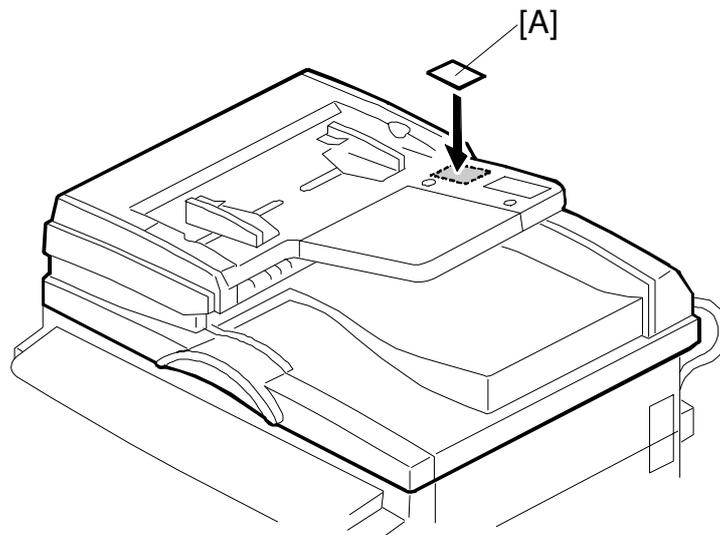
NOTE: Be sure to keep screw [A]. It will be needed to secure the grounding plate in step 4.



B4081104.WMF

B4081105.WMF

2. Install the front joint bracket [A] (2 screws – M4x17) and rear joint bracket [B] (1 screw – M4x17).
3. Remove the left stand [C] (3 screws)
4. Install the lower grounding plate [D] on the finisher (2 screws – M3x8).
NOTE: Use the screw removed in step 1 and the screw from the accessory box.
5. Open the front door [E]. Then pull the locking lever [F].
6. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever.
7. Secure the locking lever (1 knob screw – M3x8) and close the front door.
8. Install the copy tray [G] (1 knob screw – M4x10).
9. Connect the finisher cable [H] to the main machine.



B408I501.WMF

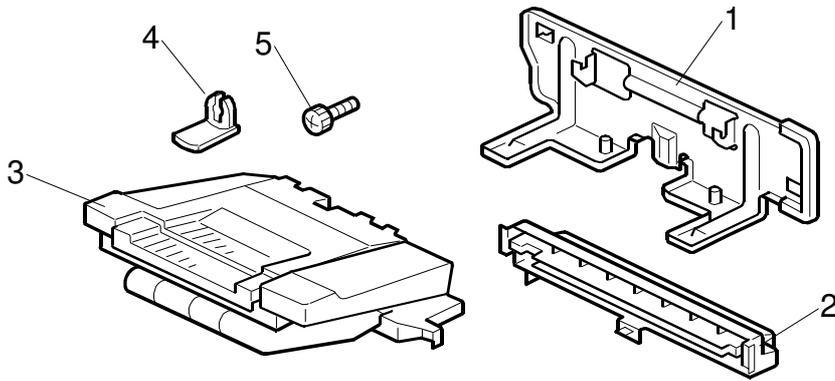
10. Attach the staple position decal [A] to the ARDF as shown.

11. Turn on the ac switch and check the finisher operation.

3.13 500-SHEET FINISHER INSTALLATION

3.13.1 ACCESSORY CHECK

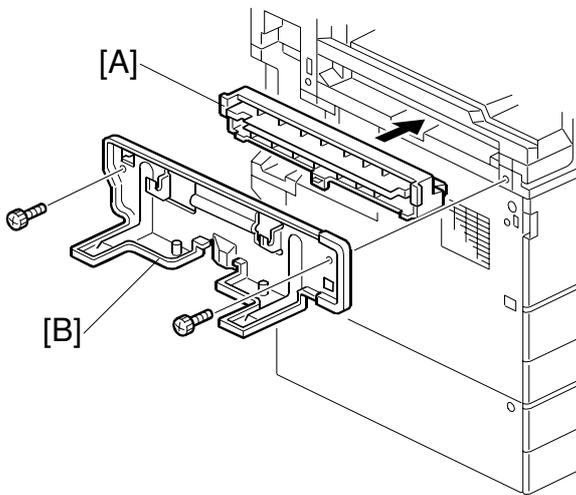
Check the quantity and condition of the accessories against the following list.



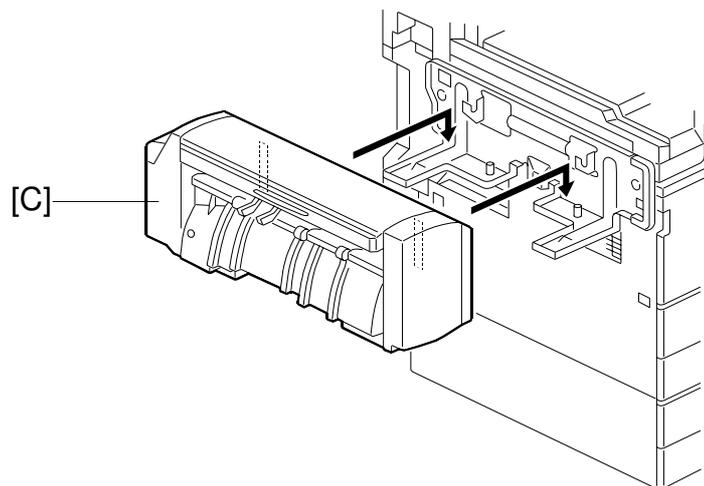
B4421101.WMF

No.	Description	Q'ty
1	Unit Holder	1
2	Entrance Guide	1
3	Output Tray	1
4	Snap Ring	2
5	Knob Screw	2

3.13.2 INSTALLATION PROCEDURE



B4421103.WMF



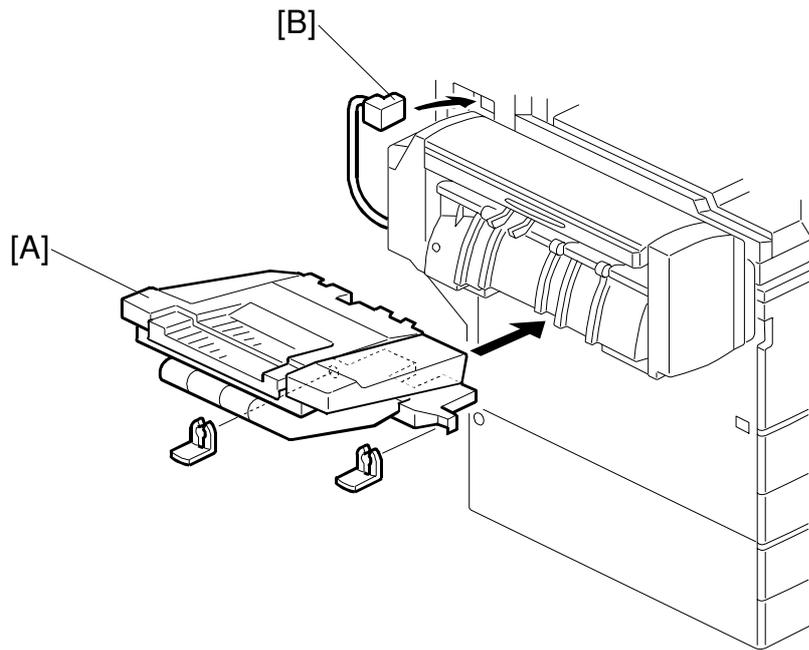
B4421104.WMF

⚠ CAUTION

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

NOTE: Before installing the 500-sheet finisher, the optional bridge unit (B417) must be installed.

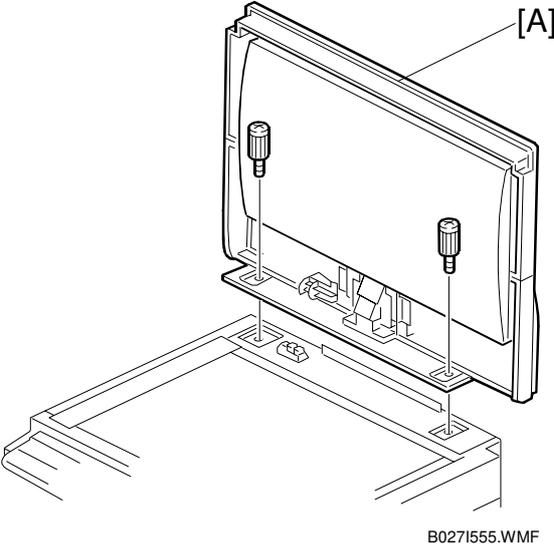
1. Unpack the finisher and remove the tapes.
2. Install the entrance guide [A].
3. Install the unit holder [B] (2 screws).
4. Install the 500-sheet finisher [C].



B4421105.WMF

5. Install the output tray [A] as shown (2 snap rings).
6. Connect the finisher cable [B].
7. Turn on the main power switch and check the finisher operation.

3.14 PLATEN COVER INSTALLATION

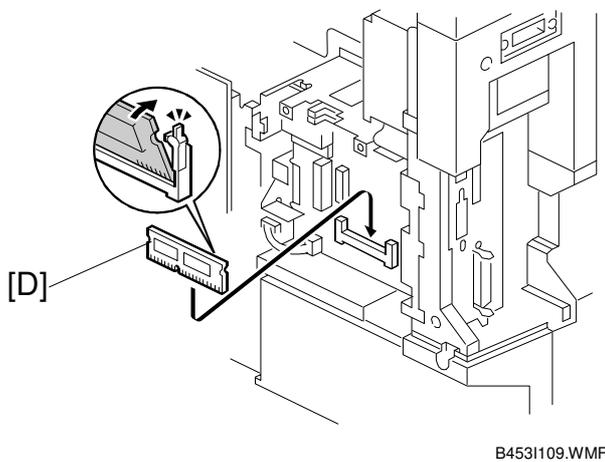
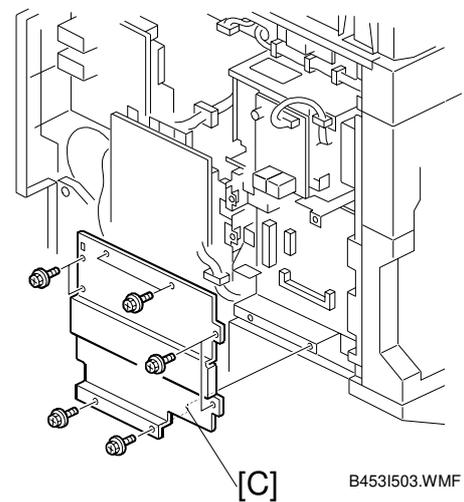
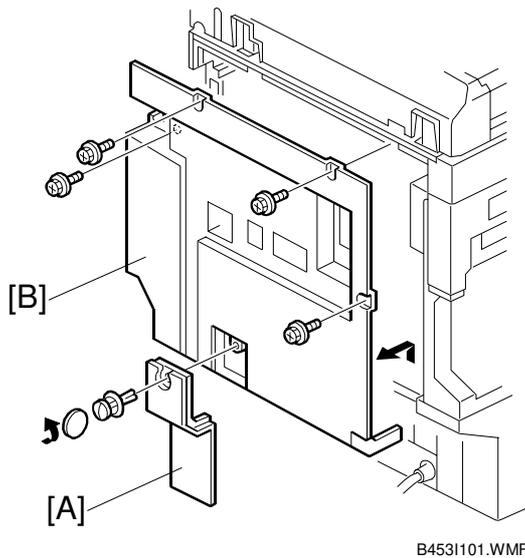


1. Install the platen cover [A] (2 screws).

3.14.1 MEMORY (G578/G579)

⚠ CAUTION

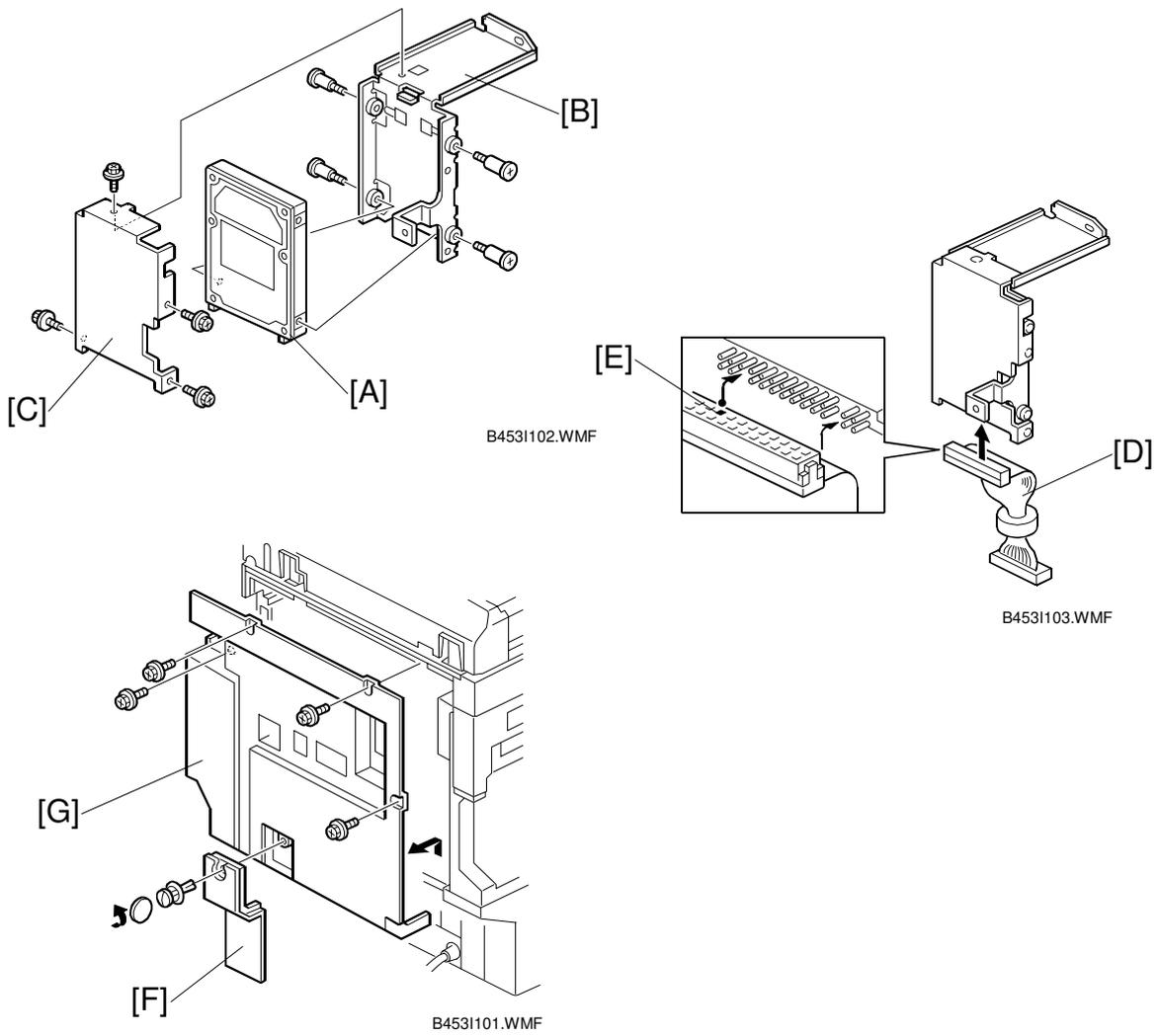
Unplug the main machine power cord before starting the following procedure.



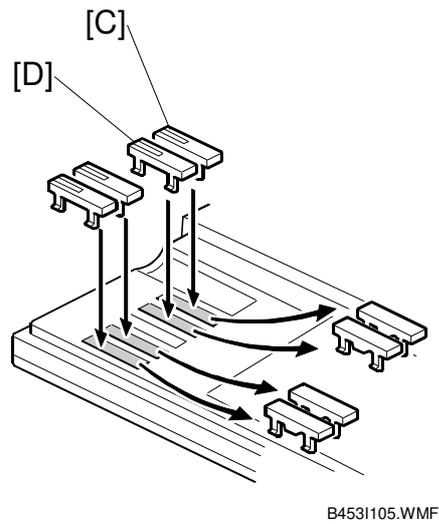
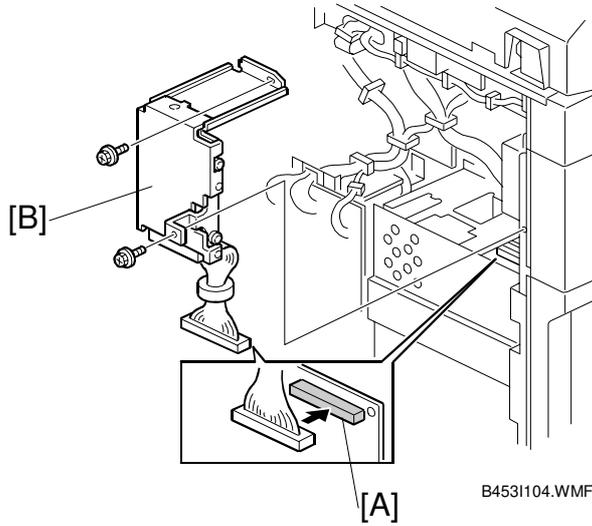
1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Remove the shield cover [C] (7 screws).
3. Install the memory DIMM [D] on the controller board.
4. Replace the controller board cover and rear cover.

3.14.2 HDD (B420)

⚠ CAUTION
Unplug the main machine power cord before starting the following procedure.

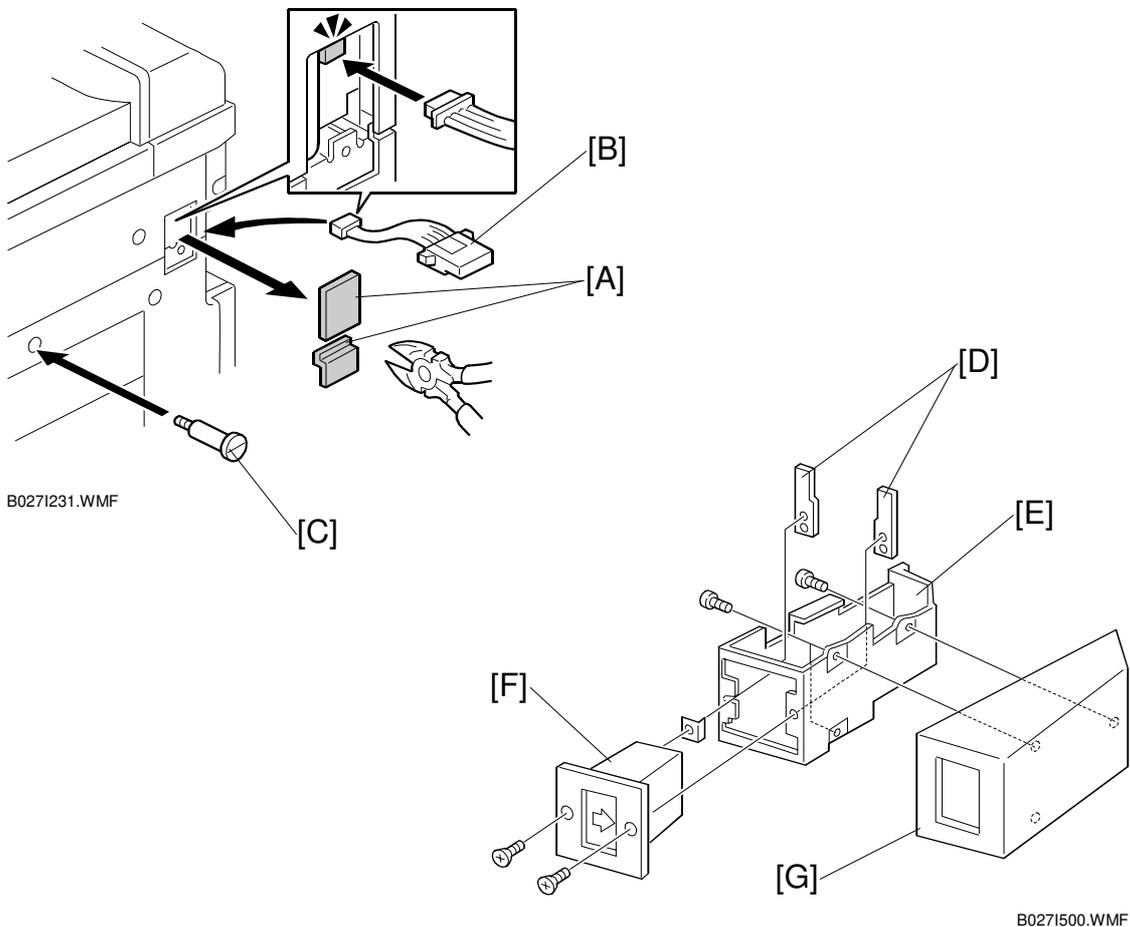


1. Attach the HDD [A] to the HDD bracket [B] (4 stepped screws).
NOTE: The PCB side of the HDD must face the HDD bracket.
2. Attach the shield plate [C] to the HDD (4 – M3x3 screws).
3. Connect the cable [D] to the HDD.
NOTE: The marked location [E] which is not a pinhole must face the HDD.
4. Remove the connector cover [F] and rear cover [G] (4 screws).



5. Connect the other end of the cable to CN509 [A] on the controller board, then install the HDD assembly [B] (2 screws).
6. Replace the rear cover and connector board.
7. Replace the key tops for the appropriate units to be installed.
C: Copy
D: Document Server

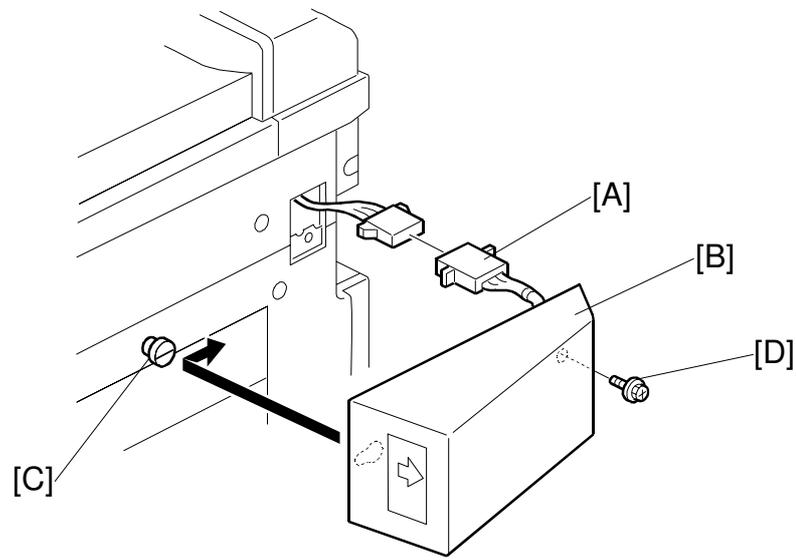
3.15 KEY COUNTER INSTALLATION



⚠ CAUTION

Unplug the machine power cord before starting the following procedure.

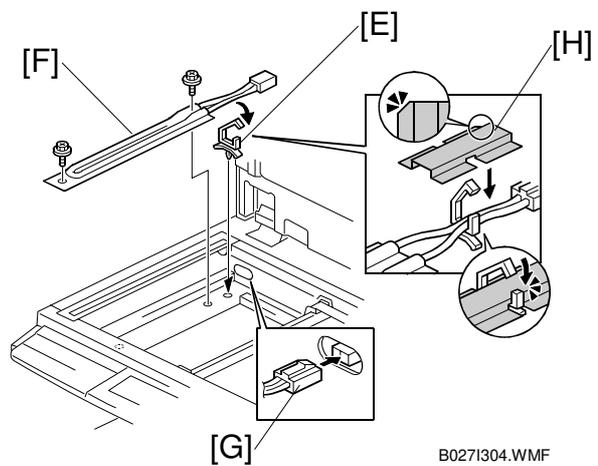
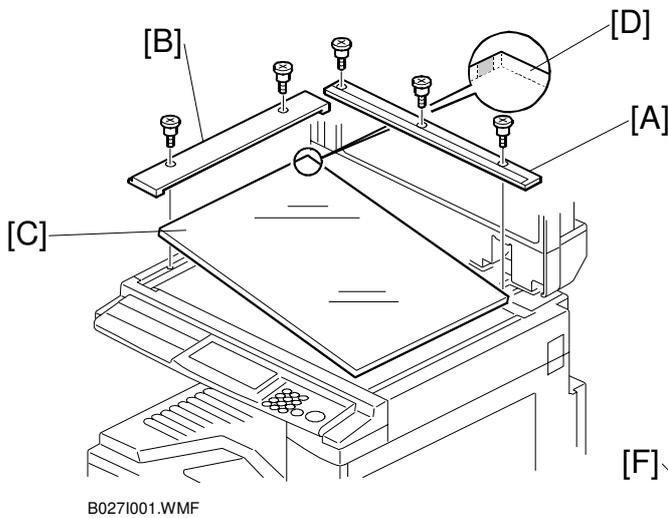
1. Remove two caps [A].
2. Connect the key counter cable [B].
3. Install the stepped screw [C].
4. Hold the key counter plate nuts [D] on the inside of the key counter bracket [E] and insert the key counter holder [F].
5. Secure the key counter holder to the bracket (2 screws).
6. Install the key counter cover [G] (2 screws).



B0271232.WMF

7. Connect the cable [A].
8. Hook the key counter holder assembly [B] onto the stepped screw [C].
9. Secure the key counter holder assembly with a screw [D].
10. Set SP5-401-2 to 1 (This enables the restricted access control function.)
NOTE: The key counter function is made available for other modes by changing the following SP modes.
 - SP5-401-12 (Document server mode)
 - SP5-401-22 (Fax mode)
 - SP5-401-32 (Scanner mode)
 - SP5-401-42 (Printer mode)

3.16 ANTI-CONDENSATION HEATER

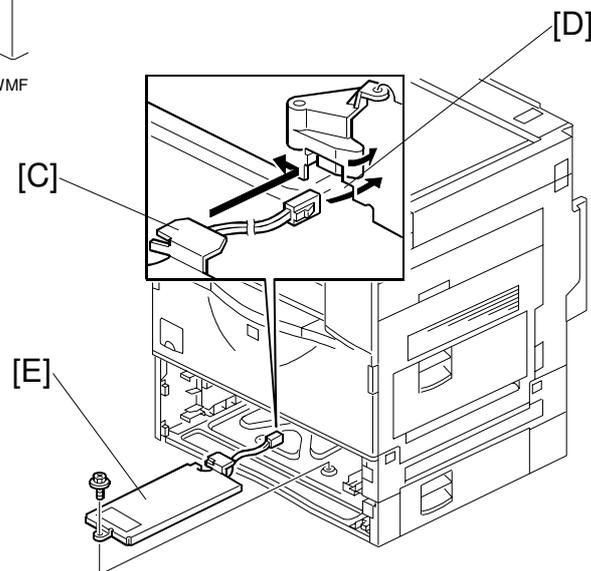
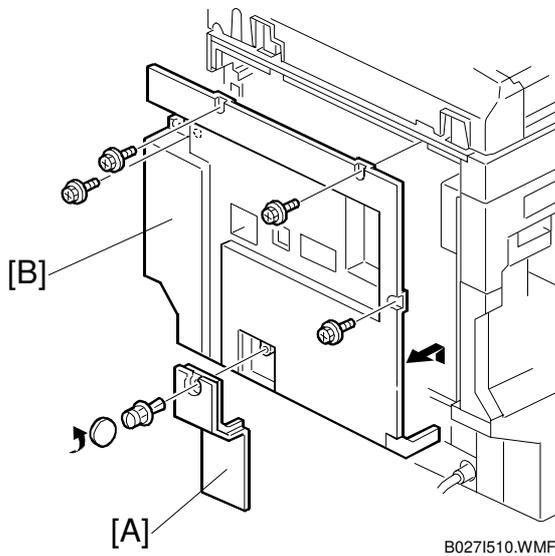


⚠ CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the rear scale [A] (3 screws), left scale [B] (2 screws), and exposure glass [C].
NOTE: When reinstalling the exposure glass, make sure that the mark [D] is positioned at the rear left corner, as shown.
2. Move the 1st and 2nd scanners to the right.
3. Install the cable clamp [E].
4. Install the anti-condensation heater [F] (2 screws).
5. Join the connectors [G]
6. Attach the cable cover [H], as shown.

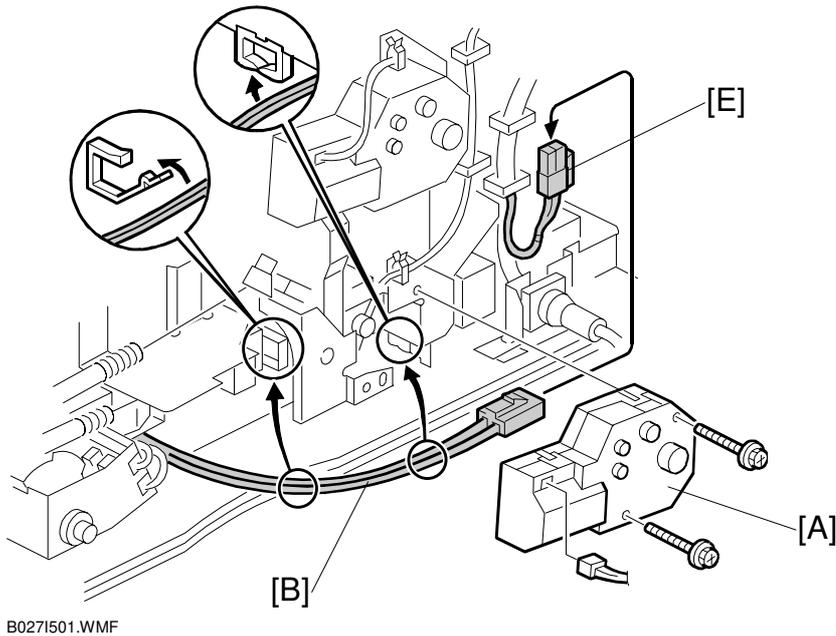
3.17 TRAY HEATER



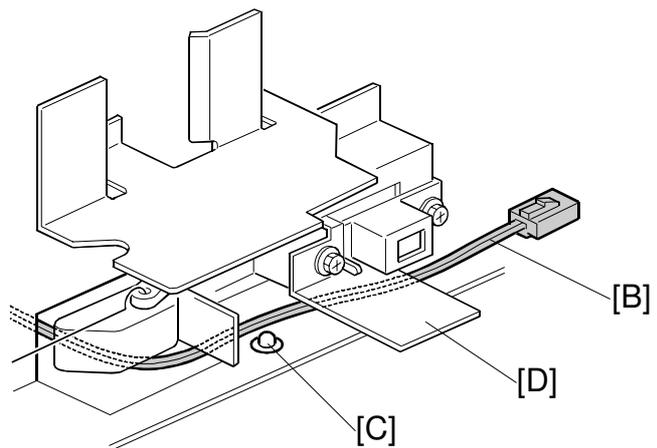
⚠ CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Slide out the 1st and 2nd paper trays.
3. Pass the connector [C] through the opening [D].
4. Install the tray heater assembly [E] (1 screw).



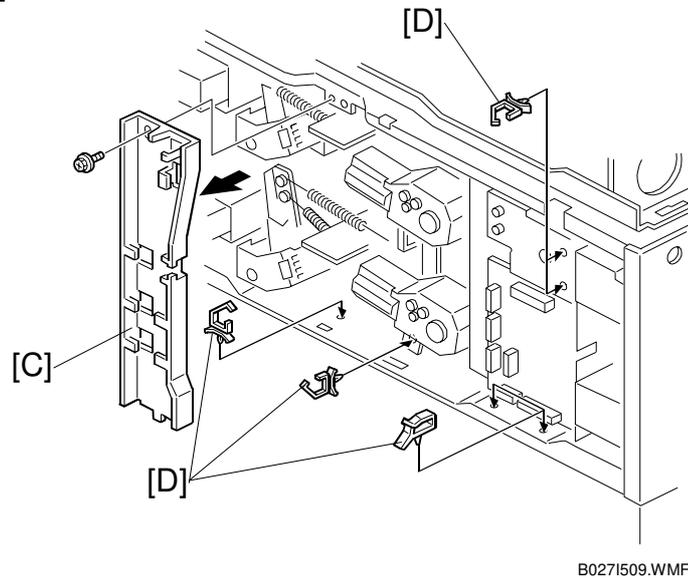
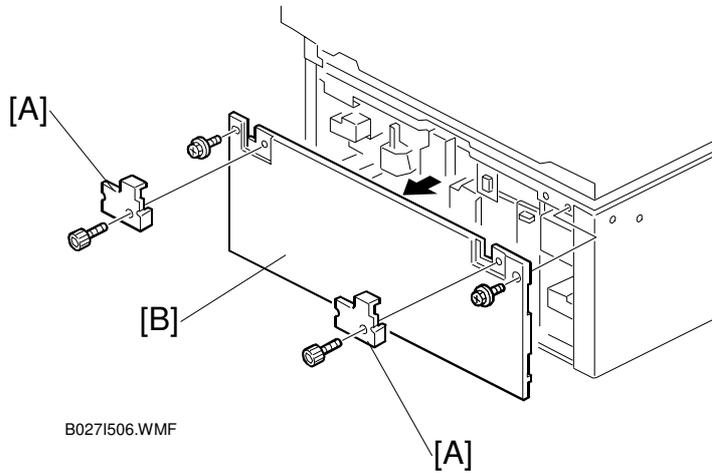
B0271501.WMF



B0271513.WMF

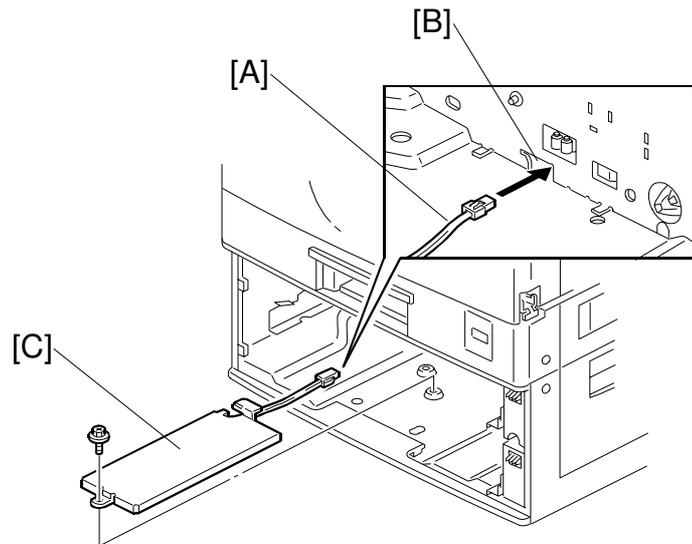
5. Remove the 2nd paper lift motor [A] (2 screws, 1 connector).
6. Route the heater cable [B] to the side of rivet [C] and under bracket [D].
7. Clamp the heater cable [B] as shown.
8. Joint the heater cable and the ac cable [E].
9. Reinstall the paper lift motor [A] and reassemble the machine.

3.18 TRAY HEATER (OPTIONAL PAPER TRAY UNIT)

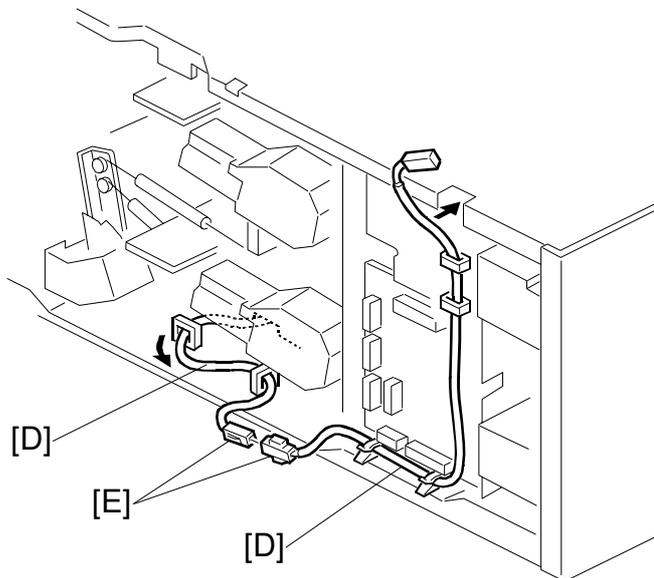
**⚠ CAUTION**

Unplug the machine power cord before starting the following procedure.

1. Remove the joint brackets [A] (1 screw each).
2. Remove the rear cover [B] for the optional paper tray unit (2 screws).
3. Remove the cable guide [C] (1 screw).
4. Install the clamps [D].

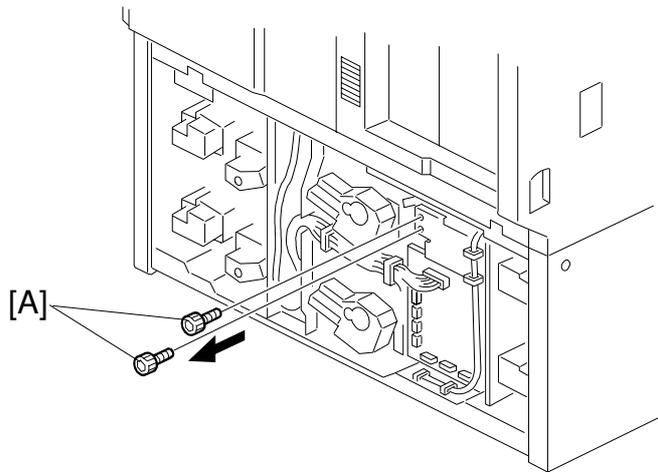


B0271503.WMF

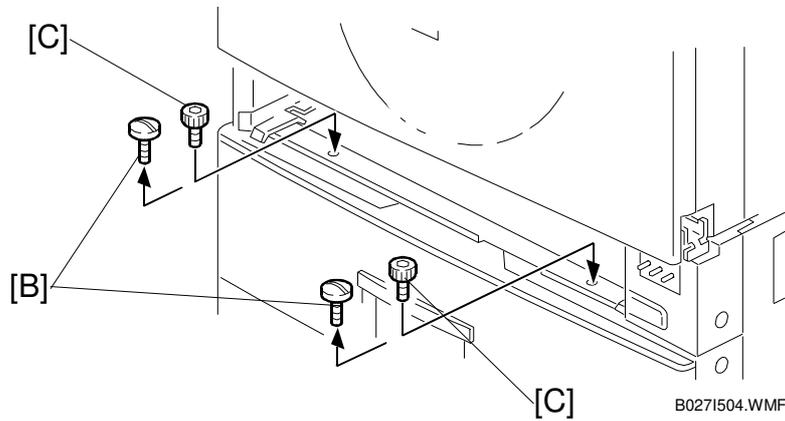


B0271505.WMF

5. Slide out the two paper trays from the optional paper tray unit.
6. Pass the connector [A] through the opening [B].
7. Install the tray heater assembly [C] (1 screw).
8. Clamp the cables [D], as shown.
9. Join the connectors [E].
10. Reinstall the cable guide.



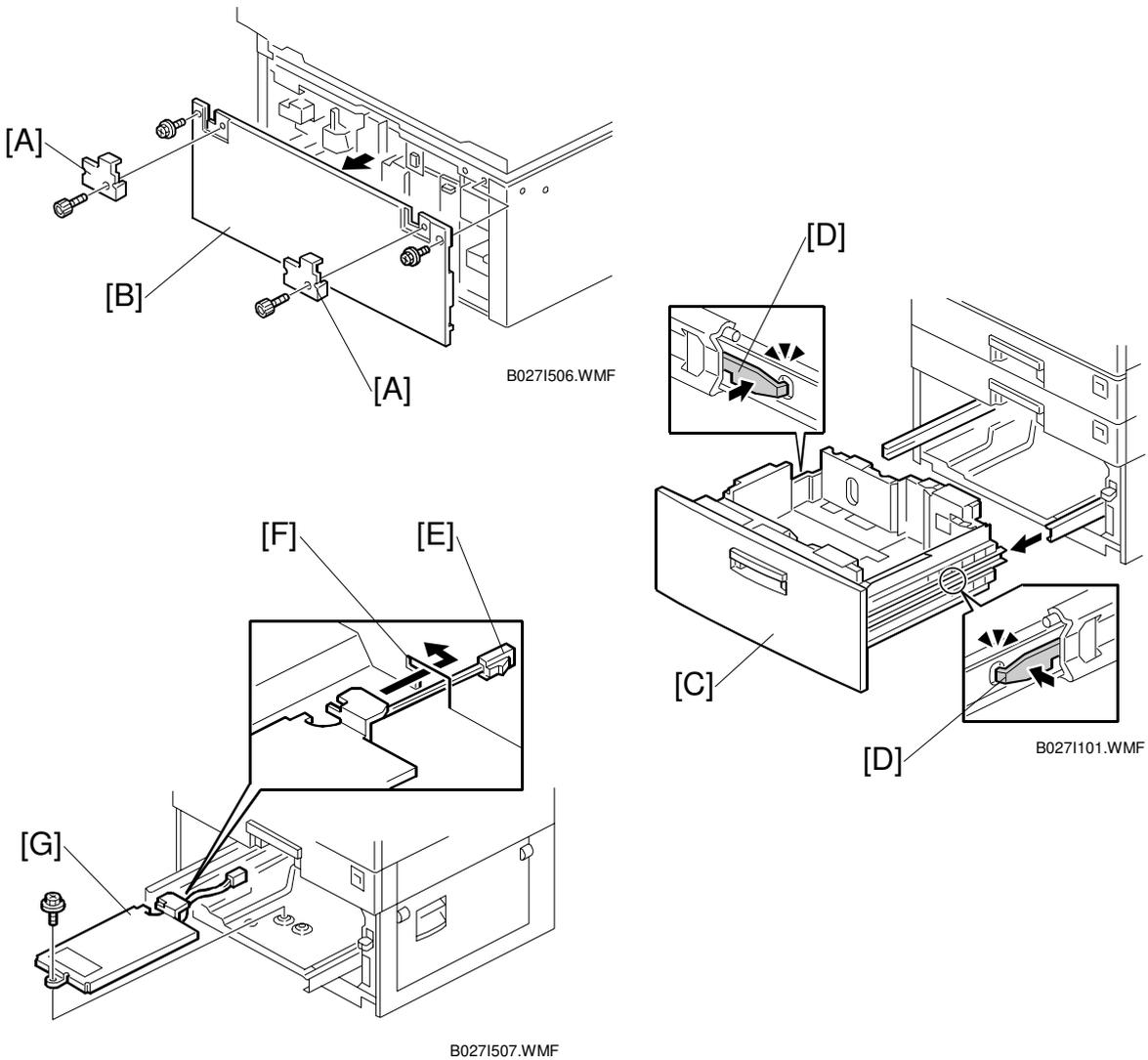
B0271508.WMF



B0271504.WMF

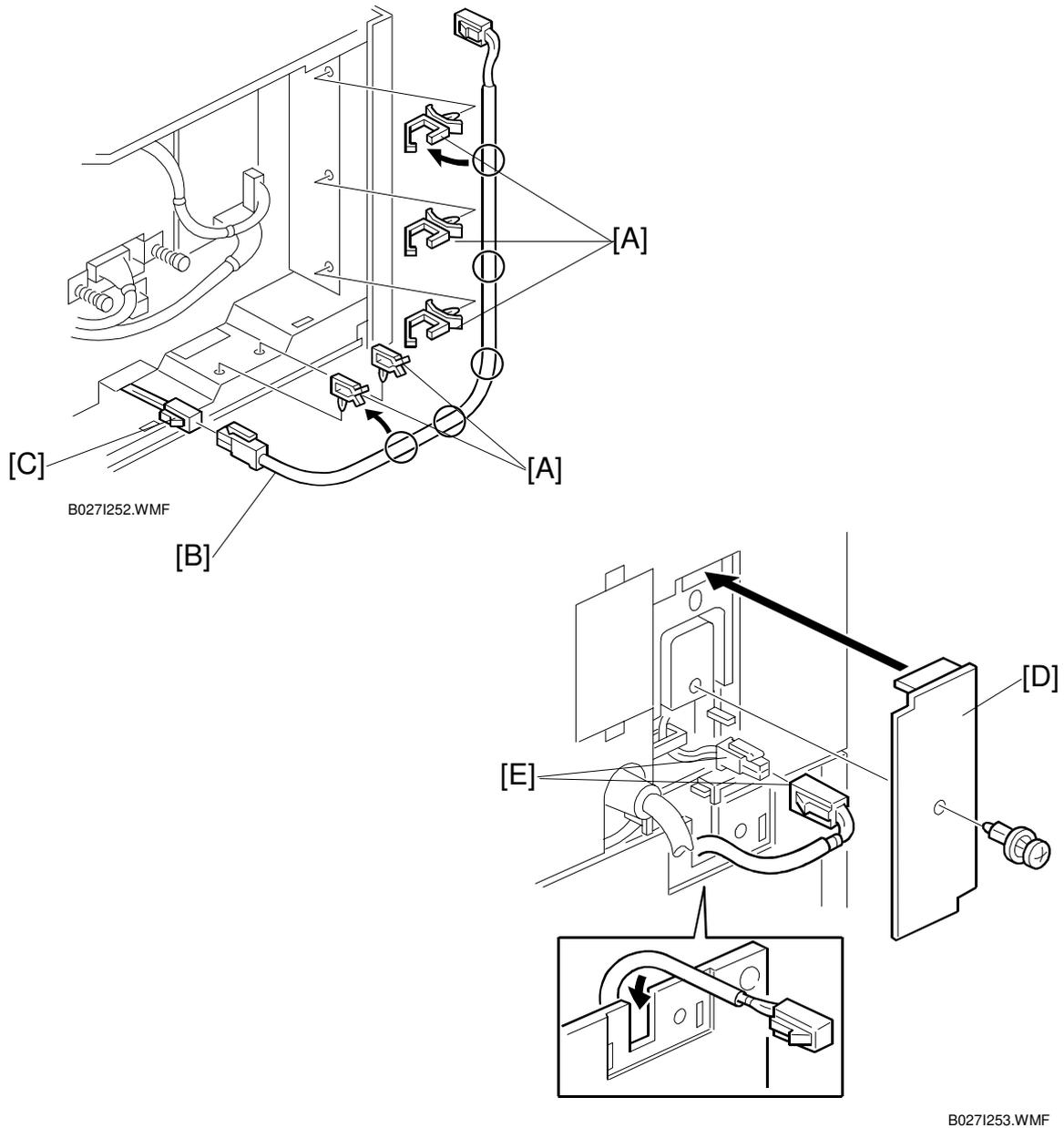
11. Remove two screws [A] from the rear side of the paper feed unit.
12. Reinstall the rear cover for the optional paper tray unit.
13. Reinstall the two paper trays into the optional paper tray unit.
14. Remove the 2nd paper tray of the copier.
15. Remove two screws [B] and install the screws [C] which were removed in step 12.
16. Reinstall the 2nd paper tray of the copier.

