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A230/A231/A232

SERVICE MANUAL

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⚠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. Note that some components of the copier and the paper tray unit are supplied with electrical voltage even if the main power switch is turned off.
4. 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.
5. If the Start key is pressed before the copier completes the warm-up period (the Start key starts blinking red and green alternatively), keep hands away from the mechanical and the electrical components as the copier starts making copies as soon as the warm-up period is completed.
6. 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

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

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The 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 system control board has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.

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

LASER SAFETY

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

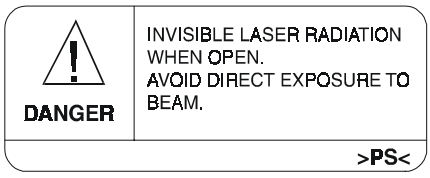
⚠WARNING

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

⚠WARNING

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

CAUTION MARKING:



Rev. 5/15/99

- A230 OVERALL MACHINE INFORMATION
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    - 3,000 SHEET FINISHER A697
      - OVERALL MACHINE INFORMATION A693
        - ISDN UNIT A816

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TAB POSITION 7

- PAPER TRAY UNIT A682
  - 1000-SHEET FINISHER A681

TAB POSITION 8

OVERALL MACHINE INFORMATION

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

	A230 / A231	A232	Note
Configuration:	Desktop		
Copy Process:	Dry electrostatic transfer system		
Original:	Sheet/Book		
Original Size	Maximum A3/11" x 17"		
Copy Paper Size:	Maximum A3/11" x 17" Minimum A5/5.5" x 8.5" lengthwise (Paper tray / Duplex) A6/5.5" x 8.5" lengthwise (By-pass)		The duplex unit and by-pass feed unit are not standard for A230.
Copy Paper Weight:	Paper Tray/Duplex: 64 - 105 g/m^2, 20 – 28 lb By-pass 52 - 157 g/m^2, 16 – 42 lb		The duplex unit and by-pass feed unit are not standard for A230.
Reproduction Ratios:	7R5E Metric version (%): 400, 200, 141, 122, 115, 100, 93, 87, 82, 71, 65, 50, 25 Inch version (%): 400, 200, 155, 129, 121, 100, 93, 85, 78, 73, 65, 50, 25	7R5E Metric version (%): 400, 200, 141, 122, 115, 100, 93, 87, 82, 71, 65, 50, 35 Inch version (%): 400, 200, 155, 129, 121, 100, 93, 85, 78, 73, 65, 50, 32	
Zoom:	Both versions: 25% to 400% in 1% steps	Metric version: 35% to 400% in 1% steps Inch version: 32% to 400% in 1% steps	
Copying Speed	35 cpm (A4/11" x 8.5" sideways) 19 cpm (A3/11" x 17")	45 cpm (A4/11" x 8.5" sideways) 22 cpm (A3/11" x 17")	Full size Repeat copy mode
Resolution:	Scanning and Printing: 400 dpi		
Gradation:	Scanning and Printing: 256 levels		
Warm-up Time:	Less than 85 s	Less than 100 s	23°C, 73°F

	A230 / A231	A232	Note
First Copy Time (1st Tray):	Less than 3.9 s	Less than 3.2 s	A4/11" x 8.5" sideways
Copy Number Input:	Ten-key pad, 1 to 999		Count up or count down
Manual Image Density Selection:	5 steps		
Automatic Reset:	60 s is the standard setting; it can be changed with a UP mode.		
Auto Shut Off:	60 min. is the standard setting; it can be changed with a UP mode.		
Copy Paper Capacity:	Paper Tray: 500 sheets (up to 56 mm, 2.2") x 2 By-pass Feed: 50 sheets (up to 5.5 mm, 0.2")		The by-pass feed unit is not standard for A230.
Copy Tray Capacity:	A4/11" x 8.5": 500 sheets A3/B4/8.5" x 14"/11" x 17": 250 sheets		Standard copy tray
Toner Replenishment:	Cartridge exchange (700 g/cartridge)		
Toner Yield:	27k copies (A4 sideways, 6% full black, 1 to 1 copying, ADS mode)		
Power Source:	North America 120V/60Hz, More than 12 A Europe/Asia 220 – 240V/50, 60Hz, More than 8 A		
Dimensions (W x D x H)	A230 600 x 640 x 720 mm (23.7" x 25.2" x 28.3") A231/A232 670 x 640 x 720 mm (26.4" x 25.2" x 28.3")		Without options
Weight:	A230 : 67 kg (147.8 lb), A231/A232: 75 kg (166 lb)		

Power Consumption:

Mainframe only

(115 V Machine)

	A230/A231	A232	Note
Maximum	Less than 1.44 kW	Less than 1.44 kW	
Copying	Less than 1.15 kW	Less than 1.3 kW	
Warm-up	Less than 1.05 kW	Less than 1.15 kW	
Stand-by	Less than 200 W/h	Less than 220 W/h	
Energy Saver Level 1	Ave. 150 W/h	Ave. 170 W/h	
Energy Saver Level 2	Ave. 130 W/h	Ave. 150 W/h	
Auto Shut Off	Ave. 12 W/h	Ave. 12 W/h	

(230 V machine)

	A230/A231	A232	Note
Maximum	Less than 1.5 kW	Less than 1.5 kW	
Copying	Less than 1.10 kW	Less than 1.2 kW	
Warm-up	Less than 1.05 kW	Less than 1.15 kW	
Stand-by	Less than 220 W/h	Less than 240 W/h	
Energy Saver Level 1	Ave. 160 W/h	Ave. 180 W/h	
Energy Saver Level 2	Ave. 154 W/h	Ave. 168 W/h	
Auto Shut Off	Ave. 12 W/h	Ave. 12 W/h	

System

(115 V machine)

	A230/A231	A232	Note
Maximum	Less than 1.44 kW	Less than 1.44 kW	Without the optional heaters, fax unit, and printer controller.
Copying	Less than 1.2 kW	Less than 1.35 kW	
Warm-up	Less than 1.05 kW	Less than 1.15 kW	
Stand-by	Less than 220 W/h	Less than 260 W/h	

(230 V machine)

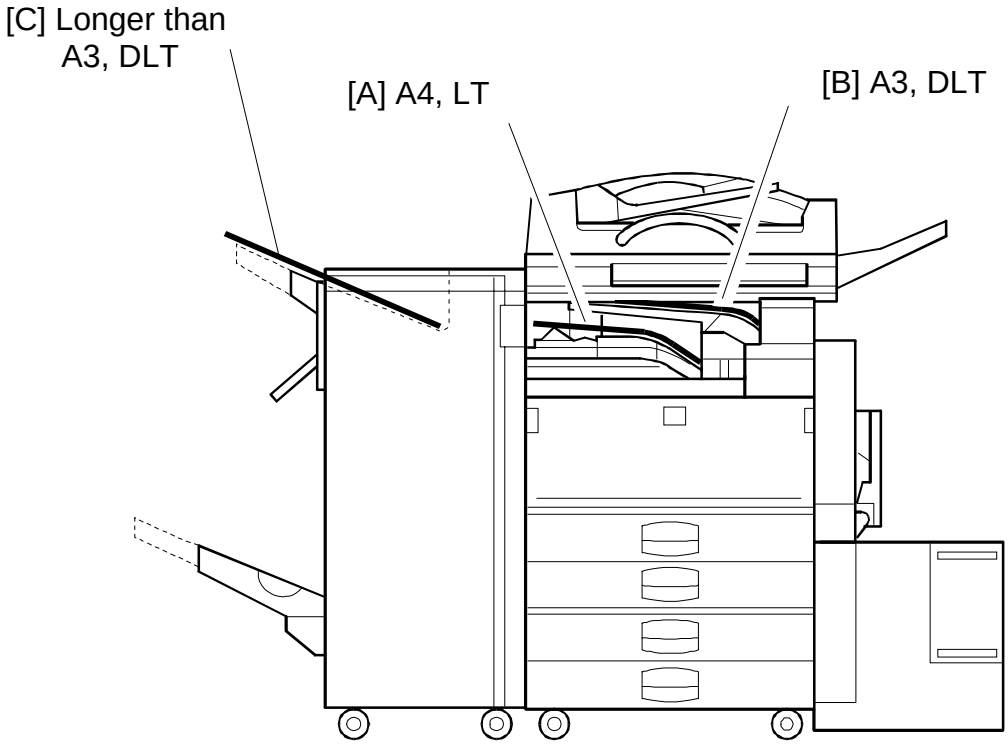
	A230/A231	A232	Note
Maximum	Less than 1.5 kW	Less than 1.5 kW	Without the optional heaters, fax unit, and printer controller.
Copying	Less than 1.15 kW	Less than 1.25 kW	
Warm-up	Less than 1.05 kW	Less than 1.15 kW	
Stand-by	Less than 240 W/h	Less than 280 W/h	

Noise Emission:

	Mainframe Only	System
1. Sound Power Level		
Copying A230/A231 A232	 69 dB(A) 70 dB(A)	 73 dB(A) 74 dB(A)
Stand-by A230/A231 A232	 42 dB(A) 42 dB(A)	 44 dB(A) 44 dB(A)
2. Sound Pressure Level at the Operator's Position		
Copying A230/A231 A232	 52 dB(A) 56 dB(A)	 60 dB(A) 62 dB(A)
Stand-by A230/A231 A232	 27 dB(A) 27 dB(A)	 28 dB(A) 28 dB(A)

NOTE: 1) The above measurements were made in accordance with ISO 7779.
2) Full system measurements do not include the optional fax unit and the printer controller.
3) In the above stand-by condition, the polygon motor is not rotating.

1.2 PAPER EXIT TRAY SELECTION

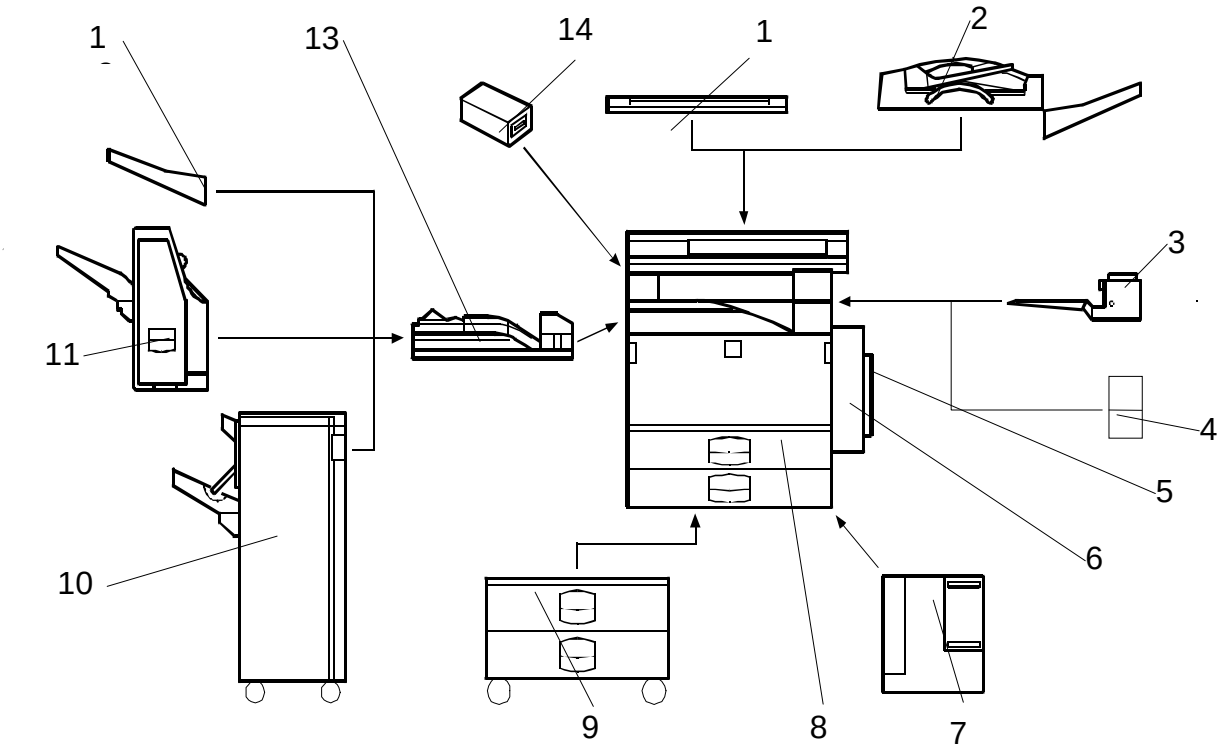


The machine allows selection between the paper tray exit trays: Int. Tray [A] (standard output tray), Int. Tray 2 [B] (optional one-bin tray), and Ext. Tray [C] (finisher or optional external output tray). If the sub-scan length is more than 330 mm, the exit tray is as shown below, if the relevant options have been installed.

Installed options	Exit tray for paper longer than 330 mm
Bridge unit & Finisher (1,000-sheet)	Int. Tray [A]
Bridge unit & Finisher (3,000-sheet)	Ext. Tray [C]: The finisher upper tray
Bridge unit & optional ext. output tray	Ext. Tray [C]: Ext. output tray

1.3 MACHINE CONFIGURATION

1.3.1 SYSTEM COMPONENTS



Version	Item	Machine Code	No.	
Copy	Copier (A230)	A230	8	
	Copier (A231)	A231	8	
	Copier (A232)	A232	8	
	ARDF (Option)	A680	2	
	Platen Cover (Option)	A381	1	
	Paper Tray Unit (Option)	A682	9	
	LCT (Option)	A683	7	
	By-pass Feed Unit (Option – A230 only)	A689	5	
	Duplex Unit (Option – A230 only)	A687	6	
	Interchange Unit (Option – A230 only)	A690	4	
	1-bin Tray (Option)	A684	3	
	Bridge Unit (Option)	A688	13	
	1000-sheet Finisher (Option)	A681	11	
	3000-sheet Finisher (Option – A232 only)	A697	10	
	Punch Unit (Option for 3000-sheet Finisher)	A812-17 (3 holes) A812-27 (2 holes)		
	External Output Tray (Option)	A825	12	
	Electrical Sort Kit – 8 MB Memory (Option – A230 only)	A818		
	Image Enhancement Kit – HDD (Option)	A691		
	Key Counter Bracket (Option)	A674	14	
	Expansion Box (Option)	A692		
Fax	Fax Unit (Option)	A693		
	ISDN Unit (Option)	A816		
	SAF Memory – HDD (Option)	A818-11		⇐
	Fax Feature Expander (Option)	A818-10		⇐
	400-dpi High Resolution (Option)	A818-12		
	Handset (Option – North America only)	A646		
	Stamp Unit (Option)	A813		

1.3.2 INSTALLABLE OPTION TABLE

Copier options

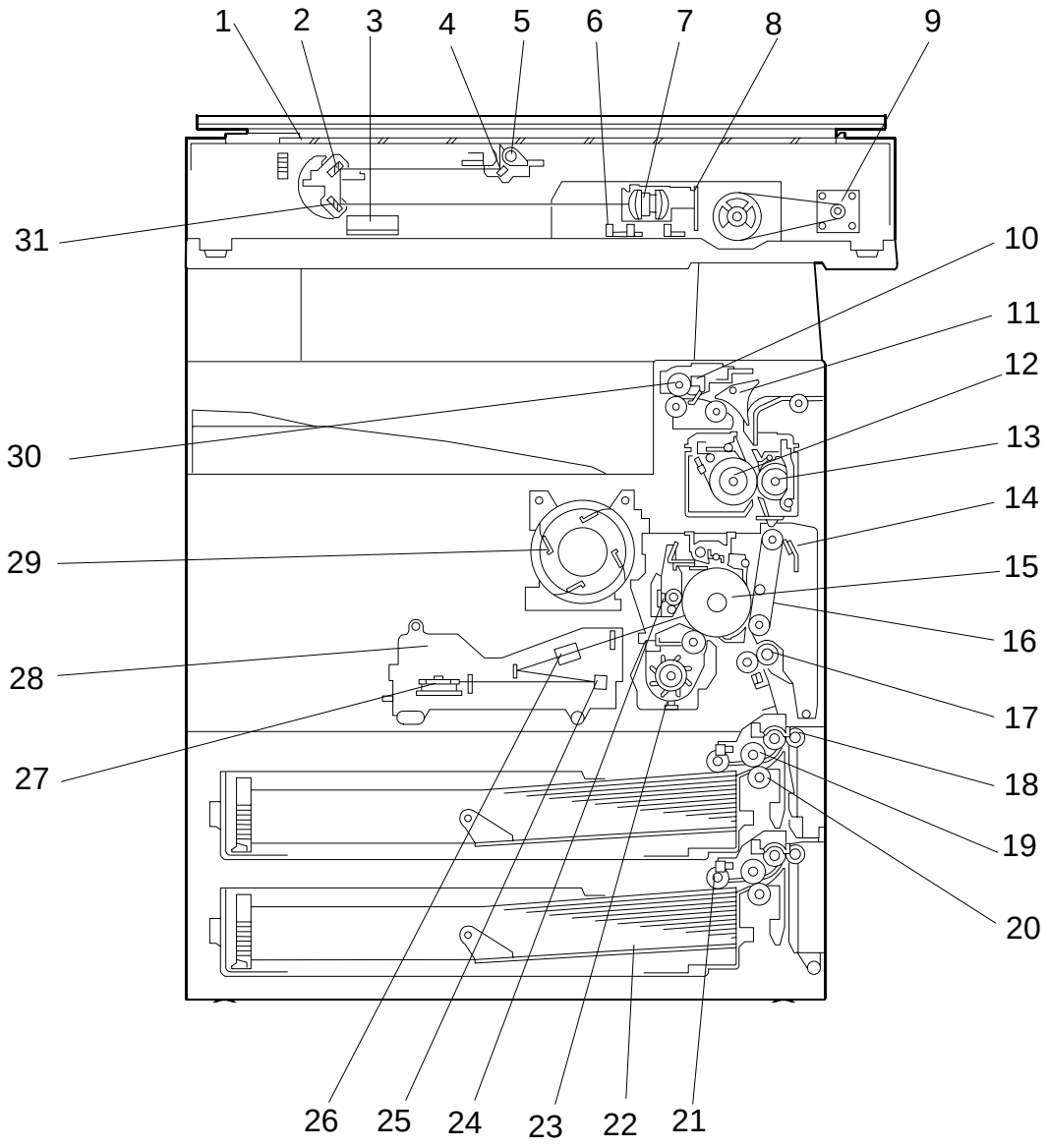
⊙ = Standard, **O** = Available, Δ = Requires another option, **X** = Not available

Option	A230	A231	A232	Note
ARDF	O	O	O	
Platen Cover	O	O	O	
Paper Tray Unit	O	O	O	
LCT	Δ	Δ	Δ	Requires the paper tray unit.
By-pass Feed Unit	O	⊙	⊙	
Duplex Unit	Δ	⊙	⊙	Requires the interchange unit and electrical sort kit.
Interchange Unit	O	⊙	⊙	
1-bin Tray	Δ	O	O	Requires the interchange unit.
Bridge Unit	O	O	O	
1,000-sheet Finisher	Δ	Δ	Δ	Requires the paper tray unit and bridge unit.
3,000-sheet Finisher	X	X	Δ	Requires the paper tray unit and bridge unit.
Punch Unit	X	X	Δ	Requires the 3000-sheet finisher.
External Output Tray	Δ	Δ	Δ	Requires the bridge unit.
Electrical Sort Kit – 8 MB Memory	O	⊙	⊙	
Image Enhancement Kit – HDD	Δ	O	O	Requires the electrical sort kit – 8 MB.
Key Counter Bracket	O	O	O	
Expansion Box	O	O	O	It is required only when the fax option and/or printer option is installed.

Fax options

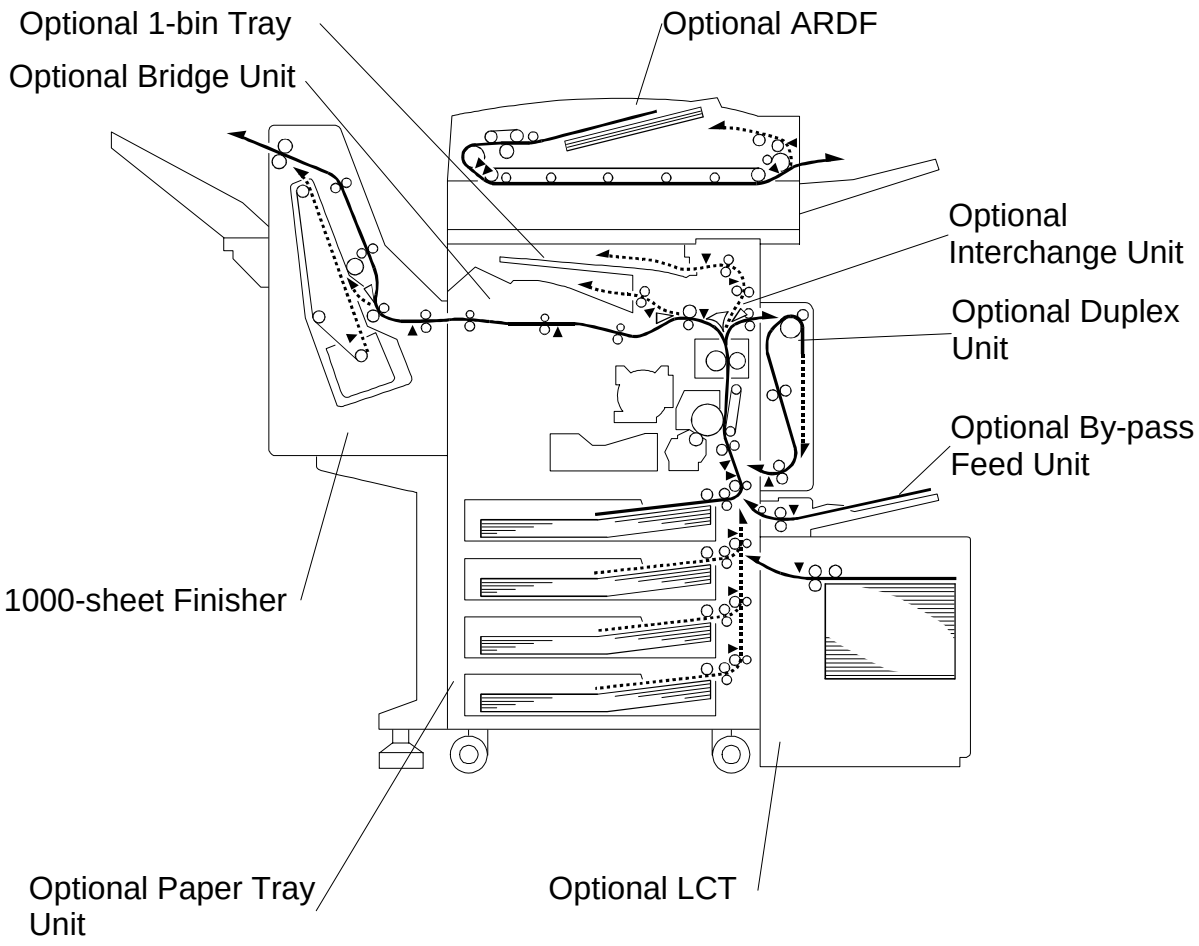
All options for the fax unit are available when the fax unit has been installed.

1.4 MECHANICAL COMPONENT LAYOUT



1. Exposure Glass
2. 2nd Mirror
3. Original Width Sensors
4. 1st Mirror
5. Exposure Lamp
6. Original Length Sensors
7. Lens
8. SBU
9. Scanner Motor
10. Paper Exit Sensor
11. Exit Junction Gate
12. Hot Roller
13. Pressure Roller
14. Transfer Belt Cleaning Blade
15. OPC Drum
16. Transfer Belt
17. Registration Roller
18. Upper Relay Rollers
19. Feed Roller
20. Separation Roller
21. Pick-up Roller
22. Bottom Plate
23. Development Unit
24. Charge Roller
25. Fθ Mirror
26. Barrel Toroidal Lens (BTL)
27. Polygonal Mirror Motor
28. Laser Unit
29. Toner Supply Bottle Holder
30. Exit Roller
31. 3rd Mirror

1.5 PAPER PATH



1.6 ELECTRICAL COMPONENT DESCRIPTIONS

Refer to the electrical component layout on the point to point diagrams for the locations of these components.

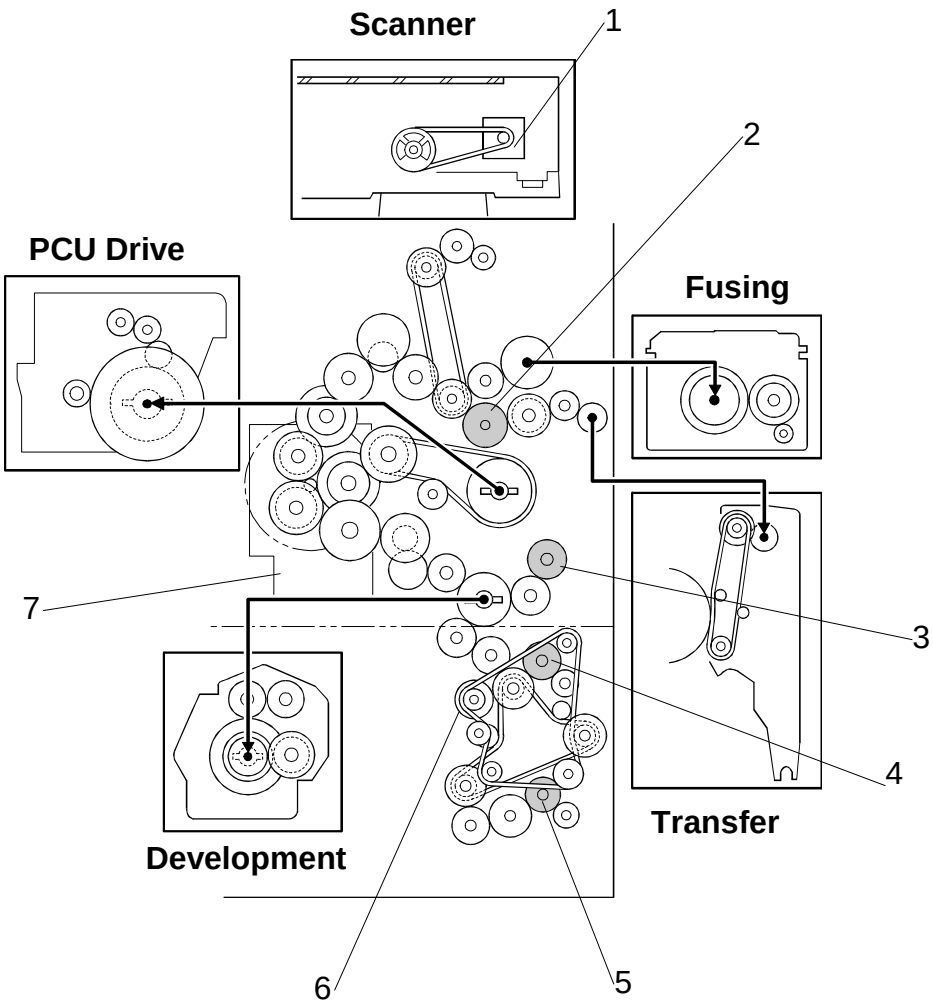
Symbol	Index No.	Description	Note
Printed Circuit Boards			
PCB1	58	BICU (Base Engine & Image Control Unit)	Controls all copier functions both directly and through other control boards.
PCB2	55	PSU (Power Supply Unit)	Provides dc power to the system and ac power to the fusing lamp and optional heaters.
PCB3	61	IOB (Input/Output Board)	Controls the mechanical parts of the printer (excluding the paper feed section), and the fusing lamp power.
PCB4	62	Paper Feed Control (PFB)	Controls the mechanical parts of all paper feed sections.
PCB5	63	High Voltage Supply	Supplies high voltage to the drum charge roller, development roller, and transfer belt.
PCB6	9	SBU (Sensor Board Unit)	Contains the CCD, and outputs a video signal to the BICU board.
PCB7	7	SIB (Scanner Interface Board)	Controls the scanner carriages and passes signals from the scanner unit to the BICU board.
PCB8	11	Operation Panel	Controls the LCD and LED matrix and monitors the key matrix.
PCB9	4	Lamp Stabilizer	Provides dc power to the exposure lamp.
PCB10	19	LDDR (Laser Diode Driver)	Controls the laser diode.
PCB11	54	SIFB (Scanner Interface Board)	Passes signals between the SIB and BICU boards.
Motors			
M1	35	Main	Drives the main body components.
M2	8	Scanner Drive	Drives the 1st and 2nd scanners.
M3	45	Tray Lift	Raises the bottom plate in the paper tray.
M4	22	Polygonal Mirror	Turns the polygonal mirror.
M5	20	LD Positioning	Rotates the LD unit to adjust the LD beam pitch when a different resolution is selected.
M6	36	Cooling Fan	Removes heat from the main PCBs.
M7	37	Exhaust Fan	Removes heat from around the fusing unit.

Symbol	Index No.	Description	Note
M8	34	Toner Supply	Rotates the toner bottle to supply toner to the development unit.
M9	56	PSU Cooling Fan	Removes heat from the PSU.
Sensors			
S1	2	Scanner Home Position	Informs the CPU when the 1st and 2nd scanners are at the home position.
S2	3	Platen Cover	Informs the CPU whether the platen cover is up or down (related to APS/ARE functions). ARE: Auto Reduce and Enlarge
S3	12	Original Width	Detects the width of the original. This is one of the APS (Auto Paper Select) sensors.
S4	5	Original Length-1	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S5	6	Original Length-2	Detects the length of the original. This is one of the APS (Auto Paper Select) sensors.
S6	21	LD Unit Home Position	Informs the CPU when the LD unit is at the home positon.
S7	17	Toner Density (TD)	Detects the amount of toner inside the development unit.
S8	24	Paper Exit	Detects misfeeds.
S9	27	Registration	Detects the leading edge of the copy paper to determine the stop timing of the paper feed clutch, and detects misfeeds.
S10	26	Image Density (ID)	Detects the density of various patterns and the reflectivity of the drum for process control.
S11	28	Upper Paper Height	Detects when the paper in the upper paper tray is at the feed height.
S12	30	Lower Paper Height	Detects when the paper in the lower paper tray is at the feed height.
S13	29	Upper Paper End	Informs the CPU when the upper paper tray runs out of paper.
S14	31	Lower Paper End	Informs the CPU when the lower paper tray runs out of paper.
S15	33	Upper Relay	Detects misfeeds.
S16	32	Lower Relay	Detects misfeeds.

Symbol	Index No.	Description	Note
S17	48	Upper Tray	Informs the CPU whether the upper paper tray is set into the machine or not.
S18	46	Lower Tray	Informs the CPU whether the lower paper tray is set into the machine or not.
S19	38	Transfer Belt Position	Informs the CPU of the current position of the transfer belt unit.
S20	18	Toner Overflow	Detects toner overflow in the toner collection tank.
Switches			
SW1	43	Right Lower Cover	Detects whether the right lower cover is open or closed.
SW2	49	Right Upper Cover	Cut the +5VLD and +24V dc power line and detects whether the right upper cover is open or closed.
SW3	51	Main Power Switch	Supplies power to the copier. If this is off, there is no power supplied to the copier.
SW4	52	Front Cover Safety	Cuts the +5VLD and +24V dc power line and detects whether the front cover is open or not.
SW5	10	Operation Switch	Provides power for machine operation. The machine still has power if this switch is off.
Magnetic Clutches			
CL1	39	Transfer Belt	Controls the touch and release movement of the transfer belt unit.
CL2	40	Registration	Drives the registration rollers.
CL3	44	Relay	Drives the relay rollers.
CL4	41	Upper Paper Feed	Starts paper feed from the upper paper tray.
CL5	42	Lower Paper Feed	Starts paper feed from the lower paper tray.
Lamps			
L1	13	Exposure	Applies high intensity light to the original for exposure.
L2	16	Fusing	Provides heat to the hot roller.
L3	25	Quenching	Neutralizes any charge remaining on the drum surface after cleaning.
Heaters			
H1	1	Optics Anti-condensation (option)	Turns on when the main power switch is off to prevent moisture from forming on the optics.
H2	47	Tray (option)	Turns on when the main power switch is off to keep paper dry in the paper tray.
Thermistors			

Symbol	Index No.	Description	Note
TH1	14	Fusing	Monitors the temperature at the central area of the hot roller.
Thermofuses			
TF1	15	Fusing	Provides back up overheat protection in the fusing unit.
Counters			
CO1	50	Total	Keeps track of the total number of prints made.
CO2	N/A	Key (option)	Used for control of authorized use. If this feature is enabled for copying, copying will be impossible until it is installed. It can also be enabled for fax and printer modes separately.
Others			
CB1	57	Circuit Breaker (220 ~ 240V only)	Provides back-up high current protection for electrical components.
LSD	23	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.

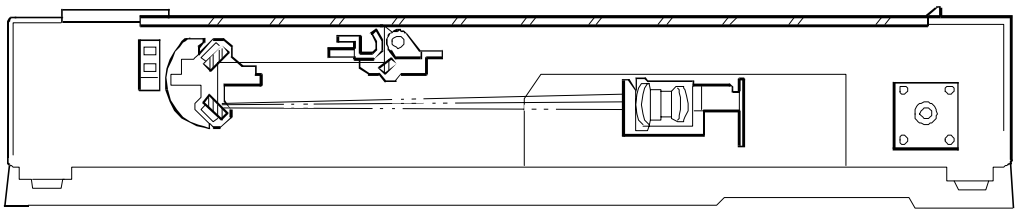
1.7 DRIVE LAYOUT



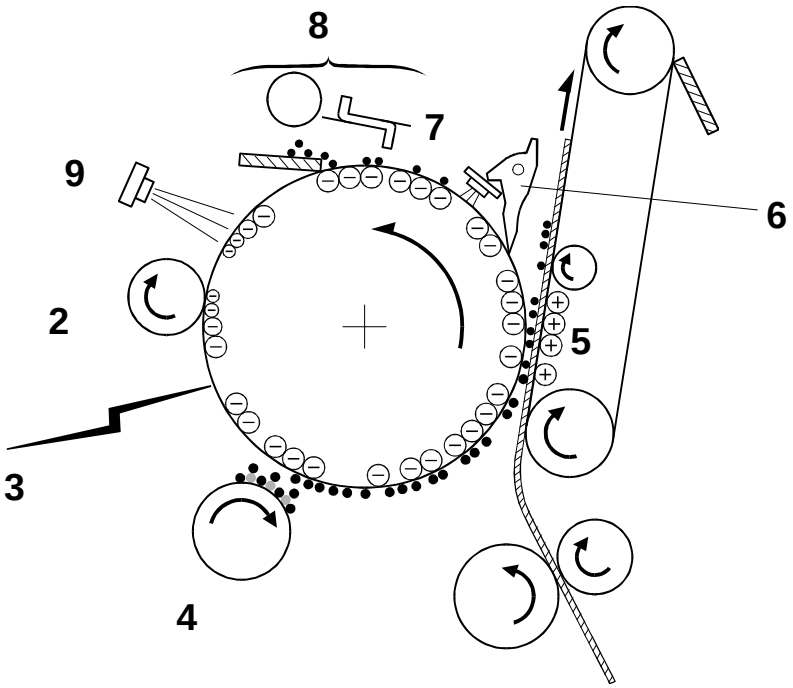
1. Scanner Drive Motor
2. Transfer Belt Clutch
3. Registration Clutch
4. Upper Paper Feed Clutch
5. Lower Paper Feed Clutch
6. Relay Clutch
7. Main Motor

1.8 COPY PROCESS

1.8.1 OVERVIEW



1



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 photo-conductive (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 from the scanned original is retrieved from the memory and transferred to the drum by two laser beams, which form an electrostatic latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the BICU board.

4. DEVELOPMENT

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

5. IMAGE TRANSFER

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

6. PAPER SEPARATION

Paper separates from the drum as a result of the electrical attraction between the paper and the transfer belt. The pick-off pawls help separate the paper from the drum.

7. 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.

8. CLEANING

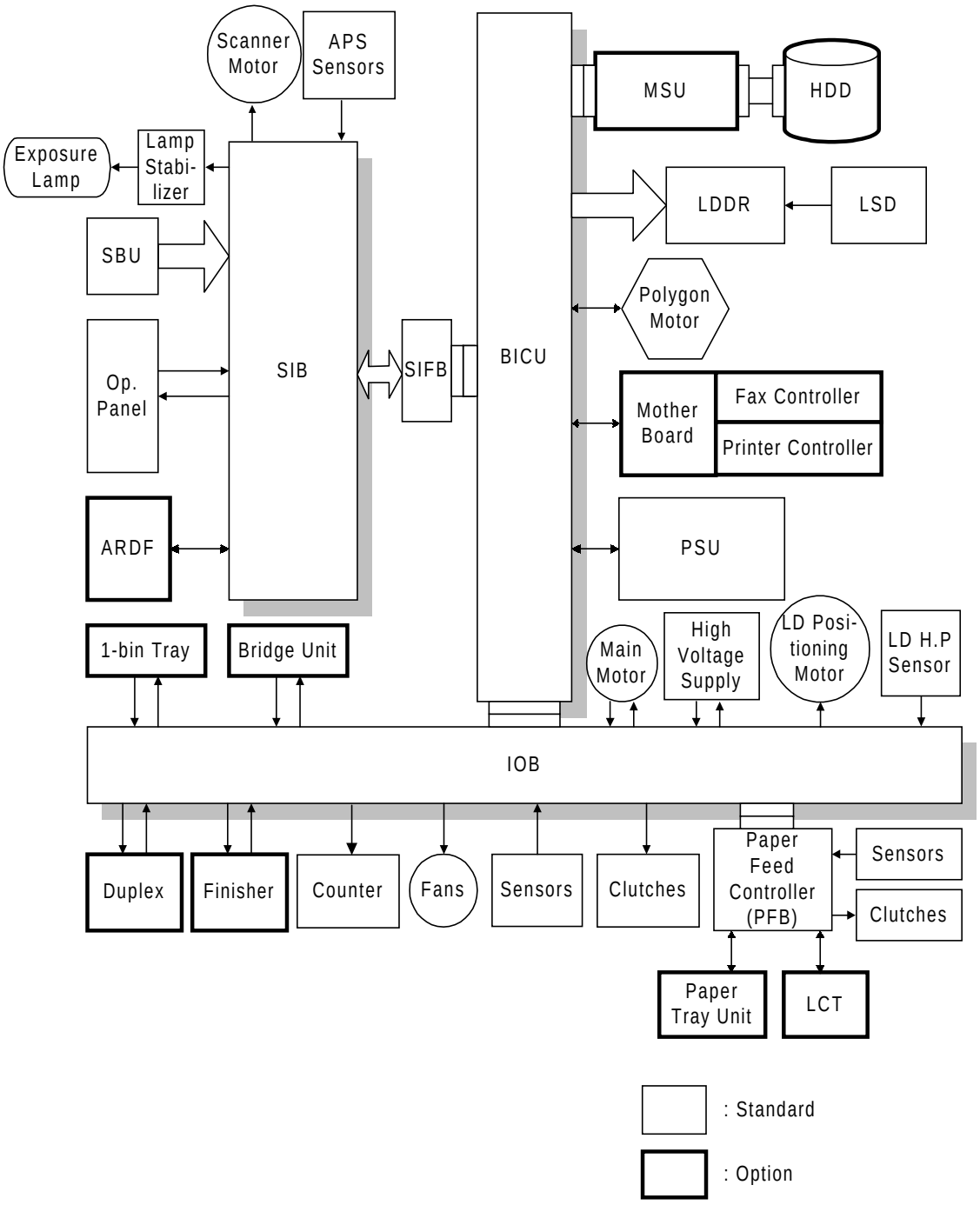
The drum cleaning blade removes any toner remaining on the drum surface after the image is transferred to the paper.

9. QUENCHING

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

1.9 BOARD STRUCTURE

1.9.1 BLOCK DIAGRAM



1.9.2 DESCRIPTIONS

1. BICU (Base Engine and Image Control Unit)

This is the main board. It controls the following functions.

- Engine sequence
- Timing control for peripherals
- Image processing, video control
- Operation control
- Application boards (fax, printer, hard disk)

2. IOB (Input/Output Board)

The IOB handles the following functions.

- Drive control for the sensors, motors, and solenoids of the printer
- PWM control for high voltage supply board
- Serial interface with peripherals
- Fusing control

3. SBU (Sensor Board Unit)

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

4. SIB (Scanner Interface Board)

This board controls the scanner motor and passes signals between the BICU board and the component parts of the scanner unit. Also, it transmits the video signals from the SBU to the BICU board.

5. SIFB (Scanner Interface Board)

This board passes signals between the SIB and BICU.

6. Mother Board (Option)

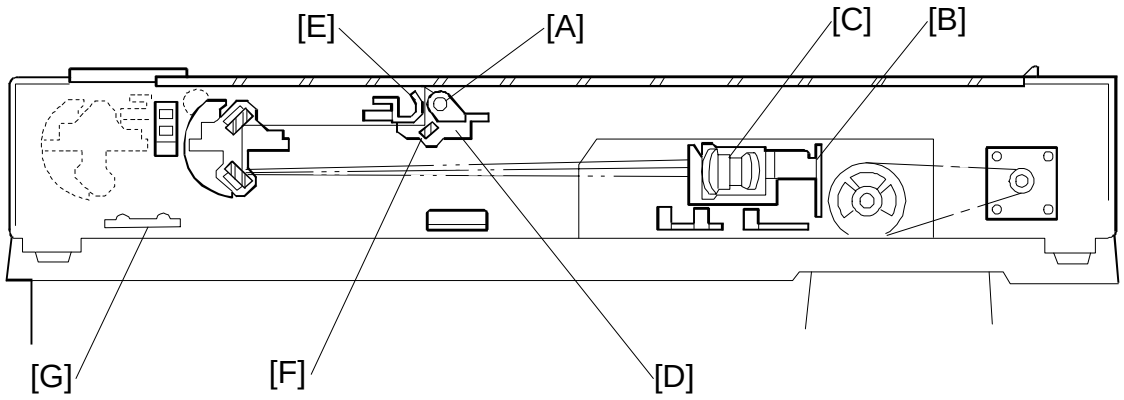
This board interfaces the BICU with the fax controller and/or the printer controller. The mother board is part of the expansion box option.

DETAILED SECTION DESCRIPTIONS

2. DETAILED SECTION DESCRIPTIONS

2.1 SCANNING

2.1.1 OVERVIEW



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, and 3rd mirrors, and through the lens [C].

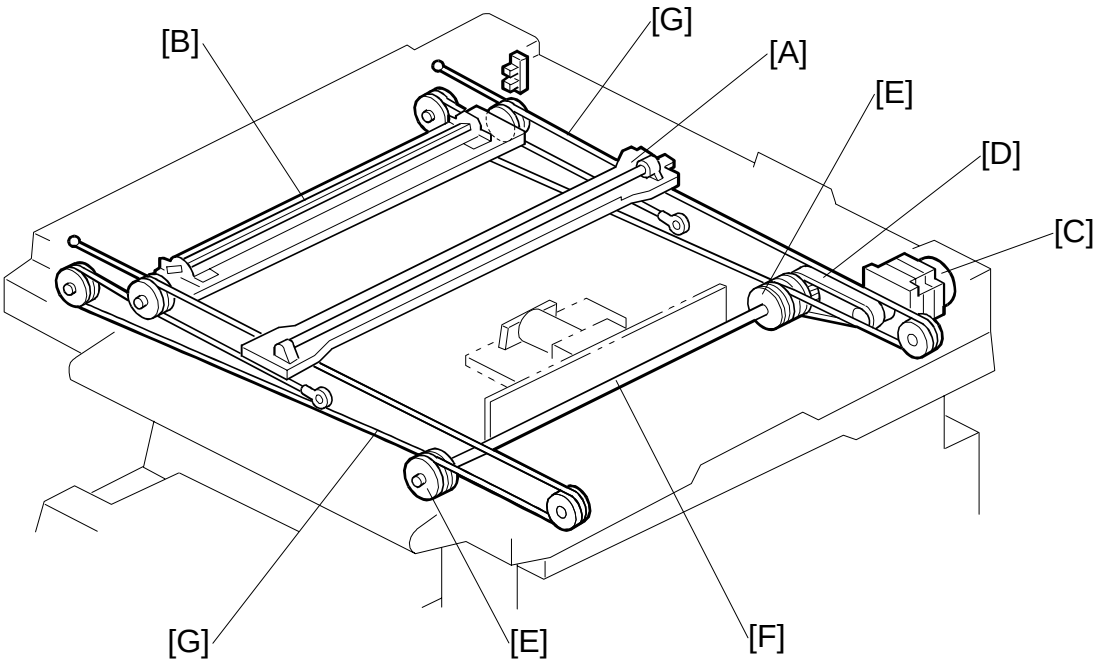
The 1st scanner [D] consists of the exposure lamp, a reflector [E], and the 1st mirror [F].

The exposure lamp is energized by a dc supply to avoid uneven light intensity while the 1st scanner moves in the sub scan direction (down the page). The entire exposure lamp surface is frosted to ensure even exposure in the main scan direction (across the page).

The light reflected by the reflector is of almost equal intensity in all directions, 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



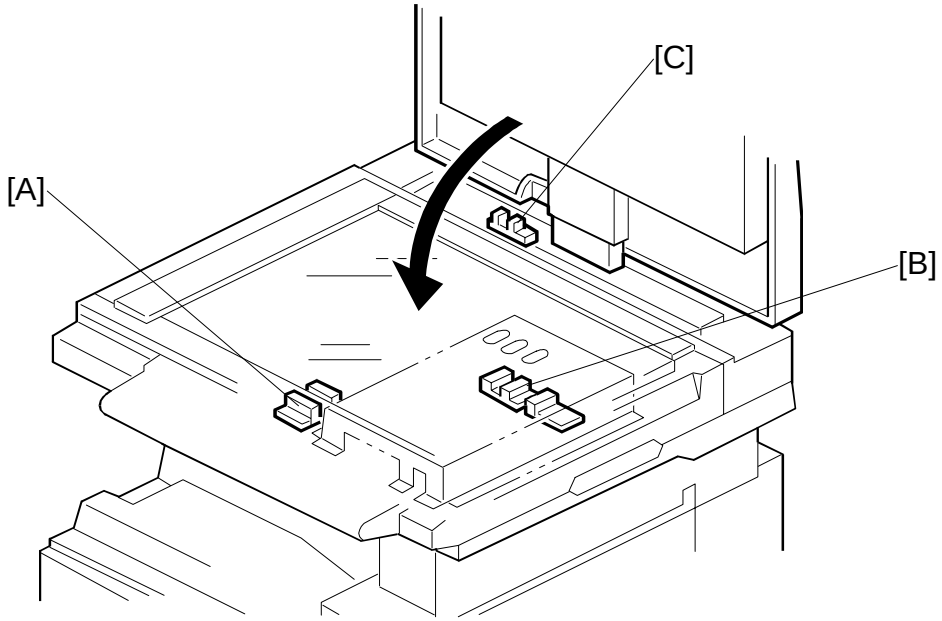
The scanner drive motor is a stepper motor. The 1st and 2nd scanners [A, B] are driven by the scanner drive motor [C] through the timing belt [D], scanner drive pulley [E], scanner drive shaft [F], and two scanner wires [G].

The scanner interface board (SIB) controls the scanner drive motor. In full size mode, the 1st scanner speed is 180 mm/s (A230/A231) or 230 mm/s (A232) 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 BICU board.

Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using SP4-008.

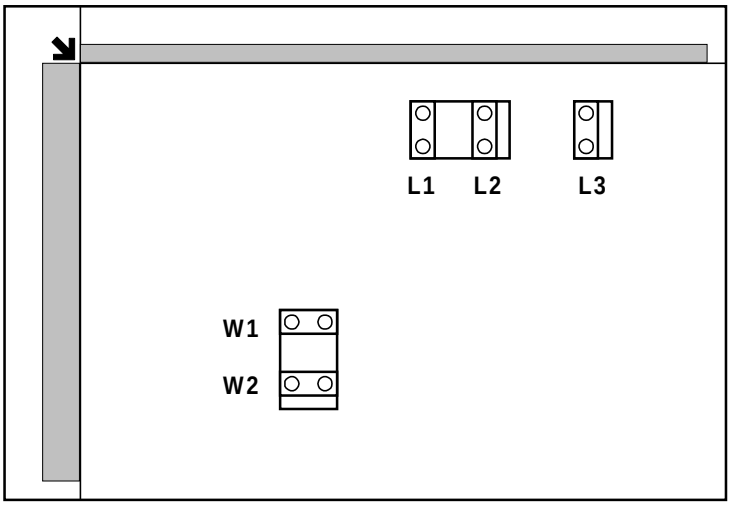
2.1.3 ORIGINAL SIZE DETECTION IN PLATEN MODE



In the optics cavity for original size detection, there are five reflective sensors. The original width sensors [A] detect the original width, and the original length sensors [B] detect the original length. These are the APS (Auto Paper Select) sensors. Each APS sensor is a reflective photosensor.

While the power 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 [C] is activated. This is when the platen reaches about 15 cm above the exposure glass, for example while it is being closed. The main CPU can recognize the original size from the on/off signals from the APS sensors.

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



Original Size		Length Sensor			Width Sensor		SP4-301 display
A4/A3 version	LT/DLT version	L3	L2	L1	W2	W1	
A3	11”x17”	O	O	O	O	O	00011111
B4	10”x14”	O	O	O	X	O	00011101
F4	8.5”x14” (8”x13”)	O	O	O	X	X	00011100
A4-L	8.5”x11”	X	O	O	X	X	00001100
B5-L		X	X	O	X	X	00000100
A4-S	11”x8.5”	X	X	X	O	O	00000011
B5-S		X	X	X	X	O	00000001
A5-L, A5-S	5.5”x8.5”, 8.5”x5.5”	X	X	X	X	X	00000000

NOTE: -L: Lengthwise, -S: Sideways, O: High (paper present) X: Low

For other combinations, "CANNOT DETECT ORIG. SIZE" will be indicated on the operation panel display.

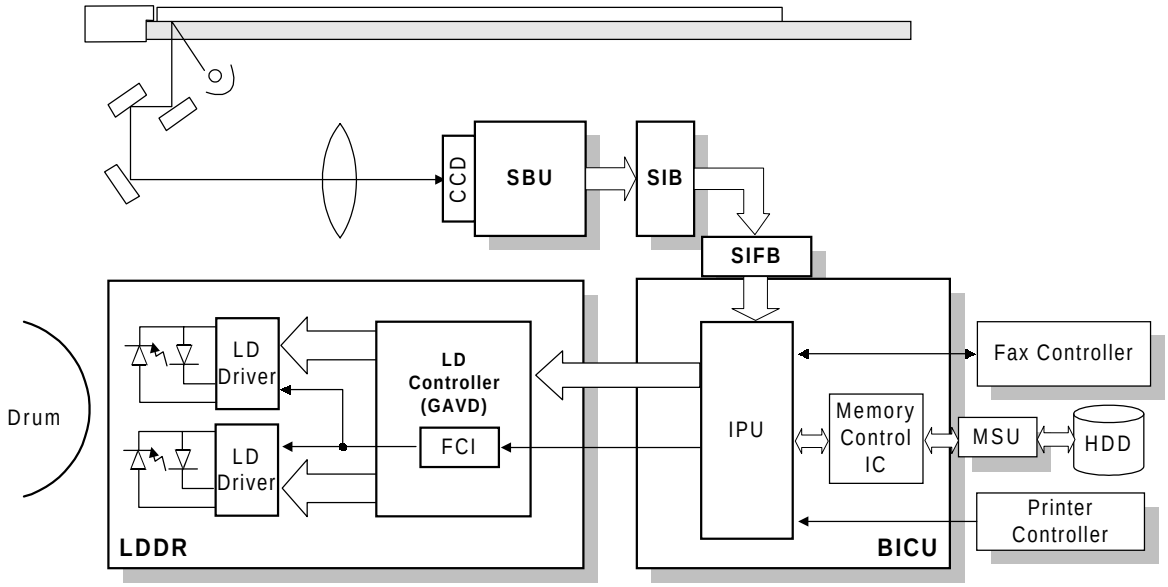
The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine's productivity.

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 a full A3 area, 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. This means that copy time for the first page may be slower (because of the longer time required for scanning), but it will be normal for the rest of the job.

Original size detection using the ADF is described in the ARDF section of the manual.

2.2 IMAGE PROCESSING

2.2.1 OVERVIEW



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 BICU (Base-engine and Image Control Unit) board.

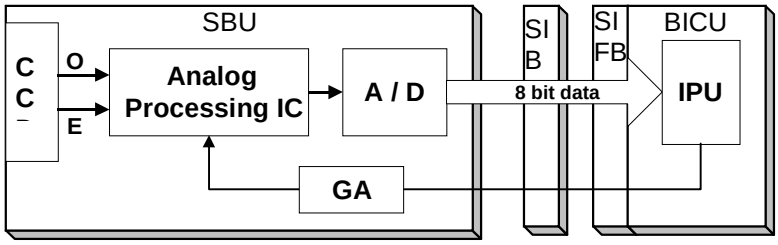
The BICU board can be divided into two image processing blocks; the IPU (Image Processing Unit) and the memory control IC. These two ICs do the following:

- IPU: Auto shading, filtering, magnification, γ correction, and gradation processing
- Memory controller: Image compression, decompression, and memory address control (binary picture processing mode only)

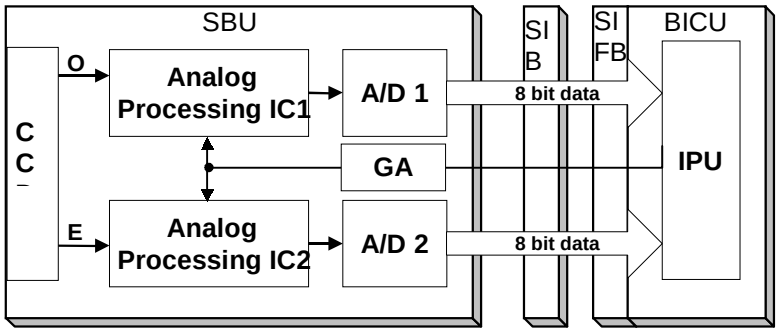
Finally, the BICU board sends the video data to the LD drive board.

2.2.2 SBU

A230/A231



A232



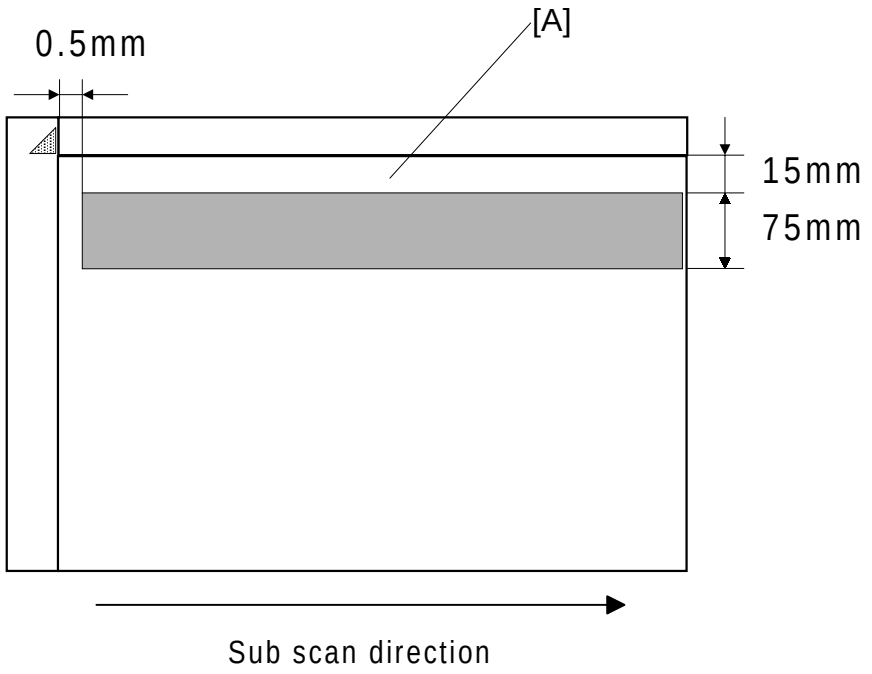
The CCD converts the light reflected from the original into an analog signal. The CCD line has 5,000 pixels and the resolution is 400 dpi (15.7 lines/mm).

The CCD has two output lines, for odd and even pixels, to the analog processing IC. For A230 and A231, there is one analog processing IC. For A232, there are two analog processing ICs; one handles odd pixels and the other handles even pixels. 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 Composition: (A230 and A231 only)
   Analog signals for odd and even pixels from the CCD are merged by a switching device.
3. Signal Amplification
   The analog signal is amplified by operational amplifiers in the AGC circuit. The maximum gains of the operational amplifiers are controlled by the CPU on the BICU board.

After the above processing, the analog signals are converted to 8-bit signals by the A/D converter. This gives a value for each pixel on a scale of 256 grades. Then, this data goes to the BICU board thorough the SIB and SIFB boards. (A230 and A231 each send one 8-bit signal, and A232 sends two 8-bit signals to the BICU board).

2.2.3 AUTO IMAGE DENSITY (ADS)



This mode prevents the background of an original from appearing on copies.

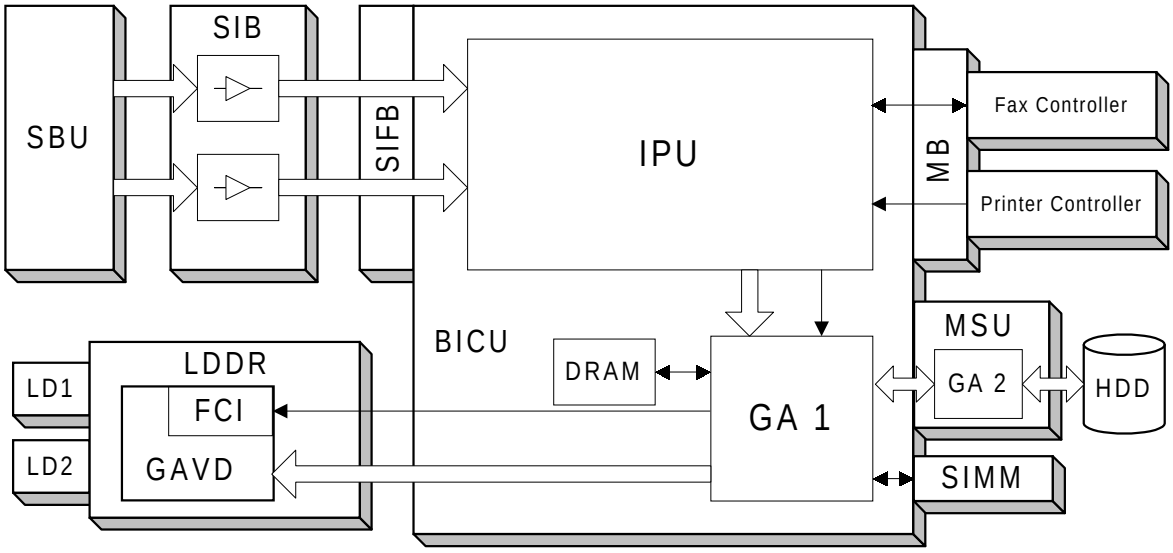
The copier scans the auto image density detection area [A]. This corresponds to a narrow strip at one end of the main scan line, as shown in the diagram. As the scanner scans down the page, the IPU on the BICU detects the peak white level for each scan line, within this narrow strip only. From this peak white level, the IPU determines the reference value for A/D conversion for the scan line. Then, the IPU sends the reference value to the A/D controller on the SBU.

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



The image data from the SBU goes to the IPU (Image Processing Unit) IC on the BICU board, which carries out the following processes on the image data:

1. Auto shading
2. Filtering (MTF and smoothing)
3. Magnification
4. γ correction
5. Grayscale processing
6. Binary picture processing
7. Error diffusion
8. Dithering
9. Video path control
10. Test pattern generation

The image data then goes to either the LDDR or the memory control IC (GA 1) depending on the selected copy modes.

Image processing path

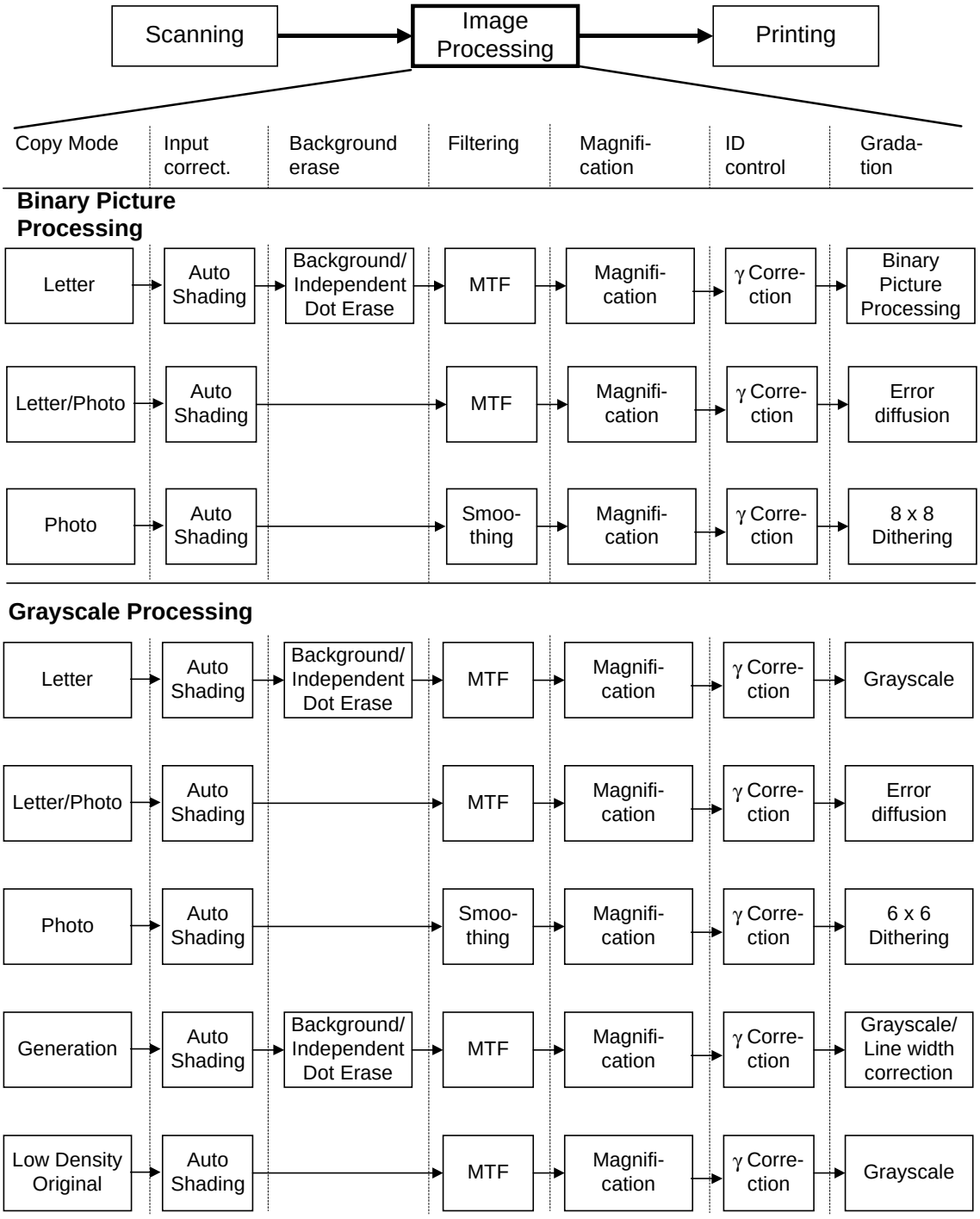


Photo mode: MTF can be used instead of smoothing (SP 4-904-3).

Background erase and independent dot erase can also be used in other modes than indicated above, depending on SP mode settings. The above diagram shows the default condition of the machine.

SP modes for each image process

The following table shows which SP modes are used for each image processing mode.

Binary picture processing mode

Copy mode	Input correct	Background erase	Filtering	Magnifi-cation	ID control	Gradation
Letter	---	**SP4903-34** Background erase level **SP4903-29** Independent dot erase level	**SP4903-41~44** MTF filter coefficient **SP4903-50~53** MTF filter strength	**SP2909-1** Main scan mag.	---	**SP4904-12** Threshold level
Letter/Photo	---	**SP4903-35** Background erase level **SP4903-30** Independent dot erase level	**SP4903-47** MTF filter coefficient **SP4903-55** MTF filter strength	**SP2909-1** Main scan mag.	---	---
Photo	---	**SP4903-36** Background erase level	**SP4904-3** Filter type (smoothing or MTF) **SP4903-16** Smoothing filter coefficient **SP4903-15** MTF filter coefficient **SP4903-24** MTF filter strength	**SP2909-1** Main scan mag.	---	**SP4904-18** Dither matrix type

Grayscale processing

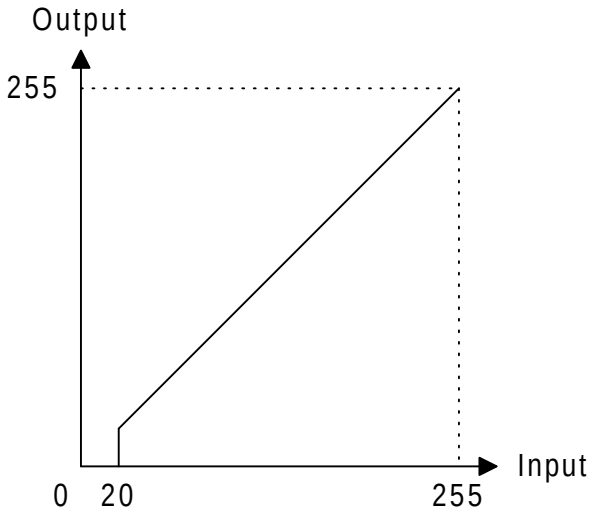
Copy mode	Input correct	Background erase	Filtering	Magnifi-cation	ID cont.	Gradation
Letter		**SP4903-34** Background erase level **SP4903-28** Independent dot erase level	**SP4903-11~14** MTF filter coefficient **SP4903-20~23** MTF filter strength	**SP2909-1** Main scan mag.		**SP4903-38** Error diffusion on/off
Letter/ Photo		**SP4903-35** Background erase level **SP4903-30** Independent dot erase level	**SP4903-17** MTF filter coefficient **SP4903-25** MTF filter strength	**SP2909-1** Main scan mag.		**SP4907** Text/photo auto separation **SP4904-7** Gradation type in text areas **SP4904-8** Gradation type in photo areas
Photo		**SP4903-36** Background erase level	**SP4904-3** Filter type (smoothing or MTF) **SP4903-16** Smoothing filter coefficient **SP4903-15** MTF filter coefficient **SP4903-24** MTF filter strength	**SP2909-1** Main scan mag.		**SP4904-2** Dither matrix type
Copied Original		**SP4903-37** Background erase level **SP4903-32** Independent dot erase level	**SP4903-19** MTF filter coefficient **SP4903-27** MTF filter strength	**SP2909-1** Main scan mag.		**SP4904-6** Line width correction type **SP4903-38** Error diffusion on/off
Low Density Original		**SP4903-31** Independent dot erase level	**SP4903-18** MTF filter coefficient **SP4903-26** MTF filter strength	**SP2909-1** Main scan mag.		**SP4903-38** Error diffusion on/off

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.

Background erase



By default, this process is used only in letter mode and copied original mode. However, it can be enabled for other modes by SP mode.

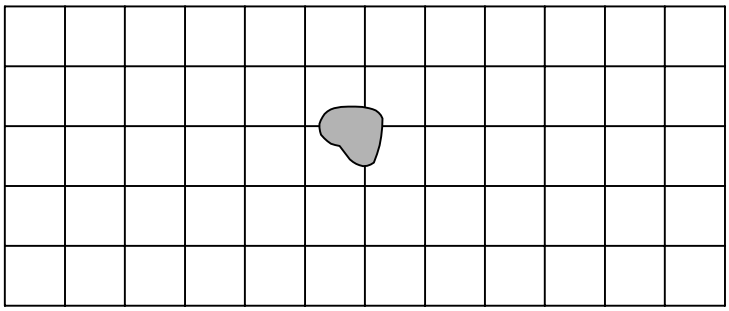
Usually, dirty background is erased using the Auto Image Density (ADS) function. However, sometimes, dirty background areas will still appear. These can be erased by this function.

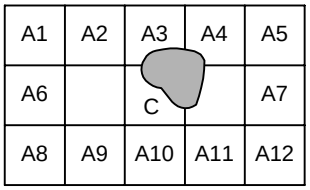
If any low image density data which is lower than a threshold level remains after auto shading, this data will be changed to “0” = white.

The threshold level can be changed with SP4-903-34 ~ 37. For example, for letter mode, use SP 4-903-34.

Independent dot erase

Original image





3 x 5 area

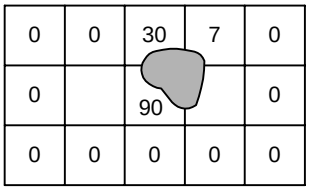


Image data

By default, this process is used only in letter mode and copied original mode. However, it can be enabled for other modes by SP mode. It erases independent black dots appearing in the copy or reduces their image density.

The software compares each pixel (C in the diagram above left) with the pixels around the edges of the surrounding 3 x 5 area. If the sum of the pixels at the edges is smaller than the threshold value stored in SP4-903-28 ~ 32 (e.g., for letter mode with binary picture processing, it is SP 4-903-29), the object pixel is changed to 0 (white) or reduced in density to an average of the pixels around the edge, depending on the SP mode setting. Each SP mode has 16 levels as follows.

A= The sum of the pixels at the edges

SP mode value	Function	SP mode value	Function
0	Disabled	8	Disabled
1	If A < 16, the pixel is deleted	9	If A < 16, density is reduced
2	If A < 32, the pixel is deleted	10	If A < 32, density is reduced
3	If A < 48, the pixel is deleted	11	If A < 48, density is reduced
4	If A < 64, the pixel is deleted	12	If A < 64, density is reduced
5	If A < 80, the pixel is deleted	13	If A < 80, density is reduced
6	If A < 96, the pixel is deleted	14	If A < 96, density is reduced
7	If A < 128, the pixel is deleted	15	If A < 128, density is reduced

Pixel density reduction works as follows. For the example in the above drawing, , when the SP mode value is “11”, the sum of the pixels around the edge is less than 48, the object pixel value is reduced from “90” to “3” as shown below.

A: (0 + 0 + 30 + 7 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0) / 12 = 3

Filtering, main scan magnification/reduction

Overview

After auto shading, the image data is processed by both filtering and main scan magnification. However, to reduce the occurrence of moire in the image, the processing order depends on the reproduction ratio, as follows.

1. 64% reduction or less

   Main Scan Reduction → Filtering

2. 65% reduction or higher

   Filtering → Main Scan Magnification

Filtering

There are two software filters for enhancing the desired image qualities of the selected original mode: the MTF filter and the smoothing filter.

The MTF filter emphasizes sharpness and is used in text and text/photo modes. The smoothing filter is used in photo mode.

The relationships between the coefficient of the filter and the filter strengths are as follows. The filter strengths and the coefficient for each mode can be adjusted with SP4-903.

MTF Filter Coefficient (SP4-903-11~15, 17~19, 41~47)

(Weak) 11 → 8 → 2 → 1 → 9 → 0 → 5 → 4 → 10 → 7 → 3 → 6 (Strong)

MTF Filter Strength (SP4-903-20~27, 50~53, 55)

(Weak) x0.25 → x0.5 → x1 → x2 → x4 (Strong)

Smoothing Filter Coefficient (SP4-903-16)

(Weak) 7 → 6 → 0 → 5 → 2 → 1 → 3 → 4 (Strong)

A stronger MTF filter leads to sharper lines. A stronger smoothing filter leads to a greater degree of smoothing.

Refer to the tables in ‘SP Modes for Each Image Process’ for more information.

Main scan magnification/reduction

Reduction and enlargement in the sub scan direction are done by changing the scanner speed. However, reduction and enlargement in the main scan direction are handled by the IPU chip.

To reduce or enlarge an image, imaginary points are calculated that would correspond to a physical enlargement or reduction of the image. The image density is then calculated for each of the imaginary points based on the image data of the nearest four true points. The calculated image data then becomes the new (reduced or enlarged) image data.

Gamma (γ) correction

Gamma correction ensures accurate generation of the various shades in the gray scale from black to white, accounting for the characteristics of the scanner and printer.

Scanner gamma correction corrects the data output to the IPU to account for the characteristics of the scanner (e.g., CCD response, scanner optics).

Printer gamma correction corrects the data output from the IPU to the laser diode to account for the characteristics of the printer (e.g., the characteristics of the drum, laser diode, and lenses).

The data for the scanner and printer gamma correction are fixed and stored in the memory. There are no SP adjustments in this machine.

Gradation processing

These are four types of gradation processing:

1. Grayscale processing: This has 256 output levels for each pixel. When the optional image enhancement kit (HDD) is installed, the binary picture processing mode cannot be selected.
2. Binary picture processing: This has only two output levels (black and white), and is used only in memory copying (only without HDD) and fax transmission.
3. Error diffusion: In text/photo mode, this is used with either grayscale processing or binary processing.
4. Dithering: In photo mode, this is used with either grayscale processing or binary processing

These four processes are used as follows.

1. Grayscale processing mode

Text mode:	Grayscale processing
Text/photo mode:	Error diffusion (256 levels)
Photo mode:	Dithering (256 levels)
Copied original mode:	Grayscale processing + line width correction
Low density original mode:	Grayscale processing

2. Binary picture processing mode

Text mode:	Binary picture processing
Text/photo mode:	Error diffusion (2 levels)
Photo mode:	Dithering (2 levels)

The above information is expressed as a diagram in the Image Processing Path section.

Grayscale processing

As stated on the previous page, this process generates up to 256 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 (LDDR). Briefly, the width of the laser pulse for a pixel depends on the output level (from 0 to 255) required for the pixel.

This machine can also change the laser pulse position (at the left side of the pixel, at the center, or at the right side) automatically, depending on the location of the image pixel so that the edges of characters and lines become clearer. There is no SP mode adjustment for this, unlike in some earlier models.

Binary picture processing

Each video signal level is converted from 8-bit to 1-bit (black and white image data) in accordance with a threshold value.

The threshold value can be adjusted with SP 4-904-12.

Error diffusion

This is used only in text/photo mode.

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 then compared with an error diffusion matrix. Separate error diffusion matrixes are used for copy mode and fax mode.

1. Grayscale processing mode

   The output image signal level has 9 levels (from white to black). There is only one matrix available.

2. Binary picture processing mode

   The output image signal level has just 2 levels (white and black).

Dithering

This is only used in photo mode.

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

1. Grayscale processing mode
   The matrix type can be selected with SP4-904-2.
2. Binary picture processing
   The matrix type can be selected with SP4-904-18.

Line width correction

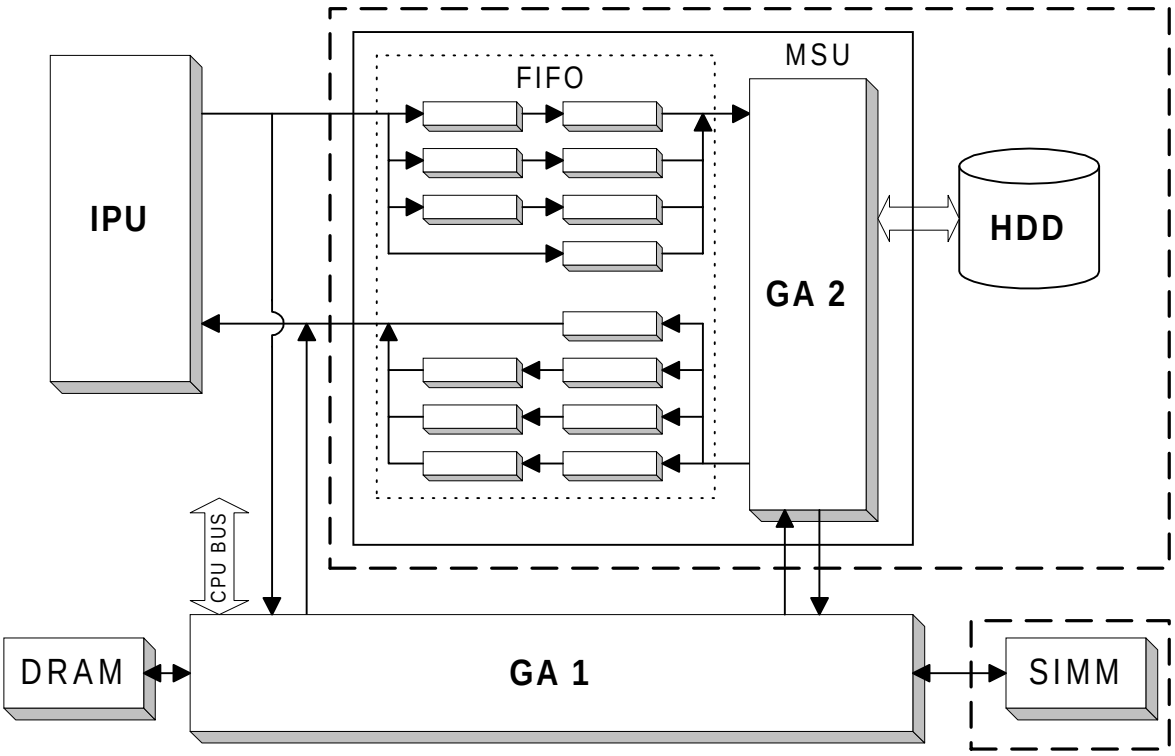
This function is effective only in copied original mode.

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.

The line width correction is done in the IPU chip.

The line width correction type can be selected with SP4-904-6.

2.2.5 MEMORY BLOCK



The memory block consists of the GA1 IC, GA2 IC, DRAM, SIMM, and the hard disk drive. The functions of each device are as follows.

GA 1:	Compressing the 1-bit image data Image rotation Image transfer to the DRAM, SIMM memory and GA 2
GA 2:	Compressing the 8-bit image data Image rotation Image data transfer to the HDD, FIFO memory, and GA1 Controls the HDD
DRAM (4 MB):	Stores compressed data in grayscale and binary picture processing mode. Page memory (2 MB), working area (2 MB)
SIMM memory (8 MB):	Stores compressed data with grayscale and binary picture processing mode. In binary picture processing mode, all the memory capacity is used for storing the image data. At this time, the DRAM is used for a working area.
Hard Disk Drive:	Stores compressed data in grayscale mode and stores archive file data.

Image compression is done for both gradation modes (grayscale and binary picture processing) and the compressed data is stored. However, there are limitations in copy mode, depending on the memory capacity and the installed memory components, as follows. DRAM is standard, but the SIMM and HDD are options.

Copy Mode	Gradation Processing	DRAM (4 MB)	DRAM + SIMM (4 + 8 MB)	DRAM + SIMM + HDD (12MB+1.6 GB)
One-to-one	Binary/Grayscale	O / O	O / O	X / O
Multiple copy of single page original	Binary/Grayscale	O / X	O / O	X / O
Multiple copy of multi-page original	Binary/Grayscale	O / X	O / O	X / O
Duplex Copy	Binary/Grayscale	X / X	O / X	X / O
Sort	Binary/Grayscale	X / X	O / X	X / O
Image Rotation	Binary/Grayscale	O / X	O / O	X / O

Key:
O / O: Possible in both binary and grayscale mode if this equipment is installed
O / X: Possible only in binary mode if this equipment is installed
X / O: Possible only in grayscale mode if this equipment is installed
X / X: Not possible in either mode

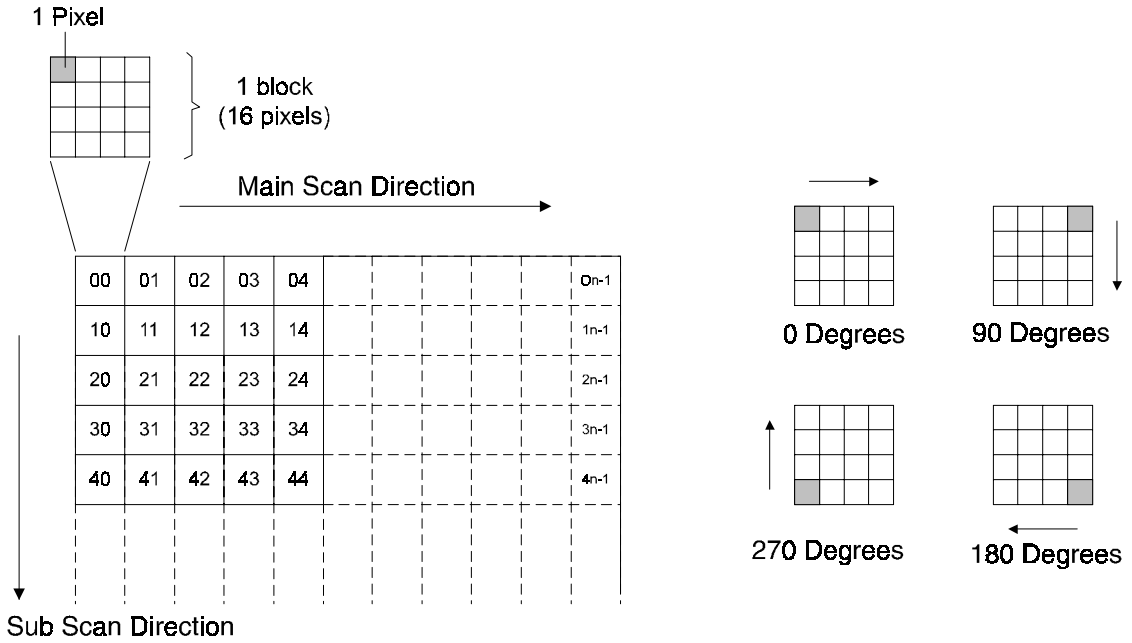
Example: Multiple copy of multi-page original is impossible with greyscale processing if only the DRAM is installed

Note that the SIMM is standard equipment for the A231 and A232.

Binary picture processing mode

The data which was treated with binary picture processing goes to the GA1 IC. The data is first compressed and the compressed data is stored in the DRAM and SIMM memory. When printing, the data from the DRAM and SIMM memory goes back to the GA1 IC, where the data is decompressed and image editing is done (e.g., image rotation, repeat image, combine image).

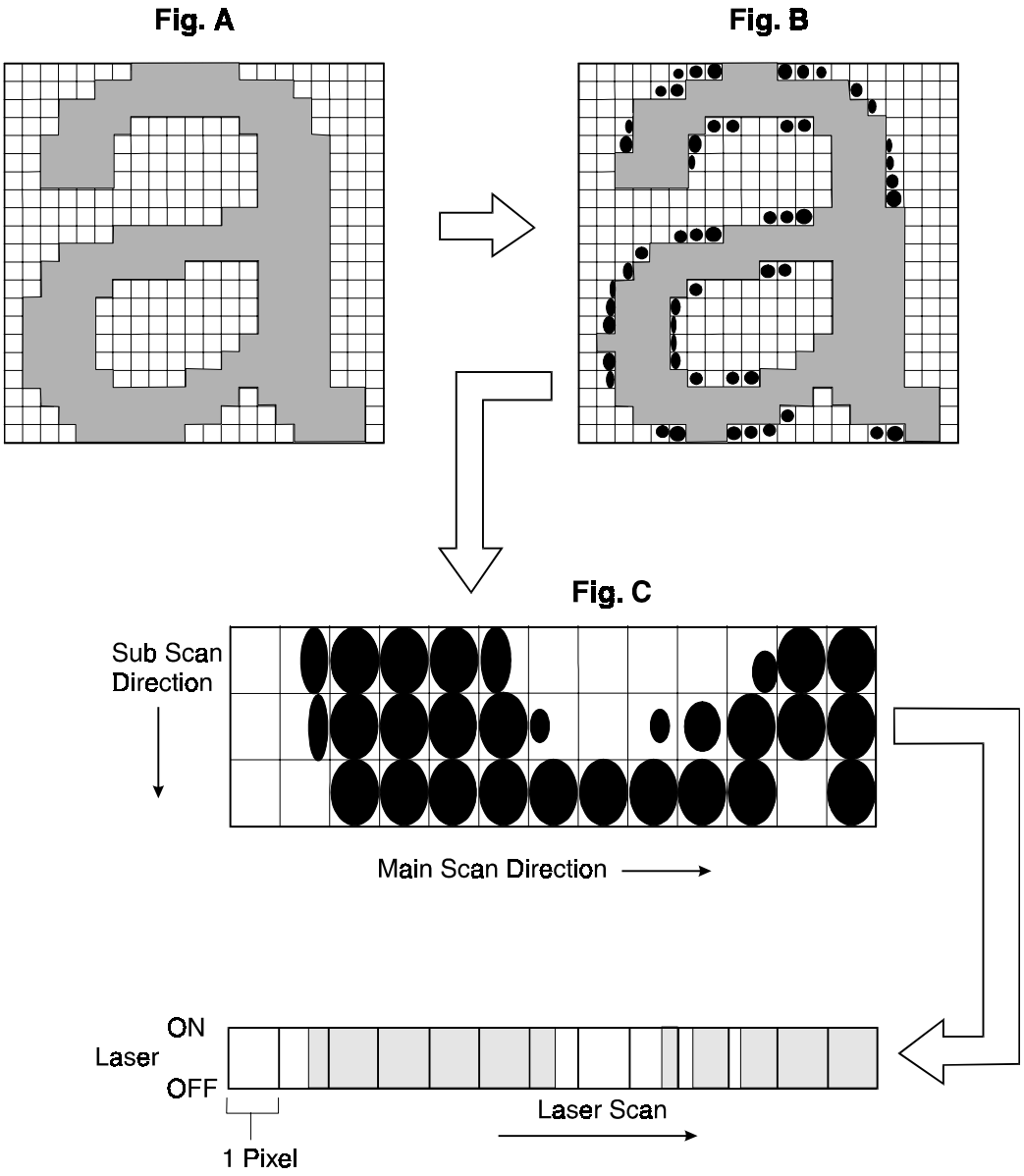
Grayscale processing mode



The image data from the IPU first goes to the FIFO block. This block consists of 14 FIFO memories (7 for data input, 7 for data output). FIFOs are used because the image compression is done using four scan lines at the same time to improve the image compression speed.

The image data then goes to the GA2 IC, where the image data for a whole page is divided into many blocks (the block size is 4 x 4 pixels) as shown above left. Then, each block is compressed and sent to HDD, DRAM and SIMM memory. For printing, the compressed data blocks from the HDD, DRAM and SIMM memory go back to the GA2 IC. This IC assigns these blocks to the proper positions for printing, then the data blocks are decompressed. In the image rotation mode, each compressed data block is rotated into the correct orientation and mapped into the proper position, then the blocks are decompressed.

2.2.6 FCI (FINE CHARACTER IMAGE)



The FCI chip on the LDDR performs image smoothing only in binary picture processed image with Letter mode.

Usually, binary picture processing generates jagged edges on characters as shown in the above left illustration. The FCI reduces jagged edges of characters using the image smoothing process.

Whether or not the object pixel undergoes smoothing depends on the surrounding image data. The smoothing process for the object pixel is done by changing the laser pulse positioning and the laser power.

2.3 LASER EXPOSURE

2.3.1 OVERVIEW

This machine uses two laser diodes to produce electrostatic images on an OPC drum. The laser diode unit converts image data from the BICU board into laser pulses, and the optical components direct these pulses to the drum.

To produce a high quality copy image, these are 256 gradations for the laser pulses, controlled through power modulation (32 levels) and pulse width modulation (8 levels).

Exposure of the drum by the laser beam creates the latent image. The laser beam makes the main scan while drum rotation controls the sub scan.

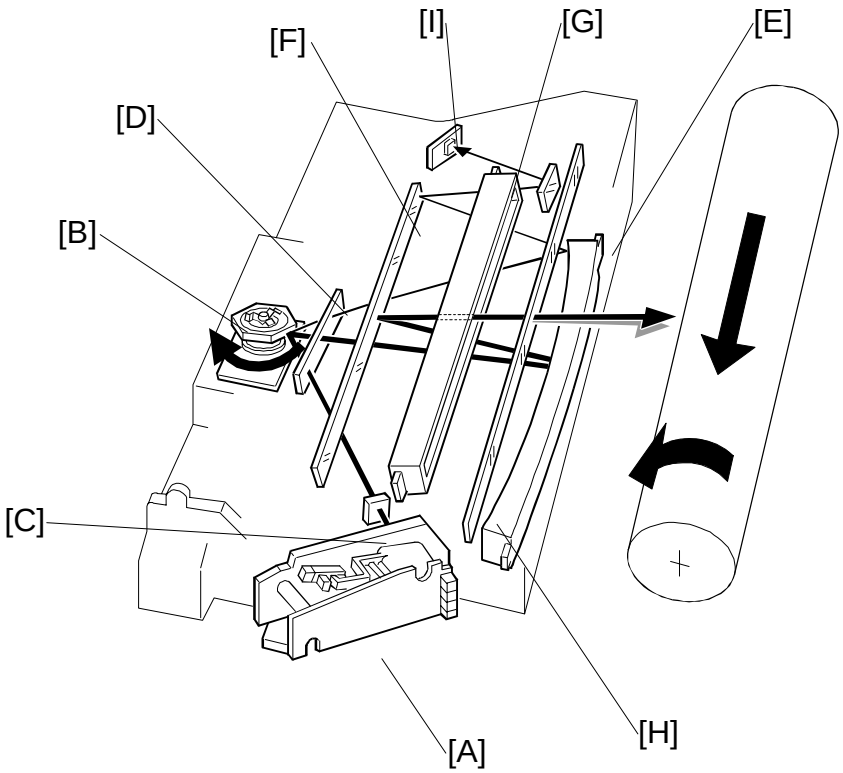
The combined strength of both beams is 0.336 mW (A230 and A231), 0.430 mW (A232) on the drum surface at a wavelength of 780 nm.

The polygon motor speed is as follows.

Resolution	Modes	Motor Speed (rpm)		1 line cycle (μs)	
		A230/ A231	A232	A230/ A231	A232
400 dpi	Copy, Fax	Approx. 14170	Approx. 18110	353	276
600 dpi	Printer	Approx. 21260	Approx. 27170	235	184
391.2 dpi	Fax (image rotation)	Approx. 14400	Approx. 18400	694	543
406.4 dpi	Fax (mm printing)	Approx. 13860	Approx. 17710	361	282

In previous models, the mirror speed increased for higher resolutions. However, for this machine, the line cycle (time taken to output one main scan line of data to the laser diode) varies also, so there is no simple relationship between resolution and mirror speed.

2.3.2 OPTICAL PATH



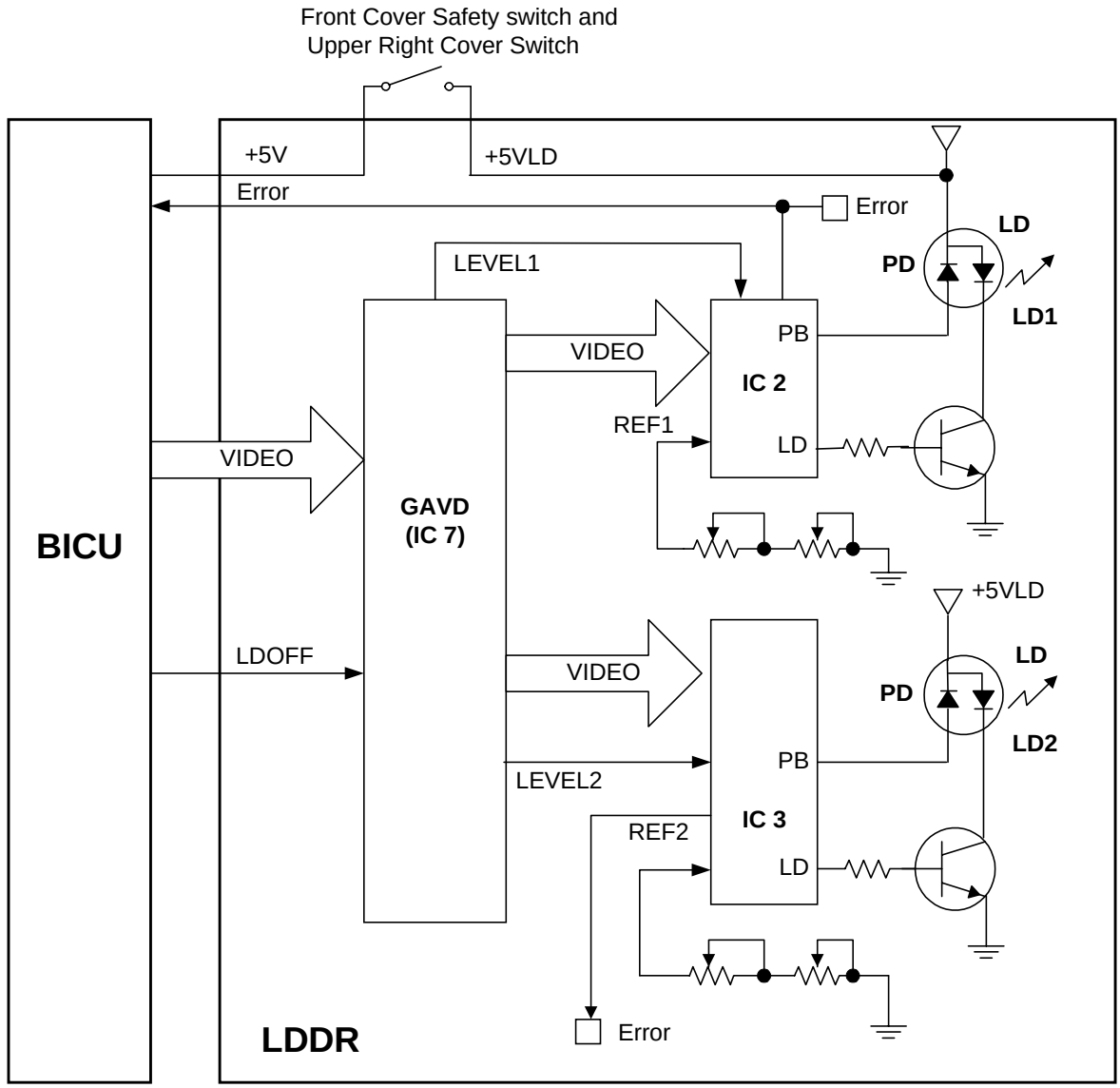
The output path from the laser diode to the drum is shown above.

The LD unit [A] outputs two laser beams to the polygon mirror [B] through the cylindrical lens [C] and the shield glass [D].

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

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

2.3.3 AUTO POWER CONTROL (APS)

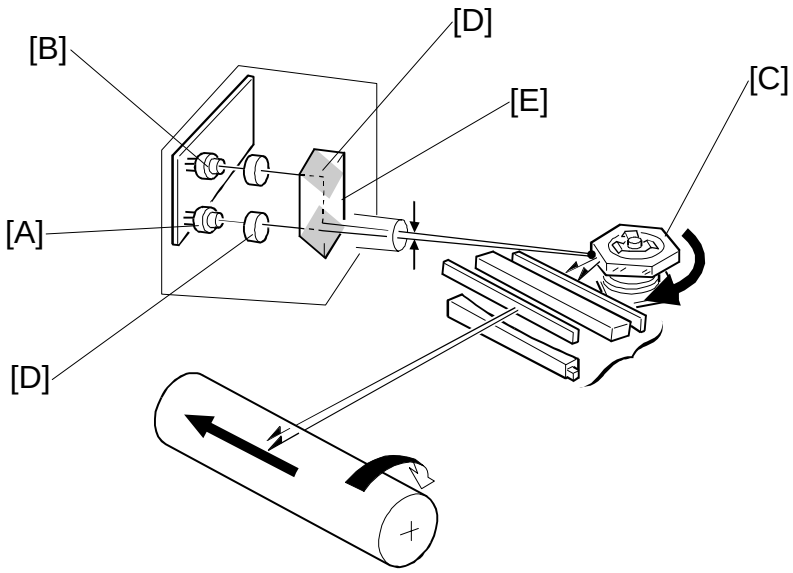


IC2 and IC3 on the LDDR drive the laser diodes. Even if a constant electric current is applied to the laser diode, the intensity of the output light changes with the temperature. The intensity of the output decreases as the temperature increases.

In order to keep the output level constant, IC2 and IC3 monitor the current passing through the photodiode (PD). Then they increase or decrease the current to the laser diode as necessary, comparing it with the reference levels (REF1 and REF2). This auto power control is done just after the machine is turned on and during printing while the laser diode is active.

The reference levels are adjusted on the production line. Do not touch the variable resistors on the LDDR in the field.

2.3.4 DUAL BEAM WRITING



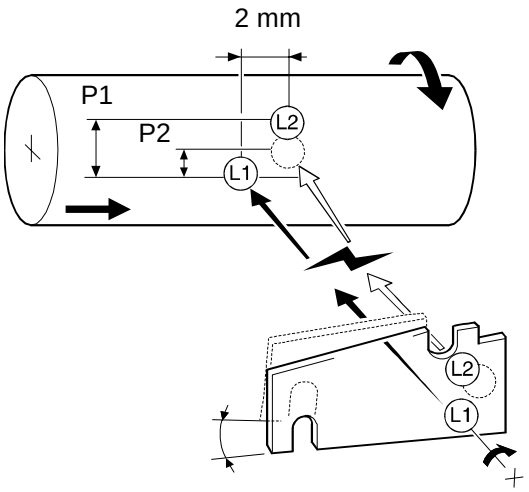
This LD unit has two laser diodes; LD1 [A] and LD2 [B] for writing the image. This means that each face of the polygon mirror writes two main scan lines, and twelve main scans are produced when the polygon mirror rotates once. The reasons for this mechanism are as follows.

1) To reduce the polygon motor rotation speed
2) To reduce the noise generated by the polygon motor
3) To reduce the frequency of the image data clock

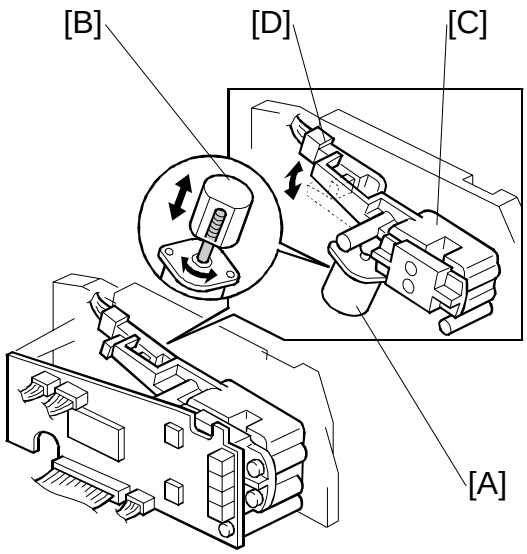
Two laser beams are transferred to the polygon mirror [C] through collimating lens [D] and prism [E]. The two laser beams arrive on the drum surface about 2 mm away from each other in the main scan direction and about 0.06 mm (at 400 dpi) in the sub scan direction (see the next page).

The reason for the two-mm difference in the main scan direction is so that the machine can detect a laser synchronization signal for each beam.

2.3.5 LASER BEAM PITCH CHANGE MECHANISM



P1: 400 dpi
P2: 600 dpi

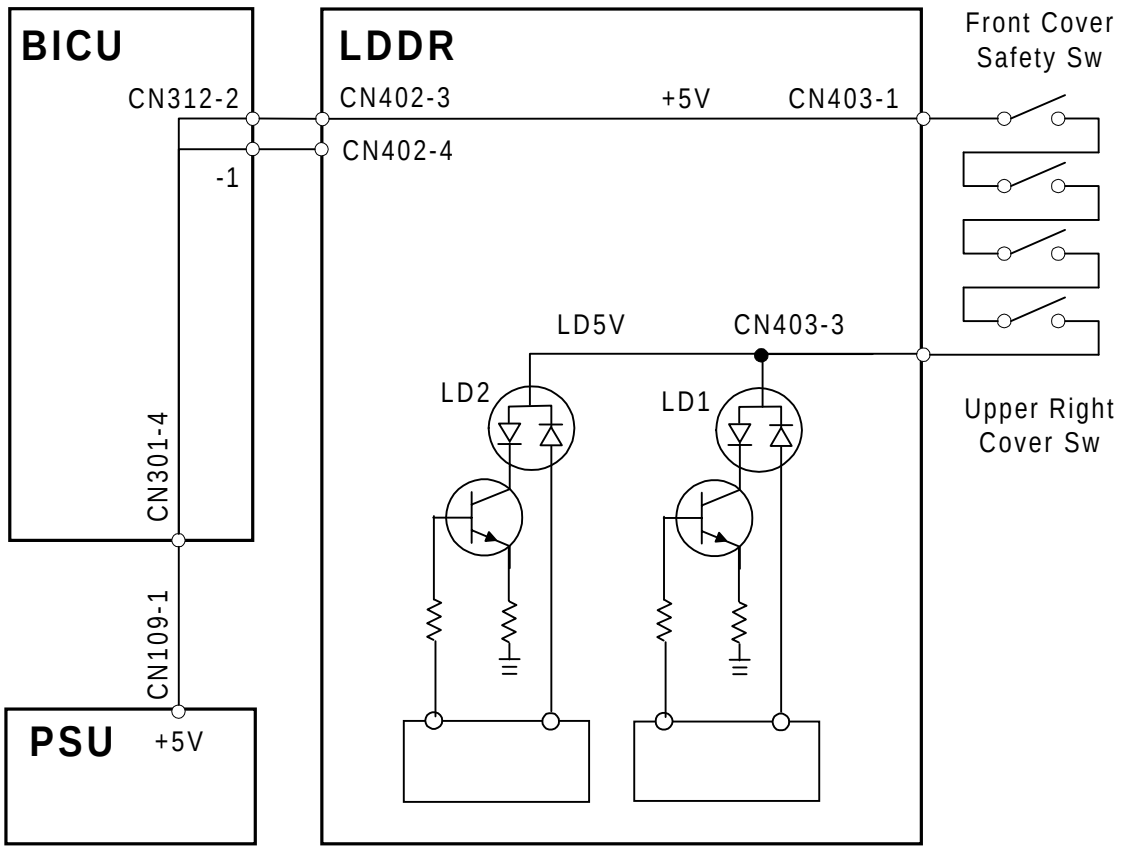


A printer option is available for this machine and the resolution of the printer is 600 dpi. The machine changes the resolution between 400 and 600 dpi by rotating the LD unit.

When the LD positioning motor [A] turns, the metal block [B] (which contacts the LD unit housing [C]) moves up and down. This changes the position of the L2 laser beam (L1 does not move).

Both LD unit positions are at fixed distances from the LD home position sensor [D] (measured by motor pulses). Usually, the LD unit moves directly to the proper position. However, when the number of times that the resolution has changed reaches the value of SP2-109-5, the LD unit moves to the home position (the home position sensor activates), then it moves to the proper position. This recalibrates the LD unit positioning mechanism.

2.3.6 LD SAFETY SWITCHES

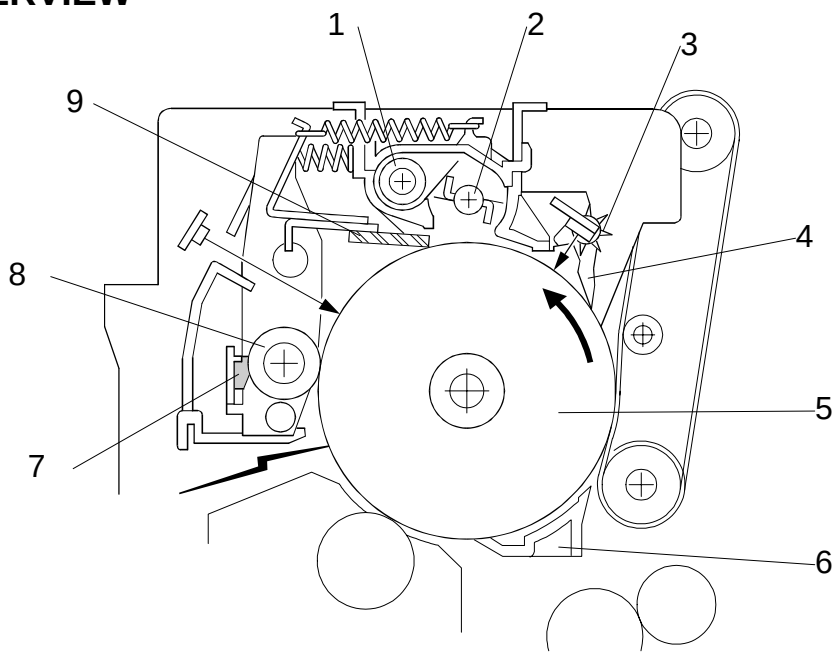


To ensure technician and user safety and to prevent the laser beam from inadvertently switching on during servicing, there are four safety switches located at the front cover and upper right cover. These four switches are installed in series on the LD5 V line coming from the power supply unit (PSU) through the BICU board.

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

2.4 PHOTOCONDUCTOR UNIT (PCU)

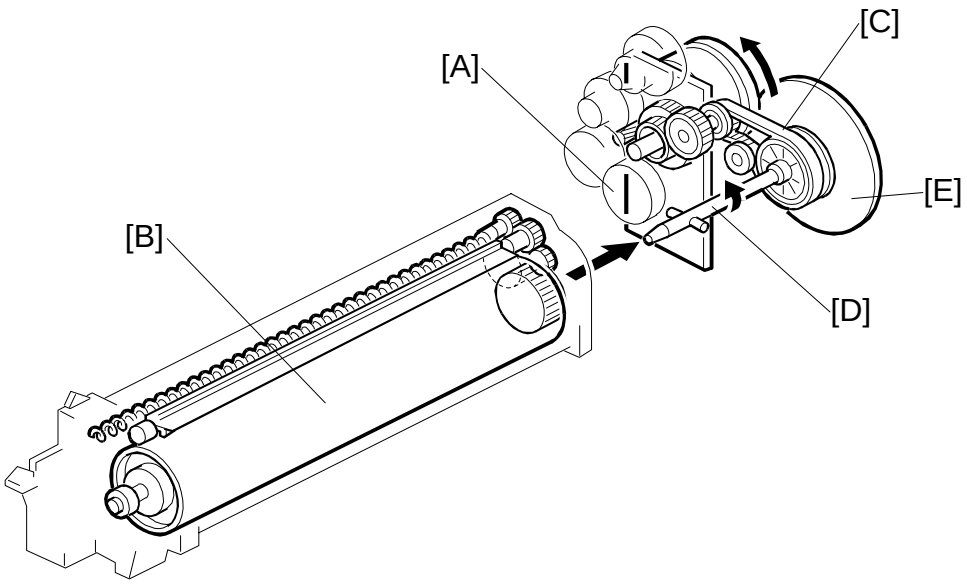
2.4.1 OVERVIEW



The PCU consists of the components shown in the above illustration. An organic photoconductor (OPC) drum (diameter: 60 mm) is used in this machine.

1. Toner Collection Coil
2. Toner Collection Plate
3. Spur
4. Pick off Pawl
5. OPC Drum
6. Transfer Entrance Guide
7. Charge Roller Cleaning Pad
8. Charge Roller
9. Cleaning Blade

2.4.2 DRIVE MECHANISM



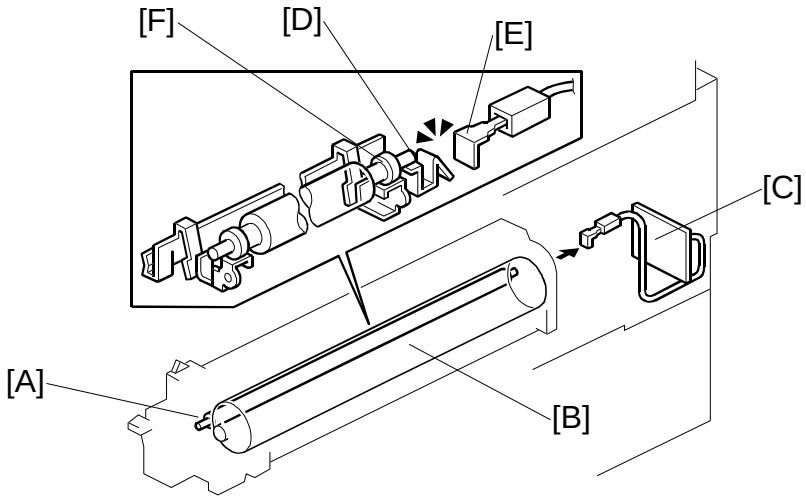
The drive from the main motor [A] is transmitted to the drum [B] through a series of gears, a timing belt [C], and the drum drive shaft [D]. The main motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range.

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

The A232 has two flywheels because of the higher speed.

2.5 DRUM CHARGE

2.5.1 OVERVIEW

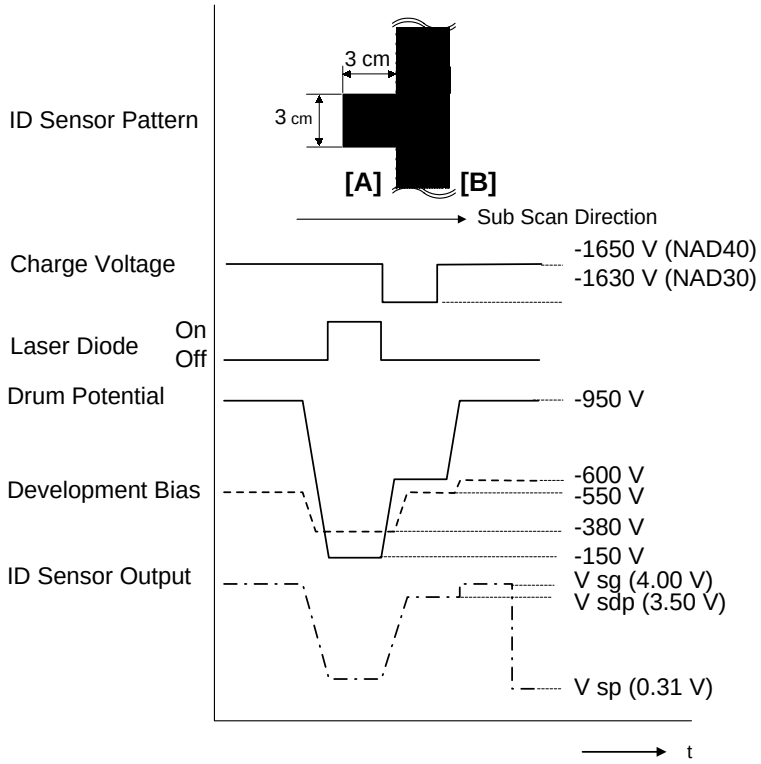


This copier uses a drum charge roller instead of a scorotron corona wire to charge the drum. The drum charge roller [A] always contacts the surface of the drum [B] to give it a negative charge.

The high voltage supply board [C] gives a negative dc voltage to the drum charge roller through the charge roller terminal [D], bias plate [E], and the rear roller bushing [F]. This gives the drum surface a negative charge of –950V.

2.5.2 CHARGE ROLLER VOLTAGE CORRECTION

Correction for Environmental Conditions



⇒ In the 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.

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 drops so that drum potential is reduced to -600V. At the same time, development bias goes back to -550V. 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 even if the charge roller voltage supply stays the same (efficiency of voltage transfer decreases with increased humidity). As a result, more 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 Vsdp with Vsg.

- Vsdp / Vsg > 0.90 = Reduce the drum charge voltage by 30 V
- Vsdp / Vsg < 0.85 = Increase the drum charge voltage by 30 V

NOTE: The maximum drum charge roller voltage is – 2 kV.

Correction for paper width and thickness (bypass tray only)

The bypass tray can be used for narrower paper than the paper trays. Also, thicker paper can be used, as well as OHP sheets. In these cases, some copy quality problems may occur.

To deal with this, the charge roller voltage can be increased for paper fed from the bypass tray. The voltage corrections are adjusted with SP 2-914-1 and 2. The width thresholds for these adjustments can be adjusted with 2-309-1 and 2-309-2.

Charge roller input voltages

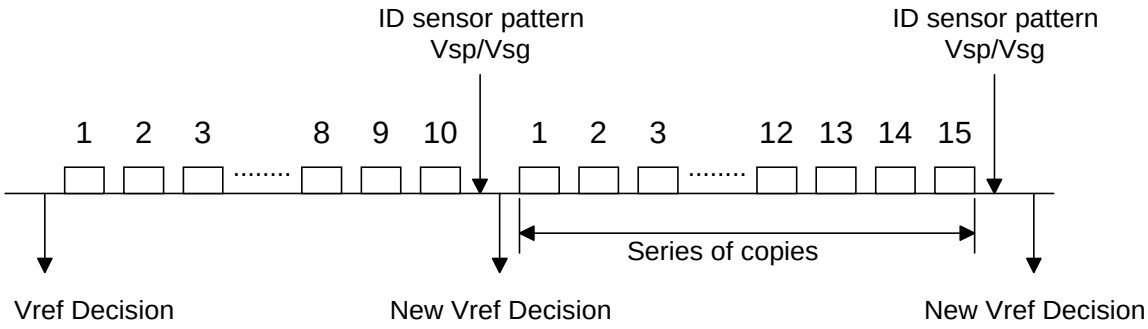
Paper width from 216 mm to 297 mm: SP2-001-1
Paper width from 150 mm to 216 mm: SP2-001-1 + 50 V (adj. with SP2-914-2)
Paper width below 150 mm: SP2-001-1 + 250 V (adj. with SP2-914-1)

Paper width limits

150 mm limit: SP2-309-1
216 mm limit: SP2-309-2

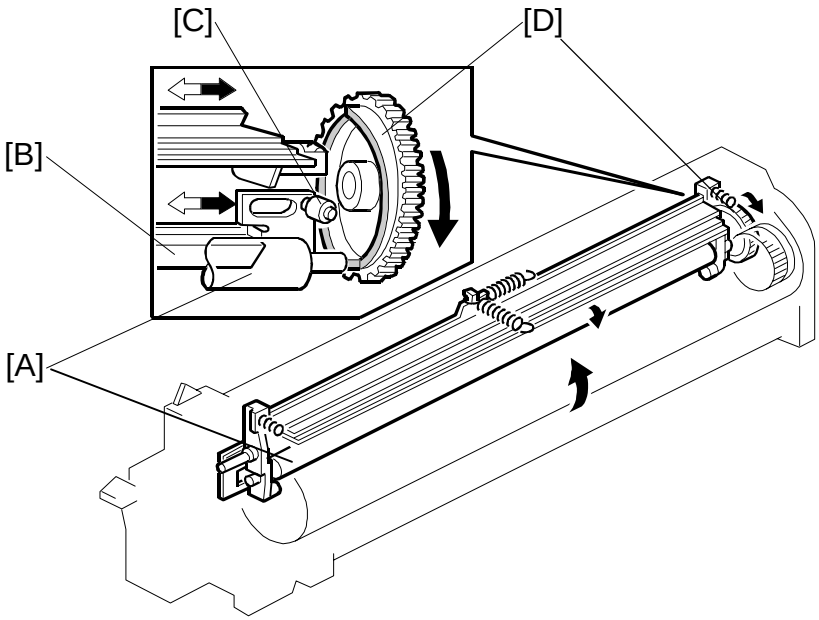
Similar voltage adjustments are available for development bias and transfer current.

2.5.3 ID SENSOR PATTERN PRODUCTION TIMING



An ID sensor pattern is made during the machine initialization (after the main power switch or operation switch is turned on) and after finishing a copy job in which 10 (default value) or more copies were made.

2.5.4 DRUM CHARGE ROLLER CLEANING

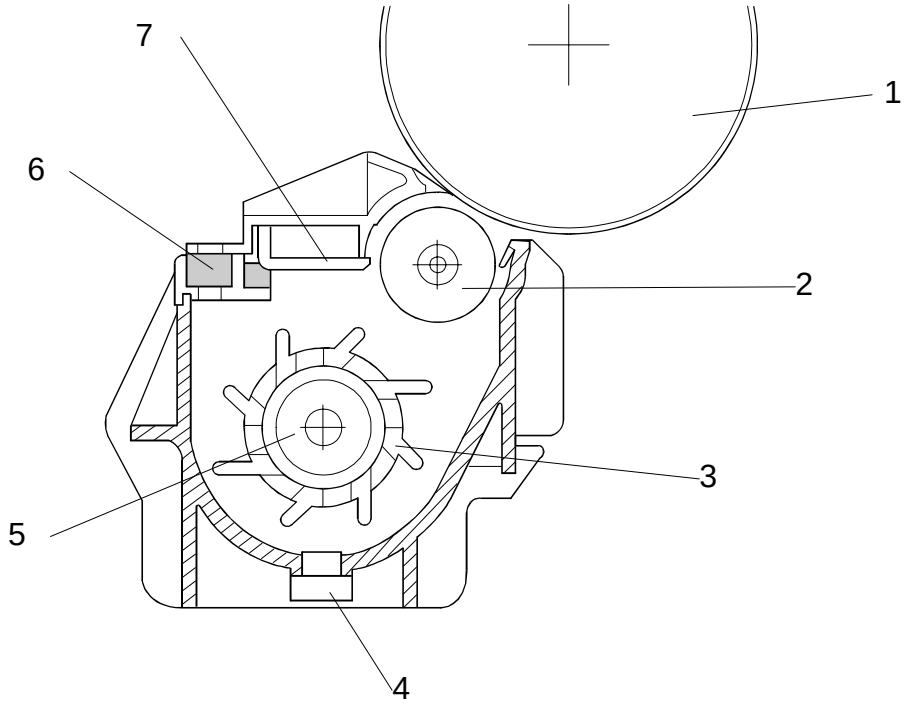


Because the drum charge roller [A] is always in contact with the drum, it gets dirty easily. So, the cleaning pad [B] is also in contact with the drum charge roller all the time to clean the surface of the drum charge roller.

The pin [C] at the rear of the cleaning pad holder touches the cam gear [D], and this gear moves the cleaning pad from side to side. This movement improves the cleaning.

2.6 DEVELOPMENT

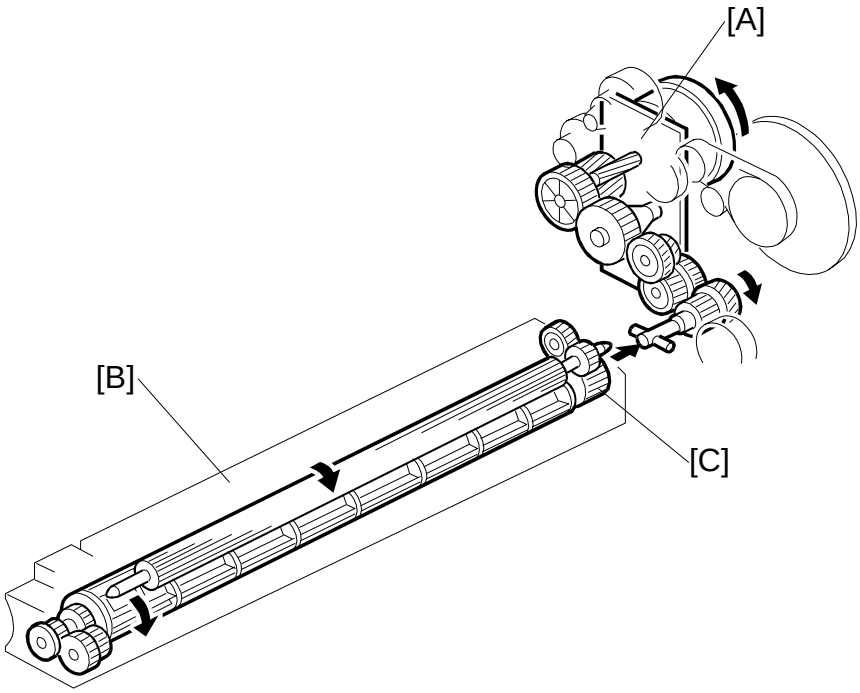
2.6.1 OVERVIEW



This machine uses a single-roller development system. A dual mixing roller mechanism is used for developer mixing.

1. Drum
2. Development Roller
3. Paddle Roller
4. TD Sensor
5. Mixing Auger
6. Development Filter
7. Doctor Blade

2.6.2 DRIVE MECHANISM

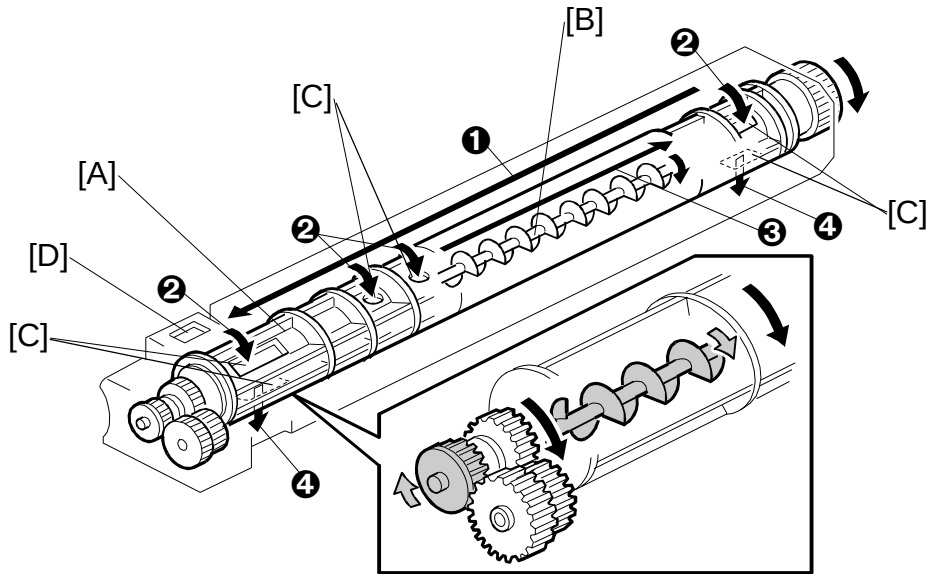


The main motor [A] drives the development roller [B] through a train of gears and the paddle roller gear [C].

The development drive gears are helical gears. These gears are quieter than normal gears.

When the development unit is pushed in, the development drive shaft engages the paddle roller gear.

2.6.3 DEVELOPER MIXING

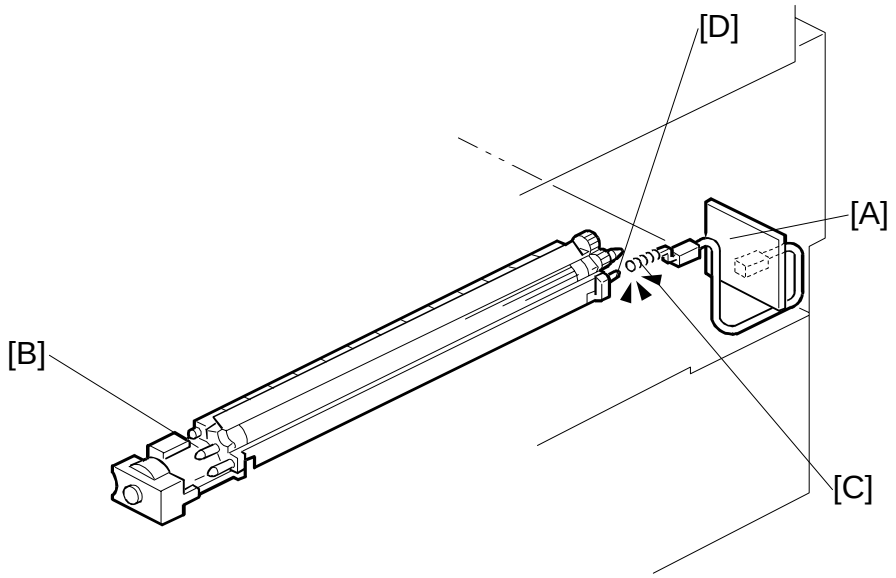


This mechanism supplies toner from the toner bottle to the development roller.

The dual mixing roller consists of the outer paddle [A] and the inner auger [B]. The outer paddle moves developer to the front ❶ and supplies it to the development roller. The developer that is spilt off by the doctor blade ❷ goes through the holes [C] in the outer paddle, and is transported towards the rear ❸ by the inner auger. While the dual mixing roller is moving the developer, some developer also goes back to the development unit through the holes in the bottom of the paddle roller ❹.

Both new toner from the toner bottle and recycled toner from the toner collection coil both enter the development unit at the top [D]

2.6.4 DEVELOPMENT BIAS



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

To attract negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board [A] applies a bias of -600 volts to the development roller throughout the image development process. The bias is applied to the development roller shaft [B] through the bias terminal spring [C] and bias terminal [D].

The development bias voltage (-600 V) can be adjusted with SP2-201.

Correction for paper width and thickness (bypass tray only)

The bypass tray can be used for narrower paper than the paper trays. Also, thicker paper can be used, as well as OHP sheets. In these cases, some copy quality problems may occur.

To deal with this, the development bias can be increased for paper fed from the bypass tray. The voltage corrections are adjusted with SP 2-914-3 and 4. The width thresholds for these adjustments can be adjusted with 2-309-1 and 2-309-2.

Development bias voltages

Paper width from 216 mm to 297 mm: SP2-201-1
Paper width from 150 mm to 216 mm: SP2-201-1 + 50 V (adj. with SP2-914-4)
Paper width below 150 mm: SP2-201-1 + 200 V (adj. with SP2-914-3)

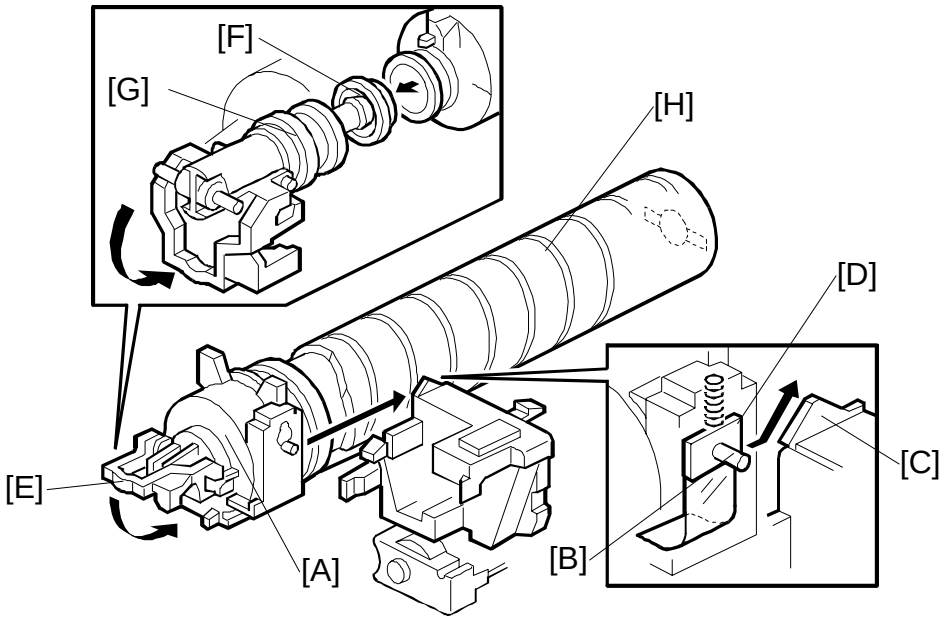
Paper width limits

150 mm limit: SP2-309-1, 216 mm limit: SP2-309-2

Similar voltage adjustments are available for charge roller input voltage and transfer current.

2.6.5 TONER SUPPLY

Toner bottle replenishment mechanism



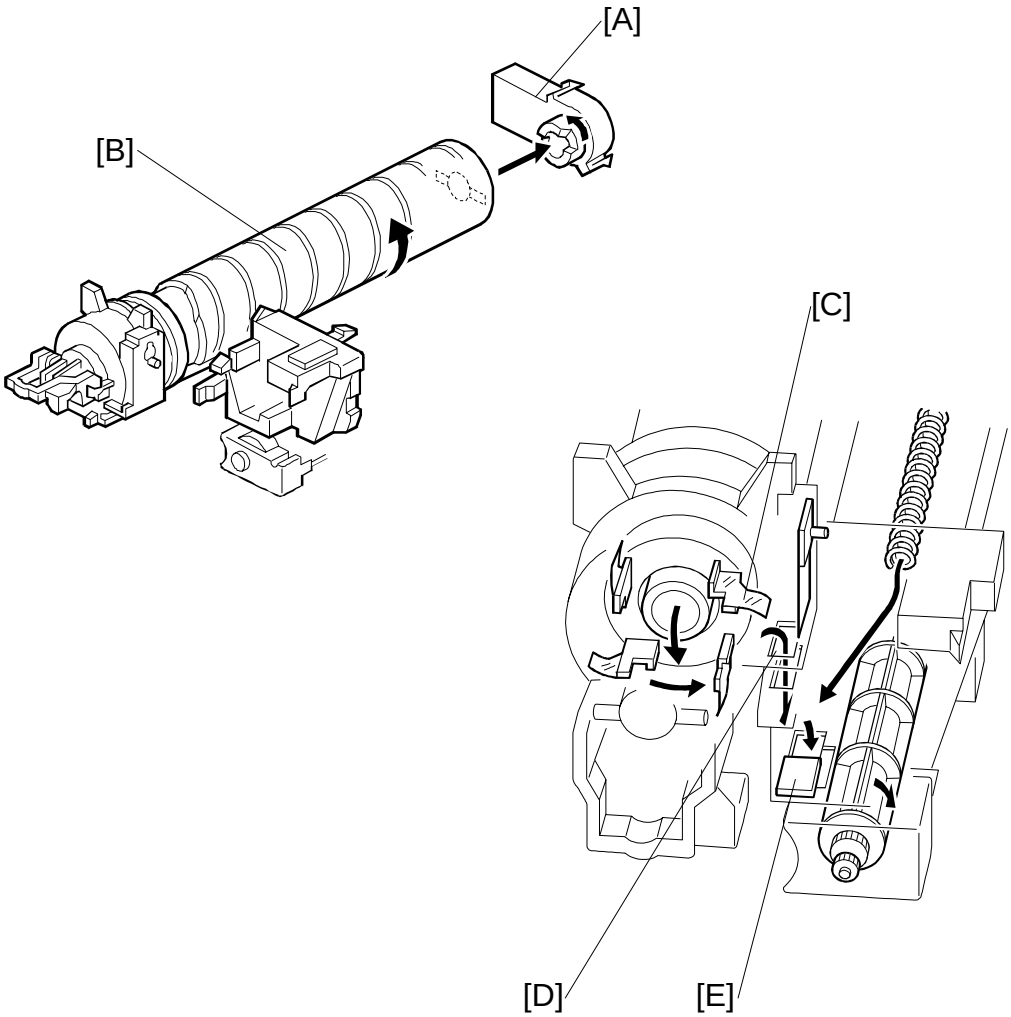
When a toner bottle is placed in the bottle holder unit [A] and the unit is pushed in completely, pin [B] moves against the side [C] of the PCU, and the toner shutter [D] is pulled out to open the bottle. When the toner bottle holder lever [E] is put back in the original position, the cap [F] on the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



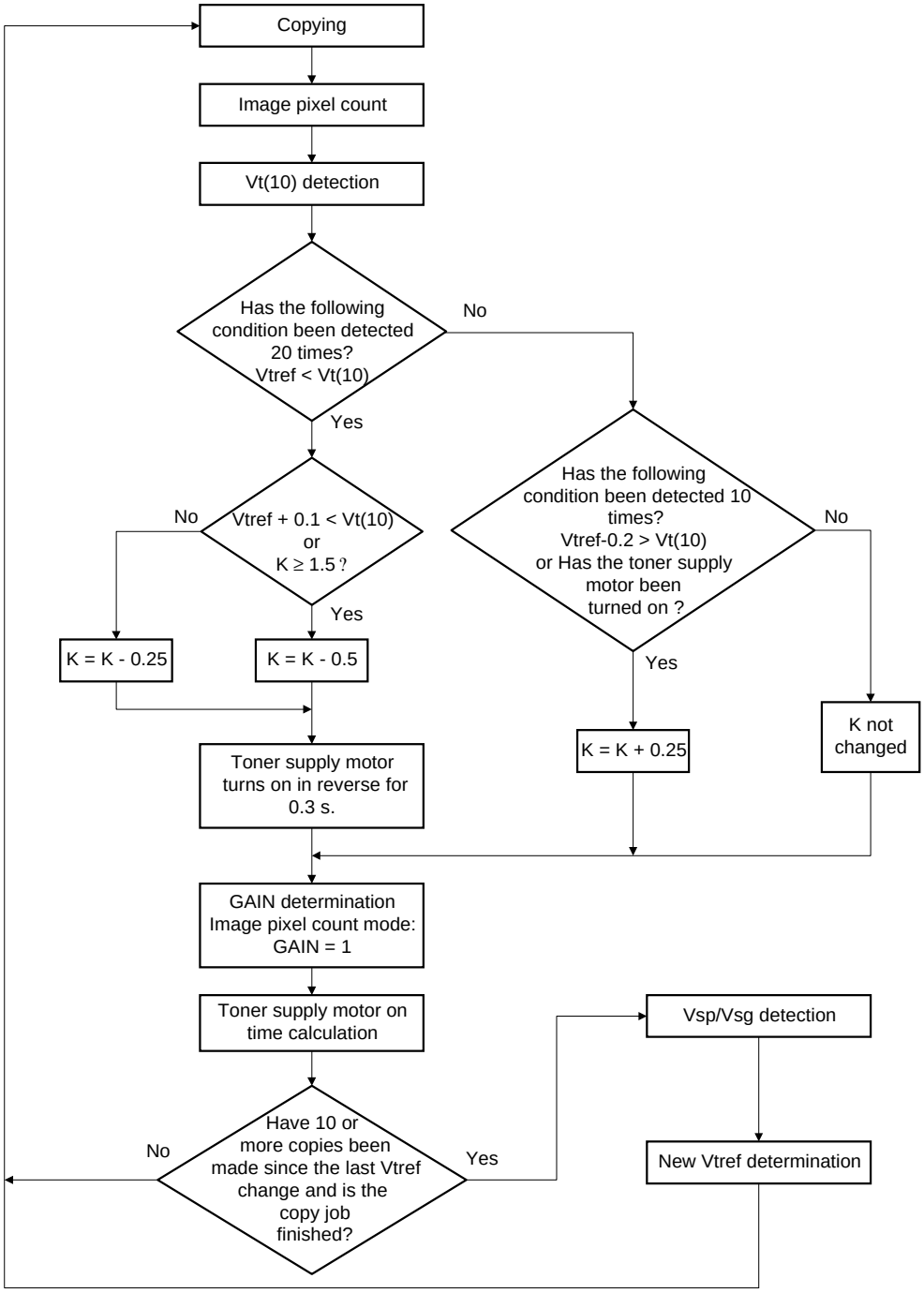
The toner supply motor [A] drives the toner bottle [B] and the mylar blades [C]. First, the toner falls down into the toner bottle holder. The toner supply mylar blades transfer the toner to the slit [D]. When the PCU is installed into the machine, the shutter [E] under the PCU is opened by the development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

2.6.6 TONER DENSITY CONTROL

Overview

There are two modes for controlling toner supply: sensor control mode and image pixel count control mode. The type of mode can be changed with SP2-208-1. The factory setting is sensor control mode. Image pixel count mode should only be used if the TD or ID sensor is defective.

Toner Density Control Flow Chart



Sensor Control Mode

In sensor control mode, the machine varies toner supply for each copy, to maintain the correct proportion of toner in the developer and to account for changes in drum reflectivity over time. The adjustment depends on two factors

- The amount of toner required to print the page (based on a black pixel amount for the page)
- Readings from the TD sensor and ID sensor

Each step of the previous flow chart is explained in more detail on the following pages.

Toner density sensor initial setting

When new developer with the standard toner concentration is installed (12.5 g of toner in 500 g of developer, which is 2.5% by weight), TD sensor initial setting must be done using SP2-801. This the sets sensor output to 4.0V. This value will be used as the toner supply reference voltage (Vtref) of the TD sensor.

Image pixel count

The CPU adds up the image data value of each pixel and converts the sum to a value between 0 and 255. (The value would be 255 if the page was completely black.)

Vt(10) detection

The toner density in the developer is detected once every copy cycle. The sensor output voltage Vt(10) is the average of the 10 most recent sensor output voltage readings.

Toner density measurement

The machine compares Vt(10) and Vtref. If Vt(10) is greater than Vtref, the toner concentration in the development unit is low and more toner should be added.

When Vt(10) > Vtref has been detected 20 times (toner concentration is consistently low), 0.1 is added to Vref, and the conditions are checked again. The result decides the value of “K” (toner supply rate coefficient), which is one of the factors in the toner supply motor on time calculation.

If Vt(10) > Vtref has not been detected 20 times, 0.2 is subtracted from Vtref, and “K” is decided in a similar way as for the previous condition.

GAIN determination

GAIN is another factor in the toner supply motor on time calculation. It is decided using the following data.

- Vtref – Vt(10)
- Ten most recent Vt values

Toner supply motor on time calculation

The toner supply motor on time is decided using the following formula:

$$\left(\frac{0.7\ \text{mg/cm}^2 \times \text{Image Pixel Count} \times \text{Gain Toner}}{\text{Toner Supply Rate} \times K} + \frac{(Vt - Vtref \times 10{,}000}{\text{Toner Supply Rate} \times K} \right) \quad \ldots\ldots(1)$$

$$\left(\frac{(255 - \text{Image Pixel Count})}{255} \times \frac{\text{Gain}}{6} \right) \quad \ldots\ldots(2)$$

NOTE: 1) The toner supply rate can be changed using SP2-209.
2) K = Toner supply rate coefficient (0.25 ~ 3.0: default = 3.0).
3) The bracket (2) in the above formula is only used if Vtref < Vt.
4) The maximum toner supply motor on time is 1.2 s.

Vsp and Vsg detection

The ID sensor (at the lower right area of the drum) 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.

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 the charge roller and laser diodes.

Vsg/Vsp is detected every 10 copies to decide the new Vtref. The Vsg/Vsp detection period can be changed using SP2-210 (the default is 10).

New Vtref determination

Even if the toner concentration in the developer is kept constant by checking the TD sensor, the toner potential (chargeability) and the image density both change with humidity and the amount of toner on the carrier. Therefore, the actual image density, using the ID sensor output, is also used as one of the factors for deciding the new Vtref which is used for toner density control.

The new Vtref is determined using the following data.

- Vtref – Vt(10)
- Vsp/Vsg

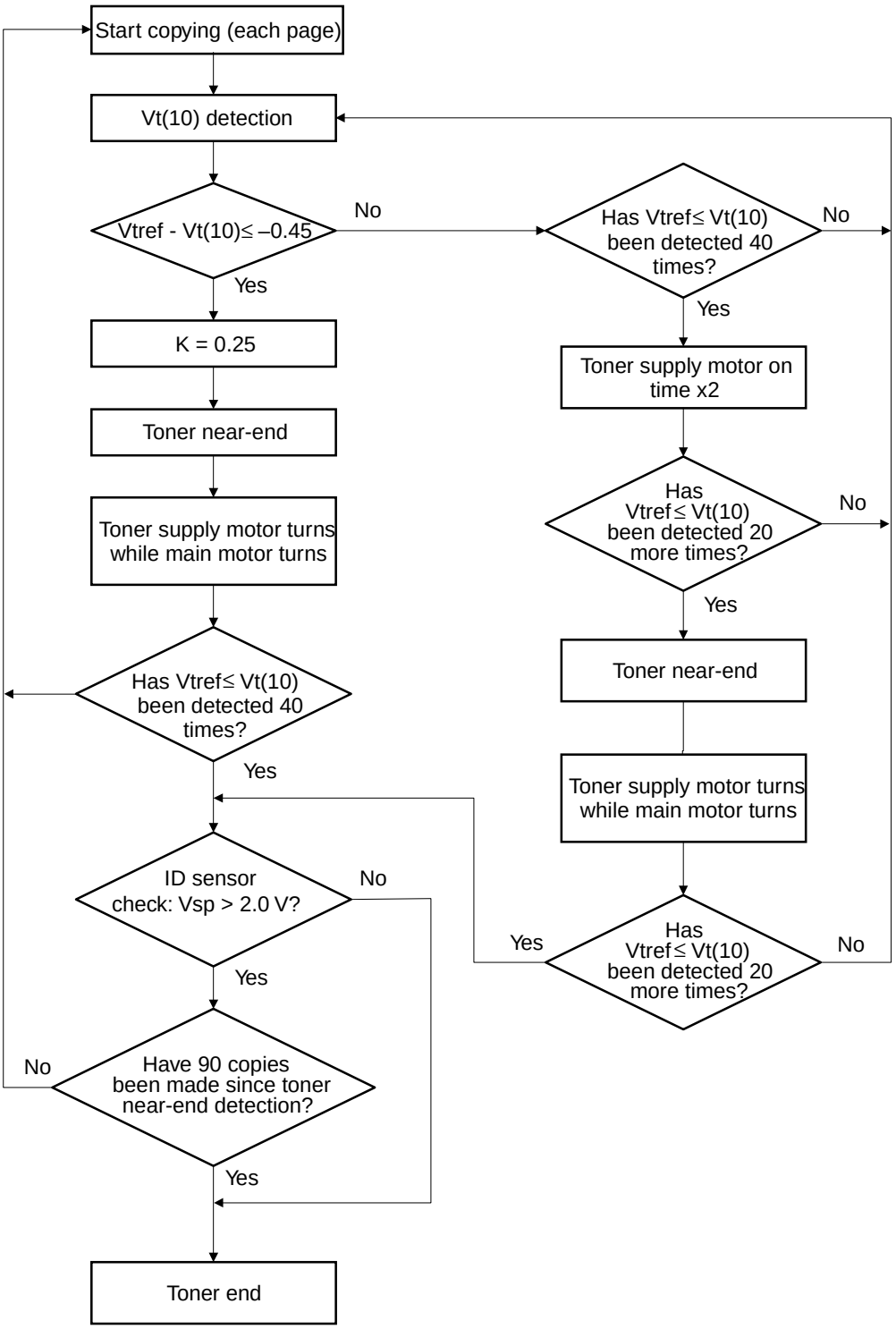
From this point, toner density control is done using the new Vtref.

Image Pixel Count Control Mode.

This mode should only be used as a temporary measure while waiting for replacement parts, such as a TD sensor. This mode controls the toner supply amount using the same formula for the toner bottle motor on time. However, the GAIN value is fixed at 1, and the other coefficients, such as “K”, “toner supply rate” keep the values that they had when the toner density control mode was changed over to image pixel count mode.

2.6.7 TONER NEAR END/END DETECTION

Toner near end/end detection flow chart



Toner near end is detected using the TD sensor output data.

If Vtref-Vt(10) is less than or equal to -0.45, the toner concentration is very low. “K” becomes 0.25 and the machine enters the toner near end condition. Then, the toner supply motor turns on to supply toner.

If Vtref-Vt(10) is greater than -0.45, the toner concentration is still not terribly low, but the machine does further tests by comparing Vtref and Vt(10). If the machine has detected 40 times that Vt(10) is greater than Vtref, the toner supply motor turns on for double the time that it would be with the previous formula. If the toner concentration is still low, the machine enters the toner near end condition.

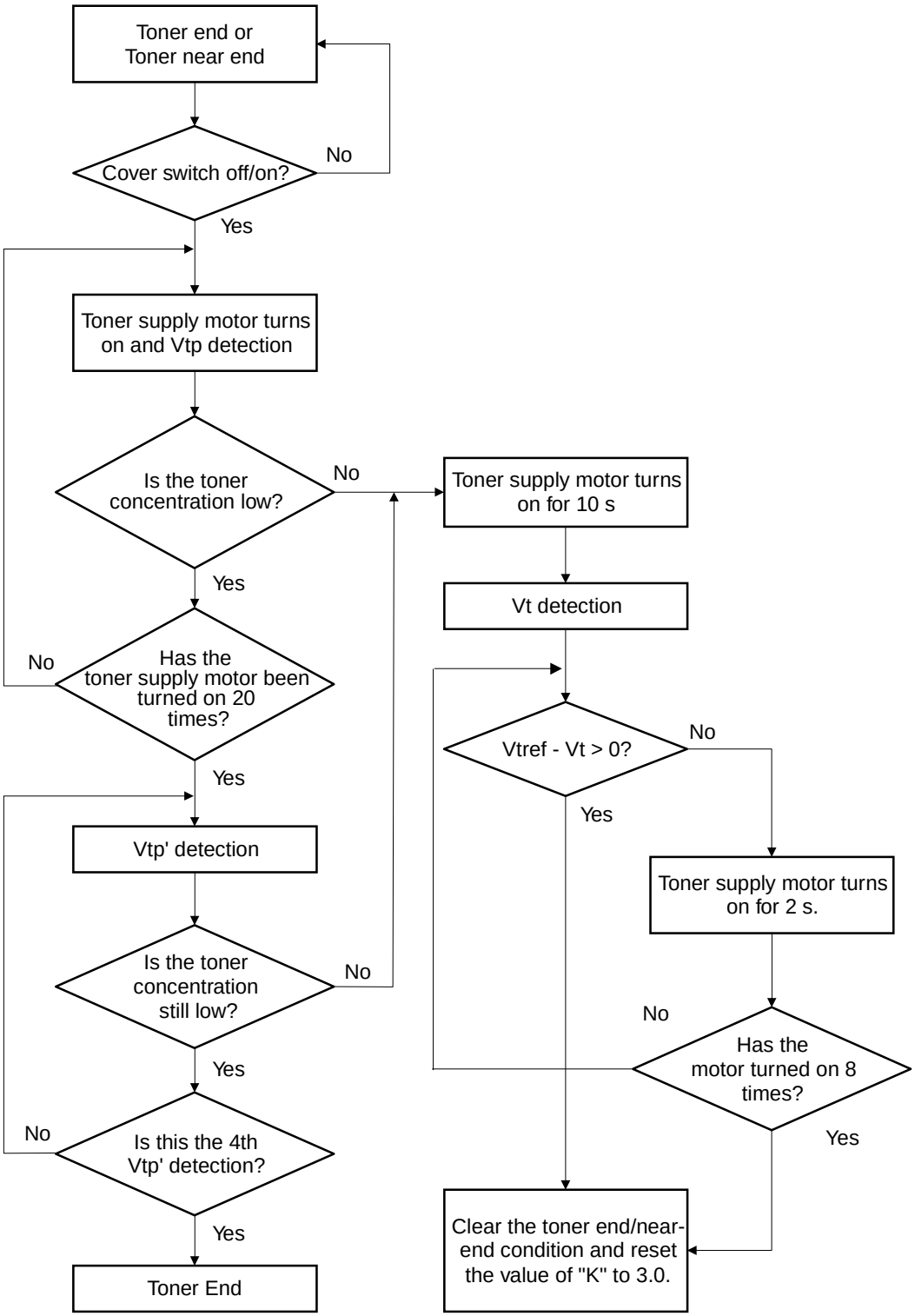
Toner end is detected using the ID sensor.

If Vsp is greater than 2.0V, the density of the ID sensor pattern is very light, so the machine detects a toner end condition. However, if Vsp stays less than 2.0V but 90 copies have been made after toner near end was determined, the machine enters the toner end condition.

The number of copies between toner near-end and toner end can be changed with SP2-213. The default is 90.

2.6.8 TONER END RECOVERY

Toner end recovery flow chart



If the front cover is opened and closed while a toner near end/end condition exists, the machine will attempt to recover using measurements from the TD sensor.

When the front cover is closed, the toner supply motor turns on to supply toner. The machine checks the TD sensor output 2 s after the main motor turns on. This is called Vtp. It is checked again every 1 s, and these values are called Vtp'.

The machine detects the toner concentration using Vtref, Vt(10), Vtp, and Vtp'. If the toner concentration is still too low, the toner supply motor turns on for another 10s. Then, the machine checks Vt. If toner concentration is at the standard level, the toner near end/end condition is cancelled and "K" is reset. If toner concentration has not reached the standard level, the toner supply motor rotates continuously until it does (maximum motor on time is 16s).

2.6.9 TONER SUPPLY IN ABNORMAL SENSOR CONDITIONS

The TD sensor is checked every copy. If the readings from the TD sensor become abnormal during a copy job, the machine holds the GAIN factor constant (GAIN is normally calculated from TD sensor readings) to allow toner supply to vary with only pixel count for the rest of the copy job. Then at the end of the copy job, an SC code is generated and the machine must be repaired.

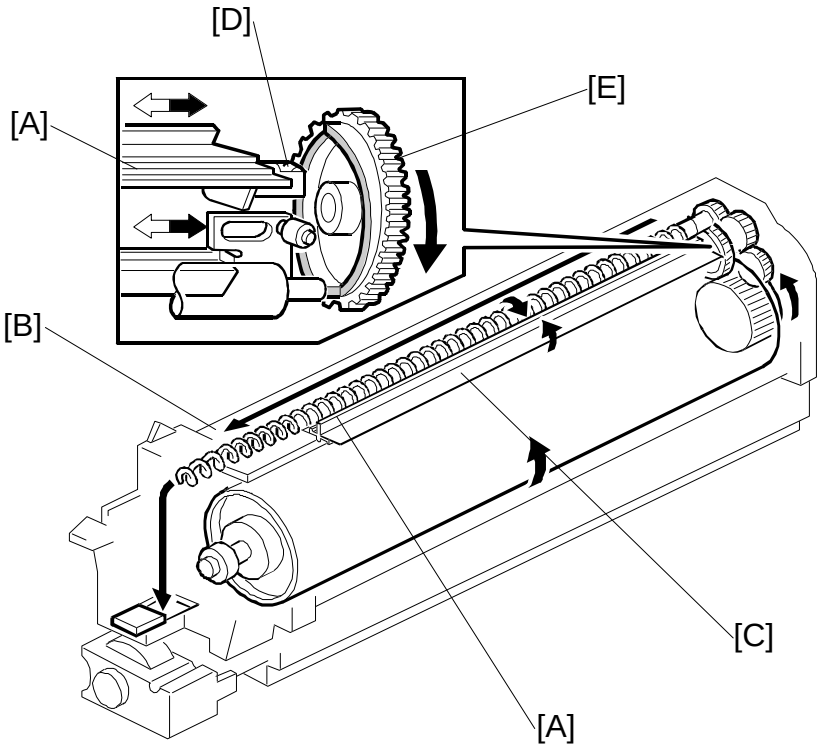
The ID sensor is checked every 10 copies. If readings become abnormal, an SC code is generated and the machine must be repaired. If this happens during a copy job, Vtref is not changed, the copy job is allowed to finish, and then the SC code is generated.

If spare parts are not available, the technician can use SP 2-208-1 to temporarily put the machine in image pixel count mode.

Details of how the machine determines an abnormal sensor detection are in section 7 (Troubleshooting).

2.7 DRUM CLEANING AND TONER RECYCLING

2.7.1 DRUM CLEANING



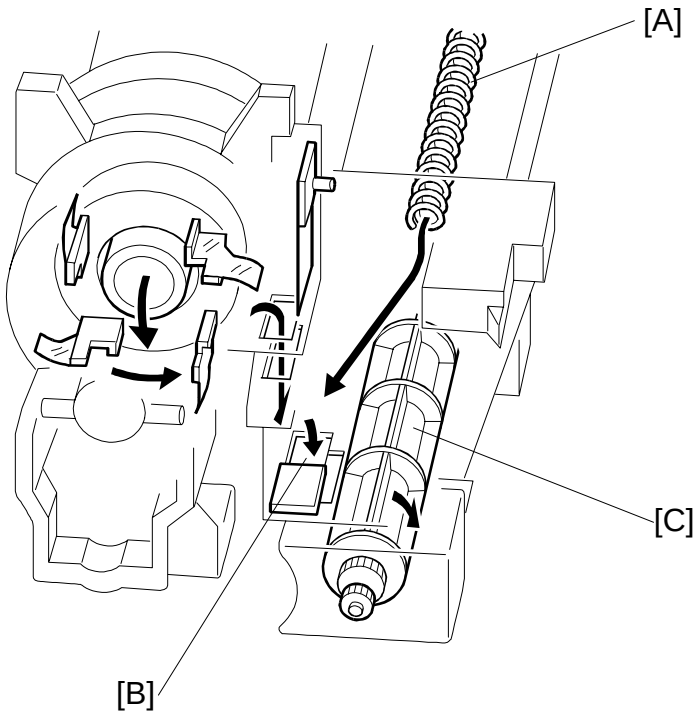
The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. This model uses a counter blade system.

The toner remaining on the drum is scraped off by the cleaning blade, and is transferred to the toner collection coil [B] by the toner collection plate [C].

The collar [D] on the cleaning blade bracket contacts the outer rim of cam gear [E], and this gear moves the cleaning blade from side to side. (This gear is the same cam gear that moves the charge roller cleaning pad from side to side.) This movement helps to disperse spots of accumulated toner to prevent early blade edge wear at any particular location.

To remove the toner and other particles that are accumulated at the edge of the cleaning blade, the drum turns in the reverse direction for about 5 mm at the end of every copy job.

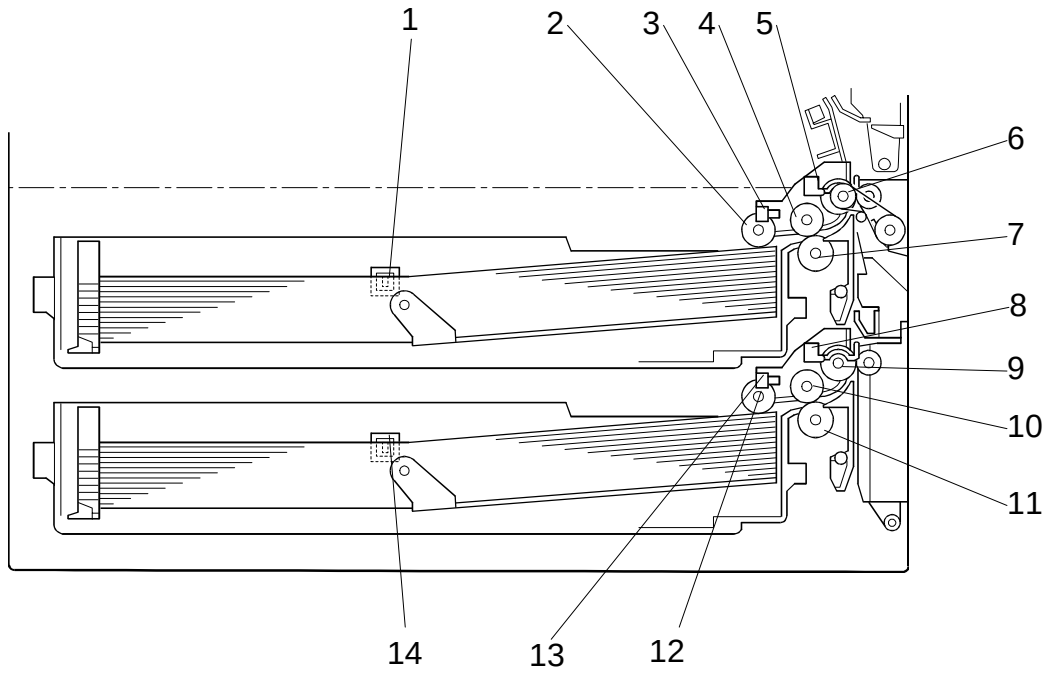
2.7.2 TONER RECYCLING



Toner which is transferred to the toner collection coil [A] is transported to the opening [B] in the bottom 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 the paddle roller [C].

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 an FRR (Feed and Reverse Roller) system.

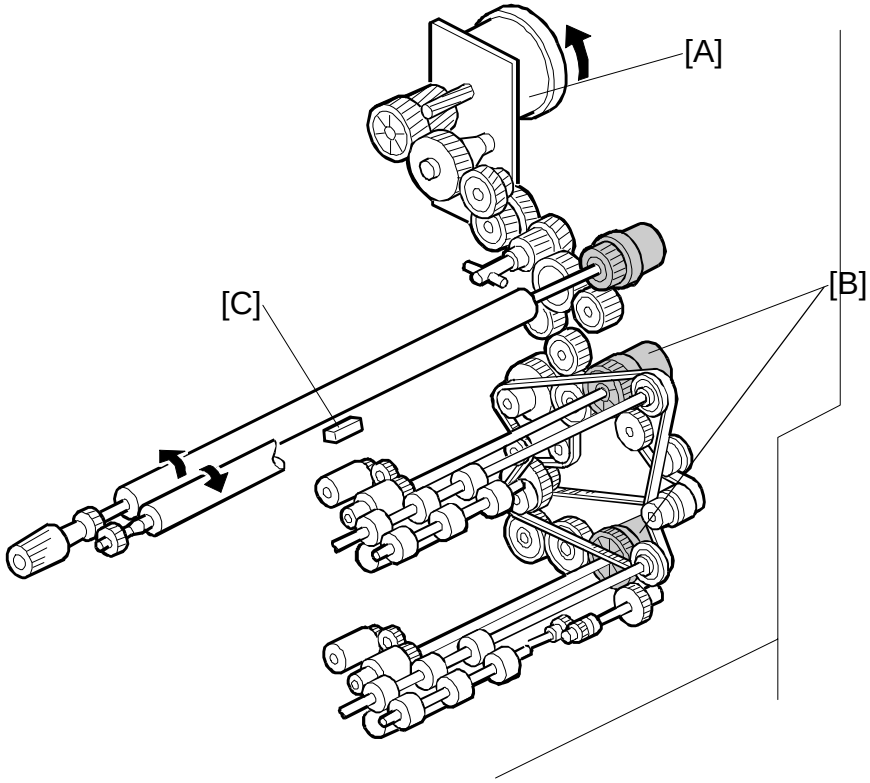
There are two relay sensors, one just above each set of relay rollers. These sensors are used for paper jam detection.

The components of the paper feed section are as follows.

There are no paper size sensors. The user inputs the paper size with a UP mode.

1. Upper Tray Set Sensor
2. Upper Pick-up Roller
3. Upper Paper Height Sensor
4. Upper Paper Feed Roller
5. Upper Relay Sensor
6. Upper Relay Roller
7. Upper Separation Roller
8. Lower Relay Sensor
9. Lower Relay Roller
10. Lower Paper Feed Roller
11. Lower Separation Roller
12. Lower Pick-up Roller
13. Lower Paper Height Sensor
14. Lower Tray Set Sensor

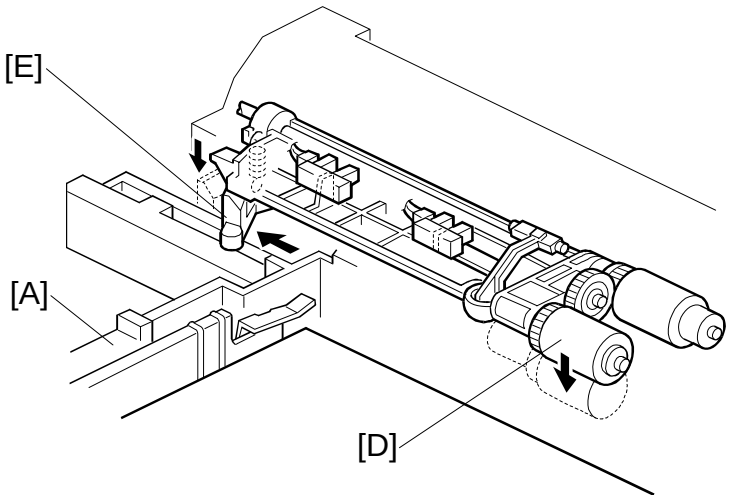
2.8.2 PAPER FEED DRIVE MECHANISM

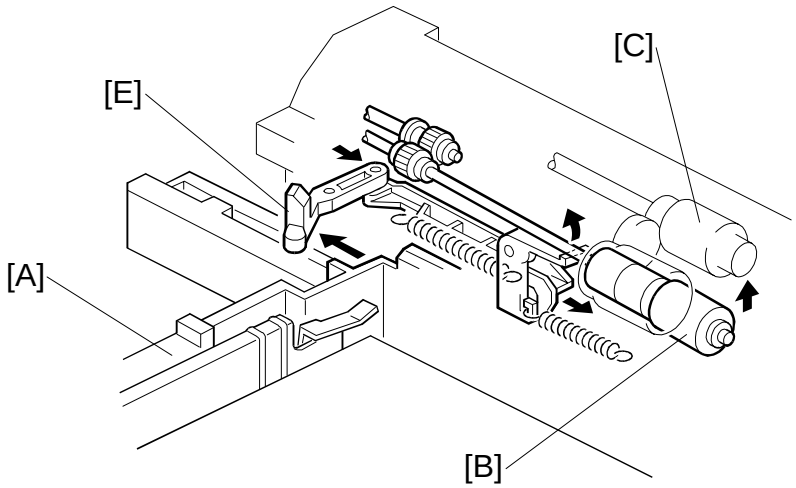


The main motor [A] drives the pick-up and feed mechanism of both the upper and second paper feed stations through gears and the paper feed clutches [B].

When the paper tray is inside the machine, the pick-up roller always contacts the top sheet of the paper stack (see Pick-up and Separation Roller Release Mechanism for more detail). When the paper feed clutch turns on, the pick-up roller, paper feed roller, and separation roller start rotating to feed the paper. The paper feed clutch stays on until shortly after the registration sensor [C] has been activated.

2.8.3 PICK-UP AND SEPARATION ROLLER RELEASE MECHANISM

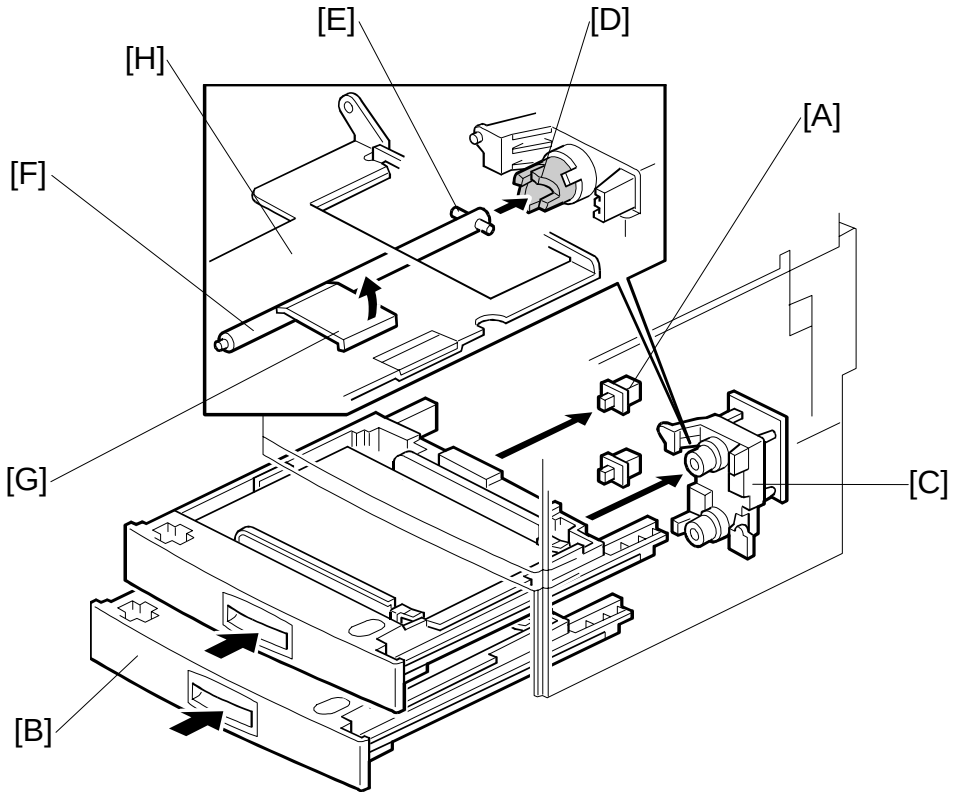




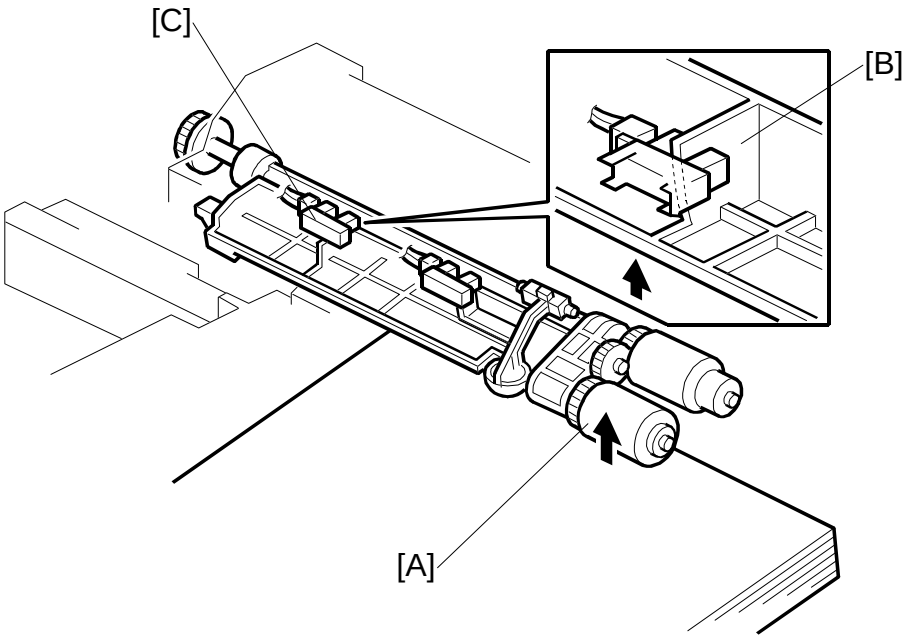
When the paper tray [A] is not inside the machine, the separation roller [B] is away from the paper feed roller [C] and the pick-up roller [D] stays in the upper position.

When the paper tray is set into the machine, it pushes the release lever [E]. This causes the pick-up roller [D] to go down and the separation roller [B] to move up and contact the paper feed roller.

2.8.4 PAPER LIFT MECHANISM



The paper tray sensor [A] detects when the paper tray [B] is placed in the machine. When the machine detects that the paper tray is in the machine, the tray lift motor [C] rotates and the coupling gear [D] on the tray lift motor engages the pin [E] on the lift arm shaft [F]. Then the tray lift arm [G] lifts the tray bottom plate [H].

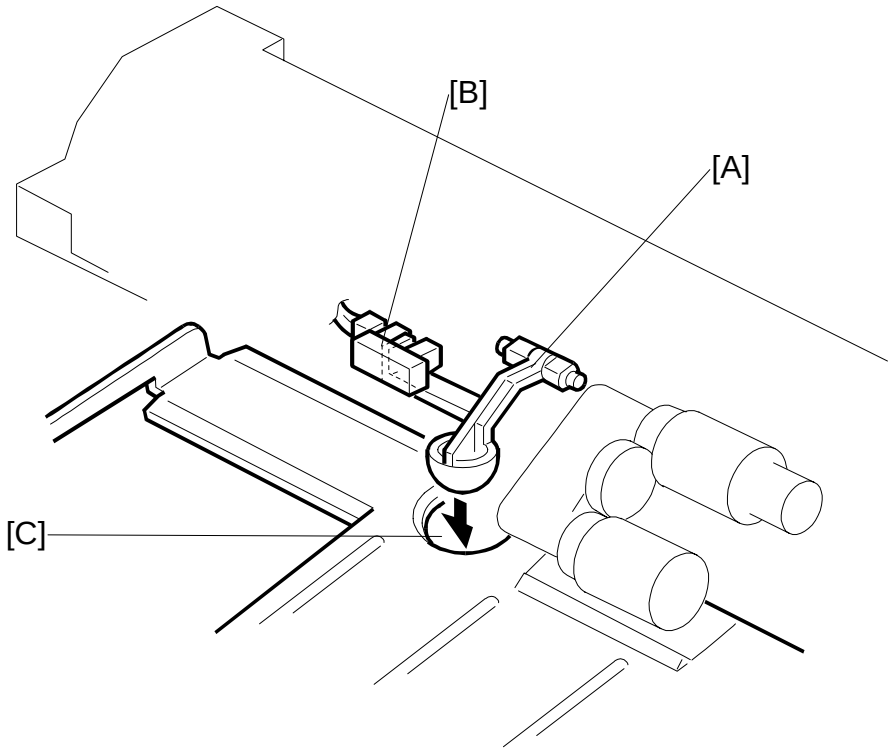


When the paper tray is placed in the machine, the pick-up roller [A] lowers. When the top sheet of paper reaches the proper height for paper feed, the paper pushes up the pick-up roller, and the actuator [B] on the pick-up roller supporter activates the paper height sensor [C] to stop the tray lift motor.

After several paper feed cycles, the paper level gradually lowers and the paper height sensor is de-activated. The tray lift motor turns on again until this sensor is activated again.

When the tray is drawn out of the machine, the tray lift motor coupling gear disengages the pin on the lift arm shaft, and the tray bottom plate then drops under its own weight.

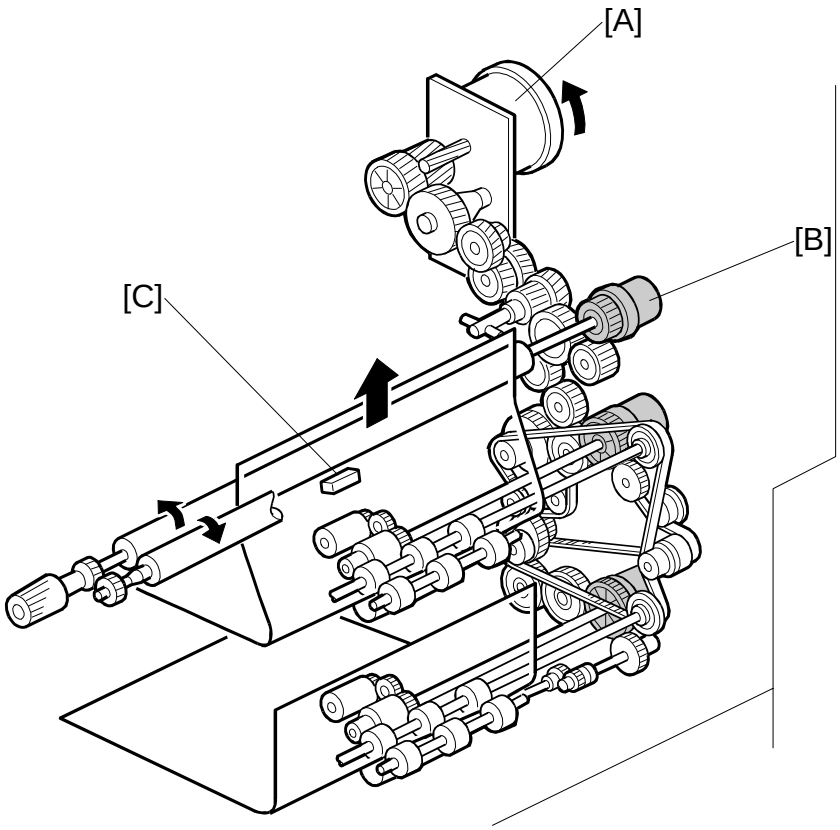
2.8.5 PAPER END DETECTION



If there is some paper in the paper tray, the paper end feeler [A] is raised by the paper stack 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.

2.8.6 PAPER REGISTRATION



⇒ Main motor [A] rotation is transmitted to the registration clutch [B] (located on the lower registration roller shaft) through a train of gears.

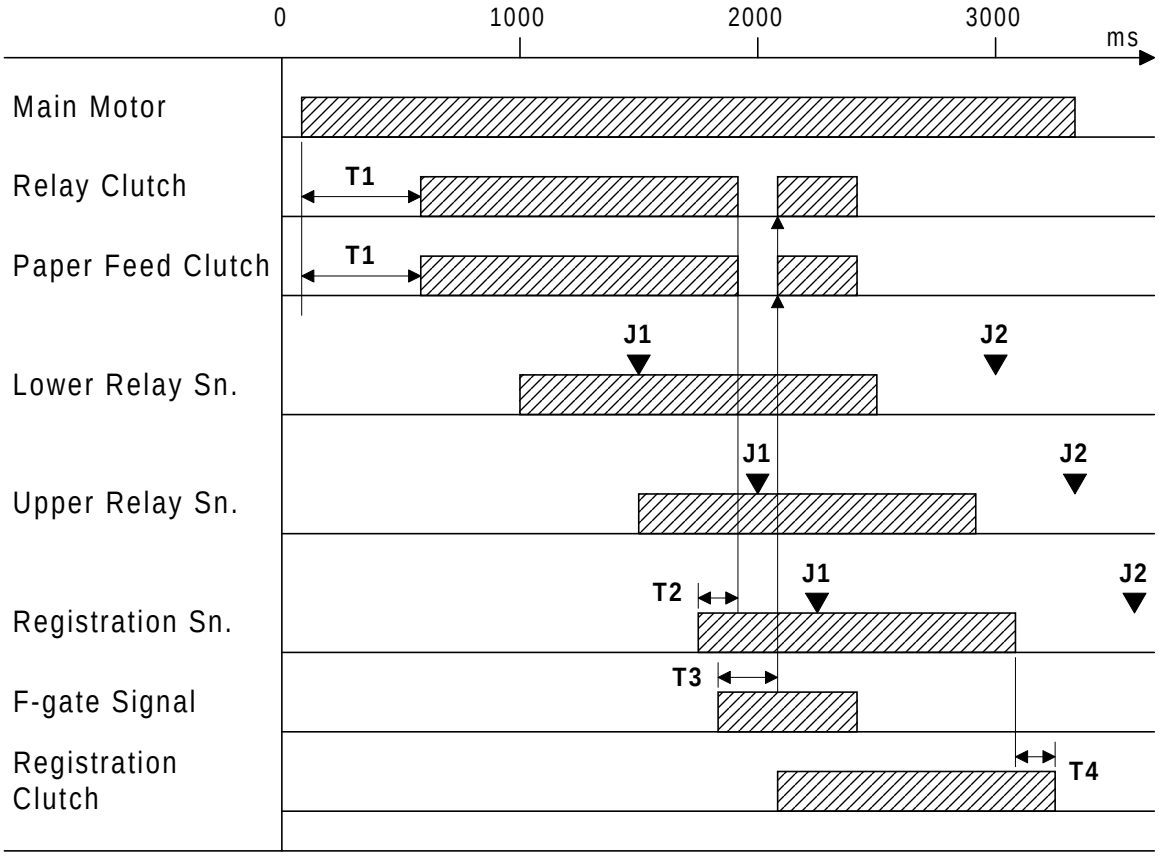
The registration sensor [C] is positioned just before the registration rollers.

When the paper leading edge activates the registration sensor, the registration clutch is off and the registration rollers are not turning. However, the relay clutch stays on for a bit longer. This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew. Then, the registration clutch energizes and the relay clutch re-energizes at the proper time to align the paper with the image on the drum. The registration and relay rollers feed the paper to the image transfer section.

The registration sensor is also used for paper misfeed detection.

2.8.7 PAPER FEED AND JAM TIMING

A232: From 2nd Paper Tray (A4 sideways)



T1. The relay clutch and paper feed clutch turn on 500 ms after the main motor turned on.

T2. The relay clutch and paper feed clutch turn off 138 ms after the registration sensor turned on.

T3. The relay clutch and paper feed clutch turn on again and the registration clutch turns on 186 ms after the F-gate signal (laser main scan writing start) has been activated.

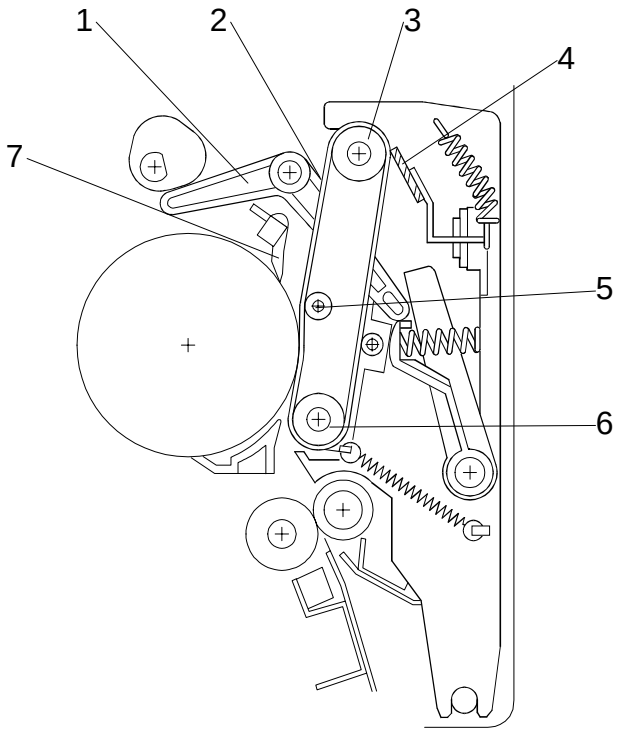
T4. The registration clutch turns off 150 ms after the registration sensor turned off.

J1. Checks whether the sensors are activated within 0.38 s (35 cpm machine) or 0.3 s (45 cpm machine) after the designated time for these sensors.

J2. Checks whether the sensors are deactivated within 0.38 s (35 cpm machine) or 0.3 s (45 cpm machine) after the designated time for these sensors.

2.9 IMAGE TRANSFER AND PAPER SEPARATION

2.9.1 OVERVIEW



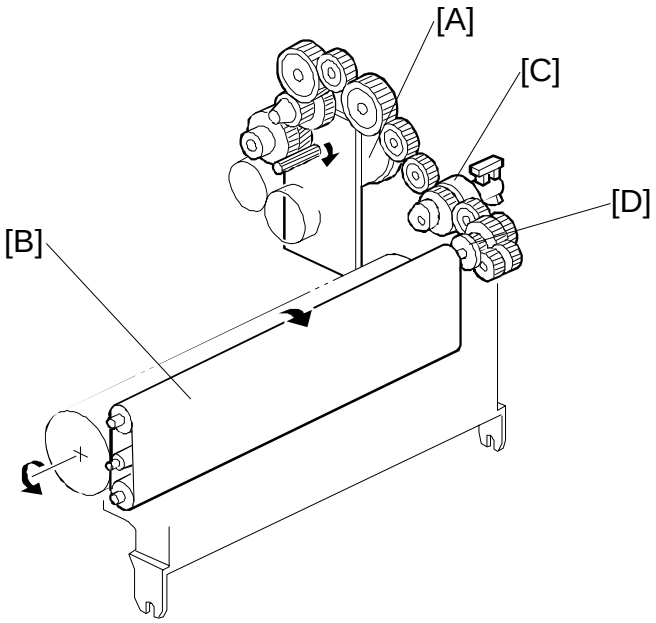
Instead of using a transfer corona or a transfer roller, this machine uses a transfer belt unit. The transfer belt unit consists of the following parts.

1. Contact lever
2. Transfer belt
3. Drive roller
4. Transfer belt cleaning blade
5. Transfer roller
6. Idle roller
7. Pick-off pawl

The belt has a high electrical resistance, so it can hold a high positive electrical potential to attract toner from the drum onto the paper. Also, the electrical potential attracts the paper itself and helps to separate the paper from the drum and to carry the paper upwards. The pick-off pawl ensures that the paper separates from the drum.

The transfer belt cleaning blade removes toner from the transfer belt to prevent the back side of the paper from being stained.

2.9.2 BELT DRIVE MECHANISM

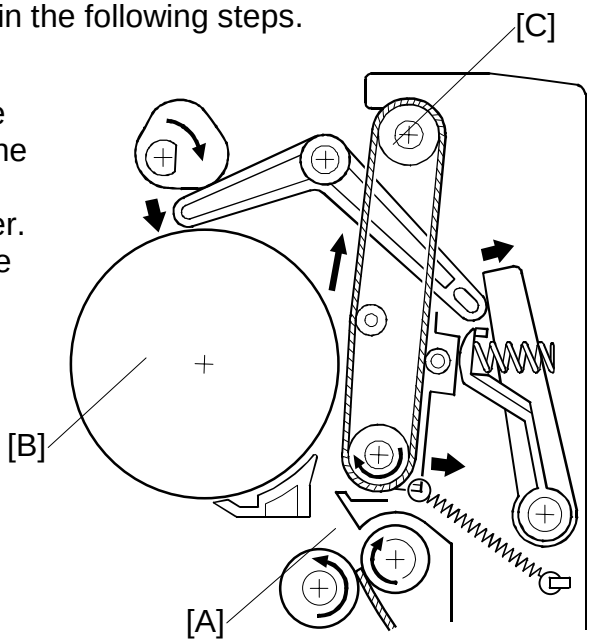


The main motor [A] drives the transfer belt [B] through a train of gears, the belt contact clutch [C], and the drive roller gear [D].

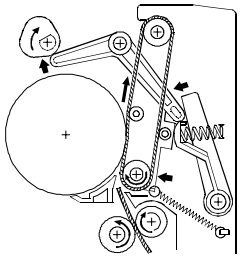
2.9.3 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM

The image is transferred from the drum in the following steps.

1. The registration clutch turns on to feed the paper [A] at the correct time to synchronize the leading edge of the developed latent image on the drum [B] with the leading edge of the paper. The transfer belt [C] is away from the drum at this time.

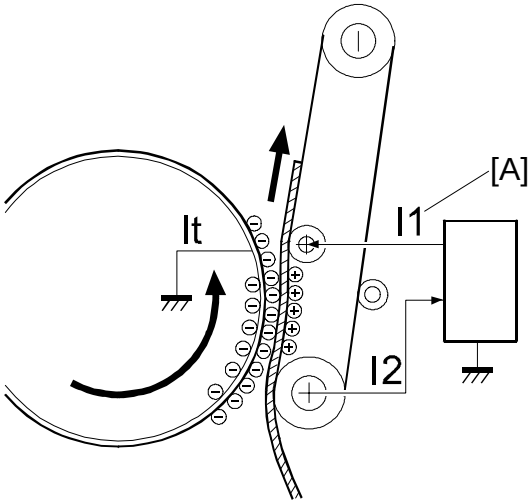


2. The transfer belt contact clutch turns on a certain time after the main motor started. Then, the transfer belt moves into contact with the drum.



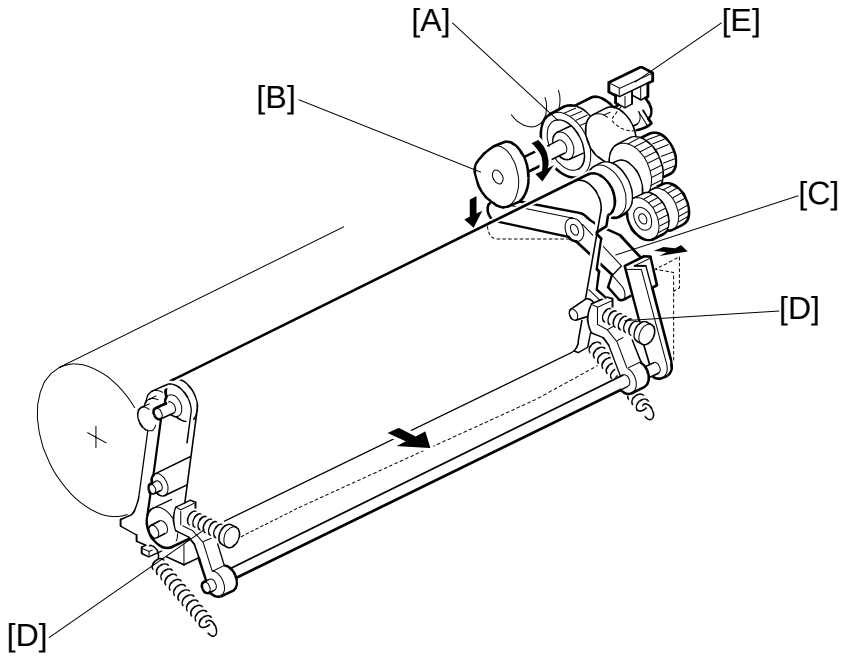
3. When the paper enters the gap between the belt and the drum, the high voltage supply board [A] applies a high positive current to the belt to transfer the image to the paper.

   I1 = It + I2



4. After receiving the image from the drum, the paper is fed by the belt.
5. The paper moves to the end of the transfer belt unit, where it separates from the belt as the belt curves away. Then, the paper goes to the fusing unit.

2.9.4 TRANSFER BELT UNIT CONTACT MECHANISM



The belt contact and release mechanism consists of the belt contact clutch [A], cam [B], and contact lever [C].

The belt contact clutch turns on and the cam with the clutch rotates half of a complete rotation. The contact lever, riding on the cam, is lifted up and the spring [D] pushes the belt into contact with the drum.

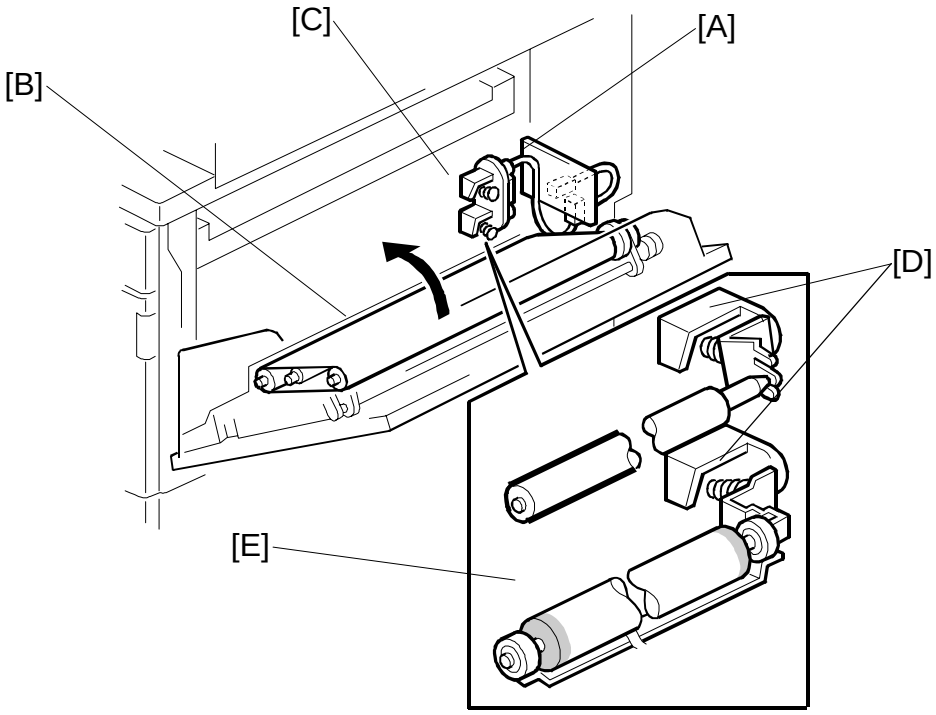
The transfer belt contact home position sensor [E] is used to detect the home position of the cam (this is when the belt is away from the drum).

The belt must be released from the drum between copy jobs. The reasons are as follows.

- To prevent the ID sensor pattern on the drum from being rubbed off by the transfer belt.
- To prevent a change in the drum's characteristics because of the influence of additives inside the rubber belt.

2.9.5 TRANSFER BELT CHARGE

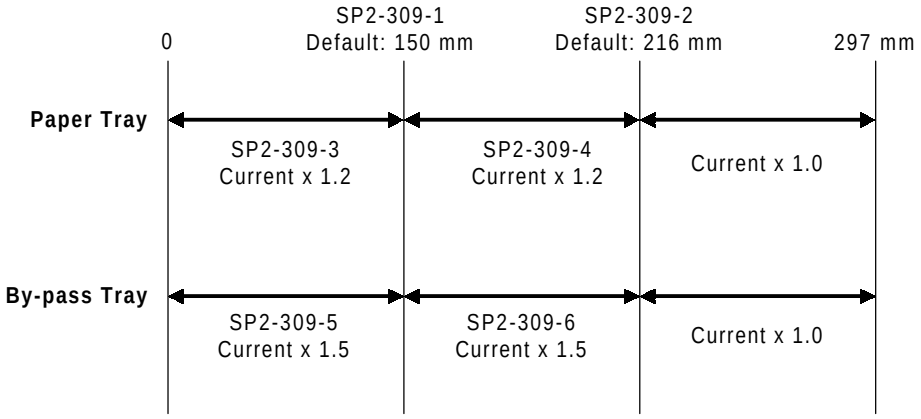
Overview



The high voltage supply board [A] applies the positive transfer belt current to the transfer belt [B] through the terminal block [C], terminal plate [D], and the roller [E]. The terminal block and the terminal plate contact each other when the right cover is closed.

The high voltage supply board adjusts the current to the roller to keep a small but constant current flow to ground through the belt, paper, and drum. If this current is not kept constant, efficiency of toner transfer and paper separation will vary with paper thickness, type, environmental condition, or changes in transfer belt surface resistance.

Correction for paper width and thickness



To counteract the effects of paper width and thickness, a range of SP modes are available.

For paper width, there are two thresholds. The factory settings are 150 and 216 mm. Below 216 mm, the transfer current can be increased (by default, it is multiplied by 1.2 for the main body paper trays). Below 150 mm, the transfer current can be set even higher, although by default it is kept the same as the current for below 216 mm. The higher current allows for the fact that current prefers to go to the drum from the belt directly, and not through the paper, which leads to insufficient toner transfer for narrow paper widths.

For thickness, it is assumed that the user will use thicker paper from the bypass tray, so separate settings are available for this tray. By default, the current for paper narrower than 216 mm is 1.5 times the normal current.

The drawing shows the SP modes which control these currents.

Currents applied to leading edge and image areas

The transfer current can also be different for the leading edge and the image area. There are separate adjustments for bypass feed for this also. The timing for starting to apply leading edge current, for the switchover from leading edge current to image area current, and for switching off at the trailing edge can also be changed.

Transfer current SP modes

- Image areas -

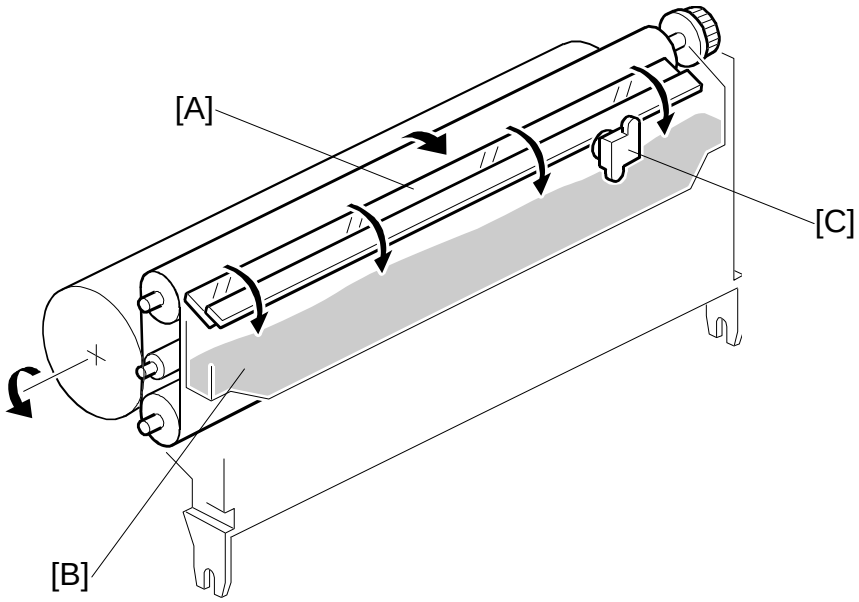
Paper trays: Side 1, SP2-301-1; Side 2, SP2-301-2
Bypass: SP2-301-4

Leading edge areas
Paper trays: SP2-301-3, Bypass: SP2-301-5

- Timing -

Leading edge start: SP2-911-1
Switchover to image area: SP2-911-2
Image area end (trailing edge): SP2-911-3

2.9.6 TRANSFER BELT CLEANING MECHANISM



The cleaning blade [A] is always in contact with the transfer belt. It scrapes off any toner and paper dust remaining on the belt.

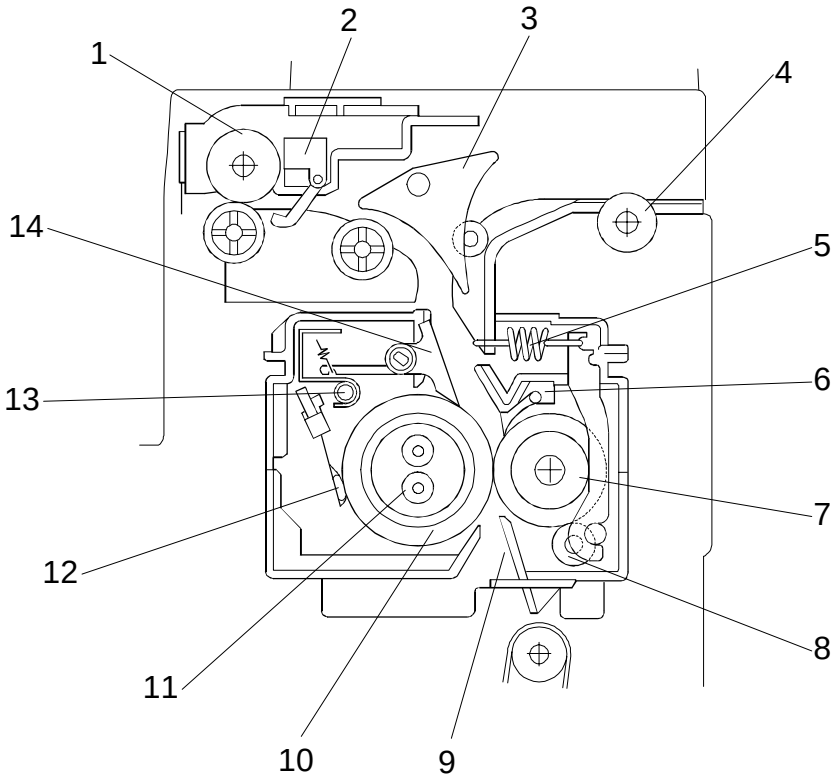
To remove toner and other particles that are accumulated at the edge of the cleaning blade, the transfer belt turns in the reverse direction at the end of every copy job, in the same way as the drum cleaning blade mechanism.

The toner and paper dust that is scraped off falls down into the toner collection tank [B], which is in the transfer belt unit. This toner is not recycled.

When the toner overflow sensor [C] in the transfer belt unit detects a toner overflow condition, the toner overflow indicator is lit. After this condition, 999 copies can be made before operation is disabled.

2.10 IMAGE FUSING AND PAPER EXIT

2.10.1 OVERVIEW



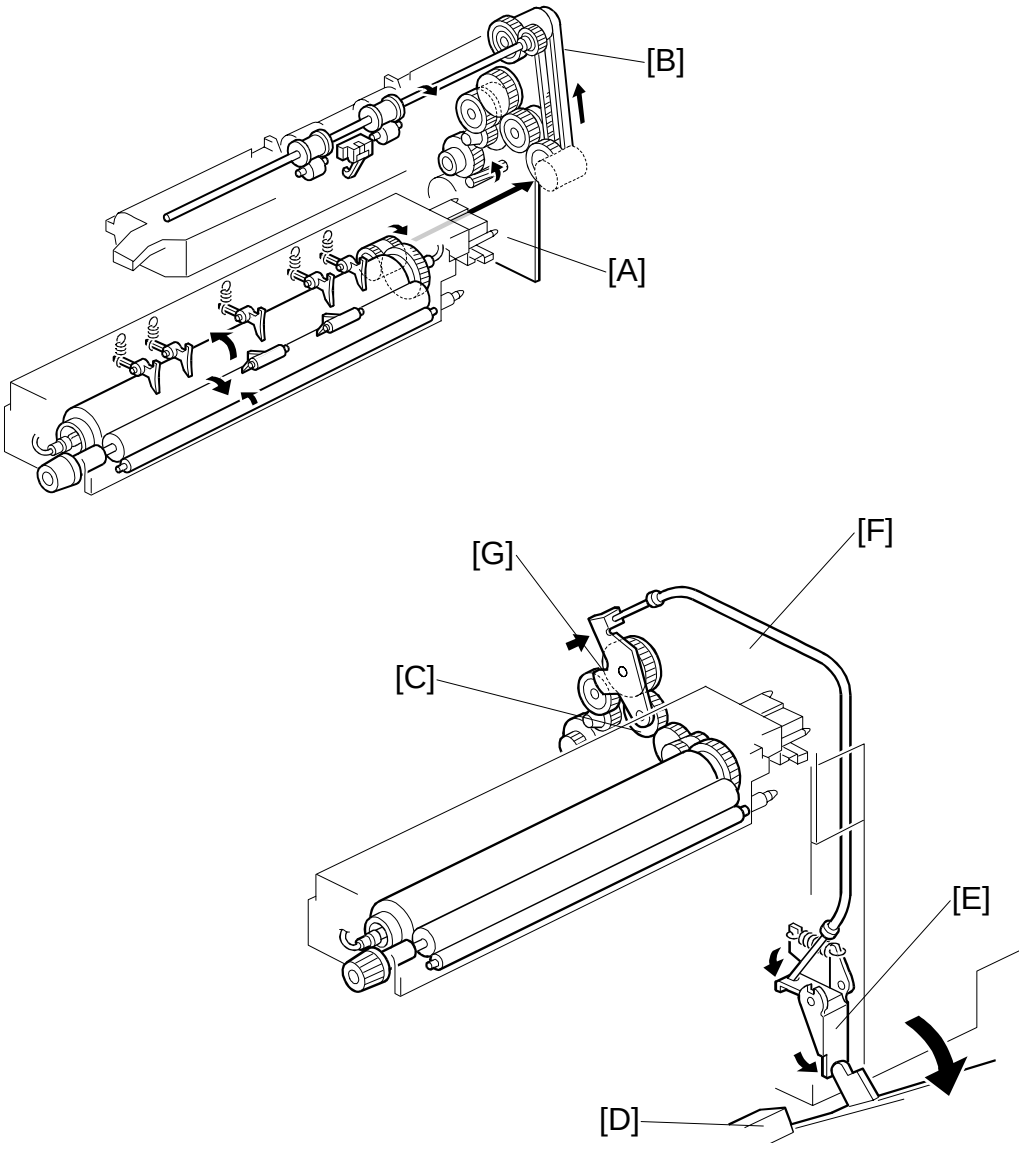
This fusing unit contains pressure roller strippers [6]. These prevent the paper from wrapping around the pressure roller (which is possible for a vertical paper transport mechanism).

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

1. Paper exit roller
2. Fusing exit sensor
3. Junction gate
4. Transport roller (A231 and A232 only)
5. Pressure spring
6. Pressure roller strippers
7. Pressure roller
8. Cleaning roller
9. Entrance guide
10. Hot roller
11. Fusing lamp(s) (see the note)
12. Thermistor
13. Thermofuse
14. Hot roller strippers

NOTE: For 115V machines: One lamp is used.
For 230V machines: Two lamps are used.

2.10.2 FUSING DRIVE AND RELEASE MECHANISM

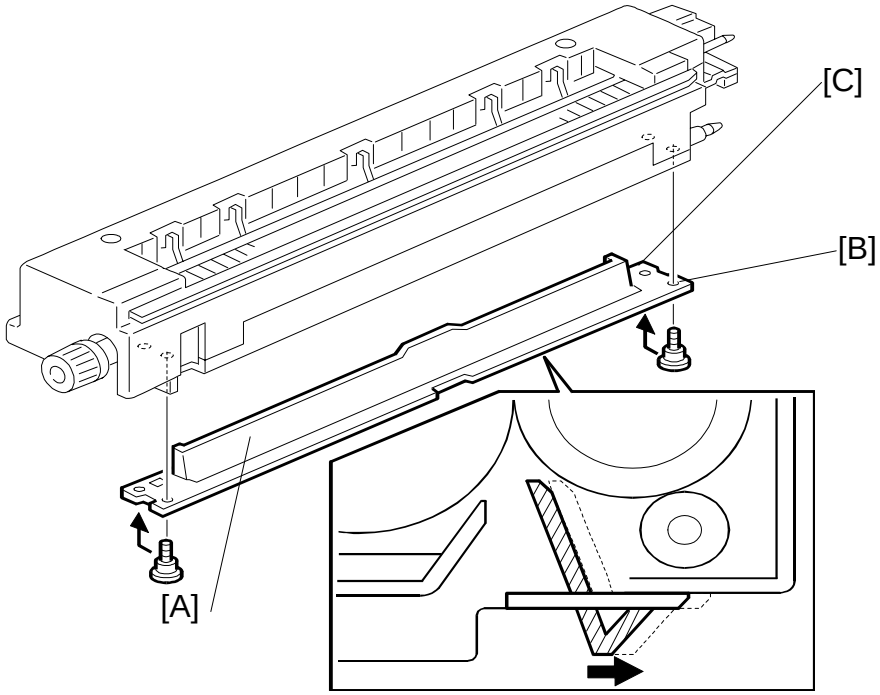


The main motor [A] drives the fusing unit through a train of gears and drives the paper exit rollers through a gear and a timing belt [B].

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

When the right cover is opened, the actuator plate [E] pulls release wire [F]. The wire pulls the fusing drive gear bracket [G] and the fusing unit drive is disengaged.

2.10.3 FUSING ENTRANCE GUIDE SHIFT MECHANISM

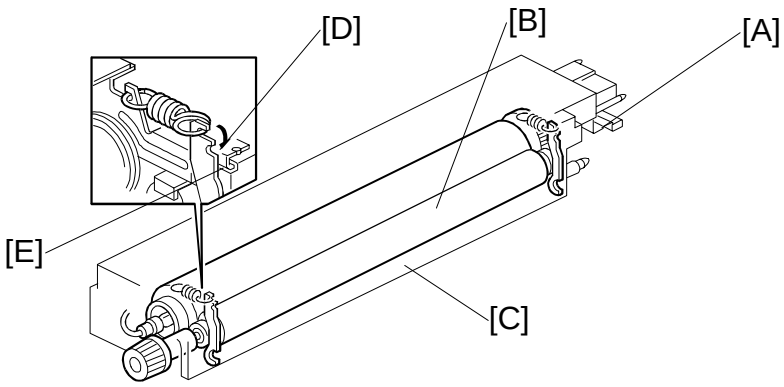


The entrance guide [A] for this machine has two holes on each side to adjust for paper thickness, to prevent creasing. Normally, the right screw hole [B] on each side is used.

For thin paper, move the entrance guide to the right by securing it with screw holes [B]. This slightly lengthens the paper path which prevents the paper from creasing in the fusing unit.

For thick paper, move the entrance guide to the left (use screw holes [C]). This setting allows more direct access to the gap between the hot and pressure rollers. This prevents thick paper from buckling against the hot roller, which can cause blurring at the leading edge of the copy. Also, thick paper does not bend as easily, and is therefore less prone to creasing.

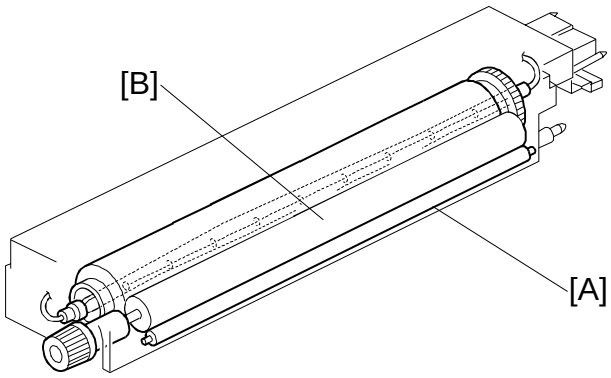
2.10.4 PRESSURE ROLLER



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

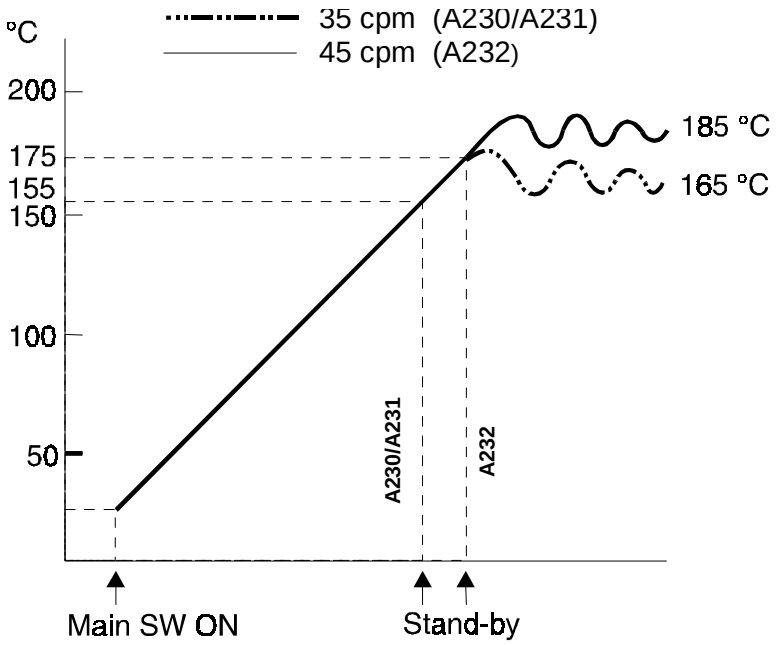
The pressure can be changed by adjusting the position of the pressure springs. The left position [D] is the normal setting. The right position [E] increases the pressure and this prevents insufficient fusing by the fusing unit.

2.10.5 CLEANING MECHANISM



The cleaning roller [A] is always in contact with the pressure roller [B]. It collects toner and paper dust adhering to the surface of the pressure roller. This is because the cleaning roller is made of metal and collects adhering matter more easily than the pressure roller (which has a teflon coating).

2.10.6 FUSING TEMPERATURE CONTROL



Temperature Control

There are two types of control: on/off control, and phase control. The mode can be selected with SP1-104.

When the main power switch turns on, the CPU checks the ac frequency for 500 ms; this is done in case phase control mode is selected later. Then the CPU turns on the fusing lamp. When the thermistor detects the stand-by temperature (155°C for A231/A230, 175°C for A232), the machine can start to print. When the thermistor detects the operating temperature (165°C for A231/A230, 185°C for A232), the CPU turns the fusing lamp off/on to maintain this temperature.

Fusing Idling

If copies are not sufficiently fused soon after the main power switch is turned on, fusing idling should be enabled with SP1-103. When fusing idling is enabled, it is done when the temperature reaches the value of SP1-105-1 (Fusing temperature adjustment) - 20°C

However, even if fusing idling is enabled, it is not done when the temperature at power-up > the value of SP1-105-1 -20°C

In the opposite case, even if fusing idling is disabled, it is done when the temperature at power-up ≤ 15°C

The fusing idling time is as follows.

The temperature at power-up	Fusing idling mode	
	Disabled	Enabled
15°C or less	30 s	2 min *
Higher than 15°C	Not performed	30 s

* In this case, fusing idling also prevents dirty background.

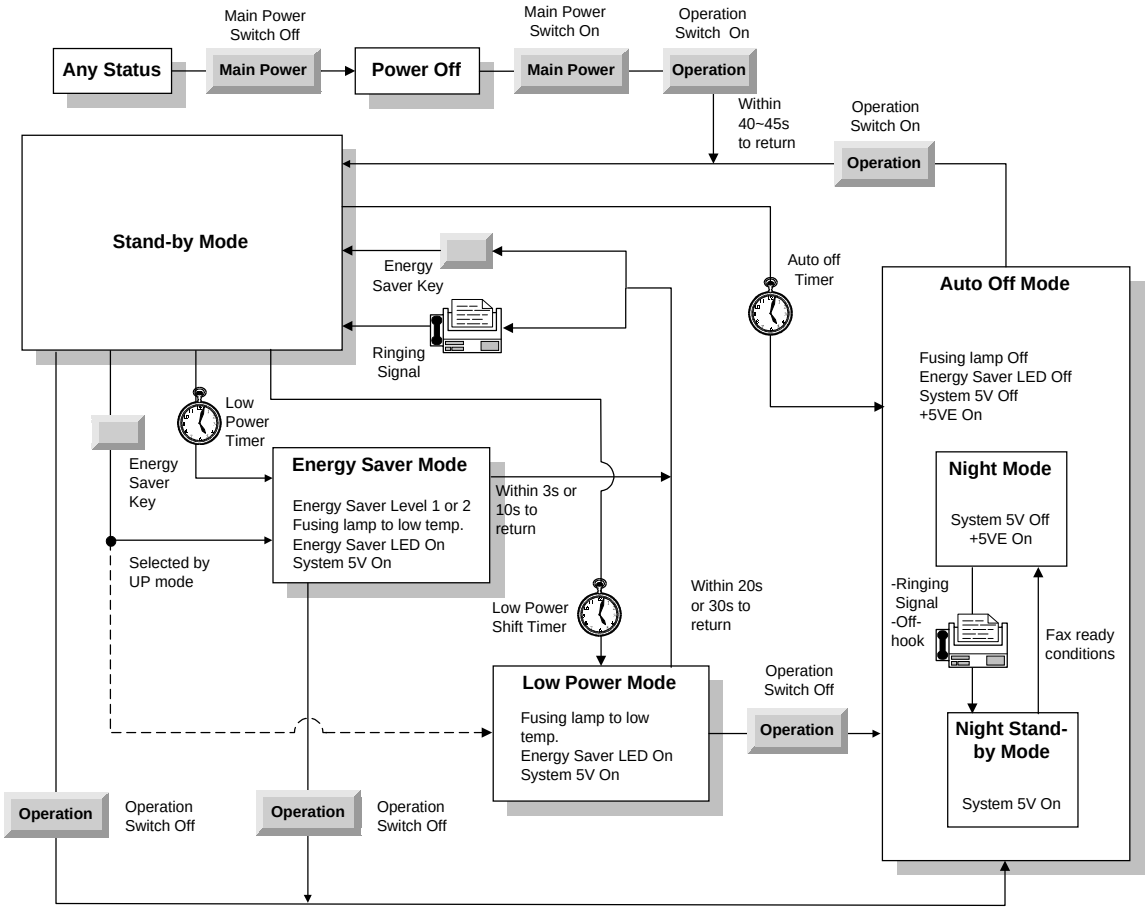
2.10.7 OVERHEAT PROTECTION

If the hot roller temperature becomes greater than 230°C, the CPU cuts off the power to the fusing lamp. At the same time, SC543 will be generated.