3.19 TRAY HEATER (OPTIONAL LCT)

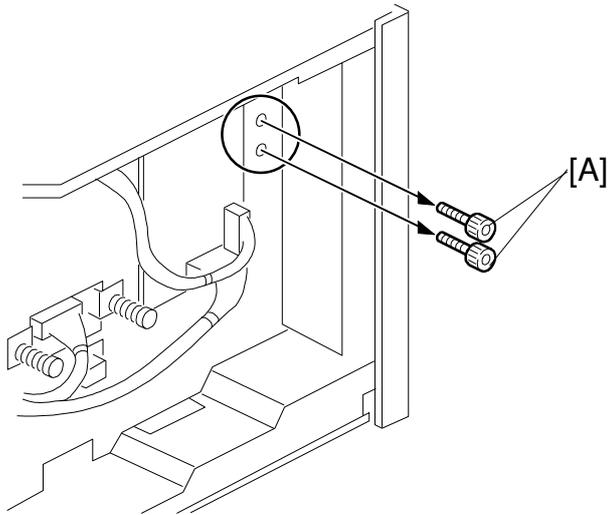


⚠ CAUTION
Unplug the machine power cord before starting the following procedure.

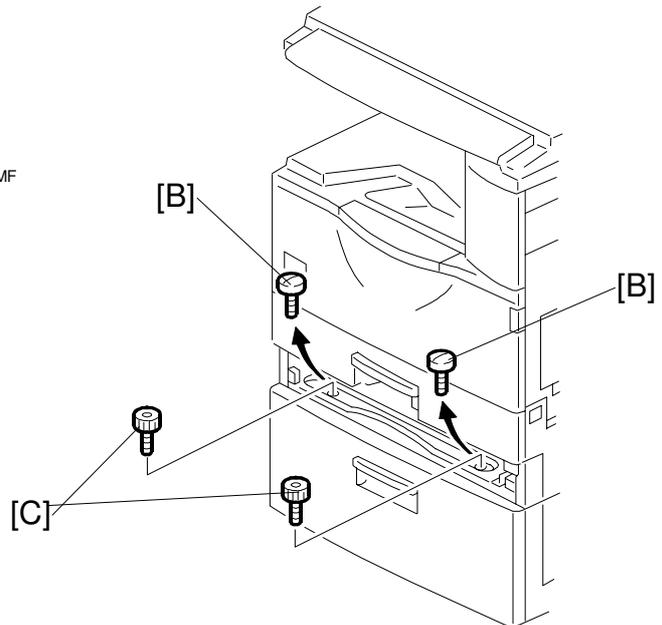
1. Remove two joint brackets [A] (1 screw each).
2. Remove the rear cover for the LCT [B] (2 screws).
3. Slide out the paper tray [C].
4. Push the stopper [D] on both slide rails and remove the paper tray.
5. Pass the connector [E] through the opening [F].
6. Install the tray heater [G] (1 screw).



7. Install five clamps [A].
8. Connect the cable [B] to the tray heater cable [C].
9. Route the cable and clamp it.
10. Remove the connector cover of the copier [D].
11. Join the connectors [E].
12. Reinstall the connector cover of the copier.



B0271601.WMF



B0271600.WMF

13. Remove two screws [A] from the rear side of the LCT.
14. Reinstall the rear cover of the LCT.
15. Reinstall the paper tray.
16. Remove the 2nd paper tray of the copier.
17. Remove two screws [B] and install the screws [C] which were removed in step 13.
18. Reinstall the 2nd paper tray of the copier.

4. SERVICE TABLES

4.1 GENERAL CAUTION

⚠ CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED (⊛) lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a fax machine or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

Do not turn off the main switch while any of the electrical components are active. Doing so might cause damage to units, such as the PCU, when they are pulled out of or put back into the copier.

4.1.1 PCU (PHOTOCONDUCTOR UNIT)

The PCU consists of the OPC drum, development unit, charge roller, and cleaning unit. Follow the cautions below when handling a PCU.

1. Never touch the drum surface with bare hands. When the drum surface is touched or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with the cotton.
2. Never used alcohol to clean the drum; alcohol dissolves the drum surface.
3. Store the PCU in a cool, dry place away from heat.
4. Never expose the drum to corrosive gases such as ammonia gas.
5. Never shake the used PCU. Doing so may cause toner and/or developer to spill out.
6. Dispose of used PCUs in accordance with local regulations.

4.1.2 TRANSFER ROLLER UNIT

1. Never touch the transfer roller surface with bare hands.
2. Take care not to scratch the transfer roller as the surface is easily damaged.

4.1.3 SCANNER UNIT

1. Clean the exposure glass with alcohol or with glass cleaner to reduce the amount of static electricity on the surface of the glass.
2. Use a blower brush or a cotton pad with water to clean the mirrors and lens.

3. Do not bend or crease the exposure lamp flat cable.
4. Do not disassemble the lens unit. Doing so will throw the lens and the copy image out of focus.
5. Do not turn any of the CCD positioning screws. Doing so will throw the CCD out of position.

4.1.4 LASER UNIT

1. Do not loosen the screws that secure the LD drive board to the laser diode casing. Doing so will throw the LD unit out of adjustment.
2. Do not adjust the variable resistors on the LD unit, as they are adjusted in the factory.
3. The polygon mirror and F-theta mirror are very sensitive to dust.
4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.

4.1.5 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that the hot roller can rotate freely.
2. Be careful not to damage the edges of the hot roller strippers or their tension springs.
3. Do not touch the fusing lamp and rollers with bare hands.
4. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.

4.1.6 PAPER FEED

1. Do not touch the surface of the paper feed roller.
2. To avoid paper misfeeds, the side fences and end fences of the paper tray must be positioned correctly to align with the actual paper size.

4.1.7 OTHERS

1. The TD sensor initial setting is performed automatically after installing the new PCU and closing the front cover. Never open the front cover or turn off the main switch during this time. The main motor stops when the initial setting has finished.
2. The toner bottle should be replaced while the main switch is on.
3. If the optional tray, drum, and optics anti-condensation heaters have been installed, keep the copier power cord plugged in, even when the copier main switch is turned off. This keeps the heaters energized.

4.2 SERVICE PROGRAM MODE

4.2.1 SERVICE PROGRAM MODE OPERATION

The service program mode is used to check electrical data, change modes, and adjust values. Two service program modes are provided:

- **SP Mode (Service)**. Includes all the options in the SP displays for normal maintenance and adjustments.
- **SSP Mode (Special Service)**. Includes the normal SP modes and *some additional options in the SP displays not required for normal settings and adjustments*. (Most are marked “DFU” in the following tables.) Do not change these important settings needlessly. For details, contact your supervisor.

Entering and Exiting 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.

To enter the Normal Service Mode:

Copy SP

On the touch-panel, press Copy SP.

To enter the Special Service Mode:

Copy SP

Hold down # and then press Copy SP.

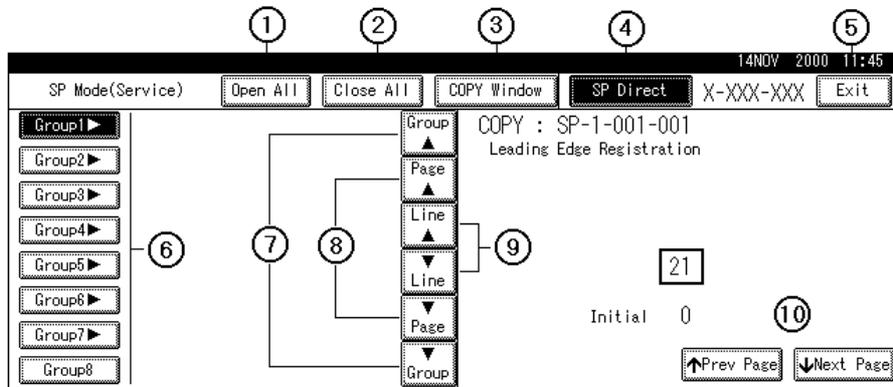
Exit

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

NOTE: Use SP2-902 to perform test pattern printing. (➔ 4.2.3)

SP Mode Button Summary

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



B027S500.WMF

- 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 #. (SP Mode must be highlighted before you can enter the number. Just press SP Mode if it is not highlighted.)
- ⑤ Press twice to leave the SP mode and return to the copy window to resume normal operation.
- ⑥ Press any Group number to open a list of SP codes and titles for that group. For example, to open the SP code list for SP1-*nnn*, press Group1. If an SP has sublevels, touch the appropriate button to expand the list.
- 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.

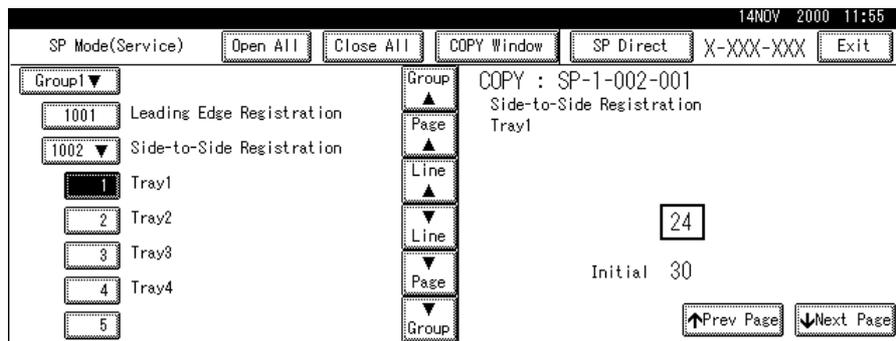
Switching Between SP Mode and Copy Mode for Test Printing

- 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. (☛ 4.2.2)
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. (☛ 4.2.2)

1. 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.
2. 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 (Ⓢ) twice, and then press SP Mode (highlighted) in the copy window to return to the SP mode display.
3. When you are finished, press Exit twice to return to the copy window.

Service
Tables

4.2.2 SERVICE PROGRAM MODE TABLES

Service Table Key

Notation	What it means
[range / default / step]	Example: [-9 ~ +9 / +3.0 / 0.1 mm step]. The setting can be adjusted in the range ± 9 , the setting is reset to +3.0 after an NVRAM reset, and the value can be changed in 0.1 mm steps with each key press.
italics	Comments added for reference.
*	Value stored in NVRAM. After a RAM reset, this default value (factory setting) is restored.
1111	An SP number set in bold-italic denotes a "Special Service Program" mode setting that appears only after entering the SP mode by pressing (Ⓢ) and Copy SP together. (☛ 4.2.1)
DFU	Denotes "Design or Factory Use". Do not change this value.
Japan only	The feature or item is for Japan only. Do not change this value.
(S)	Sideways feed direction
(L)	Lengthwise feed direction

SP1-XXX: Feed

1	Mode Number/Name	Function/[Setting]
001*	Leading Edge Registration	
	1	Paper Tray Feed
	2	By-pass Feed
	3	Duplex, Side2
		Adjusts the printing leading edge registration from each paper feed station using the Trimming Area Pattern (SP4-417, No.15). Use the (Ⓢ) key to toggle between + and – before entering the value. The specification is 3 ± 2 mm. <i>See "Replacement and Adjustment - Copy Adjustment" for details.</i> [+9.0 ~ -9.0 / +0.0 / 0.1 mm/step]
002*	Side-to-Side Registration	
	1	1st Paper Feed
	2	2nd Paper Feed
	3	3rd Paper Feed: optional PFU tray 1 or optional LCT
	4	4th Paper Feed: optional PFU tray 2
	5	By-pass Feed
6	Duplex, Side2	
		Adjusts the printing side-to-side registration from each paper feed station using the Trimming Area Pattern (SP4-417, No.15). <i>Use the (Ⓢ) key to toggle between + and – before entering the value. The specification is 2 ± 1.5 mm.</i> <i>See "Replacement and Adjustment - Copy Adjustment" for details.</i> [+9.0 ~ -9.0 / +0.0 / 0.1 mm/step]
003*	Paper Feed Timing	
	1	1st Paper Feed
	2	2nd, 3rd, 4th Paper Feed, LCT, and By-pass Feed
3	Duplex, Side2	Adjusts the paper feed clutch timing at registration. The paper feed clutch timing determines the amount of paper buckle at registration. (A larger setting leads to more buckling.) [0 ~ 10 / 5 / 1 mm/step]
		[0 ~ 20 / 6 / 1 mm/step]



1	Mode Number/Name	Function/[Setting]
007	By-pass Paper Size Display	Displays the by-pass paper width sensor output.
103	Fusing Idling	Switches fusing idling on/off. <i>Switch on if fusing on the 1st and 2nd copies is incomplete (this may occur if the room is cold.)</i> [1 = On / 0 = Off]
105*	Fusing Temperature Adjustment	
	1 Roller Center	Adjusts the fusing temperature at the center and both ends of the hot roller for normal printing. [120 ~ 200 / 165 / 1°C/step]
	2 Roller Ends	
	3 Energy Saver	Adjusts the fusing temperature at the center and both ends of the hot roller for energy saver mode. [0 ~ 160 / 150 / 1°C/step]
	4 Thick Paper (Center)	Adjusts the additional fusing temperature for thick paper for the 2nd paper tray and for the bypass tray. [0 ~ 160 / 20 / 1°C/step]
	5 Thick Paper (Ends)	
	6 After Warming-up (Center)	Adjusts the fusing temperature at the center of the hot roller after the machine has warmed up. [120 ~ 220 / 165 / 1°C/step]
	7 After Warming-up (Ends)	Adjusts the fusing temperature at both ends of the hot roller after the machine has warmed up. [120 ~ 220 / 175 / 1°C/step]
	8 Number of Pages	In this machine, fusing temperature is kept 10°C higher than the normal temperature for a number of pages after the machine has warmed up. This SP selects the number of pages made at this temperature. See Detailed Section Descriptions – Fusing for more details. [0 ~ 10 / 3 / 1 page/step]
	9 Times	In this machine, fusing temperature is kept 10°C higher than the normal temperature for a short while after the machine been warmed up. This SP selects the length of time that this temperature is used. See Detailed Section Descriptions – Fusing for more details. [0 ~ 180 / 60 / 1s/step]
106	Fusing Temp. Display	
	1 Roller Center	Displays the fusing temperature for the center or both ends of the hot roller.
	2 Roller Ends	
	3 In the Machine at Power On	Displays the temperature in the machine at power on. <i>This temperature is monitored by the thermistor on the SBCU board.</i>
108*	Fusing Soft Start Setting	
	1	Selects whether the fusing temperature control cycle is 1 or 3 seconds. <i>If this is "1 (3 s)", the power supply fluctuation caused by the fusing lamp turning on is less often.</i> [0 = 1 s / 1 = 3 s] Default: 0 = N. America, 1 = Europe/Asia

1	Mode Number/Name	Function/[Setting]								
109	Fusing Nip Band Check	Checks the fusing nip band (☛ 4.2.11) [1 = Start / 0 = Stop]								
902	AC Frequency Display	Displays the fusing lamp power control frequency which is detected by the zero cross signal generator. <i>Under "54" equals 50 Hz. Otherwise, 60 Hz.</i>								
903*	Feed Clutch Re-energize 1 By-pass Feed 2 1st Paper Tray 3 Other Paper Trays	Adjusts the paper feed amount allowed by the clutch (see the table below) after correcting the skew at registration. [0 ~ 10 / 6 / 1 mm/step] <table border="1"> <thead> <tr> <th>Paper Feed Station</th> <th>Clutch</th> </tr> </thead> <tbody> <tr> <td>By-pass Feed</td> <td>Upper Relay</td> </tr> <tr> <td>1st Paper Tray</td> <td>1st Paper Feed</td> </tr> <tr> <td>Other Paper Trays</td> <td>Upper Relay</td> </tr> </tbody> </table> When paper jams occur after restarting paper feed after registration, increase the value to help the registration roller feed the paper. [0 ~ 10 / 0 / 1 mm/step]	Paper Feed Station	Clutch	By-pass Feed	Upper Relay	1st Paper Tray	1st Paper Feed	Other Paper Trays	Upper Relay
Paper Feed Station	Clutch									
By-pass Feed	Upper Relay									
1st Paper Tray	1st Paper Feed									
Other Paper Trays	Upper Relay									
905*	Tray Paper Full Detection	Determines whether or not to detect if the built-in copy tray is full. [0 = No / 1 = Yes]								
906*	Tray Paper Full Timer	Adjusts the time that the paper overflow sensor must remain on before a message appears on the LCD. The sensor may be switched on and off again if the paper is curled, giving a false tray full detection. This SP prevents this problem. <i>This SP mode is used when SP1-905 is set to 1.</i> [100 ~ 5000 / 500 / 10 ms/step]								
908*	1st Bottom Plate Pressure Adjustment 1 Normal Size	If a middle size threshold is not stored with SP1-908-9, this SP adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-908-8. If a middle size threshold is stored with SP1-908-9, then this SP adjusts the motor reverse time for sizes larger than the middle size. Do not input a value greater than 1,200. <i>Use this SP when a paper feed problem occurs from the 1st paper tray.</i> <i>See "Paper Lift Mechanism" for details on SP1-908.</i> [0 ~ 2000 / 200 / 1 ms/step]								

1	Mode Number/Name		Function/[Setting]
908*	2	Small Size	<p>Adjusts the upper paper lift motor reverse time for paper of the same size as or smaller than the small size threshold set with SP1-908-8.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 1st paper tray.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-908.</i></p> <p>[0 ~ 2000 / 600 / 1 ms/step]</p>
	3	Middle Size	<p>Adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-908-8, up to and including the middle size threshold set with SP1-908-9. If a middle size threshold is not stored with SP1-908-9, this SP is not used.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 1st paper tray.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-908.</i></p> <p>[0 ~ 2000 / 200 / 1 ms/step]</p>
1st Bottom Plate Pressure Re-adjustment			
	4	Small Size	<p>Adjusts the upper paper lift motor forward rotation time for paper of the same size as or smaller than the small size threshold set with SP1-908-8. The motor rotates forward when the remaining paper amount is lower than the value of SP1-908-6.</p> <p><i>Use this SP when a paper feed problem occurs when paper in the 1st paper tray is running low.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-908.</i></p> <p>[0 ~ 2000 / 400 / 1 ms/step]</p>
	5	Middle Size	<p>Adjusts the upper paper lift motor forward rotation time for paper sizes larger than the small size threshold set with SP1-908-8, up to and including the middle size threshold set with SP1-908-9.</p> <p>The motor rotates forward when the amount of remaining paper is lower than the value of SP1-908-7. If a middle size threshold is not stored with SP1-908-9, this SP is not used.</p> <p><i>Use this SP when a paper feed problem occurs when paper in the 1st paper tray is running low.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-908.</i></p> <p>[0 ~ 2000 / 300 / 1 ms/step]</p>
1st Paper Amount			
	6	Small Size	<p>Selects the remaining paper amount limit for use with SP1-908-4.</p> <p><i>Set this SP to 2 or 3 when a paper feed problem occurs before near-end.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-908.</i></p> <p>[0 = None (Empty) / 1 = Near End / 2 = 25% / 3 = 75%]</p>
	7	Middle Size	<p>Selects the remaining paper amount limit for use with SP1-908-5.</p> <p><i>Set this SP to 2 or 3 when a paper feed problem occurs before near-end.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-908.</i></p> <p>[0 = None (Empty) / 1 = Near End / 2 = 25% / 3 = 75%]</p>

1	Mode Number/Name	Function/[Setting]
908*	1st Paper Size	
	8 1st Small Paper Size Setting	<p>Selects the small size threshold for the 1st paper tray. "0" means that this setting is not used.</p> <p><i>The size used by SP1-908 is determined by paper width. See "Paper Lift Mechanism" for details on SP1-908.</i></p> <p>[0 = None (Not used) / 1 = HLT/A5 / 2 = A4 / 3 = LT / 4 = DLT / 5 = A3]</p>
	9 1st Middle Paper Size Setting	<p>Selects the middle size threshold for the upper tray. "0" means that this setting is not used.</p> <p><i>The value must be larger than the small size threshold (SP1-908-8). The size used by SP1-908 is determined by paper width. See "Paper Lift Mechanism" for details on SP1-908.</i></p> <p>[0 = None (Not used) / 1 = HLT/A5 / 2 = A4 / 3 = LT / 4 = DLT / 5 = A3]</p>
909*	2nd Bottom Plate Pressure Adjustment	
	1 Normal Size	<p>If a middle size threshold is not stored with SP1-909-9, this SP adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-909-8.</p> <p>If a middle size threshold is stored with SP1-909-9, then this SP adjusts the motor reverse time for sizes larger than the middle size.</p> <p>Do not input a value greater than 1,200.</p> <p><i>Use this SP when a paper feed problem occurs from the 2nd paper tray.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-909.</i></p> <p>[0 ~ 2000 / 200 / 1 ms/step]</p>
	2 Small Size	<p>Adjusts the upper paper lift motor reverse time for paper of the same size as or smaller than the small size threshold set with SP1-909-8.</p> <p>Do not input a value greater than 1,200.</p> <p><i>Use this SP when a paper feed problem occurs from the 2nd paper tray.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-909.</i></p> <p>[0 ~ 2000 / 600 / 1 ms/step]</p>
	3 Middle Size	<p>Adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-909-8, up to and including the middle size threshold set with SP1-909-9. If a middle size threshold is not stored with SP1-909-9, this SP is not used.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 2nd paper tray.</i></p> <p><i>See "Paper Lift Mechanism" for details on SP1-909.</i></p> <p>[0 ~ 2000 / 200 / 1 ms/step]</p>

1	Mode Number/Name	Function/[Setting]
909*	2nd Bottom Plate Pressure Re-adjustment	
	4 Small Size	Adjusts the upper paper lift motor forward rotation time for paper of the same size as or smaller than the small size threshold set with SP1-909-8. The motor rotates forward when the remaining paper amount is lower than the value of SP1-909-6. <i>Use this SP when a paper feed problem occurs when paper in the 2nd paper tray is running low.</i> <i>See "Paper Lift Mechanism" for details on SP1-909.</i> [0 ~ 2000 / 400 / 1 ms/step]
	5 Middle Size	Adjusts the upper paper lift motor forward rotation time for paper sizes larger than the small size threshold set with SP1-909-8, up to and including the middle size threshold set with SP1-909-9. The motor rotates forward when the remaining paper amount is lower than the value of SP1-909-7. If a middle size threshold is not stored with SP1-909-9, this SP is not used. <i>Use this SP when a paper feed problem occurs when paper in the 2nd paper tray is running low.</i> <i>See "Paper Lift Mechanism" for details on SP1-909.</i> [0 ~ 2000 / 300 / 1 ms/step]
	2nd Paper Amount	
	6 Small Size	Selects the remaining paper amount limit for use with SP1-909-4. <i>Set this SP to 2 or 3 when a paper feed problem occurs before near-end.</i> <i>See "Paper Lift Mechanism" for details on SP1-909.</i> [0 = None (Empty) / 1 = Near End / 2 = 25% / 3 = 75%]
	7 Middle Size	<i>Set this SP to 2 or 3 when a paper feed problem occurs before near-end.</i> <i>See "Paper Lift Mechanism" for details on SP1-909.</i>
	2nd Paper Size	
	8 2nd Small Paper Size Setting	Selects the small size threshold for the 2nd paper tray. "0" means that this setting is not used. <i>The size used by SP1-909 is determined by paper width. See "Paper Lift Mechanism" for details on SP1-909.</i> [0 = None (Not used) / 1 = HLT/A5 / 2 = A4 / 3 = LT / 4 = DLT / 5 = A3]
	9 2nd Middle Paper Size Setting	Selects the middle size threshold for the upper tray. "0" means that this setting is not used. <i>The value must be larger than the small size threshold (SP1-909-8). The size used by SP1-909 is determined by paper width. See "Paper Lift Mechanism" for details on SP1-909.</i> [0 = None (Not used) / 1 = HLT/A5 / 2 = A4 / 3 = LT / 4 = DLT / 5 = A3]

1	Mode Number/Name	Function/[Setting]
910*	3rd Bottom Plate Pressure Adjustment	
	1 Normal Size (Optional PFU)	<p>If a middle size threshold is not stored with SP1-910-9, this SP adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-910-8.</p> <p>If a middle size threshold is stored with SP1-910-9, then this SP adjusts the motor reverse time for sizes larger than the middle size.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 3rd paper tray.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 ~ 2000 / 200 / 1 ms/step]</p>
	2 Small Size (Optional PFU)	<p>Adjusts the upper paper lift motor reverse time for paper of the same size as or smaller than the small size threshold set with SP1-910-8.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 3rd paper tray.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 ~ 2000 / 600 / 1 ms/step]</p>
	3 Middle Size (Optional PFU)	<p>Adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-910-8, up to and including the middle size threshold set with SP1-910-9. If a middle size threshold is not stored with SP1-910-9, this SP is not used.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 3rd paper tray.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 ~ 2000 / 200 / 1 ms/step]</p>
	3rd Bottom Plate Pressure Re-adjustment	
	4 Small Size (Optional PFU)	<p>Adjusts the upper paper lift motor forward rotation time for paper of the same size as or smaller than the small size threshold set with SP1-910-8. The motor rotates forward when the remaining paper amount is lower than the value of SP1-910-6.</p> <p><i>Use this SP when a paper feed problem occurs when paper in the 3rd paper tray is running low.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 ~ 2000 / 400 / 1 ms/step]</p>

1	Mode Number/Name		Function/[Setting]
910*	5	Middle Size (Optional PFU)	<p>Adjusts the upper paper lift motor forward rotation time for paper sizes larger than the small size threshold set with SP1-910-8, up to and including the middle size threshold set with SP1-910-9.</p> <p>The motor rotates forward when the remaining paper is lower than the value of SP1-910-7.</p> <p>If a middle size threshold is not stored with SP1-910-9, this SP is not used.</p> <p><i>Use this SP when a paper feed problem occurs when paper in the 3rd paper tray is running low.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 ~ 2000 / 300 / 1 ms/step]</p>
3rd Paper Amount			
	6	Small Size (Optional PFU)	<p>Selects the remaining paper amount limit for use with SP1-910-4.</p> <p><i>Set this SP to 2 or 3 when a paper feed problem occurs before near-end.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 = None (Empty) / 1 = Near End / 2 = 25% / 3 = 75%]</p>
	7	Middle Size (Optional PFU)	<p>Selects the remaining paper amount limit for use with SP1-910-5.</p> <p><i>Set this SP to 2 or 3 when a paper feed problem occurs before near-end.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 = None (Empty) / 1 = Near End / 2 = 25% / 3 = 75%]</p>
3rd Paper Size			
	8	3rd Small Paper Size Setting (Optional PFU)	<p>Selects the small size threshold for the 3rd paper tray. "0" means that this setting is not used.</p> <p><i>The size used by SP1-910 is determined by paper width. See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 = None (Not used) / 1 = HLT/A5 / 2 = A4 / 3 = LT / 4 = DLT / 5 = A3]</p>
	9	3rd Middle Paper Size Setting (Optional PFU)	<p>Selects the middle size threshold for the upper tray. "0" means that this setting is not used.</p> <p><i>The value must be larger than the small size threshold (SP1-910-8). The size used by SP1-910 is determined by paper width. See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.</i></p> <p>[0 = None (Not used) / 1 = HLT/A5 / 2 = A4 / 3 = LT / 4 = DLT / 5 = A3]</p>

Service Tables

1	Mode Number/Name	Function/[Setting]
911*	4th Bottom Plate Pressure Adjustment	
	1 Normal Size (Optional PFU)	<p>If a middle size threshold is not stored with SP1-911-9, this SP adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-911-8.</p> <p>If a middle size threshold is stored with SP1-911-9, then this SP adjusts the motor reverse time for sizes larger than the middle size.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 4th paper tray.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 ~ 2000 / 200 / 1 ms/step]</p>
	2 Small Size (Optional PFU)	<p>Adjusts the upper paper lift motor reverse time for paper of the same size as or smaller than the small size threshold set with SP1-911-8.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 4th paper tray.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 ~ 2000 / 600 / 1 ms/step]</p>
	3 Middle Size (Optional PFU)	<p>Adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-911-8, up to and including the middle size threshold set with SP1-911-9. If a middle size threshold is not stored with SP1-911-9, this SP is not used.</p> <p>Do not input a value greater than 1200.</p> <p><i>Use this SP when a paper feed problem occurs from the 4th paper tray.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 ~ 2000 / 200 / 1 ms/step]</p>
	4th Bottom Plate Pressure Re-adjustment	
	4 Small Size (Optional PFU)	<p>Adjusts the upper paper lift motor forward rotation time for paper of the same size as or smaller than the small size threshold set with SP1-911-8. The motor rotates forward when the remaining paper amount is lower than the value of SP1-911-6.</p> <p><i>Use this SP when a paper feed problem occurs when paper in the 4th paper tray is running low.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 ~ 2000 / 400 / 1 ms/step]</p>

1	Mode Number/Name		Function/[Setting]
911*	5	Middle Size (Optional PFU)	<p>Adjusts the upper paper lift motor forward rotation time for paper sizes larger than the small size threshold set with SP1-911-8, up to and including the middle size threshold set with SP1-911-9.</p> <p>The motor rotates forward when the remaining paper amount is lower than the value of SP1-911-7.</p> <p>If a middle size threshold is not stored with SP1-911-9, this SP is not used.</p> <p><i>Use this SP when a paper feed problem occurs when paper in the 4th paper tray is running low.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 ~ 2000 / 300 / 1 ms/step]</p>
4th Paper Amount			
	6	Small Size (Optional PFU)	<p>Selects the remaining paper amount limit for use with SP1-911-4.</p> <p><i>Set this SP to 2 or 3 when a paper feed problem occurs before near-end.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 = None (Empty) / 1 = Near End / 2 = 25% / 3 = 75%]</p>
	7	Middle Size (Optional PFU)	<p>Selects the remaining paper amount limit for use with SP1-911-5.</p> <p><i>Set this SP to 2 or 3 when a paper feed problem occurs before near-end.</i></p> <p><i>See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 = None (Empty) / 1 = Near End / 2 = 25% / 3 = 75%]</p>
4th Paper Size			
	8	4th Small Paper Size Setting (Optional PFU)	<p>Selects the small size threshold for the 4th paper tray. "0" means that this setting is not used.</p> <p><i>The size used by SP1-911 is determined by paper width. See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 = None (Not used) / 1 = HLT/A5 / 2 = A4 / 3 = LT / 4 = DLT / 5 = A3]</p>
	9	4th Middle Paper Size Setting (Optional PFU)	<p>Selects the middle size threshold for the upper tray. "0" means that this setting is not used.</p> <p><i>The value must be larger than the small size threshold (SP1-911-8). The size used by SP1-911 is determined by paper width. See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.</i></p> <p>[0 = None (Not used) / 1 = HLT/A5 / 2 = A4 / 3 = LT / 4 = DLT / 5 = A3]</p>
912*	Tray Motor Reverse Time		<p>Adjusts the tray motor reverse time.</p> <p><i>The tray motor reverses when the tray is pulled out. The tray can be put back in the machine without damage while the motor reverses.</i></p> <p>[0 ~ 9000 / 1700 / 1 ms/step]</p>

1	Mode Number/Name	Function/[Setting]
994	Punch Hole Detection	<p>When using paper that has punch holes, the registration sensor may detect the hole and a paper jam will be detected. If you select "1", the machine ignores the registration sensor off signal within 50 mm from the trailing edge of the paper.</p> <p>[0 = No 1 = Yes]</p>

SP2-XXX: Drum

2	Mode Number/Name	Function/[Setting]
001*	Charge Roller Bias Adjustment	
	1* Printing	<p>Adjusts the voltage applied to the charge roller during printing.</p> <p><i>This value will be changed automatically when the charge roller bias correction is performed.</i></p> <p><i>Note that if this value is changed, the charge roller voltage will be corrected based on the new voltage.</i></p> <p>[2100 ~ 1500 / -1700 / 1 V/step]</p>
	2* Charge Roller Bias Adjustment (ID sensor pattern)	<p>Adjusts the voltage applied to the charge roller when making the Vsdp ID sensor pattern (for charge roller bias correction).</p> <p><i>The actual charge roller voltage is this value plus the value of SP2-001-1.</i></p> <p>[0 ~ 400 / 200 / 1 V/step]</p>
	3 Charge Roller Bias Adjustment (Temporarily input)	<p>Inputs the charge roller voltage temporarily for test purposes.</p> <p>Do not change the value.</p> <p>[0 ~ -2500 / 0 / 1 V/step]</p>
005*	Charge Roller Bias Correction	
	1 Vsdp Minimum	<p>Adjusts the lower threshold value for the charge roller correction.</p> <p><i>When the value of Vsdp/Vsg is less than this value, the charge roller voltage increases by 50V (e.g. from -500 to -550). The size of the increase depends on SP2-005-3.</i></p> <p>[0 ~ 100 / 90 / 1%/step]</p>
	2 Vsdp Maximum	<p>Adjusts the upper threshold value for the charge roller correction.</p> <p><i>When the value of Vsdp/Vsg is greater than this value, the charge roller voltage decreases by 50V (e.g. from -550 to -500). The size of the decrease depends on SP2-005-3.</i></p> <p>[0 ~ 100 / 95 / 1 %/step]</p>
	3 Step	<p>Adjusts the size of the charge roller voltage correction.</p> <p>[0 ~ 200 / 50 / 1 V/step]</p>

2	Mode Number/Name	Function/[Setting]
101*	Erase Margin Adjustment	
1	Leading Edge	Adjusts the leading edge erase margin. <i>The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [0.0 ~ 9.0 / 3.0 / 0.1 mm/step]
2	Trailing Edge – Small Paper Size	Adjusts the trailing edge erase margin for paper of length 216 mm or less. <i>The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [0.0 ~ 9.0 / 2.0 / 0.1 mm/step]
3	Trailing Edge – Middle Paper Size	Adjusts the trailing edge erase margin for paper of length 216.1 ~ 297 mm. <i>The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [0.0 ~ 9.0 / 3.0 / 0.1 mm/step]
4	Trailing Edge – Large Paper Size	Adjusts the trailing edge erase margin for paper longer than 297 mm. <i>The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [0.0 ~ 9.0 / 4.0 / 0.1 mm/step]
5	Left Side	Adjusts the left edge erase margin. <i>The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [0.0 ~ 9.0 / 2.0 / 0.1 mm/step]
6	Right Side	Adjusts the right edge erase margin. <i>The specification is $2 + 2.5/-1.5$ mm. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [0.0 ~ 9.0 / 2.0 / 0.1 mm/step]
7	Rear – Trailing Edge	Adjusts the trailing edge erase margin on the reverse side of duplex copies. The actual trailing edge erase margin on the reverse side is this value plus the value of SP2-101-2 or 3 or 4. <i>The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details</i> [0.0 ~ 9.0 / 1.2 / 0.1 mm/step]
8	Rear – Left Side	Adjusts the left side erase margin on the reverse side of duplex copies. The actual left side erase margin on the reverse side is this value plus the value of SP2-101-5. <i>The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [0.0 ~ 9.0 / 0.3 / 0.1 mm/step]
9	Rear – Right Side	Adjusts the right side erase margin on the reverse side of duplex copies. The actual right side erase margin on the reverse side is this value plus the value of SP2-101-6. <i>The specification is $2 + 2.5/-1.5$ mm. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [0.0 ~ 9.0 / 0.3 / 0.1 mm/step]

2	Mode Number/Name		Function/[Setting]
101*	10	Printer, Rear Trailing Edge	In printer mode, adjusts the trailing edge erase margin on the reverse side of duplex copies. The actual trailing edge erase margin on the reverse side is this value plus the value of SP2-101-7. <i>The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details</i> [0.0 ~ 9.0 / 0.0 / 0.1 mm/step]
103*	LD Power Adjustment		Adjusts the LD power. DFU Do not change the value. [50 ~ 170 / 129 / 1/step]
110*	Test Mode dpi		Sets the scanning resolution (dpi). DFU [See below / 8 / 0~18] 0: 400x400 dpi 1: 391x406 dpi 2: 406x391 dpi 4: 300x300 dpi 8: 600x600 dpi 15: 439x430 dpi 16: 476x476 dpi 17: 483x465 dpi 18: 465x483 dpi
201*	Development Bias Adjustment		
	1	Printing	Adjusts the development bias during printing. <i>This can be adjusted as a temporary measure if faint copies appear due to an aging drum.</i> [-1500 ~ 2000 / -650 / 1 V/step]
	2	ID sensor pattern	Adjusts the development bias for making the ID sensor pattern. The actual development voltage for the ID sensor pattern is this value plus the value of SP2-201-1. <i>This should not be used in the field, because it affects ID sensor pattern density, which affects toner supply.</i> [0 = N (200V) / 1 = H (240V) / 2 = L (160V) / 3 = HH (280V) / 4 = LL (120V)]
210*	Bias Off Time		
	1	Charge Bias	Adjusts the charge voltage (-1200V) application time. DFU <i>When the charge voltage and development bias are turned off at the same time, toner or carrier will be attracted to the drum. To reduce the toner or carrier attraction, the machine applies -1200V to the charge roller before the development bias is turned off. This SP adjusts the time for applying the charge.</i> [0 ~ 150 / 80 / 1 ms /step]
	2	Development Bias	Adjusts the development bias off time. DFU [-120 ~ 120 / 0 / 1ms/step]

2	Mode Number/Name	Function/[Setting]
211*	PCU Reverse Interval	<p>Adjusts the PCU reverse interval for cleaning during a job.</p> <p>When the machine has made this number of copies in the middle of a job, the machine reverses to clean the edge of the cleaning blade. After cleaning, the machine resumes the job. Set to a shorter interval if thin white lines appear on printouts.</p> <p>0: Cleaning is never done in the middle of a job [0 ~ 999 / 100 / 1 sheet/step]</p>
213*	Copies after Near End	<p>Selects the number of copies that can be made after toner near-end has been detected.</p> <p><i>If the user normally makes copies with a high proportion of black, reduce the interval.</i></p> <p>[0 = 50 pages / 1 = 20 pages]</p>
220*	Vt/Vsg/Vsp/Vsdp/Vts Data Display	<p>Displays the Vt, Vsg, Vsp, Vsdp, and Vts values.</p>
	1	Vsp
	2	Vsg
	3	Vsdp
	4	Vt
	5	Vts
301*	Transfer Current	<p>Adjusts the current applied to the transfer roller during copying from a paper tray when the user uses the "Normal" paper setting.</p> <p><i>If the user normally feeds thicker paper from a paper tray, use a higher setting.</i></p> <p>[0 = -2 μA / 1 = 0 μA / 2 = +2 μA / 3 = +4 μA]</p> <p>Adjusts the current applied to the transfer roller during copying from the by-pass tray. These settings are also used if the 2nd tray is used and special paper is selected.</p> <p><i>If the user normally feeds thicker paper from the by-pass tray/2nd tray (special paper), use a higher setting. If waste toner is re-attracted from the drum (this can occur when using an OHP sheet), use a higher setting.</i></p> <p>[0 = -2 μA / 1 = 0 μA / 2 = +2 μA / 3 = +4 μA]</p> <p>Adjusts the current applied to the transfer roller during copying from the duplex unit when the user uses the "Normal" paper setting.</p> <p><i>Use this SP when the image on the rear side of the paper has a problem caused by poor image transfer.</i></p> <p>[0 = -2 μA / 1 = 0 μA / 2 = +2 μA / 3 = +4 μA]</p> <p>Adjusts the current applied to the transfer roller during roller cleaning.</p> <p><i>If toner remains on the roller after cleaning (dirty background appears on the rear side of the paper), increase the current.</i></p> <p>[0 ~ 10 / -4 / 1 μA/step]</p> <p>This is for the designer's test purposes.</p> <p>Do not change the value.</p> <p>[0 ~ 30 / 0 / 1 μA/step]</p>
1*		Normal Paper
2*		Thick/Thin Paper
3*		Duplex, Side2
4*		Cleaning
5		Input – Front