Even if the thermistor overheat protection fails, there is a thermofuse in series with the common ground line of the fusing lamp. If the temperature of the thermofuse reaches 169°C, the thermofuse opens, removing power from the fusing lamp. At the same time, the copier stops operating. At this time, SC542 will be generated.

2.11 ENERGY SAVER MODES

2.11.1 OVERVIEW



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

This machine has four types of energy saver modes:

1) Energy saver mode
2) Low power mode
3) Auto off mode (copier configuration only)
4) Night mode (copier/fax configuration only)

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

- Low power timer
- Low power shift timer
- Auto off timer
- Energy saver mode
- Auto off disabling (SP mode only)

The way that the machine operates depends on the combination of installed equipment (copier only, copier/fax).

2.11.2 ENERGY SAVER MODE

Entering the energy saver mode

There are two energy saver levels; Energy Saver Level 1 and Energy Saver Level 2. The energy saver level can be selected by UP mode.

The machine enters energy saver mode when one of the following occur:

- The Clear Mode/Energy Saver Key is held down for a second (see Note).
- The low power timer runs out after the end of a job.

NOTE: The machine enters either the energy saver mode or low power mode when the Clear Mode/Energy Saver key is depressed, depending on the setting of the UP mode.

What happens in energy saver mode

When the machine enters energy saver mode, the fusing lamp drops to a certain temperature, depending on the energy saver level (see the table below) and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED.

If the CPU receives the 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. However, the operation indicators remain off.

Return to stand-by mode

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

- The Clear Mode/Energy Saver Mode key is pressed
- Any key on the operation panel 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 level 1 is about 3 seconds.

The recovery time from energy saver level 2 is about 10 seconds.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	System +5V
Energy Saver Level 1	On	On	35 cpm: 157 °C 45 cpm: 175 °C	On
Energy Saver Level 2	On	On	35 cpm: 150 °C 45 cpm: 170 °C	On

2.11.3 LOW POWER MODE

Entering the low power mode

The machine enters low power mode when one of the following occurs:

- The low power shift timer runs out after the end of a job.
- The Clear Mode/Energy Saver key is held down for a second (see Note).

NOTE: The machine enters either the energy saver mode or low power mode when the Clear Mode/Energy Saver key is depressed, depending on the setting of the UP mode.

What happens in low power mode

The fusing lamp drops to a certain temperature, as shown in the table below (the temperature drops more that in energy saver mode). The other conditions are the same as for energy saver mode.

Return to stand-by mode

The machine returns to standby mode in exactly the same way as from energy saver mode.

The recovery time from low power mode is either 20s or 30s, depending on the setting of SP5-920 (the default is 30s).

Recovery Time	Operation Switch	Energy Saver LED	Fusing Temp.	System +5V
20 seconds	On	On	35 cpm: 137 °C 45 cpm: 157 °C	On
30 seconds	On	On	35 cpm: 125 °C 45 cpm: 145 °C	On

2.11.4 AUTO OFF MODE

The auto off mode is for the copier-only configuration.

Entering auto off mode

The machine enters auto off mode when one of the following occurs:

- The auto off timer runs out after the end of a job
- The operation switch is pressed to turn the power off

What happens in auto off mode

When the machine enters auto off mode, the operation switch turns off automatically. The fusing lamp and all dc supplies except +5VE (+5V for energy saver mode) are turned off. At this time, only the main power LED is lit.

Returning to stand-by mode

The machine returns to stand-by mode when the operation switch is pressed.

Operation Switch	Energy Saver LED	Fusing Temp.	System +5V	Note
Off	Off	Room Temp. (Fusing lamp off)	Off	Only +5VE is supplied to the BICU.

2.11.5 NIGHT MODE

This function is for the copier/fax configuration. There are two types of night mode: Night Stand-by mode and Night mode. The difference between night stand-by mode and night mode is the machine's condition when the machine enters auto off mode.

Entering night stand-by and night modes

The machine enters the night stand-by mode and night modes when one of the following occur:

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

If the machine is in one or more of the following conditions, the machine enters night stand-by mode. If not, the machine enters night mode.

- Error or SC condition
- An optional G4 unit is installed
- An optional fax HDD 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

What happens in night stand-by and night modes

When the machine enters either of these modes, the fusing lamp and operation switch turn off, and only the main power LED is lit.

Night stand-by mode

The system +5V is still supplied to all components. When the machine detects a ringing signal, the +24V supply is activated and the machine automatically prints the incoming message.

Night mode

The system +5V supply also turned off. However, +5VE (+5V for energy saver mode) is still activated. When the machine detects a ringing signal, or off-hook signal, the machine goes back to night stand-by mode and the system +5V and +24V supplies are activated. Then the machine receives the incoming message and prints it.

Returning to stand-by mode

The machine returns to stand-by mode when the operation switch is pressed.

The recovery time is about 45 seconds.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	System +5V	Note
Night stand-by mode	Off	Off	Room Temp. (Fusing lamp off)	On	
Night mode	Off	Off	Room Temp. (Fusing lamp off)	Off	Only +5VE is supplied to the fax controller.

INSTALLATION

3. INSTALLATION PROCEDURE

3.1 INSTALLATION REQUIREMENTS

3.1.1 ENVIRONMENT

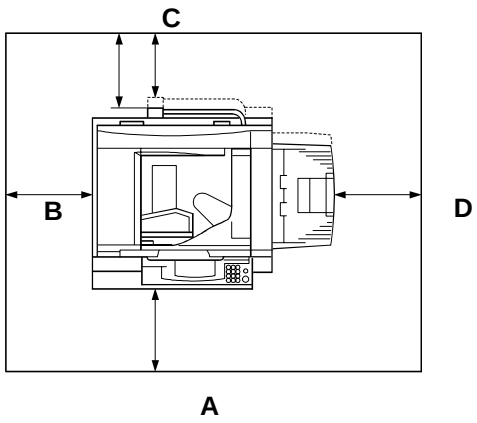
1. Temperature Range: 10 °C to 30 °C (50 °F to 86 °F)
2. Humidity Range: 15 % to 90 % RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m3/hr/person
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10 -6 oz/yd^3)
6. 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

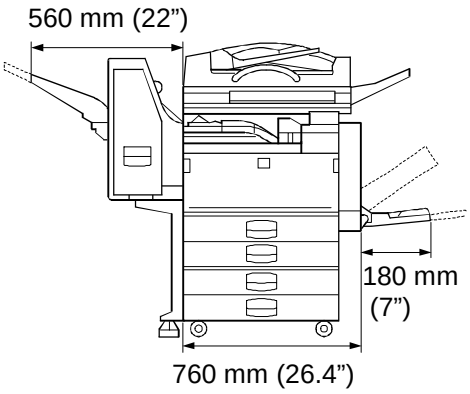
Front to back:	Within 5 mm (0.2”) of level
Right to left:	With in 5 mm (0.2”) of level

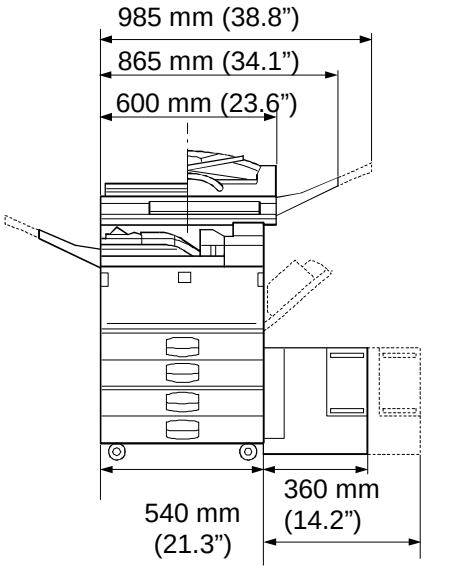
3.1.3 MINIMUM SPACE REQUIREMENTS

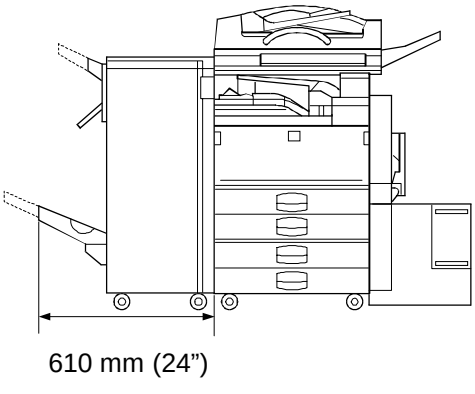
Place the copier near the power source, providing clearance as shown:



A: In Front: Over 75 cm (29.6”)
B: Left: Over 10 cm (4”)
C: To Rear: Over 10 cm (4”)
D: Right: Over 10 cm (4”)







NOTE: The 75 cm recommended for the space at the front is for pulling out the paper tray only. If an operator stands at the front of the copier, more space is required.

3.1.4 POWER REQUIREMENTS

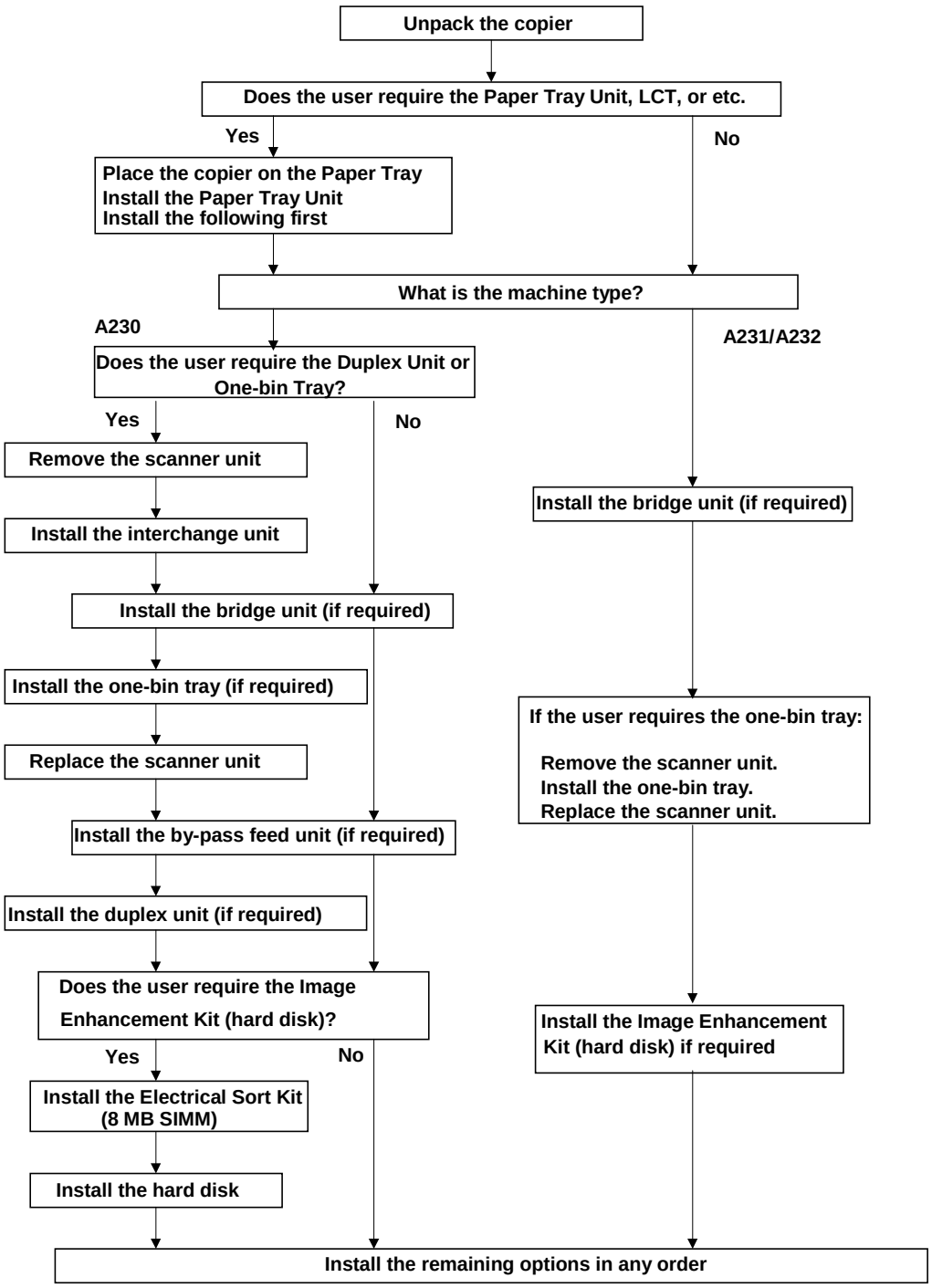
⚠CAUTION

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 8 A
2. Permissible voltage fluctuation: ±10 %
3. Do not set anything on the power cord.

3.2 INSTALLATION FLOW CHART

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



Bridge Unit: Needed for the finishers and the external output tray
Interchange Unit: Needed for the 1-bin tray and the A230 duplex unit
Paper Tray Unit: Needed for the LCT and finishers
Other requirements: See Overall Machine Information – Installation Option Table

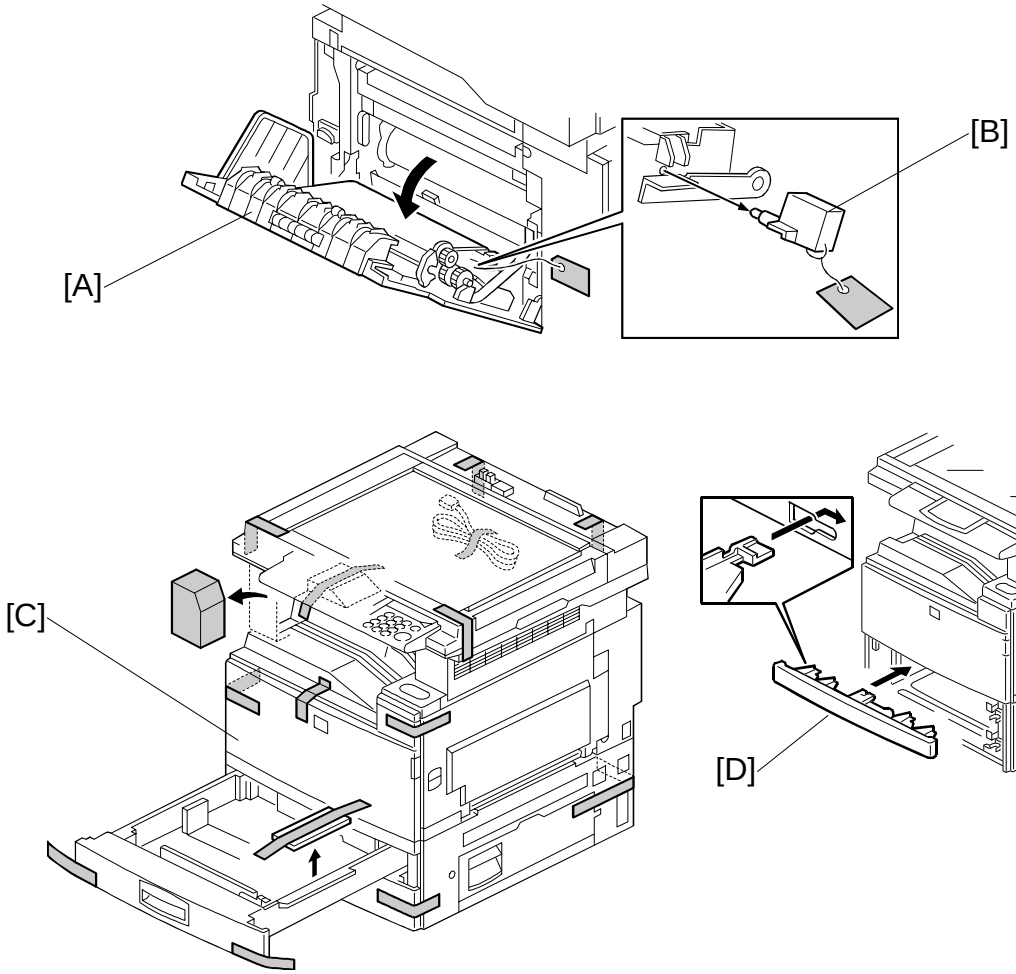
3.3 COPIER INSTALLATION

3.3.1 ACCESSORY CHECK

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

Description	Q'ty
1. Operation Panel Decal	1
2. Paper Size Decal	1
3. Model Name Decal (-10, -22 machines)	1
4. Operation Panel Brand Sticker (-10, -22 machines)	1
5. NECR – English (-17 machine)	1
6. NECR – Multi-language (-19, -27, -39, -69 machines)	1
7. User Survey Card (-17 machine)	1
8. Cushion	1
9. Pad (until April '98 production machines)	1
10. Operation Instructions – System Setting	1
11. Operation Instructions – Copy Quick Guide	1
12. Operation Instructions – Fax Reference	1

3.3.2 INSTALLATION PROCEDURE



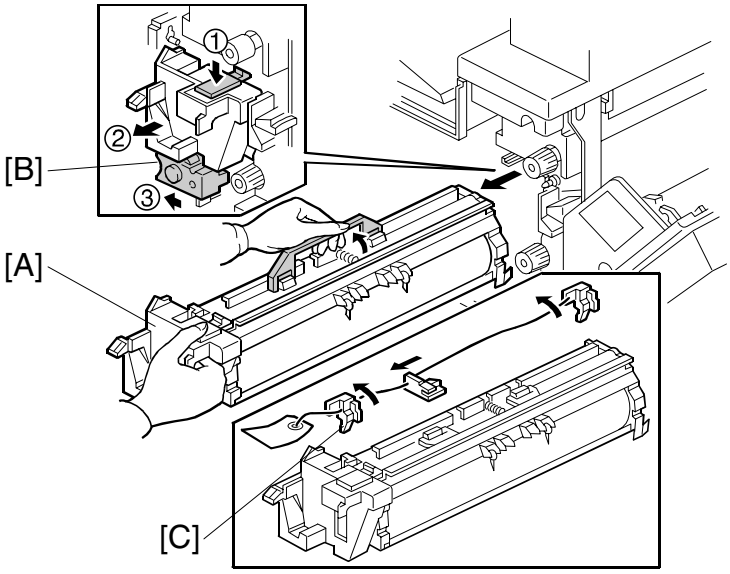
⚠CAUTION

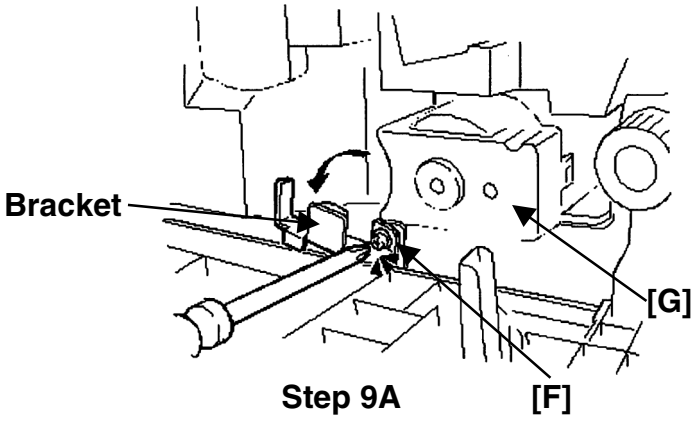
Unplug the machine power cord before starting the following procedure.

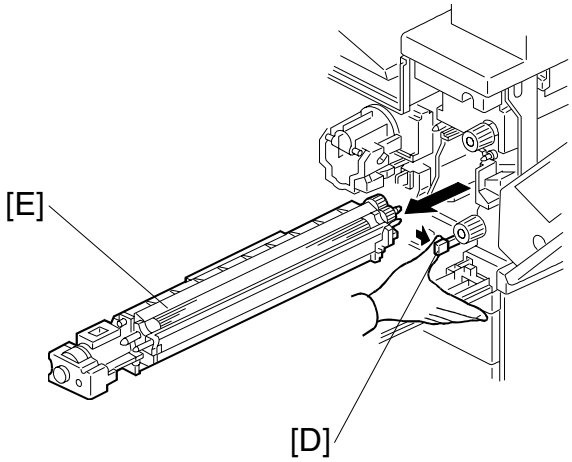
If the optional paper tray unit is going to be installed now, put the copier on the paper tray unit first, then install the paper tray unit, then install the copier.

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 on the exterior of the copier.
2. Open the duplex unit (A231 and A232 machines) and open the upper right cover [A].
3. Remove the pin [B].
4. Pull out the paper trays and remove the bottom plate stoppers [C].
5. Install the middle front cover [D] which is in the second paper tray.
   NOTE: If the optional paper tray unit is installed, this step is done while installing the paper tray unit.



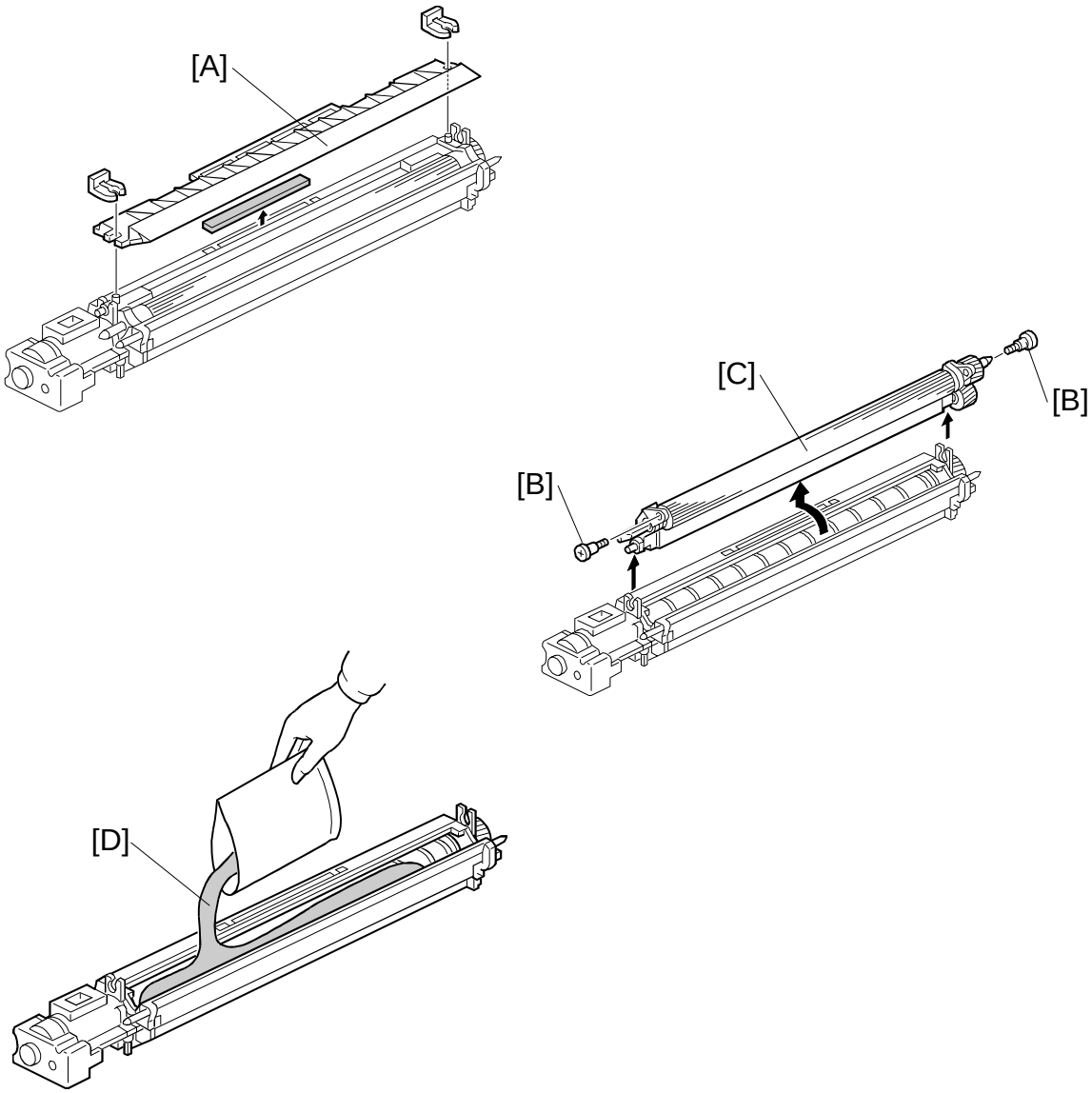




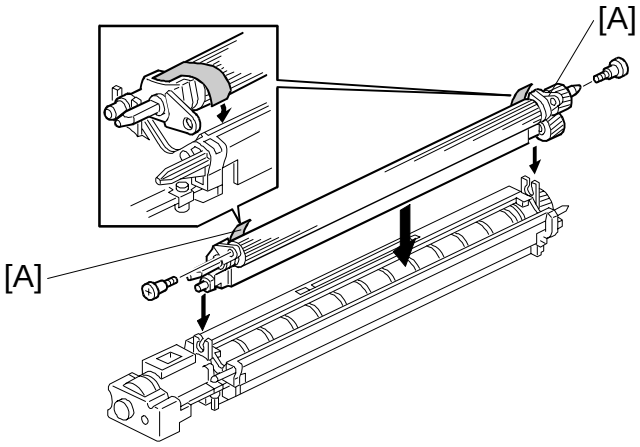
6. Open the front cover.
7. Push down the lever (1). Then pull the PCU [A] out a small distance (2), and move the development unit [B] to the left (3) so that the development unit is away from the drum, then slide out the PCU completely.
8. Remove three clamps [C].
9. Move the lever [D] to the right, then slide out the development unit [E].

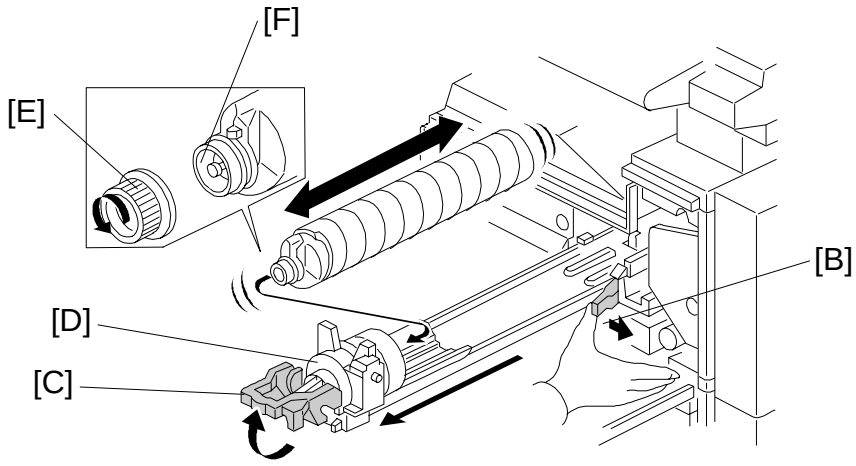
⟹ **Note:** *For machines produced after May 1999 follow Step 9A below.*

9A. While loosening screw [F] , turn the bracket counterclockwise, then remove the development unit [G].

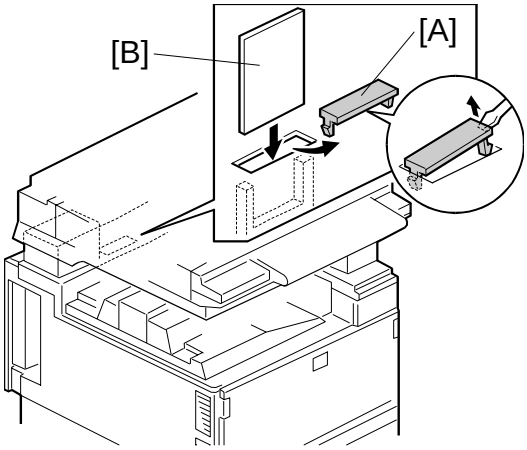


10. Remove the entrance seal plate [A] (2 clamps).
11. Remove two screws [B] and take out the development roller unit [C].
12. Pour the developer [D] into the development unit uniformly.



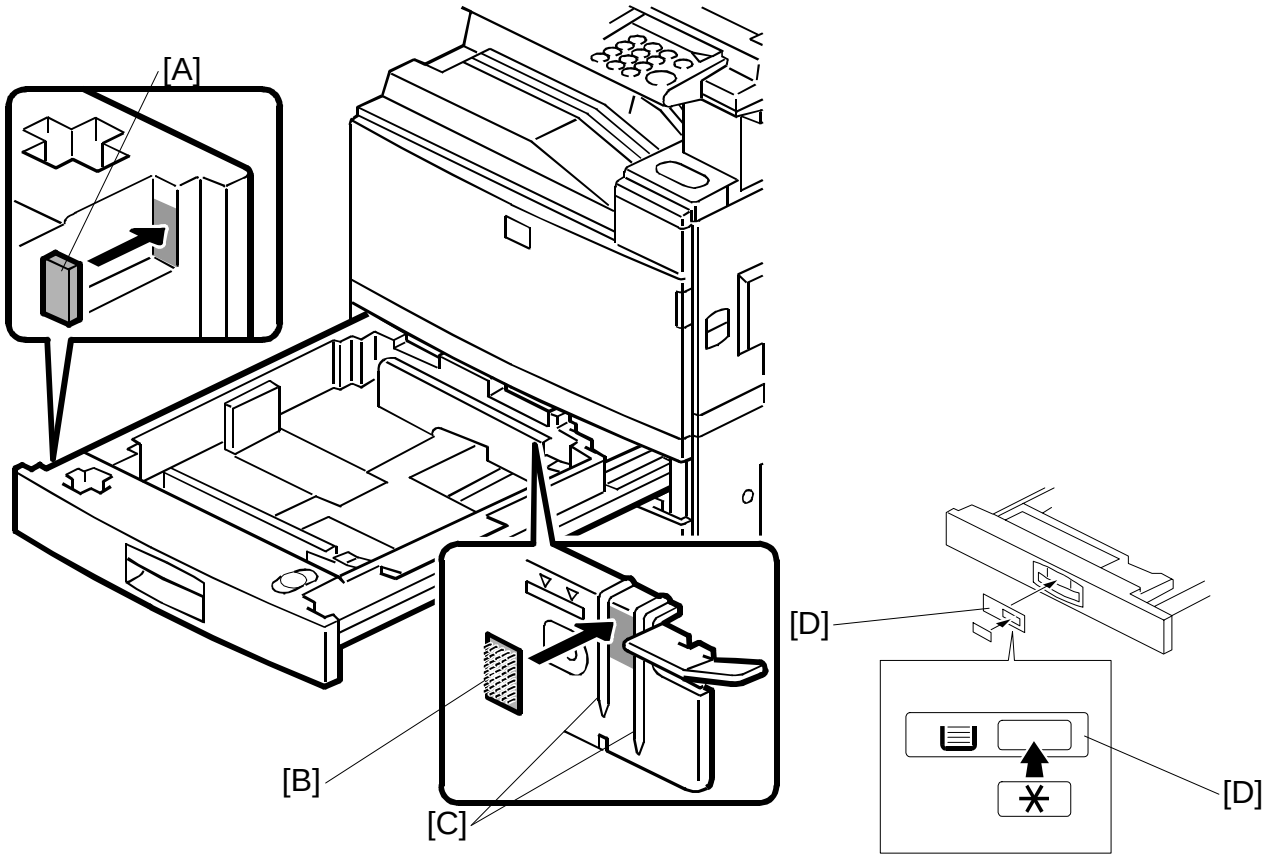


13. Reassemble the development unit.
    NOTE: Make sure that the development side seals [A] are set inside the development unit case.
14. Reassemble the machine.
    NOTE: When reinstalling the PCU, make sure it is installed properly. Otherwise, black copies may be printed.
15. Push lever [B] to the side, raise the toner bottle holder lever [C], and pull the toner bottle holder [D] out.
16. Shake the toner bottle well.
    NOTE: Do not remove the toner bottle cap [E] until after shaking.
17. Unscrew the bottle cap and insert the bottle into the holder.
    NOTE: Do not touch the inner bottle cap [F].
18. Reposition the holder and press down the holder lever to secure the bottle.



⟹ **- Steps 19 to 21 are for only Europe versions when the required language is other than English, French, and German -**

19. Remove the IC card cover [A] and plug the IC card [B] which includes the appropriate language into the IC socket.
    NOTE: When setting the IC card, the surface of the card which has “B” printed on it should be facing the front of the machine.
20. Plug in the machine and turn on the main power switch, then press the “Yes” key. The machine automatically downloads the software.
21. After the software has been downloaded, turn off the main power switch and remove the IC card.
22. Turn on the main power switch.
23. After the fusing warm-up period, enter the SP mode.
    1) Press the “Clear Mode” key.
    2) Enter “107” using the numeric keys.
    3) Hold down the “Clear/Stop” key for more than 3 seconds.
    4) Select “1” (copier).
    NOTE: Do not enter SP mode during the fusing warm-up period (the LED of the start key is red during this period)
24. Perform the TD sensor initial setting as follows:
    1) Enter “2-801” and press the “Enter” key.
    2) Press “1” to start the TD sensor initial setting.
    NOTE: The machine will automatically stop when TD sensor initial setting is completed, and the TD sensor output voltage will appear on the LCD.
25. Perform the Developer Initialization setting using SP2-805.
26. **Europe:** Select the correct language using SP 5-009.



27. When loading paper bigger than A4 (11” x 8.5”) in the 1st paper tray, attach the pad [A] and the cushion [B] to the paper tray as shown.
    NOTE: 1) This procedure is required only for the 1st paper tray.
    2) Make sure that the pad is not attached over the ribs [C].
28. Change the side fences and end fence to match the paper size that will be used. Then load paper into it.
29. Enter the proper paper size for each paper tray using the UP mode.
30. Attach the appropriate paper size decal [D] to the paper tray.
    NOTE: Paper size decals are also used for the optional paper tray unit. Keep any remaining decals for use with the paper tray unit.
31. Check the copy quality and machine operation (refer to the “Replacement and Adjustment - Copy Adjustment” section of the service manual).

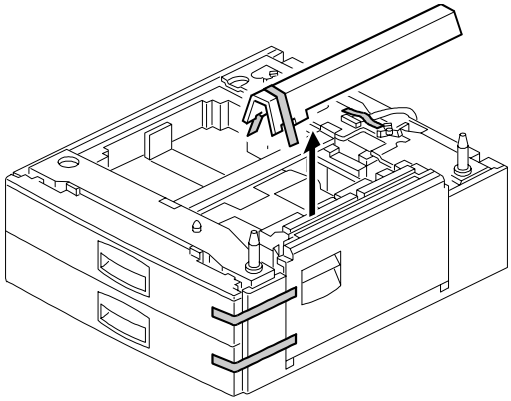
3.4 PAPER TRAY UNIT INSTALLATION

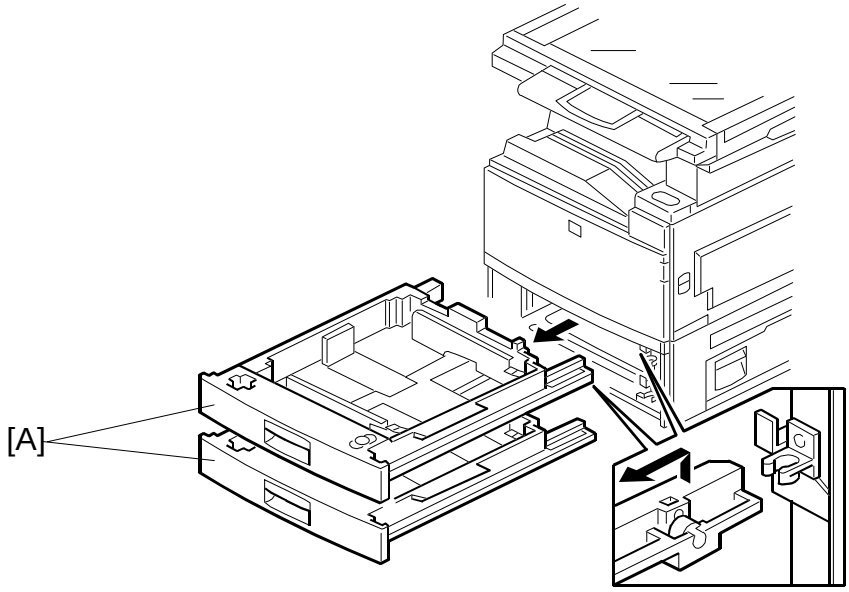
3.4.1 ACCESSORY CHECK

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

Description	Q'ty
1. Joint Bracket	1
2. Front Stand	1
3. Rear Stand	1
4. Stand Bracket	1
5. Knob Screw – M3	1
6. Knob Screw – M4x10	1
7. NECR – Multi-language (-17, -27 machines)	1
8. Installation Procedure	1

3.4.2 INSTALLATION PROCEDURE

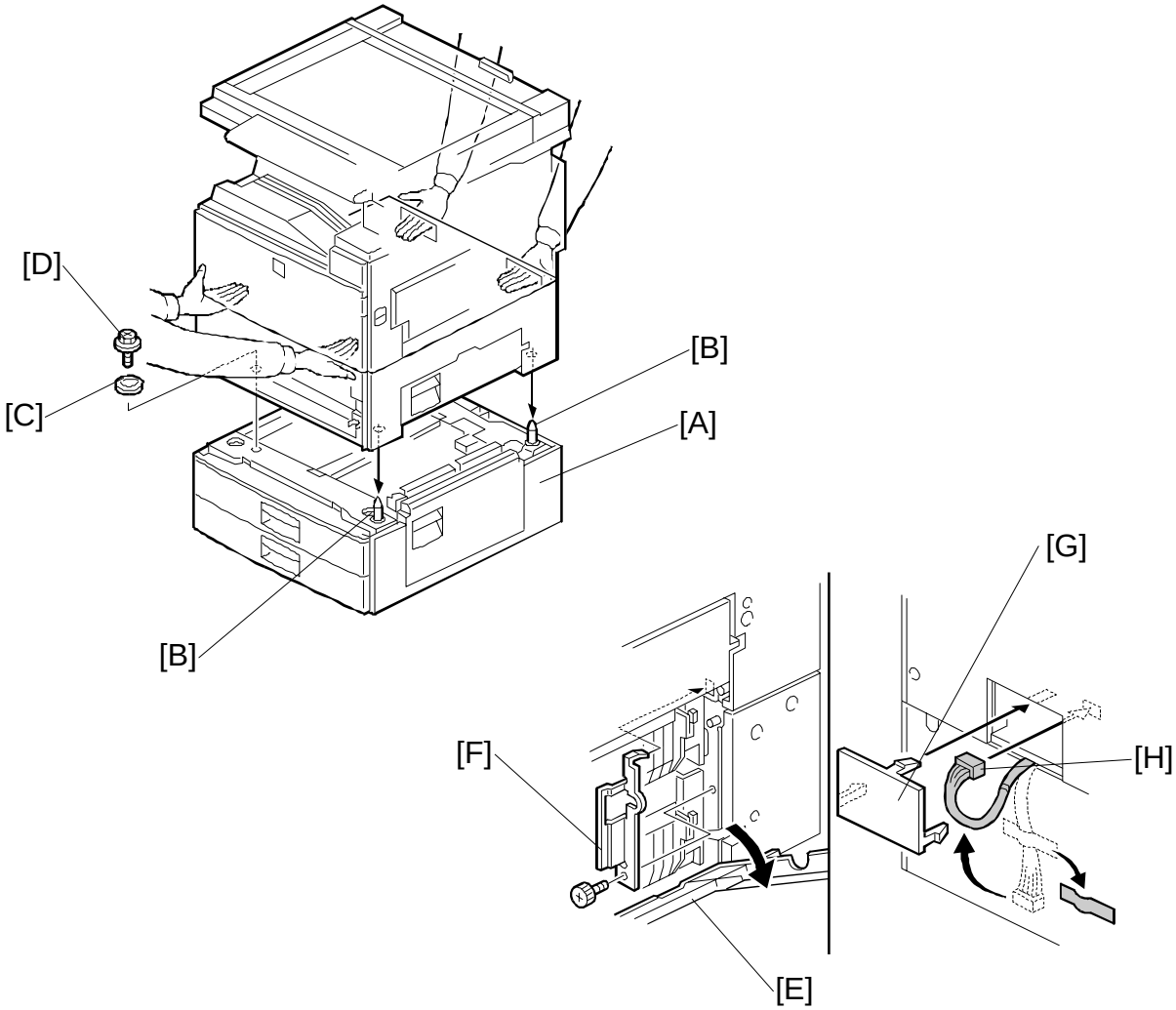




⚠CAUTION

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

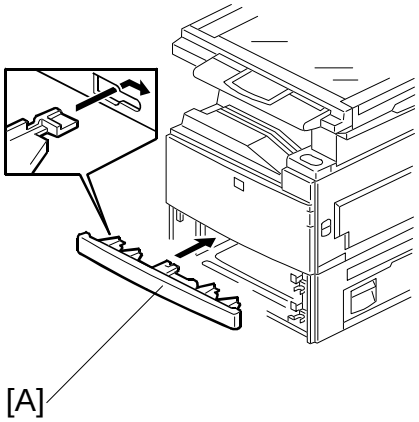
1. Unpack the paper tray unit. Then remove the tapes.
2. Remove the paper trays [A] from the base copier.

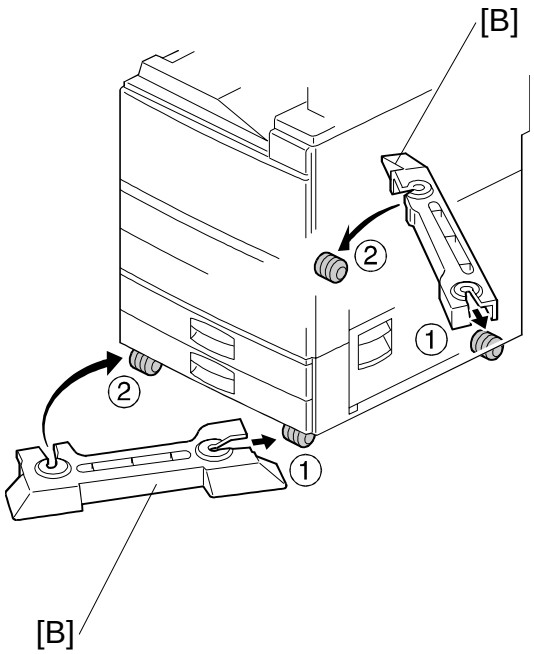


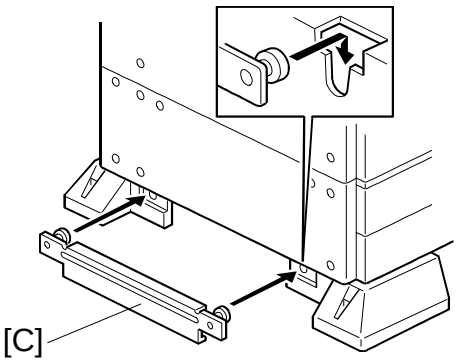
3. Place the main machine on the paper tray unit [A] with the pegs [B] fitting into main machine's peg holes.

   NOTE: 1) The machine must be held as shown in the above illustration.
   2) Do not hold the scanner unit when lifting.

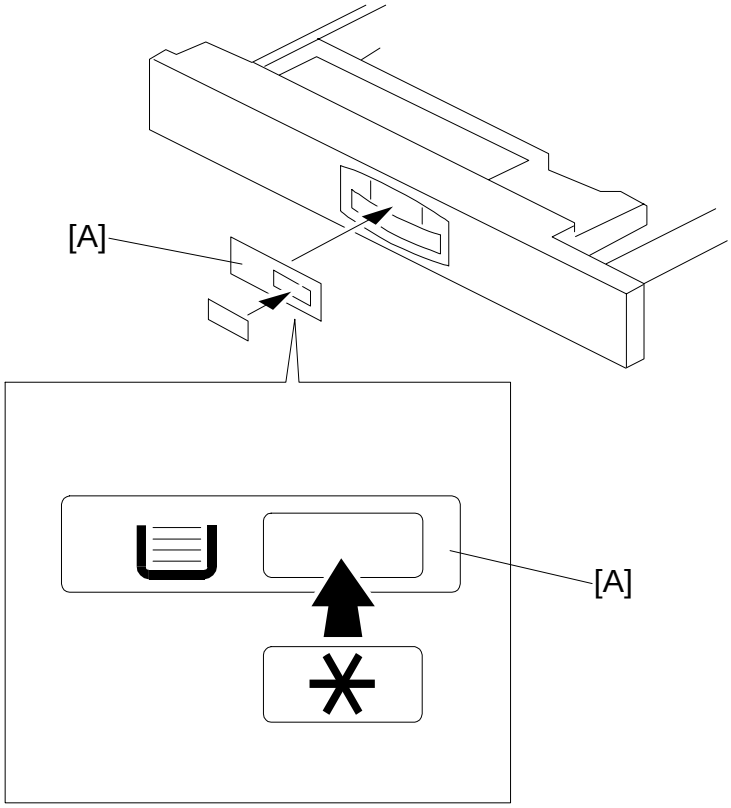
4. Attach the spring washer [C] to the short knob screw [D]. Then secure the paper tray unit.
5. Open the right cover of the paper tray unit [E].
6. Secure the joint bracket [F] (1 long knob screw).
7. Remove the connector cover [G] of the main machine.
8. Connect the paper tray unit harness [H] to the main machine and reinstall the connector cover.







10. Install the middle front cover [A], which is in the 2nd paper tray of the copier.
11. Install the front and rear stands [B] as shown above.
12. Install the stand bracket [C].



13. Load paper into the paper trays and install the paper trays.
    NOTE: The side and rear fences should be properly positioned using the green screw driver tool.
14. Attach the appropriate tray decals [A] which are included in the accessory box for the main machine.
15. Turn on the main power switch.
16. Enter the paper size for each paper tray using the UP mode.
17. Check the machine's operation and copy quality.

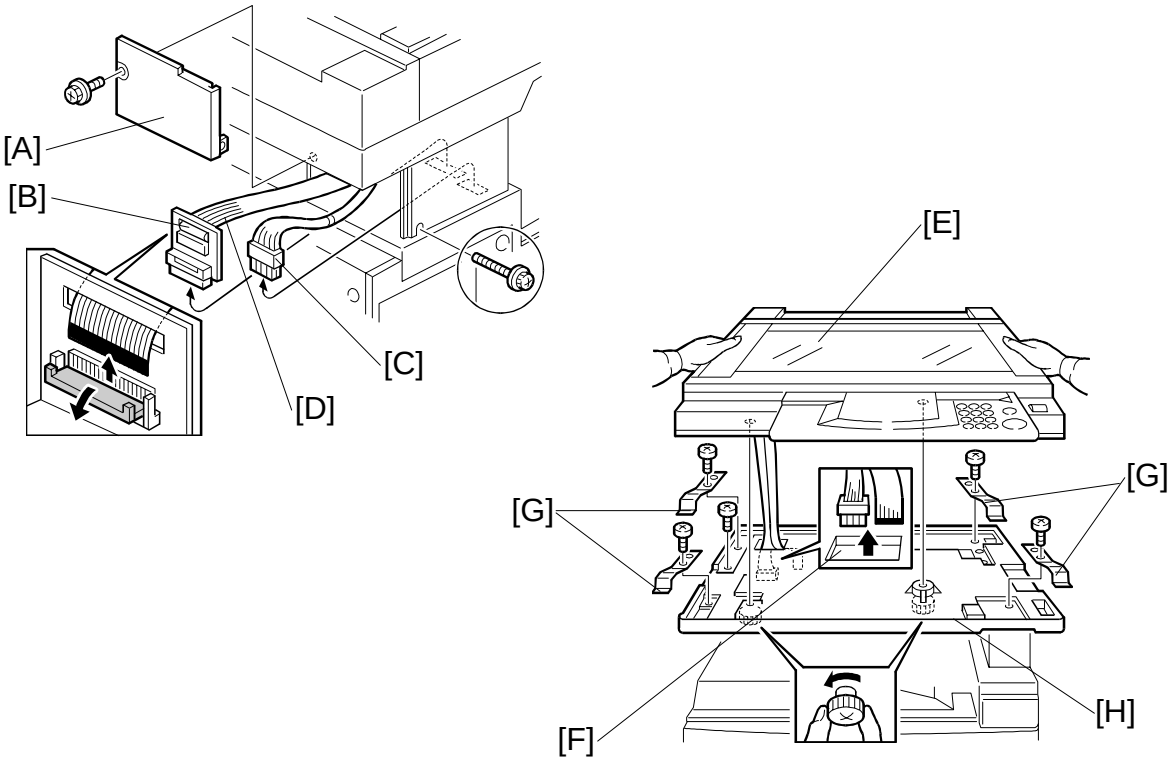
3.5 INTERCHANGE UNIT INSTALLATION

3.5.1 ACCESSORY CHECK

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

Description	Q'ty
1. Timing Belt	1
2. Spring	1
3. Gear/Pulley	1
4. Gear Bracket	1
5. Screw – M3x8	1
6. Installation Procedure	1

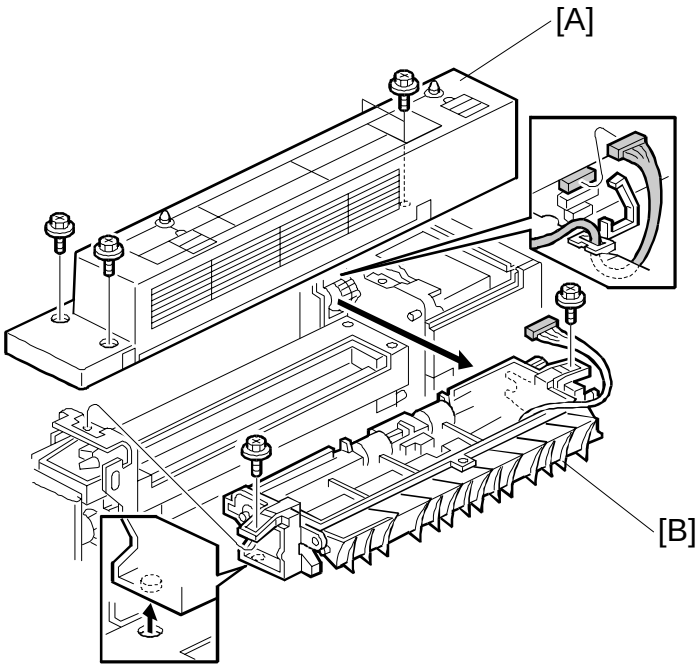
3.5.2 INSTALLATION PROCEDURE



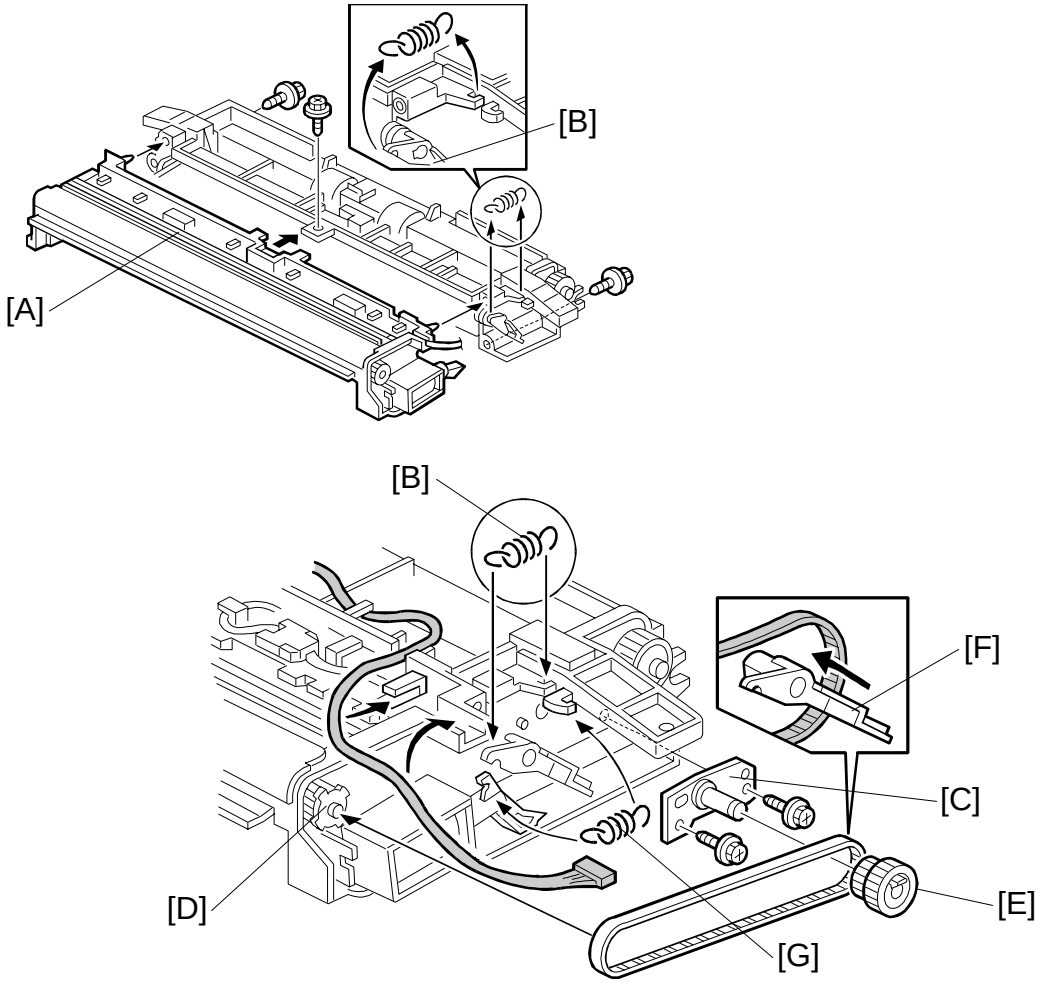
⚠CAUTION

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

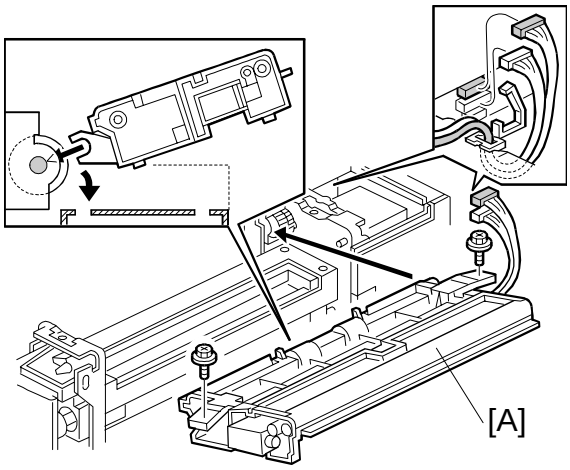
1. Remove the scanner unit.
   NOTE: If the ARDF is installed, remove the ARDF before removing the scanner unit.
   1) Remove the stand rear cover [A] (2 screws).
   2) Disconnect the scanner I/F board [B] and the power connector [C].
   3) Disconnect the scanner I/F harness [D].
   4) Remove the scanner unit [E] (2 knob screws).
   NOTE: 1) Hold the scanner unit as shown in the above illustration. Otherwise, it will be damaged.
   2) Make sure the harnesses are not damaged by the edges of the opening [F].
   3) After removing the scanner, keep it in a flat level place.
   5) Remove four plates [G] (1 screw each).
   6) Remove the scanner unit plate [H] (1 screw).

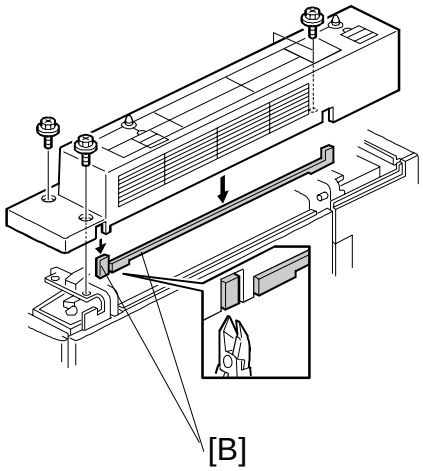


2. Unpack the interchange unit.
3. Remove the paper exit cover [A] (4 screws).
4. Open the upper right cover.
5. Remove the paper exit unit [B] (2 screws, 1 connector).



6. Install the interchange unit [A] (3 screws).
7. Remove the spring [B].
8. Install the gear bracket [C] (2 screws).
9. Loop the timing belt around the gear [D].
10. Install the pulley [E] on the gear bracket while looping the timing belt around the pulley.
    NOTE: The junction gate lever [F] should go through the timing belt.
11. Reinstall the spring which was removed in step 7.
12. Install the small spring [G] from the accessories box, as shown.





13. Install the paper exit / interchange unit [A] as shown (2 screws, 2 connectors).

- When the 1-bin tray (A684) is going to be installed -

14. Do not reinstall the paper exit cover. Install the 1-bin tray. This installation procedure is now finished.

- When the 1-bin tray (A684) is not going to be installed, do steps 15 to 18 -

15. Cut away the covers [B] and reinstall the paper exit cover (4 screws).
    NOTE: Trim off any remaining unevenness from the edges.
16. Reinstall the scanner unit plate.
17. Reinstall the scanner unit.
18. Turn on the main power switch and check that each paper path through the interchange unit operates properly, without any paper jams.

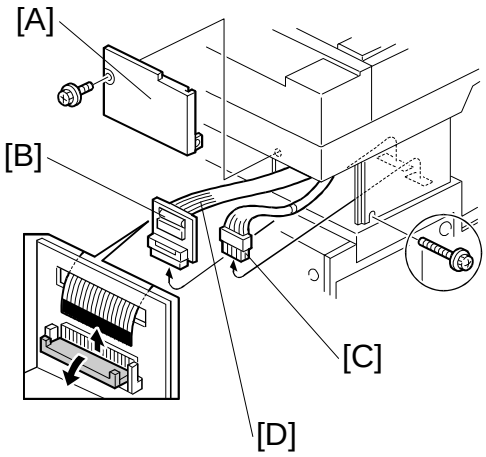
3.6 1-BIN TRAY UNIT INSTALLATION

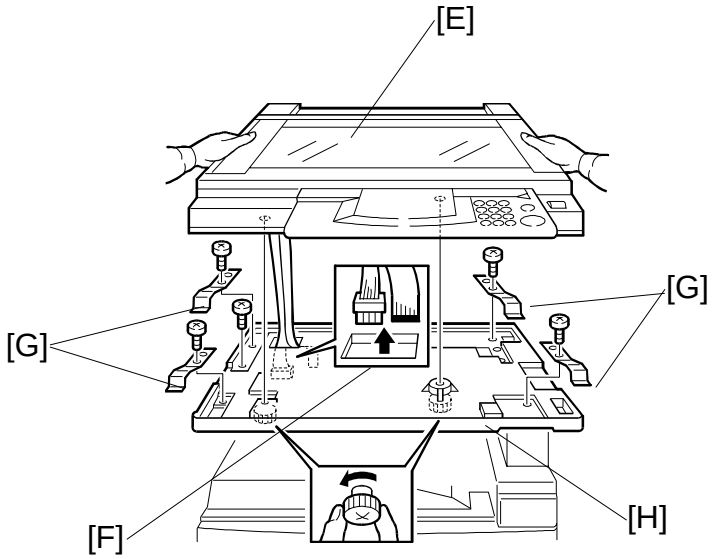
3.6.1 ACCESSORY CHECK

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

Description	Q'ty
1. Grounding Bracket	1
2. Connector Cover	1
3. Base Cover	1
4. Copy Tray	1
5. Copy Tray Bracket	1
6. Snap Ring	1
7. Mylar Strip	2
8. Stepped Screw – M3x8	5
9. Screw – M3x8	1
10. Tapping Screw – M3x6	2
11. Tapping Screw – M3x14	1
12. Tapping Screw – M3x8	1
13. NECR	1
14. Installation Procedure	1

3.6.2 INSTALLATION PROCEDURE



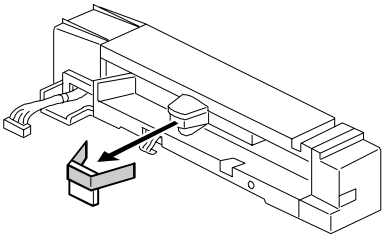


NOTE: The interchange unit (A690) must be installed before installing the 1-bin tray unit.

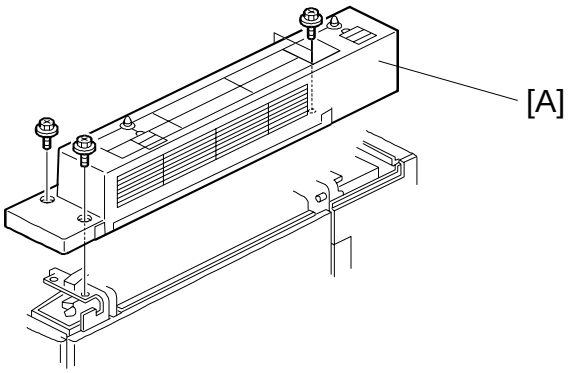
⚠CAUTION

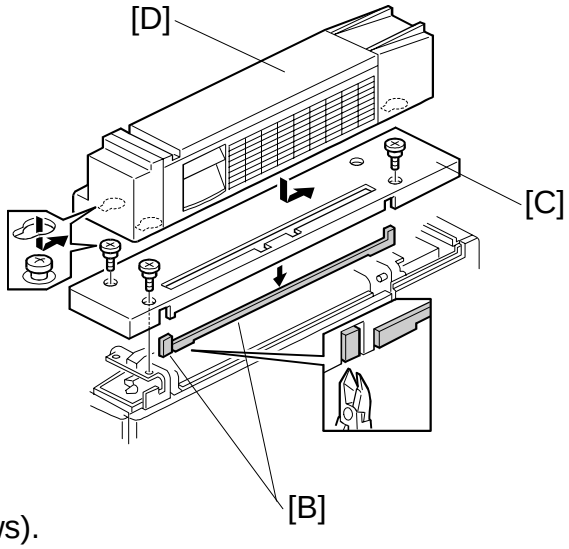
Unplug the main machine power cord before starting the following procedure.

1. Remove the scanner unit.
   NOTE: If the ARDF is installed, remove the ARDF before removing the scanner unit.
   1) Remove the stand rear cover [A] (2 screws).
   2) Disconnect the scanner I/F board [B] and the power connector [C].
   3) Disconnect the scanner I/F harness [D].
   4) Remove the scanner unit [E] (2 knob screws).
   NOTE: 1) Hold the scanner unit as shown in the above illustration. Otherwise, it may be damaged.
   2) Make sure the harnesses are not damaged by the edges of the opening [F].
   3) After removing the scanner, keep it in a flat level place.
   5) Remove four plates [G] (1 screw each).
   6) Remove the scanner unit plate [H] (1 screw).



2. Unpack the 1-bin tray unit and remove the tapes.

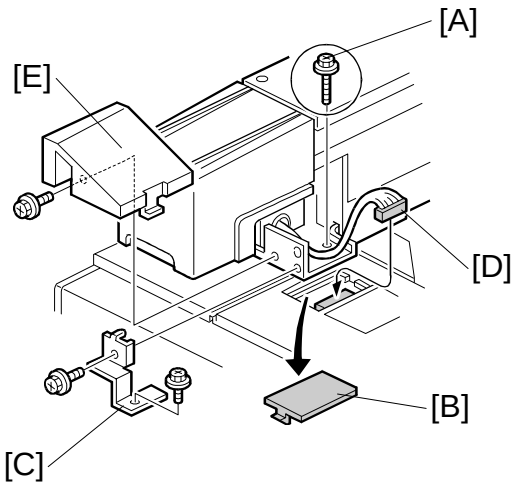


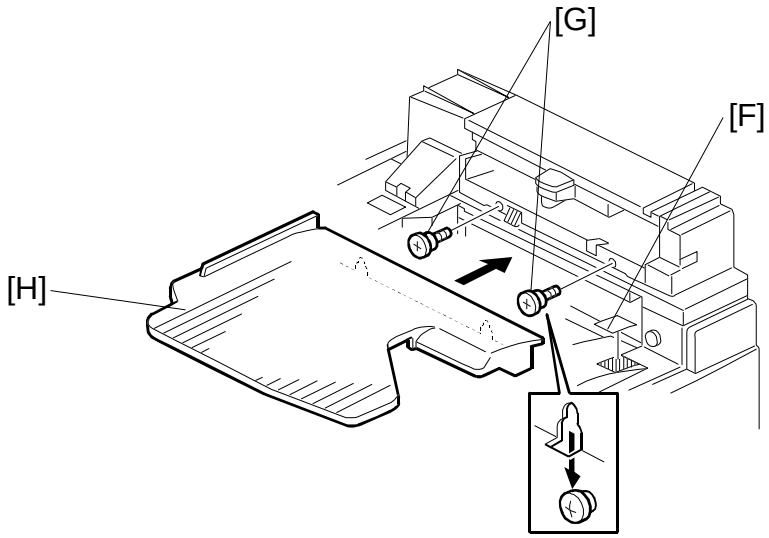


3. Remove the paper exit cover [A] (4 screws).

Do step 4 only if the duplex unit has been installed or will be installed.

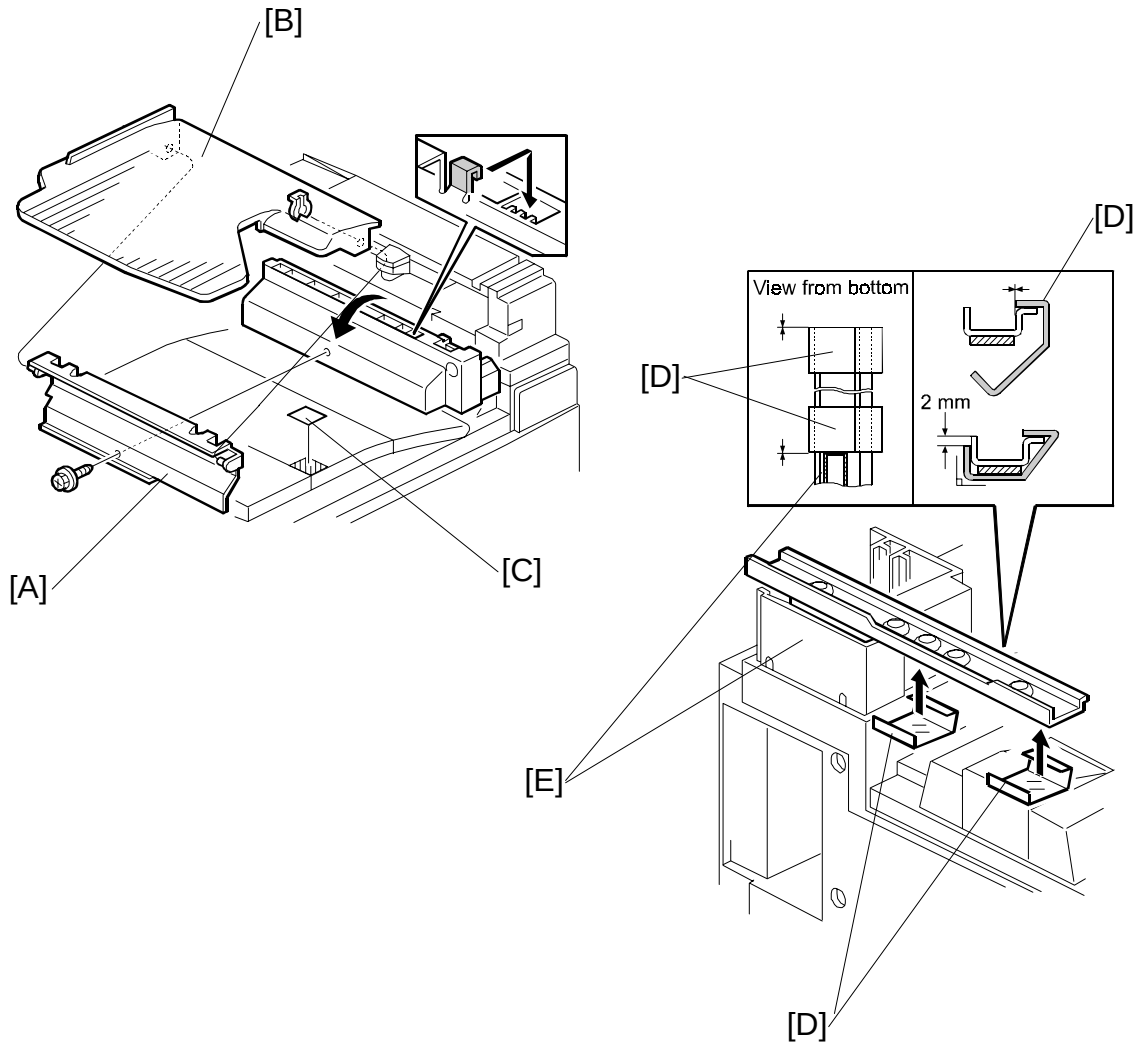
4. Cut away two covers [B] from the base cover [C].
   NOTE: Trim off any remaining unevenness from the edges.
5. Install the base cover (3 stepped screws).
6. Place the 1-bin tray unit [D] on the base cover.
   NOTE: Make sure to hold the 1-bin tray unit at both sides, **never** at the center.





7. Secure the 1-bin tray unit (1 screw [A] – M3 x 10).
8. Remove the cover [B].
9. Install the grounding bracket [C] (2 screws - M3 x 6).
10. Connect the harness [D].
11. Install the connector cover [E] (1 screw - M3 x 8).
12. Install the copy tray.
    - When the Bridge Unit (A688) has not been installed -
    1) Attach the decal [F], as shown.
    2) Install two stepped screws [G], then attach the copy tray [H].

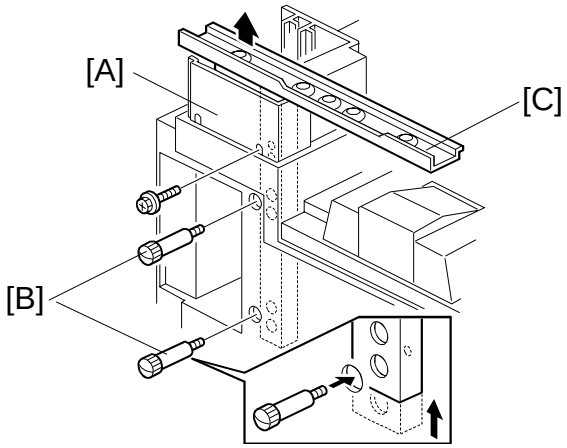
1-BIN TRAY UNIT INSTALLATION

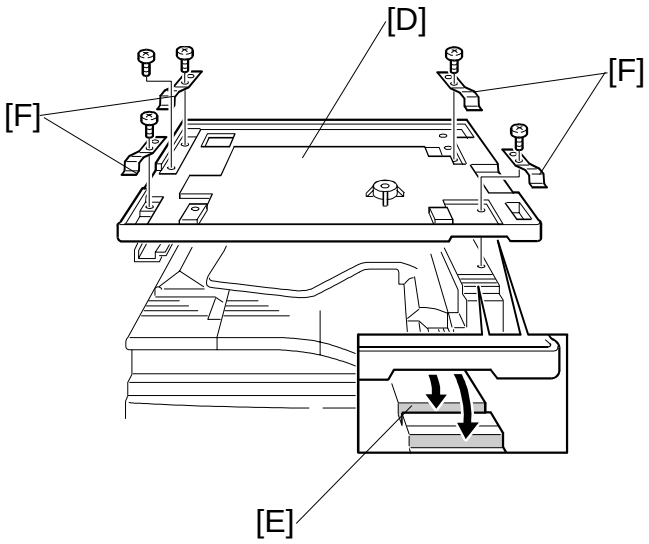


- When the Bridge Unit (A688) has been installed -

1) Open the right cover of the bridge unit.
2) Install the copy tray bracket [A] (1 screw).
3) Install the copy tray [B] (1 snap ring).
4) Attach the decal [C], as shown.

13. Fold two mylar strips [D] around the scanner stand [E], as shown.





14. Change the height of the scanner stand.
    1) Remove the stand cover [A] (1 screw).
    2) Remove two screws [B] which are securing the scanner stand [C].
    3) Raise the scanner stand until the next set of screw holes in the main frame can be seen through the screw holes in the scanner stand.
    4) Secure the stand.
    5) Reinstall the stand cover.
15. Reinstall the scanner unit plate [D] (1 screw).
    NOTE: The scanner unit plate should be positioned at the rear, as shown [E].
16. Reinstall four plates [F] (1 screw each).
17. Reinstall the scanner unit.
18. Turn on the main power switch and check the 1-bin tray unit operation.

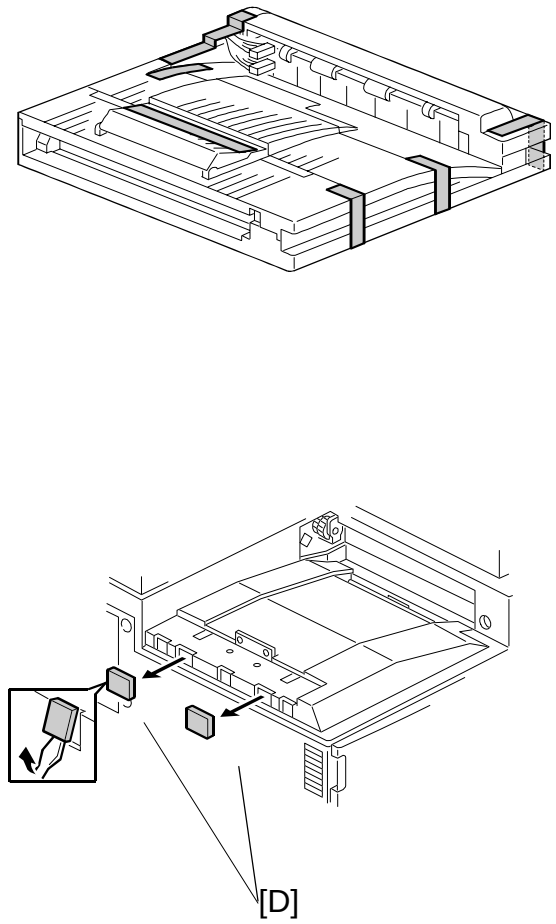
3.7 BRIDGE UNIT INSTALLATION

3.7.1 ACCESSORY CHECK

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

Description	Q'ty
1. Stepped Screw	2
2. Connector Cover	1
3. Entrance Mylar	2
4. Exit Mylar	2
5. NECR	1
6. Installation Procedure	1

3.7.2 INSTALLATION PROCEDURE



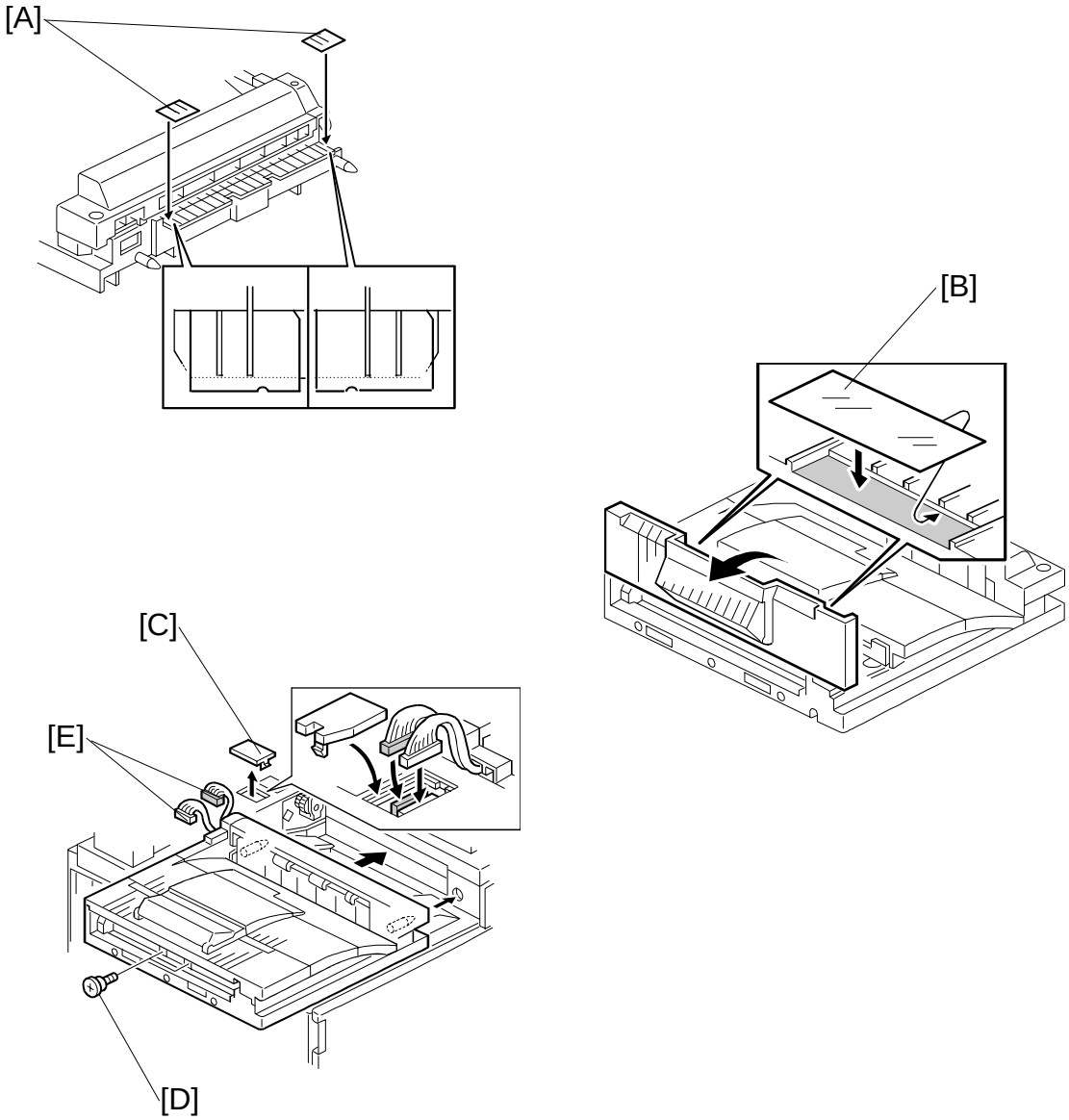
⚠CAUTION

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

1. Unpack the bridge unit. Then remove the tapes.
2. Remove the inner tray [A].
3. Remove the inner tray pin [B].
4. Remove three covers [C].

If the optional external output tray (A825) will be installed instead of a finisher, do step 5.

5. Remove the two covers [D].
6. Remove the cover [E].
7. Remove the cap [F].



7. Attach two entrance mylars [A] to the paper entrance area of the bridge unit as shown.
8. **If the optional finisher will be installed:**
   Attach two exit mylars [B] to the bridge unit as shown.
9. Remove the cover [C].
10. Install the bridge unit (2 screws) [D].
11. Connect the bridge unit I/F harnesses [E].
12. Install the connector cover.
13. Turn on the main power switch and check the bridge unit operation (make sure that there are no paper jams).

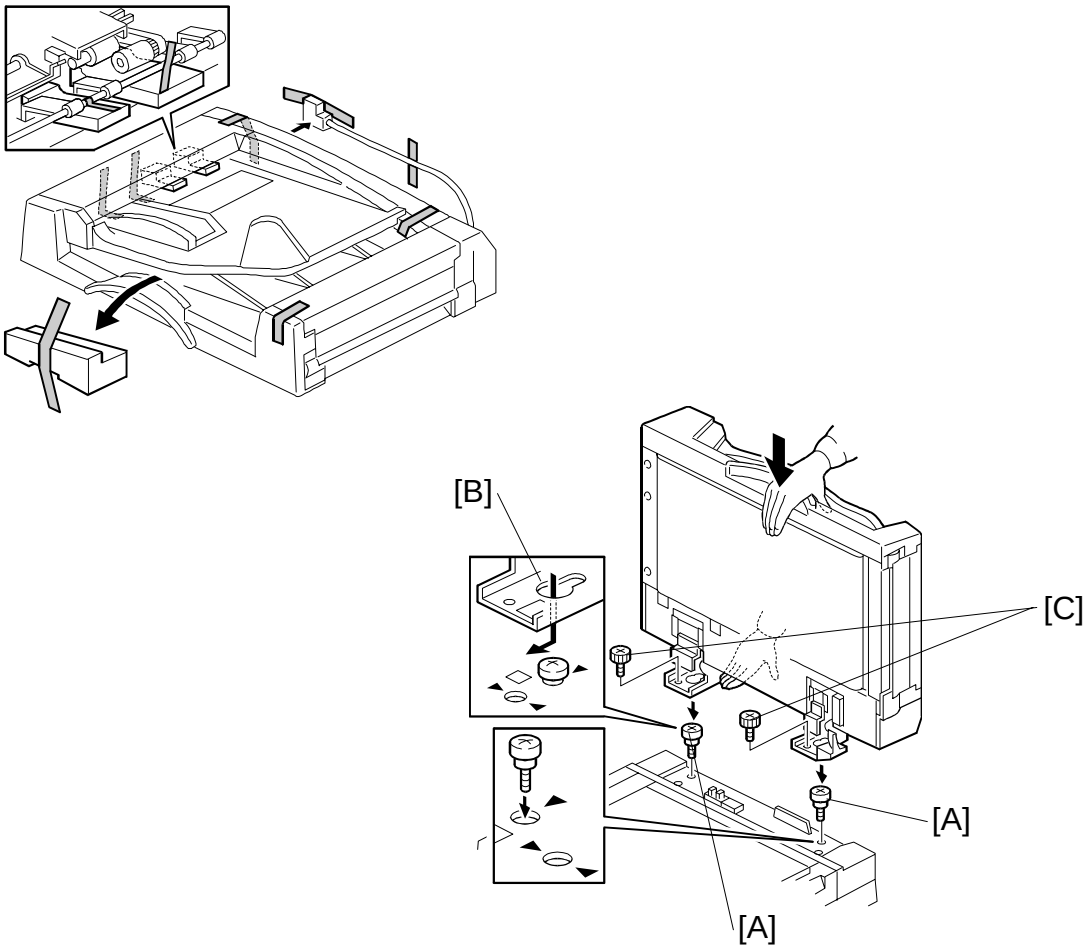
3.8 AUTO REVERSE DOCUMENT FEEDER INSTALLATION

3.8.1 ACCESSORY CHECK

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

Description	Q'ty
1. Stepped Screw	2
2. Knob Screw	2
3. Original Tray	1
4. Screw – M4x17	2
5. NECR	1
6. Installation Procedure	1

3.8.2 INSTALLATION PROCEDURE

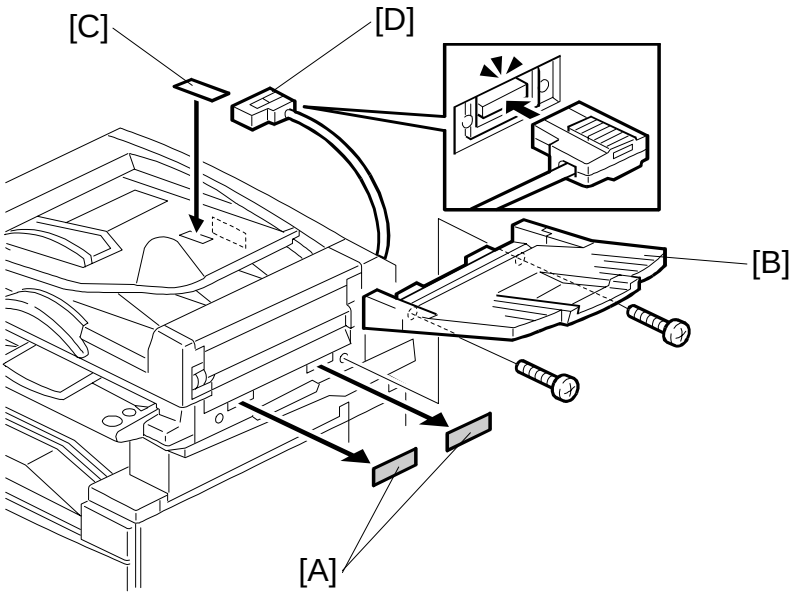


⚠CAUTION

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

1. Unpack the ARDF. Then remove the tapes on the exterior of the ARDF.
2. Tighten the two stud screws [A].
3. Mount the ARDF by aligning the screw holes [B] in the ARDF over the stud screws, and slide the ARDF to the front as shown.

   NOTE: When mounting the ARDF, hold it by hand as shown in the illustration. Holding it in another way may damage the ARDF.
4. Secure the ARDF (2 knob screws [C]).



5. Remove the two seals [A].
6. Install the original tray [B] (2 screws).
7. Attach the original direction decal [C] to the DF table as shown.
8. Connect the I/F harness [D] to the main machine.
9. Turn on the main power switch.
10. Check the ARDF operation and copy quality.

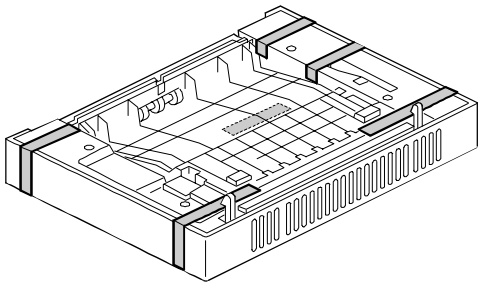
3.9 DUPLEX UNIT INSTALLATION

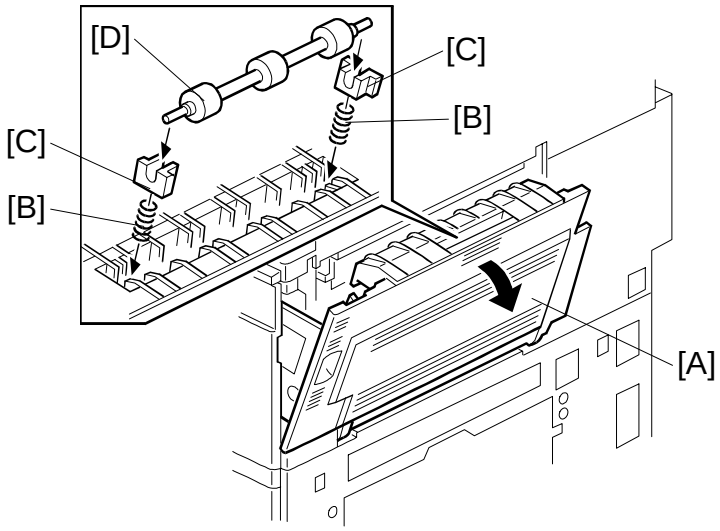
3.9.1 ACCESSORY CHECK

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

Description	Q'ty
1. Link Bracket	1
2. Connector Cover	1
3. Duplex Unit Stand	1
4. Stand Cover	1
5. Front Cover	1
6. Rear Cover	1
7. Roller	1
8. Bushing	2
9. Spring	2
10. Snap Ring	1
11. Screw – M3x6	1
12. Screw – M3x8	5
13. Screw – M4x10	4
14. NECR	1
15. Installation Procedure	1

3.9.2 INSTALLATION PROCEDURE



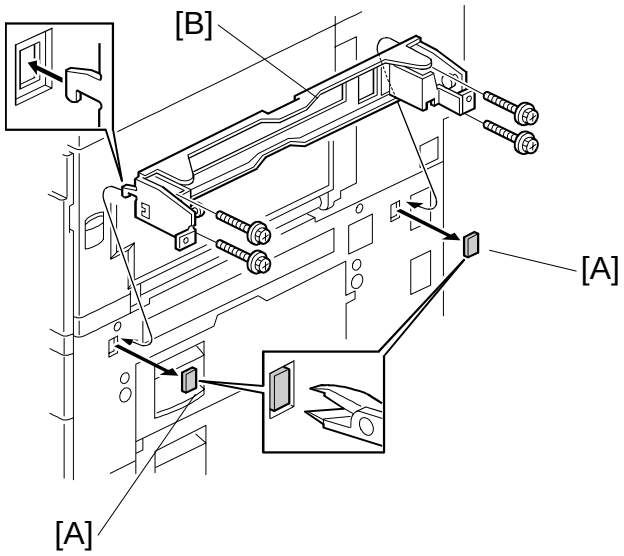


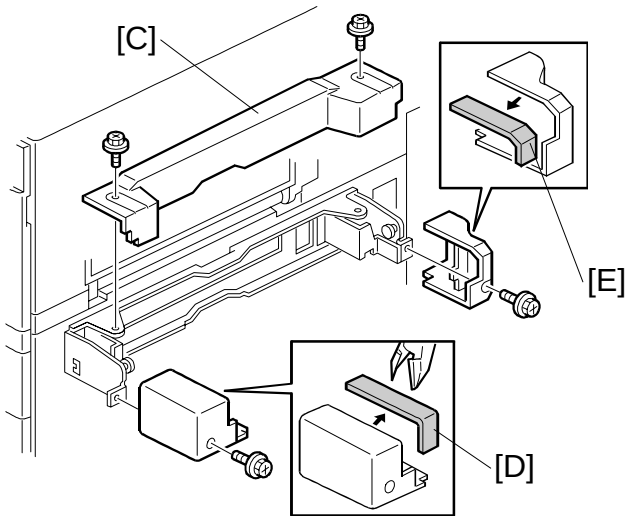
⚠CAUTION

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

NOTE: The interchange unit (A690) must be installed before installing this duplex unit.

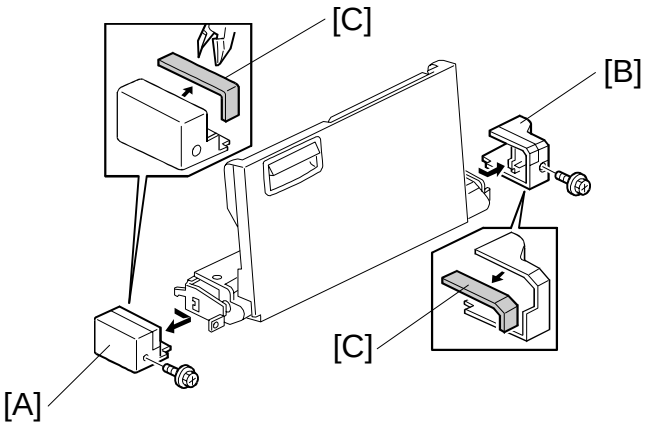
1. Unpack the duplex unit and remove the tapes.
2. Open the upper right cover [A] and install two springs [B], two bushings [C], and roller [D].



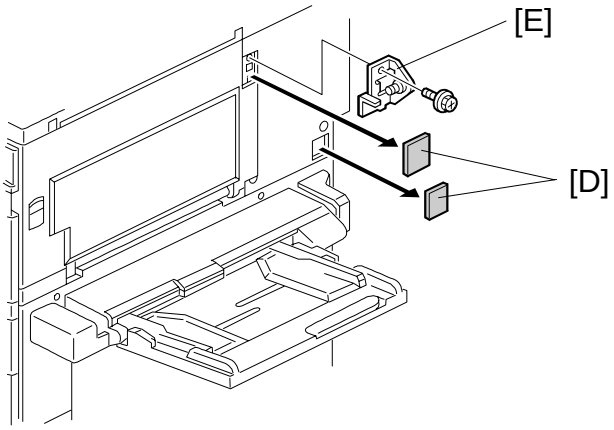


- When the By-pass Feed Unit (A689) has not been installed, do steps 3 to 7 -

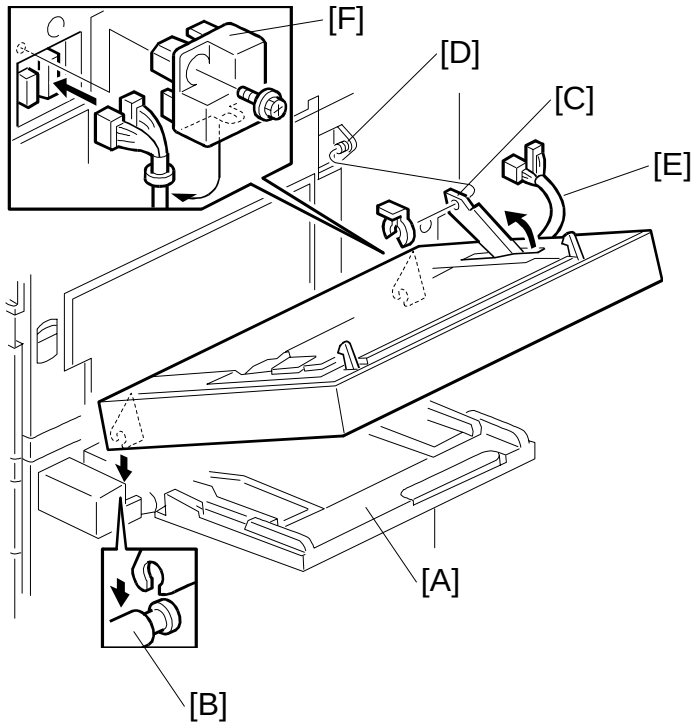
3. Remove the covers [A].
4. Install the duplex unit stand [B] (4 screws).
5. Install the stand cover [C] (2 screws).
6. Remove the indicated parts of the front cover [D] and the rear cover [E].
7. Install the front and rear covers (1 screw each).



- When the By-pass Feed Unit (A689) has been installed, do steps 8 to 12 -



8. Remove the front cover [A] and rear cover [B] of the by-pass feed unit.
9. Remove the indicated parts of both covers [C].
10. Reinstall the front and rear covers.
11. Remove the covers [D].
12. Install the bracket [E] (1 screw).



13. Open the by-pass feed table [A], if it has been installed.
14. Set the duplex unit on the shaft [B].
15. Connect the link [C] to the pin [D] (1 snap ring).
16. Connect the duplex I/F harness [E].
17. Install the connector cover [F] (1 screw).
18. Turn on the main power switch and check the duplex unit's operation.

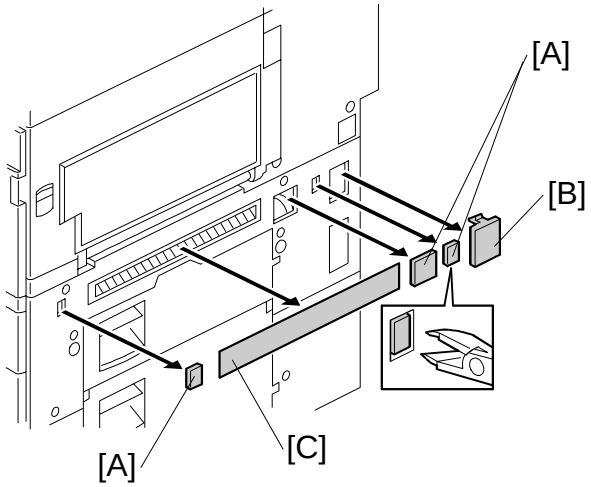
3.10 BY-PASS FEED UNIT INSTALLATION

3.10.1 ACCESSORY CHECK

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

Description	Q'ty
1. Screw – M3x8	2
2. Screw – M4x10	4
3. Front Cover	1
4. Rear Cover	1

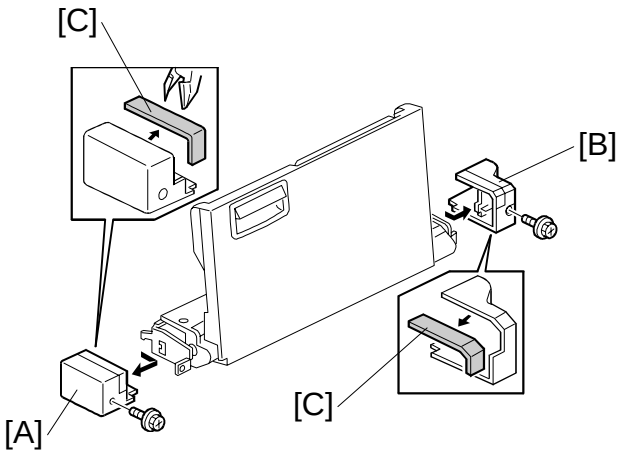
3.10.2 INSTALLATION PROCEDURE

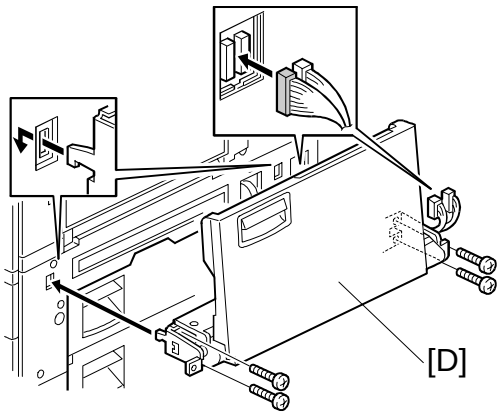


⚠CAUTION

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

1. Unpack the by-pass feed unit.
2. Remove three covers [A], a cap [B], and the seal [C] from the right side of the main machine.





3. Remove the front cover [A] and rear cover [B].
4. **When the Duplex Unit (A687) will be installed:**
   Remove the indicated part of each cover [C].
5. Install the by-pass feed unit [D] (4 screws, 2 connectors).
6. Reinstall the front and rear covers.
7. Turn on the main power switch and check the copy image registration.

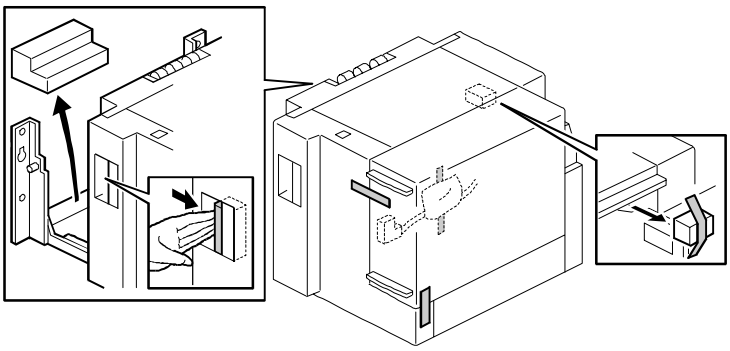
3.11 LCT INSTALLATION

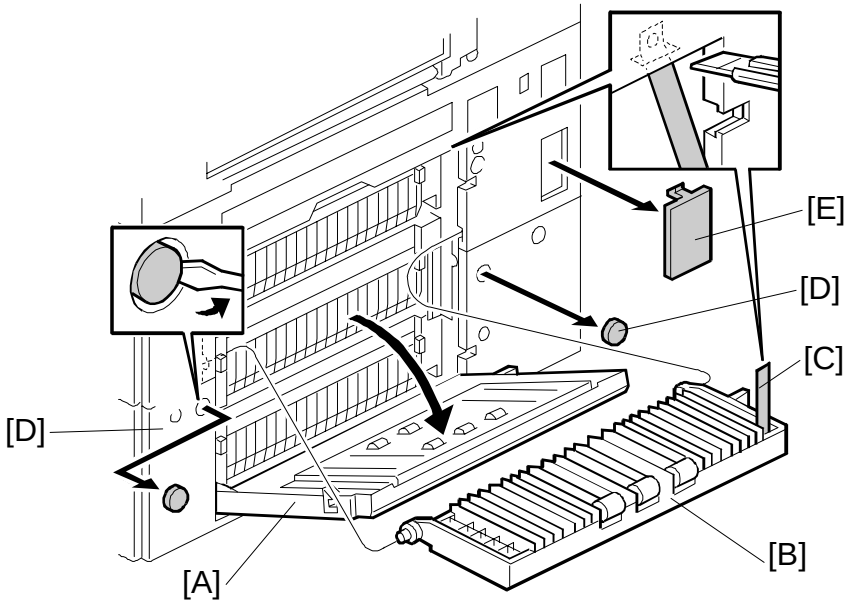
3.11.1 ACCESSORY CHECK

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

Description	Q'ty
1. Joint Pin	2
2. Stepped Screw M3x18	4
3. Magnet Cover	1
4. NECR (-17, -27 machines)	1
5. Installation Procedure	1

3.11.2 INSTALLATION PROCEDURE





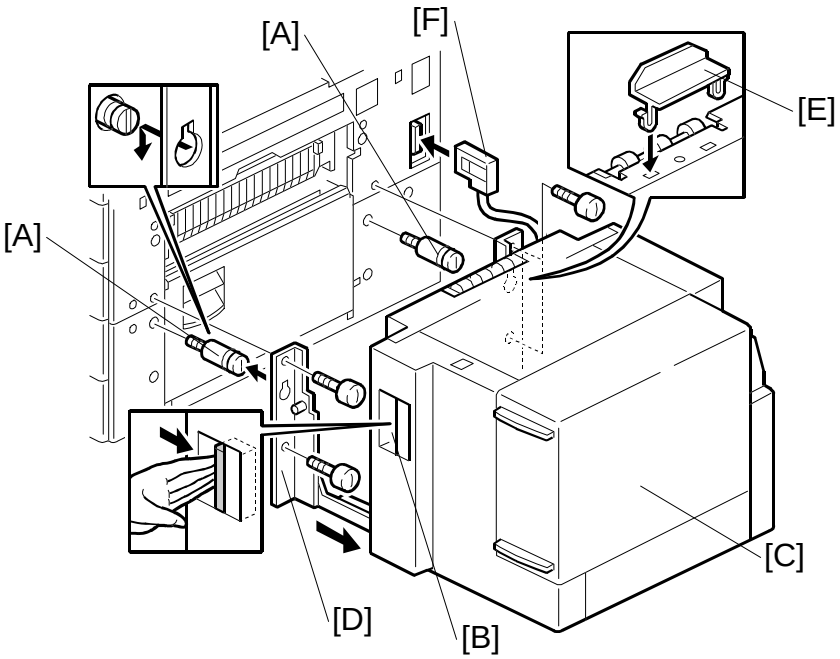
⚠CAUTION

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

NOTE: The paper tray unit (A682) must be installed before installing the LCT.

1. Unpack the LCT and remove the tapes.
2. Open the right cover of the paper tray unit [A].
3. Open the lower right cover [B] and cut the holding band [C].

   NOTE: When cutting the holding band, the upper part of the band should be cut, as shown. Otherwise, paper jams may occur.
4. Remove the lower right cover, then close the right cover [A].
5. Remove two caps [D] and a cover [E].



6. Install the joint pins [A].
7. Push the release lever [B] and slide the LCT to the right (front view).
8. Hang the LCT [C] on the joint pins, then secure the brackets [D] (4 screws).
9. **A230: If the By-pass Feed Unit (A689) has not been installed:**
   Install the magnet [E].
10. Return the LCT to the previous position and connect the LCT cable [F].
11. Open the LCT cover and load the paper.
12. Turn on the main power switch and check the LCT operation.

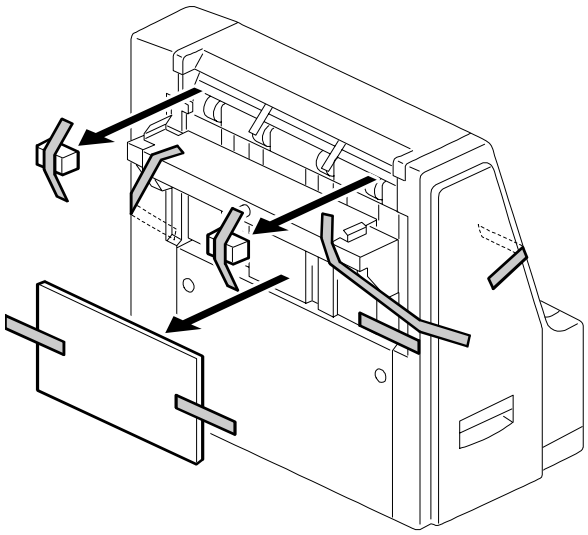
3.12 1,000-SHEET FINISHER INSTALLATION

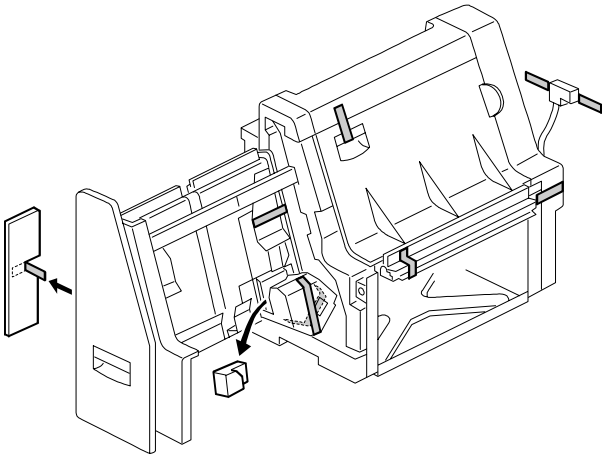
3.12.1 ACCESSORY CHECK

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

Description	Q'ty
1. Front Stand	1
2. Rear Stand	1
3. Knob Screw	1
4. Screw – M4x12	6
5. NECR (-17 machine)	1
6. Installation Procedure	1

3.12.2 INSTALLATION PROCEDURE

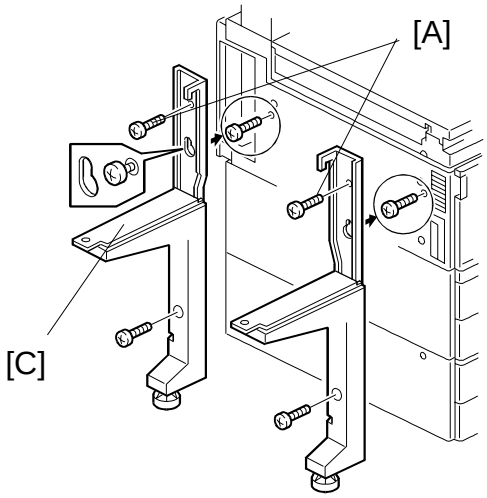


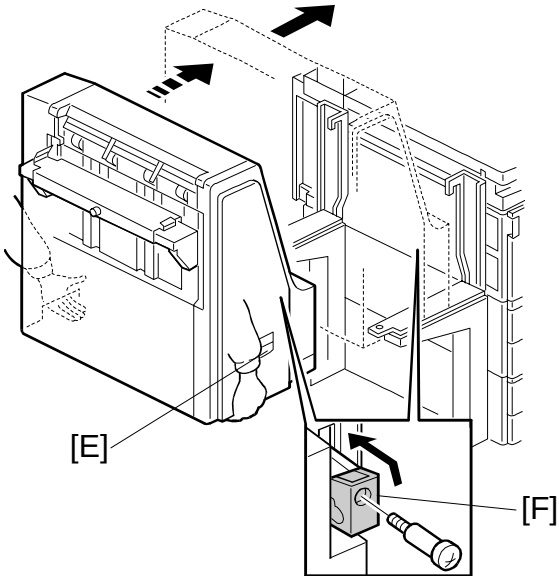


⚠CAUTION
Unplug the main machine power cord before starting the following procedure.

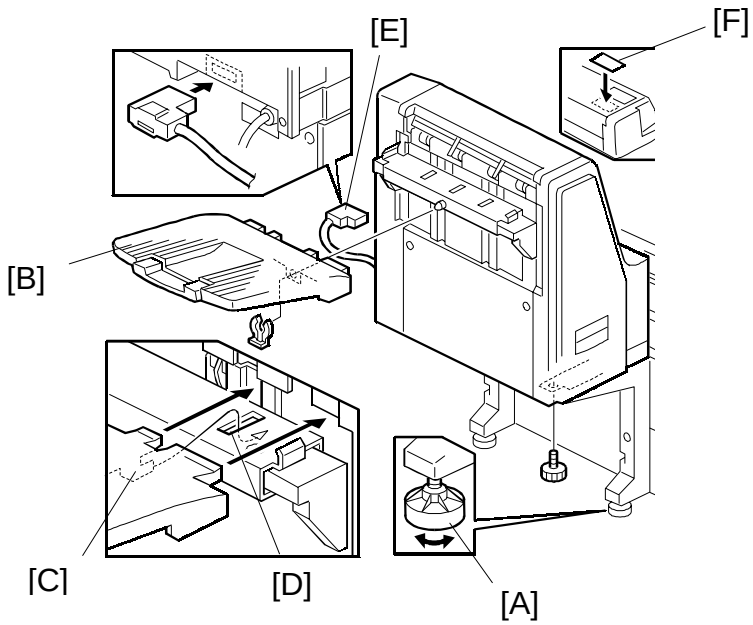
NOTE: The bridge unit (A688) and paper tray unit (A682) must be installed before installing this finisher.

1. Unpack the finisher and remove the tapes.





2. Install the two screws [A] loosely.
3. Hang the front stand [B] and rear stand [C] on the screws which were installed in step 2.
4. Secure the front and rear stands (6 screws, including the two screws [A]).
5. Pull out the drawer at the front of the finisher, using handle [E], to pull out the stapler unit.
6. Draw out the locking lever [F] (1 screw).
7. Align the finisher on the stands, and lock it in place by pushing the locking lever.
8. Secure the locking lever (1 screw) and push the stapler unit into the finisher.



9. Secure the finisher (1 screw).
10. Adjust the securing knobs [A] under the front and rear stands until the finisher is perpendicular to the floor.
11. Install the shift tray [B] (1 snap ring).
    NOTE: Make sure that the three pegs [C] fit into the slots [D] properly.
12. Connect the finisher cable [E] to the main machine.
13. Turn on the main power switch and check the finisher operation.
14. Attach the staple position decal [F] to the ARDF, as shown.

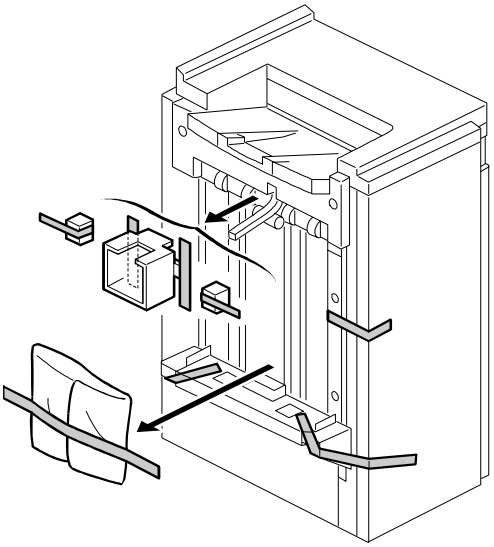
3.13 3,000-SHEET FINISHER INSTALLATION

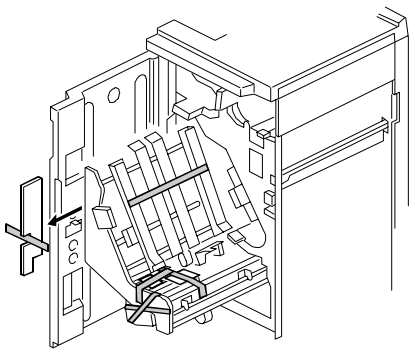
3.13.1 ACCESSORY CHECK

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

Description	Q'ty
1. Front Joint Bracket	1
2. Rear Joint Bracket	1
3. Entrance Guide Plate	1
4. Shift Tray	1
5. Exit Guide Mylar	1
6. Shift Tray Guide	1
7. Staple Position Decal	1
8. Screw – M3x6	2
9. Screw – M4x14	4
10. Screw – M3x8	4
11. Cushion	1
12. Upper Grounding Plate	1
13. Lower Grounding Plate	2
14. NECR (-17 machine)	1
15. Installation Procedure	1

3.13.2 INSTALLATION PROCEDURE



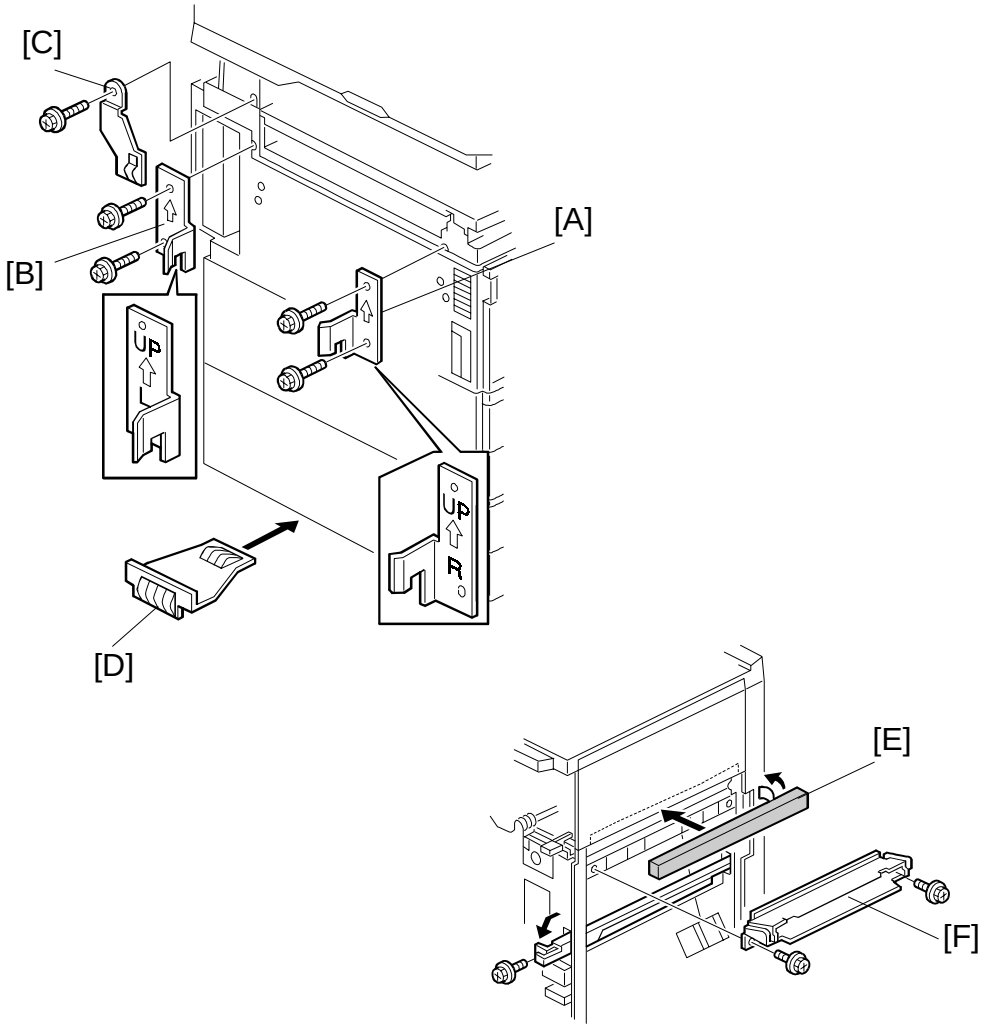


⚠CAUTION

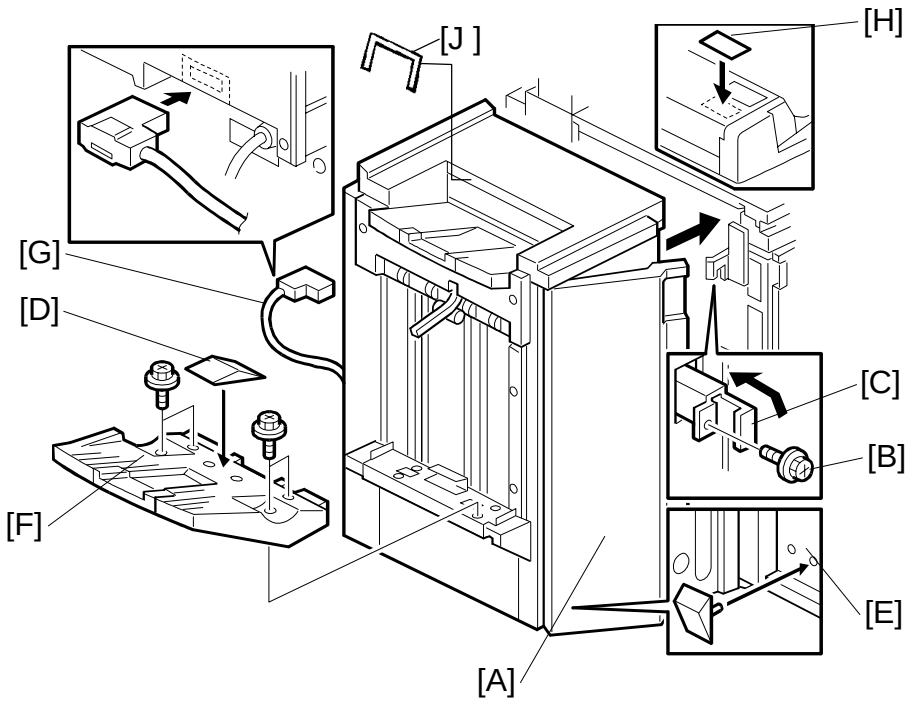
Unplug the main machine power cord before starting the following procedure.

NOTE: The bridge unit (A688) and paper tray unit (A682) must be installed before installing this finisher.

1. Unpack the finisher and remove the tapes.



2. Install the front joint bracket [A] and rear joint bracket [B] (2 screws each).
3. Attach the upper grounding plate [C] (1 screw).
4. Peel off the backing of the double sided tape that is attached to the lower grounding plate [D].
5. Attach one lower grounding plates to the bottom edge of the paper tray unit as shown.
6. Attach the cushion [E] to the plate as shown.
7. Install the entrance guide plate [G] (2 screws).



8. If the customer requires the punch unit, install it now, before attaching the finisher to the machine. See Punch Unit Installation.
9. Open the front door of the finisher [A], and remove the screw [B] which secures the locking lever [C]. Then pull the locking lever.
10. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever.
11. Secure the locking lever (1 screw [B]) and close the front door.
12. ⟹ Attach the exit guide mylar [J] to the anti-static brush bracket located above the upper tray exit roller as shown.
13. Install the shift tray guide [D] on the shift tray. If the customer does not wish to install it on the shift tray, store it at location [E].
    NOTE: The shift tray guide is required to assist in proper paper stacking. However, it reduces the capacity of the shift tray by 50, from 3000 to 2950.
14. Install the shift tray [F] (4 screws).
15. Connect the finisher cable [G] to the main machine.
16. Attach the staple position decal [H] to the ARDF or platen cover as shown.
17. Turn on the main power switch and check the finisher operation.

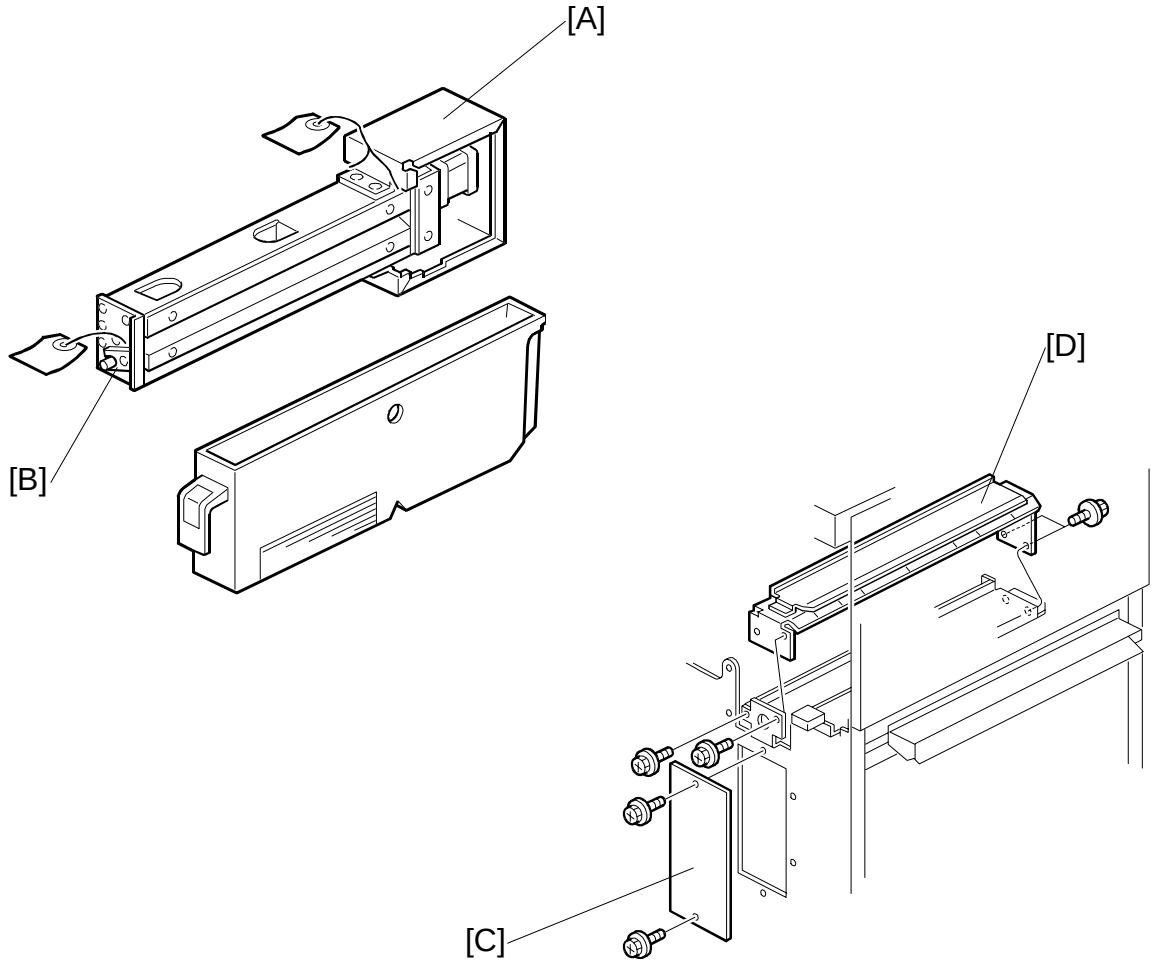
3.14 PUNCH UNIT INSTALLATION

3.14.1 ACCESSORY CHECK

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

Description	Q'ty
1. Spacer – 2 mm	1
2. Spacer – 1 mm	2
3. Stepped Screw – Short	1
4. Stepped Screw – Long	1
5. Punch Unit Knob	1
6. Spring	1
7. Harness – Long	1
8. Harness – Short	1
9. Hopper	1
10. Punch Position Decal	1
11. Tapping Screw – M4x10	2
12. Screw with Flat Washer – M4x6	1
13. NECR	1

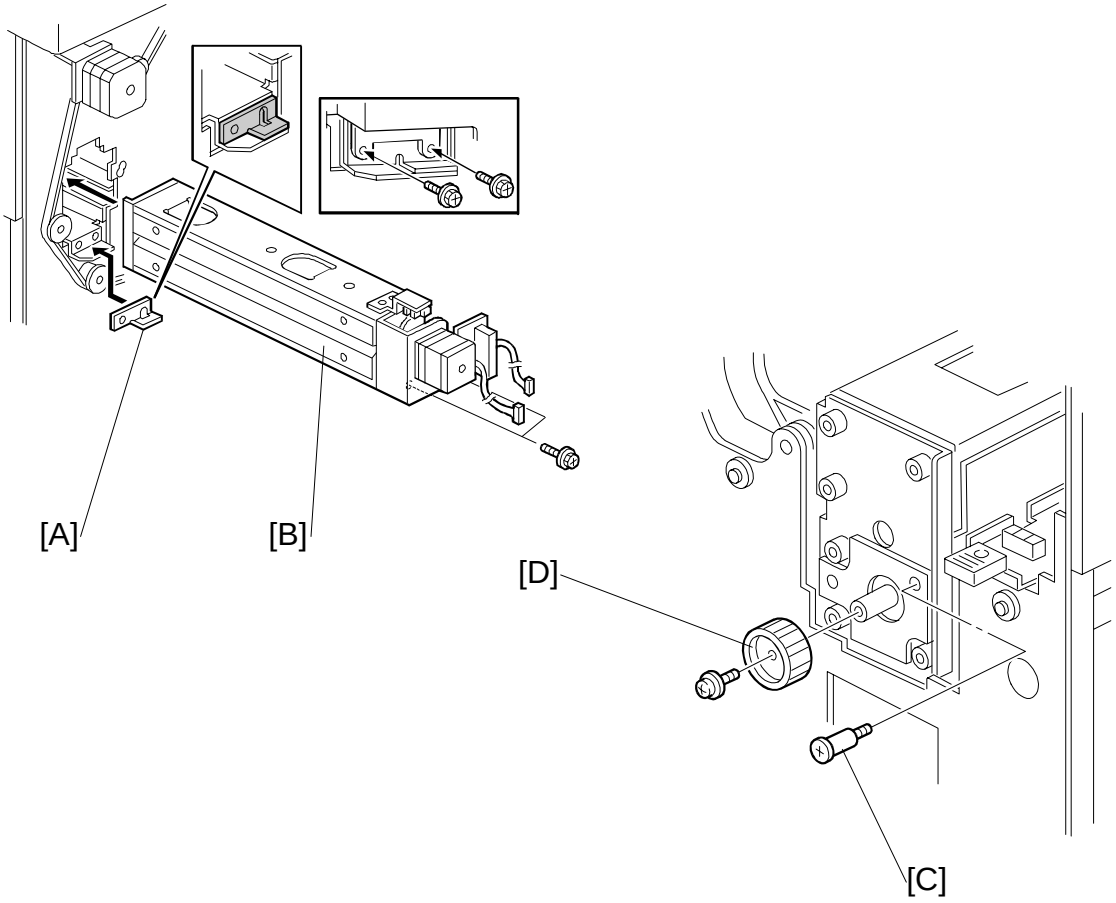
3.14.2 INSTALLATION PROCEDURE



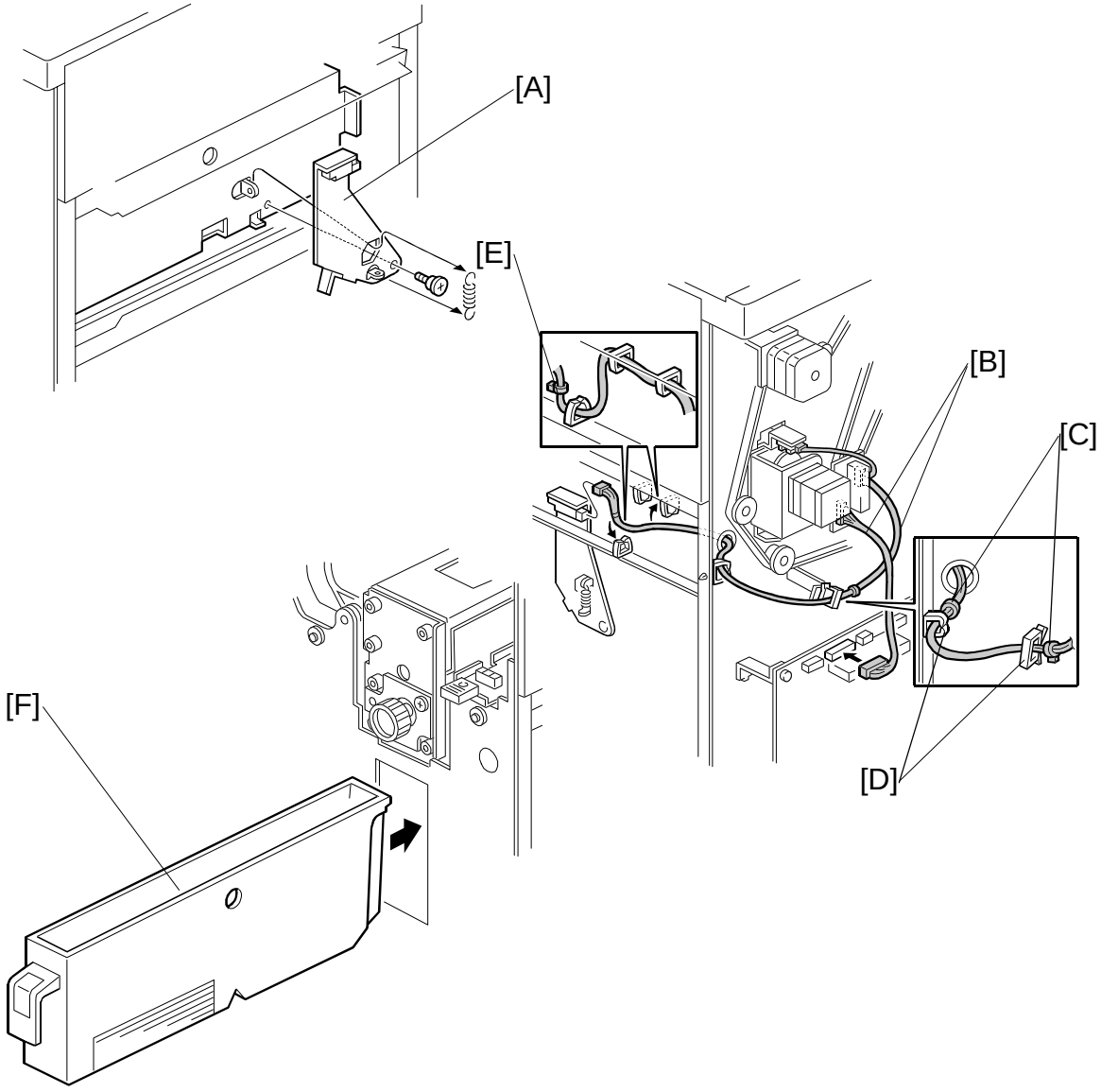
⚠CAUTION

Unplug the copier power cord and remove the 3,000-sheet finisher from the copier before starting the following procedure.

1. Unpack the punch unit and remove the shipping retainers [A] (4 screws) and [B] (1 screw).
2. Open the front door and remove the hopper cover [C] (2 screws).
3. Remove the finisher rear cover (2 screws) and remove the transport guide plate [D] (4 screws).



4. Install the spacer [A] (thickness = 2 mm).
   NOTE: There are three spacers in the accessory box. Do not lose the other two spacers (1 mm) because they are used for adjusting the punch hole position.
5. Install the punch unit [B] and secure it with a long stepped screw [C].
6. Install the punch unit knob [D] (1 screw).
7. Secure the rear of the punch unit (2 screws).

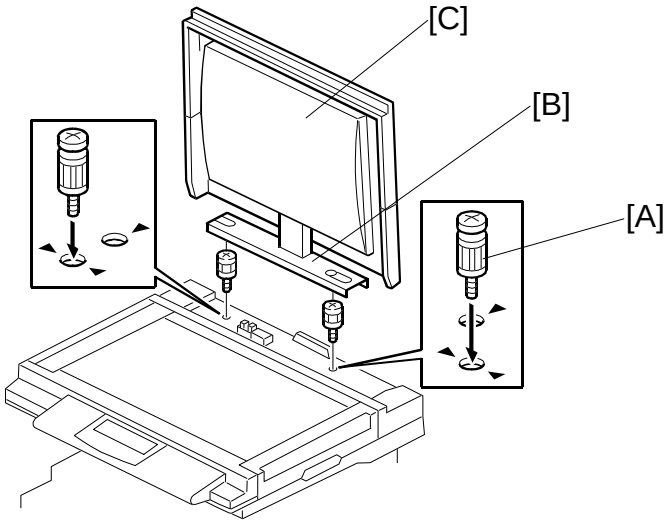


8. Install the sensor bracket [A] (1 short stepped screw, 1 spring).
9. Connect the harnesses [B].

NOTE: 1) The harness binders [C] must not be between the harness clamps [D].
2) The harness binder [E] must be positioned to the left of the harness clamp.

10. **When a three-punch-hole unit is installed:** Change switch 1 of DIP SW 100 on the finisher control board to ON.
11. Slide the hopper [F] into the finisher.
12. Reassemble the finisher and attach the 3,000-sheet finisher to the copier, then check the punch unit function.

3.15 PLATEN COVER INSTALLATION



1. Install the two stud screws [A] on the top cover as shown.
2. Position the platen cover bracket [B] on the stud screws and slide the platen cover [C] to the left.

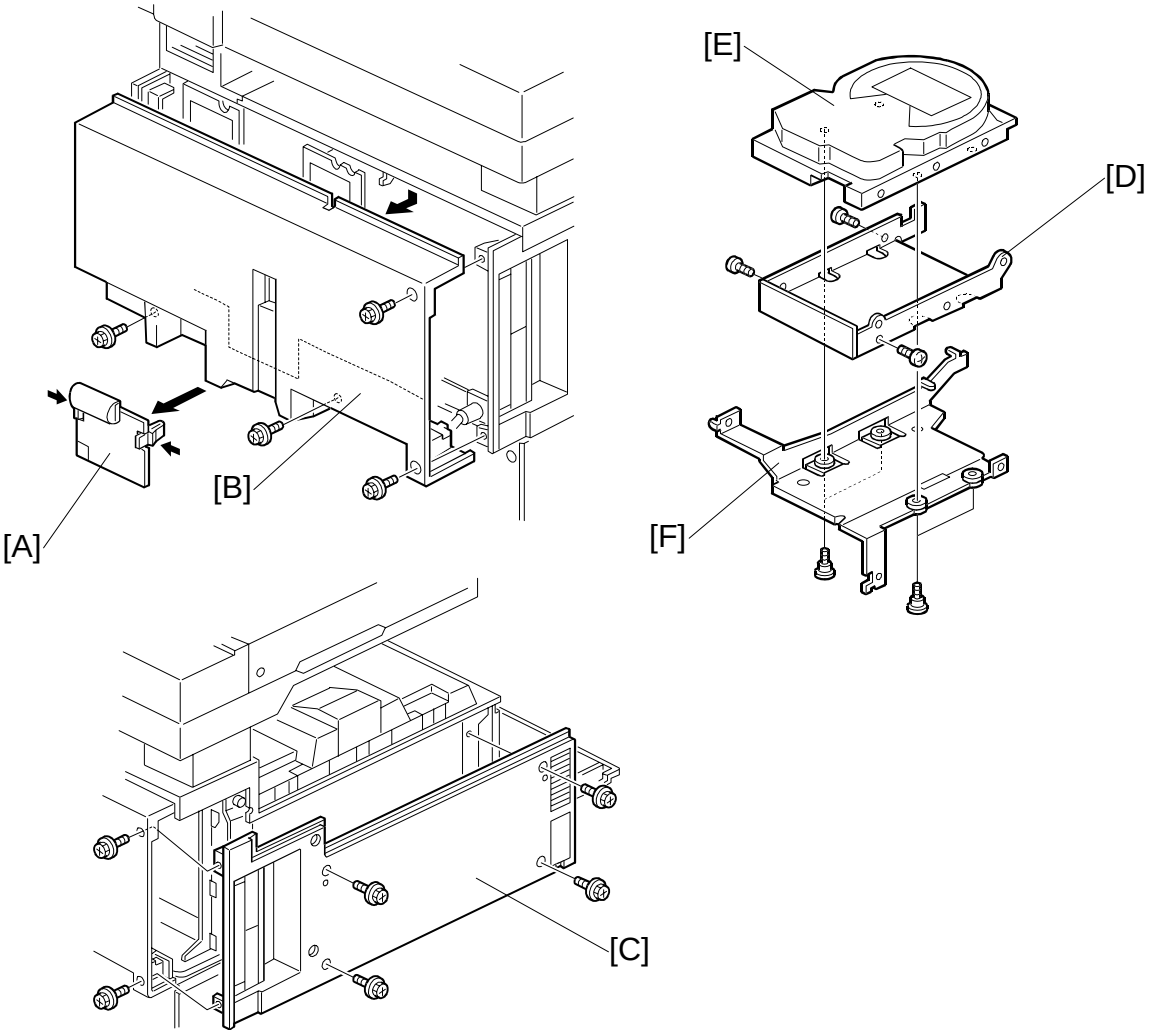
3.16 IMAGE ENHACEMENT KIT (HDD) INSTALLATION

3.16.1 ACCESSORY CHECK

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

Description	Q'ty
1. HDD	1
2. MSU	1
3. HDD Case	1
4. HDD Bracket	1
5. MSU Bracket	1
6. DC Harness	1
7. Interface Harness – MSU/HDD	1
8. Shield Plate	1
9. Harness Clamp	1
10. Stepped Screw	4
11. Pan Head Screw – M3x6	9
12. Screw – M3x6	4

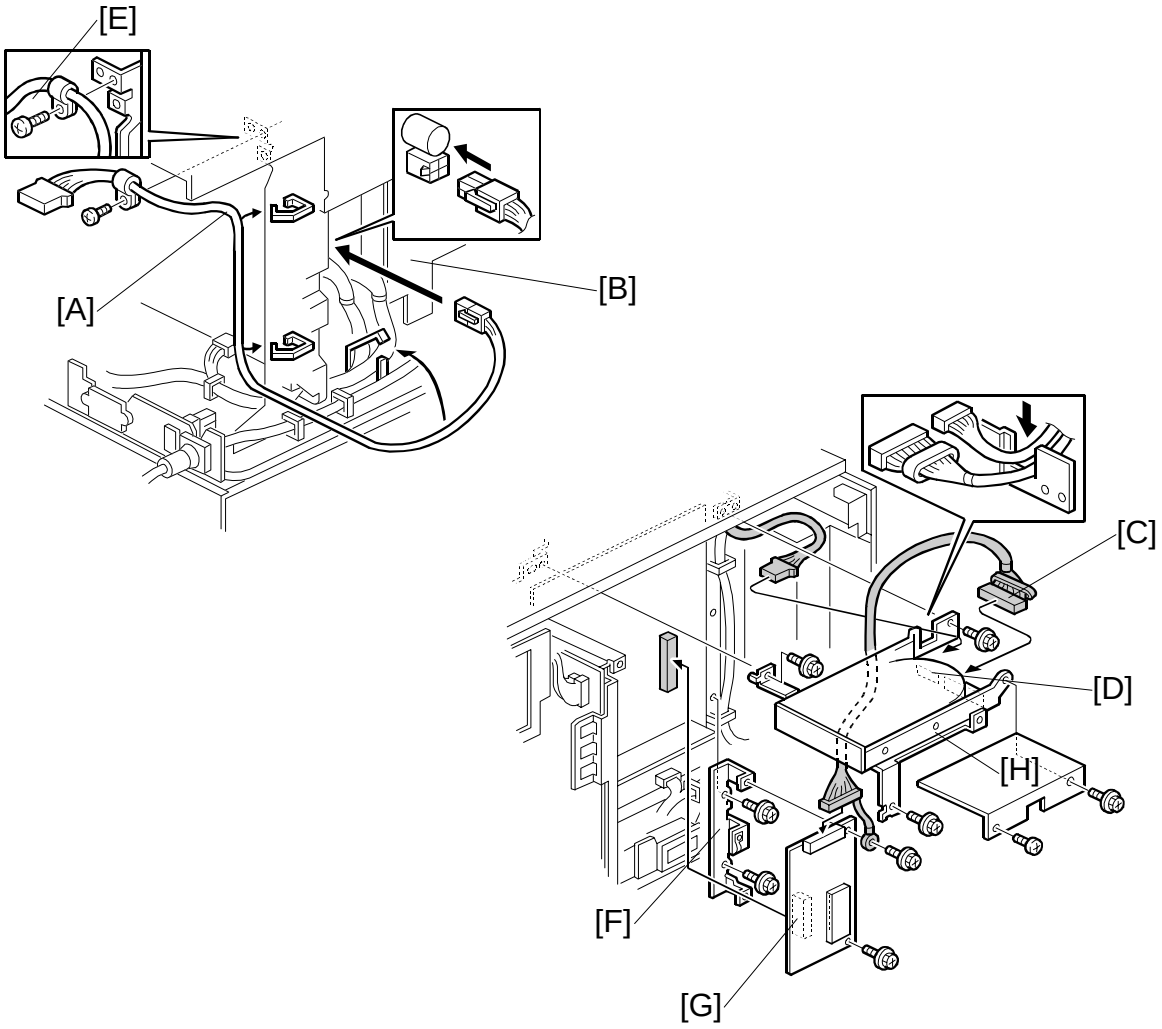
3.16.2 INSTALLATION PROCEDURE



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

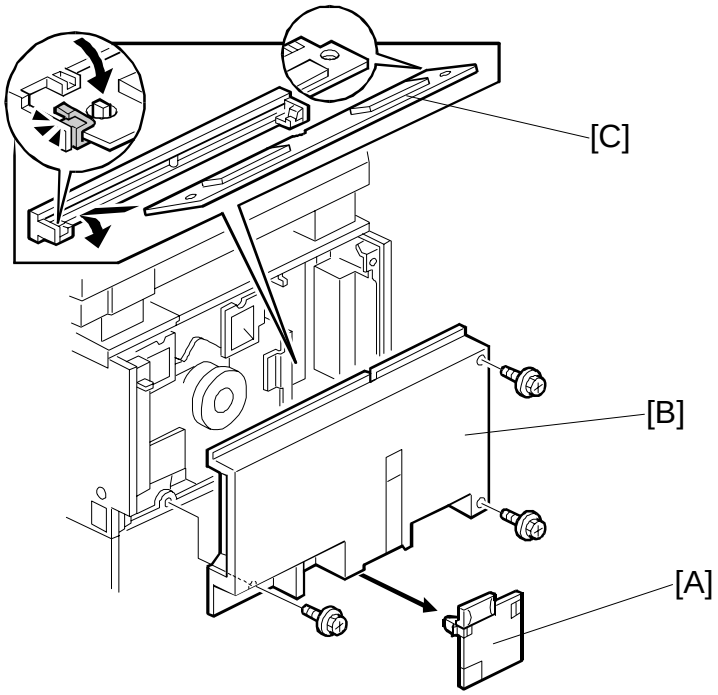
NOTE: 1) Do not drop or give a strong shock to the HDD.
2) When installing the HDD in an A230, the electric sort kit must also be installed.
3) If the expansion box has been installed, remove it before starting the following procedure.

1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Remove the upper left cover [C] (4 screws).
3. Attach the lower HDD case [D] to the HDD [E] (3 screws).
4. Install the HDD bracket [F] (4 stepped screws).



5. Connect the power cable of the HDD [A] to the PSU [B] and route the cable as shown.
6. Connect the power cable and the harness [C] to the HDD.
7. Install the HDD assembly [D] (3 screws).
   NOTE: Make sure that both harnesses are routed through the cutout in the lower HDD case.
8. Clamp the power cable with the metal clamper [E].
9. Install the HDD controller bracket [F] (2 screws).
10. Install the HDD controller [G] (2 screws) and connect the harness.
    NOTE: The upper screw secures the grounding wire, as shown.
11. Install the shield plate [H] (2 screws).

3.17 ELECTRIC SORT KIT INSTALLATION

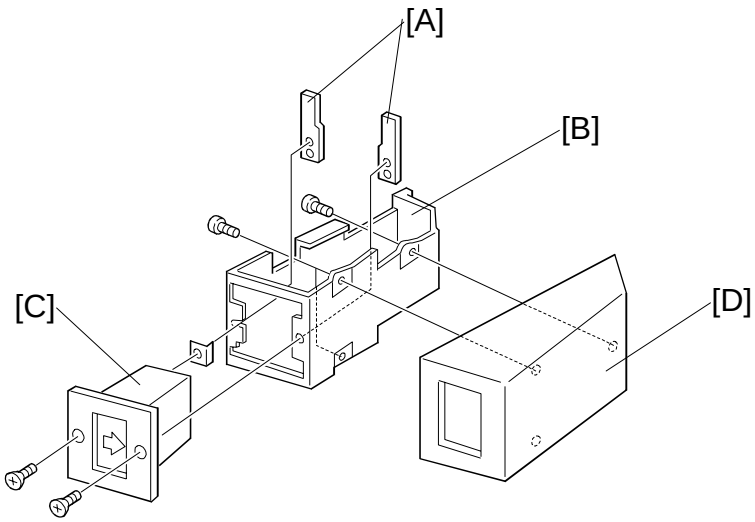


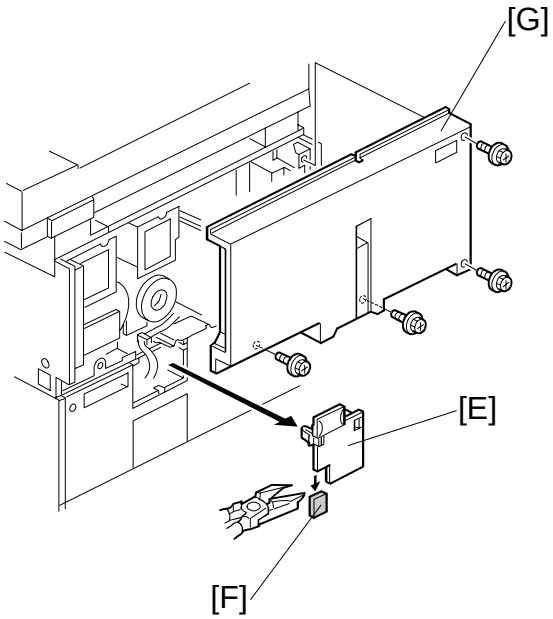
⚠CAUTION
Unplug the machine power cord before starting the following procedure.

NOTE: 1) Do not touch the connector strips (gold parts) with bare hands.
2) If the expansion box and hard disk have been installed, remove them before starting the following procedure.

1. Remove the connector cover [A].
2. Remove the rear cover [B] (4 screws).
3. Connect the electric sort kit [C] to the BICU, as shown.

3.18 KEY COUNTER INSTALLATION

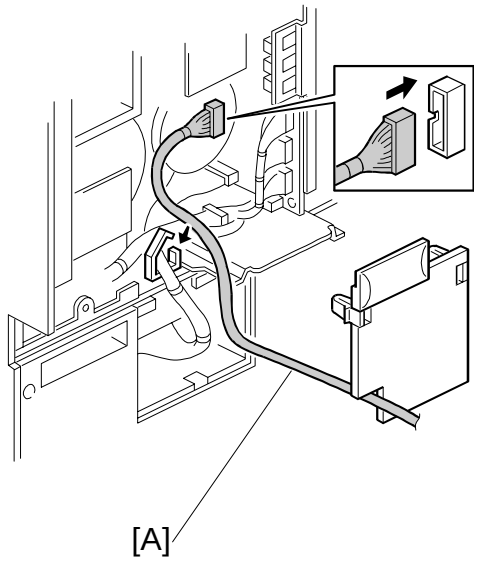


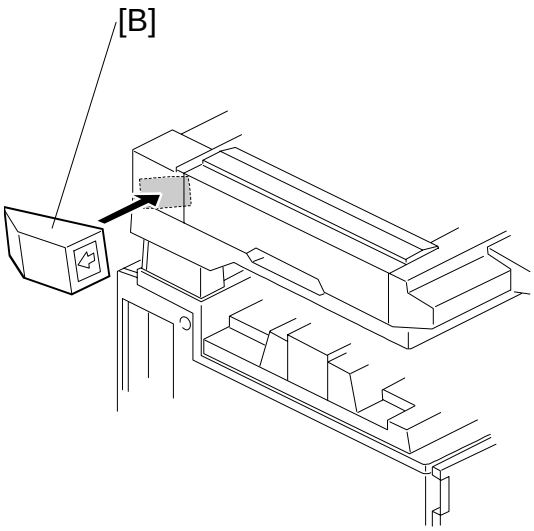


⚠CAUTION

Unplug the machine power cord before starting the following procedure.

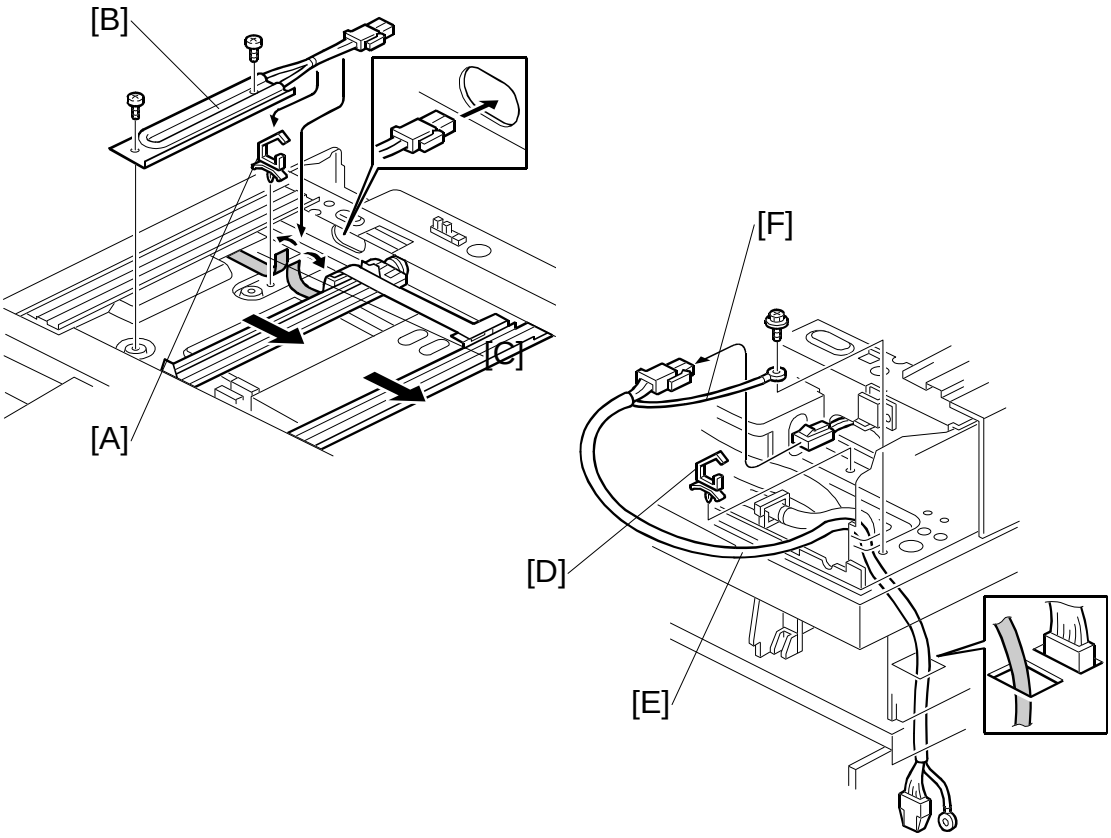
1. Hold the key counter plates [A] on the inside of the key counter bracket [B] and insert the key counter holder [C]
2. Secure the key counter holder to the bracket (2 screws).
3. Attach the key counter cover [D] (2 screws).
4. Remove the connector cover [E].
5. Cut off the part [F] of the connector cover.
6. Remove the rear cover [G] (4 screws).





7. Connect the key counter connector [A] to CN211 on the I/O board.
8. Reinstall the covers.
9. Attach the double-sided tape to the key counter bracket.
10. Peel off the backing of the double-sided tape and attach the key counter assembly [B] to the left side of the scanner unit, as shown.
    NOTE: When attaching the key counter assembly, press the assembly against the scanner cover strongly. Otherwise, the key counter assembly may come off easily.
11. Change the value of SP5-401-2 to 1.
    NOTE: The key counter function is available for Fax and Printer modes by changing the SP modes.
    SP5-401-52 (Fax mode)
    SP5-401-62 (Printer mode)

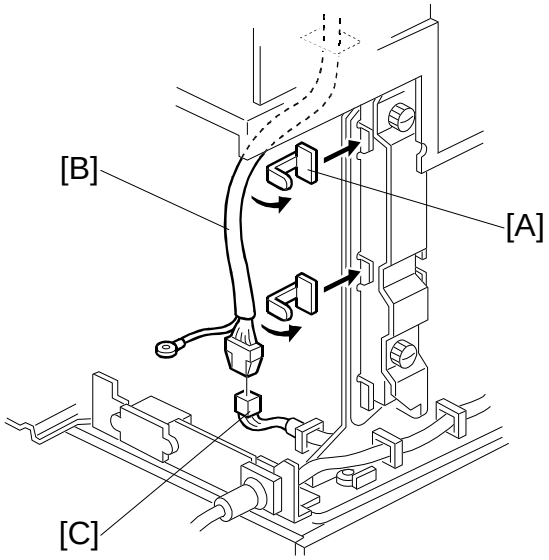
3.19 ANTI-CONDENSATION HEATER

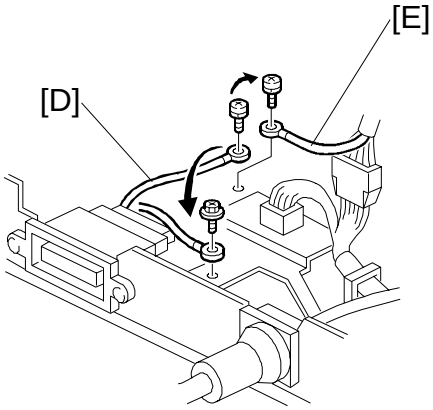


⚠CAUTION

Unplug the machine power cord before starting the following procedure.

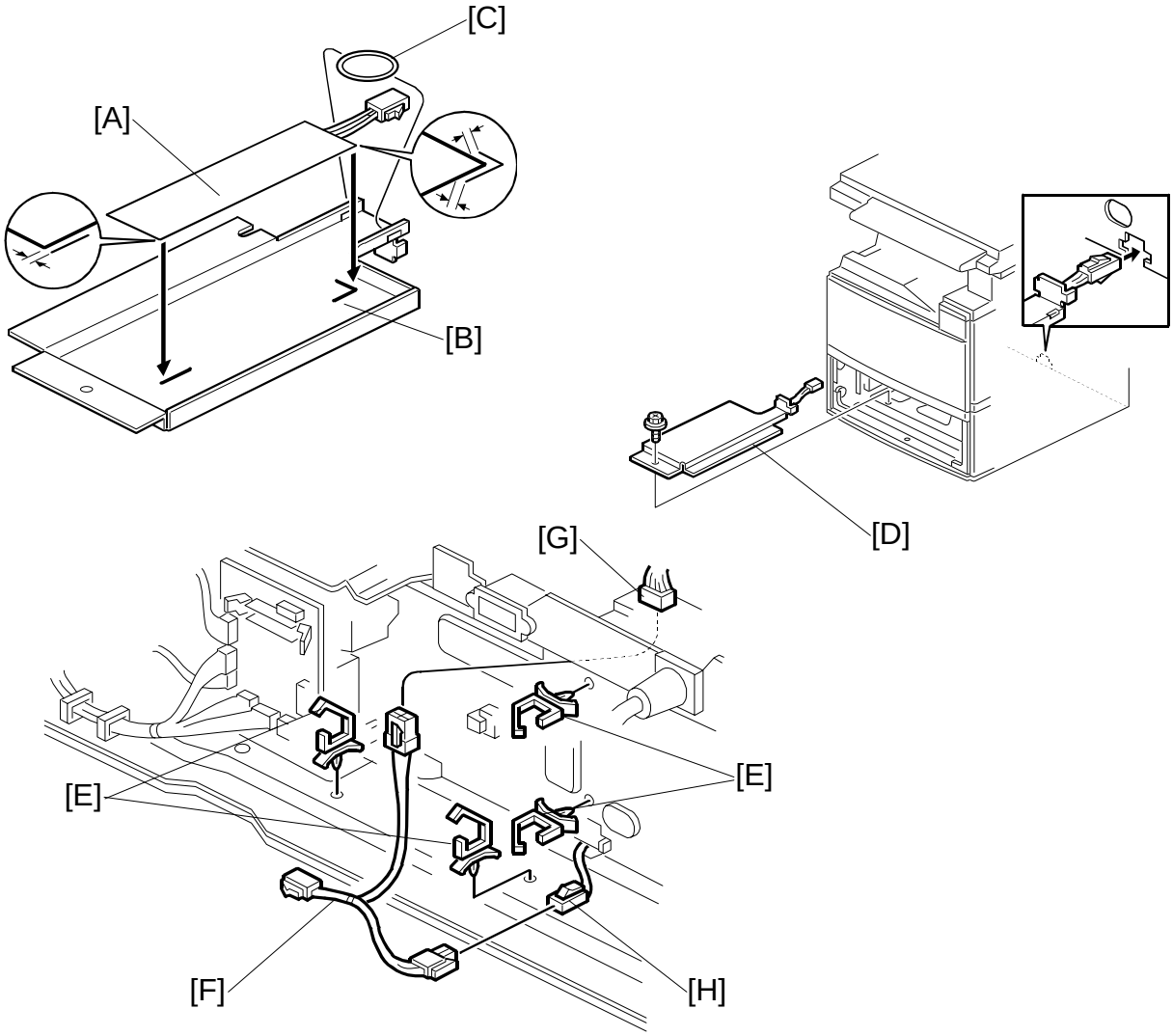
1. Remove the exposure glass, scanner rear cover, and stand rear cover (see Interchange Unit Installation for the stand rear cover).
2. Remove the rear cover and upper left cover.
3. Move the 1st and 2nd scanners to the right.
4. Install the harness clamp [A].
5. Install the anti-condensation heater [B] (2 screws).
   NOTE: The heater harness should be routed under the harness guard [C].
6. Install the harness clamp [D].
7. Connect the connector [E] to the heater, then secure the grounding wire [F] (1 screw).





8. Install two harness clamps [A] on the stand bracket.
9. Connect the connector [B] to the ac power harness [C].
10. Move the grounding wire of the connector [D], as shown.
11. Secure the grounding wire [E] of the connector cable (1 screw).

3.20 TRAY HEATER

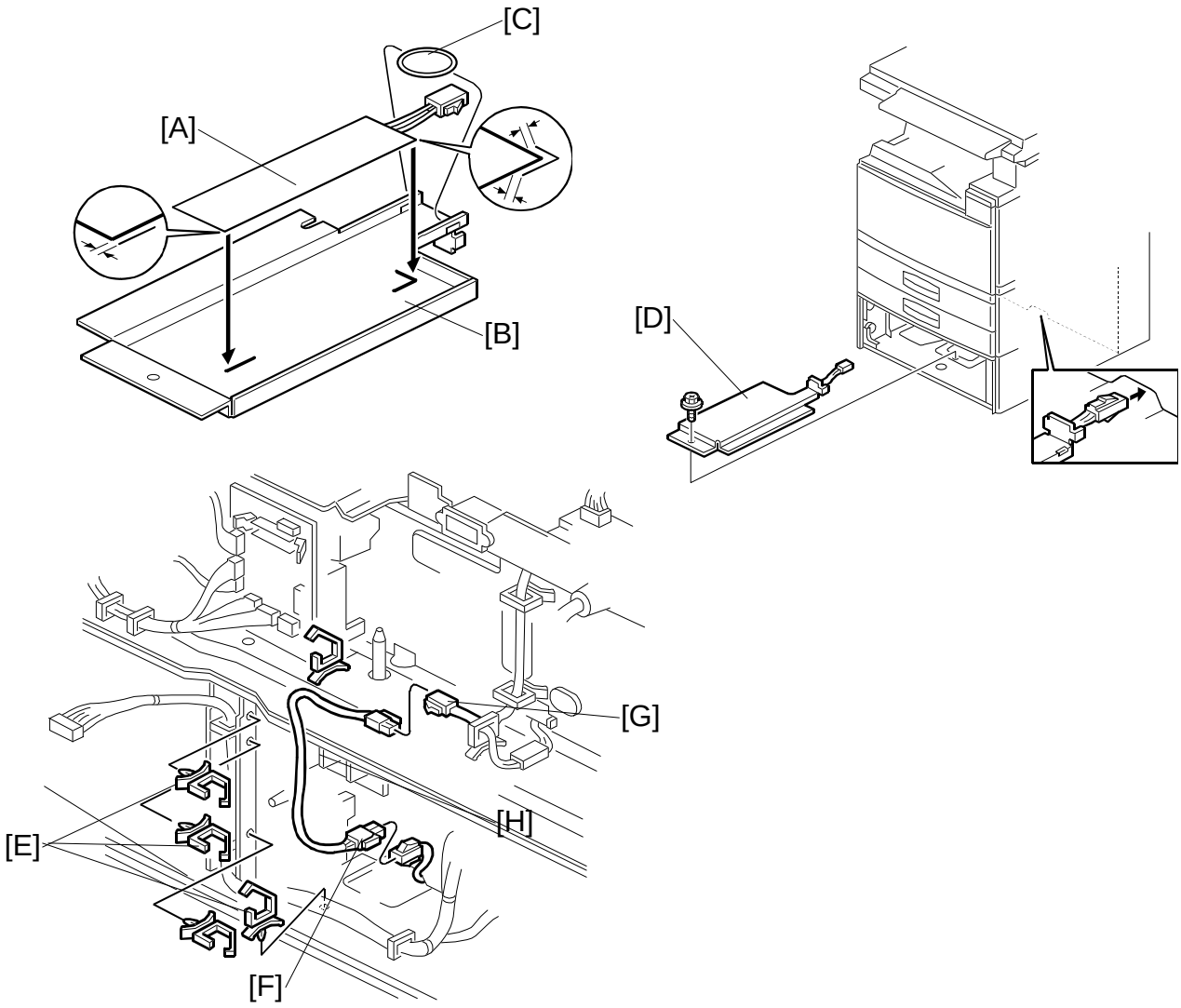


⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Attach the optional tray heater [A] to the heater bracket [B].
2. Install the harness holder [C].
3. Remove the rear cover.
4. Draw out the upper and lower paper trays.
5. Install the heater assembly [D] (1 screw).
6. Install four harness clamps [E] as shown.
7. Route the harness [F] and connect it to the ac harness [G] and heater harness [H].

3.21 TRAY HEATER (OPTIONAL PAPER TRAY UNIT)



⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Attach the optional tray heater [A] to the heater bracket [B].
2. Install the harness holder [C].
3. Remove the rear cover of the machine and the rear cover of the optional paper tray unit.
4. Draw out the upper and lower paper trays of the optional paper tray unit.
5. Install the heater assembly [D] (1 screw).
6. Install four harness clamps [E] as shown.
7. Route the harness [F] and connect it to the harness [G] and heater harness [H].

SERVICE TABLES

4. SERVICE TABLES

4.1 GENERAL CAUTIONS

Do not turn off either the power switch while any of the electrical components are active. Doing so might cause damage to units such as the transfer belt, drum, and development unit when they are pulled out of or put back into the copier.

4.1.1 DRUM

An organic photoconductor (OPC) drum is more sensitive to light and ammonia gas than a selenium drum. Follow the cautions below when handling an OPC drum.

1. Never expose the drum to direct sunlight.
2. Never expose the drum to direct light of more than 1,000 Lux for more than a minute.
3. Never touch the drum surface with bare hands. When the drum surface is touched with a finger or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with wet cotton.
4. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
5. Store the drum in a cool, dry place away from heat.
6. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
7. Never expose the drum to corrosive gases such as ammonia gas.
8. Always keep the drum in the protective sheet when keeping the drum unit, or the drum itself, out of the copier. Doing so avoids exposing it to bright light or direct sunlight, and will protect it from light fatigue.
9. Before pulling out the PCU, place a sheet of paper under the PCU to catch any spilled toner.
10. Dispose of used drums in accordance with local regulations.
11. When installing a new drum in the PCU, the following must be done in the stated order.
    1) Remove the protective sheet after securing the new drum in the drum unit.
    2) Make sure that the charge roller voltage supply is at the standard value (SP2-001-1).
    3) Do the ID Sensor Initial Setting procedure (SP 3-001-2)
    4) Do SP2-805 (developer initialization).
12. When installing the PCU, make sure that the PCU is set in the machine properly.

4.1.2 TRANSFER BELT UNIT

1. Replace the transfer belt every PM cycle (150K copies) to avoid bad effects on the drum.
2. Never touch the transfer belt surface with bare hands.
3. Take care not to scratch the transfer belt as the surface is easily damaged.
4. Before installing the new transfer belt, clean all the rollers and the inner part of the transfer belt with a dry cloth to prevent the belt from slipping.

4.1.3 SCANNER UNIT

1. When installing the exposure glass, make sure that the white paint is at the rear left corner.
2. Clean the exposure glass with alcohol or glass cleaner to reduce the amount of static electricity on the glass surface.
3. Use a cotton pad with water or a blower brush to clean the mirrors and lens.
4. Do not bend or crease the exposure lamp flat cable.
5. Do not disassemble the lens unit. Doing so will throw the lens and the copy image out of focus.
6. 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 would 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 lenses are very sensitive to dust. Do not open the optical housing unit.
4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.
5. After replacing the LD unit, do the laser beam pitch adjustment. Otherwise, an SC condition will be generated.

4.1.5 CHARGE ROLLER

1. Do not touch the charge roller with bare hands. Oil stains from fingers may cause uneven image density on copies.
2. Clean the charge roller with alcohol and water, then with a dry cloth

4.1.6 DEVELOPMENT

1. Be careful not to nick or scratch the development roller.
2. Place the development unit on a sheet of paper after removing it from the copier.
3. Never disassemble the development roller assembly. The position of the doctor plate is set with special tools and instruments at the factory to ensure the proper gap between the doctor blade and the development roller.
4. Clean the drive gears after removing used developer.
5. Dispose of used developer in accordance with local regulations.
6. Never load different types of developer and toner into the development unit. Doing so will cause poor copy quality and toner scattering.
7. Immediately after installing new developer, the TD sensor initial setting procedure should be performed to avoid damage to the copier. Do not perform the TD sensor initial setting with used developer. Do not make any copies before doing the TD sensor initial setting.
8. When using a vacuum cleaner to clean the development unit casing, always ground the casing with your fingers to avoid damaging the toner density sensor with static electricity.
9. After replacing the TD sensor, do the TD sensor initial setting procedure (SP 2-801).

4.1.7 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that it is movable.
2. Be careful not to damage the edges of the hot roller strippers or pressure 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.

4.1.8 PAPER FEED

1. Do not touch the surface of the pick-up, feed, and separation rollers.
2. The side fences and end fence of the paper tray must be positioned correctly to align with the actual paper size to avoid paper misfeeds.

4.1.9 USED TONER

1. The used toner in the transfer belt unit should be emptied at every PM cycle, but we recommend checking the amount of used toner at every EM.
2. Dispose of used toner in accordance with local regulations. Never throw toner into an open flame, for toner dust may ignite.

4.2 SERVICE PROGRAM MODE

4.2.1 SERVICE PROGRAM MODE OPERATION

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

Service Program Access Procedure

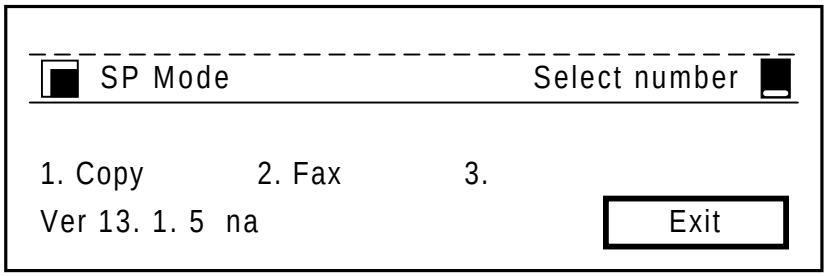
Entering SP mode

1) Press the following keys in sequence.

[#/P] → [1] → [0] → [7] → [C/P]

NOTE: Hold the [C/P] key for more than 3 seconds.

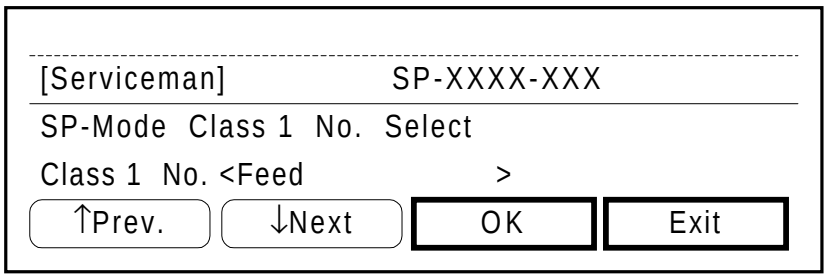
2) A menu of SP modes is displayed on the LCD.



NOTE: 1) The installed applications appear as 1. Copy, 2. Fax, 3. Printer, If an application is not installed, the application name will not appear.

2) The meaning of the bottom line is as follows.

- "Ver 13.1.5 na" is the BICU board software version.



3) Press the number for the application which you need (e.g. press "1" for copier). Then, the application's SP mode display will appear, as shown.

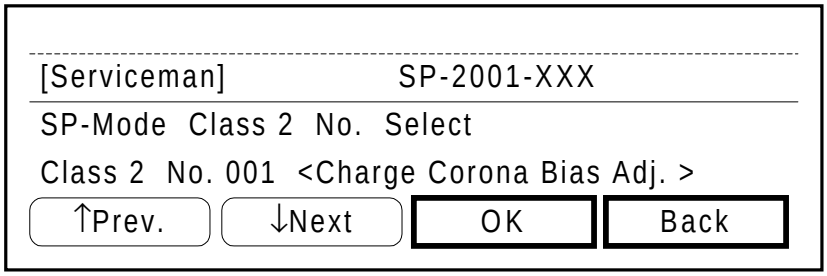
Exiting SP mode

1) Press the "Back" and "Exit" keys until the standby mode display appears.

Accessing Copy Mode from within an SP Mode

1) Press the (Interrupt) key.
2) Select the appropriate copy mode and make trial copies.
3) To return to the SP mode, press the (Interrupt) key again.

Selecting the Program Number



Program numbers are composed of two or three levels.

To input the required program number, select each program level in sequence.

1. Select the 1st level program number at the ten-key pad and press the # key or OK key.
   NOTE: The 1st level program number can be selected using the “arrow” keys or “Prev” key or “Next” key.
2. Select the 2nd level program number at the ten-key pad and press the # key or OK key.
   NOTE: The 2nd level program number can be selected using the “arrow” keys or “Prev” key or “Next” key.
3. If there any are 3rd level programs in the SP mode, they can be selected the same way as the 1st and 2nd level SP modes.
   NOTE: The 3rd level program number can be selected using the “arrow” keys or “Prev” key or “Next” key.

Inputting a Value or Setting for an SP Mode

1. Enter the required program mode as explained above.
2. Enter the required setting using the ten-key pad, then press the # key or OK key.

   NOTE: 1) If you forget to press the # key or OK key, the previous value remains.
   2) Change between “+” and “-“ using the ☒ key before entering the required value.

3. Exit SP mode.

4.2.2 SERVICE PROGRAM MODE TABLES

NOTE: 1) In the Function column, comments are in italics.
2) In the Settings column, the default value is in bold letters.
3) An asterisk " * " after the mode number means that this mode is stored in the NVRAM. If you do a RAM reset, all these SP modes will be reset to their factory settings.
4) In the Settings column, **(40)** indicates A232 and **(30)** indicates A230/A231

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-001 *		Leading Edge Registration	Adjusts the printing leading edge registration using the trimming area pattern (SP2-902-3, No.10).	+9 ~ -9 0.1 mm/step **+ 3.0 mm**
			Use the ●/✻ key to toggle between + and – before entering the value. *The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Adjustments" for details on SP 1-001 and 1-002.*	
1-002 *	1 *	Side-to-Side Registration (1st paper feed)	Adjusts the printing side-to-side registration from the 1st paper feed station using the trimming area pattern (SP2-902-3, No.10).	+9 ~ -9 0.1 mm/step **+ 3.0 mm**
			Use the ●/✻ key to toggle between + and - before entering the value. *The specification is 2 ±1.5 mm.*	
	2 *	Side-to-Side Registration (2nd paper feed)	Adjusts the printing side-to-side registration from the 2nd paper feed station using the trimming area pattern (SP2-902-3, No.10).	+9 ~ -9 0.1 mm/step **+ 3.0 mm**
			Use the ●/✻ key to toggle between + and - before entering the value. *The specification is 2 ±1.5 mm.*	
	3 *	Side-to-Side Registration (3rd paper feed: Option PFU tray 1 if present)	Adjusts the printing side-to-side registration from the 3rd paper feed station using the trimming area pattern (SP2-902-3, No.10).	+9 ~ -9 0.1 mm/step **+ 2.0 mm**
			Use the ●/✻ key to toggle between + and - before entering the value. *The specification is 2 ±1.5 mm.*	
	4 *	Side-to-Side Registration (4th paper feed: Option PFU tray 2 if present)	Adjusts the printing side-to-side registration from the 4th paper feed station using the trimming area pattern (SP2-902-3, No.10).	+9 ~ -9 0.1 mm/step **+ 2.0 mm**
			Use the ●/✻ key to toggle between + and - before entering the value. *The specification is 2 ±1.5 mm.*	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-002	5 *	Side-to-Side Registration (Duplex)	Adjusts the printing side-to-side registration from the duplex tray using the trimming area pattern (SP2-902-3, No.10).	+9 ~ -9 0.1 mm/step **+ 0.0 mm**
			Use the ●/✻ key to toggle between + and - before entering the value. *The specification is 2 ±1.5 mm. See "Replacement and Adjustment - Copy Adjustments" for details on SP1-002.*	
	6 *	Side-to-Side Registration (By-pass feed)	Adjusts the printing side-to-side registration from the by-pass feed table using the trimming area pattern (SP2-902-3, No.10).	+9 ~ -9 0.1 mm/step **+ 3.0 mm**
			Use the ●/✻ key to toggle between + and - before entering the value. *The specification is 2 ±1.5 mm.*	
	7 *	Side-to-Side Registration (LCT)	Adjusts the printing side-to-side registration from the LCT using the trimming area pattern (SP2-902-3, No.10).	+9 ~ -9 0.1 mm/step **+ 1.5 mm**
			Use the ●/✻ key to toggle between + and - before entering the value. *The specification is 2 ±1.5 mm.*	
1-003 *	1 *	Paper Feed Timing (Paper Feed Trays)	Adjusts the relay clutch timing at registration. The relay clutch timing determines the amount of paper buckle at registration. (A +ve setting leads to more buckling.)	+9 ~ -9 1 mm/step **+ 0 mm**
	2 *	Paper Feed Timing (Duplex)		
	3	Paper Feed Timing (By-pass)		
1-007		By-pass Feed Paper Size Display	Displays the paper width sensor data for the by-pass feed table.	
1-103 *		Fusing Idling	Selects whether fusing idling is done or not.	**0: Off** 1: On
			Normally disabled in this machine. However, if fusing is incomplete on the 1st and 2nd copies, switch it on. This may occur if the room is cold. *Refer to "Detailed Section Descriptions - Fusing Temperature Control" for more details.*	
1-104 *		Fusing Temperature Control	Selects the fusing temperature control mode.	**0: On/Off** 1: Phase

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
1-105 *	1*	Fusing Temperature Adjustment (Normal Tray)	Adjusts the fusing temperature for paper fed from a paper tray.	170 ~ 200 (40) 150 ~ 180 (30) 1°C/step **185°C (40)** **165°C (30)**
	2*	Fusing Temperature Adjustment (By-pass)	Adjusts the fusing temperature for paper fed from the by-pass feed unit.	170 ~ 200 (40) 160 ~ 190 (30) 1°C/step **185°C (40)** **175°C (30)**
1-106		Fusing Temperature Display	Displays the fusing temperature.	
1-109		Fusing Nip Band Check	Checks the fusing nip band *Refer to "Nip Band Width Adjustment" for more details.*	1: Start 0: Stop
1-111*		Paper Switch Back Timing (Duplex)	Adjusts the paper switch back timing *Use this SP mode when paper often jams at the inverter gate in the duplex unit.*	+ 5 ~ - 5 1 mm/step **0 mm**
2-001 *	1 *	Charge Roller Bias Adjustment (Copying)	Adjusts the voltage applied to the charge roller during copying. *After replacing the drum or charge roller, change this value to the default.*	-1000 ~ -2000 10 V/step **-1650 V (40)** **-1630 V (30)**
	2 *	Charge Roller Bias Adjustment (ID sensor pattern)	Adjusts the voltage applied to the charge roller when making the Vsdp ID sensor pattern (for charge roller voltage correction). The actual charge roller voltage is this value plus the value of SP2-001-1. ***Do not adjust.***	0 ~ 700 10 V/step **350 V**
2-005*	1 *	Charge Roller Bias Correction 1 (Lower threshold)	Adjusts the lower threshold value for the charge roller correction. *When the value of Vsp/Vsg is greater than this value, the charge roller voltage increases by 30 V (e.g., from –500 to –530).*	0.1 ~ 1.0 0.05/step **0.85**
	2 *	Charge Roller Bias Correction 2 (Upper threshold)	Adjusts the upper threshold value for the charge roller correction. *When the value of Vsp/Vsg is greater than this value, the charge roller voltage decreases by 30 V (absolute value).*	0.1 ~ 1.0 0.05/step **0.90**
	3 *	Charge Roller Bias Correction 3 (Lower limit)	Adjusts the lower limit value for charge roller voltage correction.	-1000 ~ -2000 10 V/step **-1650 V (40)** **-1630 V (30)**
	4 *	Charge Roller Bias Correction 4 (Upper limit)	Adjusts the upper limit value for charge roller voltage correction.	-1000 ~ -2000 10 V/step **-2000 V**

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-005*	5 *	Charge Roller Bias Correction Step	Adjusts the correction voltage adjustment step size.	0 ~ 100 10V/Step **30 V**
2-101 *	1 *	Leading Edge Erase Margin (Printing)	Adjusts the leading edge erase margin. *The specification is 3 ±2 mm. See "Replacement and Adjustment - Copy Adjustments" for details.*	0.0 ~ 9.0 0.1 mm/step **3.0 mm**
	2 *	Trailing Edge Erase Margin (Printing)	Adjusts the trailing edge erase margin. *The specification is 2 ±2 mm.*	0.0 ~ 9.0 0.1 mm/step **3.0 mm**
	3 *	Right Side Edge Erase Margin (Printing)	Adjusts the right side erase margin. *The specification is 2 +2.5/-1.5mm.*	0.0 ~ 9.0 0.1 mm/step **2.0 mm**
	4 *	Left Side Edge Erase Margin (Printing)	Adjusts the left side erase margin. *The specification is 2 ±1.5mm.*	0.0 ~ 9.0 0.1 mm/step **2.0 mm**
	5*	Trailing Edge Erase Margin (Back side)	Adjusts the trailing edge erase margin on the reverse side of duplex copies. *The specification is 2 ±2 mm*	0.0 ~ 4.0 0.1 mm/step **1.2 mm**
	6*	Right Side Erase Margin (Rear side)	Adjusts the right side erase margin in the reverse side of duplex copies. *The specification is 2 ±1.5 mm.*	0.0 ~ 9.0 0.1 mm/step **0.3 mm**
	7*	Left Side Erase Margin (Rear side)	Adjusts the left side erase margin in the reverse side of duplex copies. *The specification is 2 +2.5/-1.5 mm.*	0.0 ~ 9.0 0.1 mm/step **0.3 mm**
2-103 *	1*	LD Power Adjustment LD1 - 400dpi	Adjusts the power of LD1 for 400 dpi resolution. ***Do not change the value.***	-127 ~ +127 1/step 1=0.6 μW (30) 1=0.8 μW (40) **+0**
	2*	LD Power Adjustment LD1 - 600dpi	Adjusts the power of LD1 for 600 dpi resolution. ***Do not change the value.***	-127 ~ +127 1/step 1=0.6 μW (30) 1=0.8 μW (40) **+0**
	3*	LD Power Adjustment LD2 - 400dpi	Adjusts the power of LD2 for 400 dpi resolution. ***Do not change the value.***	-127 ~ +127 1/step 1=0.6 μW (30) 1=0.8 μW (40) **+0**
	4*	LD Power Adjustment LD2 - 600dpi	Adjusts the power of LD2 for 600 dpi resolution. ***Do not change the value.***	-127 ~ +127 1/step 1=0.6 μW (30) 1=0.8 μW (40) **+0**
	5	LD Power Adjustment – LD1	**Factory use only. Do not use this SP mode.**	0: Stop 1: Start

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-103 *	6	LD Power Adjustment – LD2	**Factory use only. Do not use this SP mode.**	0: Stop 1: Start
2-109*	1*	Laser Beam Pitch Adjustment – 400 dpi	Input the laser beam pitch value for 400 dpi resolution. *After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-109-3 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details.*	8 ~ 260 4 pulses/step **144**
	2*	Laser Beam Pitch Adjustment – 600 dpi	Input the laser beam pitch value for 600 dpi resolution. *After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-109-4 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details.*	28 ~ 280 4 pulses/step **168**
	3	Laser Beam Pitch Initial Setting – 400 dpi	Initializes the laser beam pitch for 400 dpi to the SP2-109-1 value. Press "1" to initialize. *After inputting data for SP2-109-1, this SP must be performed.*	1: Start
	4	Laser Beam Pitch Initial Setting – 600 dpi	Initializes the laser beam pitch for 600 dpi to the SP2-109-2 value. Press "1" to initialize. *After inputting data for SP2-109-2, this SP must be performed.*	1: Start
	5*	Laser Unit Auto. Adjustment Interval	Input the interval value of the laser beam pitch automatic adjustment. *When the number of times that the resolution been changed reaches this value, the laser unit position is automatically corrected.*	0 ~ 65535 1/step 1000 times
	6	Laser Beam Pitch Unit Position	Displays the current LD unit position (number of pulses from home position). If this is different from the value of 2-109-1 or 2-109-2, LD unit positioning has failed.	
	7	Laser Beam Pitch Change Counter	Displays how many times the LD unit position has been changed (how many times the resolution has changed.) *When the laser beam pitch adjustment is done, this counter is reset to "0".*	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-109*	8	Beam Pitch Data Reset	Resets the values of SP2-109-6 and SP2-109-7. Press "1" to reset. *After replacing the LD unit, this SP mode must be done.*	1: Start
2-110		Image Resolution Change	**Designer use only. Do not change this value.**	**0: 400 dpi** 1: 600 dpi 2: 15.4 x 16 3: 16 x 15.4
2-111*		FCI Setting	Select the FCI setting. This SP affects copier mode only. **Designer use only. Do not change this value.**	0: Through 1: Edge Smoothing **2: FCI On (parameter 2)** 3: FCI On (parameter 1)
2-112*		Polygon Motor Off Timer	Input the time that the polygon motor turns off after entering the stand-by condition. *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.*	0 ~ 60 1 s/step **10 s**
2-201 *	1 *	Development Bias Adjustment (for copying)	Adjusts the development bias for copying. *This can be adjusted as a temporary measure if faint copies appear due to an aging drum.*	200 ~ 700 10 V/step **600 V**
	2 *	Development Bias Adjustment (for ID sensor pattern)	Adjusts the development bias for making the ID sensor pattern for Vsp. *This should not be used in the field, because it affects ID sensor pattern density, which affects toner supply.*	200 ~ 700 1 V/step **380 V**
2-207		Forced Toner Supply	Forces the toner bottle to supply toner to the toner supply unit for 30 seconds. Press "1" to start. *Toner supply finishes automatically after 30 seconds. This process is not normally needed in the field for this model.*	1: Start
2-208 *		Toner Supply Mode	Selects the toner supply mode. *Use image pixel count mode only as a temporary measure if the ID or TD sensor is defective.*	**0**: Sensor 1: Image Pixel Count
2-209 *	1	Toner Supply Rate	Adjusts the toner supply rate. *Increasing this value reduces the toner supply clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.*	10 ~ 800 5 mg/s / step **30 mg/s**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-209 *	2*	Toner Supply Correction Coefficient	Displays the toner supply correction coefficient (K). It can also be used to adjust K, but the value is changed again when Vt is measured for the next copy. *The toner supply rate depends on the amount of toner in the toner bottle. This change is corrected using this coefficient. This SP can be used to check the toner supply condition. In general, the lower the value of K, the lower the toner density.*	0.25 ~ 3.00 0.25/step **3.00**
2-210 *		ID Detection Interval	Changes the interval for making the ID sensor pattern (VSP/VSG detection). *If the user normally makes copies with a high proportion of black, reduce the interval.*	10 ~ 200 1 copy/step **10 copies**
2-213*		Number of Copies After Toner Near-end Condition	Selects the number of copies can be made after entering a toner near-end condition. *If the user normally makes copies with a high proportion of black, reduce the interval.*	**0: 90 copies** 1: Unlimited 2: 10 copies
2-220 *		VREF Manual Setting	Adjust the TD sensor reference voltage (VREF). *Change this value after replacing the development unit with another one that already contains toner.* *For example, when using a development unit from another machine for test purposes, do the following:* *1. Check the value of SP2-220 in both the machine containing the test unit and the machine that you are going to move it to.* *2. Install the test development unit, then input the VREF for this unit into SP2-220.* *3. After the test, put back the old development unit, and change SP2-220 back to the original value.*	1.00 ~ 5.00 0.01V/step **4.00V**
2-223 *	1	VT Display	Displays the current TD sensor output voltage.	
	2	VT(10) Display (average)	Displays the average of the most recent 10 TD sensor outputs.	
	3	VT Change Rate Display (curve)	Displays the rate of change in the TD sensor output.	
	4	GAIN Display	Displays the value of GAIN which is used for calculating the toner supply motor on time.	
	5	Image Pixel Count Display	Displays the image pixel count.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-301 *	1 *	Transfer Current Adjustment (1st side of the paper)	Adjusts the current applied to the transfer belt during copying on the 1st side of the paper. *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	20 ~ 100 1 μA/step **45 μA (40)** **35 μA (30)**
	2 *	Transfer Current Adjustment (2nd side of the paper)	Adjusts the current applied to the transfer belt during copying on the 2nd side of the paper. *See above.*	20 ~ 100 1 μA/step **32 μA (40)** **25 μA (30)**
	3*	Transfer Current Adjustment (Leading edge of the paper)	Adjusts the current applied to the transfer belt during copying at the leading edge of the paper. *Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions.*	20 ~ 100 1 μA/step **45 μA (40)** **35 μA (30)**
	4 *	Transfer Current Adjustment Image Area (By-pass Feed)	Adjusts the current applied to the transfer belt during copying from the by-pass feed table. *See above. If the user normally feeds thicker paper from the bypass tray, use a higher setting..*	20 ~ 100 1 μA/step **45 μA (40)** **35 μA (30)**
	5*	Transfer Current Adjustment (Leading edge of the paper from by-pass Feed)	Adjusts the current applied to the transfer belt during copying at the leading edge of paper from the by-pass feed table. *Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions.*	20 ~ 100 1 μA/step **60 μA (40)** **45 μA (30)**
2-309*	1*	Transfer Current Correction a (Paper width - lower)	Adjusts the lower paper width threshold for the transfer current correction. *Use this SP when an image problem (e.g., insufficient toner transfer) occurs with a small width paper. If the paper width is smaller than this value, the transfer current will be multiplied by the factor in SP2-309-3 (paper tray) or SP2-309-5 (bypass).* *Refer to Detailed Section Descriptions – Image Transfer for more details.*	0 ~ 297 1 mm/step **150 mm**
	2*	Transfer Current Correction b (Paper width – upper)	Adjusts the upper paper width threshold for the transfer current correction. *As for SP2-309-1, but the factors are in SP2-309-4 (paper tray) and SP2-309-6 (bypass).*	0 ~ 297 1 mm/step **216 mm**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-309*	3*	Transfer Current Correction - α (Paper tray)	Adjusts the transfer current correction coefficient which is used if the paper width is less than the setting of SP2-309-1.	1.0 ~ 3.0 0.1/step **1.2**
	4*	Transfer Current Correction - β (Paper tray)	Adjusts the transfer current correction coefficient which is used if the paper width is less than the setting of SP2-309-2.	1.0 ~ 3.0 0.1/step **1.2**
	5*	Transfer Current Correction - γ (By-pass feed)	Adjusts the transfer current correction coefficient which is used if the paper width is less than the setting of SP2-309-1.	1.0 ~ 3.0 0.1/step **1.5**
	6*	Transfer Current Correction - δ (By-pass feed)	Adjusts the transfer current correction coefficient which is used if the paper width is less than the setting of SP2-309-2.	1.0 ~ 3.0 0.1/step **1.5**
2-801		TD Sensor Initial Setting	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 4.0 V. Press 1 to start. After finishing this, the TD sensor output voltage is displayed. *Use this mode only after installing the machine, changing the TD sensor, or adding new developer.*	1: Start
2-802*	1*	TD Sensor Manual Setting - V_{TS}	Adjusts the TD sensor output (V_T). *Change this value after replacing the development unit with another one that already contains toner.* *For example, when using a development unit from another machine for test purposes. To adjust V_T, use a similar procedure as for SP2-220.*	1.0 ~ 5.0 0.01V/step **4.00 V**
	2*	TD Sensor Manual Setting - V_{TMAX}	Adjusts the maximum value for SP2-802-1.	1.0 ~ 5.0 0.01V/step **4.10 V**
	3*	TD Sensor Manual Setting - V_{TMIN}	Adjusts the minimum value for SP2-802-1.	1.0 ~ 5.0 0.01V/step **3.70 V**
2-805		Developer Initialization	Performs the developer initial setting. Press 1 to start. *This SP should be performed after doing SP2-801-1 at installation and after replacing the drum.*	1. Start
2-902	2	Test Pattern Printing (IPU)	Prints the test patterns for the IPU chip. See section 4.2.3. for how to print test patterns. *This SP mode is useful for finding whether the BICU or the SBU is defective. If the printout is not OK, the BICU is defective.*	

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-902	3	Test Pattern Printing (Printing)	Prints the printer test patterns. See section 4.2.3. for how to print test patterns. Example: 10. Trimming Area	
			This SP mode is useful for finding whether the LDDR or the BICU is defective. If the printout is not OK, the LDDR is defective.	
2-909 *	1*	Main Scan Magnification (Copier)	Adjusts the magnification in the main scan direction for copy mode.	- 2.0 ~+ 2.0 0.1 %/step **+ 0.00 %**
			Use the ●/✻ key to toggle between + and -. See "Replacement and Adjustment - Copy Adjustments" for details.	
	2*	Main Scan Magnification (Printer)	Adjusts the magnification in the main scan direction when printing from a personal computer.	- 2.0 ~+ 2.0 0.1 %/step **+ 0.00 %**
			Use the ●/✻ key to toggle between + and -. See "Replacement and Adjustment - Copy Adjustments" for details.	
2-911*	1*	Transfer Current Timing (On Timing)	Adjusts the transfer current on timing at the leading edge.	-30 ~ +30 1 mm/step **0 mm**
	2*	Transfer Current Timing (Switch Timing)	Adjusts the transfer current switch timing. This determines when the leading edge stops and the image area current begins (see SP 2-301).	-30 ~ +30 1 mm/step **10 mm**
	3*	Transfer Current Timing (Off Timing)	Adjusts the transfer current off timing (– 5 mm is 5 mm after the trailing edge).	-30 ~ +30 1 mm/step **- 5 mm**
2-912*		Drum Reverse Rotation Time	**Designer use only. Do not change the value.**	0 ~ 50 1 ms/step **50 ms**
2-913		Test Pattern ID Adjustment	Adjusts the image density for printing test patterns (with SP2-902). Usually this SP mode is only used by designers.	0 ~ 15 1/step **15**
			The value is cleared when the main power switch is turned off and on.	
2-914*	1*	Process Control Setting - Cα	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1.	0 ~ 400 10 V/step **250 V**
			Use this SP when an image problem (such as white spots at the center of black dots or breaks in thin black lines) occurs when paper with a small width is fed from the by-pass feed tray.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
2-914*	2*	Process Control Setting - Cβ	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	0 ~ 400 10 V/step **50 V**
	3*	Process Control Setting - Bγ	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	0 ~ 400 10 V/step **200 V**
	4*	Process Control Setting - Bδ	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	0 ~ 400 10 V/step **50 V**
2-920		LD Off Check	**Factory use only.**	**0: On** 1: Off
2-921*		Shading Correction – Printer	Selects whether shading correction for printing is done or not. ***Do not change the setting.***	0: No **1: Yes**
2-960*		Toner Overflow Sensor	Select whether the toner overflow sensor is activated or not. ***Do not change the setting.***	0: No **1: Yes**
3-001*	1*	ID Sensor PWM Setting	This SP mode is added to solve the following problem. An SC condition occurs when ID Sensor Initial Setting is not done after doing an NVRAM Clear or replacing the NVRAM. *The PWM data is stored at doing the ID Sensor Initial Setting.*	0 ~ 255 1/step **100**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
3-001*	2*	ID Sensor Initial Setting	Performs the ID sensor initial setting. The ID sensor output for the bare drum (V_{SG}) is adjusted to 4.0 ± 0.2V. *This SP mode should be performed after replacing or cleaning the ID sensor or replacing the drum or doing an NVRAM clear.*	1: Start
3-103 *	1	ID Sensor Output Display	Displays the current V_{SG} and V_{SP} output.	V_{SP}= x.xx V
	2	ID Sensor Output – V_{SG}	*If the ID sensor does not detect the ID pattern, "V_{SP}=5.0V/V_{SG}=5.0V" is displayed and an SC code is generated.*	V_{SG}= x.xx V
	3	ID Sensor Output - V_{SDP}	*If the ID sensor does not detect the bare area of the drum, "V_{SP}=0.0V/V_{SG}=0.0V" is displayed and an SC code is generated.*	V_{SDP}= x.xxV
3-903*		Initialization at Power-up	Decides whether or not the machine is initialized (drum cleaning, charge roller H.P check, charge roller voltage correction, etc) at power-up. *If set to "1", the fusing idling mode is disabled regardless of the setting of SP1-103.*	**0: Yes** 1: No
4-008 *		Main Scan Magnification (Scanning)	Adjusts the magnification in the main scan direction for scanning. If this value is changed, the scanner motor speed is changed. *Use the ●/✻ key to toggle between + and -. See "Replacement and Adjustment - Copy Adjustments" for details.*	- 9.0 ~ + 9.0 0.1 %/step **+ 0.0 %**
4-010 *		Leading Edge Registration (Scanning)	Adjusts the leading edge registration for scanning. *(-): The image moves in the direction of the leading edge* *Use the ●/✻ key to toggle between + and -. See "Replacement and Adjustment - Copy Adjustments" for details.*	- 9.0 ~ + 9.0 0.1 mm/step **+ 0.0 mm**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-011 *		Side-to Side Registration (Scanning)	Adjusts the side-to-side registration for scanning. *(-): The image disappears at the left side.* *(+): The image appears at the left side.* *Use the ●/✻ key to toggle between + and -. See "Replacement and Adjustment - Copy Adjustments" for details.*	- 6.0 ~ + 6.0 0.1 mm/step **+ 1.0 mm**
4-012 *	1 *	Leading Edge Erase Margin (Scanning)	Adjusts the leading edge erase margin for scanning. *Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	2 *	Trailing Edge Erase Margin (Scanning)	Adjusts the trailing edge erase margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	3 *	Right Side Erase Margin (Scanning)	Adjusts the right side erase margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	4 *	Left Side Erase Margin (Scanning)	Adjusts the left side erase margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
4-013		Scanner Free Run	Performs a scanner free run with the exposure lamp off.	0: Stop 1: Start
4-301		APS Sensor Output Check	Displays the APS sensor output signals when an original is placed on the exposure glass. Bit 0: Width sensor 1 Bit 1: Width sensor 2 Bit 2: Length sensor 1 Bit 3: Length sensor 2 Bit 4: Length sensor 3 See “Detailed Section Descriptions – Original Size Detection in Platen Mode” for more details.	00000000 0: Not detected 1: Detected
⇒ 4-303 *		APS Small Size Original Detection	Selects whether or not the copier determines that the original is A5/HLT size when the APS sensor does not detect the size. (Screen Display LT) *If "A5 length/5 1/2" x 8 1/2" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise or 5 1/2" x 8 1/2".* *If "Not detected" is selected, "Cannot detect original size" will be displayed.*	**0: Not detected** 1: A5 length / 5 1/2" x 8 1/2"
4-428*	1*	Standard White Level Adjustment Flag	Displays whether or not the standard white level adjustment has been done.	0: Performed 1: Not performed

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-428*	2	Standard White Level Adjustment	Corrects the standard white level of the white plate. ***This SP mode is for factory use only. Do not use this SP mode.***	1: Start
4-901 *	1*	SBU E/O Adjustment – E ch	Checks the difference value of the black level for the EVEN channel after adjusting the black level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~255 1/step **127**
	2*	SBU E/O Adjustment – O ch (A232 only)	Checks the difference value of the black level for the ODD channel after adjusting the black level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~255 1/step **127**
	3*	Black Level Adjustment - E ch	Checks the value of the black level for the EVEN channel after adjusting the black level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **145**
	4*	Black Level Adjustment - O ch (A232 only)	Checks the value of the black level for the ODD channel after adjusting the black level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **145**
	5*	Digital Gain Adjustment – E ch	Checks the AGC gain value of the white level for the EVEN channel after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
	6*	Digital Gain Adjustment – O ch (A232 only)	Checks the AGC gain value of the white level for the ODD channel after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **0**
	7*	Analog Gain Adjustment – E ch	Checks the AGC gain value of the white level for the EVEN channel after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **46**
	8*	Analog Gain Adjustment – O ch (A232 only)	Checks the AGC gain value of the white level for the ODD channel after adjusting the white level at power-up. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **46**
	9*	Standard White Level Display	Checks the value of the standard white level after adjusting the white level. ***This SP mode is for factory use only. Do not use this SP mode.***	0 ~ 255 1/step **110**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-901*	10*	A/D Standard Voltage in ADS Mode	Adjusts the upper limit voltage for A/D conversion in ADS mode. ***This SP mode is for designer use only. Do not use this SP mode.***	0 ~ 255 1/step **191**
	11	Image Data Path (SBU)	***This SP mode is for designer use only. Do not change the value.***	**0**
	12 *	Gain Adjustment - E ch	Checks the AGC gain value of the white level for the EVEN channel after adjusting the white level in the factory. ***This SP mode is for factory use only. Do not use this SP mode.***	INI_GAIN (E): **0:23**
	13*	Gain Adjustment - O ch	Checks the AGC gain value of the white level for the ODD channel after adjusting the white level in the factory. ***This SP mode is for factory use only. Do not use this SP mode.***	INI_GAIN (E): **0:23**
	14*	Standard White Level	Checks the value of the standard white level in the factory. ***This SP mode is for factory use only. Do not use this SP mode.***	INI_FER=**110**
	15	Overflow Flag	Checks the overflow flag data during the automatic scanner adjustment. ***This SP mode is for designer use only.***	OFO/SGDO = **0000** OFE/SGDO = **0000**
	16	Time Out Flag	Checks the time out flag data during the automatic scanner adjustment. ***This SP mode is for designer use only.***	TIME OUT/SGDO = **0000**
	17	Error Flag	Checks the error flag data during the automatic scanner adjustment. ***This SP mode is for designer use only.***	GAIN/OET=**00** REF/OT=**00**
	18	White Shading Max/Min Data	Checks either the maximum or minimum white shading data. ***This SP mode is for designer use only.***	0: Maximum 1: Minimum
	19*	Digital Gain Adjustment – E ch (Scanner App.)	**These SP modes are used only for the Japanese version. Do not change the values.**	**0**
	20*	Digital Gain Adjustment – O ch (Scanner App.)		**0**
	21*	Analog Gain Adjustment – E ch (Scanner App.)		**39 (40) 51 (30)**
	22*	Digital Gain Adjustment – O ch (Scanner App.)		**39**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-902*	9*	Gate Signal Masking	**This SP mode is for designers only. Do not change the value.**	**1**
	13	Intermittent Control Mode	**This SP mode is for designers only. Do not change the value.**	**0**
4-903 *	2*	Filter Mode Setting	Selects the filter combination of the flare filter and edge filter. 0: Flare off, edge off 1: Flare on, edge off 2: Flare off, edge on 3: Flare on, edge on ***Do not change the value.***	0 ~ 3 **0**
	5	Full Size Mode	Selects whether the copy is always in full size mode even if the magnification ratio has been changed. *Set to 1 when checking the magnification in the main scan direction. If the magnification is not 100%, something is wrong with the image processing circuits.*	**0: Normal operation** 1: Always full size mode
	7	Image Shift in Magnification Mode	Adjusts the pixel shift amount in the main scan direction in magnification mode. ***This SP mode is for designer use only.***	0 ~ 5120 1/step **0**
	10*	25%/50% Reduction in Fax Mode	Selects whether the 25% and 50% reduction in fax mode is available or not. ***Do not change the setting.***	**0: Available** 1: Not available
	11*	MTF Filter Coefficient Level (25% ~ 64%)	Selects the MTF filter coefficient for 25% ~ 64% reduction for letter mode using greyscale processing. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **7**
	12*	MTF Filter Coefficient Level (65% ~ 154%)	Selects the MTF filter coefficient for 65% ~ 154% magnification for letter mode using greyscale processing. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **6**
	13*	MTF Filter Coefficient Level (155% ~ 256%)	Selects the MTF filter coefficient for 155% ~ 256% enlargement for letter mode using greyscale processing. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **10**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-903 *	14*	MTF Filter Coefficient Level (257% ~ 400%)	Selects the MTF filter coefficient for 257% ~ 400% enlargement for letter mode using greyscale processing. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **10**
	15*	MTF Filter Coefficient Level (Photo mode)	Selects the MTF filter coefficient for photo mode using greyscale mode, if MTF is enabled for this mode with SP 4-904-3. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **4**
	16*	Smoothing Filter Coefficient Level (Photo mode)	Selects the smoothing filter coefficient for photo mode using greyscale mode, if smoothing is enabled for photo with SP 4-904-3. Weak Strong 7–6–0–5–2–1–3–4	0 ~ 8 1/step **1**
	17*	MTF Filter Coefficient Level (Text/Photo mode)	Selects the MTF filter coefficient for text/photo mode using greyscale mode. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **2**
	18*	MTF Filter Coefficient Level (Low Density Original mode)	Selects the MTF filter coefficient for low density original mode (greyscale mode only). Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **0**
	19*	MTF Filter Coefficient Level (Copied Original mode)	Selects the MTF filter coefficient for copied original mode (greyscale mode only). Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **4**
	20*	MTF Filter Strength Level (25% ~ 64%)	Selects the MTF strength for 25% ~ 64% reduction for letter mode using greyscale processing.	0: x 0.25 1: x 0.5 **2: x 1** 3: x 2 4: x 4
	21*	MTF Filter Strength Level (65% ~ 154%)	Selects the MTF strength for 65% ~ 154% magnification for letter mode using greyscale processing.	0: x 0.25 1: x 0.5 **2: x 1** 3: x 2 4: x 4
	22*	MTF Filter Strength Level (155% ~ 256%)	Selects the MTF strength for 155% ~ 256% enlargement for letter mode using greyscale processing.	0: x 0.25 1: x 0.5 **2: x 1** 3: x 2 4: x 4
	23*	MTF Filter Strength Level (257% ~ 400%)	Selects the MTF strength for 257% ~ 400% enlargement for letter mode using greyscale processing.	0: x 0.25 1: x 0.5 **2: x 1** 3: x 2 4: x 4

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-903 *	24*	MTF Filter Strength Level (Photo mode)	Selects the MTF strength for photo mode using greyscale mode, if MTF is enabled for this mode with SP 4-904-3.	0: x 0.25 **1: x 0.5** 2: x 1 3: x 2 4: x 4
	25*	MTF Filter Strength Level (Text/Photo mode)	Selects the MTF strength for text/photo mode using greyscale mode.	0: x 0.25 **1: x 0.5** 2: x 1 3: x 2 4: x 4
	26*	MTF Filter Strength Level (Light Original)	Selects the MTF strength for low density original mode using greyscale mode.	0: x 0.25 1: x 0.5 2: x 1 **3: x 2** 4: x 4
	27*	MTF Filter Strength Level (Generation Copy)	Selects the MTF strength for copied original mode using greyscale mode.	0: x 0.25 **1: x 0.5** 2: x 1 3: x 2 4: x 4
	28*	Independent Dot Erase Level (Letter mode: Grayscale Processing)	Selects the independent dot erase level for letter mode with grayscale processing mode. *Refer to "Detailed Section Description – Independent Dot Erase" for details.*	0 ~ 15 1/step **11**
	29*	Independent Dot Erase Level (Letter mode: Binary Processing)	Selects the independent dot erase level for letter mode with binary processing mode. *Refer to "Detailed Sectional Description – Independent Dot Erase" for details.*	0 ~ 15 1/step **13**
	30*	Independent Dot Erase Level (Text/Photo mode: Greyscale and binary picture modes)	Selects the independent dot erase level for text/photo mode. *Refer to "Detailed Section Description – Independent Dot Erase" for details.*	0 ~ 15 1/step **0 (Disabled)**
	31*	Independent Dot Erase Level (Light Original)	Selects the independent dot erase level for low density original mode. *Refer to "Detailed Section Description – Independent Dot Erase" for details.*	0 ~ 15 1/step **0 (Disabled)**
	32*	Independent Dot Erase Level (Generation Copy)	Selects the independent dot erase level for copied original mode. *Refer to "Detailed Sectional Description – Independent Dot Erase" for details.*	0 ~ 15 1/step **11**
	33*	Smoothing Filter Threshold Level	Adjusts the threshold level for the edge filter. *This value is only effective when the setting of SP4-903-2 is "2" or "3" – Normally not used.*	0 ~ 255 1/step **200**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-903 *	34*	Background Erase Level (Text mode)	Adjust the threshold level for the background erase function in the text mode. *A larger value reduces dirty background.*	0 ~ 255 1/step **20**
	35*	Background Erase Level (Text/Photo mode)	Adjust the threshold level for background erase in text/photo mode. *A larger value reduces dirty background.*	0 ~ 255 1/step **0 (Disabled)**
	36*	Background Erase Level (Photo mode)	Adjust the threshold level for background erase in photo mode. *A larger value reduces dirty background.*	0 ~ 255 1/step **0 (Disabled)**
	37*	Background Erase Level (Generation Copy mode)	Adjust the threshold level for background erase in generation copy mode. *A larger value reduces dirty background.*	0 ~ 255 1/step **20**
	38*	Gradation Mode Setting	Selects the standard gradation mode. bit 4: 0: Normal operation 1: No gradation processing bit 3: 0: Normal operation 1: No gamma correction bit 2: Copied original mode 0: Error diffusion off 1: Error diffusion on bit 1: Low density original mode 0: Error diffusion off 1: Error diffusion on bit 0: Text mode 0: Error diffusion off 1: Error diffusion on *Input the setting for all 8 bits at once as a decimal value. Example: To set bits 2, 1, and 0 to 1, input 7.*	0 ~ 63 1/step **0**
	39*	Binary Filter Setting	Selects the binary matrix filter. 0: Filter off 1: Independent dot erase filter - 3x3 2. Independent dot erase filter - 4x4 3: Independent dot erase filter - 5x5 4: Uneven correction filter - 3x3 ***Do not change the value.***	0 ~ 4 1/step **0**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-903 *	41*	MTF Filter Coefficient Level – Binary Processing (25% ~ 64%)	Selects the MTF filter coefficient for letter mode with binary processing using 25% ~ 64% reduction. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **4**
	42*	MTF Filter Coefficient Level – Binary Processing (65% ~ 154%)	Selects the MTF filter coefficient for letter mode with binary processing with 65% ~ 154% magnification. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **4**
	43*	MTF Filter Coefficient Level – Binary Processing (155% ~ 256%)	Selects the MTF filter coefficient for letter mode with binary processing with 155% ~ 256% enlargement. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **3**
	44*	MTF Filter Coefficient Level – Binary Processing (257% ~ 400%)	Selects the MTF filter coefficient for letter mode with binary processing with 257% ~ 400% enlargement. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **3**
	47*	MTF Filter Coefficient Level – Binary Processing (Text/Photo mode)	Selects the MTF filter coefficient for binary processing in text/photo mode. Weak Strong 11–8–2–1–9–0–5–4–10–7–3–6	0 ~ 11 1/step **4**
	50*	MTF Filter Strength Level – Binary Processing (25% ~ 64%)	Selects the MTF strength for binary processing with 257% ~ 400% enlargement.	0: x 0.25 1: x 0.5 **2: x 1** 3: x 2 4: x4
	51*	MTF Filter Strength Level – Binary Processing (65% ~ 154%)	Selects the MTF strength for binary processing with 65% ~ 154% magnification.	0: x 0.25 1: x 0.5 **2: x 1** 3: x 2 4: x 4
	52*	MTF Filter Strength Level – Binary Processing (155% ~ 256%)	Selects the MTF strength l for binary processing with 155% ~ 256% enlargement.	0: x 0.25 1: x 0.5 **2: x 1** 3: x 2 4: x 4
	53*	MTF Filter Strength Level – Binary Processing (257% ~ 400%)	Selects the MTF strength for binary processing with 257% ~ 400% reduction.	0: x 0.25 1: x 0.5 **2: x 1** 3: x 2 4: x 4
	55*	MTF Filter Strength Level – Binary Processing (Letter/Photo mode)	Selects the MTF strength for binary processing with letter/photo mode.	0: x 0.25 **1: x 0.5** 2: x 1 3: x 2 4: x 4
4-904*	1*	Laser Pulse Positioning	Selects whether or not the laser pulse positioning control is used in letter and letter/photo modes ***Do not change the value.***	0: Off **1: On**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-904*	2*	Dither Matrix Setting	Selects the dither matrix for photo mode with greyscale processing	0: 4 x 4 **1: 6 x 6**
			If "0" is selected, the image will be sharper.	
	3*	Filter Type Selection in Photo Mode	Selects the filter type for photo mode.	0: MTF **1: Smoothing**
			Coefficients used: *0: SP4-903-15 and SP4-903-24.* *1: SP4-903-16* *If "0" is selected, the image will be sharper. However, dot screen areas will be faint.*	
	6*	Line Width Correction Type in Generation Mode	Selects the line width correction type for copied original mode.	0: Not corrected 1: Thin line-1 **2: Thin line-2** 3: Thick line
			In copied original mode, lines may bulge in the main scan direction. Adjust this SP mode until the result is satisfactory.	
	7*	Processing Type in Text Areas	Selects the process used for text areas in text/photo mode with greyscale mode, if auto text/photo separation enabled with SP 4-907. 0: 1-dot grayscale **1: 1-dot error diffusion**	
			If "1" is selected, the image becomes sharper in focus. However, gradation will be reduced.	
	8*	Processing Type in Photo Area	Selects the process used for photo areas in text/photo mode with greyscale mode, if auto text/photo separation enabled with SP 4-907. 0: 2-dot grayscale **1: 2-dot error diffusion**	
			If "1" is selected, the image becomes sharper in focus. However, gradation will be reduced.	
	9	Image Data Path - MSU	Selects one of the following video data outputs, which will be used for printing. 0: After image scanning 1: After gradation processing 2: After image data form application 3: After MSU 4: Not output **5: Normal video processing**	
			Do not change the value.	
	12*	Image Threshold Level Mode	Adjusts the threshold level for binary picture processing.	0 ~ 255 1/step **128**
	18*	Binary Dither Pattern	Selects the dither pattern for photo mode in binary picture processing mode.	**0: 70 lines (8x8)** 1: 95 lines (6x6) 2: 140 lines (8x8) 3: 180 lines (8x8)
			A greater number of lines gives a more detailed copy.	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-904*	23*	Binary Error Diffusion Pattern	Selects the error diffusion pattern for text/photo mode in binary processing mode.	**0: Matrix 1** 1: Matrix 2
			Do not change the value.	
4-905	1	Image Data Path – Filtering/Magnification	Selects one of the following video data outputs, which will be used for printing. 0: Filtering → Magnification 1: Magnification → Filtering 2: Test mode 1 3: Test mode 2 4: Filtering only 5: Magnification only 6: No processing **7: Normal operation**	
			Do not change the value.	
	2	Image Data Path – Gradation Processing	Selects one of the following video data outputs, which will be used for gradation processing. 0: After image scanning 1: After MSU 2. After image overlay **3: Normal operation**	
			Do not change the value.	
	3	Image Data Path – Image Overlay	Selects one of the following video data outputs, which will be used for the image overlay function. **0: Grayscale processing data** 1: Binary processing data 2: Normal operation	
			Do not change the value.	
	4	Printout Type Selection	Selects one of the following video data outputs, which will be used for the printer controller. **0: Normal operation** 1: Black/white conversion 2: Not printout 3: Application through	
			Do not change the value.	
4-906*		Image Processing Priority in Text/Photo Separation	Selects either text priority or photo priority for text/photo mode, if auto text/photo separation enabled with SP 4-907.	**0: Photo priority** 1: Text priority
			With “Photo priority”, all of the image is processed with the image processing for photo mode. With “Text priority”, the machine performs the auto text/photo separation and does the appropriate image processing for each area.	
4-907*		Text/Photo Auto Separation	Selects whether auto text/photo separation is done.	**0: No** 1: Yes
4-909*	1*	Laser Pulse Position Threshold	Decides the threshold level for selecting the type of laser pulse width modulation that is used	0 ~255 1/step **32**
			Do not change the value.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-909*	2 *	Line Width Correction 1 - White	Decides the threshold value for a pixel to be white when line width correction type 1 is performed. ***Do not change the value.***	0 ~ 15 1 /step **3**
	3 *	Line Width Correction 1 - Black	Decides the threshold value for a pixel to be black when line width correction type 1 is performed. ***Do not change the value.***	0 ~ 15 1 /step **13**
	4 *	Line Width Correction 2 - White	Decides the threshold value for a pixel to be white when line width correction type 2 is performed. ***Do not change the value.***	0 ~ 15 1 /step **4**
	5 *	Line Width Correction 2 - Black	Decides the threshold value for a pixel to be black when line width correction type 2 is performed. ***Do not change the value.***	0 ~ 15 1 /step **12**
	6*	Error Diffusion Gamma Table	Selects the gamma table for error diffusion. ***Do not change the value.***	**0: Gamma table 0** 1: Gamma table 1
	7 *	Edge Detection 1	Decides the threshold value to calculate the difference between the object pixel and the surrounding pixels. ***Do not change the value.***	0 ~ 255 1 /step **24**
	8 *	Edge Detection 2	Decides the threshold value for detecting an edge area. ***Do not change the value.***	0 ~ 255 1 /step **128**
	19	Image Data Path - Application	Selects one of the following video data outputs, which will be used for application. 0: After image processing 1: After MSU 2: After gamma correction 3: After image scanning 4: Not output **5: Normal operation** ***Do not change the value.***	
	20	Image Data Path - Printing	Selects one of the following video data outputs, which will be used for printing. 0: After image processing 1: After MSU 2: After image overlay 3: From application 4: Test mode 1 5: Test mode 2 6: Test mode 3 7: Not output **8: Normal operation** ***Do not change the value.***	