2	Mode Number/Name		Function/[Setting]
301*	6	Input – Rear	
	7	Temp inside the machine	Displays the temperature measured inside the machine just after power-on (by the thermistor on the SBCU board) the last time that the fusing unit was less than 40°C just after the machine was switched on. <i>The transfer current is corrected in accordance with this value.</i>
801	Developer Initialization		Initializes the developer and resets the TD and ID sensor outputs to their defaults. <i>Use this if the machine did not detect the new PCU when it was installed, and the TD/ID sensors were not initialized.</i>
	Developer Mixing		Mixes the developer and checks Vt. The machine mixes the developer for 2 minutes and while doing this, it reads the TD sensor output (Vt). It does not initialize the TD sensor output. <i>If the machine has not been used for a long time, prints may have a dirty background. In this case, use this SP mode to mix the developer.</i>
803*	Developer Initialization Data		
	1	TD Sensor	Displays the TD sensor output after performing the developer initialization. This value will be used in fixed supply mode.
	2	ID Sensor PWM Value	Displays the PWM value of the ID sensor after performing the developer initialization.
901*	Separation Voltage Adjustment		
	1	Front – Leading Edge	Adjusts the voltage that is applied to the separation plate during printing at the leading edge of the paper on the front side. <i>If the copies have pawl marks at the leading edge, increase this voltage.</i> [–1000 ~ 4000 / –1800 / 1 V/step]
	2	Front – Image Area	Adjusts the voltage that is applied to the separation plate during printing on the image area of the paper on the front side. <i>If the copies have pawl marks in the image area, increase this voltage.</i> [–1000 ~ 4000 / –1800 / 1 V/step]
	3	Rear – Leading Edge	Adjusts the voltage applied to the separation plate, during printing at the leading edge of the paper on the rear side. <i>See SP2-901-1.</i> [–1000 ~ 4000 / –2100 / 1 V/step]
	4	Rear – Image Area	Adjusts the voltage applied to the separation plate, during printing at the image area of the paper on the rear side. <i>See SP2-901-2.</i> [–1000 ~ 4000 / –2100 / 1 V/step]

2	Mode Number/Name	Function/[Setting]
902*	Test Pattern Printing 3	Prints the test patterns. Select the number of the test pattern that you want to print (☛ 4.2.3). <i>When adjusting the printing registration, select no.10 (Trimming Area Pattern).</i> [0 ~ 41 / 0 / 1 step]
906*	Tailing Correction 1 Shift Value 2 Interval	Shifts the image across the page at the interval specified by SP2-906-2. <i>When making many copies of an original that contains vertical lines (such as a table), separation may not work correctly, then a tailing image will occur (ghosts of the vertical lines will continue past the bottom of the table). This SP prevents this problem.</i> [0.0 ~ 1.0 / 0.0 / 1 mm/step] Changes the interval for the image shift specified by SP2-906-1. [1 ~ 10 / 0 / 1 page/step]
907*	Line Width Correction 1 Text Mode 2 Photo Mode 3 Text/Photo Mode 4 Pale Mode 5 Generation Mode	Adjusts the line width. The value "5" means that line width correction is disabled. A number smaller than 5 makes lines thinner. A number bigger than 5 makes lines thicker. Thinnest Thickest 0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 [0 ~ 10 / 5 / 1 step] [0 ~ 10 / 6 / 1 step] [0 ~ 10 / 5 / 1 step] [0 ~ 10 / 5 / 1 step] [0 ~ 10 / 5 / 1 step]
908	Forced Toner Supply	Forces the toner bottle to supply toner to the toner supply unit. Press Execute on the touch panel to start. <i>During this process, the machine supplies toner until the toner concentration in the development unit reaches a standard level. However, if the toner concentration does not reach a standard level, the machine supplies toner for 2 minutes maximum.</i>
909*	Main Scan Magnification 1 Copy - Short Edge Feed 2 Printer - Short Edge Feed 3 Copy - Long Edge Feed	Adjusts the main scan magnification in copy mode when the machine feeds the paper in the short edge feed orientation. [-0.5 ~ 0.5 / 0.0 / 0.1%/step] Adjusts the main scan magnification in printer mode when the machine feeds the paper in the short edge feed orientation. [-0.5 ~ 0.5 / 0.0 / 0.1%/step] Adjusts the main scan magnification in copy mode when the machine feeds the paper in the long edge feed orientation. [-0.5 ~ 0.5 / 0.0 / 0.1%/step]

2	Mode Number/Name		Function/[Setting]
909*	4	Printer – Long Edge Feed	Adjusts the main scan magnification in printer mode when the machine feeds the paper in the long edge feed orientation. [-0.5 ~ 0.5 / 0.0 / 0.1%/step]
910*	Margin Adjustment for By-pass		Adjusts the blank margin at the trailing edge of paper fed from the by-pass table. [-9.0 ~ +9.0 / 0.1 mm / 1mm/step]
913*	ID Adjustment for Test Pattern		Adjusts the image density level for black pixels on test pattern printouts (patterns are made with SP2-902) <i>This SP affects all test patterns except for the grayscale test patterns.</i> [0 ~ 15 / 15 / 1/step]
915*	Polygon Motor Idling Time		Selects the polygon motor idling time. <i>If the user sets an original, touches a key, or opens the platen cover/DF, the polygon motor starts idling to make a faster first copy. However, with the default (15 s), the motor stops if the user does nothing for 15 s, and stops 15 s after the end of a job.</i> <i>If set at "0", the polygon motor never turns off during stand-by. However, when the machine goes into energy saver mode, the polygon motor turns off regardless of this timer.</i> [0 = None / 1 = 15 s / 2 = 25 s]
921*	Toner Supply Mode		Selects the toner supply mode. <i>Normally, only use setting 0. Change to 3 temporarily if the TD sensor is defective. Do not use settings 1 and 2; these are for designer's use only.</i> [0 = Sensor 1 / 1 = Sensor 2 / 2 = Fixed 1 / 3 = Fixed 2]
922*	Toner Supply Time		Adjusts the toner supply motor on time for sensor supply mode. This SP is effective only when SP2-921 is "0" or "1". <i>Increasing this value increases the toner supply motor on time. So, use a high value if the user tends to make lots of copies that have a high proportion of black.</i> [0.1 ~ 5.0 / 0.6 / 0.1 s/step]
923*	Toner Recovery Time		Adjusts the toner supply motor on time during recovery from toner near-end/end. This SP is effective only when SP2-921 is "0", "1", or "2". <i>Note that toner recovery is done in a 3-second cycle. So, the input value should be a multiple of 3 (e.g. 3, 6, 9). See "Toner Density Control" for more details.</i> [3 ~ 60 / 30 / 1 s/step]

2	Mode Number/Name	Function/[Setting]
925*	Toner Supply Rate	<p>Adjusts the toner supply rate for fixed toner supply mode. This SP is effective only when SP2-921 is "2" or "3". <i>Increasing this value increases the toner supply motor on time. So, use a high value if the user tends to make lots of copies that have a high proportion of black. See "Toner Density Control" for more details.</i></p> <p>0: t 4: 12t 1: 2t 5: 16t 2: 4t 6: On continuously 3: 8t 7: 0 s</p> <p>t: 200 ms</p> <p>[0 ~ 7 / 0 / 1/step]</p>
926*	Standard Vt	<p>Adjusts Vts (Vt for a new PCU). The TD sensor output is adjusted to this value during the TD sensor initial setting process. This SP is effective only when SP2-921 is "0", "1", or "2". Do not change this value.</p> <p>[0.00 ~ 5.00 / 2.50 / 0.01 V/step]</p>
927*	ID Sensor Control	<p>Selects whether the ID sensor is used or not for toner density control. <i>If this value is "0", dirty background may occur after the machine has not been used for a long time.</i></p> <p>[0 = No / 1 = Yes]</p>
928*	Toner End Clear	<p>Clears the toner end condition. Press Execute on the touch panel to clear the toner end condition without adding new toner. <i>If press Execute, the following are cleared.</i></p> <ul style="list-style-type: none"> • Toner end indicator (goes out) • Toner near-end counter • Toner near-end level <p><i>When making a lot of copies after changing this setting to "1", the carrier may be attracted to the drum when the toner runs out, which may damage the drum.</i></p>
929*	Vref	
	1 Upper Limit	Adjusts the upper limit for Vref. [0.00 ~ 5.00 / 3.10 / 0.01 V/step]
	2 Lower Limit	Adjusts the lower limit for Vref. [0.00 ~ 5.00 / 1.40 / 0.01 V/step]
930*	TD Sensor Manual Setting	Adjusts the TD sensor output. DFU [0.5 ~ 3.5 / 0.0V / 1V/step]
931*	TD (V/wt%) Setting	Adjusts the TD sensor sensitivity (coefficient: S) for toner density control. DFU [0.01 ~ 1.50 / 0.4 / 0.1/step]

2	Mode Number/Name	Function/[Setting]
932*	Toner Density Control Level Adjustment	
		Adjusts the toner density control threshold level. [0 = Normal / 1 = Dark / 2 = Light / 3 = Darker / 4 = Lighter] <i>Use this SP when you want to adjust the image density.</i>
933*	ID Sensor Control Coefficient	
		Adjusts the ID sensor control coefficient. DFU [5 ~ 30 / 10 / 1/step]
934*	ID Sensor PWM Setting	
	1	Display Displays the PWM of the ID Sensor LED.
	2	PWM Upper Limit Adjusts the upper limit of the PWM for the ID sensor LED. DFU [0 ~ 999 / 0 / 1/step]
	3	PWM Upper Limit Correction Corrects the upper limit of the PWM for the ID sensor LED. DFU [0 ~ 999 / 0 / 1/step]
935	ID Sensor Initialization	
		Performs the ID sensor initial setting. <i>Press Execute on the touch panel to start. Perform this setting after replacing or cleaning the ID sensor.</i>
936*	ID Sensor Pattern Size	
		Selects the ID sensor pattern size in the main scan direction. <i>Set to 1 if white spots or black spots appear on prints. The ID sensor pattern is 290 mm wide, and when this is cleaned off, dirt is removed also.</i> [0 = 20 mm / 1 = 290 mm]
992*	Copies After TD Sensor Error	
		Selects the number of copies that can be made after a TD sensor error has been detected. When the machine copies this amount, an SC condition will occur. <i>If the optional fax unit is installed, the SC condition occurs immediately regardless of the number of prints (this is because the sender of the fax cannot check the image quality of the printout).</i> [0 = 100 copies / 1 = 200 copies]
994*	Vts Limitation	
	1	Upper Limit (Factory) DFU
	2	Lower Limit (Factory) DFU
995*	ID Sensor Detection Interval	
	1	Warming-up If the machine starts warming-up after this time has passed since entering energy saver mode or auto off mode , the machine makes an ID sensor pattern. <i>If this value is greater, there is a greater chance that background will become dirty.</i> [0 ~ 999 / 30 / 1 minute/step]
955*	2	Number of Page The machine makes an ID sensor pattern after the specified number of prints has been made. 0 = this feature is disabled. [0 ~ 999 / 0 / 1 page/step]

2	Mode Number/Name	Function/[Setting]
996*	Transfer Roller Cleaning	Selects whether the transfer roller is cleaned before each copy job. <i>Set this to '1' when dirty background appears on the reverse side of the first page of a copy job. However, the first copy time will be longer.</i> <i>If this SP is at 0, the transfer roller is never cleaned. See 'Detailed Section Descriptions – Transfer Roller Cleaning' for more details.</i> [0 = No / 1 = Yes]
997*	Vts Setting (Factory)	DFU
998*	PCU Reverse Rotation Time	
	1	Wait Time Adjusts the waiting time for starting to rotate the drum in reverse after the end of each job. The wait time calculation formula is as follows. This value x 30 ms. 0: Reverses immediately after the end of the job (no waiting) [0 ~ 99 / 20 / 1/step]
	2	Reverse Time Adjusts the drum reverse rotation time. The reverse rotation time calculation formula is as follows. This value x 30 ms. 0: No reverse at end of job [0 ~ 99 / 1 / 1/step]
999*	Toner Control Data Display	Displays the toner density control data on the debug monitor. DFU [0 = No / 1 = Yes]



Service Tables

SP4-XXX: Scanner

4	Mode Number/Name	Function/[Setting]
008*	Main Scan Magnification (Scanner)	Adjusts the magnification in the main scan direction for scanning. <i>Use the \odot key to toggle between + and – before entering the value. The specification is $\pm 1\%$. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [-0.9 ~ +0.9 / 0.0 / 0.1% step]
009*	Sub Scan Magnification (Scanner)	Adjusts the magnification in the sub scan direction for scanning. <i>Use the \odot key to toggle between + and – before entering the value. The specification is $\pm 1\%$. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [-0.9 ~ +0.9 / 0.0 / 0.1% step]



4	Mode Number/Name	Function/[Setting]								
010*	Leading Edge Registration (Scanner)	<p>Adjusts the leading edge registration for scanning in platen mode.</p> <p>(-): The image moves in the direction of the leading edge.</p> <p>Use the  key to toggle between + and - before entering the value. The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.</p> <p>[-0.9 ~ +0.9 / 0.0 / 0.1 mm step]</p>								
011*	Side-to-side Registration (Scanner)	<p>Adjusts the side-to-side registration for scanning in platen mode.</p> <p>(-): The image disappears at the left side.</p> <p>(+): The image appears.</p> <p>Use the  key to toggle between + and - before entering the value. The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.</p> <p>[-4.6 ~ +4.6 / 0.0 / 0.1 mm step]</p>								
012*	Scanner Erase Margin	<table border="1"> <tr> <td>1</td> <td>Leading Edge</td> </tr> <tr> <td>2</td> <td>Trailing Edge</td> </tr> <tr> <td>3</td> <td>Right Side</td> </tr> <tr> <td>4</td> <td>Left Side</td> </tr> </table> <p>Adjusts the erase margin at each side for scanning.</p> <p>Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.</p> <p>[0 ~ 9.0 / 0.5 / 0.1 mm/step]</p>	1	Leading Edge	2	Trailing Edge	3	Right Side	4	Left Side
1	Leading Edge									
2	Trailing Edge									
3	Right Side									
4	Left Side									
013	Scanner Free Run	<p>Performs a scanner free run with the exposure lamp on.</p> <p>Press ON on the touch panel to start this feature.</p> <p>Press the  (Clear/Stop) key to stop.</p>								
015*	White Plate Scanning	<table border="1"> <tr> <td>1</td> <td>Start Position</td> </tr> <tr> <td>2</td> <td>Scanning Area</td> </tr> </table> <p>Adjusts the scanning start position on the white plate for auto shading.</p> <p>The default is 10.5 mm from the leading edge. The setting specifies how far scanning starts from the default position.</p> <p>[-5.0 ~ +5.0 / 0.0 / 0.1 mm/step]</p> <p>Adjusts the width of the area on the white plate (in the sub scan direction) that is scanned for auto shading.</p> <p>The default is 4.76 mm. The current setting specifies the difference from this default.</p> <p>[-5.0 ~ +5.0 / 0.0 / 0.1 mm/step]</p>	1	Start Position	2	Scanning Area				
1	Start Position									
2	Scanning Area									
301	APS Data Display	<p>Displays the status of the APS sensors and platen/DF cover sensor ( 4.2.9).</p>								

4	Mode Number/Name	Function/[Setting]
303*	APS Small Size Original	<p>Selects whether the copier determines that the original is A5 size when the APS sensor cannot detect the size.</p> <p><i>If "A5 lengthwise" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise. If "Not detected" is selected, "Cannot detect original size" will be displayed.</i></p> <p>[0 = No (Not detected) / 1 = Yes (A5 lengthwise)]</p>
305*	Original Size Detection	<p>Selects whether the machine determines that the original is A4/LT, or 8K/16K.</p> <p>8K/16K is not available for USA models.</p> <p>[0 = Normal (LT for USA models, A4 for Europe/Asia models)</p> <p>1 = Reversed [A4 for USA models, LT for Europe/Asia models]</p> <p>2 = 8K/16K]</p>
417	IPU Test Pattern	<p>Prints test patterns from the IPU video data outputs.</p> <p>0. No Print</p> <ol style="list-style-type: none"> 1. Vertical Line - 1 dot 2. Vertical Line - 2 dot 3. Horizontal Line - 1 dot 4. Horizontal Line - 2 dot 5. Alternating Dot Pattern 6. Grid Pattern - 1 dot 7. Vertical Bands 8. Grayscale – Horizontal (8 level) 9. Grayscale – Vertical (8 level) 10. Grayscale – 16 level 11. Cross Pattern 12. Slant Pattern 13. Patch Pattern (256 level) 14. Patch Pattern (64 level) 15. Trimming Area 16. Frequency characteristics - Vertical 15. Frequency characteristics - Horizontal <p><i>Change to the copy mode display by pressing the  (Interrupt) key, then print the test pattern.</i></p>
428	SBU Auto Adjustment	<p>Performs the auto scanner adjustment.</p> <p><i>Using this SP mode after replacing the white plate or erasing the memory on the controller board. See "Replacement and Adjustment – Copy Image Adjustments - Standard White Density Adjustment" for details on how to do this.</i></p> <p><i>Press Execute on the touch panel to start.</i></p>

Service Tables

4	Mode Number/Name	Function/[Setting]
901	SBU Adjustment	
	1* Gain - EVEN	Checks the difference value of the black level for the EVEN channel after adjusting the black level at power-up. DFU <i>However, after doing a memory all clear (SP5-801), use it to re-input the previous value.</i> [0 ~ 255 / 40 / 1/step]
	2* Gain - ODD	Checks the difference value of the black level for the ODD channel after adjusting the black level at power-up. DFU . <i>However, after doing a memory all clear (SP5-801), use it to re-input the previous value.</i> [0 ~ 255 / 40 / 1/step]
	3 DC Cont - EVEN	Adjusts the coefficient of the D/A converter for the AGC gain curve for DC cont for the EVEN channel. DFU <i>However, after doing a memory all clear (SP5-801), use it to re-input the previous value.</i> [0 ~255 / 25 / 1/step]
901	4 DC Cont - ODD	Adjusts the coefficient of the D/A converter for the AGC gain curve for DC cont for the ODD channel. DFU . <i>However, after doing a memory all clear (SP5-801), use it to re-input the previous value.</i> [0 ~255 / 25 / 1/step]
	7 Current Value	Adjusts the coefficient of the D/A converter for the AGC gain curve for scanning the white plate. DFU . [0 ~255 / 147 / 1/step]
902	Exposure Lamp ON	Turns on the exposure lamp. <i>Press ON on the touch panel to turn on the lamp.</i> <i>Press OFF to turn off the lamp.</i>
903*	Image Quality Adjustment	
	1 Text : 25% ~ 34%	This adjustment is only effective for the "Custom Setting" original type. Adjusts the image quality in Text mode. <i>A larger number increases contrast and sharpens the image but moiré may appear.</i> <i>A smaller number reduces contrast and moiré but the line may become narrower.</i> [0 ~ 10 / 4 / 1 step]
	2 Text : 35% ~ 66%	[0 ~ 10 / 3 / 1 step]
	3 Text : 67% ~ 141%	[0 ~ 10 / 4 / 1/step]
	4 Text : 142% ~ 400%	[0 ~ 10 / 4 / 1/step]
	5 Photo : 25% ~ 34%	This adjustment is only effective for the "Custom Setting" original type. Adjusts the image quality in Photo mode. <i>0 ~ 6 are for a glossy photo image (error diffusion)</i> <i>7 ~ 20 are for a printed photo image (dithering)</i> <i>If copy quality is not satisfactory, try another setting (trial and error)</i> [0 ~ 20 / 11 / 1/step]

4	Mode Number/Name	Function/[Setting]	
903*	6	Photo : 35% ~ 66% [0 ~ 20 / 11 / 1/step]	
	7	Photo : 67% ~ 141% [0 ~ 20 / 11 / 1/step]	
	8	Photo : 142% ~ 400% [0 ~ 20 / 11 / 1/step]	
	9	Text/Photo : 25% ~ 34% This adjustment is only effective for the "Custom Setting" original type. Adjusts the image quality in Text/Photo mode. <i>A larger number increases contrast and sharpens the image but moiré may appear.</i> <i>A smaller number reduces contrast and moiré but the line may become narrower.</i> [0 ~ 10 / 3 / 1 step]	
	10	Text/Photo : 35% ~ 66% [0 ~ 10 / 5 / 1 step]	
	11	Text/Photo : 67% ~ 141% [0 ~ 10 / 5 / 1 step]	
	12	Text/Photo : 142% ~ 400% [0 ~ 10 / 5 / 1 step]	
	13	Pale : 25% ~ 34% This adjustment is only effective for the "Custom Setting" original type. Adjusts the image quality in Pale mode. <i>A larger number increase the number of gradations in low contrast areas.</i> [0 ~ 10 / 3 / 1 step]	
	14	Pale : 35% ~ 66% [0 ~ 10 / 3 / 1 step]	
	15	Pale : 67% ~ 141% [0 ~ 10 / 3 / 1 step]	
	16	Pale : 142% ~ 400% [0 ~ 10 / 3 / 1 step]	
	17	Generation : 25% ~ 34% This adjustment is only effective for the "Custom Setting" original type. Adjusts the image quality in Generation mode. <i>A larger number increases contrast and sharpens the image but moiré may appear.</i> <i>A smaller number reduces contrast and moiré but the line may become narrower.</i> [0 ~ 10 / 3 / 1 step]	
	18	Generation : 35% ~ 66% [0 ~ 10 / 5 / 1 step]	
	19	Generation : 67% ~ 141% [0 ~ 10 / 5 / 1 step]	
	20	Generation : 142% ~ 400% [0 ~ 10 / 5 / 1 step]	
	904*	Independent Dot Erase	
		1	Text This adjustment is only effective for the "Custom Setting" original type. <i>With a larger SP setting, more dots are detected as independent dots and erased. However, dots in mesh-like images may be detected as independent dots mistakenly. If "0" is selected, independent dot erase is disabled.</i> [0 ~ 10 / 0 / 1 step]
		2	Photo [0 ~ 10 / 0 / 1 step]
		3	Text/Photo [0 ~ 10 / 0 / 1 step]
		4	Pale [0 ~ 10 / 0 / 1 step]
5		Generation [0 ~ 10 / 3 / 1 step]	

4	Mode Number/Name	Function/[Setting]
904*	Background Erase	
	6	Text This adjustment is only effective for the "Custom Setting" original type. <i>A larger number reduces dirty background. If "0" is selected, background erase is disabled.</i> [0 ~ 255 / 0 / 1 step]
	7	Photo [0 ~ 255 / 0 / 1 step]
	8	Text/Photo [0 ~ 255 / 0 / 1 step]
	9	Pale [0 ~ 255 / 0 / 1 step]
	10	Generation [0 ~ 255 / 0 / 1 step]
	Gamma Selection	
	11	Text This adjustment is only effective for the "Custom Setting" original type. Selects the gamma table for each original type. [0 ~ 2 / 0 / 1/step] <i>0: Standard gamma table</i> <i>1: This gamma table reduces the background of the original and gives sharp characters.</i> <i>2: The gamma table increases the number of gradations in high-density areas.</i>
	12	Photo [0 ~ 2 / 0 / 1/step]
	13	Text/Photo [0 ~ 2 / 0 / 1/step]
14	Pale [0 ~ 2 / 0 / 1/step]	
15	Generation [0 ~ 2 / 0 / 1/step]	
905*	Image Data Path	
	Selects one of the following video data outputs which will be used for printing. DFU [0 ~ 3 / 0 / 1 step] 0: Normal 1: After black level correction 2: After shading correction without black level correction 3: Shading data	
907*	1	Fax 25%, 50% Reduction Determines whether 25% and 50% reduction is available in fax mode. [0 = No, 1 = Yes]
	2	Outline Level Japanese version only DFU
909*	IPU Image Data Path	
	Selects one of the following image data outputs, which will be used for printing. DFU [0 ~ 255 / 0 / 1 step] Bit 7: Shading Bit 6: Scanner gamma Bit 5: Pre-filtering Bit 4: Magnification Bit 3: Scanner/Printer Mask Bit 2: Gradation Bit 1: Filtering Bit 0: Printer gamma	

4	Mode Number/Name	Function/[Setting]
911*	HDD Formatting	Select the desired SP, then press Execute on the touch panel to format each HDD partition. Note: After execution, turn the main power switch off and on.
	1 All	Initializes the entire hard disk.
	2 Image Files	Initializes documents stored in document server mode, stamp print data, scanner send data, fax send data.
	3 NetFiles	Initializes network file application thumbnail images.
	4 Job Log	Initializes job logging data (for Poplar server) DFU
	5 Printer Fonts	Initializes printer fonts and stored fonts.
9 Debug	DFU	
920	Scanning (Factory)	DFU
930*	Sensor Condition	
	1 Platen Cover sensor	Checks the following sensors in the scanner unit. [0 = Opened, 1 = Closed]
	2 Scanner HP Sensor	[0 = Opened, 1 = Closed]

SP5-XXX: Mode

5	Mode Number/Name	Function/[Setting]
024*	mm/inch Selection	Selects whether mm or inches are used in the display. Note: After selecting the number, you must turn the main power switch off and on. Eur./Asia model [0 = mm / 1 = inch] American model [0 = mm / 1 = inch]
104*	A3/DLT Double Count	Specifies whether the counter is doubled for A3/11" x 17" paper. <i>If "Yes" is selected, the total counter (mechanical counter) and the current user code counter counts up twice when A3/11" x 17" paper is used.</i> [0 = No / 1 = Yes]
106*	ADS Level Selection	Selects the image density level that is used in ADS mode. [1 ~ 7 / 4 / 1 notch/step]
113*	Option Counter Type	Selects the optional counter type. Japan only DFU [0 = No, 1 = Key Card1, 2 = Key Card2, 3 = Pre-paid Card, 4 = Coin lock, 5 = MF key card]
118*	Disable Copying	DFU
120*	Opt. Counter Reset Setting	
		This SP is for Japan only. Do not change the value. [0 = Yes / 1 = Stand-by / 2 = None]



5	Mode Number/Name	Function/[Setting]
121*	Key Counter Up Timing	Determines whether the total counter counts up at paper feed-in or at paper exit. [0 = Feed In / 1 = Exit]
127*	APS Mode Setting	Selects whether APS mode is selected as the power-up default. [0 = Enable / 1 = Disabled]
129*	F Paper Size Selection	Selects the "F" paper size. [0 ~ 2 / 0 / 1 step] 0: 8" x 13" 1: 8.5" x 13" 2: 8.25" x 13"
131*	Paper Size Type Selection	Selects the paper size (type) for both originals and copy paper. [0~2 / DIP SW setting / 1 step] 0: Japan 1: North America 2: Europe <i>After changing the setting, turn the copier off and on. If the paper size of the archive files stored on the HDD is different, abnormal copies could result. Ask the customer to restore the archive files.</i>
150*	By-Pass Long Paper Mode	Determines whether long paper can be fed from the by-pass tray. [0 = Off, 1 = On] <i>Normally the paper length from the by-pass tray is limited to 600 mm, but this can be extended with this SP to 1260 mm. Note that, with either setting, the image quality can only be guaranteed for 432 mm.</i>
212*	Page Stamp	
	3 Duplex Printout Right/Left Position	Determines how horizontal printing is executed during duplex printing. Set the upper right corner of the front side and the upper left corner of the back side so the starting points for horizontal printing are the same on both sides. DFU . [-10~+10 / 0 / 1 mm step] -10: Extreme right +10: Extreme left
	4* Duplex Printout High/Low Position	Determines how vertical printing is executed during duplex printing. Set the upper right corner of the front side and the upper left corner of the back side so the starting points for vertical printing are the same on both sides. DFU . [-10~+10 / 0 / 1 mm step] -10: Extreme top +10: Extreme bottom

5	Mode Number/Name		Function/[Setting]
302*	2*	Set Time Zone	Adjusts the RTC (real time clock) time setting for the local time zone. [-1440~+1440 / see below / 1 min./step] NA: -300 (New York) EU: +60 (Paris) Asia: +480 (Hong Kong) <i>Example: For Japan (+9 GMT), enter 540 (9 hours x 60 min.)</i>
305*	Auto Off Mode		Selects the auto off timer setting range. <i>When "1" is selected, the auto off timer range will be wider than the default timer range, and the user can disable the auto off timer. (In UP mode, the user will be able to select a time between 0 and 240 minutes.)</i> <i>When set to "0", the user cannot set the timer to zero.</i> [0 = On (Enabled), 1 = Off (Disabled)]
401*	Restricted Access Control		
	2	Copy Mode (Key counter)	Selects whether restricted access control is done when using the key counter in copy mode. <i>If this value is changed, the user tool setting is also changed.</i> [0 = No / 1 = Yes]
	3	Copy Mode (Other counters)	Japan only DFU [0 = No / 1 = Yes]
	12	Document Server (Key counter)	Selects whether restricted access control is done when using the key counter in document server mode. <i>If this value is changed, the user tool setting is also changed.</i> [0 = No / 1 = Yes]
	13	Document Server (Other counters)	Japan only DFU [0 = No / 1 = Yes]
	22	Fax Mode (Key counter)	Selects whether restricted access control is done when using the key counter in fax mode. <i>If this value is changed, the user tool setting is also changed.</i> [0 = No / 1 = Yes]
	23	Fax Mode (Other counters)	Japan only DFU [0 = No / 1 = Yes]
	32	Scanner Mode (Key counter)	Selects whether restricted access control is done when using the key counter in scanner mode. <i>If this value is changed, the user tool setting is also changed.</i> [0 = No / 1 = Yes]
	33	Scanner Mode (Other counters)	Japan only DFU [0 = No / 1 = Yes]
	42	Printer Mode (Key counter)	Selects whether restricted access control is done when using the key counter in printer mode. <i>If this value is changed, the user tool setting is also changed.</i> [0 = No / 1 = Yes]
	43	Printer Mode (Other counters)	Japan only DFU [0 = No / 1 = Yes]



5	Mode Number/Name	Function/[Setting]
501*	PM Alarm	
	1 Interval	Sets the PM interval. <i>The value stored in this SP is used when the value of SP5-501-2 is "1".</i> [0 ~ 255 / 0 / 1 k copies/step]
	2 Original Alarm	Japan only. DFU Selects whether the PM alarm for the number of scans is enabled or not. <i>If this is "1", the PM alarm function is enabled.</i> [0 = No / 1 = Yes]
504*	Jam Alarm Setting	Sets the alarm to sound for the specified jam level (document misfeeds are not included). Japan only DFU [0~3 / 3 / 1 step] 0: Zero (Off) 1: Low (2.5K jams) 2: Medium (3K jams) 3: High (6K jams)
505*	Error Alarm Setting	Sets the error alarm level. Japan only DFU [0~255 / 50 / 100 copies per step]
507*	Consumable Alarm	
	1 Paper	Switches the control call on/off for the paper supply. Japan only DFU 0: Off, 1: On 0: No alarm. 1: Sets the alarm to sound for the specified number transfer sheets for each paper size (A3, A4, B4, B5, DLT, LG, LT, HLT)
	2 Staple	Switches the control call on/off for the stapler installed in the finisher. Japan only DFU 0: Off, 1: On 0: No alarm 1: Alarm goes off for every 1K of staples used.
	3 Toner	Switches the control call on/off for the toner end. Japan only DFU 0: Off, 1: On If you select "1" the alarm will sound when the copier detects toner end.
	128*	The "Paper Supply Call Level: nn" SPs specify the paper control call interval for the referenced paper sizes. Japan only DFU [00250 ~ 10000 / 1000 / 1 Step]
	132*	
	133*	
	134*	
	141*	
	142*	
	160*	
	164*	
	166*	
	172*	

5	Mode Number/Name	Function/[Setting]
508*	CC Call	
	1	Remain of Jam (Unattended Jam) Switches the control call on/off for an unattended jam. Japan only DFU 0: Off, 1: On If you select "1", the alarm sound if a jam is left unattended for 15 minutes.
	2	Continuous Jam Occurrence Switches the control call on/off for the occurrence of consecutive jams. Japan only DFU 0: Off, 1: On If you select "1", the alarm will sound if 5 consecutive jams occur in the copier.
	3	Continuous Door Open Switches the control call on/off for the cover open alarm. Japan only DFU 0: Off, 1: On If you select "1", the alarm will sound if the door remains open for 15 minutes.
	4	New CC Call Mode Selects whether or not the new CC call. Japan only DFU 0: Previous Mode, 1: New Mode
	11	Time for Remain of Jam This SP is effective when the value of SP5-508-4 is "1". Japan only DFU [3 ~ 30 / 10 / 1 min/step]
	12	Number of continuos Jam This SP is effective when the value of SP5-508-4 is "1". Japan only DFU [2 ~ 10 / 5 / 1 time/step]
	13	Time of Continuous Door Open This SP is effective when the value of SP5-508-4 is "1". Japan only DFU [3 ~ 30 / 10 / 1 min/step]
	21	Remain of Jam Mode (Unattended Jam) This SP is effective when the value of SP5-508-4 is "1". Japan only DFU 0: Auto Call, 1: Alarm
	22	Continuous Jam Occurrence Mode This SP is effective when the value of SP5-508-4 is "1". Japan only DFU 0: Auto Call, 1: Alarm
	23	Continuous Door Open Mode This SP is effective when the value of SP5-508-4 is "1". Japan only DFU 0: Auto Call, 1: Alarm
801	Memory All Clear	Resets all correction data for process control and all software counters, and returns all modes and adjustments to their default values. (☛ 4.2.7). <i>To execute, hold down ① for over 3 seconds, and then turn the copier off and on again.</i> <i>Use this SP only after replacing the NVRAM, or after the copier has malfunctioned due to a damaged NVRAM.</i>
	1	All modules Initializes items 2 ~ 12 below.
	2	Engine Initializes all registration settings for the engine and processing settings.
	3	SCS (System Control Service)/SRAM Initializes default system settings, CSS settings, operation display coordinates, and ROM update information. SCS: System Control Service

5	Mode Number/Name		Function/[Setting]
801	4	IMH (Image Memory Handler)	Initializes the registration setting for the image memory handler.
	5	MCS (Memory Control Service)	Initializes the automatic delete time setting for stored documents.
	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 the off-hook timer.
	8	Printer application	Initializes the printer defaults, programs registered, the printer SP bit switches, and printer CSS counter.
	9	Scanner application	Initializes the scanner defaults for the scanner and all the scanner SP modes.
	10	Network application	Deletes the network file application management files and thumbnails, and initializes the job login ID.
	11	NCS (Network Control Service)	Initializes the system defaults and interface settings (IP addresses also), SmartNetMonitor for Admin, WebStatusMonitor settings, and the TELNET settings.
	12	R-FAX	Initializes the job login ID, SmartNetMonitor for Admin, job history, and local storage file numbers.
802	Free Run		Performs a free run for both the scanner and the printer. <i>After selecting "1", press "OK" or the (#) key twice to start this feature. Press the (C) (Clear/Stop) key to stop.</i> [0 = No / 1 = Yes]
803	Input Check		Displays signals received from sensors and switches. <i>Press the (E) (Clear Modes) key to exit the program.</i> (☛ 4.2.4)
804	Output Check		Turns on electrical components individually for test purposes. (☛ 4.2.5)
807*	Option Connection Check		
	1	ARDF	Checks the connectors to the optional peripheral devices. Execution will return either a "1" or "0": 1: Device connected correctly. 0: Device not connected correctly.
	2	Bank (Paper Tray Unit)	
	3	LCT	
	4	Finisher (1000-sheet, Two-Tray finisher)	
810	SC Code Reset		Resets all level A service call conditions, such as fusing errors. DFU To clear the service call, touch "Execute" on the LCD, then turn the main power switch off/on.
	1	Fusing SC	
811	Serial Number Input		Use to input the machine serial number. (This is normally done at the factory.) <i>This serial number will be printed on the SMC report.</i>

5	Mode Number/Name	Function/[Setting]	
812*	Telephone Number		
	1	Service Telephone	Use this to input the telephone number of the service representative (this is displayed when a service call condition occurs). <i>Press the  key if you need to input a pause (-). Press the  (Clear/Stop) key to delete the telephone number.</i>
	2	Facsimile	Use this to input the fax number which will be printed on the user counter report. <i>Press the  key if you need to input a pause (-). Press the  (Clear/Stop) key to delete the telephone number.</i>
	3	Consumable	Use this to input the telephone number that the customer uses to order toner (this is displayed in the inquiry menu of UP mode). <i>Press the  key if you need to input a pause (-). Press the  (Clear/Stop) key to delete the telephone number.</i>
816*	4	Sales Telephone	Use this to input the telephone number of the sales representative (this is displayed in the inquiry menu of UP mode). <i>Press the  key if you need to input a pause (-). Press the  (Clear/Stop) key to delete the telephone number.</i>
	CSS Function		This SP is for Japan only. DFU. [0 = No / 1 = Yes]
	821 CSS-PI Device Code		This SP is for Japan only. DFU. [0 = No / 1 = Yes]
	824 NVRAM Data Upload		Uploads the UP and SP mode data (except for counters and the serial number) from the NVRAM on the control board to a flash memory card. (☛ 4.2.8) <i>While using this SP mode, always keep the front cover open. This prevents a software module accessing the NVRAM during the upload.</i>
825	NVRAM Data Download		Downloads the content of a flash memory card to the NVRAM on the control board. (☛ 4.2.8) <i>While using this SP mode, always keep the front cover open. This prevents a software module accessing the NVRAM during the download. After executing this SP, switch the copier off and on.</i>
	828* Network Setting		
	25*	Software Switch	Sets the reference for the network software. [00000000~FFFFFFFFh / 00000000h / 1 hex unit step]
	26*	Network Operation Mode Setting	Sets the TCP operation mode for the network. [00000000~FFFFFFFFh / 00000000h / 1 hex unit step]
	27*	Network Syslog Server Address Setting	Sets the syslog server address for the network. [00000000~FFFFFFFFh / 7F000001h / 1 hex unit step]

5	Mode Number/Name		Function/[Setting]
828*	28*	Network Time Server Address Setting	Sets the time server address for the network. [00000000~FFFFFFFFh / 00000000h / 1 hex unit step]
	29*	Network DNS Server Address Setting	Sets the DNS server address for the network. [00000000~FFFFFFFFh / 00000000h / 1 hex unit step]
	30*	Network Directprint Port Number Setting	Sets the directprint port number for the network. [1024~65535 / 9100 / 1 step]
	31*	Network IPP Timeout Setting	Sets the IPP timeout for the network. [30~65535 / 900 / 1 step]
	32	Network IPX Address Setting (NetWare)	Sets the IPX Address.
	33*	Network Remote Printer Number Setting (NetWare)	Sets the remote printer number for the network. [0~254 / 0 / 1 step]
	34*	Network Software Switch Setting (NetWare)	Sets the software switch for the network. [0000~FFFFh / 0003h / 1 hex unit step]
	35*	Network Transport Protocol of Print Server Setting (NetWare)	Sets the transport protocol of the print server for the network. 0000h: TCP & IPX 0100h: TCP & IPX (Priority: IPX) 0102h: TCP Only (Priority: TCP) 0001h: IPX Only
	36	Network AppleTalk Module Setting	Sets the AppleTalk module for the network. DFU 2: EtherTalk Phase2
	37	Network NetNo Setting (AppleTalk)	Sets the NetNo of the AppleTalk network.
	38	Network Object Name Setting (AppleTalk)	Sets the object name of the AppleTalk network.
	39*	Network AppleTalk Type Setting	Sets the AppleTalk type for the network.
	40	Network Working Zone Setting (AppleTalk)	Sets the AppleTalk working zone for the network.
	47*	Network Job Analysis Timeout Setting (Centronics)	Sets the Centronics job analysis timeout for the network. [0~43200 s / 3 s / 1 sec. step]
	48*	Network Job Timeout Setting (Centronics)	Sets the Centronics job timeout for the network. [0~43200 s / 0 s / 1 sec. step]
	49*	Network Noise Cancel Setting (Centronics)	Sets the noise cancel level for the network. [4~7 / 4 / 1 clock per step]
	50*	Network 1284 Compatibility Setting (Centronics)	Switches Centronics IEEE1284 compatibility on/off for the network. 0: Disabled, 1: Enabled <i>Selecting "0" disables bi-directional data transmission.</i>
	51*	Network Data Transfer Speed Setting (Centronics)	Sets the Centronics transfer speed for the network. 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>
	52*	Network ECP Setting (Centronics)	Switches the ECP setting for Centronics off/on. 0: Disabled, 1: Enabled <i>With "1" selected, SP5-828-050 must be enabled for 1284 mode compatibility.</i>

5		Mode Number/Name	Function/[Setting]
828*	53*	Network Transmission Speed Setting	Selects the Ethernet transmission speed. [0x00~0x03 / 0x00 / 0x01 step]
			Bit1 Bit2 Speed
			0 0 Auto Sense
			0 1 10Base-T
			1 0 100Base-Tx
		1 1 Auto	
833*	Job Log Transfer On/Off Setting		
	7		Switches the job log transfer on/off for Poplar server. DFU 0: Off (disable), 1: On (enable)
834	Enable Operation Panel Image Settings		Enables and disables the operation panel read (dump) feature. After powering on the machine, set this option to 1 to enable this feature. 0: Off (disable), 1: On (enable)_DFU <i>To reset the machine to 0, the machine must be turned off and on again. Selecting 0 for this option without cycling the power off and on does not restore the default setting (0).</i>
841*	Consumable Name		
			Inputs the toner type (this is displayed in the inquiry menu of UP mode).
907*	Plug & Play Setting		
			Sets the brand name and the production name for Windows Plug & Play. This information is stored in NVRAM. If the NVRAM is defective or has been replaced, these names should be registered again. <i>To set the plug and play model name, enter the model number, and then press (#).</i>
908*	LCT Paper Size		
			Selects the paper size for the LCT. <i>Use this SP after changing the paper size in the optional LCT (i.e., after changing the side plate position for the LCT).</i> [0 = A4 (Eur./Asia model) / 1 = LT (American model)]
912*	PCU Alarm Setting		
	1	Display	Selects whether the PCU alarm message (Change Photoconductor Unit) blinks when the PCU alarm interval expires. <i>When installing the machine, if the customer requires that the PCU alarm message blink, select "1". If set to "0", there will be no message.</i> [0 = No / 1 = Yes]
	2	Interval	Sets the PCU alarm interval. <i>When the machine reaches this value, the PCU alarm will be displayed on the LCD to inform the user. Only used if SP5-912-1 is at "1".</i> [1 ~ 255 / 60 / 1 k copies/step]



Service Tables

5	Mode Number/Name	Function/[Setting]	
914*	Application Counter Display		
	1 2	Printer Copy	
		Selects whether the total counters for printer mode and/or copy mode are displayed in user tool mode. [0 = No / 1 = Yes]	
915*	Mechanical Counter Detection		
		Checks whether the mechanical counter inside the inner cover is connected or not. Display: 0: Not detected 1: Detected 2: Unknown	
918*	A3/DLT Counter Display		
		Displays the counter, which counts A3/DLT as double. 0 = No , 1 = Yes <i>The A3/DLT counter counts up twice when an A3 or DLT sheet is fed out.</i>	
921*	Fan Control Time		
		Adjusts the exhaust fan motor control time. 1. After the machine has entered energy saver mode or stand-by mode, the machine slows the fan speed after this time runs out. 2. After the machine has entered the auto off mode or an error condition, the machine stops the fan after this time runs out. [30 ~ 120 / 30 s / 1 s/step]	
923*	Border Erase Area Change		
		Toggles between two settings that affect the appearance of the pages for border removal and printed facing pages: (1) Using the original area as the allotted area, or (2) Using only the copy paper as the allotted area. [0 = Original base , 1 = Copy base] 0: Original area used as base 1: Copy used as the base	
958*	Feed Clutch Start Timing Adjustment		
		Adjusts the clutch timing to optimize the intervals between fed sheets to reduce jams in the feed unit. [35 ~ 57.5 / 42.5 / 2.5mm]	
970*	Debug Serial Output		
		DFU [0 = No, 1 = Yes]	
972	Test Suite Setting		
	1*	GWIPC Logging	
			DFU [0 = Off, 1 = On]
	3*	Key Monitor	
			DFU [0 = Off, 1 = On]
	4	Key Monitor - Record	
		DFU [0 = Off, 1 = On]	
5	Key Monitor - Play		
		DFU [0 = Off, 1 = On]	
6*	Key Monitor – Play Check		
		DFU [0 = Off, 1 = On]	

5	Mode Number/Name		Function/[Setting]
972	7*	Key Monitor – Min. Time	DFU [0 ~ 255 / 0 / 0.1 s/step]
	8*	Key Monitor – Max Time	DFU [0 ~ 255 / 100 / 0.1 s/step]
	9	Key Monitor – Play Speed	DFU [0.01 ~ 100 / 100 / 0.01 s/step]
	10	Key Monitor – Repeat Time	DFU [1 ~ 65535 / 1 / 1 step]
	11	Key Monitor – Log No.	DFU
	12	Key Monitor – Play File No.	DFU
	13	Key Monitor File No.	DFU
974*	Cherry Server Selection		Switches writing between the Scan Router V2 Lite application provided and the optional full version. 0: Lite, 1: Full
990	SMC Printing		Prints all of the system parameter lists for the item selected. (☛ 4.2.6) Input the number for the item that you want to print, then press “Execute” on the touch panel.
	1	All (Data List)	
	2	SP (Mode Data List)	
	3	User Program	
	4	Logging Data	
	5	Diagnosis Report	
	7	NIB Summary	
	21	Copier User Program	
	22	Scanner SP	
23	Scanner User Program		

SP6-XXX: Peripherals

6	Mode Number/Name		Function/[Setting]
006*	ADF Registration		
	1	Side-to-Side	Adjusts the registration in ADF mode. <i>Use the  key to toggle between + and - before entering the value. See “Replacement and Adjustment - Copy Adjustment” for details.</i> [-5.0 ~ +5.0 / 0.0 / 0.1 mm/step]
	2	Leading Edge	[-5.0 ~ +5.0 / 0.0 / 0.1 mm/step]
	3	Trailing Edge Erase	Adjusts the trailing edge erase margin in ADF mode. <i>Use the  key to toggle between + and - before entering the value. See “Replacement and Adjustment - Copy Adjustment” for details.</i> [-5.0 ~ +5.0 / -1.0 / 0.1 mm/step]
4	Side-to-Side/Rear	Adjusts the side-to-side registration on the rear side of the original in ADF mode. <i>Use the  key to toggle between + and - before entering the value. See “Replacement and Adjustment - Copy Adjustment” for details.</i> [-5.0 ~ +5.0 / 0.0 / 0.1 mm/step]	

6	Mode Number/Name	Function/[Setting]
006*	5 Sub Scan Magnification	Adjusts the sub scan magnification in ADF mode. <i>Use the \odot key to toggle between + and - before entering the value. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [-5.0 ~ +5.0 / 0.0 / 0.1 % step]
	6 Skew Correction	Selects whether or not skew correction is done in ADF mode. 0 = Off, 1 = On
	7 Original Buckle Adjustment	Adjusts the amount of original buckle at the ARDF registration roller when the ARDF feeds the rear side of the original. <i>This SP is effective only when SP6-006-6 is at "1".</i> <i>Use the \odot key to toggle between + and - before entering the value. See "Replacement and Adjustment - Copy Adjustment" for details.</i> [-5.0 ~ +5.0 / 0.0 / 0.1 mm/step]
007	ADF Input Check	Displays the signals received from sensors and switches of the ARDF. (☛ 4.2.4)
008	ADF Output Check	Switches on each electrical component (ARDF motor, solenoid, etc.) of the ARDF for testing. (☛ 4.2.5) Press $\textcircled{1}$ to switch on or $\textcircled{0}$ to switch off.
009	ADF Free Run	Performs an ARDF free run in duplex mode. Press $\textcircled{1}$ to start. 1: To Start, 0: To cancel This is a general free run controlled from the copier. For more detailed free run modes, see the ARDF manual.
010*	Stamp Position Adjustment	Adjusts the stamp position in the sub-scan direction in fax mode. [-5.0 ~ +5.0 / 0 / 1 mm/step]
016*	ADF Original Size Detection	Selects whether the machine determines that the original is A4/LT, or 8K/16K when the APS sensor in the ADF does not detect the original size. 8K/16K is not available for 115V machines. [0 = Normal (LT for USA models, A4 for Europe/Asia models) 1 = Reversed [A4 for USA models, LT for Europe/Asia models] 2 = 8K/16K]
117	Finisher Input Check	Displays the signals received from sensors and switches in the finisher. (☛ 4.2.4)
118	Finisher Output Check	Switches on each electrical component of the finisher for testing. (☛ 4.2.5) Press $\textcircled{1}$ to switch on or $\textcircled{0}$ to switch off.

6	Mode Number/Name	Function/[Setting]	
901	ADF APS Data Display		
		Displays the status of the original size sensors in the ADF. (☛ 4.2.10)	
910*	ADF Shading Interval Time		
		Adjusts the interval for shading processing in DF mode. <i>Light and heat may affect the scanner response. If copy quality indicates that white level is drifting during a DF copy job, reduce this setting.</i> [0 ~ 120 / 20s / 1s/step]	
920	ADF Loop Back Test		
	1	DF GATE	DFU 0 = Gate, 1 = Asart
	2	DF TXD Break	DFU 0 = Off, 1 = On
	3	Serial Communication	DFU 0 = NG, 1 = OK
	4	Original Set	DFU 0 = Off, 1 = On
	5	Serial Check	DFU
925	Finisher/Duplex loop Back Test		
	1	Loop Back Test	DFU
	2	Result	DFU

Service Tables

SP7-XXX: Data Log

7	Mode Number/Name	Function/[Setting]	
001*	Main Motor Operation Time		
		The number of prints and drive time for drum revolutions can be obtained by counting the main motor revolution time. If the amount of the time required for the drum to revolve to print 1 copy increases, this data combined with the number of copies can be used to analyze problems and could be useful for future product development. Display: 00000000~99999999 min.	
002*	Total Original Counter		
	1	All Modes	Select a number to display the total original count (number of originals fed) for the selected item.
	2	Copier	
	3	Fax	
	4	Document Box	
	5	Scanner	
6	Others		
003*	Total Print Counter		
	1	All Modes	Select a number to display the total print count for the selected item.
	2	Copier	
	3	Fax	

7	Mode Number/Name		Function/[Setting]
003*	4	Printer	Select a number to display the total print count for the selected item.
	5	Others	
006*	C/O, P/O Counters		Displays the number of copies per original when making more than 10 copies. <i>For example, if you make 15 copies of a 3 page original document, for a total of 45 sheets, then the counter would be 15 (5 copies counted from 11 to 15 x 3 originals). No count will be returned for 1~10 copies of an original.</i>
	1	C/O Counter	
	2	P/O Counter	
007*	Other Counter		Displays the count total for the selected item.
	1	Duplex Counter	
	2	A3/DLT Counter	
	3	Staple Counter	
	4	Scan Counter	
101*	Copy Counter - Paper Size		Displays the total number of copies by paper size.
	5	A4 H (Sideways)	
	6	A5 H (Sideways)	
	14	B5 H (Sideways)	
	38	LT H (Sideways)	
	44	HLT H (Sideways)	
	132	A3 V (Lengthwise)	
	133	A4 V (Lengthwise)	
	134	A5 V (Lengthwise)	
	141	B4 V (Lengthwise)	
	142	B5 V (Lengthwise)	
	160	DLT V (Lengthwise)	
	164	LG V (Lengthwise)	
	166	LT V (Lengthwise)	
	172	HLT V (Lengthwise)	
255	Others		
201*	Total Scan Counter		Displays the total number of scanned originals.
204*	Copy Counter - Paper Tray		Displays the total number of copies fed from each paper feed station.
	1	1st	
	2	2nd	
	3	3rd	
	4	4th	
	5	LCT	
	6	By-pass	
205*	Total ADF Counter		Displays the total number of originals fed by the ADF.
206*	Staple Counter		Display the total number of staples fired. DFU
	1	Normal	
	2	Booklet	
209*	Punch Counter		Displays the total times the punch has fired. DFU

7	Mode Number/Name	Function/[Setting]
301*	Copy Counter - Mag. 1 25% ~ 49% 2 50% ~ 99% 3 Full Size 4 101% ~ 200% 5 201% ~ 400% 6 Direct Mag. 7 Direct Size Mag. 8 Auto Reduce/Enlarge	Displays the total number of copies by reproduction ratio and magnification.
304*	Copy Counter - Copy Mode 1 Text Mode 2 Text/Photo Mode 3 Photo Mode 4 Generation Mode 5 Pale Mode 6 Punch 7 Repeat 8 Sort 9 Staple 10 Series 11 Erase 12 Duplex 13 ADF 14 Double Copy 15 Duplex Original 16 Interrupt Copy 17 Combine 1 Side 18 Combine 2 Side 19 Booklet 20 Magazine 21 Batch 22 SADF 23 Mixed Sizes 24 Stamp 25 Cover Page/Chapter Page 26 Slip Sheet	Displays the total number of copies by copy mode.
305*	Copy Counter – Set Number 1 1 to 1 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	Displays the total number of prints for multiple copy jobs.

Service Tables

7	Mode Number/Name	Function/[Setting]	
306*	Job Counter – Copy Mode		
	1	Sort	Displays the total number of prints based on the job mode.
	2	Staple	
	3	Punch	
	4	Reserve Copy	
5	Check Copy		
320*	Document Server - Scanning Counter		
			Displays the original count stored on the document server.
321*	Document Server: Each Size of Originals		
	4	A3	Displays the number of originals by paper size scanned at the copy server.
	5	A4	
	6	A5	
	13	B4	
	14	B5	
	32	DLT	
	36	LG	
	38	LT	
	44	HLT	
128	Others		
323*	Document Server: Each Size of Printouts		
	5	A4 (S)	Displays the number of prints by paper size.
	6	A5 (S)	
	14	B5 (S)	
	38	LT (S)	
	44	HLT (S)	
	128	Other	
	132	A3 (L)	
	133	A4 (L)	
	134	A5 (L)	
	141	B4 (L)	
	142	B5 (L)	
	160	DLT (L)	
	164	LG (L)	
166	LT (L)		
172	HLT (L)		
324*	Document Server - Print Job Counter		
	1	Duplex	Displays the number of jobs classed by job content.
	2	Sort	
	3	Staple	
	4	Punch	
5	Check Copy		
324*	6	Print 1st Page	Displays the number of jobs classed by job content.
325*	Document Server: Job Counter – Page Number		
	1	1-page	Displays the number of print jobs classed by size of the job.
	2	2-pages	
	3	3~5 pages	
	4	6~10 pages	
	5	over 11 pages	

7	Mode Number/Name	Function/[Setting]	
326*	Document Server: Job Counter – File Number		
	1	1 file	Displays the number of print jobs classed by the number of files.
	2	2~5 files	
	3	6~10 files	
	4	over 11 files	
327*	Document Server: Job Counter – Set Number		
	1	1 to 1	Displays the number of print jobs classed by the set sizes.
	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*	Document Server: Print Counter – Print Mode		
	6	Punch	Displays the number of prints by mode.
	8	Sort	
	9	Staple	
	12	Duplex	
	19	Booklet	
	20	Magazine	
	24	Stamp	
	25	Cover/Chapter Page	
26	Slip Sheet		
401*	Total SC Counter		
		Displays the total number of service calls that have occurred.	
403*	SC History		
	1	Latest	Displays the most recent 10 service calls.
	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		
502*	Total Paper Jam Counter		
		Displays the total number of paper jams.	
503*	Total Original Jam Counter		
		Displays the total number of original jams.	

Service Tables



7	Mode Number/Name	Function/[Setting]
504*	Total Jams by Location	
	Paper Late Error No.	Paper Lag Error No. Displays the total number of paper jams by location. A "Paper Late" error occurs when the paper fails to activate the sensor at the precise time. A "Paper Lag" paper jam occurs when the paper remains at the sensor for longer than the prescribed time.
	1	At power on
	3	Upper relay sensor
	4	Lower relay sensor
	5	Vertical transport sensor (optional bank)
	6	Relay sensor (optional LCT)
	11	Registration sensor
	12	62 Paper exit sensor
	13	63 Bridge relay sensor
	14	64 Bridge exit sensor
	15	65 Duplex entrance sensor
	16	66 Duplex exit sensor
	17	67 1 bin tray exit sensor
	20	Finisher entrance sensor
	21	Finisher shift tray exit sensor
	23	Finisher staple tray paper sensor
	24	Finisher stack feed-out belt HP sensor
	By error	
	26	Finisher paper taking out
	27	Finisher drive error
	28	Finisher tray lift error
	29	Finisher jogger drive error
	30	Finisher tray shift drive error
	31	Finisher stapler error
	32	Finisher stack-feed out error
	33	Finisher feed out error
	34	Finisher no response
505*	Total Original Jam by Location	
	Displays the total number of original jams by location. These jams occur when the original does not activate the sensors. A "Paper Late" error occurs when the paper fails to activate the sensor at the precise time. A "Paper Lag" paper jam occurs when the paper remains at the sensor for longer than the prescribed time.	
	1	
	Paper Late Error No.	Paper Lag Error No.
	5	55 Registration Sensor
	6	56 Relay Sensor
	7	57 Inverter Sensor



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Service Tables

7	Mode Number/Name	Function/[Setting]
801	ROM No./Firmware Version	Displays the ROM number and firmware version numbers.
803*	PM Counter Display	Displays the PM counter since the last PM.
804	PM Counter Resets	Resets the PM counter. To reset, press Execute on the touch panel.
807	SC/Jam Counter Reset	Resets the SC and jam counters. To reset, press Execute on the touch panel. This SP does not reset the jam history counters: SP7-507, SP7-508.
808	Resets Counters	Resets all counters except SP7-003-***, SP7-006-*** and SP7-007-***. To reset, press Execute on the touch panel.
810	Key Operator Code Reset	Use to clear the key operator code if the key operator forgets the code. After clearing the code is reset for Null and the password entry display does not open. To clear, press Execute on the touch panel.
811	Original Count Clear	Clears the original total display, displayed with SP7-002-***. To clear, press Execute on the touch panel.
816	Print Counter Reset	Resets the total copy count by paper tray. To reset, press Execute on the touch panel. Use these SP modes when replacing the pick-up, feed, and separation rollers.
	1 Tray1	
	2 Tray2	
	3 Tray3	
	4 Tray4	
	5 LCT	
	6 By-pass	
822	Copy Counter Reset Magnification	Resets all counters of SP7-301 (Copy Count: Magnification). To reset, press Execute on the touch panel.
825	Total Counter Reset	Resets all electronic counters. To reset, press Execute on the touch panel. <i>Usually, this SP mode is done at installation. This SP mode is effective only once, when the counter has a negative value.</i>
826	MF Device Error Count	
	1 Error Count	Japan only DFU
	2 Staple Error Count	Japan only DFU
827	MF Device Error Count Clear	Japan only DFU



7	Mode Number/Name	Function/[Setting]	
832	Self-Diagnosis Result Display	Execute to open the "Self-Diagnostics Result Display" to view details about errors. Use the keys in the display on the touch-panel to scroll through all the information. If no errors have occurred, you will see the "No Error" message on the screen.	
904	Copy Counter Reset: Copy Mode	Resets all counters for SP7-301, SP7-304. To reset, press Execute on the touch panel.	
905	Job Counter Reset: Set Number	Resets all counters for SP7-305. To reset, press Execute on the touch panel.	
907	Job Counter Reset: Copy Mode	Resets all counters for SP7-306. To reset, press Execute on the touch panel.	
909	PCU Counter Display	Displays the value of the PCU counter (number of copies since the last PCU change).	
920	Document Server: Scan Storage Reset	Clears the count for SP7-320. To reset, press Execute on the touch panel.	
921	Document Server: Original Counter Reset	Clears the counters for SP7-321. To reset, press Execute on the touch panel.	
923	Document Server: Print Counter Reset by Size	Clears the counters for SP7-323. To reset, press Execute on the touch panel.	
924	Document Server: Print Job Counter Reset	Clears the counters for SP7-324. To reset, press Execute on the touch panel.	
925	Document Server: Job Counter Reset – Page Number	Clears the counters for SP7-325. To reset, press Execute on the touch panel.	
926	Document Server: Job Count Reset – File Number	Clears the counters for SP7-326. To reset, press Execute on the touch panel.	
927	Document Server: Job Counter Reset – Set Number	Clears the counters for SP7-327. To reset, press Execute on the touch panel.	
928	Document Server: Print Count Reset – Print Mode	Clears the counters for SP7-328. To reset, press Execute on the touch panel.	
930	Copy Document Server: All Counter Clear	Execute this SP to clear the following SP modes:	
		SP7-301	Copy Count: Magnification
		SP7-304	Copy Count: Copy Mode
		SP7-305	Copy Counter: Copy Mode
		SP7-306	Job Counter: Copy Mode
		SP7-320	Doc. Server: Scan Storage
		SP7-321	Doc. Server: Original Counter
SP7-323	Doc. Server: Paper Size Counter		

Service Tables

7	Mode Number/Name	Function/[Setting]	
930		SP7-324	Document Server: Job Counter
		SP7-325	Doc. Server: Job Counter – Page No.
		SP7-326	Doc. Server: Job Counter – File No.
		SP7-327	Doc. Server: Job Counter – Set No.
		SP7-328	Doc. Server: Count by Mode

SP9-XXX: Debug/Testing

9	Mode Number/Name	Function/[Setting]
913*	2nd Paper Feed Amount	Adjusts the amount of paper feed from the 2nd paper tray. Set a larger value when noise occurs during paper feed from the 2nd tray. [0 ~ 99.9 / 60.0 / 0.1 mm/step]

4.2.3 TEST PATTERN PRINTING (SP2-902-3)

NOTE: Always print a test pattern to confirm correct operation of the machine.

1. Enter the SP mode and select SP2-902-3.
2. Press $\text{\textcircled{3}}$.
3. Enter the number for the test pattern that you want to print and press $\text{\textcircled{\#}}$. (See the tables below.)
4. When you are prompted to confirm your selection, press Yes. This selects the test pattern for printing.
5. Press Copy Window to open the copy window and then select the settings for the test print (paper size, etc.)
6. Press Start $\text{\textcircled{\text{D}}}$ twice. (Ignore the "Place Original" messages) to start the test print.
7. Press SP Mode (highlighted) to return to the SP mode display.

No.	Test Pattern	No.	Test Pattern
0	None	15	Grayscale (Grid)
1	Vertical Line (1-dot)	16	Grayscale with White Line (Horizontal)
2	Horizontal Line (1-dot)	17	Grayscale with White Line (Vertical)
3	Vertical Line (2-dot)	18	Grayscale with White Line (Vertical /Horizontal)
4	Horizontal Line (2 dot)	23	P Pattern
5	Grid Pattern (1-dot)	31	Grayscale (Horizontal, 8bit, Odd)
6	Grid Pattern (1-dot pair)	32	Grayscale (Vertical, 8bit, Odd)
7	Alternating Dot Pattern	33	Grayscale with White Line (Horizontal 8bit, Odd)
8	Full Dot Pattern	34	Grayscale with White Line (Vertical 8bit, Odd)
9	Black band	35	Grayscale (Horizontal, 8bit, Even)
10	Trimming Area	36	Grayscale (Vertical, 8bit, Even)
11	Argyle Pattern	37	Grayscale with White Line (Horizontal 8bit, Even)
12	Grayscale (Horizontal)	38	Grayscale with White Line (Vertical 8bit, Even)
13	Grayscale (Vertical)	40	Grid (1-dot pair) (OR Outside Data 1)
14	Grayscale (Vertical/Horizontal)	41	Trimming Area (OR Outside Data)



4.2.4 INPUT CHECK

Main Machine Input Check (SP5-803)

1. Enter the SP mode and select SP5-803.
2. Enter the number (1 – 11) for the item that you want to check. A small box will be displayed on the SP mode screen with a series of 0's and 1's. The meaning of the display is as follows.

0 0 0 0 0 0 0 0

Bit 7 6 5 4 3 2 1 0

3. Check the status of each item against the corresponding bit numbers listed in the table below.

Number	Bit	Description	Reading	
			0	1
1	7	Paper Height Sensor 2 (2nd Tray)	Activated	Deactivated
	6	Paper Height Sensor 1 (2nd Tray)	Activated	Deactivated
	5	Paper Height Sensor 2 (1st Tray)	Activated	Deactivated
	4	Paper Height Sensor 1 (1st Tray)	Activated	Deactivated
	3	Paper End Sensor (2nd Tray)	Paper End	Paper is present
	2	Upper Relay Sensor	Activated	Deactivated
	1	Lower Right Cover Open	Closed	Open
	0	Not used		
2	7	Paper Exit Sensor	Activated	Deactivated
	6	Fusing Unit	Unit Set	Unit not set
	5	PCU Set	Activated	Deactivated
	4	New PCU Sensor	Activated	Deactivated
	3	Interchange Exit Sensor	Activated	Deactivated
	2	1 bin Tray Unit Set	Unit Set	Unit not set
	1	1 bin Tray Paper Sensor	Activated	Deactivated
	0	Interchange Unit Set	Unit Set	Unit not set
3	7	Bridge Exit Sensor	Activated	Deactivated
	6	Not used		
	5	Bridge Paper Sensor	Activated	Deactivated
	4	Bridge Right Guide Switch	Activated	Deactivated
	3	Bridge Left Guide Switch	Activated	Deactivated
	2	Bridge Unit Set	Unit Set	Unit not set
	1	Bridge Fan Motor Lock	Locked	Unlocked
	0	Shift Tray Unit Set	Unit Set	Unit not set

Number	Bit	Description	Reading	
			0	1
4	7	Wake up Signal	Not detected	Detected
	6	Lower Relay Sensor	Activated	Deactivated
	5	Vertical Transport Sensor (Optional paper tray unit)	Activated	Deactivated
	4	3rd Tray Paper Size	Activated	Deactivated
	3	4th Tray Paper Size	Activated	Deactivated
	2	Motor Lock (Optional paper tray unit)	Not locked	Locked
	1	Height Sensor (Optional paper tray unit)	Activated	Deactivated
	0	Unit Set (Optional paper tray unit)	Unit set	Unit not set
5	7	Fusing Drive Release Solenoid	Activated	Deactivated
	6	Main Motor Brake Signal	Not active	Active
	5	Main Motor On Signal	Activated	Deactivated
	4	Main Motor Rotation Direction Signal	Not active	Active
	3	3rd Paper End Sensor	Paper End	Paper is present
	2	4th Paper End Sensor	Paper End	Paper is present
	1	3rd Paper Height Sensor	Deactivated	Activated
	0	4th Paper Height Sensor	Deactivated	Activated
6	7	Duplex Unit Set	Unit set	Unit not set
	6	Total Counter	Not detected	Detected
	5	By-pass Tray Unit Set	Detected	Not detected
	4	By-pass Paper End Sensor	Paper End	Paper is present
	3	By-pass Paper Size 2	Activated	Deactivated
	2	By-pass Paper Size 1	Activated	Deactivated
	1	By-pass Paper Size 4	Activated	Deactivated
	0	By-pass Paper Size 3	Activated	Deactivated
7	7	Not Used		
	6	Not Used		
	5	Not Used		
	4	Not Used		
	3	Key Counter Set	Detected	Not detected
	2	Key Card Set	Detected	Not detected
	1	Polygon Motor Ready Signal	Ready	Not ready
	0	Not Used		

Service Tables

Number	Bit	Description	Reading	
			0	1
8	7	Dip Switch - 4	On	Off
	6	Dip Switch - 3	Off	On
	5	Dip Switch - 2	Off	On
	4	Dip Switch - 1	Off	On
	3	Not Used		
	2	Front Safety Sw – 5V	On	Off
	1	Front Safety Sw – 24V	Off	On
	0	Main Motor Ready Signal	Ready	Not ready
9	7	Not used		
	6	Relay Off Signal	Not detected	Detected
	5	Toner Bottle Motor Lock	Locked	Not locked
	4	Right Cover Open	Closed	Open
	3	Registration Sensor	Activated	Deactivated
	2	Exhaust Fan Lock	Not locked	Locked
	1	Interchange Cover Open	Closed	Open
	0	Paper Overflow Sensor	Activated	Deactivated
10	7	Not Used		
	8	Not Used		
	5	Not Used		
	4	Upper Relay Sensor	Activated	Deactivated
	3	1st Paper End	Paper End	Paper is present
	2	2nd Paper Lift Sensor	Activated	Deactivated
	1	1st Paper Lift Sensor	Activated	Deactivated
	0	Not Used		
11	7	2nd Paper Size 1	Activated	Deactivated
	6	2nd Paper Size 2	Activated	Deactivated
	5	2nd Paper Size 3	Activated	Deactivated
	4	2nd Paper Size 4	Activated	Deactivated
	3	1st Paper Size 1	Activated	Deactivated
	2	1st Paper Size 2	Activated	Deactivated
	1	1st Paper Size 3	Activated	Deactivated
	0	1st Paper Size 4	Activated	Deactivated

NOTE: Numbers 12 to 14 are not used for this machine.

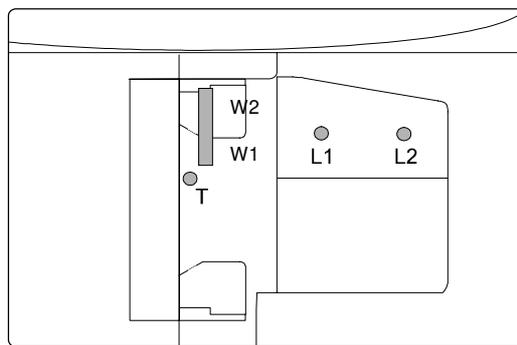
ARDF Input Check (SP6-007)

1. Enter the SP mode and select SP6-007.
2. Enter the number (1 – 11) for the item that you want to check. A small box will be displayed on the SP mode screen with a series of 0's and 1's, as shown below. However, only bit 0 at the right side of the screen is valid.

0 0 0 0 0 0 0 0

Bit 7 6 5 4 3 2 1 0

3. Check the status of bit 0 for the required item listed in the table below.



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**Service
Tables**

No..	Description	Reading	
		0	1
1	Original set sensor	Paper not detected	Paper detected
2	Original width sensor 1 (W1)	Paper not detected	Paper detected
3	Original width sensor 2 (W2)	Paper not detected	Paper detected
4	Original length sensor 1 (L1)	Paper not detected	Paper detected
5	Original length sensor 2 (L2)	Paper not detected	Paper detected
6	Original trailing edge sensor	Paper not detected	Paper detected
7	ADF cover sensor	Cover closed	Cover opened
8	DF position sensor	ADF closed	ADF opened
9	Registration sensor	Paper not detected	Paper detected
10	Exit sensor	Paper not detected	Paper detected
11	Inverter sensor	Paper not detected	Paper detected

Finisher Input Check (SP6-117)

1. Enter the SP mode and select SP6-117.
2. Enter the number (1 – 4) for the item that you want to check. A small box will be displayed on the SP mode screen with a series of 0's and 1's. The meaning of the display is as follows.

0 0 0 0 0 0 0

Bit 7 6 5 4 3 2 1 0

3. Check the status of each item against the corresponding bit numbers listed in the table below.

For 1000-sheet Finisher

Number	Bit	Description	Reading	
			0	1
1	7	Stack Feed-out Belt HP Sensor	Activated	Deactivated
	6	Not Used		
	5	Jogger Fence HP Sensor	Activated	Deactivated
	4	Stapler HP Sensor	Activated	Deactivated
	3	Stapler Tray Entrance Sensor	Activated	Deactivated
	2	Not Used		
	1	Lower Tray Exit Sensor	Activated	Deactivated
	0	Entrance Sensor	Activated	Deactivated
2	7	Not Used		
	6	Not Used		
	5	Stapler Ready Signal	Activated	Deactivated
	4	Not Used		
	3	Not Used		
	2	Staple Sensor	Activated	Deactivated
	1	Staple Hammer HP Sensor	Activated	Deactivated
	0	Stapler Tray Paper Sensor	Activated	Deactivated
3	7	Not Used		
	6	Lower Tray Lower Limit Sensor	Activated	Deactivated
	5	Not used		
	4	Stack Height Sensor	Activated	Deactivated
	3	Not Used		
	2	Not Used		
	1	Shift HP Sensor	Activated	Deactivated
	0	Exit Guide HP Sensor	Activated	Deactivated

Number	Bit	Description	Reading	
			0	1
3	7	Not Used		
	6	Not Used		
	5	Not Used		
	4	Not Used		
	3	Upper Tray Paper Limit Sensor	Activated	Deactivated
	2	Not Used		
	1	Not Used		
	0	Not Used		

For 500-sheet Finisher

Number	Bit	Description	Reading	
			0	1
1	7	Stack Near-limit Sensor	Activated	Deactivated
	6	Tray Upper Limit Sensor	Activated	Deactivated
	5	Lever Sensor	Activated	Deactivated
	4	Stack Height Sensor	Activated	Deactivated
	3	Top Cover Sensor	Closed	Opened
	2	Jogger HP Sensor	Activated	Deactivated
	1	Exit Sensor	Activated	Deactivated
	0	Entrance Sensor	Activated	Deactivated
2	7	Not Used		
	6	Not Used		
	5	Not Used		
	4	Staple Unit Lock	Locked	Not Locked
	3	Staple Cartridge Sensor	Activated	Deactivated
	2	Staple End Sensor	Activated	Deactivated
	1	Staple Hammer HP Sensor	Activated	Deactivated
	0	Staple Unit Cover Switch	Closed	Opened

Service
Tables

4.2.5 OUTPUT CHECK

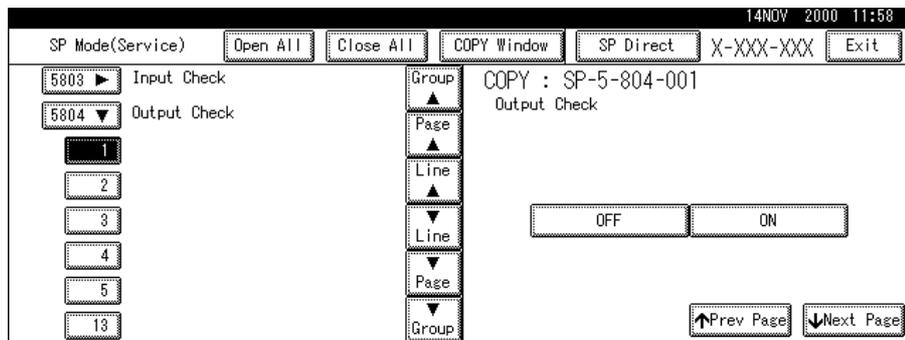
NOTE: Motors keep turning in this mode regardless of upper or lower limit sensor signals. To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

Main Machine Output Check (SP5-804)

1. Open SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table on the next page.)

3. Press On then press Off to test the selected item.

NOTE: You cannot exit and close this display until you press off to switch off the output check currently executing. Do not keep an electrical component switched on for a long time.



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Output Check Table

NOTE: Pull out the tray before performing the output checks 25, 26, 29, and 30.

Number	Description
0	Not used
1	Main motor (forward)
2	Main motor (Reverse) Do not use
3	Registration clutch
4	Not used
5	Toner supply motor
6	Exhaust fan (High Speed)
7	Exhaust fan (Low Speed)
8	By-pass feed clutch
9	Upper paper feed clutch
10	Lower paper feed clutch
11	Upper paper lift motor (Up)
12	Upper paper lift motor (Down)
13	Lower paper lift motor (Up)

Number	Description
14	Lower paper lift motor (Down)
15	Upper relay clutch
16	Lower relay clutch
17	Fusing drive release solenoid
18 ~ 20	Not Used
21	Relay clutch (Optional paper tray unit)
22	Upper paper feed clutch (Optional paper tray unit)
23	Lower paper feed clutch (Optional paper tray unit)
24	Tray motor (Optional paper tray unit)
25	Upper Paper lift motor (Up) (Optional paper tray unit or LCT)
26	Upper paper lift motor (Down) (Optional paper tray unit or LCT)
27	Lower paper lift motor (Up) (Optional paper tray unit)
28	Lower paper lift motor (Down) (Optional paper tray unit)
29	Rear fence motor (forward) (Optional LCT)
30	Rear fence motor (reverse) (Optional LCT)
31	Side fence solenoid (Optional LCT)
32	Shift tray motor (Optional shift tray)
33	Exit junction gate (Optional interchange unit)
34	Duplex junction gate (Optional interchange unit)
35 ~ 40	Not used
41	Duplex inverter motor (Reverse) (Optional duplex unit)
42	Duplex inverter motor (Forward) (Optional duplex unit)
43	Duplex transport motor (Optional duplex unit)
44	Inverter gate solenoid (Optional duplex unit)
45 ~ 50	Not used
51	Bridge cooling fan motor (Optional bridge unit)
52	Bridge unit drive motor (Optional bridge unit)
53	Junction gate solenoid (Optional bridge unit)
54 ~ 59	Not used
60	Polygonal mirror motor
61	Polygonal mirror motor and laser diode
62	Laser diode - Do not use
53 ~ 80	Not used
81	Duplex unit free run (without paper)
82	Duplex unit free run (with paper)

ARDF Output Check (SP6-008)

1. Open SP mode SP6-008.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table below.)
3. Press On then press Off to test the selected item. You cannot exit and close this display until you click Off to switch off the output check currently executing.

No.	Description
1	Feed Motor (Forward)
2	Feed Motor (Reverse)
3	Transport Motor (Forward)
4	Feed Clutch
5	Pick-up Solenoid
6	Junction Gate Solenoid
7	Stamp Solenoid

Finisher Output Check (SP6-118)

1. Open SP mode SP6-118.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table below.)
3. Press On then press Off to test the selected item. You cannot exit and close this display until you click Off to switch off the output check currently executing.

No.	Description	
	1000-sheet finisher	500-sheet finisher
1	Upper Transport Motor	Main Motor
2	Shift Tray Lift Motor	Output Tray Motor
3	Staple Hammer Motor	Stapler Motor
4	Shift Motor	Jogger Motor
5	Lower Transport Motor	Not Used
6	Shift Tray Exit Motor	Not Used
7	Tray Junction Gate Solenoid	Not Used
8	Jogger Motor	Not Used
9	Stapler Motor	Not Used
10	Stapler Junction Gate Solenoid	Not Used
11	Positioning Roller Solenoid	Not Used
12	Stack Feed-out Motor	Not Used
13	Exit Guide Plate Motor	Not Used
14	Not Used	Paddle Roller Solenoid
15	Not Used	Exit Unit Gear Solenoid
16	Not Used	Stack Height Lever Solenoid
17		

4.2.6 SMC DATA LISTS (SP5-990)

1. Open SP mode 5-990 and select the number corresponding to the list that you wish to print.

SMC (System Parameter and Data Lists)	
1	All Data List
2	SP Mode Data List
3	UP Mode Data List
4	Logging Data List
5	Self-Diagnostics Results List
7	NIB Summary
21	Copy UP Mode List
22	Scanner SP Mode List
23	Scanner UP Mode List

2. Touch "Execute" on the touch panel
3. Select. "Single Face" or "Both Face" then touch "Execute" to start printing.
4. After printing the list, press Exit twice to close the SP Mode screen and return to copy mode.

4.2.7 MEMORY ALL CLEAR (SP5-801)

Executing Memory All Clear resets all the settings stored in the NVRAM to their default settings except the following:

SP7-003-1:	Electrical total counter value
SP5-811-1:	Machine serial number
SP5-907:	Plug & Play Brand Name and Production Name Setting

Normally, this SP mode should not be used. This procedure is necessary only after replacing the NVRAM, or when the copier malfunctions because the NVRAM is damaged.

Using a Flash Memory Card

1. Upload the NVRAM data to a flash memory card (☛ NVRAM Data Upload).
2. Print out all SMC data lists (SP mode 5-990).
NOTE: Be sure to print out all the lists. If the NVRAM data upload was not completed, it is necessary to change the SP mode settings by hand.
3. Open SP mode 5-801.
4. Press the number for the item that you want to initialize. The number you select determines which application is initialized. For example, press 1 if you want to initialize all modules, or select the appropriate number from the table below.

No.	What It Initializes	Comments
1	All modules	Initializes items 2 ~ 12 below.
2	Engine	Initializes all registration settings for the engine and process settings.
3	SCS (System Control Service)/SRAM	Initializes default system settings, CSS settings, operation display coordinates, and ROM update information.
5	MCS (Memory Control Service)	Initializes the automatic delete time setting for stored documents.
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	Initializes the printer defaults, programs registered, the printer SP bit switches, and the printer CSS counter.
9	Scanner application	Initializes the scanner defaults for the scanner and all the scanner SP modes.
10	Network application	Deletes the network file application management files and thumbnails, and initializes the job login ID.
11	NCS (Network Control Service)	Initializes the system defaults and interface settings (IP addresses also), SmartNetMonitor for Admin, WebStatusMonitor settings, and the TELNET settings.
12	R-FAX	Initializes the job login ID, SmartNetMonitor for Admin, job history, and local storage file numbers.

5. Press Execute and turn the main switch off and back on.
6. Download the NVRAM data from a flash memory card (☛ NVRAM Data Download).

Without Using a Flash Memory Card

If there is no flash memory card, follow the steps below.

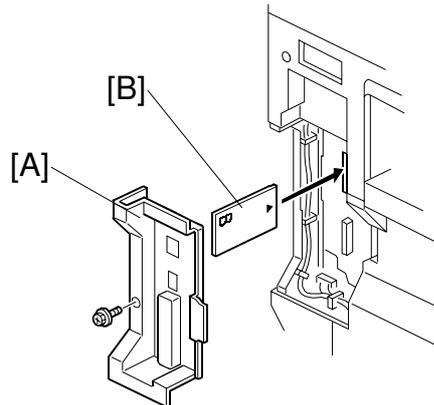
1. Execute SP5-990 to print out all SMC Data Lists.
2. Open SP mode 5-801.
3. Press the number for the item that you want to initialize.
4. Press Execute and turn the main switch off and back on.
5. Make sure that you do the following:
 - Do the printer and scanner registration and magnification adjustments (☛ 3 Replacement and Adjustment, “Copy Adjustments”).
 - Do the touch screen calibration (☛ 3 Replacement and Adjustment, “touch screen calibration”).
 - Referring to the SMC data lists, re-enter any values, which had been changed from their factory settings.
 - Do SP 3-001-2 (ID Sensor Initial Setting) and SP4-911-1 (HDD media check).
 - Do the white level adjustment (☛ Section 6.8.2 Standard White Density Adjustment)
6. Check the copy quality and the paper path, and do any necessary adjustments.

4.2.8 UPLOADING/DOWNLOADING NVRAM DATA

The content of the NVRAM can be uploaded to and downloaded from a flash memory card.

Uploading NVRAM Data (SP5-824)

The contents of the NVRAM in the machine can be uploaded to a flash memory card.



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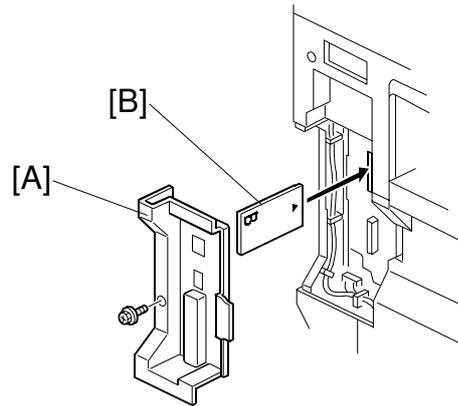
1. Turn off the main switch.
2. Remove the application cover [A].
3. Plug the flash memory card [B] into the card slot.
4. Turn on the main switch.
5. Open SP5-824.
6. Touch "Execute" to start uploading the NVRAM data.
7. Turn off the main switch, then remove the IC card.

Downloading NVRAM Data (SP5-825)

This downloads data from a flash card to the NVRAM inside the machine.

The following data are not downloaded from the flash card:

- Total count categories (SP7-003-*** Copy Counter)
- C/O, P/O Counter (SP7-006-*** C/O, P/O Count Display)
- Duplex, A3/DLT/Over 420 mm, Staple and Scanner application scanning counters (system settings).



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1. Turn off the main switch.
2. Remove the application cover [A].
3. Plug the flash memory card [B] into the card slot.
4. Turn on the main switch.
8. Open SP5-825.
5. Touch "Execute" to start download the NVRAM data.
6. Turn off the main switch, then remove the IC card.

Note that the following errors could 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 will halt.

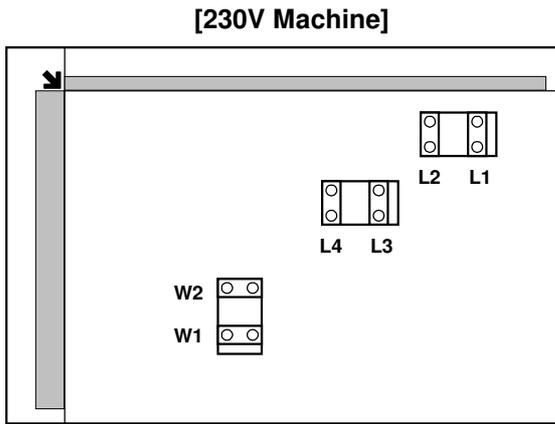
4.2.9 APS OUTPUT DISPLAY (SP4-301)

When open this SP, a small box will be displayed on the SP mode screen with a series of 0's and 1's. The meaning of the display is as follows.

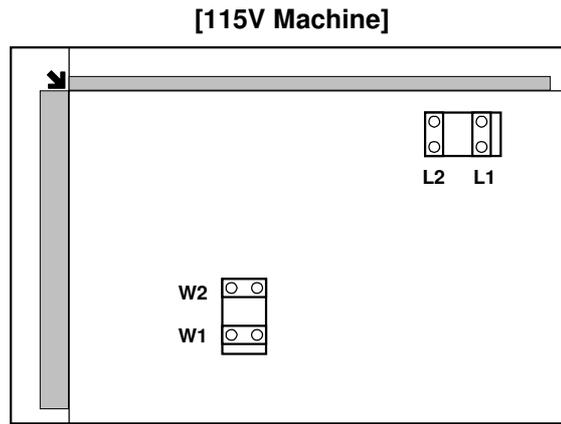
00000000

Bit 7 6 5 4 3 2 1 0

1 = Paper detected



B027S511.WMF



B027S512.WMF

Bit	Description
7	L1
6	L2
5	L3
4	L4
3	W2
2	W1
1	Not Used
0	Not Used

4.2.10 DF APS SENSOR OUTPUT DISPLAY (SP6-901)

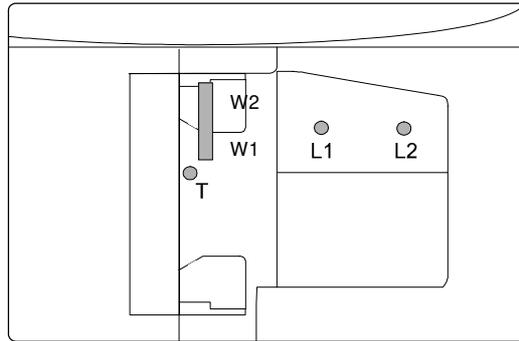
When open this SP, a small box will be displayed on the SP mode screen with a series of 0's and 1's. The meaning of the display is as follows.