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
4-910	1	Data Compression	Selects whether simple data compression is done or not. ***Do not change the value.***	**0: Yes** 1: No
	2	Data Compression Threshold	Selects the threshold level for image compression. ***Do not change the value.***	0 ~ 255 1/step **8**
	3	Data Compression – ABS Through	Selects whether the ABS function is done or not. ***Do not change the value.***	**0: Yes** 1: No
4-911*	1	HDD Setting (Media Test)	Checks for bad sectors on the hard disk that develop during machine use. Press "1" to start. This takes 4 minutes. *This SP mode should be done when an abnormal image is printed. There is no need to do this at installation as the hard disk firmware already contains bad sector information, and damage is not likely to occur during transportation. Bad sectors detected with this SP mode will be stored in the NVRAM with the bad sector data copied across from the firmware.* *If the machine detects over 50 bad sectors, SC361 will be generated. At this time, use SP4-911-2.*	1: Start
	2	HDD Setting (Formatting)	Formats the hard disk. This takes 4 minutes. Press "1" to start. **Do not turn off the main power switch during this process.**	1: Start
	3*	HDD Setting (Spindle Control)	Decides the disk drive motor (spindle motor) stop timing. **0: Enabled** The hard disk stops in low power mode. The first copy after returning to standby will take longer. 1: Disabled The hard disk keeps going in low power mode.	
	6	HDD Setting (Bad Sector Information Reset)	Resets the bad sector information which is stored in the NVRAM. Press "1" to start. *This SP should be performed when the hard disk is replaced.*	1: Start
	7	HDD Setting (Bad Sector Display)	Displays the number of bad sectors there are on the hard disk. *If the machine detects over 50 bad sectors, SC361 will be generated. At this time, use SP4-911-2.*	Total: 0 Copy: 0 Printer: 0 AF (Archive File): 0

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-911	8	HDD Model Name Display	Displays the model name of the HDD. *If the hard disk is not installed, "Not Connected" is displayed.*	
5-001		All Indicators On	Turns on all indicators on the operation panel. *Press "1" to check.* *Press [Exit] to exit this SP mode.*	M/C: Stop 1: Start
5-009*		Language Selection	Selects the language for the display. *After selecting the language, turn the main power switch off and on.*	
5-024*		mm/inch Display Selection	Selects what unit is used. *After selecting the unit, turn the main power switch off and on.*	0: mm **1: inch**
5-104 *		A3/11"x17" Double Count	Specifies whether the counter is doubled for A3/11"x17" paper. *If "1" is selected, the total counter and the current user code counter count up twice when A3/11"x17" paper is used.*	**0: No** 1: Yes
5-106 *		ADS Level Selection	Selects the image density level that is used in ADS mode.	1 ~ 6 1 notch /step **3**
5-108	2	Board Erase in Comb. Mode		0: 3mm 1: None
5-112*		Non-standard Paper Size	Selects whether a non-standard paper size can be input or not. *If "1" is selected, the customer will be able to input a non-standard paper size using a UP mode.*	**0: No** 1: Yes
5-113*		Optional Counter Type	**This SP is for Japan only. Do not change the value.**	0 ~ 6 1/step **0**
5-115*		Duplex Punch Hole Margin	Selects whether or not the image on the back of duplex copies shifts for making the punch holes.	**0: No** 1: Yes-
5-118 *		Disable Copying	Selects whether the copy function is disabled or not.	**0: No** 1: Yes
5-120		Mode Clear – Op. Counter Removal	**This SP is for Japan only. Do not change the value.**	0 ~ 2 1/step **0**
5-121*		Counter Up Timing	Determines whether the optional key counter counts up at paper feed-in or at paper exit. *The total counter is not affected by this SP mode.*	**0: Feed-in** 1: Exit
5-127*		APS Mode	Selects whether the APS function is enabled or not.	**0: Yes** 1: No

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-129*		"F" Paper Size Selection	Selects the "F" paper size.	**0: 8¼" x 13"** 1: 8½" x 13" 2: 8 x 13"
5-131*		Paper Size Type Selection	Selects the paper size type (for originals and copy paper). • *After changing the value, turn the main power switch off and on.* • *If the paper size type of the archive files stored in the HDD is different, abnormal copies will be made. In this condition, perform SP5-822 and ask the user to restore the archive files.*	0: Japan **1: North America** 2: Europe
5-305*		Auto Off Mode Disabling	Selects auto off timer setting range *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.)*	**0: On** 1: Yes
5-401*	2*	Restricted Access Control for Key Counter – Copy Mode	Selects whether restricted access control is done when using the key counter in copy mode.	**0: Off** 1: On
	3*	Restricted Access Control for other counters – Copy Mode	**This SP is for Japan only. Do not change the value.**	**0: Off** 1: On
	52*	Restricted Access Control for Key Counter – Fax Mode	Selects whether restricted access control is done when using the key counter in fax mode.	**0: Off** 1: No
	53*	Restricted Access Control for other counters – fax Mode	**This SP is for Japan only. Do not change the value.**	**0: Off** 1: On
	62*	Restricted Access Control for Key Counter – Printer Mode	Selects whether restricted access control is done when using the key counter in printer mode.	**0: Yes** 1: No
	63*	Restricted Access Control for other counters – Printer Mode	**Japanese version only.** **Do not change the value.**	**0: Off** 1: No

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-401*	82*	Restricted Access Control for Key Counter – Other Enhanced Kit	**Japanese version only.** **Do not change the value.**	**0: Off** 1: On
	83*	Restricted Access Control for other counters – Other Enhanced Kit	**Japanese version only.** **Do not change the value.**	**0: Off** 1: On
5-501 *		PM Alarm Interval	Sets the PM interval, with an alarm. *When the setting is "0", this function is disabled.*	0 ~ 255 1k copies/step **150 k copies**
5-504*	1*	Jam Alarm Level (RSS function)	**Japanese version only.** **Do not change the values.**	0: No 1: L 2: M **3: H**
	2*	Jam Auto Call (RSS function)		0: Off **1: On**
5-505*		Error Alarm Level	**Japanese version only.** **Do not change the values.**	0 ~ 255 100 copies/step **2500 copies (30)** **5000 copies (40)**
5-507*	128*	Paper Control Call Interval – Other Paper Sizes (RSS function)	**Japanese version only.** **Do not change the values.**	250 ~ 10000 1 page/step **1000 pages**
	132*	Paper Control Call Interval – A3 (RSS function)		
	133*	Paper Control Call Interval – A4 (RSS function)		
	134*	Paper Control Call Interval – A5 (RSS function)		
	141*	Paper Control Call Interval – B4 (RSS function)		
	142*	Paper Control Call Interval – B5 (RSS function)		
	160*	Paper Control Call Interval – DLT (RSS function)		
	164*	Paper Control Call Interval – LG (RSS function)		

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
5-507*	166*	Paper Control Call Interval – LT (RSS function)	**Japanese version only.** **Do not change the values.**	250 ~ 10,000 1 page/step **1,000 pages**
	172*	Paper Control Call Interval – HLT (RSS function)		
5-590*	1*	Original Auto Call (RSS function)	**Japanese version only.** **Do not change the values.**	**0: Off** 1: On
	2*	Cover Open Auto Call (RSS function)		0: Off **1: On**
	3*	Paper Control Call (RSS function)		**0: Off** 1: On
	4*	Staple Auto Call (RSS function)		**0: Off** 1: On
	5*	Toner Auto Call (RSS function)		**0: Off** 1: On
5-801		Memory All Clear	Resets all correction data for process control and all software counters. Also, returns all modes and adjustments to the default settings. See the "Memory All Clear" section for how to use this SP mode correctly. Press “1” for over 3 seconds, then turn the main power switch off and on. ***Normally, this SP mode should not be used.*** *It is used only after replacing the NVRAM, or when the copier malfunctions due to a damaged NVRAM.*	
5-802*		Free Run	Performs a free run. The scanner scans once and the printer prints for the number of copies requested. *To perform the free run, after selecting “1”, press the # key to enter copy mode then input the number of copies. Then, press the Start key.* *To stop the free run, press C/⊘.*	**0: Stop** 1: Start
5-803	1 ~ 9	Input Check	Displays the signals received from sensors and switches. See the "Input Check" section for details.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-804		Output Check	Turns on the electrical components individually for test purposes. See the "Output Check" section for details.	
5-807	1	Option Connection Check - ADF	Checks the connectors to the optional peripherals.	0: Not connected 1: Connected
	2	Option Connection Check – Paper Tray Unit		
	3	Option Connection Check - LCT		
	4	Option Connection Check - Finisher		
5-811 *		Machine Serial Number	Use to input the machine serial number. (Normally done at the factory.) *This serial number will be printed on the system parameter list.* *Use the ●/✻ key to input "A".*	
5-812 *	1*	Service Telephone Number at SC condition	Use this to input the telephone number of the service representative (this is displayed when a service call condition occurs.) *Press the "●/✻" key to input a pause. Press the "Clear modes" key to delete the telephone number.*	
	2*	Service Fax Number for Counter Printing	Use this to input the fax number of the service representative (this is printed on the Counter Report – UP mode, System No.19) *Press the "●/✻" key to input a pause. Press the "Clear modes" key to delete the telephone number.*	
5-816*	1*	CSS (CSS) Function	**Japanese version only.** **Do not change the values.**	**0: Off** 1: On
	2*	CE Visit Call (CSS function)		0: End 1: Start
5-821*		CSS PI Device Code (CSS function)	**Japanese version only.** **Do not change the value.**	0 ~ 4 1/step **0**
5-822		Archive File Clear	Clears all archive file data stored in the HDD. Press "1" to clear. *Before (or after) performing SP5-131, do this SP mode. After this, ask the user to restore the archive files.*	1: Start

Mode No.			Function	Settings
Class 1 and 2	Class 3			
-907		Plug & Play Brand Name and Production Name Setting	Selects the brand name and the production name for Windows 95 Plug & Play. This information is stored in the NVRAM. If the NVRAM is defective, these names should be registered again. *After selecting, press the "Original Type" key and # at the same time. If the setting is completed, a "*" mark will be displayed before the selection.*	
5-914		Printer Counter Display	Selects whether or not the total printer counter is displayed in the UP mode.	**0: No** 1: Yes
5-915		Mechanical Counter Detection	Checks whether the mechanical counter inside the inner cover is connected or not.	0: Not detected 1: Detected 2: Unknown
⇒ 5-920*		Recovery Time for Low Power Mode	The default recovery time is 20s (machine temp. 145 to 157C). Since recovery starts at a higher temperature with this setting, it provides the machine more leeway in reaching the ready status temperature on time.	**0: 20 s** 1: 30 s
5-990	1	SMC Printing (All Data)	Prints all the system parameter lists. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	2	SMC Printing (SP Mode Data)	Prints the SP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	3	SMC Printing (UP Mode Data)	Prints the UP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	4	SMC Printing (Machine Status Data)	Prints the machine status history data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	5	SMC Printing (UP Mode - Copy)	Prints the Copy Mode list (UP Mode No.10) See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	6	SMC Printing (Large Font Size)	Prints the SP mode data list with a large font size. See the "System Parameter and Data Lists" section for how to print the lists. *This SP mode is used when the SMC list is sent by fax to the number stored with SP5-812.*	1: Start

Mode No.			Function	Settings
Class 1 and 2	Class 3			
6-006*	1*	ADF Side-to Side Registration	Adjusts the printing side-to-side registration in the ADF mode. *Use the ●/✻ key to toggle between + and -.*	-3 ~ +3 0.1 mm/step **+ 0.0 mm**
	2*	ADF Leading Edge Registration (Simplex)	Adjusts the original stop position. *Use the ●/✻ key to toggle between + and -.*	-29 ~ +29 0.18 mm/step **+ 0.0 mm**
	3*	ADF Leading Edge Registration (Duplex-front)	Adjusts the original stop position against the original left scale in one-sided original mode. *Use the ●/✻ key to toggle between + and -.*	-29 ~ +29 0.18 mm/step **+ 0.0 mm**
	4*	ADF Leading Edge Registration (Duplex-rear)	Adjusts the original stop position against the original left scale in two-sided original mode. *Use the ●/✻ key to toggle between + and -.*	-29 ~ +29 0.1 mm/step **+ 0.0 mm**
	For details on the correct way to use SP 6-006, see the ADF service manual.			
6-007	1	ADF Input Check 1	Displays the signals received from sensors and switches of the ADF. See the "Input Check" section for details.	
	2	ADF Input Check 2	Displays the signals received from sensors and switches of the ADF. See the "Input Check" section for details.	
6-008		ADF Output Check	Turns on the electrical components of the ADF individually for test purposes. See the "Output Check" section for details.	
6-009	1	ADF Free Run (Two-sided original)	Performs an ADF free run with two-sided. Press “1” to start. *This is a general free run controlled from the copier. For more detailed free run modes, see the DF manual.*	1: Start
	2	ADF Free Run (Stamp)	Performs an ADF free run with stamp mode. Press “1” to start. *This is a general free run controlled from the copier. For more detailed free run modes, see the DF manual.*	1: Start

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
6-010*		Stamp Position Adjustment	Adjusts the stamp position in the sub-scan direction in facsimile mode. *Use the ●/✻ key to toggle between + and -.*	- 3.5 ~ + 3.5 0.5 mm/step **0 mm**
6-105*		Finisher Staple Position Adjustment (3,000-sheet Finisher Only)	Adjusts the staple position in the main scan direction when using the 3,000-sheet finisher. *Use the ●/✻ key to toggle between + and -.* *A larger value causes the staple position to shift outward.*	- 1~ +3.5 0.5 mm/step **+0.0 mm**
6-113*	1*	Punch Hole Position Adjustment (2 Punch Hole Type)	Adjusts the punch hole position in the sub-scan direction for the punch unit with two punch holes. *Use the ●/✻ key to toggle between + and -. A larger value shifts the punch holes towards the edge of the paper.*	- 7.5 ~ + 7.5 0.5 mm/step **0 mm**
	2*	Punch Hole Position Adjustment (3 Punch Hole Type)	Adjusts the punch hole position in the sub-scan direction for the punch unit with three punch holes. *Use the ●/✻ key to toggle between + and -. A larger value shifts the punch holes towards the edge of the paper.*	- 7.5 ~ + 7.5 0.5 mm/step **0 mm**
6-901	1	Original Non-wait Time Norm Original		660ms
	2	Original Non-wait Time Thin Original		550ms
7-001*		Total Operation Time Display	Displays the total drum rotation time.	Min.
7-002*	1*	Total Original Counter (Copy and Fax Modes)	Displays the total number of fed originals in copy and fax modes.	
	2*	Total Original Counter (Copy Mode)	Displays the total number of fed originals in copy mode.	
	3*	Total Original Counter (Fax Mode)	Displays the total number of fed originals in fax mode.	
7-003*	1*	Total Copy Counter (All Modes)	Displays the total number of prints in all modes.	
	2*	Total Copy Counter (Copy Mode)	Displays the total number of prints in copy mode.	
	3*	Total Copy Counter (Fax Mode)	Displays the total number of prints in fax mode.	
	4*	Total Copy Counter (Printer Mode)	Displays the total number of prints in printer mode.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-006*	1*	C/O (Copy per Original) Counter	Displays the number of sets of copies per original when making 10 or more sets of copies. e.g.: When making 15 sets of copies of an original, this counter value will increase by “6”.	
	2*	P/O (Print per Original) Counter	Displays the number of sets of prints per original data when making 10 or more sets of prints. e.g.: When making 15 sets of prints of an original data, this counter value will increase by “6”.	
7-101*	4*	Total Copies by Paper Size (A3)	Displays the total number of prints by paper size.	
	5*	Total Copies by Paper Size (A4)		
	6*	Total Copies by Paper Size (A5)		
	13*	Total Copies by Paper Size (B4)		
	14*	Total Copies by Paper Size (B5)		
	32*	Total Copies by Paper Size (DLT)		
	36*	Total Copies by Paper Size (LG)		
	38*	Total Copies by Paper Size (LT)		
	44*	Total Copies by Paper Size (HLT)		
	128*	Total Copies by Paper Size (Other Sizes)		
7-201*		Total Number of Scanning	Displays the total number of scanned originals.	
7-204*	1*	Total Paper Tray Counter (1st Paper Tray)	Displays the total number of sheets fed from each paper feed tray.	
	2*	Total Paper Tray Counter (2nd Paper Tray)		
	3*	Total Paper Tray Counter (3rd Paper Tray)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-204*	4*	Total Paper Tray Counter (4th Paper Tray)	Displays the total number of sheets fed from each paper feed tray.	
	5*	Total Paper Tray Counter (LCT)		
	6*	Total Paper Tray Counter (By-pass Feed)		
7-205*		ADF Total Counter	Displays the total number of originals fed by the ADF.	
7-206*		Total Staple Counter	Displays the total number of used staples.	
7-301*	1*	Total Copies by Reproduction Ratio (25% ~ 49%)	Displays the total number of prints by reproduction ratio.	
	2*	Total Copies by Reproduction Ratio (50% ~ 99%)		
	3*	Total Copies by Reproduction Ratio (Full size)		
	4*	Total Copies by Reproduction Ratio (101% ~ 200%)		
	5*	Total Copies by Reproduction Ratio (201% ~ 400%)		
	6*	Total Copies by Reproduction Ratio (Direct Mag.)		
	7*	Total Copies by Reproduction Ratio (Direct Size Mag.)		
	8*	Total Copies by Reproduction Ratio (Size Mag.)		
	9*	Total Copies by Reproduction Ratio (Fix Mag.)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-303*	1*	Total Copies by Image Editing (Image Invert.)	Displays the total number of prints by image editing mode.	
	2*	Total Copies by Image Editing (Repeat Copy)		
	3*	Total Copies by Image Editing (Memory Sort)		
	4*	Total Copies by Image Editing (Staple)		
	5*	Total Copies by Image Editing (Combine)		
	6*	Total Copies by Image Editing (Series Copy)		
	7*	Total Copies by Image Editing (Erase Copy)		
7-304*	1*	Total Copies by Copy Mode (Letter)	Displays the total number of prints by copy mode.	
	2*	Total Copies by Copy Mode (Letter/Photo)		
	3*	Total Copies by Copy Mode (Photo)		
	4*	Total Copies by Copy Mode (Generation)		
	5*	Total Copies by Copy Mode (Light Original)		
	6*	Total Copies by Copy Mode (Duplex)		
	7*	Total Copies by Copy Mode (ADF)		
	8*	Total Copies by Copy Mode (Double Copy)		
	9*	Total Copies by Copy Mode (2-sided Original)		
	10*	Total Copies by Copy Mode (Interrupt)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-304*	11*	Total Copies by Copy Mode (Archive File)	Displays the total number of prints by copy mode.	
	12*	Total Copies by Copy Mode (1-sided to 2-sided)		
	13*	Total Copies by Copy Mode (2-sided to 2-sided)		
	14*	Total Copies by Copy Mode (2-sided to 1-sided)		
	15*	Total Copies by Copy Mode (Book to 2-sided)		
7-305*	1*	Total Copies by Multiple Copy (1 to 1)	Displays the total number of prints by multiple copy quantity.	
	2*	Total Copies by Multiple Copy (1 to 2 ~ 5)		
	3*	Total Copies by Multiple Copy (1 to 6 ~ 10)		
	4*	Total Copies by Multiple Copy (1 to 11 ~ 20)		
	5*	Total Copies by Multiple Copy (1 to 21 ~ 99)		
	6*	Total Copies by Multiple Copy (1 to 100 ~)		
7-401*		Total SC Counter	Displays the total number of service calls that have occurred.	
7-403*	1*	SC History (Latest)	Displays the latest 10 service call codes.	
	2*	SC History (1st Latest)		
	3*	SC History (2nd Latest)		
	4*	SC History (3rd Latest)		
	5*	SC History (4th Latest)		
	6*	SC History (5th Latest)		
	7*	SC History (6th Latest)	.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-403*	8*	SC History (7th Latest)	Displays the latest 10 service call codes.	
	9*	SC History (8th Latest)		
	10*	SC History (9th Latest)		
7-501*		Total Jam Counter	Displays the total number of copy jams and original jams.	
7-502*		Total Copy Jam Counter	Displays the total number of copy jams.	
7-503*		Total Original Jam Counter	Displays the total number of original jams.	
7-504*	1*	Total Copy Jam by Location (At Power On)	Displays the total number of copy jams by location. These are paper non-feed jams.	
	3*	Total Copy Jam by Location (1st Paper Tray)		
	4*	Total Copy Jam by Location (2nd Paper Tray)		
	5*	Total Copy Jam by Location (3rd Paper Tray)		
	6*	Total Copy Jam by Location (4th Paper Tray)		
	7*	Total Copy Jam by Location (LCT)		
	8*	Total Copy Jam by Location (Upper Relay Sensor)	Displays the total number of copy jams by location. These are jams when the paper does not activate the sensor.	
	9*	Total Copy Jam by Location (Lower Relay Sensor)		
	10*	Total Copy Jam by Location (Upper Relay Sensor – Op. PTU)		
	13*	Total Copy Jam by Location (Regist. Sensor)		
	16*	Total Copy Jam by Location (Exit Sensor)	.	
	17*	Total Copy Jam by Location (Bridge Exit Sensor)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	18*	Total Copy Jam by Location (Bridge Relay Sensor)	Displays the total number of copy jams by location. These are jams when the paper does not activate the sensor.	
	19*	Total Copy Jam by Location (Duplex Entrance Sensor)		
	23*	Total Copy Jam by Location (Duplex Exit Sensor)		
	24*	Total Copy Jam by Location (1-bin Tray Entrance Sensor)		
	25*	Total Copy Jam by Location (Finisher Entrance Sensor)		
	26*	Total Copy Jam by Location (3,000-sheet Finisher Upper Tray Exit Sensor)		
	27*	Total Copy Jam by Location (3,000-sheet - Finisher Shift Tray Exit Sensor, 1,000-sheet Finisher Exit Sensor)		
	28*	Total Copy Jam by Location (3,000-sheet Staple Tray Paper Sensor, 1,000-sheet Finisher Jogger Unit Paper Sensor)		
	29*	Total Copy Jam by Location (Finisher Stack Feed-out Belt HP Sensor)		
	30*	Total Copy Jam by Location (Mail Box Entrance Sensor)		
	31*	Total Copy Jam by Location (Mail Box Proof Tray Exit Sensor)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	32*	Total Copy Jam by Location (Mail Box Relay Sensor)	Displays the total number of copy jams by location. These are jams when the paper does not activate the sensor.	
	33*	Total Copy Jam by Location (Mail Box: Mailbox Section)		
	57*	Total Copy Jam by Location (LCT)		
	58*	Total Copy Jam by Location (Upper Relay Sensor)	Displays the total number of copy jams by location. These are jams when the paper stays at the sensor.	
	59*	Total Copy Jam by Location (Lower Relay Sensor)		
	60*	Total Copy Jam by Location (Upper Relay Sensor – Op. PTU)		
	61*	Total Copy Jam by Location (Lower Relay Sensor – Op. PTU)		
	63*	Total Copy Jam by Location (Regist. Sensor)		
	66*	Total Copy Jam by Location (Exit Sensor)		
	67*	Total Copy Jam by Location (Bridge Exit Sensor)		
	68*	Total Copy Jam by Location (Bridge Relay Sensor)		
	69*	Total Copy Jam by Location (Duplex Entrance Sensor)		
	73*	Total Copy Jam by Location (Duplex Exit Sensor)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	74*	Total Copy Jam by Location (1-bin Tray Entrance Sensor)	Displays the total number of copy jams by location. These are jams when the paper stays at the sensor	
7-505*	1*	Total Original Jam by Location (At Power On)	Displays the total number of original jams by location. These are jams when the original does not activate the sensor.	
	3*	Total Original Jam by Location (ADF Feed-in Sensor)		
	4*	Total Original Jam by Location (ADF Feed-out Sensor)		
7-506*	4*	Total Copy Jam by Paper Size (A3)	Displays the total number of copy jams by paper size.	
	5*	Total Copy Jam by Paper Size (A4)		
	6*	Total Copy Jam by Paper Size (A5)		
	13*	Total Copy Jam by Paper Size (B4)		
	14*	Total Copy Jam by Paper Size (B5)		
	32*	Total Copy Jam by Paper Size (DLT)		
	36*	Total Copy Jam by Paper Size (LG)		
	38*	Total Copy Jam by Paper Size (LT)		
	44*	Total Copy Jam by Paper Size (HLT)		
	128*	Total Copy Jam by Paper Size (Other Sizes)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-507*	1*	Total Counter Value at Copy Jam (Latest)	Displays the last 5 digits of the total counter value for the most recent 10 copy jams.	
	2*	Total Counter Value at Copy Jam (1st Latest)		
	3*	Total Counter Value at Copy Jam (2nd Latest)		
	4*	Total Counter Value at Copy Jam (3rd Latest)		
	5*	Total Counter Value at Copy Jam (4th Latest)		
	6*	Total Counter Value at Copy Jam (5th Latest)		
	7*	Total Counter Value at Copy Jam (6th Latest)		
	8*	Total Counter Value at Copy Jam (7th Latest)		
	9*	Total Counter Value at Copy Jam (8th Latest)		
	10*	Total Counter Value at Copy Jam (9th Latest)		
	11*	Total Counter Value at Original Jam (Latest)		
	12*	Total Counter Value at Original Jam (1st Latest)		
	13*	Total Counter Value at Original Jam (2nd Latest)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-507*	14*	Total Counter Value at Original Jam (3rd Latest)	Displays the last 5 digits of the total counter value for the most recent 10 copy jams.	
	15*	Total Counter Value at Original Jam (4th Latest)		
	16*	Total Counter Value at Original Jam (5th Latest)		
	17*	Total Counter Value at Original Jam (6th Latest)		
	18*	Total Counter Value at Original Jam (7th Latest)		
	19*	Total Counter Value at Original Jam (8th Latest)		
	20*	Total Counter Value at Original Jam (9th Latest)		
7-801	1	ROM Version Display (BICU)	Displays the ROM versions.	
	2	ROM Version Display (CSS)		
	3	ROM Version Display (HDD Controller)		
	4	ROM Version Display (ADF)		
	5	ROM Version Display (SIB)		
	6	ROM Version Display (Finisher)		
	7	ROM Version Display (Bank)		
	8	ROM Version Display (LCT)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-801	9	ROM Version Display (Mail Box)	Displays the ROM versions.	
	10	ROM Version Display (FAX)		
	11	ROM Version Display (Printer Controller)		
	12	ROM Version Display (Scanner Controller)	**Japanese version only.**	
	13	ROM Version Display (ANITA)		
7-803*		PM Counter Display	Displays the PM counter since the last PM.	
7-804		PM Counter Reset	Resets the PM counter. Press “1” to reset.	1: Start
7-807		SC/Jam Counter Reset	Resets the SC and jam counters. Press “1” to reset.	1: Start
7-808		Resets Counters	Resets all counters except for the following: Press “1” to reset. • All counters of SP7-003 • All counters of SP7-006 • All counters which are listed on the counter list (UP1-19-2)	1: Start
7-810		Key Operator Code Number Reset	Resets the key operator code. Press “1” to reset.	1: Start
7-816	1	Reset the total Copy Counter by Paper Tray (1st Paper Tray)	Resets the total copy counter by paper tray. Press “1” to reset. Use these SP modes when replacing the pick-up, feed, and separation rollers in the paper feed stations	1: Start
	2	Reset the total Copy Counter by Paper Tray (2nd Paper Tray)		1: Start
	3	Reset the total Copy Counter by Paper Tray (3rd Paper Tray)		1: Start
	4	Reset the total Copy Counter by Paper Tray (4th Paper Tray)		1: Start
	5	Reset the Total Copy Counter by Paper Tray (LCT)		1: Start

Mode No.			Function	Settings
Class 1 and 2	**Class 3**			
7-816	6	Reset the total Copy Counter by Paper Tray (By-pass Feed)	Resets the total copy counter by paper tray. Press “1” to reset. Use these SP modes when replacing the pick-up, feed, and separation rollers in the paper feed stations	1: Start
7-822		Reset the Total Copy Counter by Magnification	Resets all counters of SP7-301. Press “1” to reset.	1: Start
7-823		Reset the Total Copy Counter by Image Editing	Resets all counters of SP7-303. Press “1” to reset.	1: Start
7-825		Electrical Total Counter Reset	Resets the electrical total counter. Press “1” to reset. *Usually, this SP mode is done at installation.* *This SP mode affects only once when the minus (“-“) counter value.*	1: Start
7-901	1	SC Contents		
	2	SC Contents Jam Conditions		
	3	SC Contents Cover Open Condition		
7-902	1	SC Details 1st		
	2	SC Details 2nd		
	3	SC Details 3rd		
7-904		Reset the Total Copy Counter by Copy Mode	Resets all counters of SP7-304. Press “1” to reset.	1: Start
7-905		Reset the Total Copy Counter by Multiple Copies	Resets all counters of SP7-305. Press “1” to reset.	1: Start

4.2.3 TEST PATTERN PRINTING (SP2-902)

NOTE: Do not operate the machine until the test pattern is printed out completely. Otherwise, an SC may occur.

1. Access the SP mode which contains the test pattern you need.
2. Press the ⇐ key on the operation panel to access the copy mode display.
3. Select required copy features such as paper size, image density, and reproduction ratio.
4. Press the "Start" key to print the test pattern.
5. After checking the test pattern, exit copy mode by pressing the ⇐ key again.
6. Exit the SP mode.

Test Pattern Table (SP2-902-2: Test Pattern Printing – IPU)

No.	Test Pattern	No.	Test Pattern
0	None	8	Vertical Lines (2-dot)
1	Grayscale 1	9	Hatch Pattern
2	Grayscale 2	10	Cross Pattern
3	Grayscale 3	11	Slant Pattern
4	Grayscale 4	12	Cross Stitch (400 dpi)
5	Grayscale 5	13	Cross Stitch (600 dpi)
6	Vertical Lines (256-greyscale)	14	Patch Pattern (256-grayscale)
7	Vertical Lines (1-dot)	15	Patch Pattern (128-grayscale)

Test Pattern Table (SP2-902-3: Test Pattern Printing – Printing)

No.	Test Pattern	No.	Teat Pattern
0	None	11	Argyle Pattern
1	Vertical Line (1-dot)	12	16 Grayscales (Horizontal)
2	Horizontal Line (1-dot)	13	16 Grayscales (Vertical)
3	Vertical Line (2 dot)	14	16 Grayscales (Vert./Hor.)
4	Horizontal Line (2-dot)	15	16 Grayscales (Vert./Hor Overlay)
5	Grid Pattern (Single-dot)	16	Not used
6	Grid Pattern (Double-dot)	17	Horizontal Line (1-dot)
7	Alternating Dot Pattern	18	Grid Pattern (Single-dot)
8	Full Dot Pattern	19	Grid Pattern (Double-dot)
9	Black Band	20	Alternating Dot Pattern
10	Trimming Area	21	Blank Page

4.2.4 INPUT CHECK

Main Machine Input Check (SP5-803)

1. Access SP mode.
2. Select the class 3 SP number which will access the switch or sensor you wish to check.
3. Check the status of the sensor or switch.
   NOTE: If you wish to change to another class 3 level, press the "Next" or "Prev." key.
4. The reading ("0" or "1") will be displayed. The meaning of the display is as follows.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
|	|	|	|	|	|	|	|
0	0	0	0	0	0	0	0

Class 3 no.	Bit no.	Description	Reading	
			0	1
1 (Upper Tray)	7	Not used		
	6	Height Sensor 2 (Op. Printer Controller)	Not activated	Activated
	5	Height Sensor 1 (Op. Printer Controller)	Not activated	Activated
	4	Not used		
	3	Paper Size Sensor 4 (Op. Printer Controller)	Switch pressed	Switch not pressed
	2	Paper Size Sensor 3 (Op. Printer Controller)	Switch pressed	Switch not pressed
	1	Paper Size Sensor 2 (Op. Printer Controller)	Switch pressed	Switch not pressed
	0	Paper Size Sensor 1 (Op. Printer Controller)	Switch pressed	Switch not pressed
2 (Lower Tray)	7	Not used		
	6	Height Sensor 2 (Op. Printer Controller)	Not activated	Activated
	5	Height Sensor 1 (Op. Printer Controller)	Not activated	Activated
	4	Not used		
	3	Paper Size Sensor 4 (Op. Printer Controller)	Switch pressed	Switch not pressed
	2	Paper Size Sensor 3 (Op. Printer Controller)	Switch pressed	Switch not pressed
	1	Paper Size Sensor 2 (Op. Printer Controller)	Switch pressed	Switch not pressed
	0	Paper Size Sensor 1 (Op. Printer Controller)	Switch pressed	Switch not pressed

Class 3 no.	Bit no.	Description	Reading	
			0	1
3 (Registration & others)	7	Zero Cross Signal	Detected	Not detected
	6	Transfer Belt Unit H.P Sensor	Not at home position	At home position
	5	Exhaust Fan Lock Signal	Not locked	Locked
	4	Cooling Fan Lock Signal	Not locked	Locked
	3	Main Motor Lock Signal	Not locked	Locked
	2	Toner Overflow Sensor	Tank full	Tank not full
	1	Cover Open	Cover closed	Cover opened
	0	Registration Sensor	Paper detected	Paper not detected
4 (By-pass)	7	Not used		
	6	Paper End Sensor	Paper detected	Paper not detected
	5	Not used		
	4	Paper Size Sensor 4	See table 1	
	3	Paper Size Sensor 3		
	2	Paper Size Sensor 2		
	1	Paper Size Sensor 1		
	0	Unit Set Signal	Connected	Not connected
5 (Bridge Unit)	7	Not used		
	6	Unit Set Signal	Connected	Not connected
	5	Paper Sensor (Op. Printer Controller)	Paper detected	Paper not detected
⇒	4	Relay Sensor	Paper detected	Paper not detected
⇒	3	Exit Sensor	Paper detected	Paper not detected
	2	Left Cover Switch	Switch pressed (cover closed)	Switch not pressed
	1	Right Cover Switch	Switch pressed (cover closed)	Switch not pressed
	0	Tray Exit Unit Switch	Switch pressed (cover closed)	Switch not pressed
6 (Unit Set)	7	Not used		
	6	F gate Signal	Active	Not active
	5	Height Sensor (Op. Printer Controller)	At feed height position	Not at feed height position
	4	Paper Exit Sensor	Paper detected	Paper not detected
	3	Fusing Unit	Detected	Not detected
	2	Total Counter	Not detected	Detected
	1	Key Counter	Detected	Not detected
	0	Not used		

Class 3 no.	Bit no.	Description	Reading	
			0	1
7 (Paper End)	7	Not used		
	6	Right Lower Cover Switch	Switch not pressed	Switch pressed
	5	2nd Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	4	1st Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	3	Lower Relay Sensor	Paper detected	Paper not detected
	2	Upper Relay Sensor	Paper detected	Paper not detected
	1	Lower Paper End Sensor	Paper not detected	Paper detected
	0	Upper Paper End Sensor	Paper not detected	Paper detected
8 (I/O Board Dip Switch 101)	7	Dip Switch – 8	On	Off
	6	Dip Switch – 7	On	Off
	5	Dip Switch – 6	On	Off
	4	Dip Switch – 5	On	Off
	3	Dip Switch – 4	On	Off
	2	Dip Switch – 3	On	Off
	1	Dip Switch – 2	On	Off
	0	Dip Switch – 1	On	Off
9 (Duplex)	7	Not used		
	6			
	5			
	4			
	3	Exit Sensor	Paper detected	Paper not detected
	2	Entrance Sensor	Paper detected	Paper not detected
	1	Cover Guide Sensor	Cover guide opened	Cover guide closed
	0	Duplex Unit Switch	Switch pressed (cover closed)	Switch not pressed

Table 1: By-pass Feed Table Paper Size Data

Class 3 no.	Bit 4	Bit 3	Bit 2	Bit 1	Paper Width
4	1	1	1	1	Post Card
	1	1	1	0	B6 lengthwise
	1	1	0	1	B5 lengthwise
	1	1	0	0	A5 lengthwise / 5.5”
	1	0	1	1	B4 lengthwise
	1	0	0	1	A4 lengthwise / 8.5” / 8”
	0	1	1	1	A3 lengthwise
	0	0	1	1	11” x 17”

ADF Input Check (SP6-007)

Class 3 no.	Bit no.	Description	Reading	
			0	1
1	7	Inverter Sensor	Paper not detected	Paper detected
	6	Exit Sensor	Paper not detected	Paper detected
	5	Registration Sensor	Paper not detected	Paper detected
	4	Entrance Sensor	Paper not detected	Paper detected
	3	Original Width Sensor 1	Paper not detected	Paper detected
	2	Original Width Sensor 2	Paper not detected	Paper detected
	1	Original Width Sensor 3	Paper not detected	Paper detected
	0	Original Set Sensor	Paper not detected	Paper detected
2 (Lower Tray)	7	Not used		
	6			
	5	Original Stopper H.P Sensor	Original stopper is up	Original stopper is down
	4	Pick-up Roller H.P Sensor	Pick-up roller is up	Pick-up roller is down
	3	Exit Cover Sensor	Cover closed	Cover opened
	2	Feed Cover Sensor	Cover closed	Cover opened
	1	DF Position Sensor	Sensor is not activated (cover open)	Sensor is activated (cover closed or being closed)
	0	APS Start Sensor	Sensor is not activated (cover open)	Sensor is activated (cover closed or being closed)

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. Access SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check.
3. Press “1”, then press # to check that component.
4. Press “0” to interrupt the test.
5. If you wish to check another component, press the “Next” or “Prev.” Key.

No.	Description	No.	Description
1	Upper Paper Feed Clutch	35	Relay Clutch (PTU)
2	Lower Paper Feed Clutch	36	Relay Clutch
3	Upper Paper Feed Clutch (PTU)	37	Not used
4	Lower Paper Feed Clutch (PTU)	38	Relay Clutch (LCT)
5	Paper Feed Clutch (By-pass)	39	Registration Clutch
6	Paper Feed Clutch (LCT)	40	Not used
7 ~ 12	Not used	41	Exit Junction Gate Solenoid (Interchange Unit)
13	Pick-up Solenoid (By-pass)	42	Duplex Junction Gate Solenoid (Interchange Unit)
14	Pick-up Solenoid (LCT)	43, 44	Not used
15, 16	Not used	45	Inverter Gate Solenoid (Duplex)
17	Upper Transport Motor (Finishers)	46	Not used
18	Lower Transport Motor (3,000-sheet Finisher only)	47	Junction Gate Solenoid (Bridge Unit)
19	Shift Tray Exit Motor (3,000-sheet Finisher), Exit Motor (1,000-sheet Finisher)	48, 49	Not used
20	Staple Hammer Motor (Finishers)	50	Tray Junction Gate Solenoid (3,000-sheet Finisher only)
21	Punch Motor (Punch Unit)	51	Stapler Junction Gate Solenoid (Finishers)
22 ~ 24	Not used	52	Positioning Roller Solenoid (Finishers)
25	LCT Motor (LCT)	53 ~ 55	Not used
26	Tray Motor (PTU)	56	Toner Supply Motor
27	Not used	57	Transfer Belt Clutch
28	Main Motor	58 ~ 61	Not used
29	Transport Motor (Duplex)	62	Quenching Lamp
30	Inverter Motor – Reverse (Duplex)	63	Charge Roller Bias
31	Inverter Motor – Forward (Duplex)	64 ~ 66	Not used
32 ~ 34	Not used	67	Development Bias
68	Not used	86 ~ 89	Not used

No.	Description	No.	Description
69	Transfer Belt Bias	90	Laser Diode
70	ID Sensor	91	Not used
71 ~ 74	Not used	92	Shift Tray Lift Motor (Finishers)
75	Exhaust Fan Motor	93	Jogger Motor (3,000-sheet Finisher)/Jogger Fence Motor (1,000-sheet Finisher)
76	Cooling Fan Motor	94	Stapler Motor (3,000-sheet Finisher)
77	Not used	95	Stack Feed Out Motor (Finishers)
78	Cooling Fan Motor (Bridge Unit)	96	Shift Motor (Finishers)
79 ~ 84	Not used	97	Stapler Rotation Motor (3,000-sheet Finisher)
85	Mechanical Counter	98 ~ 99	Not used

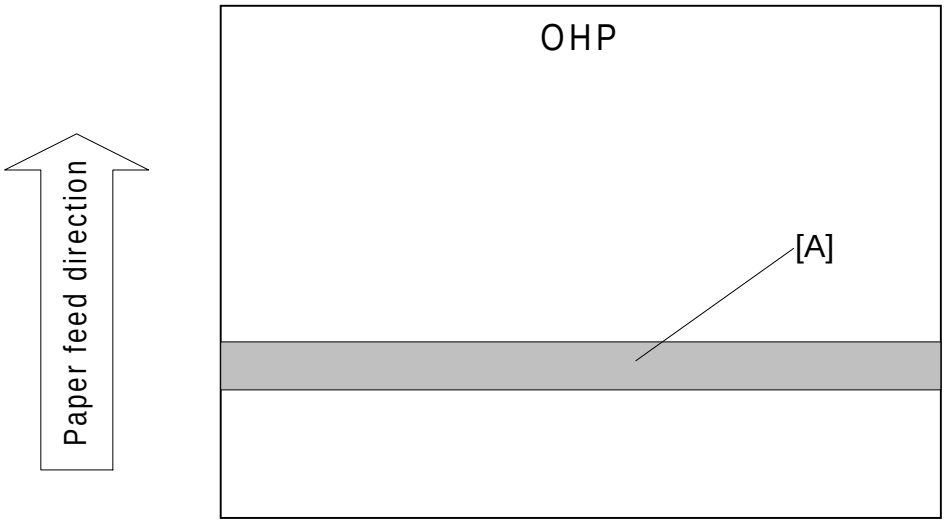
ADF Output Check (SP6-008)

No.	Description
1	Feed-in Motor (Forward)
2	Feed-in Motor (Reverse)
3	Transport Motor (Forward)
4	Transport Motor (Reverse)
5	Feed-out Motor
6	Exit Gate Solenoid
7	Inverter Gate Solenoid
8	DF Indicators
9	Pick-up Motor (Forward)
10	Pick-up Motor (Reverse)

4.2.6 SYSTEM PARAMETER AND DATA LISTS (SMC LISTS)

1. Access SP mode 5-990 and select the class 3 number corresponding to the list that you wish to print.
2. Press 1 to print.
3. Wait for printing to complete.
4. Exit SP mode.

4.2.7 NIP BAND WIDTH ADJUSTMENT (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. Enter SP1-109 and press the “1” key, then press the # key.
3. Press the key to enter copy mode.
4. Place an OHP sheet (A4/8.5”x5.5” sideways) on the by-pass feed tray.
5. Press the “Start” key.
   The OHP sheet is stopped in the fusing unit for about 10 seconds, then it will be fed out 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 centre of the OHP.

Pressure spring position	Nip width
Upper (default position)	6.0 ± 0.5 mm
Lower	6.5 ± 0.6 mm

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

4.2.8 MEMORY ALL CLEAR (SP5-801)

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

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

Among the settings that are reset are the correction data for process control and all the software counters.

Normally, this SP mode should not be used. This procedure is required only after replacing the NVRAM or when the copier malfunctions due to a damaged NVRAM.

1. Print out all SMC Data Lists (SP mode 5-990).
2. Access SP mode 5-801.
3. Hold down the "1" key for over 3 seconds. At this time the beeper will sound.
4. Turn the main power switch off and back on.
5. Do the laser beam pitch adjustment. (Refer to section 6.2.5)
6. Do the printer and scanner registration and magnification adjustments (Refer to section 6.11.).
7. Referring to the SMC data lists, re-enter any values which had been changed from their factory settings.
8. Do SP 3-001-2 (ID Sensor Initial Setting) and SP4-911-1 (HDD media test).

Check the copy quality and the paper path, and do any necessary adjustments.

4.2.9 SOFTWARE RESET

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

Either

Turn the main power switch off and on.

Or

Hold down the ☟ key and # key at the same time for over 10 seconds.

4.2.10 SYSTEM SETTING AND COPY SETTING (UP MODE) RESET

System Setting Reset

The system settings in the UP mode can be reset to their default. Using the following procedure.

1. Confirm that the machine is in the copier standby mode.
2. Press the User Tool key.
3. Holding # key and press “1” using ten-key.
4. The confirmation message will be displayed, then press “Yes”.

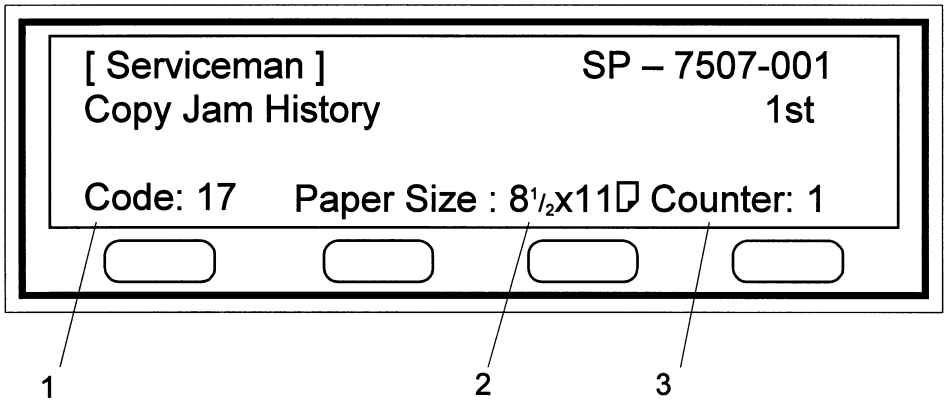
Copy Setting Reset

The copy settings in the UP mode can be reset to their default. Using the following procedure.

1. Confirm that the machine is in the copier standby mode.
2. Press the User Tool key.
3. Holding # key and press “2” using ten-key.
4. The confirmation message will be displayed, then press “Yes”.

4.2.11 COPY JAM HISTORY DISPLAY (SP7-507)

The following message will be displayed.



1: Jam Code (See Table below) 2: Paper Size 3: Counter

Jam Code	Meaning
01	Jams at power on
03	1st paper tray : paper non-feed jam
04	2nd paper tray : paper non-feed jam
05	3rd paper tray: paper non-feed jam
06	4th paper tray: paper non-feed jam
07	LCT: Paper non-feed jam
08	Upper relay sensor: paper does not activate the sensor
09	Lower relay sensor: paper does not activate the sensor
10	Upper relay sensor – opt. PTU: paper does not activate the sensor
13	Registration sensor: paper does not activate the sensor
16	Exit sensor: paper does not activate the sensor
17	Bridge exit sensor: paper does not activate the sensor
18	Bridge relay sensor: paper does not activate the sensor
19	Duplex entrance sensor: paper does not activate the sensor
23	Duplex exit sensor: paper does not activate the sensor
24	1-bin tray entrance sensor: paper does not activate the sensor
⇒ 25	Finisher entrance sensor: paper does not activate the sensor
26	3000-sheet finisher upper tray exit sensor: paper does not activate the sensor
27	Finisher shift tray exit sensor: paper does not activate the sensor
28	Staple tray paper sensor: paper does not activate the sensor
29	Finisher stack feed-out belt HP sensor: paper does not activate the sensor
30	Mail box entrance sensor: paper does not activate the sensor
31	Mail box proof tray exit sensor: paper does not activate the sensor
32	Mail box relay sensor: paper does not activate the sensor
33	Mail box sensor: paper does not activate the sensor

Jam Code Table - Continued

Jam Code	Meaning
57	LCT: paper doe not activate the sensor
58	Upper Relay Sensor: paper stays at the sensor
59	Lower Relay Sensor: paper stays at the sensor
60	Upper Relay Sensor – opt. Paper Tray Unit: paper stays at the sensor
61	Lower Relay Sensor – opt. Paper Tray Unit: paper stays at the sensor
63	Registration sensor: paper stays at the sensor
66	Exit sensor: paper stays at the sensor
67	Bridge exit sensor: paper stays at the sensor
68	Bridge relay sensor: paper stays at the sensor
69	Duplex entrance sensor: paper stays at the sensor
73	Registration sensor: paper stays at the sensor
74	1-bin tray entrance sensor: paper stays at the sensor

4.2.12 Original Jam History Display (SP7-507- 011)

Jam Code	Meaning
01	Jams at power on
03	Jams in the feed-in area
04	Jams in the feed-out area

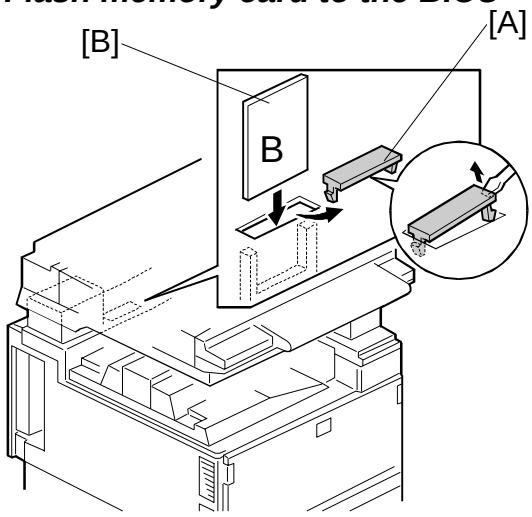
4.3 PROGRAM DOWNLOAD

In this machine, the BICU software is upgraded using a flash memory card.

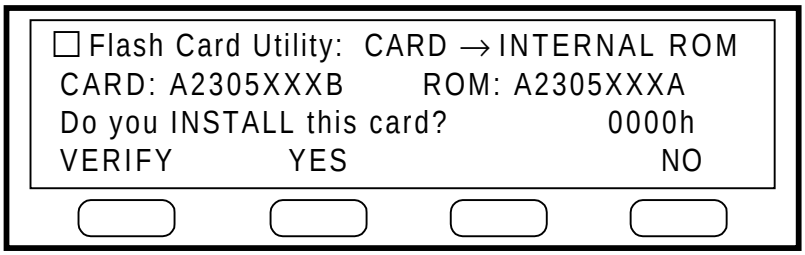
There are two program download procedures. One downloads from the flash memory card to the BICU. The other downloads from the BICU to a flash memory card.

NOTE: The procedure for how to write the source software data from a flash memory card writer to a flash memory card is described in the SwapBox FTL manual.

Download from the Flash memory card to the BICU

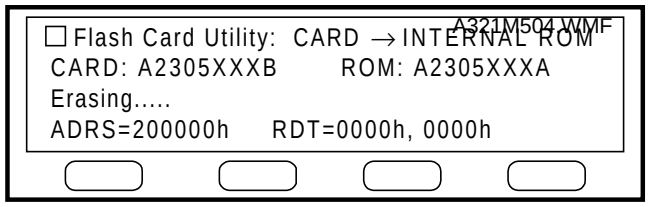


1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “B” faces the front of the machine.
4. Turn on the main power switch.

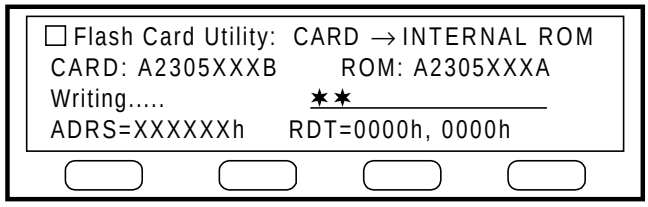


5. Press the “YES” key. The machine will erase the current software in the BICU, then will write the new software from the flash memory card to the BICU. This takes about 100 seconds.

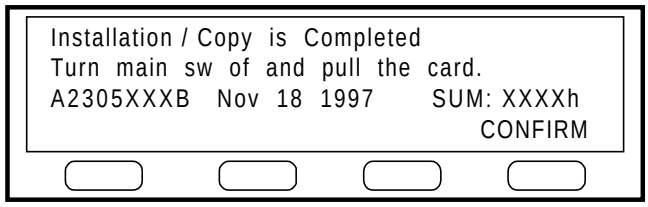
Display during erasing



Display during writing

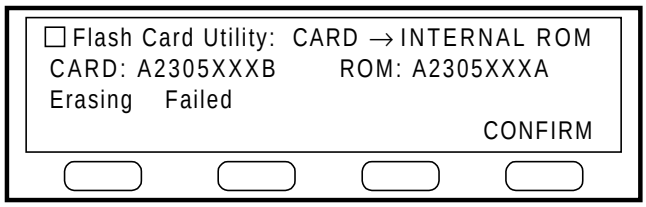


Display when the download is complete

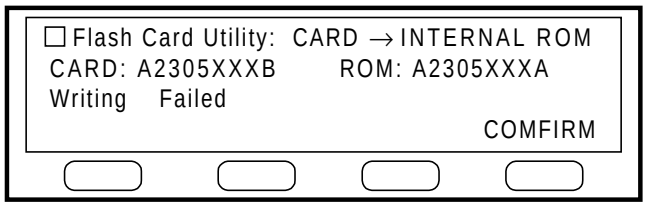


If the downloading procedure failed, an error message appears as follows. At this time, press the “CONFIRM” key to re-try the download.

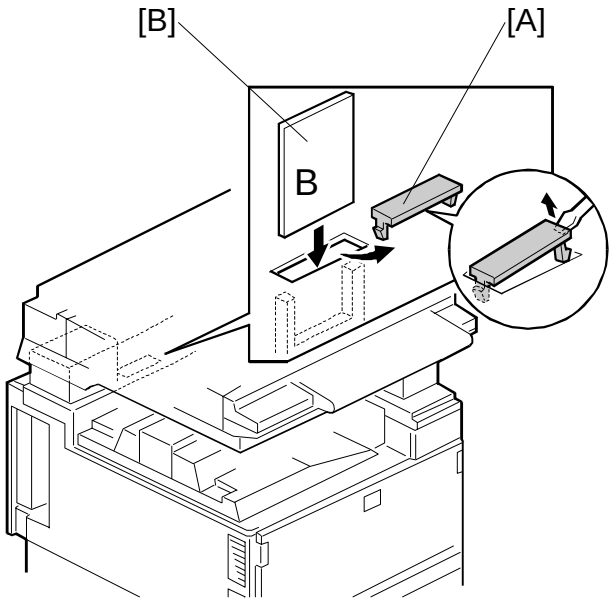
Display if erasing failed



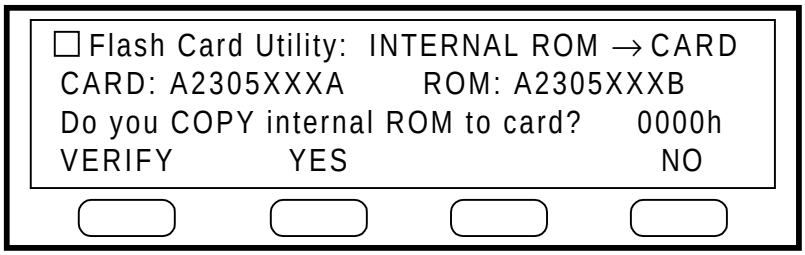
Display if writing failed



Download from BICU to Flash Memory Card

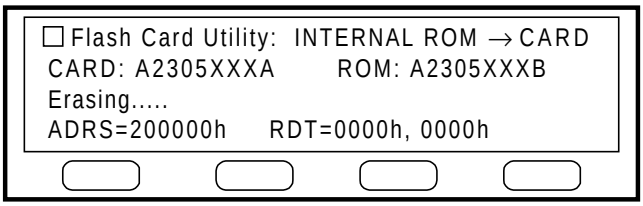


1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “B” faces the front of the machine.
4. Turn on the main power switch while holding down the operation switch.

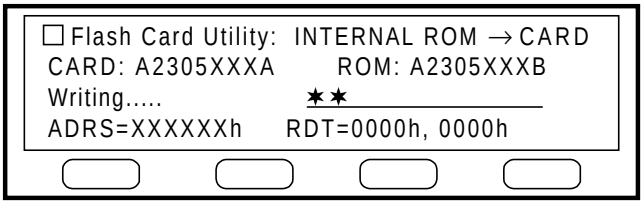


5. Press the “YES” key. The machine will erase the current software in the flash memory card, then will write the new software to the flash memory card. This takes about 100 seconds.
   NOTE: The display is inverted black on white during downloading from BICU to flash memory card.

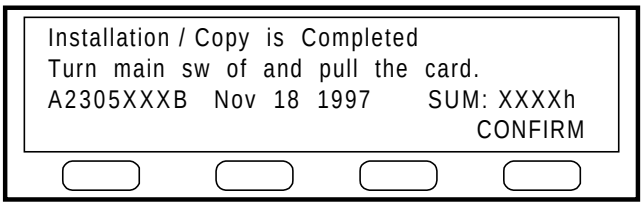
Display during erasing



Display during writing

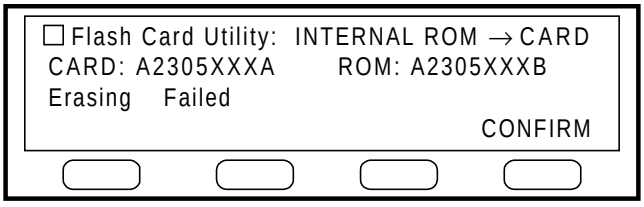


Display when the download is complete

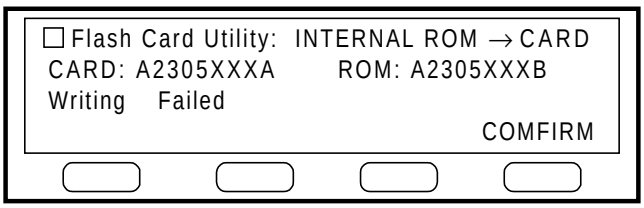


If the downloading procedure failed, an error message appears as follows. At this time, press the “CONFIRM” key to re-try the download.

Display if erasing failed



Display if writing failed



4.4 USER PROGRAM MODE

The user program (UP) mode is accessed by users and operators, and by sales and service staff. UP mode is used to input the copier's default settings.

4.4.1 HOW TO ENTER AND EXIT UP MODE

Press the User Tools button, then select the UP mode program. After finishing the UP mode program, press the User Tools button to exit UP mode.

4.4.2 UP MODE TABLE

NOTE: The function of each UP mode is explained in the System Setting and Copy Reference section of the operating instructions.

System Setting Table

1. System	01. Function Priority	
	02. Panel Beeper	
	03. Ready Beeper	
	04. Copy Count Display	
	05. System Reset	
	06. Function Switch	
	07. Low Power Shift Timer	
	08. Low Power Timer	
	09. Energy Saver Mode	
	10. Auto Off Timer	
	11. Paper Size – Tray	
	12. Paper Tray Priority	
	13. Auto Tray Switch	
	14. Special Paper Indication	
	15. Output Tray	1. Copy
		2. Fax
		3. Printer
	16. Print Priority	
	17. Contrast	
	18. User Code Manage	
	19. Management Setting	1. Show / Print Counter
		2. Print Counter List
		3. Key Operator Code
		4. Register / Change Key Operator Code
	22. ADF Original Eject	
	24. F/F4 Size Setting	

Copy Setting Table

2. Copy	1. General Features	01. APS Priority	
		02. AID Priority	
		03. Original Priority	
		04. Show All Keys	
		05. Maximum Copy Q'ty	
		06. Original Beeper	
		07. Photo Mode	
		08. Reproduction Ratio	
		09. Slip Sheet Tray	
		10. Duplex Priority	
		11. Auto Reset	
		12. Density Pattern	
		13. Initial Mode Set	
		14. Management Setting	1. Counter Reset
			2. Clear Code/Counter
			3. Register User Code
			4. Change/Delete User Code
			5. Counter List Print
	2. Adjust Image	01. Erase Border	
		02. Erase Center	
		03. Margin Adjust – Front	
		04. Margin Adjust – Back	
		05. Double Copy	
		06. Combine Copy	
		07. Image Repeat	
		08. Booklet Original	
	3. Input/Output	01. Duplex Auto Eject	
		02. Combine Auto Eject	
		03. Original Count	
		04. SADF Auto Reset	
		05. Rotate Sort	
		06. Sort	
		07. Stack	
		08. Memory Full – Auto Sort	
		09. Auto Sort Mode	
	4. Shortcut Keys		

4.5 TEST POINTS/DIP SWITCHES/LEDS

4.5.1 DIP SWITCHES

I/O Board: DIP SW101

No.	Function	ON	OFF
1	Copy Speed	35 cpm (180 mm/s)	45 cpm (230 mm/s)
2	Jam Detection (see Note 1)	Off	**On**
3	SC Generation	Disabled	**Enabled**
4	Not used	Keep at "OFF"	
5	Not used	Keep at "OFF"	
6 7	Destination	Off)Japan **On**)**N. America** Off **Off** On	Off)Europe On)Not used On
8	Paper Size Detection (see Note 2)	Enabled	**Disabled**

NOTE: 1) Disabling the jam detection is effective only for the main machine (not for the options).
2) When installing the printer option, change the setting to "ON".

Service Tables

4.5.2 TEST POINTS

I/O Board

Number	Monitored Signal
TP103	Ground
TP104	+24V
TP136	+5V
TP154	Ground
TP156	+12V
TP158	-12V
TP159	+5VE

BICU

Number	Monitored Signal
TP103	GND
TP145	F-gate signal

4.5.3 LEDS

BICU

Number	Monitored Signal
LED101	Monitors whether the program is working normally or not. The LED blinks in normal conditions.
LED102	Monitors +5VE. During the energy saver mode, this LED will blink.

4.6 SPECIAL TOOLS AND LUBRICANTS

4.6.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A2309003	Adjustment Cam – Laser Unit	1
A2309004	Positioning Pin – Laser Unit	1
A2309352	Flash Memory Card – 4MB	1
A2309351	Case – Flash Memory Card	1
A0069104	Scanner Positioning Pin (4 pcs/set)	1
54209516	Test Chart – OS-A3 (10 pcs/Set)	1
A0299387	Digital Multimeter – FLUKE 87	1
A2309099	NVRAM – Minus Counter	1

4.6.2 LUBRICANTS

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

PREVENTIVE MAINTENANCE

5. PREVENTIVE MAINTENANCE SCHEDULE

5.1 PM TABLE

NOTE: The amounts mentioned as the PM interval indicate the number of prints.
Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect

A230/A231/A232	EM	150K	300K	450K	NOTE
SCANNER/OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror		C	C	C	Optics cloth
2nd Mirror		C	C	C	Optics cloth
3rd Mirror		C	C	C	Optics cloth
Scanner Guide Rails		I	I	I	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 alcohol
AROUND THE DRUM					
Charge Roller		R	R	R	
Charge Roller Cleaning Pad		R	R	R	
Quenching Lamp			C		Dry cloth
Pick-off Pawls		R	R	R	
Spur		C	C	C	Dry cloth or alcohol
ID Sensor		C	C	C	Perform the ID sensor initial setting (SP3-001-2) after cleaning (blower brush)
CLEANING UNIT					
Drum Cleaning Blade		R	R	R	
Cleaning Entrance Seal		C	C	C	Blower brush. Replace if necessary.
Side Seal		I	I	I	
DEVELOPMENT UNIT					
Development Drive Gears		I	I	I	Replace every 5 PM (750k)
Development Filter			R		
Developer		I	R	I	
Entrance Seal		I	I	I	
Side Seal		I	I	I	
PAPER FEED					
Registration Roller	C	C	C	C	Clean with water or alcohol.

PM TABLE

A230/A231/A232	EM	150K	300K	450K	NOTE
Paper Feed Roller	I	R	R	R	Check the counter value for each paper tray station (SP7-204). If the value has reached 150k, replace the roller. After replacing the roller, reset the counter (SP7-816).
Separation Roller	I	R	R	R	
Pick-up Roller	I	R	R	R	
Paper Feed Roller (By-pass feed table)	I	R	R	R	
Separation Roller (By-pass feed table)	I	R	R	R	
Pick-up Roller (By-pass feed table)	I	R	R	R	
Paper Feed Guides		C	C	C	Clean with water or alcohol.
Relay Rollers		C	C	C	Clean with water or alcohol.
Bottom Plate Pad		C	C	C	Clean with water or alcohol.
Bottom Plate Pad (By-pass feed)		C	C	C	Clean with water or alcohol.
Registration Sensor		C	C	C	Blower brush
TRANSFER BELT UNIT					
Transfer Belt	C	R	R	R	Dry cloth
Transfer Belt Cleaning Blade		R	R	R	
Transfer Belt Rollers		C	C	C	Dry cloth
Entrance Seal		C	C	C	Dry cloth
Transfer Entrance Guide	C	C	C	C	Dry cloth
Used Toner Tank	I	C	C	C	Empty the tank.
FUSING UNIT 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 Thermistor		I	I	I	Clean if necessary (suitable solvent)
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		L	L	L	Grease Barrierta JFE 55/2
Pressure Roller Strippers		C	C	C	Clean with water or alcohol.
Hot Roller Strippers		C	R	C	Clean with water or alcohol.
Paper Exit Guide Ribs		C	C	C	Clean with water or alcohol.
OTHERS					
Drive Belts			I		Replace if necessary

	EM	80K	160K	240K	NOTE
ADF (for originals)					
Transport Belt	C	R	R	R	Belt cleaner
Feed Belt	C	R	R	R	Belt cleaner
Separation Roller	C	R	R	R	Dry or damp cloth
Sensors		C	C	C	Blower brush
Drive Gears		L	L	L	Grease G501

	EM	150K	300K	450K	NOTE
PAPER TRAY UNIT					
Paper Feed Rollers		R	R	R	Check the counter value for each paper tray station (SP7-204). If the value has reached 150k, replace the roller. After replacing the roller, reset the counter (SP7-816).
Pick-up Rollers		R	R	R	
Separation Rollers		R	R	R	
Relay Rollers		C	C	C	Dry or damp cloth
Bottom Plate Pad		C	C	C	Dry or damp cloth

	EM	150K	300K	450K	NOTE
LCT					
Paper Feed Roller		R	R	R	Check the counter value for each paper tray station (SP7-204). If the value has reached 150k, replace the roller. After replacing the roller, reset the counter (SP7-816).
Pick-up Roller		R	R	R	
Separation Roller		R	R	R	
Bottom Plate Pad		C	C	C	Dry or damp cloth

	EM	150K	300K	450K	NOTE
1,000-SHEET/3,000-SHEET FINISHERS					
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.
Punch Waste Hopper	I	I	I	I	Empty the hopper.

	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

REPLACEMENT AND ADJUSTMENT

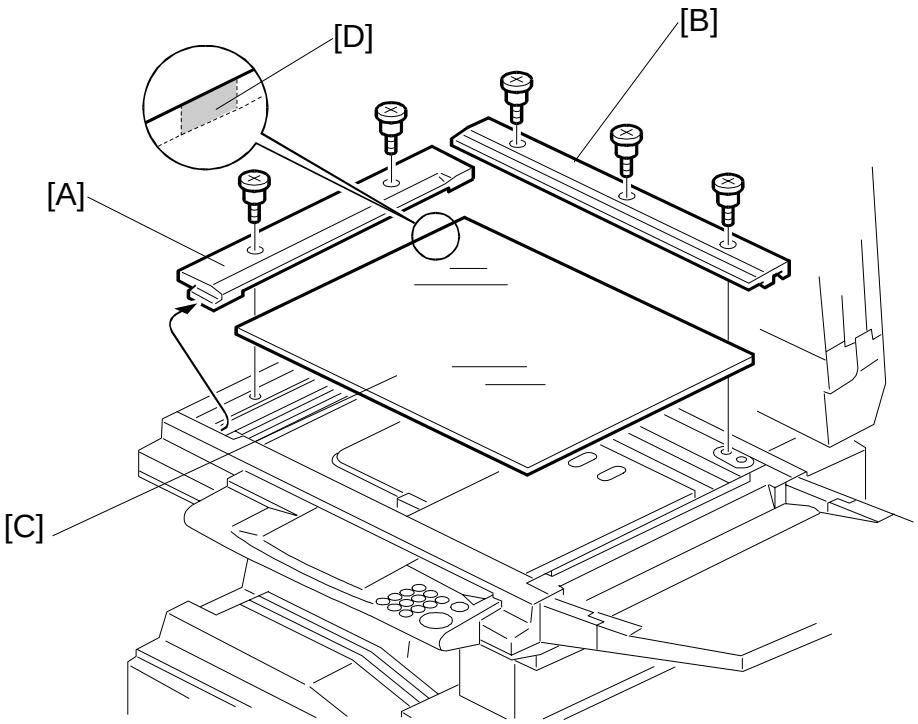
6. REPLACEMENT AND ADJUSTMENT

⚠CAUTION

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

6.1 SCANNER UNIT

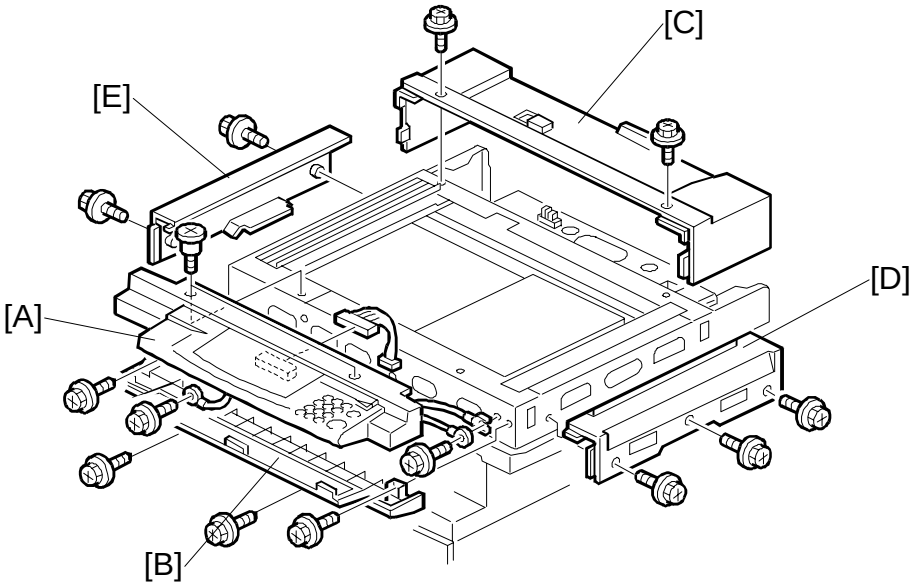
6.1.1 EXPOSURE GLASS

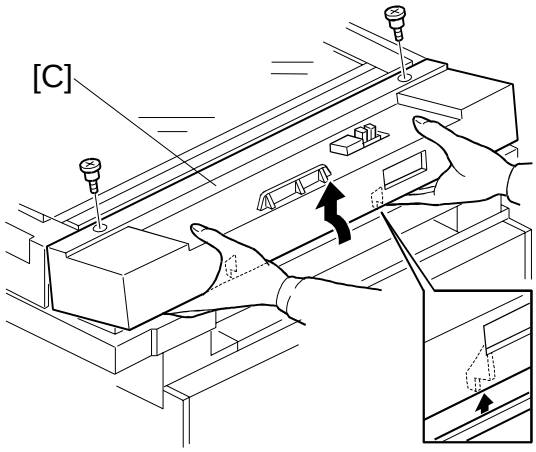


1. Open the ADF or platen cover.
2. Remove the left scale [A] (2 screws).
3. Remove the rear scale [B] (3 screws).
4. Remove the exposure glass [C].

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

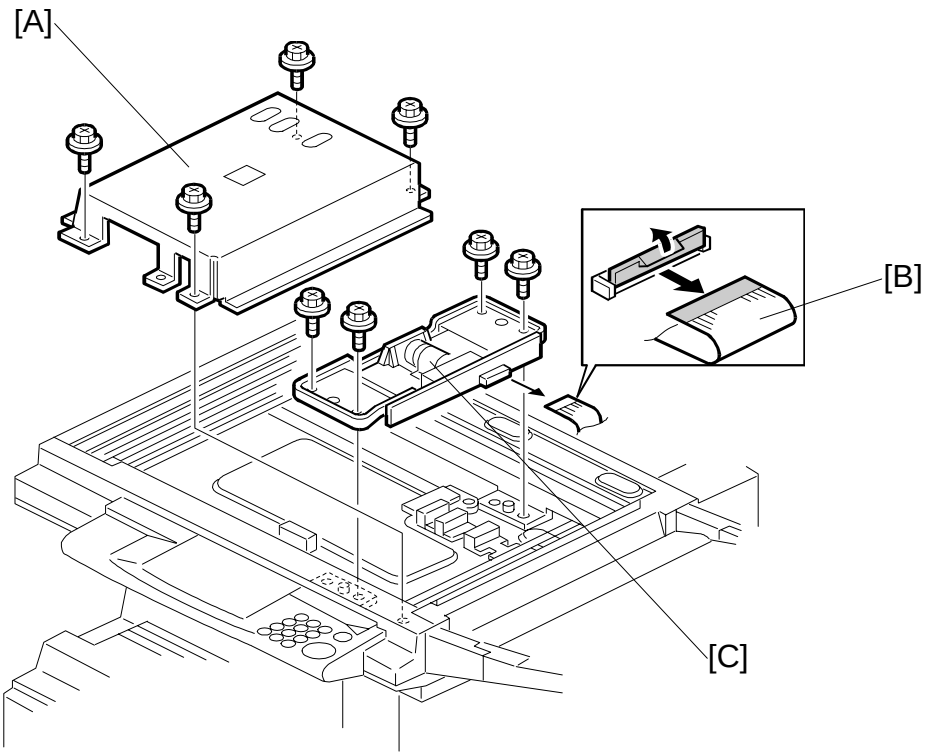
6.1.2 SCANNER EXTERIOR/OPERATION PANEL





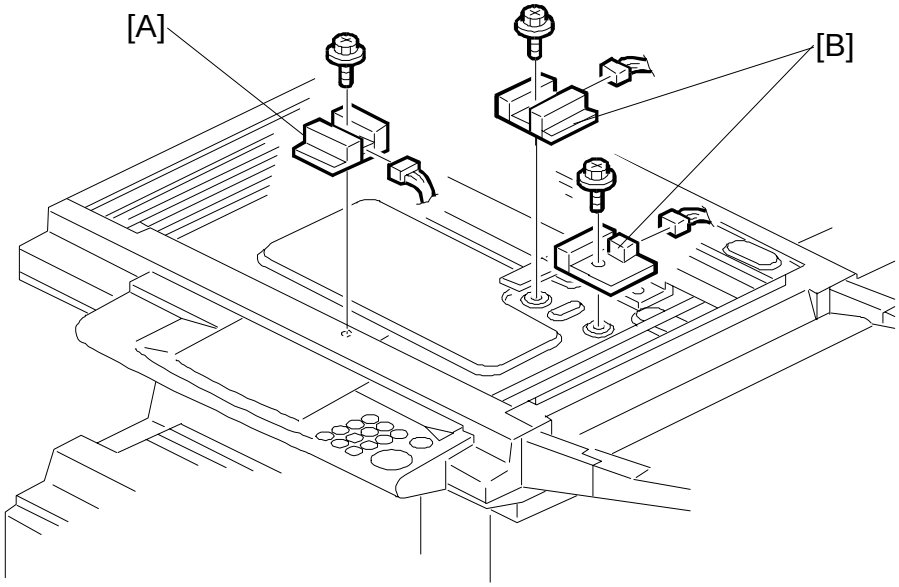
1. Remove the ADF or platen cover.
2. Remove the exposure glass. (See Exposure Glass.)
3. Remove the operation panel [A] (4 screws, 1 connector).
4. Remove the lower operation cover [B] (4 screws).
5. Remove the rear cover [C] (2 screws, 2 pegs).
6. Remove the right cover [D] (3 screws).
7. Remove the left cover [E] (2 screws).

6.1.3 LENS BLOCK/SBU ASSEMBLY



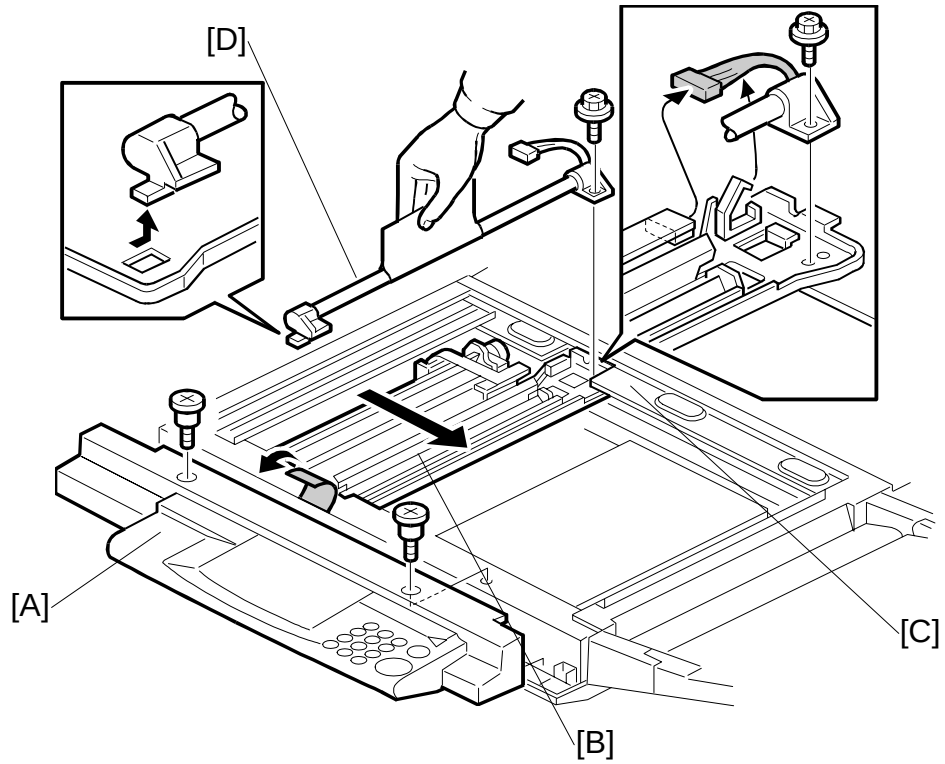
1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the lens cover [A] (4 screws).
3. Disconnect the flexible harness [B].
4. Remove the lens block assembly [C] (4 screws).
5. Do the scanner and printer copy adjustments (see Replacement and Adjustment – Copy Adjustments).

6.1.4 ORIGINAL SIZE SENSORS



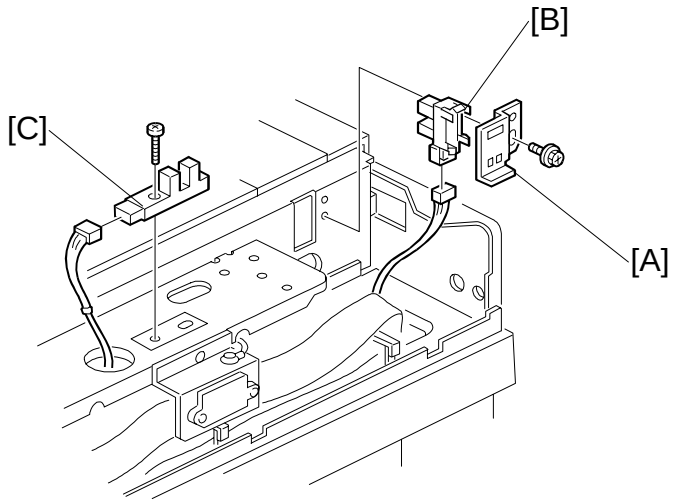
1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the original size sensor [A] (1 screw, 1 connector).
3. Remove the lens block. (See Lens Block/SBU Assembly.)
4. Remove the original size sensors [B] (1 screw, 1 connector each).

6.1.5 EXPOSURE LAMP



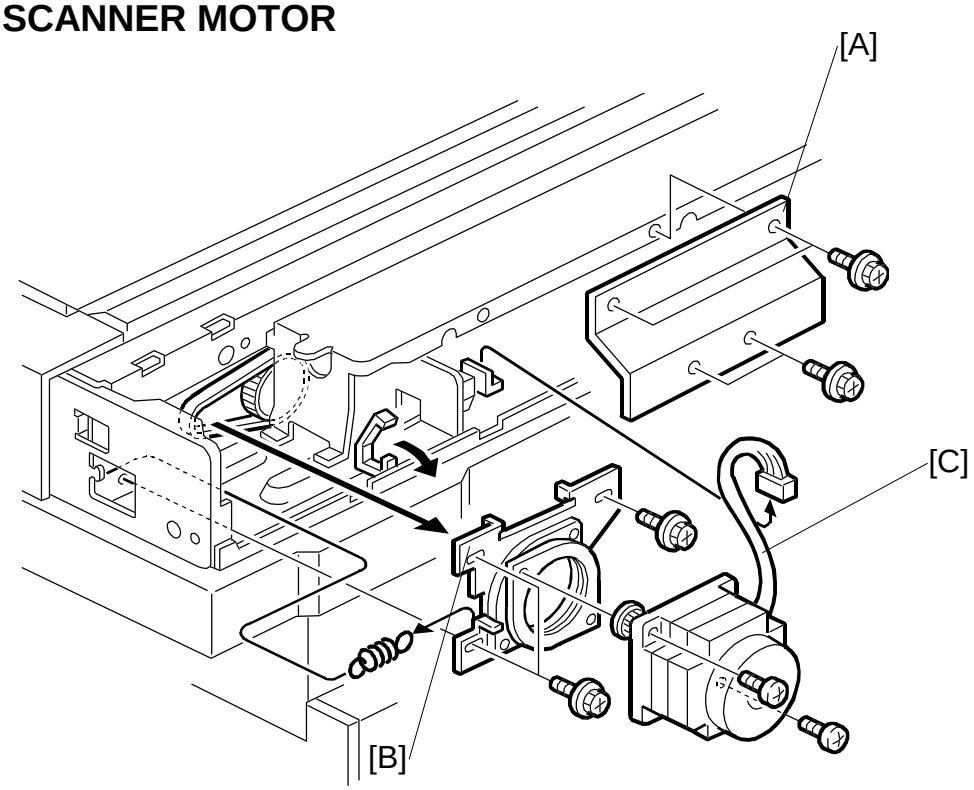
1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the operation panel [A] (4 screws, 1 connector).
3. Slide the 1st scanner [B] to the cutout [C] in the rear scanner frame.
4. Remove the exposure lamp [D] (1 screw, 1 connector).
   NOTE: Do not touch the glass surface of the exposure lamp with fingers.

6.1.6 SCANNER H.P SENSOR/PLATEN COVER SENSOR



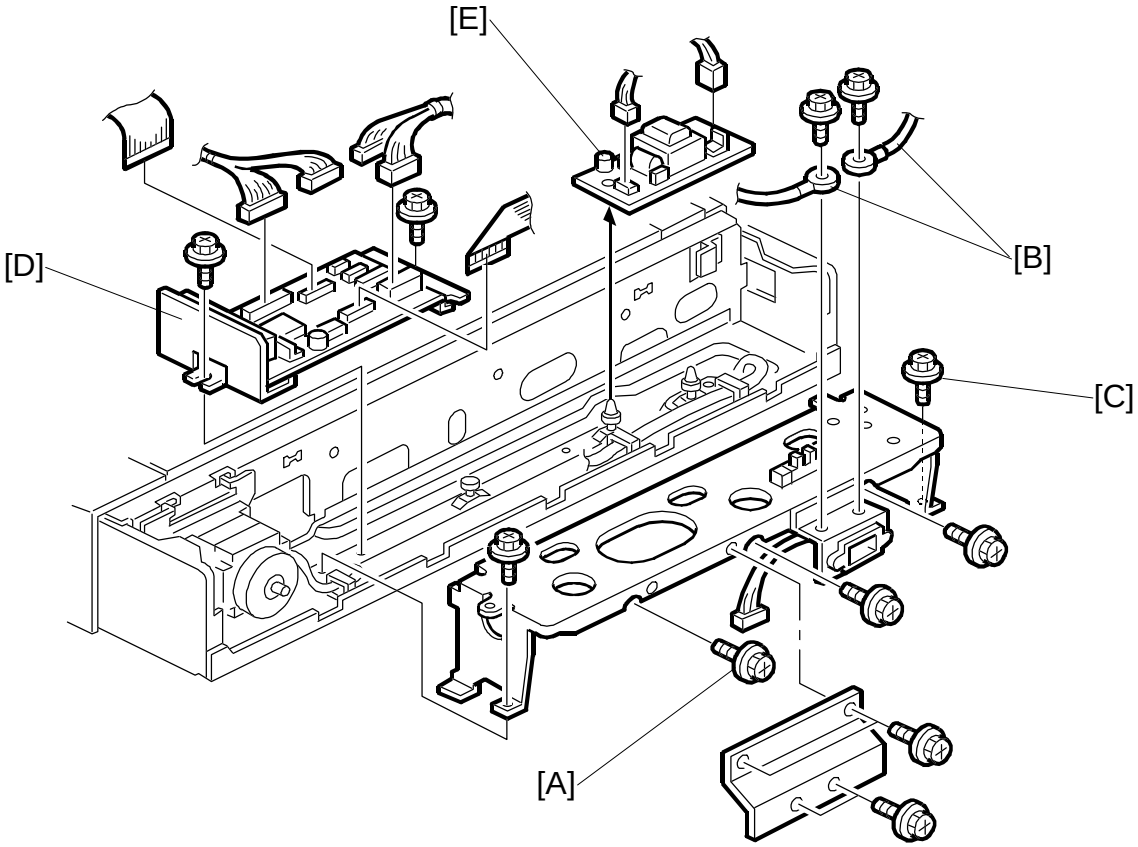
1. Remove the scanner rear cover. (See Scanner Exterior.)
2. Remove the scanner H.P sensor bracket [A] (1 screw).
3. Remove the scanner H.P sensor [B] (1 connector).
4. Remove the platen cover sensor [C] (1 screw, 1 connector).

6.1.7 SCANNER MOTOR



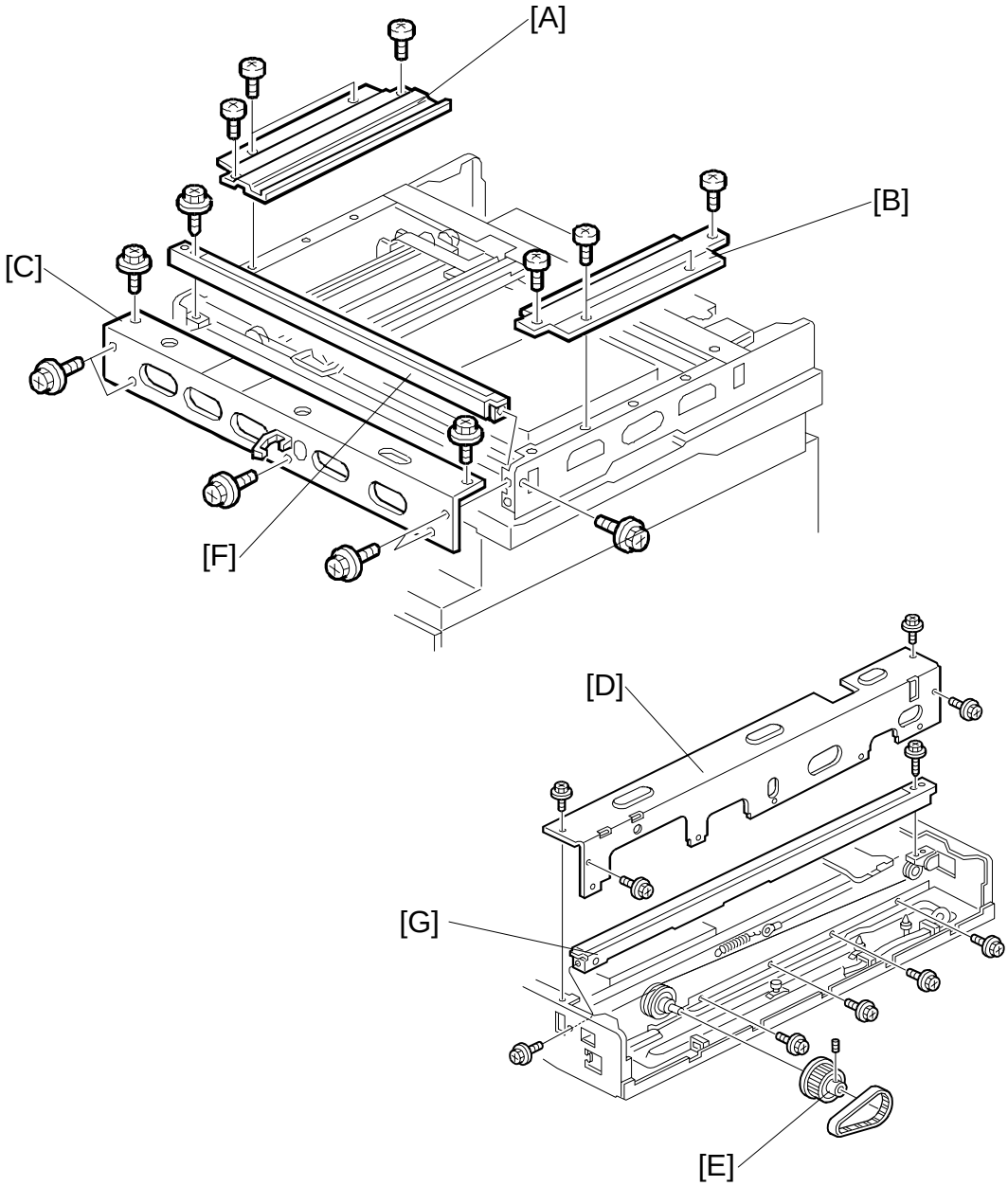
1. Remove the scanner rear cover. (See Scanner Exterior.)
2. Remove the bracket [A] (4 screws).
3. Remove the scanner motor bracket [B] (3 screws, 1 connector, 1 spring, 1 timing belt).
4. Remove the scanner motor [C] (2 screws).
5. Do the scanner and printer copy adjustments (see Replacement and Adjustment – Copy Adjustments).

6.1.8 SIB/LAMP STABILIZER

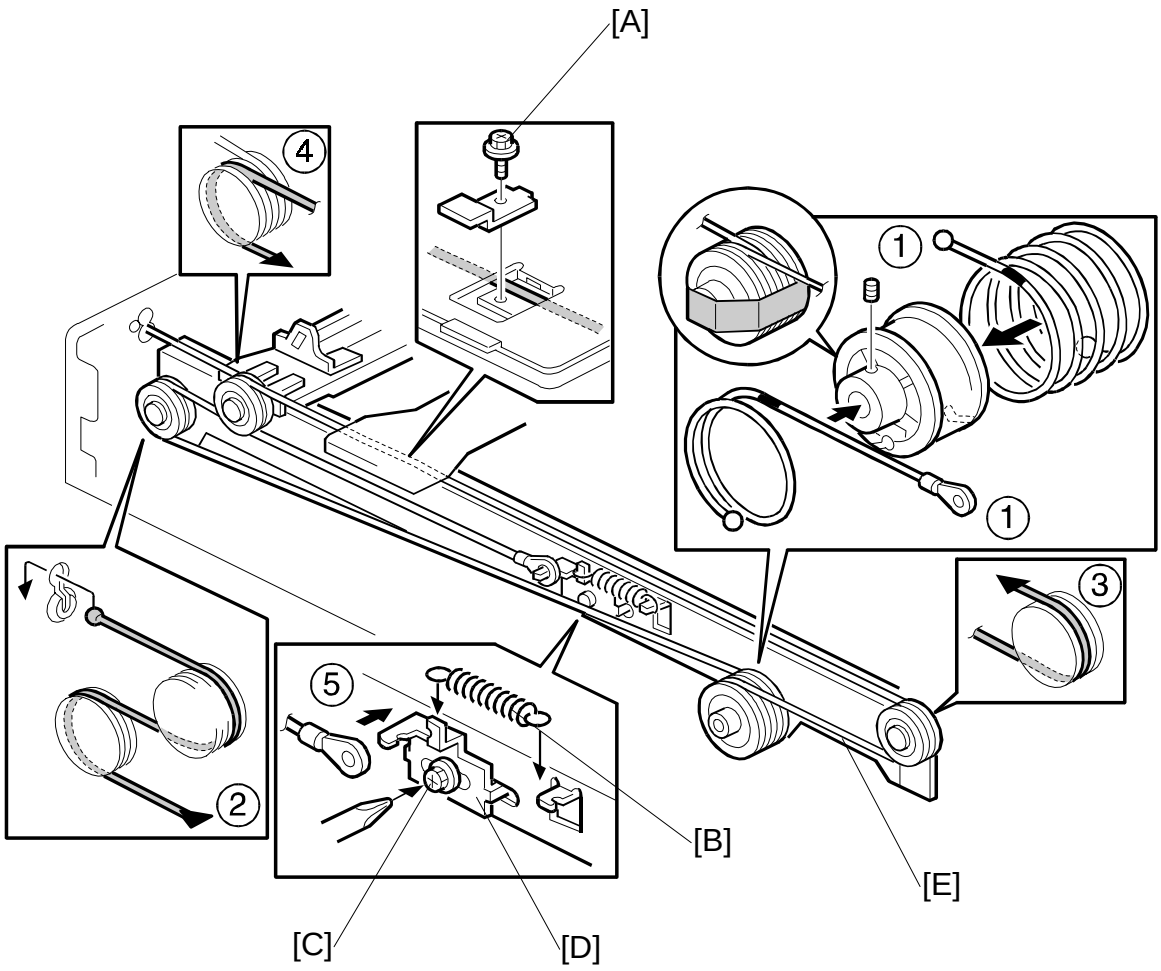


1. Remove the scanner rear cover. (See Scanner Exterior.)
2. Remove the bracket [A] (4 screws).
3. Remove two grounding wires [B] (1 screw each).
4. Remove the rear bracket [C] (5 screws, 2 connectors).
5. Remove the SIB [D] (2 screws, 4 connectors, 2 flexible harnesses).
6. Remove the lamp stabilizer [E] (2 connectors).

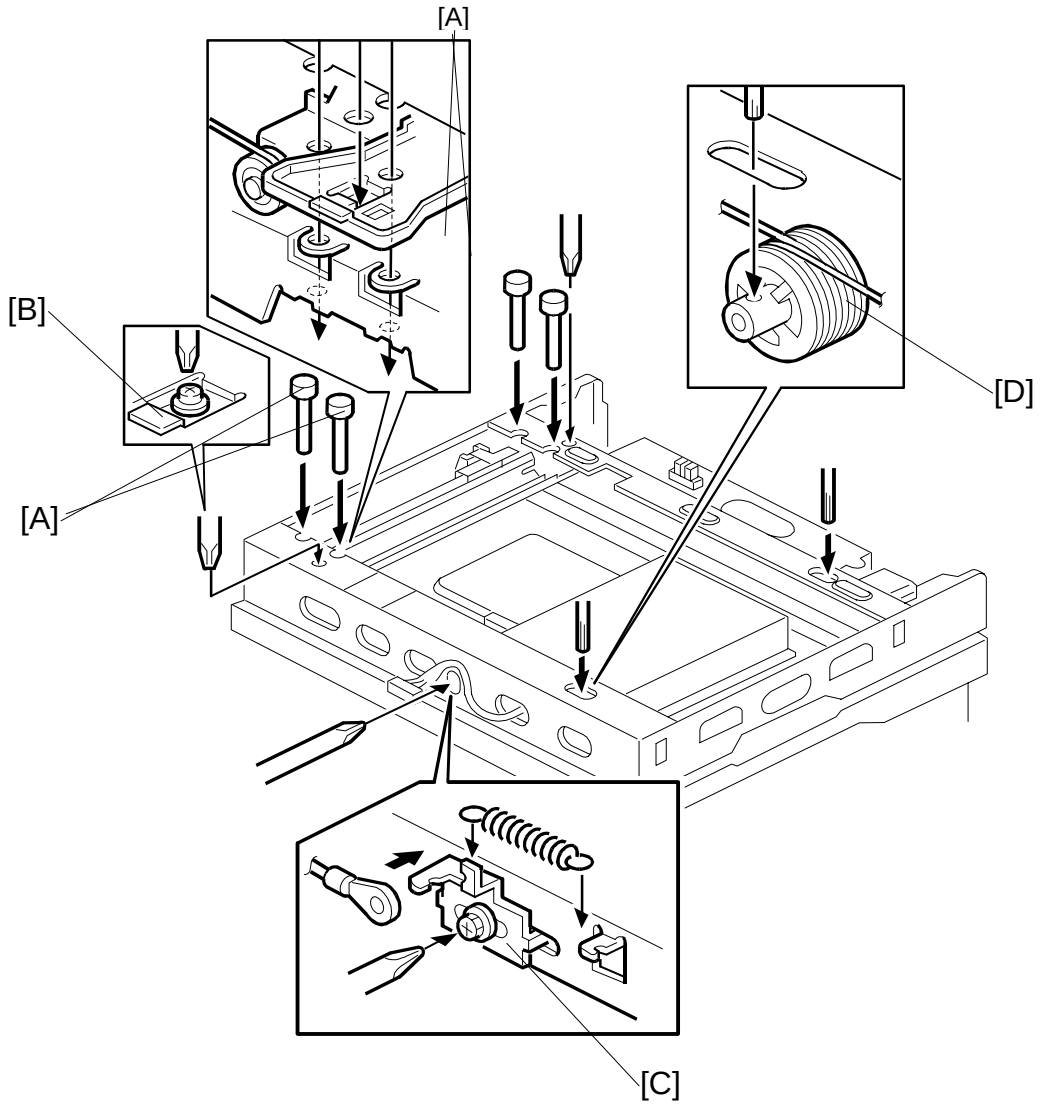
6.1.9 SCANNER WIRE



1. Remove the exposure glass, operation panel, and all scanner exterior covers. (See Exposure Glass and Scanner Exterior.)
2. Remove the left upper stay [A] (4 screws).
3. Remove the right upper stay [B] (4 screws).
4. Remove the front frame [C] (7 screws).
5. Remove the scanner motor. (See Scanner Motor.)
6. Remove the rear frame [D] (8 screws).
7. Remove the scanner drive pulley [E] (1 set screw).



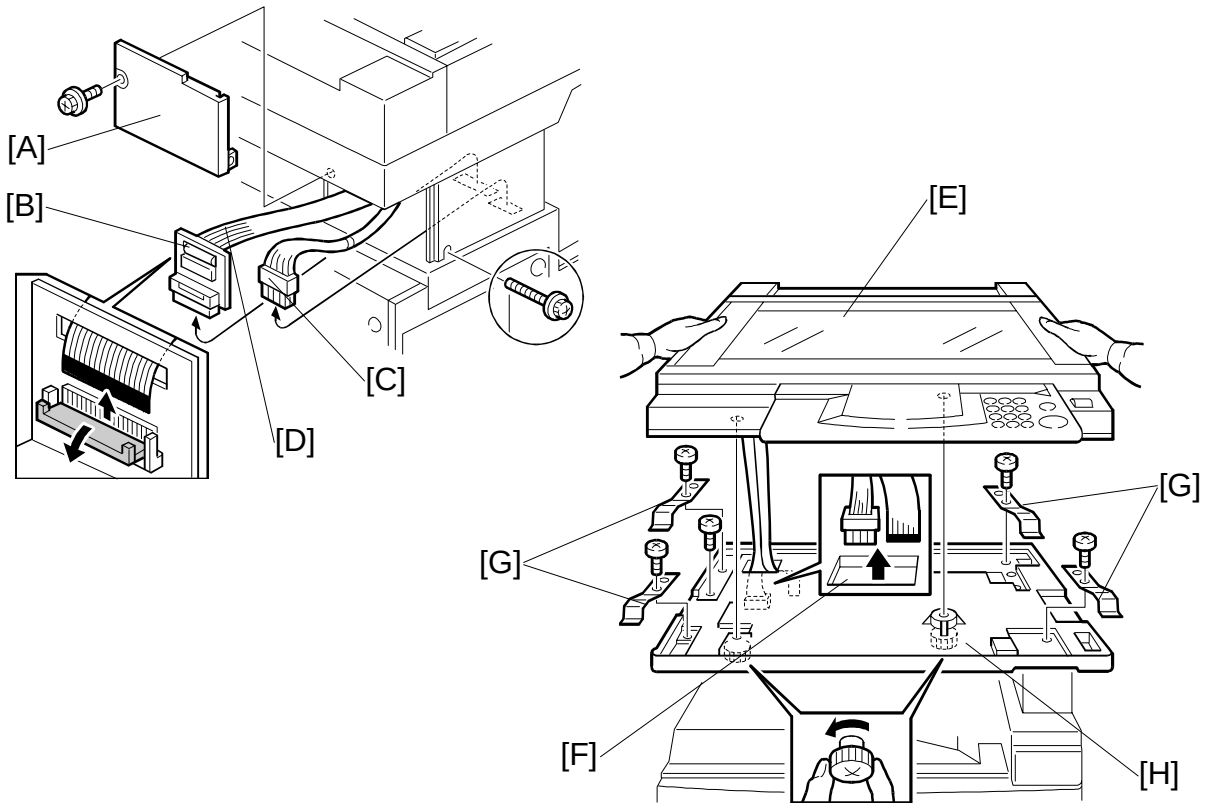
8. Remove the front and rear scanner wire brackets [A] (1 screw each). Then, remove the 1st scanner.
9. Remove the front scanner rail [F] on the previous page (2 screws).
10. Remove the rear scanner rail [G] on the previous page (2 screws).
11. Remove the tension spring [B].
12. Loosen the screw [C] securing the wire tension bracket [D].
13. Remove the scanner wire [E].
14. Wind the new scanner wire around the scanner drive pulley in the correct direction, as shown. (①)
15. Wind the end of the new wire with the ball as shown (②).
16. Wind the end of the new wire with the ring as shown (③, ④, and ⑤).
17. Install the tension spring on the wire tension bracket (⑤).
18. Wind the new scanner wire for the other side as well.



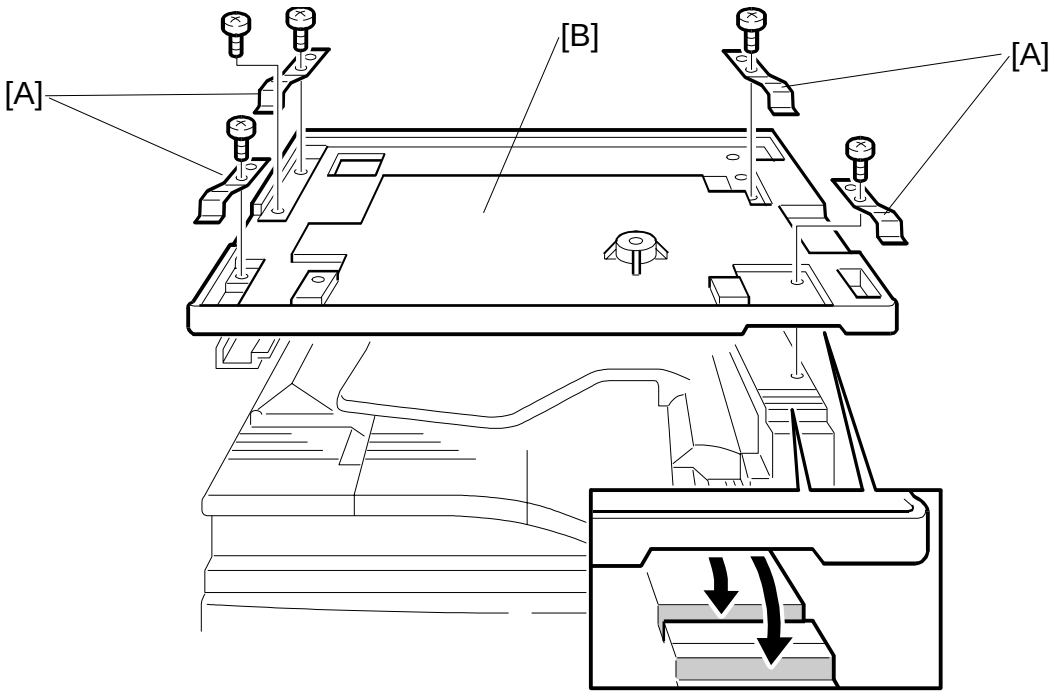
19. Reinstall the front scanner rail and rear scanner rail.
20. Install the 1st scanner and adjust its position with the scanner positioning tools (P/N A0069104) [A].
21. Secure the 1st scanner with the scanner wire bracket [B] (1 screw).
22. Tighten the tension bracket [C].
23. Secure the scanner wire pulley [D] (1 Allen screw).
24. Remove the positioning tools. After sliding the scanner to the right and left several times, set 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 (see Replacement and Adjustment – Copy Adjustments).

6.1.10 SCANNER UNIT POSITIONING ADJUSTMENT

NOTE: The scanner unit position can be changed so that it is easier to check whether there is paper on the optional one-bin tray.



1. Remove the scanner unit.
   NOTE: If the ARDF is installed, remove the ARDF before removing the scanner unit.
   1) Remove the stand rear cover [A] (2 screws).
   2) Disconnect the scanner I/F board [B] and the power connector [C].
   3) Disconnect the scanner I/F harness [D].
   4) Remove the scanner unit [E] (2 knob screws).
   NOTE: 1) Hold the scanner unit as shown in the above illustration. Otherwise, it may be damaged.
   2) Make sure the harnesses are not damaged by the edges of opening [F].
   3) After removing the scanner, keep it in a flat level place.
   5) Remove four plates [G] (1 screw each).
   6) Remove the scanner unit plate [H] (1 screw).



2. Change the scanner unit plate to the appropriate position.
   Without the optional one-bin tray: Either setting can be used
   With the optional one-bin tray: Use the rear setting
3. Reinstall four plates [A] (1 screw each).
4. Secure the scanner unit plate [B] (1 screw).
5. Reinstall the scanner unit (2 knob screws).

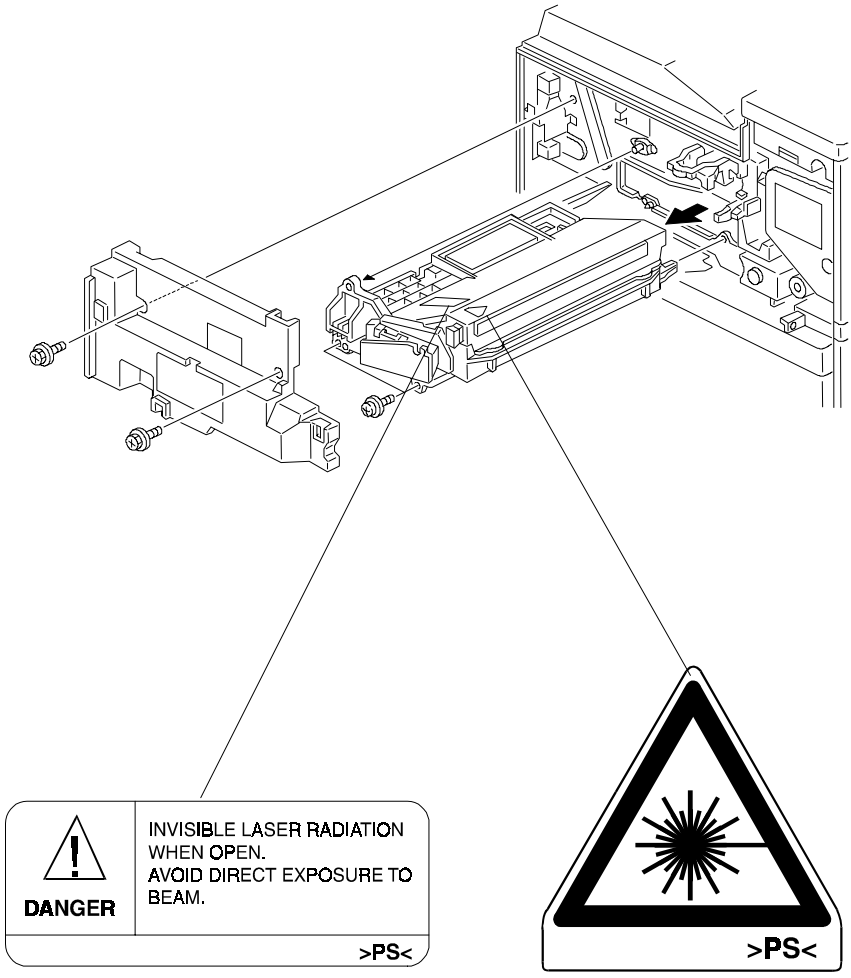
6.2 LASER UNIT

⚠WARNING

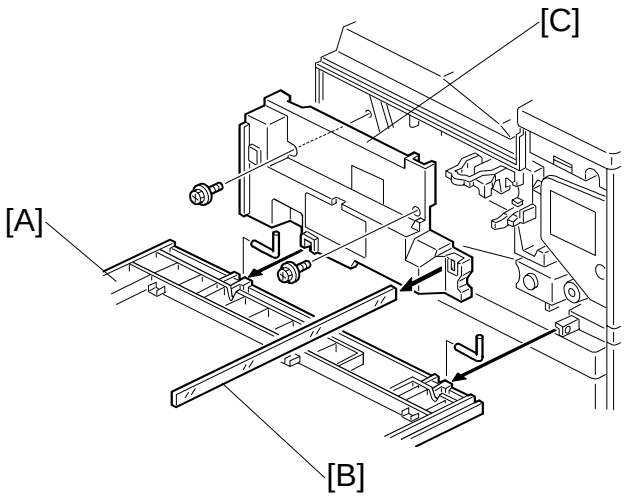
Turn off the main power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

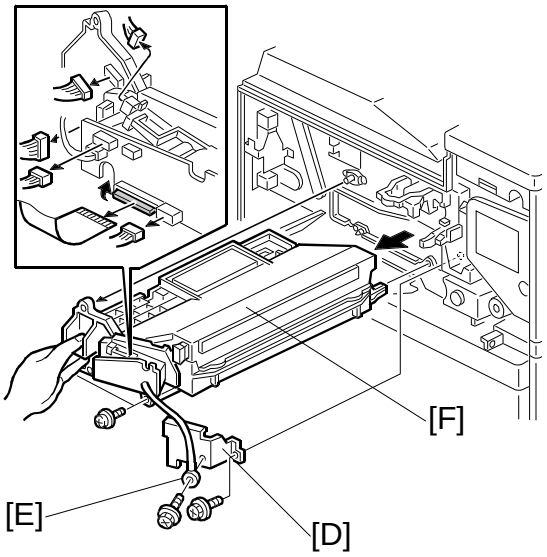
6.2.1 CAUTION DECAL LOCATIONS

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



6.2.2 LASER UNIT



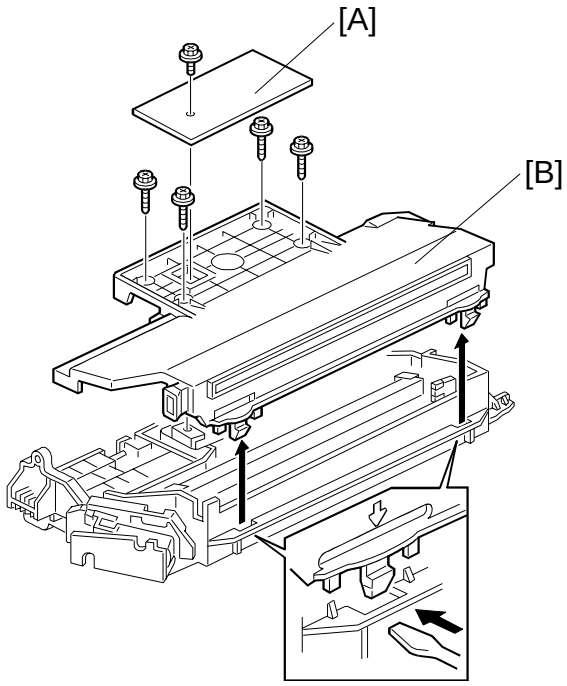


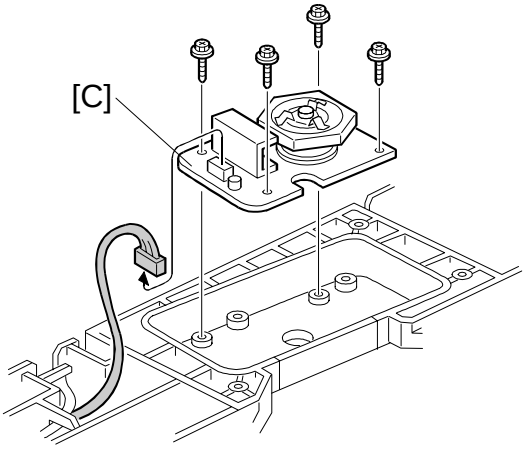
⚠WARNING

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

1. Remove the front cover [A] (2 pins).
2. Remove the shield glass [B].
3. Remove the inner cover [C] (2 screws, 1 connector - mechanical counter).
4. Remove the shield plate [D] and grounding wire [E] (1 screw each).
5. Remove the laser unit [F] (2 screws, 5 connectors, 1 flexible harness).
   NOTE: 1) When disconnecting the harnesses from the LD unit, hold on to the LD unit.
   2) When sliding out the laser unit, do not hold the LD unit.

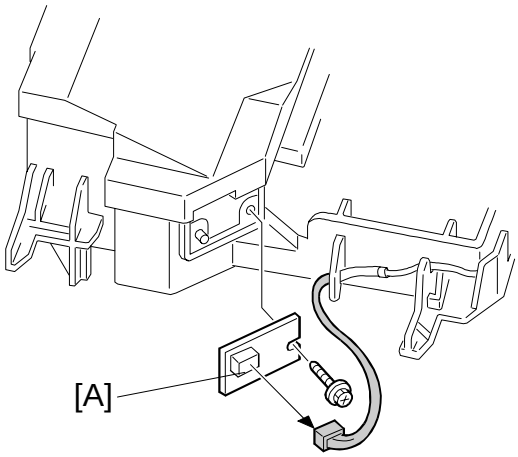
6.2.3 POLYGON MIRROR MOTOR





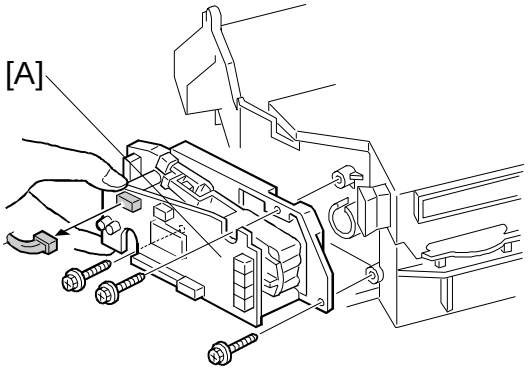
1. Remove the laser unit (see Laser Unit).
1. **A232 only:** Remove the heat sink [A] (1 screw).
2. Remove the laser unit cover [B] (4 screw, 2 pawls).
3. Remove the polygon mirror motor [C] (4 screws, 1 connector).

6.2.4 LASER SYNCHRONIZATION DETECTOR



1. Remove the laser unit (See Laser Unit).
2. Remove the laser synchronization detector [A] (1 screw, 1 connector).

6.2.5 LD UNIT



1. Remove the laser unit (See Laser Unit).
2. Remove the LD unit [A] (3 screws, 1 connector)

NOTE: When disconnecting the harness, hold on to the LD unit.

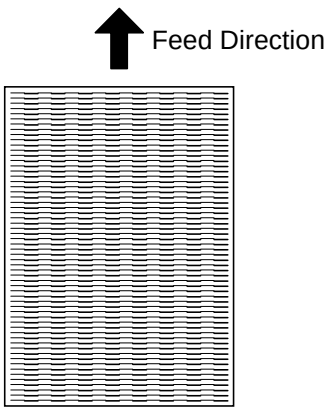
3. After replacing the LD unit, perform SP 2-109-8 then the laser beam pitch adjustment (see the following procedure).

Laser beam pitch adjustment

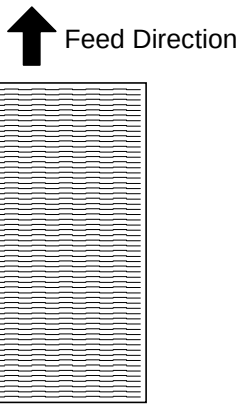
There are two laser beam pitch adjustment procedures: one for 400 dpi, and one for 600 dpi. These adjustments use the following SP modes.

- SP2-109-1: LD Beam Pitch Adjustment – 400 dpi
- SP2-109-2: LD Beam Pitch Adjustment – 600 dpi
- SP2-109-3: LD Initial Setting – 400 dpi
- SP2-109-4: LD Initial Setting – 600 dpi
- SP2-902-2, no.12: IPU Test Pattern – Cross Stitch – 400 dpi
- SP2-902-2, no.13: IPU Test Pattern – Cross Stitch – 600 dpi

1. Do SP 2-109-8.
2. Input the value “144” into SP2-109-1.
3. Perform SP2-109-3.
4. Print the 400-dpi test pattern onto A3 (11”x17”) paper using SP2-902-2 no.12. (See Service Tables - Test Pattern Printing).
5. Write the value of SP2-109-1 on the test pattern (in this case “144”).
6. Change the value of SP2-109-1 and print another test pattern, repeating steps 2 to 4. Print about 5 patterns with different values for SP2-109-1 (e.g. “48”, “96”, “192”, “240”).
7. Check these test patterns. If the laser beam pitch is not correct, the image looks like a black vertical strip pattern.
   NOTE: As an example, if the pattern made with the value “192” has less obvious strips than the other print outs, the correct value is near “192”.
8. Adjust the laser beam pitch position until the thin lines are of uniform thickness (no striping effect should appear on the printout), doing steps 2, 3, and 4 (in step 2, input a value which is estimated to be correct, then do steps 3 and 4, then if necessary go back to step 2 and try another value).
9. After adjusting the laser beam pitch for 400 dpi, adjust the laser beam pitch for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi). When starting the adjustment for 600 dpi input value for SP2-104-1 between 24 and 48 higher than the result for 400 dpi.



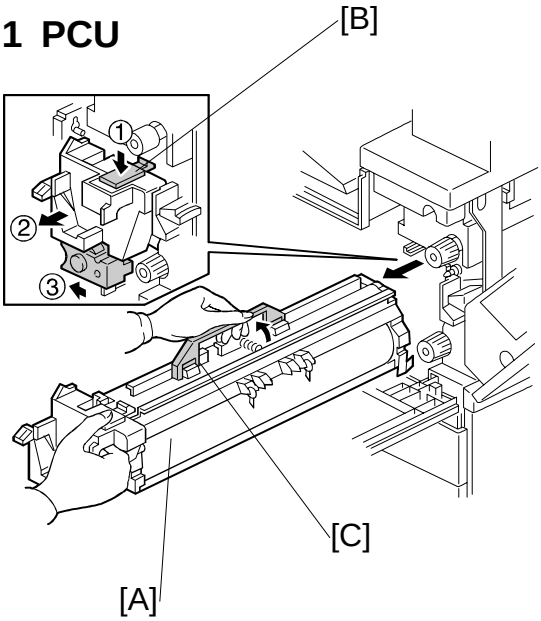
Adjustment not complete

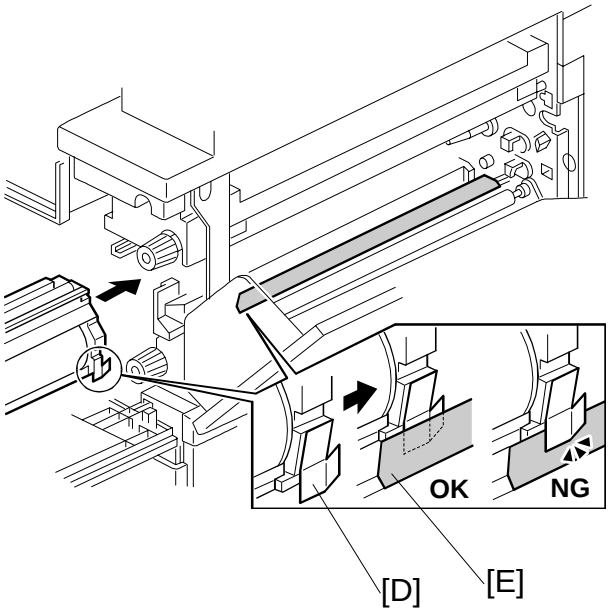


Adjustment complete

6.3 PHOTOCONDUCTOR UNIT (PCU)

6.3.1 PCU



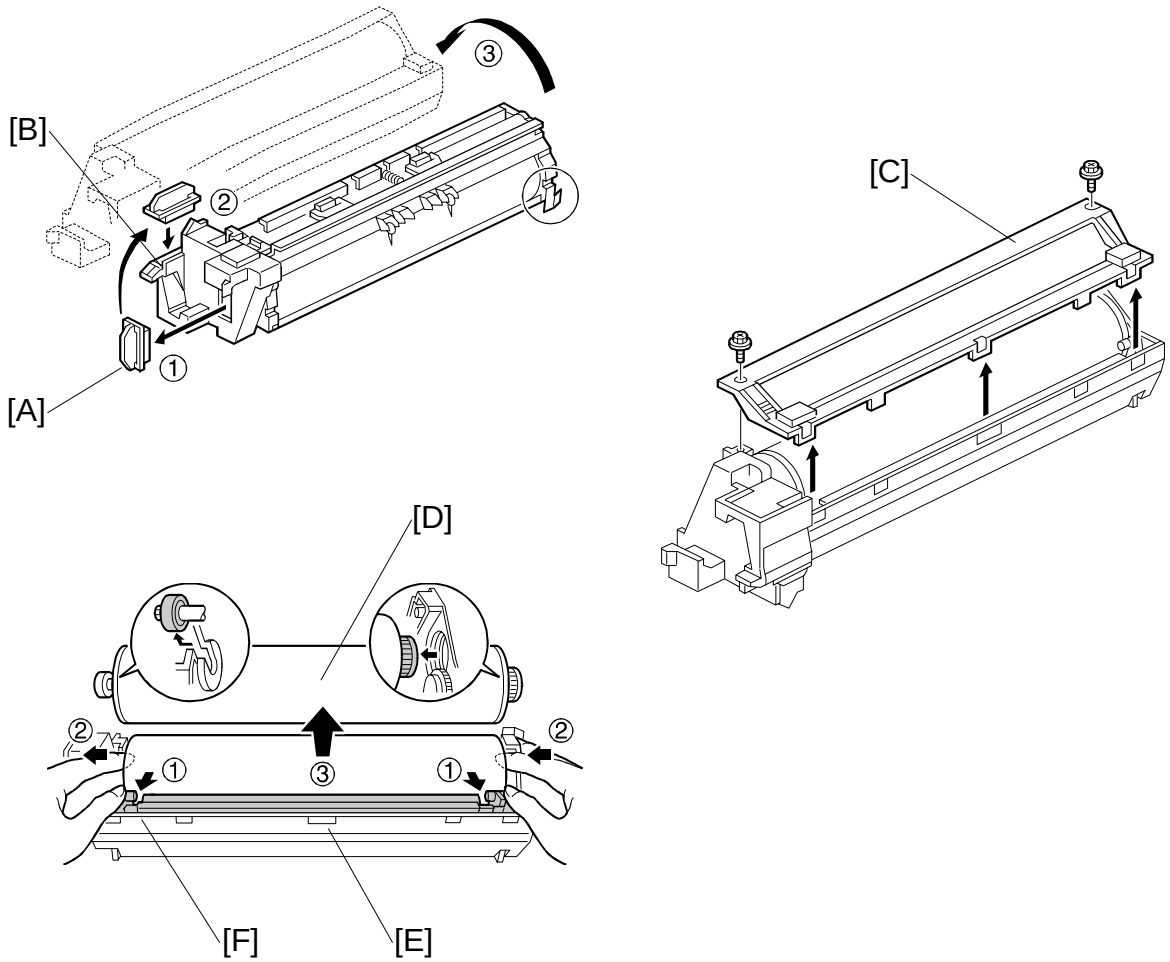


1. Open the right cover and front cover.
2. Pull the PCU [A] out slightly while pushing the release lever [B].
3. Push the development unit to the left. Then, pull the PCU out, holding the handle [C].

When reinstalling the PCU, make sure of the following:

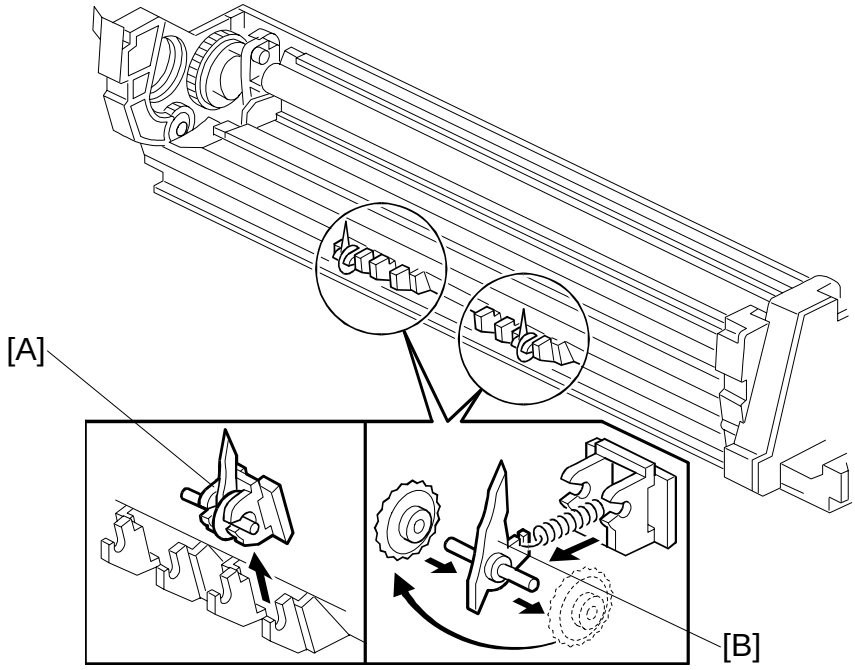
- The development unit should be pushed to the left.
- The mylar [D] should not be deformed by the PCU entrance seal [E].

6.3.2 DRUM



1. Pull the PCU out. (See PCU.)
2. Remove the toner cap [A] and put it over the toner entrance hole [B].
3. Turn the PCU upside-down. Then, remove the lower PCU cover [C] (2 screws, 3 pawls).
4. Push the drum [D] towards the front ② (the left side in the illustration), while releasing the charge roller [E] using the release lever ① [F]. Then, remove the drum ③.
   NOTE: Do not touch the drum surface with bare hands.
5. After replacing the charge roller, check the value of SP2-001-1. If it is not at the standard value, change it to the standard value using SP2-001-1.
   NOTE: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.
6. After replacing the drum, perform the ID sensor initial setting using SP3-001-2.
7. Do the developer initialization setting procedure (SP2-805).

6.3.3 PICK-OFF PAWLS



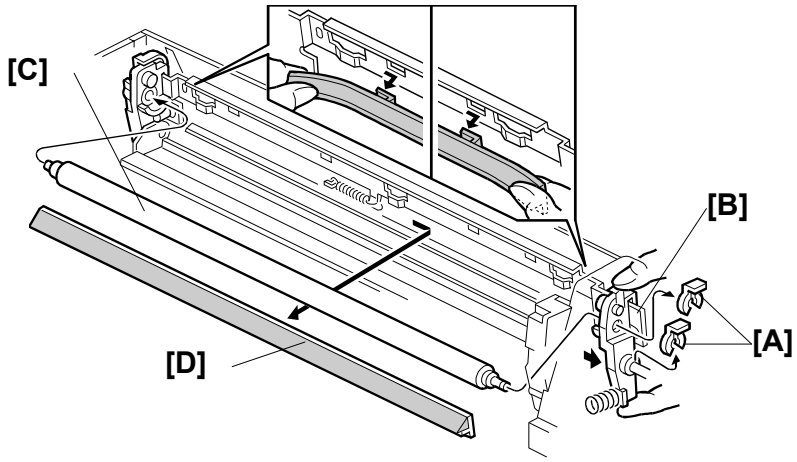
1. Remove the drum. (See Drum.)
2. Remove the pick-off pawl assembly [A].
3. Remove the pick-off pawl [B] (1 spring, 1 spur).

Pick-off pawl position adjustment

If a line has appeared on the drum surface because of the pick-off pawl, the pick-off pawl position can be adjusted using either or both of the following:

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

⇒ 6.3.4 CHARGE ROLLER/CHARGE ROLLER CLEANING PAD



1. Remove the drum. (See Drum.)
2. Remove two snap rings [A] and slide out the front charge roller holder [B].
3. Remove the charge roller [C].

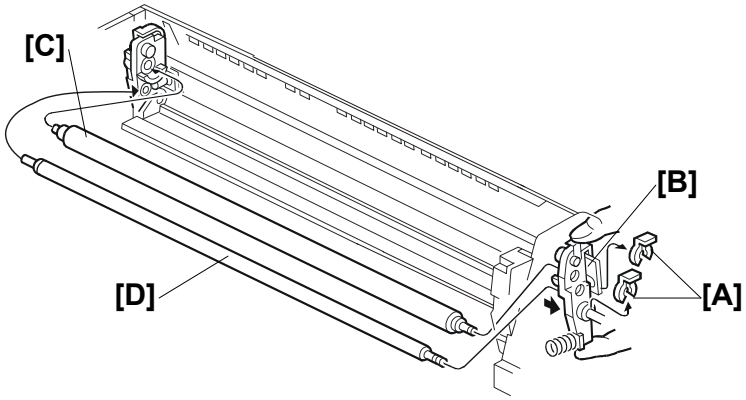
NOTE: Do not touch the charge roller with bare hands.

4. Remove the charge roller cleaning pad [D] (4 hooks).
5. After replacing the charge roller, check the value of SP2-001-1. If it is not at the standard value, change it to the standard value using SP2-001-1.

CAUTION: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.

Standard value: 1630V (A230/A231), 1650V (A232)

⇒ 6.3.4a CLEANING ROLLER BRUSH REPLACEMENT PROCEDURE



1. Remove the drum.
2. Remove two snap rings [A] and slide out the front charge roller holder [B].

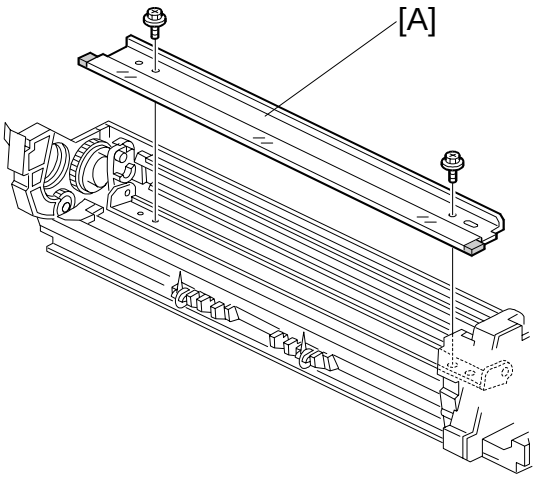
NOTE: Do not touch the charge roller with bare hands.

3. Remove charge roller [C] and the charge roller cleaning brush [D].
4. After replacing the charge roller, check the value of SP2-001-1. If it is not at the standard value, change it to the standard value using SP2-001-1.

CAUTION: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.

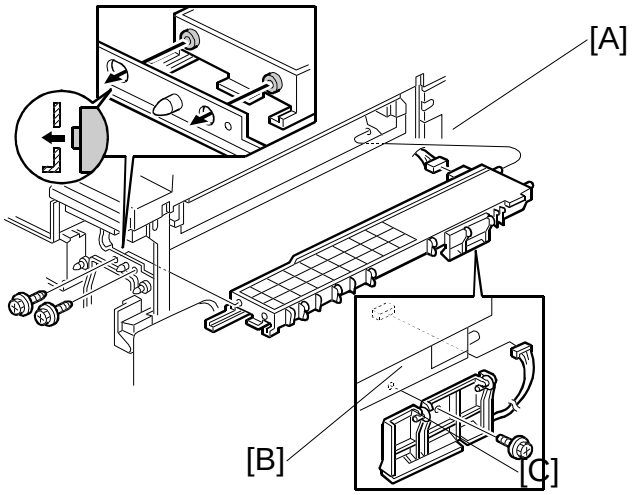
Standard value: 1630V (A230/A231), 1650V (A232)

6.3.5 DRUM CLEANING BLADE



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

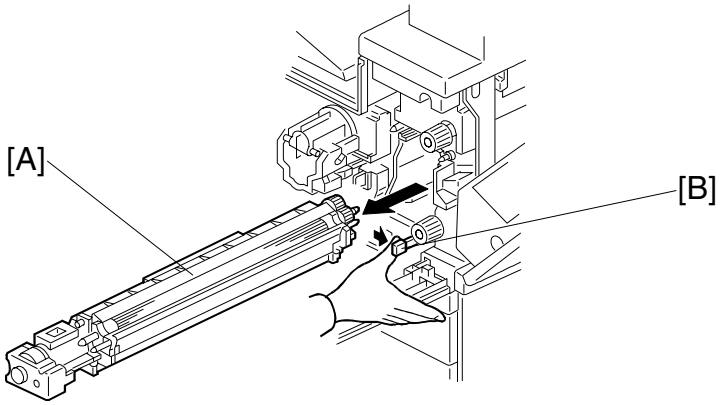
6.3.6 ID SENSOR

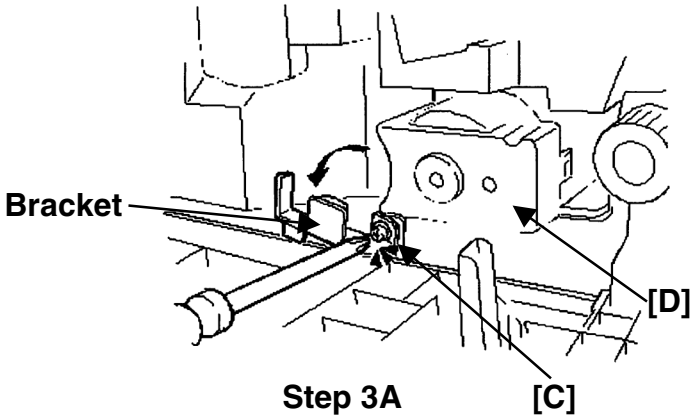


1. Remove the PCU, fusing unit, and development unit.
2. Remove the PCU rail [A] (2 screws, 1 connector).
3. Remove the ID sensor bracket [B] (1 screw, 1 connector).
4. Remove the ID sensor [C] (1 screw).
5. Perform the ID sensor initial setting using SP3-001-2.

6.4 DEVELOPMENT

6.4.1 DEVELOPMENT UNIT





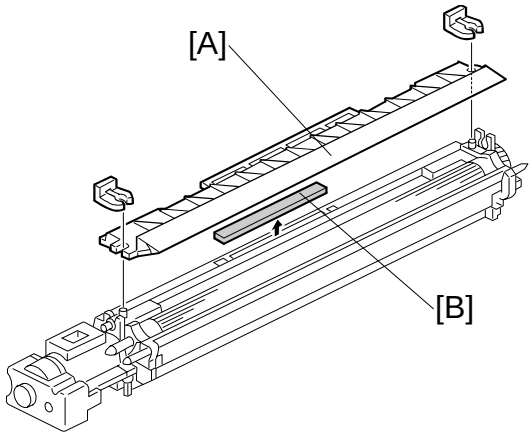
1. Open the right upper cover and front cover.
2. Remove the PCU. (See Photoconductor Unit.)
3. Remove the development unit [A] while pushing the release lever [B] to the right.

⟹ **NOTE 1:** *For machines produced after May 1999 follow Step 3A below.*

3A. While loosening screw [C] , turn the bracket counterclockwise, then remove the development unit [D].

NOTE 2: Be careful not to nick or scratch the development roller.
If you are temporarily installing a used development unit for test purposes for a long time, perform SP2-220 and 2-802 after installation (see the SP mode table for details).

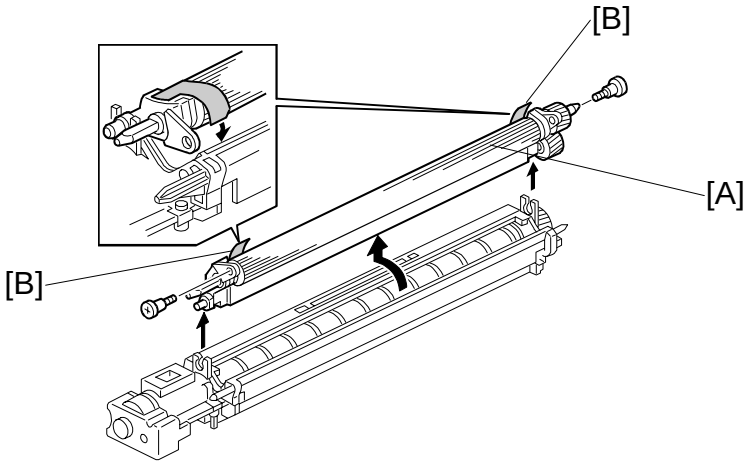
6.4.2 DEVELOPMENT FILTER



1. Remove the development unit. (See Development Unit.)
2. Remove the upper development cover [A] (2 snap rings).
3. Remove the development filter [B]

NOTE: Make sure that the surface with a red mark is facing up.

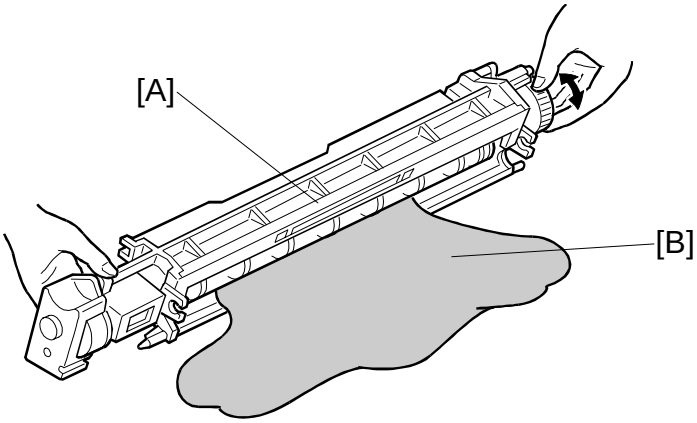
6.4.3 DEVELOPMENT ROLLER

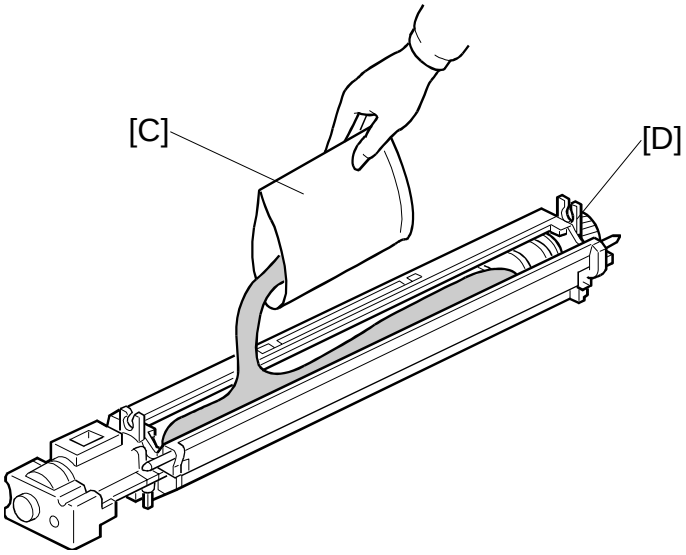


1. Remove the development unit and upper development cover. (See Development and Development Filter.)
2. Remove the development roller [A] (2 screws).

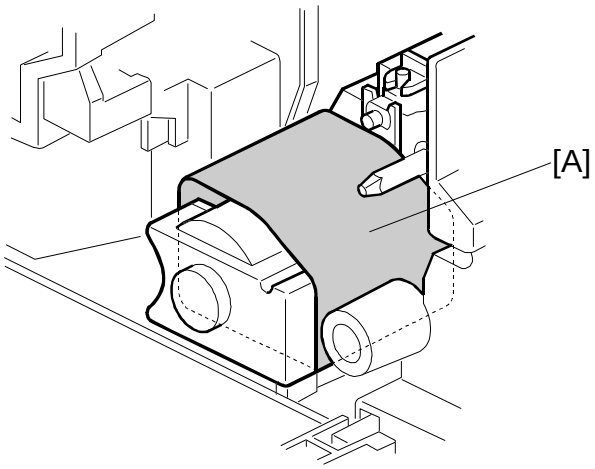
NOTE: 1) Be careful not to nick or scratch the development roller.
2) When reinstalling the development roller, the side seals [B] must be inside the development unit case.

6.4.4 DEVELOPER





1. Remove the development unit and place it on a clean sheet. (See Development Unit.)
2. Remove the development roller. (See Development Roller.)
3. Turn over the development unit (the development filter [A] must be at the top as the unit turns over, as shown) and empty all the old developer [B]. Make sure that no developer remains on the development roller or in the unit.
   NOTE: 1) Dispose of the used developer in accordance with local regulations.
   2) Be careful not to nick or scratch the development roller.
4. Pour all the new developer [C] into the development unit. Then, rotate the gear [D] so that the developer is distributed evenly.



5. Reassemble the development unit and cover the toner entrance hole with a piece of paper [A], as shown.
6. Install the development unit into the machine.
7. Turn on the main power switch, make sure that the machine has warmed up, then perform the TD sensor initial setting using SP 2-801.
8. After performing the TD sensor initial setting, take out the sheet [A] from the development unit.

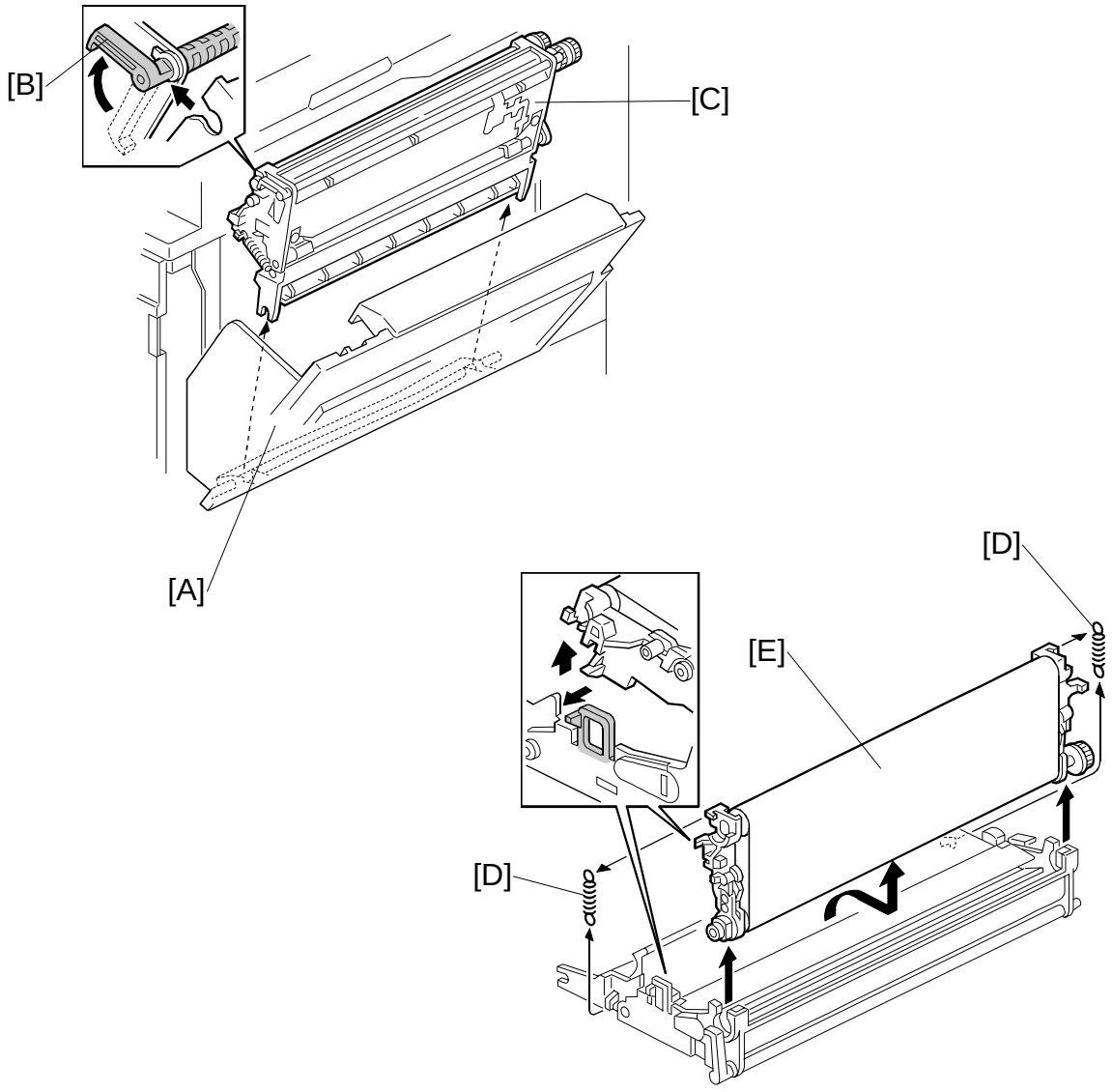
NOTE: When doing the TD sensor initial setting, cover the toner entrance hole with a piece of paper. This is because, if used toner in the PCU falls into the development unit through the toner entrance opening during TD sensor initial setting, Vref (toner density reference voltage) will not be measured correctly.

6.4.5 TD SENSOR

1. Remove the development unit and empty all the developer. (See Developer.)
2. Remove the TD sensor.
   NOTE: When installing the new TD sensor, secure it with double-sided tape.
3. Pour new developer into the development unit and perform the TD sensor initial setting using SP2-801.
   NOTE: When performing the TD sensor initial setting, cover the toner entrance hole with a piece of paper (see the above illustration).

6.5 TRANSFER UNIT

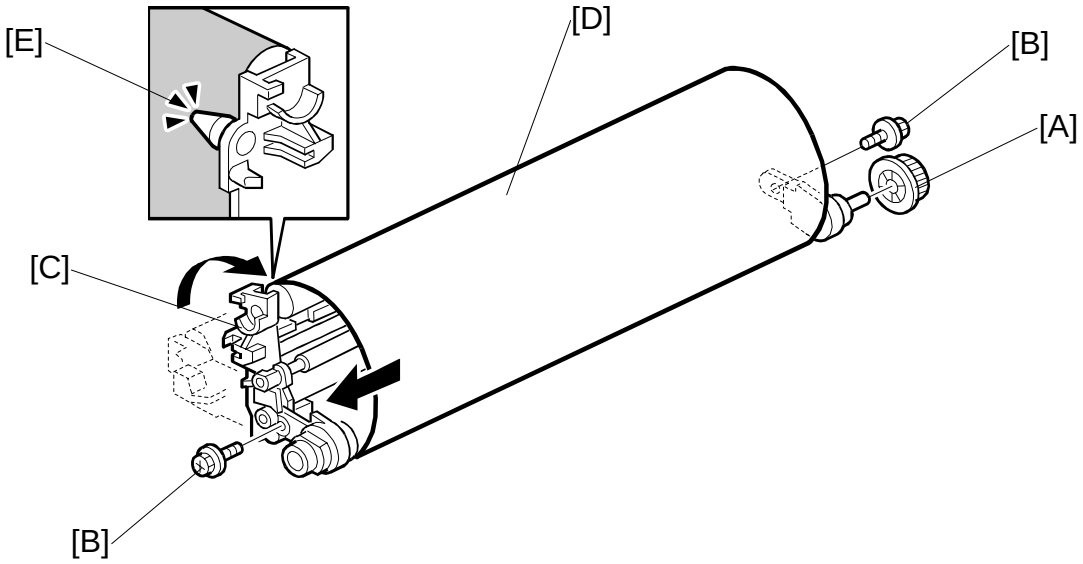
6.5.1 TRANSFER BELT UNIT



NOTE: Do not keep the right cover open for a long time, to prevent the drum from being exposed to direct light. When keeping the right cover open for a long time, cover the drum with paper, or remove the PCU then cover the PCU with paper.

1. Open the right cover [A].
2. Release the release lever [B] then remove the transfer unit [C].
3. Remove the springs [D].
4. Remove the transfer belt unit [E] (1 hook).
   NOTE: Do not touch the transfer belt surface.

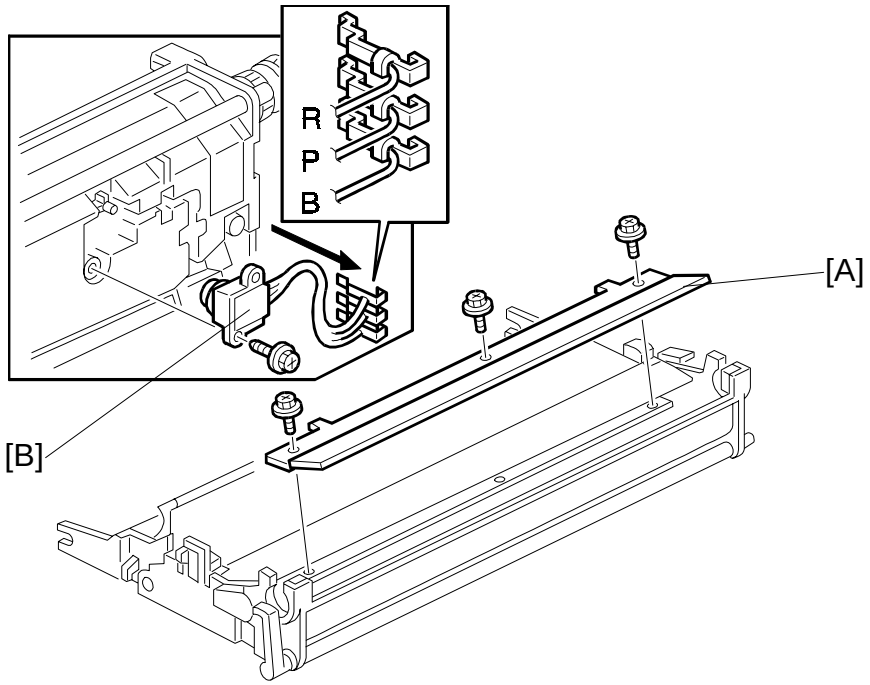
6.5.2 TRANSFER BELT



1. Remove the transfer belt unit. (See Transfer Belt Unit.)
2. Remove the belt drive gear [A].
3. Remove the screws [B] at both sides and turn the belt holder [C] until it is vertical.
4. Remove the transfer belt [D].

NOTE: 1) Do not touch the transfer belt surface with bare hands.
2) Before installing the new transfer belt, clean all the rollers and shafts with alcohol to prevent the belt from slipping.
3) When reinstalling the transfer belt, make sure that the belt is under the pin [E].
4) When reinstalling, to avoid damage to the transfer belt, manually turn the rollers and check that the new transfer belt is not running over the edge of any of the rollers.

6.5.3 TRANSFER BELT CLEANING BLADE/TONER OVERFLOW SENSOR



Transfer Belt Cleaning Blade

1. Remove the transfer belt. (See Transfer Belt.)
2. Remove the transfer belt cleaning blade [A] (3 screws).

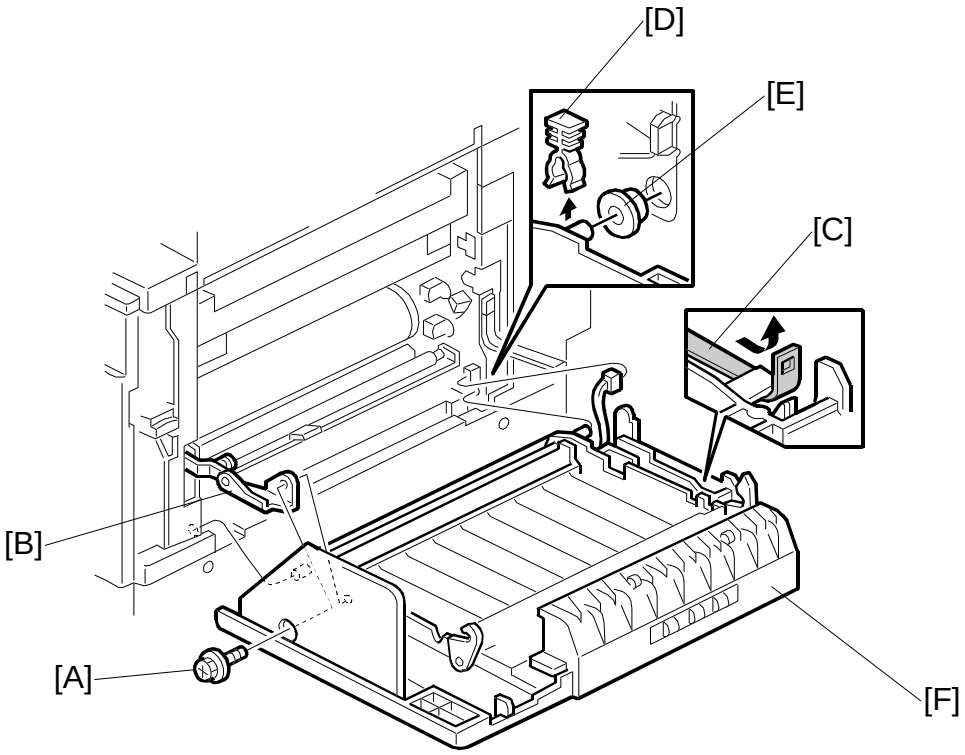
NOTE: 1) Do not touch the edge of the new blade.
2) Check that there is no dust/no damage on the edge of the new blade.

Toner Overflow Sensor

1. Remove the transfer belt cleaning blade.
2. Turn over the transfer unit and empty the used toner in the transfer unit.
3. Remove the toner overflow sensor [B] (1 screw, 3 terminal wires).

NOTE: When reinstalling the terminal wires, the wire color order from the top are red, purple, blue.

6.5.4 RIGHT COVER

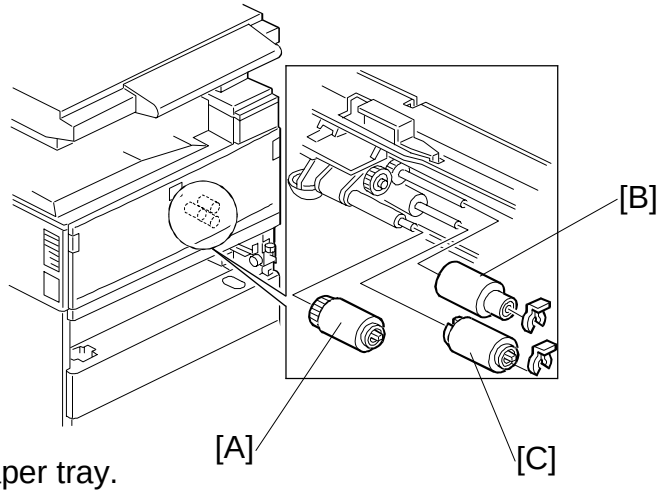


NOTE: Do not keep the right cover open for a long time, to prevent the drum from being exposed to direct light. When keeping the right cover open for a long time, cover the drum with paper, or remove the PCU then cover the PCU with paper.

1. Remove the transfer belt unit. (See Transfer Belt Unit.)
2. Remove the screw [A] which secures the link [B].
3. Remove the unit band [C].
4. Remove the clip [D] and bushing [E].
5. Remove the right cover [F] (1 connector).

6.6 PAPER FEED

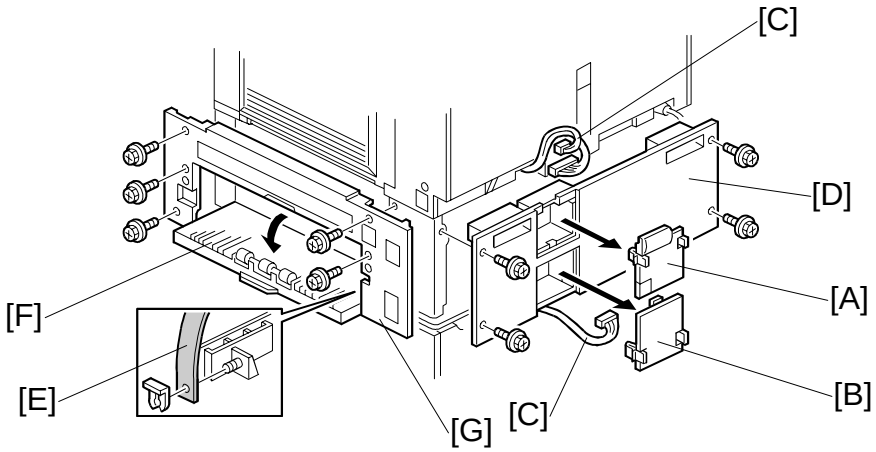
6.6.1 PICK-UP, SEPARATION, AND FEED ROLLERS



1. Remove the paper tray.
2. Remove the pick-up roller [A].
3. Remove the feed [B] and separation rollers [C] (1 clip each).

NOTE: Do not touch the roller surface with bare hands.
After installing the new rollers, do SP 7-816 for the appropriate paper tray.

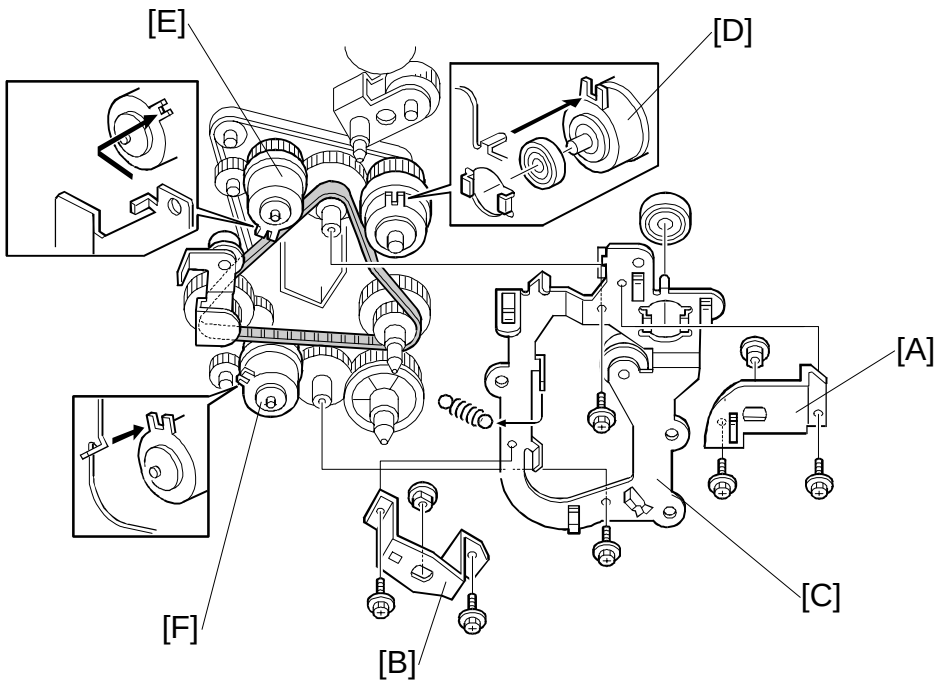
6.6.2 LOWER RIGHT COVER/LOWER REAR COVER



NOTE: If the optional LCT has been installed, remove the LCT before doing the following procedure.

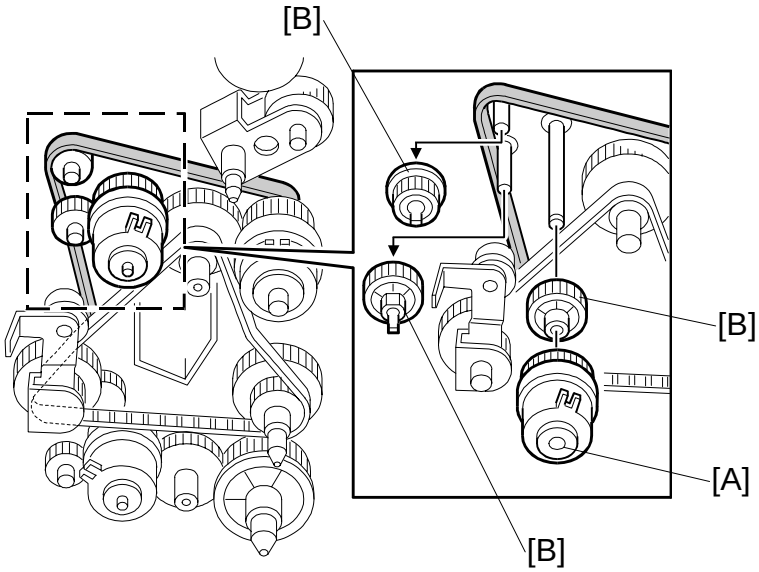
1. Remove the upper connector cover [A] and lower connector cover [B] then disconnect the harnesses [C].
2. Remove the lower rear cover [D] (4 screws).
3. Remove the unit band [E] (1 clip) and remove the vertical transport cover [F].
4. Remove the lower right cover [G] (5 screws).

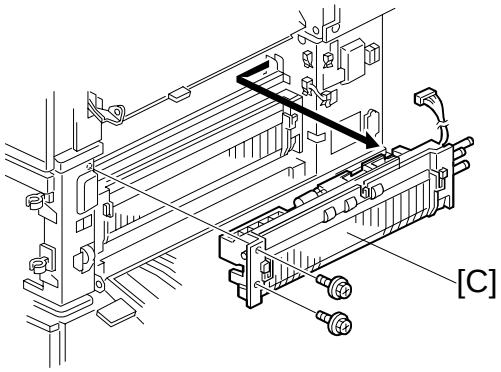
6.6.3 RELAY/UPPER PAPER FEED/LOWER PAPER FEED CLUTCHES



1. Remove the lower rear cover. (See Lower Right Cover/Lower Rear Cover.)
2. Remove the first paper feed clutch bracket [A] (2 screws, 1 bushing).
3. Remove the second paper feed clutch bracket [B] (2 screws, 1 bushing).
4. Remove the drive bracket [C] (2 screws, 1 spring, 1 bearing).
5. Remove the relay clutch [D] (1 connector).
6. Remove the upper paper feed clutch [E] (1 connector).
7. Remove the lower paper feed clutch [F] (1 connector).

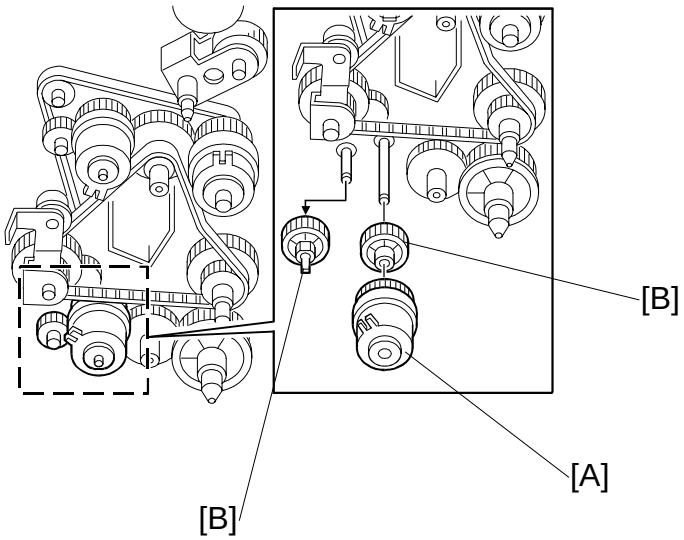
6.6.4 UPPER PAPER FEED UNIT

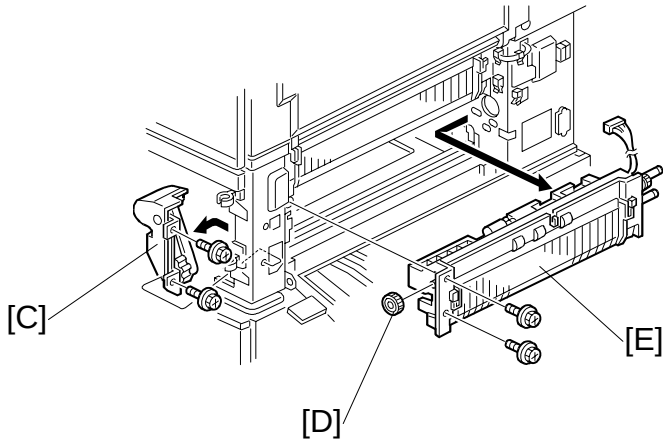




1. Remove the upper paper feed clutch [A]. (See Relay/Upper Paper Feed/Lower Paper Feed Clutches.)
2. Remove the lower right cover. (See Lower Right Cover/Lower Rear Cover.)
3. Remove three relay gears [B].
4. Remove the upper paper feed unit [C] (2 screws, 1 connector).

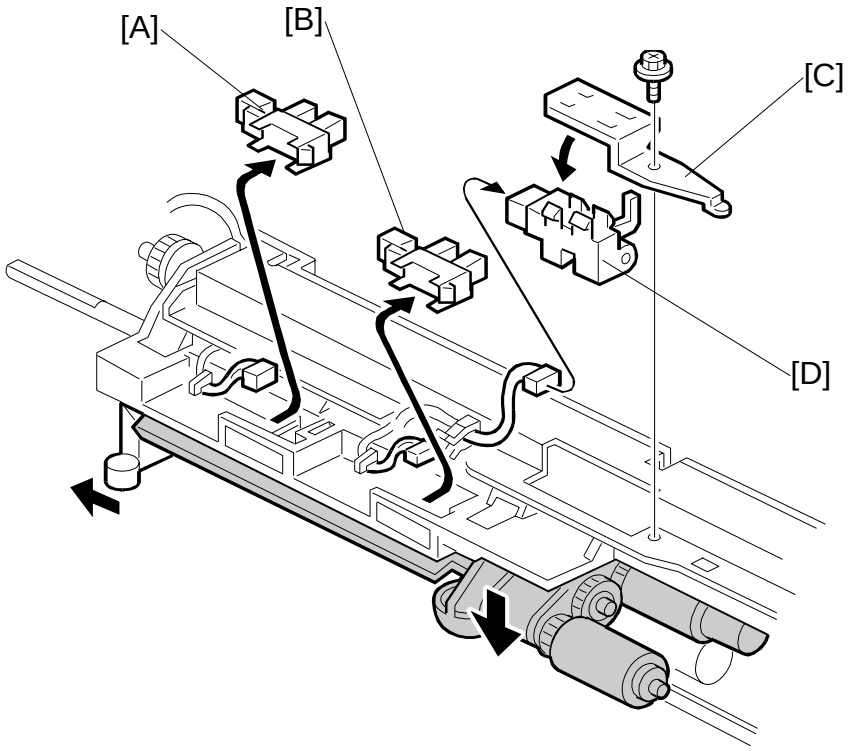
6.6.5 LOWER PAPER FEED UNIT





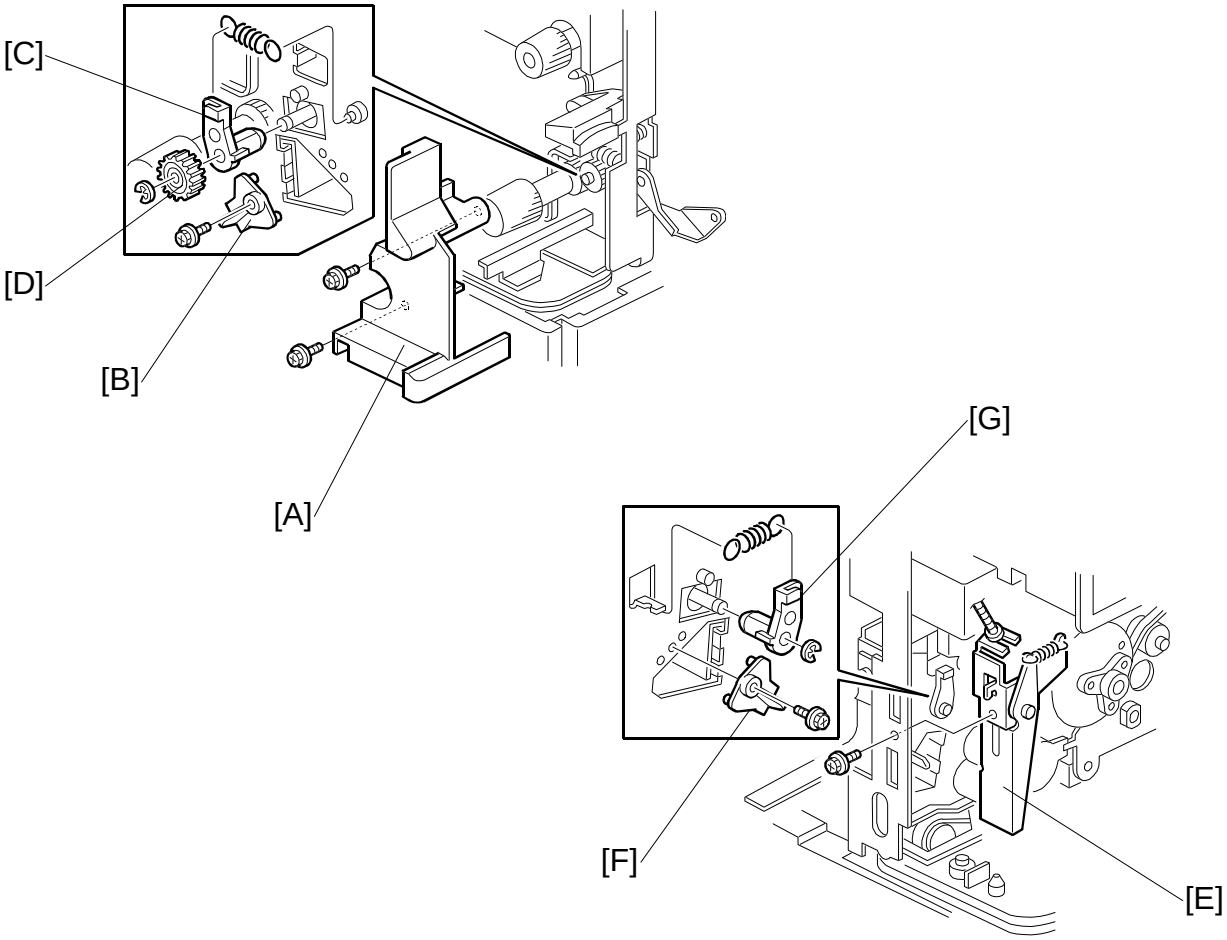
1. Remove the lower paper feed clutch [A] (See Relay/Upper Paper Feed/Lower Paper Feed Clutches.)
2. Remove two relay gears [B].
3. Remove the paper trays.
4. Remove the lower right cover. (See Lower Right Cover/Lower Rear Cover.)
5. Remove the cover [C] (2 screws).
6. Remove the gear [D].
7. Remove the lower paper feed unit [E] (2 screws, 1 connector).

6.6.6 PAPER END/PAPER HEIGHT/RELAY SENSORS

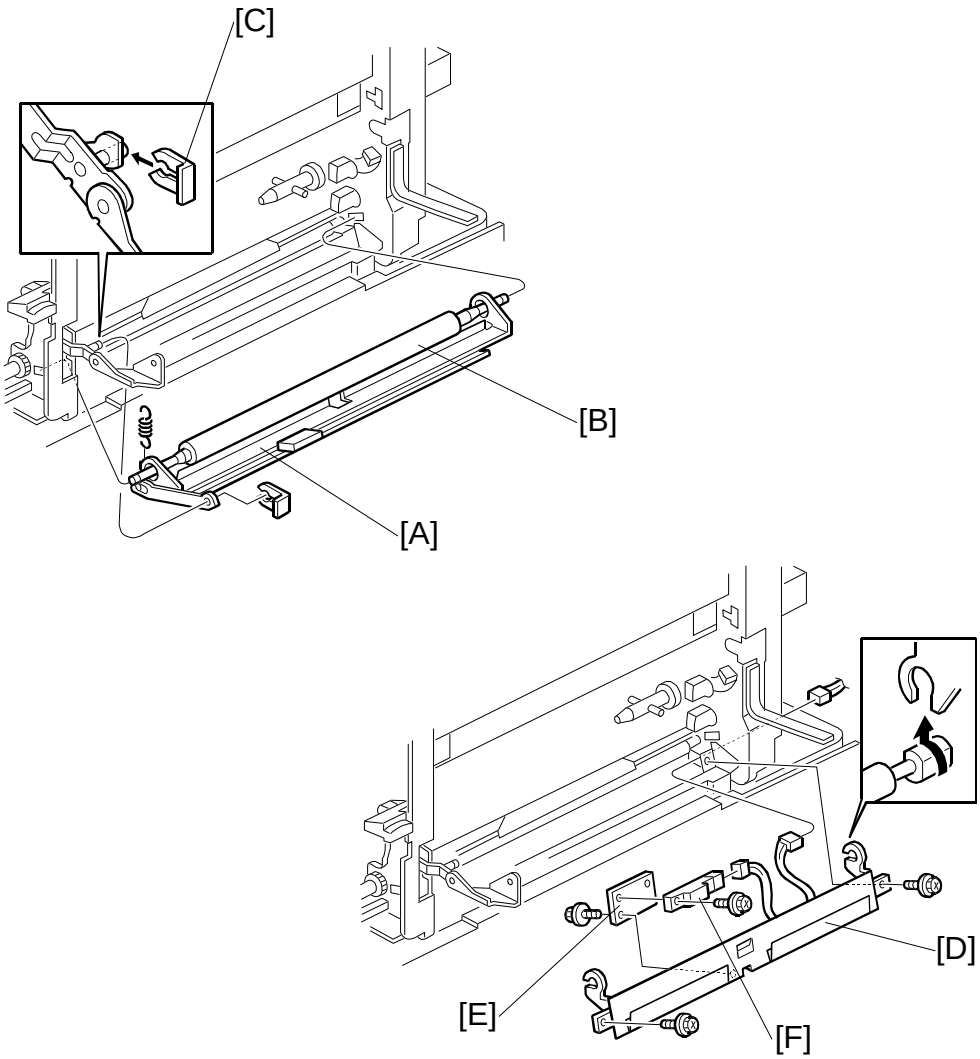


1. Remove the appropriate paper feed unit. (See Upper or Lower Paper Feed Unit.)
2. Remove the paper height sensor [A] (1 connector).
3. Remove the paper end sensor [B] (1 connector).
4. Remove the relay sensor bracket [C] (1 screw, 1 connector).
5. Remove the relay sensor [D].

6.6.7 REGISTRATION SENSOR



1. Remove the front cover, rear cover, and right rear cover.
2. Remove the PCU and development unit.
3. Remove the transfer belt unit and right cover. (See Transfer Belt and Right Cover.)
4. Remove the inner cover [A] (2 screws).
5. Remove the front registration holder [B] (1 screw).
6. Remove the registration roller bushing [C] and front registration roller gear [D] (1 E-ring, 1 spring).
7. Remove the right cover switch bracket [E] (1 screw).
8. Remove the rear registration holder [F] (1 screw).
9. Remove the registration roller bushing [G] (1 E-ring, 1 spring).

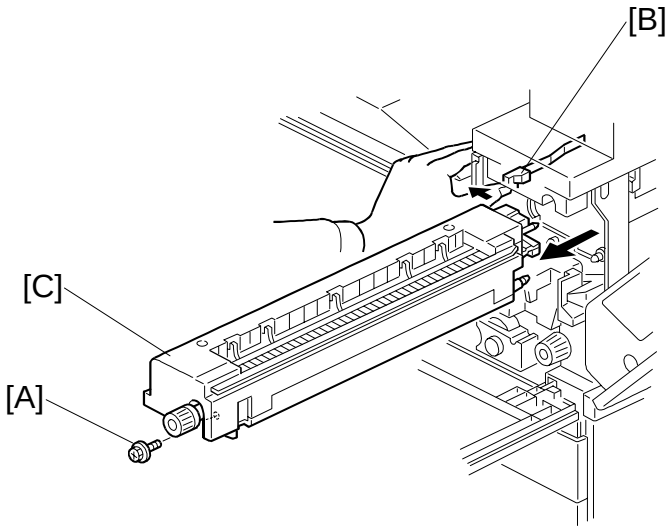


10. Remove the guide plate [A] and registration roller [B] (1 spring, 1 clip).
    NOTE: When reinstalling the clip [C], its position must be as shown.
11. Remove the registration guide plate [D] (2 screws, 1 connector).
12. Remove the sensor bracket [E] (1 screw).
13. Remove the registration sensor [F] (1 screw, 1 connector).

6.7 FUSING

6.7.1 FUSING UNIT

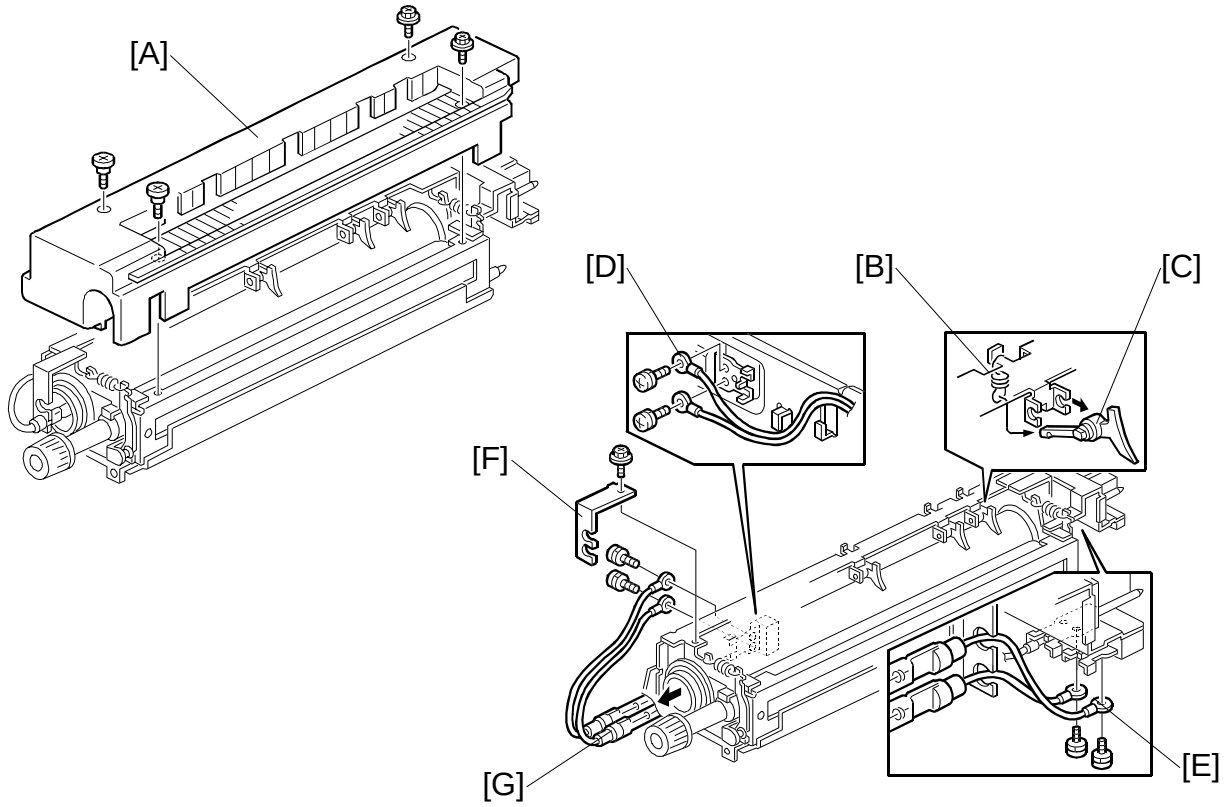
⚠CAUTION
Allow time for the unit to cool before doing the following procedure.



1. Open the front cover and right cover.
2. Remove the screw [A].
3. Release the fusing lever [B] and slide out the fusing unit [C].

NOTE: After removing the fusing unit, close the right cover.

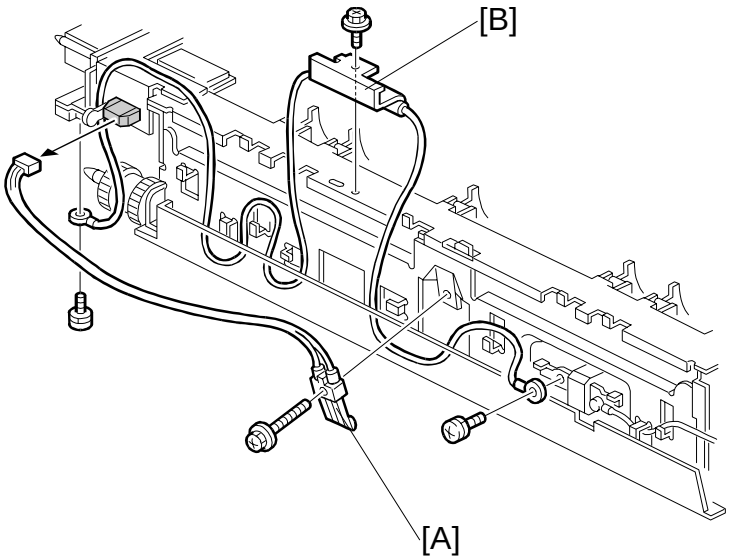
6.7.2 HOT ROLLER STRIPPERS AND FUSING LAMP

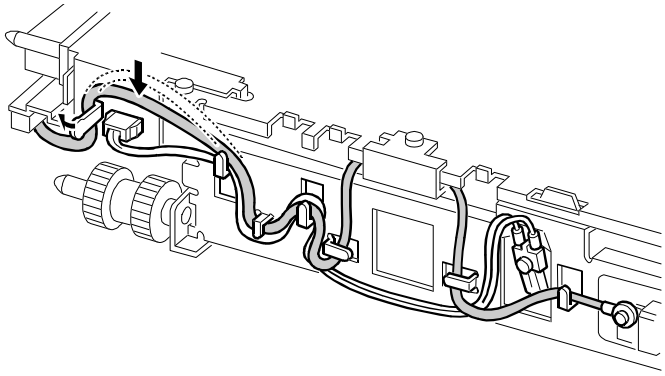


1. Remove the fusing upper cover [A] (4 screws).
2. Remove the spring [B]. Then, remove the hot roller stripper [C].
3. Remove the front fusing lamp wire [D] (1 screw for 115V machines, 2 screws for 230V machines).
4. Remove the rear fusing lamp wire [E] (1 screw for 115V machines, 2 screws for 230V machines).
5. Remove the front lamp holder [F] (1 screw).
6. Remove the fusing lamp [G] (1 lamp for 115V machines, 2 lamps for 230V machines).

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

6.7.3 THERMISTOR AND THERMOFUSE

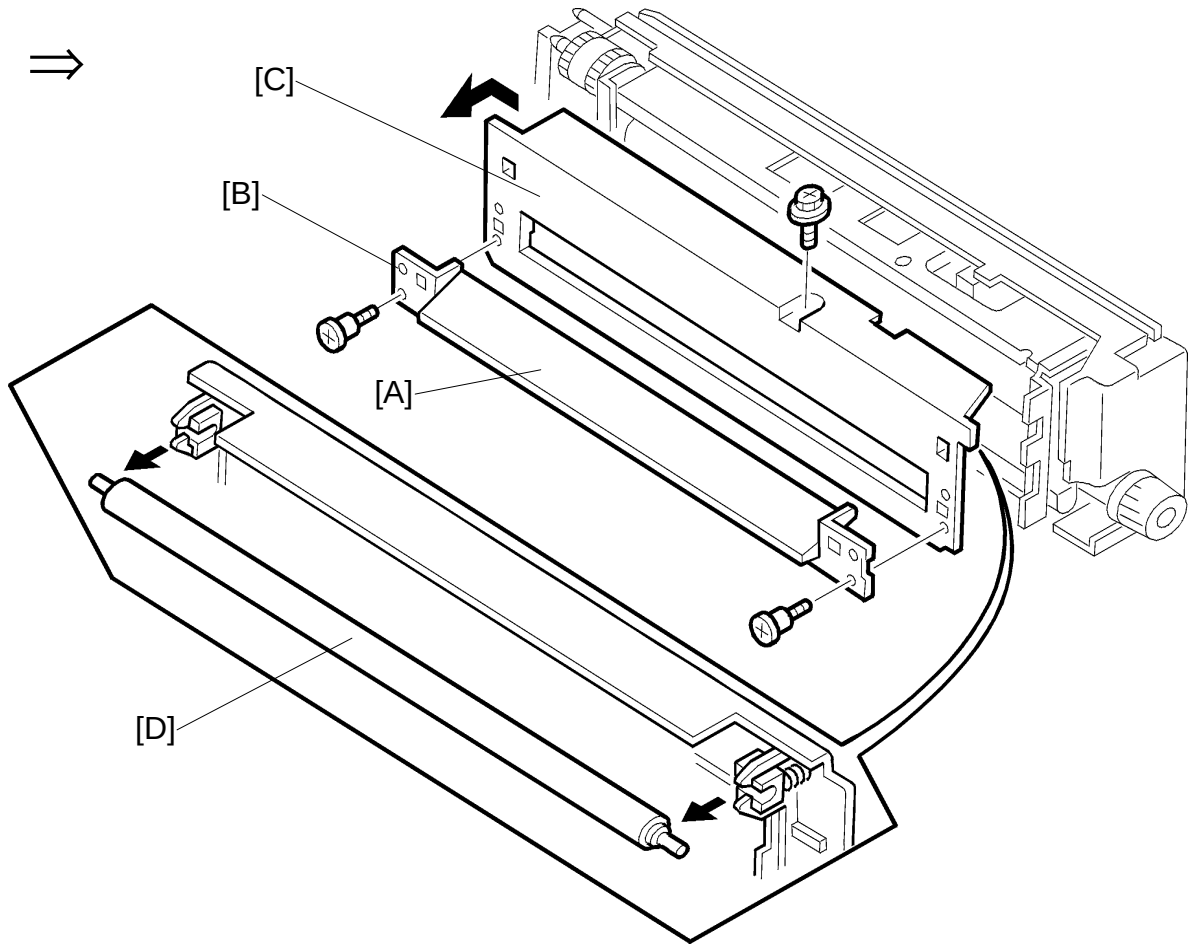




1. Remove the fusing upper cover. (See Hot Roller Strippers and Fusing Lamp.)
2. Remove the thermistor [A] (1 screw, 1 connector).
3. Remove the thermofuse [B] (3 screws).

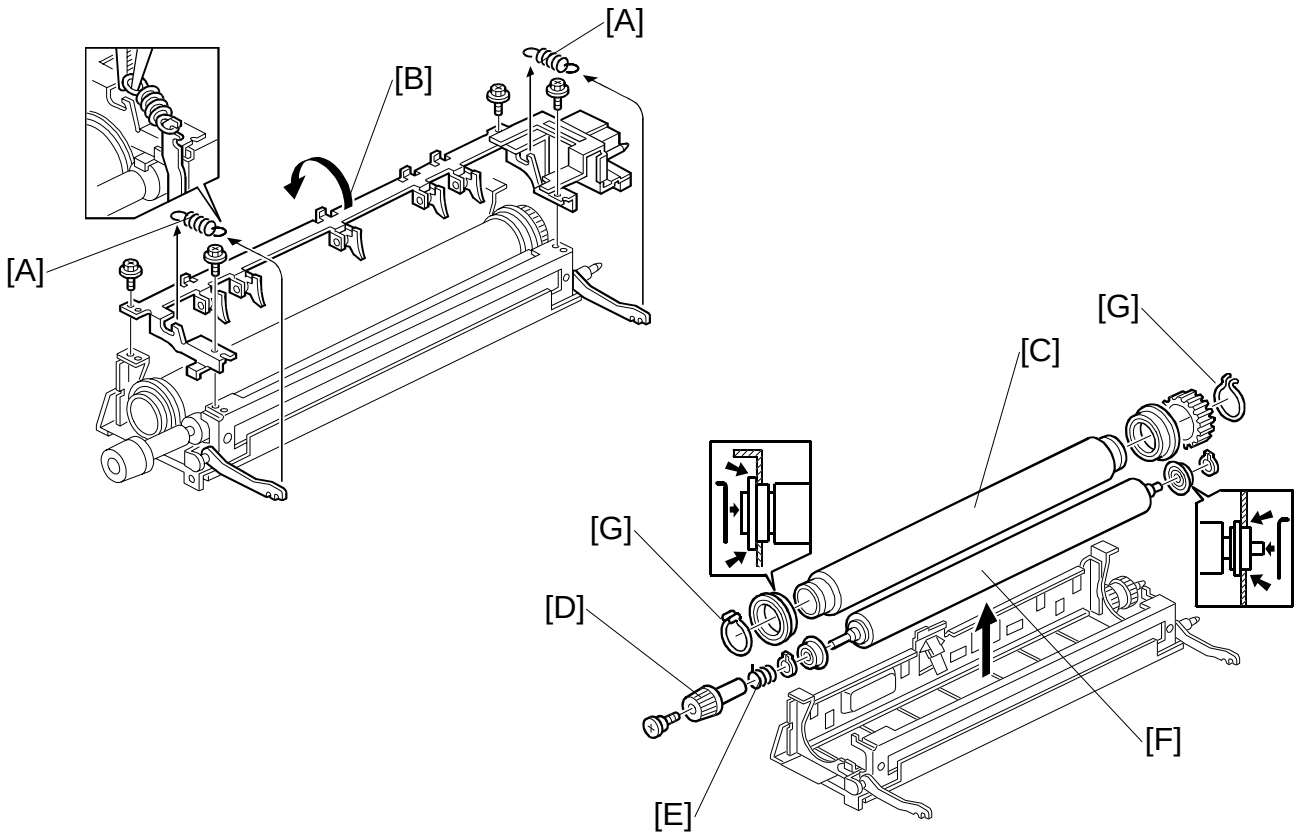
Route the cable of the thermistor and thermofuse as shown.

6.7.4 CLEANING ROLLER



1. Remove the fusing unit.
2. Remove the fusing entrance guide [A] (2 screws).
   NOTE: The standard position of the fusing entrance guide is the upper position, using the lower screw holes [B]
3. Remove the lower fusing cover [C] (1 screw).
   NOTE: When removing the lower fusing cover, be careful not to drop the cleaning roller onto the hot roller.
4. Replace the cleaning roller [D].

6.7.5 HOT ROLLER AND PRESSURE ROLLER

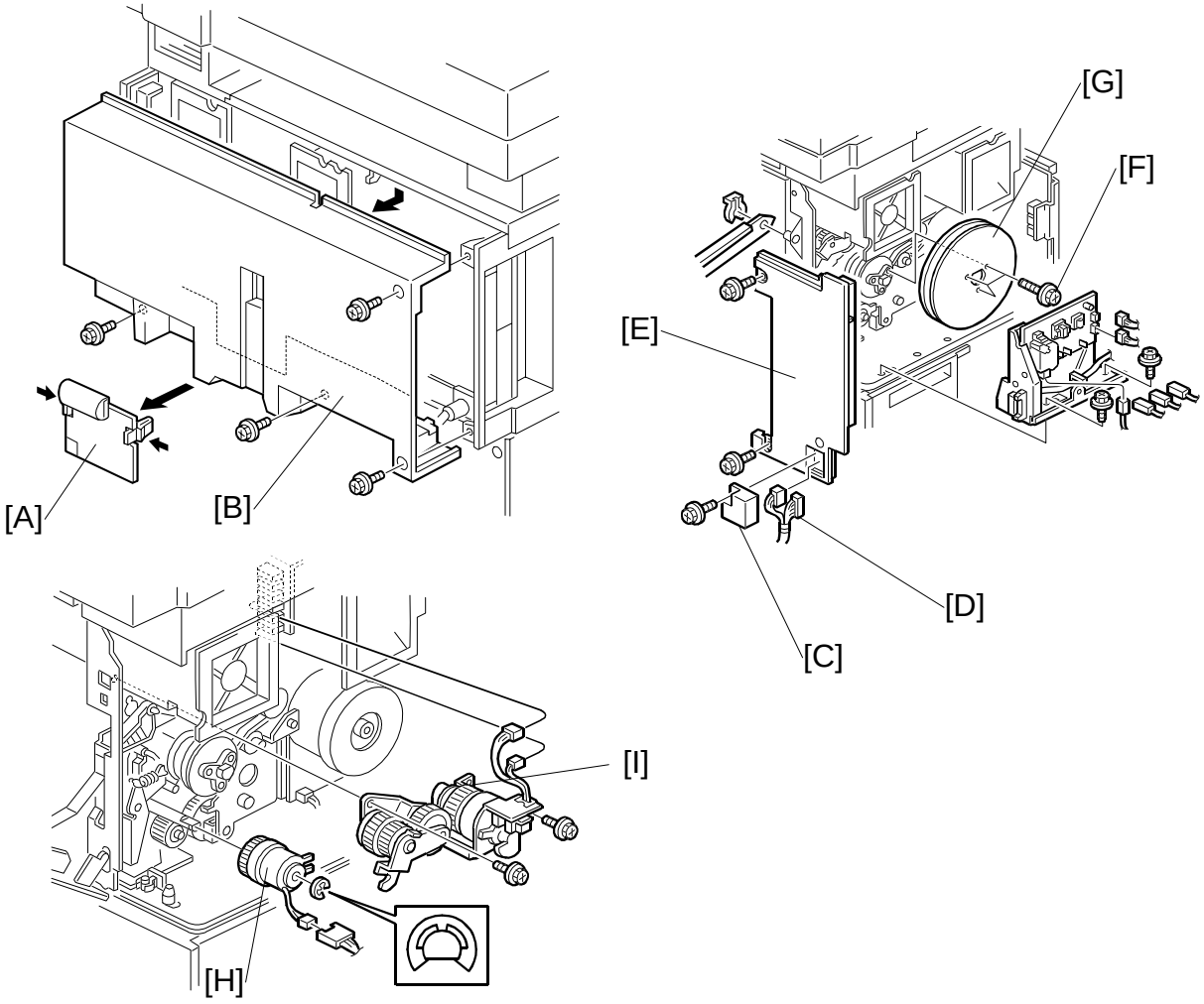


1. Remove the fusing lamp. (See Hot Roller Strippers and Fusing Lamp.)
2. Remove the pressure springs [A].
3. Remove the hot roller stripper bracket [B] (4 screws).
4. Remove the hot roller assembly then replace the hot roller [C] (2 C-rings, 1 gear, 2 bushings)
5. Remove the pressure roller assembly.
6. Remove the fusing knob [D] (1 screw).
7. Remove the spring [E].
8. Replace the pressure roller [F] (2 C-rings, 2 bushings).

NOTE: 1) Before installing the new hot roller, peel off 3 cm (1 inch) from both ends of the protective sheet on the new roller.
2) Do not touch the surface of the rollers.
3) Be careful not to damage the surface of the hot roller.
4) The standard pressure roller position is the upper position.
5) When reinstalling the hot roller assembly and pressure roller assembly, make sure that the flange position of the bushings is as shown.
6) When reinstalling the C-rings [G] of the hot roller, make sure that the position of the C-rings is as shown.

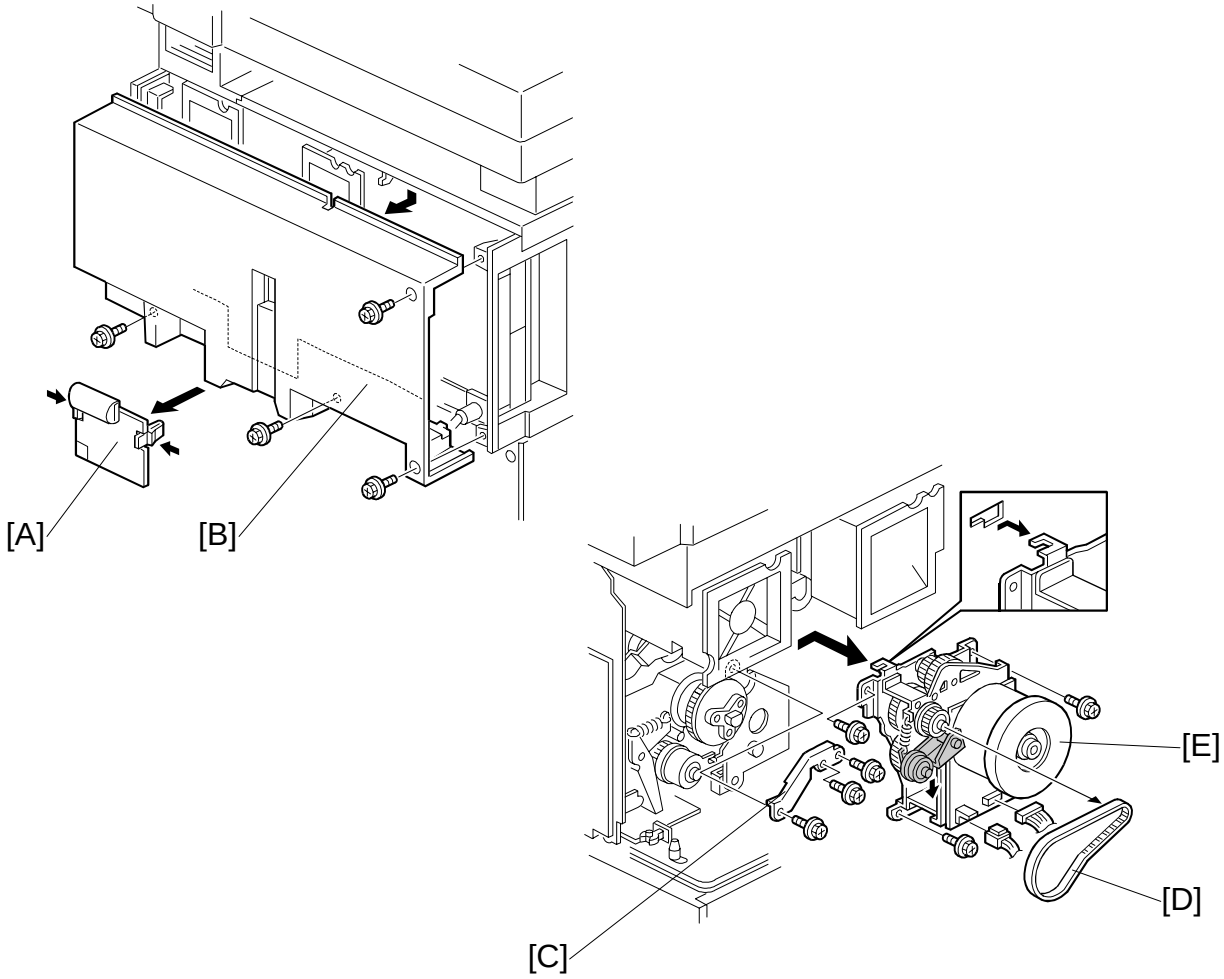
6.8 DRIVE AREA

6.8.1 REGISTRATION CLUTCH AND TRANSFER BELT CLUTCH



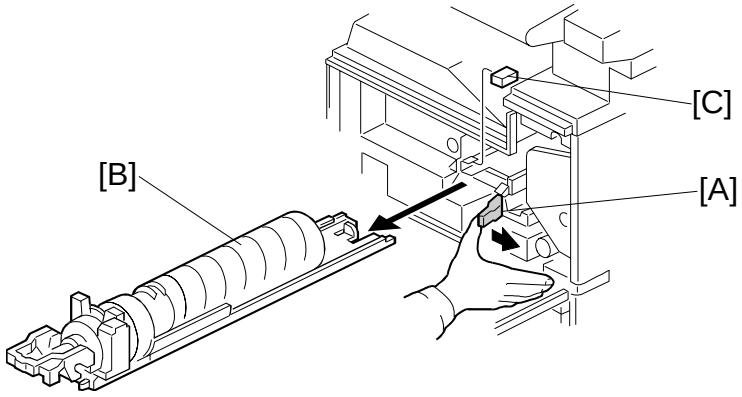
1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. **If the optional LCT has been installed:**
   Remove the harness cover [C] (1 screw) and disconnect the LCT interface harnesses [D]
3. Remove the right rear cover [E] (2 screws).
4. Remove the power pack bracket [F] (2 screws, 6 connectors).
5. Remove the flywheels [G] (3 screws).
   NOTE: One flywheel is used for A230 and A231. Two flywheels are used for A232.
6. Remove the registration clutch [H] (1 E-ring, 1 connector).
7. Remove the transfer belt clutch assembly [I] (2 screws, 2 connectors).

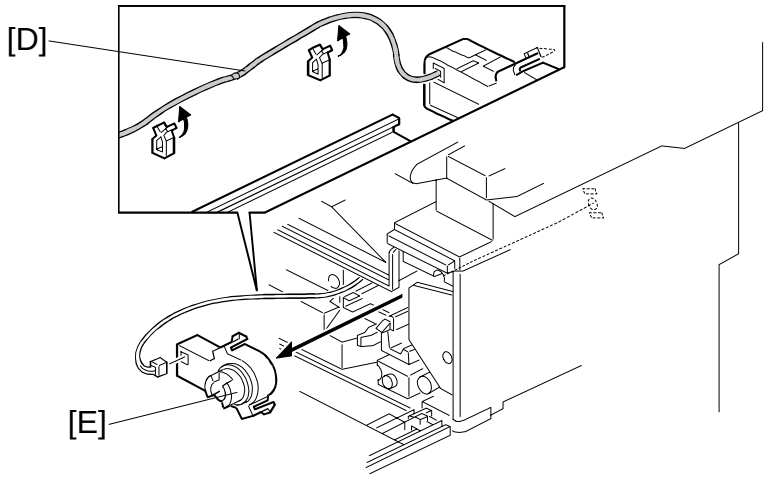
6.8.2 MAIN MOTOR



1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Remove the power pack bracket and fly wheel. (See Registration Clutch and Transfer Belt Clutch.)
3. Remove the bracket [C] (3 screws).
4. Remove the timing belt [D].
5. Remove the main motor [E] (3 screws, 2 connectors).

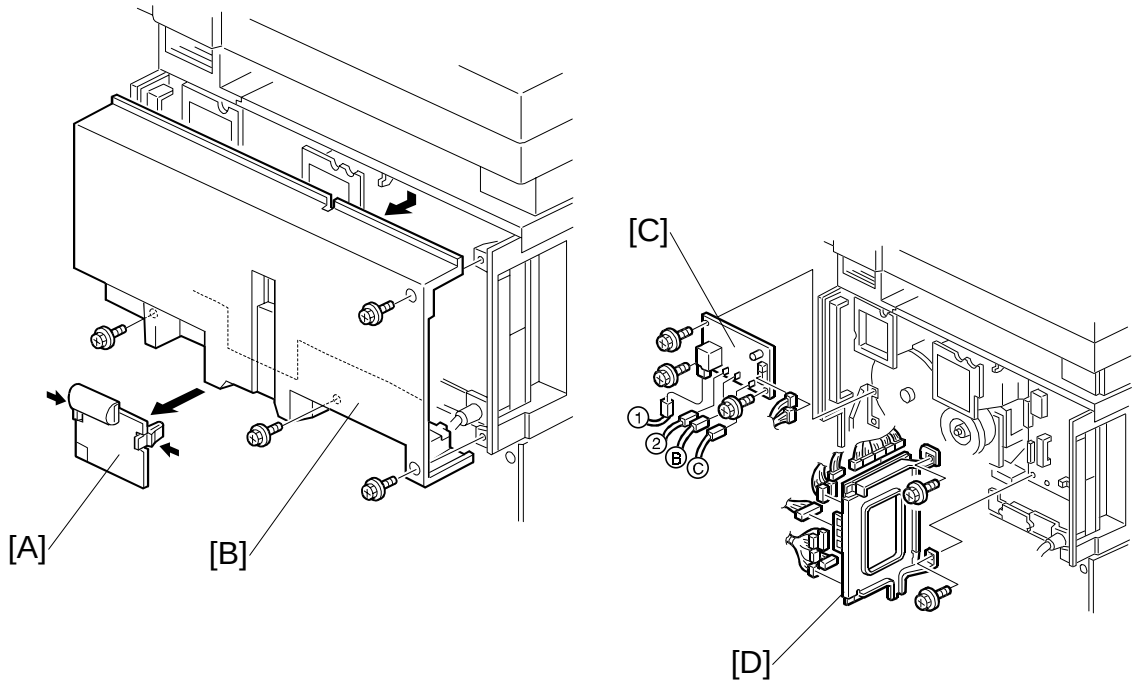
6.8.3 TONER BOTTLE MOTOR





1. Release the toner bottle holder lever [A], then slide out the toner bottle holder [B].
2. Remove the toner bottle [B].
3. Remove the holder stopper [C], then take out the toner bottle holder.
4. Remove the motor harness [D] from two wire clamps.
5. Remove the toner bottle motor [E] (2 hooks).
6. Disconnect the harness from the motor.