00000000

Bit 7 6 5 4 3 2 1 0

1 = Paper detected

illustration to be changed



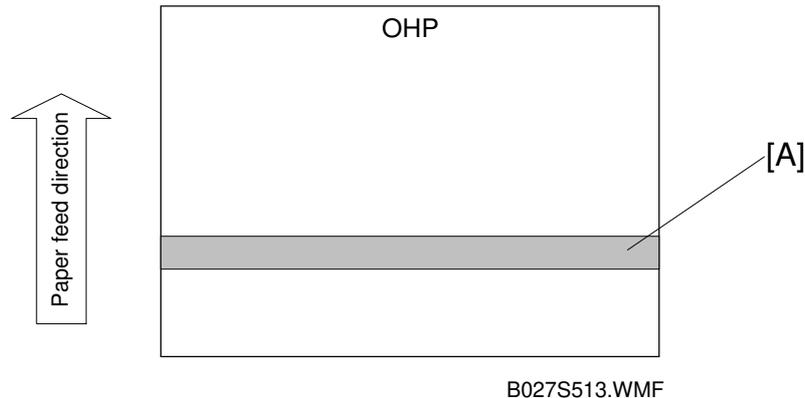
B027S600.WMF

	Large	←————→		Small
W1	0	0	1	1
W2	0	1	0	1

Bit	Description
7	Not Used
6	Not Used
5	W1
4	W2
3	L1
2	L2
1	L3
0	Not Used

Service Tables

4.2.11 NIP BAND WIDTH MEASUREMENT (SP1-109)



When paper wrinkling or image off-set occurs, the pressure from the pressure roller can be adjusted by changing the position of the pressure springs. At this time, the nip band width can also be checked with SP1-109, as follows.

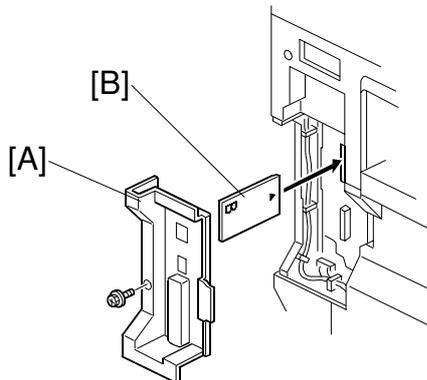
1. Do a free run (SP5-802) for about 50 sheets.
2. Access SP1-109 and press the “1” key.
3. Press Copy Window to return to the copy window.
4. Place an OHP sheet (A4/8.5”x11” sideways) on the by-pass tray or in the 2nd paper tray.
5. Press the “Start” key.
The OHP sheet is stopped in the fusing unit for about 20 seconds, then it will be fed automatically.
6. Check the nip band width [A]. The relationship between the position of the pressure spring and the band width is as follows.

NOTE: Check the nip band width around the center of the OHP.

1. Pressure spring position	Nip band width
Upper (default position)	5.2 ± 0.5 mm
Lower	5.3 ± 0.5 mm
2. Envelope feed mode (green lever down) at the default pressure spring position	4.7 ± 0.5 mm

If the width is out of the above specification, the pressure spring should be replaced.

4.3 PROGRAM DOWNLOAD



B022S999.WMF

1. Turn off the main power switch.
2. Remove the application cover [A].
3. Insert the IC card [B] containing the software you wish to download into the card slot of the controller.
4. Turn on the main power.
5. Follow the instructions displayed on the LCD panel
6. Monitor the downloading status on the operation panel.
 - While downloading is in progress, the LCD will display "Writing". When downloading has been completed, the panel will display "OK".
 - For operation panel software, the Start key lights red while downloading is in progress, and then lights green again after downloading is completed.

CAUTION

Never switch off the power while downloading. Switching off the power while the new software is being downloading will damage the boot files in the controller.

7. After confirming that downloading is completed, turn off the main power and remove the IC card.
8. If more software needs to be downloaded, repeat steps 1 to 7.
9. Turn the main power on and confirm that the new software loads and that the machine starts normally.

NOTE: If the download failed, an error message will appear on the panel. Then, download the firmware again using the IC card as usual.



4.4 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-

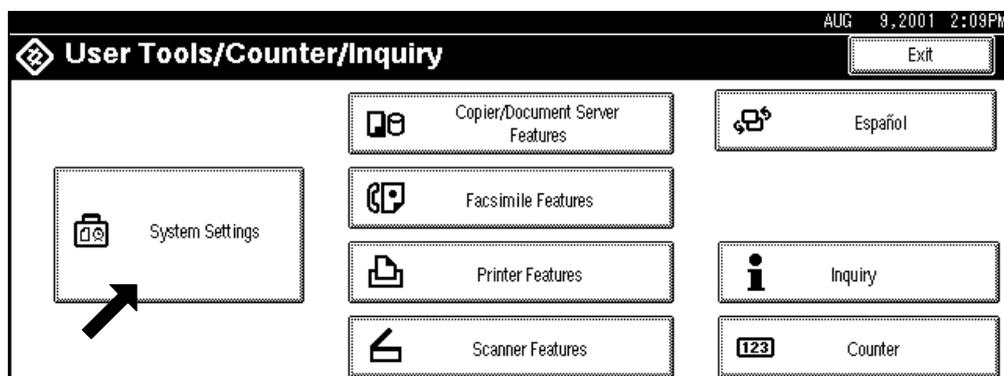
Press and hold down   together for over 10 seconds. When the machine beeps once release both buttons. After “Now loading. Please wait” is displayed for a few seconds the copy window will open. The machine is ready for normal operation.

4.5 SYSTEM SETTINGS AND COPY SETTING RESET

4.5.1 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.



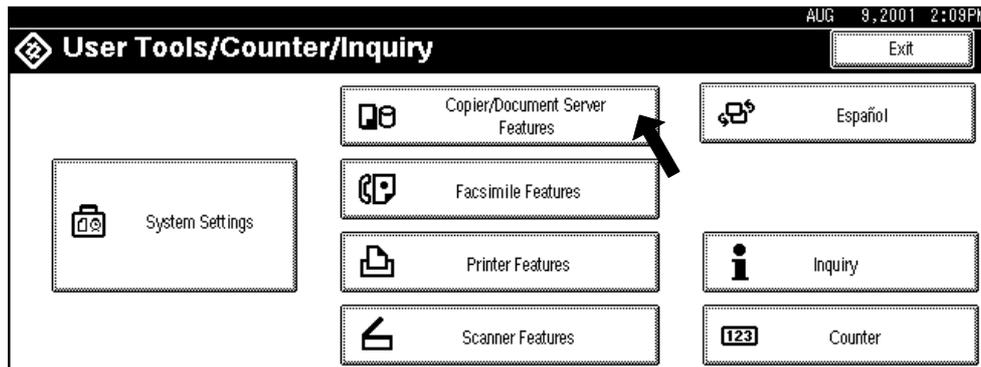
B027S503.WMF

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.

4.5.2 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.



B027S504.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.

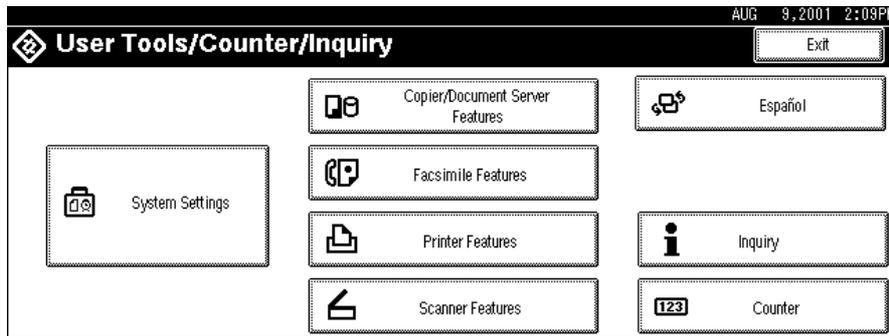
4.6 USER TOOLS

The user program (UP) mode can be accessed by users and operators, and by sales and service staff. UP mode is used to input the copier's default settings. The user can reset the default settings at any time. (☛ 4.5)

4.6.1 HOW TO USE UP MODE

UP Mode Initial Screen: User Tools/Counter Display

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

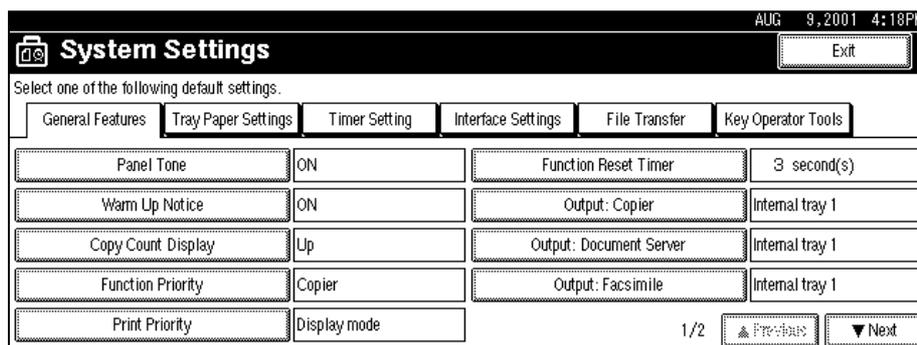


B027S505.WMF

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 it 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.

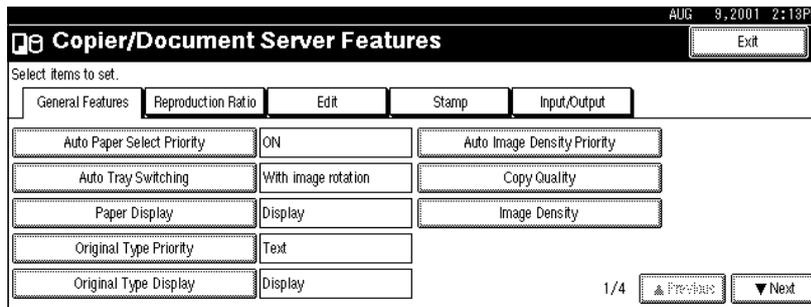


B027S707.WMF

Copier/Document Server Features

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

Click a tab to display the settings. If the Next button is lit in the lower right corner, press it 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.



B027S701.WMF

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.

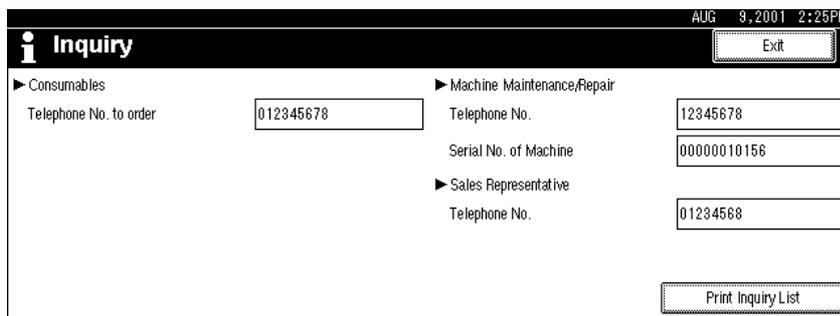
Service Tables

Inquiry

In the User/Tools Counter display, press Inquiry.

The following SP mode settings will be displayed.

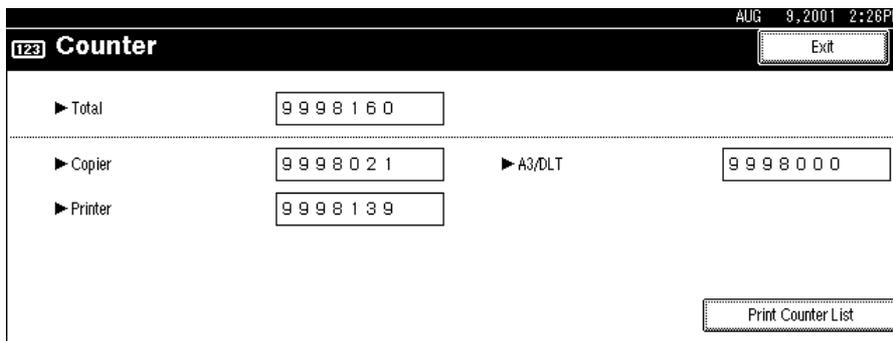
- Service Telephone Number (SP5-812-1)
- Sales Telephone Number (SP812-4)
- Consumable Telephone Number (SP812-3)
- Toner Name (SP-841)



B027S705.WMF

Counter

In the User/Tools Counter display, press Counter.



B027S706.WMF

The following SP mode counters will be displayed.

- Copy Counter (SP5-914-2)
- A3/DLT Counter (SP5-918)
- Printer Counter (SP5-914-1)

View the settings, press Print Counter Exit to return to the User Tools/Counter display, and then press Exit to return to the copy window.

4.7 LE DS

Controller

Number	Normal	Controller Software Download	Error
LED 1	Off	Blinking	Off
LED 2	Blinking	Blinking	Lit or Off
LED 3 (+5V line)	Lit	Lit	Lit

SBCU

Number	Normal	SBCU Software Download	Error
LED 1	Lit	Lit	Off or Blinking
LED 2	Blinking	Lit	Lit (except downloading) or Off

IPU

Number	Normal	Error
LED 1	Lit	Off or Blinking

Service Tables

4.8 DIP SWITCHES

Controller: DIP SW2

DIP SW No.	ON	OFF
1	IC Card Boot	System ROM Boot
2	Keep at "OFF"	
3		
4		



SBCU: DIP SW102

DIP SW No.	Function	ON		OFF	
1	Destination	On: Japan	Off: NA	On: EU/Asia	Off: Not Used
2		On	On	Off	Off
3		On	On	On	On
4	Not used	OFF (Do not change)			

4.9 SPECIAL TOOLS AND LUBRICANTS

4.9.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A2929500	S5S Test Chart (10 pcs/set)	1
A0069104	Scanner Positioning Pin (4 pcs/set)	1
A0299387	Digital Multimeter - FLUKE 87	1
A2309351	Case - Flash Memory Card	1
N8036701	Flash Memory Card - 4MB	1
B0279099	NVRAM - Minus Counter	1
A2309003	Adjustment Cam – Laser Unit	1
A2679002	Positioning Pin - Laser Unit	1

4.9.2 LUBRICANTS

Part Number	Description	Q'ty
A0289300	Grease Barrierta - JFE 5 5/2	1
52039501	Silicone Grease G-501	1

5. PREVENTIVE MAINTENANCE SCHEDULE

5.1 PM TABLE

- NOTE:** 1) The amounts mentioned as the PM interval indicate the number of prints.
2) After carrying out PM, clear the maintenance counter (SP7-804).

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

A265/A267	EM	120K	240K	360K	NOTE
SCANNER/LASER OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror	C	C	C	C	Optics cloth
2nd Mirror	C	C	C	C	Optics cloth
3rd Mirror	C	C	C	C	Optics cloth
Scanner Guide Rails		C	C	C	Do not use alcohol.
Platen Sheet Cover	C	I	I	I	Replace the platen sheet, if necessary. Dry cloth or alcohol
Exposure Glass		C	C	C	Dry cloth or alcohol
Toner Shield Glass		C	C	C	Optics cloth
APS Sensor		C	C	C	Dry cloth or blower brush
AROUND THE DRUM					
Transfer/Separation Unit		R	R	R	
ID Sensor		C	C	C	Perform the ID sensor initial setting (SP2-935) after cleaning (blower brush)
PAPER FEED					
Registration Rollers	C	C	C	C	Clean with water
Paper Feed Roller	C	R	R	R	Clean with water
Friction Pad	C	R	R	R	Dry cloth
Paper Feed Guides	C	C	C	C	Clean with alcohol.
Relay Rollers	C	C	C	C	Clean with water.
Bottom Plate Pad	C	C	C	C	Clean with water.
Registration Roller Mylar	C	C	C	C	Clean with water.
FUSING UNIT AND PAPER EXIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Clean with water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	
Fusing Thermistors		R	R	R	

A265/A267	EM	120K	240K	360K	NOTE
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		C	C	C	Clean with water or alcohol.
Hot Roller Strippers		R	R	R	
Hot Roller and Pressure Roller Bushings	L	L	L	L	Grease Barrierta JFE5 5/2 (A0289300)
Paper Exit Guide Ribs		C	C	C	Clean with water or alcohol.
OTHERS					
Main Motor Drive Gear	L	I	I	I	Silicone Grease G501 (see note 1)

	EM	120K	240K	360K	NOTE
ADF (for originals)					
Pick-up Roller	C	R	R	R	Clean with water
Feed Belt	C	R	R	R	Clean with water
Separation Roller	C	R	R	R	Clean with water
Stamp		I	I	I	Replace if necessary
ADF Exposure Glass	C	C	C	C	Clean with alcohol
White Plate	C	C	C	C	Clean with alcohol
Platen Sheet	C	C	C	C	Clean with alcohol

	EM	120K	240K	360K	NOTE
PAPER TRAY UNIT					
Paper Feed Roller	C	R	R	R	Clean with water
Friction Pad	C	R	R	R	Dry cloth
Paper Feed Guides	C	C	C	C	Clean with alcohol.
Relay Rollers	C	C	C	C	Clean with water.
Bottom Plate Pad	C	C	C	C	Clean with water.
Relay Clutch		I	I	I	Replace if necessary
Paper Feed Clutch		I	I	I	Replace if necessary

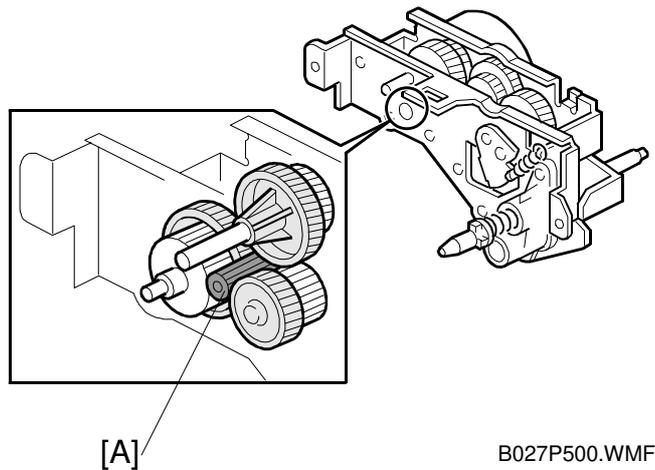
	EM	120K	240K	360K	NOTE
LCT					
Paper Feed Roller		R	R	R	
Pick-up Roller		R	R	R	
Separation Roller		R	R	R	
Transport Rollers		C	C	C	Clean with water
Bottom Plate Pad		C	C	C	Clean with water
Relay Clutch		I	I	I	Replace if necessary
Paper Feed Clutch		I	I	I	Replace if necessary

	EM	120K	240K	360K	NOTE
1,000-SHEET FINISHER					
Rollers	C				Clean with water or alcohol.
Brush Roller	I	I	I	I	Replace if necessary.
Discharge Brush	C	C	C	C	Clean with a dry cloth
Sensors	C				Blower brush
Jogger Fences	I	I	I	I	Replace if necessary.

	EM	150K	300K	450K	NOTE
1-BIN TRAY UNIT					
Rollers	C				Dry or damp cloth
Copy Tray	C				Dry or damp cloth
Sensors	C				Blower brush

NOTE 1.

Main Motor Drive Gear



Preventive Maintenance

Do the following every EM:

Lubricate the main motor drive gear [A] with silicone grease G501.

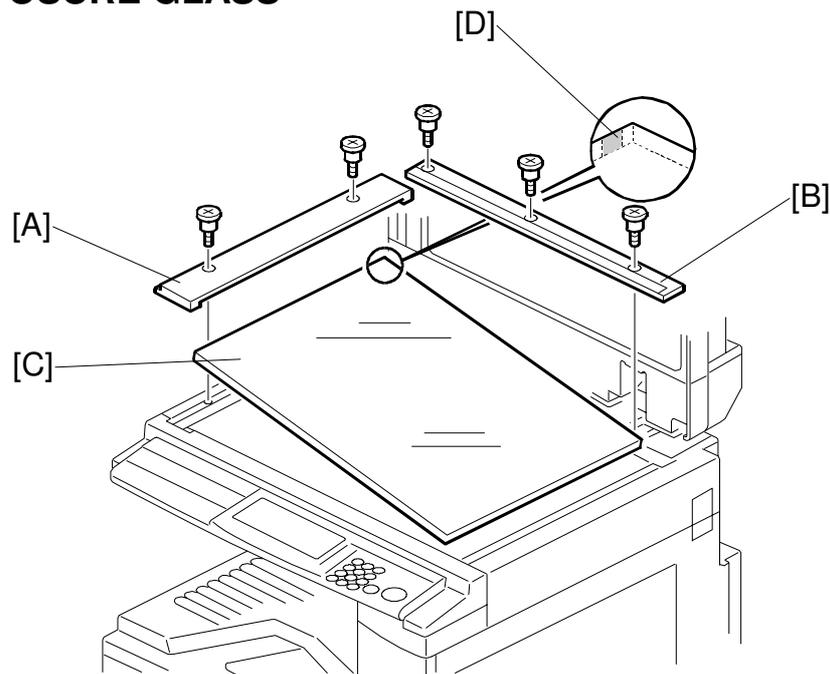
6. REPLACEMENT AND ADJUSTMENT

⚠ CAUTION

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

6.1 SCANNER UNIT

6.1.1 EXPOSURE GLASS

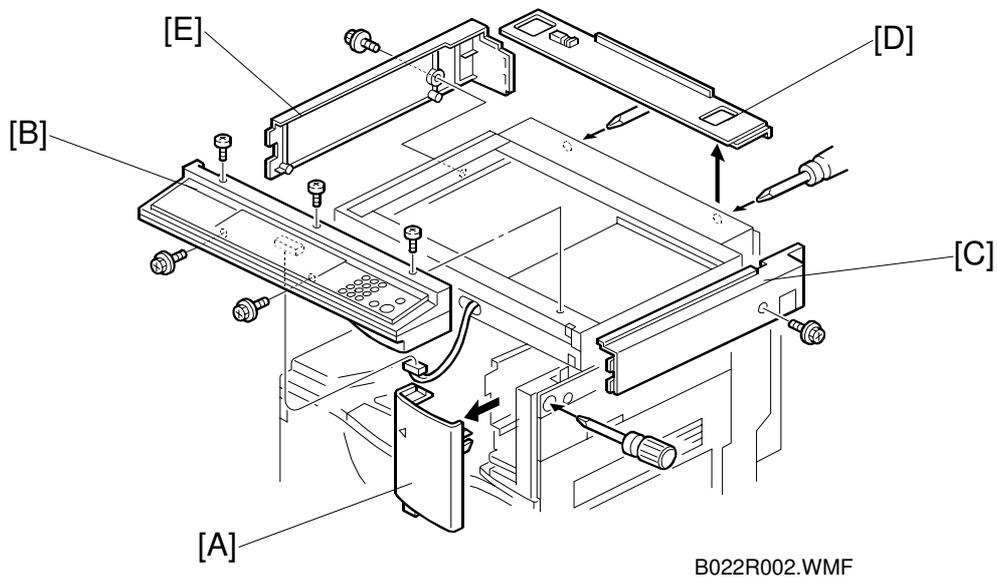


B027R001.WMF

1. Open the ADF or platen cover.
2. Remove the left scale [A] (2 screws).
3. Remove the rear scale [B] (3 screws).
4. Remove the exposure glass [C].

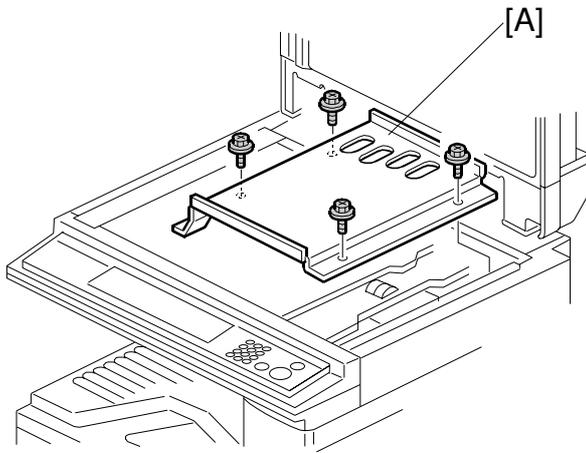
NOTE: When reinstalling the exposure glass, make sure that the mark [D] is positioned at the rear left corner, as shown.

6.1.2 SCANNER EXTERIOR/OPERATION PANEL

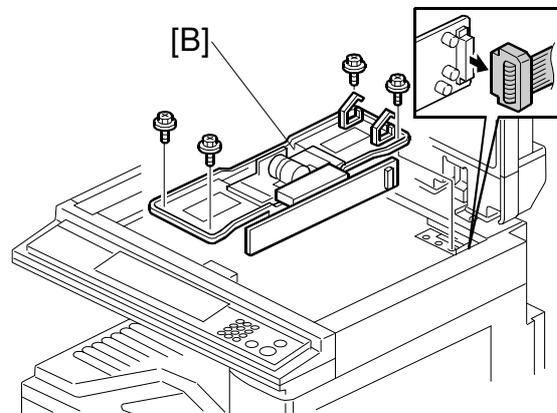


1. Remove the ADF or platen cover.
2. Remove the exposure glass. (☛ 6.1.1)
3. Remove the upper front cover [A] (1 screw, 1 hook).
4. Remove the operation panel [B] (5 screws, 1 connector).
5. Remove the right cover [C] (1 screw, 2 hooks).
6. Remove the rear cover [D] (2 screws).
7. Remove the left cover [E] (2 screws, 2 hooks).

6.1.3 LENS BLOCK ASSEMBLY



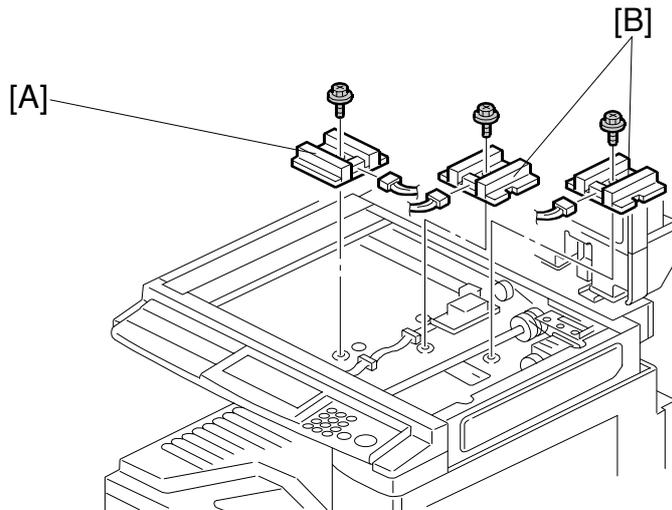
B022R003.WMF



B022R006.WMF

1. Remove the exposure glass. (☛ 6.1.2)
2. Remove the lens cover [A] (4 screws).
3. Replace the lens block assembly [B] (4 screws, 1 connector, 2 clamps).
NOTE: Do not remove the screws which are locked with white paint.
4. Reassemble the machine and do the scanner and printer copy adjustments. (☛ 6.8)

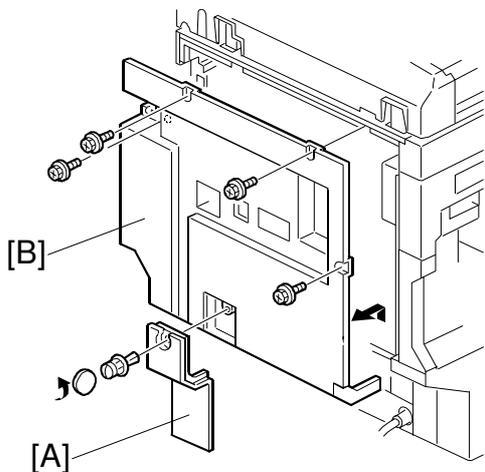
6.1.4 ORIGINAL SIZE SENSORS



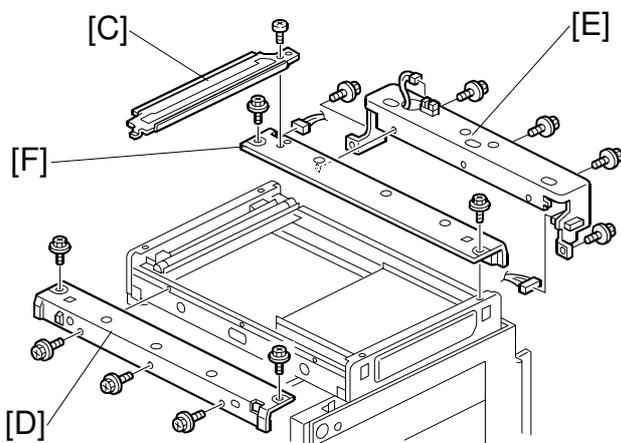
B027R054.WMF

1. Remove the exposure glass. (☛ 6.1.1)
2. Remove the lens cover. (☛ 6.1.3)
3. Remove the original width sensor [A] (1 screw, 1 connector).
4. Remove the lens block. (☛ 6.1.3)
5. Remove the original length sensors [B] (1 screw, 1 connector each).

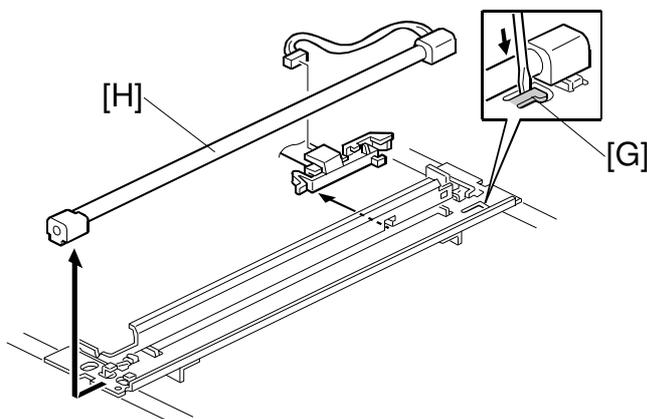
6.1.5 EXPOSURE LAMP



B027R515.WMF



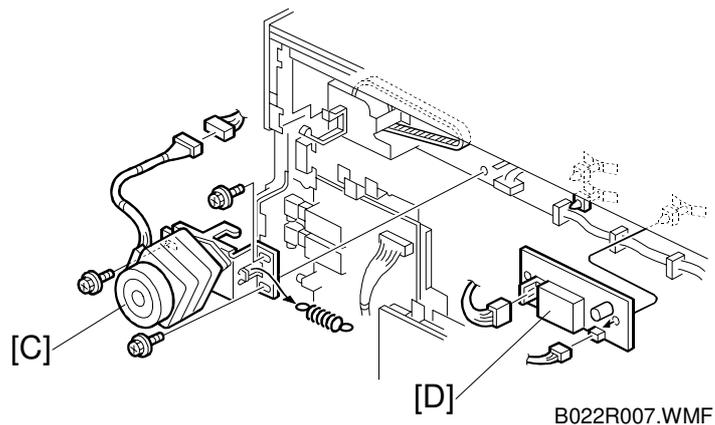
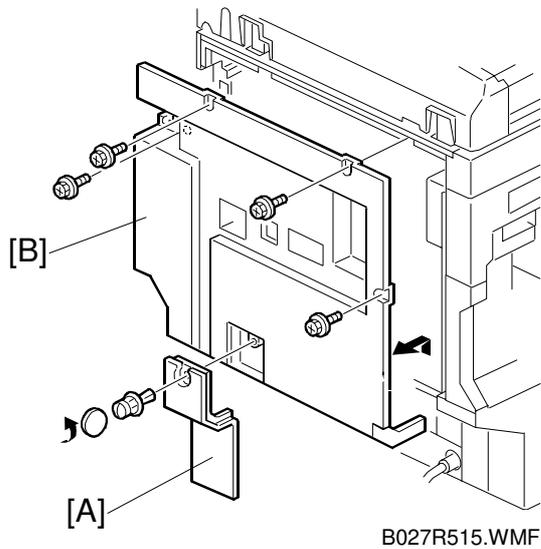
B027R008.WMF



B027R009.WMF

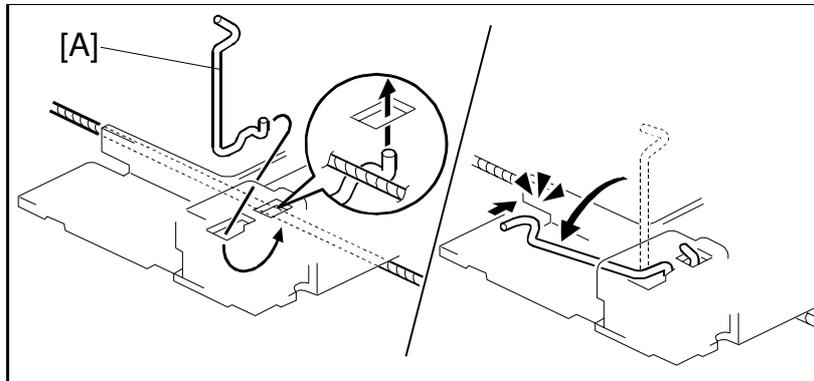
1. Remove the exposure glass. (☛ 6.1.1)
2. Remove the operation panel, rear cover, and left cover. (☛ 6.1.2)
3. Remove the connector cover [A], disconnect the cable, and remove the rear cover [B] (4 screws).
4. Remove the left upper stay [C] (1 screw).
5. Remove the front frame [D] (5 screws).
6. Remove the rear bracket [E] (5 screws, 2 connectors).
7. Remove the rear frame [F] (2 screws, 1 connector).
8. Push down the part [G] then slide out the exposure lamp [H] (1 connector).

NOTE: 1) Do not touch the glass surface of the exposure lamp with bare hands.
 2) After installing the lamp, the part [G] must be returned to the original position.

6.1.6 SCANNER MOTOR/LAMP STABILIZER

1. Remove the connector cover [A], disconnect the cable, and remove the rear cover [B].
2. Replace the scanner motor [C] (3 screws, 1 spring, 1 connector).
3. Replace the lamp stabilizer [D] (2 connectors).
4. Reassemble the machine and do the scanner and printer copy adjustments. (☛ 6.8)

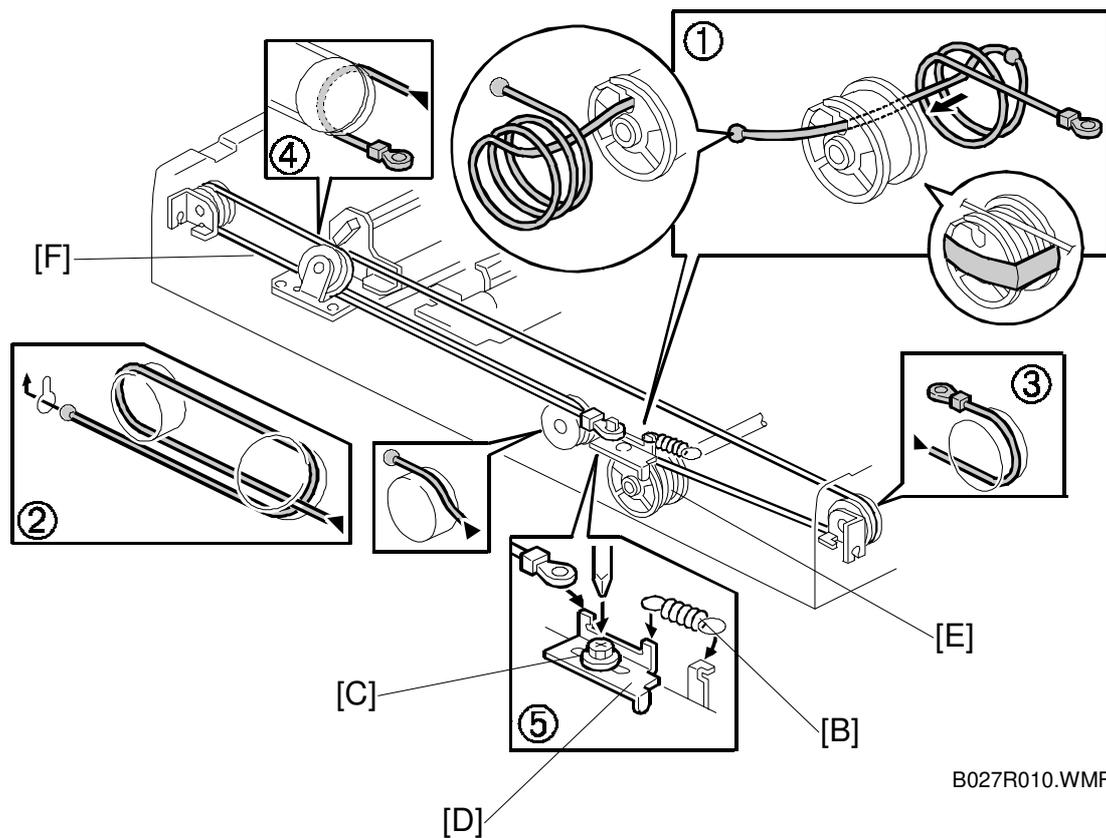
6.1.7 SCANNER WIRES



B027R012.WMF

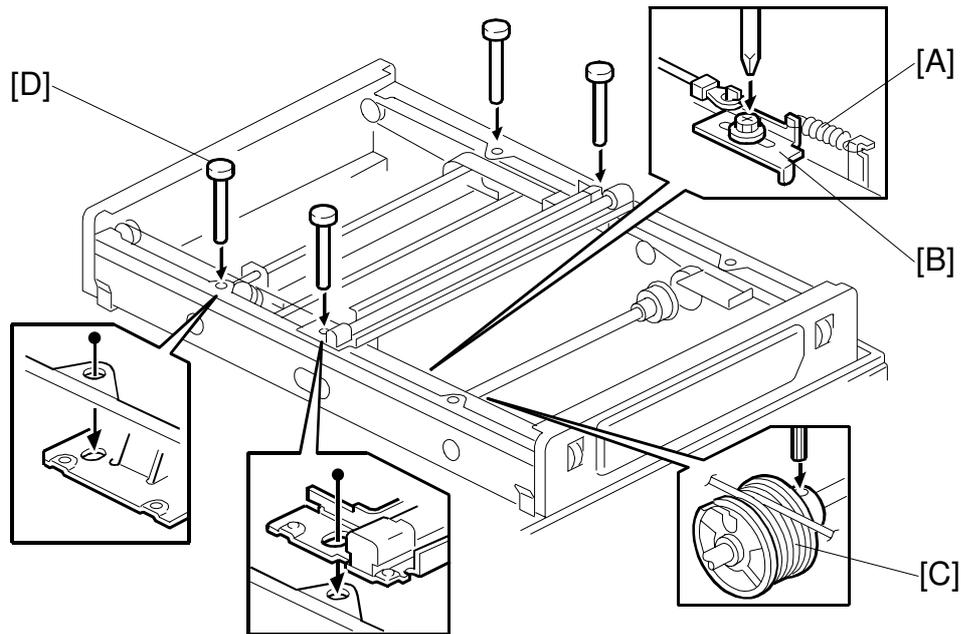
1. Remove the exposure glass, operation panel, and all scanner exterior covers. (☛ 6.1.1 and 6.1.2)
2. Remove the left upper stay. (☛ 6.1.5)
3. Remove the front frame. (☛ 6.1.5)
4. Remove the rear bracket. (☛ 6.1.5)
5. Remove the rear frame. (☛ 6.1.5)
6. Remove the lens cover. (☛ 6.1.3)
7. Remove the lens block assembly. (☛ 6.1.3)
8. Remove the front and rear scanner wire pins [A]. Then, remove the 1st scanner.

Replacement
Adjustment



B027R010.WMF

9. Remove the tension spring [B].
10. Loosen the screw [C] securing the wire tension bracket [D].
11. Remove the scanner drive pulley [E] (1 set screw).
12. Remove the scanner wire [F].
13. Wrap the new scanner wire around the pulley as shown ①, then temporarily secure the pulley with tape.
14. Re-install the 1st scanner. Then secure the 1st and 2nd scanner with the scanner positioning tools (P/N A0069104), as shown in the illustration on the next page.
15. Wind the new scanner wire around the scanner drive pulley in the correct way, as shown.
16. Wind the end of the new wire with the ball as shown (②).
17. Wind the end of the new wire with the ring as shown (③,④, and ⑤).
18. Install the tension spring on the wire tension bracket (⑤).
19. Wind the new scanner wire for the other side as well.



B027R011.WMF

20. Secure the 1st scanner with the scanner wire pins.
21. Install the tension spring [A] to the tension bracket.
22. Tighten the tension bracket [B].
23. Secure the scanner wire pulley [C] (1 Allen screw).
24. Remove the positioning tools [D]. After sliding the scanner to the right and left several times, re-install the positioning tools to check the scanner wire bracket and tension bracket again.
25. Reassemble the scanner and do the scanner and printer copy adjustments (☛ 6.8).

Replacement
Adjustment

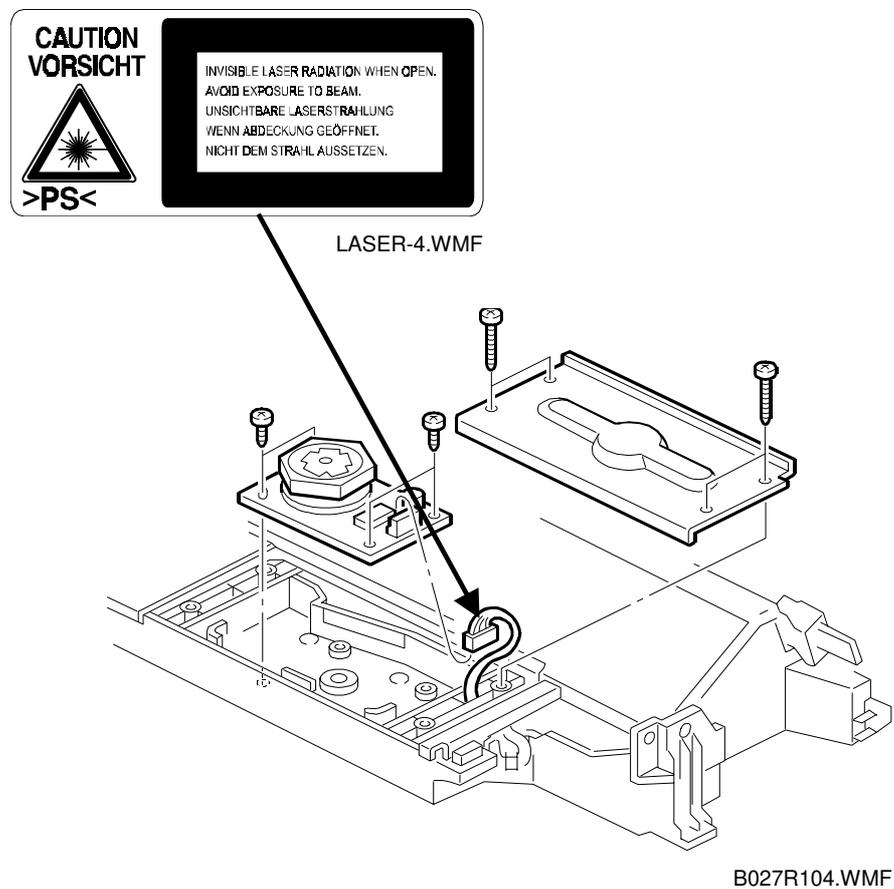
6.2 LASER UNIT

⚠ WARNING

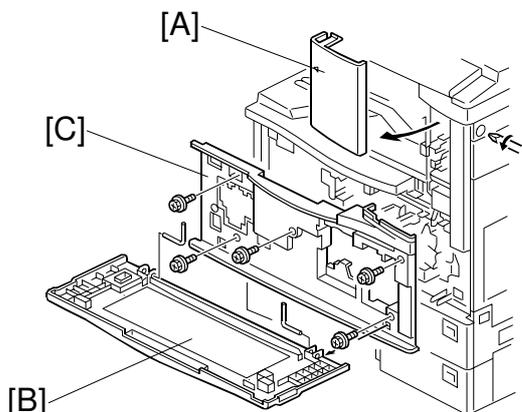
Turn off the main power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

6.2.1 CAUTION DECAL LOCATIONS

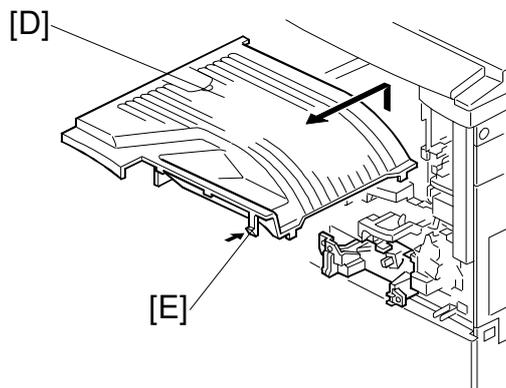
Two caution decals are located in the laser section as shown below.



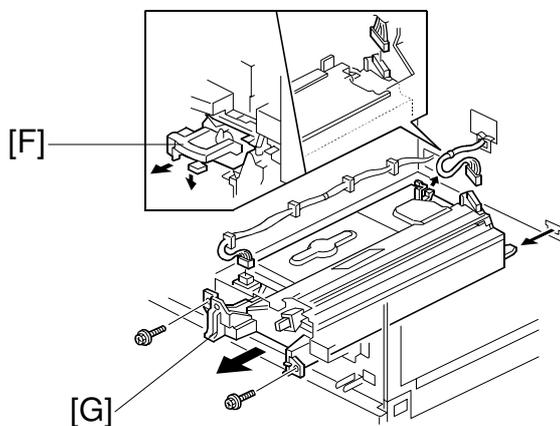
6.2.2 LASER UNIT



B027R101.WMF



B027R102.WMF



B027R103.WMF

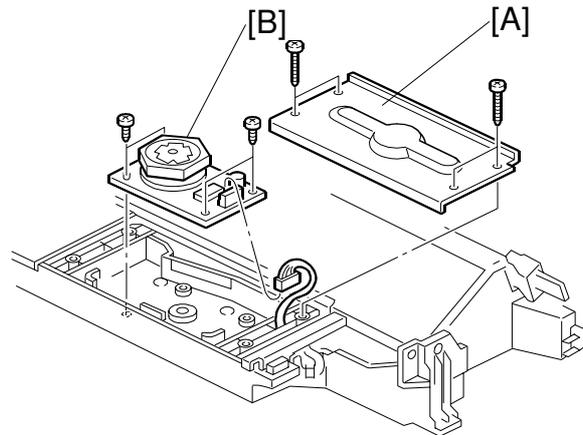
⚠ WARNING

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

Replacement
Adjustment

1. Remove the optional finisher/bridge unit, and either the tray for the optional 1-bin tray unit or optional shift tray, if these units have been installed.
2. Remove the upper front cover [A] (1 screw, 1 hook).
3. Remove the front cover [B] (2 pins).
4. Remove the inner cover [C] (5 screws).
5. Remove the copy tray [D] (1 hook [E]).
6. Remove the toner bottle holder [F].
7. Remove the laser unit [G] (2 screws, 2 connectors).
8. After reassembling the machine, do the scanner and printer copy adjustments. (➡ 6.8)

6.2.3 POLYGON MIRROR MOTOR

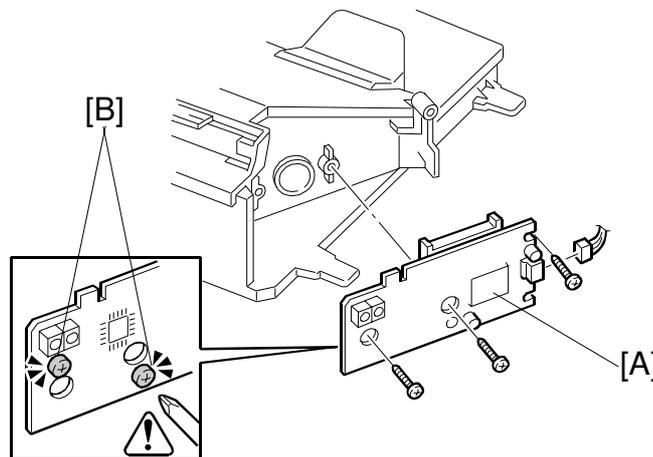


B027R104.WMF

1. Remove the laser unit (☛ 6.2.2).
2. Remove the heat sink [A] (4 screws).
3. Replace the polygon mirror motor [B] (4 screws, 1 connector).

NOTE: When installing the new polygon mirror motor, do not touch the surface of the mirror with bare hands.

6.2.4 LD UNIT

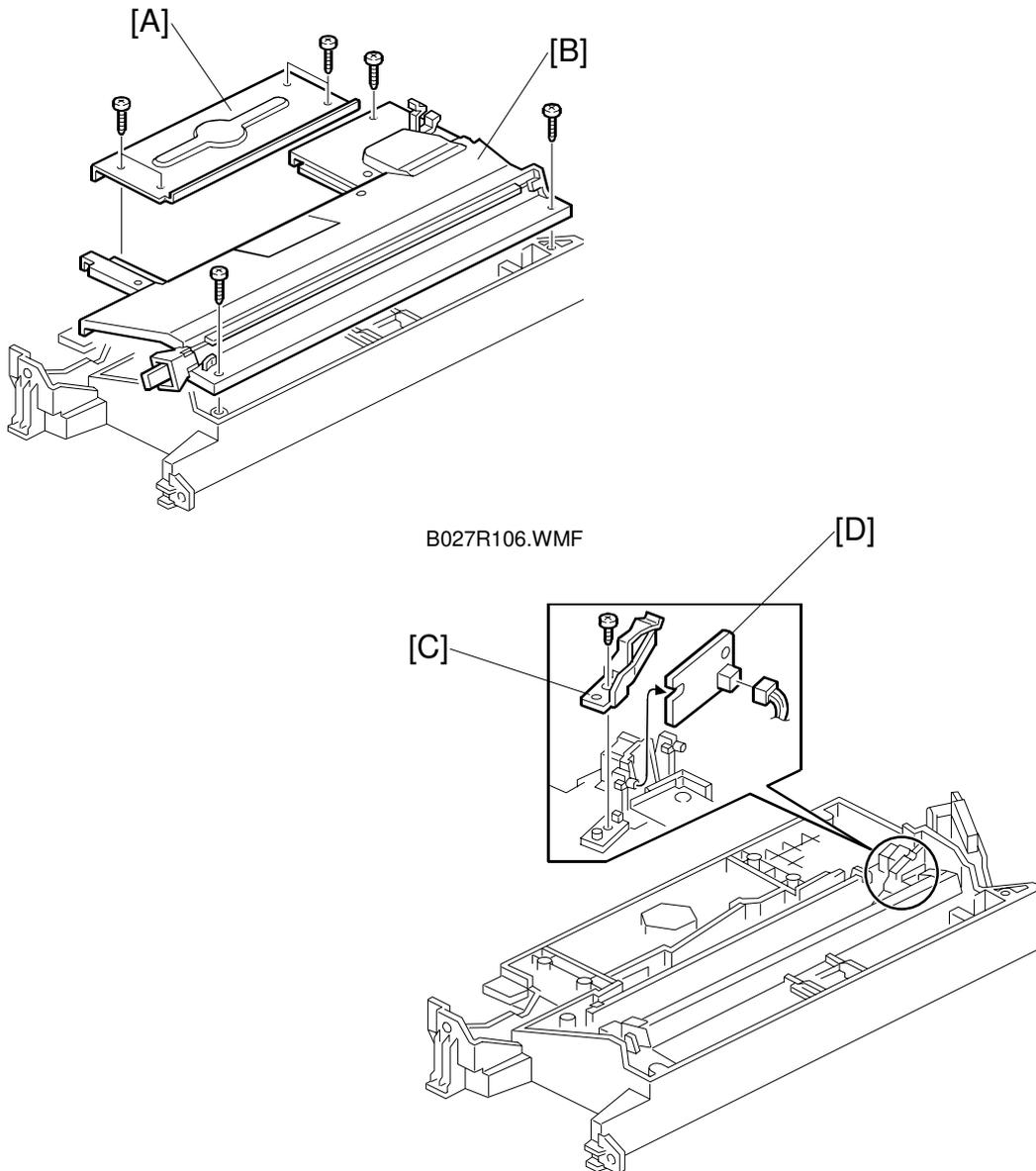


B027R105.WMF

1. Remove the laser unit (☛ 6.2.2).
2. Replace the LD unit [A] (3 screws, 1 connector).

NOTE: 1) Do not remove the screws [B].
2) Do not touch any variable resistors on the LD unit.

6.2.5 LASER SYNCHRONIZATION DETECTOR



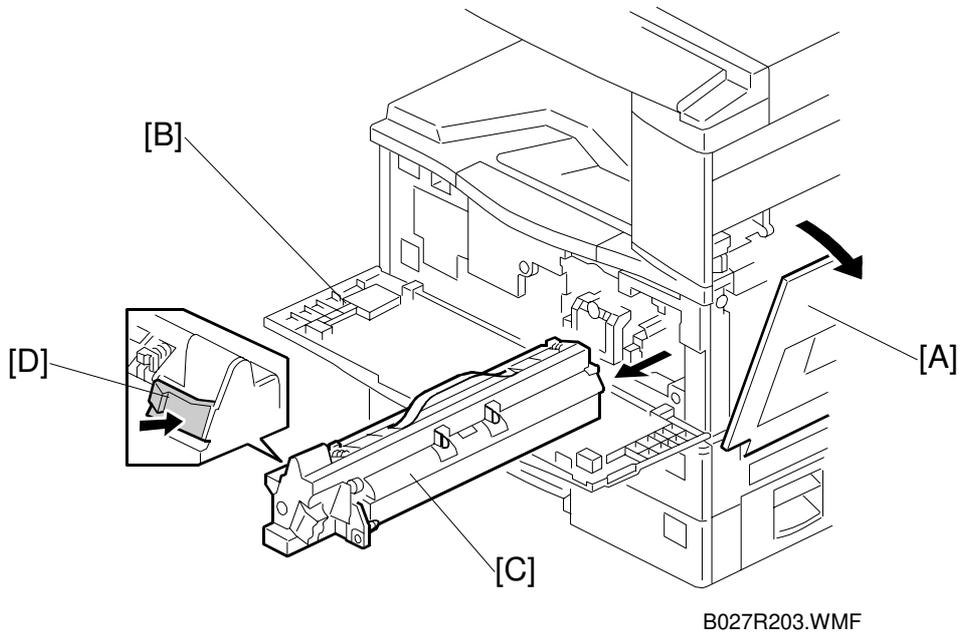
Replacement
Adjustment

B027R107.WMF

1. Remove the laser unit (☛ 6.2.2).
2. Remove the heat sink [A] (4 screws).
3. Remove the laser unit cover [B] (3 screws).
4. Remove the bracket [C] (1 screw).
5. Replace the laser synchronization detector [D] (1 connector).

6.3 PHOTOCONDUCTOR UNIT (PCU)

6.3.1 PCU

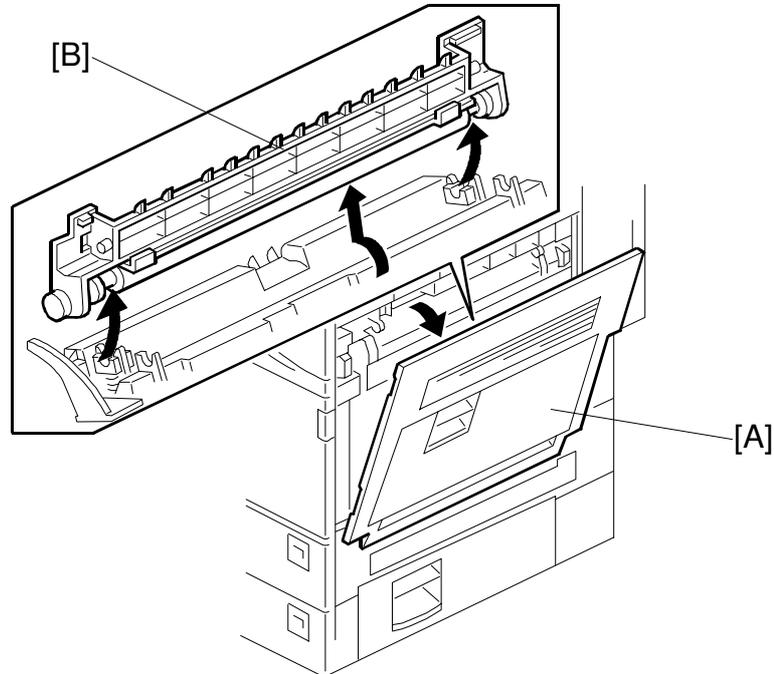


1. Open the right cover [A] and front cover [B].
2. Pull the PCU [C] out slightly while pushing the release lever [D].

NOTE: Do not touch the drum surface with bare hands.

6.4 TRANSFER UNIT

6.4.1 TRANSFER ROLLER UNIT

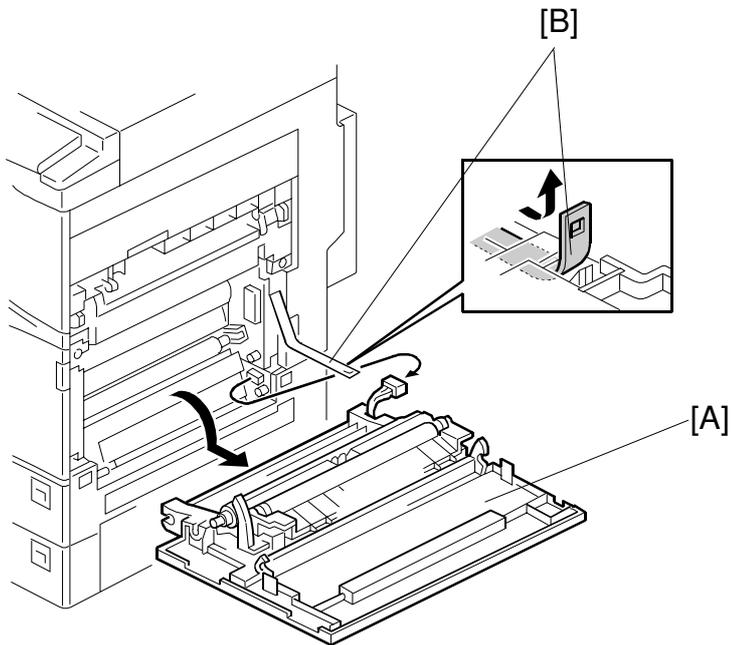


B027R401.WMF

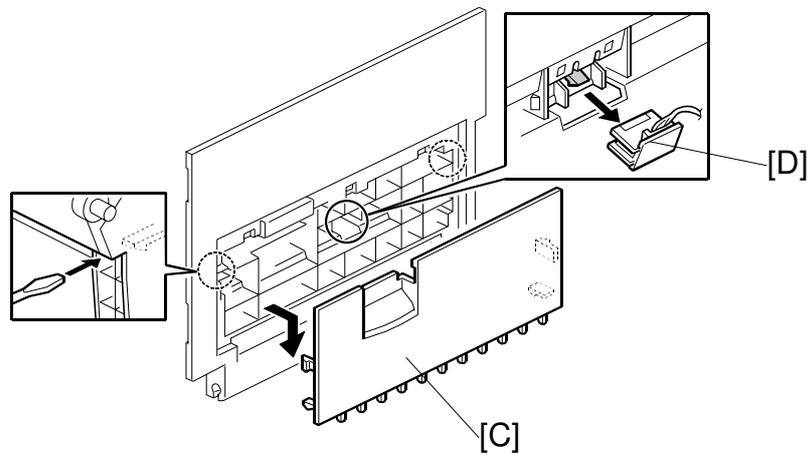
1. Open the right cover [A].
2. Remove the transfer roller unit [B] (1 hook).
NOTE: Do not touch the transfer roller surface.

Replacement
Adjustment

6.4.2 IMAGE DENSITY SENSOR



B027R201.WMF



B027R202.WMF

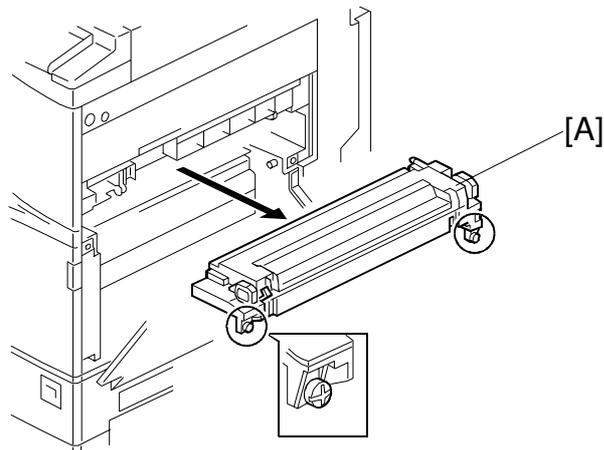
1. Open the right cover [A].
2. Remove the unit band [B].
3. Remove the right cover [A] (1 connector),
4. Remove the sub right cover [C] (2 hooks).
5. Replace the image density sensor [D] (1 connector).
6. Initialize the new sensor with SP 2-935.

6.5 FUSING/EXIT

6.5.1 FUSING UNIT

⚠ CAUTION

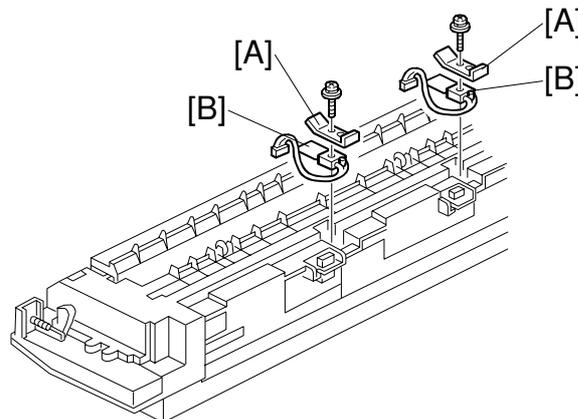
Allow time for the unit to cool before doing the following procedure.



B027R501.WMF

1. Release the duplex unit, if it has been installed, and open the right cover.
2. Remove the fusing unit [A] (2 screws).

6.5.2 THERMISTORS

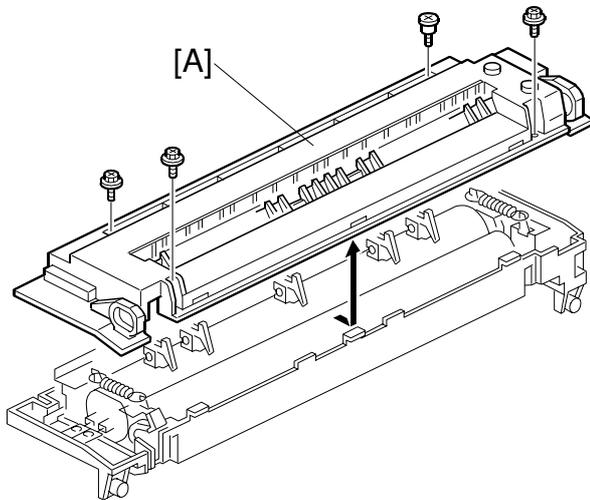


B022R551.WMF

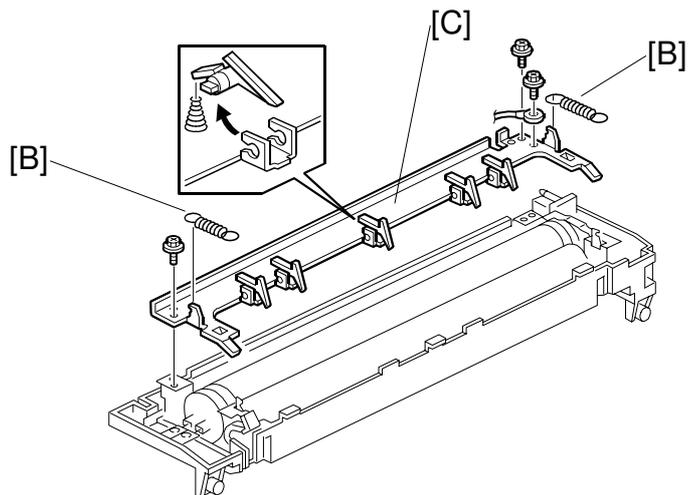
1. Remove the fusing unit. (☛ 6.5.1).
2. Remove the plates [A] (1 screw each).
3. Replace the thermistors [B] (1 connector).

Replacement
Adjustment

6.5.3 THERMOFUSE

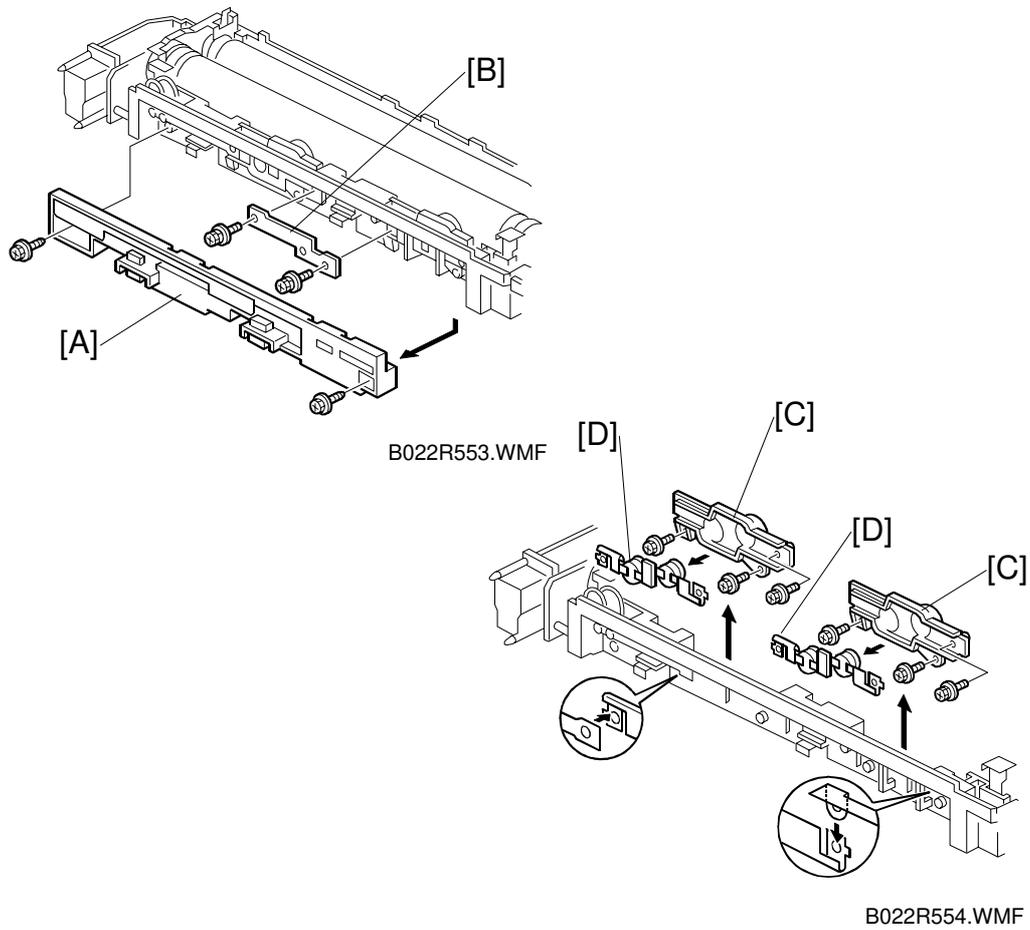


B027R503.WMF



B022R552.WMF

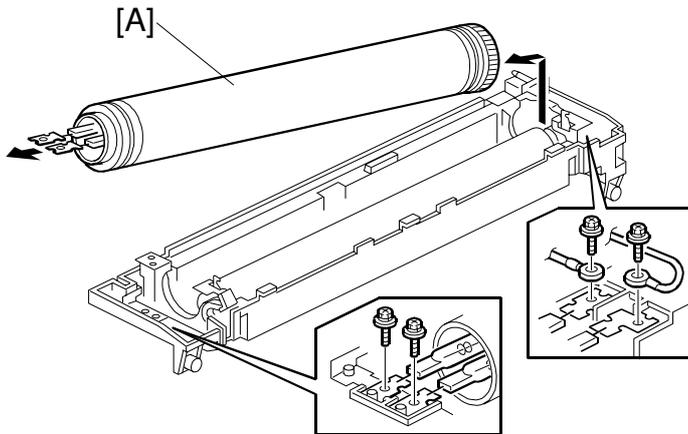
1. Remove the fusing unit. (☛ 6.5.1)
2. Remove the fusing upper cover [A] (4 screws).
3. Remove the pressure springs [B].
4. Remove the hot roller stripper bracket [C] (3 screws).



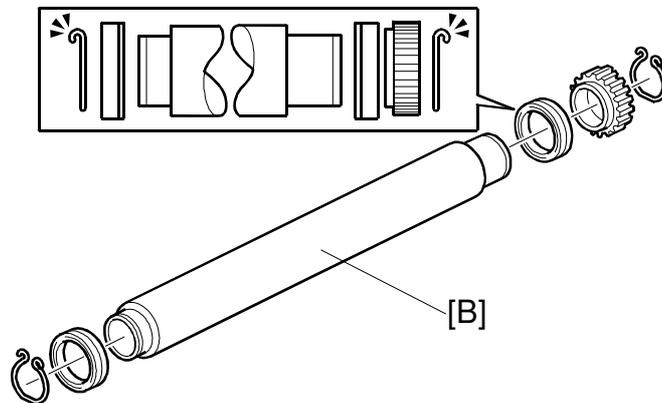
5. Remove the thermostat cover [A] (2 tapping screws).
6. Remove the plate [B] (2 screws with spring washer).
7. Remove the thermostat holder [C] (3 screws each).
8. Replace the thermostats [D].

Replacement
Adjustment

6.5.4 HOT ROLLER AND FUSING LAMP



B022R505.WMF



B027R506.WMF

1. Remove the fusing unit. (☛ 6.5.1)
2. Remove the fusing upper cover. (☛ Thermostat.)
3. Remove the pressure springs. (☛ Thermostat.)
4. Remove the hot roller stripper bracket. (☛ Thermostat.)
5. Remove the fusing lamps (4 screws) and hot roller assembly [A].

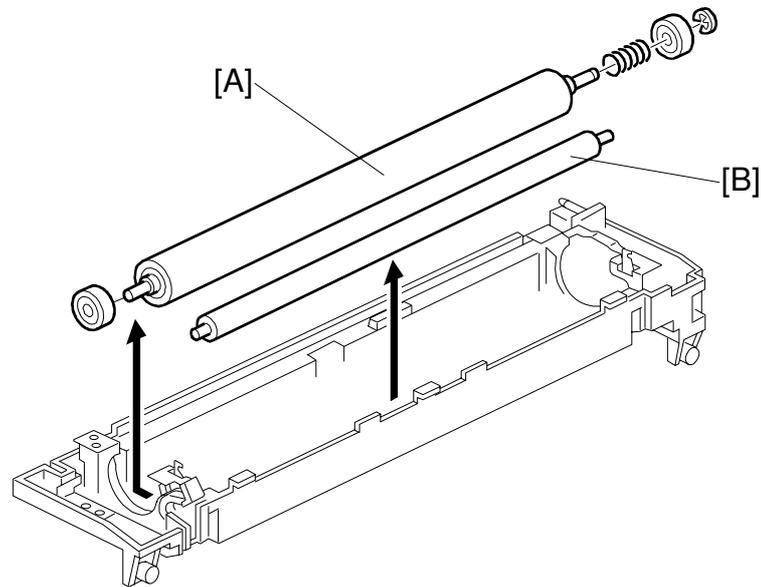
NOTE: Do not touch the surface of the fusing lamp with bare hands.



6. Replace the hot roller [B] (2 C-rings, 1 gear, 2 bushings).

NOTE: 1) Apply grease (Barrierta) to the inner surface of the bushing.
 2) Before installing the new hot roller, peel off 3 cm (1 inch) from both ends of the protective sheet on the new roller.
 3) Do not touch the surface of the rollers.
 4) When reinstalling the fusing lamp, secure the front screws first.
 5) Be careful not to damage the surface of the hot roller.

6.5.5 PRESSURE ROLLER/CLEANING ROLLER

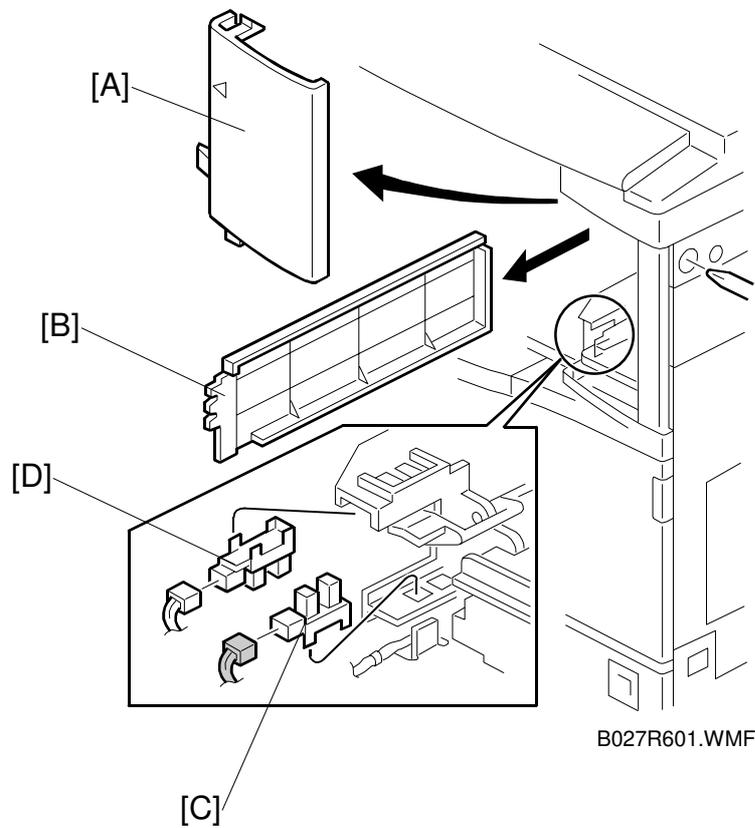


B027R507.WMF

1. Remove the fusing lamp and hot roller assembly. (☛ 6.5.4)
2. Replace the pressure roller [A] (1 E-ring, 2 bushings, 1 spring).
3. Replace the cleaning roller [B].

NOTE: 1) Apply grease (Barrierta) to the inner surface of the bushing for the pressure roller.
2) Do not touch the surface of the rollers.

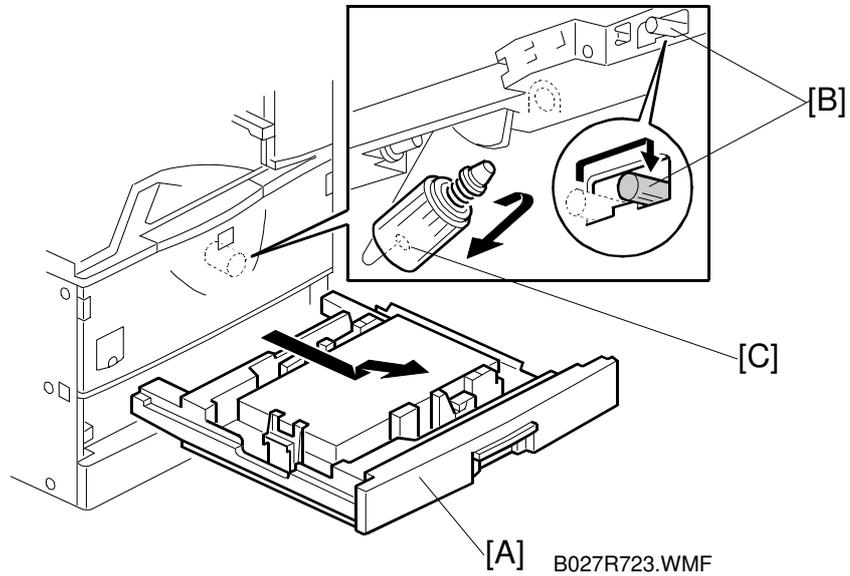
6.5.6 PAPER EXIT SENSOR/PAPER OVERFLOW SENSOR



1. Remove the front upper cover [A] (1 screw, 1 peg).
2. Remove the exit cover [B].
NOTE: If the optional 1 bin tray unit and/or interchange unit have been installed, remove them.
3. Replace the exit sensor [C] (1 connector).
4. Replace the overflow sensor [D] (1 connector).

6.6 PAPER FEED

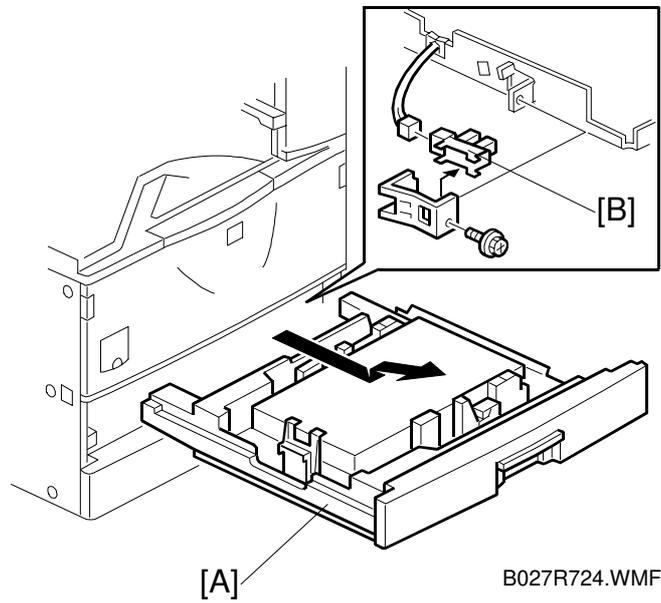
6.6.1 FEED ROLLERS



1. Remove the paper tray [A].
2. Pull the lever [B].
3. Replace the feed roller [C].

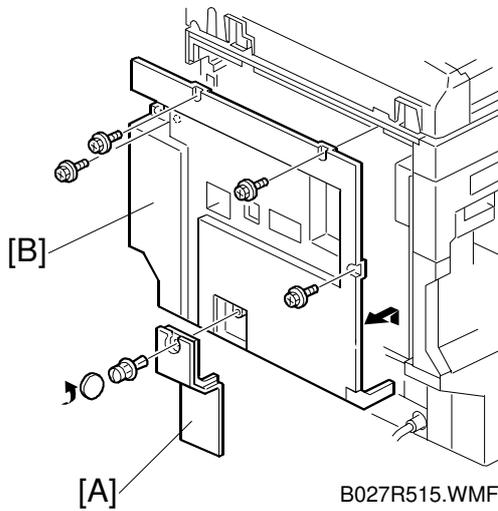
NOTE: Do not touch the roller surface with bare hands.
After reinstalling the feed roller, return the lever [A].

6.6.2 PAPER END SENSOR

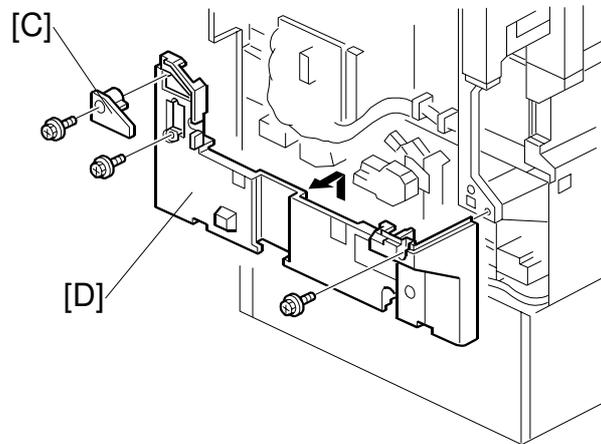


1. Remove the paper tray [A].
2. Remove the paper end sensor assembly (1 screw, 1 connector).
3. Replace the paper end sensor [B].

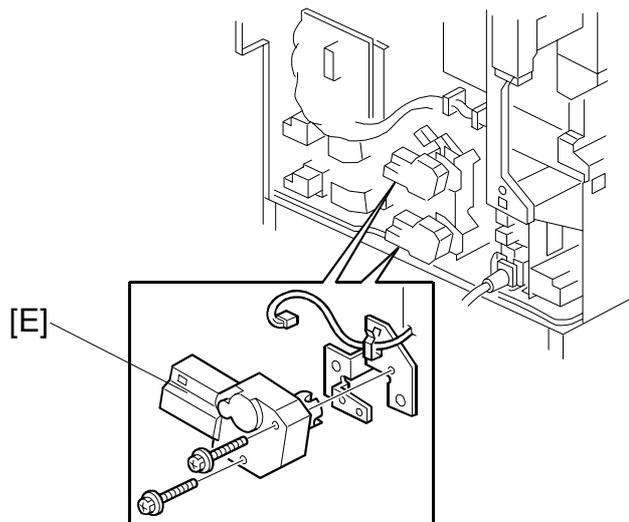
6.6.3 PAPER TRAY LIFT MOTORS



B027R515.WMF



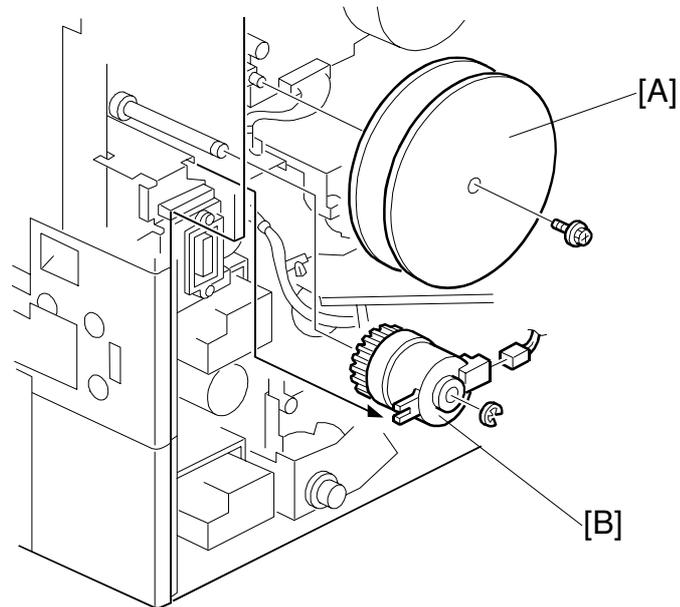
B027R705.WMF



B027R707.WMF

1. Remove the paper tray.
2. Remove the connector cover [A] (1 screw) and disconnect the cable.
3. Remove the rear cover [B] (4 screws).
4. Remove the duplex connector cover [C] (1 screw).
5. Remove the lower rear cover [D] (2 screws).
6. Replace the paper lift motors [E] (2 screws each, 1 connector each).

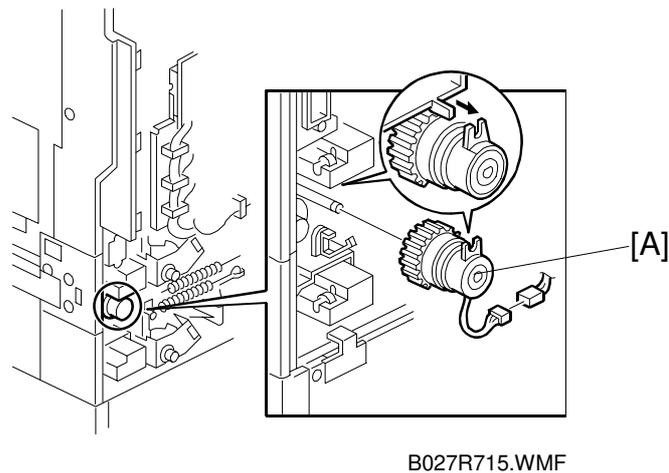
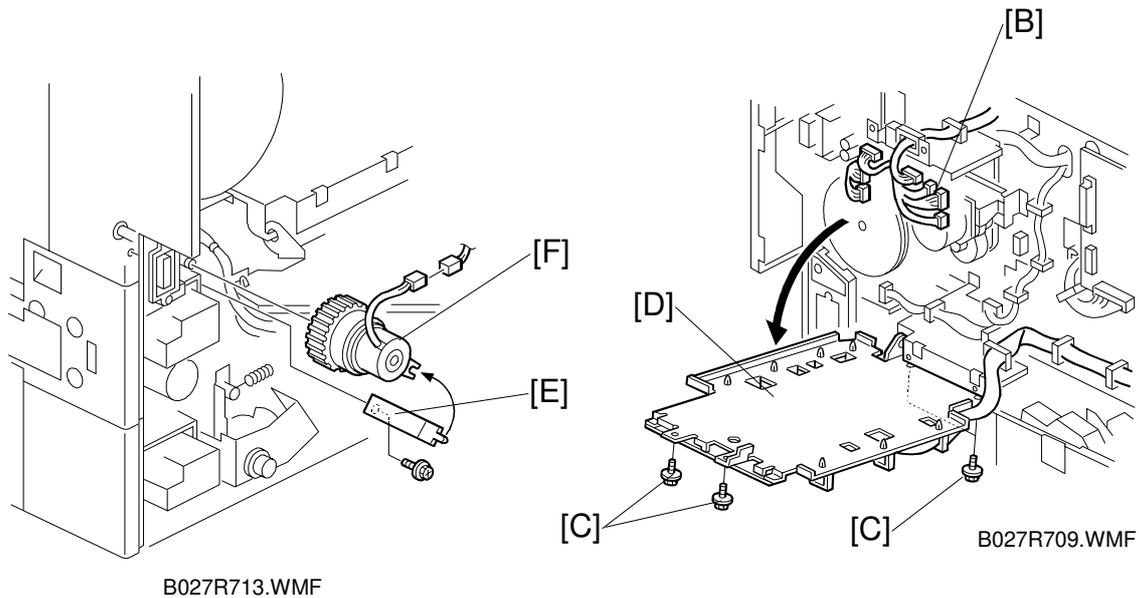
6.6.4 REGISTRATION CLUTCH



B027R712.WMF

1. Remove the connector cover and the rear cover. (☛ 6.6.3)
2. Remove the duplex connector cover and lower rear cover. (☛ 6.6.3)
3. Remove the fly wheels [A] (1 screw).
4. Remove the registration clutch [B] (1 E-ring, 1 connector).