6.9 PCBS



6.9.1 POWER PACK

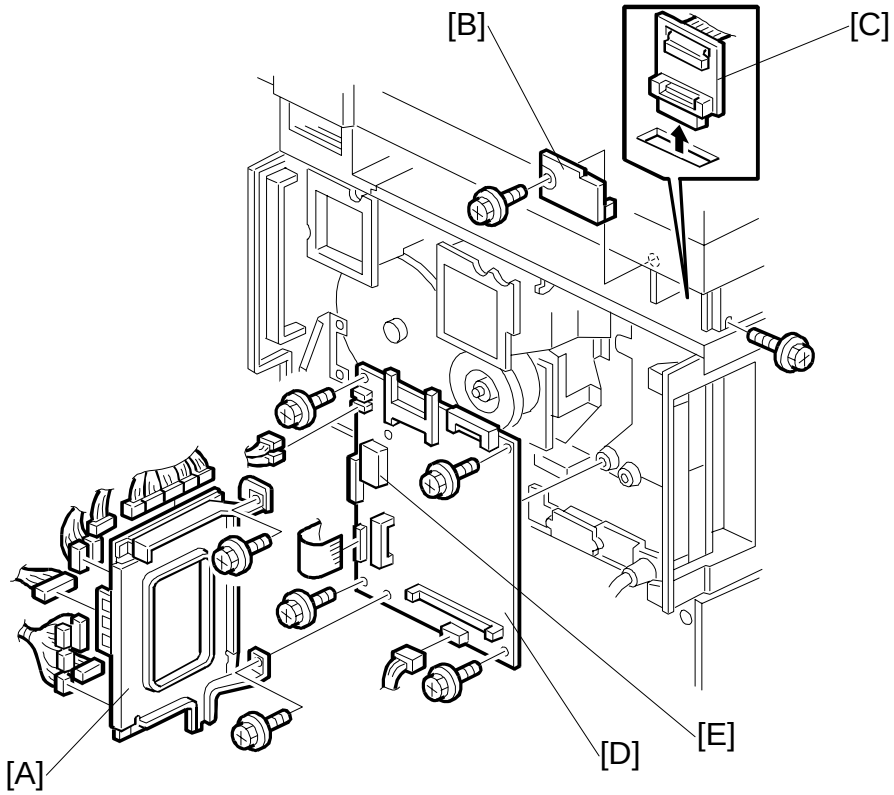
1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Remove the power pack [C] (3 screws, 6 connectors).

6.9.2 I/O BOARD

1. Remove the connector cover [A} and rear cover [B] (4 screws).
2. Remove the HDD unit, modular connector bracket, and expansion box, if these option units have been installed.
3. Remove the I/O board bracket [D] (2 screws, all connectors).
4. Remove the I/O board (4 screws).

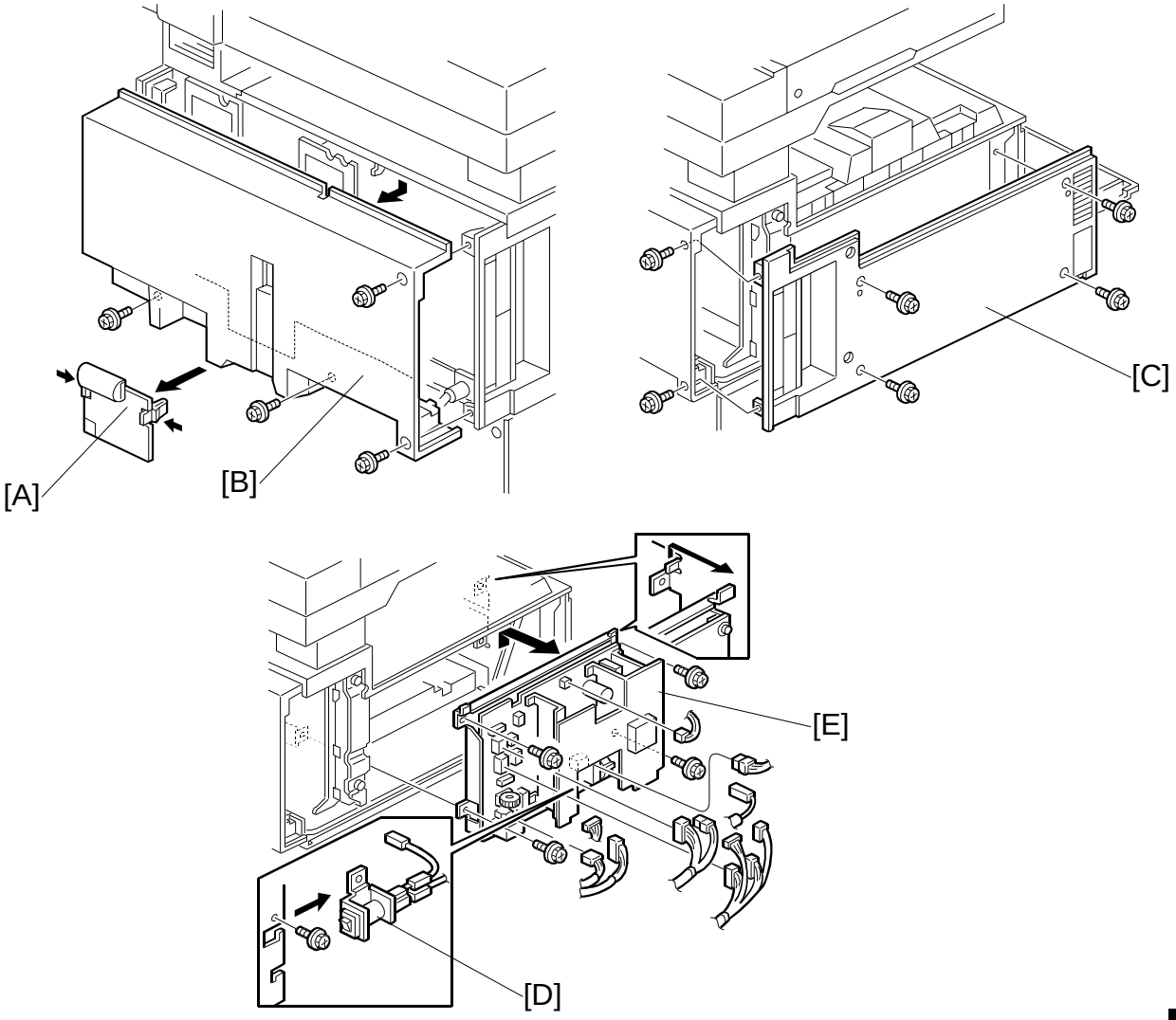
NOTE: Make sure that the DIP switch settings on the new board are the same as those on the old board.

6.9.3 BICU BOARD



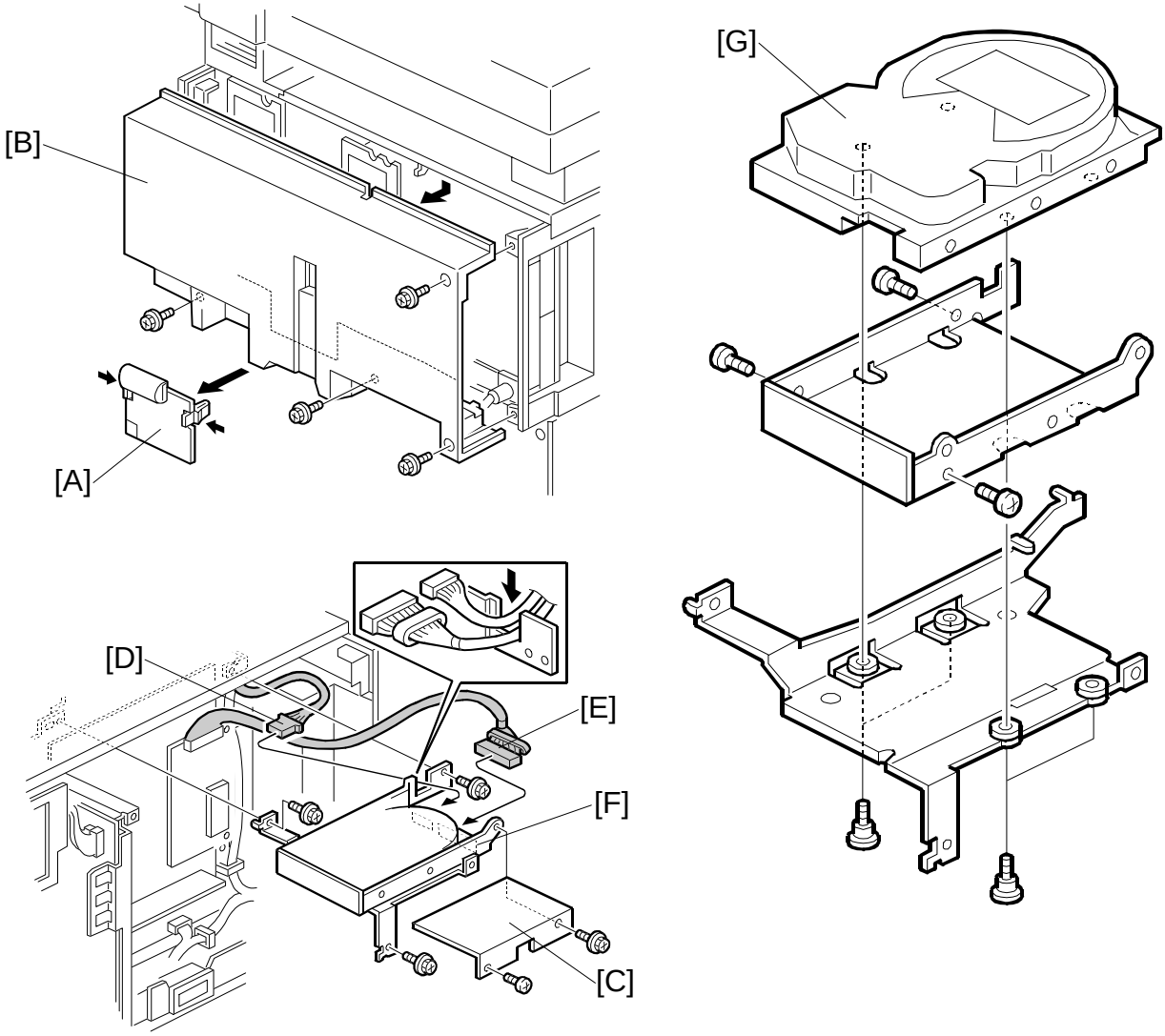
1. Remove the I/O board bracket [A]. (See I/O Board.)
2. Remove the stand rear cover [B] (2 screws).
3. Disconnect the SIFB [C].
4. Remove the BICU board [D] (4 screws, 1 stud, all connectors).
5. Remove the NV RAM [E] from the old BICU board and install it on the new board.
6. **For 230V machines:**
   Download the appropriate language software (not needed for customers using English, German, or French). Then select the correct language with SP5-009 if necessary (switch the main power off/on after changing this SP mode).

6.9.4 PSU



1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Remove the left cover [C] (4 screws).
3. Remove the NCU bracket (2 screws) if the optional fax unit has been installed.
4. **For 230V machines:** Remove the circuit breaker [D] (1 screw, 1 connector).
5. Remove the PSU [E] (4 screws, all connectors).

6.10 HARD DISK



1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Remove the modular connectors if they have been installed.
3. Remove the shield plate [C] (2 screws).
4. Disconnect the power cable [D] and harness [E].
5. Remove the HDD assembly [F] (3 screws).
6. Replace the HDD [G] (3 screws, 4 stepped screws).
   NOTE: Do not drop the HDD or shock it violently.
7. After replacing the HDD, perform SP4-911-6 “Bad Sector Information Reset”.

6.11 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.

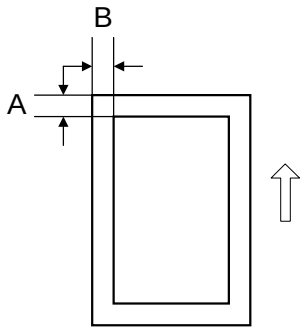
6.11.1 PRINTING

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, and adjust it using SP1-001.
   The specification is: 3 ± 2mm.
2. Check the side-to-side registration for each paper feed station, and adjust them using the following SP modes.

	SP mode	Specification
1st paper feed	SP1-002-1	2 ± 1.5 mm
2nd paper feed	SP1-002-2	
3rd paper feed (Optional PFU tray 1),	SP1-002-3	
4th paper feed (Optional PFU tray 2)	SP1-002-4	
Duplex	SP1-002-5	
By-pass feed	SP1-002-6	
LCT	SP1-002-7	



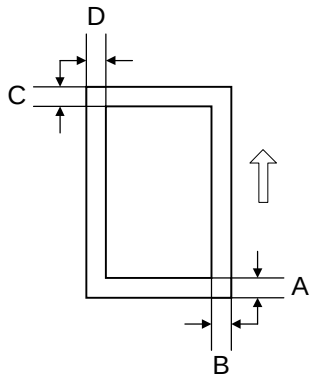
A: Leading Edge Registration
B: Side-to-side Registration

Blank Margin

NOTE: If the leading edge/side-to-side registration can not 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	2 ± 2 mm
Right edge	SP2-101-3	2 +2.5/-1.5 mm
Leading edge	SP2-101-1	3 ± 2 mm
Left edge	SP2-101-4	2 ± 1.5 mm
Trailing edge (duplex copy, 2nd side)	SP2-101-5	2 ± 2 mm
Left edge (duplex copy, 2nd side)	SP2-101-6	2 ± 1.5 mm
Right edge (duplex copy, 2nd side)	SP2-101-7	2 +2.5/-1.5 mm



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

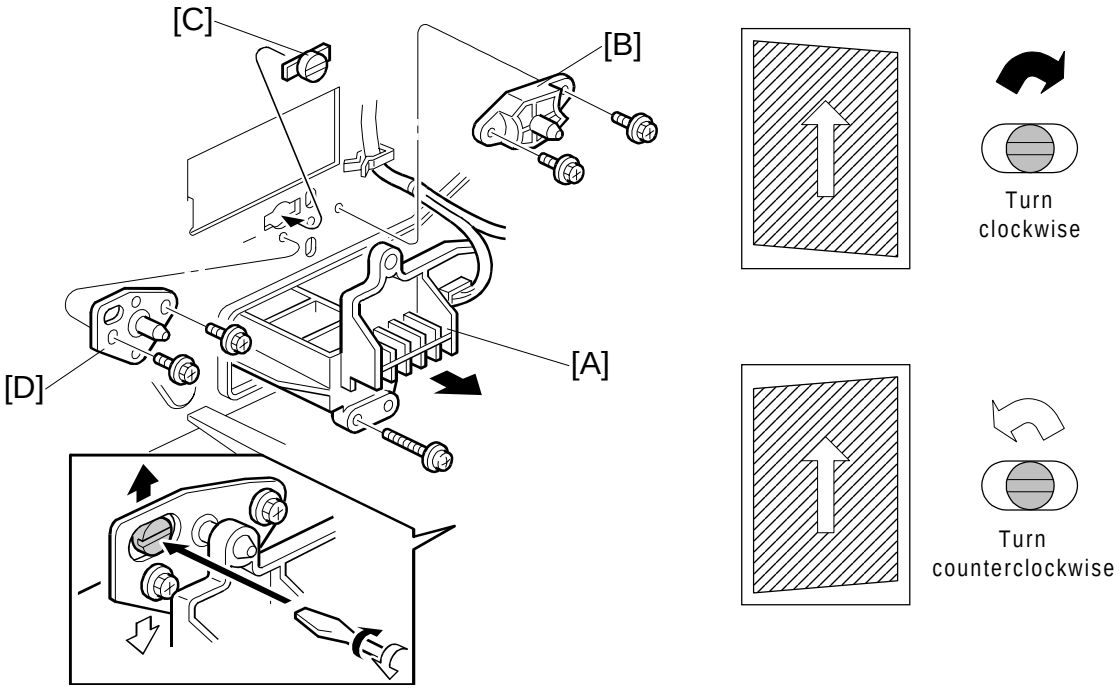
Main Scan Magnification

1. Print the single-dot grid pattern (SP2-902-3, no.5).
2. Check the magnification, and adjust the magnification using SP2-909-1 if necessary. The specification is ± 1%.

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 the trimming area pattern image (SP2-902-3, No.10) whether a parallelogram image appears or not, as shown. If it appears, do the following.
2. Remove the laser unit [A] (see Replacement and Adjustment - Laser Unit).
3. Remove the bracket [B] (2 screws).
4. Install the adjusting cam [C] (P/N: A2309003).
5. Secure the adjustment bracket [D] using the two screws which were used for the 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 the same, repeat steps 6 to 8.

6.11.2 SCANNING

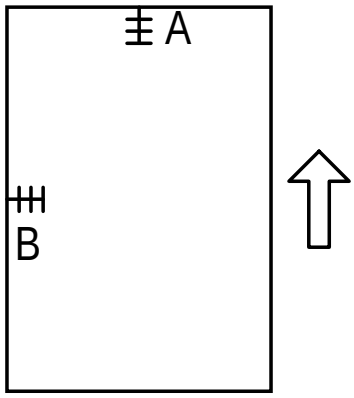
NOTE: 1) Perform or check the printing registration/side-to-side adjustment and the blank margin adjustment, before doing the following scanner adjustments.
2) Use an OS-A3 test chart to perform the following adjustments.

Registration: Platen Mode

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. 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

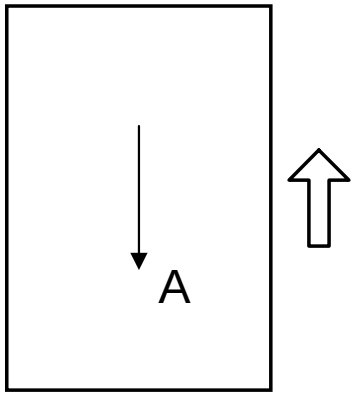


Magnification

NOTE: Use an OS-A3 test chart to perform the following adjustment.

Sub Scan Magnification

A: Main Scan Magnification



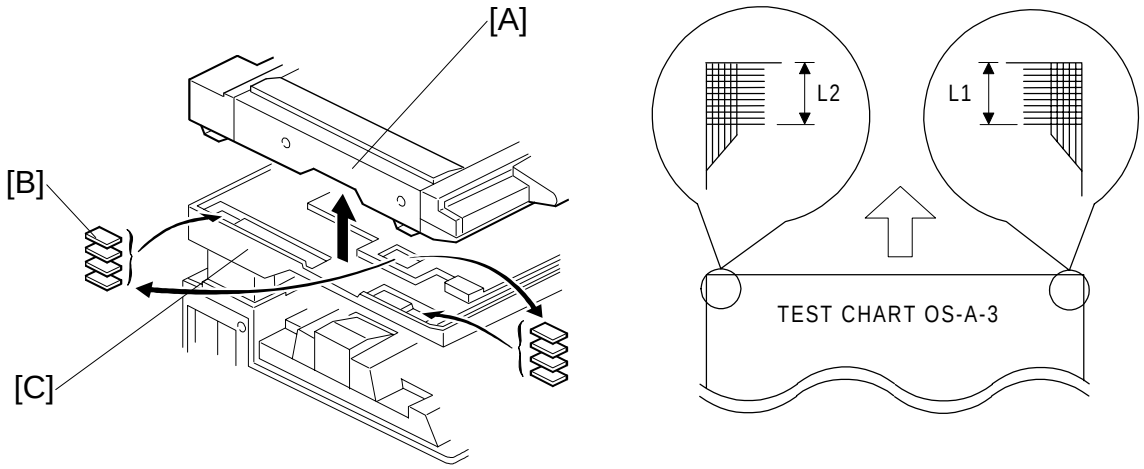
1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio, and adjust it using the following SP mode if necessary. The specification is ±1%.

	SP mode
Sub Scan Magnification	SP4-008

Scanner Skew Image Adjustment

Do the following procedure if skew is caused by the scanner (not the printer) while adjusting the scanner registration and magnification.

NOTE: 1) In machines with an ADF, do the following procedure after doing all ADF image adjustments on the following page.
2) The specification is 1.2 mm / 200 mm.



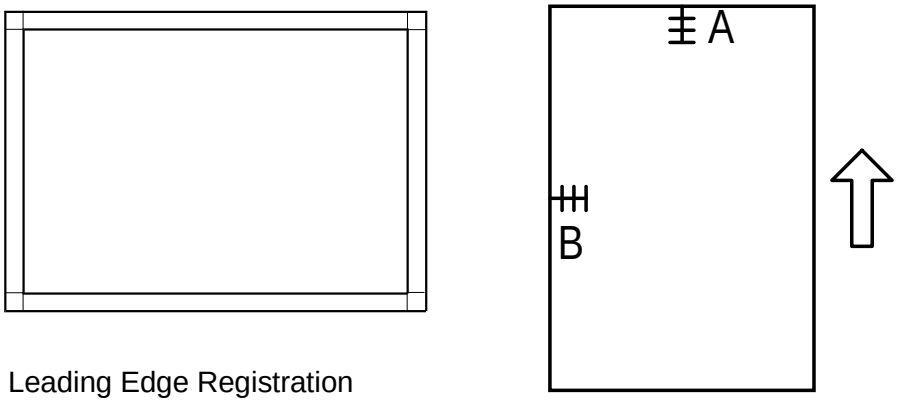
1. Place the OS-A3 test chart on the exposure glass and make a copy from one of the feed stations.
2. Measure the distance from the leading edge of the 10th line at both upper corners on the test chart (L1 and L2 in the above right illustration).
3. If the difference between the two positions is greater than 0.3 mm, do the following steps.
4. Remove the screws that secure the scanner unit and lift up the scanner, holding the grip [A].
5. Put spacer(s) [B] at the front or rear of the scanner plate [C], depending on the skew image.
   - If the distance at the right side is longer than at the left side, add the spacer(s) to the front side of the scanner plate.
   - If the distance at the left side is longer than at the right side, add the spacer(s) to the rear side of the scanner plate.

Difference	No. of spacers
0.3 mm ~ 0.6 mm	1
0.6 mm ~ 0.8 mm	2
0.8 mm ~ 1.1 mm	3

6. Make a copy again using the test chart to check the skew.
7. If there is still some skew, redo steps 5 and 6.
8. If the skew has been corrected, secure the scanner unit (2 screws).

6.11.3 ADF IMAGE ADJUSTMENT

Registration



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

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
Leading Edge Registration (Duplex: front)	SP6-006-3
Leading Edge Registration (Duplex: rear)	SP6-006-4

TROUBLESHOOTING

7. TROUBLESHOOTING

7.1 SERVICE CALL CONDITIONS

7.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The copier cannot be operated at all.	Enter SP mode, then turn the main power switch off and on.
B	The SC can be reset by turning the main power switch off and on if the SC was caused by incorrect sensor detection.	Turn the operation switch or main power switch off and on. A level B' SC can only be reset by turning the main power switch off and on.
C	The copier can be operated as usual except for the unit related to the service call.	Turn the operation switch off and on.
D	The SC history is updated. The machine can be operated as usual.	The SC will not displayed. All that happens is that the SC history is updated.

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.
3) When a Level A or B SC occurs while in an SP mode, the display does not indicate the SC number. If this occurs, check the SC number after leaving the SP mode. This does not apply to Level B' codes.

7.1.2 SC CODE DESCRIPTIONS

SC101: Exposure lamp error

- Definition - [B]

The standard white level was not detected properly when scanning the white plate.

- Possible cause -

- Exposure lamp defective
- Lamp stabilizer defective
- Exposure lamp connector defective
- Dirty standard white plate
- Dirty scanner mirror or scanner mirror out of position
- SBU board defective
- SBU connector defective
- Lens block out of position
- SIB defective

SC120: Scanner home position error 1

-Definition- [B']

The scanner home position sensor does not detect the on condition during initialization or copying.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- SIB defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective

SC121: Scanner home position error 2

-Definition- [B']

The scanner home position sensor does not detect the off condition during initialization or copying.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- SIB defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective

SC302: Charge roller current leak

-Definition- [B]

A charge roller current leak signal is detected.

- Possible causes -

- Charge roller damaged
- High voltage supply board defective
- Poor PCU connection

SC 304: Charge roller current correction error

-Definition- [B]

The charge roller bias correction is performed twice even if the maximum charge roller bias (-2000V) is applied to the roller.

- Possible causes –

- ID sensor defective

SC320: Polygon motor error

-Definition- [B']

The polygon motor does not reach its operating speed within 20 seconds after the polygon motor on signal, or the lock signal is still activated for more than 20 seconds after the polygon motor off signal.

- Possible causes -

- Polygon motor defective
- Poor connection between the polygon motor driver and the BICU board
- BICU board defective

SC321: No laser writing signal (F-GATE) error 1

- Definition- [B]

The laser writing signal (F-GATE) does not go to LOW for more than 15 seconds after the copy paper reaches the registration sensor.

- Possible causes -

- BICU board defective
- Poor connection of the fax controller or printer controller
- Fax controller or printer controller defective

SC322: 1st laser synchronization error

-Definition- [B']

The 1st laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.

- Possible causes -

- Poor connection between the laser synchronization detector board and the LD unit.
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- LD unit defective

SC323: LD drive current over

-Definition- [B']

The LD drive board applies more than 110 mA to the LD.

- Possible causes -

- LD unit defective (not enough power, due to aging)
- Poor connection between the LD unit and the BICU board
- BICU defective

SC326: 2nd laser synchronization error

-Definition- [B']

The 2nd laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.

- Possible causes -

- Poor connection between the laser synchronization detector board and the LD unit.
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- LD unit defective

SC327: LD unit home position error 1

-Definition- [B']

The LD unit home position sensor does not detect an on condition when the LD unit moves to its home position.

- Possible causes -

- LD unit home position sensor defective
- LD positioning motor defective
- LD unit movement blocked because of incorrect connector routing

SC328: LD unit home position error 2

-Definition- [B']

The LD unit home position sensor does not detect an off condition when the LD unit moves from its home position.

- Possible causes -

- LD unit home position sensor defective
- LD positioning motor defective
- LD unit movement blocked because of incorrect connector routing

SC329: Laser beam pitch adjustment error

-Definition- [B]

The LD unit home position sensor does not detect an on condition while changing the LD unit position for correcting the LD position or changing the dpi.

- Possible causes -

- The laser beam pitch adjustment (SP2-109-3 and 4) was not done after replacing the NVRAM or doing an NVRAM clear.
- The laser beam pitch adjustment (SP2-109-1 ~ 4) was not done after replacing the LD unit.
- LD unit movement blocked because of incorrect connector routing

SC350-1: ID sensor error 1

-Definition- [B]

One of the following ID sensor output voltages was detected twice consecutively when checking the ID sensor pattern.

1) Vsp $\geq$ 2.5V
2) Vsg $\leq$ 2.5V
3) Vsp = 0V
4) Vsg = 0V

- Possible causes -

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at ID sensor pattern writing area of the drum

SC350-2: ID sensor error 2

-Definition- [B]

The ID sensor output voltage is 5.0V and the PWM signal input to the ID sensor is 0 when checking the ID sensor pattern.

- Possible causes -

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-3: ID sensor error 3

-Definition- [B]

The ID sensor pattern edge voltage is detected to be not 2.5V twice consecutively during an 800 ms interval.

- Possible causes -

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-4: ID sensor error 4

-Definition- [B]

One of the following ID sensor output voltages is detected at ID sensor initialization.

1) Vsg < 4.0V when the maximum PWM input (255) is applied to the ID sensor.
2) Vsg ≥ 4.0V when the minimum PWM input (0) is applied to the ID sensor.

- Possible causes -

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC350-5: ID sensor error 5

-Definition- [B]

Vsg falls out of the adjustment target (4.0 ± 0.2V) during Vsg checking.

- Possible causes -

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- High voltage supply board defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum

SC360: Hard disk drive error 1

-Definition- [B]

The machine does not detect the connection signal from the HDD.

- Possible causes -

- Poor connection between the HDD and HDD controller board
- The ac power connector to the HDD is disconnected.
- HDD defective
- HDD controller board defective
- BICU defective

SC361: Hard disk drive error 2

-Definition- [B]

The image data stored in the HDD cannot be output properly.

- Possible causes –

When this SC occurs only once, this problem will be solved after turning the main power switch off and on.

- When this SC occurs while performing SP4-911-1 (HDD media check), it can be cured by doing SP4-911-2 (HDD formatting).
- HDD defective

SC362: IMAC (image compression IC) error

-Definition- [B]

An error occurs during image processing in the IMAC, which handles image compression and image data transmission.

- Possible causes -

- BICU defective
- HDD controller board defective

SC365: Image storage address error

-Definition- [B]

The BICU receives an image data output request signal for data that is not stored in memory.

- Possible causes -

- BICU defective

SC390-1: TD sensor error 1

-Definition- [B]

The TD sensor output voltage is less than 0.5V or more than 5.0V 10 consecutively during copying.

- Possible causes -

- TD sensor abnormal
- Poor connection between the TD sensor and the I/O board (IOB)
- I/O board (IOB) defective

SC390-2: TD sensor error 2

-Definition- [B]

The TD sensor output voltage is less than 1.8V or more than 4.8V during TD sensor initial setting.

- Possible causes -

- TD sensor abnormal
- No developer in the development unit

SC391: Development bias leak

-Definition- [B]

A development bias leak signal is detected.

- Possible causes -

- Poor connection between the development bias terminal and the high voltage supply board
- High voltage supply board defective

SC401-1: Transfer roller leak error

-Definition- [B]

A transfer roller current leak signal is detected.

- Possible causes -

- High voltage supply board defective
- Poor connection between the transfer current terminal and the high voltage supply board

SC401-2: Transfer roller open error

-Definition- [B]

The transfer roller current feedback signal is not detected.

- Possible causes -

- High voltage supply board defective
- Poor connection between the transfer current terminal and the high voltage supply board
- Poor PCU connection

SC403: Transfer belt position sensor error

-Definition- [B]

The transfer belt position sensor does not activate even if the transfer belt clutch has rotated once.

- Possible causes -

- Main motor/drive malfunction
- Transfer belt position sensor defective
- Poor transfer belt position sensor connection

SC 405: Transfer belt error

-Definition- [B]

The transfer belt does not move away from the drum during ID sensor pattern checking.

- Possible causes -

- Main motor/drive malfunction
- Transfer belt position sensor defective
- Poor transfer belt position sensor connection

SC440: Main motor lock

-Definition- [B]

A main motor lock signal is not detected within 2 seconds after the main motor turns on.

- Possible causes -

- Too much load on the drive mechanism
- Main motor defective

SC490: Exhaust fan motor lock

-Definition- [B]

An exhaust fan motor lock signal is not detected within 5 seconds after the exhaust fan motor turns on.

- Possible causes -

- Too much load on the drive mechanism
- Exhaust fan motor defective
- Poor fan motor connector connection

SC492: Cooling fan motor lock

-Definition- [B]

A cooling fan motor lock signal is not detected within 5 seconds after the cooling fan motor turns on.

- Possible causes -

- Too much load on the drive mechanism
- Cooling fan motor defective
- Poor fan motor connector connection

SC493: Bridge unit cooling fan lock

-Definition- [B]

A bridge unit cooling fan motor lock signal is not detected within 5 seconds after the bridge unit cooling fan motor turns on.

- Possible causes -

- Too much load on the drive mechanism
- Bridge unit cooling fan motor defective
- Poor fan motor connector connection

SC501-1: 1st tray lift malfunction 1

-Definition- [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

- Possible causes -

- 1st tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC501-2: 1st tray lift malfunction 2

-Definition- [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, this SC will be generated.

- Possible causes -

- 1st tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC502-1: 2nd tray lift malfunction 1

-Definition- [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 10 seconds.

- Possible causes -

- 2nd tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC502-2: 2nd tray lift malfunction 2

-Definition- [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, this SC will be generated.

- Possible causes -

- 2nd tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC503-1: 3rd tray lift malfunction 1 (optional paper tray unit)

-Definition- [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 13 seconds.

- Possible causes -

- 3rd tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC503-2: 3rd tray lift malfunction 2 (optional paper tray unit)

-Definition- [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, this SC will be generated.

- Possible causes -

- 3rd tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC504-1: 4th tray lift malfunction 1 (optional paper tray unit)

-Definition- [C]

The paper upper limit sensor is not activated after the tray lift motor has been on for 13 seconds.

- Possible causes -

- 4th tray upper limit sensor defective
- Tray lift motor defective
- Poor tray lift motor connection

SC504-2: 4th tray lift malfunction 2 (optional paper tray unit)

-Definition- [C]

If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper upper limit sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, this SC will be generated.

- Possible causes -

- 4th tray upper limit sensor defective
- Tray lift motor defective
- Too much paper in the tray

SC506: Paper tray unit main motor lock (optional paper tray)

-Definition- [C]

A main motor lock signal is detected for more than 0.5 s during rotation.

- Possible causes -

- Paper tray unit main motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC507: LCT main motor lock (optional LCT)

-Definition- [C]

A main motor lock signal is detected for more than 0.5 s during rotation.

- Possible causes -

- LCT main motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC510-1: LCT tray malfunction 1

-Definition- [C]

1) The LCT lift sensor does not activate for more than 18 seconds after the LCT lift motor turned on.
2) The LCT lower limit sensor does not activate for more than 18 seconds after the LCT lift motor turned on.
3) The LCT lift sensor is already activated when the LCT lift motor turns on.

- Possible causes -

- LCT lift motor defective
- Pick-up solenoid defective
- Poor motor connector connection
- Poor pick-up solenoid connector connection
- Paper end sensor defective
- LCT lift sensor defective
- LCT lower limit sensor defective

SC510-2: LCT tray malfunction-2

-Definition- [C]

1) During paper lifting, the LCT lift sensor does not activate for more than 1.5 seconds after the paper end sensor turned on. If this condition occurs four times consecutively, this SC will be generated.
2) During paper lifting, after the top of the paper reaches the upper limit position, the paper is lowered until the LCT lift sensor is de-activated. At this time, the LCT lift sensor does not de-activate for more than 5 seconds.

- Possible causes -

- LCT lift motor defective
- Pick-up solenoid defective
- Poor motor connector connection
- Poor pick-up solenoid connector connection
- Paper end sensor defective
- Too much paper in the LCT
- Paper is not properly loaded in the LCT

SC541: Fusing thermistor open

-Definition- [A]

The fusing temperature detected by the thermistor was below 7°C for 16 seconds.

- Possible causes -

- Fusing thermistor defective or out of position
- Poor thermistor terminal connection

⟹ SC542: Fusing temperature warming-up error

-Definition- [A]

The fusing temperature does not reach the fusing standby temperature within 135 sec (35CPM machines) or 145 seconds (45CPM machines) after the main power switch is turned on.

- Possible causes -

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- BICU defective
- Power supply board defective
- Poor fusing unit connection

SC543: Fusing overheat error 1

-Definition- [A]

A fusing temperature of over 231°C is detected for 5 seconds by the fusing thermistor.

- Possible causes -

- Fusing thermistor defective
- BICU defective
- I/O board (IOB) defective

SC545: Fusing overheat error 2

-Definition- [A]

The fusing lamp stays on at full power for 30 seconds while in the stand-by condition after warming-up is completed.

- Possible causes -

- Fusing thermistor out of position

SC546: Fusing ready temperature malfunction

-Definition- [A]

The fusing temperature goes 20 °C below or 20 °C over the stand-by temperature after warm-up is completed.

- Possible causes -

- Poor thermistor connector connection
- Poor fusing unit connection

SC547: Zero cross signal malfunction

-Definition- [A]

Zero cross signals are not detected within a certain period within 500 ms after the main power switch has been turned on.

- Possible causes -

- Power supply board defective
- Noise on the ac power line

SC548: Fusing unit installation error

- Definition - [A]

The machine cannot detect the fusing unit when the front cover and right cover are closed.

- Possible causes -

- Fusing unit is not installed
- Poor fusing unit connection

SC599: 1-bin tray motor lock (optional 1-bin tray unit)

-Definition- [C]

A 1-bin tray motor lock signal is not detected for more than 0.3 seconds during rotation.

- Possible causes -

- 1-bin tray motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

SC601: Communication error between BICU and scanner unit

-Definition- [B']

The BICU cannot communicate with the BIS board properly.

- Possible causes -

- Poor connection between the SIB and SIFB boards.
- Poor connection between the SIFB and BICU boards.
- SIB board defective
- SIFB board defective
- BICU board defective

SC602: Communication error between BICU and HDD control board

-Definition- [B']

The BICU cannot communicate with the HDD control board properly.

- Possible causes -

- Poor connection between the BICU board and HDD control board
- HDD control board defective
- BICU board defective

SC620-1: Communication error between BICU and ADF 1

-Definition- [B']

The BICU cannot receive a response signal three times when a communication error has occurred.

- Possible causes -

- Poor connection between the BICU board and ADF main board
- ADF main board defective
- BICU board defective

SC620-2: Communication error between BICU and ADF 2

-Definition- [B']

The BICU receives a "Break" signal from the ADF main board.

- Possible causes -

- Poor connection between the BICU board and ADF main board
- ADF main board defective
- BICU board defective

SC620-3: Communication error between BICU and ADF 3

-Definition- [B']

The BICU sends a command to the ADF main board which does not operate an ADF function.

- Possible causes -

- Poor connection between the BICU board and the ADF main board
- ADF main board defective
- BICU board defective

SC621: Communication error between BICU and finisher

-Definition- [B']

The BICU cannot communicate with the finisher properly.

- Possible causes -

- Poor connection between the BICU board and the finisher main board
- Finisher main board defective
- BICU board defective

SC623: Communication error between BICU and paper tray unit

-Definition- [B']

The BICU cannot communicate with the paper tray unit properly.

- Possible causes -

- Poor connection between the BICU board and the paper tray unit main board
- Paper tray unit main board defective
- BICU board defective

SC624: Communication error between BICU and LCT

-Definition- [B']

The BICU cannot communicate with the LCT properly.

- Possible causes -

- Poor connection between the BICU board and the LCT main board
- LCT main board defective
- BICU board defective

SC630: CSS (RSS) communication error between line adapter and CSS center

Japan only

SC700: ADF original pick-up malfunction

-Definition- [B']

The original stopper H.P sensor does not activate three times consecutively after the pick-up motor has turned on.

- Possible causes -

- Original stopper H.P sensor defective
- Pick-up motor defective
- Timing belt out of position
- ADF main board defective

SC701: ADF original pick-up malfunction

-Definition- [B']

The original pick-up H.P sensor does not activate three times consecutively after the pick-up motor has turned on.

- Possible causes -

- Original pick-up H.P sensor defective
- Pick-up motor defective
- ADF main board defective

SC722: Finisher jogger motor error

-Definition- [B']

1) The finisher jogger H.P sensor remains de-activated for a certain time when returning to home position.
2) The finisher jogger H.P sensor remains activated for a certain time when moving away from home position.

- Possible causes -

- Jogger H.P sensor defective
- Jogger motor defective

SC724: Finisher staple hammer motor error

-Definition- [B']

Stapling does not finish for more than 600 ms after the staple hammer motor turned on.

- Possible causes -

- Staple hammer motor defective
- Staple jam

SC725: Finisher stack feed-out motor error

- Definition - [B']

The stack feed-out belt H.P sensor does not activate within a certain time after the stack feed-out motor turned on.

- Possible causes -

- Stack feed-out H.P sensor defective
- Stack feed-out motor defective

SC726: Finisher shift/lift motor error

- Definition - [B’]

1) Tray shift does not finish within a certain time after the shift motor turned on.
2) The stack height sensor does not activate within a certain time after the shift tray lift motor turned on.

- Possible causes -

- Shift motor defective
- Shift tray lift motor defective

SC727: Finisher stapler rotation motor error

- Definition - [B’]

1) Stapler rotation does not finish within a certain time after the staple rotation motor turned on.
2) The stapler does not return to its home position within a certain time after stapling finished.

- Possible causes -

- Stapler rotation motor defective
- Poor stapler rotation motor connection

SC729: Finisher punch motor error

- Definition - [B’]

The punch H.P sensor does not activate within a certain time after the punch motor turned on.

- Possible causes -

- Punch motor defective
- Punch H.P sensor defective
- Poor punch motor connection

SC730: Finisher stapler position motor error

- Definition - [B’]

1) The stapler does not return to its home position within a certain time after the stapler motor turned on.
2) The stapler H.P sensor does not activate within a certain time after the stapler motor turned on.

- Possible causes -

- Stapler motor defective
- Stapler H.P sensor defective
- Poor stapler motor connection

SC900: Electrical total counter error

-Definition- [A]

The value of the total counter has already exceeded 9,999,999

- Possible causes -

- NVRAM defective

⇒ **SC900 - 01: Mechanical total counter error**

-Definition- [B']

Total counter is not working properly.

- Possible causes -

- Mechanical total counter defective
- Mechanical total counter disconnected
- Poor connection at total counter.

SC951: F-gate signal error 2

-Definition- [B']

When the IPU has already received the F-gate signal, the IPU receives another F-gate signal.

- Possible causes -

- BICU defective

⇒ **SC953: Scanner image setting error**

-Definition- [B']

The settings that are required for image processing using the scanner are not sent from the IPU.

- Possible causes -

- Software defective

SC954: Printer image setting error

-Definition- [B']

The settings that are required for image processing using the printer controller are not sent from the IPU.

- Possible causes -

- Software defective

SC955: Memory setting error

-Definition- [B']

The settings that are required for image processing using the memory are not sent from the IPU.

- Possible causes -

- Software defective

SC959: Printer setting ID error

-Definition- [B']

The ID that is required for image processing using the printer is not sent from the IPU.

- Possible causes -

- Software defective

SC960: Printer return ID error

-Definition- [B']

The ID that is sent from the printer controller after finishing the printout is incorrect.

- Possible causes -

- Software defective

SC961: Printer ready ID error

-Definition- [B']

The ID that is sent from the printer controller in the printer controller printing ready condition is incorrect.

- Possible causes -

- Software defective

SC962: Memory setting ID error

-Definition- [B']

The ID that is sent from the memory when the IPU sent the memory ready signal is incorrect.

- Possible causes -

- Software defective

SC963: Memory finishing ID error

-Definition- [B']

The ID that is sent from the memory when the IPU sent the memory finish signal is incorrect.

- Possible causes -

Software defective

SC964: Printer ready error

-Definition- [B']

The print ready signal is not generated for more than 17 seconds after the IPU received the print start signal.

- Possible causes -

- Software defective

SC980: HDD access error

-Definition- [B']

Incorrect parameter sent from the BICU to the MSU.

- Possible causes -

- Software defective
- Poor connection between BICU and MSU.

SC981: HDD response error

-Definition- [B']

The HDD control board does not generate any response when the IPU sends a read/write signal to the MSU.

- Possible causes -

- Software defective
- Poor connection between BICU and MSU
- HDD defective

SC982: HDD construction error

-Definition- [B']

1) The HDD has been installed without the electric sort kit (SIMM memory).
2) A HDD that does not have the correct specifications has been installed.

- Possible causes -

- Hard disk defective
- Incorrect hard disk type
- The electric sort kit is not installed

SC990: Software performance error

-Definition- [B']

The software performs an unexpected function.

- Possible causes -

- Software defective
- NVRAM Defective
- BICU Board Defective

Re-download copier firmware, if the service condition can not be cleared by cycling the machine 'OFF' and 'ON'.

When this SC occurs, the file name, address, and data will be stored in the NVRAM. This data can be checked by entering SP mode then pressing "0".

⇒ **NOTE:** The Hotline may request this information. Record and have this data and the conditions in which the service code occurs available when calling the Hotline.

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7.2 ELECTRICAL COMPONENT DEFECTS

7.2.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Scanner Home Position (S1)	505-5 (SIB)	Open	SC121 is displayed.
		Shorted	SC120 is displayed.
Platen Cover (S2)	505-8 (SIB)	Open	APS and ARE do not function properly.
		Shorted	No symptom.
Original Width (S3)	502-2,3 (SIB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-1 (S4)	502-7,8 (SIB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-2 (S5)	502-12 (SIB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
LD Unit Home Position (S6)	220-2 (IOB)	Open	SC328 is displayed when the laser beam pitch is changed.
		Shorted	SC327 is displayed when the laser beam pitch is changed.
Toner Density (TD) (S7)	204-3 (IOB)	Open	The add toner indicator blinks even if there is toner in the development unit.
		Shorted	SC390-01 is displayed.
Paper Exit (S8)	203-B2 (IOB)	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 (S9)	207-B2 (IOB)	Open	The Paper Jam indicator lights even if there is no paper.
		Shorted	The Paper Jam indicator will light whenever a copy is made.
Image Density (ID) (S10)	219-5 (IOB)	Open	SC350-03 is displayed after copying.
		Shorted	SC350-01 is displayed after copying.
Upper Paper Height (S11)	235-2 (PFB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC501-02 will be displayed.
		Shorted	SC501-01 is displayed.

Component (Symbol)	CN	Condition	Symptom
Lower Paper Height (S12)	236-2 (PFB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC502-02 will be displayed.
		Shorted	SC502-01 is displayed.
Upper Paper End (S13)	235-8 (PFB)	Open	The Paper End indicator lights even if paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the upper paper tray.
Lower Paper End (S14)	236-8 (PFB)	Open	The Paper End indicator lights even if paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the lower paper tray.
Upper Relay (S15)	235-5 (PFB)	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 (S16)	236-5 (PFB)	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 Tray (S17)	239-1 (PFB)	Open	Add Paper indicated even if there is paper.
		Shorted	Add Paper indicated when the tray is set.
Lower Tray (S18)	239-3 (PFB)	Open	Add Paper indicated even if there is paper.
		Shorted	Add Paper indicated when the tray is set.
Transfer Belt Position (S19)	203-A8 (IOB)	Open	No symptom
		Shorted	SC403 is displayed

7.2.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Right Lower Cover (SW1)	232-3 (PFB)	Open	Doors/Covers Open is displayed even if the right lower cover is closed.
		Shorted	The LCD goes blank when the lower cover is opened.
Main (SW3)	102-1~4 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Front Cover Safety (SW4)	219-11 (IOB)	Open	Doors/Covers Open is displayed even if the front cover is closed.
		Shorted	Doors/Covers Open is not displayed even if the front cover is opened.

7.3 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom when turning on the main power switch
	115V	210 ~ 230V	
Power Supply Board			
FU1	6.3A / 125V	6.3A / 250V	“Doors/Covers Open” is displayed
FU2	6.3A / 125V	6.3A / 250V	“Doors/Covers Open” for the finisher is displayed
FU3	4A / 125V	4A / 250V	Paper end condition
FU4	6.3A / 125V	6.3A / 250V	SC121 is displayed
FU5	6.3A / 125V	6.3A / 250V	One of SC302, or SC403, or SC405 is displayed
FU101	15A / 125V	---	No response
FU102	8A / 125V	5A / 250V	No response
FU103	2A / 125V	1A / 250V	Normal operation (optional heaters do not work)

7.4 ROM HISTORY

A230/A231/A232 Firmware Modification History (Copier)			
Description of Modification	**Firmware Level**	**Serial Number**	**Firmware Version**
Version A, B, & C were for pre-production machines.	A2325113 D	From initial production.	13.1.7 na
Corrects the following: • Machine may stall when making a combined copy after printing the archive file list. • The "Menu" key LED stays on even if the copy job is finished. • When pressing the "+" after 400% when using the Zoom key, "* maximum" is displayed. If this condition continues until the auto reset time, a SC990 may occur. • When the copier HDD is defective and the main power switch is turned on, the machine does not generate a SC condition but may stall. • The description of SP 5803-6 has been corrected. • When an original is stored as an archive file, two archive files will be made. • Memory clear procedure corrected. Enter SP5801. Hold down the "1" for over 3 s. • SP2213 display corrected. • Change the determination of the paper size when the machine detects a non-standard original size. Specification change: • If TD Sensor Initialization is preformed during warm-up – SC 542 will occur. Change – TD Initialization can not be performed until warm up is complete.	A2325113 E	April 1998 production.	13.1.8 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • To improve copy quality (Medaka), the default value of the following SP modes has been changed. Sp2001-1 1650v to 1620v and SP2005-3 1650v to 1620v. • Machine may not reach stand-by mode condition after main switches are turned on of after jam removal due to no zero cross signal detection. Fix - SC547 or SC542 will be generated. • When changing the value of SP6105 (staple position adjustment) and SP6113 (punch hole position adjustment) to a minus value, then turning the machine OFF and ON, the data is not sent to the finisher. • If the electrical counter value is a minus condition, the counters for the fax option do not increment. Specification change: • When A3 or B4 paper size is selected in rotate sort (or stack) mode, the machine will copy with normal sort (or Stack) mode. • Electrical total counter value of brand-new machine has been changed from –2000 to –5000. • During multiple copying and no HDD option installed, the machine can scan originals for fax transmission. • Improved copy quality of light original mode. Gamma curve for the original mode has been changed. • SC900-01 will be generated when the mechanical counter is disconnected.	A2325113 G	May 1998 production.	13.6.3 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • In the Power Saver Mode, if the front cover is left open for long period, SC542 may appear. • If the front cover is kept open for more than 125 sec. When adjusting SP1-105-01, SC542 occurs.	A2325113 H	June 1998 production.	13.6.3.1 na
Corrects the following: • If there is an A3/11x17 jam in the duplex unit, the jam location indicator “C” may also light although there is no paper there. • Fusing lamp may not turn off when a non-feed jam occurs.	A2325113 J	August 1998 production.	13.6.4.1 na
Corrects the following: • SP5001 – SP5401 will not print out on SMC printout. • In a SC condition – Memory All Clear (SP5801) does not function. • After a jam condition has been cleared, pressing the Start key does not resume copying	A2325113 K	N/A	13.6.8 na
For factory purpose only. Not released.	A2325113 L	N/A	13.6.9 na
Corrects the following: • After resetting a SC condition, incoming Fax messages will not print. • A false fusing SC may be detected after resetting a fusing SC condition. • Registration roller may not stop rotating if the leading edge of the copy is detected twice at the registration sensor.	A2325113 M	N/A	13.6.11 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • Printing image improved in smoothing mode and the printing speed has been increased in the Electronic Sort Mode when printing with 300DPI. • SC321 may be displayed due to incorrect timing of image transfer from the main frame to the printer controller. • A printing error may occur when printing 250 sheets or more to the SR720. • The ADF can not function when SP 4303 is set to 1. • The LED for the original set sensor lights when a fax message is received in night mode. • The paper end indicator erratically lights in the Enhanced Image Mode with no HDD installed.	A2325113 N	Not cut into production.	13.6.19 na
• Required from proper Print Controller operation. • Incoming fax messages cannot be printed out in Night Mode. • Can not reset “Original on glass” indication when SP4303 is set to ‘1”.	A2325113 P	January 1999 production.	13.6.20 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • Jam Reset - When a "C" jam occurs, opening doors other than the front or right door can reset the jam. Modified 'so that the "C" jam can only be reset by opening the front or right door. • Bin Tray Motor abnormal operation - The Exit Motor Off signal is misread as ON so the motor continues to switch ON/OFF. • Incorrect detection of Door Open - The serial data from the 1st bin tray is misdetected as door open/closed so machine initialization occurs, if this misdetection occurs when paper is fed, a jam occurs. • Online added - [Online] has been added for the printer fonts for the China/Taiwan machines. Please install this version when adding the printer for the China/Taiwan machines. • Characters from registered fonts cannot be displayed - The registered fonts are not displayed on the Chinese machines during 4-line displays. Please install this version when adding the Scanner option on the Chinese/Taiwan/Asian machines. • English display errors in SP Mode - SP2301, 2309: Changed "Toner" to "Trans." SP2209-002: Changed "Tonert" to "Toner."	A2325113 Q	N/A	13.6.23 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
⇒ Corrects the following: • C" jam occurs, opening the front or right door can clear the jam message display. *After modification* The "C" jams can only be cleared by opening the right door. Note: As part of the modification, one right door interlock switch has been added and one front door interlock switch has been removed. In addition, SP5957 has been added to allow usage of either the old or new interlock switches. If using the old interlock switch, please set the SP5957 to 0. If using the new switch, please set SP5957 to 1. If SP5957 is not set properly, the 'door open' Panel display may not function properly and the toner may not be fed properly after toner bottle replacement. • FALSE TONER OVERFLOW CONDITION: When the sensor detects Toner, the "Near Full" message is immediately displayed. After the Toner signal has been on for 1000 copies, the machine shuts off. Once the Toner signal disappears, the "Near Full" message is no longer displayed and the counter is reset. *After modification:* After the toner signal has been on for 500 consecutive copies, the "Near Full" message is displayed. After the "Near Full" message has been displayed for 1000 copies, the machine shuts off. Once the toner signal disappears, the counter is reset. Continued…	A2325113 R	N/A	14.1

Description of Modification	Firmware Level	Serial Number	Firmware Version
• **Dirty Background:** There is a tendency for a 'dirty' background or leading edge to develop after the machine has not been used for a long while. There is also a tendency for increased image density. These tendencies are due to the decreased turboelectric charge of the Toner. • The initial machine warm-up operations stop if one or more of the doors to the option units are open (e.g.1 bin tray, finisher). The machine warm-up does not restart after closing the doors. • When in user code mode, after entering the power save mode and then exiting, the counter does not count the number of copies the user makes. • Using the Norwegian Language, when the machine should display 'Copying will start after warm up' in Norwegian, it is displayed in French.			
⇒ Conditions: • The toner collection bottle becomes full with toner, causing toner to spill out. <u>Countermeasure:</u> Shortening of the time that the transfer belt is in contact with the drum. • The default value for recovery time for low-power mode has been changed from 30 to 20 sec (Machine temp. 145° to 157°C). Since recovery starts at a higher temperature, the machine has more leeway in attaining ready status. • Occasional occurrence of SC542 after the power is turned on in cold conditions. <u>Countermeasure:</u> Change in the timing of the detection of the fusing temperature. *35CPM machines: from 125 to 135 sec.* *45CPM machines: from 125 to 145 sec.*	A2325113S	NA	14.2

Trouble shooting

Description of Modification	Firmware Level	Serial Number	Firmware Version
⇒ Conditions: - Switching on the machine in cold condition. - Setting original and pressing start key during machine warm-up. The French message then appears in the display. • SP2207 displayed a spelling error. *After modification* Corrected spelling to “Forced”. Corrects the following • When SC101 occurs during a Fax transmission the machine prints a blank page. The transmission results are then reported as normal. The first page is blank and an SC101 message is displayed. <u>Countermeasure:</u> No actual transmission will take place during memory transmission. In the case of immediate transmission, the transmission will be interrupted and an error will be reported. • The Scanner software was also modified so that the driver in use displays an error message. • When a fusing jam occurs, the jammed paper may not be visible to the operator and a service call may result. <u>Countermeasure:</u> The detection of fusing jams has been modified so that the paper will stop at a point where the trailing edge is visible. Wrong language displayed. When in French mode the display for a one bin open cover is in German	A2325113 T	NA	14.3

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • In machines without the Image Enhancement kit, the following can occur after the paper end condition is reached: - The machine waits for the next sheet of paper to be fed from the tray. - An SC321 occurs. • An SC990 occurs 1- No Hard Disk installed. 2- Firmware v 14.3 installed 3- Duplex Mode 4- Original on glass, press Start 5- Original in ADF, press Start • After making a copy from the glass, no copies could be made from the DF. "Original is left on glass…Remove original" is displayed when an original is set in the DF. • Some parts of "Adjust Image" screen are displayed in German even though Dutch is set as the language. • Some parts of "Adjust Image" screen are displayed in English even though Spanish is set as the language.	A2325113 V	December 1999 production	14.4
⇒ Corrects the following: • When the main power switch is turned on or the machine recovers from Energy Saver Mode, an SC990 (followed by SC542) occurs before the target fusing temperature is reached. • When the G909 Mailbox has been selected as the output tray when the machine recovers from Energy Saver Mode, a jam occurs at the G909 entrance. This is because the G909 is not recognized by the mainframe. • The thermistor output is unstable when the main power is turned on or the machine recovers from Energy Saver Mode in a low-temperature environment. This causes an SC546 to occur. • An SC990 occurs when a print job is cancelled at a certain point during the job.	A2325113 W	Not Available	14.5

Description of Modification	Firmware Level	Serial Number	Firmware Version
⇒ Corrects the following: • The following SP mode displays have been changed: "Serviceman" → "Service". "Salesman" → "Sales". • In the following 2 cases, the leftover page of a 2 in 1 or 4 in 1 job (which should be blank) contains part of the image data of the previous page. *Case 1: SIMM Memory (8MB) not installed. Paper size is B4 or larger 2 in 1. Vertical transport of original. Amount of originals is an odd number. *Case 2: SIMM Memory (8MB) not installed. Paper size is B4 or larger 4 in 1. Vertical transport of original. The amount of originals are a multiple of 4. • The following occurrences of SC350-3 have been corrected: *After SP2210 (ID Detection Interval) is set to 1, and two sheets are individually set and fed from the bypass tray. *After SP2210 (ID Detection Interval) is set to 2 or 3. SC occurs at the 4th and 6th sheets, respectively. • One line of an SC message was displayed in German, even though the display language was set to French.	A2325113 X	Not Available	14.6

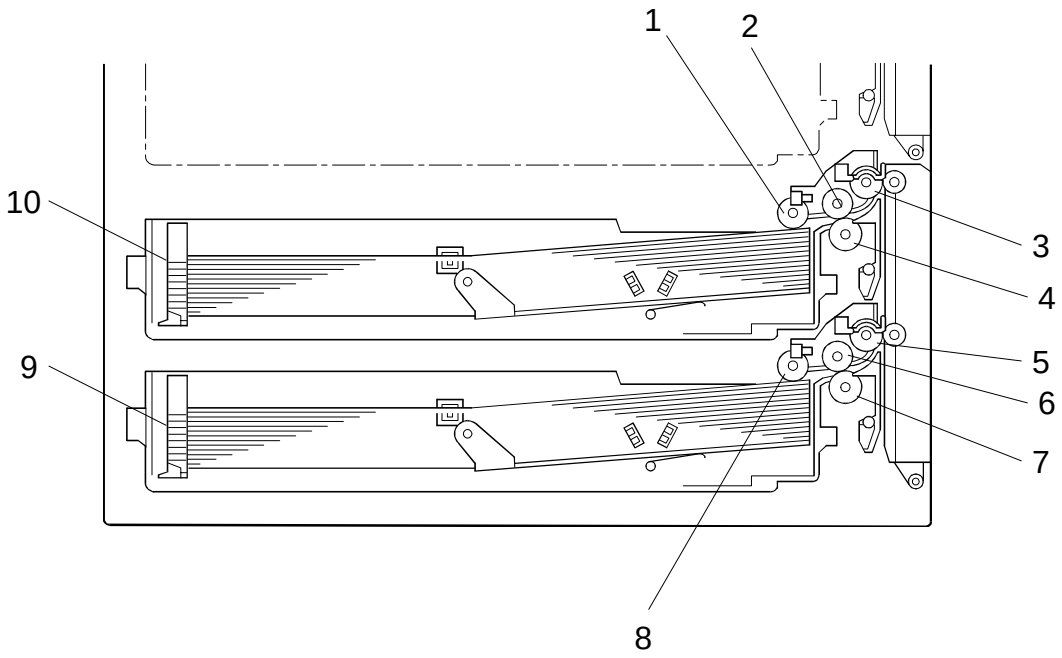
PAPER TRAY UNIT A682

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

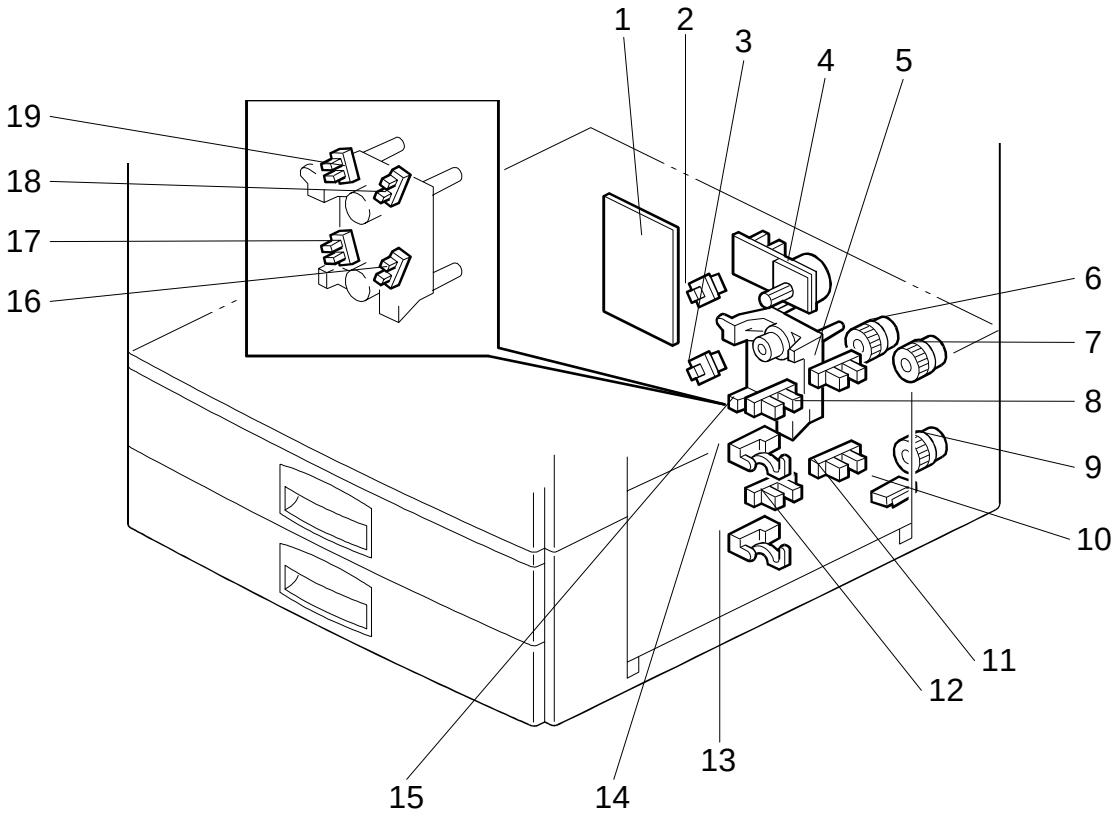
Paper Size:	A5 lengthwise to A3 HLT lengthwise to DLT
Paper Weight:	60 g/m^2 ~ 105 g/m^2, 16 lb ~ 28 lb
Tray Capacity:	500 sheets (80 g/m^2, 20 lb) x 2
Paper Feed System:	FRR (Feed and Reverse Roller)
Paper Height Detection:	4 steps (100%, 70%, 30%, Near end)
Power Source:	24 Vdc, 5 Vdc (from the copier) 120 Vac: 115 V version (from the copier) 220 ~ 240 Vac: 224/240 V version (from the copier)
Power Consumption:	50 W
Weight:	25 kg
Size (W x D x H):	540 mm x 600 mm x 270 mm

1.2 MECHANICAL COMPONENT LAYOUT



1. Upper Pick-up Roller
2. Upper Paper Feed Roller
3. Upper Relay Roller
4. Upper Separation Roller
5. Lower Relay Roller
6. Lower Paper Feed Roller
7. Lower Separation Roller
8. Lower Pick-up Roller
9. Lower Tray
10. Upper Tray

1.3 ELECTRICAL COMPONENT LAYOUT

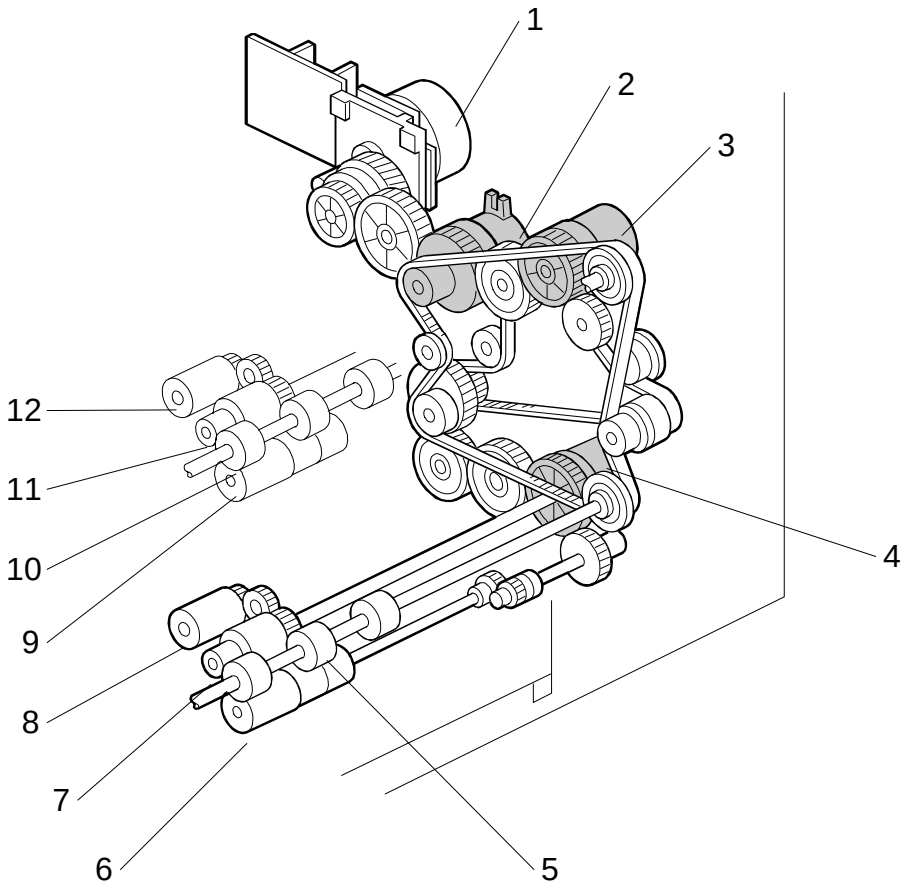


1. Main Board
2. Upper Tray Switch
3. Lower Tray Switch
4. Tray Motor
5. Upper Lift Sensor
6. Relay Clutch
7. Upper Paper Feed Clutch
8. Tray Lift Motor
9. Lower Paper Feed Clutch
10. Vertical Guide Switch
11. Lower Lift Sensor
12. Lower Paper End Sensor
13. Lower Relay Sensor
14. Upper Relay Sensor
15. Upper Paper End Sensor
16. Lower Paper Height 2 Sensor
17. Lower Paper Height 1 Sensor
18. Upper Paper Height 2 Sensor
19. Upper Paper Height 1 Sensor

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Tray	Drives all rollers.	4
M2	Tray Lift	Lifts the upper and lower tray bottom plates (there are two motors in this unit, one for each tray.	15
Sensors			
S1	Upper Lift	Detects when the paper in the upper tray is at the correct feed height.	5
S2	Lower Lift	Detects when the paper in the lower tray is at the correct feed height.	11
S3	Upper Paper End	Informs the copier when the upper tray runs out of paper.	15
S4	Lower Paper End	Informs the copier when the lower tray runs out of paper.	12
S5	Upper Relay	Detects misfeeds.	14
S6	Lower Relay	Detects misfeeds.	13
S7	Upper Paper Height 1	Detects the amount of paper in the upper tray.	17
S8	Upper Paper Height 2	Detects the amount of paper in the upper tray.	16
S9	Lower Paper Height 1	Detects the amount of paper in the lower tray.	19
S10	Lower Paper Height 2	Detects the amount of paper in the lower tray.	18
Switches			
SW1	Upper Tray	Informs the copier when the upper tray is set in the machine.	2
SW2	Lower Tray	Informs the copier when the lower tray is set in the machine.	3
SW3	Vertical Guide	Detects whether the vertical guide is opened or not.	10
Magnetic Clutches			
MC1	Upper Paper Feed	Starts paper feed from the upper tray.	7
MC2	Lower Paper Feed	Starts paper feed from the lower tray.	9
MC3	Relay	Drives the transport rollers.	6
PCBs			
PCB1	Main	Controls the paper tray unit and communicates with copier.	1

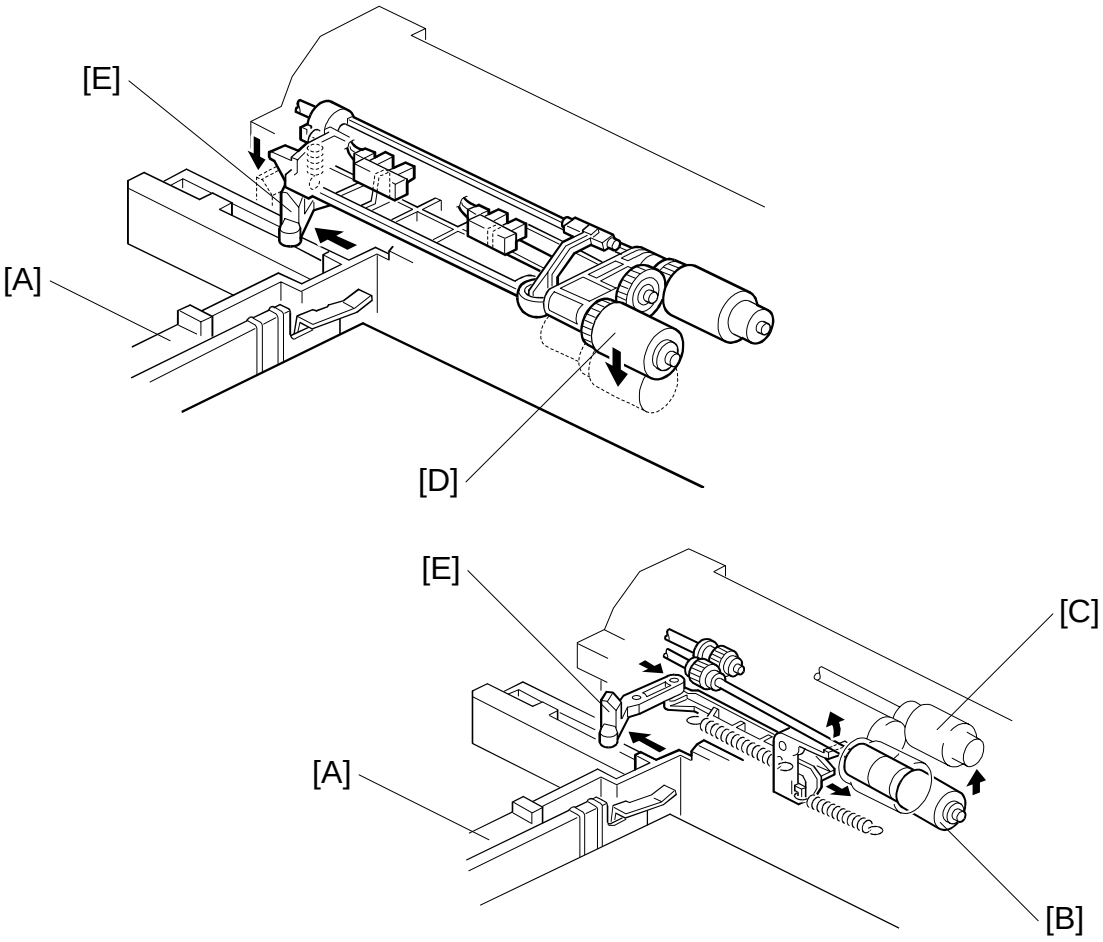
1.5 DRIVE LAYOUT



1. Tray Motor
2. Relay Clutch
3. Upper Paper Feed Clutch
4. Lower Paper Feed Clutch
5. Lower Relay Roller
6. Lower Separation Roller
7. Lower Paper Feed Roller
8. Lower Pick-up Roller
9. Upper Separation Roller
10. Upper Relay Roller
11. Upper Paper Feed Roller
12. Upper Pick-up Roller

2. DETAILED DESCRIPTIONS

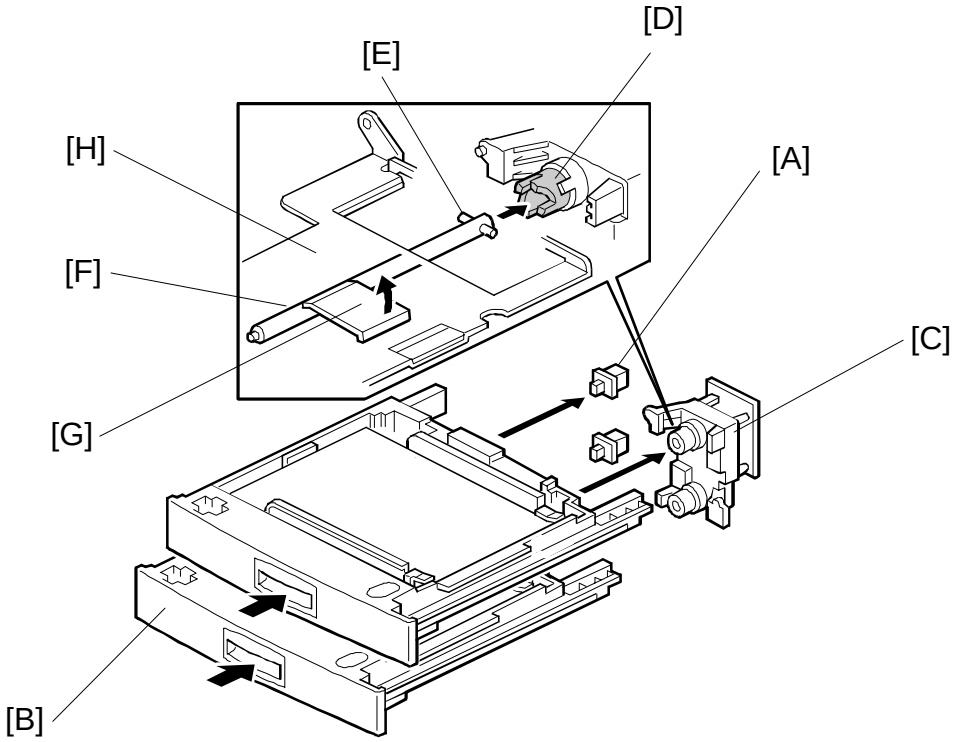
2.1 PICK-UP AND SEPARATION ROLLER RELEASE MECHANISM



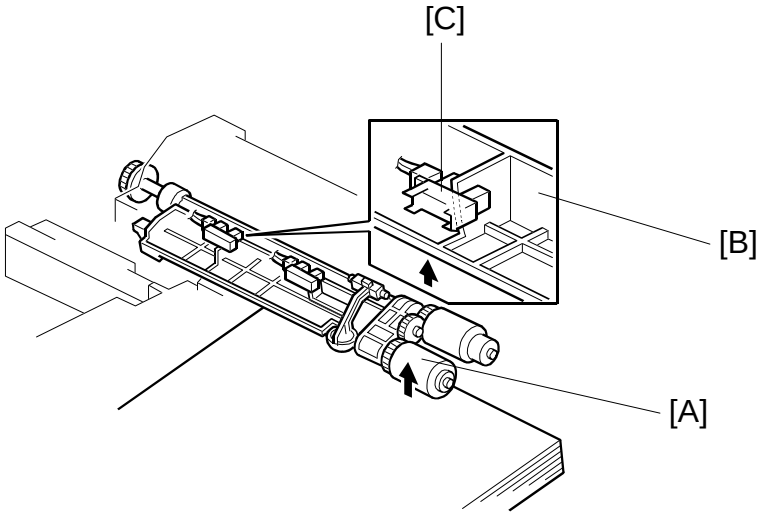
When the paper tray [A] is not inside the paper tray unit, the separation roller [B] is away from the paper feed roller [C], and the pick-up roller [D] stays in the upper position.

When the paper tray is put into the paper tray unit, it pushes the release lever [E]. This causes the pick-up roller to move down (top diagram) and the separation roller to move into contact with the paper feed roller (bottom diagram).

2.2 PAPER LIFT MECHANISM



The paper tray switch [A] detects when the paper tray [B] is placed in the machine. When the machine detects that the paper tray is in the machine, the tray lift motor [C] rotates and the coupling gear [D] on the tray lift motor engages the pin [E] on the lift arm shaft [F]. Then the tray lift arm [G] lifts the tray bottom plate [H].

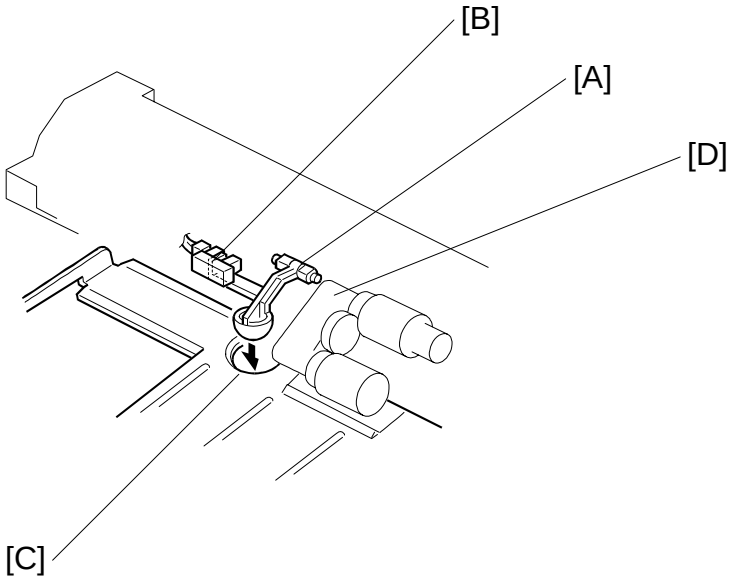


When the paper tray is placed in the machine, the pick-up roller [A] lowers. When the top sheet of paper reaches the proper height for paper feed, the paper pushes up the pick-up roller, and the actuator [B] on the pick-up roller supporter activates the lift sensor [C] to stop the tray lift motor.

After several paper feed cycles, the paper level gradually lowers and the lift sensor is de-activated. The tray lift motor turns on again until this sensor is activated again.

When the tray is drawn out of the machine, the tray lift motor coupling gear disengages the pin on the lift arm shaft, and the tray bottom plate then drops under its own weight.

2.3 PAPER END DETECTION



If there is some paper in the paper tray, the paper end feeler [A] is raised by the paper stack 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, the paper end feeler is lifted up by the pick-up roller supporter [D].

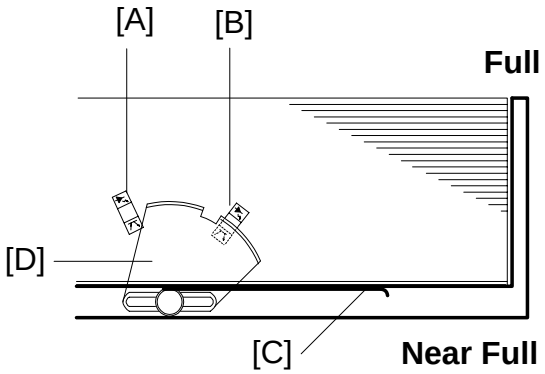
2.4 PAPER HEIGHT DETECTION

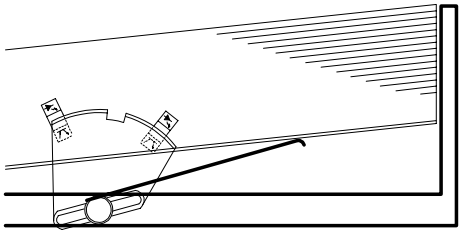
The amount of paper in the tray is detected by the combination of two paper height sensors, [A] and [B].

When the amount of 2 paper decreases, the bottom plate pressure lever [C] moves up and the actuator [D] which is mounted on the same drive shaft as the pressure lever rotates.

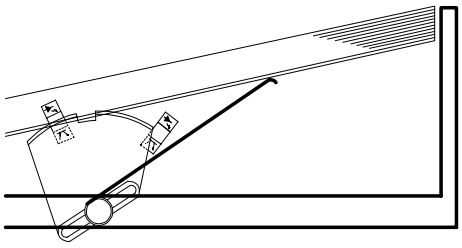
The following combination of sensor signals is sent to the copier.

Amount of Paper	Paper Height Sensor 1	Paper Height Sensor 2
Full	OFF	ON
Near Full	ON	ON
Near End 1	ON	OFF
Near End 2	OFF	OFF

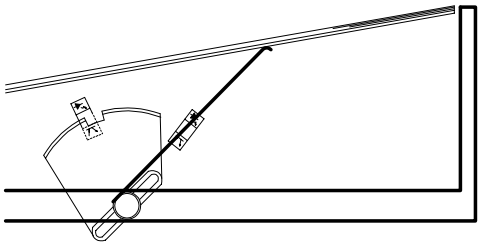




Near End 1



Near End 2



3. SERVICE TABLES

3.1 DIP SWITCHES

DPS101								Description
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	0	0	Default
0	0	0	0	0	0	0	1	Free run, feed from upper tray
0	0	0	0	0	0	1	1	Free run, feed from lower tray
0	0	0	0	0	1	0	1	Free run, feed from upper and lower trays alternately

NOTE: 1) Do not use any other settings.
2) To do the free run, proceed as follows:
1. Remove the paper from the tray (this is because the machine has no jam detection).
2. Set DPS101 for the required free run as shown above.
3. Turn the main power switch off, wait a few seconds, then switch on.
4. Press SW101 to start the free run.
5. To stop the free run, press SW102.

3.2 TEST POINTS

No.	Label	Monitored Signal
TP100	(24 V)	+24 V
TP101	(GND)	Ground
TP103	(TXD)	TXD to the copier
TP104	(RXD)	RXD from the copier
TP105	(5 V)	+5 V
TP106	(GND)	Ground

3.3 SWITCHES

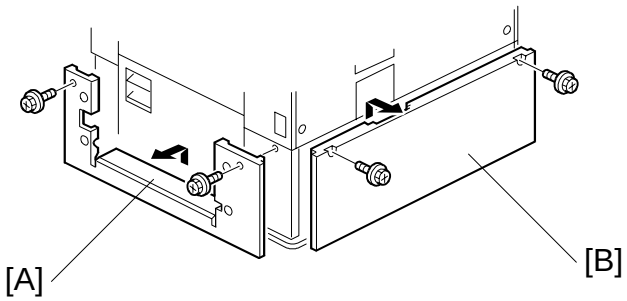
No.	Function
SW101	Starts the free run
SW102	Stops the free run

3.4 FUSES

No.	Function
FU101	Protects the 24 V line.

4. REPLACEMENT AND ADJUSTMENT

4.1 COVER REPLACEMENT



Right Cover

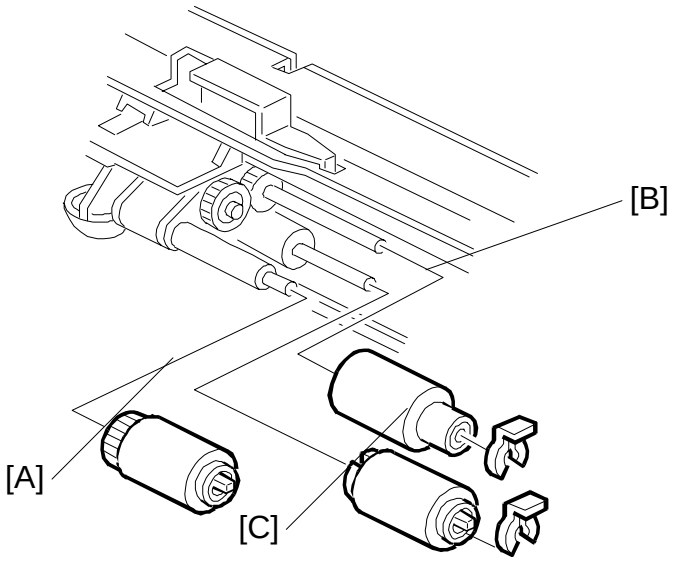
1. Remove the right cover [A] (2 screws).

Rear Cover

1. Remove the rear cover [B] (2 screws).

4.2 ROLLER REPLACEMENT

4.2.1 PAPER FEED, SEPARATION, AND PICK-UP ROLLERS



1. Remove the paper tray.

Pick-up Roller

2. Replace the pick-up roller [A].

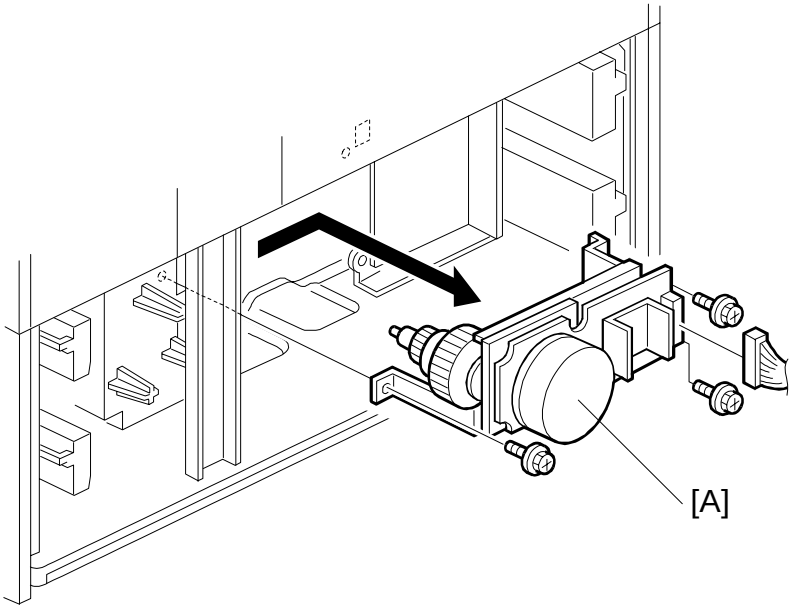
Paper Feed Roller

2. Replace the paper feed roller [B] (1 snap ring).

Separation Roller

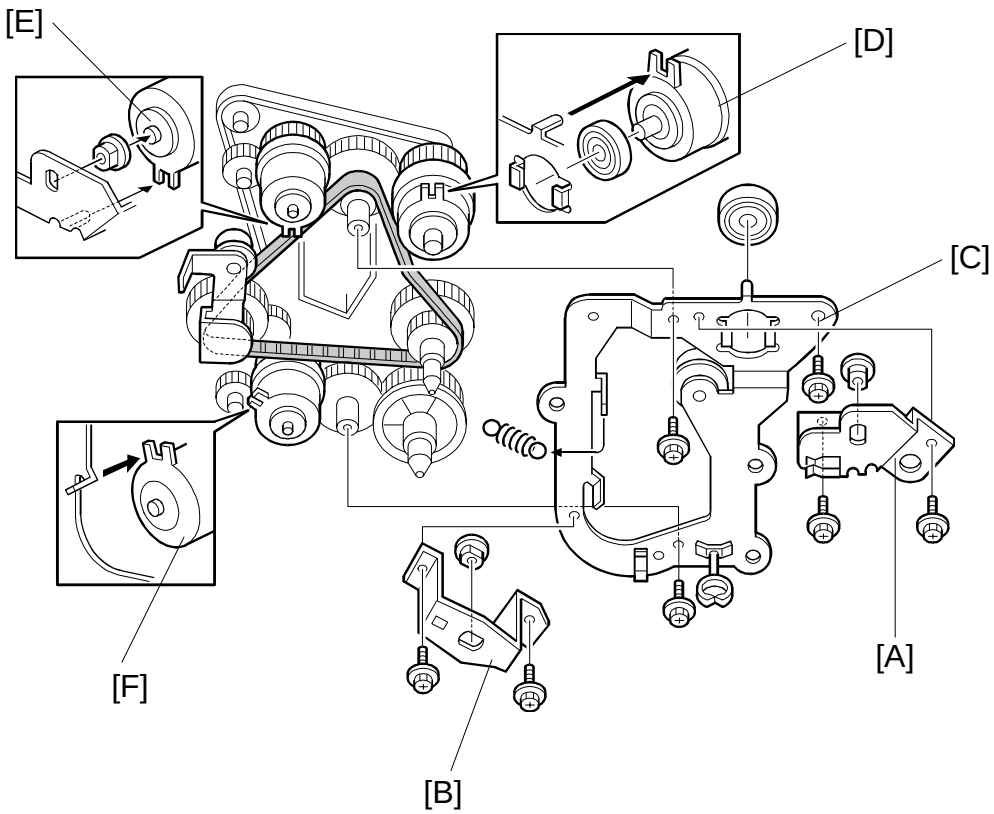
2. Replace the separation roller [C] (1 snap ring).

4.3 TRAY MOTOR REPLACEMENT



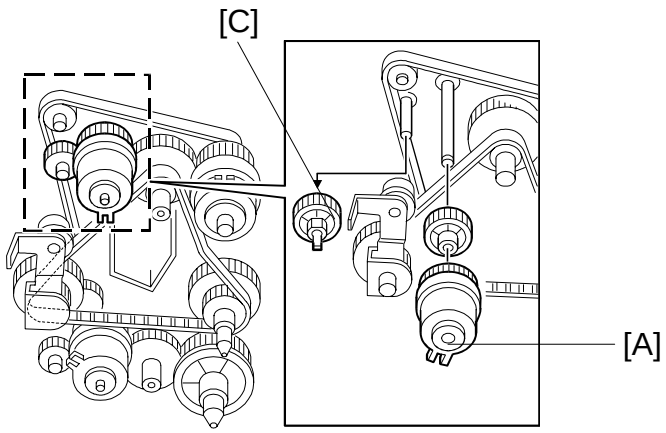
1. Remove the rear cover.
2. Remove the tray motor [A] (1 connector, 3 screws).

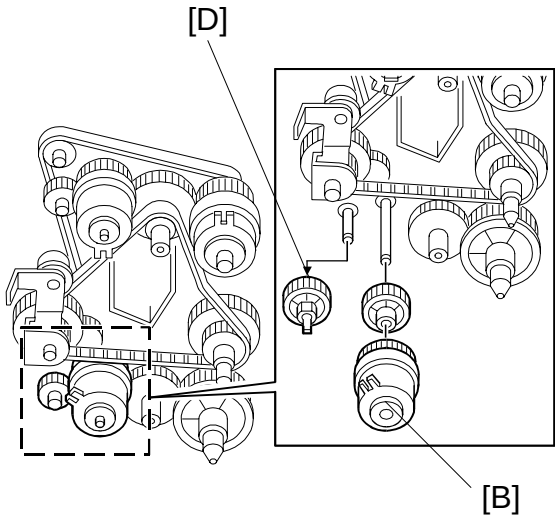
4.4 PAPER FEED AND RELAY CLUTCH REPLACEMENT



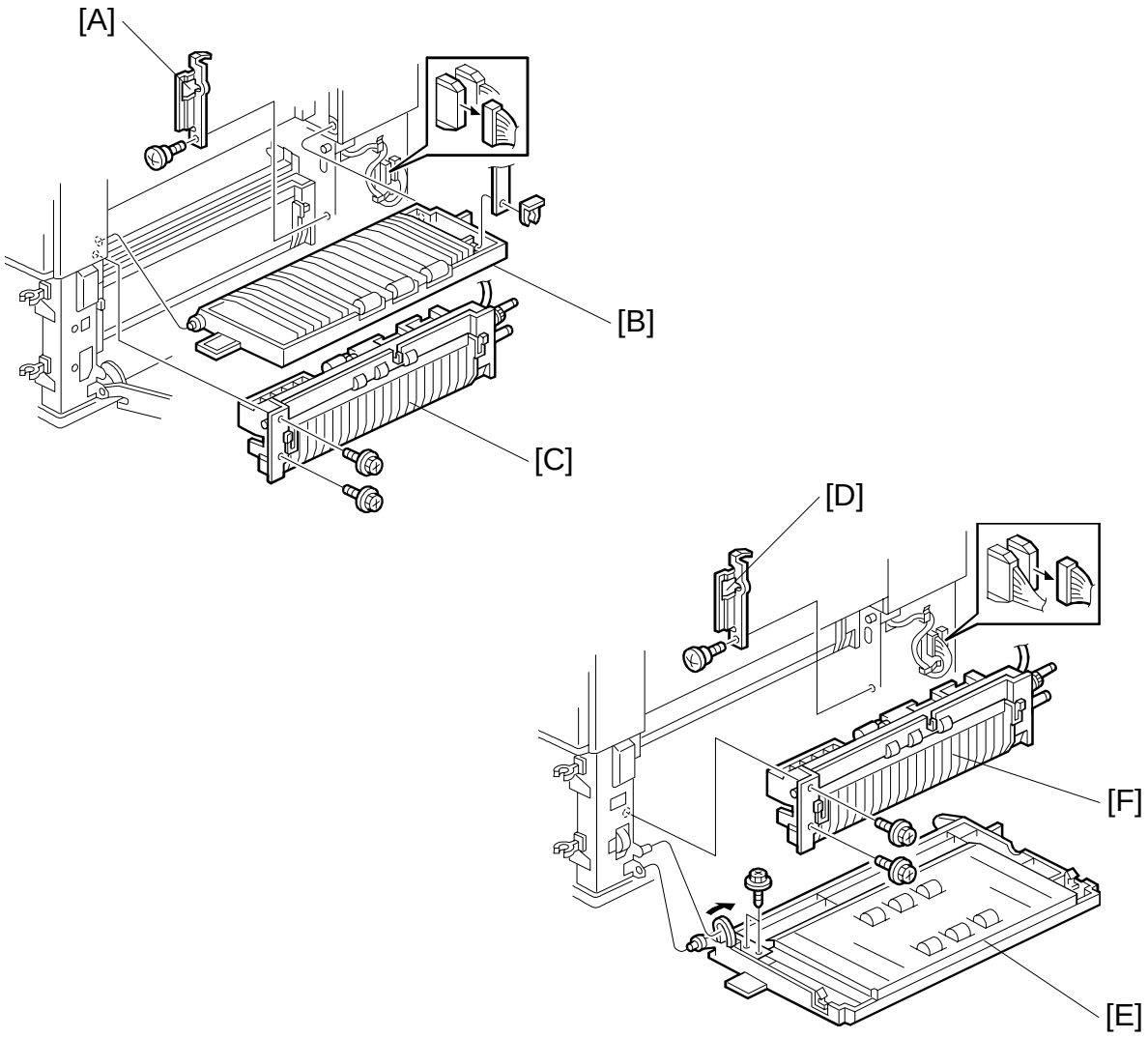
1. Remove the rear cover.
2. Remove the upper paper feed clutch holder [A] (2 screws).
3. Remove the lower paper feed clutch holder [B] (2 screws).
4. Remove the gear holder [C] (3 screws, 1 spring, 1 bearing).
5. Replace the relay clutch [D] (1 connector).
6. Replace the upper feed clutch [E] (1 bushing, 1 connector).
7. Replace the lower feed clutch [F] (1 connector).

4.5 PAPER FEED UNIT REPLACEMENT





1. Remove the rear cover.
2. Remove the upper and lower paper feed clutch holder.
3. Remove the gear holder.
4. Remove the upper feed clutch [A] or lower feed clutch [B].
5. Remove the upper or lower gear [C, D].



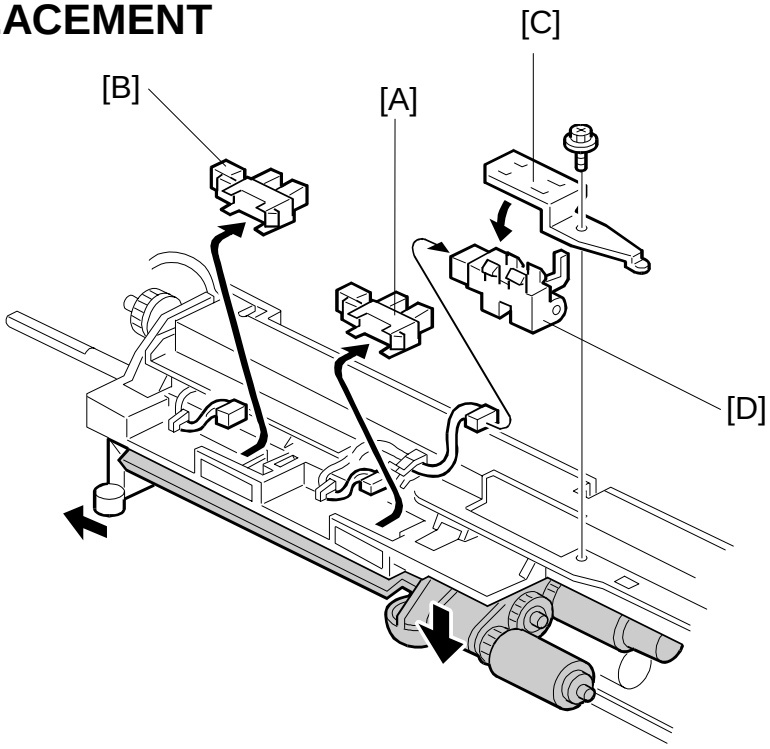
Upper Paper Feed Unit

6. Remove the docking bracket [A] (1 screw).
7. Remove the vertical transport cover [B] of the copier (1 snap ring).
8. Remove the upper paper feed unit [C] (2 screws, 1 connector).

Lower Paper Feed Unit

6. Remove the docking bracket [D] (1 screw).
7. Remove the vertical transport guide [E] (2 screws).
8. Remove the lower paper feed unit [F] (2 screws, 1 connector).

4.6 PAPER END, TRAY LIFT, AND RELAY SENSOR REPLACEMENT



1. Remove the paper feed unit.

Paper End Sensor

2. Replace the paper end sensor [A] (1 connector).

Tray Lift Sensor

2. Replace the tray lift sensor [B] (1 connector).

Relay Sensor

2. Remove the sensor bracket [C] (1 screw).
3. Replace the relay sensor [D] (1 connector).

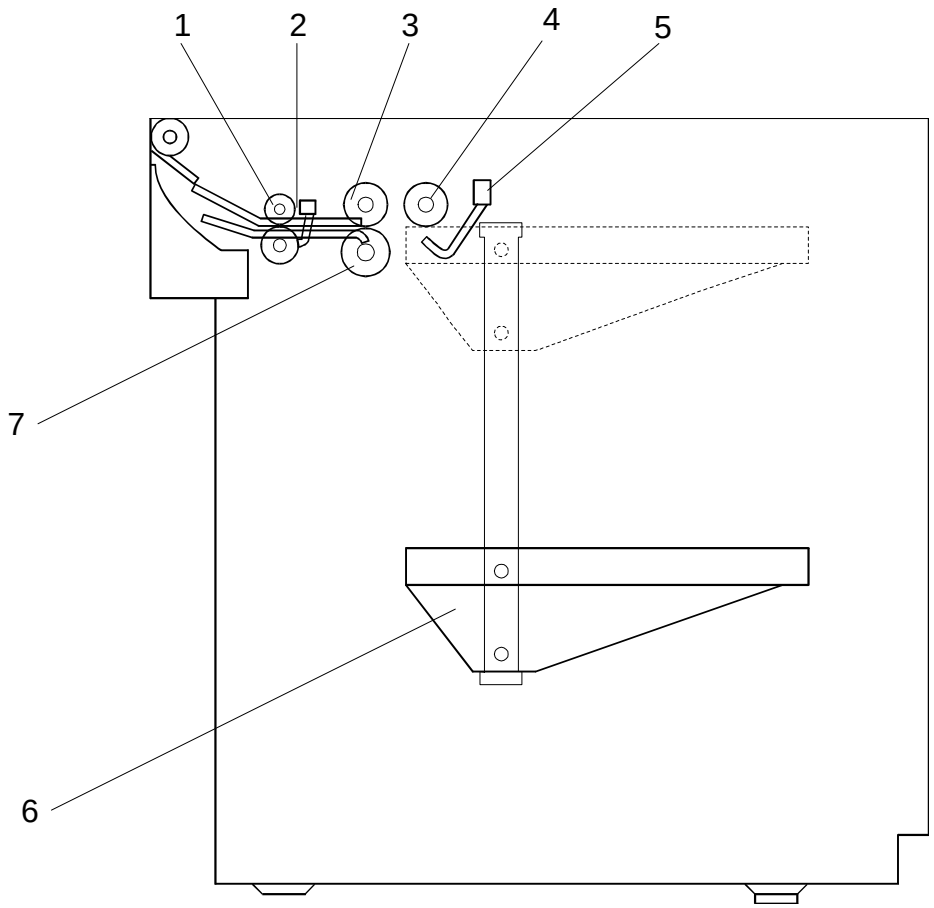
LARGE CAPACITY TRAY A683

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

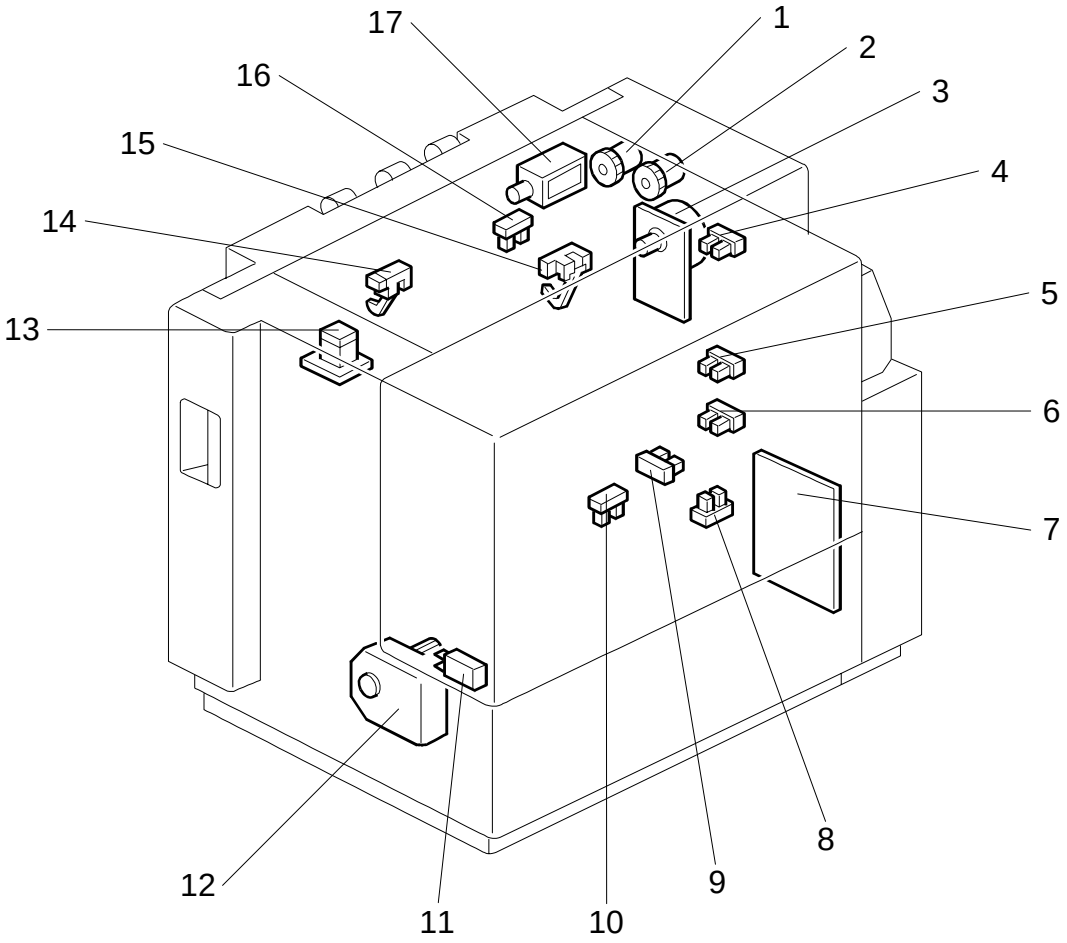
Paper Size:	A4 sideways/LT sideways
Paper Weight:	60 g/m^2 ~ 105 g/m^2, 16 lb ~ 28 lb
Tray Capacity:	1500 sheets (80 g/m^2, 20lb)
Remaining Paper Detection:	5 steps (100%, 75%, 50%, 25%, Near end)
Power Source:	24 Vdc, 5 Vdc (from copier)
Power Consumption:	40 W
Weight:	17 kg
Size (W x D x H):	390 mm x 500 mm x 390 mm

1.2 MECHANICAL COMPONENT LAYOUT



1. Relay Roller
2. Relay Sensor
3. Paper Feed Roller
4. Pick-up Roller
5. Paper End Sensor
6. Paper Tray
7. Separation Roller

1.3 ELECTRICAL COMPONENT LAYOUT

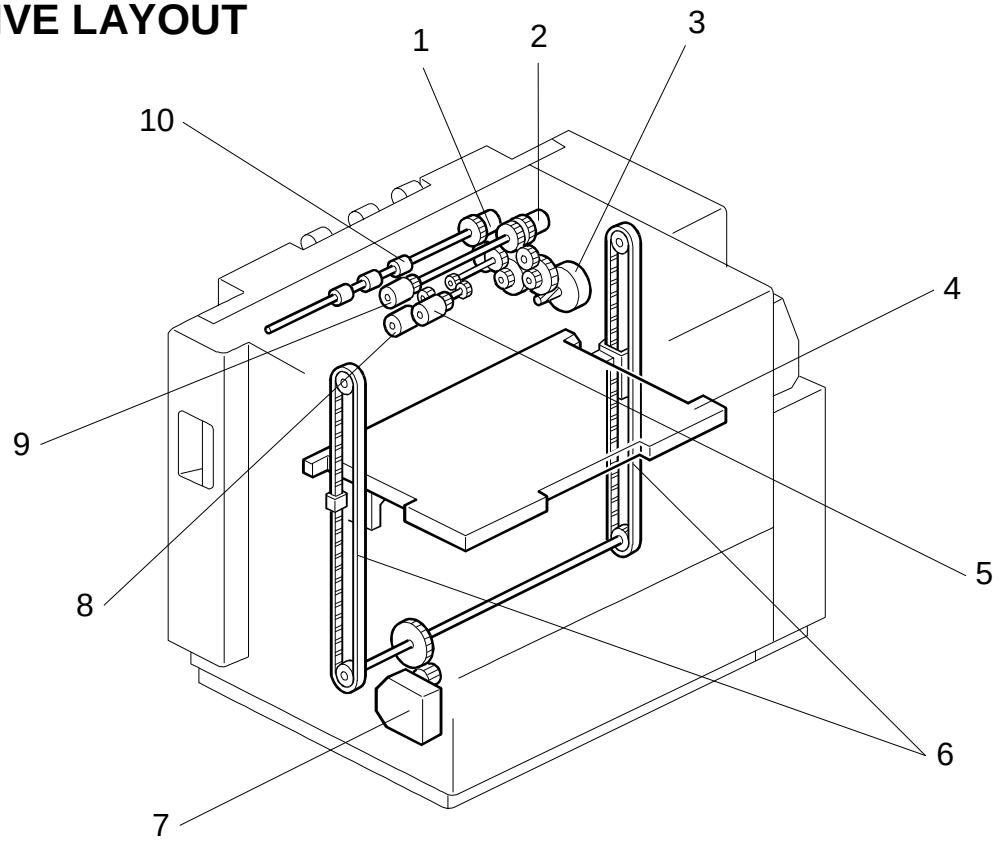


1. Relay Clutch
2. Paper Feed Clutch
3. LCT Motor
4. Paper Height 1 Sensor
5. Paper Height 2 Sensor
6. Paper Height 3 Sensor
7. Main Board
8. Side Fence Position Sensor
9. Lower Limit Sensor
10. LCT Set Sensor
11. Tray Cover Switch
12. Lift Motor
13. Down Switch
14. Relay Sensor
15. Paper End Sensor
16. Lift Sensor
17. Pick-up Solenoid

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	LCT	Drives all rollers.	3
M2	Lift	Drives the paper tray up or down.	12
Sensors			
S1	Paper End	Informs the copier when the paper has run out.	15
S2	Relay	Detects the copy paper coming to the relay roller and checks for misfeeds.	14
S3	Lift	Detects when the paper is at the correct paper feed height.	16
S4	Lower Limit	Detects when the tray is completely lowered, to stop the LCT motor.	9
S5	Paper Height 1	Detects the paper height.	4
S6	Paper Height 2	Detects the paper height.	5
S7	Paper Height 3	Detects the paper height.	6
S8	LCT Set	Detects whether the LCT is correctly set or not.	10
S9	Side Fence Position	Detects when the side fence is set at the A4 size position.	8
Switches			
SW1	Tray Cover	Stops the LCT lift motor when the tray cover is opened.	11
SW2	Down	Lowers the LCT bottom plate if pressed by the user.	13
Solenoids			
SOL1	Pick-up	Controls up-down movement of the pick-up roller.	17
Magnetic Clutches			
MC1	Paper Feed	Drives the paper feed roller.	2
MC2	Relay	Drives the relay roller.	1
PCBs			
PCB1	Main	Controls the LCT and communicates with the copier.	7

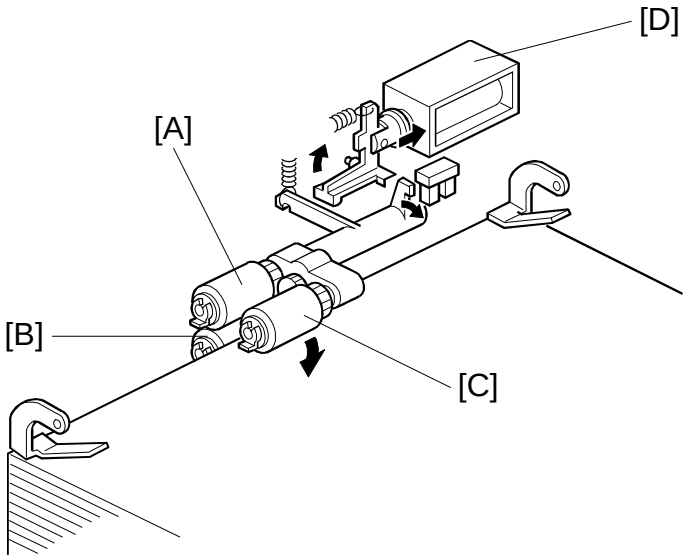
1.5 DRIVE LAYOUT



1. Relay Clutch
2. Paper Feed Clutch
3. LCT Motor
4. Tray Bottom Plate
5. Pick-up Roller
6. Tray Drive Belts
7. Lift Motor
8. Separation Roller
9. Paper Feed Roller
10. Relay Roller

2. DETAILED DESCRIPTIONS

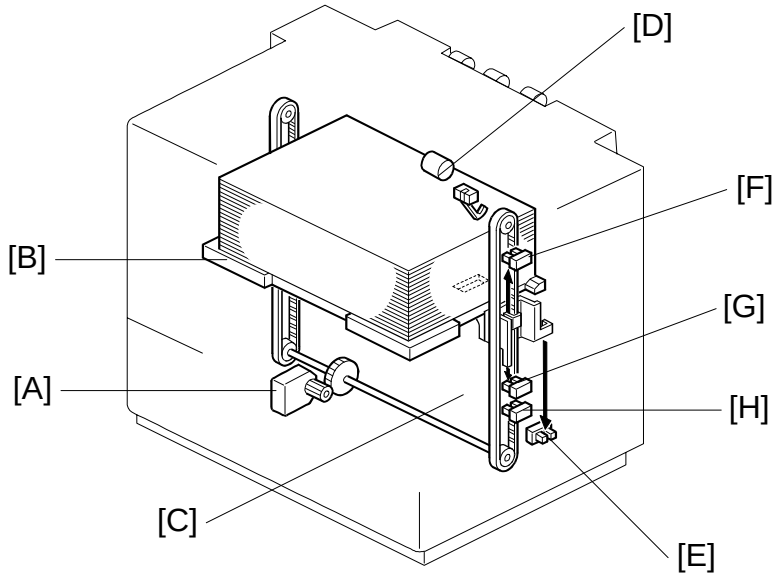
2.1 PAPER FEED MECHANISM



This machine uses the FRR (Feed and Reverse Roller) paper feed system (paper feed roller [A], separation roller [B], pick-up roller [C]).

When the start key is pressed, the pick-up solenoid [D] energizes and the pick-up roller touches the paper.

2.2 TRAY LIFT AND PAPER HEIGHT DETECTION MECHANISM



The lift motor [A] controls the vertical position of the tray bottom plate [B] through gears and timing belts [C].

Tray lifting conditions

When the tray lift sensor [D] turns off in the following conditions, the tray lift motor raises the tray bottom plate until the tray lift sensor [D] turns on again.

- Just after the main switch is turned on
- During copying
- Just after the tray cover is closed
- Just after leaving the energy saving mode

Tray lowering conditions

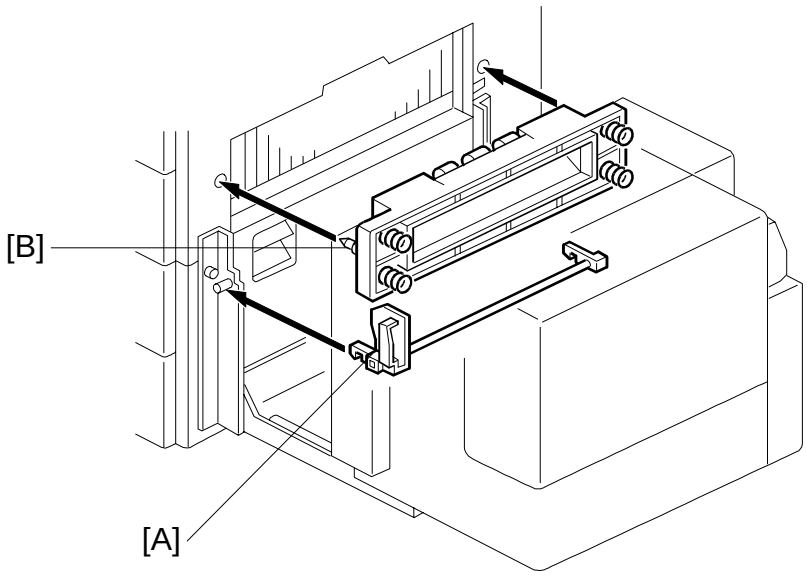
In the following conditions, the lift motor lowers the tray bottom plate until the lower limit [E] sensor turns on.

- Just after the paper end sensor turns on
- Just after the down switch is pressed by the user

The amount of the paper in the tray is detected by combination of high/low outputs from three sensors (paper height sensor 1 [F], 2 [G], and 3 [H].)

Amount of paper	Paper Height Sensor 1	Paper Height Sensor 2	Paper Height Sensor 3
Near end	On (High)	Off (Low)	Off (Low)
25%	Off (Low)	On (High)	Off (Low)
50%	Off (Low)	On (High)	On (High)
75%	Off (Low)	Off (Low)	On (High)
100%	Off (Low)	Off (Low)	Off (Low)

2.3 TRAY UNIT SLIDE MECHANISM



When there is a paper jam between the copier and the LCT, the user releases the lock lever [A] and can slide the LCT away from the copier to remove the jammed paper.

When sliding the LCT back into position, the LCT is secured against the copier in the correct position by the docking pins [B] on the LCT.

3. SERVICE TABLES

3.1 DIP SWITCHES

DPS101								Description
1	2	3	4	5	6	7	8	
1	0	0	0	0	0	0	0	Default
1	0	0	0	0	0	0	1	Free run

NOTE: 1) Do not use any other settings.
2) To do the free run, proceed as follows:
1. Remove the paper from the LCT (this is because the machine has no jam detection).
2. Set DPS101 for the free run as shown above.
3. Turn the main switch off, wait a few seconds, then switch back on.
4. Press SW101 to start the free run.
5. To stop the free run, press SW102.

3.2 TEST POINTS

No.	Label	Monitored Signal
TP100	(24 V)	+24 V
TP101	(GND)	Ground
TP103	(TXD)	TXD to the copier
TP104	(RXD)	RXD from the copier
TP105	(5 V)	+5 V
TP106	(GND)	Ground

3.3 SWITCHES

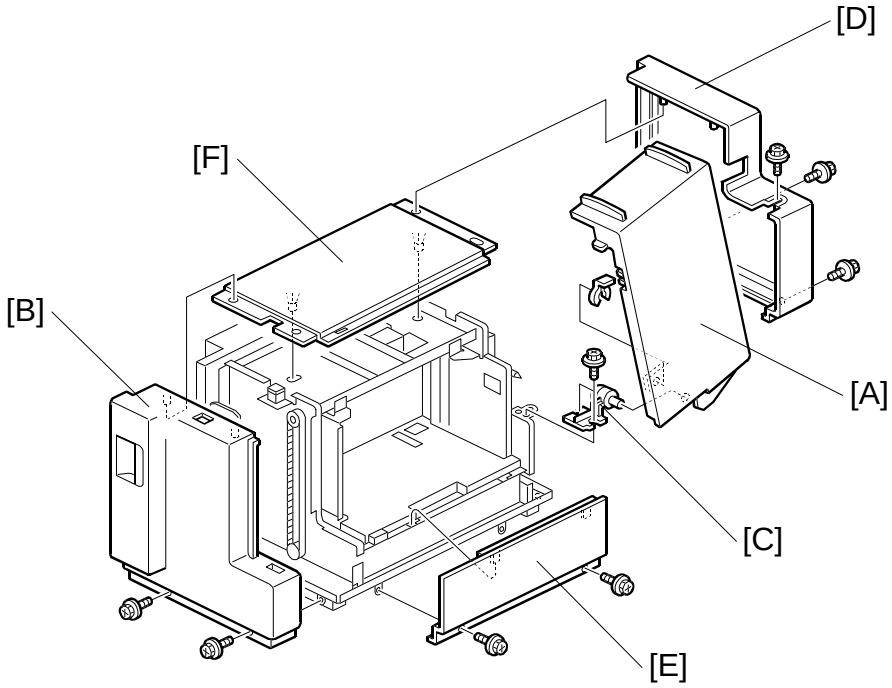
No.	Function
SW101	Starts the free run
SW102	Stops the free run

3.4 FUSES

No.	Function
FU101	Protects the 24 V line.

4. REPLACEMENT AND ADJUSTMENT

4.1 COVER REPLACEMENT



Tray Cover

1. Remove the tray cover [A] (1 snap ring).

Front Cover

1. Remove the front cover [B] (2 screws).

Rear Cover

1. Remove the tray cover.
2. Remove the cover hinge [C] (2 screws).
3. Remove the rear cover [D] (3 screws).

Right Lower Cover

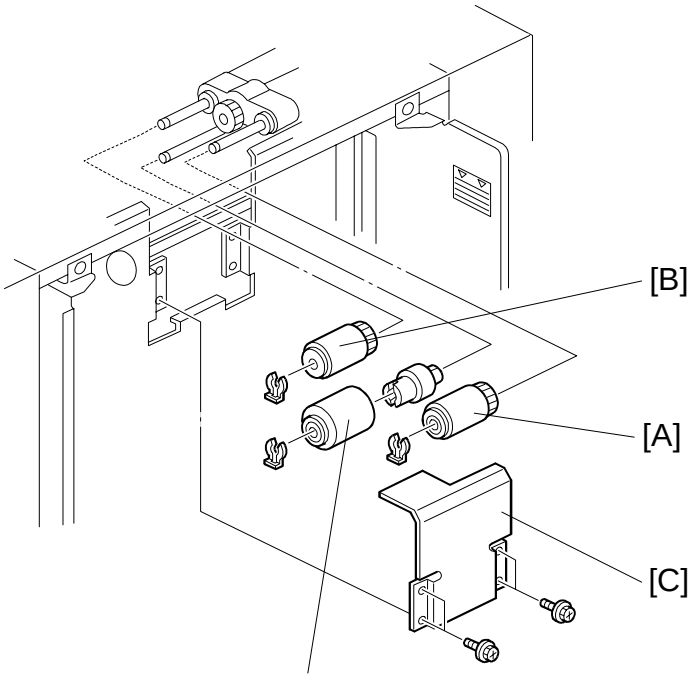
1. Remove the right lower cover [E] (2 screws).

Upper Cover

1. Remove the front cover.
2. Remove the rear cover.
3. Remove the upper cover [F].

4.2 ROLLER REPLACEMENT

4.2.1 PAPER FEED, SEPARATION, AND PICK-UP ROLLERS



[D]

1. Push the down switch to lower the tray bottom plate until it reaches its lowest position.
2. Open the tray cover.

Pick-up Roller

3. Replace the pick-up roller [A] (1 snap ring).

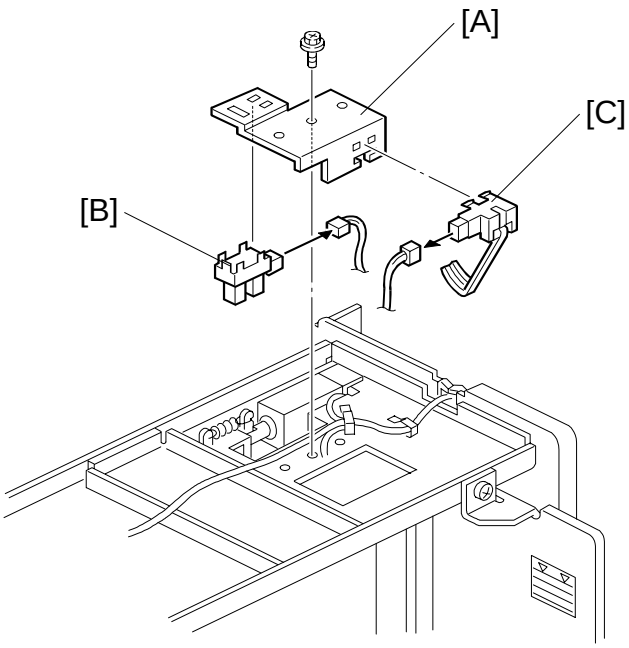
Paper Feed Roller

3. Replace the paper feed roller [B] (1 snap ring).

Separation Roller

3. Remove the guide plate [C] (2 screws).
4. Replace the separation roller [D] (1 snap ring).

4.3 TRAY LIFT AND PAPER END SENSOR REPLACEMENT



1. Remove the front and rear cover.
2. Remove the upper cover.
3. Remove the sensor bracket [A] (1 screw).

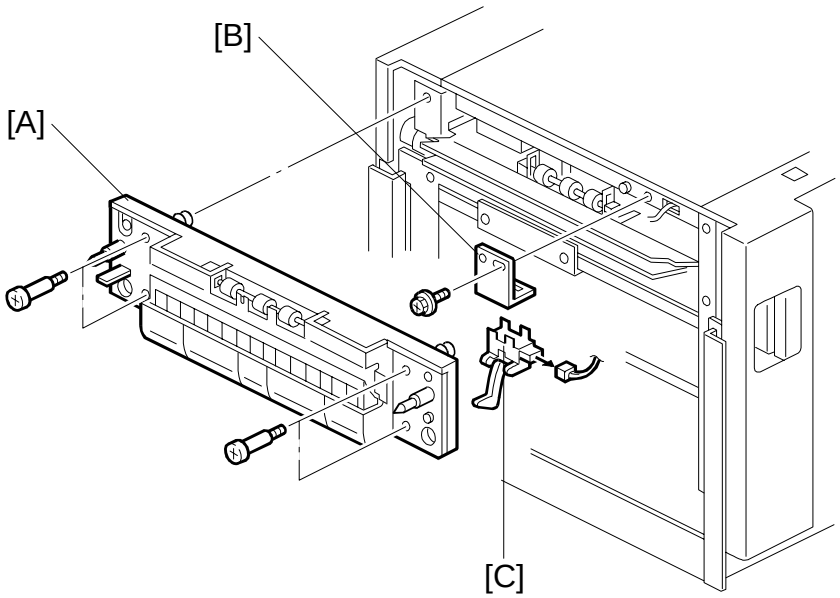
Tray Lift Sensor

3. Replace the tray lift sensor [B] (1 connector).

Paper End Sensor

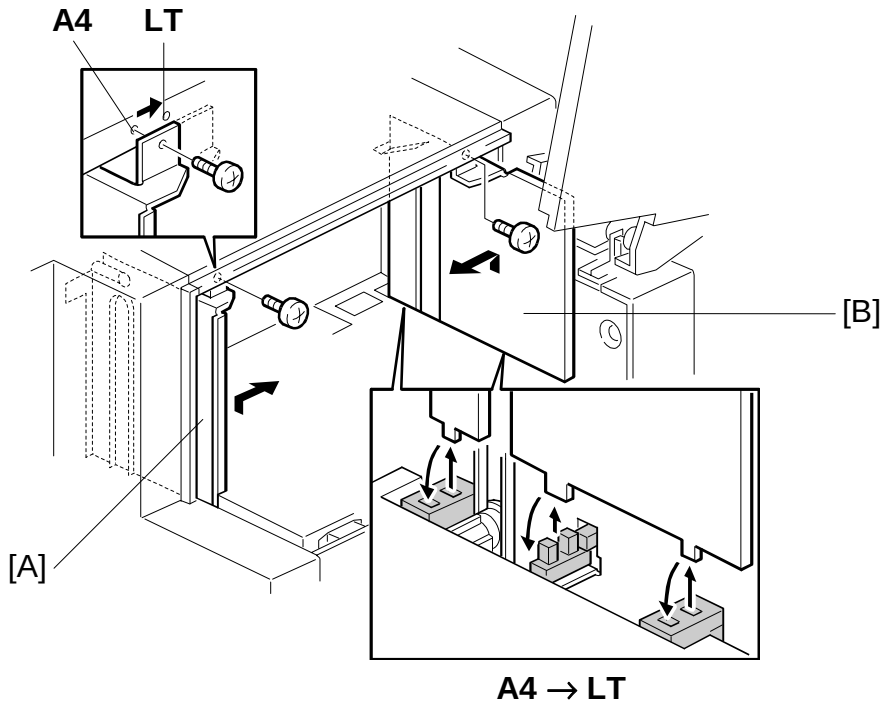
3. Replace the paper end sensor [C] (1 connector).

4.4 RELAY SENSOR REPLACEMENT



1. Pull out the LCT.
2. Remove the joint guide [A] (4 screws).
3. Remove the sensor bracket [B] (1 screw).
4. Replace the relay sensor [C] (1 connector).

4.5 SIDE FENCE POSITION CHANGE



1. Push the down switch to lower the tray bottom plate until it reaches its lowest position.
2. Remove the tray cover.
3. Remove the front and rear side fences [A, B] (1 screw each).
4. Install the side fences in the correct position.

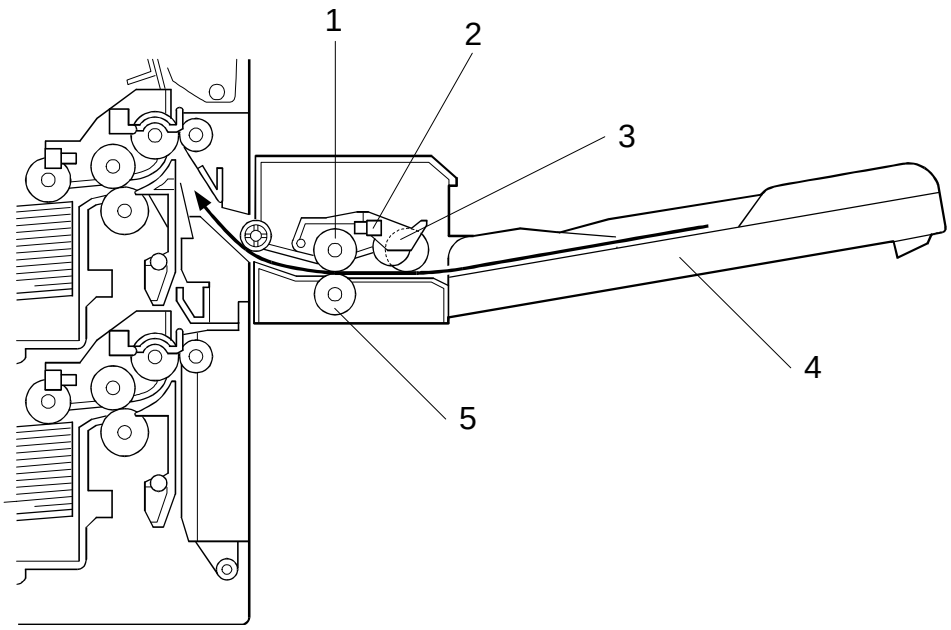
BY-PASS A689

1 OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

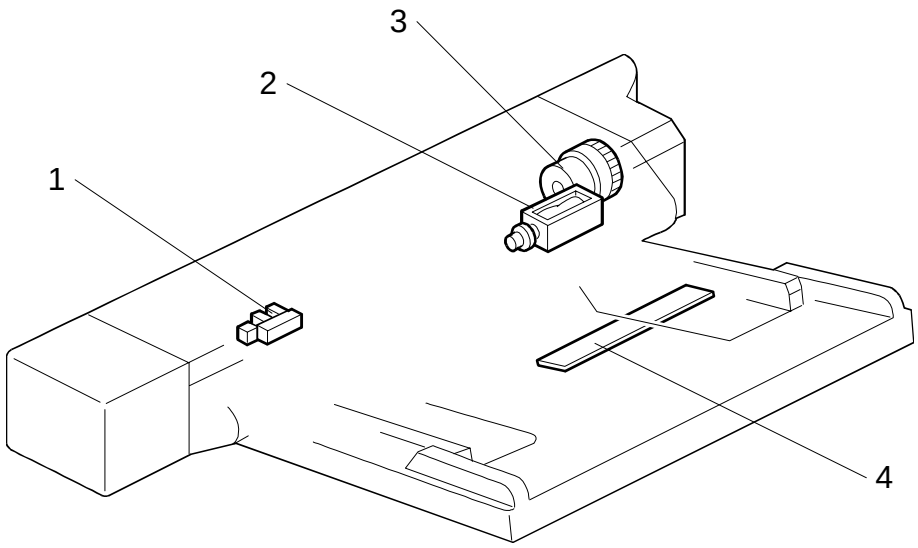
Paper Size:	Standard sizes A6 lengthwise to A3 HLT lengthwise to DLT Non-standard sizes Width: 100 to 305 mm Length: 148 to 432 mm
Paper Weight:	52 g/m^2 ~ 157 g/m^2, 16 lb ~ 42 lb
Tray Capacity:	50 sheets (80 g/m^2, 20 lb)
Paper Feed System:	FRR (Feed and Reverse Roller)

1.2 MECHANICAL COMPONENT LAYOUT



1. Paper Feed Roller
2. Paper End Sensor
3. Pick-up Roller
4. By-pass Tray
5. Separation Roller

1.3 ELECTRICAL COMPONENT LAYOUT



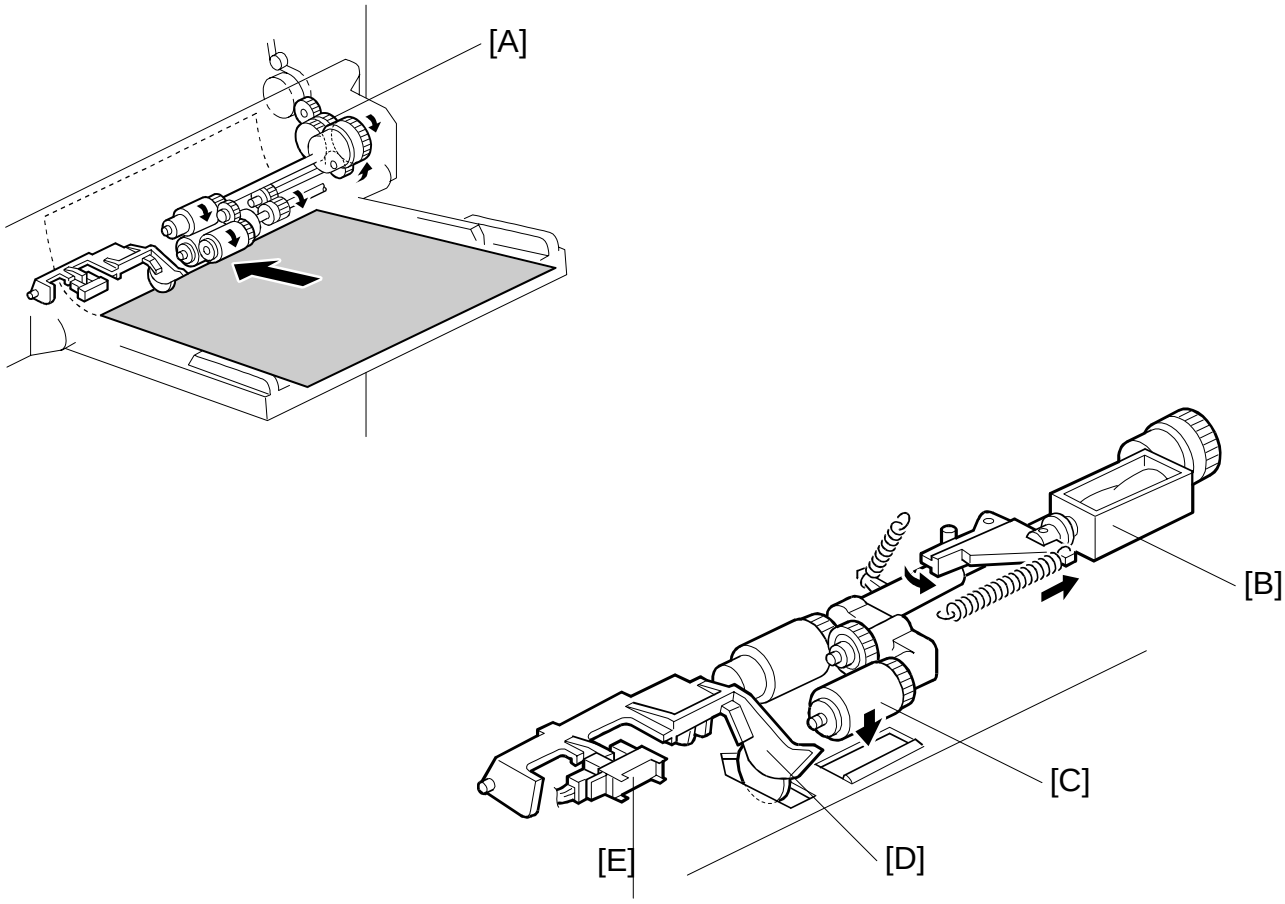
1. Paper End Sensor
2. Pick-up Solenoid
3. Paper Feed Clutch
4. Paper Size Sensor Board

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Sensors			
S1	Paper End	Informs the copier when the by-pass tray runs out of paper.	1
S2	Paper Size Sensor Board	Detects the paper width.	4
Solenoids			
SOL1	Pick-up	Moves the pick-up roller to contact the paper.	2
Magnetic Clutches			
MC1	Paper Feed	Starts paper feed from the by-pass tray.	3

2 DETAILED DESCRIPTIONS

2.1 BASIC OPERATION

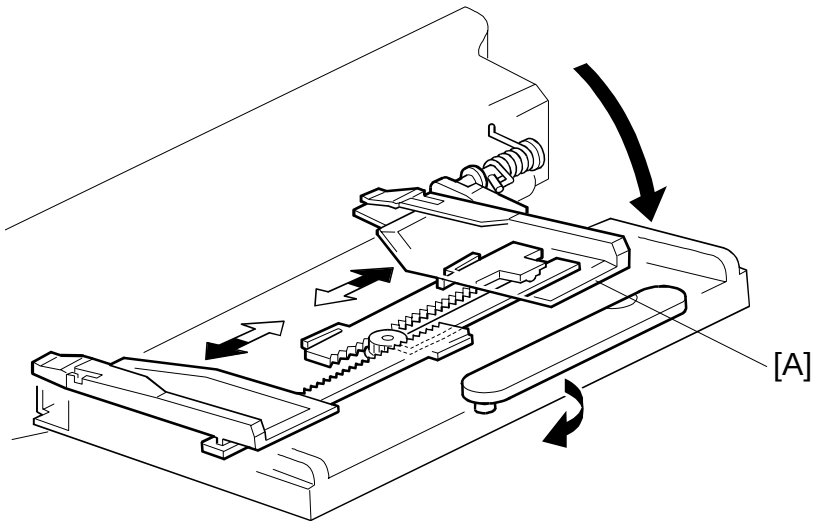


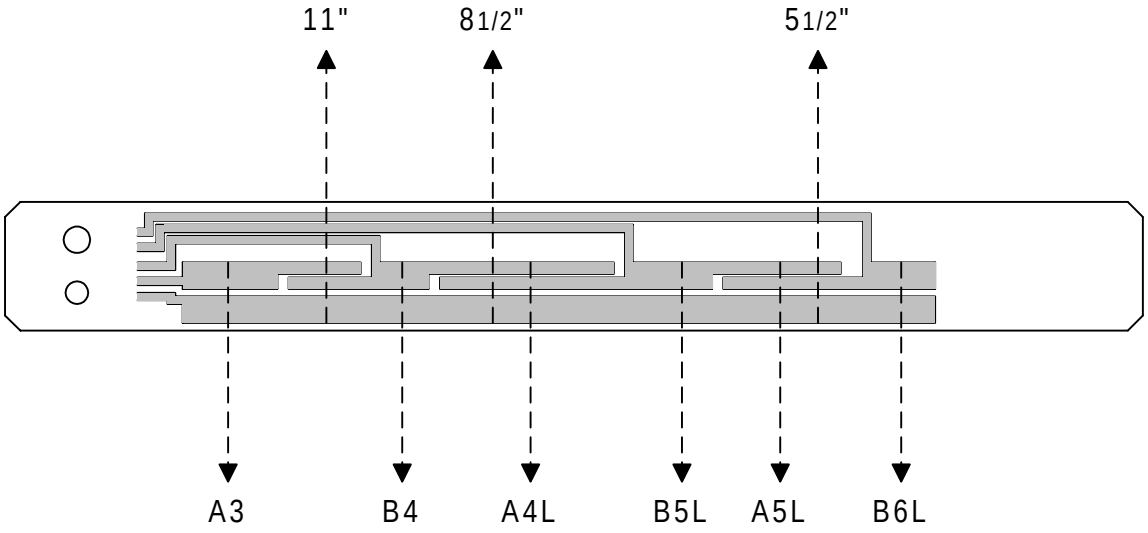
This unit is directly driven by the copier through gear [A].

When the print key is pressed, the pick-up solenoid [B] turns on and the pick-up roller [C] moves onto the paper.

When the by-pass tray runs out of paper, the paper end feeler [D] drops into the cutout in the by-pass tray and the paper end sensor [E] is activated.

2.2 PAPER SIZE DETECTION

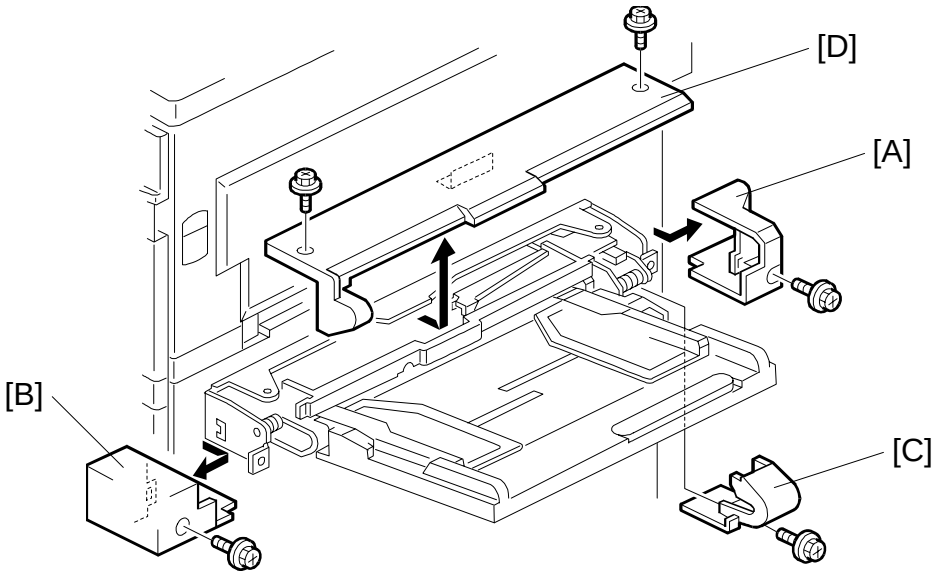




The paper size sensor board [A] monitors the paper width. The rear side fence is connected to the terminal plate. The pattern for each paper width is unique. Therefore, the copier determines which paper has been placed in the by-pass tray by the signal output from the board. However, the copier will not determine the paper length from the bypass tray hardware.

3 REPLACEMENT AND ADJUSTMENT

3.1 COVER REPLACEMENT



Rear Cover

1. Remove the rear cover [A] (1 screw).

Front Cover

1. Remove the front cover [B] (1 screw).

Hinge Cover

1. Remove the hinge cover [C] (1 screw).

Upper Cover

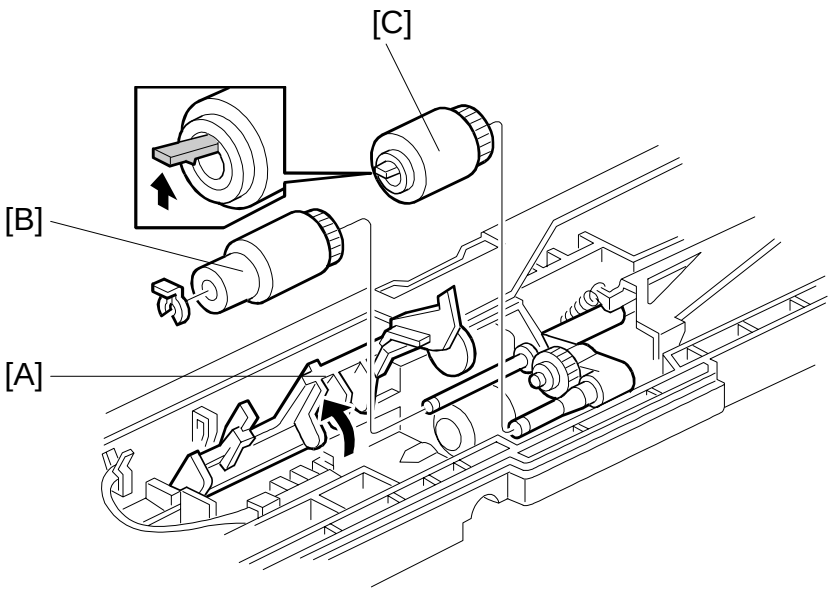
- No duplex unit -

1. Remove the upper cover [D] (2 screws).

- With duplex unit -

1. Remove the hinge cover.
2. Open the duplex unit.
3. Remove two screws for the upper cover.
4. Close the duplex unit and pull out the upper cover.

3.2 PAPER FEED AND PICK-UP ROLLER REPLACEMENT



1. Remove the upper cover.
2. Lift up the paper end feeler [A].
   NOTE: When lifted, the paper end feeler locks into position. Therefore, make sure to move it back to its original position before reinstalling the upper cover.

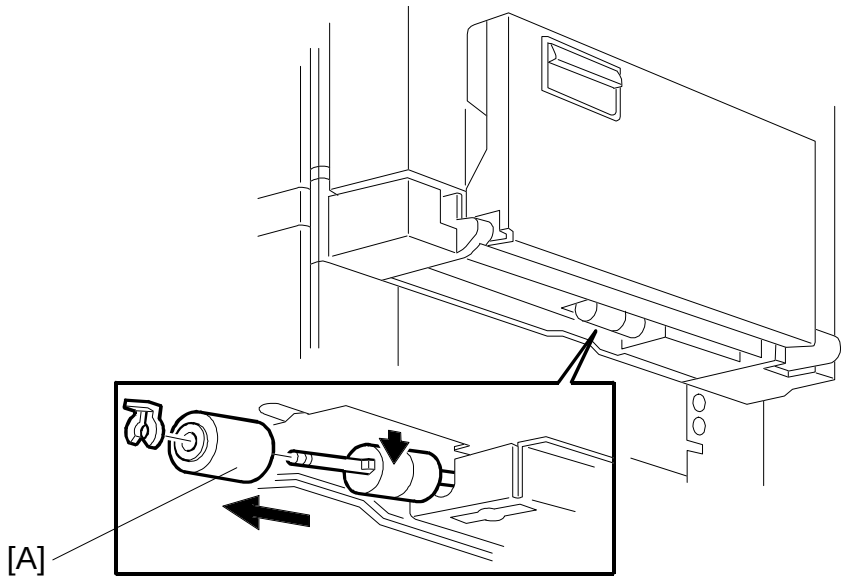
Paper Feed Roller

3. Replace the paper feed roller [B] (1 snap ring).

Pick-up Roller

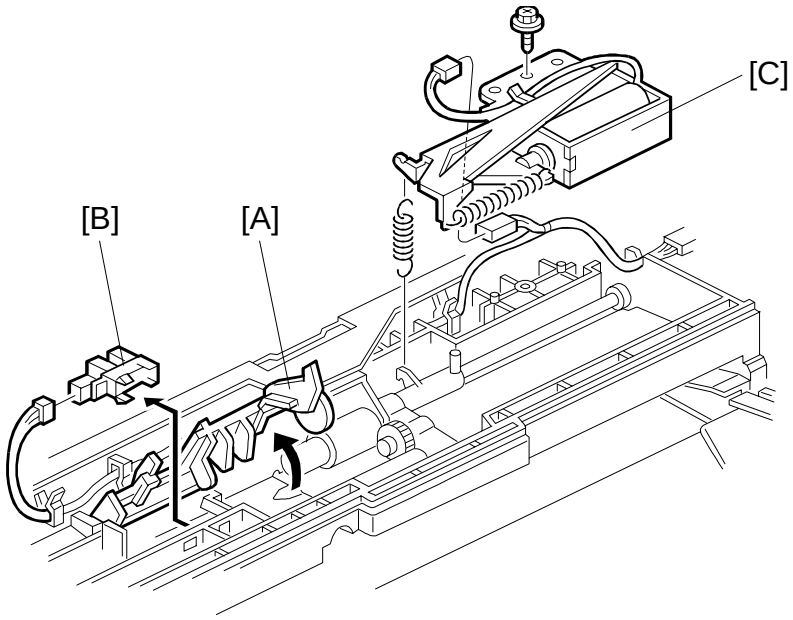
3. Replace the pick-up roller [C].

3.3 SEPARATION ROLLER REPLACEMENT



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

3.4 PAPER END SENSOR AND PICK-UP SOLENOID REPLACEMENT



1. Remove the upper cover.

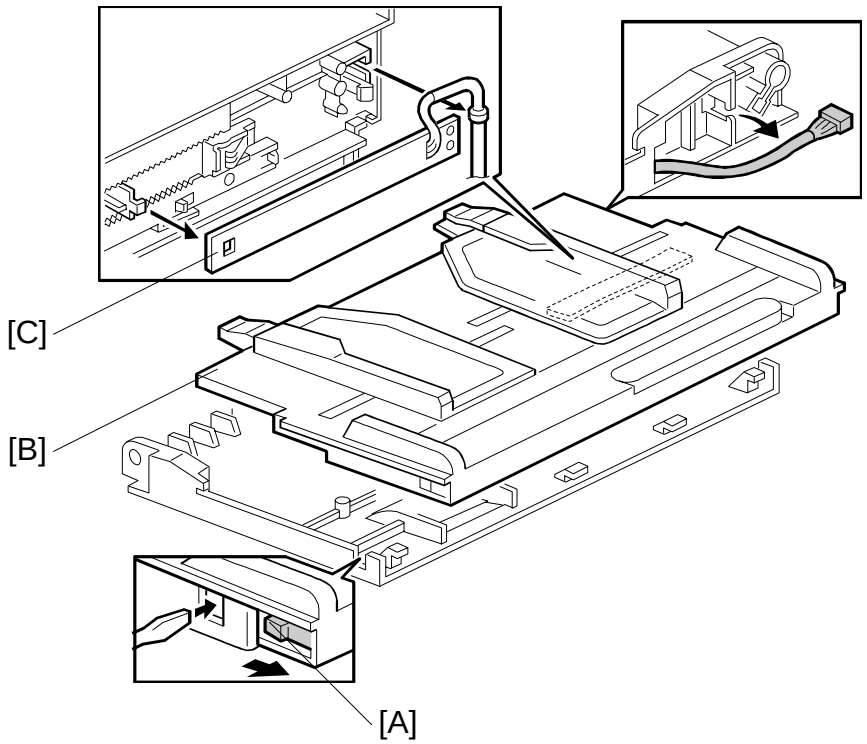
Paper End Sensor

2. Lift up the paper end feeler [A].
   NOTE: When lifted, the paper end feeler locks into position. Therefore, make sure to move it back to its original position before reinstalling the upper cover.
3. Replace the paper end sensor [B] (1 connector).

Pick-up Solenoid

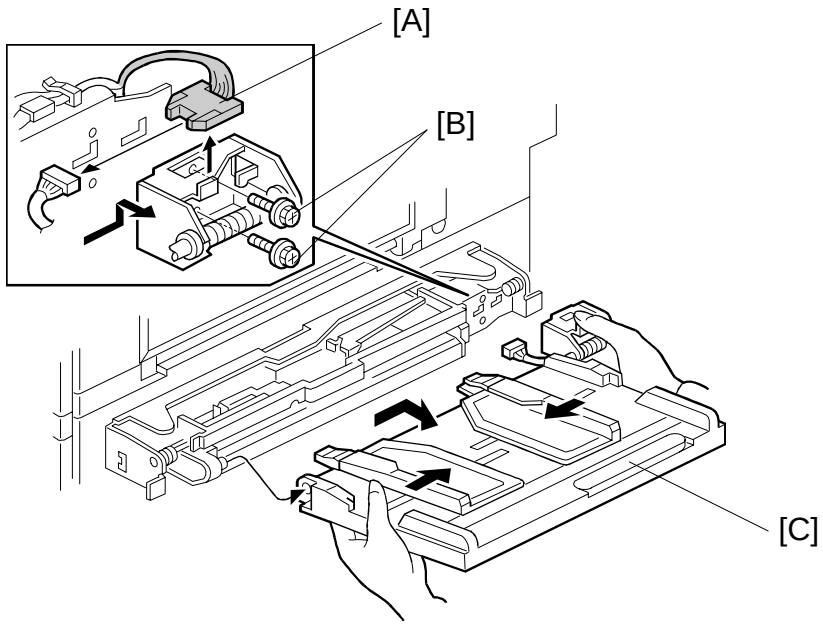
2. Remove the pick-up solenoid [C] (1 screw, 1 spring, 1 connector).

3.5 PAPER SIZE SENSOR BOARD REPLACEMENT



1. Release the hook [A] and remove the paper tray [B] (1 connector).
2. Replace the paper size sensor board [C].
   NOTE: When removing the paper size sensor board, be careful not to break its hook.

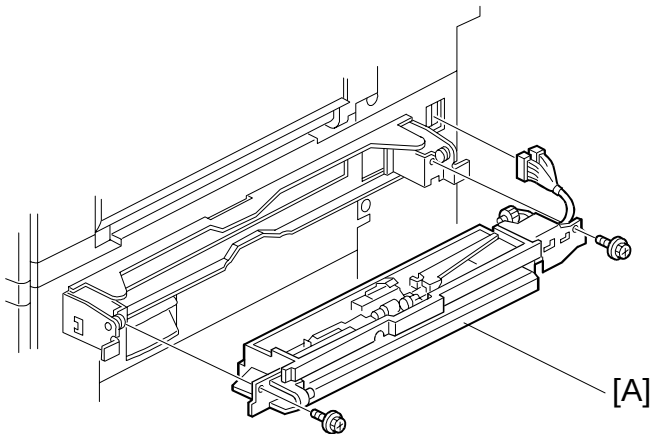
3.6 BY-PASS TABLE REMOVAL

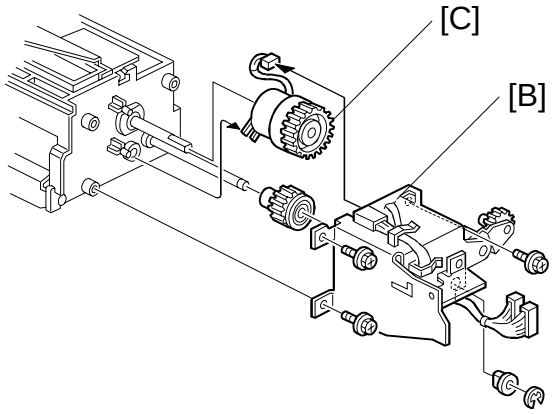


1. Remove the hinge cover.
2. Disconnect the connector [A].
3. Remove the two screws [B]
4. Hold the spring bracket and remove the by-pass table [C].

CAUTION: Pressure is applied to the spring bracket, so when removing the by-pass tray, hold the spring bracket by the right hand as shown.

3.7 PAPER FEED CLUTCH REPLACEMENT





1. Remove the by-pass tray.
2. Remove the paper feed unit [A] (2 screws, 1 connector).
3. Remove the rear bracket [B] (3 screws, 1 clip, 1 bushing).
4. Replace the paper feed clutch [C] (1 connector)

`

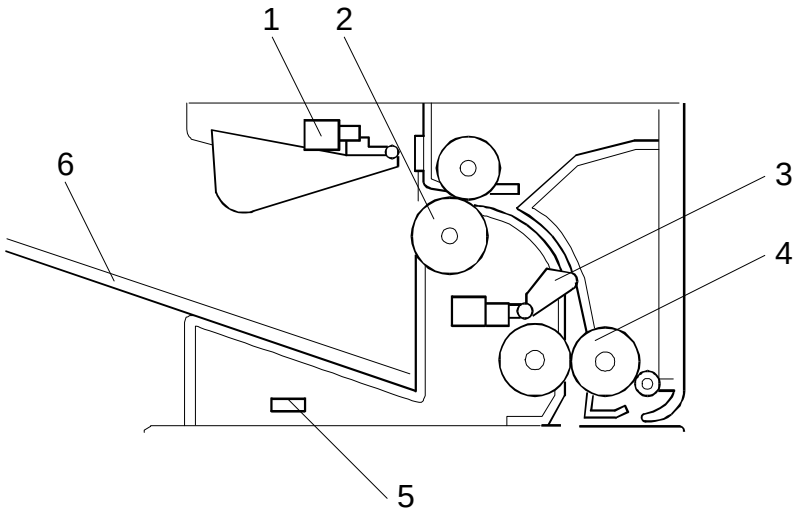
1-BIN TRAY A684

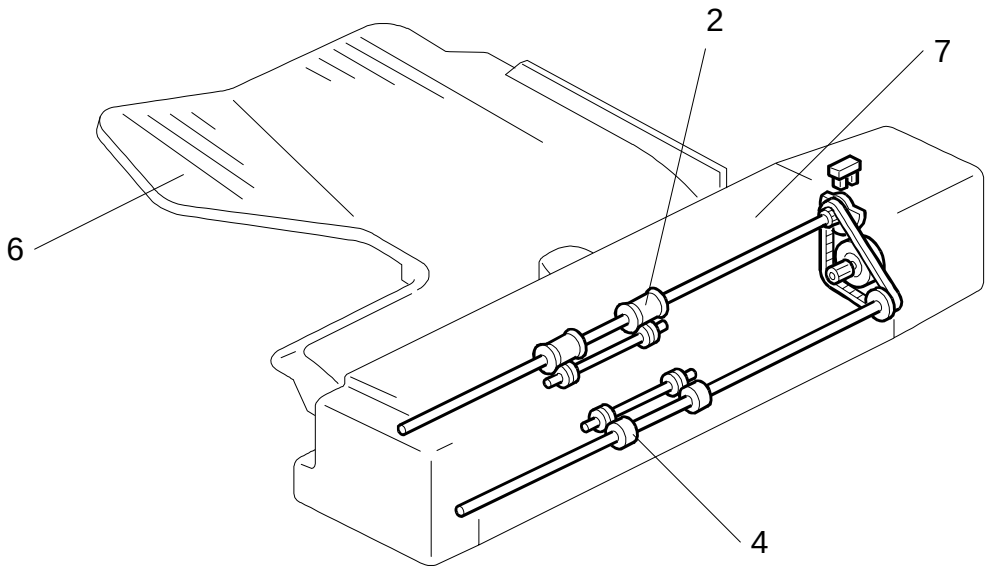
1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Paper Size:	A5 lengthwise to A3 HLT to DLT
Paper Weight:	60 g/m^2 ~ 105 g/m^2, 16 lb ~ 28 lb
Tray Capacity:	125 sheets (80 g/m^2, 20 lb)
Power Source:	5 Vdc, 24 Vdc (from copier)
Power Consumption:	15 W
Weight:	4 kg
Size (W x D x H):	470 mm x 550 mm x 110 mm

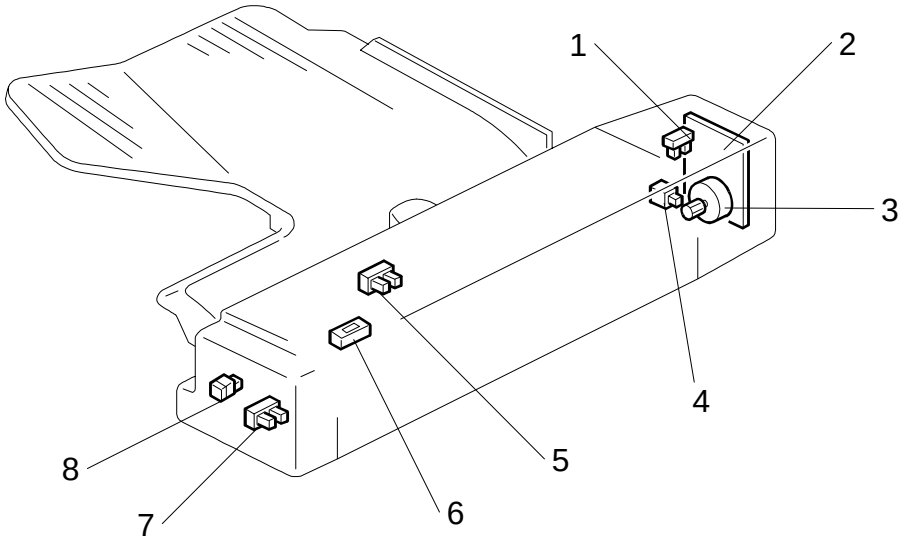
1.2 MECHANICAL COMPONENT AND DRIVE LAYOUT





1. Paper Limit Sensor
2. Exit Roller
3. Entrance Sensor
4. Entrance Roller
5. Paper Sensor
6. Paper Tray
7. Tray Motor

1.3 ELECTRICAL COMPONENT LAYOUT



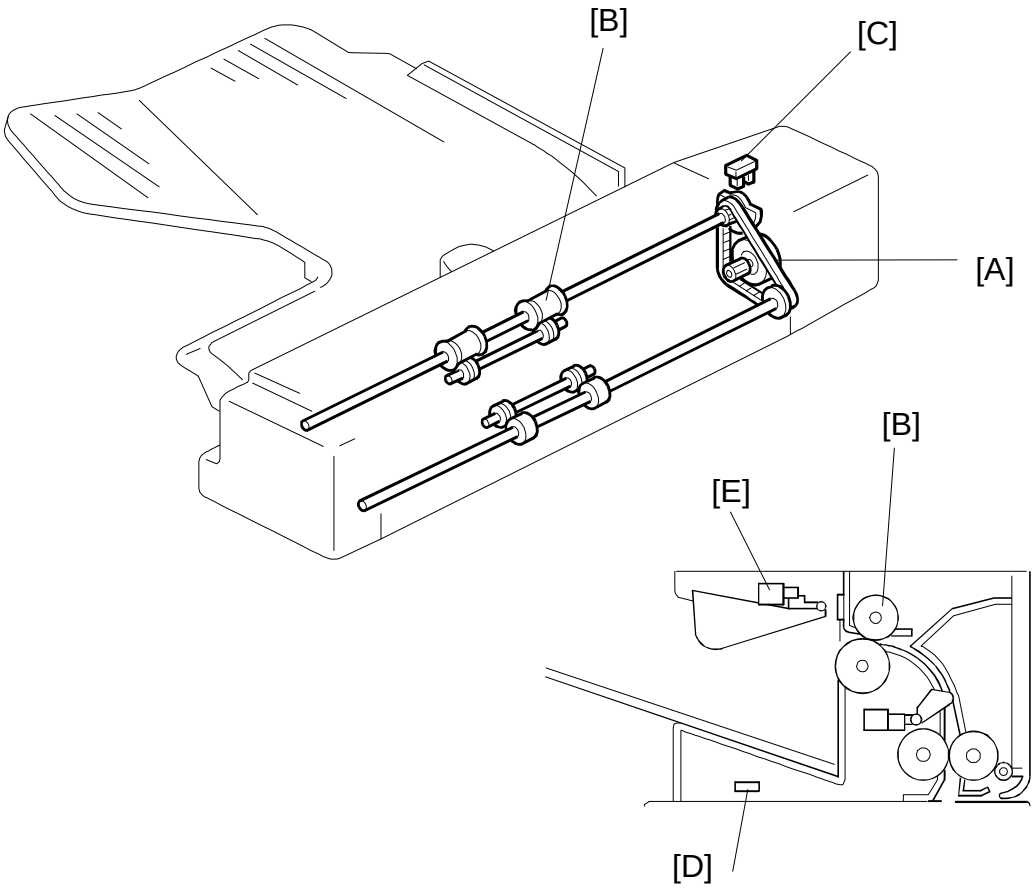
1. Motor Lock Sensor
2. Main Board
3. Tray Motor
4. Right Cover Switch
5. Paper Limit Sensor
6. Paper Sensor
7. Entrance Sensor
8. Paper Indicator

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Tray	Drives the entrance and exit rollers.	3
Sensors			
S1	Entrance	Checks for misfeeds.	7
S2	Paper Limit	Detects the paper stack limit in the tray.	5
S3	Paper	Detects whether there is paper in the tray.	6
S4	Motor Lock	Detects whether the tray motor is turning.	1
Switches			
SW1	Right Cover	Detects whether the right cover is opened.	4
PCBs			
PCB1	Main	Controls the 1-bin tray and communicates with the copier.	2
LEDs			
LED1	Paper Indicator	Indicates when there is paper in the tray.	8

2. DETAILED DESCRIPTIONS

2.1 BASIC OPERATION



When the leading edge of the first sheet of copy paper reaches the copier's hot roller, the tray motor [A] starts and turns off approximately 0.5 s after the trailing edge of the paper passes through the exit rollers [B].

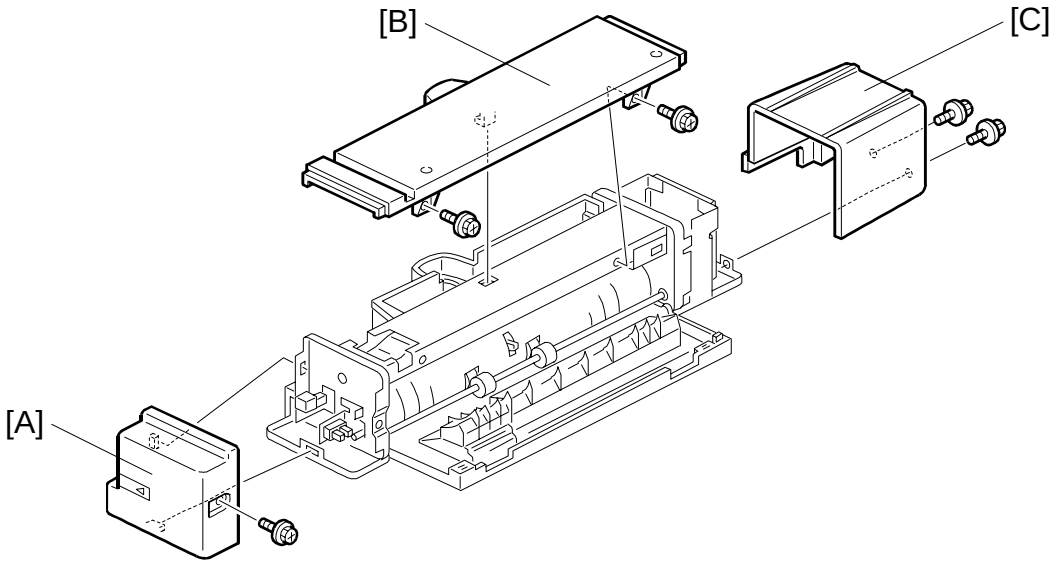
The tray lock sensor [C] checks whether the tray motor rotates or not. When the tray lock sensor does not generate pulses for 300 ms while the tray motor is on, the copier will stop and display an SC code.

The paper sensor [D] checks whether there is paper in the tray or not. The paper sensor turns on when paper is stacked in the tray, and the paper indicator is turned on.

The paper limit sensor [E] detects when the tray is full. While a sheet of copy paper is passing this sensor, the sensor feeler is always pushed up by the paper. When the paper limit sensor stays on for more than the expected time (based on the copy speed and paper size), the copier indicates that the tray is full.

3. REPLACEMENT AND ADJUSTMENT

3.1 COVER REMOVAL



Front Cover

1. Remove the scanner unit if it is at the front.
2. Remove the front cover [A] (1 screw).

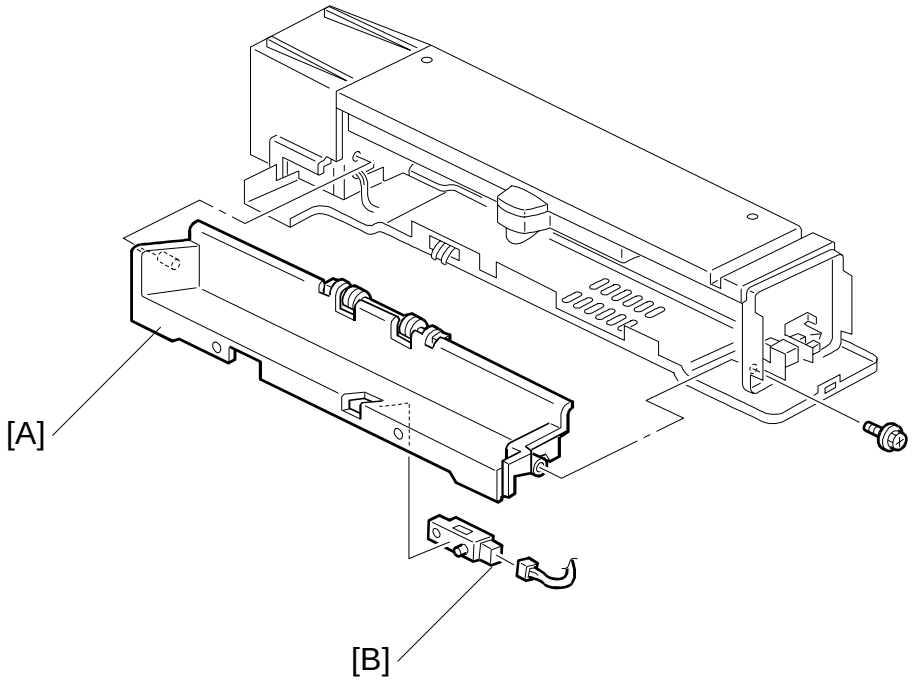
Upper Cover

1. Remove the scanner unit.
2. Remove the upper cover [B] (2 screws).

Rear Cover

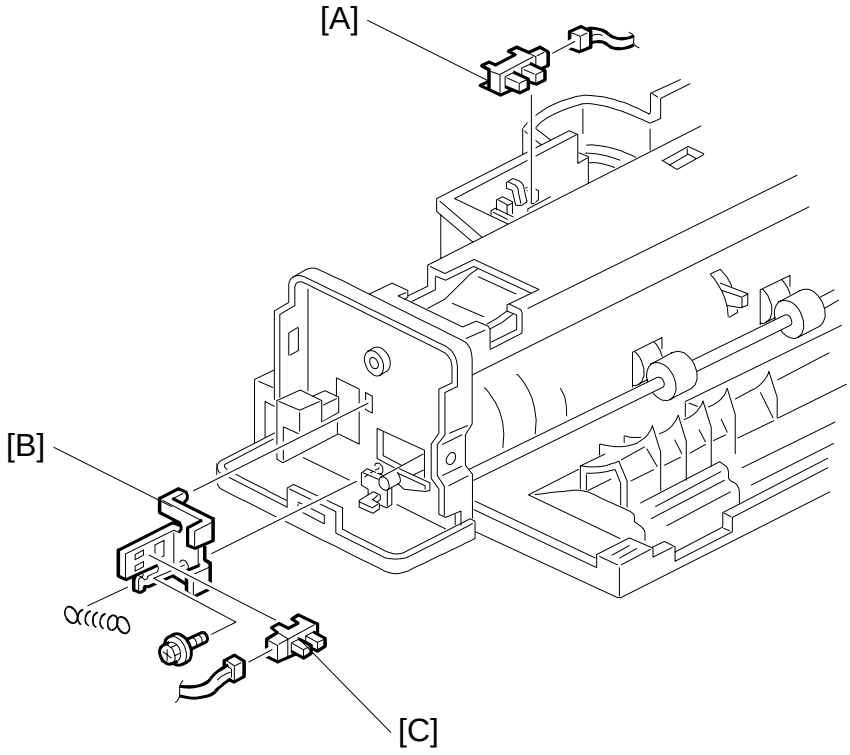
1. Remove the scanner unit.
2. Remove the rear cover [C] (2 screws).

3.2 PAPER SENSOR REPLACEMENT



1. Remove the front cover.
2. Remove the exit guide plate [A] (1 screw).
3. Replace the paper sensor [B] (1 connector).

3.3 ENTRANCE AND PAPER LIMIT SENSOR REPLACEMENT



1. Remove the front and upper covers.

Paper Limit Sensor

2. Replace the paper limit sensor [A] (1 connector).

Entrance Sensor

2. Remove the sensor bracket [B] (1 screw, 1 spring).
3. Replace the entrance sensor [C] (1 connector).

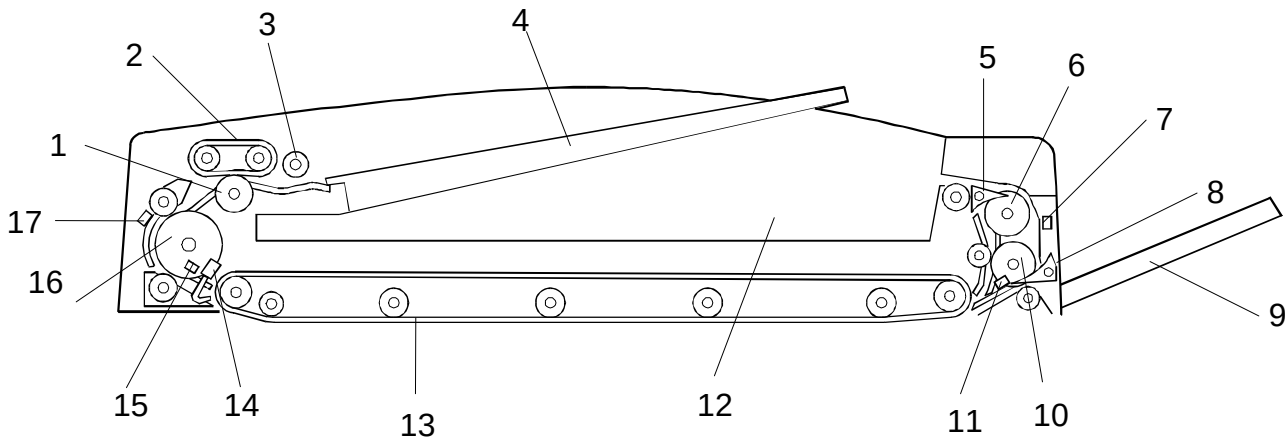
AUTO DOCUMENT FEEDER A680

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

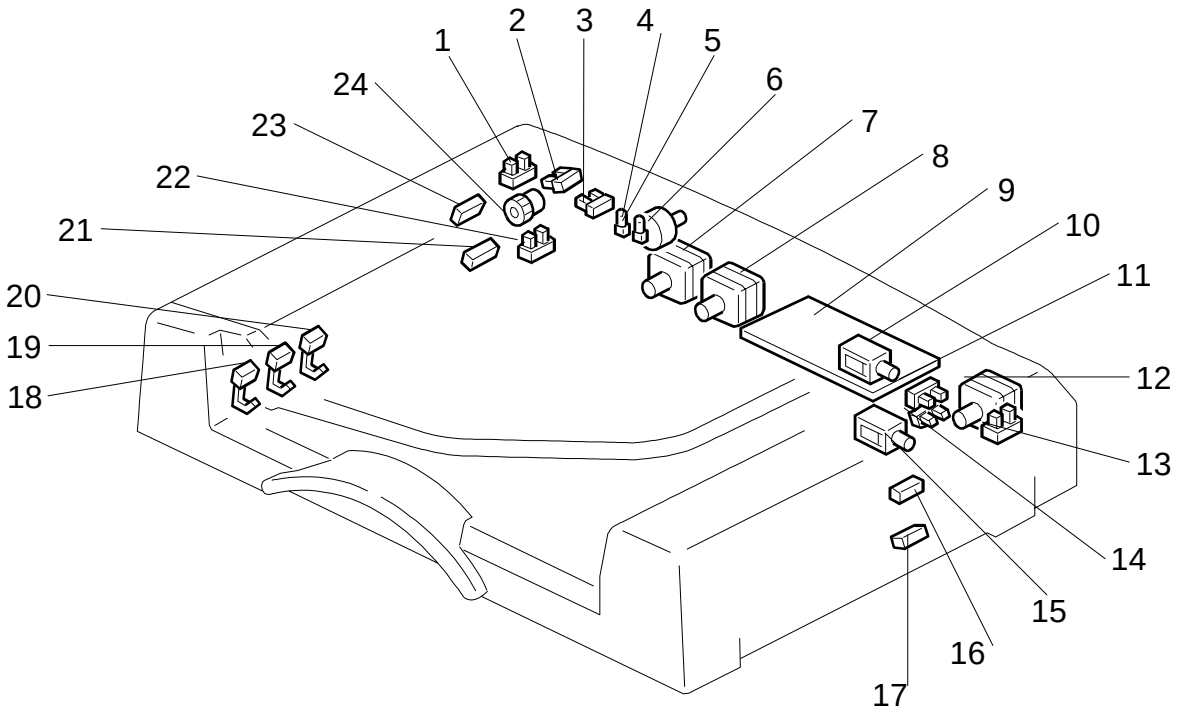
Original Size:	Normal Original Mode: A3 to B6, DLT to HLT Thin Original Mode: A3 to B6 sideways, DLT to HLT Duplex Original Mode: A3 to B5, DLT to HLT
Original Weight:	Normal Original Mode: 52 ~ 128 g/m^2, 14 ~ 34 lb Special Original Mode: 40 ~ 128 g/m^2, 11 ~ 34 lb Duplex Original Mode: 52 ~ 105 g/m^2, 14 ~ 28 lb
Table Capacity:	50 sheets (80 g/m^2, 20 lb)
Original Standard Position:	Rear left corner
Separation:	FRR (Feed and Reverse Roller)
Original Transport:	One flat belt
Original Feed Order:	From the top original
Power Source:	DC 24V from the copier
Power Consumption:	50 W
Dimensions (W x D x H):	600 x 580 x 150 mm
Weight:	12 kg

1.2 MECHANICAL COMPONENT LAYOUT



1. Separation Roller
2. Feed Belt
3. Pick-up Roller
4. Original Tray
5. Original Inverter Gate
6. Original Inverter Roller
7. Inverter Sensor
8. Original Exit Gate
9. Right Exit Tray
10. Original Exit Roller
11. Original Exit Sensor
12. Upper Exit Tray
13. Original Transport Belt
14. Original Width Sensor
15. Registration Sensor
16. Original Transport Roller
17. Entrance Sensor

1.3 ELECTRICAL COMPONENT LAYOUT



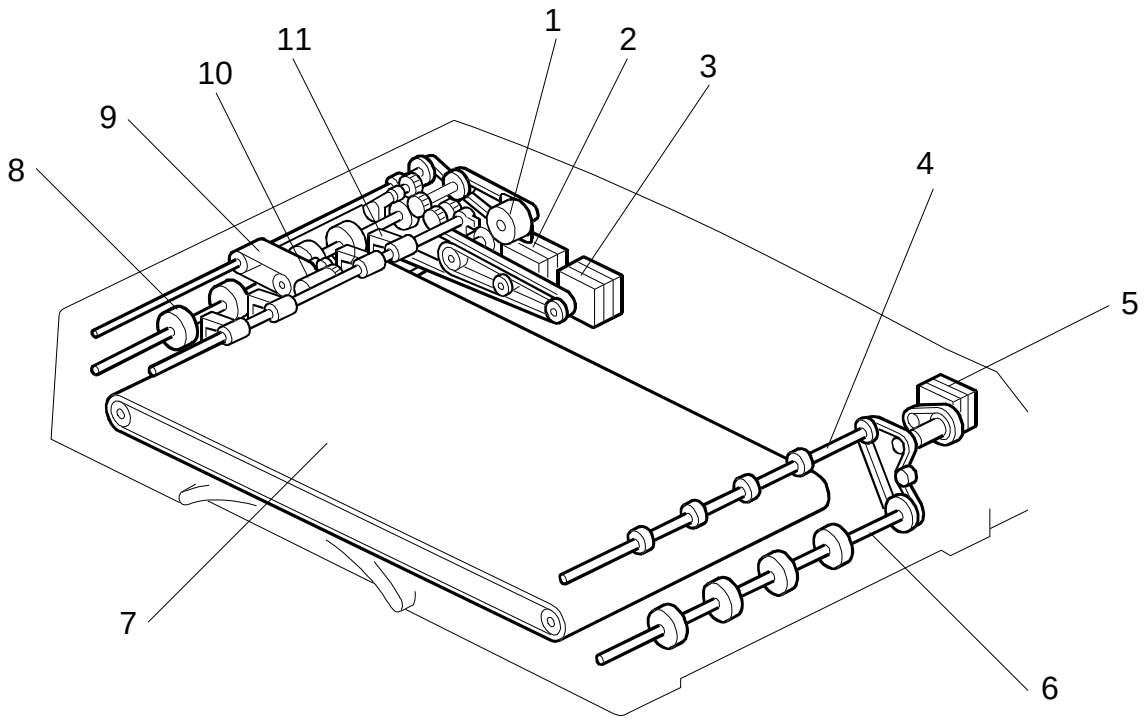
1. Feed Cover Sensor
2. Pick-up Roller HP Sensor
3. Original Stopper HP Sensor
4. Ready Indicator
5. SADF Indicator
6. Pick-up Motor
7. Feed-in Motor
8. Transport Belt Motor
9. DF Main Board
10. Inverter Gate Solenoid
11. DF Position Sensor
12. Feed-out Motor
13. Exit Cover Sensor
14. APS Start Sensor
15. Exit Gate Solenoid
16. Inverter Sensor
17. Exit Sensor
18. Original Width 3 Sensor
19. Original Width 2 Sensor
20. Original Width 1 Sensor
21. Registration Sensor
22. Original Set Sensor
23. Entrance Sensor
24. Transport Roller Clutch

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Pick-up	Moves the original stopper and pick-up roller up and down.	6
M2	Feed-in	Drives the feed belt, and the separation, pick-up, and transport rollers.	7
M3	Transport Belt	Drives the transport belt.	8
M4	Feed-out	Drives the exit roller.	12
Sensors			
S1	APS Start	Informs the CPU when the DF is opened and closed (for platen mode) so that the original size sensors in the copier can check the original size.	14
S2	DF Position	Detects whether the DF is lifted or not.	11
S3	Original Set	Detects if an original is on the tray.	22
S4	Original Stopper HP	Detects whether the original stopper is closed or not and detects when to change the original feed start motor direction.	3
S5	Pick-up Roller HP	Detects whether the pick-up roller is in the upper position or not.	2
S6	Entrance	Detects when to restart the feed start motor to lift up the pick-up roller, detects when to change the feed motor direction, detects the trailing edge of the original to finish checking the original length, and checks for misfeeds.	23
S7	Registration	Detects the leading edge of the original to check the original length, detects when to stop the original on the exposure glass, and checks for misfeeds.	21
S8	Original Width 1	Detects the original width.	20
S9	Original Width 2	Detects the original width.	19
S10	Original Width 3	Detects the original width.	18
S11	Exit	Detects when to stop the transport belt motor and checks for misfeeds.	17
S12	Inverter	Detects when to turn the inverter gate and exit gate solenoids off and checks for misfeeds.	16
S13	Feed Cover	Detects whether the feed cover is opened or not.	1
S14	Exit Cover	Detects whether the exit cover is opened or not.	13
Solenoids			
SOL1	Exit Gate	Opens and closes the exit gate.	15
SOL2	Inverter Gate	Opens and closes the inverter gate.	10

Symbol	Name	Function	Index No.
Clutches			
MC1	Transport Roller	Transfers drive to the transport roller.	24
PCBs			
PCB1	Main	Controls the DF and communicates with the copier.	9
LEDs			
LED1	Ready	Turns off when an original is inserted.	4
LED2	SADF	Turns on when the ADF is changed to SADF mode.	5

1.5 DRIVE LAYOUT

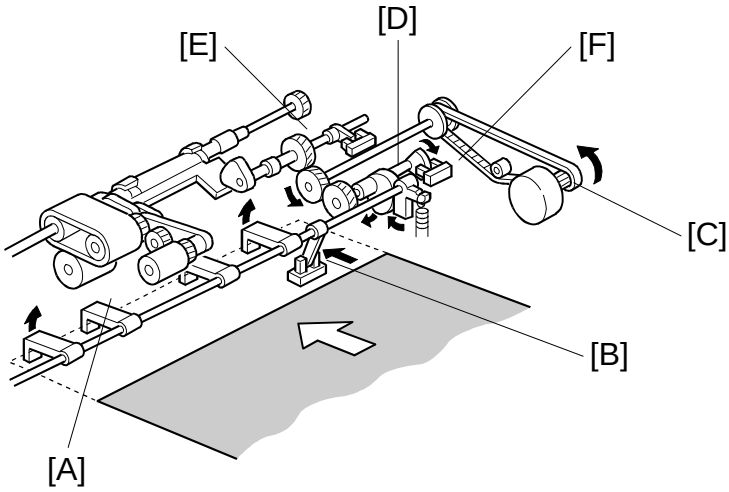


1. Pick-up Motor
2. Feed-in Motor
3. Transport Belt Motor
4. Upper Exit Roller
5. Feed-out Motor
6. Exit Roller
7. Transport Belt
8. Original Transport Roller
9. Feed Belt
10. Pick-up Roller
11. Original Stopper

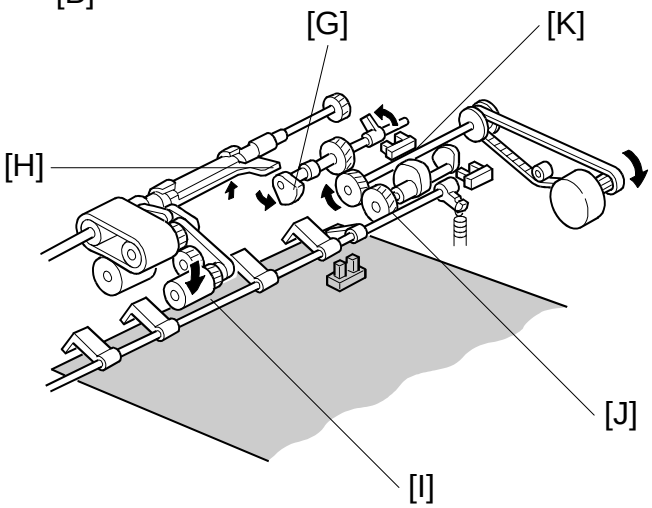
2. DETAILED DESCRIPTION

2.1 ORIGINAL FEED-IN PREPARATION MECHANISM

- Original Stopper Release -



- Pick-up Roller Release -



When an original is inserted, it is stopped at the original stopper [A] and the original set sensor [B] turns on.

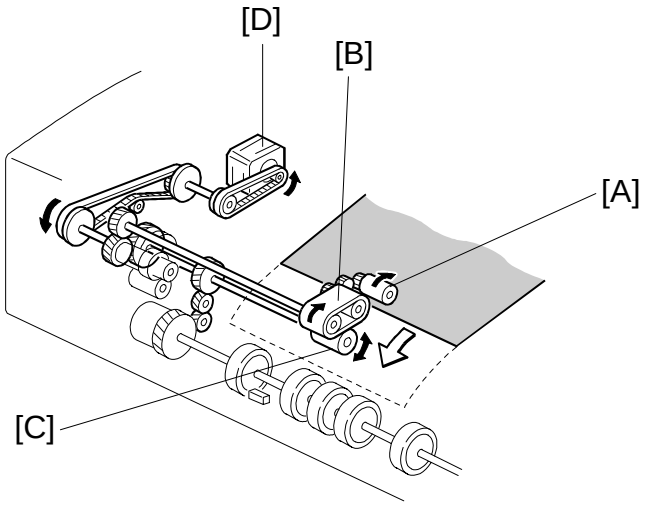
Original Stopper Release (top diagram):

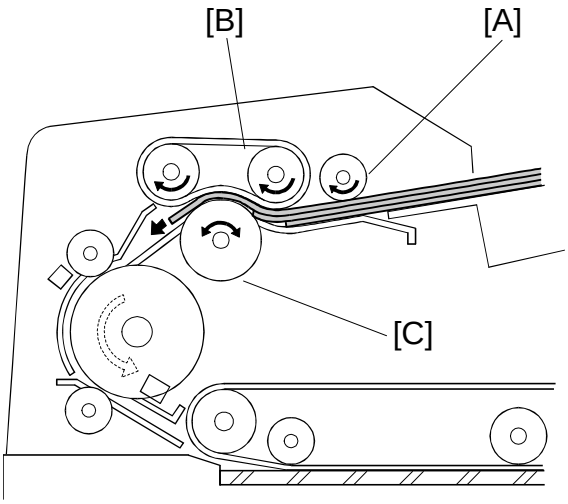
When the print key is pressed, the pick-up motor [C] turns on, the cam [D] turns and the original stopper is lifted to let the original pass. At this time, the one-way clutch in gear [E] prevents the pick-up roller release mechanism from moving, and the pick-up roller remains up.

Pick-up Roller Release (bottom diagram):

When cam [D] turns, the original stopper HP sensor [F] is turned on. A short time later, the pick-up motor [C] turns in reverse, the cam [G] rotates away from the pick-up roller release lever [H]. The lever then rises and the pick-up roller [I] drops onto the original. The one-way clutch in gear [J] prevents the original stopper from dropping. When the original reaches the entrance sensor, the pick-up motor reverses again, and the pick-up roller lifts up until the pick-up roller home position sensor [K] detects the actuator.

2.2 PICK-UP AND SEPARATION MECHANISM



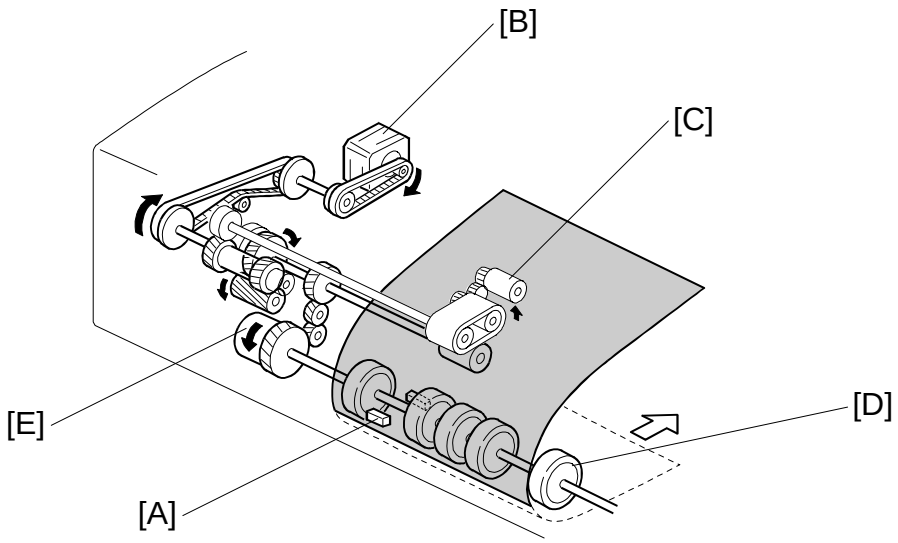


The original separation system uses an FRR (Feed and Reverse Roller) system. The pick-up roller [A], feed belt [B], and separation roller [C] are driven by the feed-in motor [D].

To drive this mechanism, the feed-in motor turns in the forward direction.

When two sheets of the original are fed by the pick-up roller, the separation roller turns in the opposite direction to the feed belt and the 2nd sheet is pushed back towards the original tray. When there is only one sheet between the feed belt and separation roller, the separation roller rotates in the same direction as the feed belt. This is because the separation roller contains a torque limiter.

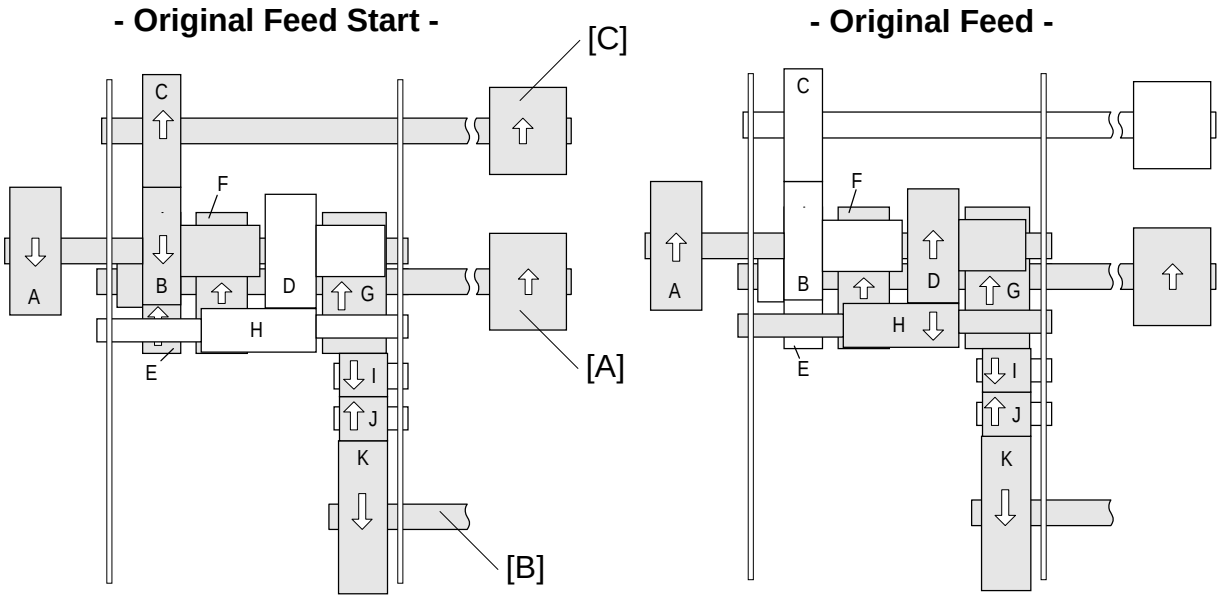
2.3 ORIGINAL FEED MECHANISM



When the leading edge of the original turns the entrance sensor [A] on, the feed-in motor [B] changes direction, and turns in reverse. However, the transport roller [D] keeps turning in the same direction because of a combination of one-way clutches (see the next page). At the same time, the pick-up motor starts again and the pick-up roller [C] is lifted up. When the pick-up roller HP sensor turns on, the pick-up motor stops (see Original Feed-in Preparation for a diagram).

The transport roller clutch [E] transfers drive from the pick-up motor to the transport roller. If there is a jam, the clutch disengages; this makes it easier for the user to remove jams at the transport roller.

2.4 ORIGINAL FEED DRIVE MECHANISM



The separation roller [A] and transport roller [B] always turn in the same direction because of a combination of gears and one-way clutches, even if the feed-in motor changes direction. However, the feed belt [C] stops during original feed.
The gears B, D, E and F each have a one-way clutch.

Original Feed Start

When the feed-in motor turns on, the drive is transferred as follows:

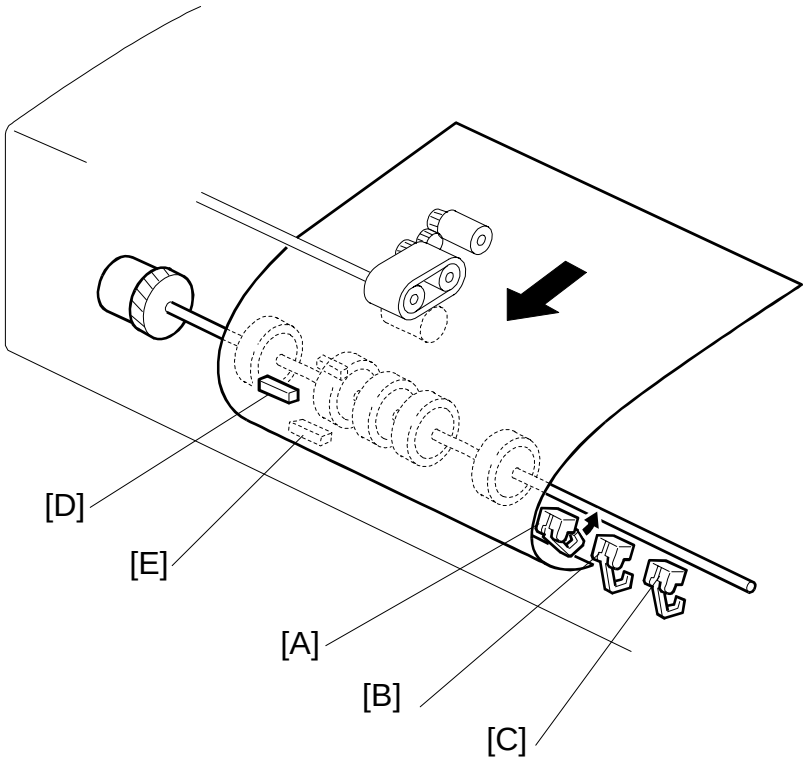
A → B → C → Feed Belt
└ → E → Separation Roller
└ → G → I → J → K → Transport Roller

Original Feed

When the leading edge of the original turns on the entrance sensor, the feed-in motor turns in reverse, and the drive is transferred as follows:

A → D → H → F → Separation Roller
└ → G → I → J → K → Transport Roller

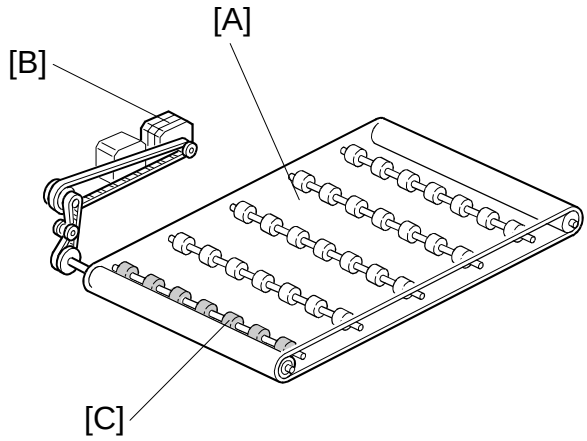
2.5 ORIGINAL SIZE DETECTION

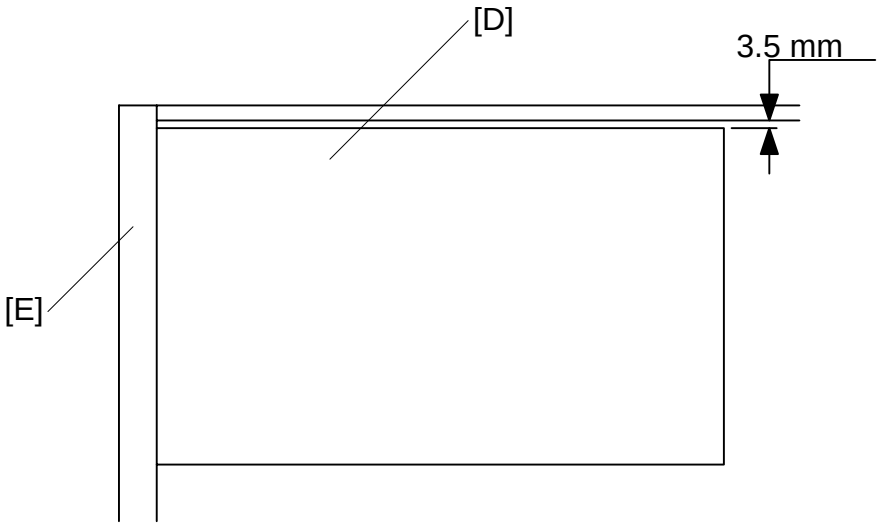


The DF detects original width using three original width sensors-1 [A], -2 [B], -3 [C], and detects original length using entrance sensor [D] and registration sensor [E]. The CPU counts the feed-in motor pulses from when the leading edge of the original turns on the registration sensor and until the trailing edge of the original turns off the entrance sensor.

The machine determines the original size from the combination of readings from all sensors.

2.6 ORIGINAL TRANSPORT MECHANISM





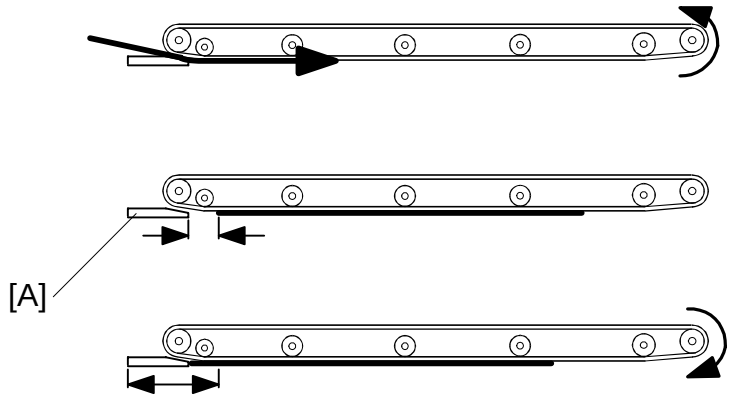
The transport belt [A] is driven by the transport belt motor [B]. The transport belt motor starts when the copier sends an original feed-in signal.

Inside the transport belt are five pressure rollers which give the proper pressure between the belt and original. The pressure roller [C] closest to the left original scale is made of rubber for the stronger pressure that is needed for thick originals. The other rollers are sponge rollers.

Since the copier's original position is at the left rear corner, the original [D] fed from the DF must also be at this position. But if the original was to be fed along the rear scale [E], original skew, jam, or wrinkling may occur.

To prevent such problems, the original transfer position is set to 3.5 mm away from the rear scale as shown. The 3.5 mm gap is compensated for by changing the starting position of the main scan.

2.7 ORIGINAL SKEW CORRECTION MECHANISM



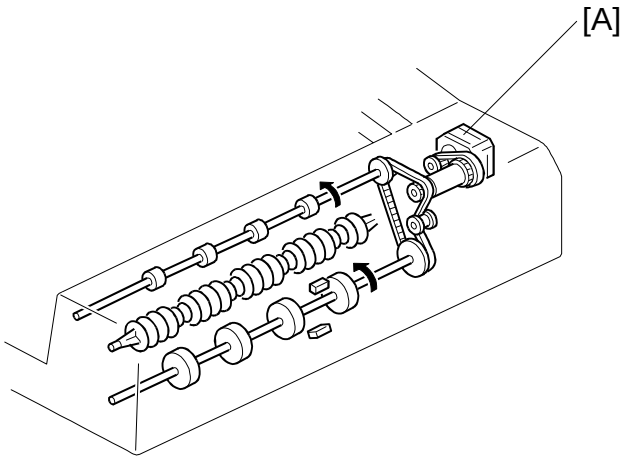
The transport belt motor remains energized to carry the original approximately 5 mm past the left scale [A] (see the middle drawing). Then the motor stops and reverses to feed the original back against the left scale (see the bottom drawing). This forces the original to hit the left scale and this aligns the trailing edge to minimize the original skew on the exposure glass.

After a two-sided original has been inverted to copy the 2nd side, it is fed in from the inverter against the left scale (see the bottom drawing; the top two drawings do not apply in this mode).

The amount of reverse feed against the left scale can be adjusted with SP modes.

2.8 ORIGINAL INVERSION AND FEED-OUT MECHANISM

2.8.1 GENERAL OPERATION

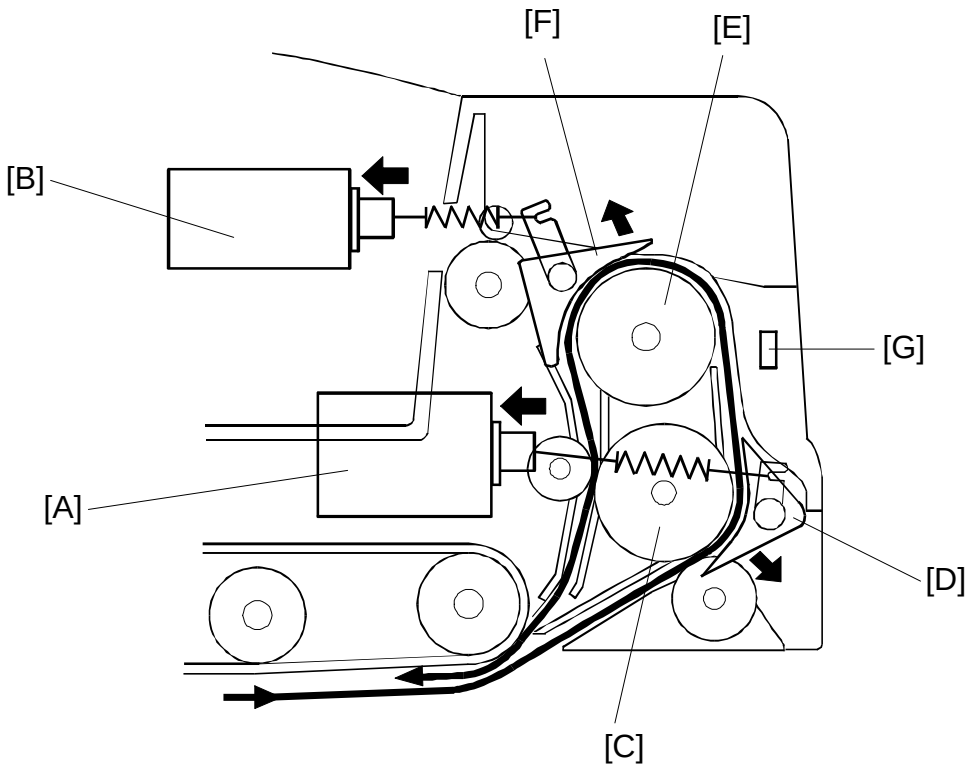


When the scanner reaches the return position, the copier's CPU sends the feed-out signal to the DF. When the DF receives the feed-out signal, the transport belt motor and feed-out motor [A] turn on. The original is then fed out to the exit tray or fed back to the exposure glass after reversing in the inverter section.

The DF has two exit trays. For single-sided original mode, the original is fed out to the right exit tray and for double-sided original mode, the original is fed out to the upper exit tray.

This causes the originals to be fed out in the correct order on the exit trays and allow the best one-to-one copy speed for each mode. The user can change the exit tray to the upper exit tray for single-sided mode (for example, if there is not enough space in the room for the right exit tray to be installed). However, one-to-one copy speed for this mode is reduced.

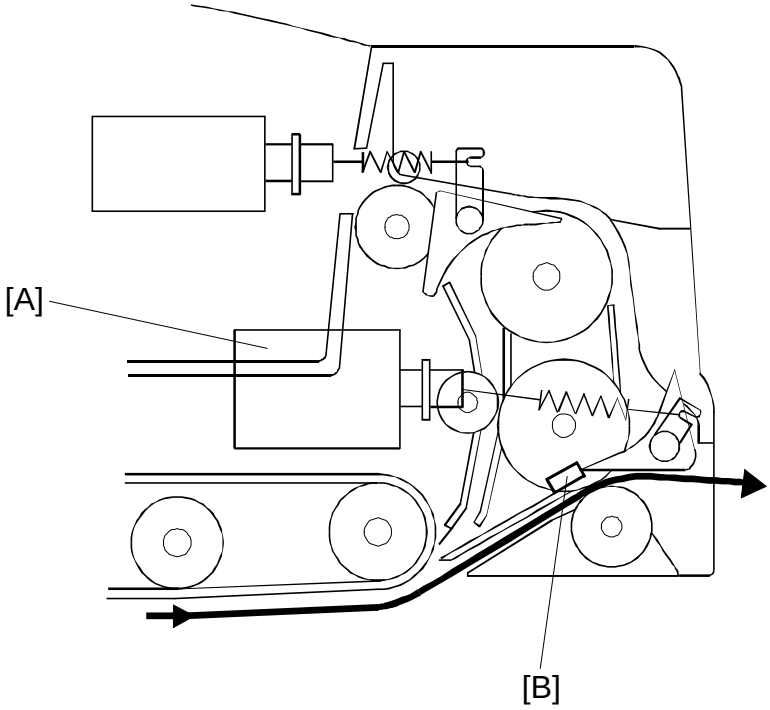
2.8.2 ORIGINAL INVERSION MECHANISM



When the DF receives the original invert signal from the copier, the transport belt motor, feed-out motor, exit gate solenoid [A], and inverter gate solenoid [B] turn on and the original is fed back to the exposure glass through the exit roller [C], exit gate [D], inverter roller [E], inverter gate [F], and exit roller.

The transport belt motor turns in reverse shortly after the leading edge of the original turns on the inverter sensor [G], and feeds the original to the left scale.

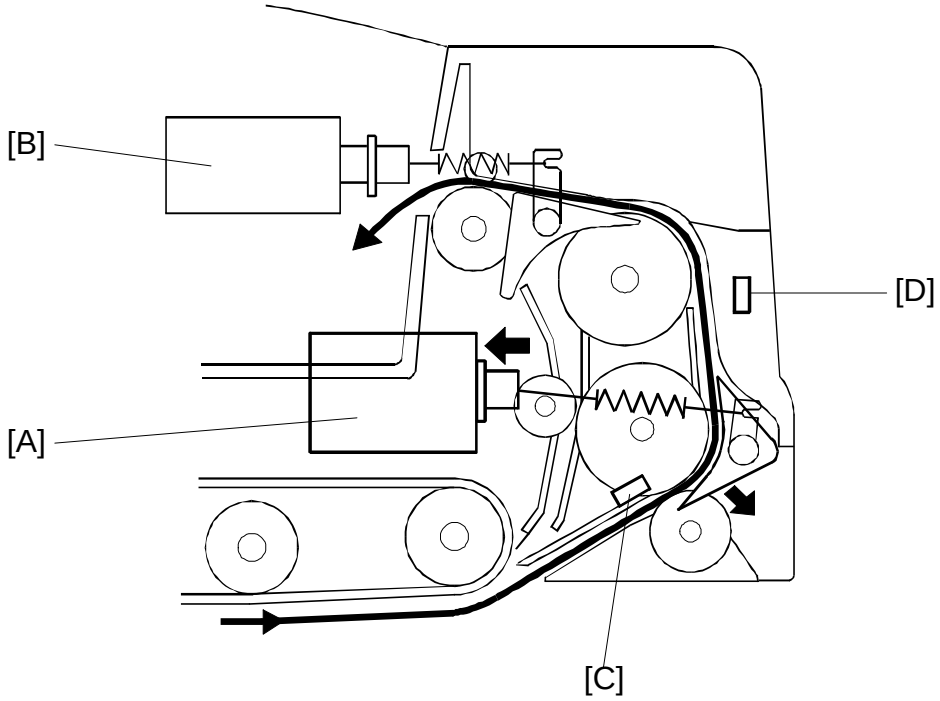
2.8.3 ORIGINAL EXIT MECHANISM (SINGLE-SIDED ORIGINAL MODE)



The exit gate solenoid [A] remains off and the original is fed out to the right exit tray. The transport belt motor turns off after the exit sensor [B] turns on.

To stack the originals tidily on the exit tray, the feed-out motor speed is reduced approximately 15 mm before the trailing edge of the original turns off the exit sensor.