6.6.5 PAPER FEED CLUTCHES



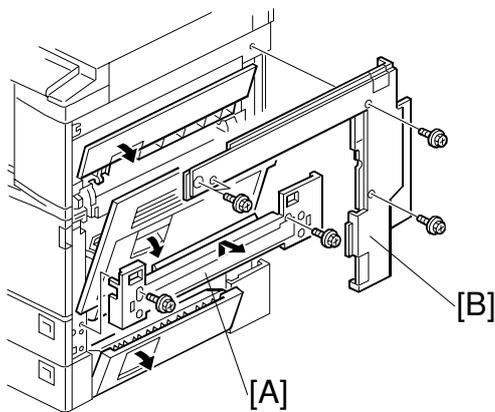
Lower Paper Feed Clutch

1. Remove the rear cover. (☛ 6.6.3)
2. Remove the lower rear cover. (☛ 6.6.3)
3. Replace the lower paper feed clutch [A] (1 connector).

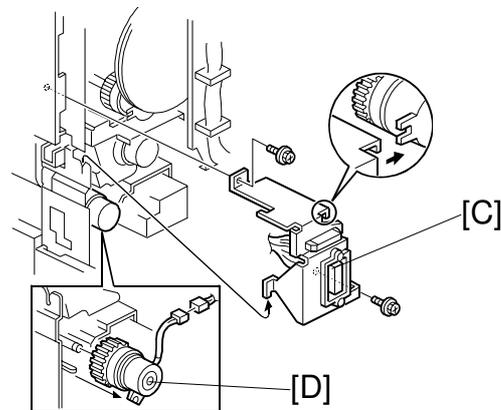
Upper Paper Feed Clutch.

4. Disconnect the connectors [B] for the SBCU board as shown (14 connectors).
5. Remove 4 screws [C] securing the SBCU board bracket then swing down the I/O board bracket [D].
6. Remove the bracket [E] (1 screw).
7. Replace the upper paper feed clutch [F] (1 connector).

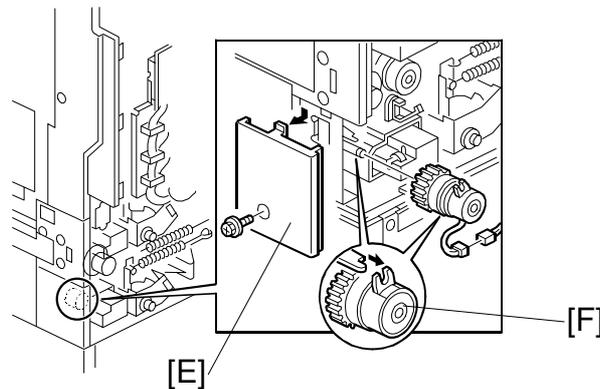
6.6.6 RELAY CLUTCHES



B027R716.WMF



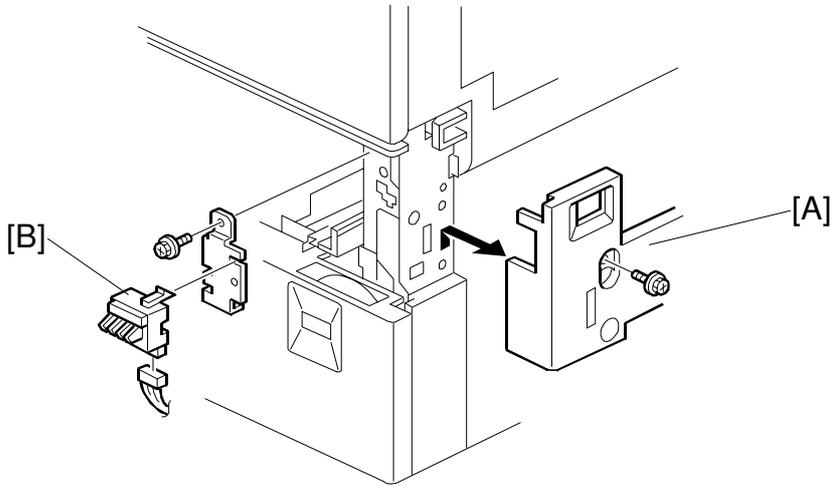
B027R717.WMF



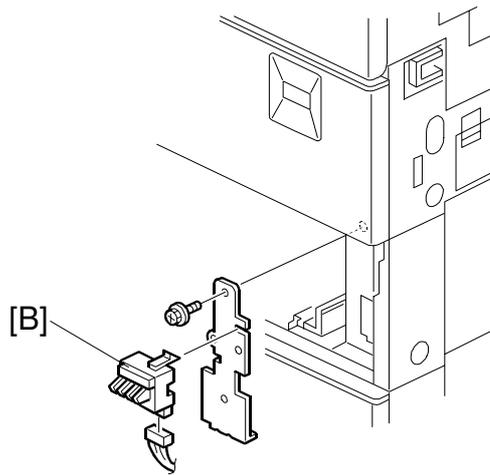
B027R714.WMF

1. Remove the optional duplex unit and/or by-pass tray unit if they have been installed.
2. Remove the rear cover and lower rear cover. (☛ 6.6.3)
3. Remove the lower right cover [A] (2 screws).
4. Remove the scanner right cover. (☛ 6.1.2)
5. Remove the right cover [B] (4 screws).
6. Swing down the I/O board bracket. (☛ 6.6.5)
7. Remove the connector bracket [C] (2 screws).
8. Replace the upper relay clutch [D] (1 connector).
9. Remove the right back cover [E] (1 screw).
10. Replace the lower relay clutch [F] (1 connector).

6.6.7 PAPER SIZE DETECTOR



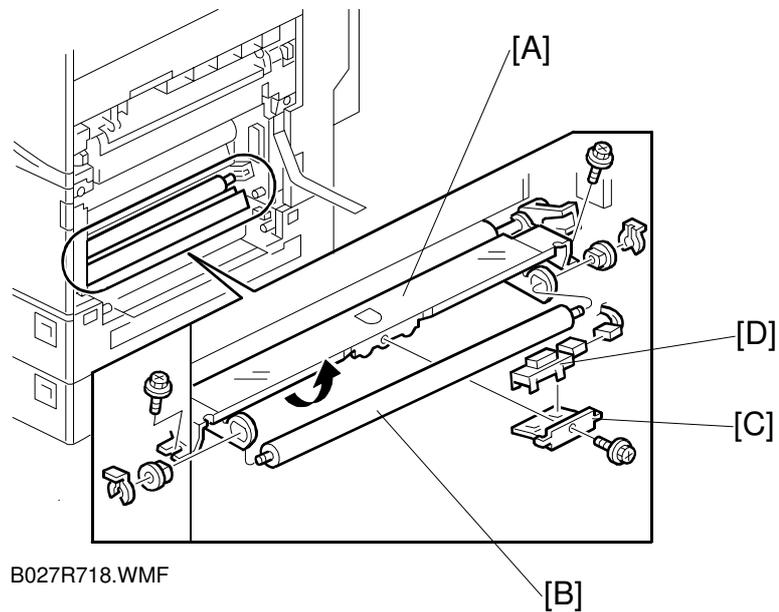
B027R721.WMF



B022R722.WMF

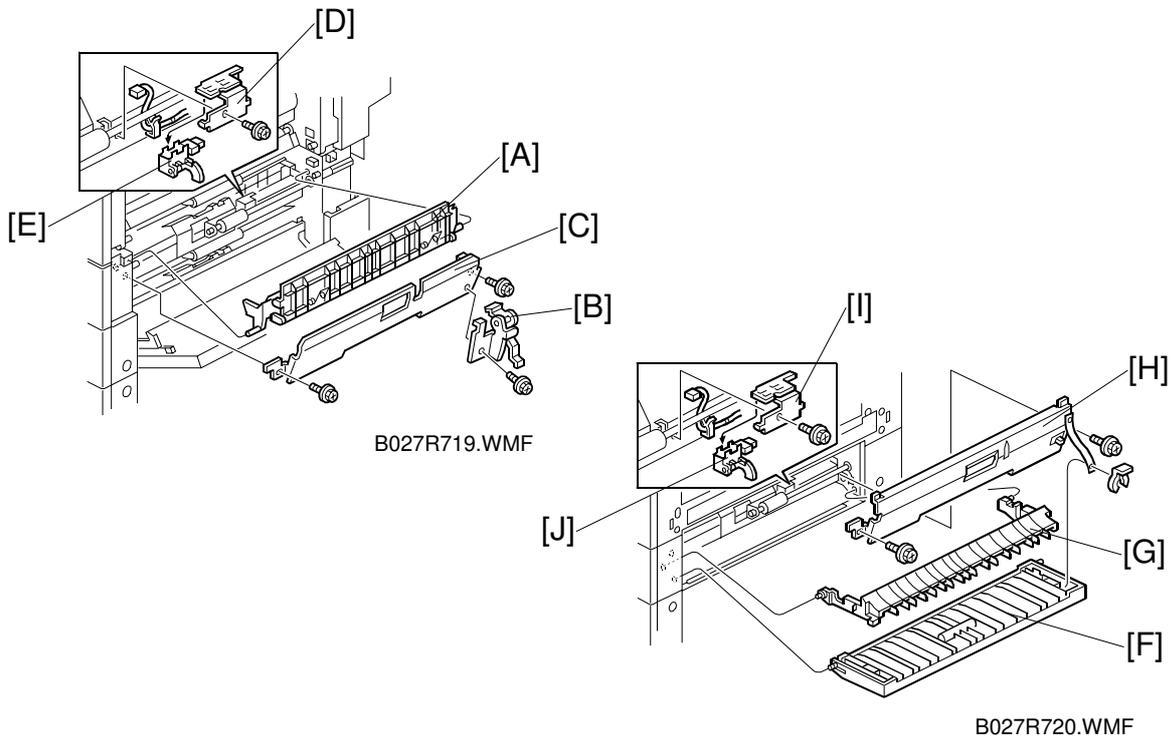
Replacement
Adjustment

1. Remove the right lower cover [A]. (☛ 6.6.6)
2. Remove the paper trays.
3. Remove the paper size detector assembly (1 screw each).
4. Replace the paper size detectors [B] (1 connector each).

6.6.8 REGISTRATION SENSOR

1. Remove the right cover. (☛ 6.4.2)
2. Remove the registration guide plate [A] (2 screws).
3. Remove the paper support roller [B] (2 snap rings, 2 bushings).
4. Remove the sensor bracket [C] (1 screw).
5. Replace the registration sensor [D] (1 connector).

6.6.9 RELAY SENSORS



Upper Relay Sensor

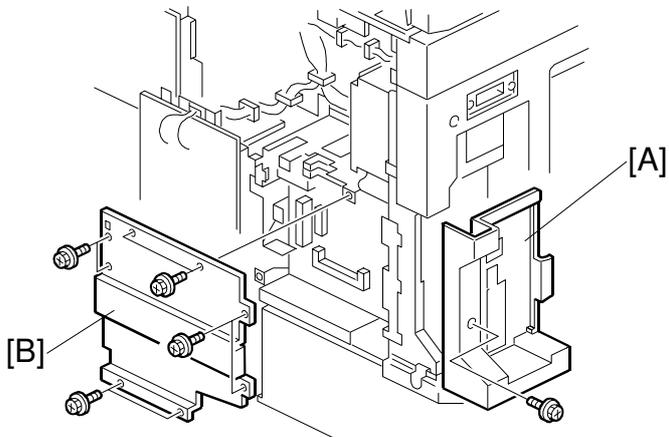
1. Remove the right cover. (☛ 6.4.2)
2. Remove the lower right cover. (☛ 6.6.6)
3. Remove the guide plate [A].
4. Remove the bracket [B] (1 screw).
5. Remove the guide plate [C] (2 screws).
6. Remove the sensor bracket [D] (1 screw).
7. Replace the upper relay sensor [E] (1 connector).

Lower Relay Sensor

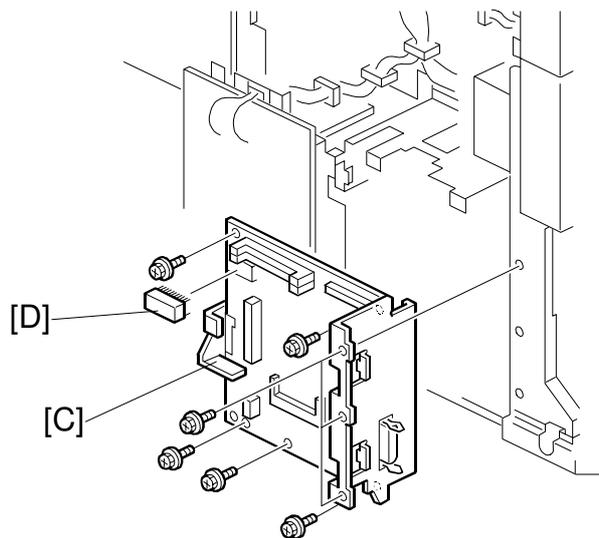
1. Remove the right lower door [F] (1 clip).
2. Remove the guide plate [G].
3. Remove the guide plate [H] (2 screws).
4. Remove the sensor bracket [I] (1 screw).
5. Replace the lower relay sensor [J] (1 connector).

6.7 PCBS AND OTHER ITEMS

6.7.1 CONTROLLER BOARD



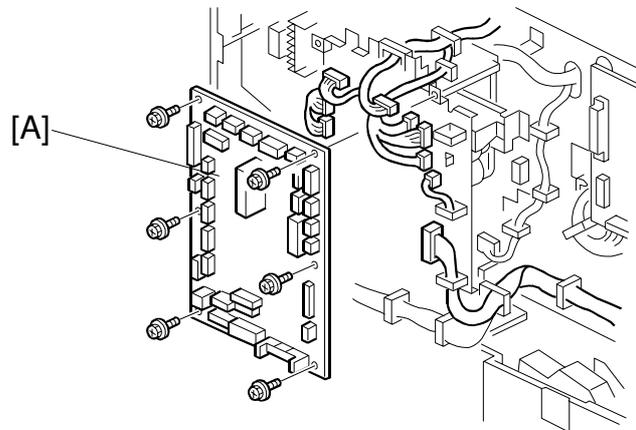
B022R951.WMF



B022R952.WMF

1. Remove the rear cover. (☛ 6.6.3)
2. Remove the optional finisher if it has been installed.
3. Remove the application cover [A] (1 screw).
4. Remove the shield plate [B] (8 screws) or the optional fax unit if it has been installed.
5. Remove the controller board [C] (2 connectors, 8 screws).
6. Remove the NVRAM [D], and DIMM (printer/scanner, memory, etc) from the old controller board and put them on the new controller board.

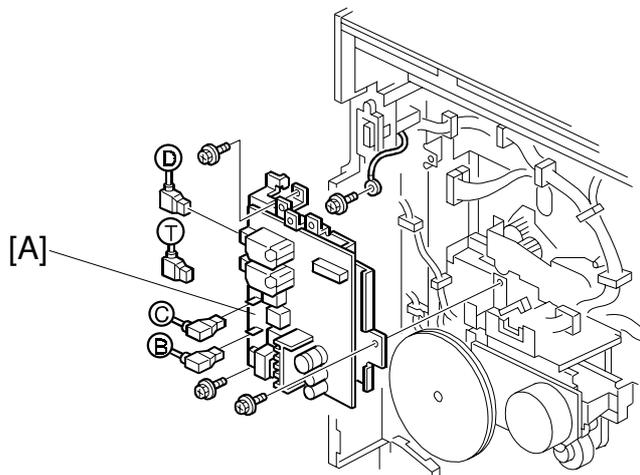
6.7.2 SBCU BOARD



B027R708.WMF

1. Remove the rear cover. (☛ 6.6.3)
2. Remove the **SBCU board** [A] (All connectors, 6 screws).

6.7.3 POWER PACK

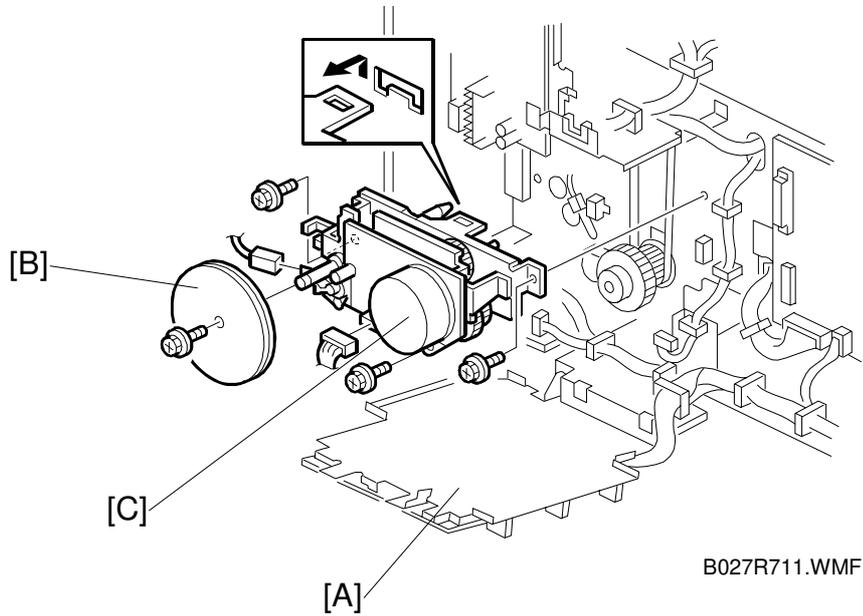


B027R710.WMF

1. Remove the rear cover. (☛ 6.6.3)
2. Swing down the I/O board bracket. (☛ 6.6.5)
3. Remove the power pack [A] (5 connectors, **3 screws**).

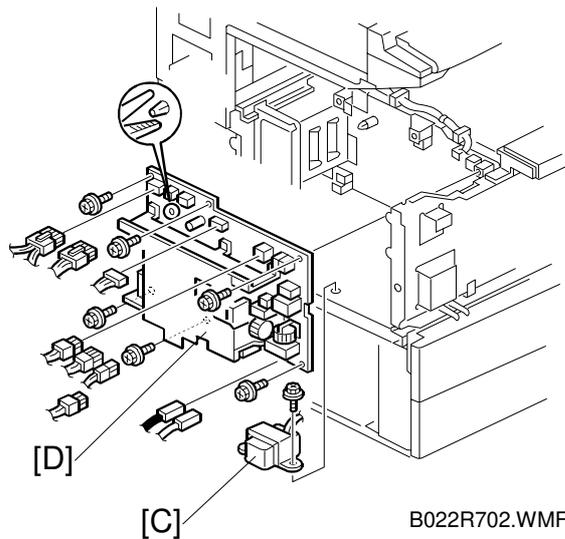
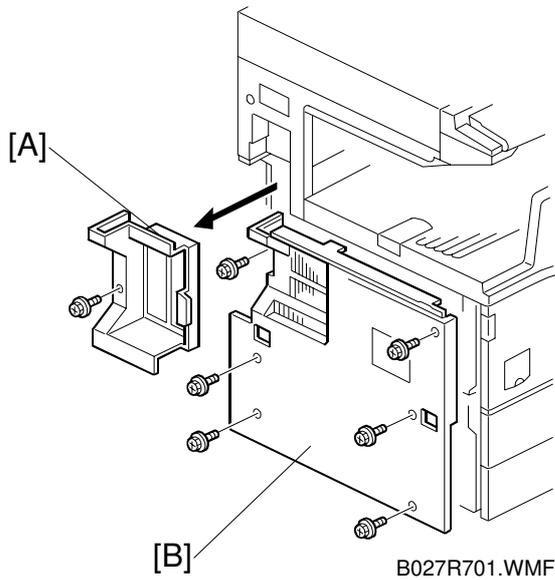
Replacement
Adjustment

6.7.4 MAIN MOTOR



1. Remove the rear cover. (☛ 6.6.3)
2. Swing down the I/O board bracket [A]. (☛ 6.6.5)
3. Remove the fly wheels [B] (1 screw).
4. Replace the main motor [C] (2 connectors, 3 screws).

6.7.5 PSU



Replacement
Adjustment

1. Remove the optional finisher if it has been installed.
2. Remove the application cover [A] (1 screw).
3. Remove the left cover [B] (6 screws).
4. **220 V machine only:** Remove the transformer [C] (1 screw).
5. Remove the PSU [D] (all connectors, 6 screws, 1 clip).

6.8 COPY ADJUSTMENTS: PRINTING/SCANNING

NOTE: 1) You need to perform these adjustment(s) after replacing any of the following parts:

- Scanner Wire
- Lens Block/SBU Assembly
- Scanner Drive Motor
- Polygon Mirror Motor
- Paper Side Fence
- Memory All Clear

2) For more details about accessing SP modes, refer to section 4.

6.8.1 PRINTING

NOTE: 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.

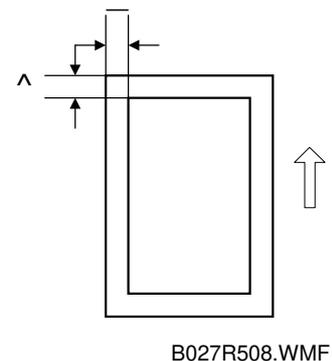
2) Use the Trimming Area Pattern (SP2-902-3, No.10) to print the test pattern for the following procedures.

3) Set SP 2-902-3 to 0 again after completing these printing adjustments.

Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration for each paper feed station, and adjust them using SP1-001.
2. Check the side-to-side registration for each paper feed station, and adjust them using SP1-002.

Tray	SP mode	Specification
Any paper tray	SP1-001-1	3 ± 2 mm
By-pass feed	SP1-001-2	
Duplex	SP1-001-3	
1st paper feed	SP1-002-1	2 ± 1.5 mm
2nd paper feed	SP1-002-2	
3rd paper feed (Optional PFU tray 1), or LCT	SP1-002-3	
4th paper feed (Optional PFU tray 2)	SP1-002-4	
By-pass feed	SP1-002-5	
Duplex, side 2	SP1-002-6	



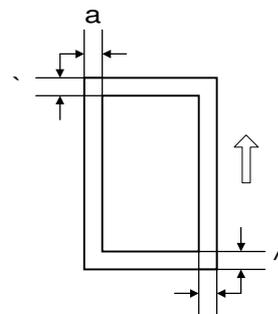
A: Leading Edge Registration
 B: Side-to-side Registration

Blank Margin

NOTE: If the leading edge/side-to-side registration cannot be adjusted within the specifications, adjust the leading/left side edge blank margin.

1. Check the trailing edge and right side edge blank margins, and adjust them using the following SP modes.

	SP mode	Specification
Trailing edge	SP2-101-2/3/4	3 ± 2 mm
Right edge	SP2-101-6	2 +2.5/-1.5 mm
Leading edge	SP2-101-1	3 ± 2 mm
Left edge	SP2-101-5	2 ± 1.5 mm
Trailing edge (duplex copy, 2nd side)	SP2-101-7	2 ± 2 mm
Left edge (duplex copy, 2nd side)	SP2-101-8	2 ± 1.5 mm
Right edge (duplex copy, 2nd side)	SP2-101-9	2 +2.5/-1.5 mm



B027R509.WMF

- A: Trailing Edge Blank Margin
- B: Right Edge Blank Margin
- C: Leading Edge Blank Margin
- D: Left Edge Blank Margin

Main Scan Magnification

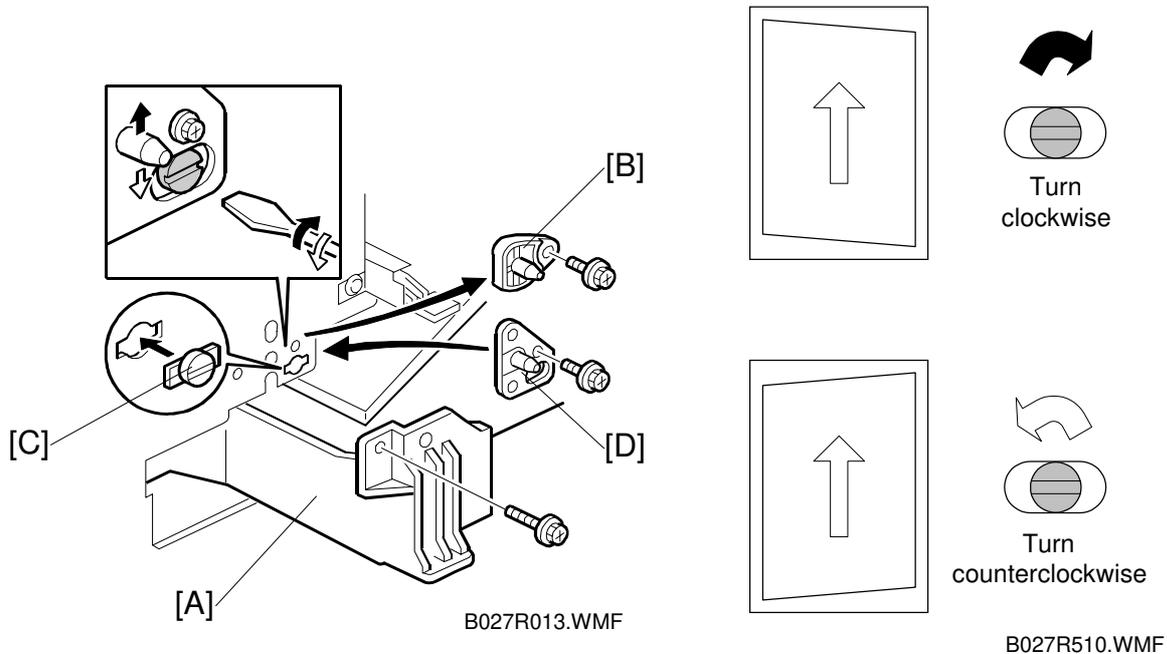
1. Print the single-dot grid pattern (SP2-902, no.5).
2. Check the magnification, and adjust the magnification using SP2-909 if necessary. The specification is ± 1%.

Replacement Adjustment

Parallelogram Image Adjustment

Do the following procedure if a parallelogram is printed while adjusting the printing registration or the printing margin using a trimming area pattern.

NOTE: The following procedure should be done after adjusting the side-to-side registration for each paper tray station.



1. Check whether the trimming area pattern ([SP2-902](#), No.10) is printed as a parallelogram, as shown. If it is, do the following.
2. Remove the laser unit [A] (☛ 6.2).
3. Remove the bracket [B] (2 screws).
4. Install the adjusting cam [C] (P/N: A2309003).
5. Secure the adjustment bracket [D] (P/N A2679002) using the screw which was used for bracket [B]. However, do not tighten the screws at this time.
6. Adjusts the laser unit position by turning the adjusting cam. (Refer to the above illustration for the relationship between the image and the cam rotation direction).
7. Tighten the adjustment bracket.
8. Print the trimming area pattern to check the image. If it is still unsatisfactory, repeat steps 4 to 8.

6.8.2 SCANNING

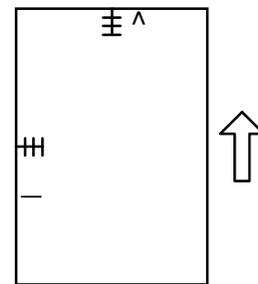
- NOTE:** 1) Before doing the following scanner adjustments, perform or check the printing registration/side-to-side adjustment and the blank margin adjustment.
 2) Use an S5S test chart to perform the following adjustments.

Registration: Platen Mode

- Place the test chart on the exposure glass and make a copy from one of the feed stations.
- Check the leading edge and side-to-side registration, and adjust them using the following SP modes if necessary.

	SP mode
Leading Edge	SP4-010
Side-to-side	SP4-011

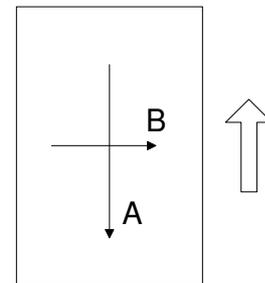
A: Leading Edge Registration
 B: Side-to-side Registration



B027R511.WMF

Magnification

NOTE: Use an S5S test chart to perform the following adjustment.



A: Sub Scan Magnification
 B: Main Scan magnification

B027R500.WMF

Replacement Adjustment

- Place the test chart on the exposure glass and make a copy from one of the feed stations.
- Check the magnification ratio, and adjust it using the following SP mode if necessary. The specification is +1%.

	SP mode
Sub Scan Magnification	SP4-009
Main Scan Magnification	SP4-008



Standard White Density Adjustment

This adjusts the standard white density level.

Perform this adjustment in any of the following conditions:

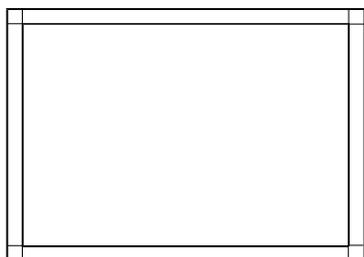
- After replacing the standard white plate.
- After replacing the NVRAM on the [controller board](#). (If only [controller board](#) is replaced, this adjustment is not necessary, as the NVRAM from the old [controller board](#) is put on the new [controller board](#).)
- After performing a memory all clear (SP5-801).

Procedure:

1. Place 10 sheets of new A4 sideways (do not use any recycled paper) or A3 paper on the exposure glass and close the platen cover or the ADF.
2. Enter [SP 4-428](#) and select "1: Yes". The standard white density is automatically adjusted.

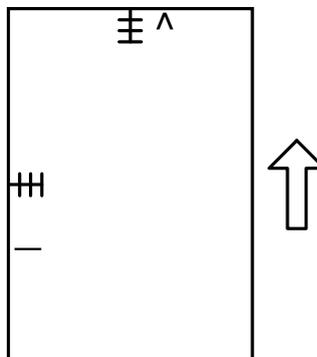
6.8.3 ADF IMAGE ADJUSTMENT

Registration



B027R514.WMF

- A: Leading Edge Registration
- B: Side-to-side Registration



A267R513.WMF

NOTE: Make a temporary test chart as shown above using A3/DLT paper.

1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
2. Check the registration, and adjust using the following SP modes if necessary.

	SP mode
Side-to-side Registration	SP6-006-1
Leading Edge Registration (Simplex)	SP6-006-2
Trailing Edge Blank Margin	SP6-006-3
Side-to-side Registration (Duplex: rear)	SP6-006-4

Sub Scan Magnification

NOTE: Make a temporary test chart as shown above using A3/DLT paper.

1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
2. Check the magnification, and adjust using the following SP modes if necessary. The specification is $\pm 1\%$.

	SP mode
Sub scan magnification	SP6-006-5

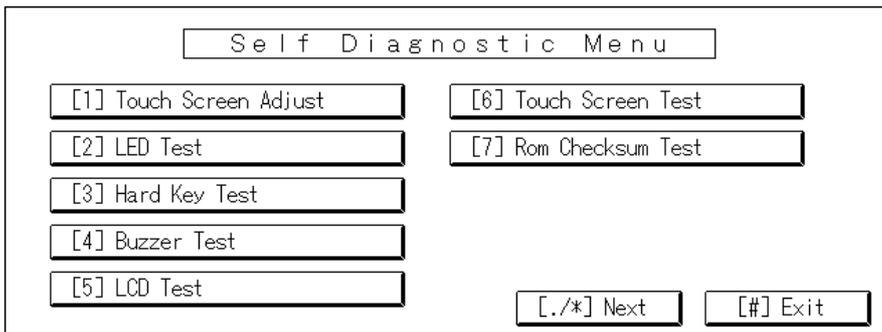
Replacement Adjustment

6.8.4 TOUCH SCREEN CALIBRATION

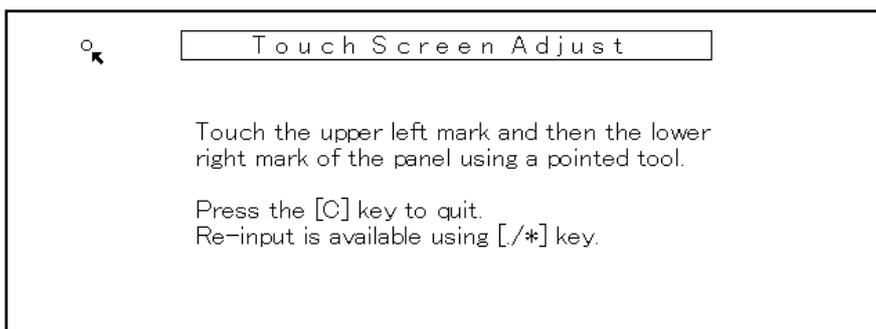
After clearing the memory, or if the touch panel detection function is not working correctly, follow this procedure to calibrate the touch screen.

NOTE: Do not attempt to use items [2] to [9] on the Self-Diagnostic Menu. These items are for design use only.

1. Press , press **1****9****9****3**, and then press **C** 5 times to open the Self-Diagnostics menu.



B027R533.WMF



B027R554.WMF

2. On the touch screen press "Touch Screen Adjust" (or press **1**).
3. Use a pointed (not sharp!) tool to press the upper left mark .
4. Press the lower right mark  after it appears.
5. Touch a few spots on the touch panel to confirm that the marker (+) appears exactly where the screen is touched.
If the + mark does not appear where the screen is touched, press Cancel and repeat from Step 2.
6. When you are finished, press [#] OK on the screen (or press **#**).
7. Touch [#] Exit on the screen to close the Self-Diagnostic menu and save the calibration settings.

7. TROUBLESHOOTING

CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED () lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

7.1 SERVICE CALL CONDITIONS

7.1.1 SUMMARY

There are 4 levels of service call conditions.

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

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.

7.1.2 SC CODE DESCRIPTIONS

Code No.		Symptom	Possible Cause
101	B	Exposure lamp error	<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
		The standard white level was not detected properly when scanning the white plate.	
120	D	Scanner home position error 1	<ul style="list-style-type: none"> • Scanner drive motor defective • Scanner motor defective • Harness between SBCU and scanner drive motor disconnected • Harness between SBCU and scanner drive motor power source disconnected • Scanner HP sensor defective • Harness between SBCU and HP sensor disconnected • Scanner wire, timing belt, pulley, or carriage defective
		The scanner home position sensor does not detect the on condition during initialization or copying.	
121	D	Scanner home position error 2	<ul style="list-style-type: none"> • SIB or scanner drive motor defective • Scanner motor defective • Harness between SBCU and scanner drive motor disconnected • Harness between SBCU and scanner drive motor power source disconnected • Scanner HP sensor defective • Harness between SBCU and HP sensor disconnected • Scanner wire, timing belt, pulley, or carriage defective
		The scanner home position sensor does not detect the off condition during initialization.	
144	B	SBU connection error	Cable between SBU and IPU board disconnected.
		The IPU does not detect the SBU connection signal.	
192	B	Automatic SBU adjustment error	<ul style="list-style-type: none"> • SBU defective • SBCU board defective • Exposure lamp stabilizer defective • Exposure lamp defective • Dirty white plate
		An error is detected during automatic SBU adjustment (SP4-428)	
193	B	Image transfer error	<ul style="list-style-type: none"> • IPU board defective • Controller board defective • Video controller defective
		The IPU board does not finish within 1 minute after the image data has been transferred to the controller board.	
195	B	DFGATE assert error	<ul style="list-style-type: none"> • ADF interface cable defective • SBCU board defective • Mismatched firmware between the SBCU board and ADF
		The DFGATE signal does not assert within 30 seconds after the original has been scanned.	
196	B	DFGATE negate error	<ul style="list-style-type: none"> • ADF interface cable defective • SBCU board defective • Mismatched firmware between the SBCU board and ADF
		The DFGATE signal does not negate within 1 minute after the DFGATE has been asserted.	



Code No.		Symptom	Possible Cause
197	B	DFGATE error	<ul style="list-style-type: none"> • ADF interface cable defective • SBCU board defective • Mismatched firmware between the SBCU board and ADF
		The DFGEATE signal has already been asserted at the original scan.	
198	B	Memory address error	<ul style="list-style-type: none"> • Mismatched firmware between the SBCU board and controller board • Controller defective • SBCU defective • IPU board defective
		The IPU board does not receive the memory address from the controller board.	
199	B	DF scanning finish error	<ul style="list-style-type: none"> • ADF interface cable defective • SBCU board defective • Mismatched firmware between the SBCU board and ADF
		The original does not finish scanning with in 1 minute	
302	B	Charge roller current leak	<ul style="list-style-type: none"> • Charge roller damaged • Charge high voltage supply board defective • Poor connection of the PCU
		A charge roller current leak signal is detected.	
320	B	Polygon motor error	<ul style="list-style-type: none"> • Polygon mirror motor defective • Poor connection between the polygon mirror motor driver and the SBCU board • SBCU board defective
		The polygon motor does not reach its operating speed within 10 seconds after the polygon motor on signal, or the lock signal is not detected for more than 200 ms continuously during operation.	
322	B	Laser synchronization error	<ul style="list-style-type: none"> • Poor connection between the laser synchronization detector board and the SBCU board • Laser synchronization detector board out of position • Laser synchronization detector board defective • SBCU board defective • LD unit defective
		The main scan synchronization detector board cannot detect the laser synchronization signal for more than 10 consecutive 50 ms intervals.	
323	B	LD drive current over	<ul style="list-style-type: none"> • LD unit defective (not enough power, due to aging) • Poor connection between the LD unit and the SBCU board • SBCU board defective
		The LD drive board applies more than 100 mA to the LD.	
390	D	TD sensor error	<ul style="list-style-type: none"> • TD sensor abnormal • Poor connection of the PCU
		The TD sensor outputs less than 0.5V or more than 4.0V 10 times consecutively during copying.	
391	B	Development bias leak	<ul style="list-style-type: none"> • Poor connection of the PCU • High voltage supply board defective
		A development bias leak signal is detected.	
392	B	TD sensor initial setting error	<ul style="list-style-type: none"> • Someone forgot to remove the toner seal of the PCU • ID sensor defective • TD sensor abnormal • Drum does not turn • Development roller does not turn • Poor connection of the PCU
		TD sensor output voltage falls out of the adjustment range (2.0 ±<> 0.2 V) after the TD sensor initial setting has been finished.	



Trouble-shooting

Code No.		Symptom	Possible Cause
401	B	Transfer roller leak error 1	<ul style="list-style-type: none"> • High voltage supply board defective • Poor connection of the PCU • Transfer/separation unit set incorrectly • Transfer roller damaged
402	B	Transfer roller leak error 2 A transfer roller current leak signal is detected. The current feedback signal for the transfer roller is not detected.	
411	B	Separation bias leak error A separation bias leak signal is detected.	<ul style="list-style-type: none"> • High voltage supply board defective • Poor connection of the PCU • Discharge plate defective
490	B	Toner supply motor leak error Over 1 A supplied to the toner supply motor for longer than 200 ms.	Toner supply motor defective
500	B	Main motor lock A main motor lock signal is not detected for more than 500 ms after the main motor starts to rotate, or the lock signal is not detected for more than 500 ms during rotation after the last signal.	<ul style="list-style-type: none"> • Too much load on the drive mechanism • Main motor defective
501	B	1st paper tray lift motor malfunction	<ul style="list-style-type: none"> • Paper lift sensor defective • Tray lift motor defective • Too much load on the drive mechanism • Poor tray lift motor connection
502	B	2nd paper tray lift motor malfunction	
503	B	3rd paper tray lift motor malfunction (optional paper tray unit)	
504	B	4th paper tray lift motor malfunction (optional paper tray unit) The paper lift sensor is not activated after the tray lift motor has been on for 18 seconds.	
506	B	Paper tray motor lock (optional paper tray unit) A motor lock signal is not detected for more than 1.5 s or the lock signal is not detected for more than 1.0 s during rotation.	<ul style="list-style-type: none"> • Paper tray unit motor defective • Too much load on the drive mechanism
508	B	Rear fence drive error (optional LCT) The return position sensor is not activated after the rear fence drive motor has been on to lower the tandem tray for 8 seconds.	<ul style="list-style-type: none"> • Rear fence motor defective • Return position sensor defective • Too much load on the drive mechanism
509	B	Side fence drive error (optional LCT) The side fence positioning sensor is not activated for more 3 seconds when the paper stack in the left tray is moved to the right tray. The side fence close sensor is not activated for more 3 seconds after moving the paper stack to the right tray.	<ul style="list-style-type: none"> • Side fence motor defective • Side fence position sensor defective • Side fence close sensor defective • Too much load on the drive mechanism
510	B	LCT lower limit error The lower limit sensor does not activate within 8 seconds after the tray has been lowered.	<ul style="list-style-type: none"> • Tray lift motor defective • Poor connection of the tray lift motor • Lower limit sensor defective • Too much load on the drive mechanism

Code No.		Symptom	Possible Cause
520	B	Paper tray error	<ul style="list-style-type: none"> • A defective motor • A defective sensor • Too much load on the drive mechanism
		An error occurs (i.e motor error, or sensor error, etc) for any paper tray.	
541	A	Fusing thermistor open	<ul style="list-style-type: none"> • Fusing thermistor defective or out of position • Fusing lamp open • Fusing thermostat open • Power supply board defective • Poor connection of the fusing unit
		<p>The fusing temperature detected by the thermistor was below 0 °C for 5 seconds.</p> <p>The fusing temperature does not rise +15 °C (center) or +12 °C (at the ends) five times within 2 minutes after the fusing lamps have been turned on.</p>	
542	A	Fusing temperature warm-up error	<ul style="list-style-type: none"> • Fusing thermistor defective or out of position • Fusing lamp open • Fusing thermostat open • Power supply board defective • Poor connection of the fusing unit
		The fusing temperature does not reach the standby temperature within 20 seconds after the main switch is turned on.	
543	A	Fusing overheat error 1	<ul style="list-style-type: none"> • Fusing thermistor defective • Power supply board defective • SBCU board defective
		A fusing temperature of over 231°C is detected for 5 second by the fusing thermistor.	
544	A	Fusing overheat error 2	<ul style="list-style-type: none"> • Fusing thermistor defective • Power supply board defective • SBCU board defective
		A fusing temperature of over 251°C is detected by the fusing temperature monitor circuit in the SBCU board.	
546	A	Unstable fusing temperature	<ul style="list-style-type: none"> • Thermistor defective • Poor connection of the fusing unit • Power supply unit defective
		The fusing temperature varies 50°C or more within 1 second twice continuously.	
547	B	Zero cross signal malfunction	<ul style="list-style-type: none"> • Power supply board defective • SBCU board defective
		Zero cross signals are not detected within a certain period.	
548	A	Fusing unit set error	<ul style="list-style-type: none"> • Poor connection of the fusing unit • The fusing unit is not installed
		The machine does not detect the fusing unit.	
590	B	Exhaust fan motor error	<ul style="list-style-type: none"> • Poor connection of the exhaust fan motor • Too much load on the motor drive
		The CPU detects an exhaust fan lock signal for more than 5 seconds.	
611	B	Communication break error between SBCU and ADF	<ul style="list-style-type: none"> • Serial line connecting SBCU and ADF unstable • External noise • ADF main board defective • SBCU board defective
		The SBCU receives a break signal from the ADF main board.	
612	B	Communication command error between SBCU and ADF	<ul style="list-style-type: none"> • SBCU board defective • Download SBCU firmware again
		The SBCU sends a command to the ADF main board that it cannot execute.	