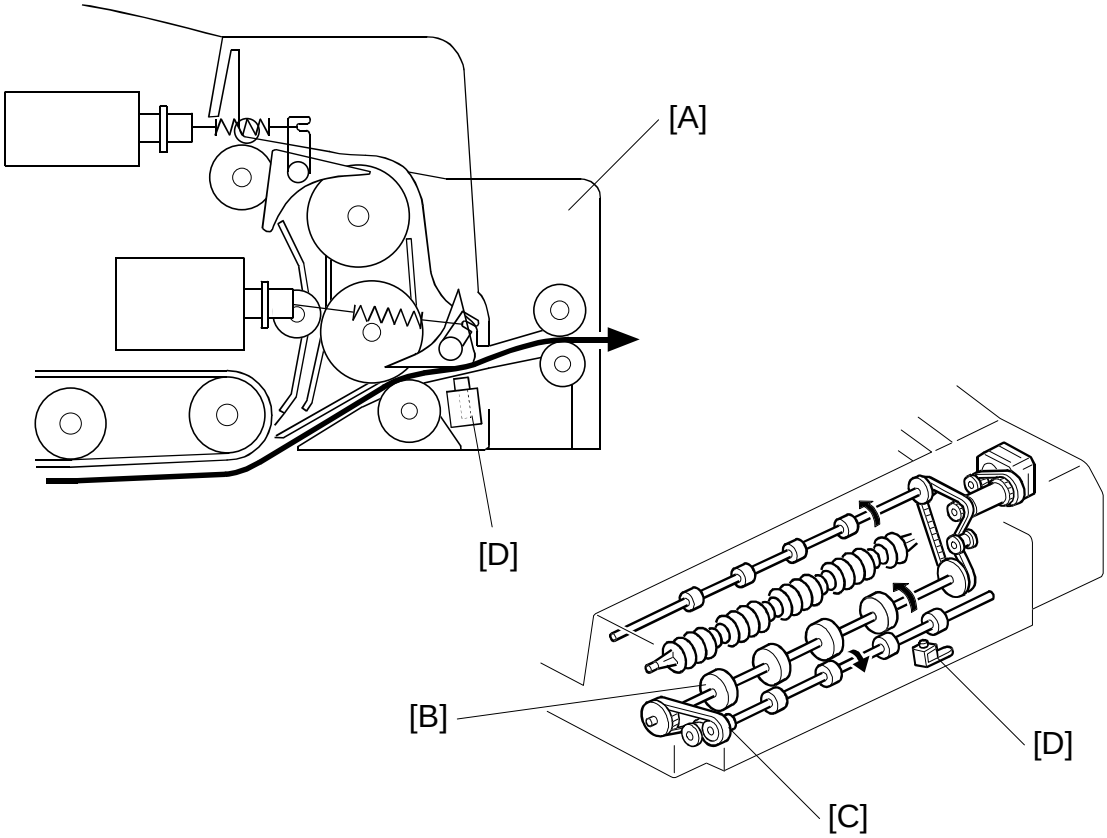
2.8.4 ORIGINAL EXIT MECHANISM (DOUBLE-SIDED ORIGINAL MODE)



The exit gate solenoid [A] turns on and the inverter gate solenoid [B] remains off, and the original is fed out to the upper tray. The transport belt motor turns off when the trailing edge of the original passes through the exit sensor [C].

To stack the originals tidily on the upper tray, the feed-out motor speed is reduced approximately 37 mm after the trailing edge of the original turns off the inverter sensor [D].

2.9 STAMP



This function is only for fax mode with the stamp unit option [A].

The stamp unit is driven by ADF exit roller [B] through timing belt [C].

The stamp function does not work when the original is fed out to the upper exit tray, because the paper does not go past the stamp.

In the single-sided original mode, when the original reaches the stamp position (15 mm before its trailing edge), it stops and stamper solenoid [D] turns on if the page was sent successfully (immediate transmission) or stored successfully (memory transmission).

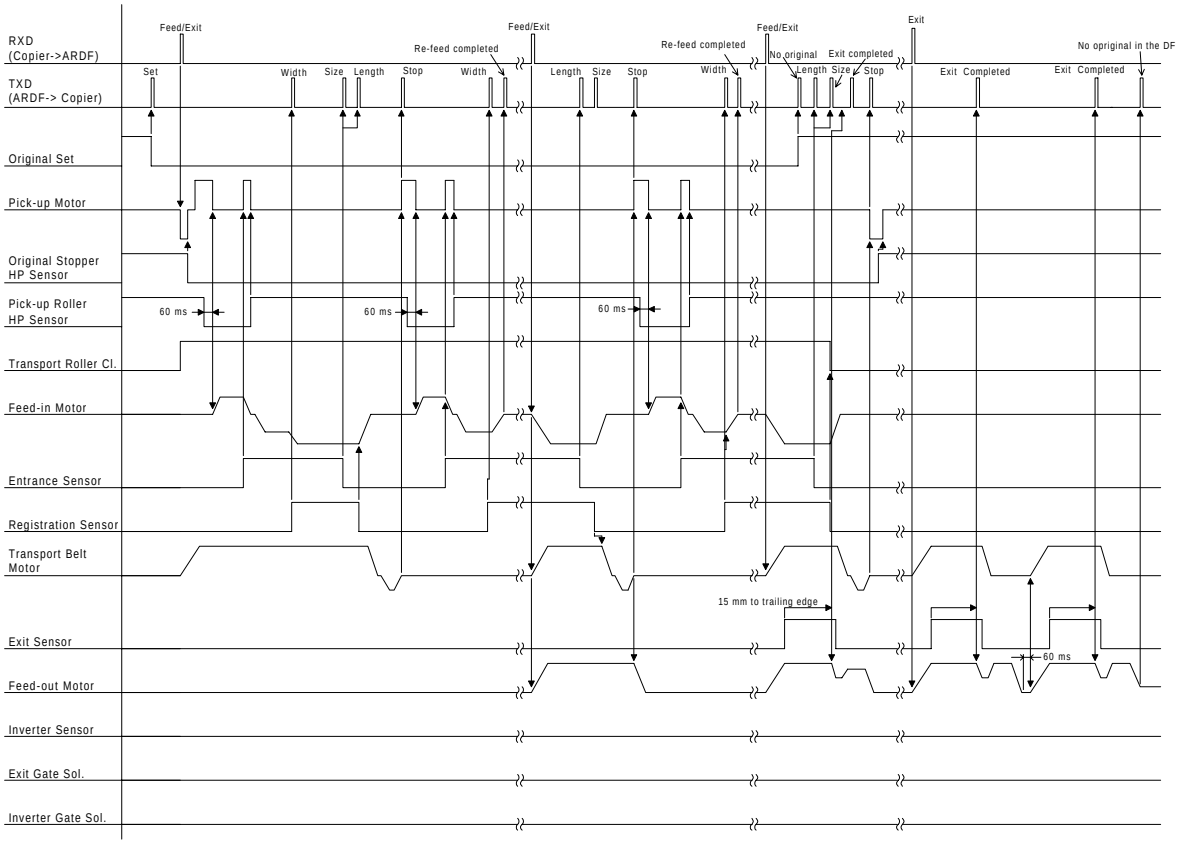
In the two-sided original mode, the stamper solenoid turns on twice, stamping the original twice. The first stamp is for the 1st side of the original, and its position is 15 mm from the leading edge. The second stamp is for the 2nd side of the original, and its position is 15 mm before the trailing edge stamp. Both stamps are made on the 1st side of the original (after side 2 is scanned, the original is inverted again so that side 1 is facing down).

2.10 JAM CONDITIONS

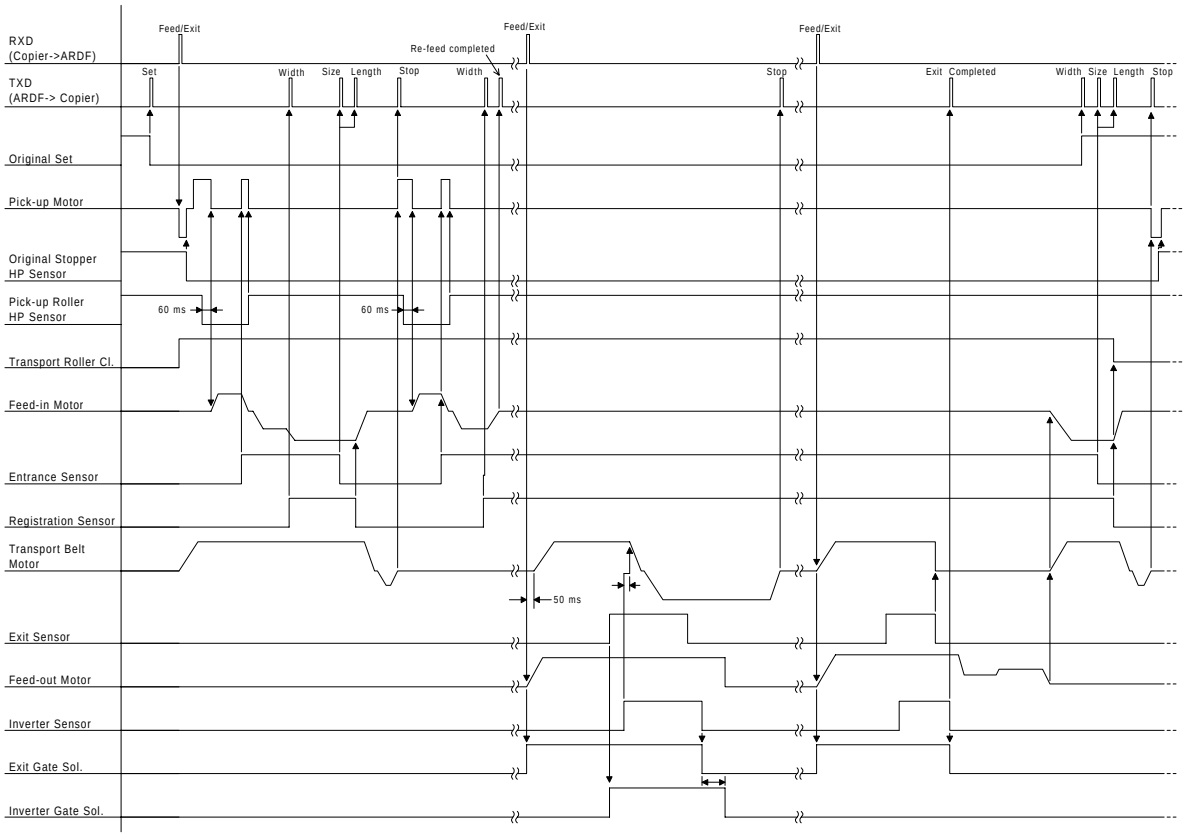
1. The entrance sensor does not turn on within 600 ms after the feed-in motor turns on.
2. The registration sensor does not turn on within 500 ms after the feed-in motor turns on in reverse.
3. The registration sensor does not turn off within 1,250 ms after the registration sensor turns on.
4. The exit sensor turns on before the 1st original is stopped on the exposure glass.
5. When feeding the original away from the exposure glass, the exit sensor does not turn on within 1,000 ms after the transport belt motor turns on.
6. The exit sensor does not turn off within 300 ms after the feed-out motor speed is reduced.
7. In duplex mode, when the inverter sensor does not turn on within 150 ms after the exit sensor turns on.
8. When the original is inverted in duplex mode, the exit sensor does not turn off within 1,250 ms after the exit sensor turns on.
9. The inverter sensor does not turn off within 150 ms of the exit gate solenoid turning off.

2.11 TIMING CHARTS

2.11.1 A4 SIDEWAYS: ONE-SIDED ORIGINAL (3 ORIGINALS)



2.11.2 A4 SIDEWAYS: TWO-SIDED ORIGINAL (2 ORIGINALS)



3. SERVICE TABLES

3.1 DIP SWITCHES

DPS101				Description
1	2	3	4	
0	0	0	0	Normal operating mode, without stamper
0	0	0	1	Normal operating mode, with stamper
0	0	1	0	Do not select
0	0	1	1	Do not select
0	1	0	0	Original registration adjustment for one-sided originals (VR101)
0	1	0	1	Original registration adjustment for two-sided originals (VR102)
0	1	1	0	Do not select
0	1	1	1	Do not select
1	0	0	0	Free run: one-sided original, thick mode
1	0	0	1	Free run: one-sided original, thick mode, low speed
1	0	1	0	Free run: one-sided original, thin mode
1	0	1	1	Free run: one-sided original, thin mode, low speed
1	1	0	0	Free run: two-sided original, thick mode
1	1	0	1	Free run: two-sided original, thick mode, low speed
1	1	1	0	Free run: one-sided original, stamp
1	1	1	1	Free run: two-sided original, stamp

- In free run mode, the DF automatically starts 3 seconds after the original is placed on the original table.
- The “Auto” LED blinks except in normal mode.

3.2 TEST POINTS

No.	Label	Monitored Signal
TP100	(GND)	Ground
TP101	(Vcc)	+5V
TP103	(TXD)	TXD to the copier
TP104	(RXD)	RXD from the copier

3.3 VARIABLE RESISTORS

No.	Function
VR101	Adjust the original registration for one-sided originals.
VR102	Adjust the original registration for two-sided originals.

3.4 FUSES

No.	Function
FU101	Protects the 24 V line.

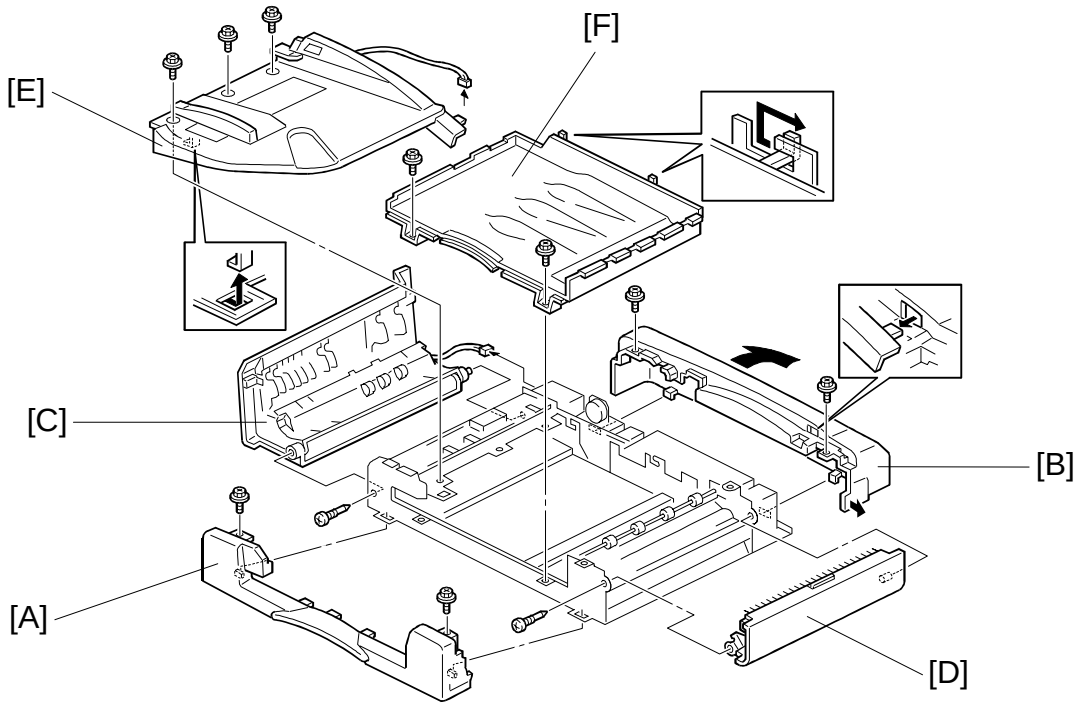
3.5 ROM HISTORY

⇒

A680 AUTO DOCUMENT FEEDER FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	**FIRMWARE LEVEL**	**SERIAL NUMBER**	**FIRMWARE VERSION**
• Stamp not running during Free Run. • After modification, the machine will use the maximum value for registration adjustment if the command received is greater then the maximum. • Noise occurs when the motor is stopped. • If paper is fed from the By-Pass Tray following jam recovery, the clutch remains on after the job is completed.	A6805620 **D**	Not Available	D
• Jobs stop copying while an original is set on the exposure glass.	A6805620 **E**	Not Available	E
• If the left cover has not been completely shut, the output of the Feed Cover Sensor fluctuates and the DF continuously repeats initial warm-up. • The machine sometimes does not detect the size of the original when sending a fax. • If a jam occurs in Duplex Mode, it is not possible to clear the job even after the jam has been cleared. • When the punch holes of the original pass the exit sensor, the sensor interprets this as the trailing edge causing a jam to occur.	A6805620 **F**	Not Available	F
• If a business card or other small sized original is left on the exposure glass, the machine will allow the ADF to feed since the small original is not detected. During the next ADF feed, a jam occurs and the original is not exited. The machine does not detect the jam and displays “Copy in progress” until the jammed original is removed.	A6805620 **G**	Not Available	G
• If a jam occurs at the exit area when the ADF Upper Tray has been selected, the copier displays ‘Copy in progress’ even if the jam itself is cleared and the Start button is pressed. As a result, the next original cannot be fed.	A6805620 **H**	Not Available	H
• If an odd number of copies has been selected for a scanning job (1,3,5…) or the job is cancelled from within a scanner application, the original is not exited normally.	A6805620 **J**	Not Available	J

4. REPLACEMENT AND ADJUSTMENT

4.1 COVER REPLACEMENT



Front Cover Removal

1. Remove the front cover [A] (2 screws).

Rear Cover Removal

2. Remove the rear cover [B] (2 screws).

Left Cover Removal

1. Remove the front cover.
2. Remove the left cover [C] (1 screw, 1 connector).

Upper Exit Cover Removal

1. Remove the front cover.
2. Remove the upper exit cover [D] (1 screw).

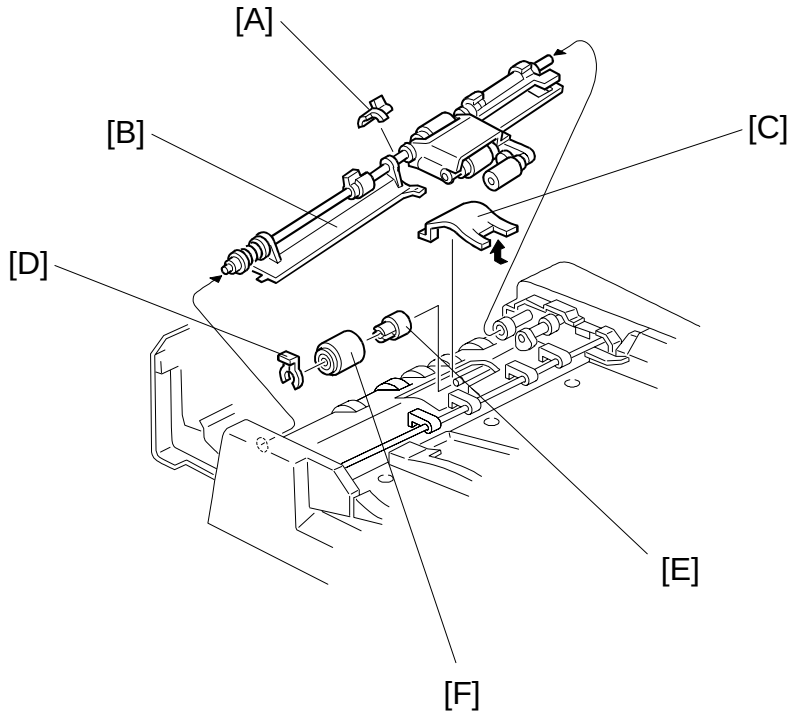
Original Tray Removal

1. Remove the rear cover.
2. Remove the original tray [E] (3 screws, 2 LEDs). When re-installing the LEDs on the original tray, the LED with the short harness is for the ready indicator, and the LED with the long harness is for the SADF indicator.

Upper Cover Removal

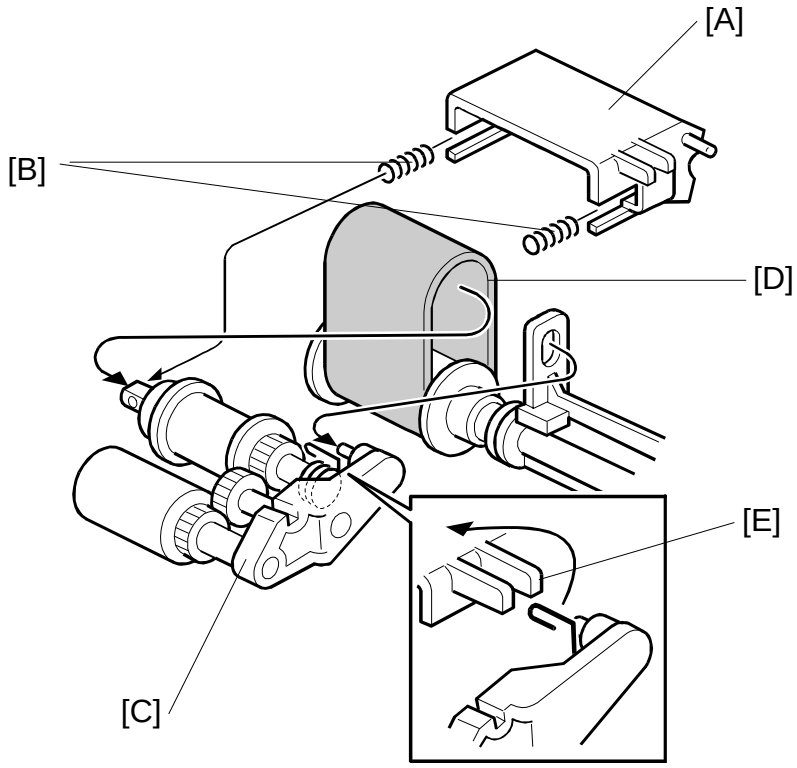
1. Remove the front, rear, and upper exit covers.
2. Remove the upper cover [F] (2 screws, 2 hooks).

4.2 FEED UNIT REMOVAL AND SEPARATION ROLLER REPLACEMENT



1. Open the left cover.
2. Remove the white clip [A].
3. Remove the feed unit [B].
4. Pull the feed unit to the front, release the shaft at the rear, and release the front bushing.
5. Remove the separation roller cover [C].
6. Remove the snap ring [D].
7. Remove the torque limiter [E] and separation roller [F].
8. Replace the separation roller.

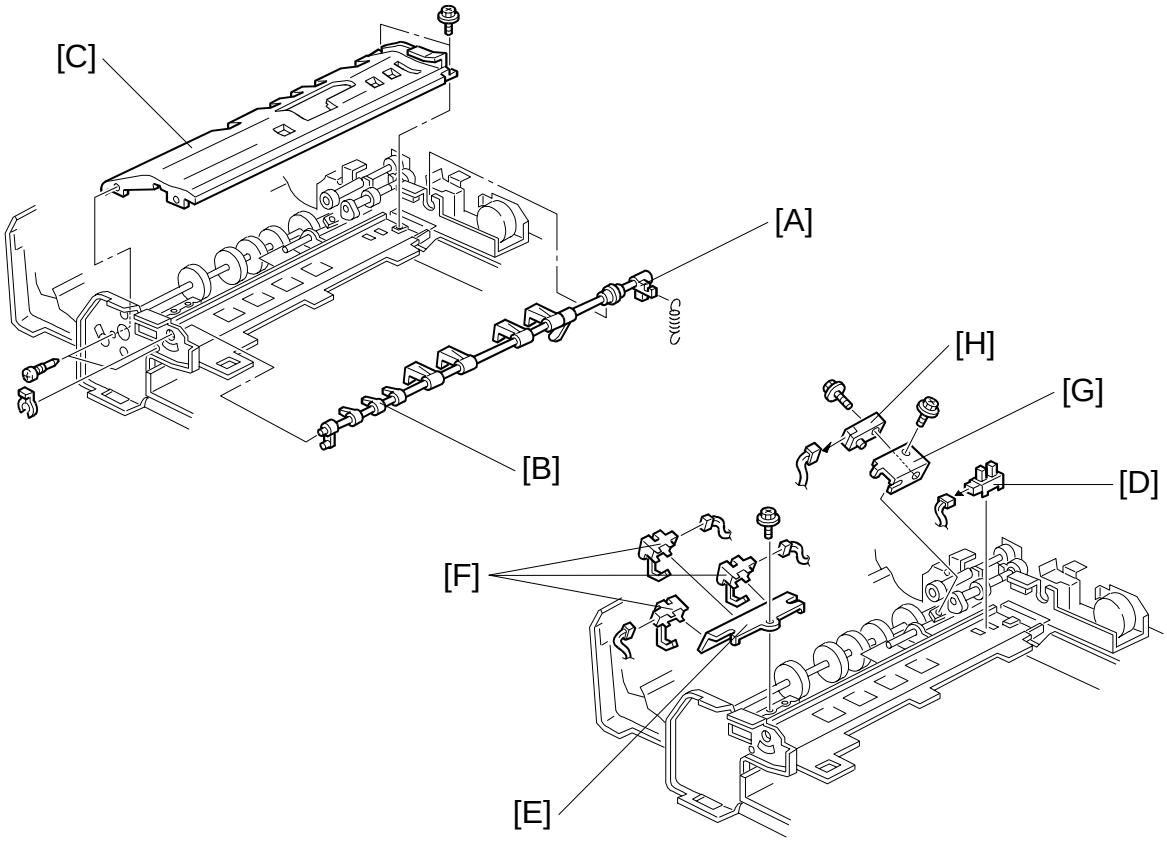
4.3 FEED BELT REPLACEMENT



1. Remove the feed unit.
2. Remove the feed belt cover [A].
   NOTE: The springs [B] come off the feed belt cover easily.
3. Remove the pick-up roller unit [C].
4. Replace the feed belt [D].
   NOTE: When reinstalling the pick-up roller unit, make sure that the pressure spring [E] is on the feed belt cover.

4.4 SENSOR REPLACEMENT

4.4.1 ORIGINAL SET, ORIGINAL WIDTH AND REGISTRATION SENSORS



1. Remove the front cover, rear cover, original tray, and feed unit.
2. Rotate the pick-up motor manually and release the cam from the lever [A] on the original stopper [B].
3. Remove the original stopper (1 snap ring, 1 spring).
4. Remove the upper original guide [C] (4 screws).

Original Set Sensor

5. Replace the original set sensor [D] (1 connector).

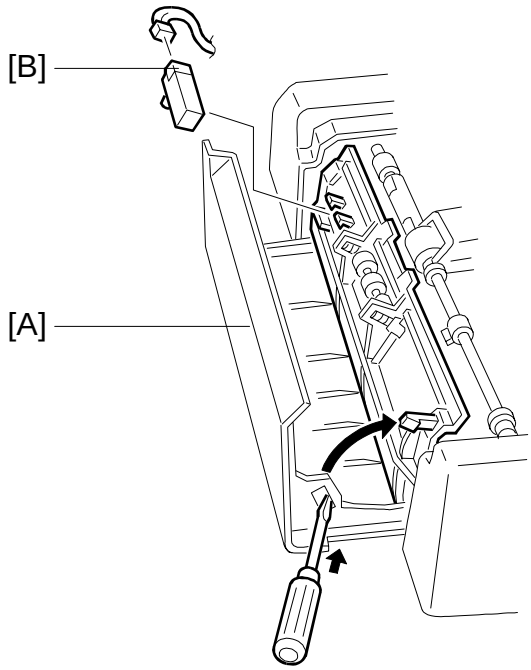
Original Width Sensor

5. Remove the original width sensor bracket [E] (1 screw).
6. Replace the original width sensor(s) [F] (1 connector each).

Registration Sensor

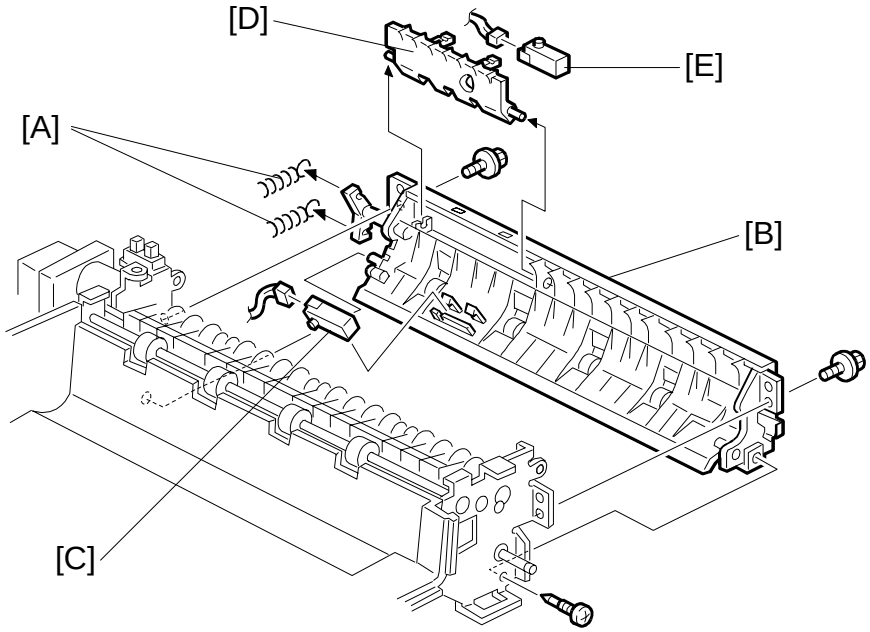
5. Remove the registration sensor bracket [G] (1 screw).
6. Replace the registration sensor [H] (1 connector, 1 screw).

4.4.2 ENTRANCE SENSOR



1. Open the left cover.
2. Release the left original guide [A].
3. Replace the entrance sensor [B].

4.4.3 EXIT SENSOR AND INVERTER SENSOR



1. Remove the front cover and rear cover.
2. Remove the two exit gate springs [A].
3. Remove the right exit cover [B] (3 screws).

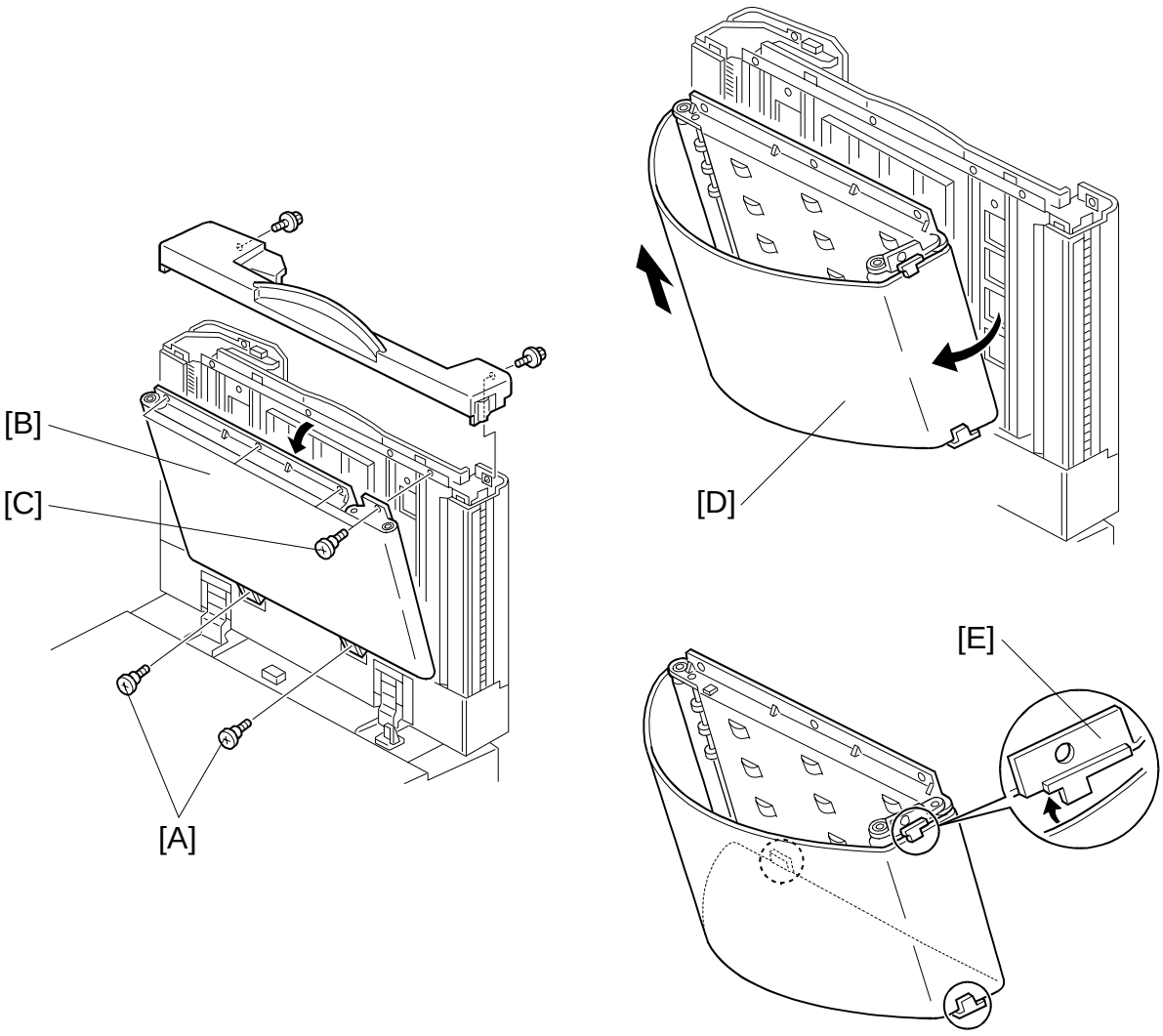
Exit Sensor

4. Replace the exit sensor [C] (1 connector).

Inverter Sensor

4. Remove the inverter sensor guide [D].
5. Replace the inverter sensor [E] (1 connector).

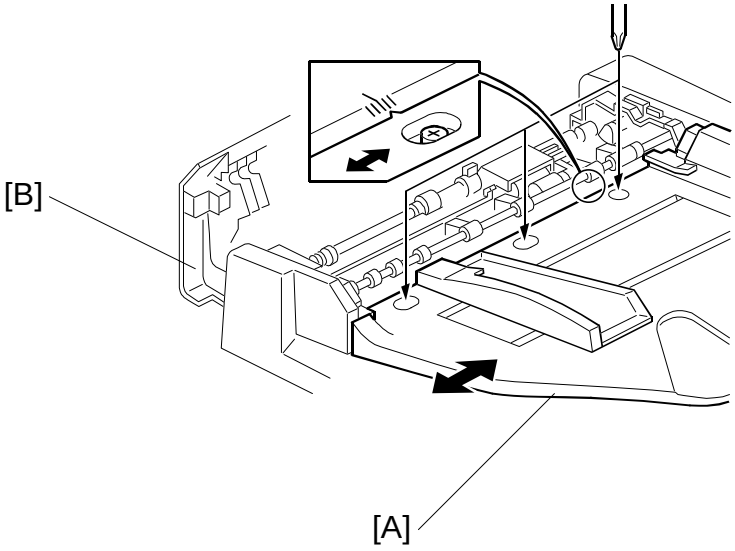
4.5 TRANSPORT BELT REPLACEMENT



1. Remove the front cover.
2. Remove the lower two screws [A] securing the transport belt assembly [B].
3. Remove the upper four screws [C] securing the transport belt assembly.
4. Bend up the transport belt assembly extension.
5. Pull off the transport belt [D] and replace it.

NOTE: 1) When releasing the transport belt assembly, make sure to remove the two lower screws first.
2) When installing the transport belt, make sure that the belt runs under the belt guide spacers [E].
3) When securing the transport belt assembly with the six screws, make sure to secure the four upper screws first.

4.6 SIDE-TO-SIDE REGISTRATION ADJUSTMENT



The side-to-side registration is adjusted as follows.

SP Mode

See the copier SP mode table.

Original Table Position

1. Loosen the 3 screws for the original table [A].
2. Move the original table and adjust the original position.
   NOTE: When removing the original table for some reason, mark the position on the entrance guide [B].

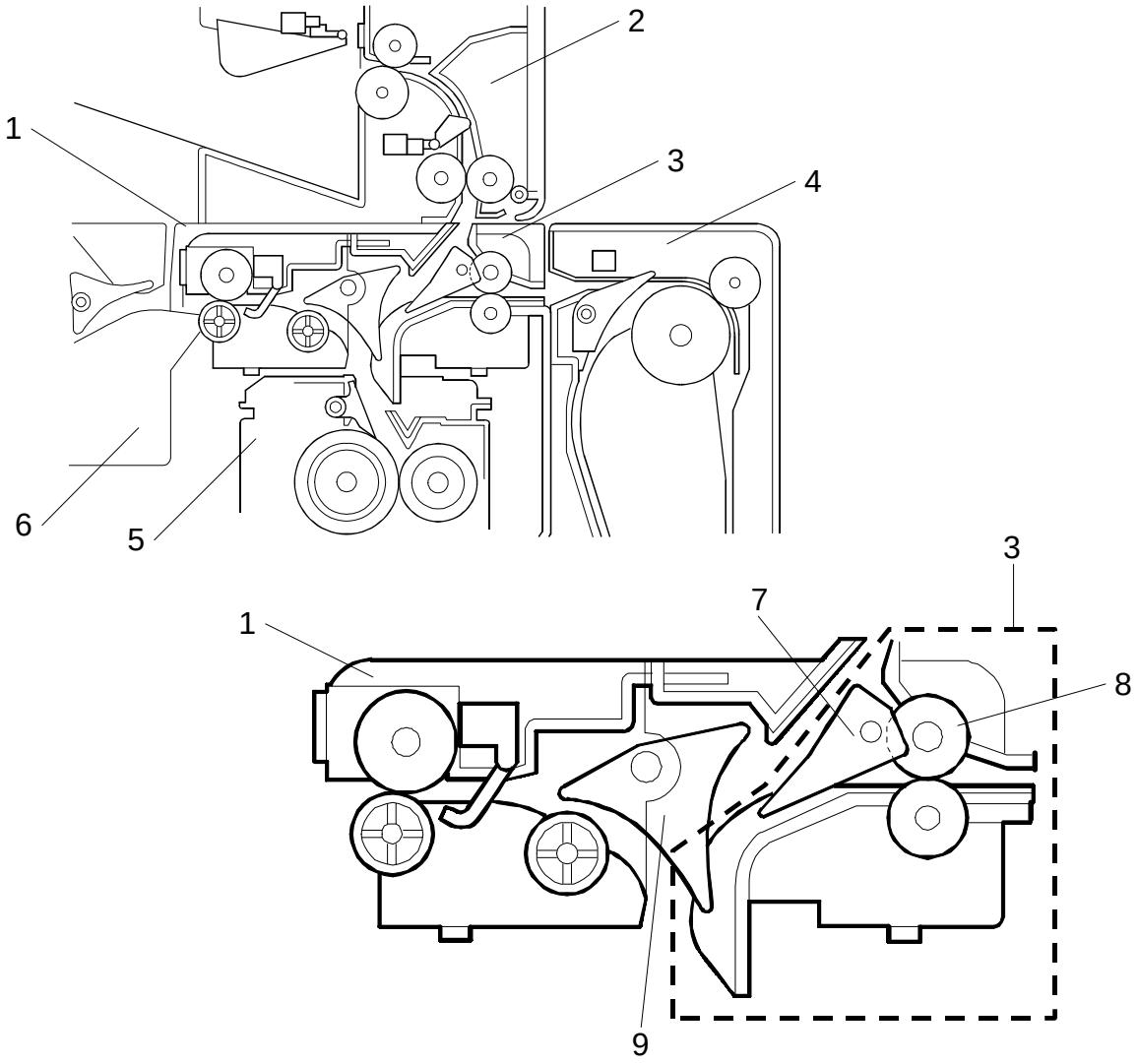
INTERCHANGE UNIT A690

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

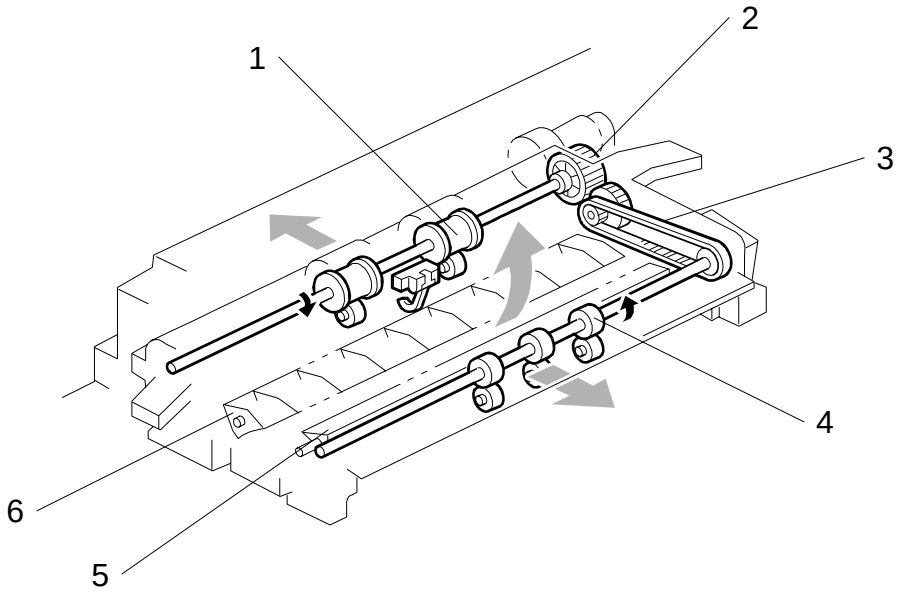
Paper Size:	Standard sizes A6 lengthwise to A3 HLT to DLT Non-standard sizes Width: 100 to 305 mm Length: 148 to 432 mm
Paper Weight:	52 g/m^2 ~ 135 g/m^2, 16 lb ~ 36 lb

1.2 MECHANICAL COMPONENT LAYOUT



1. Exit Unit (Inside the Copier)
2. 1-bin Tray (Option)
3. Interchange Unit
4. Duplex Unit (Option)
5. Fusing Unit (Inside the Copier)
6. Bridge Unit (Option)
7. Duplex Junction Gate
8. Exit Roller
9. Exit Junction Gate (Inside the Copier)

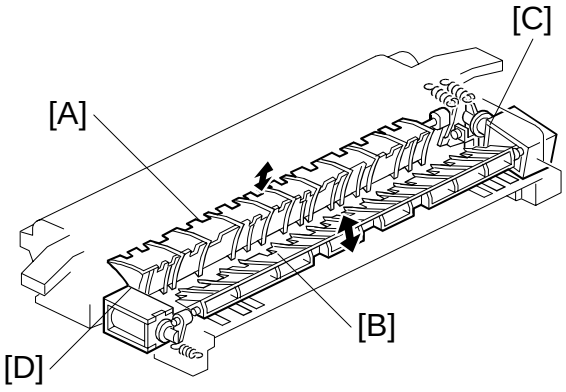
1.3 DRIVE LAYOUT



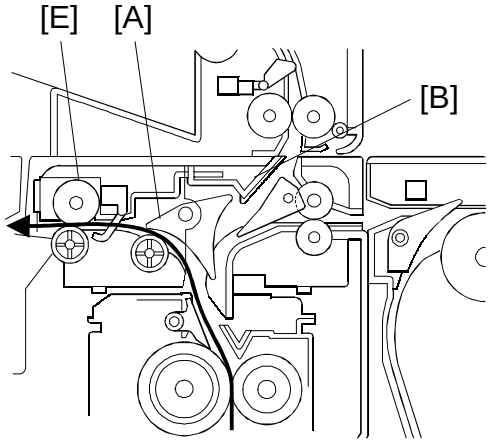
1. Exit Roller (Copier Exit Unit)
2. Exit Unit Drive Gear (Copier Exit Unit)
3. Exit Roller Drive Belt
4. Exit Roller
5. Duplex Junction Gate
6. Exit Junction Gate (Copier Exit Unit)

2. DETAILED DESCRIPTION

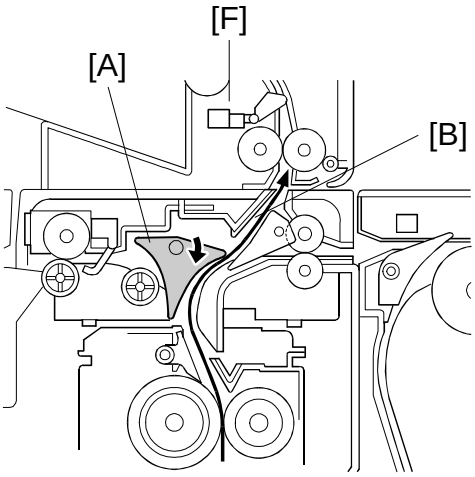
2.1 JUNCTION GATE MECHANISM



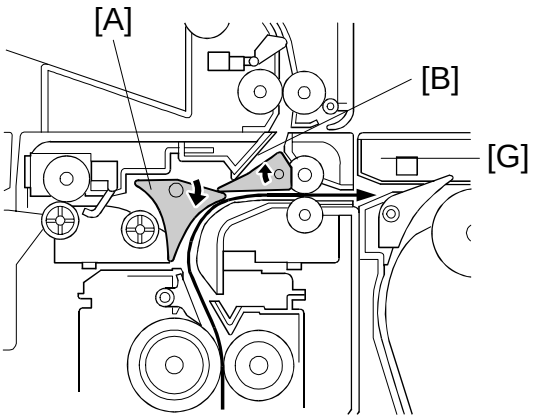
- To the Exit Tray/Bridge Unit -



- To the 1-bin Tray -



- To the Duplex Unit -



Depending on the selected mode, the copies are directed up, left, or right by the exit junction gate [A] in the copier and the duplex junction gate [B]. These are controlled by the exit junction gate solenoid [C] and the duplex junction gate solenoid [D].

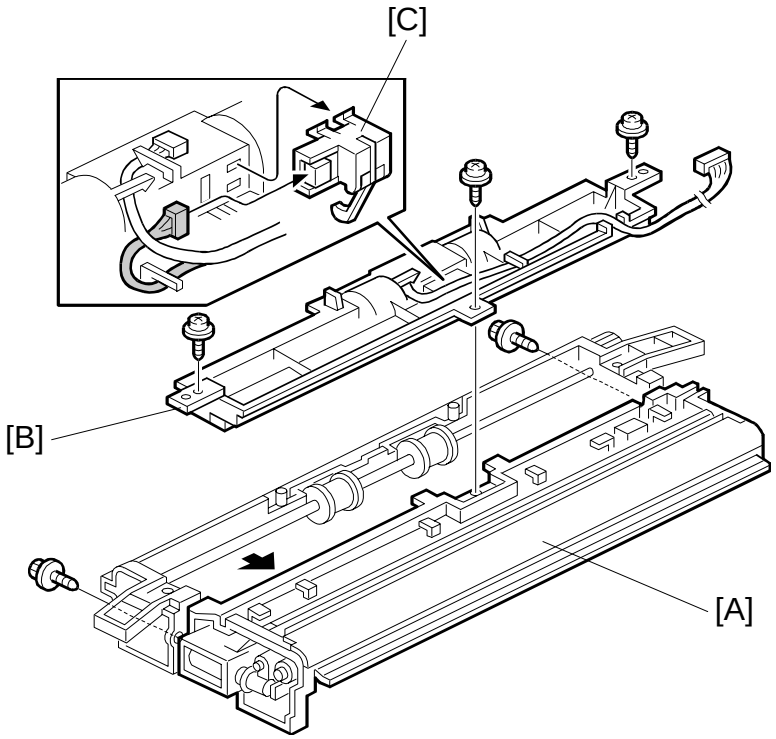
To the Exit Tray or Bridge Unit (for the Upper Tray, Left Tray, or Finisher)
The exit junction gate solenoid stays off and the copy paper is directed to the copier exit unit [E].

To the 1-bin Tray
The exit junction gate solenoid turns on and the duplex junction gate solenoid stays off. The copy paper is directed to the 1-bin tray [F].

To the Duplex Unit
The exit junction gate solenoid and the duplex junction gate solenoid both turn on and the copy paper is directed to the duplex unit [G].

3. REPLACEMENT AND ADJUSTMENT

3.1 EXIT SENSOR (COPIER) REPLACEMENT



1. Remove the scanner unit from the copier.
2. Remove the upper cover of the copier exit unit.
3. Remove the exit unit.
4. Remove the interchange unit [A] (2 screws).
5. Remove the interchange unit upper cover [B] (3 screws).
6. Replace the exit sensor [C] (1 connector).

-

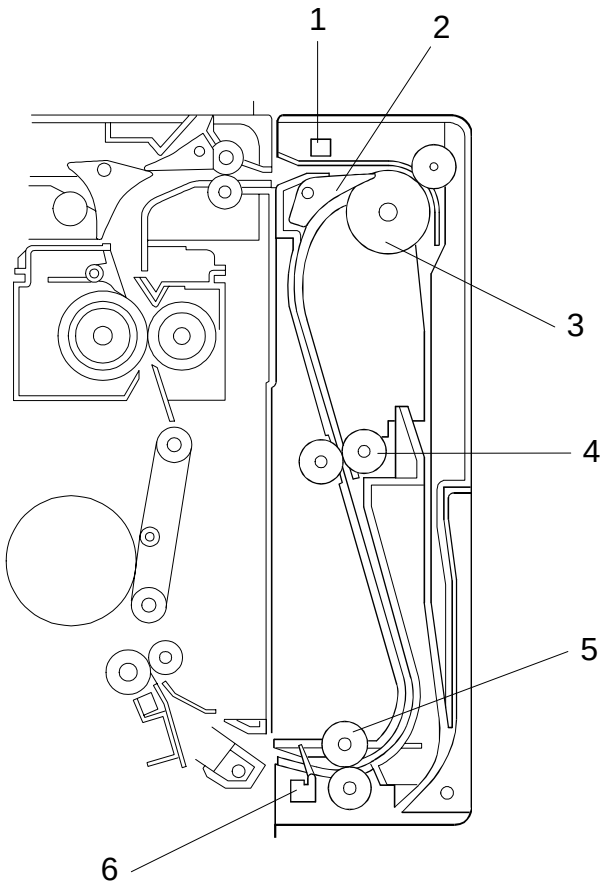
DUPLEX A687

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

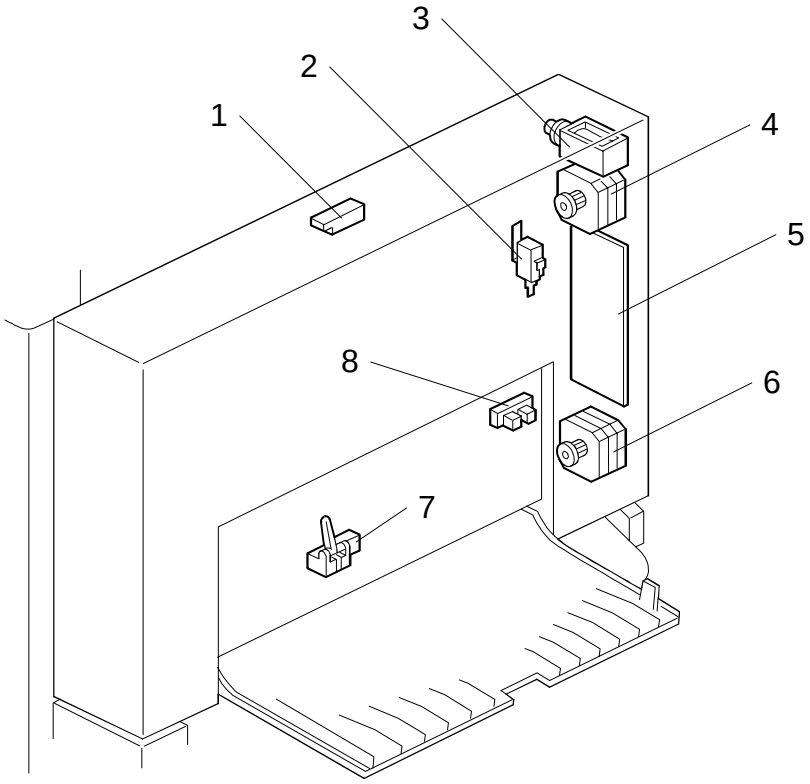
Paper Size:	Standard sizes A5 lengthwise to A3 HLT to DLT Non-standard sizes Width: 100 to 305 mm Length: 148 to 432 mm
Paper Weight:	64 g/m^2 ~ 105 g/m^2, 20 lb ~ 28 lb
Tray Capacity:	1 sheet

1.2 MECHANICAL COMPONENT LAYOUT



1. Entrance Sensor
2. Inverter Gate
3. Inverter Roller
4. Upper Transport Roller
5. Lower Transport Roller
6. Exit Sensor

1.3 ELECTRICAL COMPONENT LAYOUT

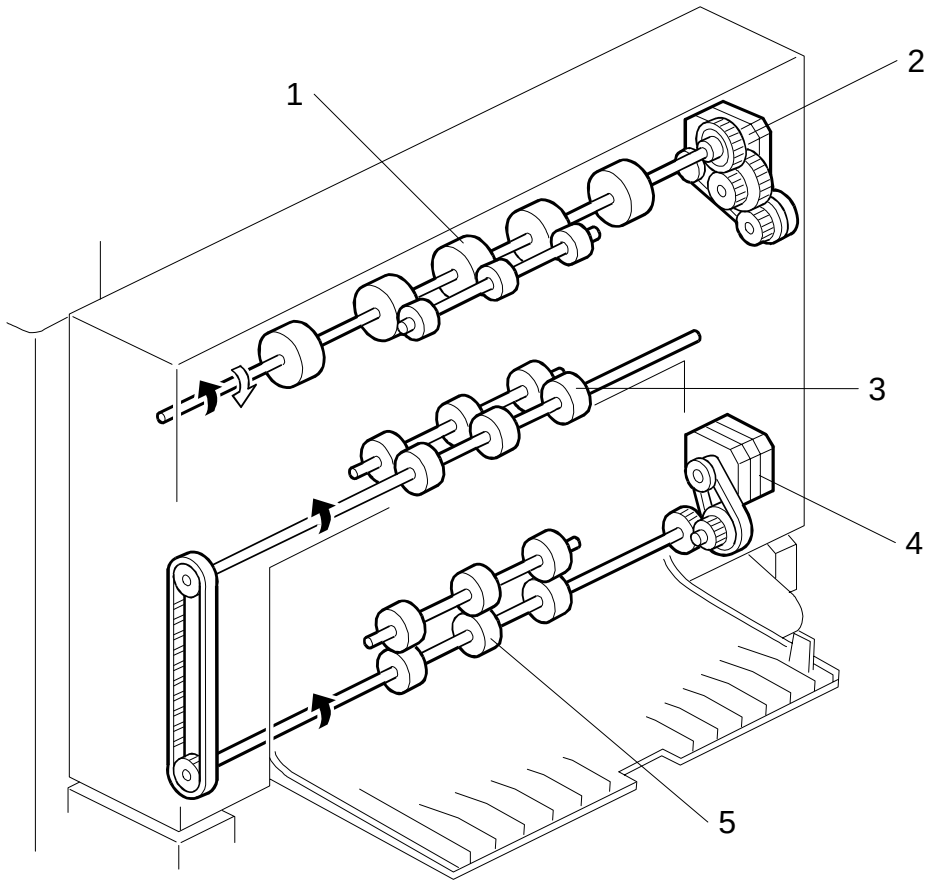


1. Entrance Sensor
2. Duplex Unit Open Switch
3. Inverter Gate Solenoid
4. Inverter Motor
5. Main Board
6. Transport Motor
7. Exit Sensor
8. Cover Guide Sensor

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Inverter	Drives the inverter roller.	4
M2	Transport	Drives the upper and lower transport rollers.	6
Sensors			
S1	Entrance	Detects the trailing edge of the copy paper to turn on the inverter gate solenoid and turn on the inverter motor in reverse. Checks for misfeeds.	1
S2	Exit	Checks for misfeeds.	7
S3	Cover Guide	Detects whether the cover guide is opened or not.	8
Switches			
SW1	Duplex Unit	Detects whether the duplex unit is opened or not.	2
Solenoids			
SOL1	Inverter Gate	Controls the inverter gate.	3
PCBs			
PCB1	Main	Controls the duplex unit and communicates with the copier.	5

1.5 DRIVE LAYOUT



1. Inverter Roller
2. Inverter Motor
3. Upper Transport Roller
4. Transport Motor
5. Lower Transport Roller

2. DETAILED DESCRIPTIONS

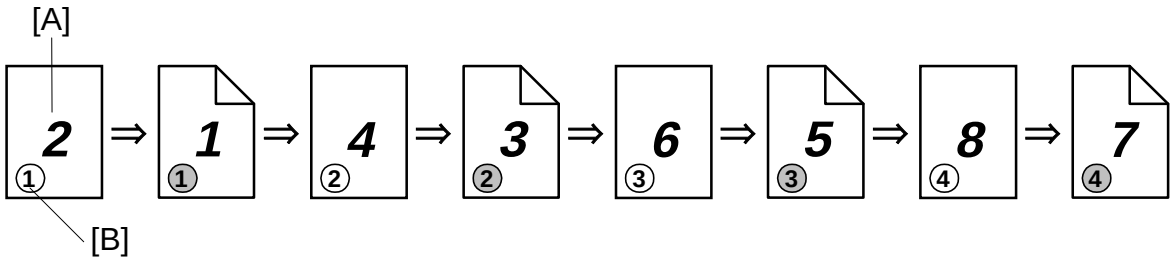
2.1 BASIC OPERATION

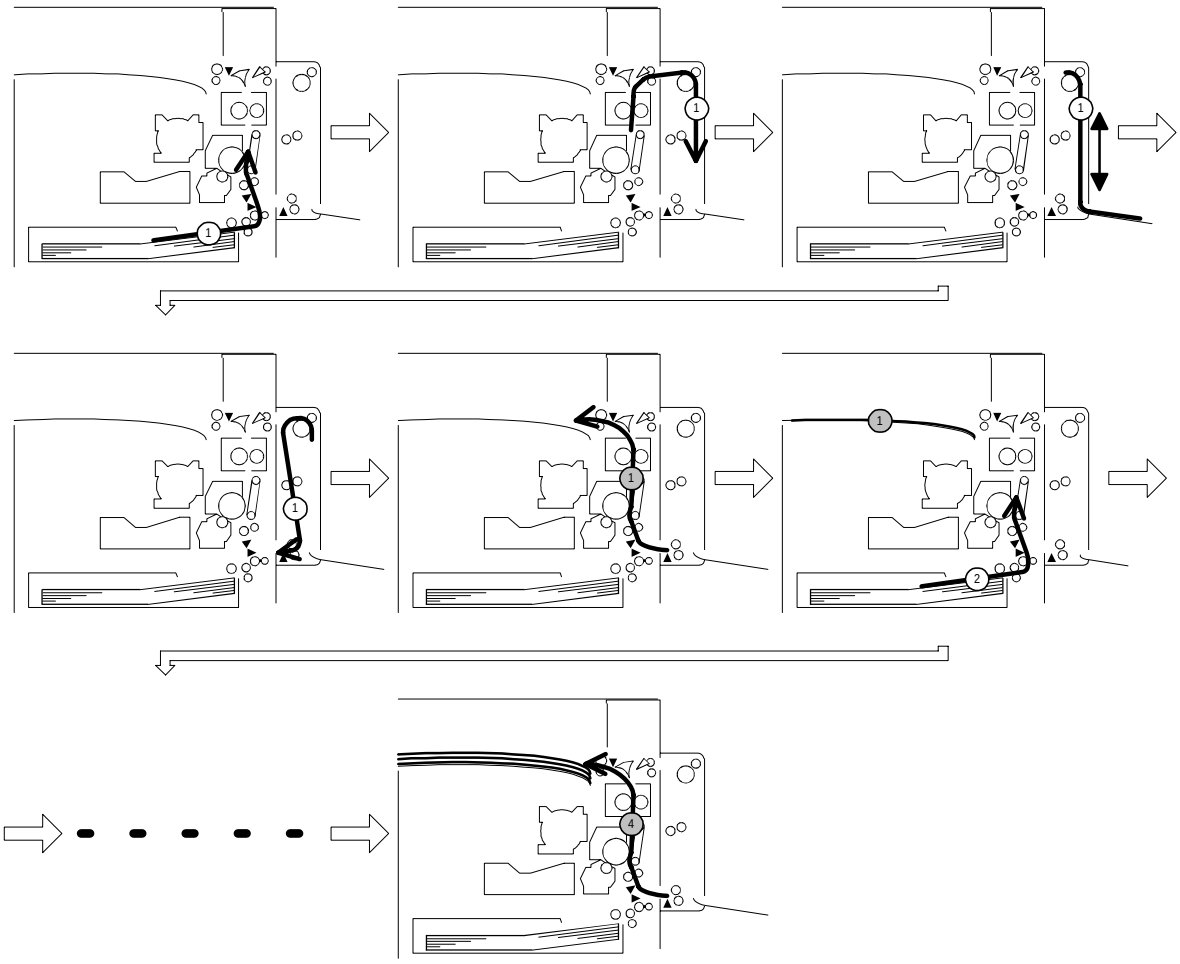
To increase the productivity of the duplex unit, copies are printed as follows.

Larger than A4 lengthwise/LT lengthwise

The duplex unit can store only one sheet of copy paper.

Example: 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).

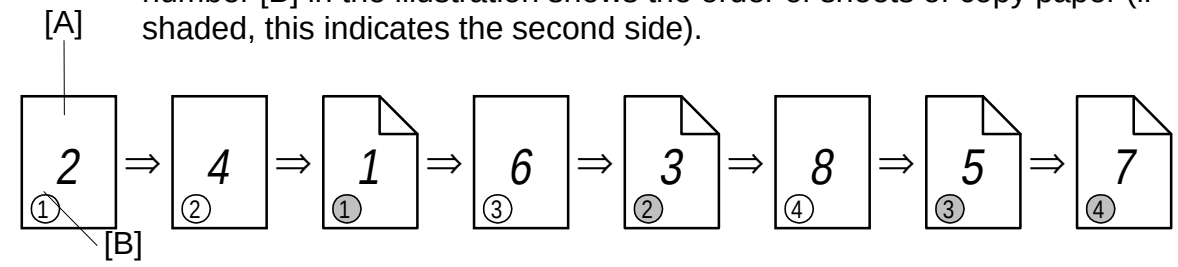


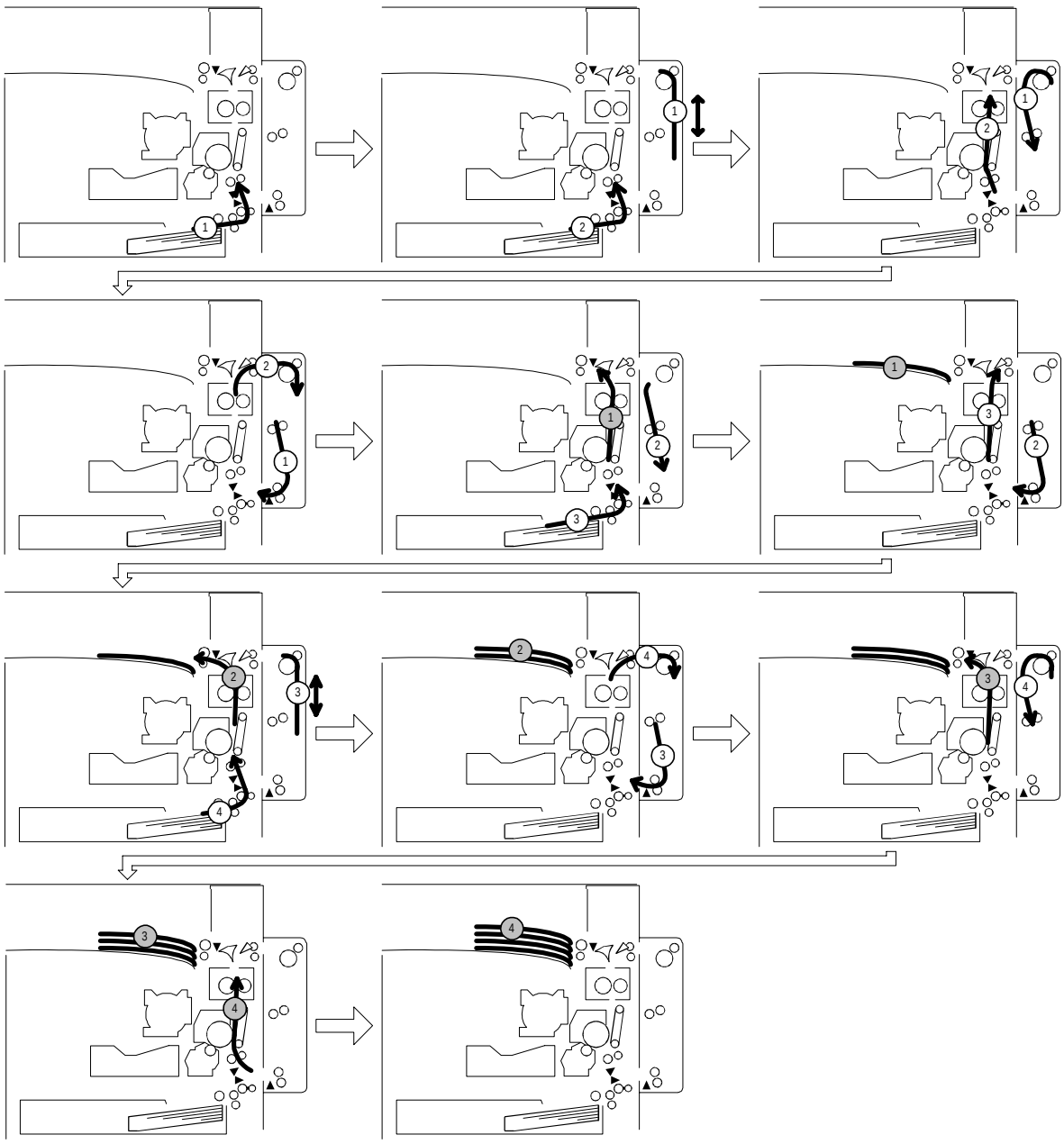


Up to A4 lengthwise/LT lengthwise

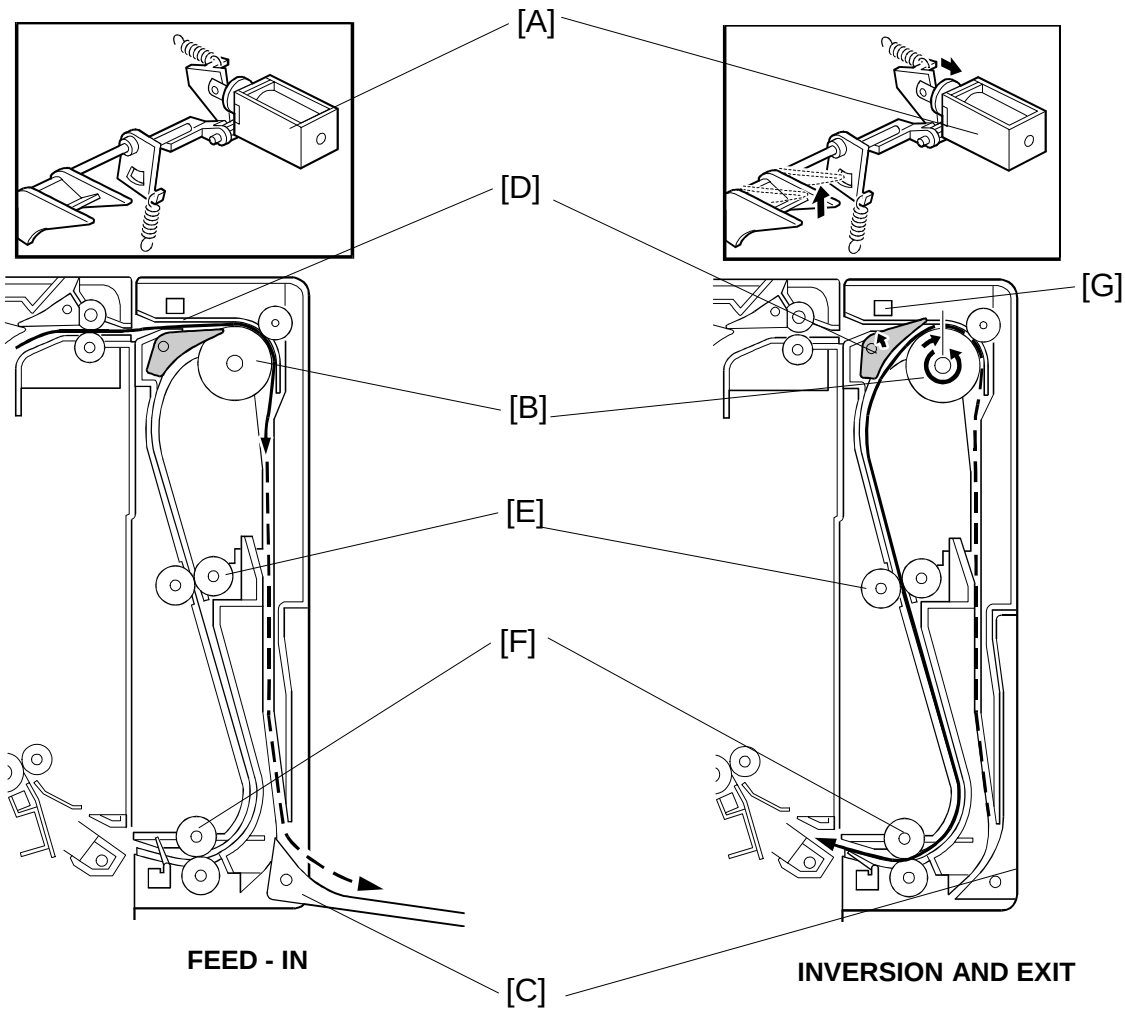
The duplex unit can store two sheets of copy paper

Example: 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).





2.2 FEED IN AND EXIT MECHANISM



Feed-in

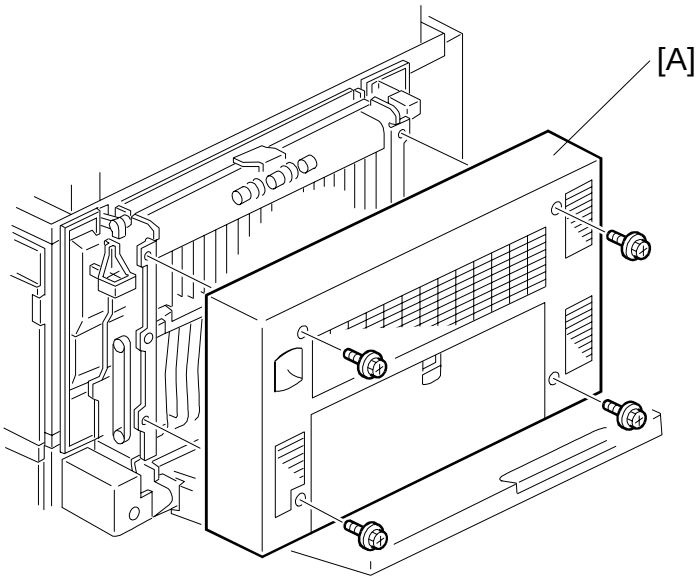
The inverter gate solenoid [A] stays off and the inverter roller [B] rotates clockwise. A sheet of paper is sent to the inverter section. The inverter section can stack sizes of up to A4 lengthwise when the cover guide [C] is closed. Therefore, the user must open the cover guide when using larger sizes of paper (longer than A4/LT lengthwise).

Inversion and Exit

The inverter gate solenoid turns on and the inverter motor turns on in reverse shortly after the trailing edge of the paper passes through the entrance sensor [G]. As a result, the inverter gate [D] is opened and the inverter roller rotates counterclockwise. The paper is sent to the copier through the upper and lower transport rollers [E, F].

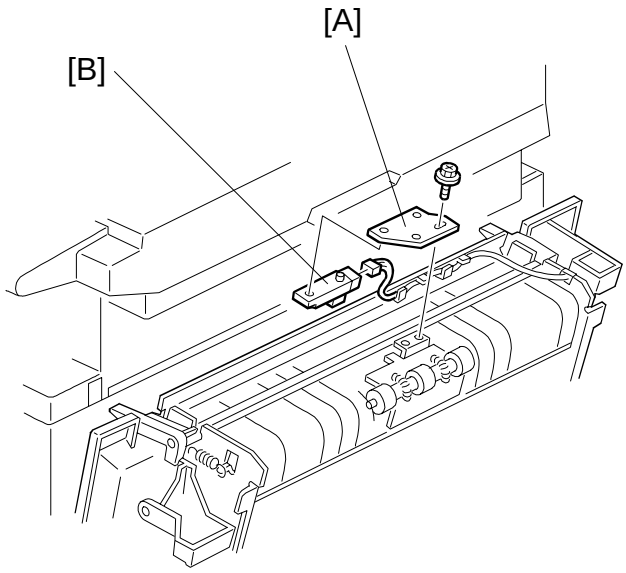
3. REPLACEMENT AND ADJUSTMENT

3.1 COVER REMOVAL



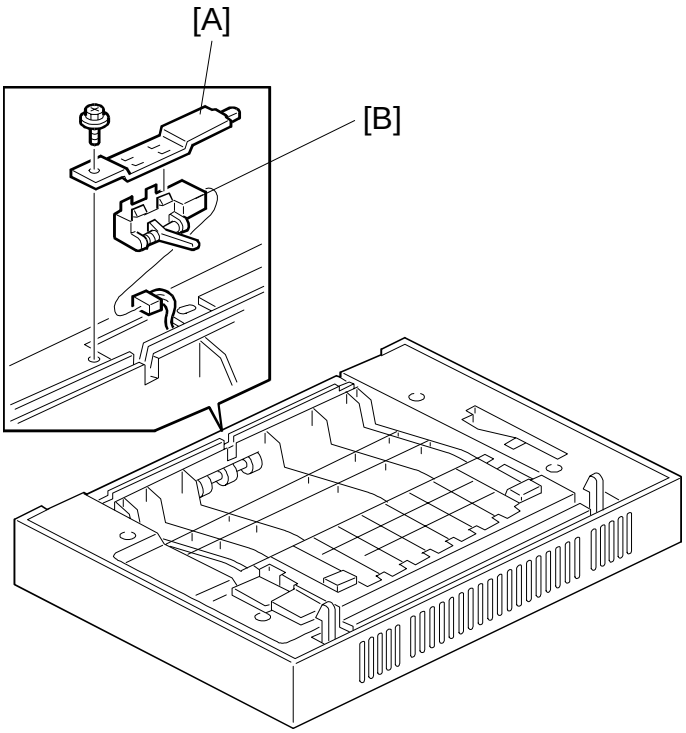
1. Remove the duplex unit cover [A] (4 screws).

3.2 ENTRANCE SENSOR REPLACEMENT



1. Remove the duplex unit cover.
2. Remove the sensor holder [A] (1 screw).
3. Replace the entrance sensor [B] (1 connector).

3.3 EXIT SENSOR REPLACEMENT



1. Remove the duplex unit.
2. Remove the sensor bracket [A] (1 screw).
3. Replace the exit sensor [B] (1 connector).

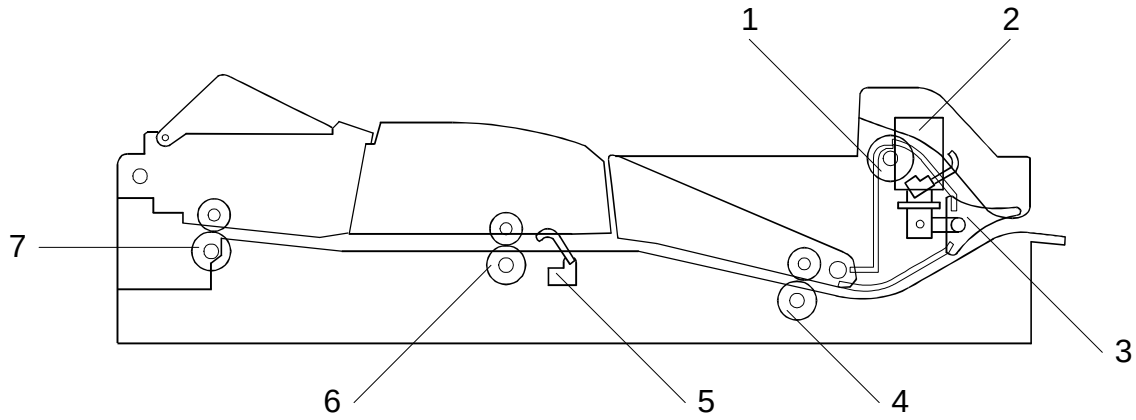
BRIDGE UNIT A688

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

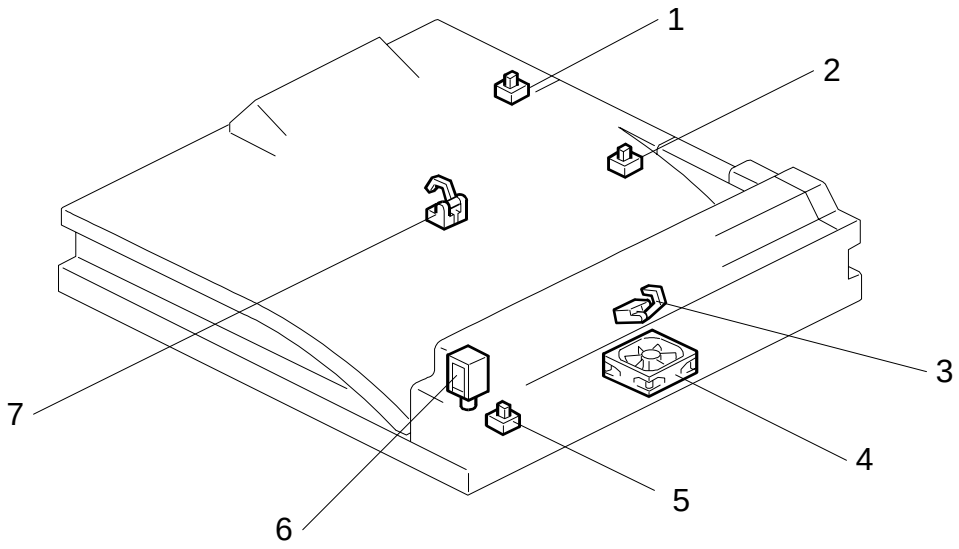
Paper Size:	Standard sizes A6 lengthwise to A3 HLT to DLT Non-standard sizes Width: 100 to 305 mm Length: 148 to 432 mm
Paper Weight:	52 g/m^2 ~ 135 g/m^2, 16 lb ~ 42 lb

1.2 MECHANICAL COMPONENT LAYOUT



1. Upper Exit Roller
2. Junction Gate Solenoid
3. Junction Gate
4. 1st Transport Roller
5. Relay Sensor
6. 2nd Transport Roller
7. Left Exit Roller

1.3 ELECTRICAL COMPONENT LAYOUT

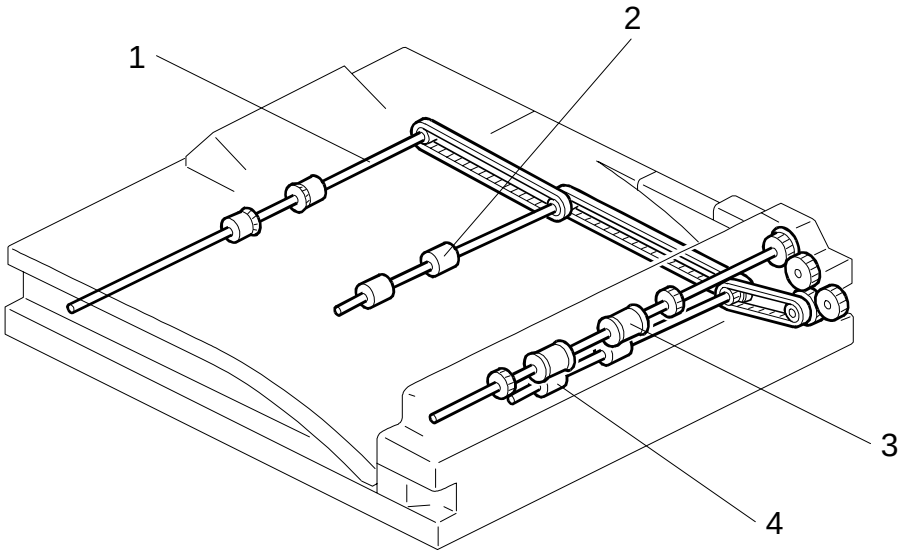


1. Left Guide Switch
2. Right Guide Switch
3. Tray Exit Sensor
4. Cooling Fan Motor
5. Tray Exit Unit Switch
6. Junction Gate Solenoid
7. Relay Sensor

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Cooling Fan	Cools the transport unit.	4
Sensors			
S1	Tray Exit	Checks for misfeeds.	3
S2	Relay	Checks for misfeeds.	7
Switches			
SW1	Tray Exit Unit	Detects when the tray exit unit is opened.	5
SW2	Right Guide	Detects when the right guide is opened.	2
SW3	Left Guide	Detects when the left guide is opened.	1
Solenoids			
SOL1	Junction Gate	Moves the junction gate to direct the paper to the upper or left tray.	6

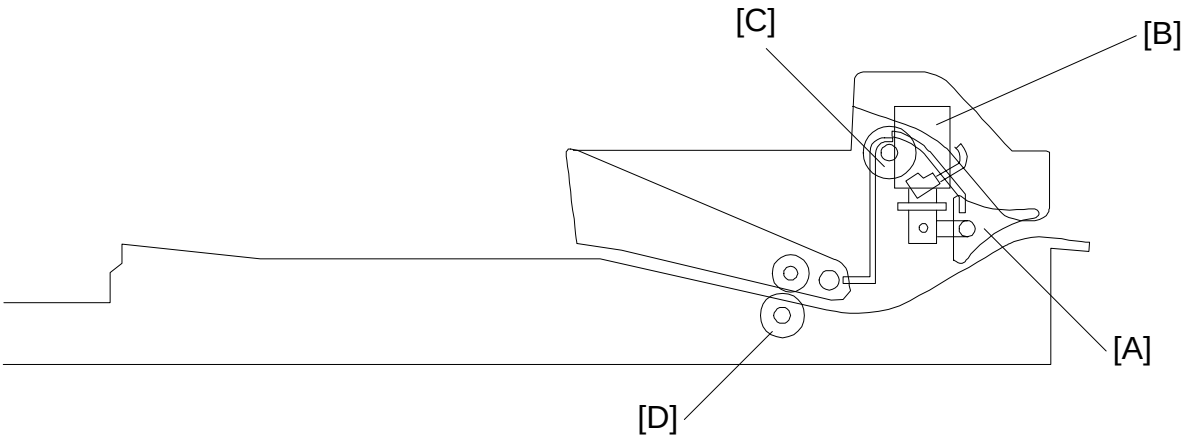
1.5 DRIVE LAYOUT



1. Left Exit Roller
2. 2nd Transport Roller
3. Upper Exit Roller
4. 1st Transport Roller

2. DETAILED DESCRIPTION

2.1 JUNCTION GATE MECHANISM



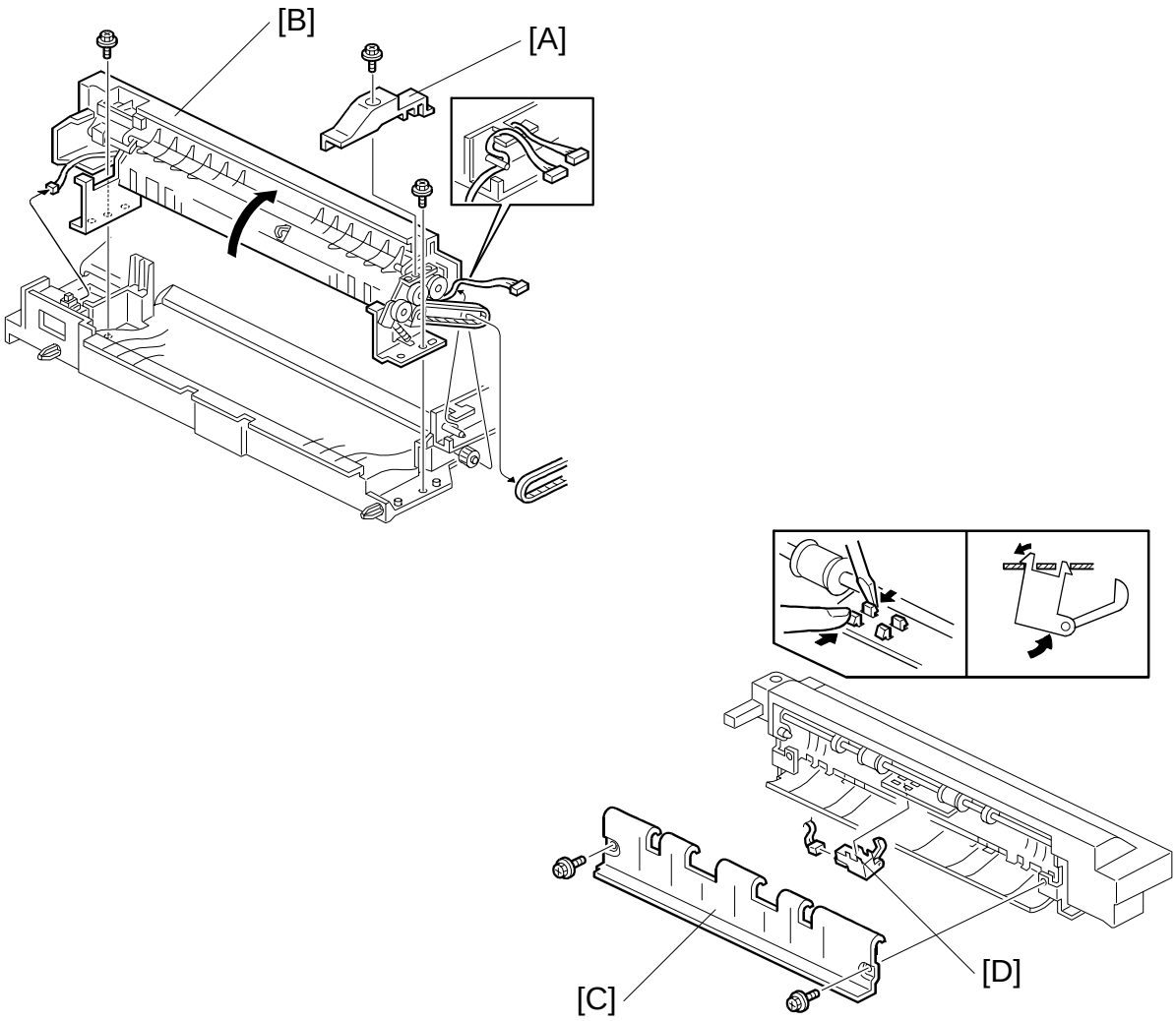
Depending on the selected mode, the copies are directed up or down by the junction gate [A], which is controlled by the junction gate solenoid [B].

When the upper tray is selected, the junction gate solenoid turns on and the paper is sent to the upper tray through the upper exit roller [C].

When the left tray or the finisher is selected, the junction gate stays off and the paper is sent to the left tray or the finisher through the transport rollers [D] and the left exit roller.

3. REPLACEMENT AND ADJUSTMENT

3.1 EXIT SENSOR REPLACEMENT



1. Remove the whole unit from the copier.
2. Remove the rear upper cover [A] (1 screw).
3. Remove the upper cover unit [B] (2 screws, 2 connectors, Timing Belt).
4. Remove the exit guide plate [C] (2 screws).
5. Replace the exit sensor [D] (1 connector).

1,000-SHEET FINISHER A681

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Paper Size:
No staple mode:
A3 to A6 lengthwise
DLT to HLT lengthwise
Staple mode:
A3, B4, A4, B5 sideways
DLT to LT

Paper Weight:
No staple mode: 52 ~ 157 g/m^2, 16 ~ 42 lb
Staple mode: 64 ~ 80 g/m^2, 17 ~ 21 lb

Stapler Capacity:
20 sheets (A3, B4, DLT, LG)
30 sheets (A4, B5 sideways, LT)

Paper Capacity:
No staple mode:
1,000 sheets (A4/LT or smaller: 80 g/m^2, 21 lb)
500 sheets (A3, B4, DLT, LG: 80 g/m^2, 21 lb)
Staple mode: (80 g/m^2, 21 lb, number of sets)

Size of each set / Size	2 to 10		11 to 20	21 to 30
	2 to 5	6 to 10		
A4/LT sideways B5 sideways	100	85	40	25
A4/LT lengthwise	50		25	15
A3, B4, DLT, LG	50		25	—

Staple Positions: 1

Staple Replenishment: Cartridge (3,000 staples/cartridge)

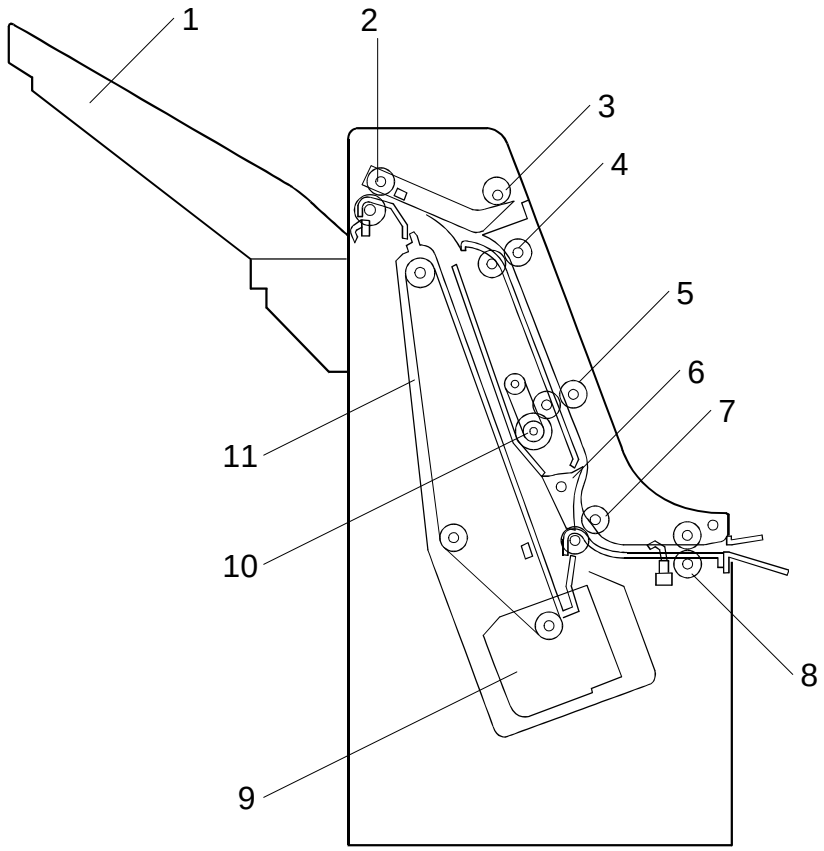
Power Source: 24 Vdc, 5 Vdc (from the copier)

Power Consumption: 48 W

Weight: 21 kg

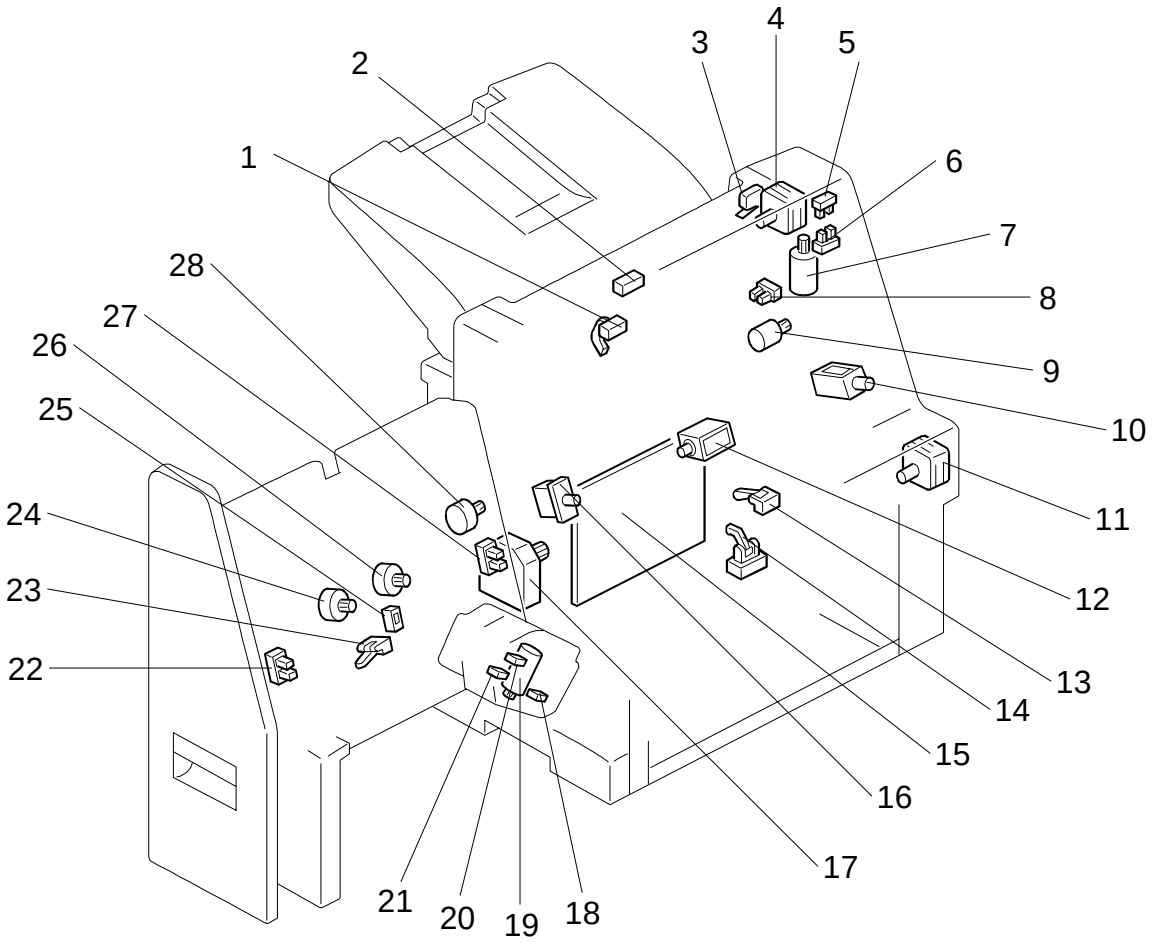
Dimensions (W x D x H): 568 x 520 x 625 mm

1.2 MECHANICAL COMPONENT LAYOUT



1. Shift Tray
2. Exit Roller
3. Exit Roller Release Cam
4. Upper Transport Roller
5. Middle Transport Roller
6. Junction Gate
7. Lower Transport Roller
8. Entrance Roller
9. Stapler Unit
10. Positioning Roller
11. Stack Feed-out Belt

1.3 ELECTRICAL COMPONENT LAYOUT



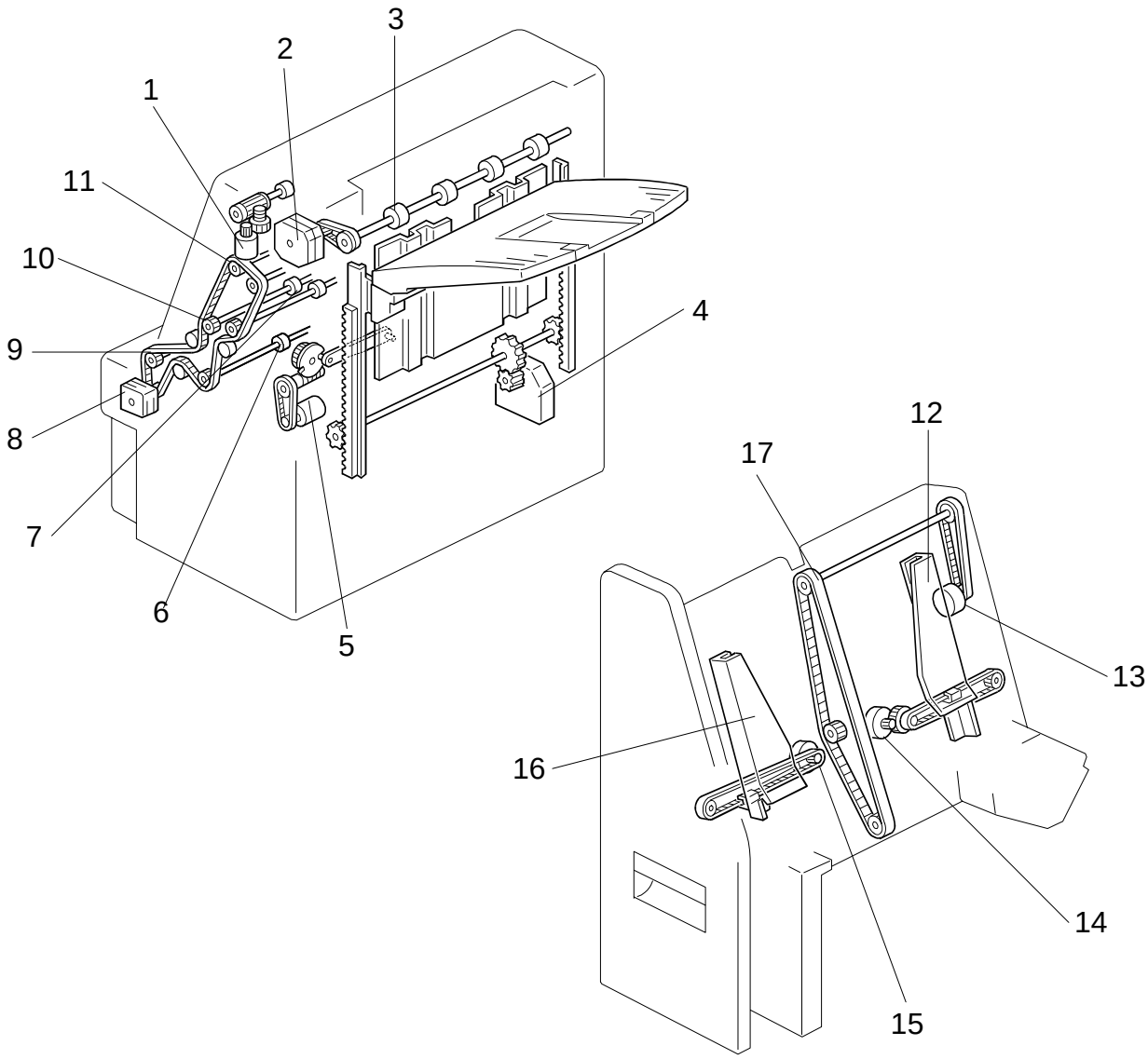
1. Stack Height Sensor
2. Exit Sensor
3. Shift Tray Upper Limit Switch
4. Exit Motor
5. Exit Guide Plate Open Sensor
6. Exit Guide Plate HP Sensor
7. Exit Guide Plate Motor
8. Shift Tray Half-turn Sensor
9. Shift Motor
10. Junction Gate Solenoid
11. Transport Motor
12. Positioning Roller Solenoid
13. Shift Tray Lower Limit Sensor
14. Entrance Sensor
15. Main Board
16. Right Cover Safety Switch
17. Shift Tray Lift Motor
18. Staple Hammer HP Sensor
19. Staple Hammer Motor
20. Cartridge Set Switch
21. Staple End Switch
22. Jogger Fence HP Sensor
23. Stack Feed-out Belt HP Sensor
24. Jogger Fence Motor
25. Jogger Unit Paper Sensor
26. Rear Fence Motor
27. Rear Fence HP Sensor
28. Stack Feed-out Motor

1.4 ELECTRICAL COMPONENT DESCRIPTIONS

Symbol	Name	Function	Index No.
Motors			
M1	Transport	Drives the entrance roller, transport rollers, and positioning roller.	11
M2	Jogger Fence	Drives the jogger fence.	24
M3	Rear Fence	Drives the rear fence.	26
M4	Staple Hammer	Drives the staple hammer.	19
M5	Stack Feed-out	Drives the stack feed-out belt.	28
M6	Exit Guide Plate	Opens and closes the exit guide plate.	7
M7	Exit	Drives the exit roller.	4
M8	Shift Tray Lift	Moves the shift tray up or down.	17
M9	Shift	Moves the shift tray from side to side.	9
Sensors			
S1	Entrance	Detects copy paper entering the finisher and checks for misfeeds.	14
S2	Jogger Unit Paper	Detects copy paper in the jogger unit.	25
S3	Jogger Fence HP	Detects the home position of the jogger fence.	22
S4	Rear Fence HP	Detects the home position of the rear fence.	27
S5	Stack Feed-out Belt HP	Detects the home position of the stack feed-out belt.	23
S6	Staple Hammer HP	Detects the staple hammer home position.	18
S7	Exit Guide Plate HP	Detects the home position of the exit guide plate.	6
S8	Exit Guide Plate Open	Detects whether the exit guide plate is opened or not.	5
S9	Exit	Checks for misfeeds.	2
S10	Stack Height	Detects the top of the copy paper stack.	1
S11	Shift Tray Lower Limit	Detects the lower limit position of the shift tray.	13
S12	Shift Tray Half-turn	Detects the stop position of the shift tray during the side-to-side movement.	8
Solenoids			
SOL1	Junction Gate	Drives the junction gate.	10
SOL2	Positioning Roller	Moves the positioning roller.	12

Symbol	Name	Function	Index No.
Switches			
SW1	Shift Tray Upper Limit	Detects the upper limit position of the shift tray.	3
SW2	Right Cover Safety	Cuts the dc power when the right cover is opened.	16
SW3	Cartridge Set	Detects whether a staple cartridge is installed.	20
SW4	Staple End	Detects staples in the cartridge.	21
PCBs			
PCB1	Main	Controls the finisher and communicates with the copier.	15

1.5 DRIVE LAYOUT

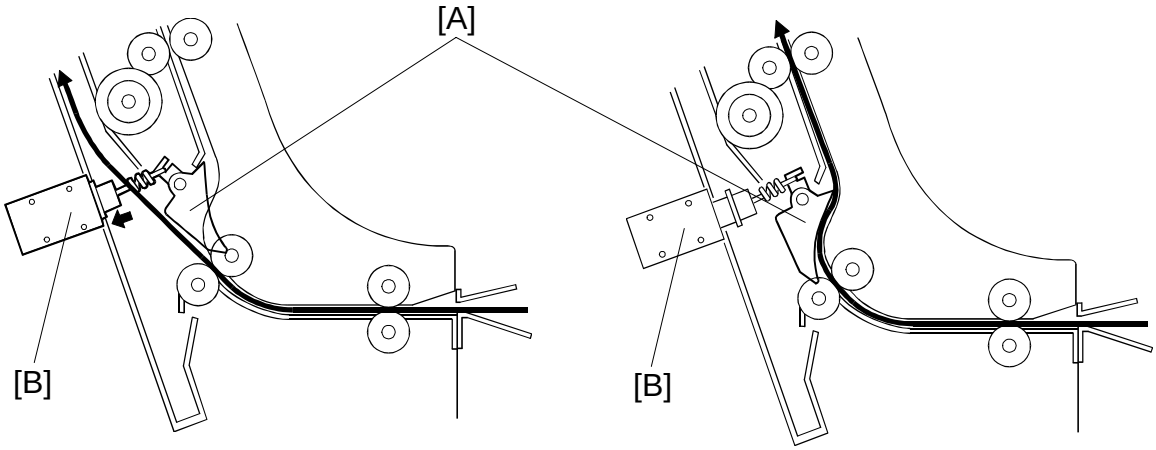


1. Exit Guide Plate Motor
2. Exit Motor
3. Exit Roller
4. Shift Tray Lift Motor
5. Shift Motor
6. Lower Transport Roller
7. Positioning Roller Drive Roller
8. Transport Motor
9. Entrance Roller
10. Middle Transport Roller
11. Upper Transport Roller
12. Rear Fence
13. Stack Feed-out Motor
14. Rear Fence Motor
15. Jogger Fence Motor
16. Jogger Fence
17. Stack Feed-out Belt

2. DETAILED DESCRIPTIONS

2.1 JUNCTION GATE MECHANISM

- Staple mode - **- No staple mode -**



Depending on the selected finishing mode, the copies are directed to the left or right by the junction gate [A], which is controlled by the junction gate solenoid [B]. This happens when the exit sensor of the copier turns on.

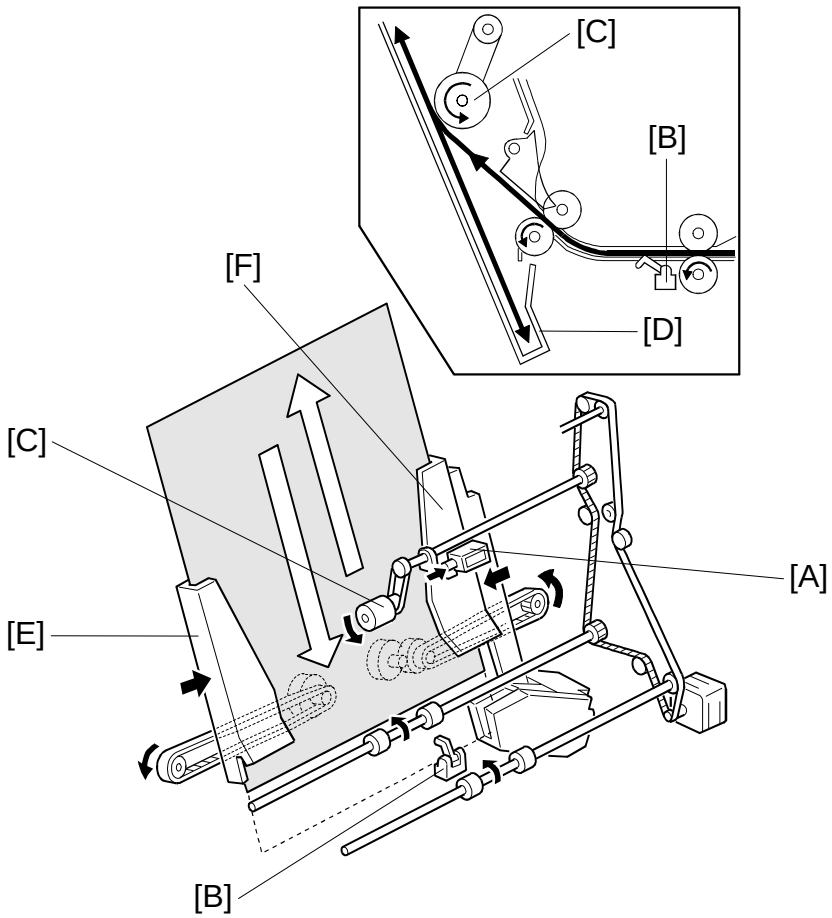
Staple mode

When the exit sensor of the copier turns on, the junction gate solenoid is energized. The paper is sent to the jogger unit.

No staple mode

The junction gate solenoid stays off and the paper is sent to the shift tray directly.

2.2 JOGGER UNIT PAPER POSITIONING MECHANISM



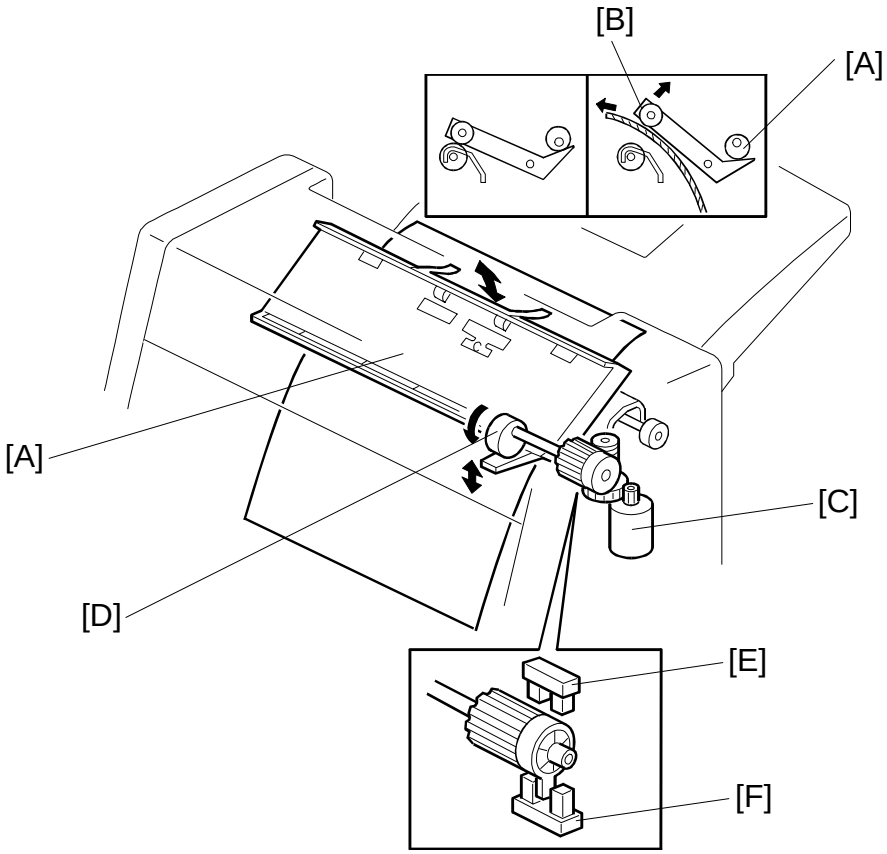
In staple mode, each sheet of copy paper is vertically and horizontally aligned when it arrives in the jogger unit.

For the vertical paper alignment, the positioning roller solenoid [A] turns on shortly after the entrance sensor [B] turns off and the positioning roller [C] pushes the copy against the bottom of stack stopper [D].

For the horizontal paper alignment, the jogger fence [E] and the rear fence [F] move to the waiting position, which is 10 mm away from the side of the paper. After the vertical position is aligned, the jogger fence pushes the paper 20 mm against the rear fence to align the paper horizontally. Then the jogger fence moves back to the previous position.

The stapler is mounted on the rear fence.

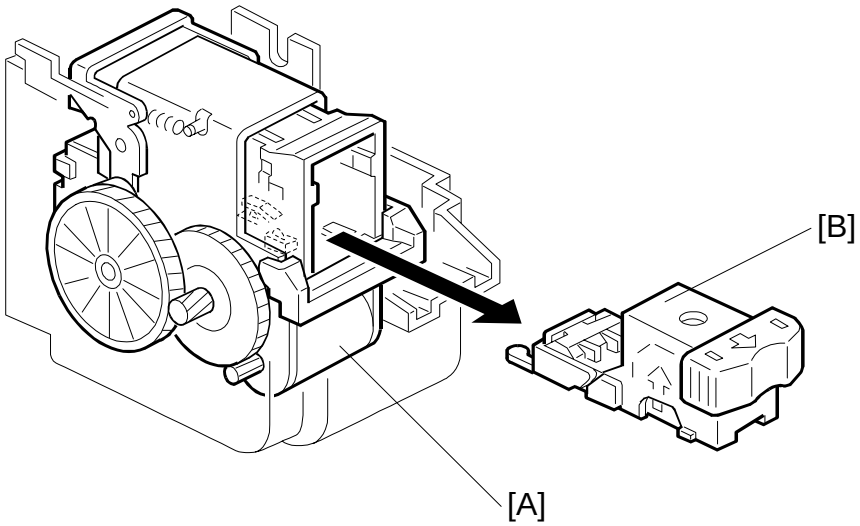
2.3 EXIT GUIDE PLATE OPEN/CLOSE MECHANISM



When stacking a large size of paper (such as A3, DLT) in the jogger unit, the leading edge of the paper reaches the exit rollers. To prevent the paper from running into the exit rollers and not being aligned correctly, the exit guide plate [A] is moved up and this makes a gap between the exit rollers [B]. This operation is done at all paper sizes, but is only needed for the larger sizes.

The exit guide plate motor [C] and exit roller release cam [D] control the exit guide plate movement. When the exit guide plate motor starts, the cam turns and the exit guide plate is moved up. When the exit guide plate open sensor [E] turns on, the motor stops. When stapling is finished, the exit guide plate motor turns on again to close the exit guide plate. When the exit guide plate HP sensor [F] turns on, the motor stops.

2.4 STAPLER



The stapler is mounted on the rear fence. When the rear fence moves, the stapler moves.

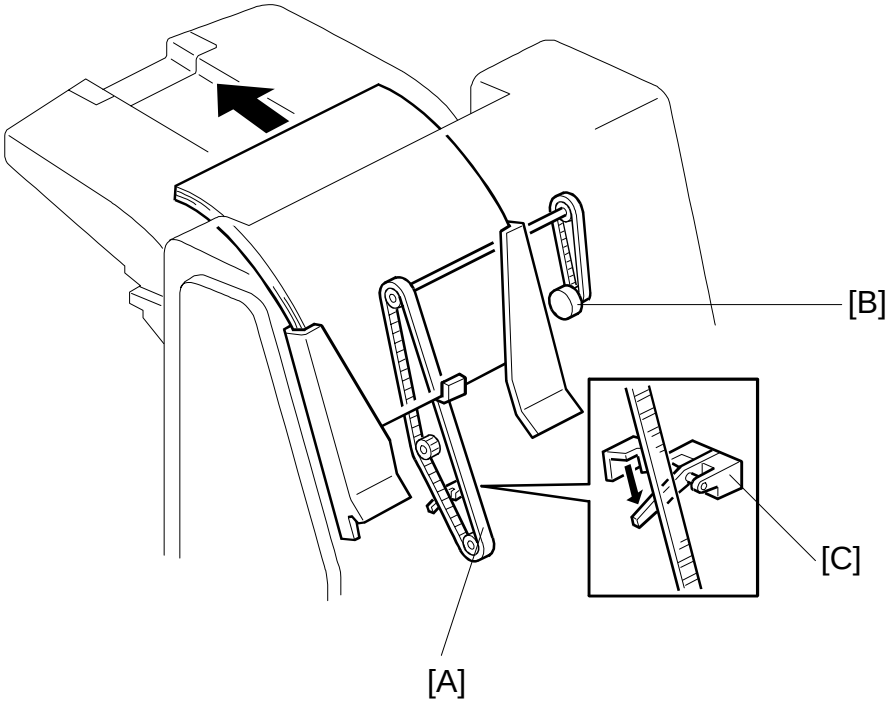
The staple hammer is driven by the stapler hammer motor [A].

When excessive load is applied to the staple hammer motor, the copier detects a staple jam. When a staple jam has occurred, the jammed staple is inside the staple cartridge [B]. Therefore, the jammed staple can be removed easily after pulling out the staple cartridge.

If there is no staple cartridge in the stapler unit or no staples in the staple cartridge, staple end is indicated on the operation panel.

This machine has only one stapling position.

2.5 FEED OUT MECHANISM



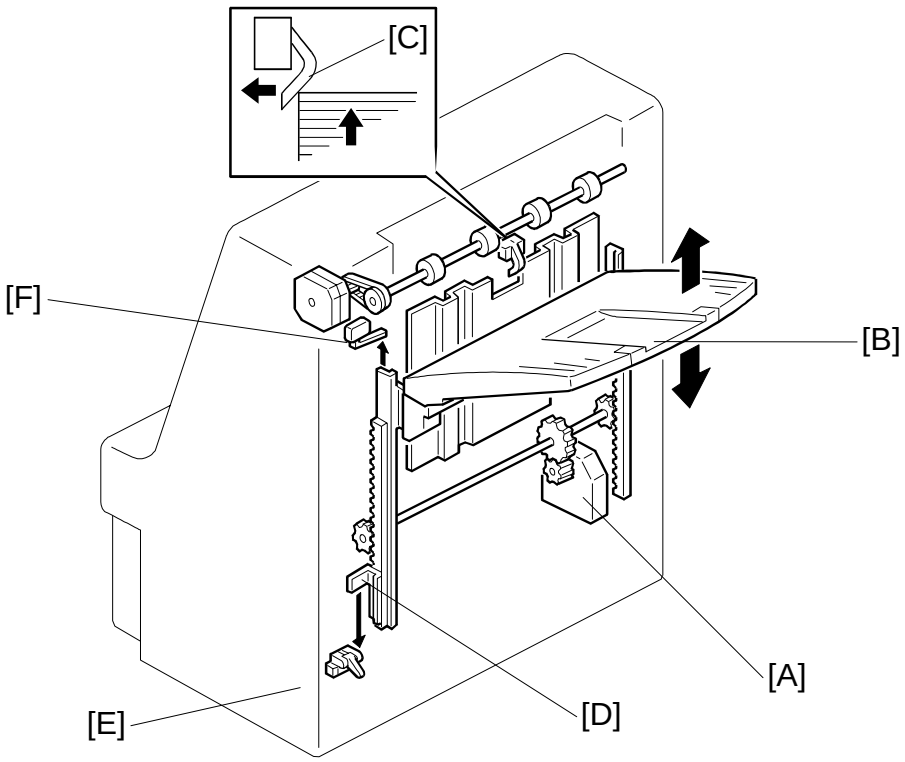
The stack feed-out belt [A] and the exit roller feed out the set of stapled copies.

After the copies have been stapled, the stack feed-out motor [B] turns on to drive the stack feed-out belt.

When the leading edge of the copies reaches the exit rollers, the exit guide plate motor turns on and the exit roller comes down to transport the set of stapled copies. Shortly afterwards, the stack feed-out motor stops, and the exit motor feeds out the stack.

When the stack has been fed out to the shift tray, the stack feed-out motor turns on again. When the stack feed-out belt HP sensor [C] turns on, the stack feed-out motor turns off.

2.6 SHIFT TRAY UP/DOWN MECHANISM



The shift tray lift motor [A] controls the vertical position of the shift tray [B] through some gears. Just after the main switch is turned on, the tray is initialized at the upper position. The tray upper position is detected when the stack height sensor [C] is activated by the shift tray.

During copying, every ten copies in no staple mode or for each set of copies in staple mode, the shift tray is lowered until the stack height sensor turns off then raised until the stack height sensor turns on, and lowered again until the stack height sensor turns off.

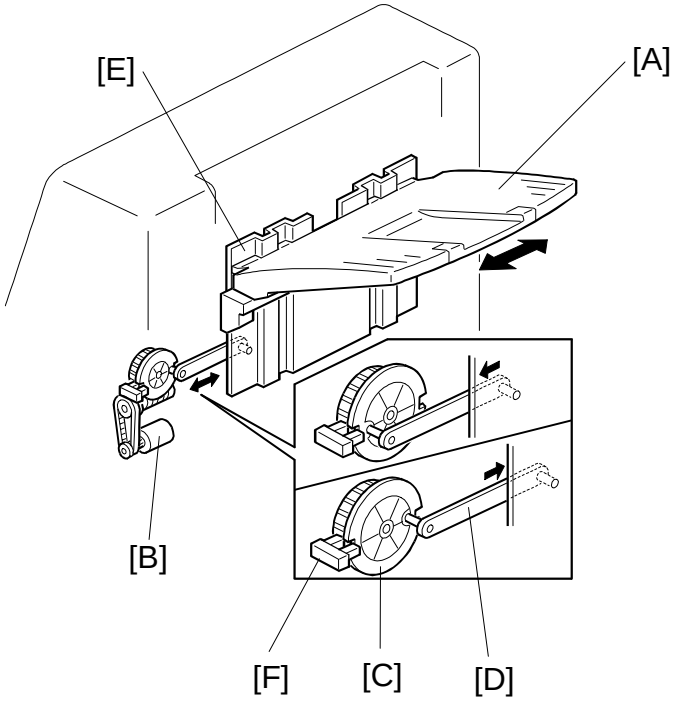
In either mode, the shift tray will rise when the user takes the stack of paper from the tray during copying.

When the shift tray reaches its lower limit, the actuator [D] turns on the shift tray lower limit sensor [E], and copying stops.

When the stack height sensor stays off for 2 seconds in standby mode, the shift tray is raised till the stack height sensor turns on.

The shift tray upper limit switch [F] prevents the drive gears from being damaged if the stack height sensor fails. When the shift tray turns on the shift tray upper limit switch, the switch cuts the power to the shift tray lift motor.

2.7 SHIFT TRAY SIDE-TO-SIDE MECHANISM



In the sort/stack mode, the shift tray [A] moves from side to side to separate the sets of copies.

The horizontal position of the shift tray is controlled by the shift motor [B] and the shift gear disk [C]. After one set of copies is made and delivered to the shift tray, the shift motor turns on, driving the shift gear disk and the link [D]. The end fence [E] is positioned by the link, creating the side-to-side movement.

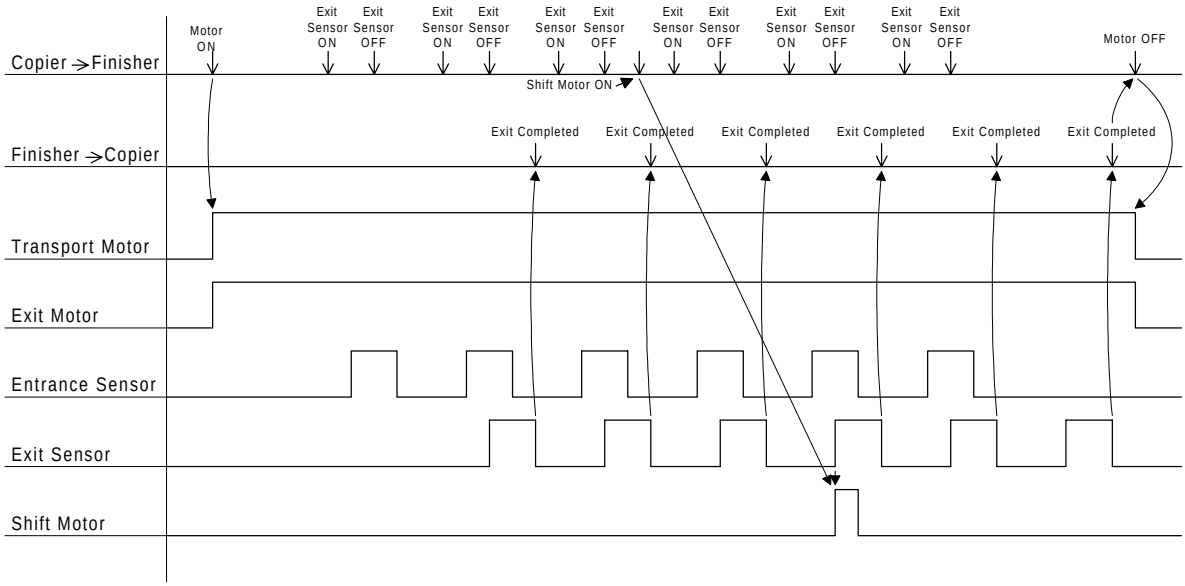
When the shift gear disk has rotated 180 degrees (when the shift tray is fully shifted across), the cut-out in the shift gear disk turns on the shift tray half-turn sensor [F] and the shift motor stops. The next set of copies is then delivered. The motor turns on, repeating the same process and moving the tray back to the previous position.

2.8 JAM CONDITIONS

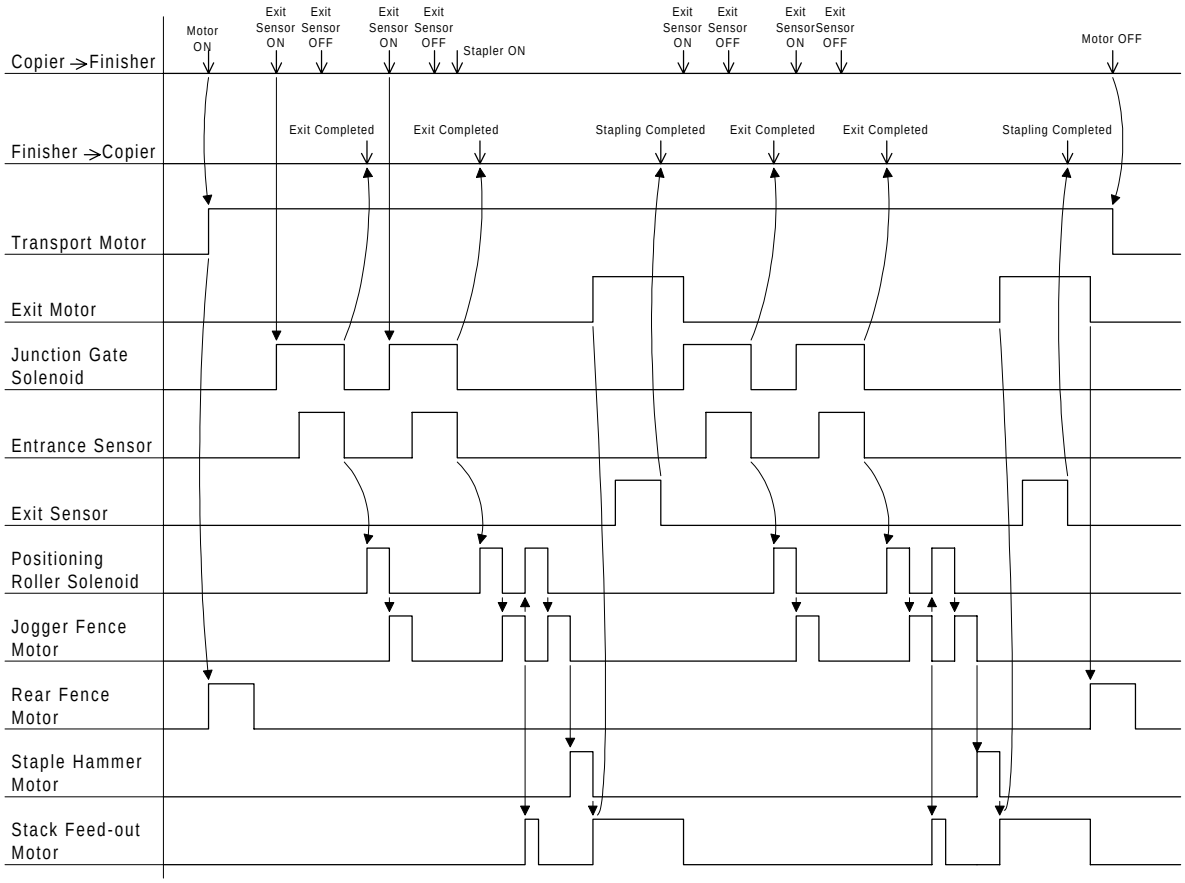
1. When the entrance sensor does not turn off within 1,000 ms after it turns on.
2. When the exit sensor does not turn off within 1,000 ms after it turns on.
3. When the exit sensor does not turn on in no staple mode within 1,250 ms after the entrance sensor turns on.

2.9 TIMING CHARTS

2.9.1 NO STAPLE MODE (A4 SIDEWAYS, 3 SHEETS/2SETS)



2.9.2 STAPLE MODE (A4 SIDEWAYS, 2 SHEETS/2 SETS)



3. SERVICE TABLE

3.1 DIP SWITCH TABLE

DPS101				Description
1	2	3	4	
0	0	0	0	Default
1	1	1	0	Free run: staple mode
1	1	0	1	Free run: no-staple mode

3.2 TEST POINTS

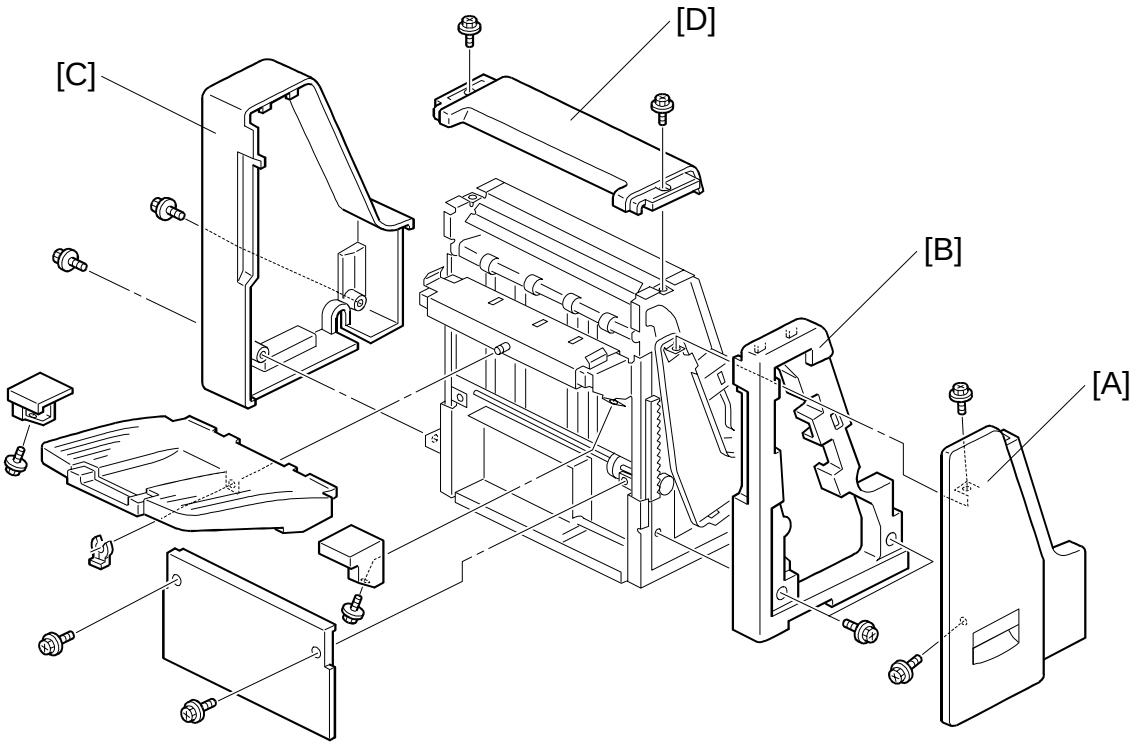
No.	Label	Monitored Signal
TP100	(5 V)	+5 V
TP101	(GND)	Ground

3.3 FUSES

No.	Function
FU100	Protects the 24 V line.

4. REPLACEMENT AND ADJUSTMENT

4.1 COVER REMOVAL



Front Door

1. Remove the front door [A] (2 screws).

Front Cover

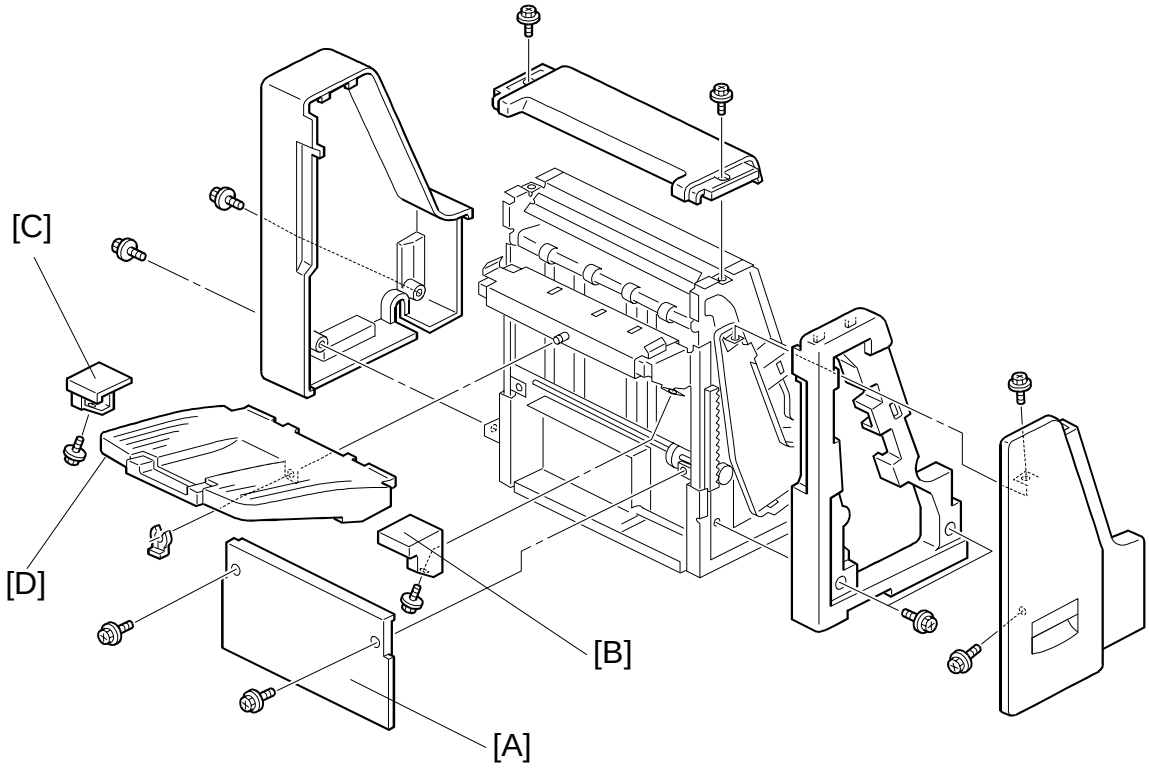
1. Remove the front door.
2. Remove the front cover [B] (2 screws).

Rear Cover

1. Remove the rear cover [C] (2 screws).

Upper Cover

1. Remove the front door.
2. Remove the front cover.
3. Remove the rear cover.
4. Remove the upper cover [D] (2 screws).



Lower Left Cover

1. Remove the lower left cover [A] (2 screws).

Front Shift Tray Cover

1. Remove the front shift tray cover [B] (1 screw).

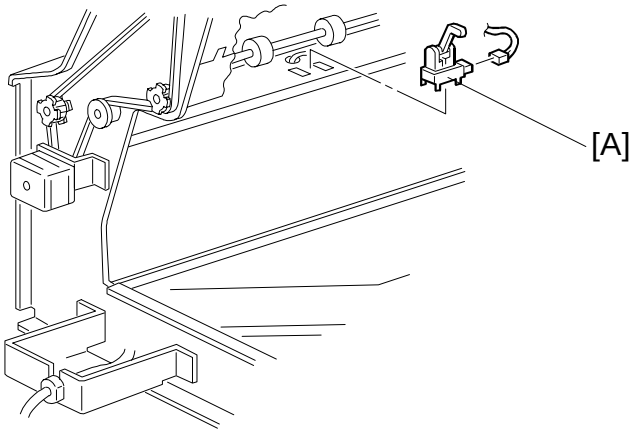
Rear Shift Tray Cover

1. Remove the rear shift tray cover [C] (1 screw).

Shift Tray

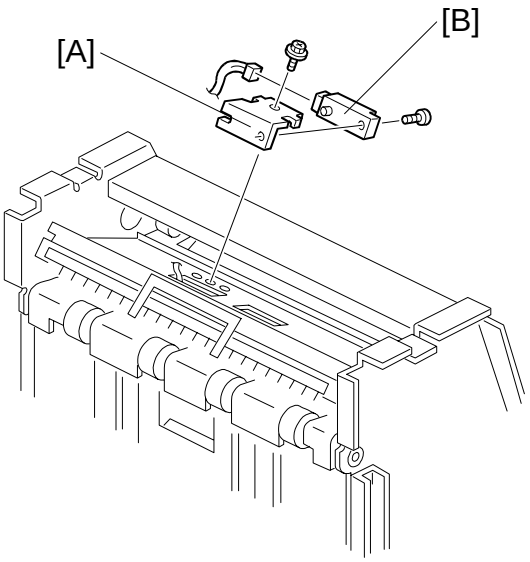
1. Remove the shift tray [D] (1 snap ring).

4.2 ENTRANCE SENSOR REPLACEMENT



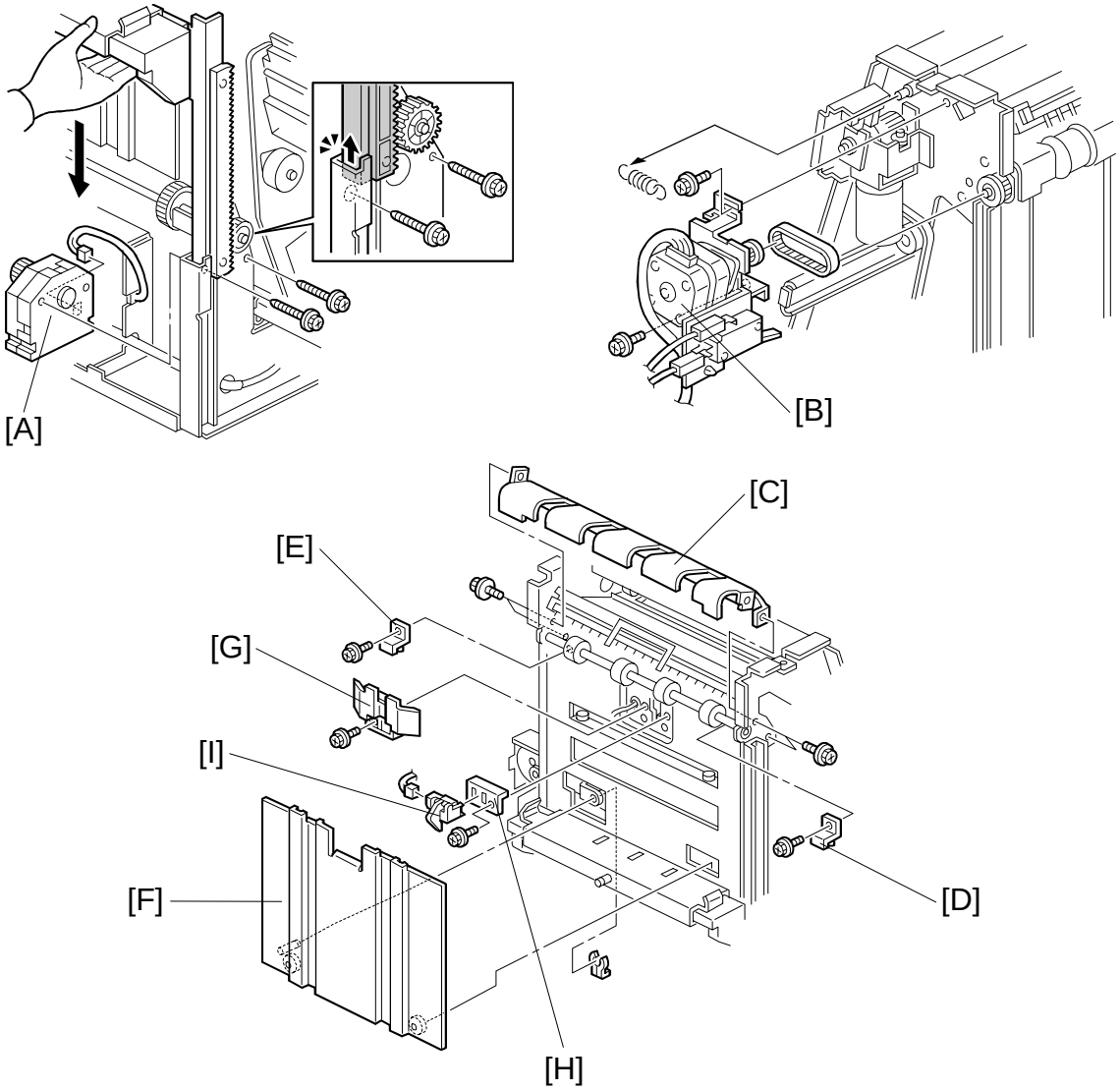
1. Remove the finisher from the copier.
2. Replace the entrance sensor [A] (1 connector).

4.3 EXIT SENSOR REPLACEMENT



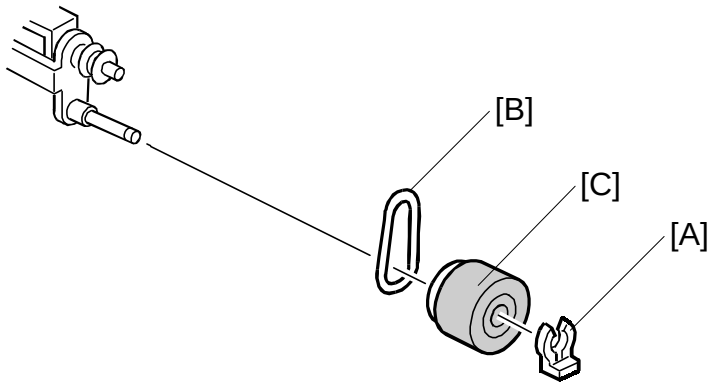
1. Remove the upper cover.
2. Remove the exit sensor bracket [A] (1 screw).
3. Replace the exit sensor [B] (1 screw, 1 connector).

4.4 STACK HEIGHT SENSOR REPLACEMENT



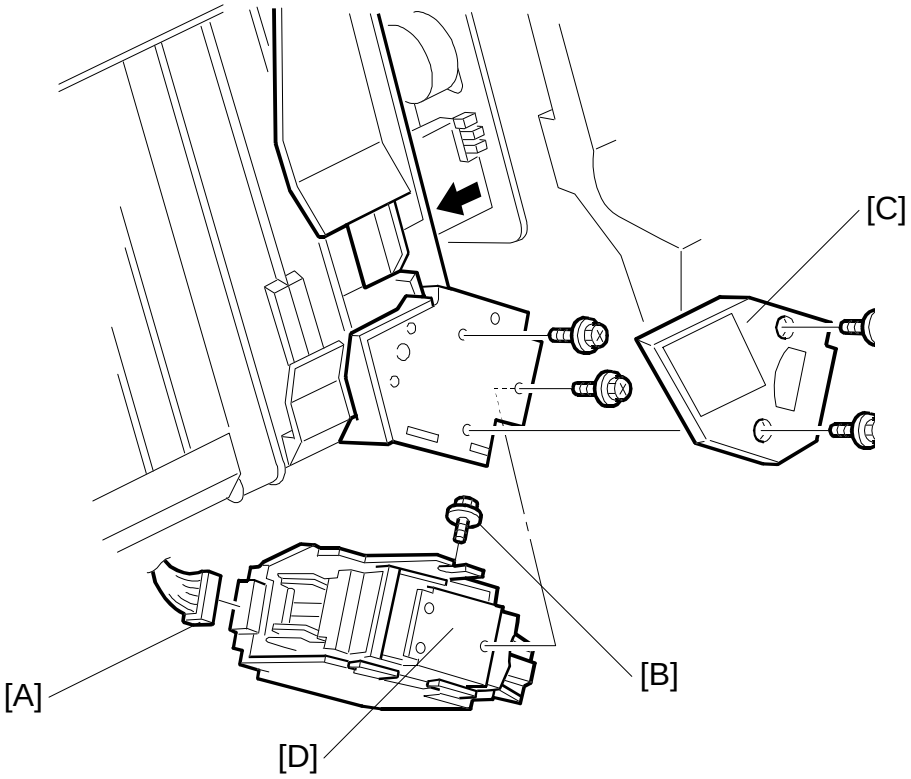
1. Remove the front cover.
2. Remove the shift tray lift motor [A] (2 screws).
   NOTE: The shift tray must be pulled up to remove the two screws.
3. Remove the rear cover.
4. Remove the exit motor unit [B] (2 screws, 1 spring, 1 timing belt).
5. Remove the lower exit guide [C] (4 screws).
6. Remove the front and rear end fence holders [D,E] (1 screw each).
7. Remove the end fence [F] (1 snap ring).
8. Remove the stack height sensor cover [G] (1 screw).
9. Remove the stack height sensor bracket [H] (1 screw).
10. Replace the stack height sensor [I] (1 connector).

4.5 POSITIONING ROLLER REPLACEMENT



1. Pull out the jogger unit.
2. Remove the snap ring [A].
3. Release the rubber belt [B].
4. Remove the positioning roller [C].

4.6 STAPLER REPLACEMENT



1. Pull out the jogger unit.
2. Disconnect the stapler connector [A].
3. Remove the lower cover screw [B].
4. Remove the upper cover [C] (2 screws).
5. Remove the stapler with the lower cover [D] (2 screws).
6. Release the harness from the lower cover.
7. Replace the stapler.

⇒4.7 ROM HISTORY

A681 Firmware Modification History (1000 Sheet Finisher)			
Description of Modification	**Level**	**Prod. Date**	**Ver.**
Corrects the following: • Paper jams due to an error in the vertical movement of the tray.	A6815103K	NA	K
Corrects the following: • Jams that occur when the door is opened during a staple job. • After the power is turned on, the copier reaches ready status even though the shift tray lower limit sensor is on (and the stack is full). A jam occurs if a copy job is started.	A6815103J	NA	J
Corrects the following: • The mainframe locks up during jam recovery. The frequency of occurrence is extremely low. • The user cancels the staple job when there is only one sheet in the staple tray and the sheet is automatically removed from the tray. A paper jam occurs when the next sheet is fed for stapling.	A6815103H	NA	H
Corrects the following: • The jam detection timing has been changed so the A681 can also be used with the A265 and A267. This change has no effect on the A232 series.	A6815103G	NA	G
Corrects the following: • Stapled paper did not stack straight.	A6815103F	NA	F
Corrects the following: • Paper rolling on the shift tray.	A6815103E	NA	E

3,000-SHEET FINISHER A697

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

The punch unit is an option for this machine.

Paper Size:

No punch mode
- Shift Tray: A3 to B5/DLT to LT (B6 lengthwise in no shift mode and no staple mode)
- Upper Tray: A3 to A6 lengthwise/DLT to HLT

Punch mode
- 2 holes: A3 to A5/DLT to LT
- 3 holes: A3, B4, A4 sideways, B5 sideways DLT, LT sideways

Paper Weight:

No punch mode
- No staple mode: 52 g/m^2 ~ 157 g/m^2, 14 ~ 42 lb
- Staple mode: 64 g/m^2 ~ 80 g/m^2, 17 ~ 21 lb

Punch mode
- 2 holes: 52 g/m^2 ~ 128 g/m^2, 14 ~ 34 lb
- 3 holes: 52 g/m^2 ~ 105 g/m^2, 14 ~ 28 lb

Paper Capacity:

Shift tray/no staple mode (80 g/m^2, 20 lb):

	Punch mode	No punch mode
A4 sideways LT sideways	2,500 sheets	3,000 sheets
Other sizes	1,500 sheets	1,500 sheets

Shift tray/staple mode/punch mode (80 g/m^2, 20 lb):

	Pages/set	Sets
B5, A4 lengthwise LT lengthwise	2 to 9	150
	10 to 40	150 to 37
A4 sideways LT sideways	2 to 9	150
	10 to 40	250 to 63
Other sizes	2 to 9	100
	10 to 25	150 to 60

Shift tray/staple mode/no punch mode (80 g/m^2, 20 lb):

	Pages/set	Sets
B5, A4 lengthwise LT lengthwise	2 to 9	150
	10 to 50	150 to 30
A4 sideways LT sideways	2 to 9	150
	10 to 50	300 to 60
Other sizes	2 to 9	100
	10 to 30	150 to 50

Upper tray (80 g/m^2, 20 lb):

	Punch mode	No punch mode
A4/LT or smaller	200 sheets	250 sheets
Larger than A4/LT	50 sheets	50 sheets

Stapler Capacity (pages/set, 80 g/m^2, 20 lb paper):

	Punch mode	No punch mode
A4/LT or smaller	40 sheets	50 sheets
Larger than A4/LT	25 sheets	30 sheets

Staple Position: 4 positions
1 staple: 3 positions
(Front, Rear, Rear-Oblique)
2 staple: 1 position

Staple Replenishment: Cartridge (5,000 staples)

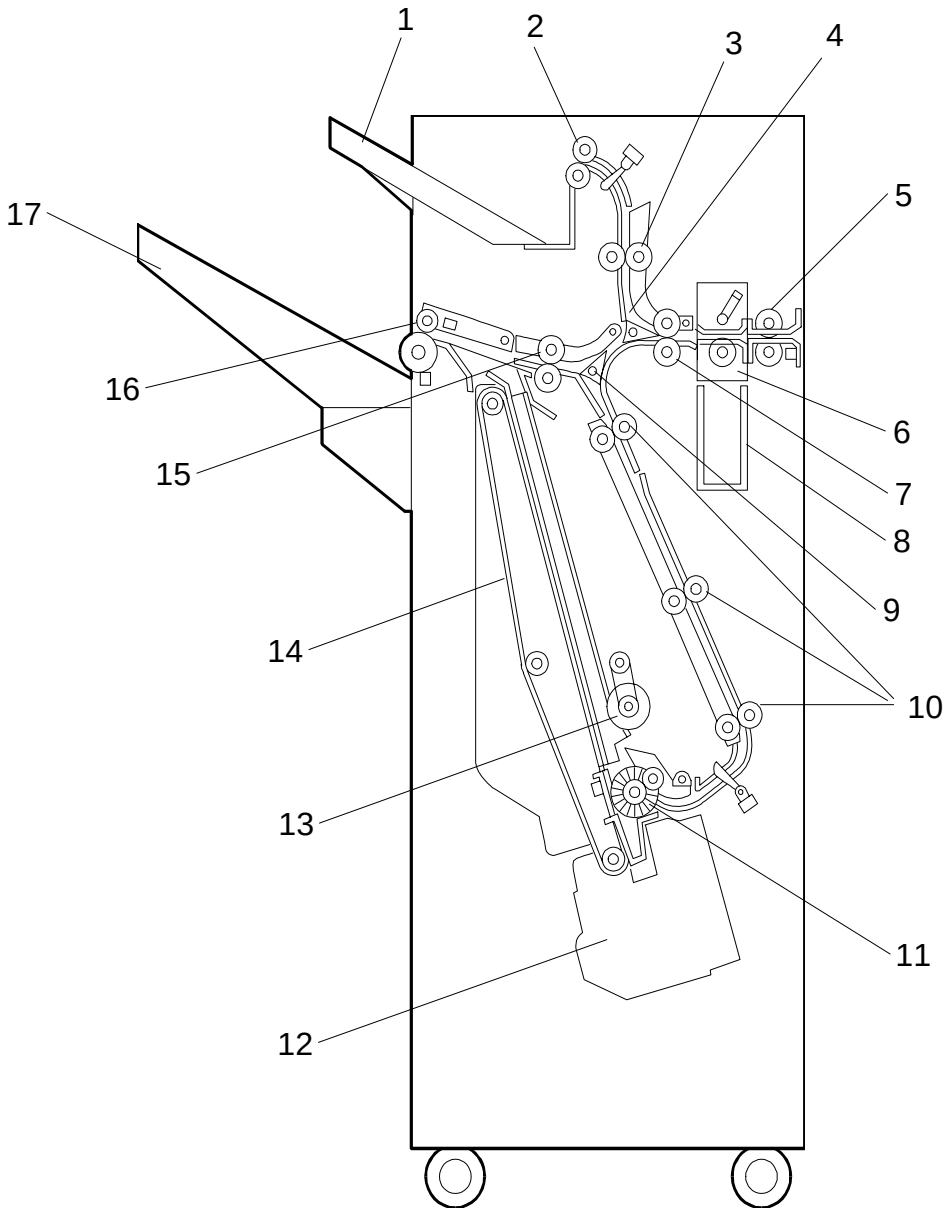
Power Source: 24 Vdc (from copier)

Power Consumption: 48 W

Weight: 45 kg

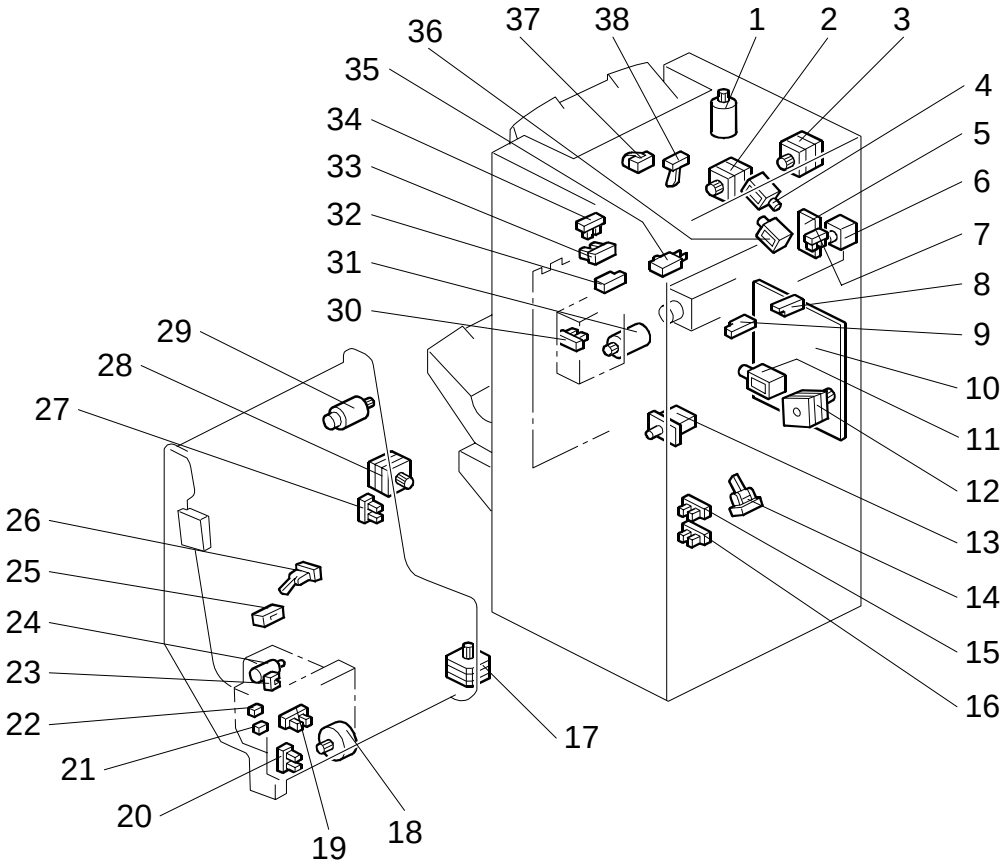
Size (W x D x H): 625 mm x 545 mm x 960 mm

1.2 MECHANICAL COMPONENT LAYOUT



1. Upper Tray
2. Upper Tray Exit Roller
3. Upper Transport Roller
4. Tray Junction Gate
5. 1st Entrance Roller
6. Punch Unit
7. 2nd Entrance Roller
8. Punch Waste Hopper
9. Stapler Junction Gate
10. Lower Transport Rollers
11. Alignment Brush Roller
12. Stapler
13. Positioning Roller
14. Stack Feed-out Belt
15. Middle Transport Roller
16. Shift Tray Exit Roller
17. Shift Tray

1.3 ELECTRICAL COMPONENT LAYOUT



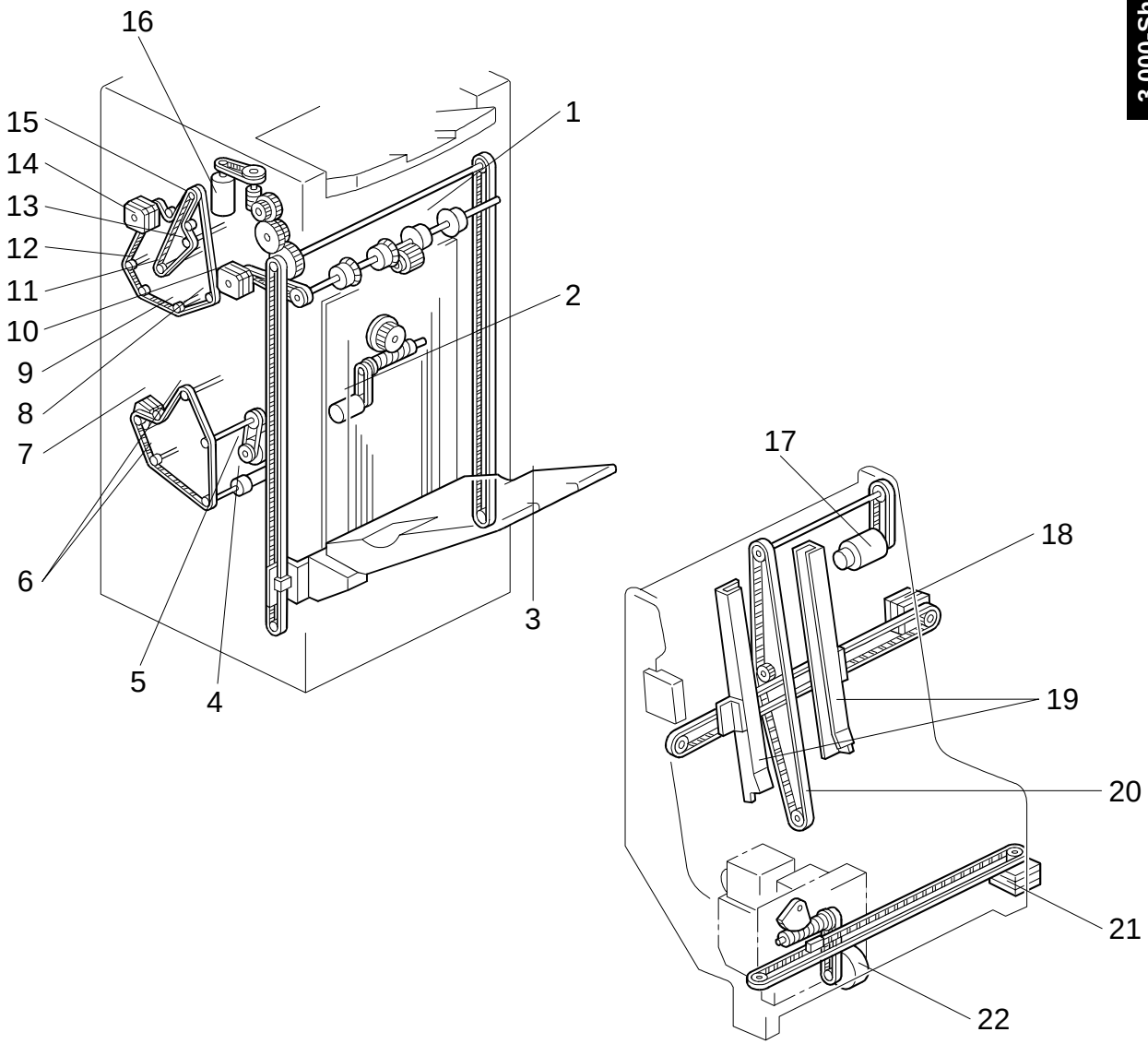
1. Shift Tray Lift Motor
2. Shift Tray Exit Motor
3. Upper Transport Motor
4. Tray Junction Gate Solenoid
5. Punch Board
6. Punch Motor
7. Punch HP Sensor
8. Hopper Sensor
9. Entrance Sensor
10. Main Board
11. Positioning Roller Solenoid
12. Lower Transport Motor
13. Front Door Safety Switch
14. Stapler Tray Entrance Sensor
15. Shift Tray Lower Limit 1 Sensor
16. Shift Tray Lower Limit 2 Sensor
17. Stapler Motor
18. Stapler Rotation Motor
19. Stapler Rotation HP Sensor
20. Stapler HP Sensor
21. Staple End Switch
22. Cartridge Set Switch
23. Staple Hammer HP Sensor
24. Staple Hammer Motor
25. Stapler Tray Paper Sensor
26. Stack Feed-out Belt HP Sensor
27. Jogger Fence HP Sensor
28. Jogger Motor
29. Stack Feed-out Motor
30. Shift Tray Half-turn Sensor
31. Shift Motor
32. Shift Tray Exit Sensor
33. Stack Height 2 Sensor
34. Stack Height 1 Sensor
35. Shift Tray Upper Limit Switch
36. Stapler Junction Gate Solenoid
37. Upper Tray Paper Limit Sensor
38. Upper Tray Exit Sensor

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Upper Transport	Drives the entrance rollers, the middle and upper transport rollers, and upper tray exit roller.	3
M2	Lower Transport	Drives the lower transport rollers, the alignment brush roller, and the positioning roller.	11
M3	Jogger	Moves the jogger fence.	28
M4	Stapler	Moves the staple unit from side to side.	17
M5	Stapler Rotation	Rotates the stapler 45 degrees.	18
M6	Staple Hammer	Drives the staple hammer.	24
M7	Stack Feed-out	Drives the stack feed-out belt.	29
M8	Shift Tray Exit	Drives the exit roller for the shift tray.	2
M9	Shift	Moves the shift tray from side to side.	31
M10	Shift Tray Lift	Moves the shift tray up or down.	1
M11	Punch	Drives the punch shaft and roller.	6
Sensors			
S1	Entrance	Detects the copy paper entering the finisher and checks for misfeeds.	9
S2	Stapler Tray Entrance	Detects the copy paper entering the staple tray and checks for misfeeds.	14
S3	Jogger Fence HP	Detects the home position of the jogger fence.	27
S4	Stapler Tray Paper	Detects the copy paper in the staple tray.	25
S5	Stapler HP	Detects the home position of the staple unit for side-to-side movement.	20
S6	Stapler Rotation HP	Detects the home position of the stapler unit for 45-degree rotation.	19
S7	Staple Hammer HP	Detects the home position of the staple hammer.	23
S8	Stack Feed-out Belt HP	Detects the home position of the stack feed-out belt.	26
S9	Shift Tray Exit	Checks for misfeeds at the shift tray.	32
S10	Stack Height 1	Detects when the top of the copy paper stack in the shift tray is at the correct position.	34
S11	Stack Height 2	Detects when the top of the copy paper stack in the shift tray has become too high.	33
S12	Upper Tray Exit	Checks for misfeeds at the upper tray.	38
S13	Upper Tray Paper Limit	Detects when the paper stack height in the upper tray is at its upper limit.	37
S14	Shift Tray Half-turn	Detects the return position for side-to-side movement of the shift tray.	30

Symbol	Name	Function	Index No.
S15	Shift Tray Lower Limit 1	Detects when the shift tray is nearly at its lower limit.	15
S16	Shift Tray Lower Limit 2	Detects when the shift tray is at its lower limit.	16
S17	Hopper	Detects when the punch waste hopper is full and detects when the punch tray is set.	8
S18	Punch HP	Detects the home position of the punch shaft and roller.	7
Switches			
SW1	Front Door Safety	Cuts the dc power when the front door is opened.	13
SW2	Shift Tray Upper Limit	Cuts the power to the shift tray lift motor when the shift tray position is at its upper limit.	35
SW3	Staple End	Detects the staples in the cartridge.	21
SW4	Cartridge Set	Detects the staple cartridge in the stapler.	22
Solenoids			
SOL1	Tray Junction Gate	Drives the tray junction gate.	4
SOL2	Stapler Junction Gate	Drives the stapler junction gate.	36
SOL3	Positioning Roller	Moves the positioning roller against the stapling tray.	12
PCBs			
PCB1	Main	Controls the finisher and communicates with the copier.	10
PCB2	Punch	Passes signals between the punch unit and the finisher main board.	5

1.5 DRIVE LAYOUT

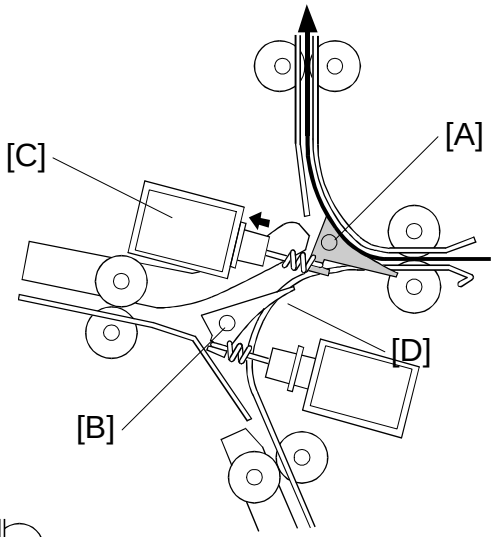


1. Shift Tray Exit Roller
2. Shift Motor
3. Shift Tray
4. Alignment Brush Roller
5. Positioning Roller
6. Lower Transport Rollers 2 and 3
7. Lower Transport Motor
8. Middle Transport Roller
9. Lower Transport Roller 1
10. Shift Tray Exit Motor
11. 2nd Entrance Roller
12. 1st Entrance Roller
13. Upper Transport Roller
14. Upper Transport Motor
15. Upper Tray Exit Roller
16. Shift Tray Lift Motor
17. Stack Feed-out Motor
18. Jogger Motor
19. Jogger Fence
20. Stack Feed-out Belt
21. Stapler Motor
22. Stapler Rotation Motor

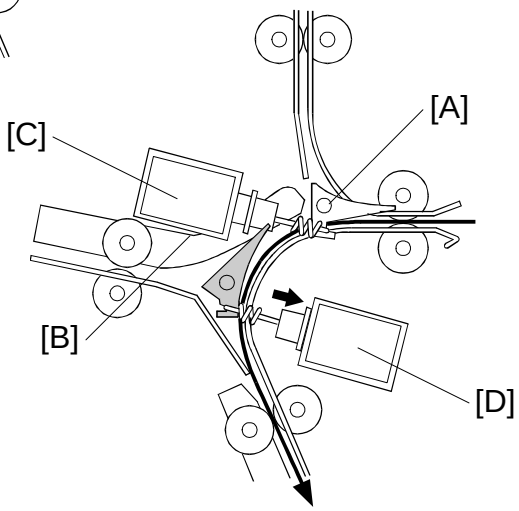
2. DETAILED DESCRIPTIONS

2.1 TRAY AND STAPLER JUNCTION GATE MECHANISM

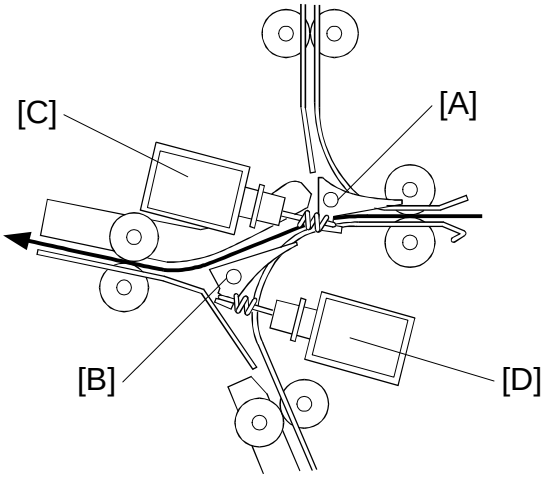
- Normal mode -



- Staple mode -



- Sort/stack mode -



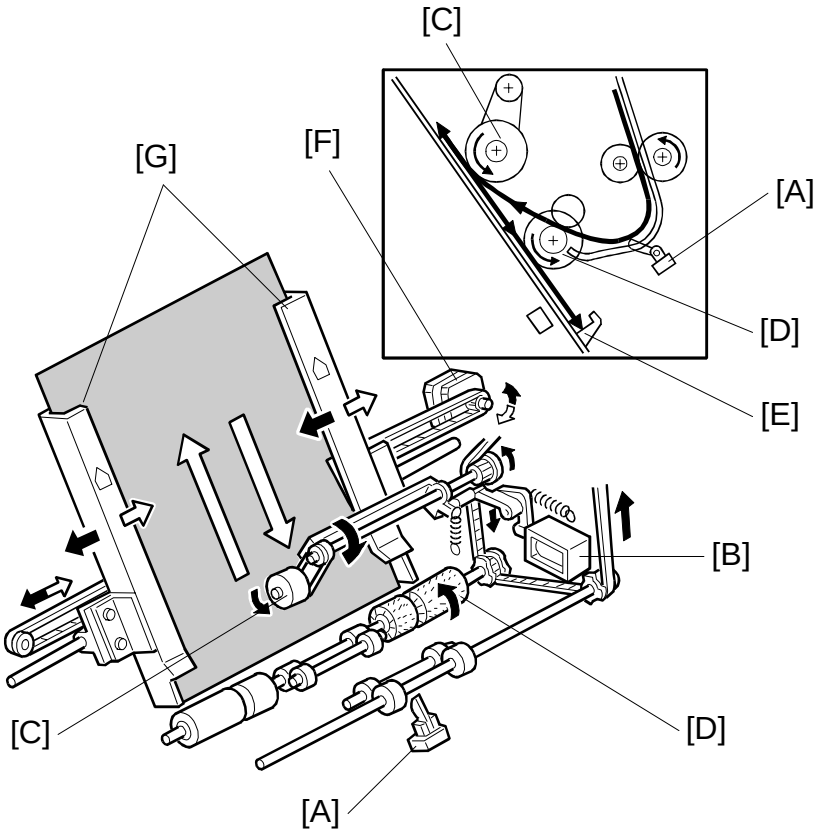
Depending on the finishing mode, the copies are directed up, straight through, or down by the combination of the tray junction gate [A] and stapler junction gate [B]. These gates are controlled by the tray junction gate solenoid [C] and stapler junction gate solenoid [D].

Normal mode
The tray junction gate solenoid turns on. The copies go up to the upper tray.

Sort/stack mode
The tray junction gate solenoid and the stapler junction gate solenoid remain off. The copies are sent to the shift tray directly.

Staple mode
The tray junction gate solenoid remains off and the stapler junction gate solenoid turns on. The copies go downwards to the jogger unit.

2.2 JOGGER UNIT PAPER POSITIONING MECHANISM



In staple mode, each sheet of copy paper is vertically and horizontally aligned when it arrives in the jogger unit.

Vertical Paper Alignment

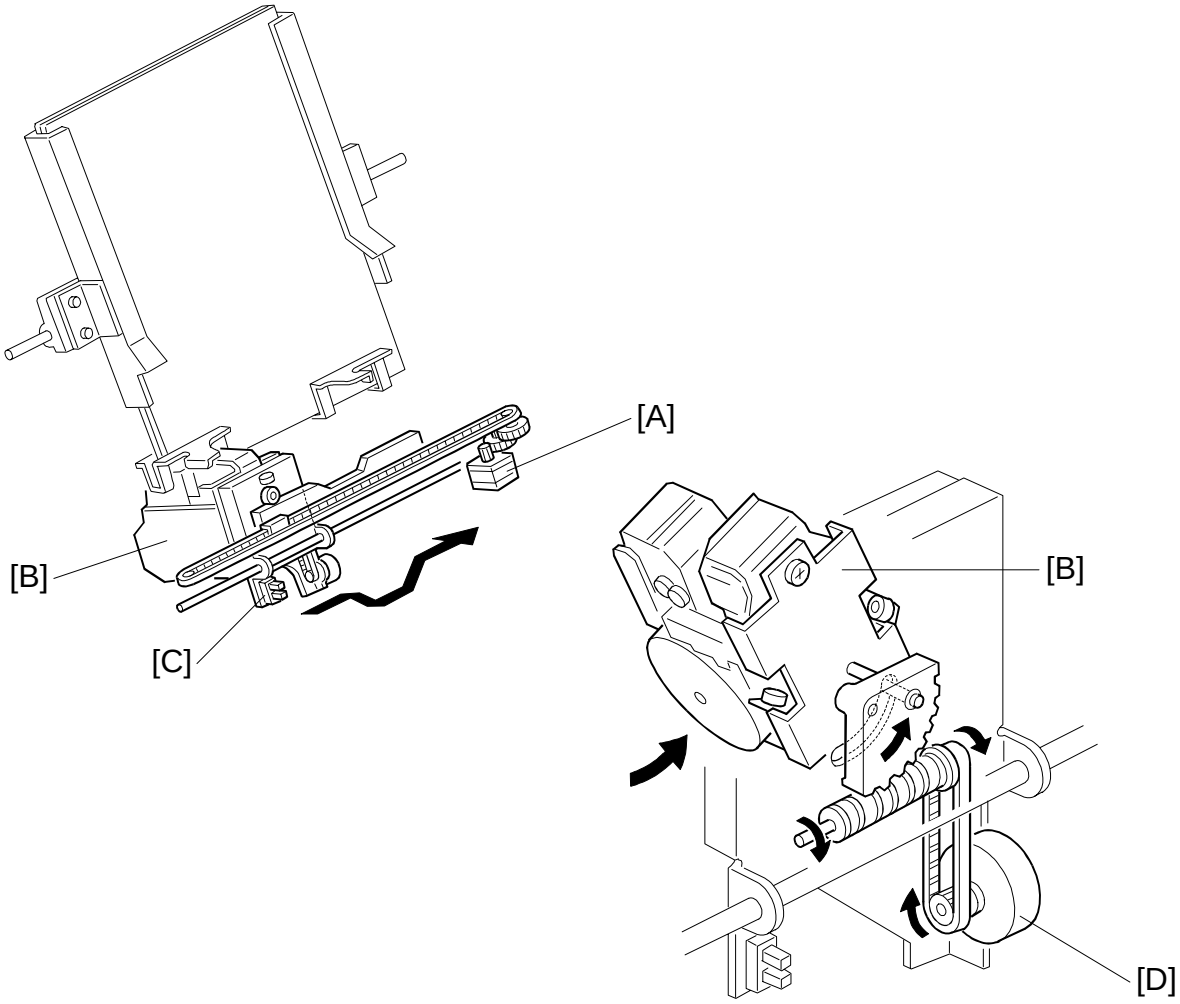
After the trailing edge of the copy passes the stapler tray entrance sensor [A], the positioning roller solenoid [B] is energized for 280 ms to push the positioning roller [C] into contact with the paper. The positioning roller and alignment brush roller [D] rotate to push the paper back and align the trailing edge of the paper against the stack stopper [E].

Horizontal Paper Alignment

When the print key is pressed, the jogger motor [F] turns on and the jogger fences [G] move to the waiting position, which is 7 mm wider on both sides than the selected paper.

When the trailing edge of the paper passes the staple unit entrance sensor, the jogger motor turns on for approximately 70 ms to move the jogger fences 5 mm towards the paper. After a short time, the jogger motor turns on again approximately for 60 ms for the horizontal paper alignment then goes back to the waiting position.

2.3 STAPLER UNIT MOVEMENT MECHANISM



Side-to-side:

The stapler motor [A] moves the stapler [B] from side to side. After the start key is pressed, the stapler moves from its home position to the stapling position.

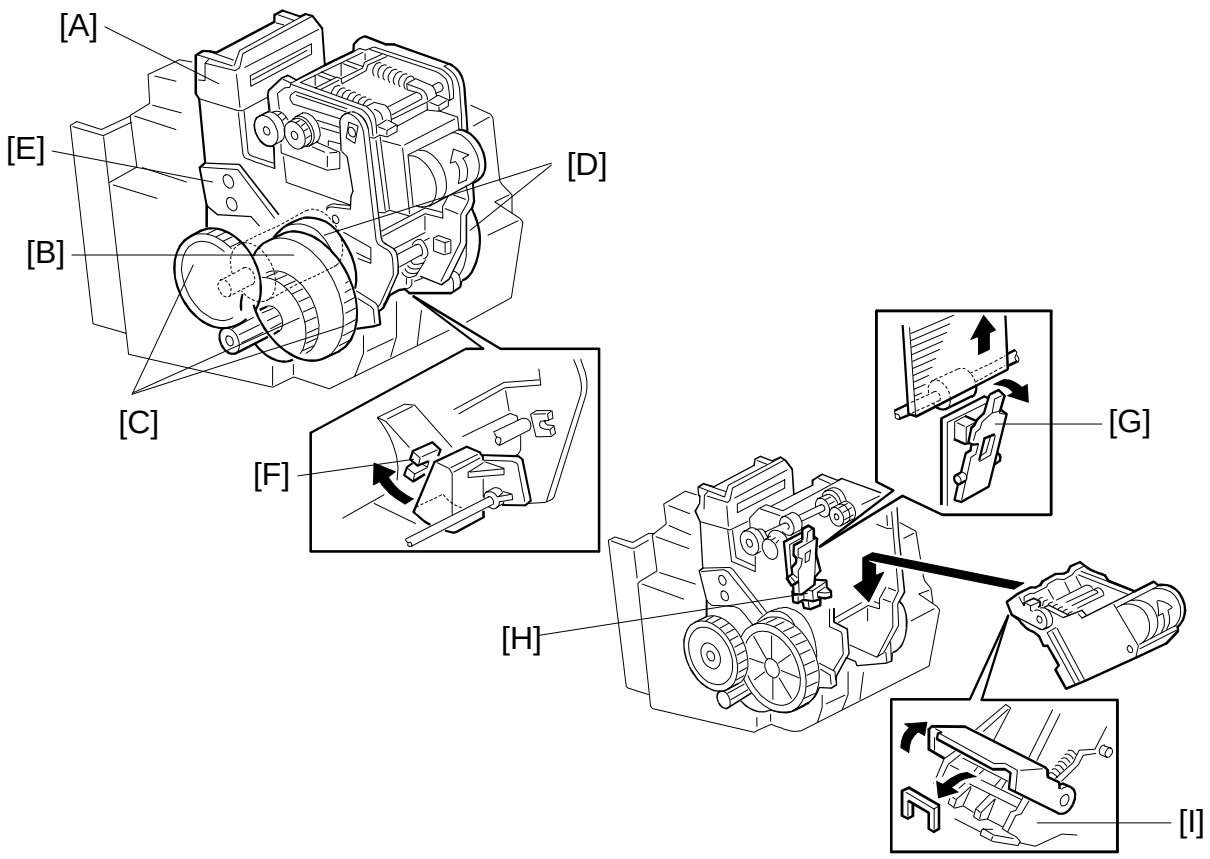
If two-staple-position mode is selected, the stapler moves to the front stapling position first, then moves to the rear stapling position. However, for the next copy set, it staples in the reverse order (at the rear side first then at the front side).

After the job is completed, the stapler moves back to its home position. This is detected by the stapler HP sensor [C].

Rotation:

In the oblique staple position mode, the stapler rotation motor [D] rotates the stapler 45° after it moves to the stapling position.

2.4 STAPLER



The staple hammer [A] is driven by the staple hammer motor [B] via gears [C], two cams [D], and two links [E].

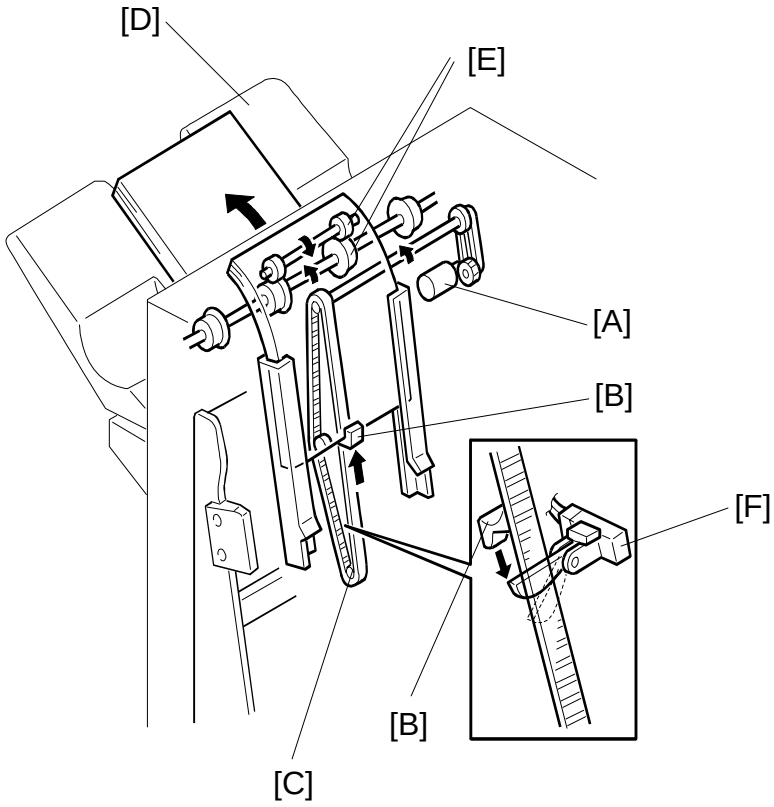
When the aligned copies are brought to the stapling position by the positioning roller, alignment brush roller and jogger fences, the staple hammer motor starts. When the cams complete one rotation, the staple hammer home position sensor [F] turns on, detecting the end of the stapling operation. The staple hammer motor then stops.

There are two sensors in the stapler. One is the staple end switch [G] for detecting staple end conditions (it detects when there is only one sheet of staples left in the cartridge). The other is the cartridge set switch [H] for detecting whether a staple cartridge is installed.

When a staple end or no cartridge condition is detected, a message is displayed advising the operator to install a staple cartridge. If this condition is detected during a copy job, the indication will appear, but the copy job will not stop.

The staple cartridge has a clinch area [I], in which jammed staples are left. Operators can remove the jammed staples from this area.

2.5 FEED-OUT MECHANISM

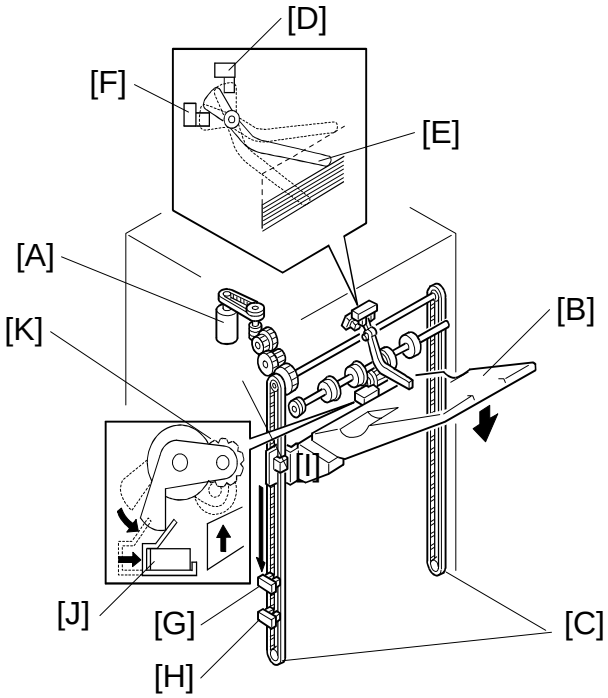


After the copies have been stapled, the stack feed-out motor [A] starts. The pawl [B] on the stack feed-out belt [C] transports the set of stapled copies up and feeds it to the shift tray [D].

The speed of the exit roller [E] (driven by the shift tray exit motor) is higher than the stack feed-out belt speed. Therefore, the shift tray exit roller takes over the stack feed-out after the leading edge reaches this roller.

Just before the stapled copies pass through the shift tray exit sensor, the stack-feed-out motor turns off 600 ms to wait until the exit rollers have completely fed the stapled stack out to the shift tray. Then, the stack-feed-out motor turns on again until the pawl actuates the stack feed-out belt home position sensor [F].

2.6 SHIFT TRAY UP/DOWN MECHANISM



The shift tray lift motor [A] controls the vertical position of the shift tray [B] through gears and timing belts [C]. When the main switch is turned on, the tray is initialized at the upper position. The tray is moved up until stack height sensor 1 [D] is de-actuated.

During copying, the actuator feeler [E] gradually rises as the copy stack grows, and the actuator gradually moves towards stack height sensor 2 [F].

In sort/stack mode, if stack height sensor 2 is actuated for 3 seconds, the shift tray lift motor lowers the shift tray for 15 ms.

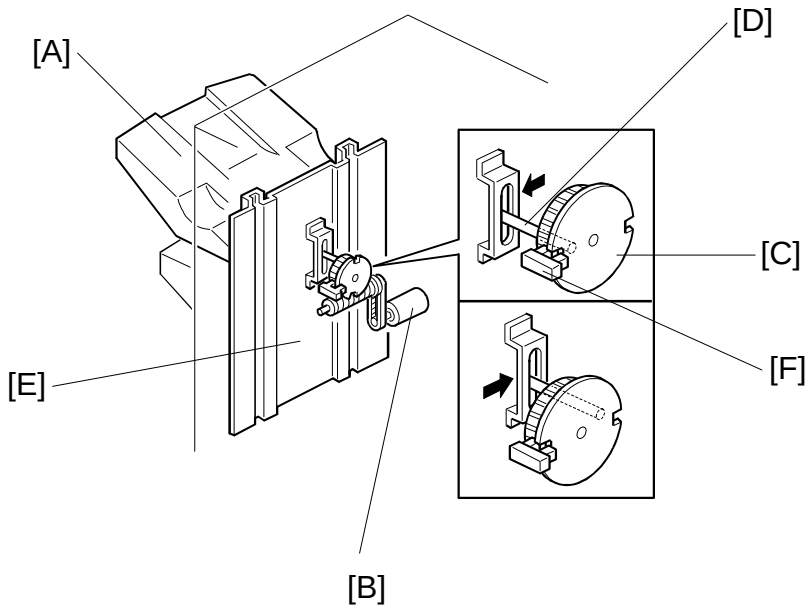
In staple mode, when the stack feed-out motor starts, the tray is moved down until stack height sensor 1 is actuated and then moved up until stack height sensor 1 is de-actuated. This corrects the current tray position. Then, the tray is moved down again until stack height sensor 1 is actuated to make space for the coming set of copies and then moved up until stack height sensor 1 is de-actuated. This means the tray lowers earlier in staple mode, to prevent the next copy suddenly exceeding the space currently available on the tray.

For both modes, the shift tray will rise until stack height sensor 1 is de-actuated when the user takes the stack of paper from the shift tray.

This machine has two shift tray lower limit sensors 1 [G], 2 [H]. Shift tray lower limit sensor 1 detects the near lower limit and sensor 2 detects the lower limit. When the actuator [I] enters sensor 1, a message will be displayed and copying will continue. When the actuator enters sensor 2, a message will be displayed and copying will stop.

The shift tray upper limit switch [J] prevents the drive gear from being damaged if stack height sensor 1 fails. When the shift tray pushes up the shift tray positioning roller [K], the switch will cut the power to the shift tray lift motor.

2.7 SHIFT TRAY SIDE-TO-SIDE MECHANISM

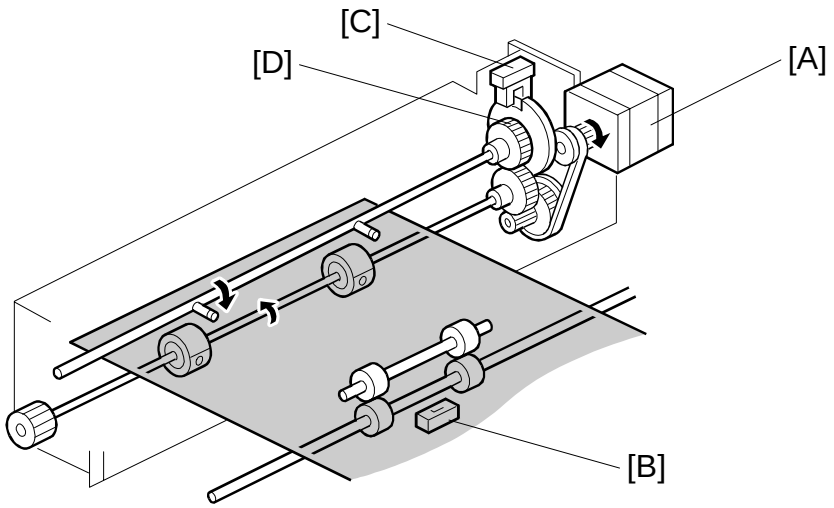


In sort/stack mode, the shift tray [A] moves from side to side to separate the sets of copies.

The horizontal position of the shift tray is controlled by the shift motor [B] and shift gear disk [C]. After one set of copies is made and delivered to the shift tray, the shift motor turns on, driving the shift gear disk and the shaft [D]. The end fence [E] is positioned by the shaft, creating the side-to-side movement.

When the shift gear disk has rotated 180 degrees (when the shift tray is fully shifted across), the cut-out in the shift gear disk turns on the shift tray half-turn sensor [F] and the shift motor stops. The next set of copies is then delivered. The motor turns on, repeating the same process and moving the tray back to the previous position.

2.8 PUNCH UNIT DRIVE MECHANISM



The punch unit makes 2 or 3 holes (depending on the type of punch unit) at the trailing edge of the paper.

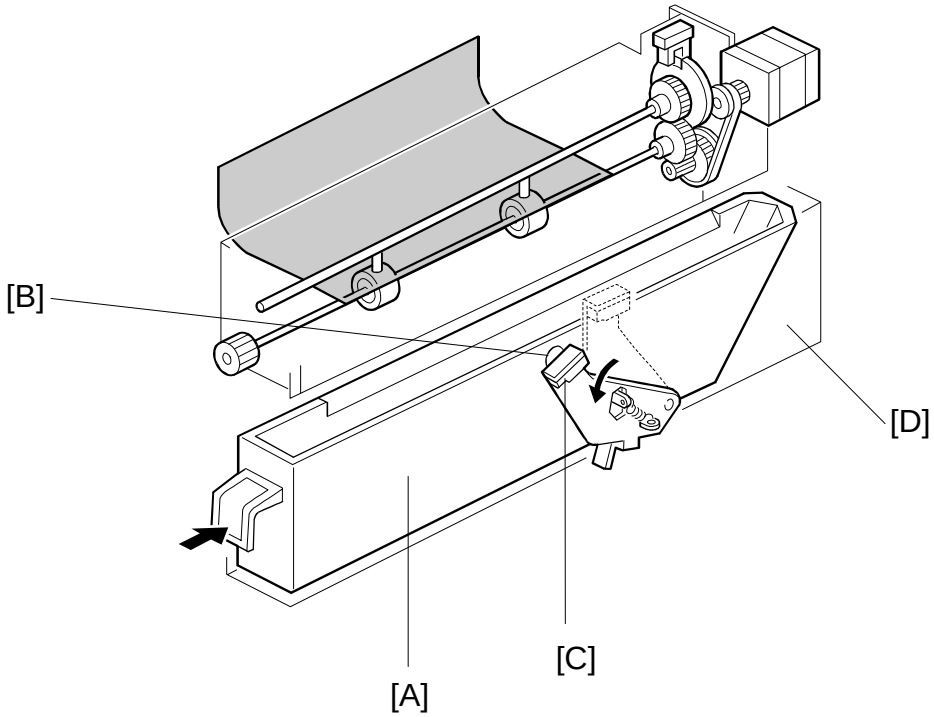
The punch unit is driven by the punch motor [A]. The punch motor turns on 78 ms after the trailing edge of the paper passes through the entrance sensor [B], and makes the punch holes.

The home position is detected by the punch HP sensor [C]. When the cut-out on the punch shaft gear disk [D] enters the punch HP sensor, the punch motor stops.

The punch position is adjusted as follows:

Right to left: SP mode
Front to rear: Spacers

2.9 PUNCH WASTE COLLECTION MECHNISM



The punch waste is collected in the punch waste hopper [A], which is under the punch unit.

When the punch waste covers the hole [B] in the hopper, the hopper sensor [C] turns on and a message will be displayed after the copy job finishes.

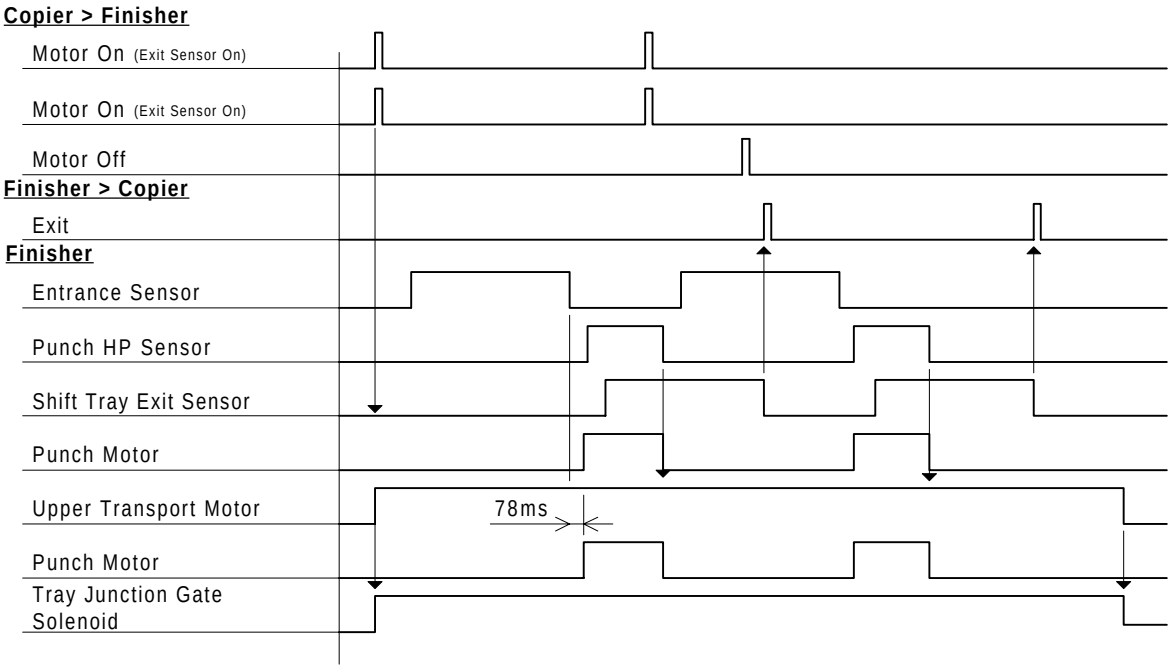
The hopper sensor also works as the hopper set sensor. If the punch waste hopper is not set, the hopper sensor moves away from the hole in the hopper holder [D] and a message is displayed. This message is the same as for the hopper full condition.

2.10 JAM CONDITIONS

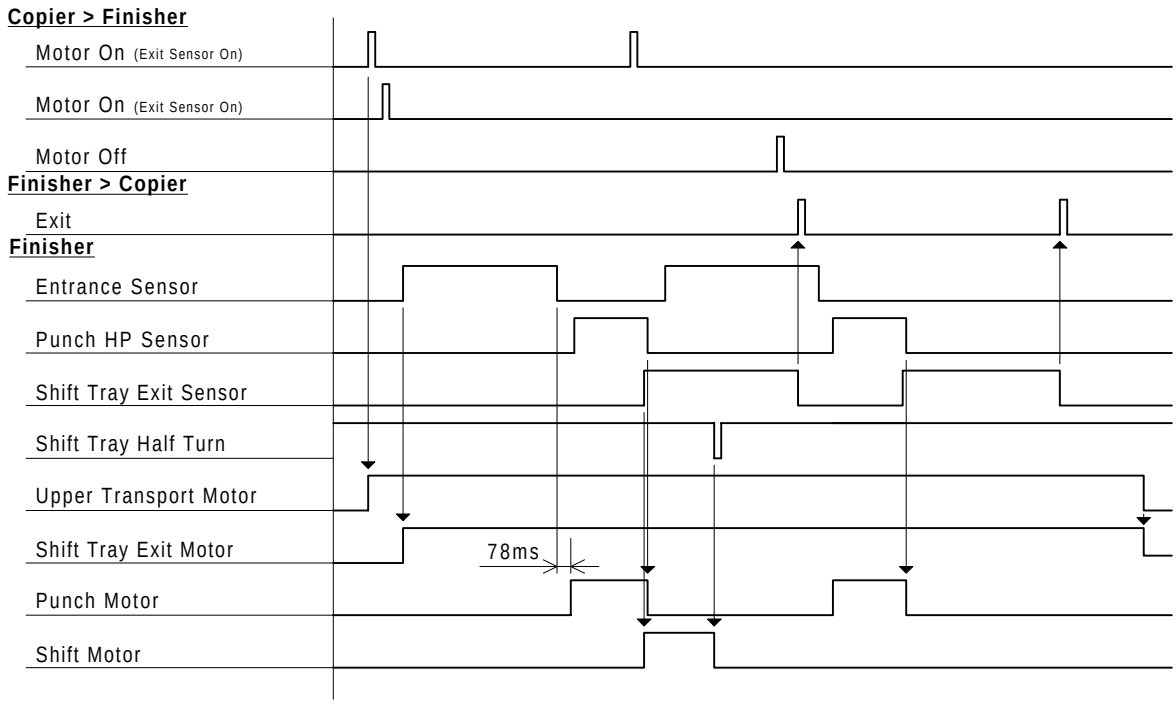
1. The entrance sensor does not turn on within 450 ms after the copier exit sensor turns off.
2. The entrance sensor does not turn off within 1,325 ms after it turns on.
3. The upper tray exit sensor does not turn on within 1,630 ms after the entrance sensor turns on.
4. The upper tray exit sensor does not turn off within 1,325 ms after it turns on.
5. In sort/stack mode, the shift tray exit sensor does not turn on within 2,090 ms after the entrance sensor turns on.
6. In sort/stack mode, the shift tray exit sensor does not turn off within 1,325 ms after it turns on.
7. In staple mode, the stapler tray entrance sensor does not turn on within 3,700 ms after the entrance sensor turns on.
8. In staple mode, the stapler tray entrance sensor does not turn off within 1,325 ms after it turns on.
9. In staple mode, the stapler tray paper sensor does not turn off within 250 pulses of the stack feed-out motor after it starts.
10. In staple mode, the shift tray exit sensor does not turn off within 1,260 ms after the stack feed-out motor starts.

2.11 TIMING CHARTS

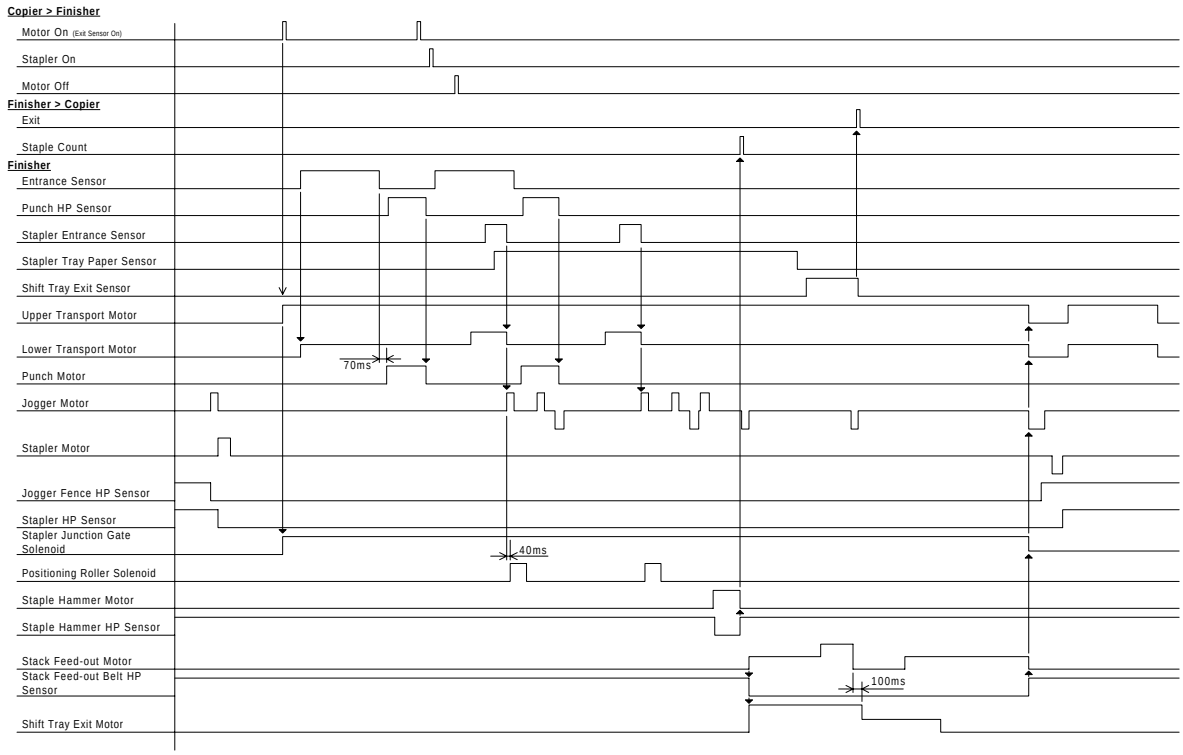
2.11.1 A4 SIDEWAYS (2 SHEETS): NORMAL AND PUNCH MODE



2.11.2 A4 SIDEWAYS (2 SHEETS): SORT/STACK AND PUNCH MODE



2.11.3 A4 SIDEWAYS (2 SHEETS): STAPLE AND PUNCH MODE



3. SERVICE TABLES

3.1 DIP SWITCHES

DPS100				DPS101				Description
1	2	3	4	1	2	3	4	
0	0	0	0	0	0	0	0	Default
1	1	0	1	1	0	0	0	Stack feed-out motor on
1	1	1	0	0	1	0	0	Free run: sort/stack mode
1	1	1	0	0	0	1	0	Free run: one staple (front side)
1	1	1	0	0	0	0	1	Free run: two staples

NOTE: Do not use any other settings.

3.2 TEST POINTS

No.	Label	Monitored Signal
TP101	(GND)	Ground

3.3 LED

No.	Function
LED100	Monitors the stack feed-out motor speed.

3.4 VARIABLE RESISTORS

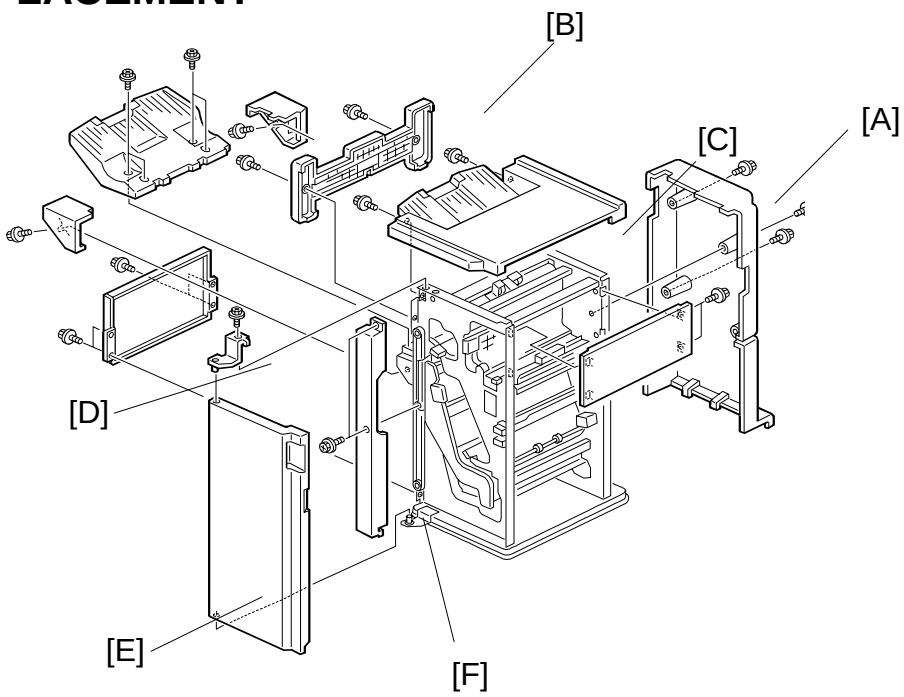
No.	Function
VR100	Adjust the stack feed-out motor speed.

3.5 FUSES

No.	Function
FU100	Protects 24 V.

4. REPLACEMENT AND ADJUSTMENT

4.1 COVER REPLACEMENT



Rear Cover

1. Remove the rear cover [A] (3 screws).

Upper Left Cover

1. Remove the upper left cover [B] (2 screws).

Upper Cover

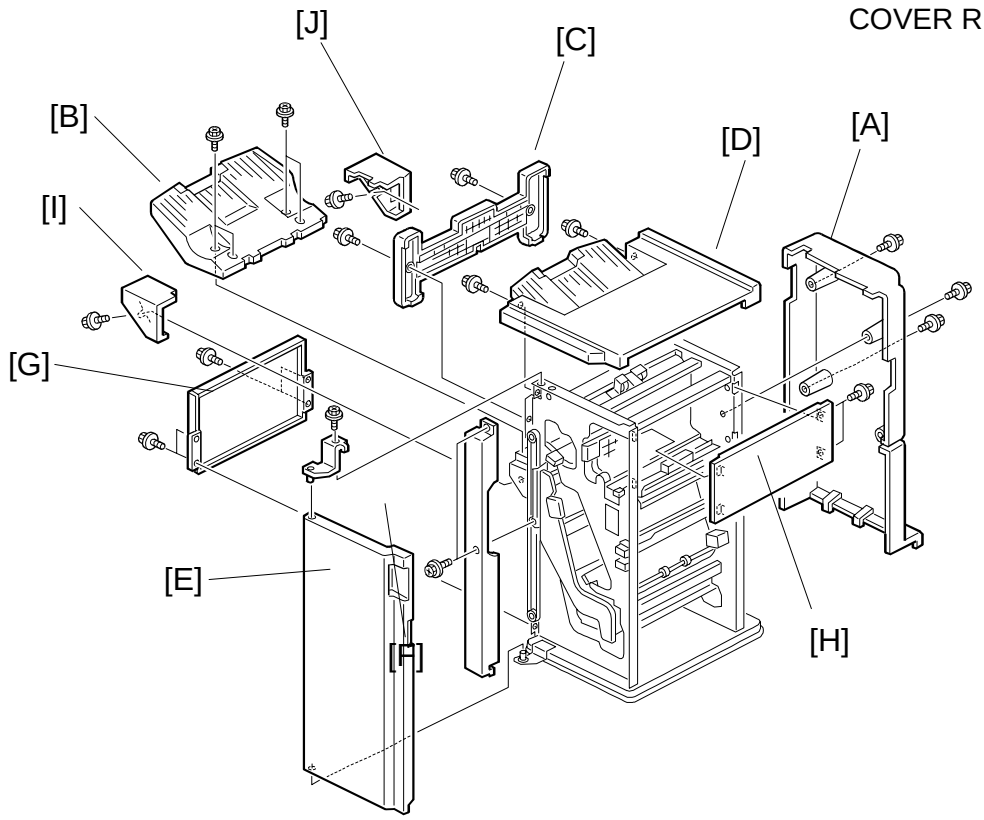
1. Remove the upper left cover.
2. Remove the upper cover [C] (2 screws).

Front Door

1. Remove the upper left cover.
2. Remove the upper cover.
3. Remove the upper bracket [D] (1 screw).
4. Remove the front door [E].

Left Front Cover

1. Remove the rear cover.
2. Remove the upper cover.
3. Remove the front door.
4. Remove the left front cover [F] (2 screws).



Shift Tray

1. Remove the rear cover [A].
2. Rotate the shift tray lift motor and lower the shift tray [B].
3. Remove the shift tray (4 screws).

Lower Left Cover

1. Remove the shift tray.
2. Remove the upper left cover [C].
3. Remove the upper cover [D].
4. Remove the front door [E].
5. Remove the left front cover [F].
6. Remove the lower left cover [G] (4 screws).

Right Cover

1. Remove the right cover [H] (2 screws).

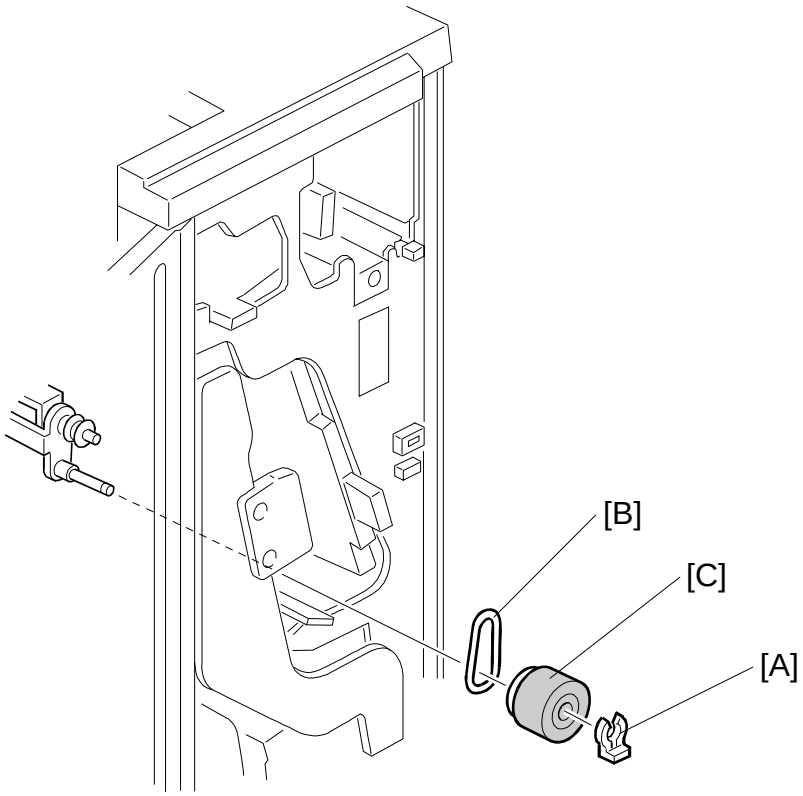
Front Shift Tray Cover

1. Remove the front shift tray cover [I] (1 screw).

Rear Shift Tray Cover

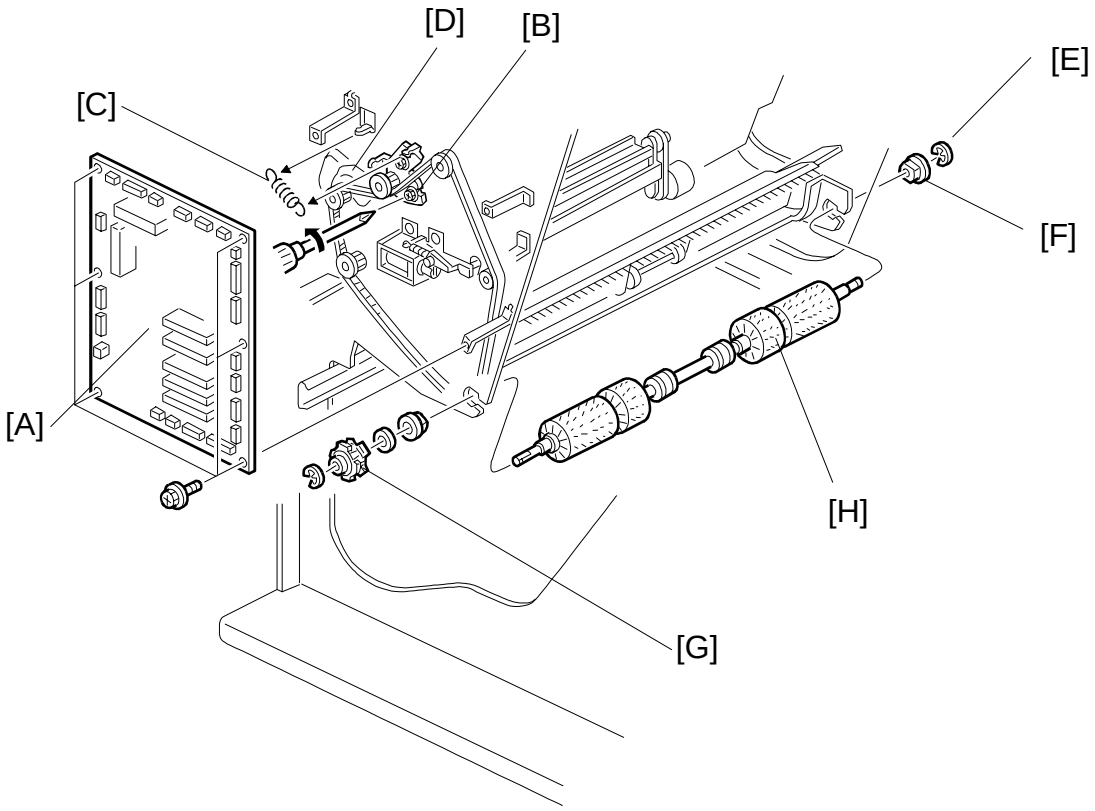
1. Remove the rear shift tray cover [J] (1 screw).

4.2 POSITIONING ROLLER REPLACEMENT



1. Open the front door.
2. Remove the snap ring [A].
3. Release the rubber belt [B].
4. Replace the positioning roller [C].

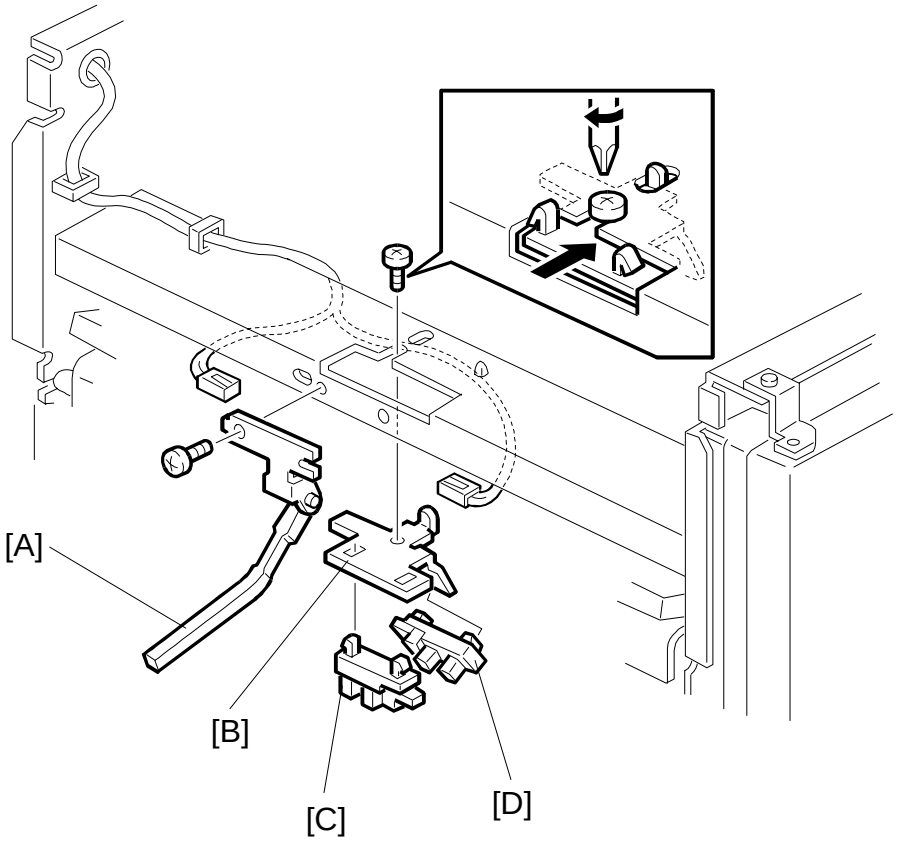
4.3 ALIGNMENT BRUSH ROLLER REPLACEMENT



1. Open the front door and pull out the jogger unit.
2. Remove the rear cover.
3. Remove the main board [A] (6 screws, all connectors).
4. Remove a screw [B] and a tension spring [C] for the tension bracket [D], and release the tension of the timing belt.
5. Remove the front side E-ring [E] and bushing [F].
6. Remove the alignment brush roller assembly.
7. Remove the timing pulley [G] (1 E-ring).
8. Replace the alignment brush roller [H] (1 spacer, 1 bushing).

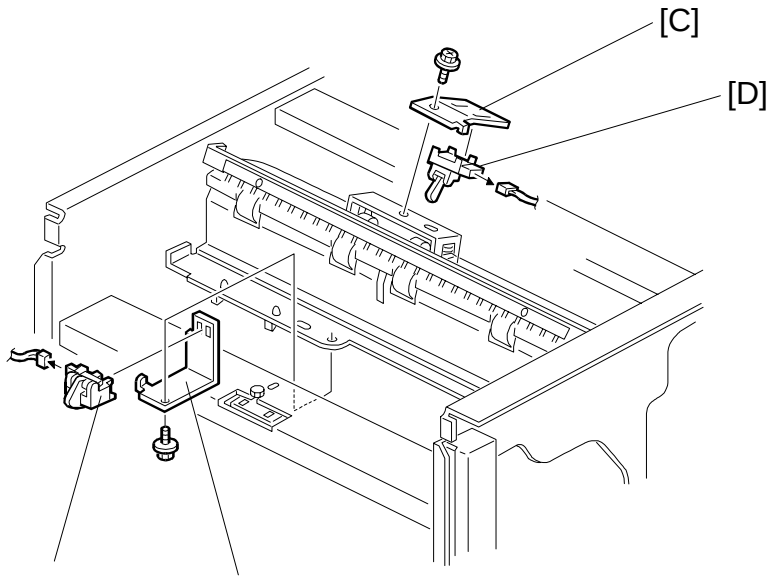
4.4 SENSOR REPLACEMENT

4.4.1 STACK HEIGHT SENSOR 1 AND 2



1. Remove the upper left cover.
2. Remove the upper cover.
3. Remove the sensor feeler [A] (1 screw, 1 connector).
4. Remove the sensor bracket [B] (1 screw).
5. Replace the stack height sensor 1 [C] or 2 [D].

4.4.2 UPPER TRAY PAPER LIMIT AND EXIT SENSOR



1. Remove the upper left cover.
2. Remove the upper cover.

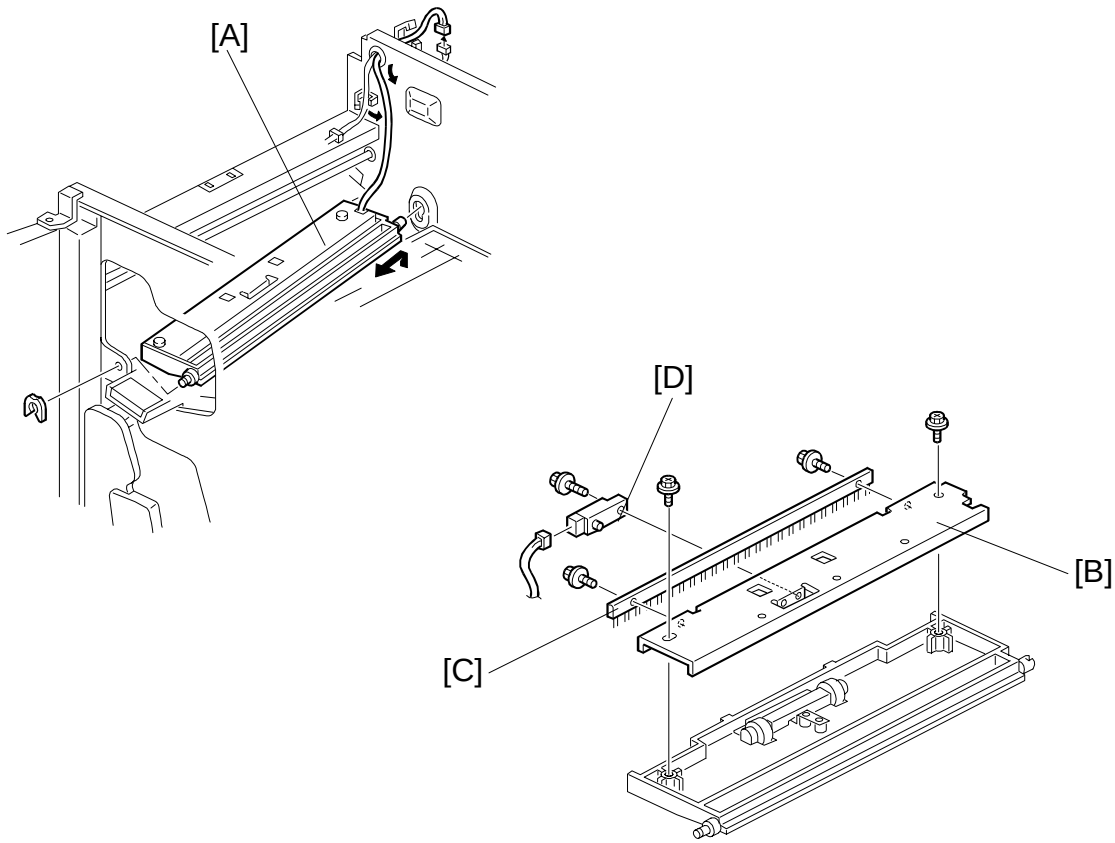
Upper Tray Paper Limit Sensor

3. Remove the sensor bracket [A] (1 screw).
4. Replace the upper tray paper limit sensor [B] (1 connector).

Upper Tray Exit Sensor

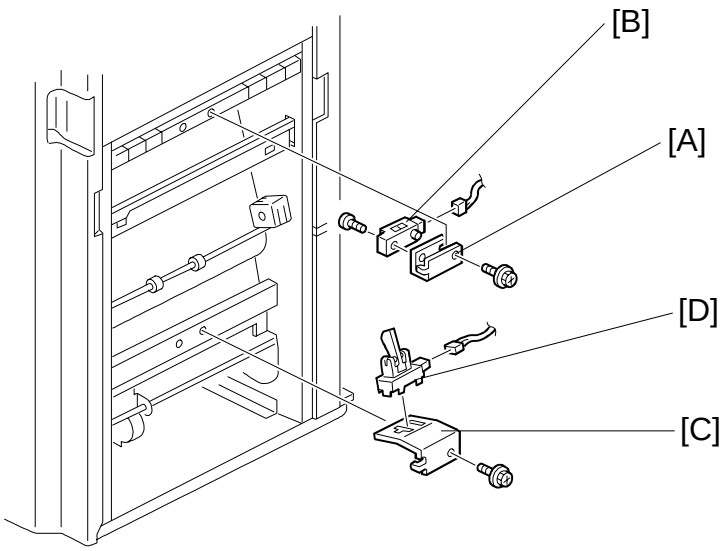
3. Remove the sensor bracket [C] (1 screw).
4. Replace the upper tray exit sensor [D] (1 connector).

4.4.3 SHIFT TRAY EXIT SENSOR



1. Remove the rear cover.
2. Remove the upper left cover.
3. Remove the upper cover.
4. Open the front door and remove the upper exit guide [A] (1 plastic clip).
5. Remove the guide stay [B] (2 screws).
6. Remove the discharge brush [C] (2 screws).
7. Replace the shift tray exit sensor [D] (1 screw, 1 connector).

4.4.4 ENTRANCE AND STAPLER TRAY ENTRANCE SENSOR



1. Remove the finisher from the copier.

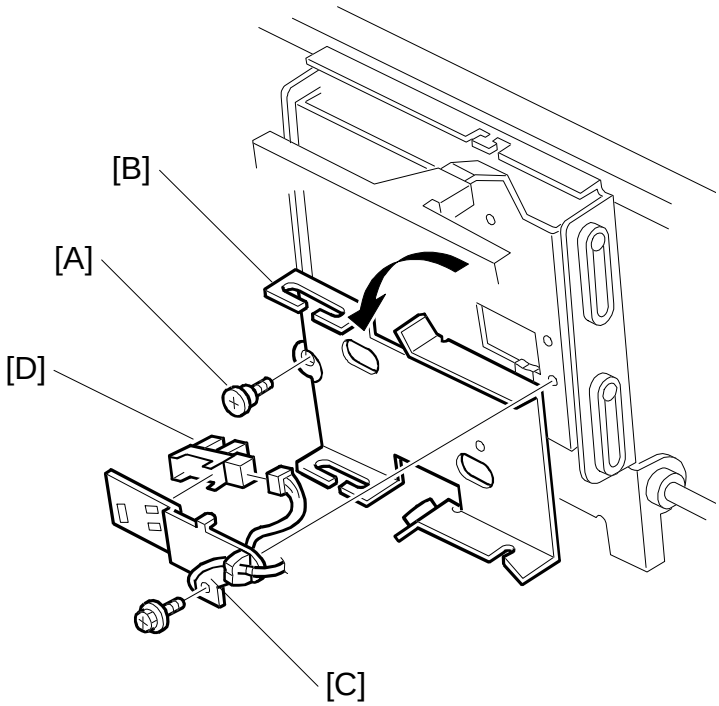
Entrance Sensor

2. Remove the sensor bracket [A] (1 screw).
3. Replace the entrance sensor [B] (1 screw, 1 connector).

Stapler Tray Entrance Sensor

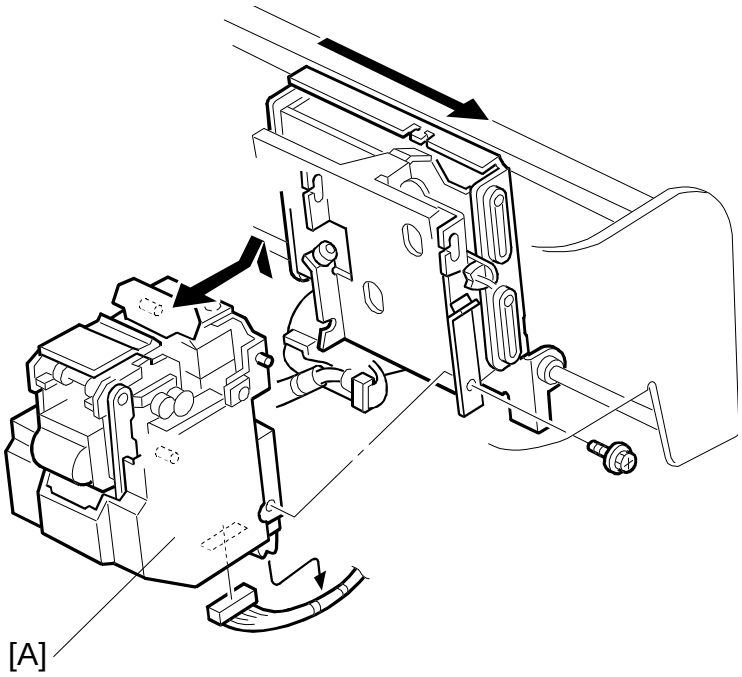
2. Remove the sensor bracket [C] (1 screw).
3. Replace the stapler tray entrance sensor [D] (1 screw, 1 connector).

4.4.5 STAPLER ROTATION HP SENSOR



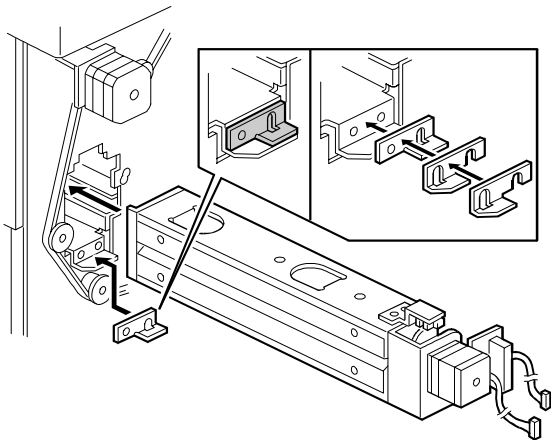
1. Remove the stapler unit.
2. Remove the screw [A] and rotate the stapler bracket [B].
3. Remove the sensor bracket [C] (1 screw).
4. Replace the stapler rotation HP sensor [D] (1 connector).

4.5 STAPLER REMOVAL



1. Open the front door and pull out the jogger unit.
2. Move the stapler to the front.
3. Remove the stapler [A] (1 screw, 1 connector).

4.6 PUNCH POSITION ADJUSTMENT



Right to left

This position is adjusted by SP modes.

Front to rear

The optional punch units have the following 3 spacers as accessories.

1 mm thickness: 2 pcs
2 mm thickness: 1 pc

The punch position can be adjusted by up to 4 mm by combinations of the 3 spacers.

4.7 STACK FEED-OUT MOTOR SPEED ADJUSTMENT

NOTE: This adjustment is required after replacing the main board.

1. Set the DIP switches on the finisher main board as follows.

DIP SW	1	2	3	4
DIP100	On	On	Off	On
DIP101	On	Off	Off	Off

2. If LED100 remains lit, turn VR100 counterclockwise until LED100 starts blinking.
3. Turn VR100 clockwise until the LED stops blinking and remains lit.

4.8 ROM HISTORY

A697 Firmware Modification History (3000 Sheet Finisher)			
Description of Modification	**Level**	**Prod. Date**	**Ver.**
Corrects the following: • Modification to allow Chinese paper sizes. • Modification of the start of the shift tray in staple mode. • Corrected the problem of an SC not being displayed even though there was a problem with the paper exit pawl home position sensor during initialization. • If the diagonal staple mode was selected when there was a problem with the stapler rotation motor home position sensor an SC occurred.	A6975656 **A**	July 1998 Production	A
Corrects the following: • To improve the stacking in the shift tray during stapling, the following modifications were implemented. 1. The initial lowering timing of the shift tray is now faster and the stack start time has been modified to allow the shift tray to return to the top position first. 2. The line velocity for the exit roller has been changed from 600 mm/sec to 700 mm/sec. The paper exit pawl speed has also been changed. 3. The timing for lowering the shift tray has been changed to 50 mm/sec after the exit sensor has detected the leading edge of the paper.	A6975656 **B**	July 1998 Production	B
Corrects the following: • When a jam occurs in the finisher, if the jam is not removed, the staple movement motor will not shut off. • When the power save mode command from the main unit is received, the machine initializes.	A6975656 **C**	Sept. 1998 Production	C
Corrects the following: • Occurrences of SC990. • Defective paper exit for LG, DLT, A3 and B4 paper sizes. • Two staples missing when B5 size paper is selected. • Stacking problems occur when paper curls during manual staple mode. • During Shift mode, the exit roller rolls up the paper if the paper curl is large. Modification of the shift tray height in shift mode, exit roller rotation speed and shift tray lowering timing.	A6975656 **D**	Nov. 1998 Production	D
Corrects the following: • While receiving a fax in Energy Saver Mode, the A697 power comes on and initializes. • When stacking with curled paper, the tray will move up and down slightly while the stapler is waiting for the remaining page(s) of a staple set. This slight up and down movement from the tray will tend to align any paper that slides out from the stack.	A6975656 **E**	Not Available	E
Corrects the following: • When the G909 was connected, the main engine was unable to recognize the A697.	A6975656 **F**	Not Available	F
Corrects the following: • Jam codes were not defined for paper jams at or before the entrance sensor.	A6975656 **G**	Not Available	G
Corrects the following: • The stack height sensor mis-detects the height, which causes the exit motor to stop and a paper jam occurs.	A6975656 **H**	Not Available	H

A697 Firmware Modification History (3000 Sheet Finisher)			
Description of Modification	**Level**	**Prod. Date**	**Ver.**
Corrects the following: • If a finisher job is initiated from 5 to 105 seconds after the copier recovers from “Energy Saver Mode”, SC990 or a paper jam occurs.	A6975656 **J**	Not Available	J

SwapBox™ and SwapFTL™
Installation Manual

1 INTRODUCTION

1.1 PRECAUTIONS

1.1.1 SWAPBOX AND SOFTWARE

If you purchase SwapBox from an authorized SCM Microsystems dealer, do not use the software enclosed with the SwapBox. You need to purchase the required software and license additionally from Ricoh.
The software part number is: **A2309353**

1.1.2 SOFTWARE LICENSE AGREEMENT

Before you use the software, you must agree to the SCM software license agreement that is enclosed in either the SwapBox or the software.
Users must be responsible for the agreement with SCM Microsystems Inc. Ricoh Co., Ltd. is not responsible for any legal problems caused by user's actions contrary to the agreement.

1.2 SYSTEM REQUIREMENTS

- An IBM PC-AT compatible computer with ISA Plug & Play BIOS
- One empty ISA bus slot (SBI-C2P and SBI-D2P)
- One empty 3.5" drive bay (SBI-D2P)
- Microsoft ® Windows ® 95 operating system 4.00.950a or later version installed (Refer to section 1.4 for more details.)
- At least 2MB of free disk space on the system partition (the partition where Windows 95 is installed) for SwapFTL software installation

1.3 ITEMS TO PREPARE BEFORE INSTALLATION

- Computer hardware user's manual
- Windows 95 installation disks or CD-ROM
- Windows 95 service pack (Refer to section 1.4 for more details.)
- SCM SwapBox SBI-C2P or SBI-D2P

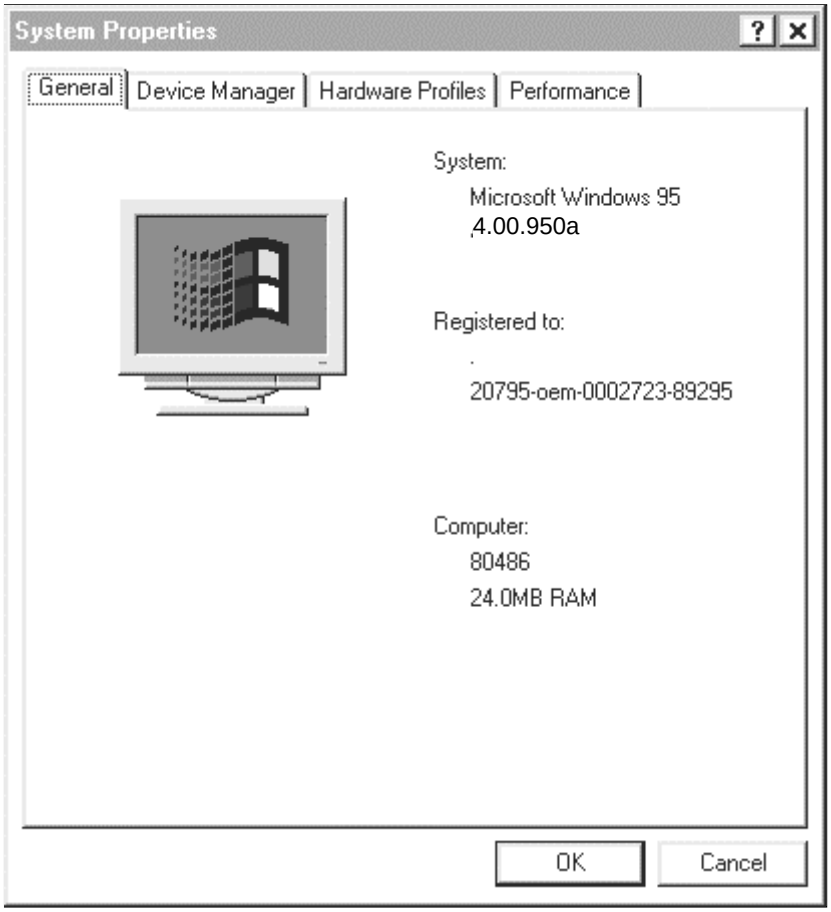
SCM/RCH SwapFTL + SwapUTI (rev. 2.01 or later) software diskette, and a software license

1.4 WINDOWS 95 VERSION CONFIRMATION

Windows 95 has several different versions as shown in the following table.

Version	Description	Remarks
4.00.950	First version	**Not suitable for SwapBox and SwapFTL installation.**
4.00.950a	First version (4.00.950) plus service pack 1	Install service pack 1 (SP1) into Windows 95 version 4.00.950. SP1 is available from Microsoft's web site.
4.00.950B	So called "OSR2 (OEM Service Release 2)"	Only computers with Windows 95 pre-installed have had this version since 1997.
4.00.950C	So called "OSR2.5 (OEM Service Release 2.5)"	Only computers with Windows 95 pre-installed have had this version since 1998.

Check the Windows 95 version first, just by clicking the "System" icon in the Windows Control Panel. If you see 4.00.950 in the box shown below, though the example version is 4.00.950a, install "Service Pack 1" into the current Windows operating system. Refer to the next page for how to get "Service Pack 1".



If the version is 4.00.950B or 4.00.950C, install SwapBox and SwapFTL without updating Windows.

"Service Pack 1" is available from the Microsoft web site.

For the detailed information, refer to the following Internet address.
http://www.microsoft.com/windows95/info/service-packs.htm

The service pack file can be downloaded from the following Internet location. Choose the one that is suitable for your Windows version.

Language	Internet Location
US English	http://www.microsoft.com/windows95/info/service-packs.htm
Chinese (Simplified)	Not available.
Chinese (Traditional)	http://www.microsoft.com/windows/software/localize/tw-eu.htm
Czech	http://www.microsoft.com/windows/software/localize/cz-eu.htm
Danish	http://www.microsoft.com/windows/software/localize/dan-eu.htm
Dutch	http://www.microsoft.com/windows/software/localize/dut-eu.htm
Finnish	http://www.microsoft.com/windows/software/localize/fin-eu.htm
German	http://www.microsoft.com/windows/software/localize/frn-eu.htm
Greek	http://www.microsoft.com/windows/software/localize/ger-eu.htm
Hungarian	http://www.microsoft.com/windows/software/localize/grk-eu.htm
Italian	http://www.microsoft.com/windows/software/localize/itn-eu.htm
Japanese (PCAT)	http://www.microsoft.com/windows/software/localize/jpcat-eu.htm
Korean	http://www.microsoft.com/windows/software/localize/kr-eu.htm
Norwegian	http://www.microsoft.com/windows/software/localize/nor-eu.htm
Pan-European	http://www.microsoft.com/windows/software/localize/pan-eu.htm
Polish	http://www.microsoft.com/windows/software/localize/pl-eu.htm
Portuguese (Brazilian)	http://www.microsoft.com/windows/software/localize/brz-eu.htm
Portuguese (Iberian)	http://www.microsoft.com/windows/software/localize/pt-eu.htm
Russian	http://www.microsoft.com/windows/software/localize/ru-eu.htm
Slovenian	http://www.microsoft.com/windows/software/localize/slv-eu.htm
Spanish	http://www.microsoft.com/windows/software/localize/spa-eu.htm
Swedish	http://www.microsoft.com/windows/software/localize/swe-eu.htm
Thai	http://www.microsoft.com/windows/software/localize/thai2.htm
Turkish	http://www.microsoft.com/windows/software/localize/trk-eu.htm

2 SWAPBOX INSTALLATION

2.1 HARDWARE INSTALLATION

CAUTION: 1) Before installing the SwapBox in a computer, turn off the computer and disconnect the power cable.
2) This manual does not explain how to install an ISA board in your computer. Refer to your computer's users manual for how to do it.

Install the SwapBox as explained in Chapter 1 to 3 of the SwapBox Manual that is enclosed in the SwapBox package.
Then go on to the next section below for the driver installation.

2.2 DRIVER INSTALLATION

CAUTION: 1) Do not use the software disks that are enclosed with the SwapBox.
2) Ensure that you have Windows 95 - 4.00.950a or a later version installed in your computer. (Refer to section 1.4 for more details.)

1. Turn on the computer. "SCM SwapBox" may appear during boot-up.
2. When Windows 95 starts, it finds the SwapBox automatically and installs the necessary driver files from the Windows installation diskette(s) or CD-ROM.
3. After Windows starts, choose "PCCard" from the Control Panel.
   - If PCCard Properties is displayed, driver installation has finished. You can go on to the next section.
   - If PCCard Wizard is displayed, go on to the next step.
4. In the PCCard Wizard, choose all the default settings to finish the wizard, then reboot the computer.
5. After Windows 95 has restarted, choose "System" from the Control Panel.
6. Choose "Device Manager" and confirm that "SCM SwapBox Family Plug and Play PCMCIA Controller" is listed in the PCMCIA socket category.
7. Double-click "SCM SwapBox Family Plug and Play PCMCIA Controller" and confirm that the SwapBox is working properly.

3 SOFTWARE (SWAPFTL) INSTALLATION

CAUTION: 1) If you purchased SwapBox from an authorized SCM dealer, do not use the software diskettes that are enclosed in the SwapBox package.
2) Use the software diskette which is labeled “SwapBox Software/ RCH SwapFTL + SwapUTI”.
3) A software license is required to **install** a software package on a computer.
4) The SwapFTL software may not work with some PC Card (PCMCIA), CardBus, or ZV port controllers installed in notebook computers.

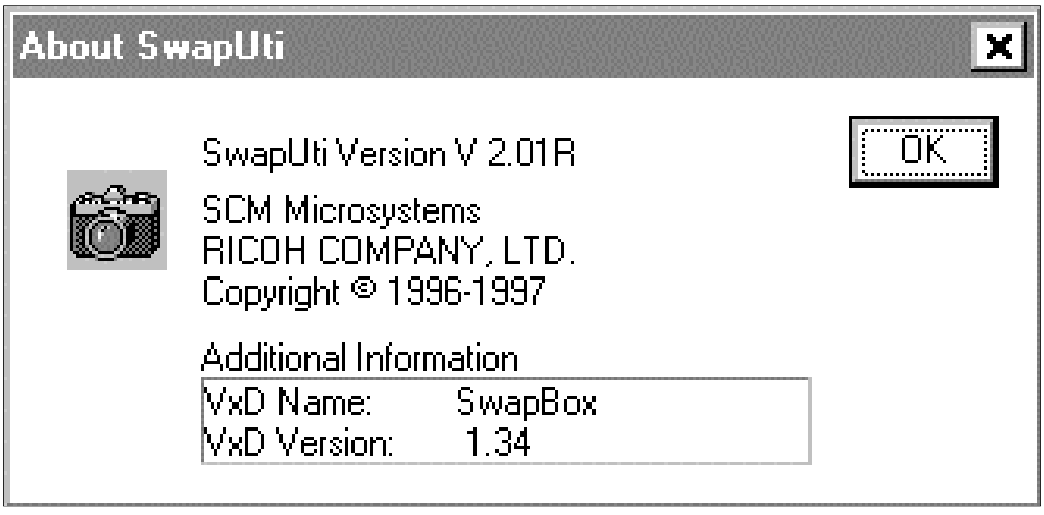
3.1 SWAPFTL SOFTWARE INSTALLATION

1. Ensure that the SwapBox has been installed and configured under the Windows 95 environment.
2. Insert the software diskette in the floppy disk drive.
3. Choose “Run” from the Start menu.
4. Type “A:\setup” and click OK.
5. Follow the instructions on the display.
6. Reboot the computer after installation has finished.

3.2 VERIFICATION

3.2.1 SOFTWARE VERSION

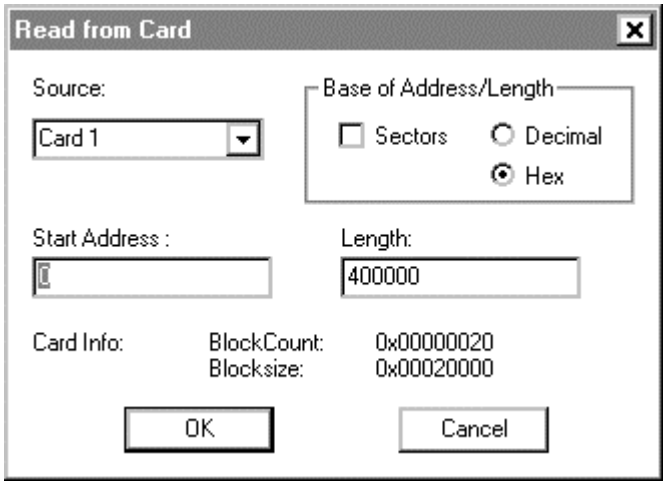
1. Choose “SwapFTL Binary Utility” from the “SCMSwapFTL” program group.
2. After the utility starts, choose [Help] – [About SwapUti..].
3. Confirm that the version information is as follows:



3.2.2 FLASH MEMORY CARD AUTOMATIC DETECTION

1. Insert the 4MB flash memory card supplied from Ricoh into a card slot.
2. Windows 95 automatically detects the card, if this is the first time a flash card has been used, Windows 95 installs the necessary drivers, and the “Found new hardware” dialog box should appear automatically.
3. Wait about 30 s, then choose “SwapFTL Binary Utility” from the “SCMSwapFTL” program group.

4. After the utility software starts, choose [Image] – [Read].
   If “Failed to open PCCard” appears, see Troubleshooting.



5. Click OK to read the card.
   If this works successfully, a new file is created as a temporary file, and this can be stored on the computer.

4 TROUBLESHOOTING

4.1 SWAPBOX RESOURCE CONFLICT

An ISA device must not share resources (IRQ, I/O address, and memory address) with another device.
ISA plug and play BIOS automatically assigns necessary resources to ISA boards. However, this could cause a problem if an ISA board requires specific resources. The SwapBox requires a specific memory address range to activate card services. So, if another ISA device or PCI device occupies this memory address range, the SwapBox and SwapFTL will not work.

4.1.1 IRQ AND I/O ADDRESS

To identify whether an IRQ or I/O address has a conflict with another device, check the SwapBox properties in the Windows device manager. If you find a conflict, follow the instructions given by Windows Help.

4.1.2 MEMORY ADDRESS

The SwapBox and card services require a memory Window between 0xC8000 to 0xD3FFF.
The SwapBox properties do not tell you if the memory address is in conflict with others. To identify whether the memory address is in conflict with another device, do the following:

1. Choose “Computer” in the Windows device manager, and click “Properties”.
2. Choose “Memory” in the “View resources” tab.
3. Check if any other device is using the address range from **0xC8000** to **0xD3FFF**. If it is a PCI device, you need to adjust the plug and play BIOS settings. If it is an ISA device, you need to remove the device from the system.

Conflict with a PCI device

1. Shut down Windows and reboot the computer.
2. Enter BIOS setup during system boot-up.
   NOTE: How to enter BIOS setup and BIOS setup options depends on your system.
3. Find the ISA plug and play settings in the BIOS setup.
4. Adjust the settings so that the BIOS does not allocate the SwapBox memory range to PCI devices.

Example: Award BIOS

1. Press the “DEL” key during boot-up to gain access to BIOS setup.
2. Choose “PNP AND PCI SETUP” from the main menu.

3 Change the “ISA MEM BLOCK BASE” setting as follows:
   - ISA MEM BLOCK BASE: No/ICU → **D000**
   - ISA MEM BLOCK SIZE: **8k**

4 Press “Esc” to exit “PNP AND PCI SETUP”.

5 Choose “SAVE & EXIT SETUP”.

Conflict with a plug and play ISA device

1. Shut down the computer.
2. Remove the ISA device that is in conflict with the SwapBox.
3. Restart the computer and see if the SwapBox and the SwapFTL work under the Windows environment.

Conflict with a legacy ISA device

Either remove the ISA device that is in conflict with the SwapBox to change its jumper settings, or run the setup utility of the device to change the setting.

4.2 “FAILED TO OPEN PCCARD” ERRORS

4.2.1 TIMELAG TO LOADING DRIVER

Windows requires a certain time, which depends on system performance, to enable card services for a flash memory card after inserting it in a PC card socket.
If you try to read, erase, or write to the card before the card service is ready, you receive a “Failed to open PCCard” error.
Wait for about 30 s, then try again.

4.2.2 PCCARD NOT CONFIGURED

If the PCCard icon in the Windows Control Panel is not configured, you receive a “Failed to open PCCard” error when you try to access the card.
Configure the PCCard icon using Control Panel as explained in the driver installation procedure.

4.2.3 RESOURCE CONFLICT

If you receive a “Failed to open PCCard” error even if the SwapBox looks correctly configured in the device manager, a memory address conflict is causing the error.
Refer to section 4.1.2 to solve the problem.

4.3 ”INVALID DYNAMIC LINK CALL FROM SWAPENUM…” ERROR

A blue screen error with a message *“Invalid dynamic link call from SwapEnum to device xxxx service x”* may happen, if SwapFTL software was installed before SwapBox had been activated.
Once this happens, follow the procedure below.

1. Uninstall SwapFTL (choose “SwapFTL Uninstall” from “SCM SwapFTL” program menu).
2. Reboot the computer.
3. After Windows has restarted, double-click “System” icon in the Control Panel.
4. Choose “Device Manager” tab and double-click “SCM SwapBox” in the “PCMCIA sockets” category.
5. If the device was not activated, activate it.
6. Reboot the computer.
7. After Windows has restarted, re-install SwapFTL.

4.4 SWAPFTL PROBLEM WITH NOTEBOOK COMPUTERS

4.4.1 WINDOWS AND PC CARD DRIVER VERSION

Before installing the SwapFTL software into a notebook computer, ensure the following.

- Windows 95 OSR2 is installed or Service Pack 1 is installed.
  For how to identify the version of Windows 95, refer to section 1.4 for details.
- The latest PC Card driver is installed.
  Contact your computer manufacturer or PC Card controller vender.

4.4.2 SYSTEM SUMMERY

If you still have problems after updating Windows and the drivers, send your computer’s system summary to the support database.
To prepare the system summary as a PostScript file, do the following.

1. Install a PostScript printer (e.g., HP LaserJet 4 PS).
2. Double-click the “System” icon in the Control Panel.
3. Choose the “Device manager” tab, and select “Computer” in the device map.
4. Click the “Print” button.
5. Choose the PostScript printer using the “Setup” button, choose “All devices and system summary” as the report type, and check the “Print to file” box.
6. Click OK to make a PostScript print file.

4.5 COMPLETE UNINSTALL

If the SwapBox and the SwapFTL software do not work due to unsuccessful configuration, the following process helps you to restart Windows plug and play from the beginning.
This procedure uninstalls all the software and drivers that were installed for the SwapBox, as well as deleting the Windows registry settings.

1. Uninstall the SCM SwapFTL programs.
   Choose “SwapFTL uninstall” from the Start menu.
2. Delete the following files from the \Windows\System directory.
   - SOCKETSV.VXD
   - FLS2MTD.VXD
   - FLS1MTD.VXD
   - SRAMMTD.VXD
   - CARDDRV.EXE
   - CSMAPPER.SYS
   - PCCARD.VXD
3. Delete “SCM SwapBox Family Plug and Play PCMCIA Controller” from the Windows device manager.
   (Choose ‘System” from the Control panel to access the device manager.)
4. Shutdown and restart Windows.
   Windows starts the plug & play process again to install the SwapBox.

SwapFTL™ Binary Utility
Operation Manual

Microsoft and Windows are registered trademarks of Microsoft Corp.
SwapBox and SwapFTL are trademarks of SCM Microsystems Inc.

1. OVERVIEW

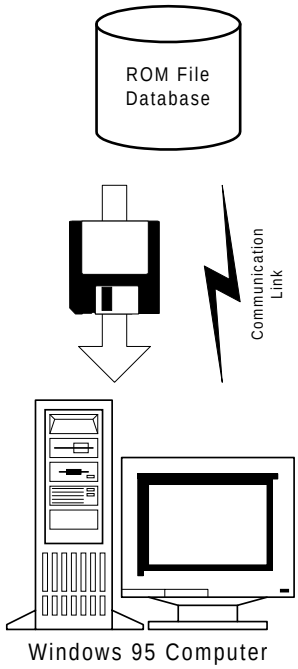
This software allows a flash memory card to be used as an intermediate medium between a flash ROM (or RAM) on the machine and a Windows 95 based computer.

The basic procedure is as follows:

1. You receive ROM files from a database either via network or via physical medium, and save them onto your computer's local hard disk.

   NOTE: Your computer works as a flash memory card programmer after you install SwapBox and SwapFTL software (this software).

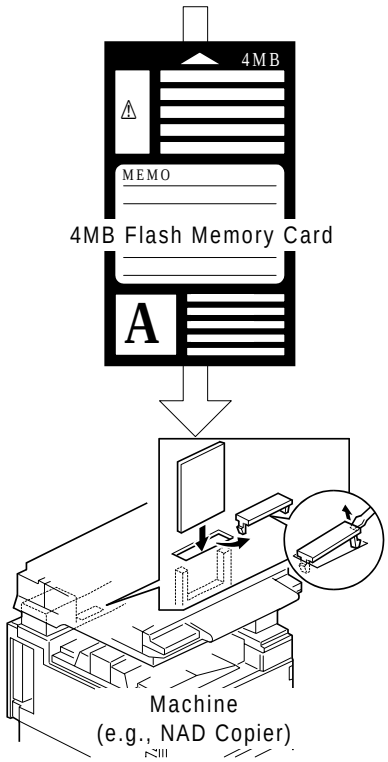
2. You program the ROM file to a flash memory card using this software.



3. You carry the programmed card to a machine site and download the ROM data from the card to the machine's internal flash ROM.

   NOTE: The 4MB flash memory card that is customized for this application is available from SPC.
   You cannot use other types of flash memory card.

4. After downloading ROM data to one machine, you can use the same card with another machine of the same type.



2. OPERATION

2.1. PROGRAMMING A FLASH MEMORY CARD

2.1.1 GETTING A SOURCE FILE

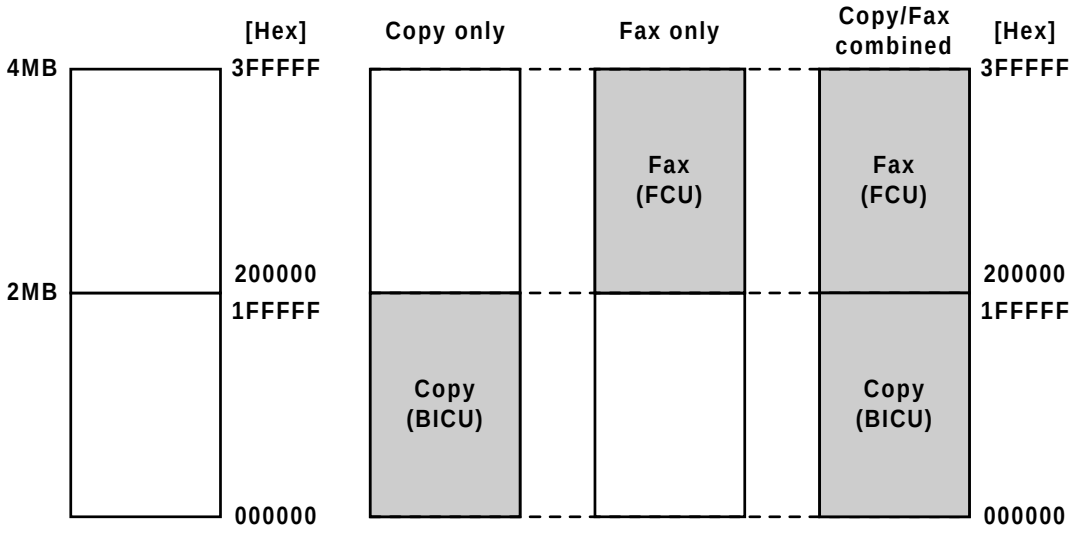
You can (or will be able to) obtain the source firmware file(s) in one of the following ways.

- Notes mail or through a Notes database
- Internet-mail
- BBS
- Floppy disk
- Flash memory card (you need to save the data on the card as a file on a PC before using the data.)
- Others (as yet unspecified)

2.1.2 PROGRAMMING A CARD WITH THE SOURCE

A230/A231/A232 Copy and Fax Main Firmware

You can program copy and fax firmware together onto one 4MB flash memory card, as shown below.



Start Address (Hex)	0	200000
Length (Hex)	200000	200000
Size (kB)	2,000 (2MB)	2,000 (2MB)

A230/A231/A232 Fax Modem Firmware and Fax SRAM Backup

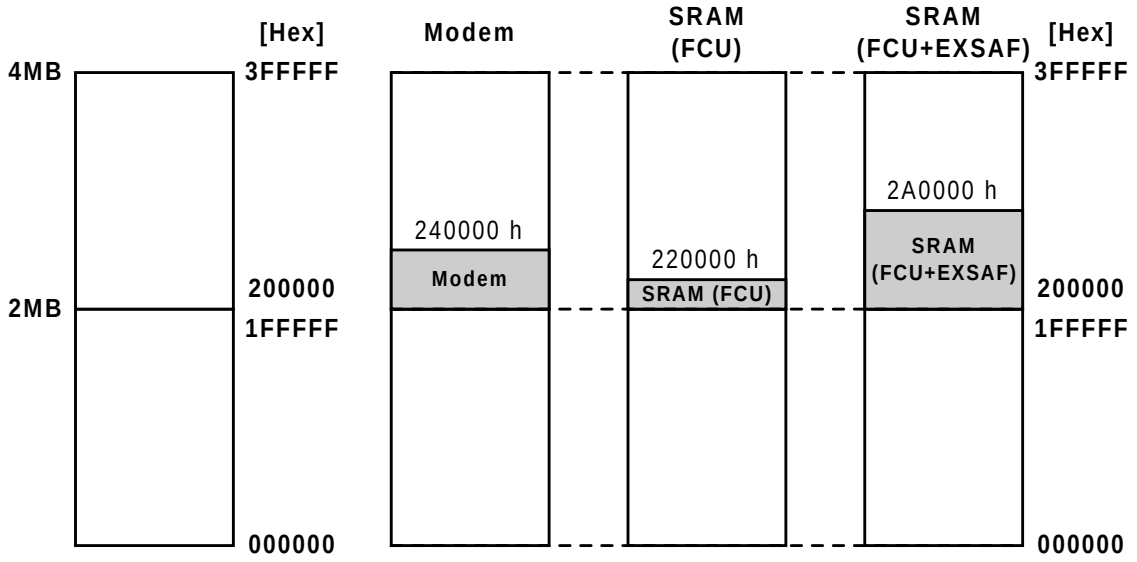
Modem

Program modem firmware using the address and length settings as shown below. You cannot program other data on the card once the modem firmware has been programmed.

SRAM

Using Fax SP mode, you can make a backup of SRAM data onto the 4MB flash memory card. This will help you set up multiple machines with fax options with the same settings, or will help you restore user data if the SRAM data has been erased accidentally.

To save the SRAM backup data from a fax unit on a 4MB flash memory card as a file, or to program a backup file from a PC onto a 4MB flash memory card, use the address and length settings as shown below.



Start Address (Hex)	200000	200000	200000
Length (Hex)	40000	20000	A0000
Size (kB)	256	128	128 + 512

2.2 DOWNLOADING TO A MACHINE

Refer to the machine's service manual for how to download its firmware to the flash ROM inside it.

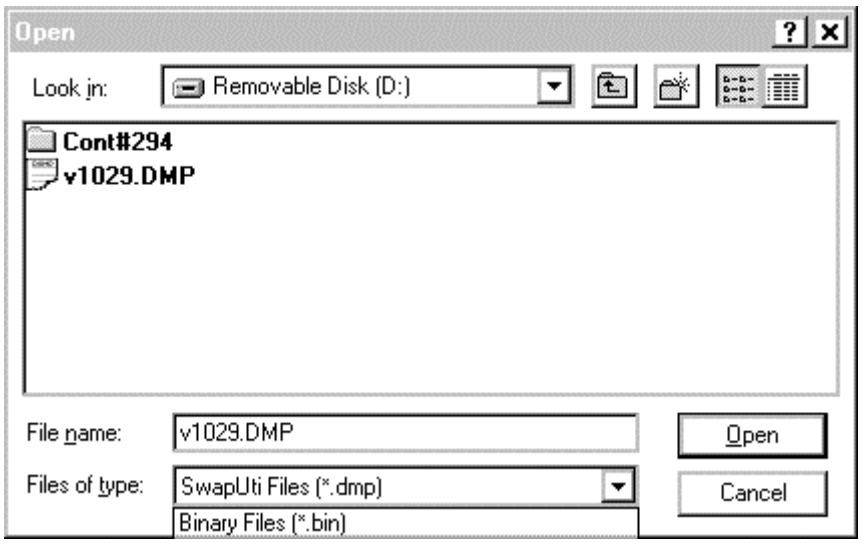
2.3 SAVING DATA TO A FILE

Some machines can upload an internal flash ROM image to a flash memory card. To save the image on the flash memory card as a computer file, read the card with a specific address range setting that was mentioned in section 2.1.2, and save the read data as a file.

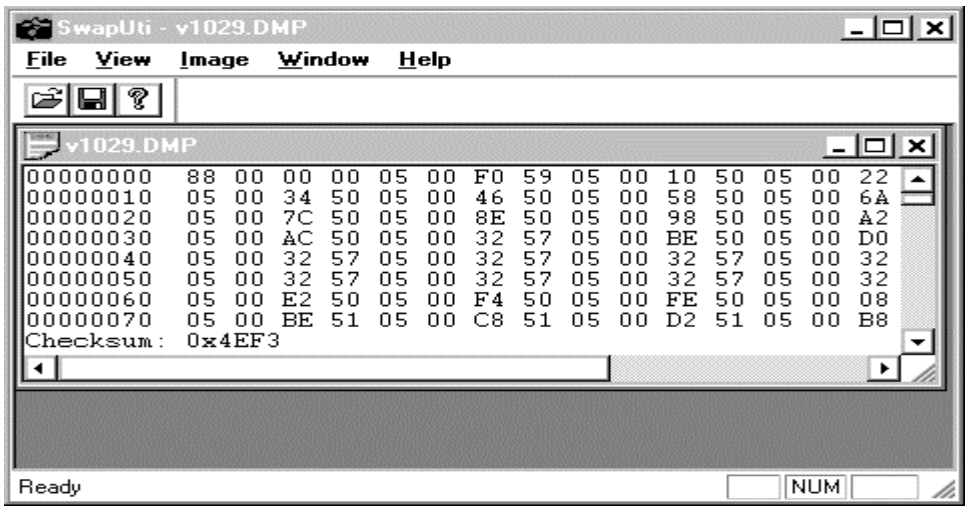
3. FUNCTIONS

3.1 FILE MENU

3.1.1 [FILE] – [OPEN]



This opens a binary file.
Use “Binary Files (*.bin)” or “SwapUti Files (*.dmp). Do not use the others.
The default setting is “Binary Files (*.bin).



An 8-bit checksum is displayed at the lower left corner of the opened file.

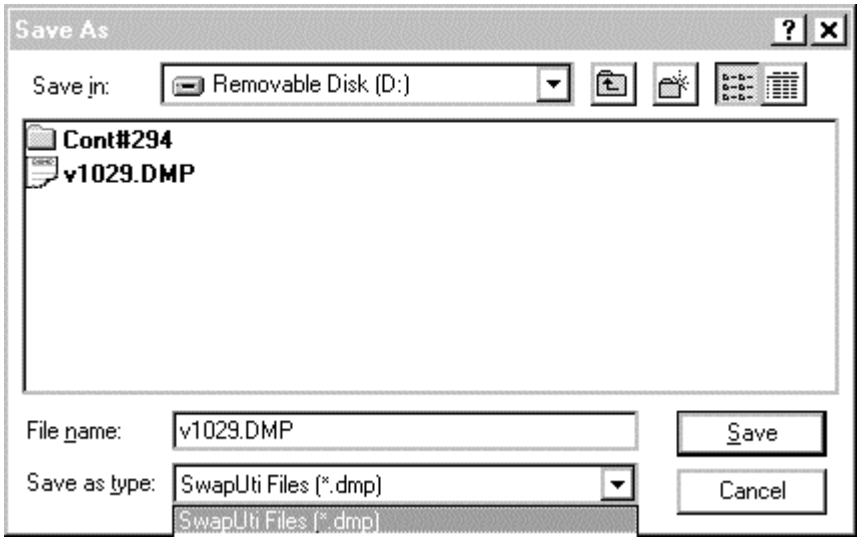
3.1.2 [FILE] – [CLOSE]

This closes an active file that has been opened.

3.1.3 [FILE] – [SAVE]

This saves an active file with the same name.

3.1.4 [FILE] – [SAVE AS]



This saves an active file with a different name from the original.

3.2 VIEW MENU

3.2.1 [VIEW] – [TOOLBAR]

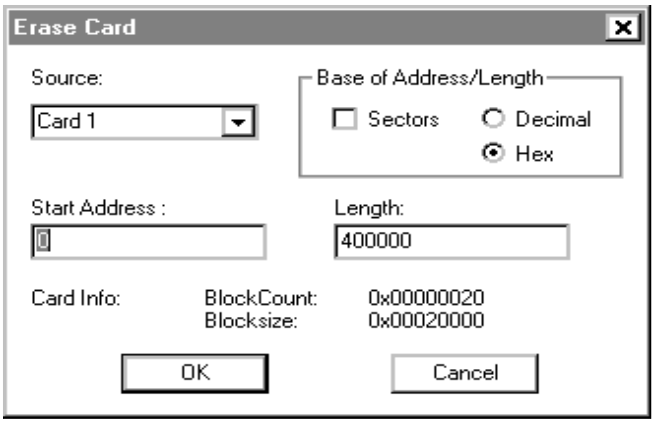
This switches on the toolbar display.

3.2.2 [VIEW] – [STATUS BAR]

This switches on the status bar display.

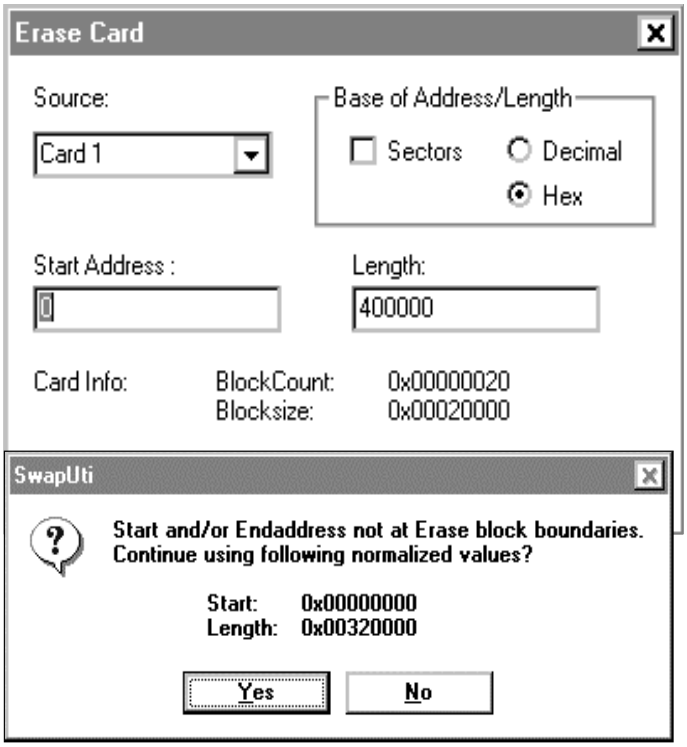
3.3 IMAGE MENU

3.3.1 [Image] – [Erase]

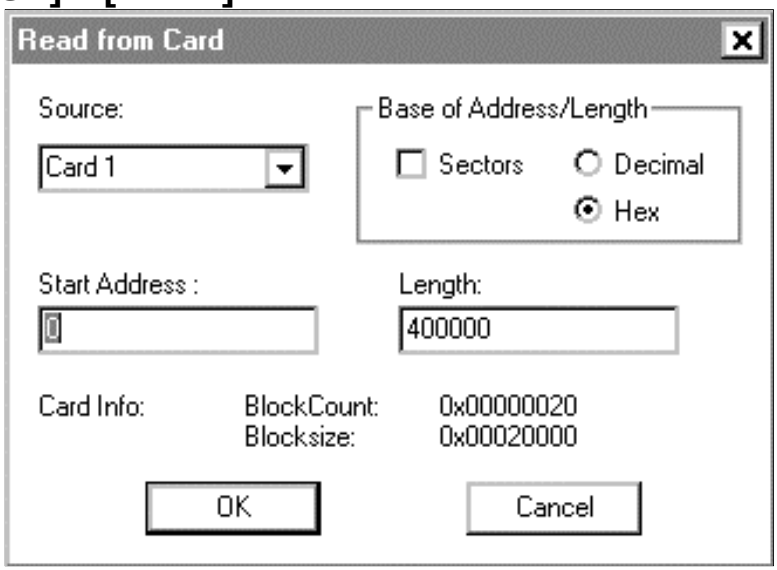


Field	Description
Source	Card slot number that has a flash memory card currently installed.
Start Address	A “0 (zero)” appears at default. To erase the whole card, do not change the setting
Length	Hexadecimal length of the card appears at default. To erase the whole card, do not change the setting
Base of Address/ Length	Do not change the settings. The default setting is “Hex”.

NOTE: If the specified start address and length do not coincide with block boundaries on the flash memory card, the message below appears.

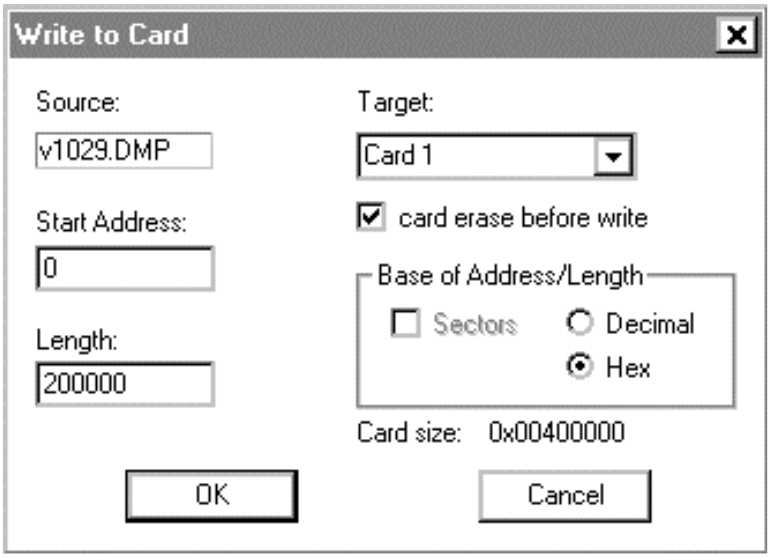


3.3.2 [IMAGE] – [READ]

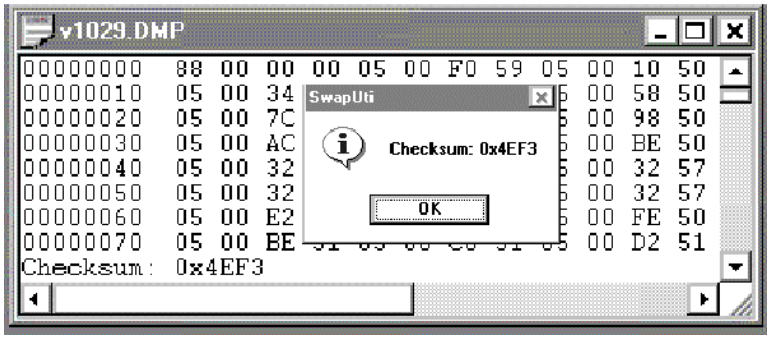


Field	Description
Source	Card slot number that has a flash memory card currently installed.
Start Address	A “0 (zero)” appears at default. Change this setting if necessary.
Length	Hexadecimal length of the card appears at default. Change this setting if necessary.
Base of Address/ Length	Do not change the settings. The default setting is “Hex”.

3.3.3 [IMAGE] – [WRITE]

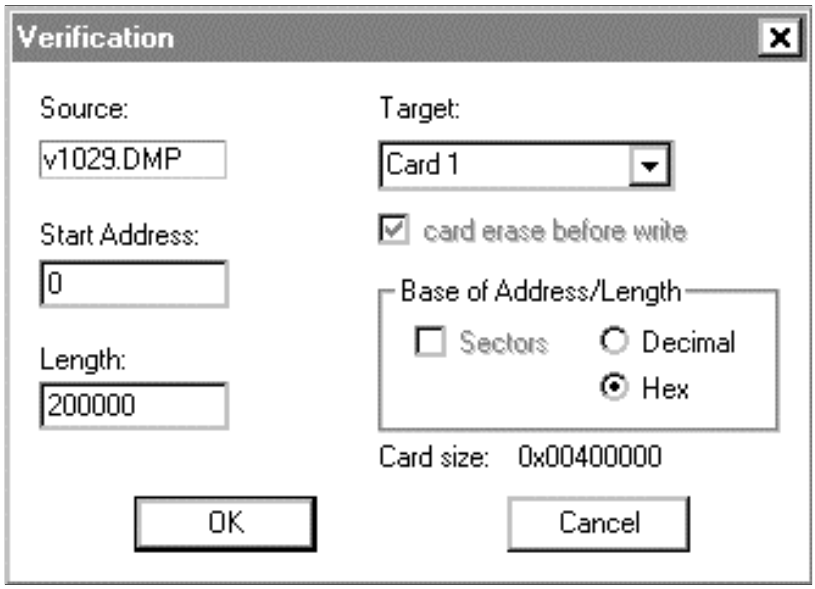


Field	Description
Source	Source file name that is currently active in the application.
Target	Card slot number that has a flash memory card currently installed.
Card erase before write	If this is checked, the application erases the whole card before writing data from the source file. The default setting is checked (= erase).
Start Address	A “0 (zero)” appears at default. Change this setting if necessary.
Length	Hexadecimal length of the source file appears at default. Do not change the setting.
Base of Address/ Length	Do not change the settings. The default setting is “Hex”.



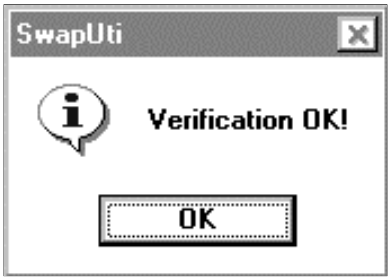
After writing the data to a flash memory card, an 8-bit checksum ① pops up, so that you can compare it with the checksum ② of the source file.

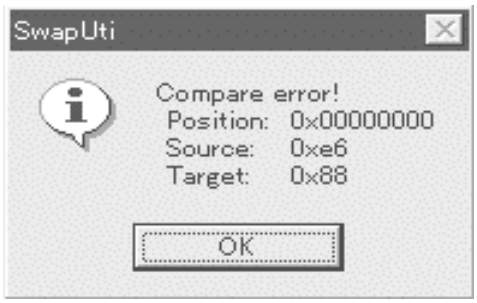
3.3.4 [Image] – [Verification]



Field	Description
Source	Source file name that is currently active in the application.
Target	Card slot number that has a flash memory card currently installed.
Start Address	A “0 (zero)” appears at default. Change this setting if necessary.
Length	Hexadecimal length of the source file appears at default. Do not change the setting.
Base of Address/ Length	Do not change the settings. The default setting is “Hex”.

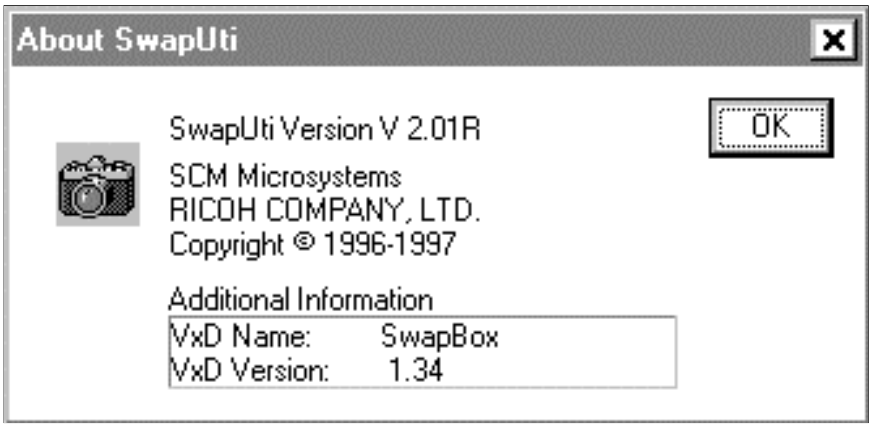
If verification was successful, a ‘Verification OK!” message pops up.
If verification was not successful, a “Compare error !” message pops up with the source and target addresses.





3.4 HELP MENU

3.4.1 [HELP] – [ABOUT SWAPUTI…]



NINE-TRAY MAILBOX AND BRIDGE UNIT G909/G912

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Number of Trays	9 trays and a proof tray
Tray Capacity:	Trays and proof tray: 100 sheets (80 g/m^2, 20 lb)
Paper Size for Trays:	Trays: Maximum: A3 or 11” x 17” Minimum: A5 (LEF) or 11” x 8 1/2” Proof tray: Maximum: A3 or 11” x 17” Minimum: A6 (LEF) or 11” x 8 1/2”
Paper Weight:	Trays: 60 ~ 90 g/m^2, 16 ~ 24 lb Proof tray: 52 ~ 157 g/m^2, 14 ~ 42 lb
Power Consumption:	48 W or less (average)
Power Source:	DC24 V, 5 V (supplied by the main machine)
Dimensions (W x D x H):	600 x 545 x 970 mm (23.6” x 21.5” x 38.2”)
Weight:	38 kg, 83.6 lb

- Specifications are subject to change without notice.

Legend:

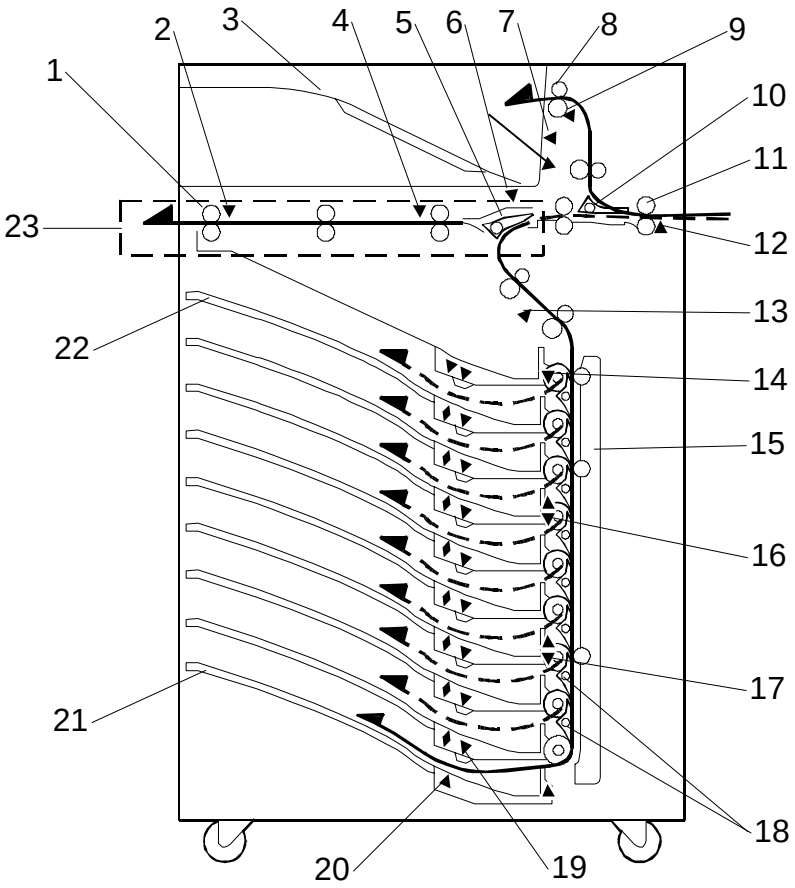
PRODUCT CODE	COMPANY		
	GESTETNER	RICOH	SAVIN
G909	CS360	CS360	CS360
G912	BRIDGE UNIT TYPE 460	BRIDGE UNIT TYPE 460	BRIDGE UNIT TYPE 460

NOTE:

The installation of the G909 MailBox requires that the A688 Bridge Unit Type 450 and the A682 Paper Tray Unit (PS360) must also be installed.

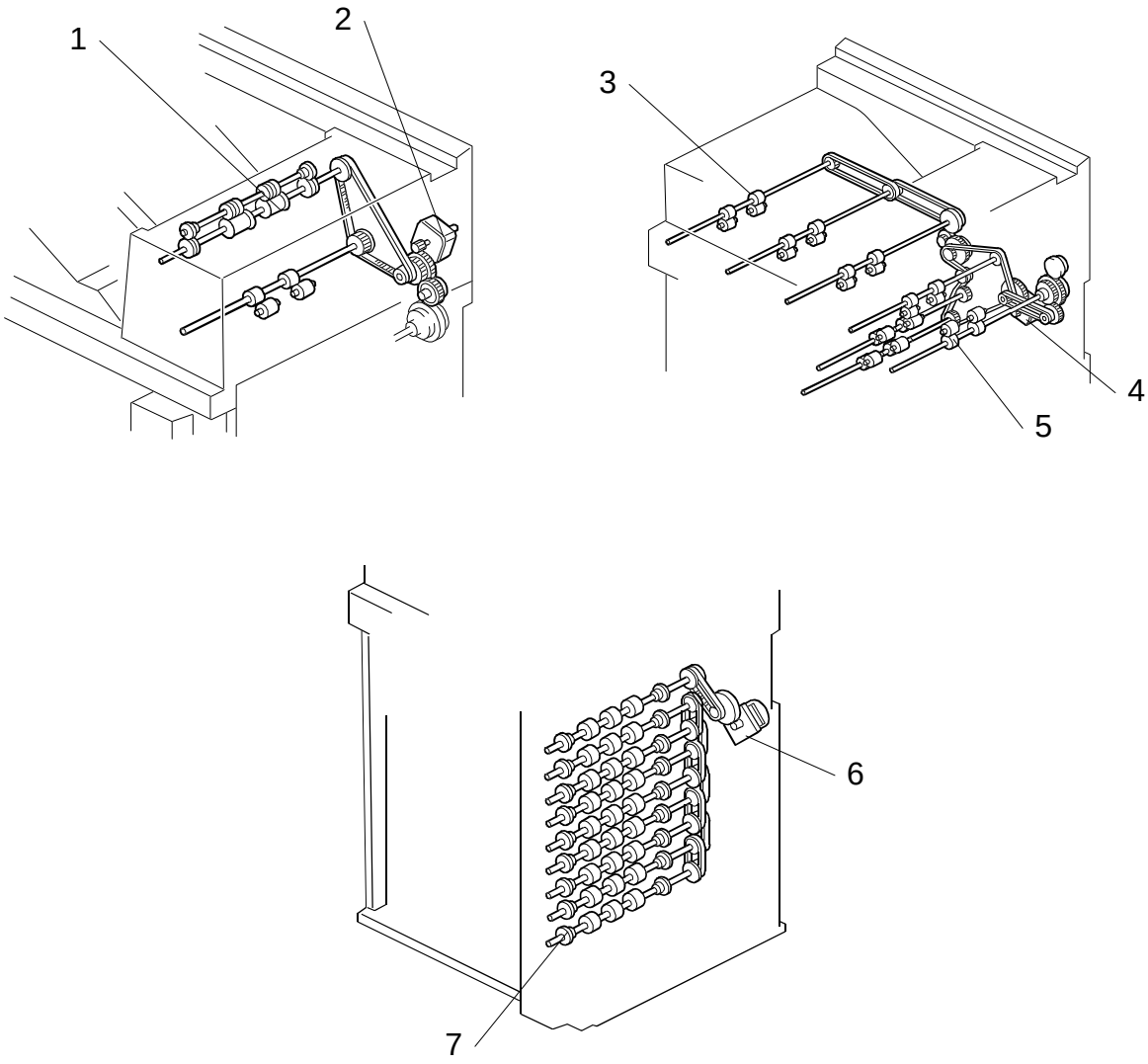
1.2 COMPONENT LAYOUT

1.2.1 MECHANICAL COMPONENT LAYOUT



1. Bridge Exit Roller
2. Bridge Exit Sensor
3. Proof Tray
4. Bridge Relay Sensor
5. Relay Junction Gate
6. Proof Tray Paper Sensor
7. Proof Tray Paper Overflow Sensor
8. Proof Tray Exit Roller
9. Proof Tray Exit Sensor
10. Proof Tray Junction Gate
11. Entrance Roller
12. Entrance Sensor
13. Relay Sensor
14. Tray Exit Sensor 1
15. Vertical Transport Guide
16. Tray Exit Sensor 2
17. Tray Exit Sensor 3
18. Tray Gates
19. Paper Overflow Sensor
20. Paper Sensor
21. 9th Tray
22. 1st Tray
23. Bridge Unit

1.2.2 DRIVE LAYOUT



1. Proof Tray Exit Roller
2. Proof Tray Transport Motor
3. Bridge Exit Roller
4. Transport Motor
5. Entrance Roller
6. Vertical Transport Motor
7. Tray Feed-out Roller

1.3 ELECTRICAL COMPONENT DESCRIPTIONS

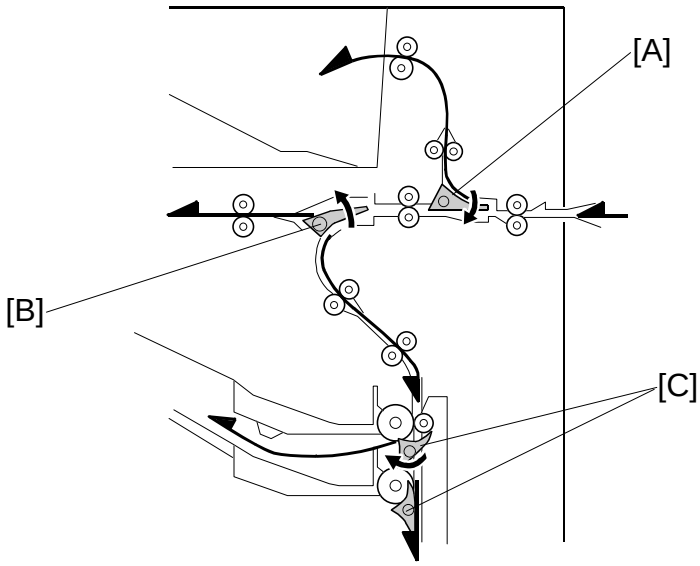
Refer to the electrical component layout and the point-to-point diagram, printed on waterproof paper and located in a protective sleeve for the component locations.

Symbols	Name	Function	Index No.
Motors			
M1	Proof Tray Transport	Drives all the proof tray rollers.	7
M2	Transport	Drives all rollers in the entrance area and all rollers in the bridge unit.	8
M3	Vertical Transport	Drives all tray feed-out rollers.	19
Sensors			
S1	Bridge Exit	Detects misfeeds.	1
S2	Bridge Relay	Detects misfeeds.	2
S3	Proof Tray Paper Overflow	Detects paper overflow in the proof tray.	3
S4	Proof Exit	Detects misfeeds.	4
S5	Proof Cover	Detects whether the proof cover is open or closed.	6
S6	Entrance	Detects copy paper entering the mail box and detects misfeeds.	9
S7	Relay	Detects misfeeds.	10
S8	Proof Tray Paper 1 (LED)	Informs the CPU when there is paper on the proof tray.	14
S9	Proof Tray Paper 2 (Photo Transistor)	Informs the CPU when there is paper on the proof tray.	13
S10	Tray Exit 1	Detects misfeeds.	21
S11	Tray Exit 2	Detects misfeeds.	25
S12	Tray Exit 3	Detects misfeeds.	29
S13	Tray Exit 4	Detects misfeeds.	32
S14	Paper 0	Contains an LED for paper sensor 1.	47
S15	Paper 1	Informs the CPU when there is paper on the 1st tray.	15
S16	Paper 2	Informs the CPU when there is paper on the 2nd tray.	43
S17	Paper 3	Informs the CPU when there is paper on the 3rd tray.	41
S18	Paper 4	Informs the CPU when there is paper on the 4th tray.	39
S19	Paper 5	Informs the CPU when there is paper on the 5th tray.	37
S20	Paper 6	Informs the CPU when there is paper on the 6th tray.	36
S21	Paper 7	Informs the CPU when there is paper on the 7th tray.	35
S22	Paper 8	Informs the CPU when there is paper on the 8th tray.	34

Symbols	Name	Function	Index No.
S23	Paper 9	Informs the CPU when there is paper on the 9th tray.	33
S24	Paper Overflow 1	Detects paper overflow in the 1st tray.	49
S25	Paper Overflow 2	Detects paper overflow in the 2nd tray.	46
S26	Paper Overflow 3	Detects paper overflow in the 3rd tray.	44
S27	Paper Overflow 4	Detects paper overflow in the 4th tray.	42
S28	Paper Overflow 5	Detects paper overflow in the 5th tray.	40
S29	Paper Overflow 6	Detects paper overflow in the 6th tray.	38
S30	Paper Overflow 7	Detects paper overflow in the 7th tray.	28
S31	Paper Overflow 8	Detects paper overflow in the 8th tray.	30
S32	Paper Overflow 9	Detects paper overflow in the 9th tray.	31
Solenoids			
SOL1	Proof Tray Junction Gate	Opens and closes the proof junction gate to direct paper either into the proof tray or to the trays.	17
SOL2	Relay Junction Gate	Opens and closes the relay junction gate to direct paper either to the bridge unit or to the trays.	15
SOL3	1st Tray	Opens and closes the 1st tray gate.	16
SOL4	2nd Tray	Opens and closes the 2nd tray gate.	18
SOL5	3rd Tray	Opens and closes the 3rd tray gate.	20
SOL6	4th Tray	Opens and closes the 4th tray gate.	22
SOL7	5th Tray	Opens and closes the 5th tray gate.	23
SOL8	6th Tray	Opens and closes the 6th tray gate.	24
SOL9	7th Tray	Opens and closes the 7th tray gate.	26
SOL10	8th Tray	Opens and closes the 8th tray gate.	27
PCBs			
PCB1	Main Control	Controls all sorter functions	48
PCB2	Proof Control	Drives the motors in the proof unit and informs the sensor status to the main control board.	5
Switches			
SW1	Bridge Cover	Cuts the +24 V power line and detects when the bridge cover is opened.	12
SW2	Front Cover	Cuts the +24 V power line and detects when the front cover is opened.	11

2. DETAILED DESCRIPTIONS

2.1 BASIC OPERATION



Proof Tray

When the proof tray is selected as the output tray and the exit sensor of the main machine is actuated by the leading edge of the paper, the transport motor and proof tray transport motor energize, causing the transport rollers to turn.

Soon after the motors start, the proof tray junction gate solenoid energizes and the proof tray junction gate [A] is lowered so that the paper goes to the proof tray.

When the last page passes the proof tray exit sensor and feeds out, the proof tray junction gate solenoid and the proof tray transport motor de-energize.

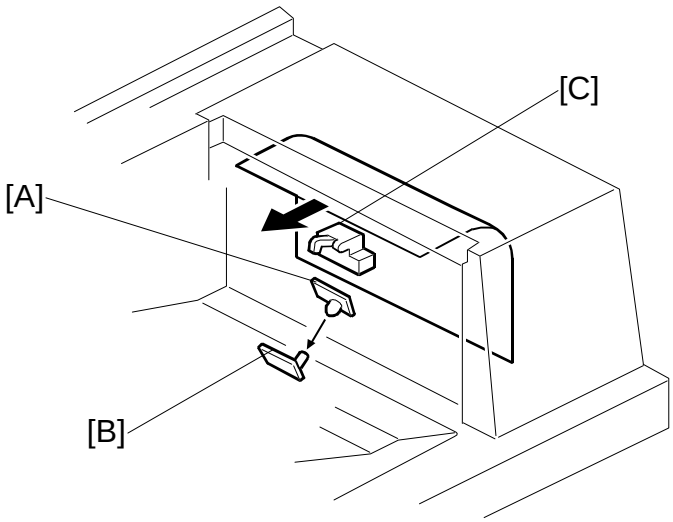
Bridge Unit

The relay junction gate [B] in the bridge unit delivers the paper either to the finisher or down to the trays. When the finisher is selected as the output tray, the relay junction gate stays closed, and the paper goes to the bridge unit. When a tray is selected as the output tray, the relay junction gate solenoid energizes and the relay junction gate is open so that the paper goes downwards to the tray area.

Trays

When the proof tray is selected as the output tray, the transport motor and the vertical transport motor energize. Each tray gate [C] is individually controlled by a solenoid. When a solenoid is energized, the tray gate opens and the paper goes into the tray.

2.2 PROOF TRAY SENSORS



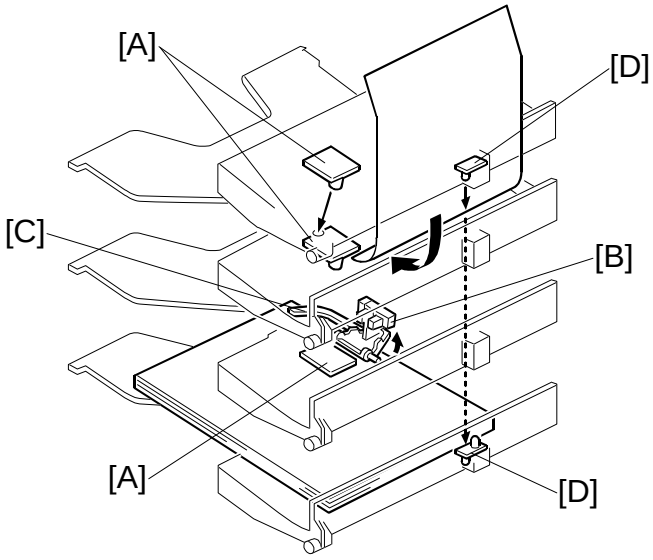
2.2.1 PAPER SENSOR

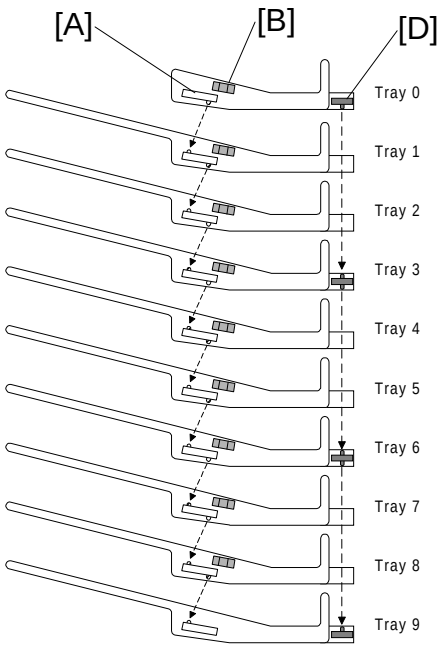
The paper sensor in the proof tray consists of two sensor boards; one is an LED board [A] and the other is a phototransistor board [B]. The sensor detects whether or not there is paper on the proof tray. When there is paper on the proof tray, the paper interrupts the light from the LED.

2.2.2 PAPER OVERFLOW SENSOR

There is also a paper overflow sensor [C] located in the proof tray. The machine detects paper overflow when the top sheet of the paper stack pushes up the sensor feeler. When this occurs, a message will be displayed on the operation panel and the machine stops printing until the paper stack on the proof tray is removed.

2.3 TRAY SENSORS





2.3.1 PAPER SENSOR

There is a paper sensor [A] for each tray (total 10 pcs). The paper sensors in tray 1 to tray 8 contain an LED and a phototransistor. The paper sensor in the tray 0 contains only an LED. The paper sensor in tray 9 contains only a phototransistor. The paper detection mechanism and their function are the same as for the proof tray.

2.3.2 PAPER OVERFLOW SENSOR

There is a paper overflow sensor [B] above each tray. The machine detects paper overflow in a tray when the top of the paper stack pushes up the sensor feeler [C]. When this condition occurs, the printing job is stopped until the paper stack is removed.

2.3.3 TRAY EXIT SENSOR

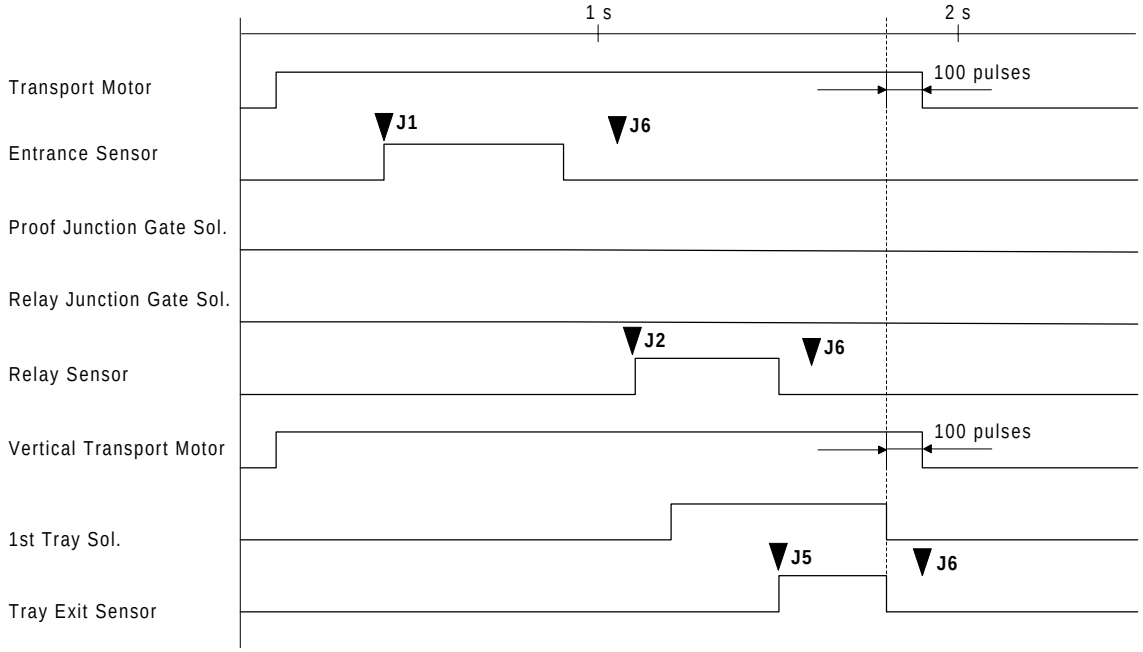
There is a tray exit sensor board [D] above the 1st tray (the mounting above tray 1 is called ‘tray 0’) and on trays 3, 6, and 9. The tray exit sensor board on trays 3 and 6 contains an LED and a phototransistor.

The tray exit sensor board above the 1st tray contains only an LED. The tray sensor board on the 9th tray contains only a phototransistor.

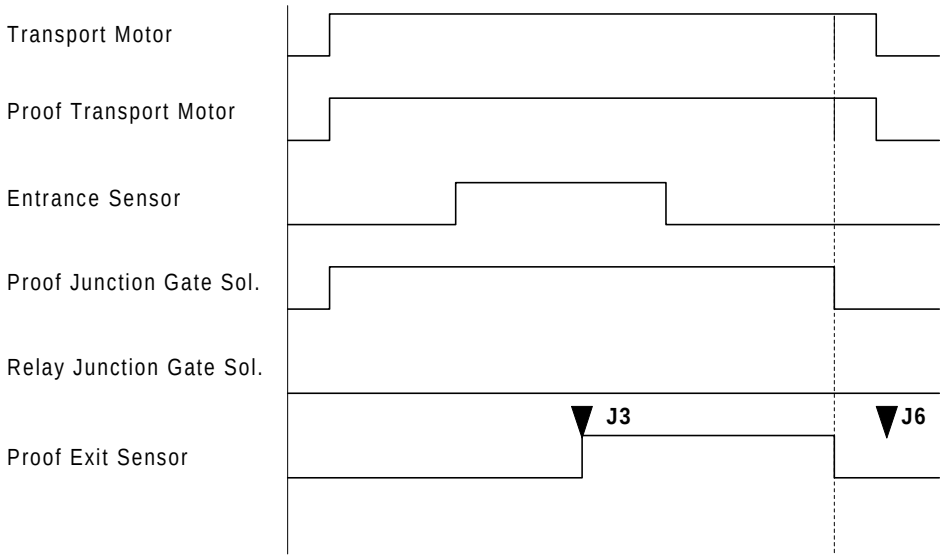
The machine detects paper leaving trays 1 to 3 using the sensor above tray 1 and the one on tray 3. When paper passes between those sensors, the light from the LED above tray 1 is interrupted.

2.4 TIMING CHART AND MISFEED DETECTION

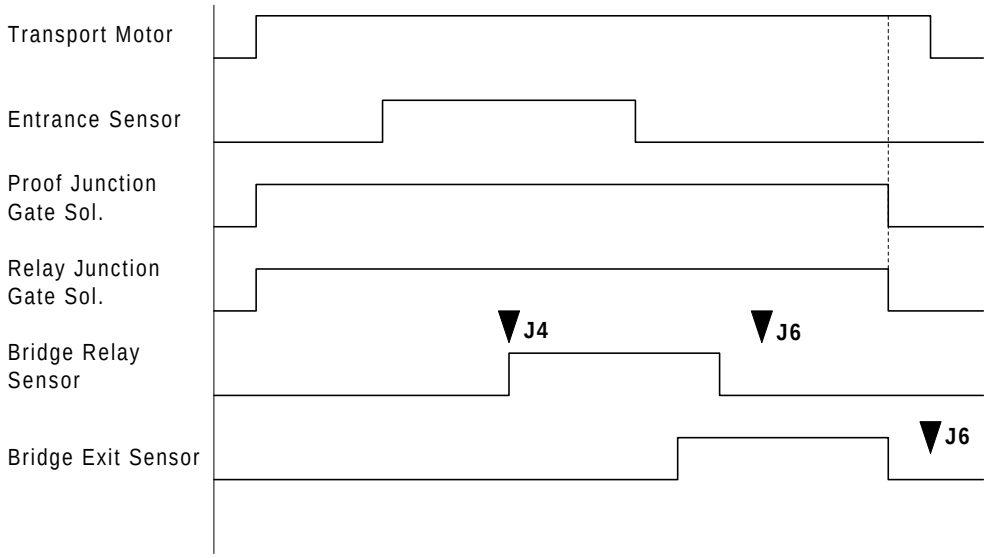
A4 Sideways (to 1st Tray)



A4 Sideways (to Proof Tray)



A4 Sideways (to Bridge Unit)



1. On check:
   - J1: The entrance sensor does not activate within 2460 pulses after the exit sensor of the main machine has been activated.
   - J2: The relay sensor does not activate within 1965 pulses after the entrance sensor has been activated.
   - J3: The proof tray exit sensor does not activate within 1665 pulses after the entrance sensor has been activated.
   - J4: The bridge relay sensor does not activate within 1954 pulses after the entrance sensor has been activated.
   - J5: The appropriate tray exit sensor does not activate within the appropriate number of pulses (see below) after the relay sensor has been activated.

J5 jam timing

Tray Exit Sensor	**Sensor 1**			**Sensor 2**			**Sensor 3**		
Tray No.	1	2	3	4	5	6	7	8	9
Pulses	72	139	176	206	242	273	304	343	375

2. Off check
   - J6: A sensor does de-activate within the specified number of pulses after that sensor has been activated.

Number of pulses = Paper length (in the paper feed direction) x 1.5

1 pulse = 0.1707 mm

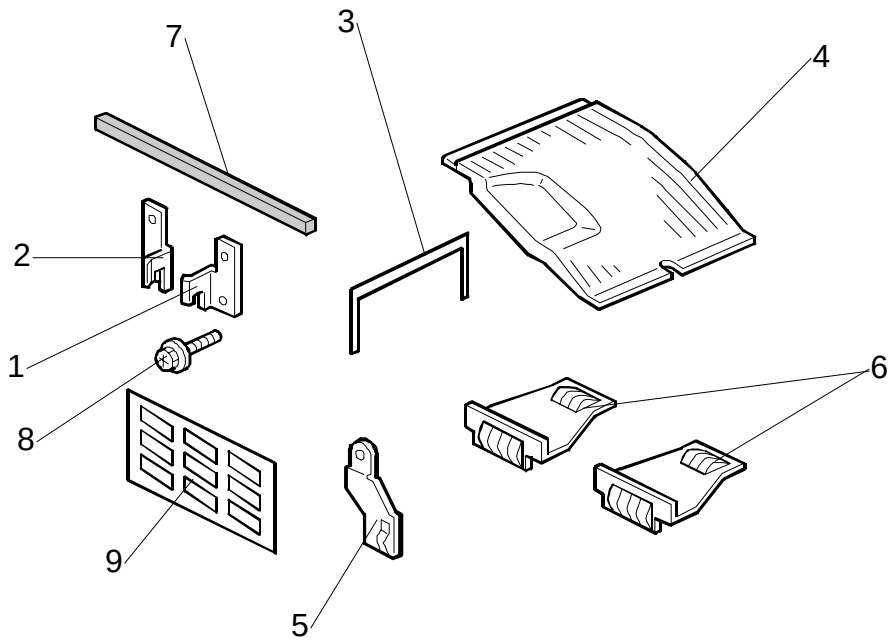
3. INSTALLATION PROCEDURE

3.1 MAILBOX (G909)

3.1.1 ACCESSORY CHECK

Check the accessories in the box against the following list.

No.	Description	Q'ty	Note
1	Front Joint Bracket	1	
2	Rear Joint Bracket	1	
3	Exit Guide Mylar	1	For A229
4	Proof Tray Attachment	1	For A230, A231, and A232
5	Upper Grounding Plate	1	For A230, A231, and A232
6	Lower Grounding Plate	2	One for A230, A231, and A232 Two for A229
7	Cushion	1	
8	Tapping Screw - M4 x 14	4	
9	Tray Decals	1	
10	Installation Procedure	1	

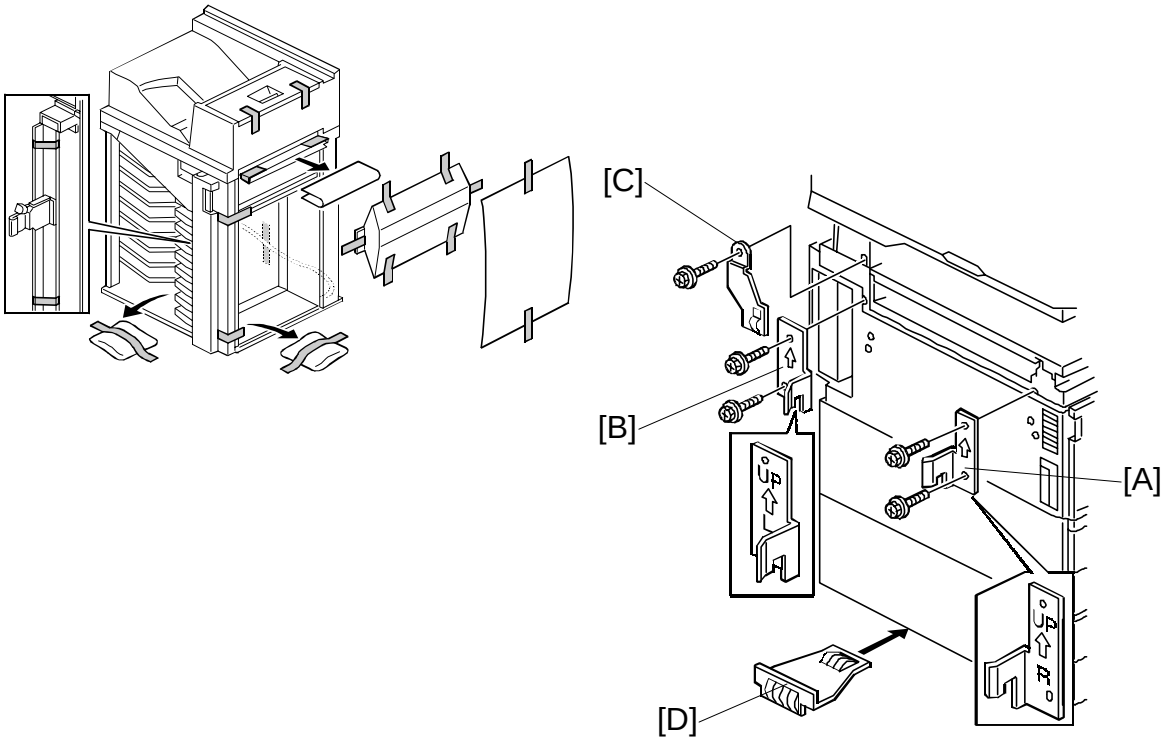


3.1.2 REQUIREMENT OPTIONS FOR MAIN MACHINE

When the mailbox is going to be installed to the A230, A231, or A232 machines, the following options for the main machine are required.

1. Bridge Unit Type 450 (A688)
2. Paper Tray Unit – PS360 (A682)

3.1.3 INSTALLATION PROCEDURE



- A230, A231 and A232 machines -

⚠CAUTION

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

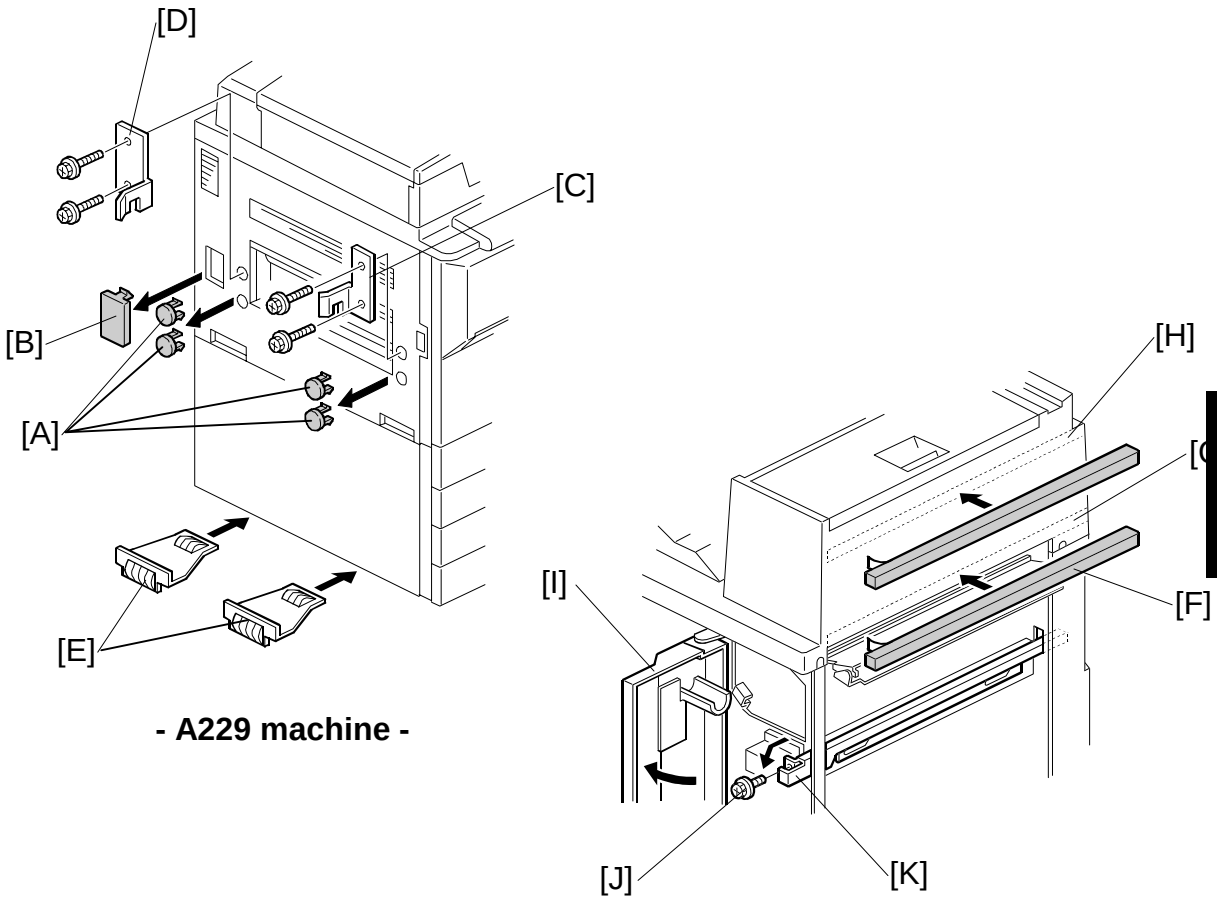
NOTE: 1) When the finisher (A697) is installed on the machine, the bridge unit for the mailbox (G912) must be installed.
2) The bridge unit for the mailbox must be installed before installing the Mailbox on the main machine.

1. Unpack the finisher and carefully remove all the shipping tapes.

- A230, A231, and A232 machines -

2. Attach the front joint bracket [A] and rear joint bracket [B] to the main machine (2 screws each).
3. Attach the upper grounding plate [C] (1 screw).
4. Peel off the backing of the double sided tape that is attached to the lower grounding plate [D].
5. Attach one lower grounding plate to the center of the bottom edge of the paper tray unit as shown.

Go to step 7.



- A229 machine -

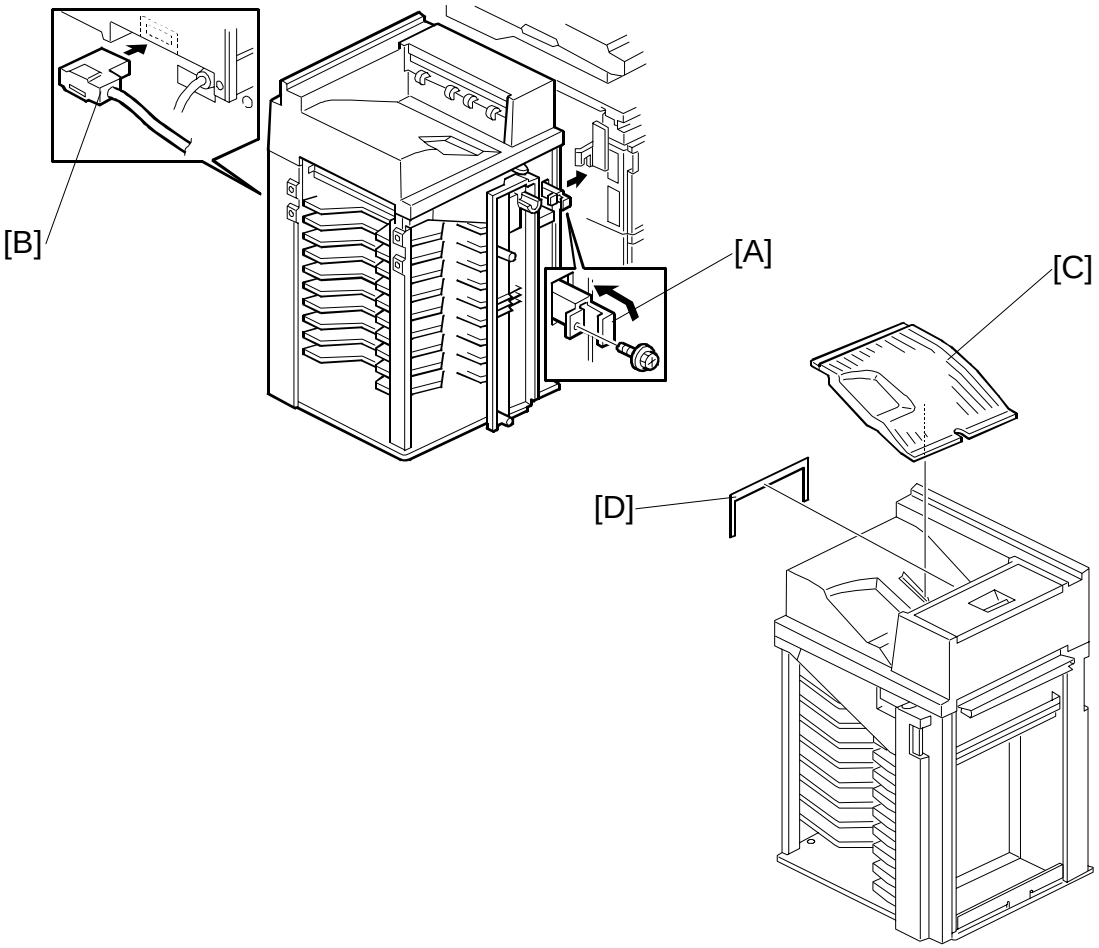
- A229 machines -

2. Remove the four plastic caps [A] from the copier's left cover.
3. Remove the connector cover [B].
4. Attach the front joint bracket [C] and rear joint bracket [D] to the main machine (2 screws each).
5. Peel off the backing of the double-sided tape that is attached to the lower grounding plate [E].
6. Attach two lower grounding plates to the bottom edge of the paper tray unit as shown.

- All machines -

7. The position of the cushion [F] depends on which main machine the mailbox is installed to. Attach the cushion to the plate as follows:
   - Position [G] for A230, A231, and A232 machines.
   - Position [H] for A229 machines.

   NOTE: When attaching the cushion to position [H], cut about 40 mm (1.6 inches) off one edge of the cushion.
8. Open the front cover [I] of the mailbox, and remove the screw [J] that secures the locking lever [K]. Then pull the locking lever.



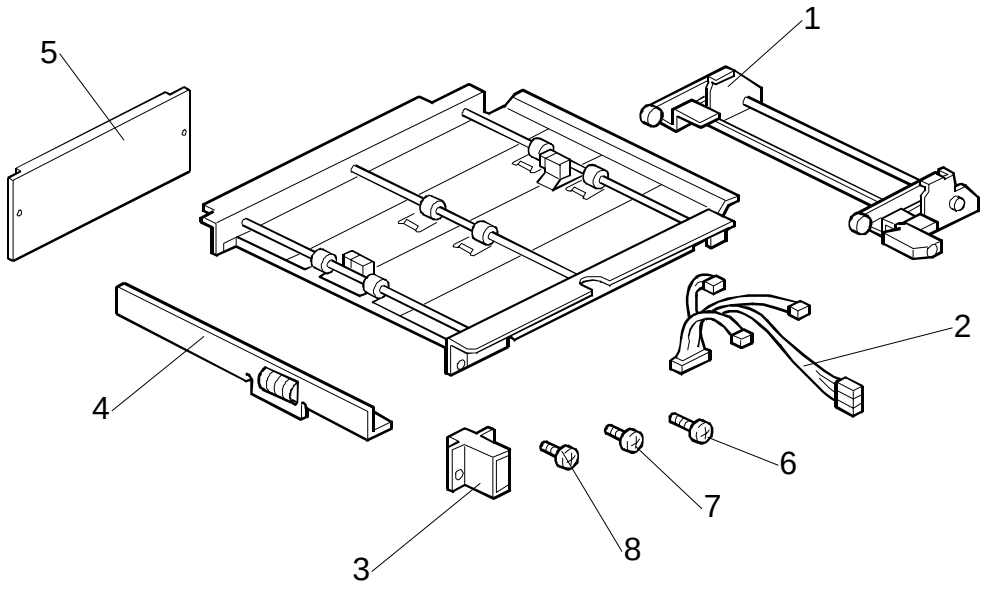
9. Align the mailbox on the joint brackets, and lock it in place by pushing the locking lever [A].
10. Secure the locking lever (1 screw) and close the front door.
11. Connect the mailbox cable [B] to the main machine.
12. **A230/A231/A232 machines only:** Peel off the backing of the double-sided tape that is attached to the proof tray attachment [C].
13. Install the proof tray attachment on the proof tray.
14. **A229 machines only:** Install the exit guide mylar [D] on the upper cover just above the anti-static brush.
15. Power on the main switch and check the mailbox operation.

3.2 BRIDGE UNIT FOR MAILBOX (G912)

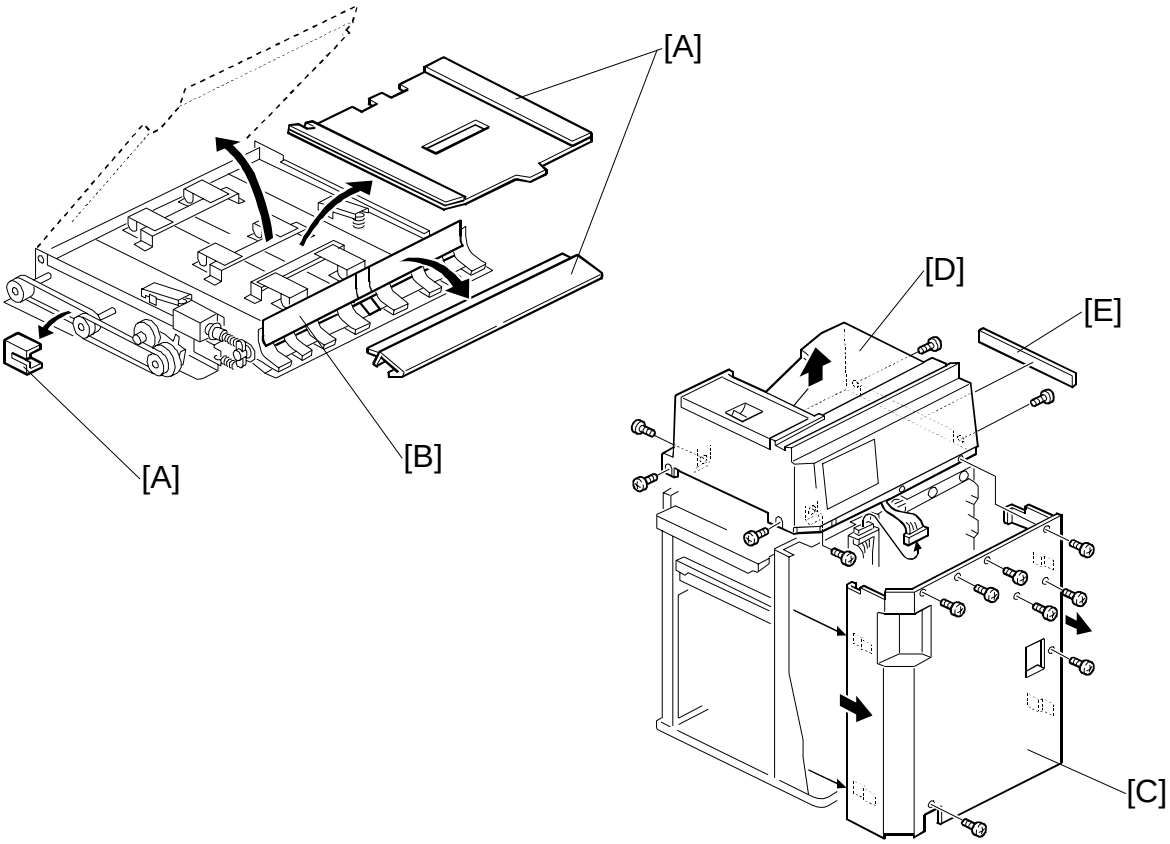
3.2.1 ACCESSORY CHECK

Check the accessories in the box against the following list.

No.	Description	Q'ty
1.	Guide Plate Bracket	1
2	Cable	1
3	Cover Switch	1
4	Grounding Bracket	1
5	Finisher Shielding Plate	1
6	Screw - M4 x 8	9
7	Screw - M4 x 4	4
8	Screw - M3 x 6	2



3.2.2 INSTALLATION PROCEDURE

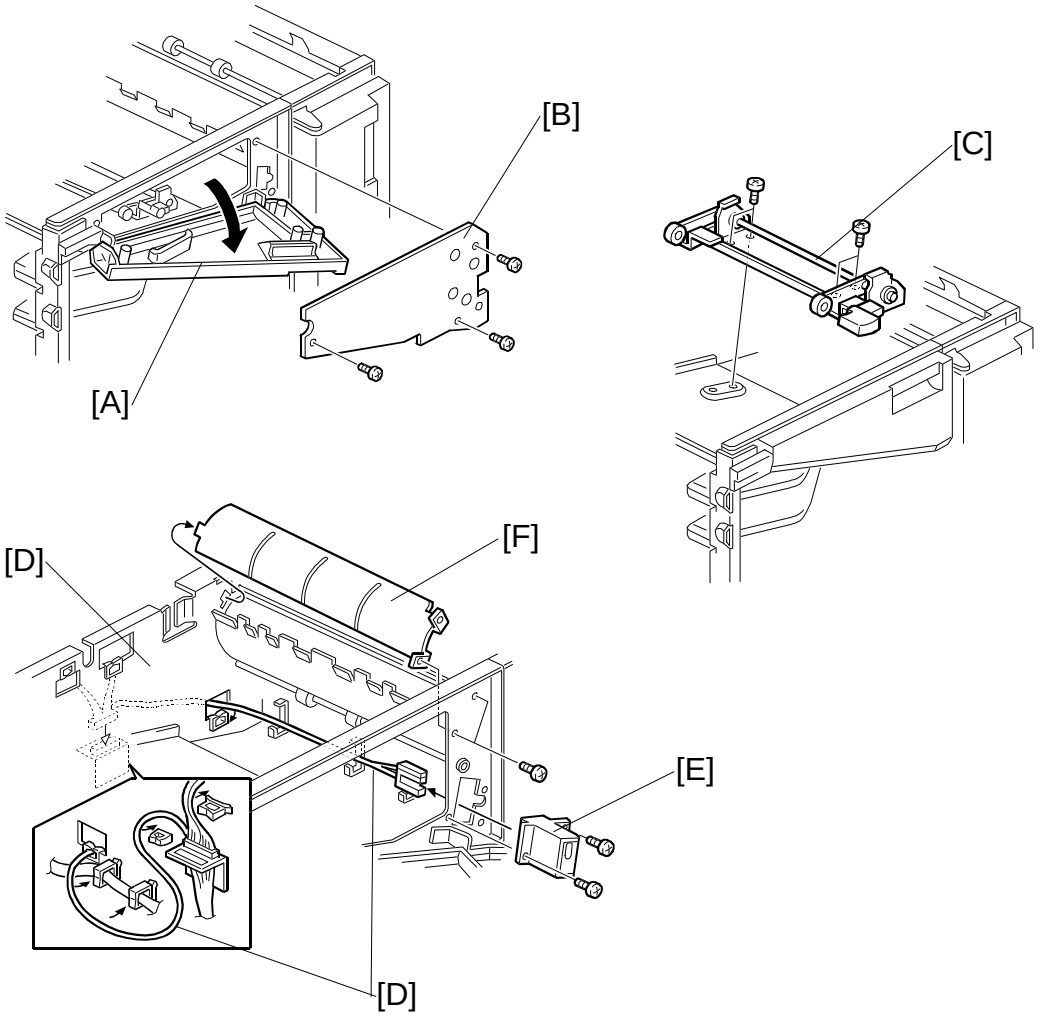


⚠CAUTION

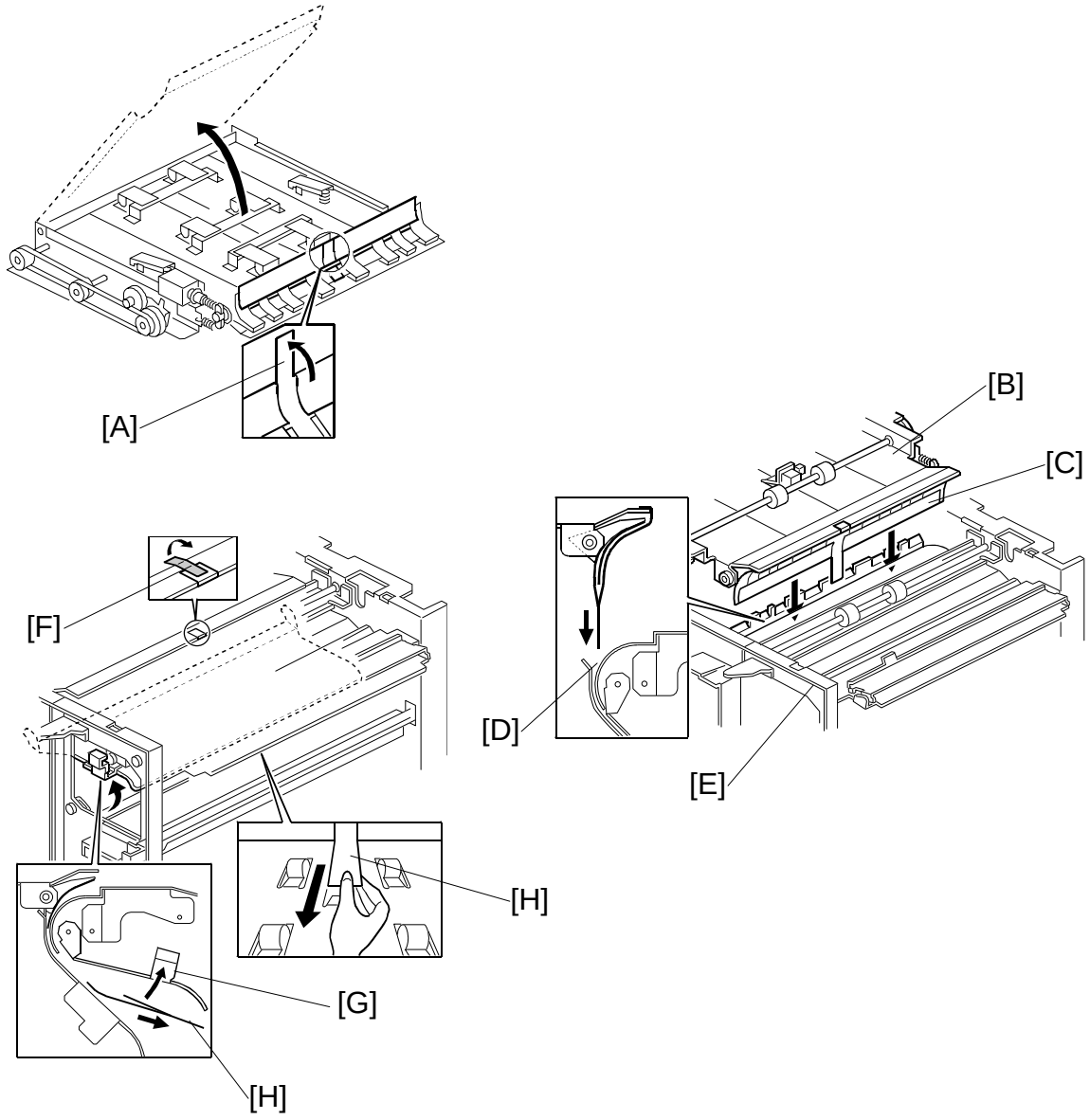
Unplug the main machines power cord before starting the following procedure.

NOTE: 1) The bridge unit for the mailbox must be installed when the 3000 sheet finisher (A697) will be installed.
2) The 3000 sheet finisher (A697) can be installed only on the A232 and A229 machines.

1. Unpack the bridge unit and remove the shipping retainers [A].
   NOTE: Do not remove the protective sheet [B] at this time.
2. Remove the mailbox if it has been previously installed.
3. Remove the rear cover [C] of the mailbox (8 screws).
4. Remove the proof tray unit [D] (6 screws, 1 connector).
5. Remove the cover [E].

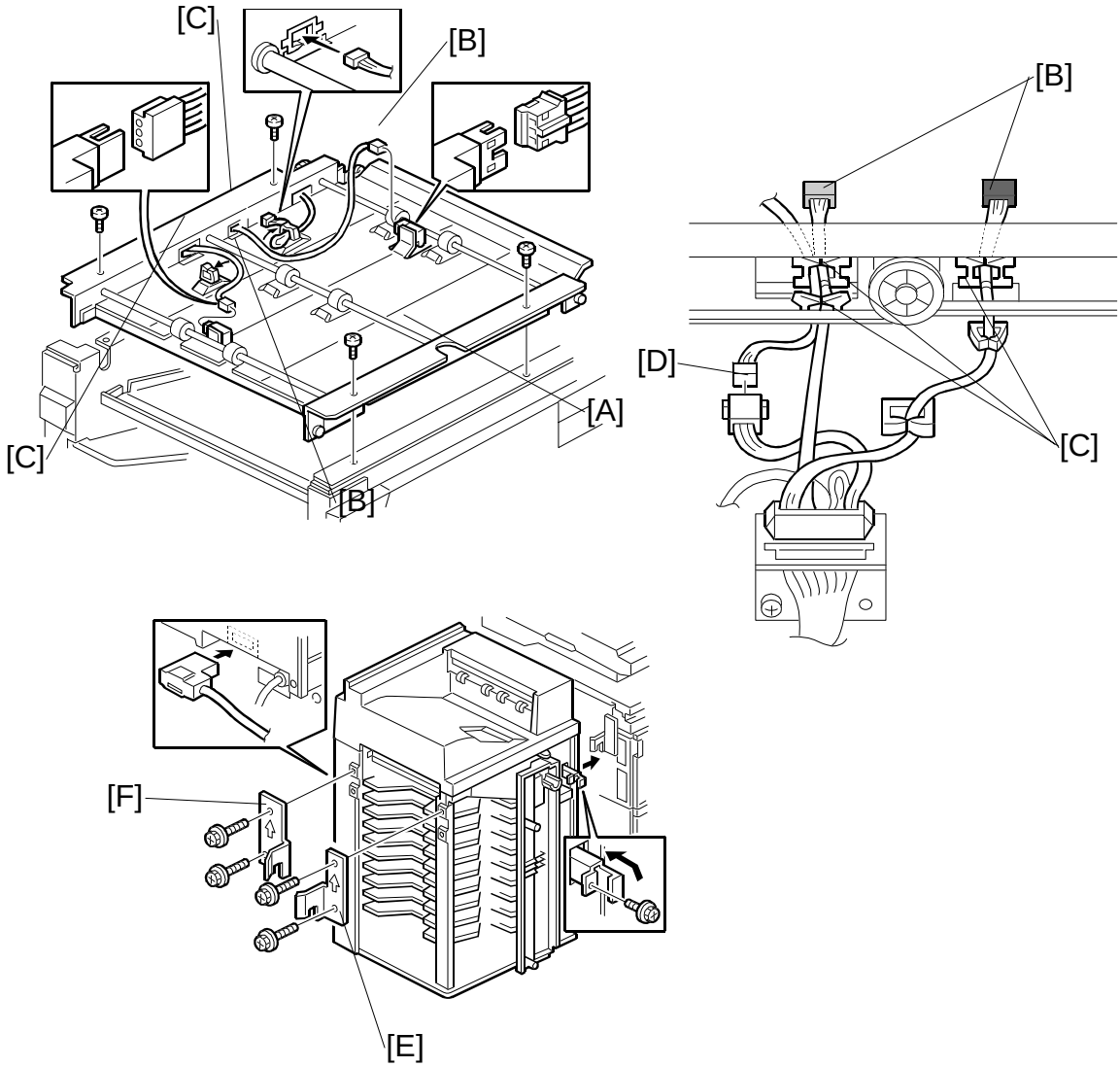


6. Open the left front cover [A] of the mailbox, and remove the inner plate [B] (3 screws).
7. Install the guide plate bracket [C] (4 screws - M4 x 4).
8. Route the cable [D] and affix it to the clamp as shown.
9. Connect the cover switch [E] to the cable then install the cover switch (2 screws – M4 x 8).
10. Remove the paper guide plate [F] (2 screws).



11. Pull up the tab [A] of the protective sheet.
    NOTE: 1) Do not remove the protective sheet at this time.
    2) Make sure that all mylars are held between the two folded halves of the protective sheet.
12. Carefully turn over the bridge unit [B] and insert the protective sheet [C] into the gap [D] between the paper guides. Next, insert the bridge unit onto the mailbox [E].

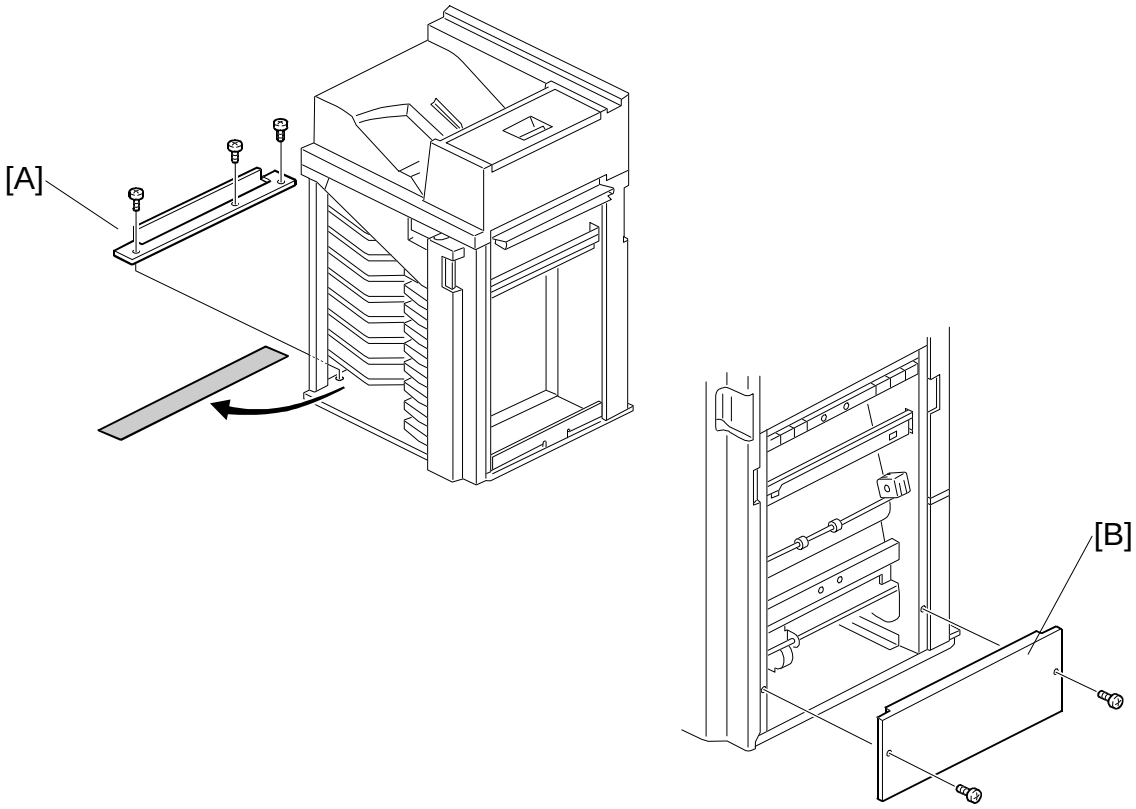
    NOTE: When holding the bridge unit, do not touch the timing belt. Otherwise the timing belt may come off the gear.
13. Remove the tape [F] of the protective sheet.
14. Open the upper paper guide [G] then pull out the protective sheet [H].
    NOTE: Check that all mylars are set into the gap between the paper guides.



15. Secure the bridge unit [A] (4 screws – M4 x 8).
16. Route the cables [B] through the openings [C].
17. Route the solenoid harness [D] through the opening [C].
18. Connect the cables to the solenoid and sensors and clamp the cable as shown.
19. Reinstall the rear cover and proof tray unit.
20. Install the mailbox on the main machine (refer to the Mailbox Installation procedure for more detail).

    If the 3000 sheet finisher (A697) is going to be installed, perform steps 21 to 25.

21. Install the front joint bracket [E] and rear joint bracket [F] which are contained in the finisher's accessory box.

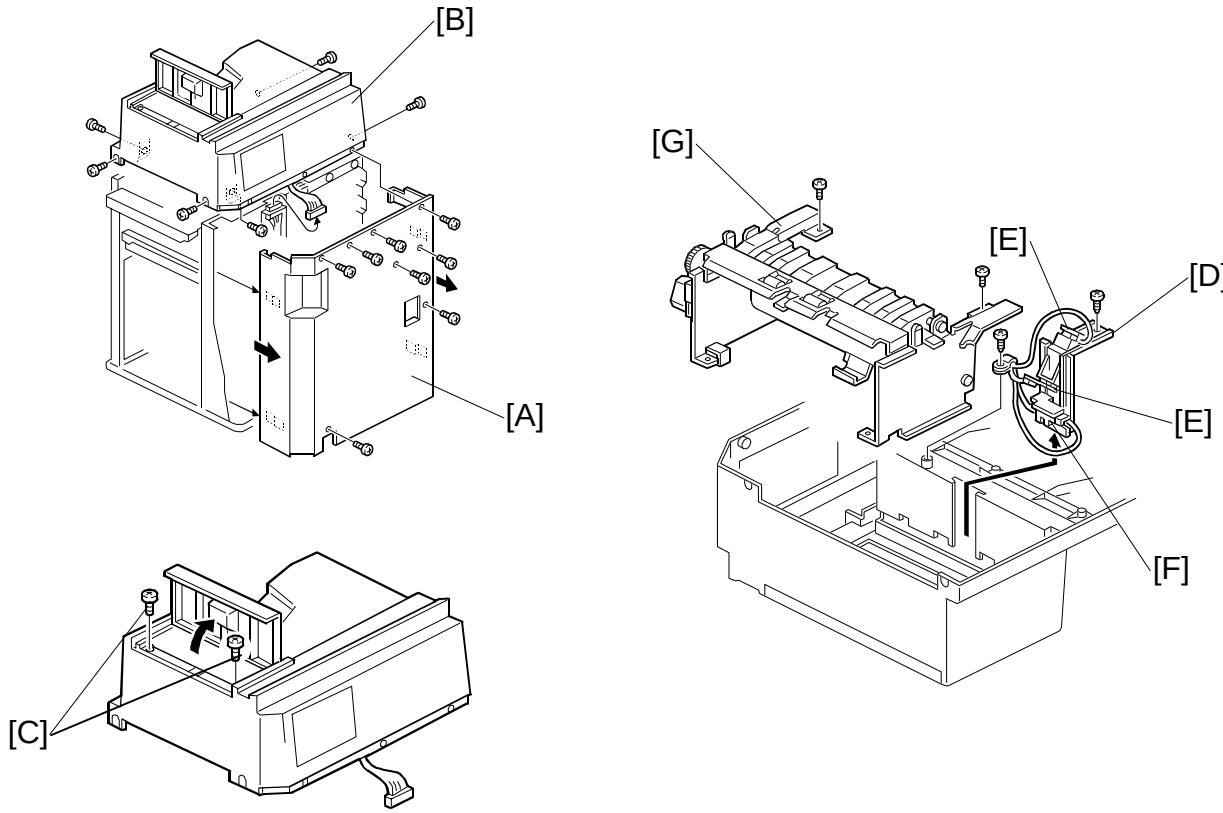


22. Remove the seal [A].
23. Attach the grounding bracket [B] (3 screws - M4 x 8).
24. Attach the shielding plate [C] to the finisher (2 screws – M3 x 8).
25. Attach the finisher to the mailbox (refer to the Finisher Installation Procedure).
26. Power-on the main switch of the main machine and check the bridge unit operation. (Select a copy mode that uses the finisher.)

4. REPLACEMENT AND ADJUSTMENT

4.1 PROOF TRAY UNIT

4.1.1 PROOF TRAY SENSOR AND PAPER OVERFLOW SENSORS



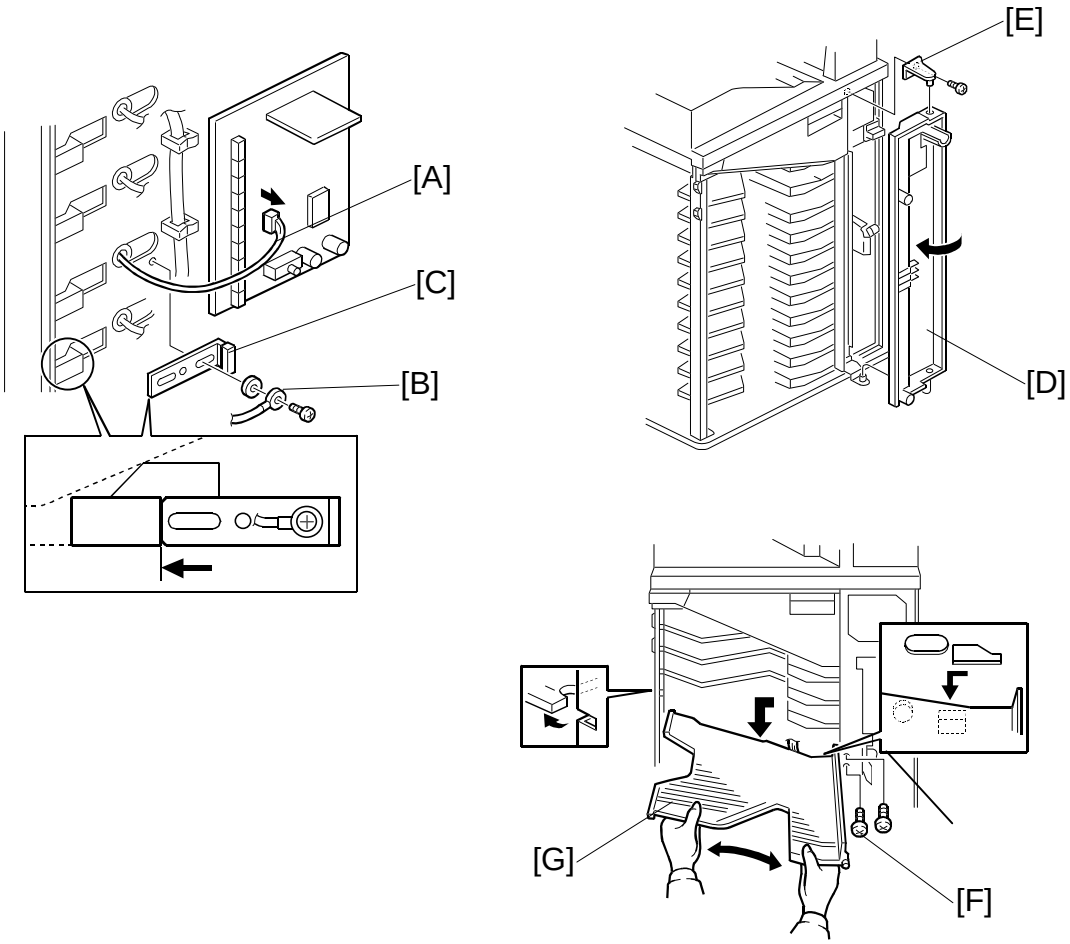
1. Remove the rear cover [A] (8 screws).
2. Remove the proof tray unit [B] (6 screws).
3. Remove two screws [C], then turn over the proof tray unit.
4. Remove the sensor bracket [D] (2 screws, 1 clamp).
5. Remove the proof tray paper sensor [E] (1 screw each).
6. Remove the proof tray paper overflow sensor [F].

4.1.2 PROOF TRANSPORT UNIT

1. Remove the proof tray unit [B] and remove two screws [C].
2. Carefully turn over the proof tray unit and remove the proof transport unit [G] (2 screws).

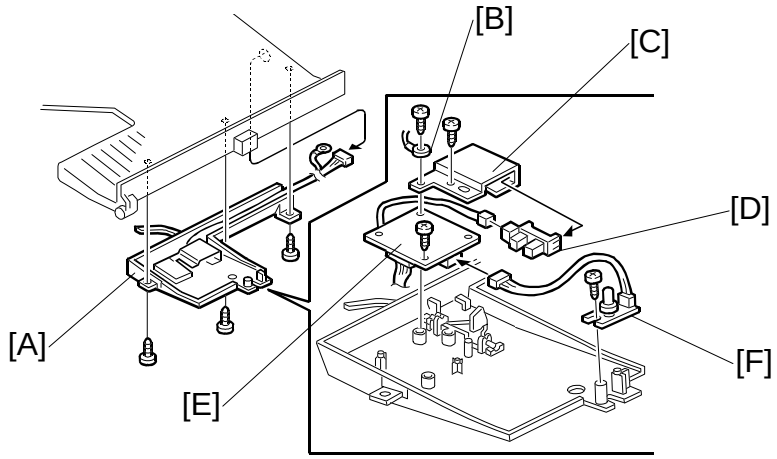
4.2 TRAY UNIT

4.2.1 TRAYS



1. Remove the rear cover (8 screws).
2. Disconnect the cable [A] of the tray which will be removed.
3. Remove the grounding wire [B] (1 screw, 1 washer) and remove the tray stopper [C].
   NOTE: When reinstalling the tray stopper, push the stopper to the left against the tray.
4. Open the front cover [D] and remove the cover bracket [E] (1 screw), then remove the front cover.
5. Remove the two screws [F] which secure the tray.
6. Remove the tray [G]. (First move the tray to the left and gently flex it, then remove the tray.)

4.2.2 PAPER SENSOR, PAPER OVERFLOW SENSOR, AND TRAY EXIT SENSOR



NOTE: When removing the paper sensor or paper overflow sensor for the 1st tray, or the tray exit sensor above the 1st tray, first remove the 1st tray and remove the sensor cover, then remove these sensors.

1. Remove the tray (see Trays).
2. Remove the sensor cover [A] (3 screws).

Paper Overflow Sensor

3. Remove the grounding wire [B] (1 screw) and paper overflow sensor bracket [C] (1 screw).
4. Remove the paper overflow sensor [D] (1 connector).

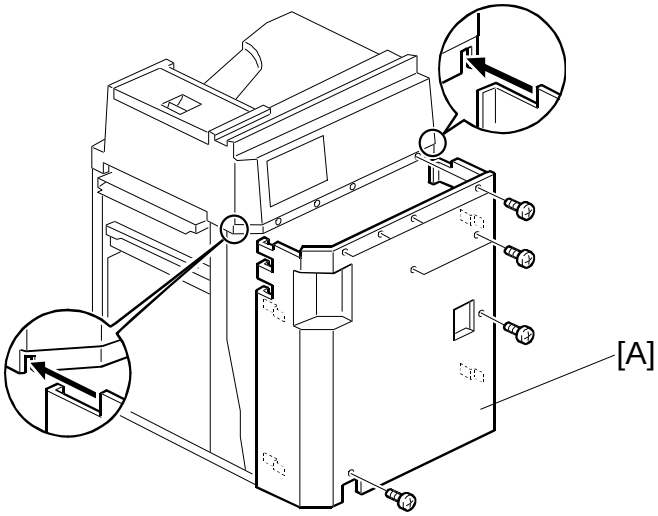
Paper Sensor

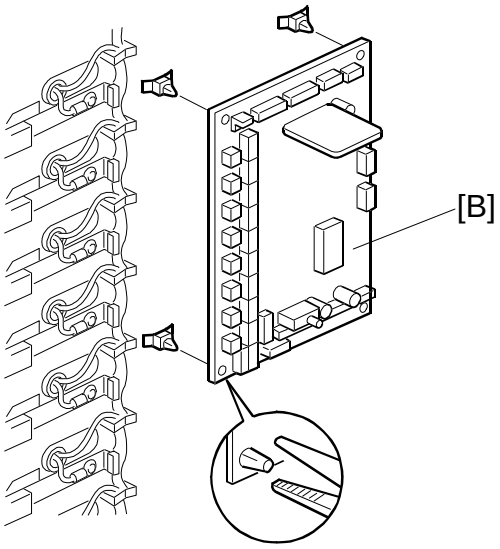
5. Remove the paper sensor [E] (1 screw, 1 connector).

Tray Exit Sensor (above the 1st tray, and in the 3rd, 6th, and 9th trays)

6. Remove the tray exit sensor [F] (1 screw, 1 connector).
7. After replacing the tray exit sensor, perform the tray exit sensor adjustment (see Tray Exit Sensor Adjustment).
   NOTE: After replacing the tray exit sensor, do not put the rear cover back on the mailbox, because the tray exit sensor adjustment must be performed first.

4.2.3 MAIN CONTROL BOARD



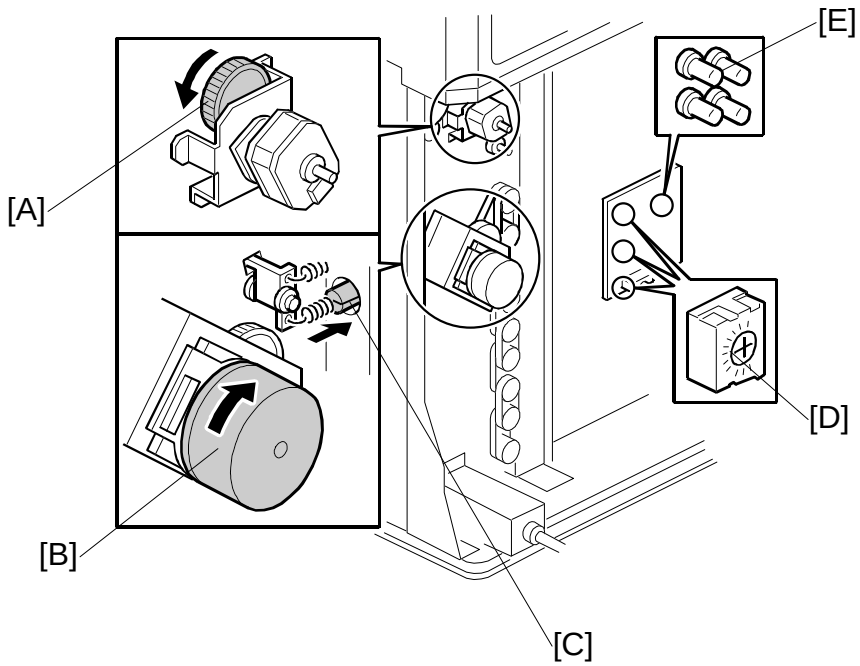


1. Remove the rear cover [A] (8 screws).
2. Remove the main control board [B] (all connectors).
3. After replacing the main control board, perform the tray exit sensor adjustment procedure (see Tray Exit Sensor Adjustment).

4.2.4 TRAY EXIT SENSOR ADJUSTMENT

This sensor adjustment must be performed after replacing the tray exit sensor or main control board, using the special paper that comes as a spare part for the tray exit sensor.

The tray exit sensor board has two devices: An LED and a phototransistor. So, when replacing the tray exit sensor on the 3rd tray, the sensor adjustment must be performed between trays 1 and 3 and between trays 4 and 6. When replacing the main control board, this sensor adjustment must be performed for all sensors. The sensor adjustment procedure is as follows.



Example: Sensor adjustment between trays 1 and 3

1. Insert the special paper (which comes with the tray exit sensor) into the entrance guide of the mailbox.
2. Turn the transport motor gear [A] counterclockwise to transport the paper to the tray unit.
3. When the leading edge of the paper reaches the tray feed-out roller, turn the vertical transport motor [B] clockwise to transport the paper to the appropriate tray.
4. Open the tray gate by pushing the plunger of the tray solenoid [C], and transport the paper until half of it has fed out to the tray.
5. Change switches 1 and 2 of the DIP switch on the main control board to ON.
6. Make sure that the interface cable is connected to the main machine and turn the main switch on.
7. Fully turn the appropriate variable resistor (VR) [D] clockwise, then check that the appropriate LED [E] has turned off (the relationship between tray, VR, and LED are shown in the table below).

8. Turn back the VR slowly until the LED just turns on.
9. Measure the voltage between TP3 on the main control board and the frame of the mailbox and confirm the voltage is greater than 3.5 Vdc. If it is not, adjust the voltage using the VR (the relationship between tray, TP, and VR are shown in the table below).
10. Remove the special paper from the tray, then measure the voltage on the main control board in the same way as step 9. The voltage should be less than 1.2 Vdc.
11. After adjusting, change the DIP switch setting to the default (all switches off) and reassemble the machine.

Adjusted Sensor	VR No.	LED No.	TP No.
Trays 1 to 3	VR1	LED 2	TP3
Trays 4 to 6	VR2	LED 3	TP4
Trays 7 to 9	VR3	LED 4	TP13

NOTE: The DIP switches to change are the same regardless of the adjusted sensor.

5. SERVICE TABLES

5.1 DIP SWITCHES/VRIABLE RESISTORS/LEDS

5.1.1 DIP SWITCHES

0 = OFF 1 = ON

Item	Switch No.				Function
	1	2	3	4	
Default	0	0	0	0	
Motor Test	1	0	0	0	
Solenoid Test	0	1	0	0	
Tray Exit Sensor Check	1	1	0	0	When detecting paper between the 1st and 3rd trays, LED2 will light.
					When detecting paper between the 4th and 6th trays, LED3 will light.
					When detecting paper between the 7th and 9th trays, LED4 will light.
Paper Sensor Check (1st to 3rd trays)	0	0	1	0	When the 1st tray paper sensor is activated, LED2 will light.
					When the 2nd tray paper sensor is activated, LED3 will light.
					When the 3rd tray paper sensor is activated, LED4 will light.
Paper Sensor Check (4th to 6th trays)	1	0	1	0	When the 4th tray paper sensor is activated, LED2 will light.
					When the 5th tray paper sensor is activated, LED3 will light.
					When the 6th tray paper sensor is activated, LED4 will light.
Paper Sensor Check (7th to 9th trays)	0	1	1	0	When the 7th tray paper sensor is activated, LED2 will light.
					When the 8th tray paper sensor is activated, LED3 will light.
					When the 9th tray paper sensor is activated, LED4 will light.
Proof Tray Sensors Check	1	1	1	0	When the proof paper overflow sensor is activated, LED2 will light.
					When the proof paper sensor is activated, LED3 will light.
Paper Overflow Sensor Check (1st to 3rd trays)	0	0	0	1	When the 1st paper overflow sensor is activated, LED2 will light.
					When the 2nd paper overflow sensor is activated, LED3 will light.
					When the 3rd paper overflow sensor is activated, LED4 will light.
Paper Overflow Sensor Check (4th to 6th trays)	1	0	0	1	When the 4th paper overflow sensor is activated, LED2 will light.

Item	Switch No.				Function
	1	2	3	4	
Paper Overflow Sensor Check (4th to 6th trays)	1	0	0	1	When the 5th paper overflow sensor is activated, LED3 will light.
					When the 6th paper overflow sensor is activated, LED4 will light.
Paper Overflow Sensor Check (7th to 9th trays)	0	1	0	1	When the 7th paper overflow sensor is activated, LED2 will light.
					When the 8th paper overflow sensor is activated, LED3 will light.
					When the 9th paper overflow sensor is activated, LED4 will light.
Entrance, Bridge Relay, and Bridge Exit Sensor Check	1	1	0	1	When the entrance sensor is activated, LED4 will light.
					When the bridge relay sensor is activated, LED3 will light.
					When the bridge exit sensor is activated, LED2 will light.
Proof Exit and Relay Sensor Check	0	0	1	1	When the proof exit sensor is activated, LED4 will light.
					When the relay sensor is activated, LED3 will light.
Free Run	1	1	1	1	

5.1.2 VARIABLE RESISTORS

Number	Function
VR1	Adjusts the tray exit sensor sensitivity between trays 1 and 3
VR2	Adjusts the tray exit sensor sensitivity between trays 4 and 6
VR3	Adjusts the tray exit sensor sensitivity between trays 7 and 9

5.1.3 LEDS

Number	Monitored Signal
LED1	Monitors the software operation. Blinking: Normal operation Others: Abnormal operation
LED2	The LED lights when the appropriate sensor is activated. (Refer to the DIP switch table for more details.)
LED3	
LED4	

SCANNER KIT

A695

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Scanning Resolution:	Main scan/Sub scan Binary Picture Processing 100 ~ 1600 dpi (in 1 dpi steps) Grayscale Processing 100 ~ 400 dpi (in 1 dpi steps)
Grayscales:	8 bits/pixel
Scanning Speed:	4 seconds/200 dpi (A4 lengthwise, Binary, Book mode)
Scanning Throughput:	Simplex mode (ADF): A230/A231: 19 ppm/200 dpi (A4 lengthwise, Binary) A232: 21 ppm/200 dpi (A4 lengthwise, Binary) Duplex mode (ARDF): A230/A231: 17 ppm/200 dpi (A4 lengthwise, Binary) A232: 18 ppm/200 dpi (A4 lengthwise, Binary)
Interface:	SCSI-2, high density
Interface Connector:	50 pin, half-pitch (x 1)
Video Memory Capacity:	2 MB
Power:	DC 5V, 2A (from the main machine)
Cable	50-Pin, half-pitch, pin type (Purchased locally)

1.2 SOFTWARE

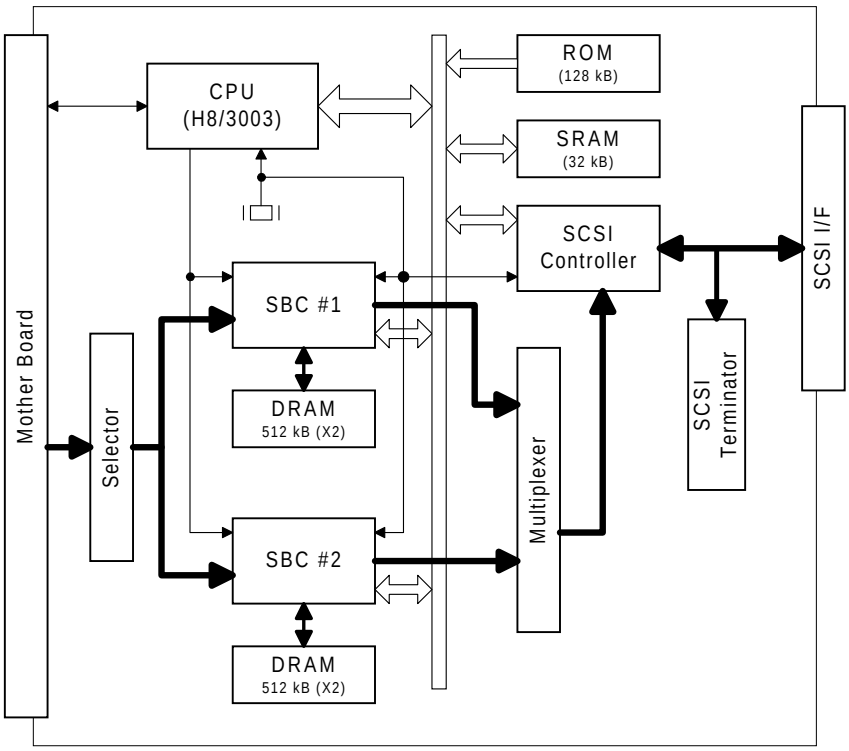
1.2.1 SCANNER DRIVER

The following programs are included in the CD-ROM.

- TWAIN Driver for Windows 3.1/95/98/NT
- Ricoh Scan Utility

2. DETAILED SECTION DESCRIPTIONS

2.1 HARDWARE OVERVIEW



The functions of each component are as follows:

CPU: HD6413002F

- Scanner sequence control
- Clock/time control
- DMA control

SBC (Scan Buffer Controller):

- Stores the image data from the BICU board in the main machine in the buffer memory (DRAM).
- Address control when recalling the data from the memory.

SCSI Controller: SCSI interface controller.

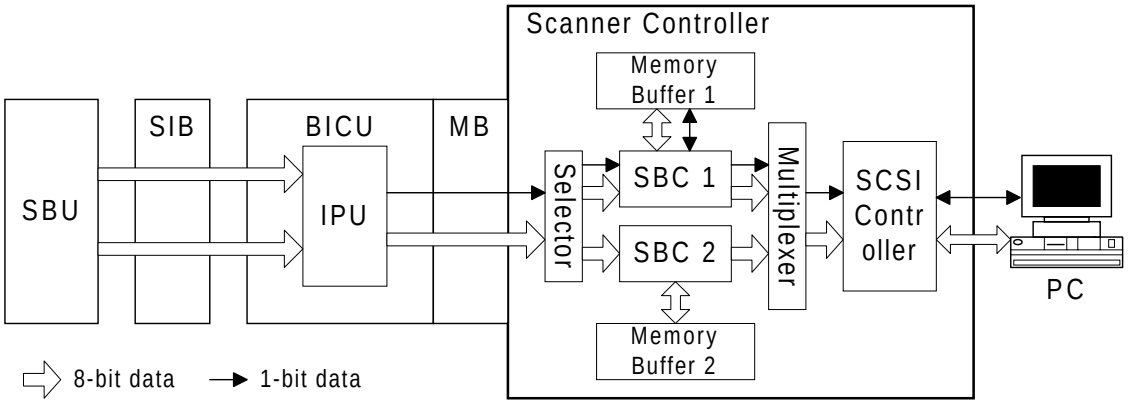
SRAM: Working area (32 kbytes)

ROM: Contains the program (128 kbytes)

DRAM: Stores the image data from the main machine.

SCSI Terminator: It is always enabled.

2.2 IMAGE SCANNING



The image data for the scanner comes from the Image Processing Unit (IPU) chip on the Base Engine and Image Control Unit (BICU) board in the main machine through the Mother Board (MB) of the expansion box. Most image processing for the scanner is performed in the IPU. However, gamma patterns and dither patterns which are stored in the RAM on the scanner board are used.

The 8-bit image data (in grayscale processing mode) from the IPU chip goes to the Selector, where the data is divided into two image data signals: odd-pixel data and even-pixel data. This is to match the data transfer speed between the input data (20 MHz – grayscale processing mode) and the process speed in the scanner Buffer Control (SBC) chips (10 MHz each). Then, filters and patterns are used to process the data and the data is merged in the Multiplexer. The data is then sent to the PC through the SCSI Controller.

1-bit data (in binary picture processing mode) is not divided into two data signal and it will be used only the SBC 1 chip.

The image data is stored in the Memory Buffers (1 & 2). The total memory size is 2 MB. When the memory is full, the scanner will stop scanning until the memory is empty. Then, the scanner will start scanning again.

2.3 SCANNER FUNCTIONS

2.3.1 SELF DIAGNOSTICS

Whenever the main power switch is turned on, the Scanner Board will automatically perform a self diagnostics and the following items will be checked.

- SRAM read/write check
- Initializes the SBC chips
- Initializes the SCSI Controller
- A connection check between the Scanner Board and main machine

If an error is detected, an appropriate error message or condition will be generated (refer to the section 4:Troubleshooting).

2.3.2 ENTERING THE SCANNER MODE

There is no scanner function key on the operation panel. Instead, the machine will enter the scanner mode whenever the machine receives the scanner command from a PC. However, the machine cannot enter the scanner mode during any of the following conditions.

- When the scanner or ADF is in use (copying, scanning for facsimile transmission, etc)
- When in the Interrupt copy mode
- When in either the User Tools (UT) Mode or the Service Program (SP) Mode
- With either an ADF jam or the ADF cover is open
- The machine is in Auto Off mode or Night mode

2.3.3 EXITING THE SCANNER MODE

The machine will automatically exit the scanner mode when the system reset timer has run out or when a function key (Copy or Fax or Printer) is pressed.

2.3.4 SCSI ID

The SCSI ID can be selected using UP mode (1. System – 21. Scanner SCSI ID). The factory default SCSI ID is number 4. It is not necessary to select a new ID number, unless another connected SCSI device was assigned the number 4.

The SCSI terminator is located on the Scanner Controller board and it is always activated. So, when installing the machine in the computer's SCSI chain, this machine must be at the end of the SCSI chain.

3. INSTALLATION PROCEDURE

CAUTION: The software on the SIB (Sensor Interface Board) in the machine was modified to support the new scanner option. The scanner option **will not** operate with the original versions of the SIB board.

Before initiating the installation of the scanner option, verify that the machine contains latest version SIB board (ver. 3). The SIB board version can readily be identified by checking either the stamped manufacturer production date or by displaying the ROM level on the SIB board.

Method 1:
The SIB board can be easily identified by the manufacturer production date of the machine. The production date is stamped on the serial number plate, which is located behind the right side cover of the machine.

If the production date is November 1998 or earlier, the SIB board **must** be replaced before the scanner option kit can be installed.

Method 2:
The SIB ROM level can be displayed using the Service Program Mode 7-801-5. Refer to the A230/A231/A232 Service Manual, page 4-48.

If **A2327006** (any suffix) is displayed, the SIB Board **must** be replaced before the scanner option kit can be installed.

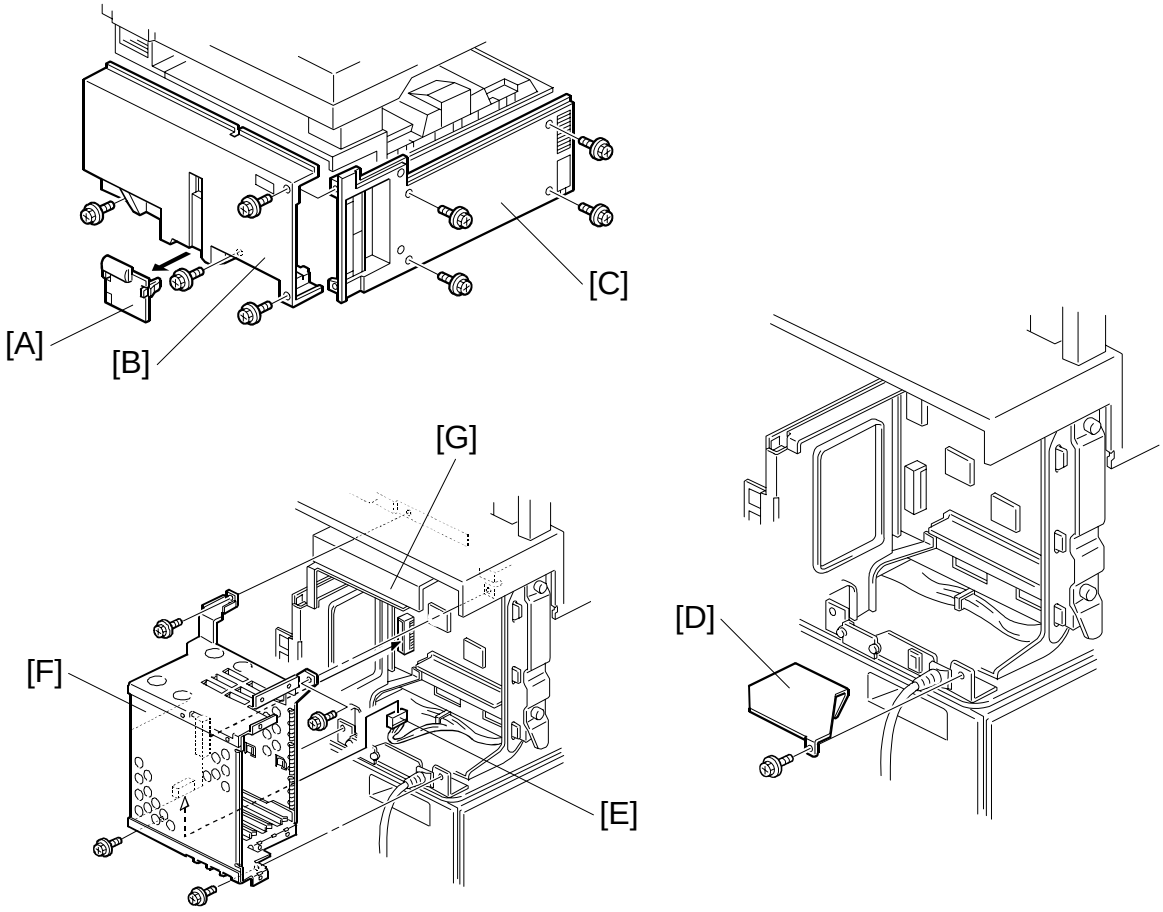
If **A2325376** (any suffix) is displayed, the correct SIB board is installed.

Part Numbers:

The part numbers for the new SIB board are as follows:

Model	Part Number SIB (ver. 3)
A230/A231	A6955330
A232	A6955340

Refer to the A230/A231/A232 Service Manual, page 6-8 for the SIB removal and replacement procedure.



CAUTION

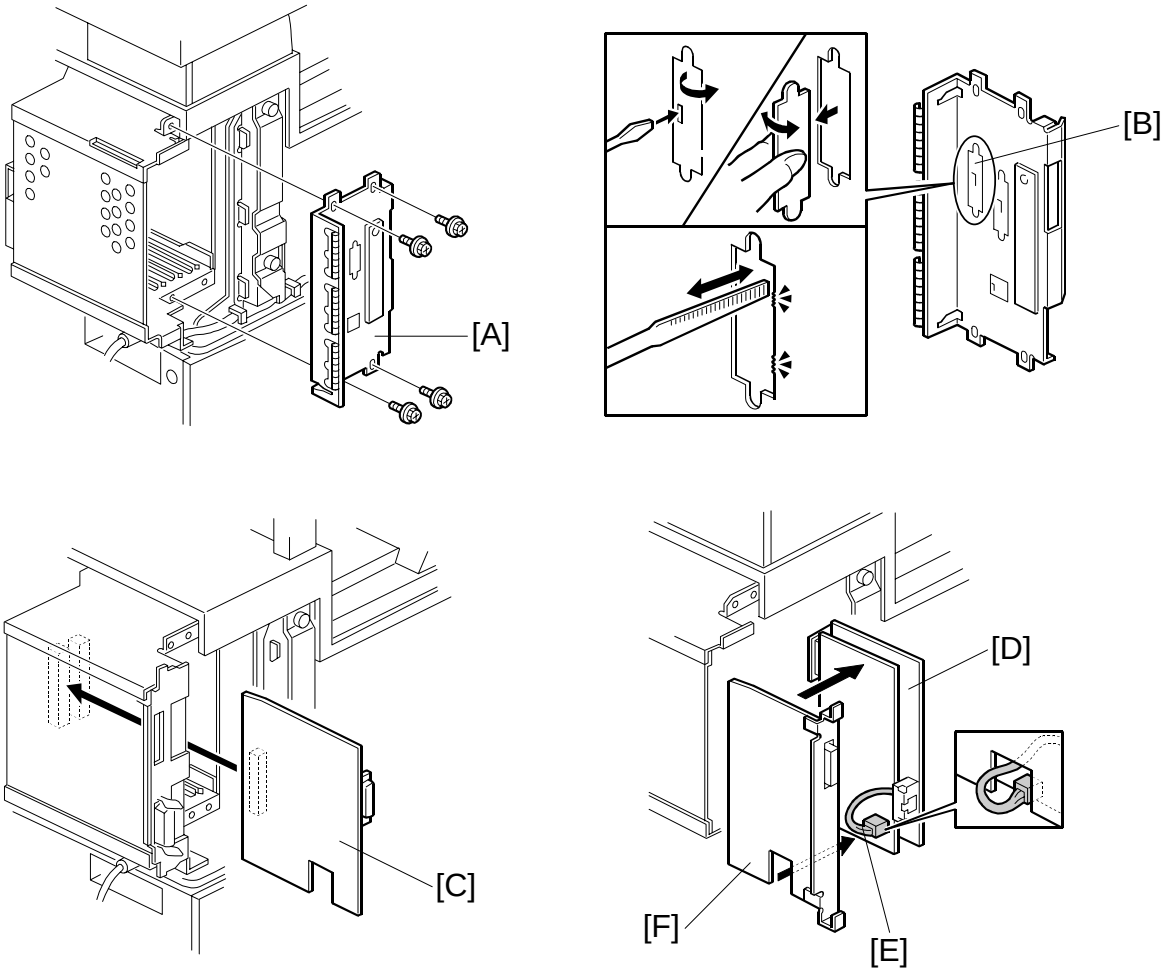
Unplug the main machine power cord before starting the following procedure.

Expansion Box Installation

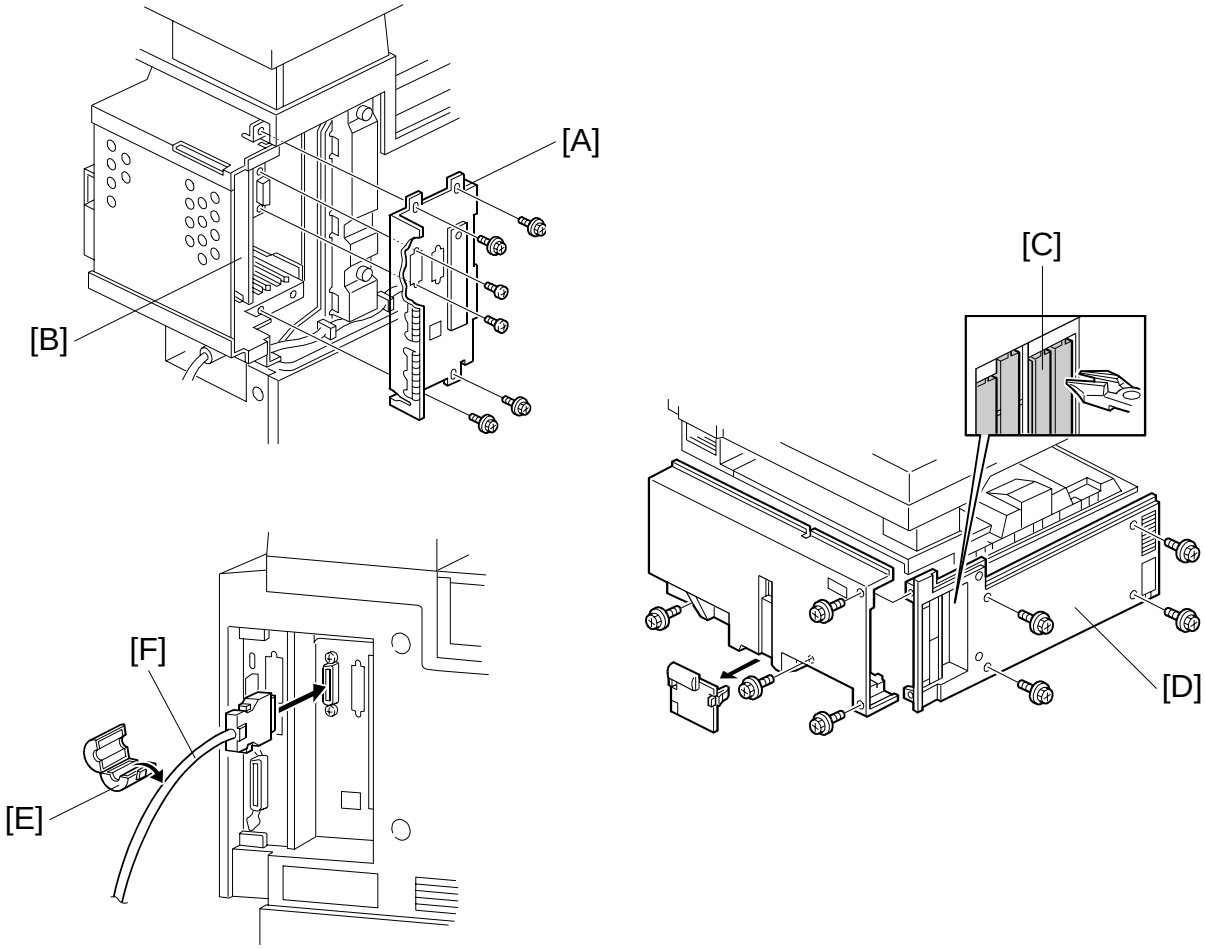
NOTE: 1) If the Image Enhance Kit Type 450 (HDD) [G] has been installed, remove it, then install the expansion box.
2) If the Fax Option Type 450 and/or the Printer Controller Type 450 have been installed, skip steps 2 and 3.

1. Remove the connector cover [A], rear cover [B] (4 screws), and left cover [C] (4 screws).
2. Remove the bracket [D] (1 screw).
3. Connect the cable [E] to the expansion box [F], then install the expansion box (4 screws).

Scanner Board Installation



4. Remove the shield plate [A] (4 screws).
5. Open the Scanner SCSI I/F window [B] in the plate.
6. Insert the Scanner Controller Board [C] in the third slot from the right of the expansion box.
   If the ISDN board has already been installed, perform steps 7 to 9.
7. Slide out the ISDN board [D].
8. Thread the ISDN modular cable [E] through the opening [F] in the scanner board, as shown.
9. Install the Scanner Controller board and ISDN board in the expansion box at the same time.



10. Reinstall the shield plate [A] (4 screws) and secure the scanner board [B] (2 screws)
11. Cut away the cover [C] from the left cover [D].
12. Reassemble the machine.
13. Attach the ferrite core [E] to the SCSI cable [F], as shown. Then, turn the machine on.
14. Enter the User Tool Mode and change the setting of Function Switch (User Tool - 1. System - 06. Function Switch) to “Instant”. Refer to the service manual, section 4.4.2.
15. In the User Tool Mode, set the SCSI ID number (User Tool - 1. System - 21. Scanner SCSI ID). Then turn the machine off and on to store the ID number. Note: System 21 is not listed in the System Setting Table.

NOTE: 1) The factory default SCSI ID is #4. It is not necessary to change the SCSI ID, unless another connected device was assigned SCSI ID #4.
2) Do not enter a SCSI ID number that is used by another SCSI device.
3) If the machine is connected to a SCSI chain, it must be connected as the last device. (The terminator on the scanner board is fixed).

16. Enter the Copier Service Program Mode, SP5-907 and select the vendor model number: Plug & Play Brand Name and Production Name Setting. Refer to the service manual, section 4.2.2 and the chart listed below.

    The displayed message will alternately flash the following messages: Plug & Play **"Press 1-17 to select"** and **"Orig. Key to decide"**

	Vendor	Model
1	RICOH	Aficio 340
2	RICOH	Aficio 350/355
3	RICOH	Aficio 450/455
4	NRG	D435s/28355/323s
5	NRG	D435/2835/3235
6	NRG	D445/2845/3245
7	infotec	4351MF
8	infotec	4352MF
9	infotec	4451MF
10	Savin	9935D
11	Savin	9935DP/2035DP
12	Savin	9945DP/2045DP
13	Lanier	5235
14	Lanier	5245
15	Gestetner	3235s
16	Gestetner	3235
17	Gestetner	3245

    Enter the number corresponding the vendor and model number, then press the **Special Orig.** key to enter the selection.

4. TROUBLESHOOTING

4.1 SELF-DIAGNOSTICS

The Scanner Controller board will automatically perform a self-diagnostics test procedure whenever the main power switch is turned on. The LED on the Scanner Controller board is used to indicate the condition of the unit.

4.1.1 ERROR INDICATION

Error Items	Conditions	Display	LED	SC code
Normal condition	---	---	Blinking (0.5s interval)	---
SRAM Error	Scanner board cannot initialize	---	Stays on	---
SBC Error	The machine cannot scan the document	Error message: “Functional Problems” will be displayed	---	SC4001
SCSI Controller Error	The PC cannot detect the scanner board	---	Stays on	SC4001
Communication Error	The main machine cannot detect the scanner board	---	Blinking (1.5s on – 0.5s off)	---

Note: Service Code SC4001 is not listed in the Service Manual, section 7.1.2

5. SOFTWARE INSTALLATION PROCEDURE

After completing the scanner option installation into the copier's expansion box, the next step will be connecting the scanner hardware to the computer. To connect the scanner option to the computer, the computer must have a SCSI interface installed such as an Adaptec 2940U SCSI card. Other SCSI cards can be used, but may cause a more complex connection procedure involving a converter, etc. Using a SCSI cable will make the scanner to computer connection. To use the correct SCSI cable, the one side of the cable must have a 50-pin male SCSI-2 type connector and the other side will be determined by the computer's SCSI interface connection. The SCSI cable length must be no longer that nine (9) feet. Connect the SCSI cable between the computer SCSI interface and the copier's scanner option.

5.1 PLUG & PLAY INSTALLATION PROCEDURE:

The first prompt when connecting a new device to the computer is the plug and play feature of the operating system. Therefore when the scanner option is connected for the first time to a computer running Windows 95, 98 or NT, the operating system will find the new hardware that is connected. After locating the new hardware, it may automatically load a device driver or call for a file name with the extension of *.inf. For Windows 95 and NT, the correct device driver file is named scsiscan.inf, which is located in the subdirectory named INF and found under the Windows directory. The scsiscan.inf is installed with the SCSI cards' software. For example, EZ SCSI version 4.01 for Adaptec SCSI cards.

5.2 SOFTWARE INSTALLATION PROCEDURE

The CD-ROM received with the Scanner Option kit contains two programs, the RICOH TWAIN Driver program and the RICOH Scan Utility Program.

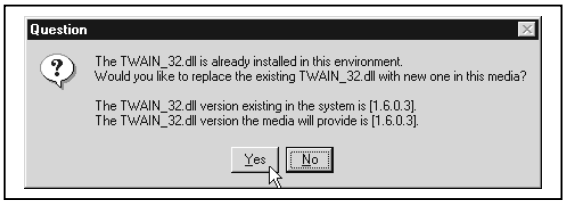
During this installation procedure, we will install and use the RICOH Scan Utility and Ricoh TWAIN driver to operate the scanner feature

In addition to the RICOH Scan Utility program, the scanner option will operate with scanner programs that are TWAIN Compliant such as CorelDraw and Paint Shop Pro.

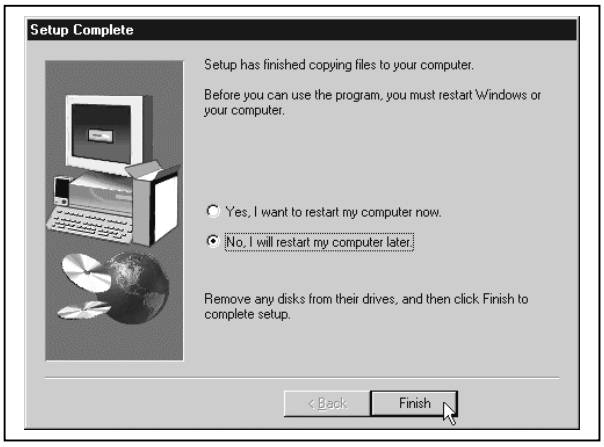
5.3 TWAIN DRIVER INSTALLATION PROCEDURE A: (PLUG & PLAY)

After installing the provided TWAIN CD-ROM, the computer will automatically initiate the TWAIN Driver procedure (Plug & Play). Answer the displayed messages accordingly to install the TWAIN driver. If Plug & Play is not initiated, proceed to section 5.4

At both Question screens, click on the **Yes** key.



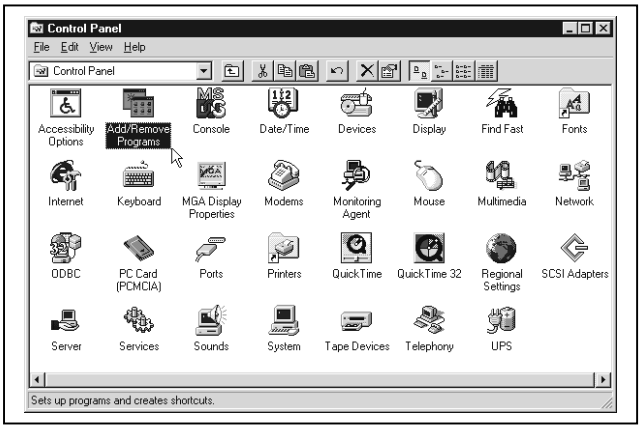
At the completion of the installation, you are asked if you want to restart your computer.



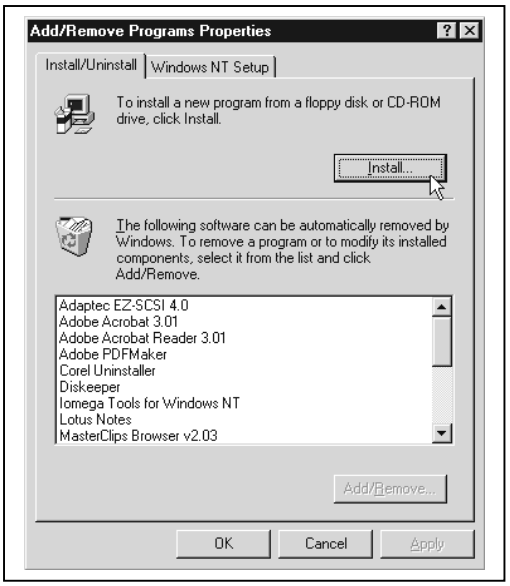
1. Select **No** if you are going to install THE RICOH Scan Utility program, then click on the **Finish** key. Proceed to section 5.5.
2. Select **Yes** if you are not going the install the RICOH Scan Utility program, then click on the **Finish** key.

5.4 TWAIN DRIVER INSTALLATION PROCEDURE B: (WITHOUT PLUG & PLAY)

1. Insert the CD-ROM into the computer.
2. In sequence, click on **Start\Setting\Control Panel.**
3. The Control Panel will be displayed.



4. Double click on the **Add/Remove Programs** icon.
5. The Add/Remove Properties screen will be displayed.

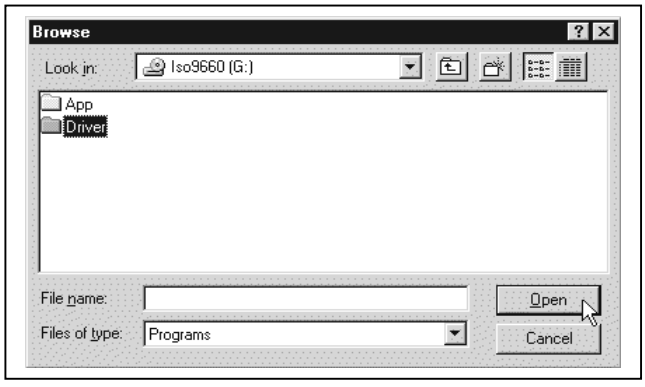


6. With the Install/Uninstall tab displayed, click on the **Install** key.
7. The Install screen will be displayed.

8. Click on the **Next** key.
9. The Run Installation screen will be displayed.
10. The computer will search for the installation program (setup.exe) which is located on your CD-ROM.

    In the sample illustration, the CD-ROM drive is G:\. Your CD-ROM driver location may vary. Enter **your CD-ROM drive** and click on the **Browse** key.

11. The Browse screen will be displayed.

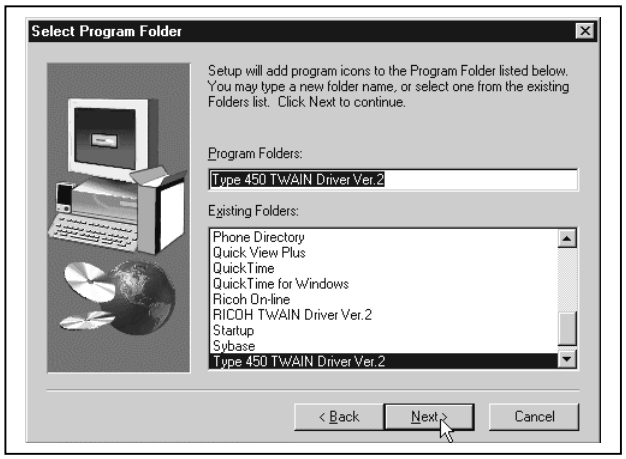


12. Highlight the program **Driver** and click on the **Open** key.
13. In the following sequence of Browse screens, highlight the following selections, then click on the Open key:

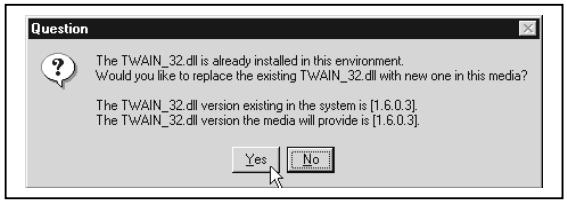
    Highlight **Twain** – click the **Open** key
    Highlight **Others** – click the **Open** key
    Highlight **Setup.exe** – click the **Open** key

14. The Run Installation screen will be displayed.

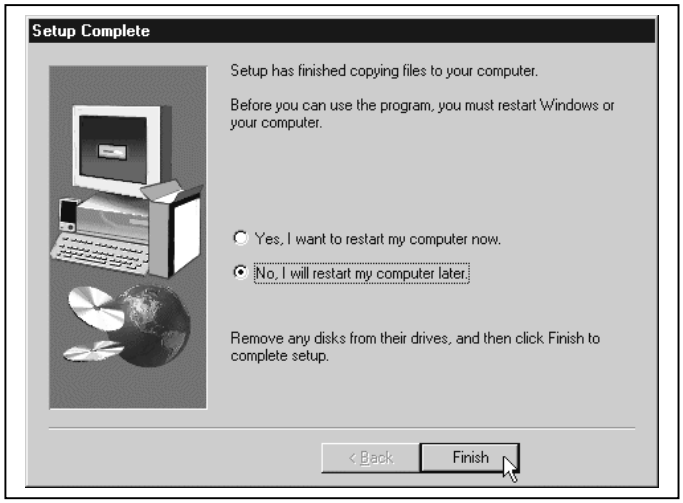
15. Confirm that the program sequence listed in the Command line is ***your drive*\DRIVER\TWAIN\OTHER\Setup.exe** and then click on the **Finish** key.
16. The Type 450 TWAIN Driver ver.2 program will be initiated.
17. At the Welcome screen, click on the **Next** key.
18. At the Software License screen, click on the **Yes** key.
19. The Select Program screen will be displayed.



20. Confirm that ***Type 450 TWAIN Driver Ver.2*** is selected and then, click on the **Next** key.
21. The Question screens will be displayed.



22. At each of the Question screens, click on the **Yes** key.
23. The TWAIN driver program will be installed.
24. At the completion of the installation, the Setup Complete screen will be displayed.



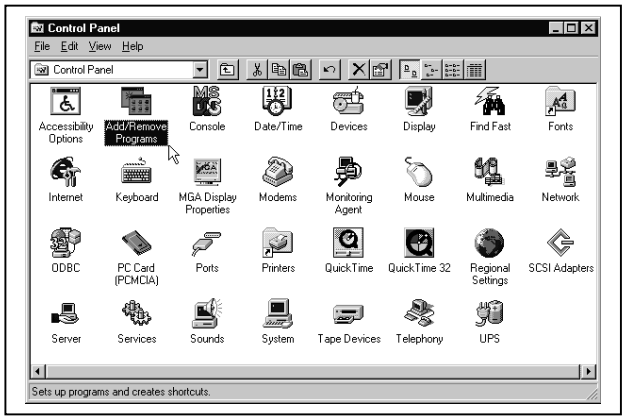
25. At the completion of the installation, you are asked if you want to restart your computer.

    A. If you are going to continue the installation procedure for the RICOH Scan Utility program, select **No**, then, click on the **Finish** key, Proceed to section 5.5.

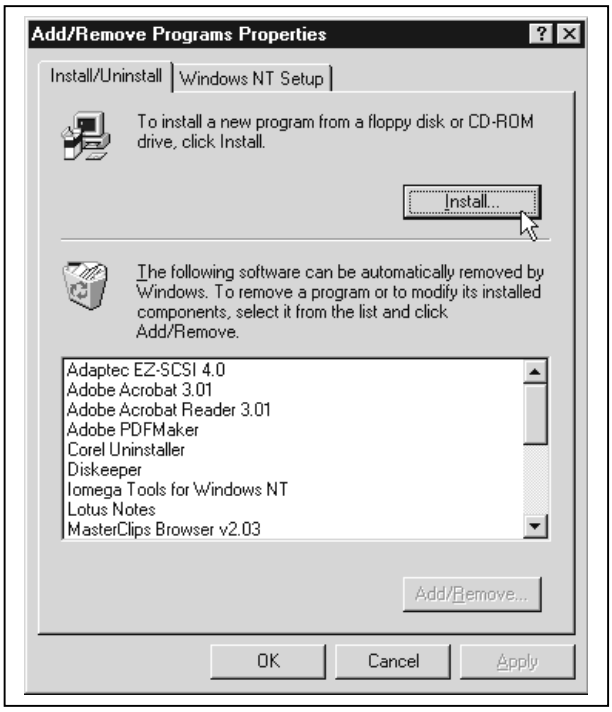
    B. If you are <u>not</u> going the install the RICOH Scan Utility program, select **Yes**, and then click on the **Finish** key.

5.5 RICOH SCAN UTILITY INSTALLATION PROCEDURE:

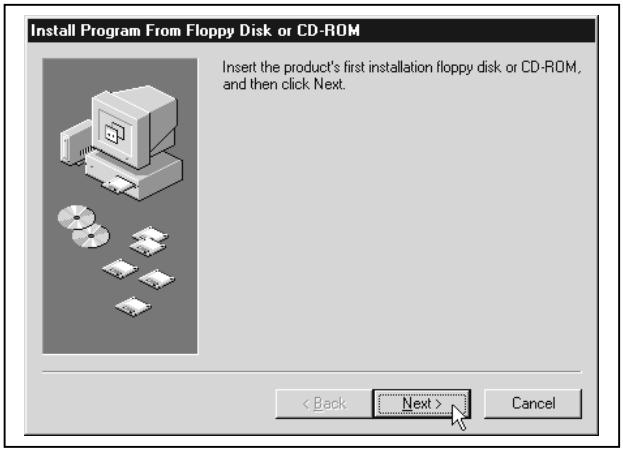
1. Insert the CD-ROM into the computer.
2. In sequence, click on **Start\Setting\Control Panel.**
3. The Control Panel will be displayed.



4. Double click on the **Add/Remove Programs** icon.
5. The Add/Remove Properties screen will be displayed.



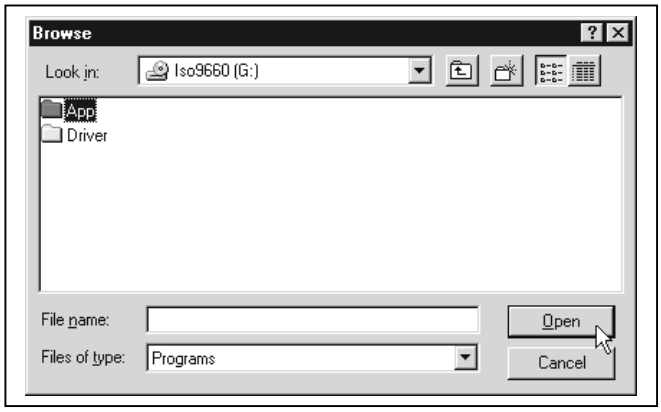
6. With the Install/Uninstall tab displayed, click on the **Install** key.
7. The Install screen will be displayed.



8. Click on the **Next** key.
9. The Run Installation screen will be displayed.
10. The computer will search for the installation program (setup.exe) which is located on your CD-ROM.

    In the sample illustration, the CD-ROM drive is G:\. Your CD-ROM driver location may vary. Enter **your CD-ROM drive** and press the **Browse** key.

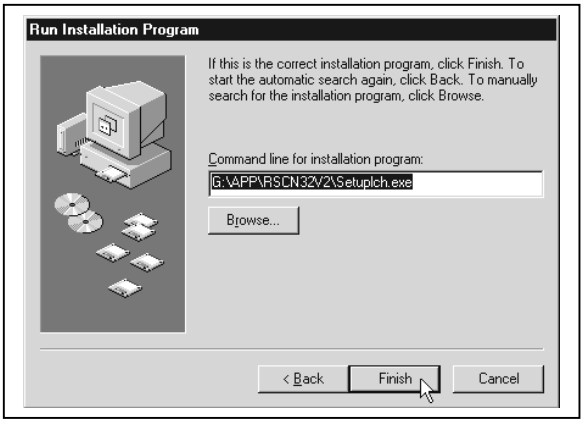
11. The Browse screen will be displayed.



12. Highlight the program **App** and click on the **Open** key.
13. In the following sequence of Browse screens, highlight the following selections, then click on the Open key:

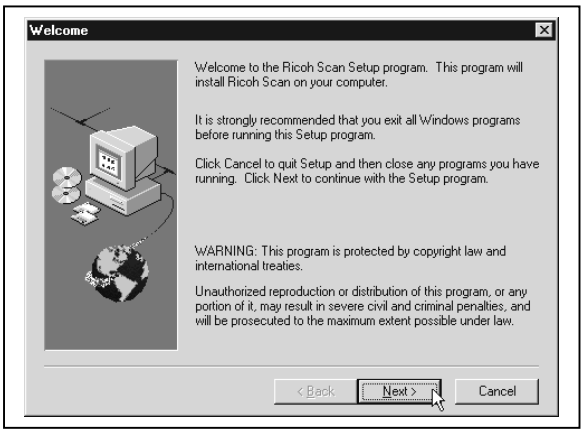
    Highlight **Rscn32v2** – Click on the **Open** key
    Highlight **Setuplch.exe** – Click on the **Open** key.

14. The Run Installation screen will be displayed.

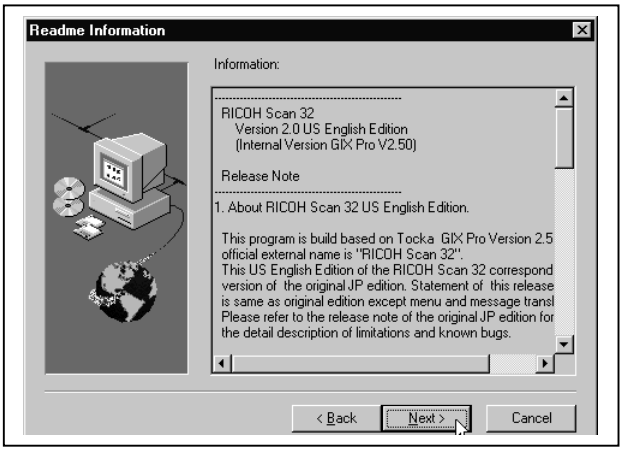


15. Confirm that the program sequence listed in the Command line and then click on the **Finish** key.

16. The installation procedure will be initiated. The RICOH Scan 32 Version 2.0 Welcome screen will be displayed.

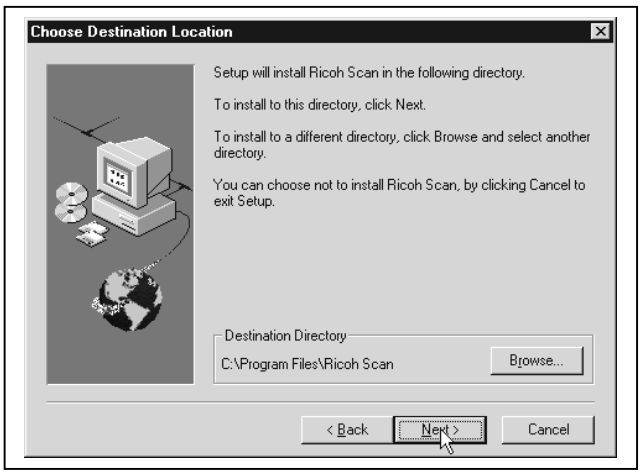


17. Click on the Next key.
18. The Readme Information screen will be displayed.

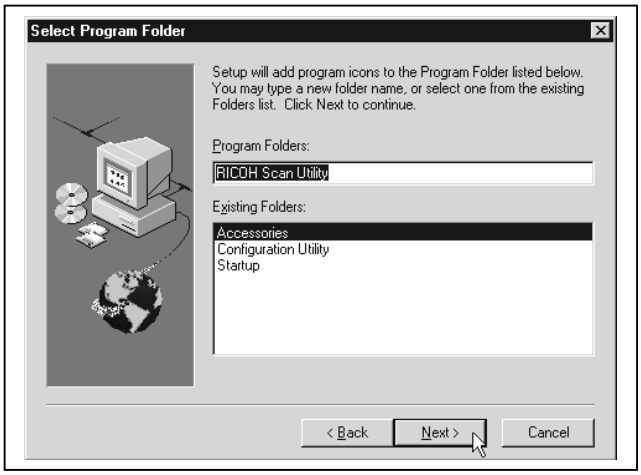


19. Click on the **Next** key.

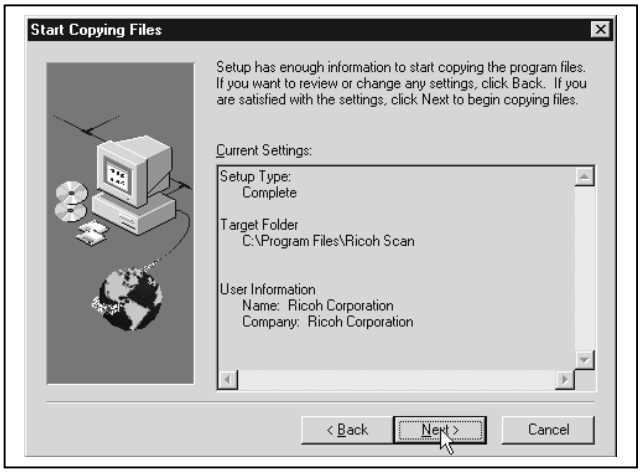
20. The Choose Destination Location screen will be displayed.



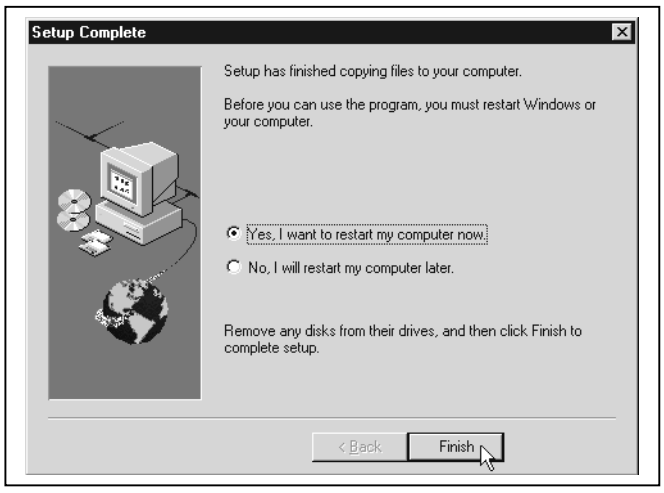
21. Click on the **Next** key.
22. The Select Program Folder screen will be displayed.



23. Click on the **Next** key.
24. The Start Copying Files screen will be displayed.



25. Click on the **Next** key.
26. The installation procedure will be initiated.
27. On the completion of the installation, the Setup Complete screen will be displayed.



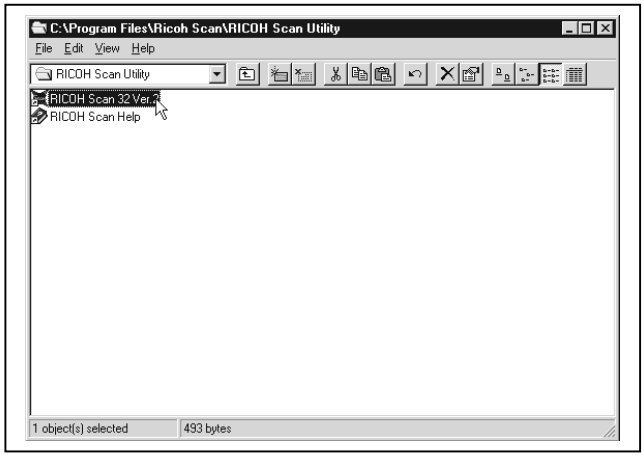
28. Click on the **Yes** button to restart your computer and then click on the **Finish** key

5.6 SCANNING PROCEDURE:

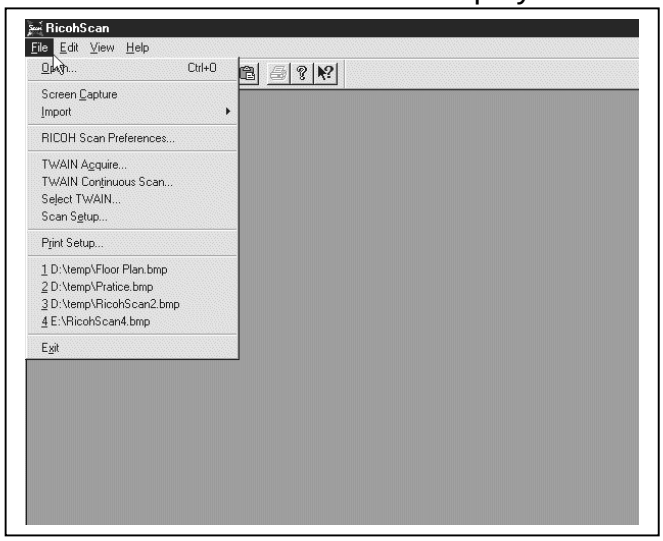
The RICOH Scan program automatically recognizes that you have the scanner option installed in your machine.

Open the RICOH Scan Utility.

1. In sequence, click on **Start\Programs\RICOH Scan Utility**.
2. The Ricoh Scan Utility screen will be displayed.



3. Double click on the **RICOH Scan 32Ver.2** program.
4. The Ricoh Scan screen will be displayed.

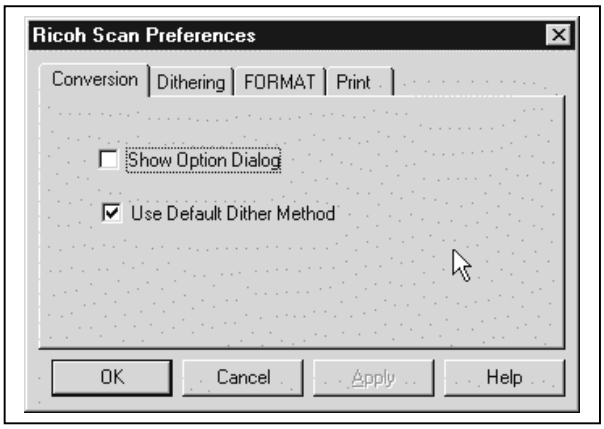


5. Click on the **File** pull down menu. A definition of each of the pull down selections are as follows:

   A. **Screen Capture:** Allows you to capture the entire screen image and save it as an image file. To use the screen capture feature, minimize the scan program, open an application program and arrange the image on the screen. Maximize the scan program and select Screen capture. The program will capture the screen image located behind the scan screen.

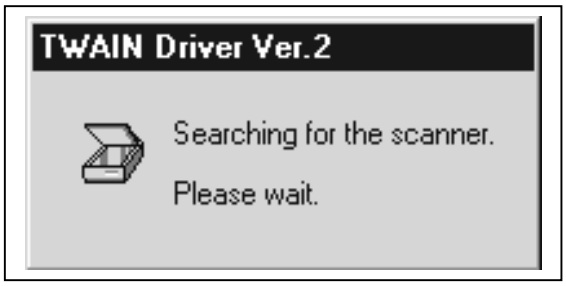
   B. **Import\RAW FAX:** Allows you to import faxed images and will treat the image as a graphic element. The scan program will recognize most fax formats. Once received, you can flip, zoom or clean up the image to make the faxed image be more useable.

C. **RICOH Scan Preferences:** Allows you to set up the type of dithering, the default graphic file type and other systems settings. When selected, the following screen will be displayed.

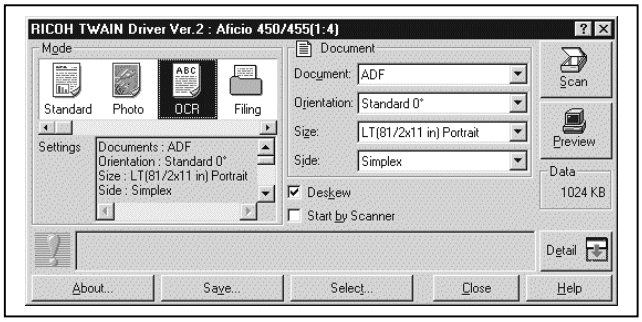


D. **TRAIN Acquire:** Allows you to acquire the image from the connected scanner device. With the original placed on the exposure glass or inserted into the ADF, select the acquire function.

The scanner program will momentary display the screen below to indicate that the program is automatically searching for the connected scanner device. After the scanner device is located, the screen will then momentary display the message that it is automatically updating the scanner settings.



The RICOH TWAIN Driver screen will then be displayed.



Mode is used to optimize the scan setting for the various types of documents. As each type is document is selected, the program will update the scanner setting to match the document type.

Settings display the mode-selected settings. For instance, when Standard is selected, the resolution is automatically set at 400 dpi. The resolution for Photo and Filing is set at 200 dpi and OCR (Optical Character Recognition) is set at 300 dpi.

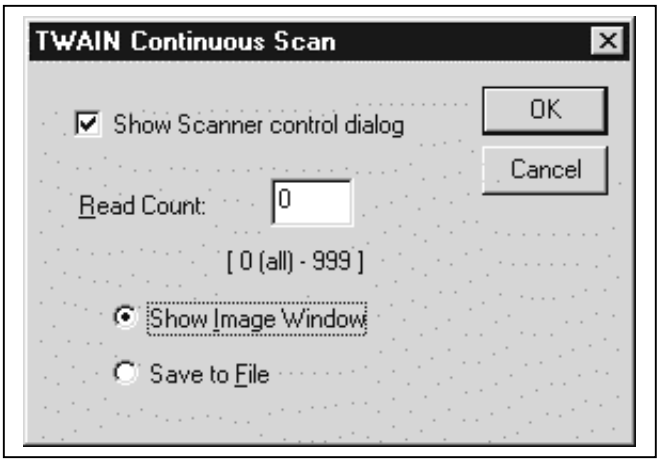
Document identifies the location of the document, that is, the platen glass or the ADF unit. **Orientation** enables you to rotate the image before scanning. **Size** selects the document size and the image orientation. **Deskew** corrects slanted letters on the document. **Start by Scanner** allows the operator to set the computer for scanning without initiating the scan function. The operator pressing the Start key on the machine initiates the scan function.

The **Scan** key initiates the scan function and the **Preview** key performs a preview scan prior to the actual scan to allow the operator to check the scan settings. In the preview mode, the operator can rotate and change the magnification of the image before actual scan function.

The **Save** key allows the operator to save a set of special settings and will add a new icon in the Mode box to identify the special settings. The **Select** key identifies all of the scanners that are currently connected to your computer. The **Detail** key toggles the displayed screen from the Easy screen to the Detail screen. After toggling from the Easy screen to the Detail screen, the **Easy** key will toggle the displayed screen back to the Easy screen.

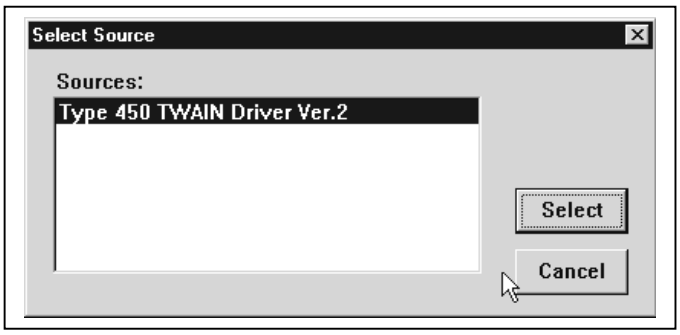
E. **TWAIN Continuous Scan:** The feature allows the operator to place a stack of originals in the ADF and as each original is scanned, the operator can select to have each scanned image be displayed or have each scanned image be automatically saved as a file.

When selected, the TWAIN Continuous Scan screen will be displayed.

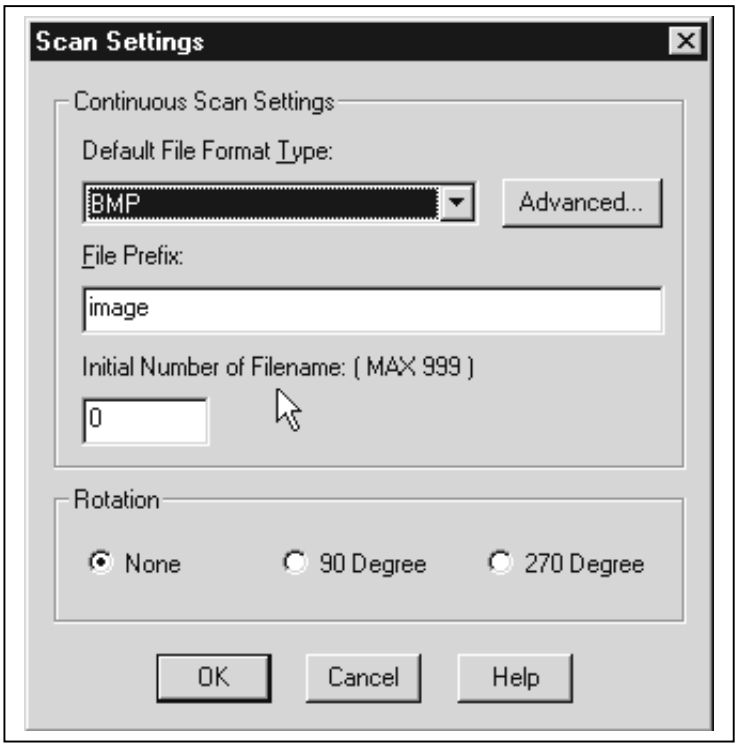


Check the **Show Image Window** button to have each scanned image is displayed or check the **Save a File** button to have each image automatically saved as a file.

F. **Select TWAIN:** Lists the scanner drivers that are currently installed in your computer. When selected, the Select Source screen will be displayed.



G. Scan Setting: Allows the operator to select the file format type of the scanned image. The default setting is BMP (Bit Map). When selected, the Scan Setting screen will be displayed. A brief description of each file format is located in the help menu. Click on **Help\Help Topics**. Scroll down and double click on **graphics File formats** and click on each individual file format for its description.



5.7 WINDOWS 98 CAUTIONS

When the TWAIN driver is installed in Win98, STI (Microsoft's Still Image Architecture) must be installed for the TWAIN driver to function. The following excerpt is all that is stated in the README.TXT for the TWAIN driver:

> * It is necessary to install STI driver under Windows 98.
>
> * If the STI driver has been previously installed under Windows 98, select IS450 from: **My computer/Property/Device Manager** and renew the driver on property.

The README was not launched to state this requirement, it does not tell the user how to install the STI driver, and assumes that the driver is already installed, even though the driver was not installed.

It is best to have the STI driver installed before the TWAIN driver. For the STI driver to be installed, the user must:

* Connect the scanner to their PC and turn on the scanner.
* Boot the PC into Win98.
* When Win98's auto-detect new hardware finds the scanner as an "Other Device," insert the RICOH TWAIN Driver Ver.2 disk into the CD-drive.
* Using the Have Disk and Browse buttons, point the installer to **\DRIVER\STI\RICOH.INF** on the installer CD.
* Choose IS450 from the box of choices and select OK.

At this point, the IS450 should be included in Device Manager (DM) under the Imaging Devices category. There should also be a Scanners and Cameras icon in the Control Panel. The two icons confirm that the STI driver is installed.

The STI driver cannot be installed if the user had previously installed any version of Adaptec's EZ-SCSI software before the IS450 driver was installed. EZ-SCSI installs SCSISCAN.INF in the \WINDOWS\INF\ folder that interferes with the STI installation of the scanner. With EZ-SCSI installed, the first time the PC is booted with the IS450 connected, the scanner is auto-detected as a "SCSI Scanner" instead of an "Other Device" as in the scenario above. At this point it is impossible to install the STI driver for the IS450. Trying to update the Scanner driver from within DM gets an error message that the location (\DRIVER\STI\RICOH.INF) does not contain information about the device. If the "Add New Hardware" control panel is used and Imaging Device is chosen as the new device type, the install gets stuck when the OS wants a port to be selected, because it only lists COM and LPT ports. The user is now stuck with a non-functioning TWAIN driver that reports a power or cabling error when the driver is accessed.

A work-around is available. If the user renames SCSISCAN.INF to SCSISCAN.OLD and reboots, with the scanner connected and on, the above installation process will work. After the IS450 STI driver has been installed, SCSISCAN.INF can be returned to its original file name and everything will work.

The documentation printed on the CD jacket does not mention the need for STI in Win98; it only appears in the README.TXT that is installed with the TWAIN driver. The jacket simply states to insert the CD and follow the instructions on the screen, which never mention STI

FAX UNIT A693

This manual explains the Fax Unit, as well as the following.

- EXSAF A818
- HDD A818
- PMU A818
- ISDN A816
- Handset A646
- Stamp A813

Lithium Batteries

⚠CAUTION
The danger of explosion exists if batteries on the FCU and EXSAF boards 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.**

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Type
Desktop type transceiver

Circuit
PSTN, PABX, ISDN (optional)

Connection
Direct couple

Original Size (Book)
Maximum Length: 432 mm [17 ins]
Maximum Width: 297 mm [11.7 ins]

Original Size (ADF)
Length: 105 - 432 mm [4.1 - 17 ins]
Width: 105 - 297 mm [4.1 - 11.7 ins]
Thickness: 0.05 to 0.2 mm [2 to 8 mils] (equivalent to 40 - 90 g/m^2)

Scanning Method
Flat bed, with CCD

Scan Width
210 mm [8.64 ins] ± 1% (A4)
216 mm [8.5 ins] ± 1% (8.5" x 11")
256 mm [10.2 ins] ± 1% (B4)
279 mm [11.0 ins] ± 1% (11" x 17"r)
296 mm [12.2 ins] ± 1% (A3)

Resolutions
8 x 3.85 lines/mm (G3 only)
8 x 7.7 lines/mm (G3 only)
8 x 15.4 lines/mm (G3 only)
16 x 15.4 lines/mm (G3 only)
200 x 100 dpi
200 x 200 dpi
400 x 400 dpi

Note:
To use the 8 x 15.4 lines/mm, 16 x 15.4 lines/mm and 400 x 400 dpi resolutions, an optional PMU (page memory) is required.