Trouble-shooting



Code No.		Symptom	Possible Cause
620	B	Communication timeout error between SBCU and finisher	<ul style="list-style-type: none"> Serial line connecting SBCU and finisher unstable External noise SBCU board and finisher main board connection defective or loose Finisher main board defective SBCU board defective
		The SBCU cannot receive a response within 100 ms after 3 attempts after sending data to the finisher.	
621	B	Communication timeout error between SBCU and finisher	<ul style="list-style-type: none"> Serial line connecting SBCU and finisher unstable External noise
		A break (low) signal was received from the finisher.	
630	C	Communication failure with CSS (RSS)	<ul style="list-style-type: none"> Occurred with an SC call, CC call, supply management call, user call, or CE call. Timeout while no response from the LADP, and abnormal signal on the RS-485 line between PI and LADP.
		The communication from the copier was detected as abnormal at the CSS center. This error occurs when the acknowledge signal from the LADP does not complete normally.	
640	C	SBCU control data transfer checksum error	<ul style="list-style-type: none"> Controller board defective External noise SBCU board defective
		A sampling of control data sent from the SBCU to the controller reveals a checksum error. Only the logging count is performed.	
641	C	SBCU control data transfer abnormal	<ul style="list-style-type: none"> Controller board defective External noise SBCU board defective
		A sampling of the control data sent from the SBCU reveals an abnormality.	
650	B	Communication timeout error between SBCU and duplex unit	<ul style="list-style-type: none"> Serial line connecting SBCU and duplex unit unstable External noise SBCU board and duplex main board connection defective or loose Duplex main board defective SBCU board defective
		The SBCU cannot receive a response within 1 second from the duplex unit.	
670	D	Engine response error	<ul style="list-style-type: none"> SBCU installed incorrectly SBCU defective Controller board defective
		After powering on the machine, a response is not received from the engine within 30 seconds.	
672	D	Controller-to-operation panel communication error at startup	<ul style="list-style-type: none"> Controller stall Controller board installed incorrectly Controller board defective Operation panel connector loose or defective
		After powering on the machine, the communication circuit between the controller and the operation panel is not opened, or communication with controller is interrupted after a normal startup.	
720	B	Finisher jogger motor error (500-sheet finisher)	<ul style="list-style-type: none"> Jogger H.P sensor defective Jogger motor defective
		The finisher jogger H.P sensor remains de-activated for a certain time when returning to home position. The finisher jogger H.P sensor remains activated for a certain time when moving away from home position.	

Code No.		Symptom	Possible Cause
722	B	Finisher jogger motor error (1000-sheet finisher)	<ul style="list-style-type: none"> • Jogger H.P sensor defective • Jogger motor defective
		<p>The finisher jogger H.P sensor remains de-activated for a certain time when returning to home position.</p> <p>The finisher jogger H.P sensor remains activated for a certain time when moving away from home position.</p>	
724	B	Finisher staple hammer motor error (1000-sheet finisher)	<ul style="list-style-type: none"> • Staple jam • Stapler overload caused by trying to staple too many sheets • Staple hammer motor defective
		Stapling does not finish within 600 ms after the staple hammer motor turned on.	
725	B	Finisher stack feed-out motor error (1000-sheet finisher)	<ul style="list-style-type: none"> • Stack feed-out H.P sensor defective • Stack feed-out motor defective
		The stack feed-out belt H.P sensor does not activate within a certain time after the stack feed-out motor turned on.	
726	B	Finisher lift motor error (1000-sheet finisher)	<ul style="list-style-type: none"> • Shift tray lift motor defective • Stack height sensor defective
		The stack height sensor does not activate within a certain time after the shift tray lift motor turned on.	
727	B	Finisher staple hammer motor error (500-sheet finisher)	<ul style="list-style-type: none"> • Staple jam • Stapler overload caused by trying to staple too many sheets • Staple hammer motor defective
		Stapling does not finish within a certain time after staple hammer motor turned on.	
728	B	Finisher paper stack height error (500-sheet finisher)	<ul style="list-style-type: none"> • Stack height lever solenoid defective • Stack height sensor defective • Lever sensor defective • Main control board defective
		The stack height detection lever does not return to its home position before going to detect the stack height.	
730	B	Finisher stapler motor error (1000-sheet finisher)	<ul style="list-style-type: none"> • Stapler motor defective • Stapler H.P sensor defective • Poor stapler motor connection
		<p>The stapler does not return to its home position within a certain time after the stapler motor turned on.</p> <p>The stapler H.P sensor does not activate within a certain time after the stapler motor turned on.</p>	
731	B	Output tray motor error (500-sheet finisher)	500-sheet finisher <ul style="list-style-type: none"> • Output tray motor defective • Tray upper limit sensor defective
		Exit guide plate motor error (1000-sheet finisher) <p>The tray upper limit sensor does not activate within a certain time after the shift motor turned on. (500-sheet finisher)</p> <p>The exit guide plate open sensor or exit guide plate HP sensor does not activate within a certain time after the exit guide plate motor turned on. (1000-sheet finisher)</p>	

Trouble-shooting

Code No.		Symptom	Possible Cause
732	B	Finisher shift motor error (1000-sheet finisher)	<ul style="list-style-type: none"> • Shift motor defective • Shift tray HP sensor defective
		Roller shift does not finish within a certain time after the shift motor turned on.	
791	B	Bridge communication error	<ul style="list-style-type: none"> • Poor connection between the main machine and bridge unit • SBCU board defective
		The SBCU cannot communicate with the bridge unit properly when the finisher is installed.	
792	B	Finisher connection error	<ul style="list-style-type: none"> • Poor connection between the finisher and bridge unit • SBCU board defective
		The SBCU cannot communicate with the finisher properly when the bridge unit is installed.	
793	B	Interchange communication error	<ul style="list-style-type: none"> • Poor connection between the interchange unit and main machine • SBCU board defective
		The SBCU cannot communicate with the interchange unit properly when the duplex unit is installed.	
800	D	Startup without video output end error (K)	Controller board defective
		Video transfer to the engine is started, but the engine did not issue a video transmission end command within the specified time.	
804	D	Startup without video input end (K)	Controller board defective
		A video transmission was requested from the scanner, but the scanner did not issue a video transmission end command within the specified time.	
818	D	Watchdog error	<ul style="list-style-type: none"> • Controller board defective • Software malfunction – download controller firmware again
		The CPU does not access the watchdog register within a certain time.	
819	D	Kernel mismatch error	Download controller firmware again
		Software bug	
820	D	Self-Diagnostic Error: CPU	<ul style="list-style-type: none"> • Controller board defective • Download controller firmware again
		The central processing unit returned an error during the self-diagnostic test.	
821	D	Self-Diagnostic Error: ASIC	Controller board defective
		The ASIC returned an error during the self-diagnostic test because the ASIC and CPU timer interrupts were compared and determined to be out of range.	
822	D	Self-Diagnostic Error: HDD	<ul style="list-style-type: none"> • HDD defective • HDD connector defective • Controller board defective
		The hard disk drive returned an error during the self-diagnostic test.	
823	D	Self-diagnostic Error: NIB	<ul style="list-style-type: none"> • Network interface board defective • Controller board defective
		The network interface board returned an error during the self-diagnostic test.	
824	D	Self-diagnostic Error: NVRAM	<ul style="list-style-type: none"> • Replace the NVRAM on the controller board • Replace the controller board
		The resident non-volatile RAM returned an error during the self-diagnostic test.	

Code No.		Symptom	Possible Cause
826	D	Self-diagnostic Error: NVRAM/Optional NVRAM	Replace the NVRAM on the controller board
		The NVRAM or optional NVRAM returned an error during the self-diagnostic test.	
827	D	Self-diagnostic Error: RAM	Download controller firmware again
		The resident RAM returned a verify error during the self-diagnostic test.	
828	D	Self-diagnostic Error: ROM	<ul style="list-style-type: none"> • Controller board defective • Download controller firmware again
		The resident read-only memory returned an error during the self-diagnostic test.	
829	D	Self-diagnostic Error: Optional RAM	<ul style="list-style-type: none"> • Replace the optional memory board • Controller board defective
		The optional RAM returned an error during the self-diagnostic test.	
835	D	Self-Diagnostic Error: Parallel Interface	<ul style="list-style-type: none"> • Loopback connector not detected • IEEE1284 connector defective • Controller board defective
		Loopback test error.	
836	D	Self-diagnostic Error: Resident Font ROM	Replace the controller board
		The resident font ROM returned an error during the self-diagnostic test.	
837	D	Self-diagnostic Error: Optional Font ROM	Replace the controller board
		The optional font ROM returned an error during the self-diagnostic test.	
838	D	Self-diagnostic Error: Clock Generator	Replace the controller board
		A verify error occurred when setting data was read from the clock generator via the I2C bus.	
850	D	Network I/F Abnormal	<ul style="list-style-type: none"> • NIB defective • Controller board defective
		NIB interface error.	
851	D	IEEE 1394 I/F Abnormal	<ul style="list-style-type: none"> • IEEE1384 interface board defective • Controller board defective
		IEEE1394 interface error.	
860	B	Startup without HD connection at main power on	<ul style="list-style-type: none"> • Cable between HDC and HDD loose or defective • HDD power connector loose or defective • HDD defective • Replace the controller board
		The hard disk connection is not detected.	
861	B	Startup without HD detection at power key on	<ul style="list-style-type: none"> • Cable between HDC and HDD loose or defective • HDD power connector loose or defective • HDD defective
		The hard disk connection is not detected.	
862	A	Maximum number of bad sectors detected on HD	SC863 returned while reading data from the HD and the number of registered bad sectors reached 101.
		Up to 101 bad sectors have appeared in the area on the hard disk where image data is archived, and the hard disk may require replacement.	



Code No.		Symptom	Possible Cause
863	B	Startup without HD data lead	A bad sector occurred during operation of the HDD
		Data stored on the hard disk is not read correctly.	
864	D	HD data CRC error	Data transfer was abnormal in the data read from the HDD.
		During operation of the HD, the HD responded with a CRC error.	
865	D	HD access error	Replace the controller board
		The hard disk detected an error.	
900	D	Electronic total counter error	Replace the NVRAM on the controller board
		The value of the total counter has already exceeded 9999999	
901	D	Mechanical total count error	Mechanical total counter defective
		The SBCU board cannot receive the mechanical total count data.	
951	B	F-gate error at write request	<ul style="list-style-type: none"> • Download controller firmware • SBCU board defective
		After the IPU receives an F-gate signal, it receives another F-gate signal.	
953	B	Scanner setting error	Download controller firmware
		The IPU does not respond with the scanner setting signal required to start scanning processing.	
954	B	Printer setting error	<ul style="list-style-type: none"> • Replace the IPU board • Replace the controller board • Download the controller firmware
		The IPU does not respond with the settings that are required to start image processing by the printer.	
955	B	Memory setting error	<ul style="list-style-type: none"> • Replace the IPU board • Replace the controller board • Download the controller firmware
		The IPU does not respond with the settings that are required to start image processing using the memory.	
964	B	Printer ready error	<ul style="list-style-type: none"> • Replace the IPU board • Replace the controller board • Download the controller firmware
		The printer ready signal is not generated within 17 seconds after the IPU received the print start signal.	
984	D	Print image data transfer error	<ul style="list-style-type: none"> • Controller board defective • SBCU board defective • Connectors between SBCU and controller loose or defective
		The image transfer from the controller to the engine via the PCI bus does not end within 15 s after starting.	
986	D	Software write parameter setting error	Download controller firmware again
		An unstable area at the storage destination in the settings table is set at NULL for the parameter received by the write module.	



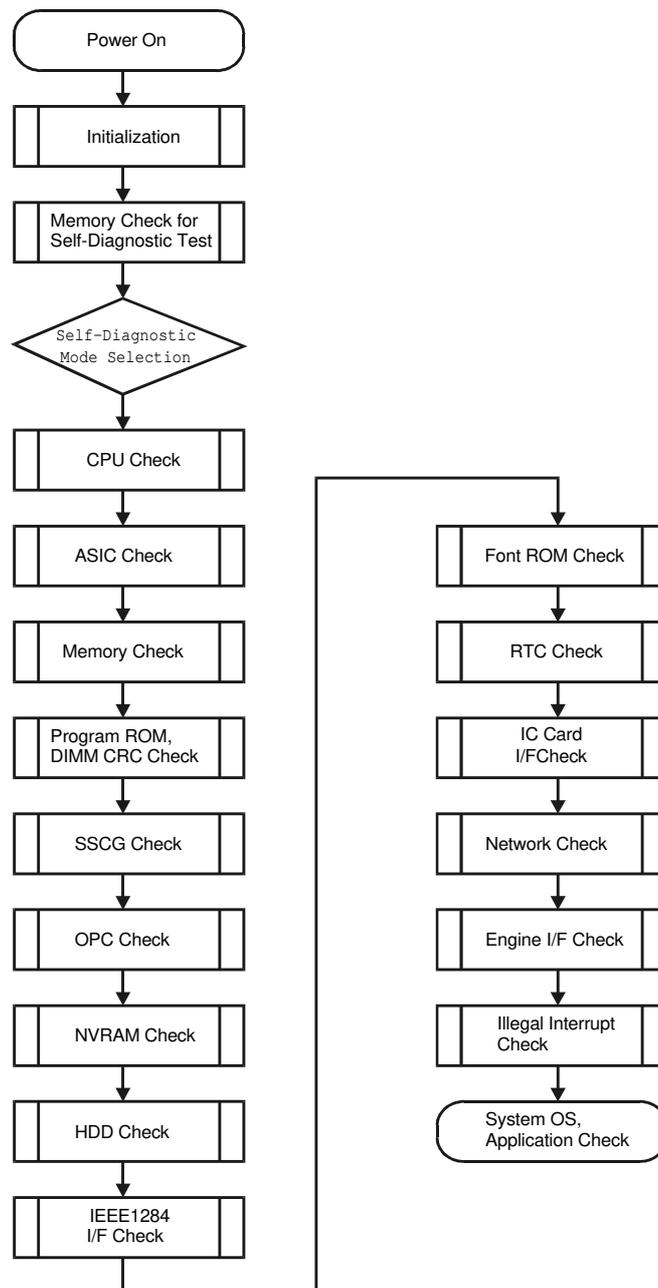
Code No.		Symptom	Possible Cause
990	D	Software performance error	<ul style="list-style-type: none"> • Software defective • Internal parameter incorrect • Insufficient working memory • When this SC occurs, the file name, address, and data will be stored in NVRAM. This information can be checked by using SP7-403. Note the above data and the situation in which this SC occurs. Then report the data and conditions to your technical control center.
		The software attempted to perform an unexpected operation.	
991	C	Software continuity error	<ul style="list-style-type: none"> • No operation required. This SC code does not appear on the panel, and is only logged.
		The software attempted to perform an unexpected operation. However, unlike SC990, the object of the error is continuity of the software.	
996	B	FCU board error	<ul style="list-style-type: none"> • FCU board defective and requires replacement • Download FCU firmware
		FCU board is connected but not ready.	
997	B	Application function selection error	<ul style="list-style-type: none"> • Download the firmware for the application that failed • An option required by the application (RAM, DIMM, board) is not installed
		The application selected by a key press on operation panel does not start or ends abnormally.	
998	D	Application start error	<ul style="list-style-type: none"> • Download controller firmware • Replace the controller board • An option required by the application (RAM, DIMM, board) is not installed
		After power on, the application does not start within 60 s. (All applications neither start nor end normally.)	
999	D	Program download error	<ul style="list-style-type: none"> • Board installed incorrectly • SBCU board defective • Controller board defective • IC card defective • NVRAM defective • Loss of power during downloading • Important Notes About SC999 • Primarily intended for operating in the download mode, logging is not performed with SC999. • If the machine loses power while downloading, or if for some other reason the download does not end normally, this could damage the controller board or the PCB targeted for the download and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced.
		The download (program, print data, language data) from the IC card does not execute normally.	

7.2 SELF-DIAGNOSTIC MODE

7.2.1 SELF-DIAGNOSTIC MODE AT POWER ON

As soon as the main machine is powered on, the controller waits for the initial settings of the copy engine to take effect and then starts an independent self-diagnostic test program. The self-diagnostic test follows the path of the flow chart shown below and checks the CPU, memory, HDD, and so on. An SC code is displayed in the touch panel if the self-diagnostic program detects any malfunction or abnormal condition.

Self-Diagnostic Test Flow



B027T516.WMF

7.2.2 DETAILED SELF-DIAGNOSTIC MODE

In addition to the self-diagnostic test initiated every time the main machine is powered on, you can set the machine in a more detailed diagnostic mode manually in order to test other components or conditions that are not tested during self-diagnosis after power on. The following device is required in order to put the machine in the detailed self-diagnosis mode.

No.	Name
G02119350	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.

A report like the one below is printed every time a detailed self-diagnostic test is executed, whether errors were detected or not.

MODEL NAME XXXX

	Serial No. : ACLD000034	Firmware P/# : ACP82XXXX	[1/1]
Self-Diagnosis Report	Firmware Version : 2.49.01	Wed Nov 22 13:15:30 2000	

[System Construction]

Kernel Version : NetBSD 1.3.3 (SHINYOKOHAMA_ROM) #0: Sat Nov 11 16:15:35 JST 2000	CPU Pipeline Clock : 200.0 MHz
CPU System Bus Clock : 100.0 MHz	ASIC Version : 1397306160
Board Type : 7	RAM Capacity : 100.663296 MB
RTC Existence : existence	HDD Model :
HDD Existence : existence	

[Total Counter]

0001000

[Program No. @]

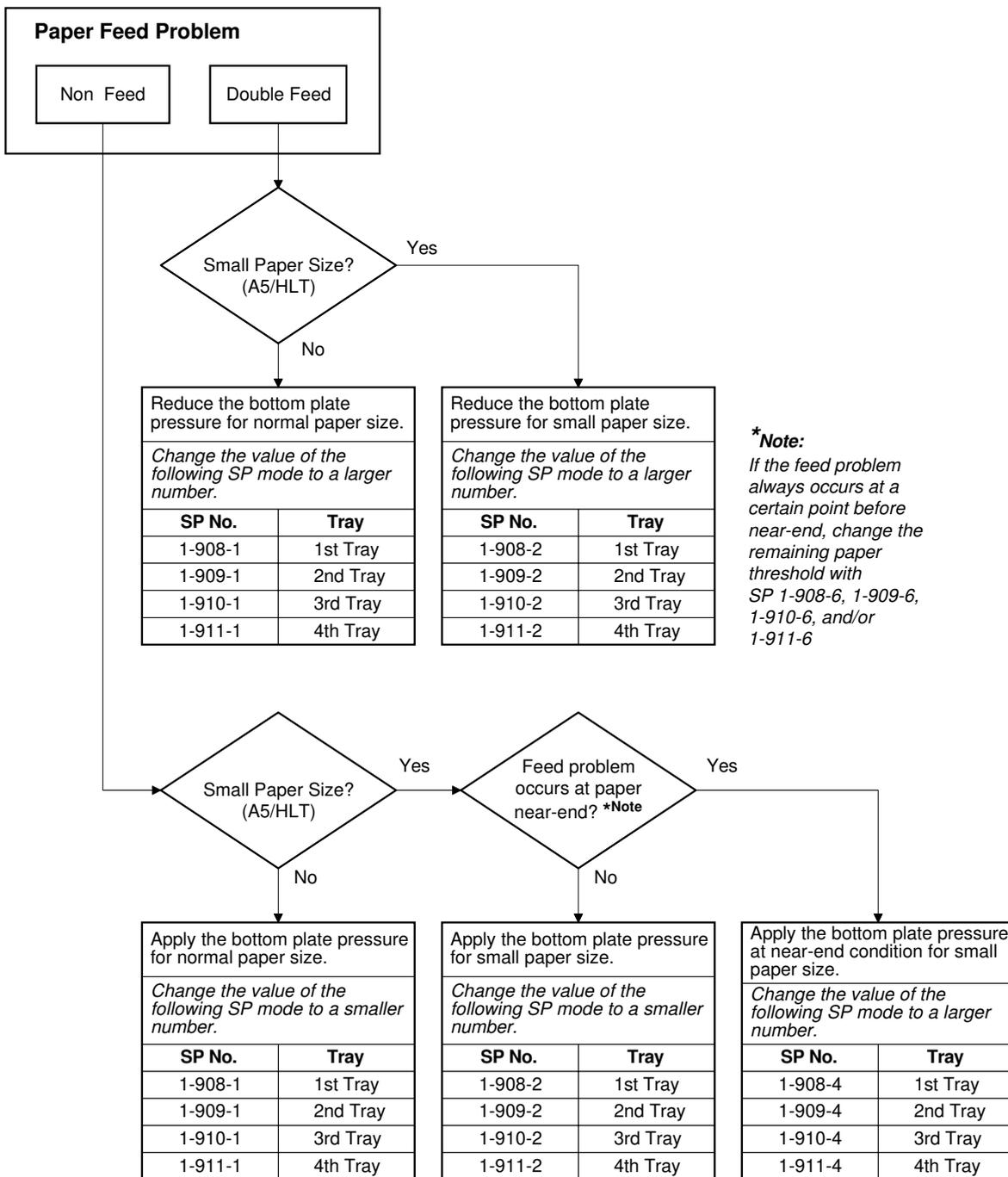
MAIN : ACP82XXXX	ENGINE : Ver1.96
LCDC : V1.39	PI :
ADF : B3515620B	SIB : B0045383
FIN :	FIN_SDL :
BANK : A6825150	LCT :
MBX :	FCU :
DPX :	

[Error List @@@]

SCCODE (ERROR CODE)	SC CODE (ERROR CODE)	SC CODE (ERROR CODE)	SC CODE (ERROR CODE)
SC835 (110C)	SC820 (0001)	SC820 (0002)	SC820 (0003)
SC820 (0004)	SC820 (0005)		

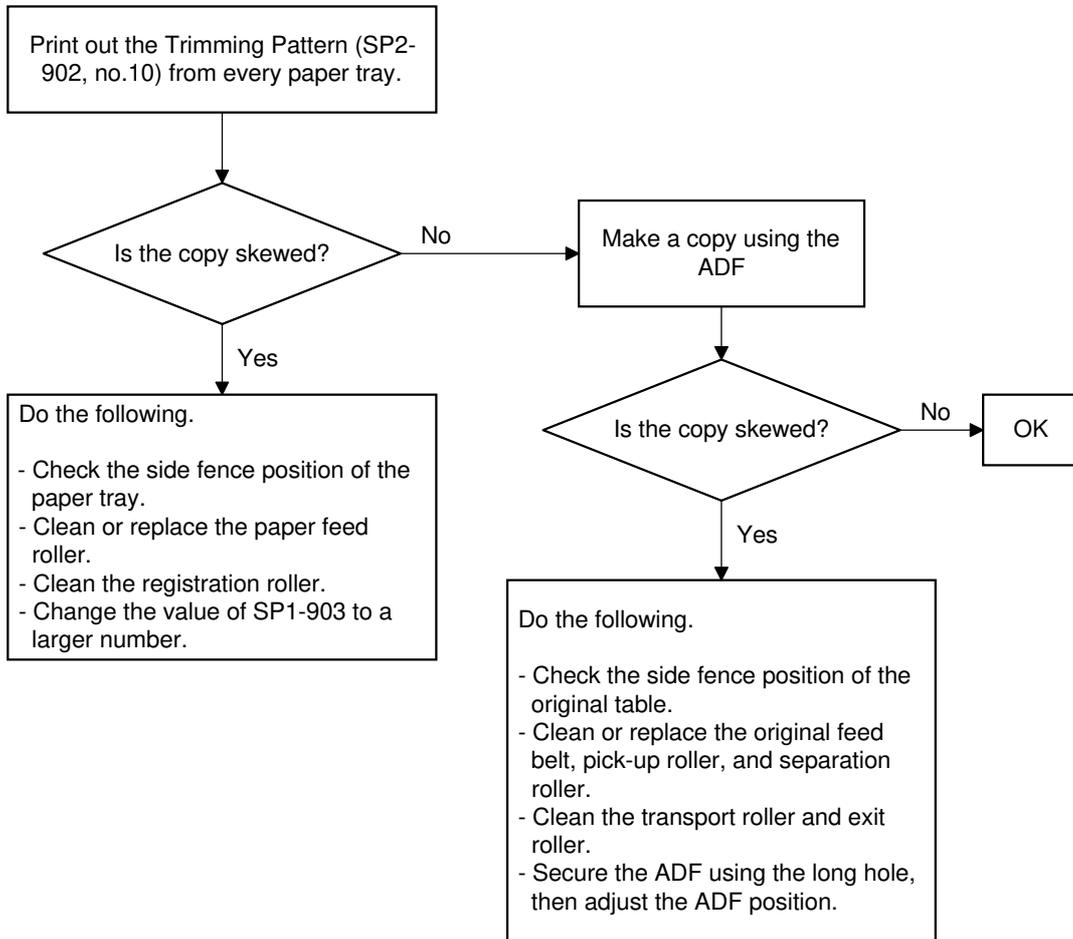
7.3 PAPER FEED TROUBLESHOOTING

When a paper double feed or paper non feed problem occurs, fix the problem in accordance with the following flow chart.



7.4 SKEWED IMAGE

Do the following to fix a skewed image problem.



B027T501.WMF

7.5 ELECTRICAL COMPONENT DEFECTS

7.5.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Scanner H.P	337-2 (SBCU)	Open	SC120 is displayed.
		Shorted	The CPU does not detect the scanner home position and the scanner motor does not stop.
Platen Cover	337-5 (SBCU)	Open	APS and ARE do not function correctly.
		Shorted	No symptom
Original Width	335-3, -4 (SBCU)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-1	335-8, -9 (SBCU)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-2	336-3, -4 (SBCU)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Toner Density	327-3 (SBCU)	Open	SC390 is displayed
		Shorted	
1st Paper End	306-2 (SBCU)	Open	The Paper End indicator lights even if paper is placed in the 1st paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the 1st paper tray.
2nd Paper End	307-A2 (SBCU)	Open	The Paper End indicator lights even if paper is placed in the 2nd paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the 2nd paper tray.
Image Density	321-3 (SBCU)	Open	SC392 is displayed (see note)
		Shorted	
Paper Over Flow	324-5 (SBCU)	Open	The paper overflow message is not displayed when the paper overfull condition exist.
		Shorted	The paper overflow message is displayed.
Paper Exit	324-2 (SBCU)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Upper Relay	306-5 (SBCU)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Lower Relay	307-A5 (SBCU)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Registration	321-6 (SBCU)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
1st Paper Lift	305-7 (SBCU)	Open	SC501 will be displayed.
		Shorted	Paper jam will occur during copying.

Component (Symbol)	CN	Condition	Symptom
2nd Paper Lift	305-10 (SBCU)	Open	SC502 will be displayed.
		Shorted	Paper jam will occur during copying.
1st Paper Height – 1	307-B2 (SBCU)	Open	The CPU cannot determine the paper near-end condition properly.
		Shorted	
1st Paper Height – 2	307-B5 (SBCU)	Open	The CPU cannot determine the paper near-end condition properly.
		Shorted	
2nd Paper Height – 1	307-B9 (SBCU)	Open	The CPU cannot determine the paper near-end condition properly.
		Shorted	
2nd Paper Height – 2	307-B12 (SBCU)	Open	The CPU cannot determine the paper near-end condition properly.
		Shorted	

NOTE: An SC condition occurs only when a new PCU is being installed in the machine. During copying, if the ID sensor fails, the image density will be changed.

7.5.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Main	281-1,2 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Right Upper Cover	324-8 (SBCU)	Open	The Cover Open indicator is not lit even if the right upper cover is opened.
		Shorted	The Cover Open indicator is lit even if the right upper cover is closed.
Right Cover	308-9 (SBCU)	Open	The Cover Open indicator is not lit even if the right cover is opened.
		Shorted	The Cover Open indicator is lit even if the right cover is closed.
Right Lower Cover	307-A8 (SBCU)	Open	The Cover Open indicator is not lit even if the right lower cover is opened.
		Shorted	The Cover Open indicator is lit even if the right lower cover is closed.
Upper Paper Size	308-1,2,4,5 (SBCU)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
Lower Paper Size	308-6,7,9,10 (SBCU)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
New PCU Detect	327-7 (SBCU)	Open	The TD sensor initial setting procedure is not performed when a new PCU is installed.
		Shorted	The TD sensor initial setting procedure is performed whenever the front cover is closed.
Front Cover Safety	311-2, 4 (SBCU)	Open	The Cover Open indicator is not lit even if the front cover is opened.
		Shorted	The Cover Open indicator is lit even if the front cover is closed.
Operation	105-1 (IPU)	Open	The LCD does not off even if the operation switch is turned off.
		Shorted	The LCD does not on even if the operation switch is turned on.

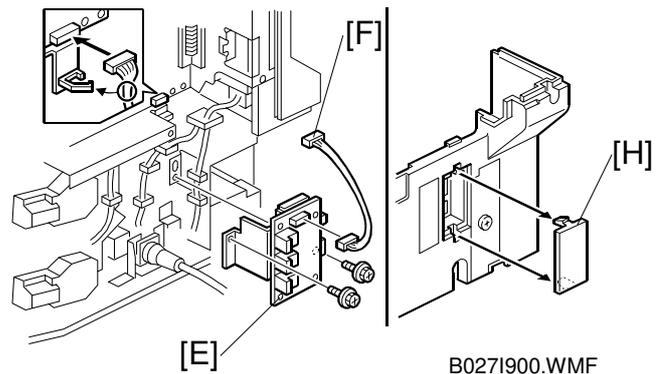
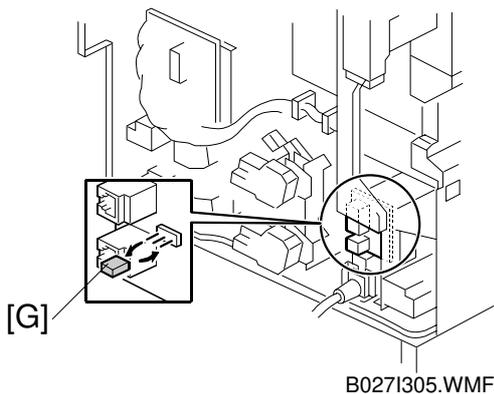
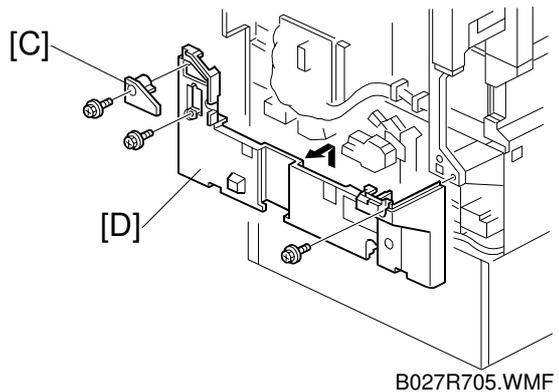
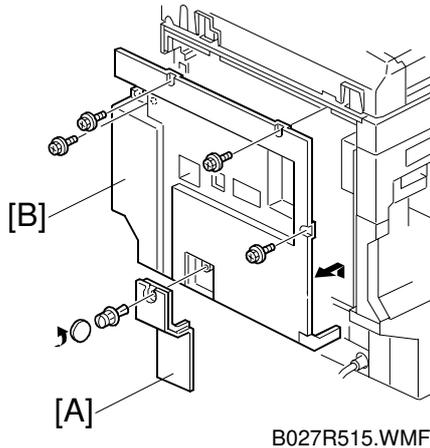
7.6 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom when turning on the main switch
	115 V	220 ~ 240 V	
Power Supply Board			
FU1	15 A/250 V	----	No response.
FU2	8 A/125 V	5 A/250 V	No response
FU3	2 A/125 V	1 A/250V	Anti-condensation/Tray Heater does not turn on.
FU4	6.3 A/125 V	6.3 A/250V	Optional finisher, bridge unit, and shift tray does not work then SC792 is displayed.
FU5	6.3 A/125 V	6.3 /250 V	Covers Open indicator is lit then SC901 is displayed
FU6	6.3 A/125 V	6.3 A/250V	The touch panel does not turn on.
FU7	4 A/125 V	4 A/250 V	SC990 is displayed

APPENDIX 1 (FOR MODEL R-C2)

1. RSS (REMOTE SERVICE SYSTEM)

1.1 RSS SET UP



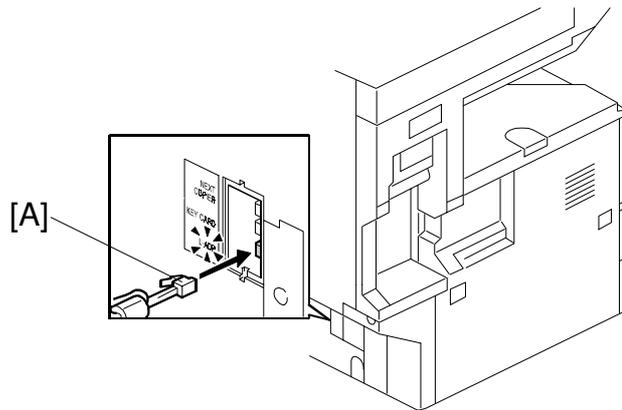
⚠ CAUTION

Unplug the machine power cord before starting the following procedure.

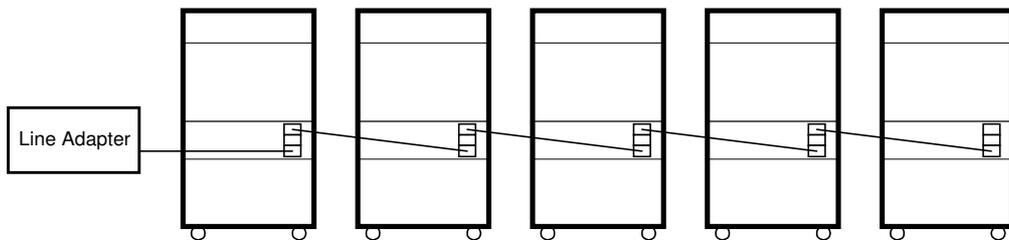
1. Remove the connector cover [A] (1 clip) and disconnect the cable.
2. Remove the rear cover [B] (4 screws).
3. Remove the duplex connector cover [C] (1 screw) and the lower rear cover [D] (2 screws).
4. Install the RSS board [E] (2 screws).
5. Install the harness [F] between the RSS board and the SBCU board (CN512).

When connecting only one machine to the line adapter, skip step 6.

6. Set the jumper switch [G] on the RSS board as shown (default setting: 1-2).
7. Remove the cover [H] from the lower rear cover.



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Machine No.	1	2	3	4	5
Jumper Set	2-3	2-3	2-3	2-3	1-2
PI device code	0	1	2	3	4

8. Reassemble the machine.
9. Connect the modular cord [A] to the line adapter as shown.
10. Install the line adapter (refer to chapter 2-1 L-ADP Installation Procedure in the CSS Service Manual).
11. Turn on the machine.

When connecting only one machine to the line adapter, skip step 12.

12. Enter the Copier SP mode and set the PI device code with SP5-821 (default 0).

NOTE: After changing the value, turn the main power switch off and on to enable the PI device code.

1.2 SP MODE SETTINGS

After installing the machine and line adapter, change the value of SP5-816 (CSS Function) to 1.

Check the values of the following SP modes. Ensure they are set correctly.

NOTE: SP5-507 is only for the Japanese version. Do not change.

- SP5-501-1 (PM Alarm Interval): 120k
- SP5-504 (Jam Alarm Setting): 3
- SP5-505 (Error Alarm Setting): 50
- SP5-508-1 (CC Call – Remain of Jam): 1 (On)
- SP5-508-2 (CC Call – Continuous Jam Occurrence): 1 (On)
- SP5-508-3 (CC Call - Cover Open): 1 (On)
- SP5-508-4 (New CC Call Mode): 1 (New Mode)

1.3 CHECKING ITEMS USING RSS

1.3.1 READ ONLY ITEMS

Item
Paper end
Toner end
Staple end
Toner near end
Door open
Paper jam information
Machine condition
Paper size information
System configuration
Vsg, Vsp, Vsdp, Vt data
Fax information (Total No. of Tx, Total No. of Rx, Quick dial, Speed dial, etc)
Printer information (Total No. of print by Emulation, Bit switches, etc)
SP7-001~003, -101, -204~-206, -301~-305, -320~-328, -401, -403, -502~-507, -801, -803

1.3.2 AUTO CALL AND READ ITEMS

SC Calls

The SC calls are generated according to the SC level as follows. Please note that the SC levels of this copier are defined differently from other copiers.

SC Level	Definition	SC Auto Call Condition
A	Fusing unit SCs which cannot be reset by customer.	An SC call is generated immediately
B	SCs that disable only the features which use the defective item.	An SC call is generated when the SC occurs two times within 10 copies.
C	SCs that are not shown on the operation panel.	An SC call is not generated.
D	SCs caused by incorrect sensor detection; these can be reset by turning the main power switch off and on.	An SC call is generated when the SC occurs two times within 10 copies.

CC Manual Calls

The CC manual call may be generated by the customer, when "1: New Mode" is selected with SP5-508-4 (the default is "1"). There are two types of CC manual calls as follows.

CC Code	Definition
Manual Call: CC 101	When the number of jams specified by SP5-508-12 are detected consecutively: a). When "0:Auto Call" is selected with SP5-508-22, CC101 will be generated automatically. b). When "1: Manual Call" is selected with SP5-508-22, the Manual call key appears on the LCD. Upon pressing the key, a "Manual Call: CC101" is generated immediately. "Manual Call:CC101" will be listed as an MC in the Call List screen of the Concorde system, and "Manual Call:CC101" will be indicated in the "Symptom" column of the call detail screen. The default setting of SP5-508-22 is "1: Manual Call".
Manual Call: CC 202	When in a paper jam or an original jam condition and a cover is open for longer than the time specified by SP5-508-13, one of the following will occur after all doors are closed. a). When "0: Auto Call" is selected with SP5-508-23, CC202 will be generated automatically. b). When "1: Manual Call" is selected with SP5-508-23, the Manual call key appears on the LCD. Upon pressing the key, a "Manual Call: CC202" is generated immediately. "Manual Call:CC202" will be listed as an MC in the Call List screen of the Concorde system, and "Manual Call:CC202" will be indicated in the "Symptom" column of the call detail screen. The default setting of SP5-508-23 is "1: Manual Call".

CC Auto Call

The CC auto call will be automatically generated when “0: Previous Mode” is selected with SP5-508-4 (default is “1”). There are three types of CC auto calls as follows.

CC Code	Definition
CC 101	When a paper jam is detected five times consecutively, CC101 is automatically generated.
CC 201	When a paper jam condition is not reset for 15 minutes, CC201 is automatically generated.
CC 202	When a cover is left open for 15 minutes, CC202 is automatically generated.

Alarm Calls

There are four types of Alarm Calls as follows:

Type	Definition
PM	When the PM counter reaches 120,000, a PM Alarm Call is automatically reported to the Concorde system.
Original Count	An alarm call is generated after the specified total number of originals goes through the ARDF.
SC	When the SC alarm counter reaches 5, an SC Alarm Call is automatically generated. The SC alarm counter counts the number of SCs and it decreases when an SC does not occur for a specified number of copies.
Jam	When Jam alarm counter reaches 10, a Jam Alarm Call is automatically generated. The Jam Alarm counter counts the number of paper jams and it decreases when a paper jam does not occur for a specified number of copies.

1.3.3 READ AND WRITE ITEMS

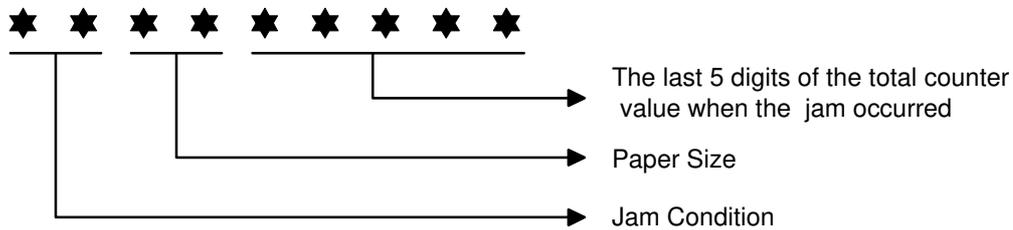
All data for SP modes and UP modes, except for a few modes.

1.3.4 EXECUTE ITEMS

Item	Item
Memory all clear	Counter reset (all except total counter)
SC reset	Original counter reset
PM counter reset	Copy counter reset
SC/Jam counter reset	Reset counters by each paper tray

1.4 JAM HISTORY

The jam history is read as shown below.



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1.4.1 JAM CONDITION TABLE

Copier

Code	Meaning
01	Jams at power on.
03	Paper does not reach the upper relay sensor (from paper tray unit)
04	Paper does not reach the lower relay sensor.
05	Paper does not reach the vertical transport sensor (optional paper tray unit).
06	Paper does not reach the LCT relay sensor.
11	Paper does not reach the registration sensor.
12	Paper does not reach the paper exit sensor
13	Paper does not reach the bridge relay sensor
14	Paper does not reach the bridge exit sensor
15	Paper does not reach the duplex entrance sensor.
16	Paper does not reach the duplex exit sensor
17	Paper does not reach the 1-bin tray exit sensor.
20	Paper does not reach the finisher entrance sensor
21	Paper does not reach the finisher shift tray exit sensor.
23	Paper does not reach the finisher staple tray paper sensor.
24	The finisher stack feed out belt H.P sensor does not turn on.
26	Finisher paper taking out error
27	Finisher drive error
28	Finisher tray lift error
29	Finisher jogger drive error
30	Finisher tray shift drive error
31	Finisher staple error
32	Finisher stack feed-out error
33	Finisher feed out error
34	Finisher no response
61	Paper caught at the registration sensor.
62	Paper caught at the paper exit sensor.
63	Paper caught at the bridge relay sensor.
64	Paper caught at the bridge exit sensor.
65	Paper caught at the duplex entrance sensor.
66	Paper caught at the duplex exit sensor.
67	Paper caught at the 1-bin tray exit sensor.

Document Feeder

Code	Meaning
01	Jam at power on.
05	Original does not reach the registration sensor.
06	Original does not reach the original exit sensor.
07	Original does not reach the original reverse sensor.
55	Original caught at the registration sensor.
56	Original caught at the original exit sensor.
57	Original caught at the original reverse sensor.

1.4.2 PAPER SIZE

Code	Paper Size	Code	Paper Size
05	A4 sideways	86	A5 lengthwise
06	A5 sideways	87	A6 lengthwise
07	A6 sideways	8D	B4
0E	B5 sideways	8E	B5 lengthwise
0F	B6 sideways	8F	B6 lengthwise
11	Prepaid reply post card sideways	91	Prepaid reply post card lengthwise
12	Post card sideways	92	Post card lengthwise
24	8.5" x 14" sideways	A0	11" x 17"
26	8.5" x 11" sideways	A4	8.5" x 14" lengthwise
2C	8.5" x 5.5" sideways	A6	8.5" x 11" lengthwise
84	A3	AC	8.5" x 5.5" lengthwise
85	A4 lengthwise		

1.5 OTHERS**1.5.1 SC630 [RDS COMMUNICATION ERROR]**

Frequent occurrence of SC630 indicates a problem in the customer's communication line or line adapter. To maintain the communications environment in good working order, it is necessary to make planned inspections periodically.

1.5.2 PM PROCEDURE OR OTHER MAINTENANCE

Before beginning PM or other maintenance procedures, SP5-816-2 should be set to "0". This will disable the RSS function. When maintenance is completed, SP5-816-2 should be set to "1". This will re-enable the RSS function.

NOTE: The RSS function will remain disabled for four hours. Therefore, if maintenance for longer than four hours is required, SP5-816-2 should be set to "0" again to disable RSS.