Memory Capacity

ECM: 128 Kbytes

SAF:
Standard: 2 Mbytes (160 pages)

With optional memory board (EXSAF):
6 Mbytes (480 pages)

With optional HDD:
130 Mbytes (3000 pages)

Measured using an ITU-T #1 test document (Slerexe letter)

Compression
MH, MR, MMR, SSC
JBIG (PMU is required)
(MMR only with ECM and G4)
SAF storage for memory tx: MMR and raw data

Protocol
Group 3 with ECM
Group 4 (ISDN unit required)

Modulation
V.34, V.17 (TCM), V.29 (QAM),
V.27ter (PHM), V.21 (FM)

Data Rate (bps)
Super G3:
33600/31200/28800/26400/24000/21600/19200/16800/14400/12000/9600/7200/4800/2400, Automatic fallback
G4 (option): 64 kbps/56 kbps

I/O Rate
With ECM: 0 ms/line
Without ECM: 2.5, 5, 10, 20, or 40 ms/line

Transmission Time
Super G3: 3 s at 28800 bps; Measured with G3 ECM using memory for an ITU-T #1 test document (Slerexe letter) at 8 x 3.85 l/mm resolution
G4 (option): 3 s at 64 kbps; Measured with an ITU-T #1 test document (Slerexe letter) at 200 x 200 dpi resolution

1.2 FEATURES

1.2.1 FEATURES LIST

KEY:
O = Used, X = Not Used,
A = Optional EXSAF required
B = Optional HDD required
C = Optional PMU required
D = Optional ISDN unit required
E = Optional STAMP unit

Video Processing Features	
Automatic image density selection	O
Contrast	O
Halftone (Basic & Error Diffusion)	O
MTF	O
Reduction before tx (B4 -> A4)	O
Reduction before tx (A3 -> B4)	O
Reduction before tx (A3 -> A4)	O
Scanning Resolution – Standard	O
Scanning Resolution – Detail	O
Scanning Resolution – Fine	C
Scanning Resolution – Superfine	C
Smoothing to 400 x 400 dpi when printing	O
JBIG compression	C

Communication Features – Automatic	
V.34 communication	O
AI short protocol	O
Automatic fallback	O
Automatic redialing (Memory tx only)	O
Confidential reception	A
Dual Access	O
Substitute reception	O

Communication Features - User Selectable	
90° Image Rotation before tx	O
Action as a transfer broadcaster	A
AI Redial (last ten numbers)	O
Answering machine interface	X
Authorized Reception	O
Automatic dialing (pulse or DTMF)	O
Auto Document	O
Automatic Voice Message	X
Batch Transmission	A
Book Original tx	O
Broadcasting	O
Chain Dialing	O
Communication Record Display	O
Confidential ID Override	O
Confidential Reception	A
Confidential Transmission	O
Direct Fax Number Entry	O
Economy Transmission	A
Fax on demand	X
Forwarding	A
Free Polling	O
Groups (9 groups)	O
Group Transfer Station	A
Hold	X
ID Transmission	O
Immediate Redialing	O
Immediate transmission	O
Keystroke Programs	O
Length Reduction	O
Memory transmission	O
Multi-step Transfer	A
Next Transfer Station	X
Non-standard original size transmission	O
OMR	X
On Hook Dial	O
Ordering Toner	X
Page Count	O

Communication Features - User Selectable	
Page separation mark	O
Parallel memory transmission	O
Personal Codes	O
Personal Codes with Conf. ID	X
Partial Image Area Scanning	X
Polling Reception	O
Polling Transmission	O
Polling tx file lifetime in the SAF	O
Quick Dial (Standard: 56 stations)	O
Reception modes (Fax, Tel)	O
Remote control features	X
Remote Transfer	X
Resolutions available for reception Standard Detail Fine (16 x 15.4 l/mm only) Superfine	 O O C C
Restricted Access	O
Secured Polling	O
Secured Polling with Stored ID Override	O
Secure Transmission	X
Send Later	O
SEP/SUB/PWD	O
Silent ringing detection	X
Speed Dial (Standard: 100 stations)	O
Stamp	E
Telephone Directory	O
Tonal Signal Transmission	O
Transfer Request	O
Transmission Deadline (TRD)	O
Turnaround Polling	X
Two-step Transfer	X
Two in one	O
Voice Request (immed. tx only)	X

Communication Features - Service Selectable	
AI Short Protocol	O
Auto-reduction override option	O

Communication Features - Service Selectable	
Busy tone detection	O
Cable Equalizer	O
PSTN	O
ISDN	D
Closed Network (rx)	O
Continuous Polling Reception	O
Dedicated tx parameters	O
ECM	O
EFC	X
Inch-mm conversion before tx	O
mm-inch selection when printing	O
Page retransmission times	O
Protection against wrong conn.	O
Short Preamble	X

Other User Features	
Area code prefix	X
Center mark	O
Checkered mark	O
Clearing a memory file	O
Clearing a polling file	O
Clock	O
Confidential ID	A
Counters	O
Daylight Saving Time	O
Destination Check	X
Direct entry of names	O
File Retention Time	O
File Retransmission	O
Function Programs (F1 – F5)	O
Hard Disk Filing System	X
ID Code	O
Label Insertion ("To xxx")	O
Language Selection	SP mode
Manual service call	O
Memory Lock	A
Modifying a memory file (tx)	O
Multi Sort Document Reception	A
Own telephone number	O
Energy Saver	O
Print density control	O

Other User Features	
Printing a memory file	SP mode
RDS on/off	O
Reception Mode Switching Timer	X
Reception time printing	O
Remaining memory indicator	O
Reverse Order Printing	A
RTI, TTI, CSI	O
Speaker volume control	O
Specified Cassette Selection	O
Substitute reception on/off	O
Telephone line type	O
Toner Saving Mode	X
TTI/CIL on/off	O
User Function Keys (5 keys)	O
User Parameters	O
Wild Cards	O

Reports - Automatic	
Charge Control Report	X
Communication Failure Report	O
Confidential File Report	A
Error Report	O
Fax On Demand Report	X
Memory Storage Report	O
Mode Change Report	X
Polling Clear Report	O
Polling Reserve Report	O
Polling Result Report	O
Power Failure Report	O
TCR (Journal)	O
Toner Cassette Order Form	X
Transfer Result Report	A
Transmission Result Report	O

Reports - User-initiated	
Authorized Reception List	O
Charge Control Report	X
File List	O
Forwarding List	A
Group List	O
Hard Disk File List	X
Personal Code List	O

Reports - User-initiated	
Program List	O
Quick Dial Label	O
Quick Dial List	O
Specified Cassette Selection List	X
Speed Dial List	O
TCR/Journal	O
Transmission Status Report	X
User Function List	X
User Parameter List	O

Service Mode Features	
Back-to-back test	O
Bit switch programming	O
Buzzer test	O
Cable equalizer	O
Comm. parameter display	O
Counter check	O
Country code	O
DTMF tone test	O
Echo countermeasure	O
Effective term of service calls	O
Error code display	O
Excessive jam alarm	O
File Transfer	O
Hard Disk Utilities (Format etc.)	A and B
LCD contrast adjustment	SP mode
Line error mark	X
Memory file printout (all files)	O
Modem test (includeV.34 / V.8)	O
NCU parameters	O
Periodic service call	O
PM Call	O
Printing all communication records kept in memory	O
Protocol dump list	O
RAM display/rewrite	O
RAM dump	O
RAM test	O
RDS - RAM read/write - Dial data transfer (Quick/Speed) - Software transfer	 O O O

Service Mode Features	
Ringer test	O
ROM version display (FCU and Modem)	O
Serial number	O
Service monitor report	O
Service station number	O
Software Download	O
Software Upload	O
Modem Software Download	O
SRAM data backup and restore	O
System parameter list	O
Technical data on the TCR/Journal	O

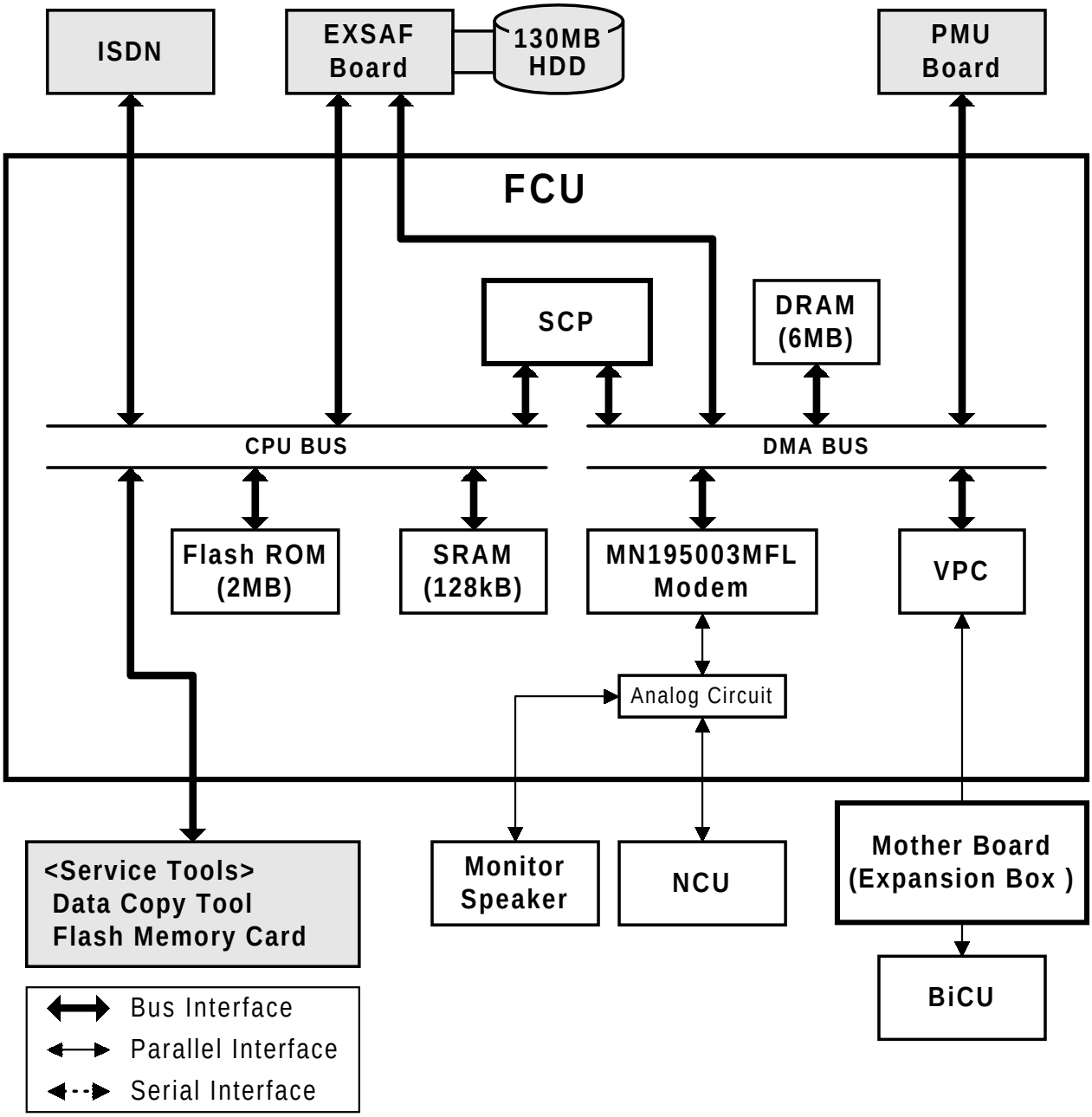
1.2.2 CAPABILITIES OF PROGRAMMABLE ITEMS

The following table shows how the capabilities of each programmable item will change after the optional memory board (EXSAF) is installed.

Item	Standard	With optional memory board (EXSAF)
Maximum number of memory files plus polling rx files	200	1000
Maximum number of memory files	200	1000
Maximum number of destinations per file	200	1000
Maximum number of destinations overall	500	2000
Maximum number of pages overall	160	480 (HDD: 3000)
Number of Quick Dials	56	56
Number of Speed Dials	100	1000
Number of Groups	9	30
Maximum number of destinations per Group	200	200
Maximum number of destinations dialed from the ten-key pad overall	100	1000
Maximum number of programs	56 (programmed in 56 Quick Dial keys)	56 (programmed in 56 Quick Dial keys)
Maximum number of destinations per program	200	200
Maximum number of destinations used for all programs	300	2000
Maximum number of Auto Documents	6 (programmed in 6 Quick Dial keys)	18 (programmed in 18 Quick Dial keys)
Maximum number of communication records for the TCR (Journal) stored in the memory	200	900
Maximum number of addresses specified for features such as Authorized Reception and Specified Cassette Selection	30	50
Maximum number of user function keys	5	5
Maximum number of personal codes	20	50

1.3 OVERALL MACHINE CONTROL

1.3.1 SYSTEM CONTROL



The basic fax unit consists of two PCBs: an FCU and an NCU.
The FCU controls all the fax communications and fax features, in cooperation with the base copier's main board, the BiCU. The NCU switches the analog line between the fax unit and the optional external telephone.

Fax Options

1. ISDN unit: This allows the fax unit to communicate over an ISDN (Integrated Services Digital Network) line.
2. EXSAF board: This expands the SAF memory capacity to hold up to 6MB of received data or data for transmission. Also, some additional features become available. In addition, this expands the system's SRAM capacity to hold programmed telephone numbers, communication records, etc.
3. PMU board: This expands the page memory capacity to 4MB to enable 400 dpi communications. Also, JBIG compression becomes available.
4. Hard Disk: This expands the SAF memory capacity to 130MB. The EXSAF is required to install this option.

1.3.2 POWER DISTRIBUTION AND CONTROL

The FCU power is supplied from the base copier's BiCU (+24V, +12V, -12V, and +5VE) and PSU (+5V). Refer to the base copier's service manual for details.

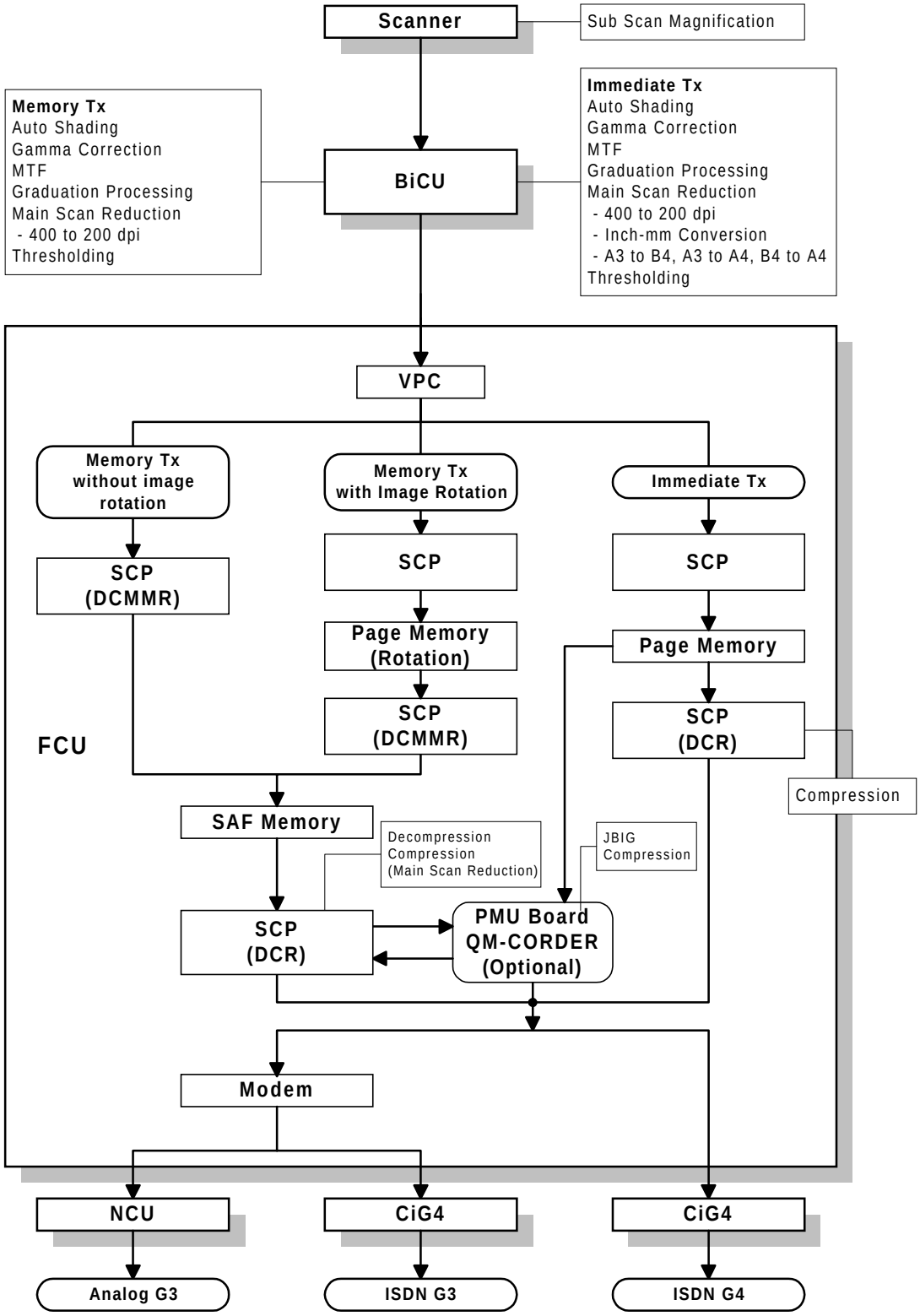
1.3.3 MEMORY BACK-UP

The system parameters and programmed items in the SRAM on the FCU and the EXSAF board are backed up by batteries (long-term backup), in case the base copier's main switch is turned off.

The SAF memory (DRAM) on the FCU and the EXSAF board are backed up by rechargeable batteries for 1 hour.

1.4 VIDEO DATA PATH

1.4.1 TRANSMISSION



Memory Transmission and Parallel Memory Transmission

The base copier's scanner scans the original at the selected resolution in inch format. The BiCU processes the data and transfers it to the FCU.

NOTE: When scanning a fax original, the BiCU uses the MTF and thresholding parameter settings programmed in the fax unit's scanner bit switches, not the copier's SP modes.

Then, the FCU converts the data to mm format, and compresses the data in MMR+raw format to store it in the SAF memory. If image rotation is possible, the image is rotated in page memory before compression.

At the time of transmission, the FCU decompresses the stored data, then re-compresses and/or reduces the data if necessary for transmission. Either the NCU or CiG4 (optional) transmits the data to the line.

Immediate Transmission

The base copier's scanner scans the original at the resolution agreed with the receiving terminal. The BiCU video processes the data and transfers it to the FCU.

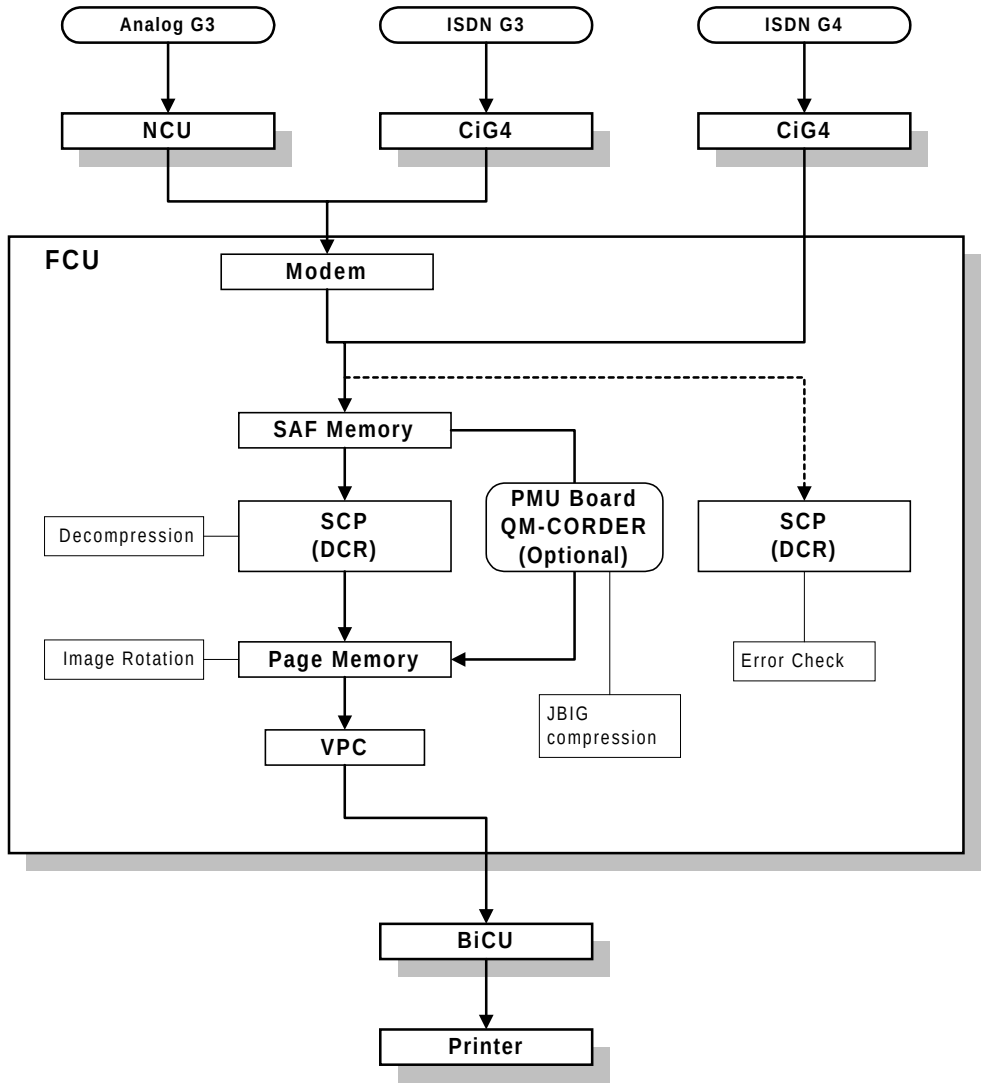
NOTE: When scanning a fax original, the BiCU uses the MTF and thresholding parameter settings programmed in the fax unit's scanner bit switches, not the copier's SP modes.

Then the FCU stores the data in page memory, and compresses the data for transmission. Either the NCU or CiG4 (optional) transmits the data to the line.

JBIG Transmission

- **Memory transmission:** With memory transmission, if the receiver has JBIG compression, the data goes from the SCP (DCR) to the PMU for JBIG compression. Then either the NCU or CiG4 (ISDN unit) transmits the data to the line.
- **Immediate transmission:** With immediate transmission, if the receiver has JBIG compression, the data goes from the page memory to the PMU for JBIG compression. Then either the NCU or CiG4 (optional) transmits the data to the line.

1.4.2 RECEPTION



First, the FCU stores the data from either an analog line or an ISDN line to the SAF memory. (The data goes in parallel to the SCP, and is checked for error lines/frames.)

The FCU then decompresses the data and transfers it to page memory. If image rotation is possible, the image is rotated in the page memory. The data is transferred to the BiCU.

JBIG Reception

When the machine receives data compressed with JBIG, the data is sent to PMU for decompression. Then the data is stored in the page memory, and transferred to the BiCU.

2. DETAILED SECTION DESCRIPTIONS

2.1 AUTOMATIC SERVICE CALLS

2.1.1 SERVICE CALL CONDITIONS

The fax unit makes an automatic service call when an SC code other than the following is informed from the base copier's BiCU.

NOTE: The service station's fax number has to be programmed in advance, or the machine cannot make a service call.

Exceptions

Address (H)	Definition	Default	SC code
480A30	1st SC code - High byte (BCD)	03	329 Laser beam pitch adjustment error
480A31	1st SC code - Low byte (BCD)	29	
480A32	2nd SC code - High byte (BCD)	03	361 Hard disk drive error 2
480A33	2nd SC code - Low byte (BCD)	61	
480A34	3rd SC code - High byte (BCD)	03	365 Image storage address error
480A35	3rd SC code - Low byte (BCD)	65	
480A36	4th SC code - High byte (BCD)	05	548 Fusing unit installation error
480A37	4th SC code - Low byte (BCD)	48	
480A38	5th SC code - High byte (BCD)	06	630 CSS communication error Japan only
480A39	5th SC code - Low byte (BCD)	30	
480A3A	6th SC code - High byte (BCD)	09	9AA From 900 to 999
480A3B	6th SC code - Low byte (BCD)	AA	
480A3C	7th SC code - High byte (BCD)	FF	Not programmed
480A3D	7th SC code - Low byte (BCD)	FF	
480A3E	8th SC code - High byte (BCD)	FF	Not programmed
480A3F	8th SC code - Low byte (BCD)	FF	
480A40	9th SC code - High byte (BCD)	FF	Not programmed
480A41	9th SC code - Low byte (BCD)	FF	
480A42	10th SC code - High byte (BCD)	FF	Not programmed
480A43	10th SC code - Low byte (BCD)	FF	
480A44	11th SC code - High byte (BCD)	FF	Not programmed
480A45	11th SC code - Low byte (BCD)	FF	
480A46	12th SC code - High byte (BCD)	FF	Not programmed
480A47	12th SC code - Low byte (BCD)	FF	
480A48	13th SC code - High byte (BCD)	FF	Not programmed
480A49	13th SC code - Low byte (BCD)	FF	
480A4A	14th SC code - High byte (BCD)	FF	Not programmed
480A4B	14th SC code - Low byte (BCD)	FF	
480A4C	15th SC code - High byte (BCD)	FF	Not programmed
480A4D	15th SC code - Low byte (BCD)	FF	

Address (H)	Definition	Default	SC code
480A4E	16th SC code - High byte (BCD)	FF	Not programmed
480A4F	16th SC code - Low byte (BCD)	FF	
480A50	17th SC code - High byte (BCD)	FF	Not programmed
480A51	17th SC code - Low byte (BCD)	FF	
480A52	18th SC code - High byte (BCD)	FF	Not programmed
480A53	18th SC code - Low byte (BCD)	FF	
480A54	19th SC code - High byte (BCD)	FF	Not programmed
480A55	19th SC code - Low byte (BCD)	FF	
480A56	20th SC code - High byte (BCD)	FF	Not programmed
480A57	20th SC code - Low byte (BCD)	FF	

To add additional SC codes, program them in the blank addresses.

Wild Cards

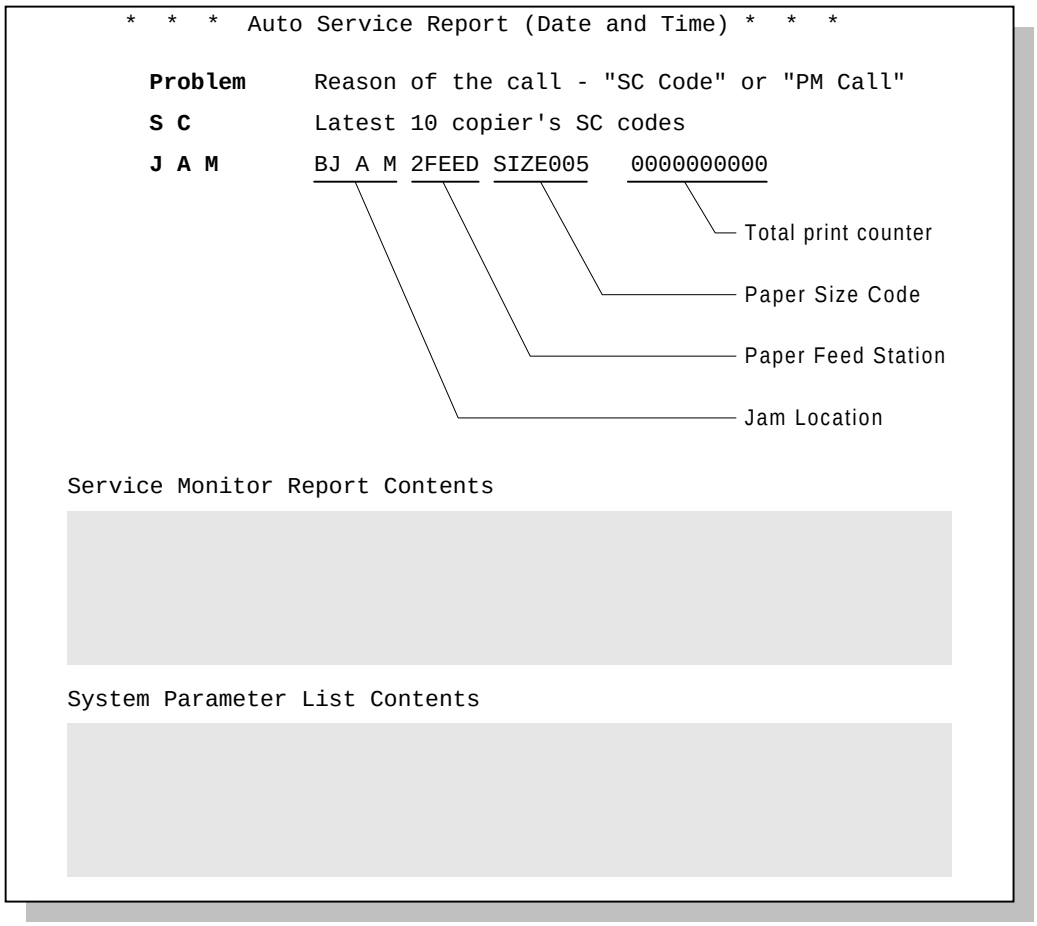
This function allows ’A’ or ’a’, to be used as a wild card instead of numbers from 0 to 9. For example, ‘1AA’ or ‘1aa’ means all the SC codes from 100 to 199, and ‘39A’ or ‘39a’ means all the SC codes from 390 to 399.

The fax unit cannot make an automatic service call when a Fax SC code condition has occurred. Refer to Troubleshooting for Fax SC code details.

Manual Service Call

If the service station needs a report, the user can make a service call manually, by changing bit 7 of User Parameter 14 (0E) to ’1’.

A sample auto service report



Paper Size Code Table			
Code	**Size**	**Code**	**Size**
005	A4 sideways	038	8.5 x 11" sideways
014	B5 sideways	160	11 x 17" lengthwise
031	Non-standard	164	8.5 x 14" lengthwise
132	A3 lengthwise	166	8.5 x 11" lengthwise
133	A4 lengthwise	172	5.5 x 8.5" lengthwise
134	A5 lengthwise		
141	B4 lengthwise		
142	B5 lengthwise		
159	Non-standard		

2.1.2 PERIODIC SERVICE CALL

The periodic service call notifies the service station of the machine's condition. The call is made at the time interval programmed in the following RAM addresses:

Parameters		Address (H)
Call interval: 01 through 15 month(s) (BCD) 00: Periodic Service Call Disabled		480379
Date and time of the next call		
	Year: last two digits of the year (BCD)	48037A
	Month: 01 through 12 (BCD)	48037B
	Day: 01 through 31 (BCD)	48037C
	Hour: 00 through 23 (BCD)	48037D

To change these settings after programming, change the call interval. The machine will then automatically change the remaining parameters by referring to the interval and the current date and time.

2.1.3 PM CALL

If PM alarm is enabled by the base copier's SP mode and PM call is enabled by system switch 01, the machine will make an automatic service call when the base copier's PM counter reaches the PM interval.

Cross reference

- PM service call on/off: System switch 01, bit 0
- PM alarm setting: SP mode 5-501 (default: 150K)

2.1.4 EFFECTIVE TERM OF SERVICE CALLS

If a time limit for the effectiveness of service calls is programmed, the machine will stop making automatic service calls after the time limit.

Program the time limit at the following addresses. This function is disabled when all of these addresses are 00(H).

	Address (H)
Year: last two digits of the year (BCD)	480383
Month: 01 through 12 (BCD)	480384
Day: 01 through 31 (BCD)	480385

2.2 SCANNING FEATURES

2.2.1 SUB-SCAN LENGTH CORRECTION USING ADF

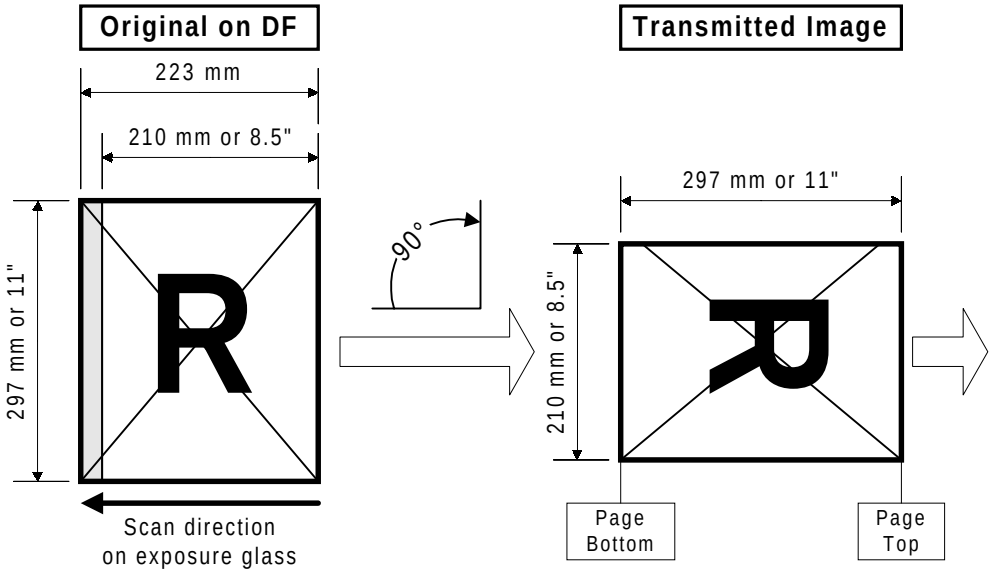
The ADF informs the FCU of the original length. If the length data is incorrect or the original is skewed, the machine corrects the sub-scan length to a standard paper length.

The correction algorithm is follows.

Before sub-scan length correction	After sub-scan length correction
Under 135mm	128mm (B6 short edge length)
136mm – 157mm	148mm (A5 short edge length)
158mm – 192mm	182mm (B6 long edge length)
193mm – 223mm	210mm (A4 short edge length) 216mm (LT short edge length) See the note below the table.
267mm – 287mm	279mm (LT long edge length)
288mm – 307mm	297mm (A4 long edge length)
355mm – 374mm	364mm (B4 long edge length)
410mm – 425mm	420mm (A3 long edge length)
Over 426mm	432mm (DLT long edge length)

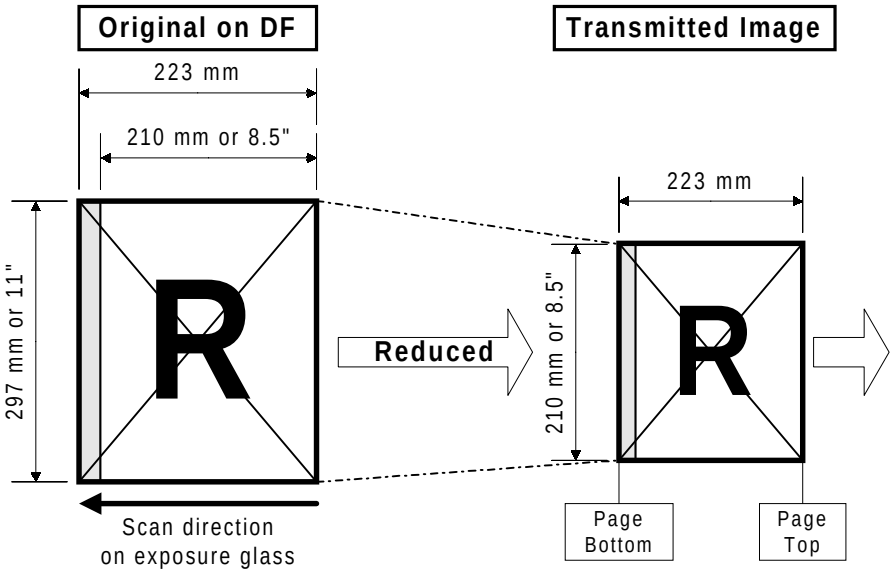
Note: Depends on the settings of scanner switch 0C bit 6

Length Correction Enabled (Default setting)



When this feature is enabled, in the above example, the gray part of the original is not scanned. However this allows the machine to rotate the image before transmission in order to avoid unintentional reduction.

Length Correction Disabled

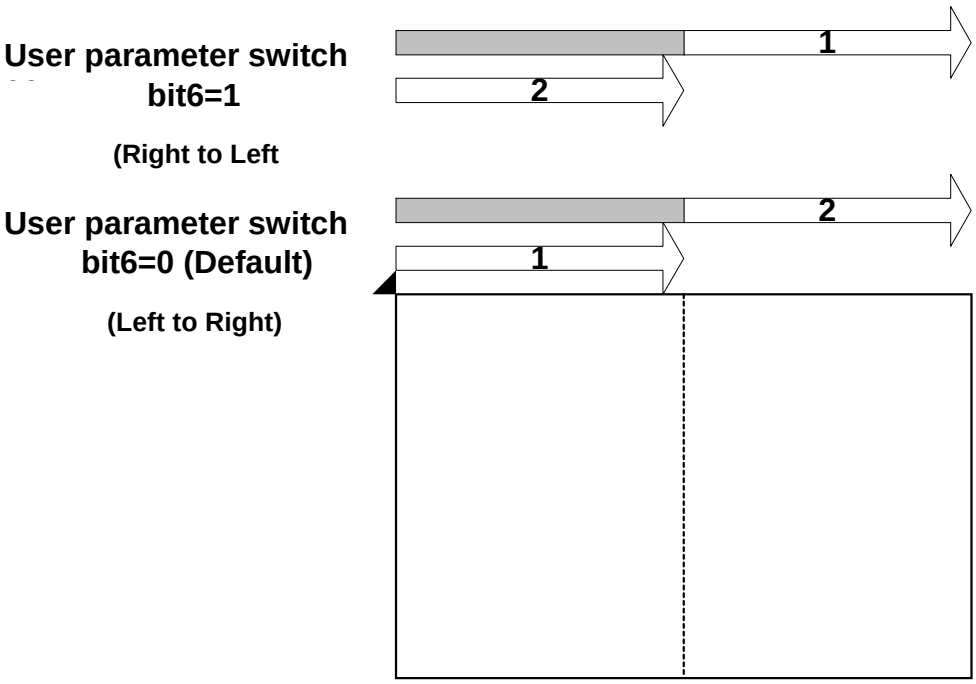


In the above example, this feature is disabled. An unintentional reduction may occur if the receiving machine cannot print on paper with a width of 297mm. However, with length-correction disabled, the machine sends the entire image.

Cross Reference

- Image rotation before transmission – section 2.2.3.
- Sub-scan length correction on/off – Scanner switch 0C, bit 7
  Default setting is 0. (Sub-scan length correction is enabled)
- Setting A4 or LT size when sub-scan length correction is on.
  – Scanner switch 0C bit 6. Default setting is 1. (Recognize as A4 or LT size)

2.2.2 PAGE SPLIT TRANSMISSION (BOOK TRANSMISSION)



This function allows a B4, A4/8.5 x 11", or A3/11 x 17" size book original to be sent as two separate pages.

When this function is selected, the machine scans the original twice and transmits the pages in the same sequence they were scanned.

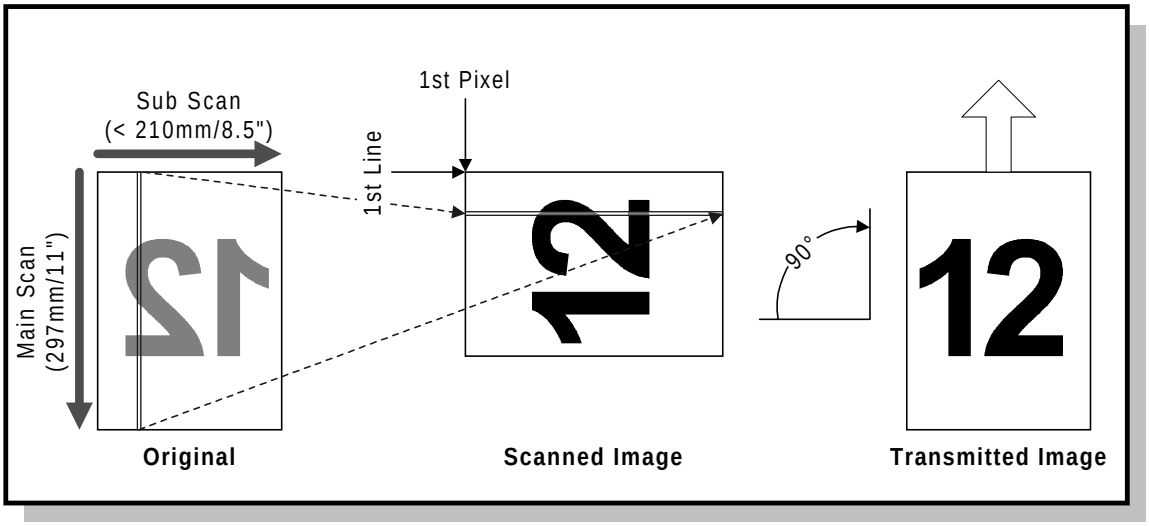
With the default setting, the left page is sent first, then the right page is sent. If the setting is changed, the order is reversed.

Cross Reference

- Scanning start page – User parameter switch 06, bit 6
  Default setting is 0. (Start scan from the left)

NOTE: 1) Memory transmission is used whenever this function is selected.
2) This function is only possible when sending a book original from the exposure glass.
3) If this function is used for an A3 or 11 x 17" original, the pages may be transmitted in a lengthwise direction, depending on the setting of "Image Rotation before Transmission" (see the next page).

2.2.3 IMAGE ROTATION BEFORE TRANSMISSION



A4 or 8.5 x 11” sideways

This function avoids the unintentional reduction of an A4 or 8.5 x 11” sideways original. When the machine detects a sideways A4 or 8.5 x 11" original in the ADF or on the exposure glass, the fax unit rotates the scanned image clockwise by 90 degrees before transmission, as shown above.

A5 or HLT lengthwise

This function avoids a blank space in the main scan direction. When the machine detects an A5 or HLT original placed lengthwise in the ADF or on the exposure glass, the fax unit rotates the scanned image clockwise by 90 degrees before transmission, as shown above.

NOTE: 1) Even if Parallel Memory Transmission is enabled, the machine uses normal memory transmission to send an A4 or 8.5 x 11" sideways original.
2) If the machine carries out this function while printing, the machine stops printing until scanning is completed.
3) The machine determines if it will rotate the image after the paper size is determined.
4) This feature is not performed during parallel memory transmission.
5) In Book mode, the machine determines image rotation for each page scanned.
In ADF mode, the machine determines image rotation for the first page. If it is rotated, the machine will check each page. If the first page need not be rotated, the machine will not check the rest of the pages.
6) When this feature is enabled for A5 or HLT lengthwise, 'APS small original detection' must be changed. This allows the machine to detect an A5/HLT size original. With the default setting, the machine does not detect A5 or HLT lengthwise in book mode.

Cross Reference

- Image rotation before Tx A3 or 11" width original on/off
  - Scanner switch 0F, bit 0 (Default setting is enabled)
- Image rotation before Tx A5 or HLT width original on/off
  - Scanner switch 0F, bit 2 (Default setting is disabled)
- APS small size original detection
  - Base copier's SP 4-303 (Default setting is "Not detected")
  - Scanner switch 0C, bits 1 and 2
    (Default setting is "Depends on the setting of the base copier")

2.3 PRINTING FEATURES

2.3.1 PAPER SIZE SELECTION

This section explains how the FCU selects the appropriate paper size for printing a received fax image. Refer to the 'Paper Size Selection Priorities' tables at the end of this section for how the appropriate paper size is actually selected.

WIDTH PRIORITY AND LENGTH PRIORITY

When 'Width Priority' is selected, a paper size of the same width as the received fax image has a higher priority. The fax image may be printed on several pages.

When 'Length Priority' is selected, a paper size that has enough length to print the received fax image has higher priority. The fax image is printed on one sheet of paper, but the printed fax may have wide margins on the left and right.

Cross Reference

- Paper selection priority - Printer switch 0E, bit 0 (Default: Width)

IMAGE ROTATION BEFORE PRINTING

If the machine has the same size paper as the received fax image size, but in sideways orientation, the fax unit rotates the image by 90 degrees clockwise, and prints it sideways.

This feature is only possible when the received fax image is one of the following sizes: A4 lengthwise, 8.5 x 11" lengthwise, B5 lengthwise

NOTE: This function can not be disabled.

SUB-SCAN REDUCTION AND PAGE SEPARATION

Sub-scan Reduction Disabled

When Sub-scan Reduction is disabled, the received fax image is printed unreduced.

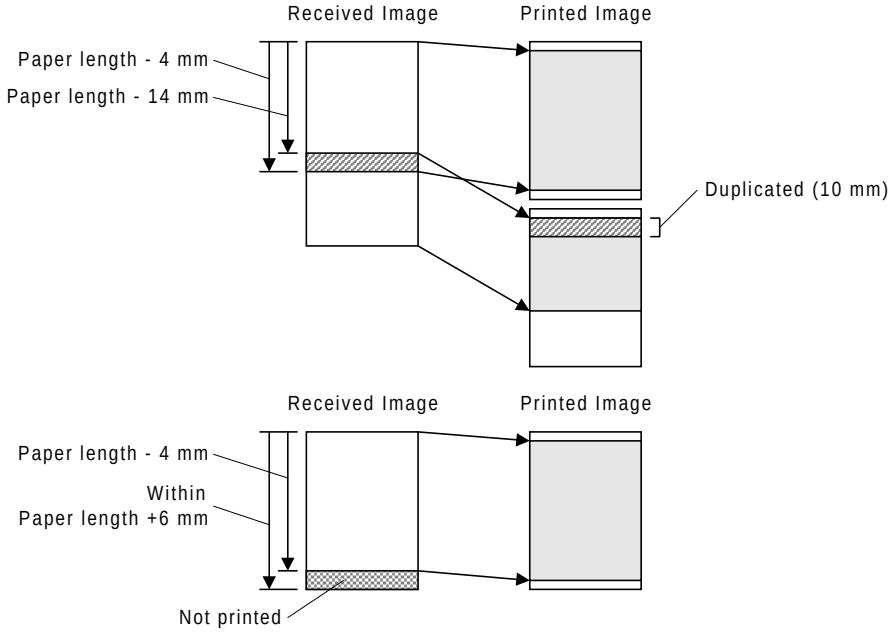
If the image is longer than the paper length + 6 mm, the image is separated onto two pages (see the top drawing below).

If the image is shorter than the paper length + 6 mm but longer than the paper length - 4 mm, the part of the image after paper length - 4 mm will be lost (see the bottom drawing below).

NOTE: The page separation threshold is adjustable between 0 and 15 mm (the default is paper length + 6 mm). Refer to Printer Switch 03, bits 4 to 7 for more details.

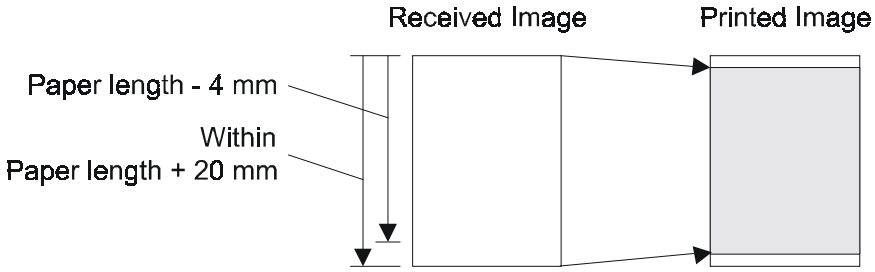
The 2 mm gaps at the leading and trailing edges depend on the leading and trailing edge margin settings.

The 10 mm image duplication can be adjusted or disabled.



Sub-scan Reduction Enabled

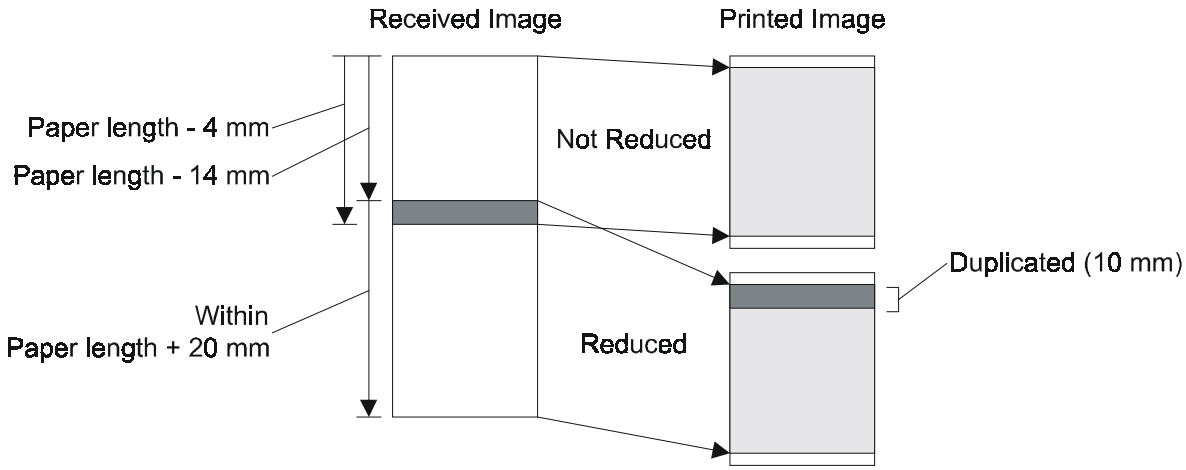
When Sub-scan Reduction is enabled, the received fax image is reduced in the page memory to fit on the selected paper, if the received image length is between [paper length - 4 mm] and [paper length + 20 mm]. See the drawing below.



NOTE: The upper limit (page length + 20 mm) is adjustable between 0 and 155 mm. Refer to Printer Switch 04, bits 0 to 4 for more details.

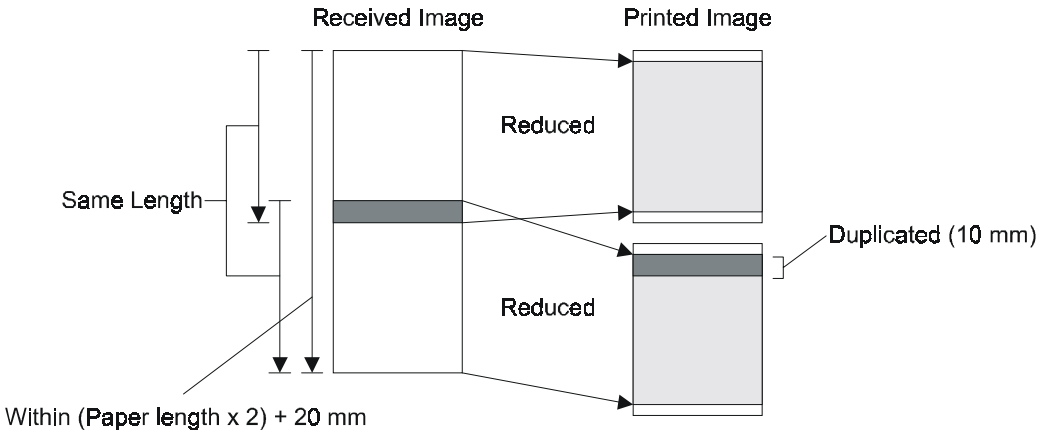
If the FCU detects that the image must be separated into more than one page after reduction, what happens to the data depends on the Reduction Rate Equalization setting (Printer Switch 0E, bit 7).

- Reduction Rate Equalization Off (Example Diagram: Two-page Printout) -



1. The data up to [page length - 4 mm] will be printed on page 1, without reduction.
2. The last 10 mm of this data will be repeated at the top of the next page (this length can be can be adjusted or repetition can be switched off).
3. The remaining data will be printed on page 2, with reduction, if it is within [paper length + 20 mm].
4. If it is longer than this, page separation is done again. Data up to [page length - 4 mm] will be printed on page 2, without reduction.
5. The process for page 3 and subsequent pages will repeat from step 2.

- Reduction Rate Equalization On (Example Diagram: Two-page Printout) -



1. The machine determines how many pages will be needed to print the message, taking the following into account:
   The final page (n) is such that the received image length is within (paper length x n) + 20 mm
   The data must be reduced to fit on pages of length (paper length - 4 mm), with an equal reduction rate for each page
   The last 10 mm of the previous page will be repeated at the top of the next page (this length can be adjusted or repetition can be disabled).
2. The machine prints all the pages, at the same reduction rate.

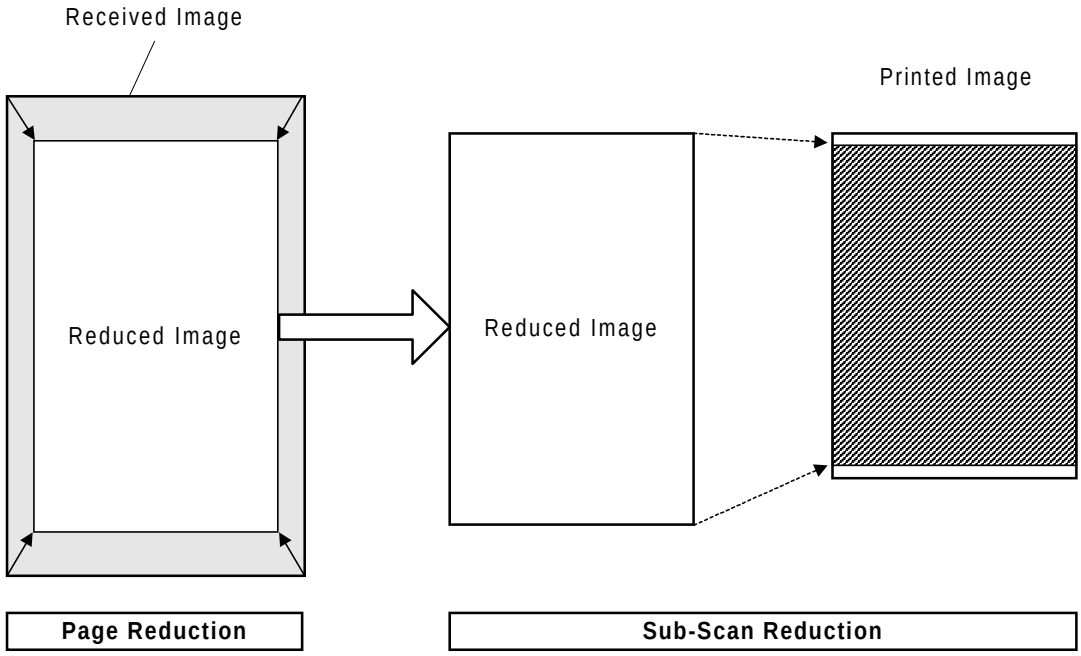
If the customer does not want to receive a fax message on separate pages, page separation can be disabled. However, once it has been disabled, the machine will not print the received fax message until a paper size which can hold the received fax image on one page is set in a cassette. Keep page separation enabled if the customer expects to receive fax messages longer than the installed paper.

Cross Reference

Parameter	Switch	Default Setting
Reduction in sub-scan direction on/off	Printer Switch 03, bit 0	Enabled (except Germany)
Equalizing reduction rate among separated pages	Printer Switch 0E, bit 7	Enabled
Page separation threshold when reduction is disabled	Printer Switch 03, bits 4-7	6 mm
Page separation threshold when reduction is enabled	Printer Switch 04, bits 0-4	20 mm
Page separation on/off	Printer Switch 0E, bit 2	Enabled
Page separation mark on/off	Printer Switch 00, bit 0	Enabled
Image duplication with page separation, on/off	Printer Switch 00, bit 1	Enabled
Length of the repeated image on the next page	Printer Switch 04, bits 5-6	10 mm

PAGE REDUCTION

This function allows a received fax image to be printed on paper with less width than the fax image.



First, the received image is reduced by a fixed reduction rate in the main and sub-scan directions. The available reduction rates are as follows:

- 84% - A3 to B4 reduction
- 82% - B4 to A4 lengthwise reduction

Then, the reduced image is further reduced (if necessary) in the sub-scan direction so that it can be printed on one page. However, if the FCU detects that the image does not fit on one page after sub-scan reduction, the FCU cancels the page reduction, but uses normal sub-scan reduction on the received fax image.

NOTE: 1) Sub-scan reduction is automatically enabled when Page Reduction is enabled.
2) A3 to A4 reduction is not available.

Cross Reference

- Page reduction on/off - User parameter 10 (0A), bit 3 (Default: Disabled)

Examples

1. When printing a B4 size fax image on 8.5" x 11" lengthwise paper
   - Fax image size: 256 x 364 mm (10.7 x 14.3")
   - Paper size: 216 x 279 mm (8.5 x 11")
   - Reduction rate used: 82%
   - Page separation threshold: 20 mm

The received image is printed on one 8.5 x 11" sheet, because the image length after page reduction (364 mm x 82% = 298.5 mm) is shorter than the paper length (279 mm) plus 20 mm.

2. When printing a non-standard size (256 x 400 mm) fax image on 8.5 x 11" lengthwise paper
   - Fax image size: 256 x 400 mm (10.7 x 15.7")
   - Paper size: 216 x 279 mm (8.5 x 11")
   - Reduction rate used: 82%
   - Page separation threshold: 20 mm

The received fax image is printed on two 8.5 x 11" sheets after page separation and image rotation, because the image length after page reduction (400 mm x 82% = 328 mm) is longer than the paper length (279 mm) plus 20 mm.

Refer to the “Paper Size Selection Priorities” table later in this chapter.

TWO IN ONE

This function allows two small pages to be printed on one sheet of paper. However, this function only works when the machine does not have the following size of paper in the cassette.

- The same size of paper as the received image
- The paper which has the same width and sufficient length

Cross Reference

- Two in one on/off - User parameter 10 (0A), bit 1 (Default: Disabled)

2.3.2 PAPER SIZE SELECTION PRIORITIES

Page Reduction	Disabled
Reduction in Sub-scan Direction	Disabled
Page Separation Threshold	
Width or Length Priority	Width

: Image Rotation

: Half of the page is blank

: Page Reduction

Paper Select Priorities	Received Image Size										
	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
1	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
2	11x17"	A3	A4	A4	B5	8.5x11"	A3	A4	8.5x11"	8.5x11"	8.5x14"
3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A4	A4	A3	A4
4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	11x17"	A4
5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	8.5x11"	F/F4	A4	8.5x11"
6	8.5x11"	A4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	A4	8.5x11"
7	F/F4	A4	8.5x11"	11x17"	8.5x11"	8.5x14"	F/F4	B4	A3	F/F4	B4
8	B4	8.5x11"	B4	B4	F/F4	B5	B4	A3	B4	B4	A3
9	8.5x14"	8.5x11"	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
10		F/F4	A5		11x17"	A3		A5	A5		A5
11		8.5x14"	B5		8.5x14"	B4		B5	B5		B5
12			B5			11x17"		B5	B5		B5

Lengthwise

Sideways

Page Reduction	Disabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Width

: Image Rotation

: Half of the page is blank

: Page Reduction

Paper Select Priorities	Received Image Size										
	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
2	11x17"	A3	A4	A4	B5	8.5x11"	11x17"	A4	8.5x11"	A4	8.5x14"
3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A4	A4	8.5x11"	A4
4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	8.5x11"	A4
5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	8.5x11"	F/F4	A3	8.5x11"
6	8.5x11"	A4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	F/F4	8.5x11"
7	F/F4	A4	8.5x11"	11x17"	8.5x11"	8.5x14"	F/F4	B4	A3	11x17"	B4
8	B4	8.5x11"	B4	B4	F/F4	B5	B4	A3	B4	B4	A3
9	8.5x14"	8.5x11"	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
10		F/F4	A5		11x17"	A3		A5	A5		A5
11		8.5x14"	B5		8.5x14"	B4		B5	B5		B5
12			B5			11x17"		B5	B5		B5

Lengthwise

Sideways

Page Reduction	Disabled
Reduction in Sub-scan Direction	Disabled
Page Separation Threshold	
Width or Length Priority	Length

: Image Rotation

: Half of the page is blank

: Page Reduction

Paper Select Priorities	Received Image Size										
	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
1	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
2	11x17"	A3	A4	A4	B5	8.5x11"	A3	B4	8.5x11"	8.5x11"	8.5x14"
3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A3	A4	F/F4	B4
4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	11x17"	A4	A3	A3
5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	A4	F/F4	11x17"	11x17"
6	8.5x11"	A4	B4	F/F4	8.5x11"	F/F4	8.5x11"	A4	8.5x14"	B4	A4
7	F/F4	A4	11x17"	11x17"	8.5x11"	8.5x14"	F/F4	8.5x11"	A3	8.5x14"	A4
8	B4	8.5x11"	8.5x11"	B4	F/F4	B5	B4	8.5x11"	B4	A4	8.5x11"
9	8.5x14"	8.5x11"	8.5x11"	8.5x14"	A3	B5	8.5x14"	F/F4	11x17"	A4	8.5x11"
10		F/F4	A5		11x17"	A3		A5	A5		A5
11		8.5x14"	B5		8.5x14"	B4		B5	B5		B5
12			B5			11x17"		B5	B5		B5

Lengthwise

Sideways

Page Reduction	Disabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Length

: Image Rotation

: Half of the page is blank

: Page Reduction

Paper Select Priorities	Received Image Size										
	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
2	11x17"	A3	A4	A4	B5	8.5x11"	11x17"	B4	8.5x11"	A4	8.5x14"
3	A4	11x17"	F/F4	8.5x11"	B4	8.5x11"	A4	A3	A4	8.5x11"	B4
4	A4	B5	8.5x14"	8.5x11"	A4	A4	A4	11x17"	A4	8.5x11"	A3
5	8.5x11"	B5	A3	A3	A4	A4	8.5x11"	A4	F/F4	A3	11x17"
6	8.5x11"	A4	B4	F/F4	8.5x11"	F/F4	8.5x11"	A4	8.5x14"	F/F4	A4
7	F/F4	A4	11x17"	11x17"	8.5x11"	8.5x14"	F/F4	8.5x11"	A3	11x17"	A4
8	B4	8.5x11"	8.5x11"	B4	F/F4	B5	B4	8.5x11"	B4	B4	8.5x11"
9	8.5x14"	8.5x11"	8.5x11"	8.5x14"	A3	B5	8.5x14"	F/F4	11x17"	8.5x14"	8.5x11"
10		F/F4	A5		11x17"	A3		A5	A5		A5
11		8.5x14"	B5		8.5x14"	B4		B5	B5		B5
12			B5			11x17"		B5	B5		B5

Lengthwise

Sideways

Page Reduction	Enabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Width

: Image Rotation

: Half of the page is blank

: Page Reduction

Paper Select Priorities	Received Image Size										
	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
2	11x17"	A4	A4	A4	B5	8.5x11"	11x17"	A4	8.5x11"	A4	8.5x14"
3	B4	A4	F/F4	8.5x11"	B4	8.5x11"	B4	A4	A4	8.5x11"	A4
4	A4	F/F4	8.5x14"	8.5x11"	A4	A4	A4	8.5x11"	A4	8.5x11"	A4
5	A4	8.5x14"	A3	A3	A4	A4	A4	8.5x11"	F/F4	A3	8.5x11"
6	8.5x11"	A3	8.5x11"	F/F4	8.5x11"	F/F4	8.5x11"	F/F4	8.5x14"	F/F4	8.5x11"
7	8.5x11"	11x17"	8.5x11"	11x17"	8.5x11"	8.5x14"	8.5x11"	B4	A3	11x17"	B4
8	F/F4	B5	B4	B4	F/F4	B5	F/F4	A3	B4	B4	A3
9	8.5x14"	B5	11x17"	8.5x14"	A3	B5	8.5x14"	11x17"	11x17"	8.5x14"	11x17"
10		8.5x11"	A5		11x17"	A3		A5	A5		A5
11		8.5x11"	B5		8.5x14"	B4		B5	B5		B5
12			B5			11x17"		B5	B5		B5

Lengthwise

Sideways

Page Reduction	Enabled
Reduction in Sub-scan Direction	Enabled
Page Separation Threshold	20 mm
Width or Length Priority	Length

: Image Rotation

: Half of the page is blank

: Page Reduction

Paper Select Priorities	Received Image Size										
	A3	B4	A4	A4	B5	A5	11x17"	8.5x14"	8.5x11"	8.5x11"	F/F4
1	A3	B4	A4	A4	B5	A5	A3	8.5x14"	8.5x11"	A4	F/F4
2	11x17"	A4	A4	A4	B5	8.5x11"	11x17"	B4	8.5x11"	A4	8.5x14"
3	B4	A4	F/F4	8.5x11"	B4	8.5x11"	B4	A3	A4	8.5x11"	B4
4	A4	F/F4	8.5x14"	8.5x11"	A4	A4	A4	11x17"	A4	8.5x11"	A3
5	A4	8.5x14"	A3	A3	A4	A4	A4	A4	F/F4	A3	11x17"
6	8.5x11"	A3	B4	F/F4	8.5x11"	F/F4	8.5x11"	A4	8.5x14"	F/F4	A4
7	8.5x11"	11x17"	11x17"	11x17"	8.5x11"	8.5x14"	8.5x11"	8.5x11"	A3	11x17"	A4
8	F/F4	B5	8.5x11"	B4	F/F4	B5	F/F4	8.5x11"	B4	B4	8.5x11"
9	8.5x14"	B5	8.5x11"	8.5x14"	A3	B5	8.5x14"	F/F4	11x17"	8.5x14"	8.5x11"
10		8.5x11"	A5		11x17"	A3		A5	A5		A5
11		8.5x11"	B5		8.5x14"	B4		B5	B5		B5
12			B5			11x17"		B5	B5		B5

Lengthwise

Sideways

2.3.3 JUST SIZE PRINTING

This function restricts the machine so that it can only print a received message on paper with the highest priority paper size.

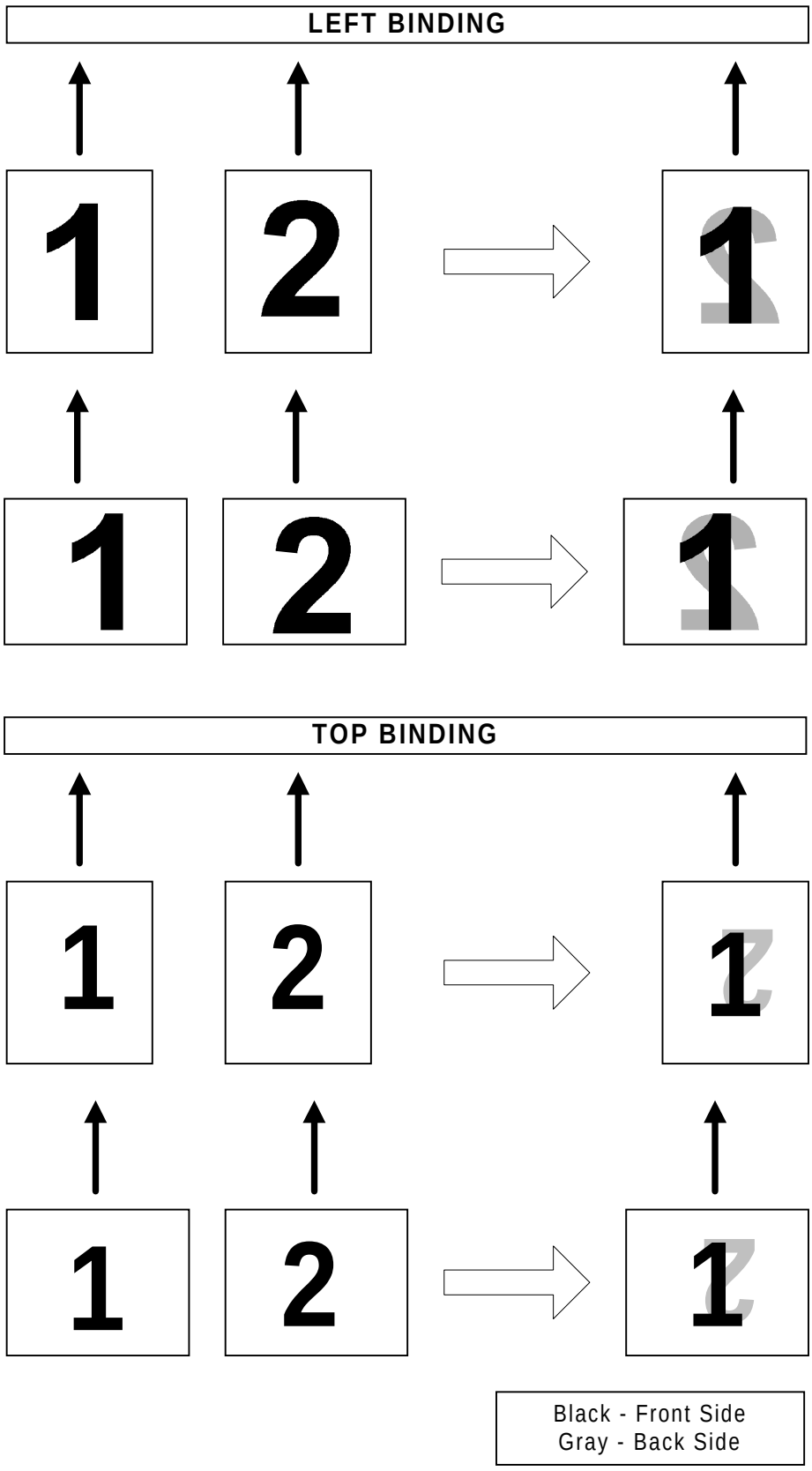
NOTE:

1) Example:
   A: The machine has A4 (lengthwise) and B4.
   B: The A4 paper tray is empty
   C: The machine receives an A4 (lengthwise) size message.
   When just size printing is disabled, the machine prints the received image on B4 paper. When just size printing is enabled, the machine will not print on B4 paper. If the machine has A4 (sideways), the machine prints using image rotation.
2) When the paper tray with the highest priority paper size is empty, the machine displays ‘Paper designated to print Fax/lists are empty. Refill -- size’.
3) When both page reduction and just size printing are enabled, page reduction is given priority

Cross Reference

- Just size printing on/off – User parameter switch 05, bit 5
  Default setting is 0: Just size printing is disabled
- Just size printing while a paper cassette is opened – Printer switch 06, bit 0
  Default setting is 0: Printing will not start

2.3.4 TWO-SIDED (DUPLEX) PRINTING



When duplex printing is enabled in fax mode, the machine prints two consecutive pages, which must be the same size and direction, onto both sides of the page. Duplex printing can utilize both Left Binding and Top Binding, selected by a bit switch.

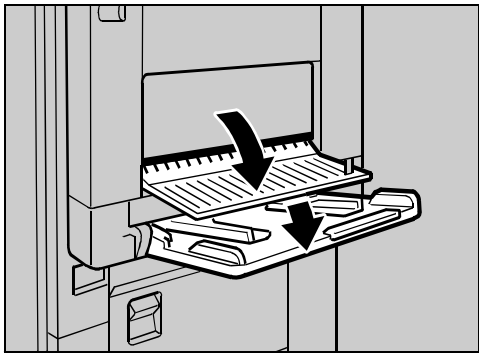
LEFT BINDING

As shown on the previous page, the printed results of both sides are in the same direction.

TOP BINDING

As shown on the previous page, the printed results of both sides are in the reverse direction.

NOTE: 1) The optional duplex unit and EXSAF card are required to enable duplex printing.
2) The machine starts printing after all pages have been received.
3) For duplex printing on B4, 8.5” x 14” or larger paper, open the right side cover on the duplex unit, as shown. If the right side cover is not opened, the machine will print the data on one side only.



Cross Reference

- Duplex printing on/off for specific senders - Key operator mode 07
- Duplex printing on/off for all received fax messages - Printer Switch 0F, bit 2
- Wait time when duplex unit is in use - Printer Switch 0F, bits 6 and 7
- Bind direction - Printer Switch 0F, bit 3

2.4 FAX COMMUNICATION FEATURES

2.4.1 SEP/SUB/PWD

In 1996, ITU-T introduced the following protocol signals as the T.30 recommendations. These signals enable confidential transmission and secured polling between machines produced by different manufacturers.

SEP (Selective Polling): This signal informs the other terminal of a polling ID to enable secured (ID) polling or to select a document to poll.
Up to 20 digits or characters can be sent in a SEP frame.

PWD (Password): This signal informs the other terminal of a password to enable extra security.
Up to 20 digits or characters can be sent in a PWD frame.

SUB (Sub-address): This signal informs a sub-address of a destination. Some fax servers use this information to route a received fax message to a specific address in the local network.
Up to 20 digits or characters can be sent in a SUB frame.

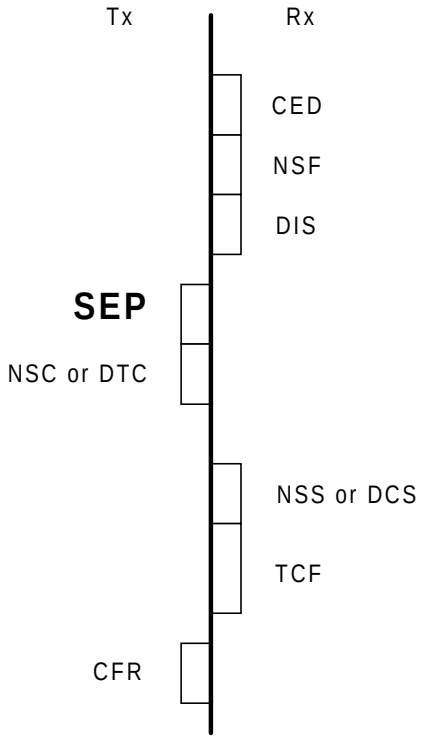
SID (Sender ID): This signal informs the other terminal of the sender ID to identify the transmitter.
Up to 20 digits or characters can be sent in a SID frame.

NOTE: SID is not available with this machine.

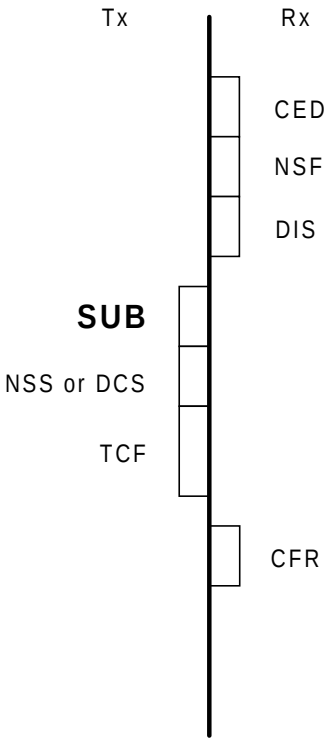
The ITU-T recommendation only clarifies transmission requirements, and does not specify reception requirements. How the receiving terminal treats these signals varies with receiver terminal and manufacturer.

This machine is capable of sending SEP, SUB and PWD codes in transmission or for polling reception, but it is not capable of receiving these codes. If the machine receives one of these frames, the machine will ignore it.

Selective Polling (SEP/PWD)



Sub-address (SUB)



2.4.2 JBIG COMPRESSION

JBIG (Joint Bi-Level Image Coding Expert Group) is a working group which consists of members of ITU-T T.82 and ISO11544. The JBIG compression method allows data compression of approximately 1.2 to 1.3 times the MMR method in text mode, and 2 to 10 times in halftone mode.

The optional PMU board is required for JBIG compression.

JBIG compression is disabled when any of the following conditions occur.

- When JBIG compression is turned off with communication switch 00.
- When ECM is turned off with communication switch 01, BIT 0.
- When the receiving terminal does not have the JBIG feature.
- When the receiving terminal does not have the ECM feature.

There are two modes for JBIG compression.

- Standard mode: one stripe (data block) consists of 128 lines.
- Optional mode: one stripe of one page (transmission speed with this mode is faster).

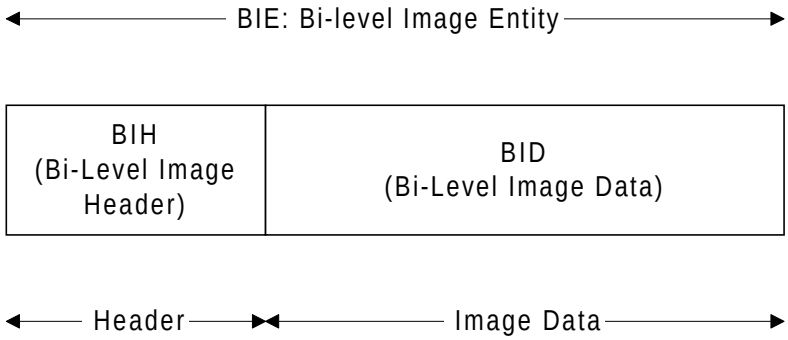
This machine supports both modes for transmission and reception. The mode used is determined during handshaking.

Cross reference: Section 4.2 Bit switches

- JBIG reception mode : Communication bit switch 00 bit 5
  0: Standard mode only 1: Standard mode and optional mode (default)
- Priority of JBIG mode used for transmission: Communication bit switch 00 bit 6
  0: Standard mode 1: Optional mode (default)

Data Compression

JBIG compressed data is referred to as a Bi-level Image Entity (BIE).
The BIE consists of a header frame (BIH: Bi-level Image Header) and a compressed data frame (BID: Bi-level Image Data).
The BIH frame contains information such as main scan width (pixels), sub-scan length, and compression mode (standard/optional).
The BID frame contains the actual data.



2.4.3 V.8/V.34 PROTOCOL

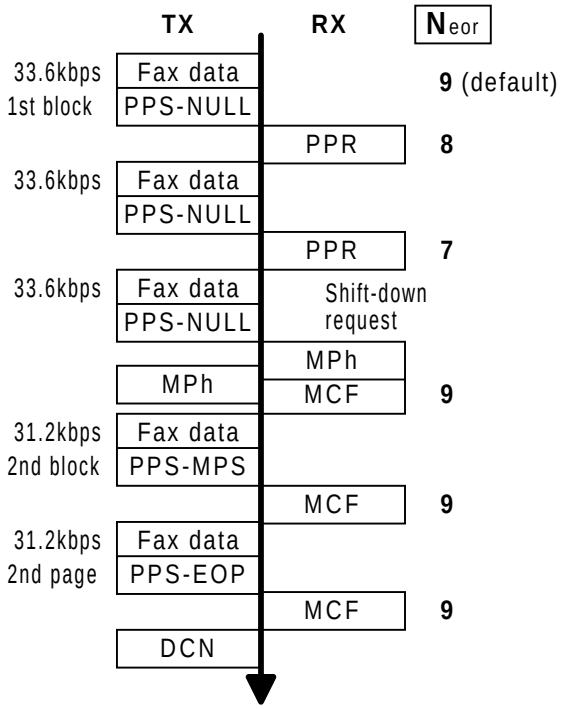
NOTE: 1) Refer to “V.8/V.34 Training Manual” for overall information about V.8/V.34 protocol.
2) This section explains machine specific functions only.

V.8 in Manual Reception

This machine starts V.8 procedure in order to make V.34 communication enabled in manual reception, though some other fax machines do not.
Refer to “V.8/V.34 Training Manual – section 3.1” for detailed procedures.

Shift-down Conditions

One-step Shift-Down from Receiving Terminal

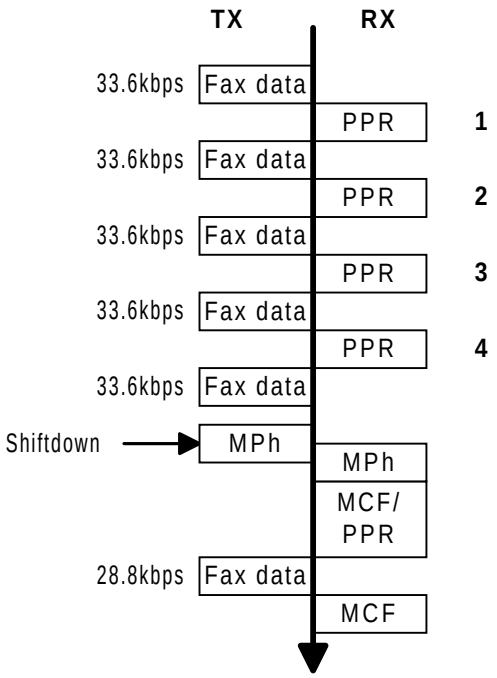


NOTE: The receiving terminal must be this machine.

If this machine has sent two PPRs for one ECM block, it will request a one step shift-down to the sender terminal in the next control channel.

N eor : Number of frame re-transmissions remaining until the Tx terminal sends DCN to terminate the communication. This is fixed at “9”, not adjustable.

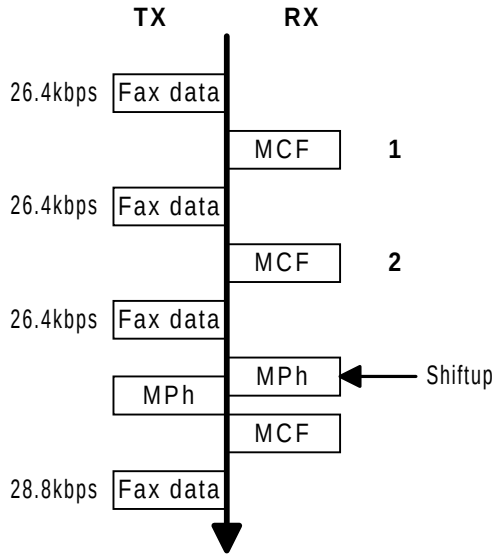
Two-step Shift-down from Sending Terminal



NOTE: The sender terminal must be this machine.

If this machine has received four PPRs for one ECM block, it will request a two step shift-down to the receiving terminal in the next control channel.

One-step Shift-up from Receiving Terminal

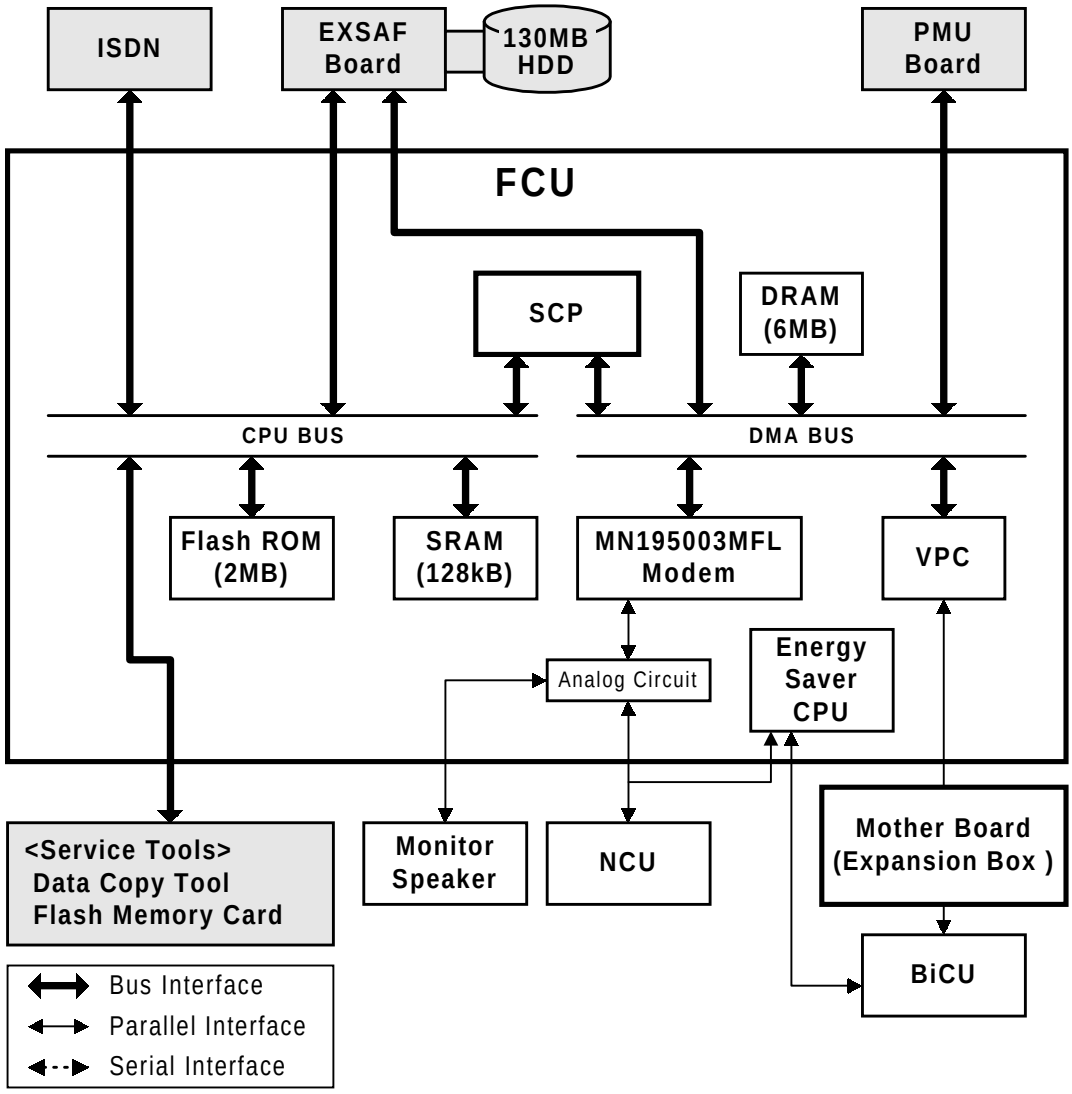


NOTE: The receiving terminal must be this machine.

If this machine has sent two consecutive MCFs and it can detect a good line condition, it will request a one step shift-up to the sender terminal in the next control channel.

2.5 PCBS

2.5.1 FCU



The FCU (Facsimile Control Unit) controls fax communications, the video interface to the base copier's engine, energy saver mode, and fax options.

SCP (System Control Processor)

- CPU
- Data compression and reconstruction (DCR)
- MMR + raw data compression for SAF storage (DCMMR)
- DMA control
- Clock generation
- DRAM backup control
- Ringing signal/tone detection

VPC

- Video and command interface to the BiCU

Modem (Matsushita: MN195003MFL)

- V.34, V17, V.29, V.27ter, V.21, and V.8

Energy Saver CPU

- Power distribution control in energy saver mode

ROM

- 2MB (16 Mbit) flash ROM for system software storage

DRAM

- The 6 MB of DRAM is shared between SAF Memory (2 MB), ECM Buffer (128 KB), Page Memory (2 MB), Working Memory (384 kB), and Line buffer etc (512 kB). The remaining 1 MB of memory is not used.
- The 2 MB of SAF memory is backed up by the rechargeable battery.

SRAM

- The 128 KB SRAM for system and user parameter storage is backed up by the lithium battery.

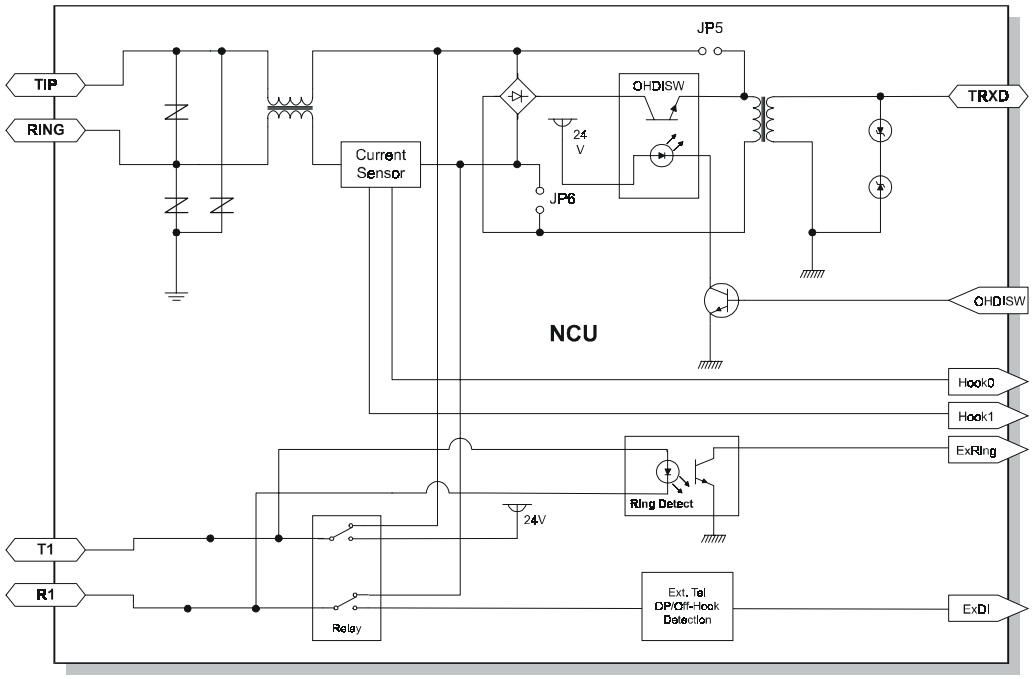
Oscillators

- 42.20545MHz oscillator for system clock generation
- 32.768MHz oscillator for the real time clock. This is backed up by the lithium battery.
- 24.192MHz oscillator for the MN195003MFL modem

Jumpers, Switches, and Test Points

Item	Description
SW1	Switches the SRAM backup battery on/off
SW2	Reset switch
SW3	Switches the data transfer direction

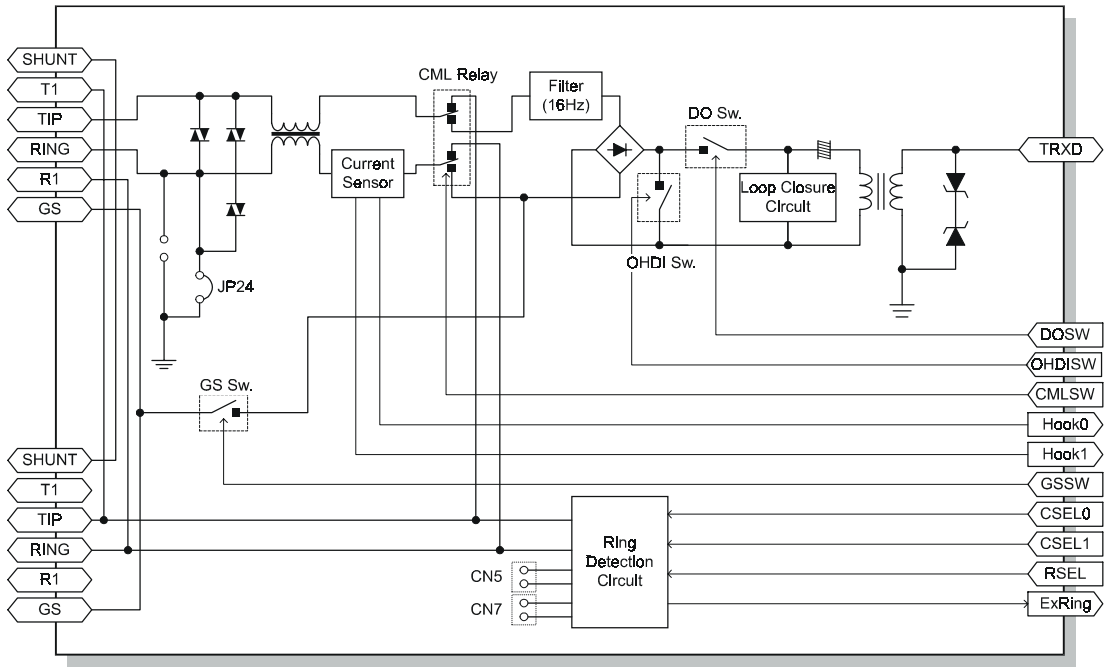
2.5.2 NCU (US)



Jumpers

Item	Description
JP5	These jumpers should be shorted when the machine is connected to a dry line.
JP6	

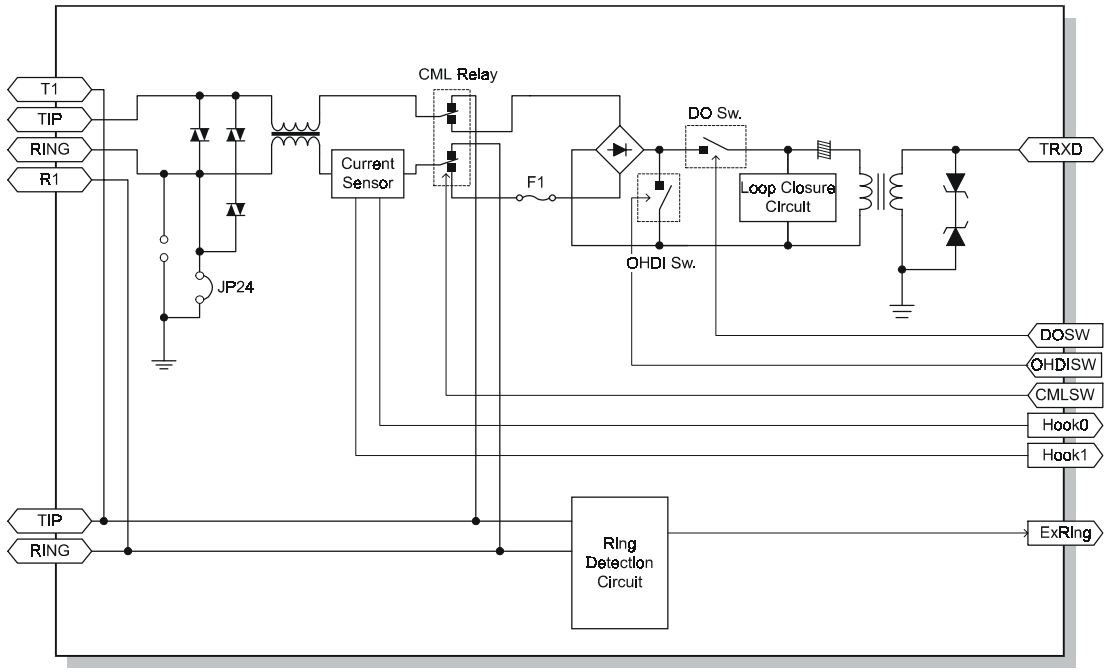
2.5.3 NCU (EUROPE/ASIA)



Control Signals and Jumpers

	CSEL0	CSEL1	RSEL	JP24	CN5	CN7
Country	**CN2-4**	**CN2-5**	**CN1-13**			
Germany	L	H	H	S	O	O
Holland	L	H	H	S	O	O
Austria	L	H	H	S	O	O
Italy	L	L	L	S	O	O
Spain	L	L	L	S	O	O
Ireland	H	L	L	S	S	S
Finland	L	H	L	O	O	O
Switzerland	L	H	L	O	O	O
Other	L	H	L	S	O	O
	L: Low, H: High			S: Short, O: Open		

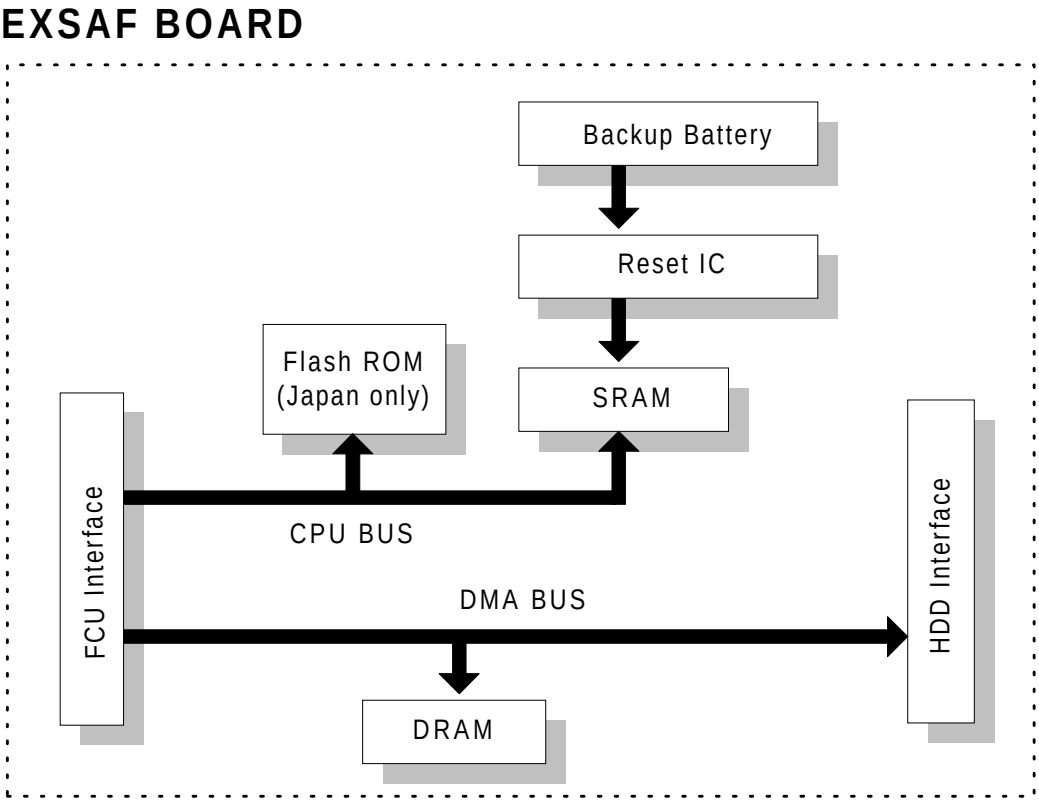
2.5.4 NCU (FRANCE)



Jumper

Item	Description
JP24	Keep this shorted.

2.5.5 EXSAF BOARD



The EXSAF board expands the SAF memory capacity to hold up to 6 MB, and some additional features become available. In addition, this expands the SRAM capacity. This board also serves as the HDD interface.

DRAM

- 4MB DRAM for SAF expansion.

SRAM

- 512KB SRAM for programmable area expansion.

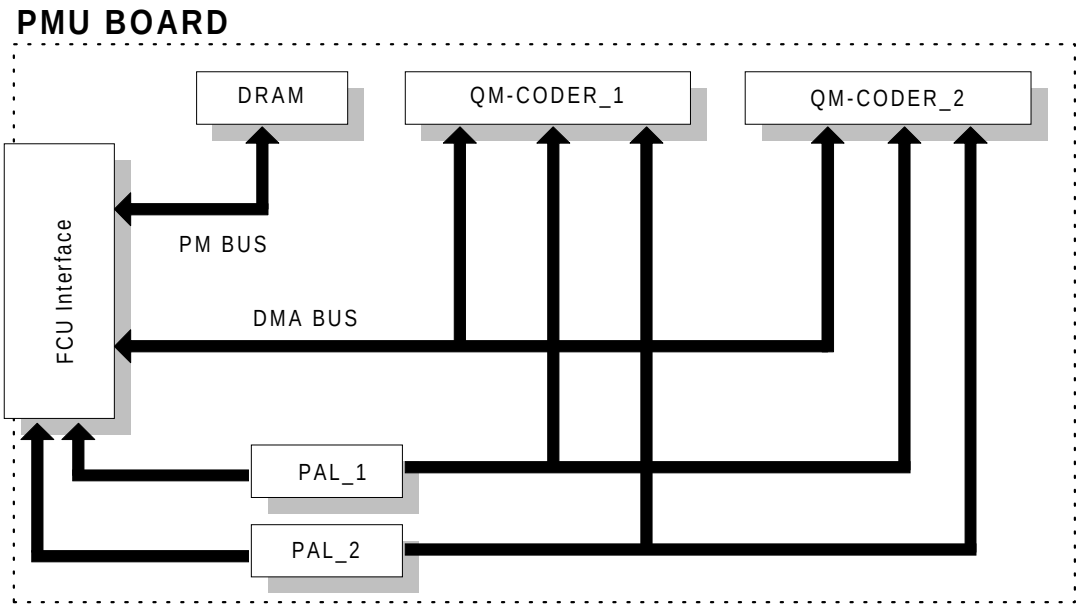
Lithium battery

- Backs up the SRAM.

Jumpers, Switches, and Test Points

Item	Description
SW1	Switches the backup battery on/off

2.5.6 PMU BOARD



The PMU board expands the page memory capacity to 4MB. Also, 400dpi resolution and JBIG compression become available.

DRAM

- 2MB DRAM for page memory expansion.

QM Coder

- 2 QM coders for JBIG compression.

PAL (PALCE16V8H-15PC)

- 2 PALs make a strobe control signal. This is used for DMA selection.

3. INSTALLATION

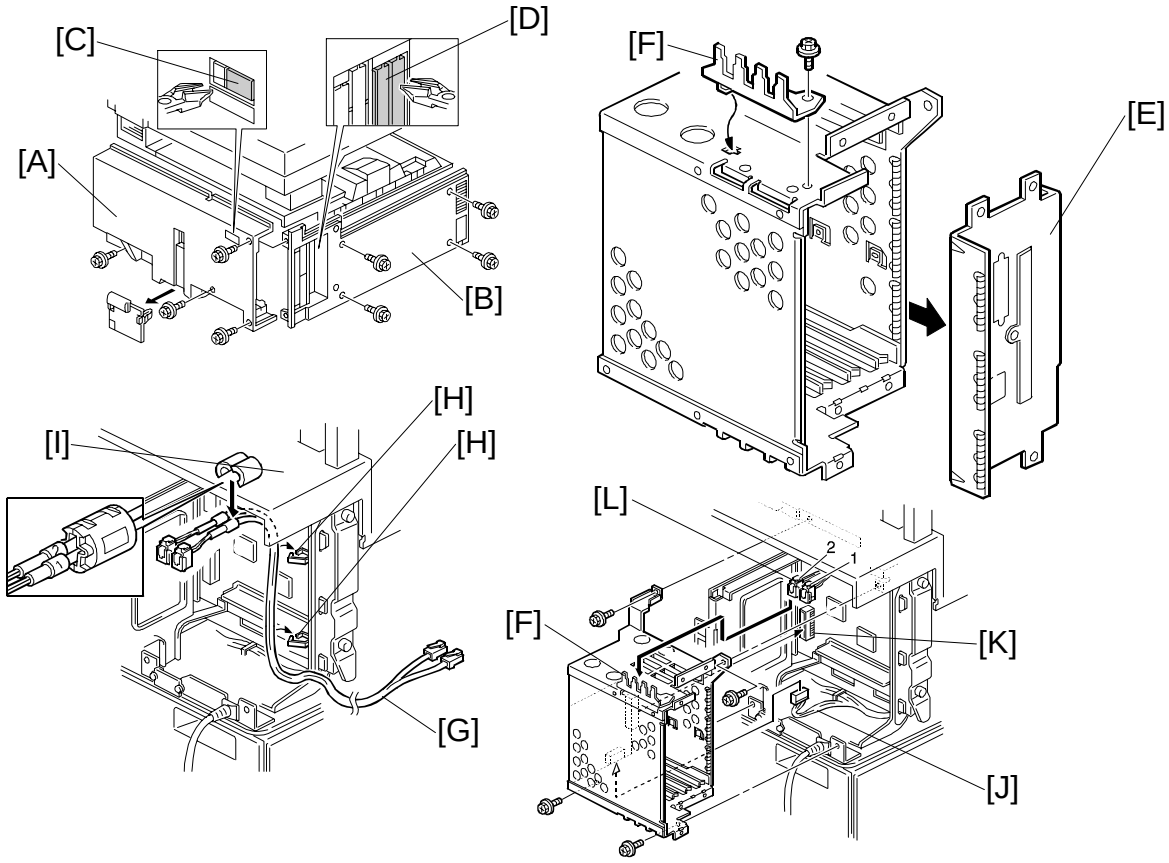
3.1 FAX UNIT

NOTE: 1) Never install telephone wiring during a lightning storm.
2) Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3) Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4) Use caution when installing or modifying telephone lines.
5) Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
6) Do not use the telephone to report a gas leak in the vicinity of the leak.

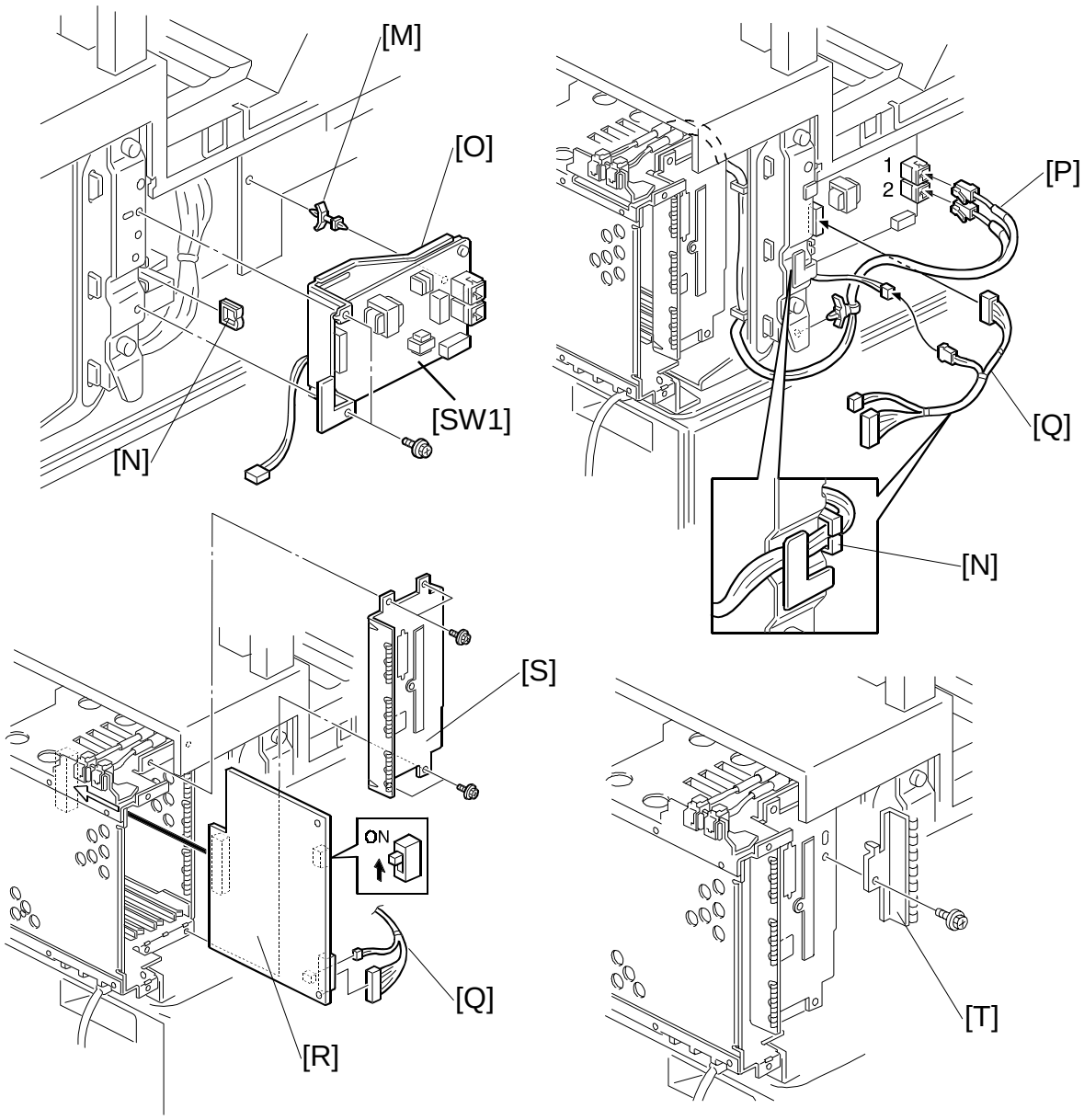
⚠CAUTION

1. **Before installing the fax unit, switch off the main power and operation switches, and disconnect the power cord.**
2. **The fax unit contains a lithium battery. The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.**

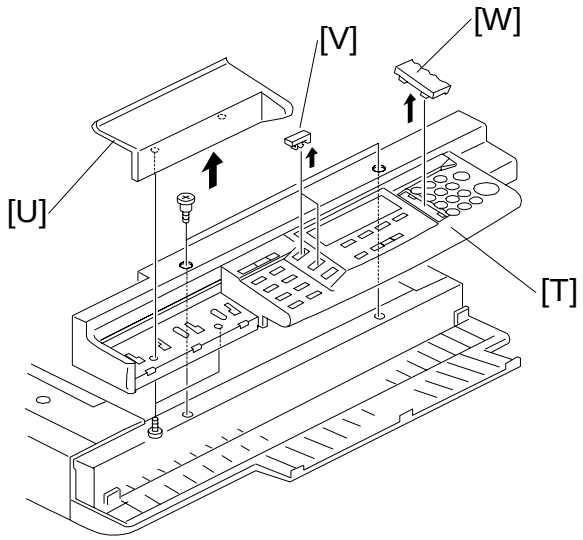
NOTE: To install the fax unit, the Expansion Box Type 450 is required in addition. The following procedure is written on the premise that the Expansion Box has not been installed. If the copier hard disk was installed prior to the installation of the fax option, disconnect and remove the copier hard disk. Reinstall the copier hard disk at the completion of the fax option installation.

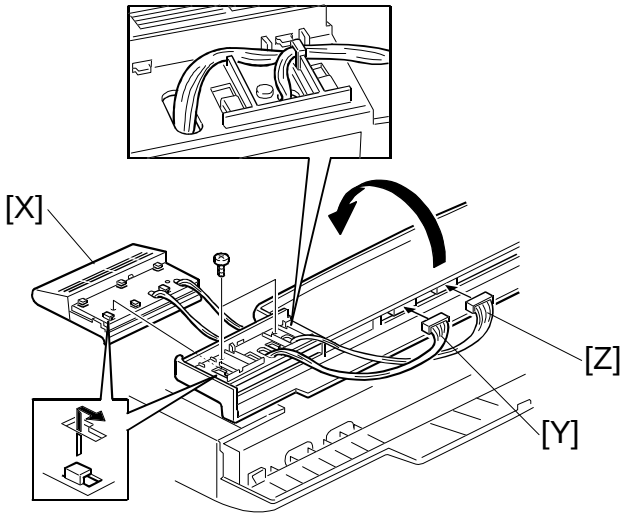


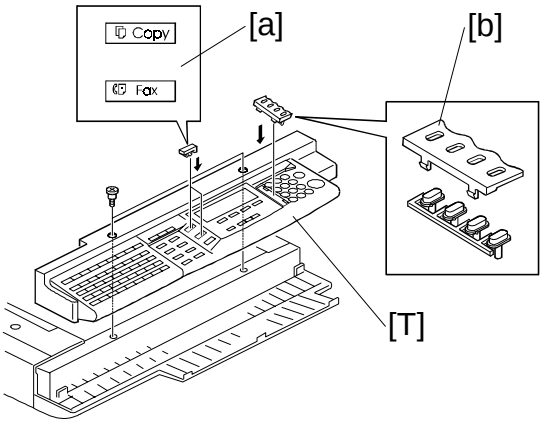
1. Remove the rear cover [A] (4 screws) and the left side cover [B] (4 screws), as shown.
2. Cut away the covers [C] and [D] (shaded parts), as shown.
   NOTE: If installing the fax hard disk option at the same time, refer to the hard disk installation procedure before going on to the next step.
3. Remove the cover [E] from the expansion box, then install the FCU cover bracket [F] (1 screw) as shown.
   NOTE: The bracket [F] is included in the fax unit.
4. Run the cable [G] through the clamps [H], then install a metal core [I] as shown.
5. Connect the harness [J] to CN355 on the expansion box, then install the expansion box (4 screws) so that the CN350 fits in CN304 [K] on the BiCU.
   NOTE: Use a magnetic screwdriver so as not to drop any screws inside the machine.
6. Attach the modular jacks [L] to the bracket [F] as indicated on the bracket.

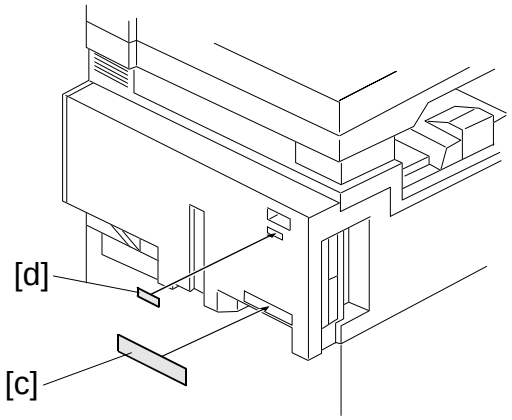


7. Set the locking support [M] and the edge saddle [N] as shown, then install the NCU/Speaker assembly [O] (2 screws).
8. Connect the cable [P] and the harness [Q] as shown. The harness [Q] must run through the edge saddle [N] as shown.
9. Turn on the battery switch (SW1) on the FCU [R] then insert the board into the tracks for the right-most slot of the expansion box as shown. Connect the harness [Q] to the FCU (CN328 and CN330), then slide the FCU [R] all the way in (1 connector).
10. Install the bracket [S] (4 screws) and [T] (1 screw) as shown.

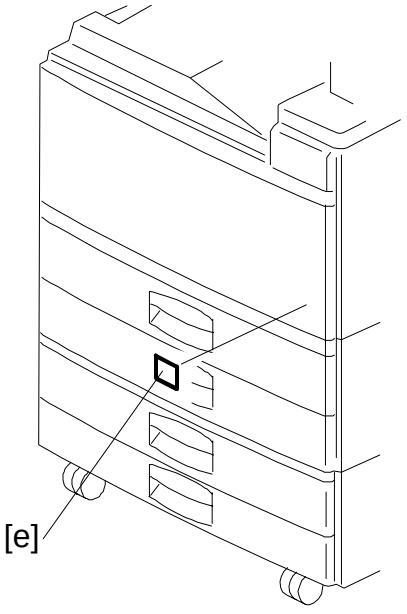


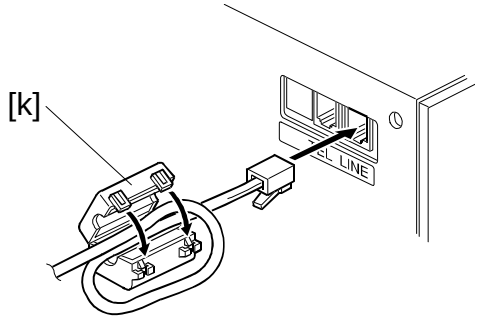






11. Remove the operation panel [T], then carefully remove parts [U], [V], and [W].
12. Install part [X], then connect the harnesses [Y] and [Z] to the operation panel as shown.
13. Re-install the operation panel [T], then install the parts [a] and [b], as shown.
14. Re-install the left side cover (4 screws) and the rear cover (4 screws).
15. Attach the serial number label [c] and the LINE/TEL label [d] to the rear cover.
16. Attach the “Super G3” label [e] to the front cover.





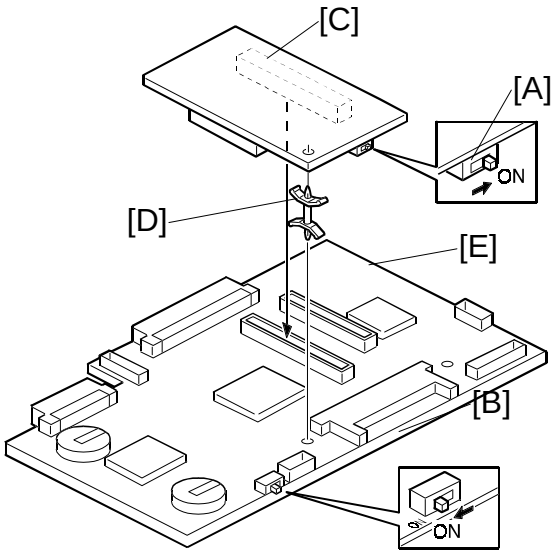
17. Wrap the phone line around the core [K] as shown and connect the telephone line to the “LINE” jack at the rear of the machine.
18. Plug in the machine and turn on the main power switch.
19. Press the ‘Facsimile’ key and check the facsimile LED lights.
    At this time, the display reads: SC1201 - Functional problem with the fax. Data should be initialized.
    NOTE: This is not a functional problem. The machine shows this message only when the fax unit is first installed. If the same message appears at the next power-on, check whether the battery switch (SW1) on the FCU has been turned on.
20. Press “Yes” to initialize the fax unit.
21. Set up and program the items required for fax communications as shown below. If the user function keys (F1, F2, F3, F4, and F5) need to be programmed, attach the label.

    The default settings of the user function keys are as follows:
    - F1: Start Manual Rx
    - F2: Tx Result Display
    - F3: TEL Mode
    - F4: Not programmed
    - F5: Not programmed

    NOTE: Be sure to set the clock (date and time).
22. Program the serial number into the fax unit (service function 10). The serial number can be found on the serial number label (attached to the machine in step 15).

3.2 EXSAF BOARD

1. Remove the rear cover (4 screws), and the left side cover (4 screws).
2. Remove the FCU board (2 or 3 connectors).
3. Turn on the battery switch [A] on the EXSAF board, as shown.

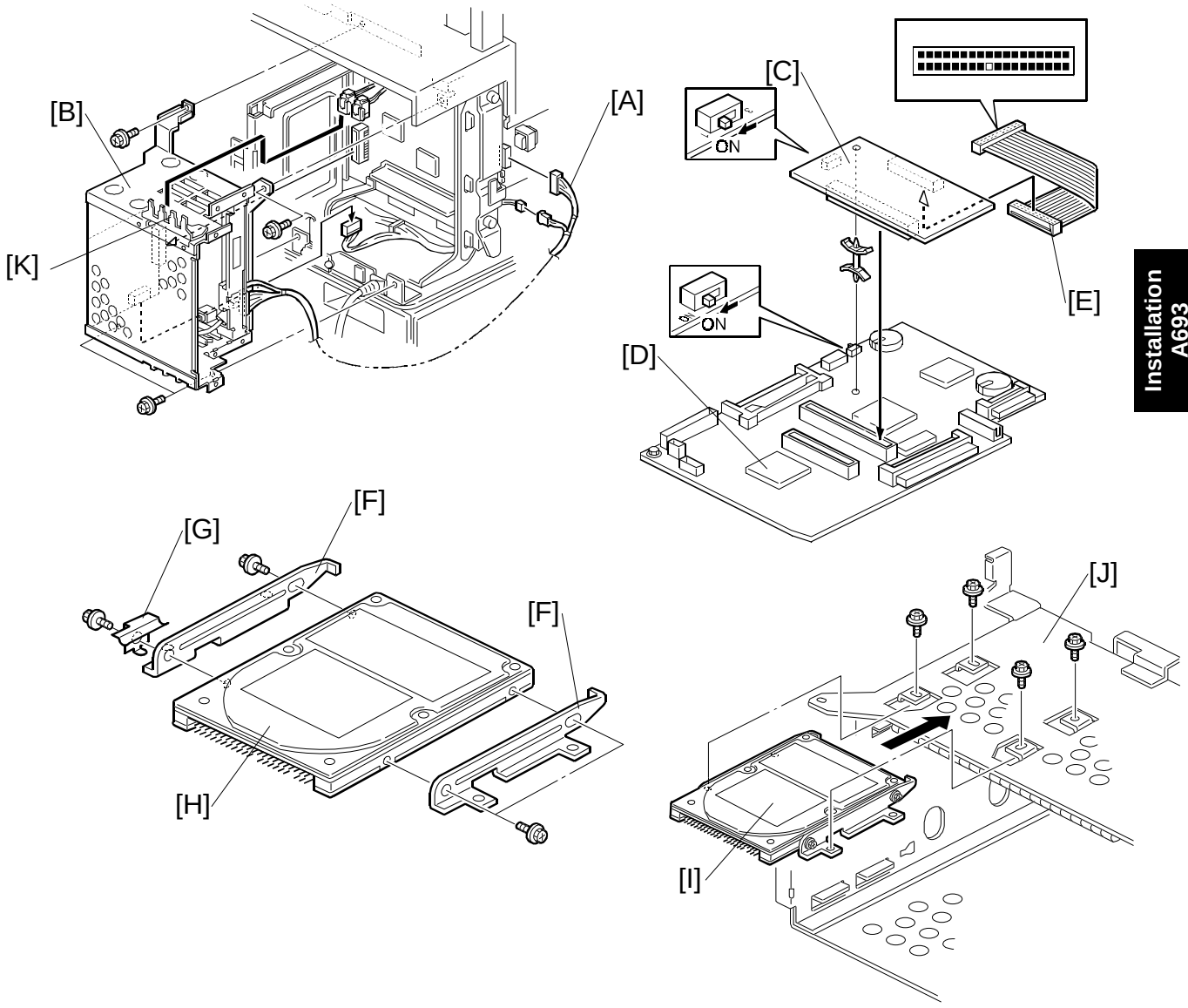


NOTE: If installing the FCU board at the same time, be sure to turn on the FCU board battery switch [B].

4. Install the EXSAF board [C] and spacer [D] onto the FCU board [E], as shown.
5. Insert the FCU/EXSAF assembly into the expansion box (2 or 3 connectors).
6. Re-install the left-side cover (4 screws) and the rear cover. (4 screws).
7. Plug in the machine and turn on the main power switch.
8. Press the 'Facsimile' key and check that the facsimile LED lights. At this time, the following message appears:
   "SC1207 - Adding FAX feature expander causes data loss. Turn the main power switch off remove it to avoid loss. To continue press Yes."
9. Press "Yes" to initialize the SRAM.
   NOTE: Whenever installing the EXSAF board at the first time, the machine displays SC1207, but this is not a problem.
10. Enter the service mode, and set bit 7 of system switch 1E to "1".
11. Print the system parameter list and make sure that "EXSAF" is listed as an option. Also check that the memory indicator shows "100%" in standby mode. Refer to section 4.1.1 and 4.1.3.
12. Connect the telephone cable to the NCU.

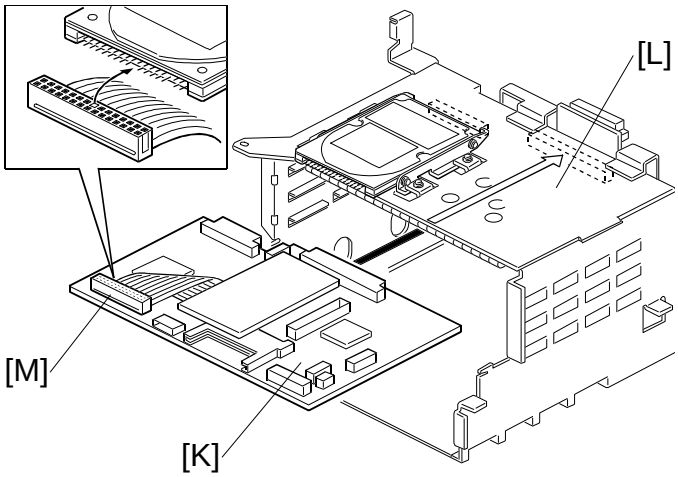
3.3 HARD DISK

NOTE: To install this option, a fax unit, an expansion box, and an EXSAF are also required.

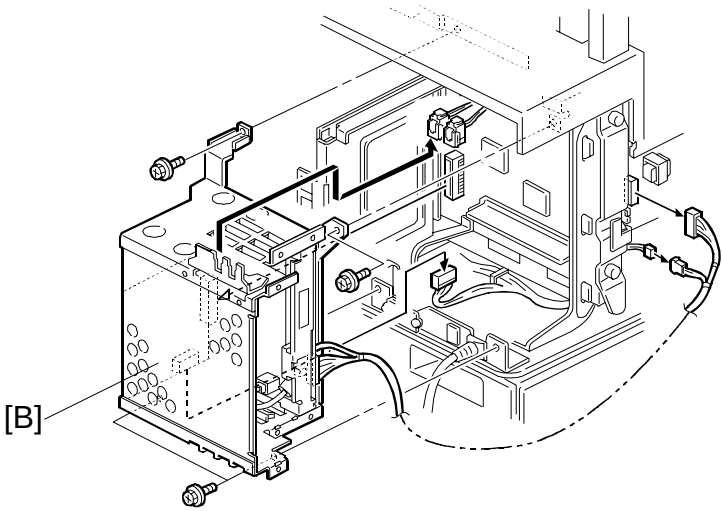


1. Remove the rear cover (4 screws) and the left-side cover (4 screws).
2. Disconnect the harness [A], remove the expansion box [B] (1 harness), remove the FCU cover bracket [K]. Then remove the FCU from the box.
3. Make sure that the EXSAF board [C] has been installed on the FCU [D] and the battery switches on both FCU and EXSAF are turned on. Then, connect the harness [E] to the EXSAF board [C].
4. Attach the brackets [F] and the grounding plate [G] to the hard disk drive [H] as shown. (4 screws)
5. Install the hard disk assembly [I] in the expansion box [J] (4 screws) .

6. Install the FCU board [K] in the expansion box [L], and connect the harness [M] to the hard disk drive.
   Then replace the FCU cover bracket.



7. Re-install the expansion box [B] (3 harnesses), as shown.

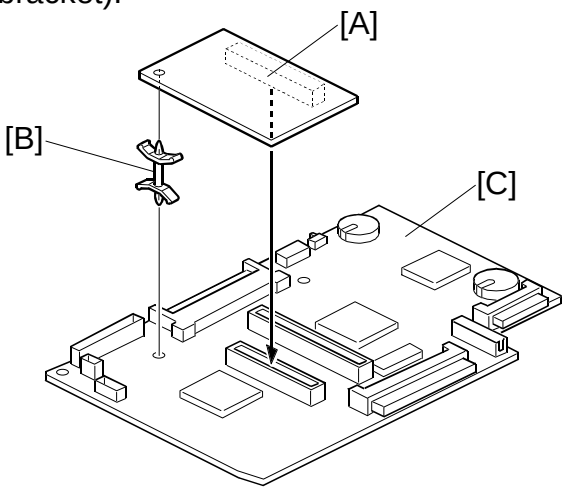


8. Re-install the left-side cover (4 screws) and the rear cover (4 screws).
9. Connect the telephone line to the NCU.
10. Plug in the machine and turn on the main power switch.
11. Enter the service mode, and set bit 4 of system switch 05 to “1”. Refer to section 4.2.1.
12. Exit the service mode, turn off the machine, then turn the machine back on.
13. Enter the service mode, and initialize the memory files (function 07: RAM Clear – 2. Files). Refer to section 4.1.13.
14. Print the system parameter list and make sure that “HD” is listed as an option. Also check that the memory indicator shows “100%” in standby mode. Refer to section 4.1.3.

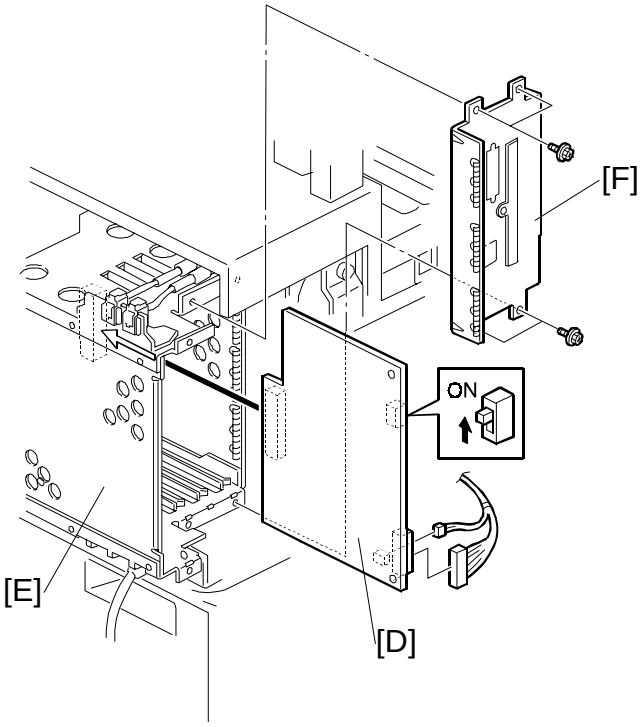
3.4 PMU BOARD

NOTE: To use this option, the fax unit and expansion box are also required.

1. Remove the rear cover (4 screws) and the left-side cover (4 screws).
2. Remove the FCU board (4 screws, 1 bracket).
3. Connect the PMU board [A] and the double locking spacer [B] to the FCU board [C], as shown.

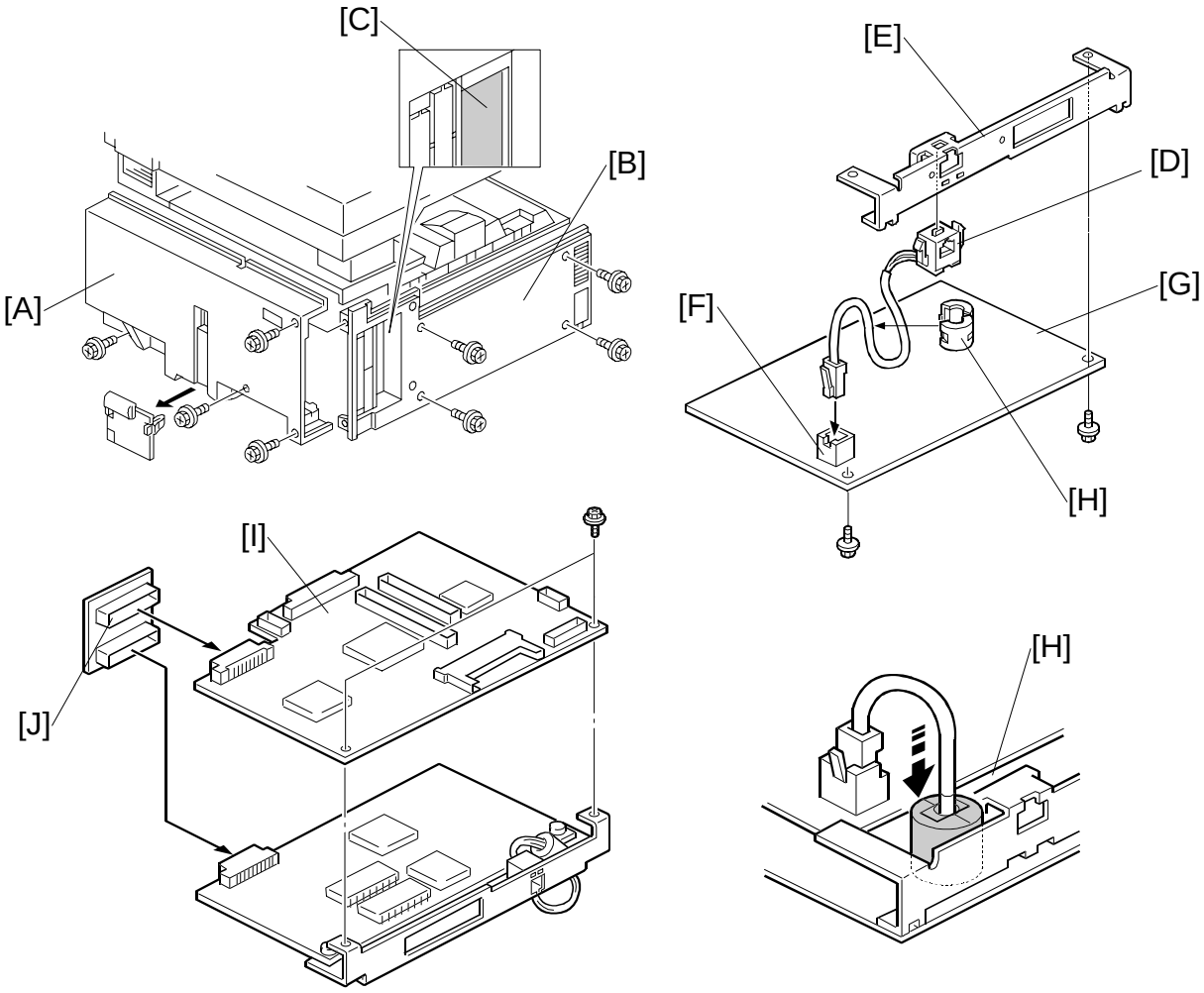


4. Make sure that the battery switch (SW1) is turned on. Then, insert the FCU/PMU assembly [D] into the expansion box [E], and install the metal cover [F] (4 screws).

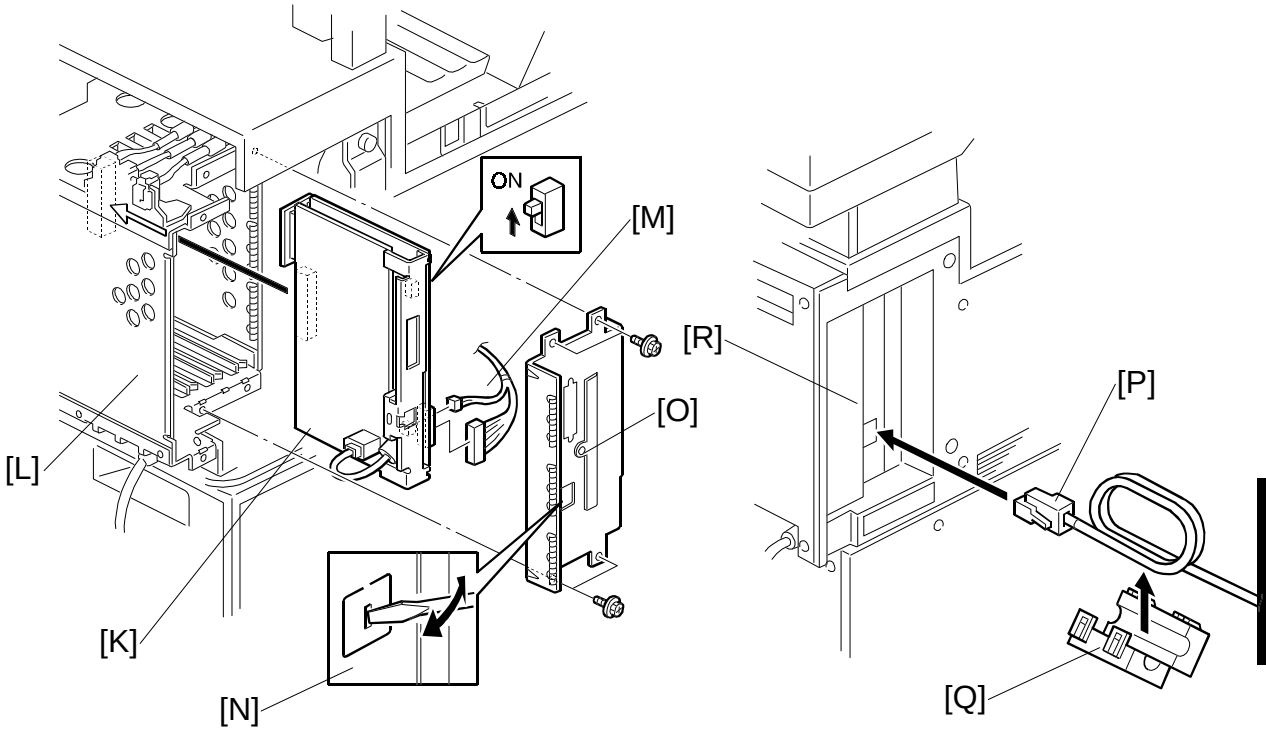


5. Re-install the rear cover (4 screws), and the left side cover (4 screws).
6. Connect the telephone cable, then plug in the machine and turn on the main power switch.
7. Print the system parameter list and make sure that “PMU” is listed as an option. Refer to section 4.1.1 and 4.1.3.

3.5 ISDN UNIT

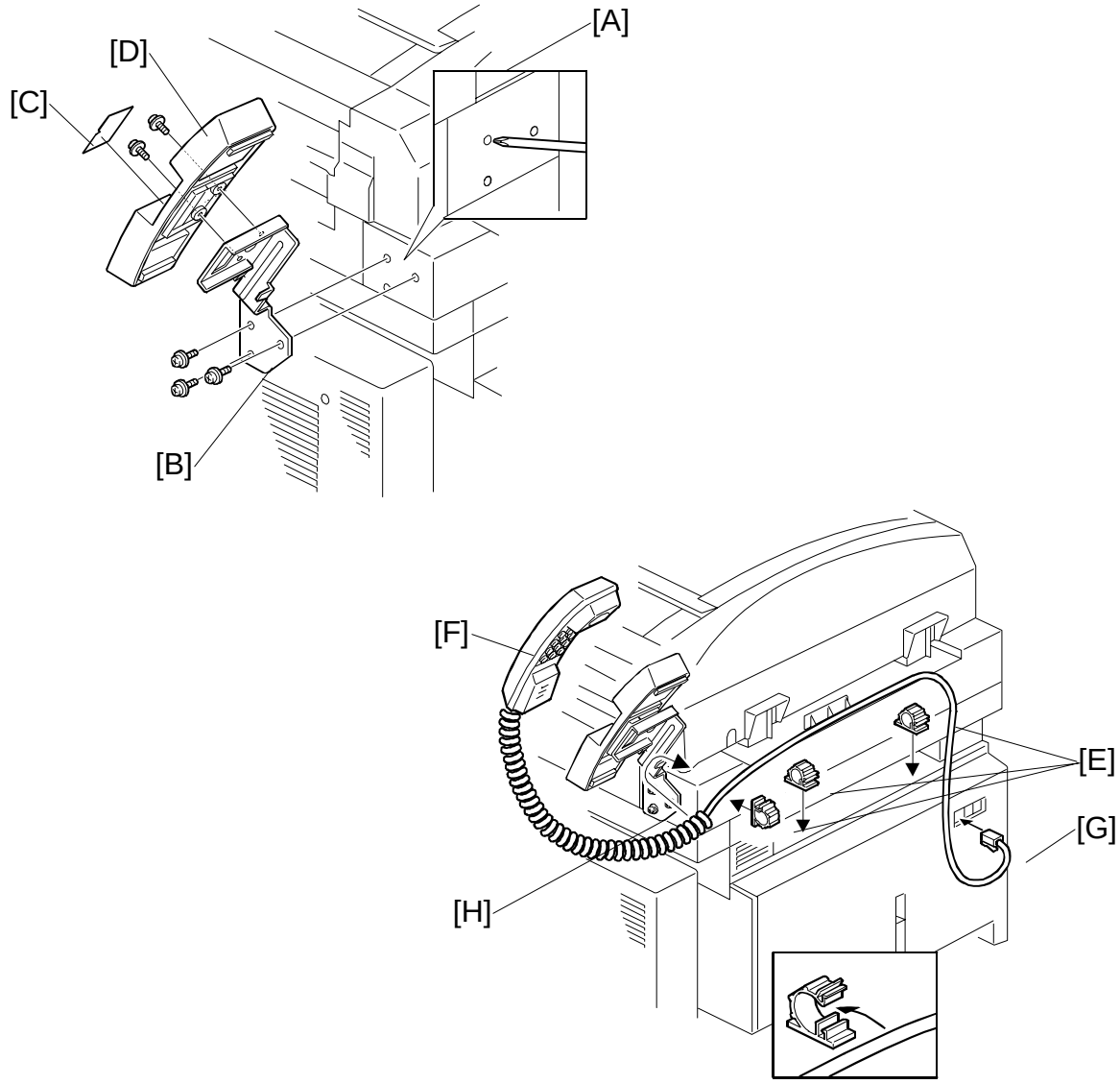


1. Remove the rear cover [A] (4 screws) and the left-side cover [B] (4 screws).
2. Remove the FCU from the expansion box.
3. Make sure that the option cover [C] (shaded part) has been cut off.
4. Clip the ISDN modular jack [D] onto the bracket [E], then connect the cable to the connector [F] on the CiG4 board [G].
5. Attach the bracket [E] to the CiG4 board [G] (2 screws), then attach the metal core [H] to the cable as shown. Be sure to slide the metal core [H] in between the bracket and the CiG4 board as shown.
6. Attach the FCU [I] to the bracket (2 screws), then connect the FCU and CiG4 using the relay board [J].



7. Insert the FCU/CiG4 assembly [K] into the expansion box [L], connect the harness [M], and then slide the assembly all the way into the box.
8. Open the ISDN modular jack window [N] in the bracket [O], then install the bracket [O] on the application rack.
9. Re-install the left-side cover (4 screws) and the rear cover. (4 screws).
10. Attach the enclosed ‘G4’ label to the function key (F4) space.
    After G4 unit installation, this key is dedicated to switching between G3 and G4 communication modes. (Note the user function key assignment, below.)
    Function keys with G4 unit
    - F1: Start Manual Rx
    - F2: Tx result display
    - F3: TEL mode
    - F4: G3/G4 communication mode selection
    - F5: Not programmed
11. Make two turns on the ISDN cable [P] and attach the metal core [Q] so that the cable goes through the core three times. Then, connect the cable to the ISDN jack [R]. If an analog telephone line has been removed before installation, re-connect it to the NCU.
12. Plug in the machine and turn on the main power switch.
13. Print the system parameter list and ensure that “G4” is listed as an option. Refer to section 4.1.1. and 4.1.3.
14. Set up and program the items required for ISDN communications.
    After setting up the ISDN parameters, be sure to turn the main power switch off and on.

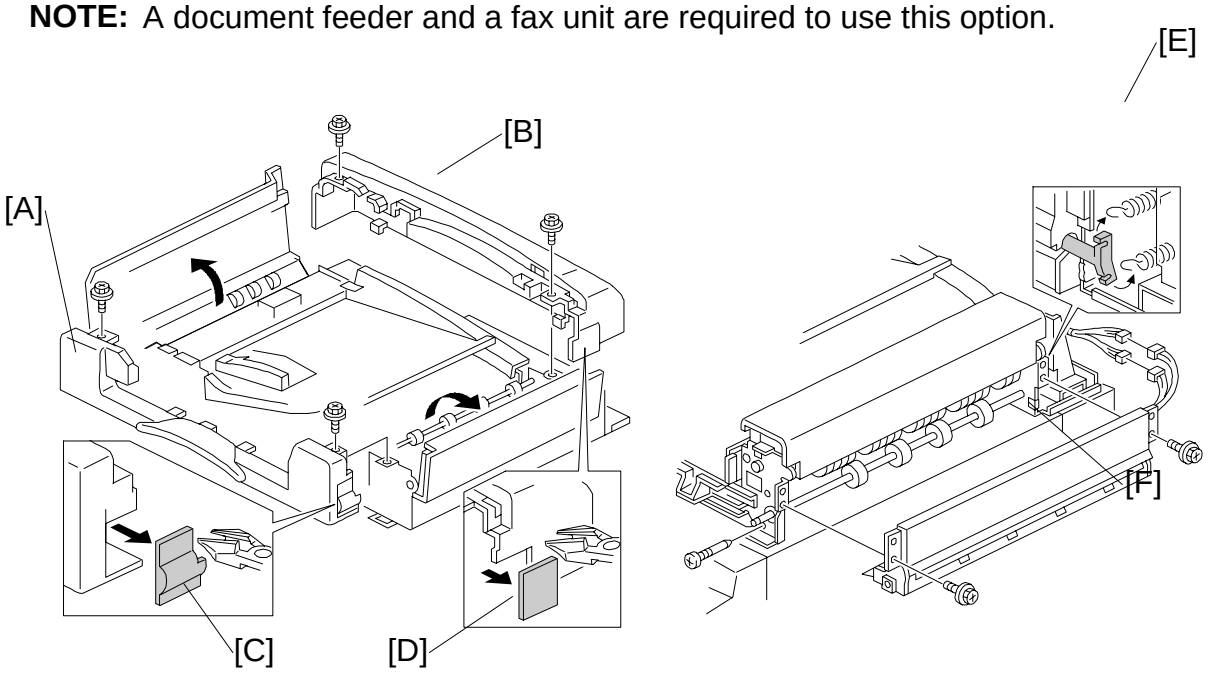
3.6 HANDSET



1. Clear the screw holes on the right side of scanner rear cover as shown in [A].
2. Install the bracket [B] (3 screws).
3. Remove the label [C] from the handset cradle [D]. Install the cradle on the bracket [A] (2 screws), then reinstall the label [C].
4. Affix the wire clamps [E], as shown.
5. Install the handset [F] as shown. Run the handset cable through the clamps [E], then connect it to the “TEL” jack [G] at the rear of the machine.
6. Hook the curled cord onto the bracket as shown [H].

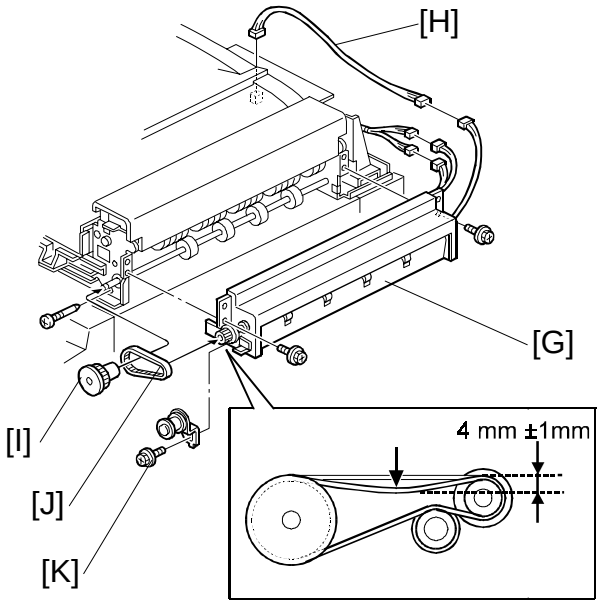
3.7 STAMP UNIT

NOTE: A document feeder and a fax unit are required to use this option.

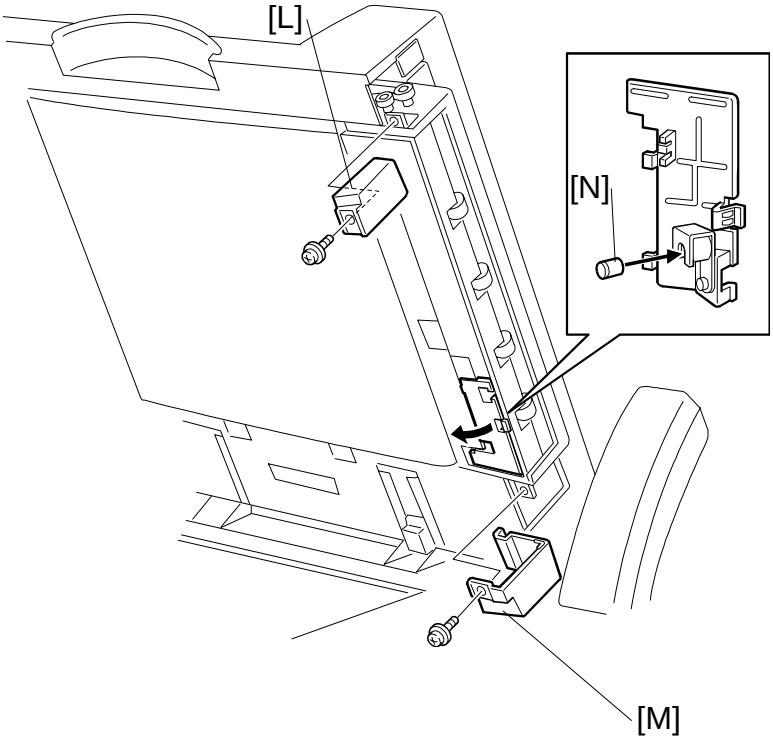


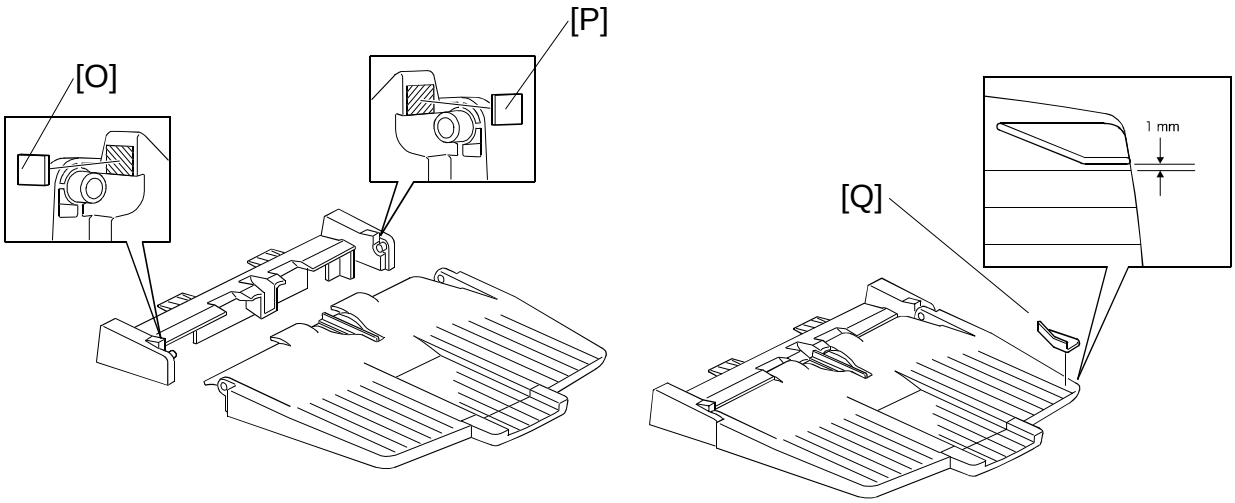
1. Remove the ADF front [A] (2 screws) and rear [B] (2 screws) covers.
2. Cut away the covers [C] and [D], as shown.
3. Remove two springs [E] and the cover [F] (3 screws, 2 harnesses).

4. Install the stamp unit [G] (3 screws, 3 harnesses) as shown.
   Then connect the harness [H] to CN270 on the DF control board.
5. Install the pulley [I], then loop the timing belt [J] as shown.
   NOTE: Before installing the pulley, first loosen the idler gear screw [K]
6. Adjust the tension of the timing belt, as shown in the callout. Then tighten the idler gear screw [K].
7. Turn on DIP switch 4 on the DF control board.
8. Re-install the ADF front (2 screws) and rear (2 screws) covers.



9. Lift up the document feeder and install the covers [L] (1 screw) and [M] (1 screw).
10. Install the stamper [N] in the stamp unit.





11. Attach the spacers [O] and [P] to the ADF external tray holder, as shown.
12. Attach the guide [Q] to the tray, as shown
    NOTE: The ADF external tray is included in the ADF, not in this option.
13. Change the “ADF original ejection” setting to the “ADF External Tray” using system settings in the “User Tools” menu. Stamping is not possible if “ADF Tray” is selected.

    After the stamp unit has been installed, the F5 key is dedicated to switching the stamper on and off. (Note the user function key assignment, below.)
    Function keys with Stamp unit
    - F1: Start Manual Rx
    - F2: Tx result display
    - F3: TEL mode
    - F4: Not programmed
    - F5: Stamper on/off

4. SERVICE TABLES

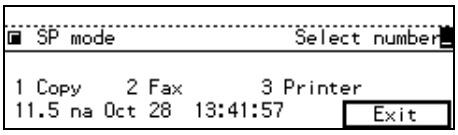
4.1 SERVICE LEVEL FUNCTIONS

4.1.1 HOW TO ENTER AND EXIT THE FAX SERVICE MODE

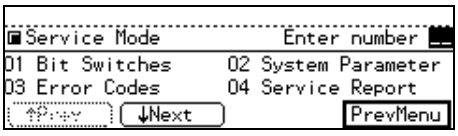
To Enter Fax Service Mode:

1. Ensure that the machine is in standby mode.

2. Press C/⊘ ① ⓪ ⑦, then hold down ⓒ/⊘ for more than 3 seconds.
   The SP mode main menu appears.



3. Press 2 to enter the fax service mode.

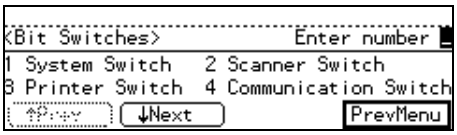


To Exit Fax Service Mode:

1. Press 'OK' or 'PrevMenu' until the SP mode main menu appears.
2. Press the C/⊘ key.

4.1.2 BIT SWITCH PROGRAMMING (FUNCTION 01)

1. Enter the fax service mode.
2. Press 0 1
3. Press one of the following numbers, as required:
   - 1 – System bit switches
   - 2 – Scanner bit switches
   - 3 – Printer bit switches
   - 4 – Communication bit switches
   - 5 – G3 bit switches
   - 6 – G4 internal switches
   - 7 – G4 parameter switches



NOTE: An optional G4 interface is required to access the G4 internal and G4 parameter bit switches.

Example:

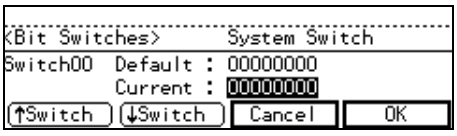
1. Press [1]
2. Scroll through the bit switches.

   To increment the bit switch number: press '↓ Switch'.

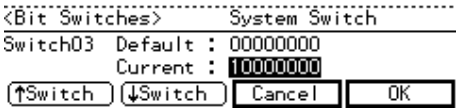
   To decrement the bit switch number: press '↑ Switch'.

   Example:

   To display bit switch 03: Press '↓ Switch' 3 times.



3. Adjust the bit switch.
   Example:
   To change the value of bit 7, press 7.



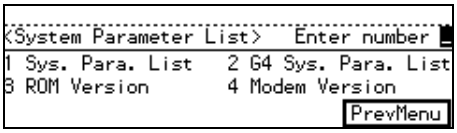
4. To adjust more bit switches, go to step 2.
   To finish, press 'OK' then 'PrevMenu'.
5. Exit the service mode.

NOTE: After changing any of the G4 bit switches, be sure to turn the main power switch off and back on to activate the new settings.

4.1.3 SYSTEM PARAMETER LISTS (FUNCTION 02)

1. Enter the fax service mode.
2. Press [0] [2]
3. Press one of the following numbers, as required:
   [1] – G3 system parameter list
   [2] – G4 system parameter list

   NOTE: An optional G4 interface is required to print the G4 system parameter list.



4. Press [◈]
5. Exit the service mode.

- An example of a G3 system parameter list

```
      *  *  *  SYSTEM PARAMETER LIST (Date and Time) *  *  *
                                                        TTI

Serial Number     - Copier's Serial number programmed by SP-Mode 5-811
Fax Serial Number - Fax serial number programmed by function 10
FAX ROM NO.      [Software Title] [Software part no.]
FAX ROM VER.     [Version no.]  [Software release date]  [Checksum]
MODEM ROM Ver.   [Software version no.]
Bicu ROM Ver.    [Software part no.]
2-Side ROM Ver. [Duplex unit ROM version]
HDC ROM Ver.     [HDD controller (for copier) ROM version]
BANK ROM Ver.    [Paper feed unit ROM version]
LCT ROM Ver.     [LCT ROM version]
ADF ROM Ver.     [ADF ROM version]
FINISHER ROM Ver.[Finisher ROM version]
MAILBOX ROM Ver.[Mailbox ROM version]
CSS ROM Ver.     [CSS ROM version]
R  T  I
T  T  I
C  S  I
Polling ID
Conf.ID
Number
   Own Number
   Own Number(ISDN G4)
   Own Number(ISDN G3)
   Service Number
NCU Parameters

Counter

Option
```

```
PMU - Page Memory and JBIG
EXSAF - Optional SAF and SRAM
G4 - ISDN unit
HD - HDD for fax
MSU(4M/12M/12M+H.D) - Copier memory and HDD
BANK - Paper feed unit
Int. Tray2 - 1-bin tray
DUPLEX - Duplex unit
LCT - Large capacity tray
Finisher1000 - 1000 sheet capacuty finisher
Finisher3000 - 3000 sheet capacity finisher
Relay Unit - Relay unit
Bypass - Bypass tray
Mailbox - Mailbox for printer
```

```
Service Switch (upper:Default lower:Current)

(SWUSR) - User Parameter Settings

(SWSYS) - System Bit Switch Settings

(SWSCN) - Scanner Bit Switch Settings

(SWPLT) - Printer Bit Switch Settings
```

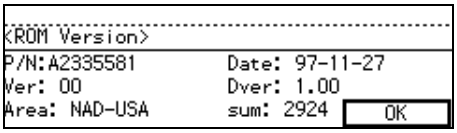
```
Service Switch (upper:Default lower:Current)

(SWCOM) - Communication Bit Switch Settings

(SWG3)  - G3 Bit Switch Settings
```

- An example of a G4 system parameter list

```
     *  *  *  G4 System Parameter List (Date and Time) *  *  *
                                                          TTI

G4 ROM Data
   FAX ROM VER.    [Version]  [Software release no.]  [Software release date]
   G4 ROM VER.                [Software release no.]  [Software release date]

G4 Terminal Data
   G4 Terminal ID          -=
   ISDN_IP
   G4 SN1 (main)
   G4 SN2 (sub)
   G4 Subaddress

G3 Terminal Data
   G3 RTI
   G3 ISDN CSI
   G3 SN1 (main)
   G3 SN2 (sub)
   G3 Subaddress


G4 Internal Switch (upper:Default lower:Current)

G4 Parameter Switch (upper:Default lower:Current)
```

4.1.4 FCU ROM VERSION DISPLAY (FUNCTION 02)

1. Enter the fax service mode.
2. Press [0] [2] then [3]

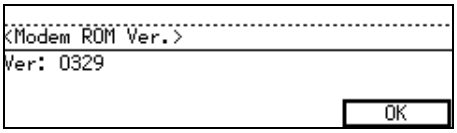


3. Exit the service mode.

Note: The check-sum value displayed is calculated in a 16-bit hexidecimal format.

4.1.5 MODEM ROM VERSION DISPLAY (FUNCTION 02)

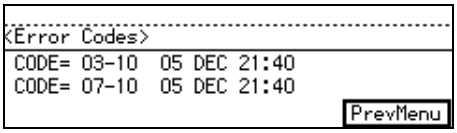
1. Enter the fax service mode.
2. Press [0] [2] then [4]



3. Exit the service mode.

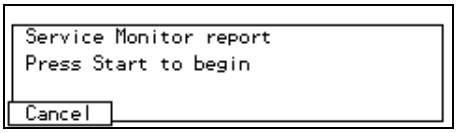
4.1.6 ERROR CODE DISPLAY (FUNCTION 03)

1. Enter the fax service mode.
2. Press [0] [3]
3. Press either Prev. or Next to scroll through the error codes.
4. Exit the service mode.



4.1.7 SERVICE MONITOR REPORT (FUNCTION 04)

1. Enter the fax service mode.
2. Press [0] [4] then [◇]



3. Exit the service mode.

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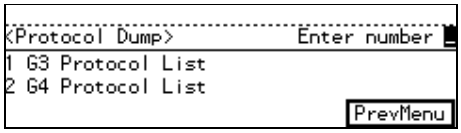
4.1.8 G3 PROTOCOL DUMP LIST (FUNCTION 05)

1. Enter the fax service mode.
2. Press [0] [5]



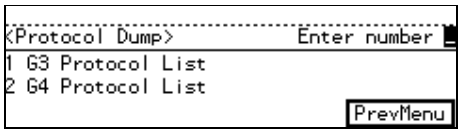
3. Press [1] then [◇]
4. Exit the service mode.

NOTE: Refer to the Troubleshooting section for details of the codes listed on the V.34 protocol dump list.

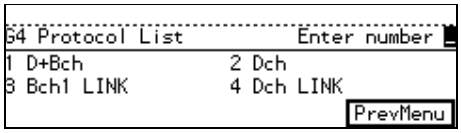
4.1.9 G4 PROTOCOL DUMP LIST (FUNCTION 05)

NOTE: An optional G4 interface is required to print the G4 protocol dump list.

1. Enter the fax service mode.
2. Press [0] [5]



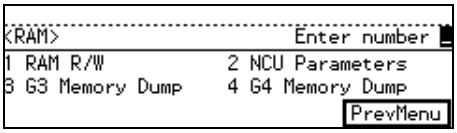
3. Press [2]
4. Press one of the following numbers as required:
   [1] – D + Bch
   [2] – Dch
   [3] – Bch1 Link
   [4] – Dch Link



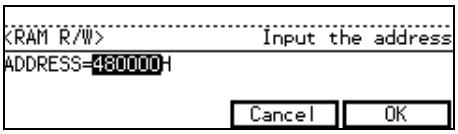
5. Exit the service mode.

4.1.10 RAM DISPLAY AND REWRITE (FUNCTION 06)

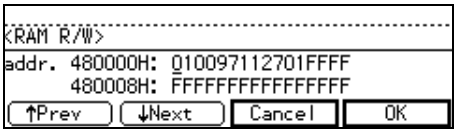
1. Enter the fax service mode.
2. Press [0] [6]
3. Press [1]



4. Enter the start address of the RAM area to be displayed, then press OK.

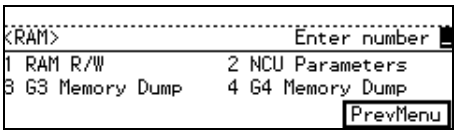


5. Move the cursor to the target address using the arrow keys, then enter a new value.
6. To scroll through the RAM addresses: press Prev. or Next.
   To jump to an another address: press OK, and go back to step 4.
7. Exit the service mode.

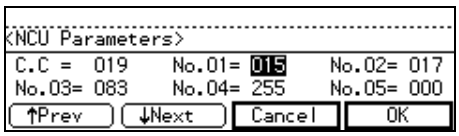


4.1.11 NCU PARAMETERS (FUNCTION 06)

1. Enter the fax service mode.
2. Press [0] [6]
3. Press [2]

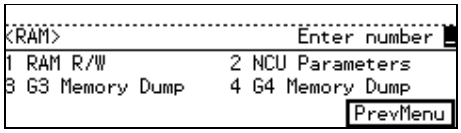


4. Move the cursor to the target parameter using the arrow keys, then enter a new value.
5. Exit the service mode.

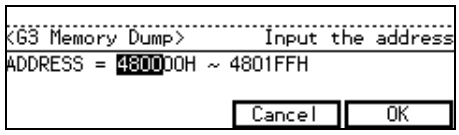


4.1.12 RAM DUMP (FUNCTION 06)

1. Enter the fax service mode.
2. Press [0] [6]



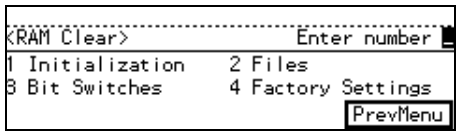
3. Press one of the following numbers as required:
   [3] – G3 memory dump list
   [4] – G4 memory dump list
   NOTE: An optional G4 interface is required to print the G4 memory dump list.
4. Enter the first four digits of the start and end addresses, then press [◇]
   Example: Start at 480000, end at 4801FF
   [4] [8] [0] [0] [4] [8] [0] [1] [◇]



5. Exit the service mode.

4.1.13 RAM CLEAR (FUNCTION 07)

1. Enter the fax service mode.
2. Press [0] [7]



3. Press one of the following numbers, as required:
   [1] – Initializes the data in the SRAM, files in the SAF memory, and the clock.
   [2] – Erases all the files stored in the SAF memory.
   [3] – Resets the bit switches and the user parameters.
   [4] – Initializes the data in the SRAM and files in the SAF memory. The machine automatically returns to standby mode after self-initialization.

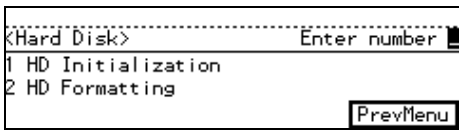
To initialize the fax unit without erasing files or resetting the bit switches, perform one of the following procedures:

- Hold down the “Speed Dial” key for more than 10 seconds, while the machine is in facsimile mode. This will initialize the fax unit only.
- Remove the rear cover, and press SW2 on the FCU. This will initialize the fax unit only.
- Turn off the main power and operation switches and turn them back on. This initializes the whole machine.
- Hold down the # and * keys for more than 10 seconds. This will initialize the whole machine.

4.1.14 HARD DISK (FUNCTION 08)

NOTE: To access this function, the hard disk option must be installed, and System Switch 05, bit 4 must be set to 1.

1. Enter the fax service mode.
2. Press [0] [8]
3. Press one of the following numbers, as required, then press [◇]
   [1] – Erases everything stored on the hard disk
   [2] – Low level hard disk formatting (requires over 50 min.)

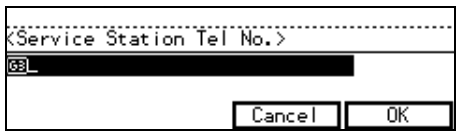


NOTE: If there is an error during the test, the machine displays 'NG'.

4. Make sure that OK is displayed after the process, then exit the service mode.

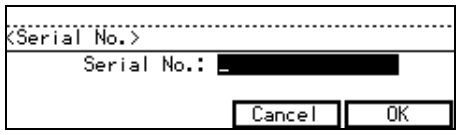
4.1.15 SERVICE STATION FAX NUMBER (FUNCTION 09)

1. Enter the fax service mode.
2. Press [0] [9]
3. Enter the fax number of the service station that will receive Automatic Service Calls from this machine. To use a G4 number, press the 'F4' key.
4. Press OK.
5. Exit the service mode.



4.1.16 SERIAL NUMBER (FUNCTION 10)

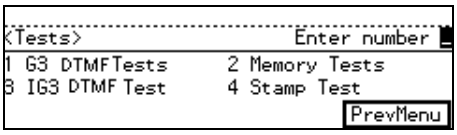
1. Enter the fax service mode.
2. Press [1] [0]
3. Enter the fax unit's serial number at the keypad, then press OK.
4. Exit the service mode.



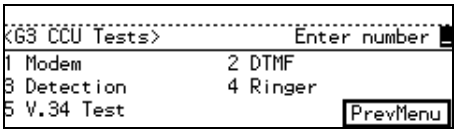
4.1.17 MODEM TEST (FUNCTION 11)

NOTE: Refer to section 4.1.18 for V.8 and V.34 tests.

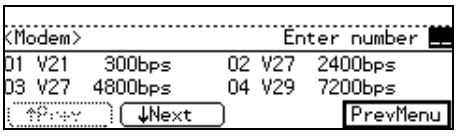
1. Enter the fax service mode.
2. Press [1] [1]



3. Press one of the following numbers:
   [1] – Modem test (analog line)
   [3] – Modem test (ISDN line)
   NOTE: An optional ISDN interface is required to test a modem on an ISDN line.



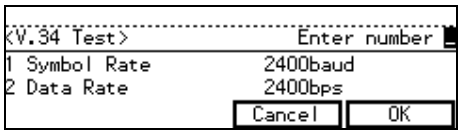
4. Press [1]
5. Choose a modem signal type at the keypad, then press [◇]
   To stop, press [C/⊘].



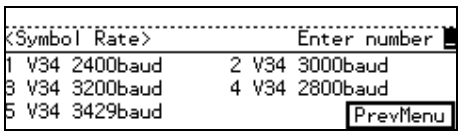
6. Exit the service mode.

4.1.18 V.34 MODEM TEST (FUNCTION 11)

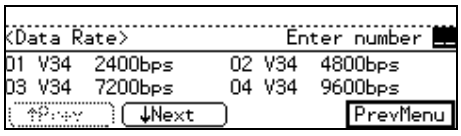
1. Enter the service mode.
2. Press [1] [1] then [1]
3. Press [5].



4. Press a symbol rate and a data rate, then press OK.
   [1] – Select a symbol rate
   [2] – Select a data rate



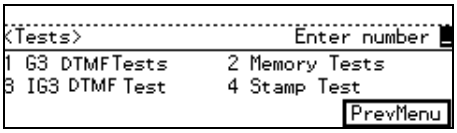
5. Press “Start” to start the test.
   To stop the test, press “Stop”.



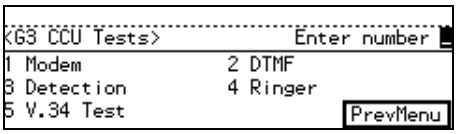
6. Exit the service mode.

4.1.19 DTMF TEST (FUNCTION 11)

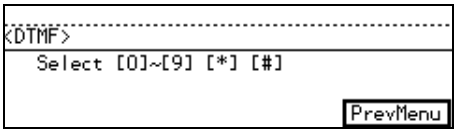
1. Enter the fax service mode.
2. Press [1] [1]



3. Press one of the following numbers:
   [1] – DTMF test (analog line)
   [3] – DTMF test (ISDN line)
   NOTE: A G4 interface is required to test DTMF tones on an ISDN line.



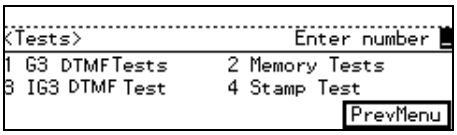
4. Press [2]
5. Choose a DTMF signal type at the keypad, then press [◇]
   To stop the test, press [C/⏻]



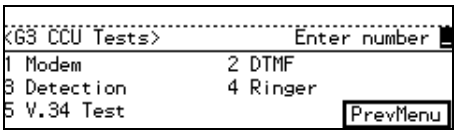
4.1.20 MODEM SIGNAL DETECTION TEST (FUNCTION 11)

NOTE: V.8 and V.34 signal detection tests are not available.

1. Enter the fax service mode.
2. Press [1] [1]



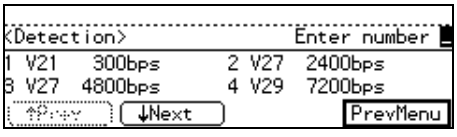
3. Press one of the following numbers, as required:
   [1] – G3 CCU Tests



4. [3] – 1 G3 CCU Tests

   NOTE: An optional G4 interface is required to test a modem signal on an ISDN line.

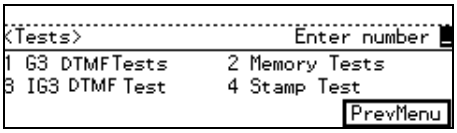
5. Press [3]
6. Choose the modem signal type to be detected at the keypad, then press [◇]
   To stop the test, press [C/⏻]



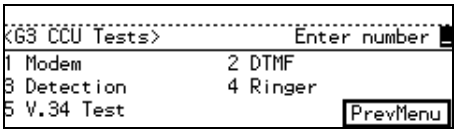
7. Exit the service mode.

4.1.21 RINGER TEST (FUNCTION 11)

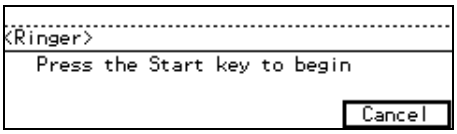
1. Enter the fax service mode.
2. Press 1 1



3. Press 1



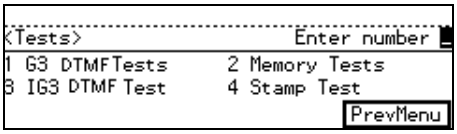
4. Press 4 then ◇
   To stop the test, press C/⊘
5. Exit the service mode.



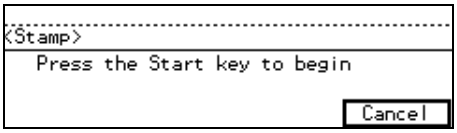
4.1.22 STAMP TEST (FUNCTION 11)

NOTE: An optional stamp unit is required to use this function.

1. Enter the fax service mode.
2. Press 1 1



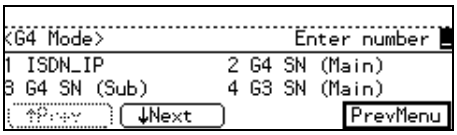
3. Press 4 then ◇
   To stop the test, press C/⊘
4. Exit the service mode.



4.1.23 G4 PARAMETER PROGRAMMING (FUNCTION 12)

NOTE: An optional G4 interface is required to access this function.

1. Enter the fax service mode.
2. Press [1] [2]

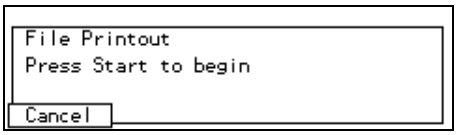


3. Press one of the following numbers, as required:
   [1]–ISDN IP (International Prefix)
   [2]–G4 SN (Subscriber Number) Main
   [3]–G4 SN (Subscriber Number) Sub
   [4]–ISDN G3 SN (Subscriber Number) Main
   [5]–ISDN G3 SN (Subscriber Number) Sub
   [6]–G4 Subaddress
   [7]–ISDN G3 Subaddress
4. Program the selected item.
5. Exit the service mode.

NOTE: After changing any of the G4 parameters, be sure to turn the main power switch off and on to activate the new settings.

4.1.24 FILE PRINTOUT (FUNCTION 13)

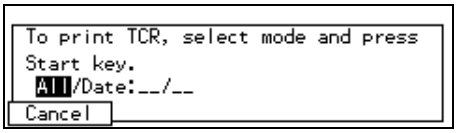
1. Enter the fax service mode.
2. Press [1] [3] then [◇]
   The machine prints all the files stored in the SAF memory, including confidential messages.



NOTE: Do not use this function, unless the customer is having trouble printing confidential messages or recovering from a memory lock status.

4.1.25 TCR/JOURNAL PRINTOUT (FUNCTION 14)

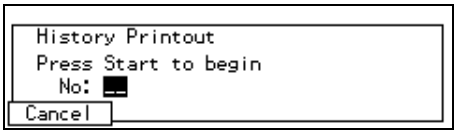
1. Enter the fax service mode.
2. Press [1] [4]
3. Either:
   Choose All - The machine prints all the communication records on the report. The maximum is 200 records, without the optional EXSAF board, or 900 records, with the EXSAF board.
   Specify a date - The machine prints all communication records after the specified date.
4. Exit the service mode.



4.1.26 USAGE LOG PRINTOUT (FUNCTION 15)

The following functions are for designer use only. However, list 5 (SC history) may be useful.

1. Enter the fax service mode.
2. Press [1] [5]
3. Press one of the following numbers, as required, then press [◇]
   01 – Engine interface
   02 – Mailbox usage
   03 – Operation trace
   04 – Print log
   05 – SC history
   06 – File storage
   07 – Scanner
   08 – Job and SAF file
   09 – Data reconstruction
4. Exit the service mode.



4.1.27 DATA TRANSFER (FUNCTION 16)

This function allows ROM and SRAM data transfer between the FCU inside the machine and an external flash memory card or FCU. Refer to the following sections for details.

- Section 5.4.1 - FCU ROM download from a flash memory card
- Section 5.4.2 - FCU ROM upload to a flash memory card
- Section 5.4.3 - Modem ROM download from a flash memory card
- Section 5.5.1 - SRAM backup to a flash memory card
- Section 5.3.3 - SRAM restore from a flash memory card
- Section 5.3.2 – SRAM restore from FCU

4.2 BIT SWITCHES

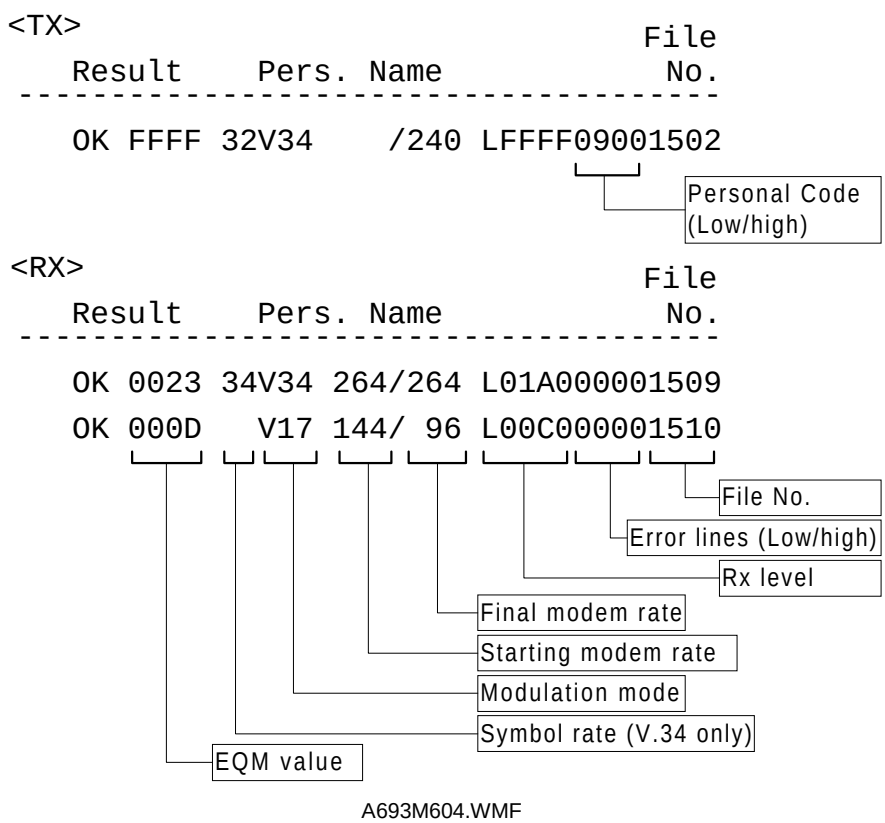
⚠WARNING

Do not adjust a bit switch that is described as "Not used", as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.

NOTE: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List printed by the machine.

4.2.1 SYSTEM SWITCHES

System Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Not used.	Do not change the settings.
1	Technical data (optional) printout on TCR/Journal **0:** Disabled **1:** Enabled	**1:** Instead of the personal name, the following data are listed on the TCR/Journal for each G3 communication. If enabled, bits 2 and 3 settings are ignored.



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Notes:
The error lines field is not used.
EQM and Rx level are fixed at "FFFF" in TX mode.
Symbol rate is printed only for V.34 communications.

<table>
<tr><th colspan="3">System Switch 00</th></tr>
<tr><th>No</th><th>FUNCTION</th><th>COMMENTS</th></tr>
<tr><td>2</td><td>Technical data (standard) printout on TCR/Journal
0: Disabled
1: Enabled</td><td>1: Instead of the personal name, the following data are listed on the TCR for each G3 communication.</td></tr>
<tr><td></td><td colspan="2">e.g. 32 V34 288 M 01 00 03 04
First number: Symbol rate (V.34 only)
Second number: Final modem type used
Third number: Final data rate (for example, 288 means 28.8 kbps)
Fourth: M means modem EQM / L means Rx level
Fifth and sixth numbers: Line quality data. Either a measure of the error rate or the rx level is printed, depending on the bit 3 setting below. (An M on the report indicates that it is error rate, and an L indicates Rx level.) The left hand figure is the low byte and the right hand figure is the high byte (refer to the following note for how to read the rx level). If it is a measure of the error rate; a larger number means more errors.
Seventh number (rx mode only): Total number of error lines that occurred during non-ECM reception.
Eighth number (rx mode only): Total number of burst error lines that occurred during non-ECM reception.
The fifth and sixth numbers are fixed at 00 for transmission records and ECM reception records.</td></tr>
<tr><td></td><td colspan="2">Rx level calculation

Example: 32 V34 288 L <u>01</u> <u>00</u> 03 04

The four-digit hexadecimal value (N) after “L” indicates the rx level.
The <u>high</u> byte is given first, followed by the <u>low</u> byte. Divide the decimal value of N by -16 to get the rx level.

In the above example, the decimal value of N (= 0100 [H]) is 256.
So, the actual rx level is 256/-16 = -16 dB</td></tr>
<tr><td>3</td><td>Line quality data output method
0: Measure of error rate (during image data transmission only)
1: Rx level</td><td>This bit determines the data type to be printed on the TCR (Journal) when technical data printout is enabled by bit 2 above.</td></tr>
<tr><td>4</td><td>Not used</td><td>Do not change the settings.</td></tr>
<tr><td>5</td><td>G3/G4 Communication parameter display
0: Disabled
1: Enabled</td><td>This is a fault-finding aid. The LCD shows the key parameters (see the next 2 pages). This is normally disabled because it cancels the CSI display for the user.
Be sure to reset this bit to 0 after testing.</td></tr>
<tr><td>6</td><td>Protocol dump list output after each communication
0: Off
1: On</td><td>This is only used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after finishing testing.</td></tr>
</table>

System Switch 00		
No	**FUNCTION**	**COMMENTS**
7	Amount of protocol dump data in one protocol dump list printout operation **0:** Up to the limit of the memory area for protocol dumping **1:** Last communication only	Change this bit to 1 if you want to have a protocol dump list of the last communication only.

G3 Communication Parameters

Modem rate	336: 33600 bps 168: 16800 bps 312: 31200 bps 144: 14400 bps 288: 28800 bps 120: 12000 bps 264: 26400 bps 96: 9600 bps 240: 24000 bps 72: 7200 bps 216: 21600 bps 48: 4800 bps 192: 19200 bps 24: 2400 bps
Resolution	S: Standard (8 x 3.85 dots per mm) D: Detail (8 x 7.7 dots per mm) F: Fine (8 x 15.4 dots per mm) SF: Superfine (16 x 15.4 dots per mm) - optional PMU board required. 21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi) 44: Superfine (400 x 400 dpi) - optional PMU board required.
Compression mode	MMR: MMR compression MR: MR compression MH: MH compression JBO: JBIG compression (Optional mode) – optional PMU board required JBB: JBIG compression (Basic mode) – optional PMU board required
Communication mode	ECM: With ECM SSC: Using SSC EFC: Using EFC NML: With no ECM, SSC, or EFC
Width and reduction	A4: A4 (8.3”), no reduction B4: B4 (10.1”), no reduction A3: A3 (11.7”), no reduction
I/O rate	0: 0 ms/line 25: 2.5 ms/line 5: 5 ms/line 10: 10 ms/line 20: 20 ms/line 40: 40 ms/line **Note:** “40” is displayed while receiving a fax message using AI short protocol.

G4 Communication Parameters

Compression mode	MMR: MMR compression MR: MR compression MH: MH compression
Resolution	21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi) 44: Superfine (400 x 400 dpi) – optional PMU board required
Width and reduction	A4: A4 (8.3”), no reduction B4: B4 (10.1”), no reduction A3: A3 (11.7”), no reduction
Transfer	T: Transfer - : Other
Confidential	C: Confidential - : Other
Other parameters	The following information is shown in 6-bit format. Bit 1 is the first bit from the left, and bit 6 is at the right end. Bit 1 - Smoothing 0: Enabled, 1: Disabled (Smoothing is disabled in halftone mode.) Bit 2 - CIL printing 0: Enabled, 1: Disabled Bit 3 - Not used Bit 4 - mm/inch conversion 0: Disabled, 1: Enabled Bit 5 - Engine type 0: mm, 1: inch Bit 6 - Resolution unit 0: mm, 1: inch

System Switch 01		
No	**FUNCTION**	**COMMENTS**
0	Automatic Service Call **0:** Disabled **1:** Enabled	This bit switch determines whether the machine will send an Auto Service Call to the service station when it is time for PM. **Cross reference** Auto service calls: Section 2.1
1-7	Not used	Do not change the settings.

System Switch 02		
No	**FUNCTION**	**COMMENTS**
0 to 5	Not used	Do not change the settings.
6 7	Memory read/write by RDS **Bit 7 6 Setting** 0 0 Always disabled 0 1 User selectable 1 0 User selectable 1 1 Always enabled	**(0,0):** All RDS systems are always locked out. **(0,1), (1,0):** Normally, RDS systems are locked out, but the user can temporarily switch RDS on to allow RDS operations to take place. RDS will automatically be locked out again after a certain time, which is stored in System Switch 03 (see below). Note that if an RDS operation takes place, RDS will not switch off until this time limit has expired. **(1,1):** At any time, an RDS system can access the machine.

System Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Length of time that RDS is temporarily switched on when bits 6 and 7 of System Switch 02 are set to “User selectable”	00 - 99 hours (BCD). This data is only valid if bits 6 and 7 of System Switch 02 are set to “User selectable”. The default setting is 24 hours.

System Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 2	Not used	Do not change the settings.
3	Printing dedicated tx parameters on Quick/Speed Dial Lists **0:** Disabled **1:** Enabled	**1:** Each Quick/Speed dial number on the list is printed with the dedicated tx parameters (8 bytes each). The first 8 bytes of data are the programmed dedicated tx parameters, even though 32 bytes of data are printed (the other 24 bytes have no use in the field).
4	Not used	Do not change the setting.

System Switch 04		
No	**FUNCTION**	**COMMENTS**
5	Memory file transfer operation **0:** Service level **1:** User level	If the machine is unable to print fax messages due to a mechanical problem, change this bit to 1 to transfer all messages in the memory (including confidential rx messages) to an another terminal. Always reset this bit to zero after transfer. However, this bit can be left at 1, if the customer's key-operator wants to transfer the files himself. **Procedure** 1. Enter service mode and change this bit to 1. 2. Exit the service mode. 3. Enter the key-operator mode, and select 'Key-operator settings'. 4. Choose '04' and specify a destination for the machine to transfer all the files to. 5. Press 'OK'. 6. After the machine transfers the memory files, enter the service mode and reset this bit to 0. Otherwise, anybody who knows how to enter the key-operator mode can transfer confidential messages.
6	G3 CSI/G4 Terminal ID programming level **0:** User level **1:** Service level	**1:** The CSI and Terminal ID can only be programmed using a service function. The Terminal ID can only be programmed if a Group 4 option is installed.
7	Telephone line type programming mode **0:** User level **1:** Service level	**1:** Telephone line type selection (tone dial or pulse dial) can only be programmed using a service function.

System Switch 05		
No	**FUNCTION**	**COMMENTS**
0 **1**	Not used	Do not change the settings.
2	Display of both RTI and CSI on the LCD **0:** Disabled **1:** Enabled	**1:** An RTI will be displayed until phase B of the protocol sequence, and a CSI will be displayed after phase C.
3	Not used	Do not change the setting.
4	Hard disk option **0:** Not installed **1:** Installed	Change this bit to 1 when installing the hard disk option.
5 **6** **7**	Not used	Do not change the setting.

System Switch 06 - Not used (Do not change the factory settings.)

System Switch 07 - Not used (Do not change the factory settings.)
System Switch 08 - Not used (Do not change the factory settings.)

System Switch 09		
No	**FUNCTION**	**COMMENTS**
0	Addition of image data from confidential transmissions on the transmission result report **0:** Disabled **1:** Enabled	If this feature is enabled, the top half of the first page of confidential messages will be printed on transmission result reports.
1	Inclusion of communications on the TCR when no image data was exchanged. **0:** Disabled **1:** Enabled	**0:** Communications which reached phase C (message tx/rx) of the T.30 protocol are listed on the TCR (Journal). **1:** Communications which reached phase A (call setup) of T.30 protocol are listed on the TCR (Journal). This will include telephone calls.
2	Automatic error report printout **0:** Disabled **1:** Enabled	**0:** Error reports will not be printed. **1:** Error reports will be printed automatically after a failed communication.
3	Printing of the error code on the error report **0:** No **1:** Yes	**1:** Error codes are printed on the error reports.
4	Not used	Do not change the setting.
5	Power failure report **0:** Disabled **1:** Enabled	**1:** A power failure report will be automatically printed after the power is switched on if a fax message disappeared from the memory when the power was turned off last.
6	Not used	Do not change the setting.
7	Priority given to various types of remote terminal ID when printing reports **0:** RTI > CSI > Dial label > Tel. number **1:** Dial label > Tel. number > RTI > CSI	This bit determines which set of priorities the machine uses when listing remote terminal names on reports. In G4 communication, G4_TID (Terminal ID) is used instead of RTI or CSI. **Dial Label:** The name stored, by the user, for the Quick/Speed Dial number.

System Switch 0A		
No	**FUNCTION**	**COMMENTS**
0 **1** **2**	Not used	Do not change the settings.
3	Continuous polling reception **0:** Disabled **1:** Enabled	This feature allows a series of stations to be polled in a continuous cycle. This will continue until the polling reception file is erased. The dialing interval is the same as memory transmission.

System Switch 0A		
No	**FUNCTION**	**COMMENTS**
4	Dialing on the ten-key pad when the external telephone is off-hook **0:** Disabled **1:** Enabled	**0:** Prevents dialing from the ten-key pad while the external telephone is off-hook. Use this setting when the external telephone is not by the machine, or if a wireless telephone is connected as an external telephone. **1:** The user can dial on the machine's ten-key pad when the handset is off-hook.
5	On hook dial **0:** Disabled **1:** Enabled	**0:** On hook dial is disabled.
6	Line used for G3 transmission **0:** PSTN **1:** ISDN	If an ISDN unit has been installed, this bit determines whether G3 transmissions go out over the PSTN or the ISDN.
7	Line used when the machine falls back to G3 from G4 if the other end is not a G4 machine **0:** PSTN **1:** ISDN	This bit switch has no effect if Communication Switch 07 bit 0 is set to 0.

System Switch 0B - Not used (Do not change the factory settings.)
System Switch 0C - Not used (Do not change the factory settings.)
System Switch 0D - Not used (Do not change the factory settings.)

System Switch 0E		
No	**FUNCTION**	**COMMENTS**
0 **1** **2**	Not used	Do not change the settings.
3	Action when the external handset goes off-hook **0:** Manual tx and rx operation **1:** Memory tx and rx operation (the display remains the same)	**0:** Manual tx and rx are possible while the external handset is off-hook. But, memory tx is not possible. **1:** The display stays in standby mode even when the external handset is used, so that other people can use the machine for memory tx operation. Note that manual tx and rx are not possible with this setting.
4 **to** **7**	Not used	Do not change the settings.

System Switch 0F		
No	**FUNCTION**	**COMMENTS**
0 to 7	Country code for functional settings (Hex) 00: France 10: Canada 01: Germany 11: USA 02: UK 12: Asia 03: Italy 13: Japan 04: Austria 14: Hong Kong 05: Belgium 15: South Africa 06: Denmark 16: Australia 07: Finland 17: New Zealand 08: Ireland 18: Singapore 09: Norway 19: Malaysia 0A: Sweden 1A: China 0B: Switz. 1B: Taiwan 0C: Portugal 20: Turkey 0D: Holland 21: Greece 0E: Spain 0F: Israel	This country code determines the factory settings of bit switches and RAM addresses. However, it has no effect on the NCU parameter settings and communication parameter RAM addresses. **Cross reference** NCU country code: Function 06, parameter C.C.

System Switch 10		
No	**FUNCTION**	**COMMENTS**
0 to 7	Threshold memory level for parallel memory transmission	Threshold = N x 64 kbytes + 256 kbytes N can be between 00 - FF(H) Default setting: 04(H) = 512 kbytes

System Switch 11		
No	**FUNCTION**	**COMMENTS**
0	TTI printing position **0:** Printed before the data leading edge **1:** Superimposed on the page data	Change this bit to 1 if the TTI overprints information that the customer considers to be important (G3 transmissions).
1	TSI (G3) or CIL (G4) printing position **0:** Printed before the data leading edge **1:** Superimposed on the page data	Change this bit to 1 if the TSI (G3) or CIL (G4) overprints information that the customer considers to be important.
2 to 6	Not used	Do not change the factory settings.
7	Use of parallel memory transmission with G4 transmission **0:** Disabled **1:** Enabled	This determines whether parallel transmission can be used with a G4 transmission or not. Note that this bit is only effective if Parallel Memory transmission is enabled (User Parameter 07 - bit 2).

System Switch 12		
No	**FUNCTION**	**COMMENTS**
0 to 7	TTI/CIL printing position in the main scan direction CIL: Command Information Line (Group 4)	08 to 92 (BCD) mm. Input even numbers only. This setting determines the print start position for the TTI and CIL from the left edge of the paper. If the TTI is moved too far to the right, it may overwrite the file number which is on the top right of the page. On an A4 page, if the CIL is moved over by more than 60 mm, it may overwrite the page number.

System Switch 13 - Not used (do not change the settings)

System Switch 14		
No	**FUNCTION**	**COMMENTS**
0	Action when JBIG files and MH/MR/MMR files are mixed in batch transmission **0**: JBIG files are transmitted separately **1**: Transmitted in one batch	**0**: JBIG files are transmitted separately from MH/MR/MMR files. **1**: JBIG files are converted into MH, MR, or MMR format, and transmitted in one batch together with MH/MR/MMR files.
1 to 5	Not used	Do not change the settings.
6	File no. print in TTI **0**: Enabled **1**: Disabled	**1:** File number will not be printed in TTI. (G3 only)
7	Page no. print in TTI **0**: Enabled **1**: Disabled	**1:** Page number will not be printed in TTI. (G3 only)

System Switch 15		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the setting.
1	Going into the Night mode automatically **0**: Enabled **1**: Disabled	**1:** The machine will restart from the Energy Saver mode quickly, because the +5V power supply is active even in the Energy Saver mode.
2	DRAM backup during Night mode **0**: Disabled **1**: Enabled	**1:** The machine backs up the DRAM (SAF and Page Memory) even in the Night mode. If the machine frequently goes into Night Mode, keep this bit at “0 (default setting)” to backup SAF data in case of a real power-down.
3 to 7	Not used	Do not change the settings.

System Switch 16 - Not used (do not change the settings)
System Switch 17 - Not used (do not change the settings)
System Switch 18 - Not used (do not change the settings)

System Switch 19		
No	**FUNCTION**	**COMMENTS**
0 to 2	Key acknowledgement tone volume adjustment (in the fax application) **000** (Min.: OFF)-**111** (Max.) Default setting – 011	
3 to 6	Not used	Do not change the settings.
7	Special Original mode **0:** Disabled **1:** Enabled	**1:** "Special Original" can be selected in addition to the "Text", "Text/Photo" and "Photo" modes. If the customer frequently wishes to transmit a form or letterhead which has colored or printed background, change this bit to "1" and adjust the scan parameters dedicated for the desired document type using the following switches. **Special Original Mode Parameters** ❑ Dirty background elimination level – Scanner switch 04, bits 4 to 7 ❑ MTF setting – Scanner switch 05, bits 4 to 7 ❑ Independent dot elimination level – Scanner switch 06, bits 4 to 6 ❑ Scan density step value – Scanner switch 09, bits 0 to 3 ❑ Binary threshold – Scanner switch 0A, bit 0 to 7

System Switch 1A - Not used (do not change the settings)
System Switch 1B - Not used (do not change the settings)
System Switch 1C - Not used (do not change the settings)
System Switch 1D - Not used (do not change the settings)

System Switch 1E		
No	**FUNCTION**	**COMMENTS**
0	Communication after the TCR (Journal) data storage area has become full **0:** Possible **1:** Impossible	This setting is effective only when Automatic TCR (Journal) printout is enabled. **0:** If the buffer memory of the communication records for the TCR (Journal) is full, fax communications are still possible. But the machine will overwrite the oldest communication records. **1:** If the buffer memory of the communication records for the TCR (Journal) has become full, fax communications will become impossible, to prevent overwriting the communication records before the machine prints them out. **Cross Reference** ❑ Automatic TCR (Journal) output - User switch 03, bit 7 ❑ Number of communication records for TCR (Journal): 200 records (without EXSAF board) 900 records (with EXSAF board)
1	Action when the SAF memory has become full during scanning **0:** The page is erased. **1:** The file is erased.	**0:** If the SAF memory becomes full during scanning, the successfully scanned pages are transmitted. **1:** If the SAF memory becomes full during scanning, the file is erased and no pages are transmitted. Not applicable to parallel memory transmission
2	RTI/CSI display priority **0:** RTI **1:** CSI	This bit determines which identifier, RTI or CSI, is displayed on the LCD while the machine is communicating in G3 non-standard mode.
3	File No. printing **0**: Enabled **1**: Disabled	**1:** File numbers are not printed on any reports.
4	Action when authorized reception is enabled in the following conditions: Receive messages only from senders whose RTI/CSIs are programmed AND Authorized addresses are **not** programmed **0**: Authorized reception is automatically disabled **1**: Authorized reception is enabled	If authorized reception is enabled in this condition, the machine will not receive any fax messages. If customer intends to do so, change this bit to “1” before enabling Authorized Reception. Otherwise, keep this bit to “0 (default setting)” so that the customer will not mistakenly set up the machine not to receive any fax messages.

System Switch 1E		
No	**FUNCTION**	**COMMENTS**
5	Address display priority in the AI redial mode. 0: RTI/CSI 1: Telephone number	0: When the machine has both RTI/CSI and the telephone number information, the machine displays RTI/CSI priority. 1: The machine always displays the telephone number.
6	Not used	Do not change the setting
7	RAM initialization after the optional EXSAF board is installed or removed **0:** Enabled **1:** Disabled	When the machine detects that an EXSAF has been installed or removed, the machine shows the following message on the display for the customer. *"CAUTION! Adding/Removing EXSAF board results in data loss. Turn off the main switch and replace the card to cancel. If you want to continue, press Yes."* If Yes is pressed, the machine initializes the RAM to the "with" or "without card" configuration. However, changing this bit to '1' disables this initialization, even if Yes is pressed. Change this bit to 1 after installing the EXSAF board. **0:** When the above message is displayed, the machine initializes the RAM if Yes is pressed. The amount of data lost depends on whether the board is in or out (see Installation – EXSAF). To avoid losing data, the user must switch off immediately and put the board back in. **1:** When the above message is displayed, the machine does not initialize the RAM even if Yes is pressed. However, the fax unit cannot be used until the user switches the machine off, puts the board back in, then switches the machine back on. No data is lost.

System Switch 1F		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the setting.
1	Report printout after an original jam during SAF storage or if the SAF memory is full **0:** Enabled **1:** Disabled	**0:** When an original jams, or the SAF memory overflows during scanning, a report will be printed. Change this bit to "1", if the customer does not want to have report in these cases. Memory tx – Memory storage report Parallel memory tx – Transmission result report
2	Not used	Do not change the setting.
3	Received fax print start timing (G3 reception) **0:** After receiving each page **1:** After receiving all pages	**0:** The machine prints each page immediately after the machine receives it. **1:** The machine prints the complete message after the machine receives all the pages in the memory.
4	Received fax print start timing (G4 reception) **0:** After receiving each page **1:** After receiving all pages	
5 **6**	Not used	Do not change the factory settings.
7	Action when a fax SC has occurred **0:** Automatic reset **1:** SC code display	**0:** When the fax unit detects a fax SC code other than SC1201, SC1202, SC1207, SC1802, SC1811 and SC1815, the fax unit automatically resets itself. **1:** When the fax unit detects any fax SC code, the fax unit displays the SC code and stops. **Cross Reference** Fax SC codes - See "Troubleshooting"

4.2.2 SCANNER SWITCHES

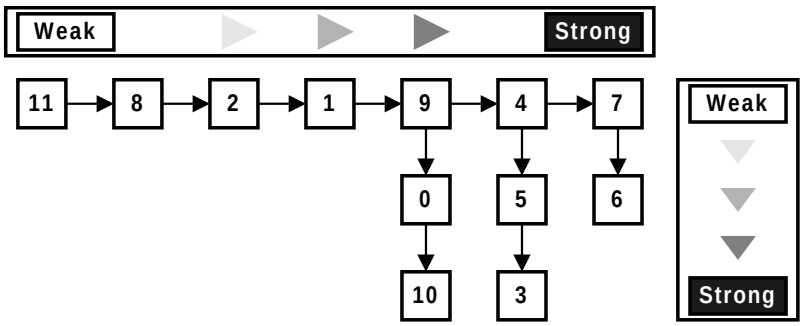
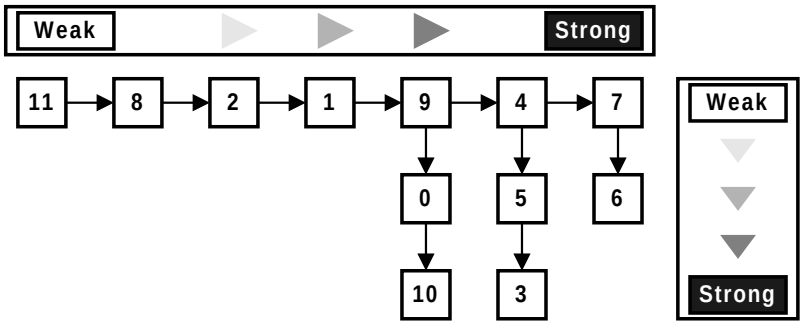
Scanner Switch 00		
No	**FUNCTION**	**COMMENTS**
0 to 7	Not used	Do not change the settings.

Scanner Switch 01		
No	**FUNCTION**	**COMMENTS**
0 to 4	Scan density step value (Text mode)	When scan density is adjusted manually away from the Normal setting, the threshold value for binary picture processing changes for each step from the value specified by Scanner Switch 02, by the amount programmed here. For example, with the default settings (20), the threshold value changes as follows. +3 (Darkest) : 68 (= 88 – 20) +2 : 88 (= 108 – 20) +1 : 108 (= 128 - 20) 0 (Normal) : 128 (Scanner Switch 02 setting) -1 : 148 (= 128 + 20) -2 : 168 (= 148 + 20) -3 (Lightest) : 188 (= 168 + 20) The value can be between 00 and 1F (H) [= 31(D)]. For a darker threshold, input a lower value. Default setting: 20
5 to 7	Not used.	Do not change the settings.

Scanner Switch 02		
No	**FUNCTION**	**COMMENTS**
0 to 7	Binary picture processing: Threshold for Text mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in Text mode (when the scan density setting is at the center). The value can be between 00 and FF. For a darker threshold, input a lower value. Default setting: 77(H) = 119(D)

Scanner Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Binary picture processing: Threshold for Text/Photo mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in Text/Photo mode (when the scan density setting is at the center). The value can be between 00 and 0F. For a darker threshold, input a lower value. Default setting: 26(H) = 38(D) This setting is independent from the threshold setting specified by the copier's SP mode 4-418-2.

Scanner Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 3	Dirty background elimination level (Text mode)	This setting determines the threshold value for dirty background in text mode. The value can be between 00 and 0F. For a stronger threshold, input a higher value. Default setting: 02(H) This setting is independent of the threshold setting specified by the copier's SP mode 4-903-34.
4 to 7	Dirty background elimination level (Special Original mode)	This setting determines the threshold value for dirty background in special original mode. The value can be between 00 and 0F. For a stronger threshold, input a higher value. Default setting: 09(H) This setting is independent of the threshold setting specified by the copier's SP mode 4-903-34.

Scanner Switch 05		
No	**FUNCTION**	**COMMENTS**
0 to 3	MTF setting (Text mode) The value can be between 0 and 11. Refer to the following diagram for details. Default setting: 5 This setting is independent from the threshold specified by copier SP mode 4-903. 
4 to 7	MTF setting (Special original mode) The value can be between 0 and 11. Refer to the following diagram for details. Default setting: 4 This setting is independent from the threshold specified by copier SP mode 4-903. 

Scanner Switch 06		
No	**FUNCTION**	**COMMENTS**
0 to 3	MTF setting (Text/Photo mode)	The value can be between 0 and 11. Refer to Scanner Switch 05 for details. Default setting: 8 This setting is independent from the threshold setting specified by the copier's SP mode 4-903.
4 to 6	Isolated dot elimination level (Both Text and Special Original modes)	The value can be between 0 and 7. For higher threshold, input a higher value. Default setting: 6 This setting is independent from the threshold setting specified by the copier's SP mode 4-903.
7	Not used	Do not change the setting.

Scanner Switch 07		
No	**FUNCTION**	**COMMENTS**
0 to 3	MTF setting (Photo mode)	The value can be between 0 and 11. Refer to the diagram on the previous page for details. Default setting: 4 This setting is independent from the threshold setting specified by the copier's SP mode 4-903.
4 to 7	Not used	Do not change the settings.

Scanner Switch 08		
No	**FUNCTION**	**COMMENTS**
0 to 3	Scan margin setting (top and bottom margin in book scan mode, and top margin in ADF mode) The setting can be between 0 and F (H) (in mm). Default setting: 3 mm If the scanned image margin is still incorrect after adjustment, the base copier's SP mode settings may be incorrect. Check and adjust SP modes 4-012-1, 4-012-2, and 6-006-2.	
4 to 7	Not used	Do not change the settings.

Scanner Switch 09		
No	**FUNCTION**	**COMMENTS**
0 to 3	Scan density step value (Special original mode)	When scan density is adjusted manually away from the Normal setting, the threshold value for binary picture processing changes for each step from the value specified by Scanner Switch 02, by the amount programmed here. For example, with the default settings (20), the threshold value changes as follows: +3 (Darkest) : 68 (= 88 – 20) +2 : 88 (= 108 – 20) +1 : 108 (= 128 - 20) 0 (Normal) : 128 (Scanner Switch 02 setting) -1 : 148 (= 128 + 20) -2 : 168 (= 148 + 20) -3 (Lightest) : 188 (= 168 + 20) The value can be between 00 and 1F (H) [= 31(D)]. For a darker threshold, input a lower value. Default setting - 20
4 to 7	Not used.	Do not change the settings.

Scanner Switch 0A		
No	**FUNCTION**	**COMMENTS**
0 to 7	Binary picture processing: Threshold for Special original mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in Text mode (when the scan density setting is at the center). The value can be between 00 and FF. For a darker threshold, input a lower value. Default setting: 77(H) = 119(D)

Scanner Switch 0B - Not used (do not change the settings)

Scanner Switch 0C		
No	**FUNCTION**	**COMMENTS**
0	Action when an original jam has occurred while scanning the original into memory for memory tx **0:** Continues scanning after recovery **1:** Stops scanning and erases all scanned pages for that job	This bit is only effective when parallel memory tx is disabled (user parameter 07 - bit 2). If parallel memory tx is enabled, the machine always erases the scanned pages when an original jam occurs. The machine then asks the user to retry from the first page, even if the parallel memory tx is not actually used. **0:** The machine displays a message asking the user to put the jammed page back into the original stack, and continues scanning. The message is displayed for the time period specified by scanner switch 0E, bit 2. **1:** The machine erases all the scanned pages and asks the user to retry from the first page.
1 to 2	Setting when an original size cannot be recognized **Bit 2 1 Setting** 0 0 Depending on the copier's setting 0 1 A5 ▯ 1 0 A5 ▭ 1 1 No original	When both bits are set to "0", the machine recognizes an original size depending on SP4-303 copier's service mode.
3 to 5	Not used	Do not change the settings.
6	Scan width used for a document set in the ADF when the width is less than 230 mm. **0**: A4 (210 mm) **1**: LT (216 mm)	This bit is set at "1" when the country code is set to the US. Refer to Sub Scan Length Correction using ADF in section 2.
7	Original length adjustment for A4/LT LEF originals in ADF scan mode **0**: Enable **1**: Disable	**0:** An original of 193 to 223 mm length is regarded as A4 or LT depending on the setting of bit 6 above. **1:** Original length data from the ADF sensor is used. Refer to Sub Scan Length Correction using ADF in section 2.

Scanner Switch 0D		
No	**FUNCTION**	**COMMENTS**
0 **1**	Scan magnification ratio fine tuning (Main scan direction) $\binom{0}{0} = 0\%, \binom{1}{0} = -0.5\%, \binom{0}{1} = +0.5\%, \binom{1}{1} = \text{Do not use this setting}$ The actual magnification ratio is the sum of the SP mode 4-008 setting and this setting.	
2 **3**	Scan magnification ratio fine tuning (Sub scan direction) $\binom{0}{0} = 0\%, \binom{1}{0} = -1.0\%, \binom{0}{1} = +1.0\%, \binom{1}{1} = \text{Do not use this setting}$ The actual magnification ratio is the sum of the SP mode 4-101 setting and this setting.	
4 **to** **6**	Not used	Do not change the settings.
7	Scan width for A5 lengthwise or B5 lengthwise originals **0:** 210 mm (8.5") **1:** Original width	**0:** The machine scans the original as 210 mm (8.5") width. The transmitted image has a blank area on the right. **1:** The machine scans 148 mm (A5) or 182 mm (B5) and centers the scanned data on a 216 mm width transmitted image.

Scanner Switch 0E		
No	**FUNCTION**	**COMMENTS**
0	Wait time for the next page when scanning a book original into memory **0:** 60 s **1:** 30 s	This bit determines how long the machine waits for the next page when scanning a book original for memory transmission. If this timer expires, the machine transmits all the pages scanned so far as one document. **Note:** In immediate tx, the wait time for the next page is 10 s.
1	Scan resolution unit (except standard resolution in book scan mode) **0:** mm **1:** inches	This bit determines which resolution unit will be used for scanning a fax message. Default setting: mm
2	ADF jam alarm display time **0:** 60 s **1:** 30 s	The bit is only effective when bit 0 of scanner bit switch 0C is '0'. This bit determines how long the machine displays the ADF jam alarm after a jam occurred.
3 **to** **7**	Not used	Do not change the settings.

Scanner Switch 0F		
No	**FUNCTION**	**COMMENTS**
0	Image rotation before transmission (A4/LT size) **0:** Disabled **1:** Enabled	This bit determines whether the machine rotates the scanned image by 90 degrees before transmission. If this bit is set at 1, A4 (LT) sideways images (297 mm width in the protocol) will be transmitted as A4 (LT) lengthwise images (216 mm width in the protocol). Refer to Image Rotation Before Transmission in chapter 2 for more details.
1	Not used	Do not change the setting
2	Image rotation before transmission (A5/HLT size) **0:** Disabled **1:** Enabled	This bit determines whether the machine rotates the scanned image by 90 degrees before transmission. If this bit is set at “1”, A5 (HLT) lengthwise images will be transmitted as A4 (LT) width images (216 mm width in the protocol). Refer to Image Rotation Before Transmission in chapter 2 for more details.
3 to 7	Not used	Do not change the settings.

4.2.3 PRINTER SWITCHES

Printer Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Page separation mark **0:** Disabled **1:** Enabled	**0:** No marks are printed. **1**: If a received page has to be printed out on two sheets, an asterisk inside square brackets is printed at the bottom right hand corner of the first sheet, and a “2” inside a small box is printed at the top right hand corner of the second sheet. This helps the user to identify pages that have been split.
1	Repetition of data when the received page is longer than the printer paper **0:** Disabled **1:** Enabled	**0:** The next page continues from where the previous page left off. **1:** The final few mm of the previous page are printed at the top of the next page. See Sub Scan Reduction and Page Separation in section 2 for details.
2	Prints date and time data on received fax messages **0:** Disabled **1:** Enabled	This switch is only effective when user parameter 02 - bit 2 (printing the received date and time on received fax messages) is enabled. **1:** The machine prints the received and printed date and time at the bottom of each received page.
3 to 7	Not used	Do not change the settings.

Printer Switch 01		
No	**FUNCTION**	**COMMENTS**
0 1 2	Not used	Do not change the settings.
3 4	Maximum print width used in the setup protocol $\binom{0}{0}$ = Not used $\binom{1}{0}$ = 297 mm 11.7 inch $\binom{0}{1}$ = 254 mm 10.1 inch $\binom{1}{1}$ = 216 mm 8.5 inch	
5 6	Not used	Do not change the settings.
7	Received message width restriction in the protocol signal to the sender **0:** Disabled **1:** Enabled	**0:** The machine informs the transmitting machine of the print width depending on the paper size available from the paper feed stations. Refer to the table on the next page for how the machine chooses the paper width used in the setup protocol (NSF/DIS). **1:** The machine informs the transmitting machine of the fixed paper width which is specified by bits 3 and 4 above.

Relationship between available paper sizes and printer width used in the setup protocol

Available Paper Size	Printer width used in the Protocol (NSF/DIS)
A4 or 8.5 x 11”	297 mm width
B5	256 mm width
A5 or 8.5 x 5.5”	216 mm width
No paper available (Paper end)	216 mm width

Printer Switch 02		
No	**FUNCTION**	**COMMENTS**
0	1st paper feed station usage for fax printing **0:** Enabled **1:** Disabled	**0:** The paper feed station can be used to print fax messages and reports. **1**: The specified paper feed station will not be used for printing fax messages and reports. **Note:** Do not disable usage for the paper feed station which has been specified by User Parameter Switch 0F (15), or which is used for the Specified Cassette Selection feature.
1	2nd paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
2	3rd paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
3	4th paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
4	LCT usage for fax printing **0**: Enabled **1**: Disabled	
5 to 7	Not used	Do not change the settings.

Printer Switch 03		
No	**FUNCTION**	**COMMENTS**
0	Length reduction of received data **0:** Disabled **1:** Enabled	**0:** Incoming pages are printed without length reduction. **Cross reference** Page separation threshold: Printer Sw. 03, bits 4 to 7. **1:** Incoming page length is reduced when printing. **Cross reference** Maximum reducible length: Printer Switches 04, bits 0 to 4 Page separation and data reduction: Section 2
1 **2** **3**	Not used	Do not change the settings
4 **to** **7**	Page separation threshold (with reduction disabled in switch 03-0 above) If the incoming page is up to x mm longer than the length of copy paper, the excess portion will not be printed. If the incoming page is more than x mm longer than the length of copy paper, the excess portion will be printed on the next page. The value of x is determined by these four bits. Hex value of bits 4 to 7 — x (mm) 0 — 0 1 — 1 and so on until F — 15 Default setting: 6 mm **Cross reference** Page separation and data reduction: section 2 Length reduction On/Off: Printer Switch 03, Bit 0	

Printer Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 4	Maximum reducible length when length reduction is enabled in switch 03-0 above. <Maximum reducible length> = <Paper length> + (N x 5mm) 'N' is the decimal value of the binary setting of bits 0 to 4. Bit 4 3 2 1 0 Setting 0 0 0 0 0 0 mm 0 0 0 0 1 5 mm 0 0 1 0 0 20 mm (default setting) 1 1 1 1 1 155 mm For A5 sideways and B5 sideways paper <Maximum reducible length> = <Paper length> + 0.75 x (N x 5mm)	
5 6	Length of the duplicated image on the next page, when page separation has taken place. $\binom{0}{0} = 4\text{ mm}, \binom{1}{0} = 10\text{ mm}, \binom{0}{1} = 20\text{ mm}, \binom{1}{1} = 40\text{ mm}$	
7	Not used.	Do not change the setting.

Printer Switch 05 - Not used (do not change the settings)

Printer Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Printing while a paper cassette is pulled out, when the Just Size Printing feature is enabled. **0**: Printing will not start **1**: Printing will start if another cassette has a suitable size of paper, based on the paper size selection priority tables.	Refer to Just Size Printing in section 2 for details. **Cross reference** Just size printing on/off – User switch 05, bit 5
1 to 7	Not used.	Do not change the settings.

Printer Switch 07 - Not used (do not change the settings)
Printer Switch 08 - Not used (do not change the settings)
Printer Switch 09 - Not used (do not change the settings)
Printer Switch 0A - Not used (do not change the settings)
Printer Switch 0B - Not used (do not change the settings)
Printer Switch 0C - Not used (do not change the settings)
Printer Switch 0D - Not used (do not change the settings)

Printer Switch 0E		
No	**FUNCTION**	**COMMENTS**
0	Paper size selection priority **0:** Width **1:** Length	**0:** A paper size which has the same width as the received data is selected first. **1:** A paper size which has enough length to print all the received lines without reduction is selected first.
1	Paper size selected for printing A4 width fax data **0:** 8 x 11" size **1:** A4 size	This switch determines which paper size is selected for printing A4 width fax data, when the machine has both A4 and 8" x 11" size paper.
2	Page separation **0:** Enabled **1:** Disabled	**1:** If all paper sizes in the machine require page separation to print a received fax message, the machine does not print the message (Substitute Reception is used). After a larger size of paper is set in a cassette, the machine automatically prints the fax message.
3 to 4	Printing the document image on reports **Bit 4 Bit 3 Setting** 0 0 The upper half only 0 1 50% reduction of sub scan 1 0 Same size 1 1 Not used	"Same size" means the document image is printed at 100%, even if page separation occurs.
5 to 6	Not used	Do not change the settings.
7	Equalizing the reduction rate among separated pages (Page Separation) **0:** Enabled **1:** Disabled	**0:** When page separation has taken place, all the pages are reduced with the same reduction ratio. **1:** Only the last page is reduced to fit the selected paper size when the page separation has taken place. Other pages are printed without reduction.

Printer Switches 0F		
No	**FUNCTION**	**COMMENTS**
0 to 1	Smoothing feature **Bit 1 Bit 0 Setting** 0 0 Disabled 0 1 Disabled 1 0 Enabled 1 1 Not used	**(0, 0) (0, 1):** Disable smoothing if the machine receives halftone images from other manufacturer's fax machines frequently.
2	Duplex printing **0:** Disabled **1:** Enabled	**1:** The machine always prints received fax messages in duplex printing mode. **Cross Reference** "Duplex Printing" in chapter 2
3	Binding direction for Duplex Printing **0**: Left binding **1**: Top binding	**Cross Reference** "Duplex Printing" in chapter 2
4	Printing fax messages in user code mode **0:** Enabled **1:** Disabled	**1:** The machine holds the received fax messages until the machine exits the restricted access mode using user codes or key counter. If the machine enters the restricted access mode again while printing fax messages, the machine stops printing until the machine exits the mode again. **Cross reference** User code mode on/off – SP Mode 5-401
5	Not used	Do not change the setting.
6 7	Wait timer for Duplex Print Mode. $\binom{0}{0}$ = No limit $\binom{1}{0}$ = 1 min., $\binom{0}{1}$ = 3 min., $\binom{1}{1}$ = 10 min. If the duplex unit is already being used for a copy or print job when the fax unit is going to print a fax message in duplex mode, the fax unit waits until the duplex unit becomes available. The time that the fax unit will wait can be specified, as shown above. If the timer expires, the message is printed on single sides.	

4.2.4 COMMUNICATION SWITCHES

Communication Switch 00		
No	**FUNCTION**	**COMMENTS**
0 to 1	Compression modes available in receive mode **Bit** 1 0 Modes 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 MH/MR/MMR/ JBIG	These bits determine the compression capabilities to be declared in phase B (handshaking) of the T.30 protocol.
2 to 3	Compression modes available in transmit mode **Bit** 3 2 Modes 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 MH/MR/MMR/ JBIG	These bits determine the compression capabilities to be used in the transmission and to be declared in phase B (handshaking) of the T.30 protocol.
4	Not used	Do not change the setting.
5	Setting of JBIG compression method: Reception **0**: Only basic **1**: Basic and Optional	Change the setting when communication problems occur using JBIG compression.
6	Setting of JBIG compression method: transmission **0**: Basic priority **1**: Optional priority	Change the setting when communication problems occur using JBIG compression.
7	Closed network (reception) **0:** Disabled **1:** Enabled	**1:** Reception will not go ahead if the ID code of the other terminal does not match the ID code of this terminal. This function is only available in NSF/NSS mode.

Communication Switch 01		
No	**FUNCTION**	**COMMENTS**
0	ECM **0:** Off **1:** On	If this bit is set to 0, ECM is switched off for all communications. In addition, V.8 protocol and JBIG compression are switched off automatically.
1	Not used	Do not change the setting.

Communication Switch 01		
No	**FUNCTION**	**COMMENTS**
2 to 3	Wrong connection prevention method **Bit 3** **Bit 2** **Setting** 0 0 None 0 1 8 digit CSI 1 0 4 digit CSI 1 1 CSI/RTI	**(0,1) -** The machine will disconnect the line without sending a fax message, if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work when manually dialed. **(1,0) -** The same as above, except that only the last 4 digits are compared. **(1,1) -** The machine will disconnect the line without sending a fax message, if the other end does not identify itself with an RTI or CSI. **(0,0) -** Nothing is checked; transmission will always go ahead. **Note:** This function does not work when dialing is done from the external telephone.
4 to 5	Not used	Do not change the settings.
6 7	Maximum printable page length available **Bit 7** **6** **Setting** 0 0 No limit 0 1 B4 (364 mm) 1 0 A4 (297 mm) 1 1 A3 (432 mm)	The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 02		
No	**FUNCTION**	**COMMENTS**
0	Burst error threshold **0:** Low **1:** High	If there are more consecutive error lines in the received page than the threshold, the machine will send a negative response. The Low and High threshold values depend on the sub-scan resolution, and are as follows. **Resolution** **100 dpi 3.85 l/mm** **200 dpi 7.7 l/mm** **400 dpi 15.4 l/mm** Low settings 3 6 12 High settings 6 12 24
1	Acceptable total error line ratio **0:** 5% **1:** 10%	If the error line ratio for a page exceeds the acceptable ratio, RTN will be sent to the other end.
2	Treatment of pages received with errors during G3 reception **0:** Deleted from memory without printing **1:** Printed	**0:** Pages received with errors are not printed.

Communication Switch 02		
No	**FUNCTION**	**COMMENTS**
3	Hang-up decision when a negative code (RTN or PIN) is received during G3 immediate transmission **0:** No hang-up, **1:** Hang-up	**0:** The next page will be sent even if RTN or PIN is received. **1:** The machine will send DCN and hang up if it receives RTN or PIN. This bit is ignored for memory transmissions or if ECM is being used.
4 to 6	Not used	Do not change the settings.
7	Method of total error rate calculation **0:** Normal method **1:** French PTT requirement	**0:** Error rate is calculated by dividing the number of total lines by the number of error lines. **1:** Error rate is calculated by dividing the number of total plus error lines by the number of error lines.

Communication Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Maximum number of page retransmissions in a G3 memory transmission	00 - FF (Hex) times. This setting is not used if ECM is switched on. Default setting - 03(H)

Communication Switch 04 - Not used (do not change the settings)
Communication Switch 05 - Not used (do not change the settings)

Communication Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Dialing requirements: Germany **0:** Disabled **1:** Enabled	These switches are automatically set to the settings required by each country after the country code (System Switch 0F) is programmed.
1	Dialing requirements: Austria **0:** Disabled **1:** Enabled	
2	Dialing requirements: Norway **0:** Disabled **1:** Enabled	
3	Dialing requirements: Denmark **0:** Disabled **1:** Enabled	
4	Dialing requirements: France **0:** Disabled **1:** Enabled	
5	Dialing requirements: Switzerland **0:** Disabled **1:** Enabled	
6	Not used	Do not change the setting.
7	Carrier drop display **0:** Disabled **1:** Enabled	This is an European PTT requirement. This bit is available only for the European models.

Communication Switch 07		
No	**FUNCTION**	**COMMENTS**
0	Fallback from G4 to G3 if the other terminal is not a G4 terminal **0:** Disabled **1:** Enabled	Also see system switch 0A bit 7. Refer to the ISDN G4 option service manual (G4 Internal Switches 17, 18, 1A, 1B, and 1C) for the CPS code set (Cause Value set) to determine G4 to G3 fallback.
1	Not used	Do not change the setting.
2	Use of the date and time provided from the network for the CIL **0:** Disabled **1:** Enabled	**0:** The date and time programmed in the receiving terminal is used in the CIL. **1:** The date and time informed in the document layer from the remote terminal (through the network) is used in the CIL.
3 to 5	Not used	Do not change the settings.
6	Usage the ISDN line of an outer line or extension line **0:**Outer line **1:**Extension line	When use the ISDN extension line, program the extension access number (communication switch 08), then change this bit to 1.
7	Not used	Do not change the setting.

Communication Switch 08		
No	**FUNCTION**	**COMMENTS**
0 to 7	Program the ISDN extension access number	When use the ISDN extension line, program the extension access number, then change communication switch 07 bit 6 to 1. The value can be between 00 and 99 (BCD). If the value is set to FF (BCD), it means that no number is programmed. Do not use any setting other than listed above.

Communication Switch 09 - Not used (do not change the settings)

Communication Switch 0A		
No	**FUNCTION**	**COMMENTS**
0	Point of resumption of memory transmission upon redialing **0:** From the error page **1:** From page 1	**0:** The transmission begins from the page where transmission failed the previous time. **1:** Transmission begins from the first page, using normal memory transmission.
1 to 6	Not used	Do not change the settings.
7	Emergency calls using 999 **0:** Enabled **1:** Disabled	If this bit is at 1, the machine will not allow you to dial 999 at the auto-dialer. This is a PTT requirement in the UK and some other countries.

Communication Switch 0B		
No	**FUNCTION**	**COMMENTS**
0	Use of Economy Transmission during a Transfer operation to end receivers **0:** Disabled **1:** Enabled	These bits determine whether the machine uses the Economy Transmission feature when it is carrying out a Transfer operation as a Transfer Station.
1	Use of Economy Transmission during a Transfer operation to the Next Transfer Stations **0:** Disabled **1:** Enabled	
2	Use of Label Insertion for the End Receivers in a Transfer operation **0:** Disabled **1:** Enabled	This bit determines whether the machine uses the Label Insertion feature when it is carrying out a Transfer operation as a Transfer Station.
3	Conditions required for Transfer Result Report transmission **0:** Always transmitted **1:** Only transmitted if there was an error	**0:** When acting as a Transfer Station, the machine will always send a Transfer Result Report back to the Requesting Station after completing the Transfer Request, even if there were no problems. **1:** The machine will only send back a Transfer Result Report if there were errors during communication so that one or more of the End Receivers could not be contacted.
4	Printout of the message when acting as a Transfer Station **0:** Disabled **1:** Enabled	When the machine is acting as a Transfer Station, this bit determines whether the machine prints the fax message coming in from the Requesting Terminal.

Communication Switch 0B		
No	**FUNCTION**	**COMMENTS**
5	Action when there is no fax number in the programmed Quick/Speed dials which meets the requesting terminal's own fax number **0:** Transfer is disabled **1:** Transfer is enabled	After the machine receives a transfer request, the machine compares the last N digits of the requesting terminal's own fax number with all the Quick/Speed dials programmed in the machine. (N is the number programmed in communication switch 0C.) **0:** If there is no matching number programmed in the machine, the machine rejects the transfer request. **1:** Even if there is no matching number programmed in the machine, the machine accepts the transfer request. The result report will be printed at the transfer terminal, but will not be sent back to the requesting terminal.
6 to 7	Not used	Do not change the settings.

Communication Switch 0C		
No	**FUNCTION**	**COMMENTS**
0 to 4	Number of digits compared to find the requester's fax number from the programmed Quick/Speed Dials when acting as a Transfer Station	00 - 1F (0 to 31 digits) After the machine receives a transfer request, the machine compares the own telephone number sent from the Requesting Terminal with all Quick/Speed Dials programmed in the machine, starting from Quick Dial 01 to the end of the Speed Dials. This number determines how many digits from the end of the telephone numbers the machine compares. If it is set to 00, the machine will send the report to the first Quick/Speed Dial that the machine compared. If Quick Dial 01 is programmed, the machine will send the report to Quick 01. If Quick Dial 01 through 04 are not programmed and Quick Dial 05 is programmed, the machine will send the report to Quick 05. Default setting - 05(H) = 5 digits
5 to 7	Not used	Do not change the settings.

Communication Switch 0D		
No	**FUNCTION**	**COMMENTS**
0 to 7	The available memory threshold, below which ringing detection (and therefore reception into memory) is disabled	00 to FF (Hex), unit = 2 kbytes (e.g., 0C(H) = 24 kbytes) One page is about 24 kbytes. The machine refers to this setting before each fax reception. If the amount of remaining memory is below this threshold, the machine cannot receive any fax messages. If this setting is kept at 0, the machine will detect ringing signals and go into receive mode even if there is no memory available. This will result in communication failure.

Communication Switch 0E		
No	**FUNCTION**	**COMMENTS**
0 to 7	Minimum interval between automatic dialing attempts	06 to FF (Hex), unit = 2 s (e.g., 06(H) = 12 s) This value is the minimum time that the machine waits before it dials the next destination.

Communication Switch 0F		
No	**FUNCTION**	**COMMENTS**
0 to 7	Minimum number of times that a destination will dialed when TRD is being used	01 - FF (Hex) times

Communication Switch 10		
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Maximum number of dialing attempts to the same destination	01 - FF (Hex) times

Communication Switch 11 - Not used (do not change the settings.)

Communication Switch 12		
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Interval between dialing attempts to the same destination	01 - FF (Hex) minutes

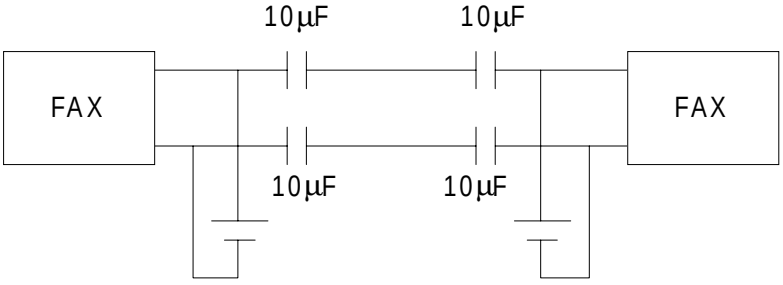
Communication Switch 13 - Not used (do not change the settings.)

Communication Switch 14		
No	**FUNCTION**	**COMMENTS**
0	Inch-to-mm conversion during transmission **0:** Disabled **1:** Enabled	**0:** In immediate transmission, data scanned in inch format are transmitted without conversion. In memory transmission, data stored in the SAF memory in mm format are transmitted without conversion. **Note:** When storing the scanned data into SAF memory, the fax unit always converts the data into mm format. **1:** The machine converts the scanned data or stored data in the SAF memory to the format which was specified in the set-up protocol (DIS/NSF) before transmission.
1 to 5	Not used	Do not change the factory settings.
6 7	Available unit of resolution in which fax messages are received **Bit 7 Bit 6 Unit** 0 0 mm 0 1 inch 1 0 mm and inch (default) 1 1 Not used	For the best performance, do not change the factory settings. The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 15 - Not used (do not change the settings)
Communication Switch 16 - Not used (do not change the settings)
Communication Switch 17 - Not used (do not change the settings)
Communication Switch 18 - Not used (do not change the settings)
Communication Switch 19 - Not used (do not change the settings)
Communication Switch 1A - Not used (do not change the settings)
Communication Switch 1B - Not used (do not change the settings)
Communication Switch 1C - Not used (do not change the settings)
Communication Switch 1D - Not used (do not change the settings)
Communication Switch 1E - Not used (do not change the settings)
Communication Switch 1F - Not used (do not change the settings)

4.2.5 G3 SWITCHES

G3 Switch 00		
No	**FUNCTION**	**COMMENTS**
0 **1**	Monitor speaker during communication (tx and rx) **Bit 1** **Bit 0** **Setting** 0 0 Disabled 0 1 Up to Phase B 1 0 All the time 1 1 Not used	**(0, 0):** The monitor speaker is disabled all through the communication. **(0, 1):** The monitor speaker is on up to phase B in the T.30 protocol. **(1, 0):** Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing.
2	Monitor speaker during memory transmission **0:** Disabled **1:** Enabled	**1:** The monitor speaker is enabled during memory transmission.
3 to 6	Not used	Do not change the settings.
7	Back to back test **0:** Disabled **1:** Enabled	Set this bit to 1 when you wish to do a back to back test. **115 V model:** Be sure to connect jumpers JP5 and JP6 on the NCU before doing the test. **220 V model:** Be sure to apply dc voltage between wires L1 and L2 on the NCU.



Back-to-Back Connection:
The dc power supplies should be adjusted so that the line current to the NCU is about 30mA.

G3 Switch 01		
No	**FUNCTION**	**COMMENTS**
0 to 3	Not used	Do not change the settings.
4	DIS frame length **0:** 10 bytes **1:** 4 bytes	**1:** The bytes in the DIS frame after the 4th byte will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames).
5	Not used	Do not change the setting.
6	CED/ANSam transmission **0:** Disabled **1:** Enabled	Do not change this setting, unless the communication problem is caused by the CED/ANSam transmission.
7	Not used	Do not change the setting.

G3 Switch 02		
No	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0:** Standard and non-standard **1:** Standard only	Change this bit to 1 only when the other end can only communicate with machines that send T.30-standard frames only. **1:** Disables NSF/NSS signals (these are used in non-standard mode communication)
1 to 4	Not used	Do not change the settings.
5	Use of modem rate history for transmission using Quick/Speed Dials **0:** Disabled **1:** Enabled	**0:** Communications using Quick/Speed Dials always start from the highest modem rate. **1:** The machine refers to the modem rate history for communications with the same machine when determining the most suitable rate for the current communication.
6	AI short protocol (transmission and reception) **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol.
7	Short preamble **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about Short Preamble.

G3 Switch 03		
No	**FUNCTION**	**COMMENTS**
0	DIS detection number (Echo countermeasure) **0:** 1 **1:** 2	**0:** The machine will hang up if it receives the same DIS frame twice. **1:** Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line.
1	V.8 protocol in manual reception **0:** Disabled **1:** Enabled	**0:** The machine sends CED instead of ANSam when starting a manual reception. **1:** The machine sends ANSam in manual reception.
2	V.8 protocol **0:** Disabled **1:** Enabled	**0:** V.8/V.34 communications will not be possible. **Note:** Do not change this setting unless the line condition is always bad enough to slow down the data rate below 14.4kbps.
3	ECM frame size **0:** 256 bytes **1:** 64 bytes	Keep this bit at "0" in most cases.
4	CTC transmission conditions **0:** After one PPR signal received **1:** After four PPR signals received (ITU-T standard)	**0:** When using ECM in non-standard (NSF/NSS) mode, the machine sends a CTC to drop back the modem rate after receiving a PPR, if the following condition is met in communications at 14.4, 12.0, 9.6, and 7.2 kbps. $\sqrt{N_{Transmit}} \leq N_{Resend}$ $N_{Transmit}$- Number of transmitted frames N_{Resend}- Number of frames to be retransmitted **1:** When using ECM, the machine sends a CTC to drop back the modem rate after receiving four PPRs. PPR, CTC: These are ECM protocol signals. This bit is not effective in V.34 communications.
5	Modem rate used for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The machine's tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used.
6 **7**	Not used	Do not change the setting.

G3 Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 3	Training error detection threshold	0 - F (Hex); 0 - 15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that training has succeeded.
4 to 7	Not used	Do not change the settings.

G3 Switch 05		
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.4 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers. If a modem rate slower than 14.4 kbps is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2
4 to 5	Initial modem type for 9.6 k or 7.2 kbps. **Bit 5 Bit 4 Setting** 0 0 V.29 0 1 V.17 1 0 Not used 1 1 Not used	These bits set the initial modem type for 9.6 and 7.2 kbps, if the initial modem rate is set at these speeds.
6 to 7	Not used	Do not change the settings.

G3 Switch 06		
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Rx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.4 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for reception. Use a lower setting if high speeds pose problems during reception. If a modem rate slower than 14.4 kbps is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2
4 to 7	Modem types available for reception **Bit 7 6 5 4 Setting** 0 0 0 1 V.27ter 0 0 1 0 V.27ter, V.29 0 0 1 1 V.27ter, V.29 V.33 0 1 0 0 V.27ter, V.29, V.17/V.33 0 1 0 1 V.27ter, V.29, V.17/V33, V.34 Other settings - Not used	The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode. If V.34 is not selected, V.8 protocol must be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2

G3 Switch 07		
No	**FUNCTION**	**COMMENTS**
0 to 1	PSTN cable equalizer (tx mode: Internal) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently. Note: This setting is not effective in V.34 communications.
2 to 3	PSTN cable equalizer (rx mode: Internal) **Bit 3 Bit 2 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. Note: This setting is not effective in V.34 communications.
4	PSTN cable equalizer (V.8/V.17 rx mode: External) **0**: Disabled **1**: Enabled	Keep this bit at “1”.
5	PSTN cable equalizer (V.34 rx mode; External)	Keep this bit at “1”.
6 7	Not used	Do not change the settings.

G3 Switch 08 - Not used (do not change the settings)

G3 Switch 09		
No	**FUNCTION**	**COMMENTS**
0 **to** **1**	ISDN cable equalizer (tx mode: Internal) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently. Note: This setting is not effective in V.34 communications.
2 **to** **3**	ISDN cable equalizer (rx mode: Internal) **Bit 3 Bit 2 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. Note: This setting is not effective in V.34 communications.
4	ISDN cable equalizer (V.8/V.17 rx mode: External) **0**: Disabled **1**: Enabled	Keep this bit at “0” in most cases.
5	ISDN cable equalizer (V.34 rx mode: External) **0**: Disabled **1**: Enabled	Keep this bit at “0” in most cases.
6 **7**	Not used	Do not change the settings.

G3 Switch 0A		
No	**FUNCTION**	**COMMENTS**
0 **1**	Maximum allowable carrier drop during image data reception **Bit 1** **Bit 0** **Value (ms)** 0 0 200 0 1 400 1 0 800 1 1 Not used	These bits set the acceptable modem carrier drop time. Try using a longer setting if error code 0-22 is frequent.
2 **3**	Not used	Do not change the settings.
4	Maximum allowable frame interval during image data reception. **0:** 5 s **1:** 13 s	This bit set the maximum intervals between each EOL signal (end-of-line) or intervals between each ECM frame from the other end. Try using a longer setting if error code 0-21 is frequent.
5	Not used	Do not change the setting.
6	Reconstruction time for the first line in receive mode **0:** 6 s **1:** 12 s	When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. This is outside the T.30 recommendation. But, if this delay occurs, set this bit to 1 to give the sending machine more time to send data. Refer to error code 0-20. ITU-T T.30 recommendation: The first line should come within 5 s of CFR.
7	Not used	Do not change the setting.

G3 Switch 0B		
No	**FUNCTION**	**COMMENTS**
0	Protocol requirements: Europe **0:** Disabled **1:** Enabled	The machine does not automatically reset these bits for each country after a country code (System Switch 0F) is programmed. Change the required bits manually at installation.
1	Protocol requirements: Spain **0:** Disabled **1:** Enabled	
2	Protocol requirements: Germany **0:** Disabled **1:** Enabled	
3	Protocol requirements: France **0:** Disabled **1:** Enabled	
4	PTT requirements: Germany **0:** Disabled **1:** Enabled	
5	PTT requirements: France **0:** Disabled **1:** Enabled	
6	Not used	Do not change the settings.
7	DTS requirements : Germany **0:** Disabled **1:** Enabled	Change this bit manually if required.

G3 Switch 0C		
No	**FUNCTION**	**COMMENTS**
0 **1**	Pulse dialing method **Bit 1** **Bit 0** **Setting** 0 0 Normal (P=N) 0 1 Oslo (P=10 - N) 1 0 Sweden (N+1) 1 1 Not used	P = Number of pulses sent out, N = Number dialed.
2 to 7	Not used	Do not change the settings.

G3 Switch 0D - Not used (do not change the settings)
G3 Switch 0E - Not used (do not change the settings)

G3 Switch 0F		
No	**FUNCTION**	**COMMENTS**
0	Alarm when an error occurred in Phase C or later **0**: Disabled **1**: Enabled	If the customer wants to hear an alarm after each error communication, change this bit to “1”.
1	Alarm when the handset is off-hook at the end of communication **0**: Disabled **1**: Enabled	If the customer wants to hear an alarm if the handset is off-hook at the end of fax communication, change this bit to “1”.
2 to 7	Not used	Do not change the settings.

4.3 NCU PARAMETERS

The following tables list the RAM addresses and units of calculation of the parameters that the machine uses for ringing signal detection and automatic dialing. The factory settings for each country are also given. Most of these must be changed by RAM read/write (Function 06-1), but some can be changed using NCU Parameter programming (Function 06-2); if Function 06-2 can be used, this will be indicated in the Remarks column. The RAM is programmed in hex code unless (BCD) is included in the Unit column.

Address	Function	Unit	Remarks
480400	Country code for NCU parameters	Use the Hex value to program the country code directly into this address, or use the decimal value to program it using Function 06-2 (parameter 00). **Country** — **Decimal** — **Hex** France — 00 — 00 Germany — 01 — 01 UK — 02 — 02 Italy — 03 — 03 Austria — 04 — 04 Belgium — 05 — 05 Denmark — 06 — 06 Finland — 07 — 07 Ireland — 08 — 08 Norway — 09 — 09 Sweden — 10 — 0A Switzerland — 11 — 0B Portugal — 12 — 0C Holland — 13 — 0D Spain — 14 — 0E Israel — 15 — 0F **USA — 17 — 11** Asia — 18 — 12 Hong Kong — 20 — 14 South Africa — 21 — 15 Australia — 22 — 16 New Zealand — 23 — 17 Singapore — 24 — 18 Malaysia — 25 — 19 China — 26 — 1A Taiwan — 27 — 1B Turkey — 32 — 20 Greece — 33 — 21	
480401	Line current detection time	20 ms	Line current detection is disabled. Line current is not detected if 480401 contains FF.
480402	Line current wait time		
480403	Line current drop detect time		

Address	Function	Unit	Remarks
480404	PSTN dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480405	PSTN dial tone frequency upper limit (low byte)		
480406	PSTN dial tone frequency lower limit (high byte)	Hz (BCD)	
480407	PSTN dial tone frequency lower limit (low byte)		
480408	PSTN dial tone detection time	20 ms	If 480408 contains FF, the machine pauses for the pause time (address 48040D / 48040E). See Note 2 (Italy).
480409	PSTN dial tone reset time (LOW)		
48040A	PSTN dial tone reset time (HIGH)		
48040B	PSTN dial tone continuous tone time		
48040C	PSTN dial tone permissible drop time		
48040D	PSTN wait interval (LOW)		
48040E	PSTN wait interval (HIGH)		
48040F	PSTN ringback tone detection time	20 ms	Detection is disabled if this contains FF.
480410	PSTN ringback tone off detection time	20 ms	
480411	PSTN detection time for silent period after ringback tone detected (LOW)	20 ms	
480412	PSTN detection time for silent period after ringback tone detected (HIGH)	20 ms	
480413	PSTN busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480414	PSTN busy tone frequency upper limit (low byte)		
480415	PSTN busy tone frequency lower limit (high byte)	Hz (BCD)	
480416	PSTN busy tone frequency lower limit (low byte)		
480417	PABX dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480418	PABX dial tone frequency upper limit (low byte)		
480419	PABX dial tone frequency lower limit (high byte)	Hz (BCD)	
48041A	PABX dial tone frequency lower limit (low byte)		
48041B	PABX dial tone detection time	20 ms	If 48041B contains FF, the machine pauses for the pause time (480420 / 480421).

Address	Function	Unit	Remarks
48041C	PABX dial tone reset time (LOW)	20 ms	
48041D	PABX dial tone reset time (HIGH)	20 ms	
48041E	PABX dial tone continuous tone time	20 ms	
48041F	PABX dial tone permissible drop time	20 ms	
480420	PABX wait interval (HIGH)	20 ms	
480421	PABX wait interval (LOW)	20 ms	
480422	PABX ringback tone detection time	20 ms	Detection is disabled if this contains FF.
480423	PABX ringback tone off detection time	20 ms	
480424	PABX detection time for silent period after ringback tone detected (LOW)	20 ms	
480425	PABX detection time for silent period after ringback tone detected (HIGH)	20 ms	
480426	PABX busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480427	PABX busy tone frequency upper limit (low byte)		
480428	PABX busy tone frequency lower limit (high byte)	Hz (BCD)	
480429	PABX busy tone frequency lower limit (low byte)		
48042A	Busy tone ON time: range 1	20 ms	
48042B	Busy tone OFF time: range 1	20 ms	
48042C	Busy tone ON time: range 2	20 ms	
48042D	Busy tone OFF time: range 2	20 ms	
48042E	Busy tone ON time: range 3	20 ms	
48042F	Busy tone OFF time: range 3	20 ms	
480430	Busy tone ON time: range 4	20 ms	
480431	Busy tone OFF time: range 4	20 ms	
480432	Busy tone continuous tone detection time	20 ms	

Address	Function	Unit	Remarks
480433	Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Bits 7 and 6 – number of cycles required for cadence detection in tx Bit 7 6 0 0 2 times 0 1 3 times 1 0 4 times 1 1 5 times Bits 5 and 4 - number of cycles required for cadence detection in rx Bit 5 4 0 0 2 times 0 1 3 times 1 0 4 times 1 1 5 times Bits 3 and 2 - Not used. Keep these bits at 0. Bits 1 and 0 - Tolerance (±) Bit 1 0 0 0 75% 0 1 50% 1 0 25% 1 1 12.5%		
480434	International dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480435	International dial tone frequency upper limit (low byte)		
480436	International dial tone frequency lower limit (high byte)	Hz (BCD)	
480437	International dial tone frequency lower limit (low byte)		
480438	International dial tone detection time	20 ms	If 480438 contains FF, the machine pauses for the pause time (48043D / 48043E). See Note 2 (Belgium).
480439	International dial tone reset time (LOW)	20 ms	
48043A	International dial tone reset time (HIGH)	20 ms	
48043B	International dial tone continuous tone time	20 ms	
48043C	International dial tone permissible drop time	20 ms	
48043D	International dial wait interval (HIGH)	20 ms	
48043E	International dial wait interval (LOW)	20 ms	
48043F	Country dial tone upper frequency limit (HIGH)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
480440	Country dial tone upper frequency limit (LOW)		

Address	Function	Unit	Remarks
480441	Country dial tone lower frequency limit (HIGH)	Hz(BCD)	
480442	Country dial tone lower frequency limit (LOW)		
480443	Country dial tone detection time	20 ms	If 480443 contains FF, the machine pauses for the pause time (480448 / 480449).
480444	Country dial tone reset time (LOW)		
480445	Country dial tone reset time (HIGH)		
480446	Country dial tone continuous tone time		
480447	Country dial tone permissible drop time		
480448	Country dial wait interval (LOW)		
480449	Country dial wait interval (HIGH)		
48044A	Time between opening or closing the DO relay and opening the OHDI relay	1 ms	See Notes 3 and 6. Function 06-2 (parameter 11).
48044B	Break time for pulse dialing	1 ms	See Note 3. Function 06-2 (parameter 12).
48044C	Make time for pulse dialing	1 ms	See Note 3. Function 06-2 (parameter 13).
48044D	Time between final OHDI relay closure and DO relay opening or closing	1 ms	See Notes 6. Function 06-2 (parameter 14). This parameter is only valid in Europe.
48044E	Minimum pause between dialled digits (pulse dial mode)	20 ms	See Note 3. Function 06-2 (parameter 15).
48044F	Time waited when a pause is entered at the operation panel		Function 06-2 (parameter 16).
480450	DTMF tone on time	1 ms	Function 06-2 (parameter 17).
480451	DTMF tone off time		Function 06-2 (parameter 18).
480452	Tone attenuation level of DTMF signals while dialing	-dBm x 0.5	Function 06-2 (parameter 19). See Note 5.
480453	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	-dBm x 0.5	Function 06-2 (parameter 20). The setting must be less than –5dBm, and should not exceed the setting at 480452h above. See Note 5.

Address	Function	Unit	Remarks
480454	PSTN: DTMF tone attenuation level after dialling	-dBm x 0.5	Function 06-2 (parameter 21). See Note 5.
480455	ISDN: DTMF tone attenuation level after dialling	-dBm x 0.5	See Note 5
480456	Not used		Do not change the settings.
480457	Time between 48044Dh (NCU parameter 14) and 48044Eh (NCU parameter 15)	1 ms	This parameter takes effect when the country code is set to France.
480458	Not used		Do not change the setting.
480459	Grounding time (ground start mode)	20 ms	The Gs relay is closed for this interval.
48045A	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
48045B	International dial access code (High)	BCD	For a code of 100: 48045B - F1 48045C - 00
48045C	International dial access code (Low)		
48045D	PSTN access pause time	20 ms	This time is waited for each pause input after the PSTN access code. If this address contains FF[H], the pause time stored in address 48044F is used. Do not set the number more than 7 in the UK.
48045E	Bits 7 to 5 - Progress tone detection level Bit 7 Bit 6 Bit 5 dBm 0 0 0 -25.0 0 0 1 -35.0 0 1 0 -30.0 0 1 1 -36.0 1 0 0 -40.0 1 1 0 -49.0 (-36dBm setting is only valid for 100Hz tone in Holland) Bits 4 and 3 - Not used Bit 2 - International dial tone detection method 0: Detect by time parameters 1: Detect by cadence parameters (Belgium - See Note 3) Bit 1 - Not used Bit 0 - PSTN dial tone detection method 0: Detect by time parameters 1: Detect by cadence parameters (Italy - See Note 3)		

Address	Function	Unit	Remarks
48045F	Bit 7 and 6 - Not used Bit 5 - Polarity change detection in rx (1: Enabled) Bit 4 - Polarity change detection in tx (1: Enabled) Bits 3 to 0 - Not used		Detection time is 500 ms in both tx and rx. See Note 8.
480460 to 480464	Not used		Do not change the settings.
480465	Long distance call prefix (HIGH)	BCD	For a code of 0: 480465 - FF 480466 - F0
480466	Long distance call prefix (LOW)	BCD	
480467 to 480471	Not used		Do not change the settings.
480472	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz).	Function 06-2 (parameter 02).
480473	Acceptable ringing signal frequency: range 1, lower limit		Function 06-2 (parameter 03).
480474	Acceptable ringing signal frequency: range 2, upper limit		Function 06-2 (parameter 04).
480475	Acceptable ringing signal frequency: range 2, lower limit		Function 06-2 (parameter 05).
480476	Number or rings until a call is detected	1	Function 06-2 (parameter 06). The setting must not be zero (0).
480477	Minimum required length of the first ring	20 ms	See Note 4. Function 06-2 (parameter 07).
480478	Minimum required length of the second and subsequent rings	20 ms	Function 06-2 (parameter 06-2).
480479	Ringing signal detection reset time (LOW)	20 ms	Function 06-2 (parameter 09).
48047A	Ringing signal detection reset time (HIGH)		Function 06-2 (parameter 10).
48047B to 480480	Not used		Do not change the settings.
480481	Interval between dialing the last digit and switching the Oh relay over to the external telephone when dialing from the operation panel in handset mode.	20 ms	Factory setting: 500 ms

Address	Function	Unit	Remarks
480482	Bits 0 and 1 - Handset off-hook detection time **Bit 1 0 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 2 and 3 - Handset on-hook detection time **Bit 3 2 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 4 to 7 - Not used		
480483 to 4804A0	Not used		Do not change the settings.
4804A1	Acceptable CED detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(F), tone detection is disabled.
4804A2	Acceptable CED detection frequency upper limit (low byte)		
4804A3	Acceptable CED detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(F), tone detection is disabled.
4804A4	Acceptable CED detection frequency lower limit (low byte)		
4804A5	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms
4804A6	Acceptable CNG detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(F), tone detection is disabled.
4804A7	Acceptable CNG detection frequency upper limit (low byte)		
4804A8	Acceptable CNG detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(F), tone detection is disabled.
4804A9	Acceptable CNG detection frequency lower limit (low byte)		
4804AA	Not used		Do not change the setting.
4804AB	CNG on time	20 ms	Factory setting: 500 ms
4804AC	CNG off time	20 ms	Factory setting: 200 ms

Address	Function	Unit	Remarks
4804AD	CNG On/Off time tolerance, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Bits 7, 6, 5, 4 - number of cycles required for cadence detection Bits 3 and 2 - OFF time tolerance (±) Bit 3 2 OFF time tolerance 0 0 75% 0 1 50% 1 0 25% 1 1 12.5% Bits 1 and 0 – ON time tolerance (±) Bit 1 0 ON time tolerance 0 0 75% 0 1 50% 1 0 25% 1 1 12.5%		
4804AE	Not used		Do not change the settings.
4804AF	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(F), tone detection is disabled.
4804B0	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (low byte)		If both addresses contain FF(F), tone detection is disabled.
4804B1	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(F), tone detection is disabled.
4804B2	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (low byte)		If both addresses contain FF(F), tone detection is disabled.
4804B3	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
4804B4	PSTN: Tx level from the modem	- dBm	Function 06-2 (parameter 01).
4804B5	PSTN: 1100 Hz tone transmission level	- N 4804B4 - 0.5N 4804B5 (dB) See Note 7.	
4804B6	PSTN: 2100 Hz tone transmission level	- N4804B4 - 0.5N 4804B6 (dB) See Note 7.	
4804BA	ISDN: Tx level from the modem	- dBm	The setting must be between -12dBm and -15dBm.
4804BB	ISDN: 1100 Hz tone transmission level	- N 4804BA - 0.5N 4804BB (dB)	
4804BC	ISDN: 2100 Hz tone transmission level	- N 4804BA - 0.5N 4804BC (dB)	

Address	Function	Unit	Remarks
4804BD	Modem turn-on/off level (incoming signal detection level) **Turn-on level** 00 (H): -33dBm 01 – 0A (H): -38 dBm 0B – 14 (H): -43 dBm 15 – 1F (H): -48 dBm **Turn-off level** The turn-off level is automatically set at “turn-on level minus 3 dBm”.		
4804BE to 4804C6	Not used		Do not change the settings.
4804C7	Bits 0 to 3 – Not used. Bit 4 – V.34 protocol dump **0:** Simple, **1:** Detailed (default) Bits 5 to 7 – Not used.		
4804C8 to 4804D9	Not used		Do not change the settings.
4804DA	T.30 T1 timer	1 s	

NOTES

1. If a setting is not required, store FF in the address.
2. Italy and Belgium only

   RAM address 48045E: the lower four bits have the following meaning.
   Bit 2 1: International dial tone cadence detection enabled (Belgium)
   Bit 1 Not used
   Bit 0 1: PSTN dial tone cadence detection enabled (Italy)

   If bit 0 or bit 2 is set to 1, the functions of the following RAM addresses are changed.
   480408 (if bit 0 = 1) or 480438 (if bit 2 = 1): tolerance for on or off state duration (%), and number of cycles required for detection, coded as in address 480433.
   48040B (if bit 0 = 1) or 48043B (if bit 2 = 1): on time, hex code (unit = 20 ms)
   48040C (if bit 0 = 1) or 48043C(if bit 2 = 1): off time, hex code (unit = 20 ms)
3. Pulse dial parameters (addresses 48044A to 48044F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.
4. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.
5. The calculated level must be between 0 and 10.
   The attenuation levels calculated from RAM data are:
   High frequency tone: - 0.5 x $N_{480452/480454/480455}$ dBm
   Low frequency tone: - 0.5 x ($N_{480452/480454/480455}$ + N_{480453}) dBm
   Note: N_{480452}, for example, means the value stored in address 480452(H)
6. 48044A: Europe - Between Ds opening and Di opening, France - Between Ds closing and Di opening
   48044D: Europe - Between Ds closing and Di closing, France - Between Ds opening and Di closing
7. Tone signals which frequency is lower than 1500Hz (e.g., 800Hz tone for AI short protocol) refer to the setting at 4804B5h. Tones which frequency is higher than 1500Hz refer to the setting at 4804B6h.
8. Polarity change detection in transmission starts after dialing has been finished in automatic dialing mode, or after Start key is pressed in manual dialing mode. Polarity change detection in reception should be enabled in Spain.

4.4 DEDICATED TRANSMISSION PARAMETERS

Each Quick Dial Key and Speed Dial Code has eight bytes of programmable parameters allocated to it. If transmissions to a particular machine often experience problems, store that terminal's fax number as a Quick Dial or Speed Dial, and adjust the parameters allocated to that number.

The programming procedure will be explained first. Then, the eight bytes will be described.

4.4.1 PROGRAMMING PROCEDURE

1. Make sure the machine is in 'Facsimile' mode. Press 'User Tools' key then choose 'Fax'.
2. Press [1], then either choose 'Registering Quick Dial' or 'Registering Speed Dial'.
   Example: Change the Parameters in Quick Dial 10.
3. Press Quick Dial key 10.
   NOTE: The selected Quick or Speed Dial must be programmed beforehand.
4. When the programmed dial number is displayed, press S - V - C using Quick Dial keys, then press 'Start'.
5. The settings for byte 0 are now displayed. Press a number from 0 to 7 corresponding to the bit that you wish to change.
   Example: Change bit 7 to 1: Press 7
6. To scroll through the parameter bytes, either:
   Select the next byte: press '↓ Switch'
   or
   Select the previous byte: press '↑ Switch'
   until the correct byte is displayed. Then go back to step 6.
7. After the setting is changed, press OK.
8. To finish, press 'User Tools'.

4.4.2 PARAMETERS

The initial settings of the following parameters are all FF(H) - all the parameters are disabled.

Switch 01
FUNCTION AND COMMENTS
CCITT T1 time (for PSTN G3 mode) If the connection time to a particular terminal is longer than the NCU parameter setting , adjust this byte. The T1 time is the value stored in this byte (in hex code), multiplied by 1 second. **Range:** 1 to 127 s (01h to 7Fh) 00h or FFh - The local NCU parameter factory setting is used. Do not program a value between 80h and FEh.

Switch 02		
No	**FUNCTION**	**COMMENTS**
0 to 4	Tx level **Bit 4 3 2 1 0 Setting** 0 0 0 0 0 0 0 0 0 0 1 -1 0 0 0 1 0 -2 0 0 0 1 1 -3 0 0 1 0 0 -4 : : 0 1 1 1 1 -15 1 1 1 1 1 Disabled	If communication with a particular remote terminal often contains errors, the signal level may be inappropriate. Adjust the Tx level for communications with that terminal until the results are better. When disabled, the NCU parameter 01 setting is used. **Note:** Do not use settings other than listed on the left.
5 to 7	Cable equalizer **Bit 7 6 5 Setting** 0 0 0 None 0 0 1 Low 0 1 0 Medium 0 1 1 High 1 1 1 Disabled	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange when calling the number stored in this Quick/Speed Dial. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. **Note:** Do not use settings other than listed on the left.

Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 0 Not used 0 0 0 1 2,400 0 0 1 0 4,800 0 0 1 1 7,200 0 1 0 0 9,600 0 1 0 1 12,000 0 1 1 0 14,400 0 1 1 1 16,800 1 0 0 0 19,200 1 0 0 1 21,600 1 0 1 0 24,000 1 0 1 1 26,400 1 1 0 0 28,800 1 1 0 1 31,200 1 1 1 0 33,600 1 1 1 1 Disabled	If training with a particular remote terminal always takes too long, the initial modem rate may be too high. Reduce the initial Tx modem rate using these bits. For the settings slower than 14.4 kbps, Switch 04 bit 4 must be changed to 0.
4 to 7	Not used	Do not change the settings.

Switch 04		
No	**FUNCTION**	**COMMENTS**
0 1	Inch-mm conversion before tx **Bit 1 Bit 0 Setting** 0 0 Inch-mm conversion available 0 1 Inch only 1 0 Not used 1 1 Disabled	The machine uses inch-based resolutions for scanning. If “inch only” is selected, the printed copy may be slightly distorted at the other end if that machine uses mm-based resolutions.
2 to 3	DIS/NSF detection method **Bit 3 Bit 2 Setting** 0 0 First DIS or NSF 0 1 Second DIS or NSF 1 0 Not used 1 1 Disabled	**(0, 1):** Use this setting if echoes on the line are interfering with the set-up protocol at the start of transmission. The machine will then wait for the second DIS or NSF before sending DCS or NSS.
4	V.8 protocol **0**: Disabled **1**: Enabled	If transmissions to a specific destination always end at a lower modem rate (lower than 14,400 bps), disable V.8 protocol so as not to use V.34 protocol. **0:** V.34 communication will not be possible.

Switch 04		
No	**FUNCTION**	**COMMENTS**
5	Compression modes available in transmit mode **0:** MH only **1:** All available compression modes	This bit determines the capabilities that are informed to the other terminal during transmission.
6 **7**	ECM during transmission **Bit 7 Bit 6 Setting** 0 0 Disabled 0 1 Enabled 1 0 Not used 1 1 Disabled	For example, if ECM is switched on but is not wanted when sending to a particular terminal, use the (0, 0) setting. Note that V.8/V.34 protocol and JBIG compression are automatically disabled if ECM is disabled.

Switch 05 - Optional ISDN G4 kit required		
No	**FUNCTION**	**COMMENTS**
0 **to** **3**	Data rate **Bits 3 2 1 0 Setting** 0 0 0 0 64 kbps 0 0 0 1 56 kbps 1 1 1 1 Disabled	When disabled, the G4 parameter switch 2 (bits 0 and 1) setting is used.
4 **to** **7**	Not used	Do not change the settings.

Switch 06 - Optional ISDN G4 kit required		
No	**FUNCTION**	**COMMENTS**
0 **to** **3**	Link Modules **Bits 3 2 1 0 Setting** 0 0 0 0 Modulo 8 0 0 0 1 Modulo 128 1 1 1 1 Disabled	When disabled, the G4 parameter switch 3 (bit 0) setting is used.
4 **to** **7**	Not used	Do not change the settings.

Switch 07 - Optional ISDN G4 kit required		
No	**FUNCTION**	**COMMENTS**
0 **to** **3**	Layer 3 protocol **Bits 3 2 1 0** Setting 0 0 0 0 ISO 8208 0 0 0 1 T.70 NULL 1 1 1 1 Disabled	When disabled, the G4 parameter switch 6 (bit 0) setting is used.
4 **to** **7**	Packet modules **Bits 3 2 1 0 Setting** 0 0 0 0 Modulo 9 0 0 0 1 Modulo 128 1 1 1 1 Disabled	When disabled, the G4 parameter switch 6 (bit 4) setting is used.

Switch 08 - Not used

4.5 SERVICE RAM ADDRESSES

⚠CAUTION
Do not change the settings which are marked as "Not used" or "Read only."

011000 to 011007(H) – ROM name (ASCII)
011009 to 011012(H) – ROM part number (ASCII)
011017 to 011020(H) – ROM version number (ASCII)
011022 to 01102A(H) – ROM release date (ASCII)

480001 to 480004(H) - ROM version (Read only)
480001(H) - Revision number (BCD)
480002(H) - Year (BCD)
480003(H) - Month (BCD)
480004(H) - Day (BCD)

480006 to 480015(H) - Machine's serial number (16 digits - ASCII)

480018(H) - Total program checksum (low)
480019(H) - Total program checksum (high)

480020 to 48003F(H) - System bit switches
480040 to 48004F(H) - Scanner bit switches
480050 to 48005F(H) - Printer bit switches
480060 to 48007F(H) - Communication bit switches
480080 to 48008F(H) - G3 bit switches

4800A0(H) - User parameter switch 00 (SWUER_00)
Bit 0: Stamp home position 0: Disabled, 1: Enabled
Bits 1 to 3: Scanning contrast home position

Bit 3	2	1	Setting
0	0	0	Automatic
0	0	1	Position 1 (Lightest)
0	1	0	Position 2
0	1	1	Position 3 (Medium)
1	0	0	Position 4
1	0	1	Position 5 (Darkest)

Bits 4 and 5: Scanning resolution home position

Bit 5	4	Setting
0	0	Standard
0	1	Detail
1	0	Superfine
1	1	Superfine

Bit 6: Transmission mode home position 0: Memory tx, 1: Immediate tx
Bit 7: Not used

4800A1(H) - User parameter switch 01 (SWUSR_01)

Bit 0: Label insertion home position 0: Disabled, 1: Enabled
Bit 1: ID transmission home position 0: Disabled, 1: Enabled
Bit 2: Automatic reduction (tx) home position 0: Disabled, 1: Enabled
Bits 3 and 4: Scanning mode LED home position

Bit	4	3	Setting
	0	0	Text
	0	1	Text/ Photo
	1	0	Photo
	1	1	Special Original (See Note below)

NOTE: "Special Original" setting is not explained in the Operator's Manual, because it can be selected only if System Switch 19 – bit 7 is set to "1".

Bit 5: TTI print home position 0: Disabled, 1: Enabled
Bit 6: Not used
Bit 7: Settings return to home position after scanning 0: Disabled, 1: Enabled

4800A2(H) - User parameter switch 02 (SWUSR_02)

Bit 0: Forwarding mark printing on forwarded messages 0: Disabled, 1: Enabled
Bit 1: Center mark printing on received copies 0: Disabled, 1: Enabled
Bit 2: Reception time printing 0: Disabled, 1: Enabled
Bit 3: TSI print on received messages 0: Disabled, 1: Enabled
Bit 4: Checkered mark printing 0: Disabled, 1: Enabled
Bit 5: CIL printing (G4) 0: Disabled, 1: Enabled
Bit 6: TID printing (G4) 0: Disabled, 1: Enabled
Bit 7: Not used

4800A3(H) - User parameter switch 03 (SWUSR_03: Automatic report printout)

Bit 0: Transmission result report (memory transmissions) 0: Off, 1: On
Bit 1: Not used
Bit 2: Memory storage report 0: Off, 1: On
Bit 3: Polling reserve report (polling reception) 0: Off, 1: On
Bit 4: Polling result report (polling reception) 0: Off, 1: On
Bit 5: Transmission result report (immediate transmissions) 0: Off, 1: On
Bit 6: Polling clear report 0: Off, 1: On
Bit 7: TCR (Journal) 0: Off, 1: On

4800A4(H) - User parameter switch 04 (SWUSR_04: Automatic report printout)

Bit 0: Automatic confidential reception report output 0: Off, 1: On
Bits 1 to 6: Not used
Bit 7: Inclusion of a sample image on reports 0: Off, 1: On

4800A5(H) - User parameter switch 05 (SWUSR_05)
Bit 0: Substitute reception when the base copier is in SC condition 0: Off, 1: On
Bits 1 and 2: Condition for substitute rx when the machine cannot print messages (Paper end, Toner end, and Jam in night mode)

Bit 2	1	Setting
0	0	The machine receives all the fax messages
0	1	The machine receives the fax messages with RTI or CSI
1	0	The machine receives the fax messages with the same ID code
1	1	The machine does not receive anything.

Bit 3: Not used
Bit 4: Restricted Access using personal code 0: Off, 1: On
Bit 5: Just size printing 0: Off, 1: On
Bit 6: Allow document with mixed paper sizes in the ADF 0: No, 1: Yes
Bit 7: Add paper display when a cassette is empty 0: Off, 1: On

4800A6(H) - User parameter switch 06 (SWUSR_06)
Bit 0: Not used
Bit 1: G3/G4 LED home position 0: G3, 1: G4
Bit 2 to 4: Not used
Bit 5: Quick dial label print format
0: Suitable for white paper, 1: Suitable for transparent paper
Bit 6: Scan sequence in Book transmission
0: Left to right, 1: Right to left
Bit 7: Not used

4800A7(H) - User parameter switch 07 (SWUSR_07)
Bits 0 and 1: Not used
Bit 2: Parallel memory transmission 0: Off, 1: On
Bits 3 and 7: Not used

4800A8(H) - User parameter switch 08 (SWUSR_08)
Bit 0 and 1: Not used.
Bit 2: Authorized reception
0: Only faxes from senders whose RTIs/CSIs are specified for this feature are accepted.
1: Only faxes from senders whose RTIs/CSIs are not specified for this feature are accepted.
Bits 3 to 7: Not used.

4800A9(H) - User parameter switch 09 (SWUSR_09)
Bits 0 to 7: Not used

4800AA(H) - User parameter switch 10 (SWUSR_0A)
Bit 0: Not used
Bit 1: 2 into 1 0: Off, 1: On
Bit 2: Not used
Bit 3: Page reduction 0: Off, 1: On
Bits 4 to 7: Not used

4800AB(H) - User parameter switch 11 (SWUSR_0B)

Bit 0: Not used
Bit 1: Method of transmitting numbers after the “Tone” mark over an ISDN line
0: UUI, 1: Tone
Bits 2 to 5: Not used
Bit 6: Printout of messages received while acting as a forwarding station
0: Off, 1: On
Bit 7: Polling Standby duration 0: Once, 1: No limit

4800AD(H) - PSTN access method (SWUSR_0D)

Bits 0 and 1: PSTN access method from behind a PABX

Bit 1	0	Setting
0	0	PSTN
0	1	Loop start
1	0	Ground start
1	1	Flash start

Bits 2 to 7: Not used

4800AE(H) - Function settings (SWUSR_0E)

Bit 0: Message printout while the machine is in Night Timer mode 0: On, 1: Off
Bit 1: Not used
Bit 2: Batch transmission 0: Off, 1: On
Bit 3: Unconditional forwarding 0: Off, 1: On
Bits 4 to 6: Not used
Bit 7: Manual service call (system parameter list tx) 0: Off, 1: On

4800AF(H) - Function settings (SWUSR_0F)

Bits 0, 1 and 2: Cassette for fax printout

Bit 2	1	0	Setting
0	0	1	1st paper feed station
0	1	0	2nd paper feed station
0	1	1	3rd paper feed station
1	0	0	4th paper feed station
1	0	1	LCT
Other settings			Not used

Bits 3 and 4: Not used
Bit 5: Using the cassette specified by bits 0, 1 and 2 above only 0: On, 1: Off
Bits 6 and 7: Not used

4800B0(H) – Function settings (SWUSR_10)

Bits 0 and 1: Not used
Bit 2: Paper size selection priority for A4 size fax message when A4/LT size paper is not available.
0: A3 has priority, 1: B4 has priority
Bits 3 to 7: Not used

4800B1(H) – Function settings (SWUSR_11)
Bits 0 and 1: Not used
Bit 2: Necessity of “Add” button to add a destination for broadcasting
0: Yes (users have to press “Add” after selecting a destination)
1: No (selected destination is added without pressing “Add” button
Bits 3 to 7: Not used

4800B8(H) - Function settings (SWUSR_18)
Bits 0 and 1: File retention time

Bit 1	0	Setting
0	0	Disabled
0	1	24 hours
1	0	Disabled
1	1	72 hours

Bits 2 to 7: Not used

4800B9(H) - Function settings (SWUSR_19)
Bits 0 to 3: Not used
Bit 4: RDS operation 0: Not acceptable
1: Acceptable for the limit specified by system switch 03
Note: This bit is only effective when RDS operation can be selected by the user.
Bits 5 and 6: Not used
Bit 7: Daylight saving time 0: Disabled, 1: Enabled

4800BA(H) - Fucntion settings (SWUSR_1A)
Bit 0: Not used
Bit 1: Dialing type 0: Pulse dialing (10 pps), 1: Tone (DTMF) dialing
Bits 2 to 7: Not used

4800BB(H) - PSTN access number from behind PABX (SWUSR_1B)

Access number	Hex value to program (BCD)
0	F0
⇩	⇩
0	F0
00	00
⇩	⇩
99	99

4800C0 to 4800CF(H) - G4 Parameter Switches
(Refer to the ISDN G4 option service manual for details.)

4800D0 to 4800EF(H) - G4 Internal Switches
(Refer to the ISDN G4 option service manual for details.)

4800F0 to 480103(H) - RTI (Max. 20 characters - ASCII) - See the following note.
480104 to 480117(H) - CSI (Max. 20 characters - ASCII)
480118 to 800137(H) - TTI (Max. 32 characters - ASCII) - See the following note.
480138(H) - Number of CSI characters (Hex)

NOTE: If the number of characters is less than the maximum (20 for RTI, 32 for TTI), add a stop code (FF[H]) after the last character.

480139 to 480147(H) - Service station's fax number (Service mode 09)
See 48018F(H) for the type of network used for this number**.**

480157 to 480165(H) - Own fax number (PSTN)
480166 to 480174(H) - Own fax number (ISDN G4)
480175 to 480183(H) - Own fax number (ISDN G3)

480184(H) - ID code (low - Hex)
480185(H) - ID code (high - Hex)

480186(H) - Confidential ID (low - BCD)
480187(H) - Confidential ID (high - BCD)

480188(H) - Memory lock ID (low - Hex)
480189(H) - Memory lock ID (high - Hex)

48018F(H) - Network type used for the service station number
00(H) - G3 (PSTN)
01(H) - G4 (ISDN)

480198 to 48019F(H) - Last power off time (Read only)
480198(H) - 01(H) - 24-hour clock, 00(H) - 12-hour clock (AM), 02(H) - 12-hour clock (PM)
480199(H) - Year (BCD)
48019A(H) - Month (BCD)
48019B(H) - Day (BCD)
48019C(H) - Hour
48019D(H) - Minute
48019E(H) - Second
48019F(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday

4801AC(H) - Optional equipment (Read only – Do not change the setting)

Bit 0: PMU	0: Not installed, 1: Installed
Bit 1: Not used	
Bit 2: Not used	
Bit 3: EXSAF	0: Not installed, 1: Installed
Bit 4: Hard disk	0: Not installed, 1: Installed
Bit 5: Not used	
Bit 6: ISDN unit	0: Not installed, 1: Installed
Bit 7: Not used	

4801AE(H) - Optional equipment (Read only – Do not change the setting)

Bit 0: Bank	0: Not installed, 1: Installed
Bit 1: 1-bin tray	0: Not installed, 1: Installed
Bit 2: Duplex unit	0: Not installed, 1: Installed
Bit 3: Finisher (1,000 or 3,000)	0: Not installed, 1: Installed (See Note)
Bit 4: LCT	0: Not installed, 1: Installed
Bit 5: Bypass tray	0: Not installed, 1: Installed
Bit 6: Mailbox	0: Not installed, 1: Installed
Bit 7: Bridge unit	0: Not installed, 1: Installed (See Note)

NOTE: Bridge unit status changes to “Not installed” when a finisher is installed in the machine.

4801AF(H) - Optional equipment (Read only – Do not change the setting)

Bit 0: Not used	
Bit 1: Not used	
Bit 2: ARDF	0: Not installed, 1: Installed
Bit 3: Stamp	0: Not installed, 1: Installed
Bit 4: MSU	0: Not installed, 1: Installed
Bits 5 to 7: Not used	

4802AE to 4802C5(H) - G4 terminal ID (ASCII - Max. 24 characters)

4802C6 to 4802D9(H) - ISDN G3 CSI (ASCII - Max. 20 digits)

4802DA(H) - Number of digits programmed in the ISDN G3 CSI (Hex)

4802DB to 4802DE(H) - ISDN IP

4802DF to 4802E2(H) - ISDN G3 sub-address

4802E3 to 4802E6(H) - ISDN G4 sub-address

4802E7 to 4802EB(H) - CiG4 board ROM information

- 4802E7(H) - Suffix
- 4802E8(H) - Version (BCD)
- 4802E9(H) - Year (BCD)
- 4802EA(H) - Month (BCD)
- 4802EB(H) - Day (BCD)

480300(H) - Number of copies for multi-sort document reception

480356(H) - Time for economy transmission (hour in 24h clock format - BCD)
480357(H) - Time for economy transmission (minute - BCD)

480372(H) - Transmission monitor volume 00 - 07(H)
480373(H) - Reception monitor volume 00 - 07(H)
480374(H) - On-hook monitor volume 00 - 07(H)
480375(H) - Dialing monitor volume 00 - 07(H)
480376(H) - Buzzer volume 00 - 07(H)

480379 to 48037D(H) - Periodic service call parameters (Refer to section 2.1.2 for details)

480383 to 480385(H) - Effective term of automatic service calls (Refer to section 2.1.4 for details)

48038C to 48038D(H) – Modem ROM information
48038C(H) – Modem ROM version (Low)
48038D(H) – Modem ROM version (High)
48038E(H) – Modem ROM checksum value (Low)
48038F(H) – Modem ROM checksum value (High)

480400 to 4804DA(H) - NCU parameters (Refer to section 4.3 for details)

480A30 to 480A57(H) - SC codes NOT for automatic service call

If the fax unit receives an SC code from the copier engine other than programmed in these addresses, the fax unit sends an automatic service call report to the programmed service station.
Six SC codes have already been programmed at default, as shown in the table below. Four more SC codes can be programmed, if required (if an address contains FF(H), a code is not programmed in it).
Program a SC code in four-digit BCD format as shown in the example below.
Example 1: SC code '192'
Address (High) - 01(BCD)
Address (Low) - 92 (BCD)

Wildcard characters "a" or "A" can be used to specify a series of SC codes.
Example 2: SC code '900 to 999"
Address (High) – 09 (BCD)
Address (Low) – aa or AA (Hex)

Example 3: SC code '330 to 339"
Address (High) – 03 (BCD)
Address (Low) – 3a or 3A (Hex)

- Default settings -

High Address (H)	Data (BCD)	Low Address (L)	Data (BCD)	SC code
480A30	03	480A31	29	329
480A32	03	480A33	61	361
480A34	03	480A35	65	365
480A36	05	480A37	48	548
480A38	06	480A39	30	630
480A3A	09	480A3B	AA	900 to 999
480A3C to 480A56	FF(H)	480A3D to 480A57	FF(H)	Not Programmed

480A58 to 480AD6(H) – Fax operation log data

Each of the following counters uses 4 bytes. The data is stored in hexadecimal format as shown in the example below.

480A58 to 480A5B(H) – Total number of transmissions

Example 1

The counter value is 01 00 01 85 (Hex) = 65,925 (decimal), when the data is stored as follows:

- 480A58 – 85(H)
- 480A59 – 01(H)
- 480A5A – 01(H)
- 480A5B – 00(H)

480A5C to 480A5F(H) – Total number of receptions
480A60 to 480A63(H) – Number of transmitted pages
480A64 to 480A67(H) – Number of received pages
480A68 to 480A6B(H) – Number of G3/IG3 transmissions
480A6C to 480A6F(H) – Number of G4 transmissions
480A70 to 480A73(H) – Number of G3/IG3 receptions
480A74 to 480A77(H) – Number of G4 receptions

Each of the following counters uses 2 bytes. The data is stored in hexadecimal format as shown in the example below.

480A78 to 480A79(H) – Number of pages scanned at 8 x 3.85 l/mm

Example 2

The counter value is 01 85 (Hex) = 389 (decimal), when the data is stored as follows:

- 480A78 – 85(H)
- 480A79 – 01(H)

480A7A to 480A7B(H) – Number of pages scanned at 8 x 7.7 l/mm
480A7C to 480A7D(H) – Number of pages scanned at 8 x 15.4 l/mm
480A7E to 480A7F(H) – Number of pages scanned at 16 x 15.4 l/mm
480A80 to 480A81(H) – Number of pages scanned at 200 x 100 dpi
480A82 to 480A83(H) – Number of pages scanned at 200 x 200 dpi
480A84 to 480A85(H) – Number of pages scanned at 200 x 400 dpi
480A86 to 480A87(H) – Number of pages scanned at 400 x 400 dpi

Each of the following counters uses 4 bytes. The data is stored in hexadecimal format as shown in example 1 above.

480A88 to 480A8B(H) – Total number of scanned pages
480A8C to 480A8F(H) – Number of scanned pages of A4 width
480A90 to 480A93(H) – Number of scanned pages of B4 width
480A94 to 480A97(H) – Number of scanned pages of A3 width
480A98 to 480A9B(H) – Number of scanned pages in Text mode
480A9C to 480A9F(H) – Number of scanned pages in Photo mode
480AA0 to 480AA3(H) – Number of scanned pages in Text/Photo mode

480AA4 to 480AA7(H) – Number of scanned pages in Special Original mode
480AA8 to 480AAB(H) – Total number of transmission jobs
480AAC to 480AAF(H) – Total number of memory transmissions

Each of the following counters uses 2 bytes. The data is stored in hexadecimal format as shown in example 2 above.

480AB0 to 480AB1(H) – Number of send later transmissions
480AB2 to 480AB3(H) – Number of TRD transmissions
480AB4 to 480AB5(H) – Number of confidential transmissions
480AB6 to 480AB7(H) – Number of transfer request transmissions
480AB8 to 480AB9(H) – Number of transfer broadcasts
480ABA to 480ABB(H) – Number of broadcasts
480ABC to 480ABD(H) – Number of polling transmissions
480ABE to 480ABF(H) – Number of image rotation transmissions
480AC0 to 480AC1(H) – Number of label insertions
480AC2 to 480AC3(H) – Number of 2-sided original transmissions
480AC4 to 480AC5(H) – Not used
480AC6 to 480AC7(H) – Number of confidential receptions
480AC8 to 480AC9(H) – Number of memory lock receptions
480ACA to 480ACB(H) – Number of receptions from specific senders
480ACC to 480ACD(H) – Number of polling receptions

492D00 to 4931DF(H) - Dedicated tx parameters for Quick Dial 01 - 56 and Speed Dial #00 - #99.

As explained in section 4.4, each set of dedicated tx parameters consists of 8 bytes.

492D00 to 492D07(H) - Dedicated tx parameters for Quick 01
492D08 to 492D0F(H) - Dedicated tx parameters for Quick 02
492D10 to 492D17(H) - Dedicated tx parameters for Quick 03
⇩
492EB8 to 492EBF(H) - Dedicated tx parameters for Quick 56
492EC0 to 492EC7(H) - Dedicated tx parameters for Speed #00
492EC8 to 492ECFH) - Dedicated tx parameters for Speed #01
492ED0 to 492ED7(H) - Dedicated tx parameters for Speed #03
⇩
4931D8 to 4931DF(H) - Dedicated tx parameters for Speed #99

49CA00 to 49CB7F(H) - Latest 64 error codes (Read only)

One error record consists of 6 bytes of data.

First error record start address – 49CA00(H)
Second error record start address – 49CA06(H)
Third error record start address – 49CA0C(H)
:
64th error record start address – 49CB7A(H)

The format is as follows:
1st byte - Minute (BCD)
2nd byte - Hour (BCD)
3rd byte - Day (BCD)
4th byte - Month (BCD)
5th byte - Error code (low) [If the error code is 1-23, 23 is stored here.]
6th byte - Error code (high) [If the error code is 1-23, 01 is stored here.]

49F084 to 49F763(H) - Latest 20 error communication records (Read only)

One error communication record consists of 88 bytes. The format is as follows:

1st byte - Header
Bit 0: Communication result 0: OK, 1: NG
Bit 1: Document jam 1: Occurred
Bit 2: Power down 1: Occurred
Bit 3: Not used
Bit 4: Technical data printout instead of personal codes 0: No, 1: Yes
Bit 5: Type of technical data 0: Rx level, 1: Measure of error rate
Bit 6: Error report 0: Not printed, 1: Printed
Bit 7: Data validity 0: Not valid, 1: Valid

2nd byte - Not used

3rd to 6th bytes - Date and time when the communication started
3rd byte - Month (BCD)
4th byte - Day (BCD)
5th byte - Hour (BCD)
6th byte - Minute (BCD)

7th and 8th bytes - Communication time
7th byte - Minutes (BCD)
8th byte - Seconds (BCD)

9th and 10th byte - Number of pages transmitted or received
9th byte - Low byte (Hex)
10th byte - High byte (Hex)

11th and 12th bytes - Personal code or number of total/burst error lines
If bit 4 of the 1st byte is 0:
- 11th byte - Personal code (low - BCD)
- 12th byte - Personal code (high - BCD)

If bit 4 of the 1st byte is 1:
- 11th byte - Number of total error lines (Hex)
- 12th byte - Number of burst error lines (Hex)

13th byte - File number (low - Hex)
14th byte - File number (high - Hex)

15th and 16th bytes - Rx level or measure of error rate
If bit 5 of the 1st byte is 0:
- 15th byte - Rx level (low - Hex)
- 16th byte - Rx level (high - Hex)

If bit 4 of the 1st byte is 1:
- 15th byte - Measure of error rate (low - Hex)
- 16th byte - Measure of error rate (high - Hex)

17th byte - Final modem rate
Bits 0 to 2: Final modem speed

$$\begin{pmatrix} Bit0 \\ Bit1 \\ Bit2 \\ Bit3 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : 2.4\,\text{k} \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix} : 4.8\,\text{k} \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : 7.2\,\text{k} \quad \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} : 9.6\,\text{k} \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : 12.0\,\text{k} \quad \begin{pmatrix} 0 \\ 1 \\ 1 \\ 0 \end{pmatrix} : 14.4\,\text{k} \quad \begin{pmatrix} 1 \\ 1 \\ 1 \\ 0 \end{pmatrix} : 16.8\,\text{k}$$

$$\begin{pmatrix} Bit0 \\ Bit1 \\ Bit2 \\ Bit3 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 1 \end{pmatrix} : 19.2\,\text{k} \quad \begin{pmatrix} 1 \\ 0 \\ 0 \\ 1 \end{pmatrix} : 21.6\,\text{k} \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 1 \end{pmatrix} : 24.0\,\text{k} \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 1 \end{pmatrix} : 26.4\,\text{k} \quad \begin{pmatrix} 0 \\ 0 \\ 1 \\ 1 \end{pmatrix} : 28.8\,\text{k} \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 1 \end{pmatrix} : 31.2\,\text{k} \quad \begin{pmatrix} 0 \\ 1 \\ 1 \\ 1 \end{pmatrix} : 33.6\,\text{k}$$

Bits 4 to 6: Final modem type

$$\begin{pmatrix} Bit4 \\ Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \text{V.27ter} \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{V.29} \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{V.33} \quad \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \text{V.17 (Long)} \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \text{V.17 (Short)}$$

$$\begin{pmatrix} Bit4 \\ Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 1 \end{pmatrix} : V.34\ 2400\,baud \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 1 \end{pmatrix} : V.34\ 3000\,baud \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 1 \end{pmatrix} : V.34\ 3200\,baud \quad \begin{pmatrix} 0 \\ 0 \\ 1 \\ 1 \end{pmatrix} : V.34\ 2800\,baud \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 1 \end{pmatrix} : V.34\ 3429\,baud$$

18th to 20th byte - Not used

21st to 44th byte - Remote terminal's ID (RTI, TSI or CSI) (ASCII)

45th byte - Communication mode #1
Bits 0 - 1: Network

$$\begin{pmatrix} Bit0 \\ Bit1 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} : PSTN \quad \begin{pmatrix} 0 \\ 1 \end{pmatrix} : ISDN$$

Bit 2: Communication Protocol 0: G3, 1: G4
Bit 3: ECM 0: Off, 1: On
Bits 4 to 7: Communication mode used

$$\begin{pmatrix} Bit4 \\ Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \text{Normal} \quad \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : \text{Confidential} \quad \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{Polling} \quad \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : \text{Transfer}$$

$$\begin{pmatrix} Bit4 \\ Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \text{Forwarding} \quad \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \text{Automatic Service Call}$$

46th byte - Communication mode #2

Bit 0: Tx or Rx 0: Tx, 1: Rx
Bit 1: Reduction in Tx 0: Not reduced, 1: Reduced
Bit 2: Batch transmission 0: Not used, 1: Used
Bit 3: Send later transmission 0: Not used, 1: Used
Bit 4: Transmission from 0: ADF, 1: Memory
Bits 5 to 7: Network type used

$$\begin{pmatrix} Bit5 \\ Bit6 \\ Bit7 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} : Standard \quad \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} : \text{Detail} \quad \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} : Fine \quad \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} : Superfine$$

47th byte - Not used

48th byte - Number of errors duing communication (Hex)

49th to 52nd byte - 1st error code and page number where the error occurred
- 49th byte - Page number where the error occurred (low - Hex)
- 50th byte - Page number where the error occurred (high - Hex)
- 51th byte - Error code (low - BCD)
- 52st byte - Error code (high - BCD)

53th to 56th byte - 2nd error code and page number where the error occurred
57th to 60th byte - 3rd error code and page number where the error occurred
61st to 64th byte - 4th error code and page number where the error occurred
65th to 68th byte - 5th error code and page number where the error occurred
69th to 72nd byte - 6th error code and page number where the error occurred
73rd to 76th byte - 7th error code and page number where the error occurred
77th to 80th byte - 8th error code and page number where the error occurred
81st to 84th byte - 9th error code and page number where the error occurred
85th to 88th byte - 10th error code and page number where the error occurred

64A800 to 64C41F(H) - Dedicated tx parameters for Speed Dial #100 - #999, when EXSAF is installed.
As explained in Dedicated Transmission parameters in section 4, each set of dedicated tx parameters consists of 8 bytes.

64A800 to 64A807(H) - Dedicated tx parameters for Speed #100
64A808 to 64A80F(H) - Dedicated tx parameters for Speed #101
64A810 to 64A817(H) - Dedicated tx parameters for Speed #102
⇩
64C418 to 64C41F(H) - Dedicated tx parameters for Speed #999

4.6 SPECIAL TOOLS AND LUBRICANTS

- Flash/SRAM data copy tool (P/N: A1939353)
- Flash Memory Card – 4MB (P/N: A2309352)
- Card Case (P/N: A2309351)

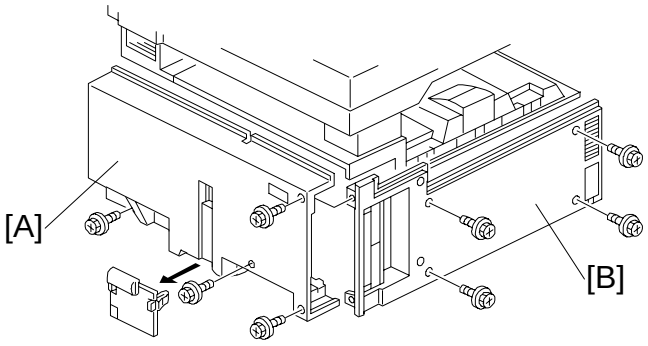
5. REMOVAL AND REPLACEMENT

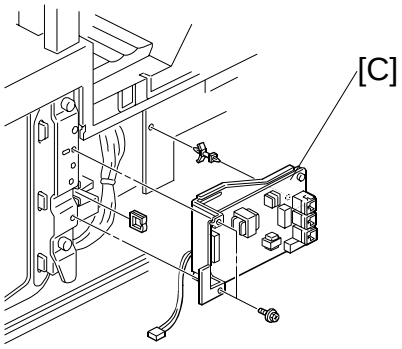
5.1 PRECAUTION

⚠CAUTION
Before starting disassembly, be sure to print all message files in the SAF memory. Then, turn off the main power switch and disconnect the power cord and telephone cable for safety.
Lithium Battery **The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.**

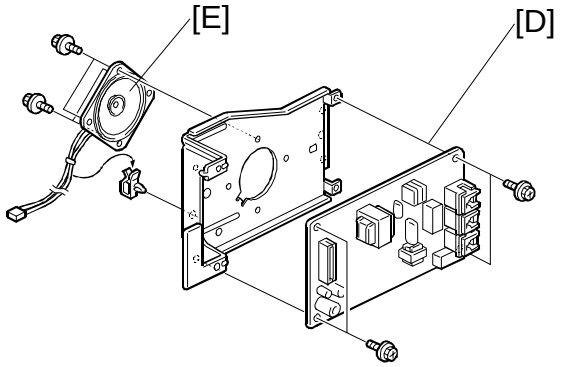
5.2 NCU AND SPEAKER

NOTE: If the machine has an optional finisher and/or a mailbox installed, remove it/them before starting the following procedure.





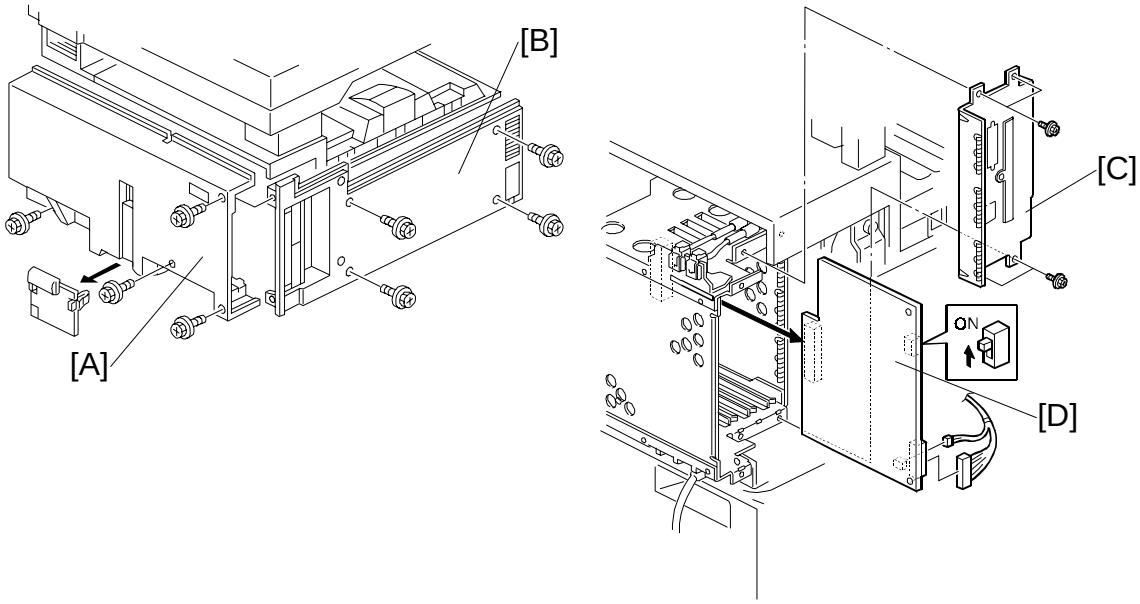
1. Remove the rear cover [A] (4 screws) and the left side cover [B] (4 screws).
2. Remove the NCU/speaker assembly [C] (2 screws).
3. Remove the NCU [D] (4 screws) and speaker [E] (2 screws) from the assembly.



5.3 FCU

5.3.1 REMOVAL

NOTE: If the machine has an optional finisher and/or a mailbox installed, remove it/them before starting the following procedure.



1. Remove the rear cover [A] (4 screws) and the left side cover [B] (4 screws).
2. Remove the FCU bracket [C] (4 screws), then the FCU [D] (2 connectors).
3. Go to one of the following procedures:
   - To restore SRAM data from the old FCU (if you do not have the latest data backup) – Go to section 5.3.2.
   - To restore SRAM data from a flash memory card backup – Go to section 5.3.3.

5.3.2 SRAM DATA RESTORE FROM FCU

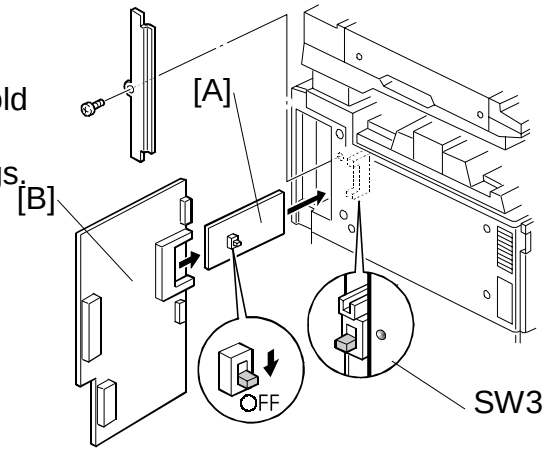
Before restoring the SRAM data, install a new FCU and initialize the SRAM on the new FCU using the following procedure.

1. Install a new FCU in the machine (see section 5.3.1)
   NOTE: Do not install the EXSAF and PMU yet, if they were present.
2. Turn on the machine. The machine displays “SC1201”.
   NOTE: The machine always displays “SC1201” the first time the FCU is installed. Please ignore it.
3. Press OK to initialize the SRAM.

Then, restore the SRAM using the following procedure.

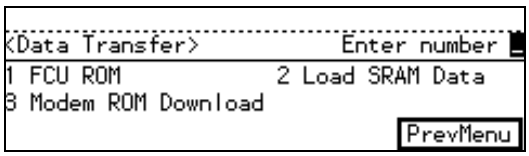
4. Turn off the machine.
5. Connect the data copy tool [A] with the old FCU [B] to the card slot as shown.
   See the note below for the switch settings.

   IMPORTANT: Support the old FCU by hand from now until the end of the download procedure

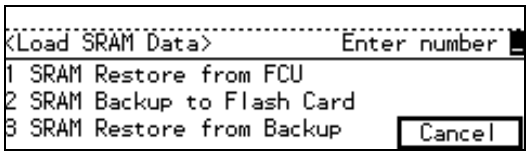


NOTE: 1) The switch on the data copy tool must be OFF.
2) SW3 below the card slot must be OFF (lower position).
3) Do not turn off the battery switch on the old FCU.

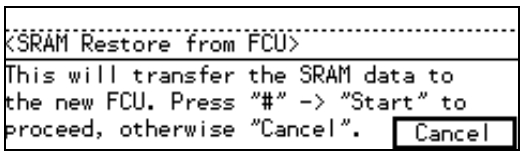
6. Turn on the machine, and enter the fax service mode.
7. Press 1 6 then 2.



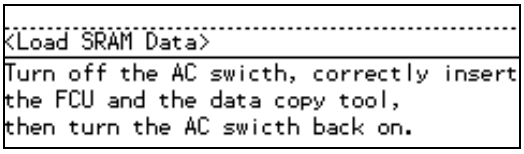
8. Press 1.



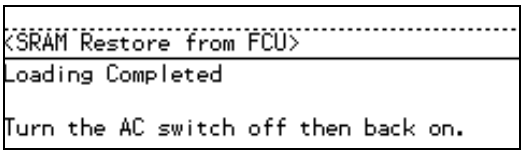
If the switch settings are correct, the message on the right appears.
Then go to the next step.



If the one of the switch settings is wrong, or if the tool is not connected correctly, the message on the right appears. Then turn off the machine and retry the procedure.



9. Press "#" then ◇.
   If data has been restored successfully, the message on the right appears.



10. Turn off the main power switch then disconnect the tools.
11. Install the EXSAF and PMU if they were present.
12. Turn the machine back on.
13. Print the system parameter list to check if the previous settings have been successfully recovered.

5.3.3 SRAM DATA RESTORE FROM FLASH CARD BACKUP

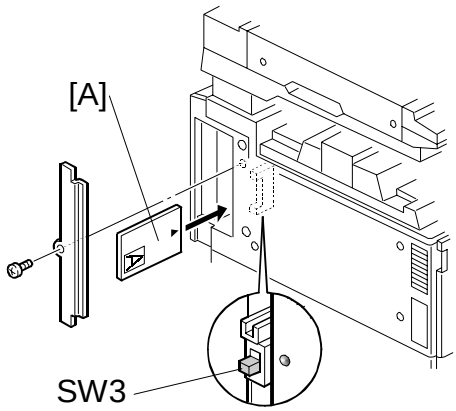
SRAM data can be copied to a flash memory card. For how to do this, refer to section 5.5.

Before restoring the SRAM data, install a new FCU and initialize the SRAM on the new FCU using the following procedure.

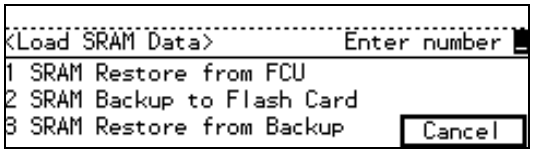
1. Install a new FCU in the machine (see section 5.3.1).
2. Turn on the machine. The machine displays “SC1201”.
   NOTE: The machine always displays “SC1201” the first time the FCU is installed. Please ignore it.
3. Press OK to initialize the SRAM.

Then, restore the SRAM using the following procedure.

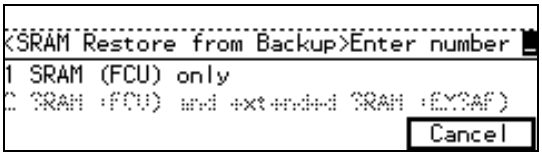
4. Turn off the machine.
   NOTE: If the EXSAF board was present; make sure that the backup of EXSAF and FCU SRAM is available, then install the EXSAF.
   If this backup is not available, restore the data from the old FCU. After restoring, connect the EXSAF to the new FCU.

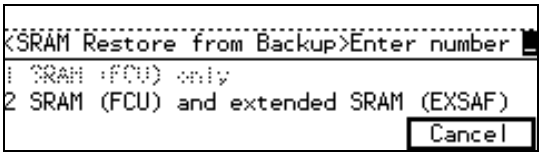


5. Connect the flash memory card [A] to the card slot as shown.
   See the note below for the switch settings.
   NOTE: 1) SW3 below the card slot must be OFF (lower position).
   2) If the switch setting is wrong, the fax function will not start up.
6. Turn on the machine, and enter the fax service mode.
7. Press [1] [6] then [2].



8. Press [3].
   If the switch settings are correct, either of the messages below appears.

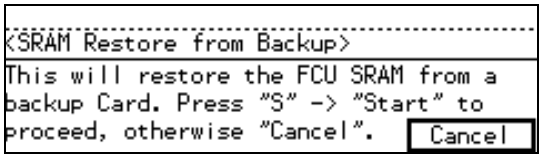




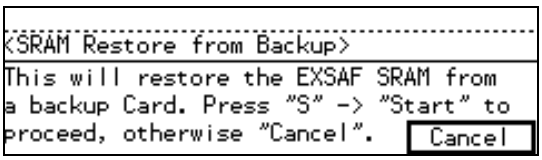
   Refer to the table below for which type of backup must be used, depending on the presence of EXSAF.

EXSAF	Type of backup	
	FCU SRAM	FCU and EXSAF SRAM
Not present	**OK**	**Do not use.**
Present	**Do not use.**	**OK**

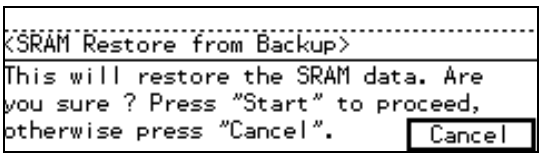
9. Press either of the following:
   [1] – Standard SRAM only



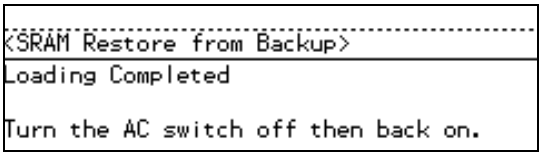
   [2] – Standard SRAM and SRAM on the EXSAF.



10. Press “S” then [◇]; a confirmation message appears.



11. Press Start to restore the SRAM.
    If data has been restored successfully, the message on the right appears.



12. Turn off the main power switch then disconnect the card.
13. Turn the machine back on.
14. Print the system parameter list to check if the previous settings have been successfully recovered.

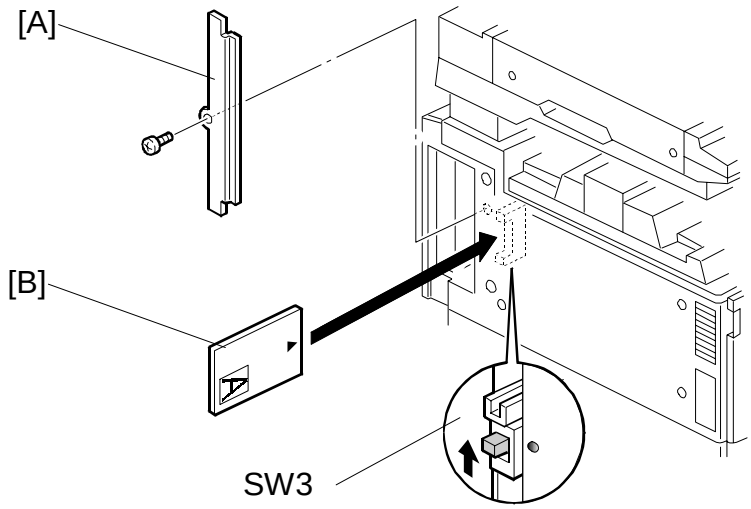
5.4 ROM UPDATE

5.4.1 FCU ROM DOWNLOAD

This function updates the FCU ROM using a flash memory card.

NOTE: The flash memory card must be programmed with FCU ROM data as explained in section 5.6.

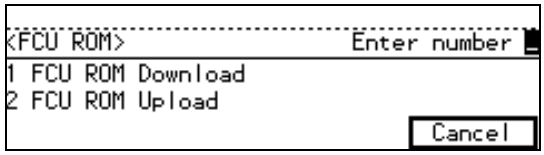
1. Turn off the machine and remove the cover [A].



2. Connect the flash memory card [B] to the card slot as shown.

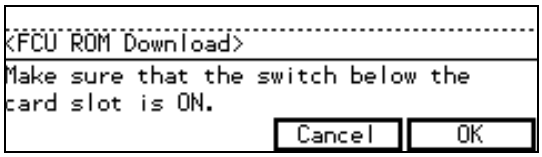
   NOTE: SW3 below the card slot must be **ON** (upper position).

3. Turn on the machine and enter the fax service mode.
4. Press 1 6 then 1.

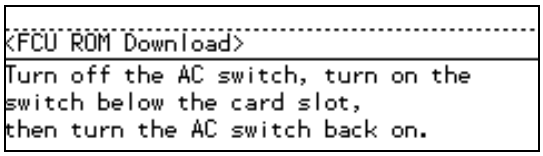


5. Press 1.

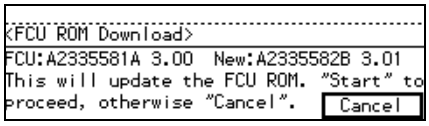
   If the switch setting is correct, the message on the right appears. Then go to the next step.



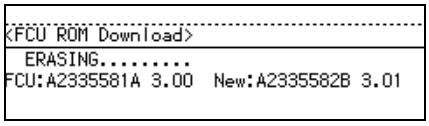
   If the switch setting is wrong, or if the tool is not connected correctly, the message on the right appears. Then turn off the machine and retry the procedure again.



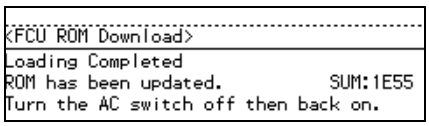
6. Press OK, then check the ROM version.
   If the card does not contain FCU ROM data, “Please check flash card” appears. Turn off the machine and retry the procedure with the correct card.



7. Press Start.



   After the machine updates the ROM data, the message on the right appears.



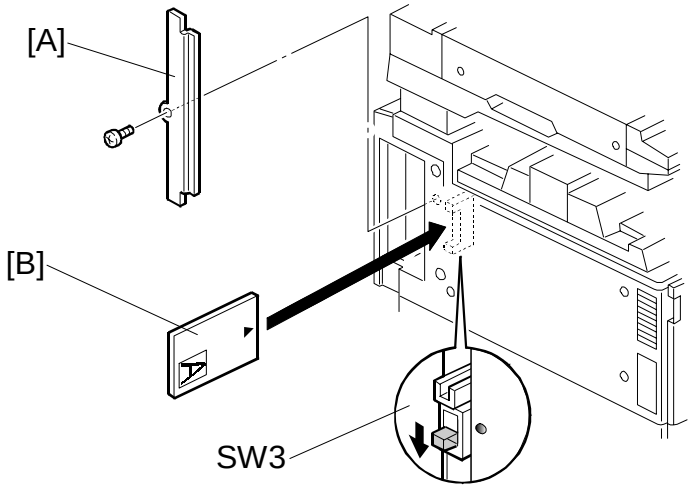
8. Turn off the main power switch then disconnect the flash memory card.
9. Turn off switch SW3 (lower position).
10. Turn the machine back on.
11. Print the system parameter list to check if the new ROM version is printed.

5.4.2 FCU ROM UPLOAD

This function makes a copy of the FCU ROM inside the machine onto a flash memory card.

NOTE: This procedure erases the flash memory card completely before uploading ROM data.

1. Turn off the machine and remove the cover [A].

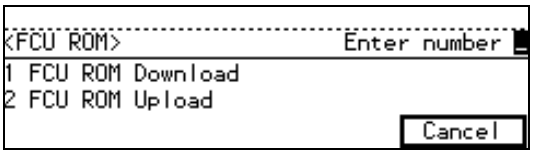


2. Connect the flash memory card [B] to the card slot as shown.

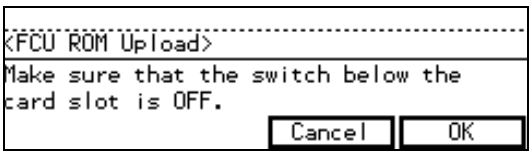
   NOTE: SW3 below the card slot must be **OFF** (lower position).

3. Turn on the machine and enter the fax service mode.

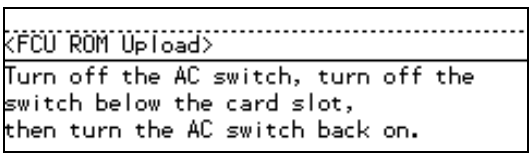
4. Press 1 6 then 1.



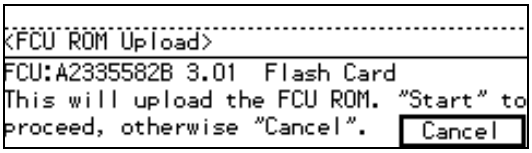
5. Press 2.
   If the switch setting is correct, the message on the right appears. Then go to the next step.



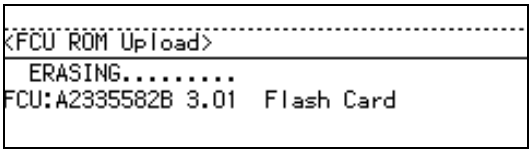
   If the switch setting is wrong, or if the tool is not connected correctly, the message on the right appears. Then turn off the machine and retry the procedure.



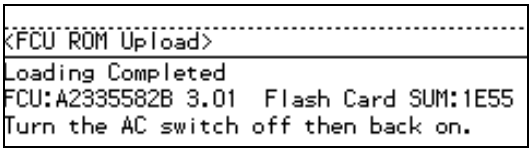
6. Press OK, then check the ROM version.



7. Press Start.



After the machine updates the ROM data, the message on the right appears.



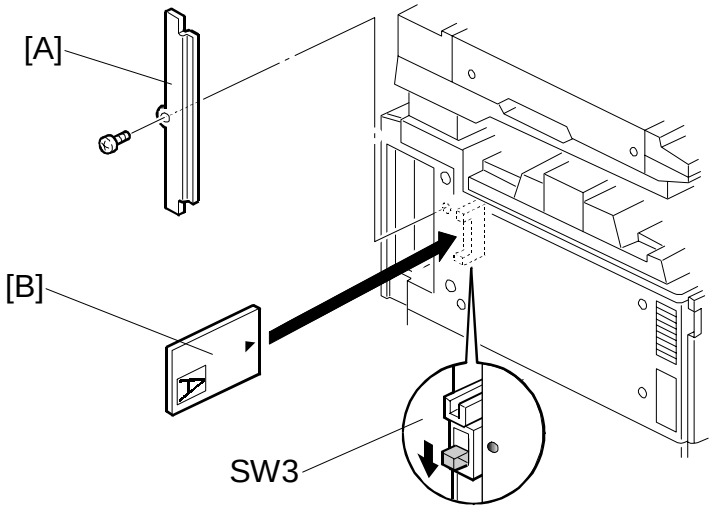
8. Turn off the main power switch then disconnect the flash memory card.
9. Turn the machine back on.

5.4.3 MODEM ROM DOWNLOAD

This function updates the Modem ROM on the FCU using a flash memory card.

NOTE: The flash memory card must be programmed with modem ROM data for the Fax Option type 450 as explained in section 5.6.
Do not use a flash card with data for another model.

1. Turn off the machine and remove the cover [A].

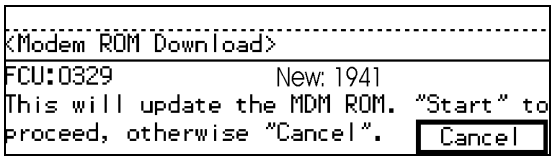


2. Connect the flash memory card [B] to the card slot as shown.

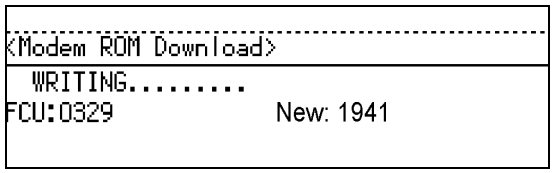
NOTE: SW3 below the card slot must be **OFF** (lower position).

3. Turn on the machine and enter the fax service mode.

4. Press 1 6 then 3.

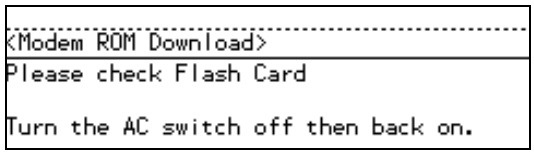


5. Press Start.



After the machine updates the ROM data, the message on the right appears.

If the card does not contain modem ROM data, the message on the right appears. Then turn off the machine and retry the procedure again.



6. Turn off the main power switch then disconnect the flash memory card.
7. Turn the machine back on. Print the system parameter list to check the new modem ROM version.

5.5 SRAM DATA BACKUP AND RESTORE

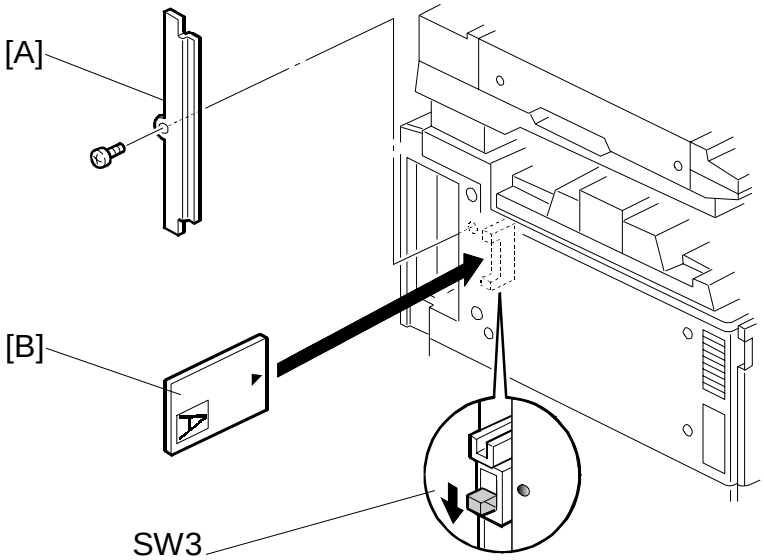
5.5.1 SRAM BACKUP TO A FLASH MEMORY CARD

This function makes a backup copy of all the fax SRAM data onto a flash memory card. If a computer based PC card writer system is available, the backup can be saved as a computer file from the flash memory card.

If the EXSAF board is not installed, this function makes a backup copy of the standard SRAM on the FCU.
If the EXSAF board is installed, this function makes a backup copy of the standard SRAM and the SRAM on the optional EXSAF board.

NOTE: This procedure erases the flash memory card completely before uploading SRAM data.

1. Turn off the machine.

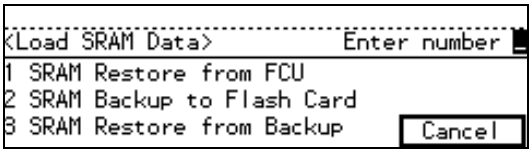


2. Connect the flash memory card [B] to the card slot as shown.

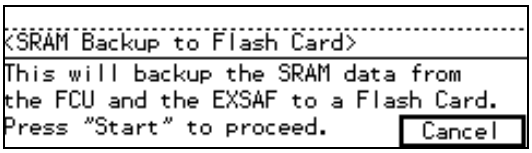
   NOTE: SW3 below the card slot must be **OFF** (lower position).

3. Turn on the machine and enter the fax service mode.

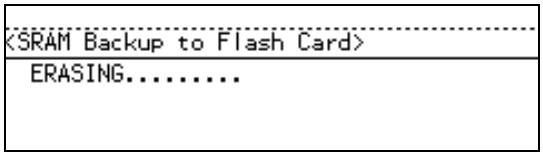
4. Press 1 6 then 2.



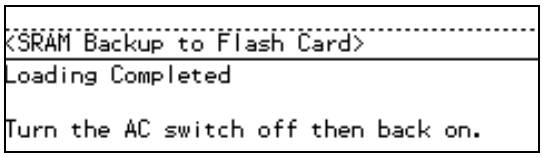
5. Press 2.



6. Press Start.



After the machine backs up the data to the flash card, the message on the right appears.



7. Turn off the main power switch then disconnect the flash memory card.
8. Turn the machine back on

The data in the flash card can be copied to a PC for safe keeping. This data can then be uploaded from the PC to a flash memory card if the SRAM data has to be restored later.

Refer to the SwapFTL manual for details.

5.5.2 SRAM RESTORE FROM A FLASH MEMORY CARD

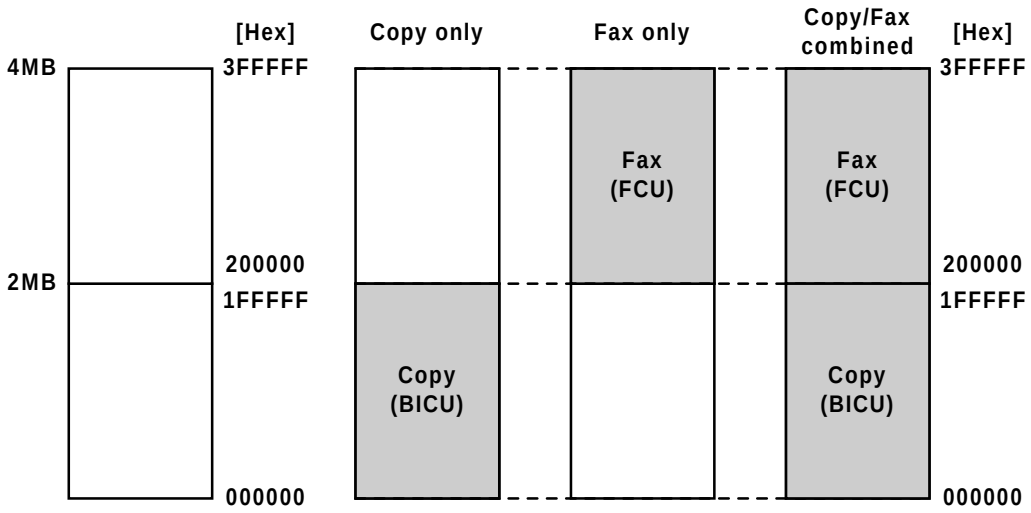
This function recovers SRAM data if the FCU is replaced or SRAM data was lost accidentally.

For how to restore the SRAM data from the backup on a flash memory card, refer to section 5.3.3 for details.

5.6 DATA ADDRESS RANGES ON THE CARD

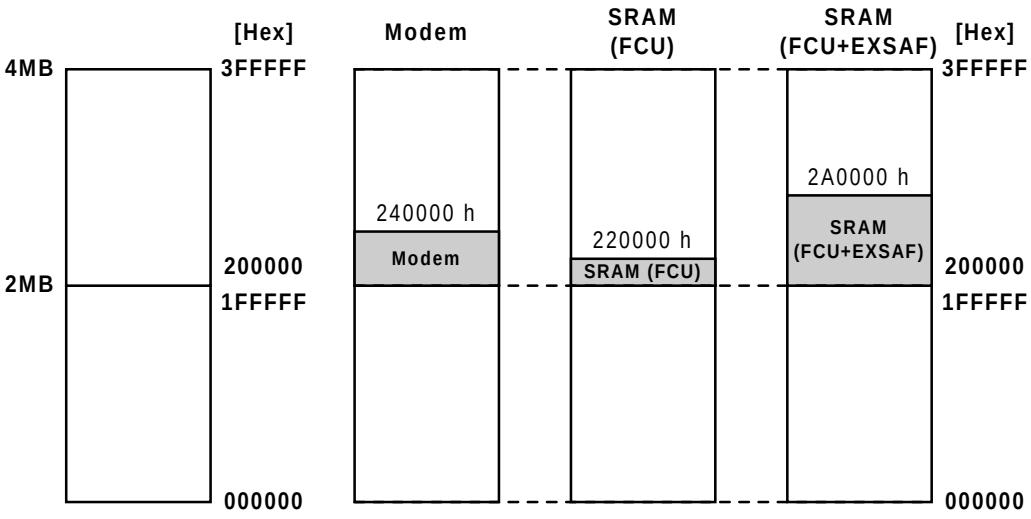
The following sections show how ROM and RAM data must be programmed before downloading, or how data is uploaded onto the 4MB flash memory card.

5.6.1 FCU AND BICU ROM DATA



Start Address (Hex)	0	200000
Length (Hex)	200000	200000
Size (kB)	2,000 (2MB)	2,000 (2MB)

5.6.2 MODEM ROM AND SRAM DATA



Start Address (Hex)	200000	200000	200000
Length (Hex)	40000	20000	A0000
Size (kB)	256	128	128 + 512

Replacement Adjustment A693

6. TROUBLESHOOTING

6.1 ERROR CODES

If an error code occurs, retry the communication. If the same problem occurs, try to fix the problem as suggested below. Note that some error codes appear only in the error code display and on the service report.

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF not detected within 40 s of Start being pressed	• Check the line connection. • Check the NCU - FCU connectors. • The machine at the other end may be incompatible. • Replace the NCU or FCU. • Check for DIS/NSF with an oscilloscope. • If the rx signal is weak, there may be a bad line.
0-01	DCN received unexpectedly	• The other party is out of paper or has a jammed printer. • The other party pressed Stop during communication.
0-03	Incompatible modem at the other end	• The other terminal is incompatible.
0-04	CFR or FTT not received after modem training	• Check the line connection. • Check the NCU - FCU connectors. • Try changing the tx level and/or cable equalizer settings. • Replace the FCU or NCU. • The other terminal may be faulty; try sending to another machine. • If the rx signal is weak or defective, there may be a bad line. **Cross reference** • Tx level - NCU Parameter 01 (PSTN) • Cable equalizer - G3 Switch 07 (PSTN) • Dedicated Tx parameters - Section 4
0-05	Unsuccessful after modem training at 2400 bps	• Check the line connection. • Check the NCU - FCU connectors. • Try adjusting the tx level and/or cable equalizer. • Replace the FCU or NCU. • Check for line problems. **Cross reference** • See error code 0-04.

Code	Meaning	Suggested Cause/Action
0-06	The other terminal did not reply to DCS	• Check the line connection. • Check the FCU - NCU connectors. • Try adjusting the tx level and/or cable equalizer settings. • Replace the NCU or FCU. • The other end may be defective or incompatible; try sending to another machine. • Check for line problems. **Cross reference** • See error code 0-04.
0-07	No post-message response from the other end after a page was sent	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • The other end may have jammed or run out of paper. • The other end user may have disconnected the call. • Check for a bad line. • The other end may be defective; try sending to another machine.
0-08	The other end sent RTN or PIN after receiving a page, because there were too many errors	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • The other end may have jammed, or run out of paper or memory space. • Try adjusting the tx level and/or cable equalizer settings. • The other end may have a defective modem/NCU/FCU; try sending to another machine. • Check for line problems and noise. **Cross reference** • Tx level - NCU Parameter 01 (PSTN) • Cable equalizer - G3 Switch 07 (PSTN) • Dedicated Tx parameters - Section 4
0-14	Non-standard post message response code received	• Check the FCU - NCU connectors. • Incompatible or defective remote terminal; try sending to another machine. • Noisy line: resend. • Try adjusting the tx level and/or cable equalizer settings. • Replace the NCU or FCU. **Cross reference** • See error code 0-08.

Code	Meaning	Suggested Cause/Action
0-15	The other terminal is not capable of specific functions.	The other terminal is not capable of accepting the following functions, or the other terminal's Memory is full. • Confidential rx • Transfer function • SEP/SUB/PWD
0-16	CFR or FTT not detected after modem training in confidential or transfer mode	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Try adjusting the tx level and/or cable equalizer settings. • The other end may have disconnected, or it may be defective; try calling another machine. • If the rx signal level is too low, there may be a line problem. **Cross reference** • See error code 0-08.
0-17	Communication was interrupted by pressing the Stop key.	If the Stop key was not pressed and this error keeps occurring, replace the operation panel or OPU.
0-20	Facsimile data not received within 6 s of retraining	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Check for line problems. • Try calling another fax machine. • Try adjusting the reconstruction time for the first line and/or rx cable equalizer setting. **Cross reference** • Reconstruction time - G3 Switch 0A, bit 6 • Rx cable equalizer - G3 Switch 07 (PSTN)
0-21	EOL signal (end-of-line) from the other end not received within 5 s of the previous EOL signal	• Check the connections between the FCU, NCU, & line. • Check for line noise or other line problems. • Replace the NCU or FCU. • The remote machine may be defective or may have disconnected. **Cross reference** • Maximum interval between EOLs and ECM frames - G3 Bit Switch 0A, bit 4

Code	Meaning	Suggested Cause/Action
0-22	The signal from the other end was interrupted for more than the acceptable modem carrier drop time (default: 200 ms)	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Defective remote terminal. • Check for line noise or other line problems. • Try adjusting the acceptable modem carrier drop time. **Cross reference** • Acceptable modem carrier drop time - G3 Switch 0A, bits 0 and 1
0-23	Too many errors during reception	• Check the line connection. • Check the FCU - NCU connectors. • Replace the NCU or FCU. • Defective remote terminal. • Check for line noise or other line problems. • Try asking the other end to adjust their tx level. • Try adjusting the rx cable equalizer setting and/or rx error criteria. **Cross reference** • Rx cable equalizer - G3 Switch 07 (PSTN) • Rx error criteria - Communication Switch 02, bits 0 and 1
0-30	The other terminal did not reply to NSS(A) in AI short protocol mode	• Check the line connection. • Check the FCU - NCU connectors. • Try adjusting the tx level and/or cable equalizer settings. • The other terminal may not be compatible. **Cross reference** • Dedicated tx parameters - Section 4
0-52	Polarity changed during communication	• Check the line connection. Retry communication.
0-70	Communication mode specified in CM/JM was not available. (V.8 calling and called terminal)	• The other terminal did not have a compatible communication mode (e.g., the other terminal was a V.34 data modem.) • A polling tx file was not ready at the other terminal when polling rx was initiated from the calling terminal.
0-74	Calling terminal fell back to T.30 mode, because it could not detect ANSam after sending CI.	• The calling terminal could not detect ANSam due to noise, etc. • ANSam was too short to detect. • Check the line connection and condition. • Try making a call to another V.8/V.34 fax.

Code	Meaning	Suggested Cause/Action
0-75	Called terminal fell back to T.30 mode, because it could not detect a CM in response to ANSam. (ANSam timeout)	• The terminal could not detect ANSam. • Check the line connection and condition. • Try receiving a call from another V.8/V.34 fax.
0-76	Calling terminal fell back to T.30 mode, because it could not detect a JM in response to a CM. (CM timeout)	• The called terminal could not detect a CM due to noise, etc. • Check the line connection and condition. • Try making a call to another V.8/V.34 fax.
0-77	Called terminal fell back to T.30 mode, because it could not detect a CJ in response to JM. (JM timeout)	• Calling terminal could not detect a JM due to noise, etc. • A network that has narrow bandwidth cannot pass JM to the other end. • Check the line connection and condition. • Try receiving a call from another V.8/V.34 fax.
0-80	Line was disconnected due to timeout in V.34 phase 2 – line probing.	• The guard timer expired while starting these phases. Serious noise, narrow bandwidth, or low signal level can cause these errors. • If these errors happen at transmitting terminal: • Try making a call at a later time. • Try using V.17 or slower modem using dedicated tx parameters. • Try increasing the tx level. • Try adjusting the cable equalizer setting. • If these errors happen at the receiving terminal: • Try adjusting the cable equalizer setting. • Try increasing the tx level. • Try using V.17 or slower modem if the same error is frequent when receiving from multiple senders.
0-81	Line was disconnected due to timeout in V.34 phase 3 – equalizer training.	
0-82	Line was disconnected due to timeout in V.34 phase 4 – control channel start-up.	
0-83	Line was disconnected due to timeout in V.34 control channel restart sequence.	
0-84	Line was disconnected due to abnormal signaling in V.34 phase 4 – control channel start-up.	• Signal did not stop within 10 s. • Turn off the machine, then turn it back on. • If the same error is frequent, replace the FCU.
0-85	Line was disconnected due to abnormal signaling in V.34 control channel restart.	• Signal did not stop within 10 s. • Turn off the machine, then turn it back on. • If the same error is frequent, replace the FCU.
0-86	Line was disconnected because the other terminal requested a data rate using MPh that was not available in the currently selected symbol rate.	• The other terminal was incompatible. • Ask the other party to contact the manufacturer.

Code	Meaning	Suggested Cause/Action
0-87	Control channel started after unsuccessful primary channel.	• The receiving terminal restarted the control channel because data reception in the primary channel was not successful. • This does not result in an error communication.
0-88	Line was disconnected because PPR was transmitted/received 9 (default) times within the same ECM frame.	• Try using a lower data rate at the start. • Try adjusting the cable equalizer setting.
2-10	The modem cannot enter tx mode	• Replace the FCU.
2-11	Only one V.21 connection flag was received	• Replace the FCU.
2-12	Modem clock irregularity	• Replace the FCU.
2-13	Modem initialization error	• Turn off the machine, then turn it back on. • Update the modem ROM. • Replace the FCU.
2-20	Abnormal coding/decoding (cpu not ready)	• Replace the FCU.
2-23	JBIG compression or reconstruction error	• Turn off the machine, then turn it back on. • Replace the PMU board if the error is frequent.
2-24	JBIG ASIC error	• Turn off the machine, then turn it back on. • Replace the PMU board if the error is frequent.
2-25	JBIG data reconstruction error (BIH error)	• JBIG data error. • Check the sender's JBIG function. • Update the FCU ROM.
2-26	JBIG data reconstruction error (Float marker error)	
2-27	JBIG data reconstruction error (End market error)	
2-28	JBIG data reconstruction error (Timeout)	
2-50	The machine reset itself	• If this is frequent, update the ROM, or replace the FCU.
3-00	G4 interface board reset	• Replace the G4 interface board or FCU.
3-10	Disconnection during ISDN G3 communication	• Check the other terminal and the ISDN line. • The other terminal may have dialed a wrong number.
3-11	Disconnection during ISDN G4 communication	• Check the other terminal and the ISDN line.
3-20	A CSA signal was received during ISDN G4 communication	• The operator at the other terminal may have interrupted the communication.
3-21	A CSA was sent during ISDN G4 communication, because the Stop key was pressed	• The local operator has interrupted the communication.
3-30	Mismatched specifications (rx capability)	• Check the receive capabilities requested from the other terminal.

Code	Meaning	Suggested Cause/Action
4-00	One page took longer than 8 minutes to transmit	• Check for a bad line. • Try the communication at a lower resolution, or without halftone. • Replace the FCU.
4-01	Line current was cut	• Check the line connector. • Check the connection between FCU and NCU. • Check for line problems. • Replace the FCU or the NCU.
4-02	The other end cut the received page, as it was longer than the maximum limit.	• Split the page into smaller pieces, or ask the other end to change their maximum receive length setting, then resend pages.
4-10	Communication failed because of ID Code mismatch (Closed Network) or Tel. No./CSI mismatch (Protection against Wrong Connections)	• Get the ID Codes the same and/or the CSIs programmed correctly, then resend. • The machine at the other end may be defective.
5-00	Data reconstruction not possible	• Replace the FCU.
5-10	DCR timer expired	• Replace the FCU.
5-20	Storage impossible because of a lack of memory	• Temporary memory shortage. • Test the SAF memory. • Replace the FCU or optional EXSAF
5-21	Memory overflow	
5-22	Mode table overflow after the second page of a scanned document	• Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-23	Print data error when printing a substitute rx or confidential rx message	• Test the SAF memory. • Ask the other end to resend the message. • Replace the FCU or IC memory card.
5-24	Memory overflow after the second page of a scanned document	• Try using a lower resolution setting. • Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-25	SAF file access error	• Replace the FCU, EXSAF, or the hard disk.
5-30	Mode table for the first page to be printed was not effective	• Replace the FCU, EXSAF or the hard disk.
6-01	G3 ECM - no V.21 signal was received	• Try adjusting the rx cable equalizer. • Replace the FCU or NCU.
6-02	G3 ECM - EOR was received	
6-03	G3 ECM - non-standard V.21 code received	• The other terminal may be defective.

Code	Meaning	Suggested Cause/Action
6-04	G3 ECM - RTC not detected	• Check the line connection. • Check connections from the NCU to the FCU. • Check for a bad line or defective remote terminal. • Replace the FCU or NCU.
6-05	G3 ECM - facsimile data frame not received within 18 s of CFR, but there was no line fail	• Check the line connection. • Check connections from the NCU to the FCU. • Check for a bad line or defective remote terminal. • Replace the FCU or NCU. • Try adjusting the rx cable equalizer **Cross reference** • Rx cable equalizer - G3 Switch 07 (PSTN)
6-06	G3 ECM - coding/decoding error	• Defective FCU. • The other terminal may be defective.
6-08	G3 ECM - PIP/PIN received in reply to PPS.NULL	• The other end pressed Stop during communication. • The other terminal may be defective.
6-09	G3 ECM - ERR received	• Check for a noisy line. • Adjust the tx levels of the communicating machines. • See code 6-05.
6-10	G3 ECM - error frames still received at the other end after all communication attempts at 2400 bps	• Check for line noise. • Adjust the tx level (use NCU parameter 01 or the dedicated tx parameter for that address). • Check the line connection. • Defective remote terminal.
6-11	G3 ECM - printing impossible because of a missing first line in the MMR coding	• Check for problems in the printer mechanism.
6-21	V.21 flag detected during high speed modem communication	• The other terminal may be defective or incompatible.
6-99	V.21 signal not stopped within 6 s	• Replace the FCU.
9-30	HDD write error	• Turn both power switches off and on, to mark defective sectors as bad and to initialize the hard disk. • Initialize the hard disk interface (service mode 08-1). • Check the cable connections. • Format the hard disk (service mode 08-2). • Replace the hard disk interface card. • Replace the hard disk.

Code	Meaning	Suggested Cause/Action
9-31	HDD control error	• Turn both power switches off and on. • Replace the hard disk.
9-32	HDD read error	
9-33	HDD fatal error	
21-00	BiCU communication error	Check the cable connection between BiCU and FCU. Replace the BiCU or FCU.
21-01	BiCU turned off	• Check if the LED (+5V supply) on the BiCU is lit or not. Check the cable connection between BiCU and FCU. Replace the BiCU or FCU.
21-02	BiCU handshake error	• Check the cable connection between BiCU and FCU. Replace the BiCU or FCU.
22-00	Original length exceeded the maximum scan length	• Divide the original into a few pages. Check the resolution used for scanning. Lower the scan resolution if possible. Add optional page memory.
22-01	Memory overflow while receiving	• Wait for the files in the queue to be sent. Delete unnecessary files from memory. Transfer the substitute reception files to an another fax machine, if the machine's printer is busy or out of order. Add an optional SAF memory card or hard disk.
22-02	Tx or rx job stalled due to line disconnection.	• Tx or rx job does not finish even after line connection. • Restart the machine.
22-03	Cache memory for HDD has become full while receiving.	• Writing data to the HDD takes too long. • Check the cable connection to the HDD. If problem persists, replace the HDD.
23-00	HDD data read timeout	• Reading data from the HDD takes too long. • Check the cable connection to the HDD. If problem persists, replace the HDD.

6.2 MODEM STATUS CODES IN V.34 PROTOCOL DUMP

The following sections explain the meaning of modem status codes which appear on the G3 protocol dump list after V.34 communications.

NOTE: 1) The machine sometimes cannot print all the status codes. For example, even if code 0127 (INFOh reception) is not printed, the modem may actually have received INFOh.
2) In polling, the signals go in the opposite direction after phase 2. Also, INFO0c replaces INFO0a, and vice versa.

6.2.1 CALLING SIDE

Phase 1 (V.8)

FIF	Description
0010	Idle
0110	Idle
0111	ANSam reception
0011	CM transmission
0112	JM reception
0012	CJ transmission
0013	Phase 1 end

Phase 2 (Line Probing)

FIF	Description
0020	Idle
0021	75 ms interval
0121	Waiting for INFO0a
0022	INFO0c transmission
0122	INFO0a reception
0123	A reception
0023	INFO0c retransmission due to missing INFO0a
0024	INFO0c retransmission due to the second INFO0a reception
0031	B transmission
0032	B bar transmission
0033	L1 transmission
0034	L2 transmission
0041	B transmission during INFOh reception.
0127	INFOh reception
0042	Phase 2 end
0043	Waiting for A due to recovery from phase 3 (control channel)

Phase 3 (Equalizer Training)

FIF	Description
0050	Idle
0051	70 ms interval
0130	Phase 3
0052	S transmission
0053	S bar transmission
0054	PP transmission
0055	TRN transmission
0056	Phase 3 end

Phase 4 and 5 (Control Channel)

FIF	Description
0060	Idle
0141	Waiting for PPh
0061	70 ms interval
0062	PPh transmission
0142	PPh reception
0063	ALT transmission
0143	ALT reception
0064	MPh transmission
0144	MPh reception
0065	E transmission
0145	E reception
0066	T.30 control signal transmission (e.g., NSS or DCS)
0151	Flag reception
0152	T.30 control signal reception (e.g., NSF, DIS or CFR)
0067	Phase 5 end

Phase 6 (Primary Channel)

FIF	Description
00A0	Idle
00A1	70 ms interval
0160	Phase 6
00A2	S transmission
00A3	S bar transmission
00A4	PP transmission
00A5	B1 transmission
00A6	Image data transmission
00A7	Phase 6 end

Control Channel (Post Message - Sh)

FIF	Description
0070	Idle
0071	70 ms interval
0141	Waiting for Sh or PPh
0072	Sh transmission
0073	Sh bar transmission
0146	Sh/Sh bar reception
0074	ALT transmission
0143	ALT reception
0075	E transmission
0076	T.30 control signal transmission (e.g., PPS-EOP)
0151	Flag reception
0152	T.30 control signal reception (e.g., MCF)
0077	End

Control Channel (Post Message – PPh)

FIF	Description
0080	Idle
0081	PPh transmission
0142	PPh reception
0082	ALT transmission
0143	ALT reception
0083	MPh transmission
0144	MPh reception
0084	E transmission
0085	T.30 control signal transmission (e.g., PPS-MPS)
0151	Flag reception
0152	T.30 control signal reception (e.g., MCF)
0086	End

Control Channel Recovery (AC)

FIF	Description
0090	Idle
0091	AC transmission
0092	PPh transmission
0142	PPh reception
0093	ALT transmission
0143	ALT reception
0094	MPh transmission
0144	MPh reception
0095	E transmission
0096	T.30 control signal transmission (e.g., PPS-EOP)
0151	Flag reception
0152	T.30 control signal reception (e.g., MCF)
0097	End

V.34 End

FIF	Description
00B0	Modem idle

6.2.2 CALLED SIDE

Phase 1 (V.8)

FIF	Description
0010	Idle
0110	Idle
0111	CM reception
0012	JM transmission
0112	CI reception
0113	CJ reception
0013	Phase 1 end

Phase 2 (Line Probing)

FIF	Description
0020	Idle
0121	Waiting for INFO0c
0021	75 ms interval
0122	INFO0c reception
0022	INFO0a transmission
0023	INFO0a retransmission due to missing INFO0c
0024	INFO0a retransmission due to the second INFO0c reception
0123	B reception
0124	B bar reception
0031	A transmission
0032	A bar transmission
0033	No signal. Waiting for L1/L2
0125	L1/L2 reception
0126	B reception
0041	A transmission
0042	INFOh transmission
0043	Phase 2 end
0044	Waiting for B due to recovery from phase 3 (control channel)

Phase 3 (Equalizer Training)

FIF	Description
0050	Idle
0131	No signal
0051	70 ms interval
0052	Waiting for S
0132	S reception
0053	Waiting for S bar
0133	S bar reception
0054	Waiting for PP
0134	PP reception
0055	Waiting for TRN
0135	TRN reception
0056	Phase 3 end

Phase 4 and 5 (Control Channel)

FIF	Description
0060	Idle
0141	No signal
0061	70 ms interval
0142	PPh reception
0062	PPh transmission
0143	ALT reception
0063	ALT transmission
0144	MPh reception
0064	MPh transmission
0145	E reception
0065	E transmission
0066	T.30 control signal transmission (e.g., NSF and DIS)
0067	Phase 5 end

Phase 6 (Primary Channel)

FIF	Description
00A0	Idle
0161	No signal
00A1	70 ms interval
0162	S reception
00A2	Waiting for S
0163	S bar reception
00A3	Waiting for S bar
0164	PP reception
00A4	Waiting for PP
0165	B1 reception
00A5	Waiting for B1
0166	Flag reception
0167	Image data reception
00A6	Waiting for image data
0168	Turn off
00A7	Phase 6 end

Control Channel (Post Message - Sh)

FIF	Description
0070	Idle
0071	70 ms interval
0041	No signal
0072	Detecting Sh and Sh bar
0146	Sh/Sh bar reception
0073	Sh transmission
0074	Sh bar transmission
0143	ALT reception
0075	ALT transmission
0145	E reception
0076	E transmission
0151	Flag reception
0152	T.30 control signal reception (e.g., PPS-EOP)
0077	T.30 control signal transmission (e.g., MCF)
0078	End

Control Channel (Post Message – PPh)

FIF	Description
0080	Idle
0142	PPh reception
0081	PPh transmission
0143	ALT reception
0082	ALT transmission
0144	MPh reception
0083	MPh transmission
0145	E reception
0084	E transmission
0151	Flag reception
0152	T.30 control signal reception (e.g., PPS-MPS)
0085	T.30 control signal transmission (e.g., MCF)
0086	End

Control Channel Recovery (AC)

FIF	Description
0090	Idle
0091	AC transmission
0147	AC reception
0142	PPh reception
0092	PPh transmission
0143	ALT reception
0093	ALT transmission
0144	MPh reception
0094	MPh transmission
0145	E reception
0095	E transmission
0151	Flag reception
0152	T.30 control signal reception (e.g., PPS-MPS)
0096	T.30 control signal transmission (e.g., MCF)
0097	End

V.34 End

FIF	Description
00B0	Modem idle

6.3 FAX SC CODES

When the FCU detects a Fax SC Code condition other than SC1201 and SC1207, it resets itself automatically (default setting). This initializes the FCU without erasing files in the SAF memory or resetting the switches.

NOTE: For details on Fax SC Codes 1201 and 1207, refer to the following sections.

If bit 7 of System Switch 1F is changed to “1”, when the FCU detects a Fax SC Code condition, it displays the code on the display and stops working until the fax unit is initialized using one of the following methods:

- Hold down the “#” and “*” keys for more than 10 s.
- Turn off the main power switch and turn it back on.
- Remove the rear cover, and press SW2 on the FCU.

The fax unit cannot make automatic service calls in reaction to a Fax SC Code, because the fax unit cannot make fax communications in SC Code conditions.

6.3.1 SC1201

When the FCU detects an unrecoverable error in the SRAM, which requires a complete SRAM initialization, the fax unit displays this SC Code and stops. There is no way to recover from this error condition without a complete SRAM initialization (all the user and service programmed data will be erased).

The possible causes are:

- SRAM backup battery defect or SW1 on the FCU is at the “OFF” position
- SRAM on the FCU has a physical defect
- Flash memory card or data copy tool connection was loose

6.3.2 SC1202

When the FCU detects an unrecoverable error in the HDD control area of the EXSAF SRAM, or if the HDD is replaced without initializing the SAF memory, the fax unit displays this SC code and stops.

To recover from this error, do the following.

1. Disconnect the HDD from the EXSAF.
2. Initialize the SAF files using service mode function 07-2.
3. Connect the HDD again.

If the problem persists, replace the EXSAF.

6.3.3 SC1207

This is the same as SC1201 except the error location is the SRAM on the EXSAF.

The possible causes are:

- SRAM backup battery defect or SW1 on the EXSAF is at the “OFF” position.
- SRAM on the EXSAF has a physical defect.
- EXSAF connection was loose.

6.3.4 SC1802/1811/1815

If file location data in the SRAM on the EXSAF or HDD itself has a serious defect, the machine displays one of these SC codes.

To recover from these errors, initialize the SAF memory using service function 08. If the problem persists, try formatting the HDD. If formatting does not have any effect, replace the EXSAF or HDD.

6.3.5 FAX SC CODE TABLE

SC Code	Description	Suggested Action	When bit 7 of System Switch 1F = 0	When bit 7 of System Switch 1F = 1
1101	Handshake error with BiCU at start-up	Initialize the fax unit. (See the previous page for the initialization procedure)	Automatic reset	SC Code display
1102				
1103				
1111	Command tx/rx error to/from the BiCU			
1112	Base copier's engine was reset			
1120	Interface module error			
1201	Unrecoverable FCU - SRAM error	Refer to the section 6.3.1.	SC Code display	
1202	EXSAF battery backup error (HD control area)	Refer to section 6.3.2.	SC Code display	
1203	Software error	Initialize the fax unit.	Automatic reset	
1204				
1205				
1206				
1207	Unrecoverable EXSAF - SRAM error	Refer to section 6.3.3.	SC Code display	
1251	Software error	Initialize the fax unit.	Automatic reset	
1252				
1253				
1290				
1301				
1302				
1303				
1304				
1305				
1306				
1307				
1308				
1401	DCMMR timed out	Initialize the fax unit, or replace the FCU.		
1402	DMA4 table creation timed out			
1501	Error in Quick Dial data storage area			
1802	HDD file table error	Refer to section 6.3.4.	SC Code display	
1811	HDD read error			
1815	HDD write error			

6.4 FIRMWARE HISTORY

6.4.1 A693 FIRMWARE MODIFICATION HISTORY

A693 FAX OPTION FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	**FIRMWARE LEVEL**	**SERIAL NUMBER**	**FIRMWARE VERSION**
• **Cannot print out incoming fax.** Even if only one of the output trays has not been set properly, it is not possible to print out an incoming fax to any tray. • **System Switch** The default for System Switch 0A (Germany) has been changed from 00H to 30H. • **Print end buzzer** If fax printout and communication finish at the same time when using Direct Receive, the print end buzzer does not turn off. • **SC101 does not stop transmission** Transmission is not stopped even if SC101 occurs. • **Duplex Print** Page order is reversed in duplex mode if the page memory unit has not been installed (2/1, 4/3). The specifications have been changed so that the order will be 1/2, 3/4 (correct). As part of this modification, the default for Printer SW 0F bit 5 has been changed to 1. • **FCC Standards (86)** The following modification was made to comply with the changes made to FCC standards (86) and applies only to A2335581**G**: The default for communication SW10 has been changed to 02H. The default for communication SW12 has been changed to OAH.	A2335581 **G**	NA	10.00 11.00 12.00

Trouble-shooting

TECHNICAL SERVICE BULLETINS

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A693 – 001 **08/21/98**

APPLICABLE MODEL:

GESTETNER – FAX OPTION for 3235S/3235/3245
RICOH – FAX OPTION for AFICIO 340/350/450
SAVIN – FAX OPTION for 9935D/9935DP/9945DP

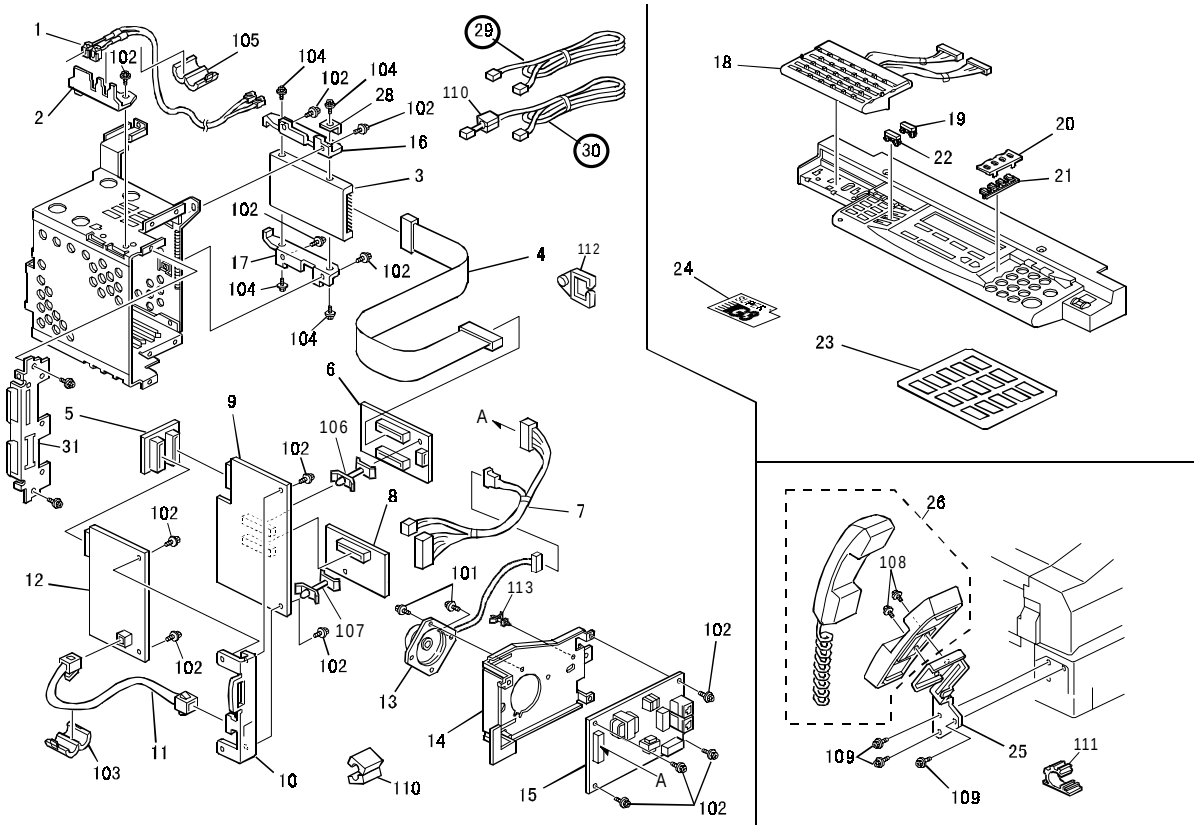
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following parts updates are being issued for all A693 Parts Catalog Sections.

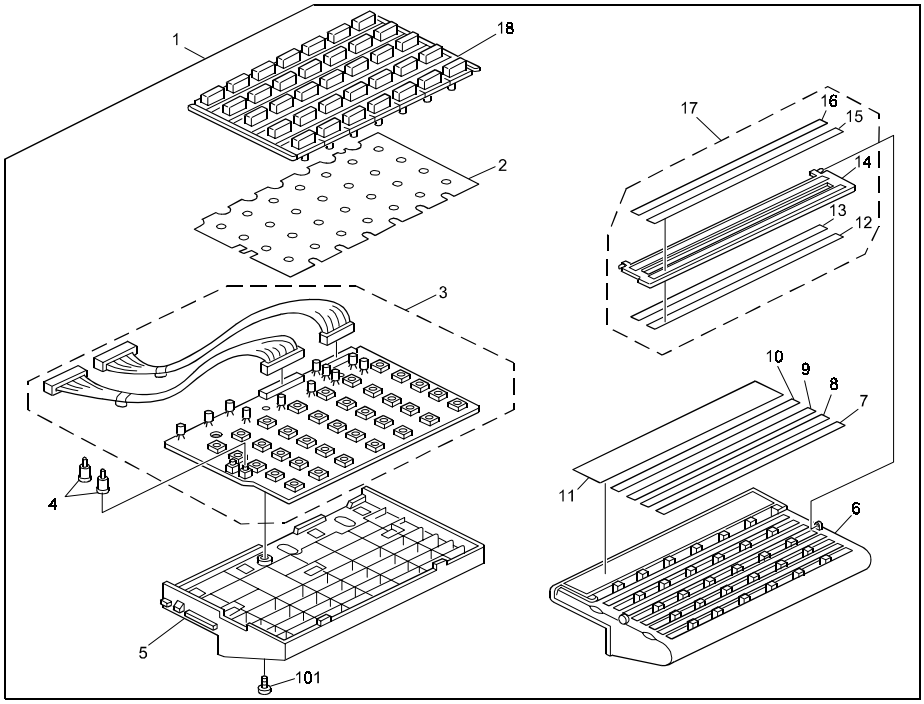
- **UPDATE 1:** PSTN and ISDN CABLES – The part numbers for the PSTN and ISDN Cables have been updated. Please update your Parts Catalog with the new part numbers.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
H3025700	H0815700	PSTN Cable	1	1	3	29
	H3025700	ISDN Cable	1		3	30

Continued…

- **UPDATE 2:** OPERATION PANEL ASS'Y – The part numbers for the OperationPanel Ass'y have been listed. Please update your Parts Catalog with the following part numbers.



			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A6937220	FAX Operation Panel Ass' y (NA)	1	*1 7	*2 1
A2331572	Insulation OP Sheet	1	*1 7	*2 2
A2331575	OP Board	1	*1 7	*2 3
A2331573	Spacer Pin (2 pieces)	1	*1 7	*2 4
A2331574	OP Lower Cover	1	*1 7	*2 5
A2331552	OP Panel	1	*1 7	*2 6
A2331555	Label Quick Dial 22-28	1	*1 7	*2 7
A2331554	Label Quick Dial 15-21	1	*1 7	*2 8
A2331557	Label Quick Dial 36-42	1	*1 7	*2 9
A2331556	Label Quick Dial 29-35	1	*1 7	*2 10
A6937225	Label OP Panel	1	*1 7	*2 11
A2331563	Label Quick Dial 01-07	1	*1 7	*2 12
A2331564	Label Quick Dial 08-14	1	*1 7	*2 13
A2331562	Quick Dial Plate	1	*1 7	*2 14
A2331566	Label Quick Dial 50-56	1	*1 7	*2 15
A2331565	Label Quick Dial 43-49	1	*1 7	*2 16
A2331561	Quick Dial Plate Ass y	1	*1 7	*2 17
A2331571	Key Pad	1	*1 7	*2 18
04330102B	Tapping Screw	1	*1 7	*2 101

*1 Denotes new page number.
*2 Denotes new item number.

Continued…

- **UPDATE 3:** NEW MANUALS – The Operation Manual – Facsimile Reference and the Manual – Facsimile Quick Guide have been added to the Parts Catalog. Please update your Parts Catalog with the following part numbers.

			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A6938607	Operation Manual – Facsimile Reference	1	3	*2 31
A6938657	Manual – Facsimile Quick Guide	1	3	*2 32

*2 Denotes new item number.

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

ISDN Unit A816

1. INSTALLATION

1.1 INSTALLATION PROCEDURE

Install the hardware as described in Chapter 3 of the host fax machine's service manual. Then program the following items.

1.1.1 USER LEVEL PROGRAMMING

The following items can be programmed with key operator settings. Make sure that the items are programmed correctly.

Item	ISDN		PSTN	Remarks
	G4	G3	G3	
Own analog number			✔	Used for transfer operations in PSTN G3 communication
Own ISDN-G4 number	✔			Used for transfer operations in ISDN G4 communication.
Own ISDN-G3 number		✔		Used for transfer operations in ISDN G3 communicaiton.
Polling ID	✔	✔	✔	Used for secured polling, transfer operations, and closed network.
Confidential ID	✔	✔	✔	Used for confidential reception. Optional SAF memory required.
Memory lock ID	✔	✔	✔	Used for memory lock. Optional SAF memory required.
RTI		✔	✔	Used to identify the terminal in G3 NSF/NSS communications.
TTI		✔	✔	Printed on each transmitted page in G3 communications.
G4_TID (Terminal ID)	✔			Used to identify the terminal in G4 communications.
CSI			✔	Used to identify the terminal in G3 DIS/DCS communications over PSTN.
IG3_CSI (ISDN G3 CSI)		✔		Used to identify the terminal in G3 communications over an ISDN.

1.1.2 SERVICE LEVEL PROGRAMMING

Item	Function No.	Remarks
System Switches	01 - 0	**System Switch 0A** - Network used for G3 transmission - Network used for G4-to-G3 fallback
Communication Switches	01 - 4	**Communication Switch 07** - G4-to-G3 fallback On/Off
G4 internal switches	17 - 01	Change the country code, and reset the machine first. Then change any of the locally required settings and/or the following. **Internal Switches 17, 18, 1A, 1B and 1C** - G4 to G3 automatic fallback parameters **Parameter Switch 01, bits 4 to 6** - Codec attenuation level
G4 parameter switches	17 - 02	
ISDN international prefix	17 - 03	Program the international access code.
G4 subscriber number - 1	17 - 04	**When not using MSN* service:** Program the ISDN subscriber number here. If an another terminal is on the same bus from the DSU, identify the terminals using a sub-address. **When using MSN* service:** Program the dedicated ISDN number for the terminal as the 1st ISDN subscriber number. If the customer wishes the machine to answer the calls to a different number, program it as the 2nd subscriber number. **Note for US national ISDN** Program SPID (Service Profile Identification) number in ISDN G4 subscriber number – 2.
G4 subscriber number - 2	17 - 05	
ISDN G3 subscriber number - 1	17 - 06	**When not using MSN* service:** Program the ISDN subscriber number here. If an another termial is on the same bus from the DSU, identify the terminals using a sub-address. **When using MSN* service:** Program the dedicated ISDN number for the terminal as the 1st ISDN subscriber number. If the customer wishes the machine to answer the calls to a different number, program it as the 2nd subscriber number. **Note for US national ISDN** Program SPID (Service Profile Identification) number in ISDN G3 subscriber number – 2.
ISDN G3 subscriber number - 2	17 - 07	

Item	Function No.	Remarks
G4 subaddress	17 - 08	Program a subaddress to identify the terminal, if two or more terminals answer the call to the subscriber number for G4 fax.
ISDN G3 subaddress	17 - 09	Program a subaddress to identify the terminal, if two or more terminals answer the call to the subscriber number for G3 fax.

* MSN = Multiple Subscriber Number; This is also referred to as “Direct Dialing In” in some countries

After changing any setting, make sure to turn off the machine, wait for 5 or more seconds, then turn it back on, so that the new settings take effect.

1.2 SWITCH SETTINGS

The following tables show the default settings of the Internal Switches and the Parameter Switches for each country setting.

1.2.1 INTERNAL SWITCHES

Switch No.	USA	Europe	Asia	Germany (1TR6)	France (CNET)
00 Country code	11(H)	European country code setting	Asian country code setting	01(H)	00(H)
01	00(H)	00(H)	00(H)	00(H)	00(H)
02	00(H)	00(H)	00(H)	00(H)	00(H)
03	00(H)	00(H)	00(H)	00(H)	00(H)
04	00(H)	00(H)	00(H)	20(H)	00(H)
05	00(H)	00(H)	00(H)	00(H)	00(H)
06	00(H)	00(H)	00(H)	00(H)	00(H)
07	00(H)	00(H)	00(H)	00(H)	00(H)
08	00(H)	00(H)	00(H)	00(H)	00(H)
09	00(H)	00(H)	00(H)	02(H)	00(H)
0A	00(H)	00(H)	00(H)	00(H)	00(H)
0B	00(H)	00(H)	00(H)	00(H)	00(H)
0C	00(H)	00(H)	00(H)	00(H)	00(H)
0D	00(H)	00(H)	00(H)	00(H)	00(H)
0E	00(H)	00(H)	00(H)	00(H)	00(H)
0F	00(H)	00(H)	00(H)	00(H)	00(H)
10	10(H)	10(H)	10(H)	10(H)	10(H)
11	00(H)	00(H)	00(H)	01(H)	00(H)
12	00(H)	00(H)	00(H)	00(H)	00(H)
13	00(H)	00(H)	00(H)	00(H)	00(H)
14	01(H)	00(H)	00(H)	00(H)	00(H)
15	00(H)	00(H)	00(H)	00(H)	00(H)
16	00(H)	00(H)	00(H)	01(H)	02(H)
17	00(H)	00(H)	00(H)	00(H)	00(H)
18	00(H)	00(H)	00(H)	00(H)	00(H)
19	01(H)	00(H)	00(H)	00(H)	00(H)
1A	00(H)	00(H)	00(H)	00(H)	00(H)
1B	00(H)	00(H)	00(H)	00(H)	00(H)
1C	00(H)	00(H)	00(H)	00(H)	00(H)
1D	00(H)	00(H)	00(H)	00(H)	00(H)
1E	00(H)	00(H)	00(H)	00(H)	00(H)
1F	00(H)	00(H)	00(H)	00(H)	00(H)

1.2.2 PARAMETER SWITCHES

Switch No.	USA	Europe	Asia	Germany (1TR6)	France (CNET)
00	00(H)	00(H)	00(H)	00(H)	00(H)
01	30(H)	21(H)	21(H)	30(H)	30(H)
02	01(H)	00(H)	00(H)	00(H)	00(H)
03	00(H)	00(H)	00(H)	00(H)	00(H)
04	07(H)	07(H)	07(H)	07(H)	07(H)
05	02(H)	02(H)	02(H)	06(H)	02(H)
06	00(H)	00(H)	00(H)	01(H)	00(H)
07	0B(H)	0B(H)	0B(H)	0B(H)	0B(H)
08	07(H)	07(H)	07(H)	07(H)	07(H)
09	00(H)	00(H)	00(H)	00(H)	00(H)
0A	01(H)	01(H)	01(H)	01(H)	01(H)
0B	0B(H)	0B(H)	0B(H)	07(H)	0B(H)
0C	01(H)	01(H)	01(H)	01(H)	01(H)
0D	00(H)	00(H)	00(H)	00(H)	00(H)
0E	B2(H)	B2(H)	B2(H)	B2(H)	B2(H)
0F	00(H)	00(H)	00(H)	00(H)	00(H)

2. SERVICE TABLES AND PROCEDURES

2.1 SERVICE LEVEL FUNCTIONS

Refer to the “Fax Unit Type 450” service manual for how to enter service mode, and how to operate with functions.

Function Number	Description
01	Programming G4 International and Parameter switches
02	Printing G4 System Parameter List
05	G4 Protocol Dump Lists
06	G4 RAM read/write and printing G4 Memory Dump List
11	ISDN G3 CCU tests
12	Programming ISDN parameters

2.2 BIT SWITCHES

⚠WARNING

Do not adjust a bit switch that is described as "Not used", as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.

NOTE: After changing any of the switches below, turn off the machine, wait for 5 seconds or more, and turn it back on, so that the new settings take effect.

2.2.1 G4 INTERNAL SWITCHES

Bit Switch 00

No.	FUNCTION	COMMENTS
0 to 7	Country code Bit 4 3 2 1 0 Country 0 0 0 0 0 France 0 0 0 0 1 Germany (1TR6 mode) 0 0 0 1 0 UK 0 0 0 1 1 Italy 0 0 1 0 0 Austria 0 0 1 0 1 Belgium 0 0 1 1 0 Denmark 0 0 1 1 1 Finland 0 1 0 0 0 Ireland 0 1 0 0 1 Norway 0 1 0 1 0 Sweden 0 1 0 1 1 Switzerland 0 1 1 0 0 Portugal 0 1 1 0 1 Netherlands 0 1 1 1 0 Spain 0 1 1 1 1 Israel 1 0 0 0 1 USA 1 0 0 1 0 Asia 1 0 0 1 1 Japan 1 0 1 0 0 Hong Kong 1 0 1 0 1 South Africa 1 0 1 1 0 Australia 1 0 1 1 1 New Zealand 1 1 0 0 0 Singapore 1 1 0 0 1 Malaysia **Note:** In Germany, use the UK setting for the EuroISDN lines.	

Bit switches 01 and 02 are not used.

Bit Switch 03		
No.	**FUNCTION**	**COMMENTS**
0	Amount of protocol dump data in one protocol dump list **0:** Last communication only **1:** Up to the limit of the memory area for protocol dumping	Change this bit to 0 if you want to have a protocol dump list of the last communication only. This bit is only effective for the dump list #2 (D + Bch1).
1 to 7	Not used	Do not change the factory settings.

Bit Switch 04		
No.	**FUNCTION**	**COMMENTS**
0 to 4	Not used	Do not change the factory settings.
5	RCBCTR **0:** Not valid **1:** Valid	This bit is used in Germany; set it to 1 for German PTT approval tests. **1:** RCBCTR counts consecutive R:RNR signals. If the counter reaches the value of N2, the link is disconnected.
6	Not used	Do not change the factory settings.
7		

Bit Switch 05		
No.	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the factory setting.
1	Logical channel number (LCN) **0:** Not controlled **1:** Fixed at 01	This bit is normally 0. However, some networks may require a fixed LCN. In such cases, this bit should be 1, and you may have to set a different value for the LCN using G4 Parameter Switch A.
2	Protocol ID check **0:** Yes **1:** No	The Protocol ID is in the CR packet.
3 to 7	Not used	Do not change the factory settings.

Bit Switch 06		
No.	**FUNCTION**	**COMMENTS**
0	Inclusion of the DTE address in the S:CR packet **0:** No **1:** Yes	When the CR packet format matches ISO8208 protocol, some networks may require this bit to be set at 1. This bit is only effective if bit 0 of G4 Parameter switch 6 is at 0.
1	Calling and called DTE addresses **0:** Not used **1:** Used	This is only for packet networks. The CR packet should contain the rx side's DTE address, but does not have to include the tx side's; it can include it as an option.
2 to 7	Not used	Do not change the factory setting.

Bit switch 07 and 08 are not used.

Bit Switch 09		
No.	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the factory setting.
1	New session within the same call **0:** Not accepted **1:** Accepted	**0:** If a new R:CSS is received, the machine sends back S:RSSN. **1:** If a new R:CSS is received, the machine sends back S:RSSP. Set this bit to 1 for German PTT approval tests.
2 to 7	Not used	Do not change the factory settings.

Bit switches 0A to 0F are not used.

Bit Switch 10 (Dch. Layer 1)		
No.	**FUNCTION**	**COMMENTS**
0	Connection detector **0:** Disabled **1:** Enabled	In most countries (including Europe), this should be disabled.
1 **2**	Layer 1 T3 timer **Bit 2 1 Time** 0 0 5 s 0 1 29 s 1 0 10 s 1 1 Not used	This should be kept at 5 s (both bits at 0) for normal operation. However, you may have to change this during PTT approval tests.
3	Layer 1 T4 timer **0:** Not used **1:** Used	Set this bit to 1 for French PTT approval tests.
4	Not used	Do not change the factory settings.
5		

Bit Switch 10 (Dch. Layer 1)		
No.	**FUNCTION**	**COMMENTS**
6	INFO1 signal resend **0:** Resend **1:** No resend	0: Some DSUs may not reply to the INFO1 signal with INFO2, if there is noise in the INFO1 signal accidentally. Try changing this bit to 0, to resend INFO1 before the machine displays “CHECK INTERFACE”.
7	Loop back 4 mode **0:** Disabled **1:** Enabled	This is normally kept at 0. However, set it to 1 for British PTT approval tests.

Bit Switch 11 (Dch. Layer 2)		
No.	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the factory setting.
1	Type of TEI used **0:** Dynamic TEI **1:** Static TEI	This is normally fixed at 0. However, some networks such as the Northern Telecom ISDN may require this bit to be set at 1 (see below). In this case, you may have to change the values of bits 2 to 7. **Note for US National ISDN** Keep this setting at 0.
2 to 7	Static TEI value	This is used in the USA with the DMS100 (Northern Telecom ISDN) exchanger. Store the lowest bit of the TEI at bit 7 and the highest bit of the TEI at bit 2. **Example:** If the static TEI is 011000, set bits 3 and 4 to 1 and bits 2, 5, 6, and 7 to 0.

Bit switch 12 is not used. Do not change any of the factory settings.

Bit Switch 13: D channel layer 3 (Attachment IE in S: SETUP)		
No.	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the factory settings.
1		
2	Attachment of calling ID **0:** No **1:** Yes	Normally, this bit should be at 0, because most networks add the calling ID to the SETUP signal to the receiver. However, some networks may require the machine to add this ID. Only in this case should this bit be at 1. **Note for US National ISDN** Keep this setting at 1.
3	Attachment of the Lower Layer Capabilities **0:** No **1:** Yes	This bit determines whether Lower Layer Capabilities are informed in the [SETUP] signal or not. Keep this bit at 0 in most cases.
4	Attachment of the Higher Layer Capabilities **0:** Yes **1:** No	This bit determines whether Higher Layer Capabilities are informed in the [SETUP] signal or not. Keep this bit at 0 in most cases.

Bit Switch 13: D channel layer 3 (Attachment IE in S: SETUP)		
No.	**FUNCTION**	**COMMENTS**
5	Attachment of channel information element (L3 CONN) **0:** No **1:** Yes	**Note for US National ISDN** Keep this setting at 1.
6 to 7	Not used	Do not change the factory settings.

Bit Switch 14: D channel layer 3 (Selection IE in S: SETUP)		
No.	**FUNCTION**	**COMMENTS**
0	ISDN G3 information transfer capability **0:** 3.1 kHz audio **1:** Speech	In tx mode, this determines the information transfer capability informed in the [SETUP] message. In rx mode, this determines the information transfer capability that the machine can use to receive a call. Refer to Appendix C for more details. Set this bit to 1 if the ISDN does not support 3.1 kHz audio. This bit is only used in the USA and the UK. **Note for US National ISDN** Keep this setting at 1.
1 **2**	Not used	Do not change the factory settings.
3 **4**	Channel selection in [SETUP] in tx mode Bit 4 3 Setting 0 0 Any channel 0 1 B1 channel 1 0 B2 channel 1 1 Not used	**Any channel:** When this is informed to the exchanger, the exchanger will select either B1 or B2.
5	Called ID mapping **0:** Called party number **1:** Keypad facility	**0:** Called ID is mapped to the called party number. **1:** Called ID is mapped to the keypad facility. On the 5ESS network (USA), set it to 1. **Note for US National ISDN** Keep this setting at 1.
6	Numbering plan for the called party number **0:** Unknown **1:** E.164	**E.164:** This may be used in Sweden if an AXE10 exchanger is fitted with old software, and in Australia. **Unknown:** This is the normal setting.
7	Subaddress coding type **0:** IA5 (NSAP) **1:** BCD (ISO8348)	This is normally kept at 0. However, some networks require this bit to be at 1.

Bit Switch 15: D channel layer 3 (Judgement R: MSG)		
No.	**FUNCTION**	**COMMENTS**
0	Action when receiving [SETUP] signal containing no called subaddress, if the subaddress was programmed in the dialed number **0:** A reply is sent **1:** No reply is sent	This bit depends on user requirements. If it is at 1, communication will be halted if the other terminal has not input the subaddress. Refer to Appendix C for more details.
1 to 4	Not used	Do not change the factory settings
5	Global call reference **0:** Ignored **1:** Global call number is used	Global call reference means 'call reference value = 0'. This bit determines how to deal with such an incoming call if received from the network. Keep this bit at 1 in France and Germany (1TR6), also in countries where the global call reference is used.
6	Not used	Do not change the factory settings.
7		

Bit Switch 16: D channel layer 3 (Approval)		
No.	**FUNCTION**	**COMMENTS**
0 **1**	Answer delay time Bit 1 0 Setting 0 0 No delay 0 1 1.0 s delayed (1TR6) 1 0 0.5 s delayed (CNET) 1 1Not used	In Germany (1TR6) and France (CNET), a time delay to answer a call is required. In other countries, use this switch as follows: If the machine is connected to the same bus from the DSU as a model K200 is connected, the machine receives most of the calls because the response time to a call is faster than the K200. If the customer wants the K200 to receive most of the calls, adjust the response time using these bits. If the customer does not want one machine to receive most of the calls, use subaddresses to identify each terminal.
2	Action when receiving [SETUP] signal containing user-specific callrd party subaddress **0:** Ignores the call **1:** Receives the call	Normally, the 3rd octet of called party subaddress information in the [SETUP] signal is set to NSAP. However, some networks may add “user-specific” subaddress to the [SETUP] signal (UK), and the result of this is that the machine won't answer the call if a subaddress is specified. So, change this bit to 1 to let the machine receive the call if the machine is connected to such a network.
3	Not used	Do not change the factory settings.
4		

Bit Switch 16: D channel layer 3 (Approval)		
No.	**FUNCTION**	**COMMENTS**
5	Indicated bearer capabilities **0:** 56 kbps **1:** 64 kbps	**1:** 64 kbps calling is indicated in the Bearer Capabilities, but communication is at 56 k. Use this bit if the machine is connected to a network which does not accept a 56 kbps data transfer rate as a bearer capability.
6	Not used	Do not change the factory settings.
7		

Bit Switch 17: CPS Code Used for G4 to G3 Fallback - 1		
No.	**FUNCTION**	**COMMENTS**
0 to 6	Condition for fallback from G4 to G3 Bits 0 to 6 of bit switch 17 contain a CPS code, and bits 0 to 6 of bit switch 18 contain another CPS code. If a CPS code is received which is the same as either of these, communication will fall back from ISDN G4 mode to ISDN G3 mode. The CPS codes must be the same as those specified in table 4-13 of CCITT recommendation Q.931. Examples: Bit 6 5 4 3 2 1 0 1 0 0 0 0 0 1 CPS code 65 1 0 1 1 0 0 0 CPS code 88 For the codes in bits 0 to 6 of bit switches 17 and 18 to be recognized, bit 7 of bit switch 17 must be 1. Also, bit 0 of the Communication Switch 07 must be at 0, or Fallback from G4 to G3 will be disabled.
7	This bit determines whether fallback from G4 to G3 occurs on receipt of one of the CPS codes programmed in bit switch 17 or 18, or on receipt of a certain standard code. **0:** Fallback occurs on receipt of any of the following CPS codes: UK (EuroISDN mode) - #3, #18, #57, #58, # 63, # 65, #79, #88, and #127 Germany (1TR6 mode) - #3, #31, #53, #58, #62, #89, and #90 France - #3, #65, #88, and #113 Others - #3, #65, and #88 **1:** Fallback from G4 to G3 occurs on receipt any of above CPS codes or one of the CPS codes programmed in bit switch 17, 18, 1A, 1B, or 1C

Bit Switch 18: CPS Code Used for G4 to G3 Fallback - 2		
	FUNCTION	**COMMENTS**
0 to 6	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	This bit helps to choose the CPS code set for G4 to G3 fallback. **0:** Fallback occurs on receipt of the CPS code set which is specified by the country code setting. **1:** Fallback occurs on receipt of the UK CPS code set (#3, #18, #57, #58, # 63, # 65, #79, #88, and #127) even if another counry code is programmed.	

Bit Switch 19		
No.	**FUNCTION**	**COMMENTS**
0	Permanence of the link **0:** Set/released each LAPD call **1:** Permanent	Keep this at 1 in the USA. In other areas, this bit is normally 0, depending on network requirements. **Note for US National ISDN** Keep this setting at 1.
1	Channel used in ISDN L2 (64k) mode **0:** B1 **1:** B2	When making an IDSN L2 back-to-back test, you can select either the B1 or B2 channel with this bit switch.
2	SPID procedure (L2) **0:** Disabled **1:** Enabled	**Note for US National ISDN** Keep this setting at 1.
3	G4 SPID procedure (L2) **0:** Disabled **1:** Enabled	**Note for US National ISDN** Keep this setting at 1.
4 to 7	Not used	Do not change the factory settings.

Bit Switch 1A: CPS Code Used for G4 to G3 Fallback - 3		
No.	**FUNCTION**	**COMMENTS**
0 to 6	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	Not used.	Do not change the setting.

Bit Switch 1B: CPS Code Used for G4 to G3 Fallback - 4		
No.	**FUNCTION**	**COMMENTS**
0 to 6	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	Not used.	Do not change the setting.

Bit Switch 1C: CPS Code Used for G4 to G3 Fallback - 5		
No.	**FUNCTION**	**COMMENTS**
0 to 6	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	Not used.	Do not change the setting.

Bit switches 1D to 1F are not used. Do not change any of the factory settings.

2.2.2 G4 PARAMETER SWITCHES

Parameter Switch 00		
No.	**FUNCTION**	**COMMENTS**
0 **1** **2**	Network type Bit 2 1 0 Type x 0 0 Circuit switched ISDN Other settings: Not used	Do not change the default setting.
3 **to** **7**	Not used	Do not change the default settings.

Parameter Switch 01		
No.	**FUNCTION**	**COMMENTS**
0	Voice coding **0:** μ law **1:** A law	**0:** This setting is used in Japan, Taiwan, and the USA. **1:** This setting is used in Europe and Asia.
1	Action when [SETUP] signal without HLC is received **0:** Respond to the call **1:** Not respond to the call	If there are several TEs on the same bus and the machine responds to calls for another TE, the call may be without HLC information. Identify the type of calling terminal and change this bit to 1 if the caller is not a fax machine.
2	Not used	Do not change the default settings.
3		
4 **5** **6**	Signal attenuation level for G3 fax signals received from ISDN line. If an analog signal comes over an digital line, the signal level after decoding by the TE is theorically the same as the level at the entrance to the digital line. However, this sometimes causes the received signal level to be too high at the received end. In this case, adjust the decoded signal's attenuation level using these switches. The values in the “Codec” column below show the attenuation level at the G4 interface board. The values in the “Modem” column show the actual attenuation level at the modem, because the signal is attenuated again on the FCU by -6dB. Bit 6 5 4 Codec Modem (Actual attenuation level) 0 0 0 -4.5dB -10.5dB 0 0 1 -2.5dB -8.5dB 0 1 0 -0.5dB -6.5dB 0 1 1 +1.5dB -4.5dB (default setting) 1 0 0 +3.5dB -2.5dB 1 0 1 +5.5dB -0.5dB 1 1 0 +7.5dB +1.5dB 1 1 1 +9.5dB +3.5dB	
7	Not used	Do not change the default settings.

Parameter Switch 02		
No.	**FUNCTION**	**COMMENTS**
0 **1**	Data rate (kbps) Bit 1 0 Setting 0 0 64 kbps 0 1 56 kbps	Other settings: Not used
2	Not used	Do not change the default settings.
3		
4 **5**	Transmission mode Bit 5 4 Mode 0 0 CS	Other settings: Not used
6	Not used	Do not change the default settings.
7		

Parameter Switch 03		
No.	**FUNCTION**	**COMMENTS**
0	Link modulus **0:** 8 **1:** 128	This setting determines whether protocol frame numbering is done using 3 bits (0 to 7 then start again at 0) or 7 bits (0 to 127 then start again at 0). Set this bit switch to match the network's specifications.
1 **to** **7**	Not used	Do not change the default settings.

Parameter Switch 04 is not used. Do not change any of the default settings.

Parameter Switch 05		
No.	**FUNCTION**	**COMMENTS**
0 **1** **2** **3**	Link timer (D-channel layer 2 T1 timer) Bit 3 2 1 0 Value 0 0 0 0 0 s 0 0 0 1 1 s 0 0 1 0 2 s and so on until 0 0 1 0 10 s	The link timer is the maximum allowable time between sending a protocol frame and receiving a response frame from the remote terminal.
4 **to** **7**	Not used	Do not change the default settings.

Parameter Switch 06		
No.	**FUNCTION**	**COMMENTS**
0	Layer 3 protocol **0:** ISO8208 **1:** T.70NULL	Set this bit to match the type of layer 3 signalling used by the ISDN. The dedicated parameters have the same setting for specific destinations.
1	Not used	Do not change the default settings.
2		
3		
4	Packet modulus **0:** 8 **1:** 128	Do not change the default setting, unless the machine is experiencing compatibility problems.
5	Not used	Do not change the default settings.
6		
7		

Parameter Switch 07		
No.	**FUNCTION**	**COMMENTS**
0 **1** **2** **3**	Packet size Bit 3 2 1 0 Value 0 1 1 1 128 1 0 0 0 256 1 0 0 1 512 1 0 1 0 1024 1 0 1 1 2048	This value is sent in the CR packet. This value must match the value stored in the other terminal, or communication will stop (CI will be returned). If the other end returns CI, check the value of the packet window size with the other party. Note that this value must be the same as the value programmed for the transport block size (G4 Parameter Switch B, bits 0 to 3). Normally, do not change the default setting.
4 **to** **7**	Not used	Do not change the default settings.

Parameter Switch 08		
No.	**FUNCTION**	**COMMENTS**
0 **1** **2** **3**	Packet window size Bit 3 2 1 0 Value 0 0 0 1 1 0 0 1 0 2 and so on until 1 1 1 1 15	This is the maximum number of unacknowledged packets that the machine can send out before having to pause and wait for an acknowledgement from the other end. This should be kept at 7 normally. If the packet modulus (G4 Parameter Switch 6, bit 4) is 8, the packet window size cannot be more than 7. However, if the packet modulus is 128, the window size can be up to 15. Also, if the layer 3 protocol setting (G4 Parameter Switch 6, bit 0) is at IS8208, the packet window size cannot be more than 7.

Parameter Switch 08		
No.	**FUNCTION**	**COMMENTS**
4 to 7	Not used	Do not change the default settings.

Parameter Switch 09		
No.	**FUNCTION**	**COMMENTS**
0 **1** **2** **3**	LCGN Bit 3 2 1 0 Value 0 0 0 0 0 0 0 0 1 1 0 0 1 0 2 and so on until 1 1 1 1 15	Keep the value of the LCGN at 0.
4 to 7	Not used	Do not change the default settings.

Parameter Switch 0A		
No.	**FUNCTION**	**COMMENTS**
0 **1** **2** **3** **4** **5** **6** **7**	LCN Bit 7 6 5 4 3 2 1 0 Value 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 1 0 2 0 0 0 0 0 0 1 1 3 and so on until 1 1 1 1 1 1 1 1 255	Keep at the value of the LCN at 1.

Parameter Switch 0B		
No.	**FUNCTION**	**COMMENTS**
0 **1** **2** **3**	Transport block size Bit 3 2 1 0 Value 0 1 1 1 128 1 0 0 0 256 1 0 0 1 512 1 0 1 0 1024 1 0 1 1 2048	This value must match the value set in the other terminal. Note that this value must be the same as the value programmed for the packet size (G4 Parameter Switch 7, bits 0 to 3). Also, the transport block size is limited by the amount of memory in the remote terminal.
4 to 7	Not used	Do not change the default settings.

Parameter Switch 0C is not used. Do not change any of the default settings.

Parameter Switch 0D		
No.	**FUNCTION**	**COMMENTS**
0 **1**	Back-to-back test mode Bit 1 0 Setting 0 0 Off 0 1 Not used 1 0 ISDN L2 test mode (TE mode) 1 1 ISDN L2 test mode (NT mode)	When doing a back-to-back test or doing a demonstration without a line simulator, use these bits to set up one of the machines in TE mode, and the other in NT mode. After the test, return both bits to 0. See "Back-to-back Testing" in the Troubleshooting section for full details.
2 **to** **7**	Not used	Do not change the default settings.

Parameter Switch E		
No.	**FUNCTION**	**COMMENTS**
0	Troubleshooing mode - real time status codes display **0:** Off **1:** On	If this is switched on, the status codes will be displayed in the lower two lines of the LCD. These codes are explained in the Troubleshooting section (G4CCU Status Codes). Change this bit back to 0 after testing.
1	Saving frames to the protocol dump list **0:** Off **1:** On	Keep this bit at 1 normally.
2 **to** **7**	Not used	Do not change the default settings.

2.3 DEDICATED TRANSMISSION PARAMETERS

The following G4 communication parameter bytes have been added for each Quick Dial and Speed Dial. For how to program Dedicated Transmission Parameters, refer to the Service Manual for the base machine.

Switches 01 to 04 are for use with Group 3 communication and are explained in the Service Manual for the base machine. Switch 08 is not used.

Switch 05	
No.	**FUNCTION**
0 **1** **2** **3**	Data rate Bit 3 2 1 0 Setting 0 0 0 0 64 kbps 0 0 0 1 56 kbps 1 1 1 1 As in Parameter Switch 2, bits 0 and 1 Other settings: Not used
4	Not used
5	
6	
7	

Switch 06	
No.	**FUNCTION**
0 **1** **2** **3**	Link modulus Bit 3 2 1 0 Setting 0 0 0 0 Modulo 8 0 0 0 1 Modulo 128 1 1 1 1 As in Parameter Switch 3, bit 0 Other settings: Not used
4	Not used
5	
6	
7	

Switch 07	
No.	**FUNCTION**
0 **1** **2** **3**	Layer 3 protocol Bit 3 2 1 0 Setting 0 0 0 0 IS.8208 0 0 0 1 T.70 NULL 1 1 1 1 As in Parameter Switch 6, bit 0 Other settings: Not used
4 **5** **6** **7**	Packet modulus Bit 7 6 5 4 Setting 0 0 0 0 Modulo 8 0 0 0 1 Modulo 128 1 1 1 1 As in Parameter Switch 6, bit 4 Other settings: Not used

3. TROUBLESHOOTING

3.1 ERROR CODES

The tables on the following pages show the error codes that will be printed on the Service Monitor Report. See the Service Manual for the base machine for instructions on how to print this report.

The meaning of the numbers in the Action column is as follows.

1. Check Layer 1 signalling with a protocol analyzer to determine the cause of the problem. This may require assistance from a G4 specialist.
2. Repeat the communication. If the problem does not repeat itself, the problem was a temporary one caused by the user connecting the machine to another interface. However, if the problem remains, there is a network problem.
3. There is a network problem.
4. There is a network problem. Do the following:
   - Check the error bit rate of the network. If it is high, contact the network and ask them to improve the line.
   - Check the network speed (is it 56 or 64 kbps), and make sure that the bit switch setting is correct. You may also use the dedicated transmission parameters if this problem only occurs when dialling certain numbers.
   - Check that the user dialled the correct number.
5. There is a network problem, or a problem in the machine at the other end.
6. There is a problem in the machine at the other end; ask a technician to check it.
7. The machine at the other end is not a Group 4 fax terminal.
8. The machine is not compatible with the machine at the other end. A compatibility test is needed.

Error codes related with the errors detected by the FCU are listed in the Service Manual of the main body.

3.1.1 D-CHANNEL LAYER MANAGEMENT

Code	Probable Cause	Action
7-00	Link reset	2
7-01	Link set-up failed because of time-out.	2
7-02	Link release failed because of time-out.	2
7-03	Link set-up parameter error	2

3.1.2 D-CHANNEL, LAYER 1

Code	Probable Cause	Action
7-10	T3 timeout (layer 1 activation error)	1
7-11	No connection on the S0 interface	1
7-12	Deactivated	1

3.1.3 D-CHANNEL LINK LAYER

Code	Probable Cause	Action
7-20	At the start of link set-up, the machine received an unsolicited S (F=1).	2
7-21	At the start of link set-up, the machine received an unsolicited DM (F=1).	2
7-22	At TEI release, the machine received an unsolicited UA (F=1).	2
7-23	At the start of link set-up, the machine received an unsolicited DM (F=0).	2
7-24	At TEI release, the machine received an unsolicited UA (F=0).	2
7-25	SABME received at the start of network link set-up	No error
7-26	N200 retransmission error for SABME	2
7-27	N200 retransmission error for DISC	2
7-28	N200 retransmission error for situation enquiry (RR)	2
7-29	N(R) sequence number error	3
7-30	N(S) sequence number error	3
7-31	FRMR received	3
7-32	Non-standard frame received	3
7-33	Abnormal frame length	3
7-34	N201 error; information field N in the I frame exceeded N201	3
7-35	T201 timeout; timeout while waiting for checking	3
7-36	T202 timeout; timeout while waiting for ID assignment	3

3.1.4 D-CHANNEL NETWORK LAYER

Code	Probable Cause	Action
7-40	Insufficient mandatory information elements	3
7-41	Abnormal LI for a mandatory information element	3
7-42	T301 timeout; timeout while waiting for R:CONN	3
7-43	T303 timeout; timeout while waiting for R:CALL-PROC etc.	3
7-44	T304 timeout; timeout while waiting for R:CALL-PROC etc.	3
7-45	T305 timeout; timeout while waiting for R:REL	3
7-46	T308 timeout; timeout while waiting for R:REL-COMP	3
7-47	T310 timeout; timeout while waiting for R:ALERT etc.	3
7-48	T313 timeout; timeout while waiting for R:CONN-ACK	3
7-49	Internal error	3
7-51	Release call reference during communication	3

3.1.5 B-CHANNEL LINK LAYER

Code	Probable Cause	Action
7-60	T3 timeout; timeout while waiting for flag	4
7-61	T3 timeout; timeout while waiting for SABM during an incoming call	4
7-62	T1 timeout x N2; timeout while waiting for UA after sending SABM	5
7-63	T1 timeout x N2; timeout while waiting for a response to a transmitted S frame (P=1)	5
7-64	T1 timeout x N2; timeout while waiting for SABM or DISC after sending FRMR	5
7-65	T1 timeout x N2; timeout while waiting for a response to DISC	5
7-66	RNR x N2 (other end busy, RCB counter error)	5
7-67	Invalid (Ad) frame received	5
7-68	Invalid short frame received	5
7-69	Link reset error	5
7-70	FRMR received	5
7-71	Non-standard (Cn) frame received	5
7-72	An S or U frame having an information field was received	5
7-73	A frame longer than the maximum N1 length was received	5
7-74	An S or I frame having an N(R) error was received	5
7-75	CRC error	3

3.1.6 B-CHANNEL NETWORK LAYER

Code	Probable Cause	Action
7-80	A packet having an abnormal GFI was received	6
7-81	A packet was received that had a logical channel number different from the logical channel being used for the communication	6
7-82	A packet containing a format error was received	6
7-83	A packet containing an LI error was received	7
7-84	A CN packet was received that had a PID different from 02	7
7-85	Unsupported packet type received	7
7-86	Abnormal or unsupported facility received	7
7-87	P(s) sequence number error	6
7-88	P(r) sequence number error	6
7-89	A reset using S:RQ or R:RI occurred	6
7-90	A restart using S:RQ or R:SI occurred	6
7-91	Call set-up error; in reply to S:CR, R:CI was received to indicate rejection of the call	7
7-92	T20 timeout; timeout while waiting for an SF packet	6
7-93	T21 timeout; timeout while waiting for a CC packet	6
7-94	T22 timeout; timeout while waiting for an RF packet	6
7-95	T23 timeout; timeout while waiting for a CF packet	6
7-96	T10 timeout; timeout while waiting for the first frame	6

3.1.7 TRANSPORT LAYER

Code	Probable Cause	Action
8-00	Invalid block received	8
8-01	TCC block received	8
8-02	TBR block received	8
8-05	TCR block; block format error	8
8-06	TCR block; block size parameter LI error	8
8-07	TCR block; extended addressing LI error	8
8-08	TCR block; block size length error	8
8-10	TCA block; block format error	8
8-11	TCA block; Tx origin reference data in TCR disagreed with the address reference data in TCA	8
8-12	TCA block; octet 7 did not equal 0	8
8-13	TCA block; extended addressing LI error	8
8-14	TCA block; block size exceeded that set by TCR	8
8-15	TCA block; block size parameter LI error	8
8-20	TDT block; block format error	8
8-21	TDT block; octet 3 did not equal either 00 or 80(H)	8
8-22	TDT block; the end indicator was “Continue” even though there was no field data	8

Code	Probable Cause	Action
8-23	TDT block; an end block with no field data was received after an end indicator of “End”	8
8-26	Timeout during state 0.2	8
8-27	Timeout during state 1.1	8
8-28	Timeout during state 0.3	8

3.1.8 SESSION LAYER

Code	Probable Cause	Action
8-30	Invalid frame received	8
8-31	RSSN received	8
8-32	CSA received	8
8-34	Calling terminal identification error in CSS	8
8-35	Date and time error in CSS	8
8-36	Window size error in CSS	8
8-37	Service identification error in CSS	8
8-38	Session user data error in CSS	8
8-39	CSS rejected (new session rejected)	8
8-40	Called terminal identification error in RSSP	8
8-41	Date and time error in RSSP	8
8-42	Date and time in RSSP was not the same as that in CSS	8
8-43	Window size error in RSSP	8
8-44	Service identification error in RSSP	8
8-45	<%2>Session user data error in <%0>RSSP	8
8-47	Message synchronization error inside the CCU	8
8-48	Document task busy	8
8-50	Ti timeout; non-communication surveillance timer (T.62)	8
8-51	T2 timeout; timeout while waiting for a response (T.62)	8
8-52	T3 timeout; CSA timer timeout (T.62)	8
8-53	G4 board load timer timeout; calling side waited too long for a new session	8
8-54	G4 board load timer timeout; calling side waited too long for transport probability	8
8-55	G4 board load timer timeout; called side waited too long for S:RSSP	8
8-56	G4 board load timer timeout; document transmission surveillance timer timeout	8
8-57	G4 board load timer timeout; timeout while waiting for a user abort request after a provider fail	8

3.1.9 DOCUMENT LAYER

Code	Probable Cause	Action
8-60	T.62 coding format error (LI error)	8
8-61	A mandatory PI was absent, or the LI for a mandatory PI was 0	8
8-62	Calling/called terminal identification LI was different from that specified by F.184 (LI = 24)	8
8-63	The LI for session user data exceeded the maximum value (512)	8
8-64	The LI for CDUI was not 0	8
8-65	Checkpoint and document reference numbers LI error, or they were not in T.61 (ASCII) coding	8
8-66	The checkpoint reference number differed from the expected value	8
8-70	RDGR received	8
8-71	A non-standard PDU was received while in calling mode	8
8-72	A non-standard PDU was received while in called mode	8
8-73	Abnormal PDU received while in calling state ds1	8
8-74	15 consecutive CDCL signals received	8
8-75	Session window size control error (size not equal to 0)	8
8-76	Internal error	8

3.1.10 PRESENTATION LAYER

Code	Probable Cause	Action
8-80	X.209 coding error in session user data (LI error)	8
8-81	PV error in session user data	8
8-82	PI error in session user data	8
8-83	The capabilities in the session user data of CDS/CDC were not the same as those in RDCLP	8
8-84	X.209 coding error in the DP (LI error)	8
8-85	X.209 coding error in the SLD (document descriptor/page descriptor) (LI error)	8
8-86	SLD object type absent	8
8-87	PI error in the SLD (document descriptor/page descriptor)	8
8-88	The capabilities in the SLD (document descriptor/page descriptor) are duplicated or are not the same as those in RDCLP	8
8-89	No document descriptor at the start of the document	8
8-90	No page descriptor at the start of the page	8
8-91	Page descriptor PV error	8
8-92	X.209 coding error in the TU (LI error)	8
8-93	The TU was absent	8
8-94	PV error in the TU	8
8-95	TI error	8
8-96	X.209 coding nest level >> 8, or an LI form error	8
8-97	CDPB/CDE received while TU/TI not yet completed, or an unexpected PDU was received while analyzing an SLD	8

3.2 G4CCU STATUS CODES

The display of G4CCU status codes is affected by the Real Time Display On/off setting (G4 Parameter Switch E, bit 0).

- If Real Time Display is off (the bit is 0; this is the default setting), there is no indication on the operation panel.
- If Real Time Display is on (the bit is 1), the codes are fully displayed on the operation panel.

The codes are defined in the following pages.

3.2.1 LAYER 1 (PHYSICAL LAYER)

Code (H)	Status	Code (H)	Status
10	Ready	E0	R: [DISC]
01	S: [SETUP]	E1	S: [REL]
02	R: [CALL_PROC]	E3	R: [REL_COMP]
03	R: [CONN]	E4	R: [STAT]
04	S: [CONN_ACK]	E5	R: [STAT_ENQ]
05	R: [SETUP ACK]	F0	S: [DISC]
06	R: [ALERT]	F1	R: [REL]
11	R: [SETUP]	F2	S: [REL_COMP]
12	S: [CALL_PROC]	F3	S: [STAT]
13	S: [CONN]		
14	R: [CONN_ACK]		

3.2.2 LAYER 2 (LINK LAYER)

Code (H)	Status	Code (H)	Status
20	S: SABM, or R: SABM	D0	S: DISC, or R: DISC
21	S: UA, or R: UA	D1	S: DM, or R: DM
22	S: FRMR, or R: FRMR		
28	S: SABME, or R: SABME		

3.2.3 NETWORK LAYER (LAYER 3)

Code (H)	Status	Code (H)	Status
30	S: CR	C2	S: SQ
31	R: CC	C3	R: SF
38	R: CN	CA	R: SI
39	S: CA	CB	S: SF
32	S: GF	C4	S: RQ
3A	R: GQ	C5	R: RF
3B	R: GF	CC	R: RI
C0	S: CQ	CD	S: RF
C1	R: CF	C6	R: IT
C8	R: CI	C7	R: IF
C9	S: CF	CE	R: DIAG

3.2.4 TRANSPORT LAYER (LAYER 4)

Code (H)	Status	Code (H)	Status
40	S: TCR, or R: TCR	42	S: TBR, or R: TBR
41	S: TCA, or R: TCA	43	S: TCC or R: TCC

3.2.5 SESSION LAYER, SESSION CONTROL LAYER (LAYER 5)

Code (H)	Status	Code (H)	Status
50	S: CSS, or R: CSS	56	S: RSUI, or R: RSUI
51	S: RSSP, or R: RSSP	A0	S: CSA, or R: CSA
52	S: RSSN, or R: RSSN	A1	S: RSAP, or R: RSAP
53	S: CSCC, or R: CSCC	A2	S: CSE, or R: CSE
54	S: RSCCP, or R: RSCCP	A3	S: RSEP, or R: RSEP

3.2.6 SESSION LAYER, DOCUMENT CONTROL LAYER (LAYER 5)

Code (H)	Status	Code (H)	Status
60	S: CDCL, or R: CDCL	90	S: CDE, or R: CDE
61	S: RDCLP, or R: RDCLP	91	S: RDEP, or R: RDEP
62	S: CDS, or R: CDS	92	S: CDD, or R: CDD
63	S: CDC, or R: CDC	93	S: RDDP, or R: RDDP
64	S: CDPB, or R: CDPB	94	S: CDR, or R: CDR
65	S: RDPBP, or R: RDPBP	95	S: RDRP, or R: RDRP
70	S: CDUI, or R: CDUI (Data phase - layer 6 and facsimile data)	96	S: RDGR, or R: RDGR
		97	S: RDPBN, or R: RDPBN

3.3 LEDS

There are six LEDs on the G4 Interface board, as shown below.

		LED 5	LED 6
LED 1	LED 2	LED 3	LED 4

These LEDs give the following information about the status of the machine.

Initial Settings O=ON, --=OFF

Power-up/Reset			O	O
	--	--	--	--
Initial setting request from FCU			--	O
	--	--	--	--
Initial setting confirmation to FCU			--	--
	--	--	--	--
Communication				
Layer 1 activated			--	--
	O	--	--	--
Layer 2 set			--	--
	O	O	--	--
B channel connected (ISDN G4)			--	--
	O	O	O	--
B channel connected (ISDN G3)			--	--
	O	O	--	O
B channel released			--	--
	O	O	--	--
Layer 2 released			--	--
	O	--	--	--
Layer 1 deactivated			--	--
	--	--	--	--

The following will be displayed if bit 1 of G4 parameter switch E is at 1.

B channel: send I frame (A blinks at this time if bit 1 of G4 parameter switch E is at 1)			--	A
	O	O	O	--
B channel: receive I frame (B blinks at this time if bit 1 of G4 parameter switch E is at 1)			B	--
	O	O	O	--

Note: At the start and end of communication, both A and B will blink.

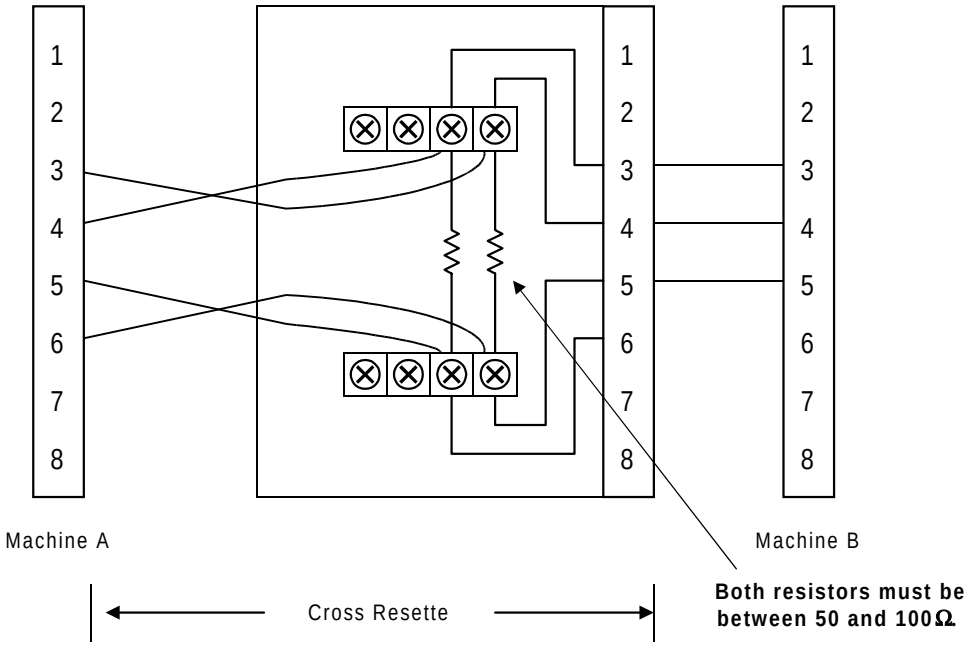
3.4 BACK-TO-BACK TEST

To make a back-to-back test, you need:

- Two machines (both of them must have CiG4 board)
- Cross rosette

The procedure is as follows.

1. Switch off the machines
2. Connect two machines back-to-back using the cross rosette as follows.



3. Make the following bit switch adjustments:
   - In the machine acting in NT mode, set bits 0 and 1 of G4 parameter switch 0D to 1.
   - In the machine acting in TE mode, set bit 0 of G4 parameter switch 0D to 0 and bit 1 to 1.
4. Reset the machine by switching it off, waiting a few seconds, then switching back on.
5. Place a document in one of the machines, dial a number, then press Start.
6. After you have finished the test, set bits 0 and 1 of G4 parameter switch 0D back to 0. then reset the machine.

NOTE: The following cannot be tested using this procedure:

- ISDN G3 communication
- P to M

APPENDIX A

1. D-CHANNEL LAYER 1 DUMP LIST

1.1 HOW TO PRINT THE DUMP LIST

Use this function to print the D-ch. Layer 1 dump list.

1. After entering the service mode, press [0] [6], then [4]
2. Input the addresses 03B000 to 03B1FF:
   Input 0 - 3 - B - 0 - 0 - 3 - B - 1 - [◇]

List Sample

```
   * * * G4 CCU MEMORY DUMP LIST (SEP. 25.1995  4.05PM) * * *
          0  1  2  3   4  5  6  7   8  9  A  B   C  D  E  F
-------------------------------------------------------------
03B000    00 00 00 F2  10 1E 00 F3  01 1C 64 F4  10 12 00 F5
03B010    10 22 00 F6  10 36 00 F7  02 00 08 F7  20 A6 08 F7
03B020    03 81 00 F7  07 34 60 F7  10 32 00 F7  02 00 03 F7
03B030    20 29 03 F7  02 00 18 F7  20 A9 04 F7  20 AB 0B F7
03B040    02 00 04 F7  20 AB 0C F7  02 00 04 F7  02 00 08 F7
03B050    20 A9 04 F7  20 AB 0E F7  02 00 04 F7  02 00 08 F7
03B060    20 A9 04 F7  20 00 03 F7  20 29 03 F7  10 02 7C F3
03B070    10 3E 40 F3  10 1E 00 F3  FF FF FF FF  00 00 FF FF
03B080    FF FF 00 00  00 00 FF FF  FF FF 00 00  00 00 FF FF
03B090    FF FF 00 00  00 00 FF FF--------------------------
   ¦
   ¦
```

Refer to “How to Read the Dump List” later in this chapter.

1.2 HOW TO READ THE DUMP LIST

Data Format

The machine logs the details of layer 1 communication whenever a event has taken place. The event can be either a request from the machine, a request from the DSU, a transmission of a signal, or a reception of a signal.

Each log consists of 4 bytes. The first byte indicates the type of event, the second and the third bytes for optional data, which depends on the type of event, and the fourth byte indicates the layer 1 status. The following table explains all types of data formats.

<table>
<tr><th>1st byte</th><th>2nd byte</th><th>3rd byte</th><th>4th byte</th></tr>
<tr><td>00(H): TE mode initialization request</td><td>00(H)</td><td>00(H)</td><td>Layer 1 status</td></tr>
<tr><td>01(H): Layer 1 activation request</td><td rowspan="2">See note 1</td><td rowspan="2">See note 2</td><td rowspan="8">TE mode
F1(H): F1 status
F2(H): F2 status
F3(H): F3 status
F4(H): F4 status
F5(H): F5 status
F6(H): F6 status
F7(H): F7 status
F8(H): F8 status

NT mode
C1(H): G1 status
C2(H): G2 status
C3(H): G3 status
C4(H): G4 status

Refer to the “Layer 1 Activation/ Deactivation Procedure” later in this chaper</td></tr>
<tr><td>10(H): Layer 1 status has changed</td></tr>
<tr><td>02(H): Frame transmission request</td><td>00(H)</td><td>Number of transmitted data bytes
(Max. 255 bytes)</td></tr>
<tr><td>20(H): Frame reception indication</td><td>See note 3</td><td>Number of received data bytes
(Max. 255 bytes)</td></tr>
<tr><td>03(H): TEI assignment request</td><td>Assigned TEI value</td><td>00(H)</td></tr>
<tr><td>04(H): Layer 1 de-activation request</td><td>See note 4</td><td>See note 2</td></tr>
<tr><td>05(H): Loop back mode request</td><td>00(H)</td><td>00(H)</td></tr>
<tr><td>06(H): NT mode initialization request</td><td>00(H)</td><td>00(H)</td></tr>
<tr><td>EE(H): Communication error</td><td>See note 5</td><td>00(H)</td></tr>
</table>

The data “FF FF FF FF” indicates the end of the data.

NOTE:

1) Status Register Value

Data (Hex)	Description
1E or 1C	Deactivated or standby
02 or 00	INFO0 signal received
0E or 0C	Not connected
1A or 18	Error status
12 or 10	Non-synchronized signal received
22 or 20	INFO2 signal received
32 or 30	Priority high
36 or 34	Priority low
3E or 3C	Terminated

2) Command Register Value

Data (Hex)	Description
00	No command requested
40	Standby request
44	Reset request
60	Priority change requset (High priority)
64	Priority change request (Low priority)
7C	Termination request

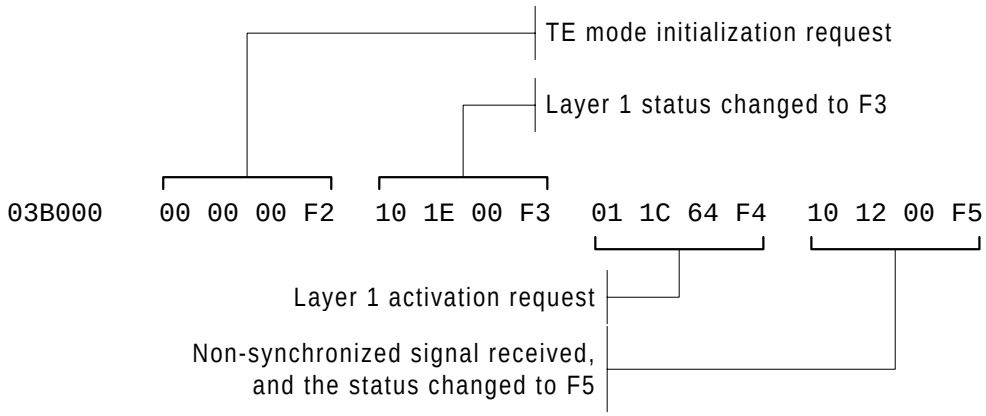
3) Received Frame Status Register
   Bit 7 - Not used
   Bit 6 - 0: Normal, 1: Received data overflow
   Bit 5 - 0: Normal, 1: CRC error
   Bit 4 - 0: Normal, 1: Received frame aborted
   Bits 3 to 0: Not used

4) Interrupt Status Register
   Bit 7 - 0: Normal, 1: Frame received
   Bit 6 - 0: Normal, 1: Receive buffer full
   Bit 5 - Not used
   Bit 4 - 0: Normal, 1: Transmission buffer full
   Bit 3 - Not used
   Bit 2 - 0: Normal, 1: Layer 1 status has changed
   Bit 1 - Not used
   Bit 0 - 0: Normal, 1: Communication error

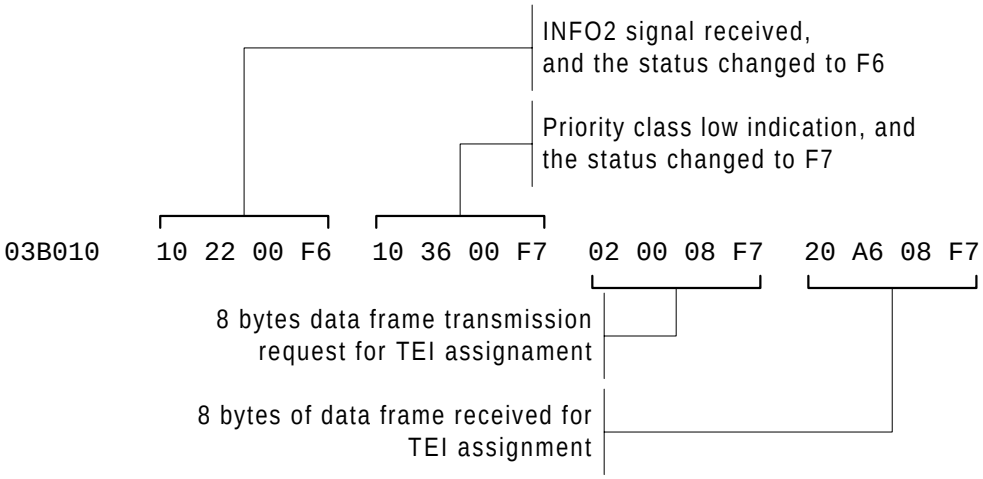
5) Communication Error Status Register
   Bit 7 - 0: Normal, 1: Frame resend
   Bit 6 - 0: Normal, 1: Transmission underrun
   Bit 5 - Not used
   Bit 4 - 0: Normal, 1: Transmission pool overflow
   Bits 3 to 0 - Not used

Reading the Sample Dump List

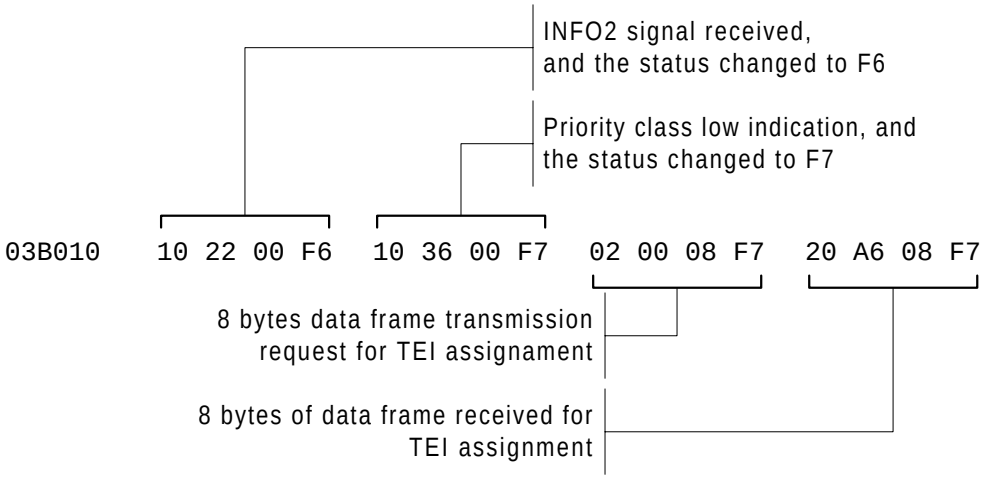
Line #1



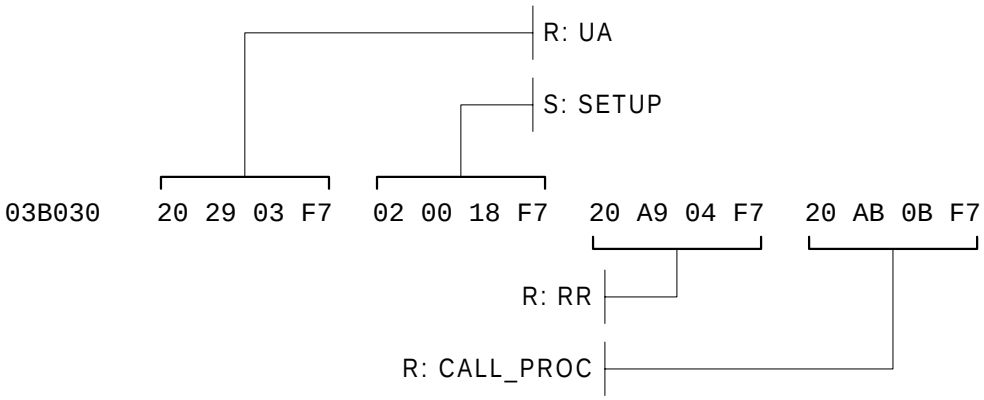
Line #2



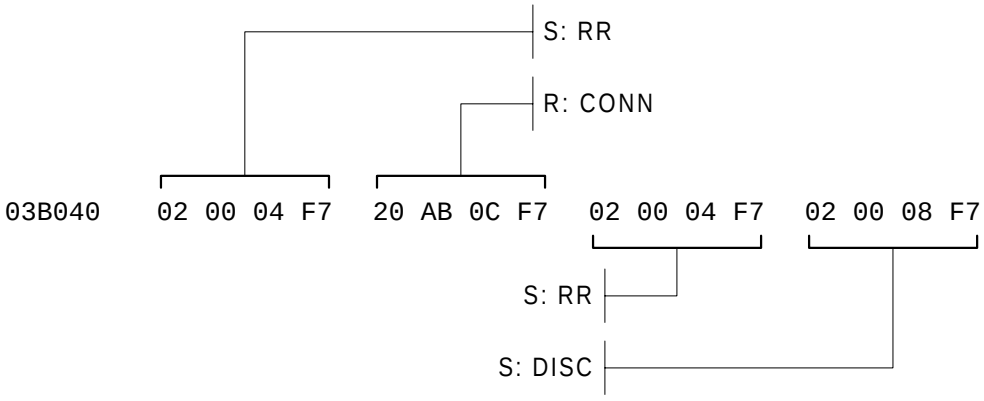
Line #3



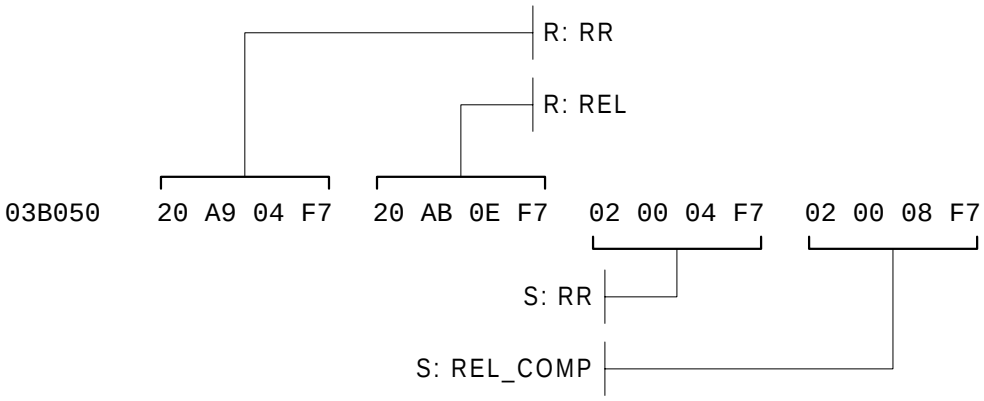
Line #4



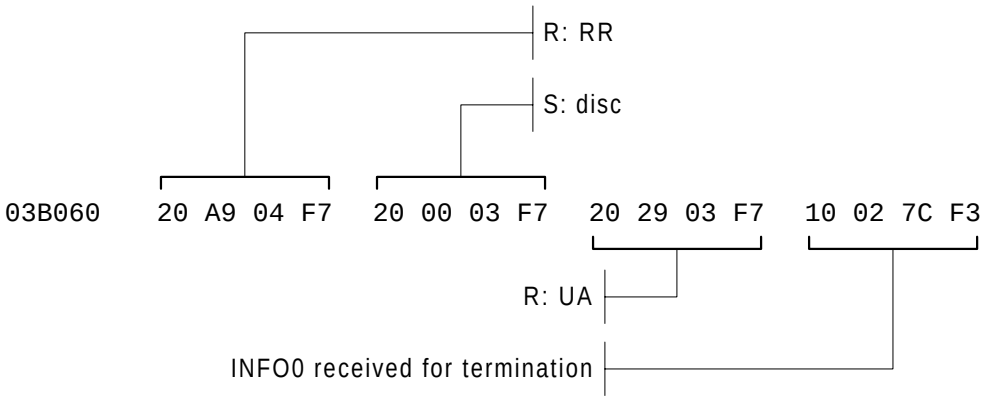
Line #5



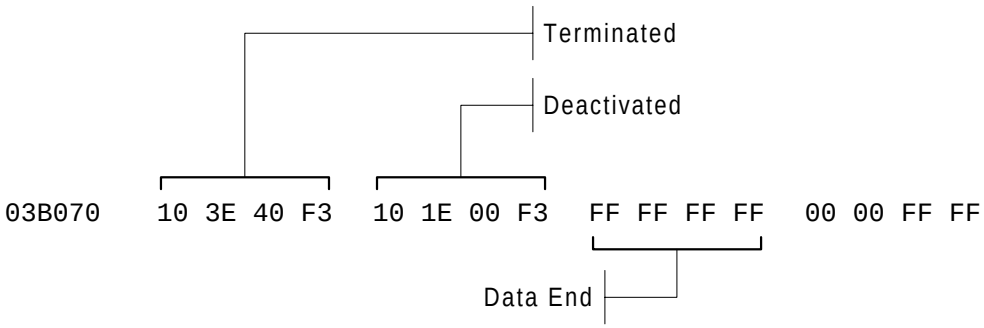
Line #6



Line #7


R: RR
S: disc
03B060 20 A9 04 F7 20 00 03 F7 20 29 03 F7 10 02 7C F3
R: UA
INFO0 received for termination

Line #8


Terminated
Deactivated
03B070 10 3E 40 F3 10 1E 00 F3 FF FF FF FF 00 00 FF FF
Data End

Layer 1 Status

The ITU-T I.430 recommendation (the basic user-network interface - Layer 1 specification) specifies layer 1 activation/deactivation procedures.

Before understanding the procedures, the status and INFO signals should be noted.

TE (Terminal Equipment) Status

Status	Description
F1	TE is turned off.
F2	TE is turned on, but no signal is exchanged.
F3	TE is stopped. No signal is exchanged between TE and NT.
F4	TE is waiting for the response to INFO1 signal from NT.
F5	TE is checking if the signal from the NT is INFO2 or INFO4.
F6	TE is waiting for signals from NT after receiving INFO2 signal.
F7	TE and NT are in synchronized condition.
F8	TE has failed to synchronize to NT, and waiting for the stop request from NT

NT (Network Termination) Status

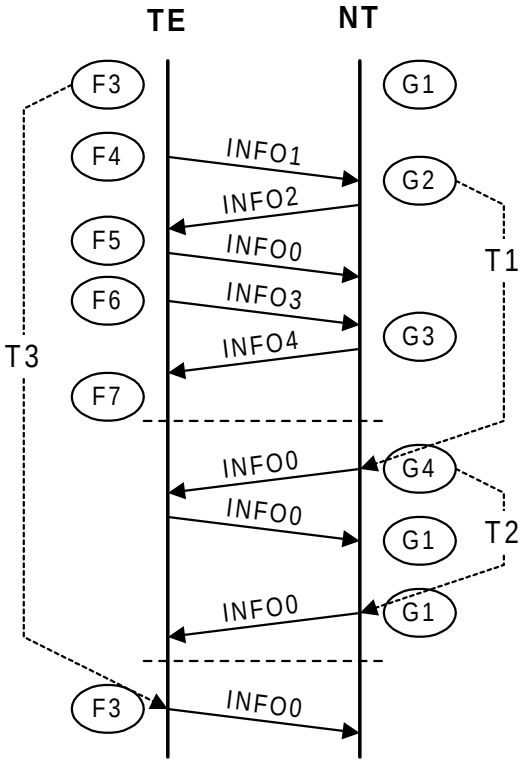
Status	Description
G1	NT is stopped.
G2	NT is sending INFO2 signal.
G3	TE and NT are in synchronized condition.
G4	NT is terminating itself.

INFO Signals

NT to TE Direction		TE to NT direction	
INFO0	No signal (11111111...)	INFO0	No signal (11111111...)
INFO2	Activation signal in synchronized condition (B=0, D=0, E=0, A=0)	INFO1	Activation signal in non-synchronized condition (+0-0111111+0-0)
INFO4	Synchronized frame	INFO3	Synchronized frame

Activation Procedure from the TE

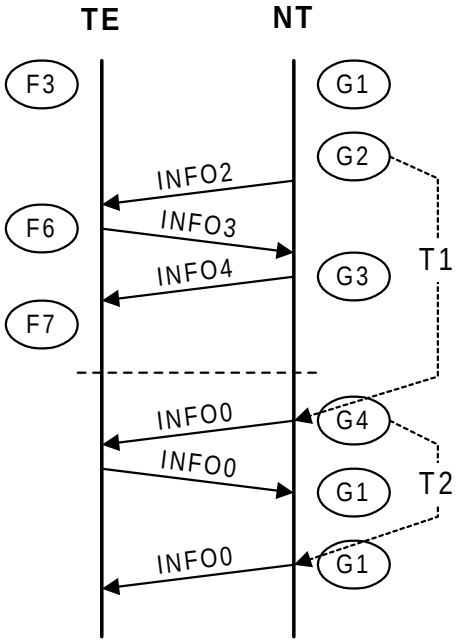
In idle “F3” status, the TE send the INFO1 signal to the NT and changes to “F4” status. The NT then changes to “G2” status and sends INFO2 signal to the TE.
The TE changes to “F5” status and stops sending signals to synchronize itself to the signal from the NT.
After the TE has synchronized to the signal, it sends INFO3 signal to the NT and changes to the “F6” status.
The NT then changes to “G3” status and sends INFO4 signal back to the TE to inform that a physical link has been established.
The timers T1, T2 and T3 are used to reset the TE or NT if a correct response has not received before the timers expire.



Activation Procesure from the NT

The procedure starts from the NT by sending INFO2 signal to the TE.

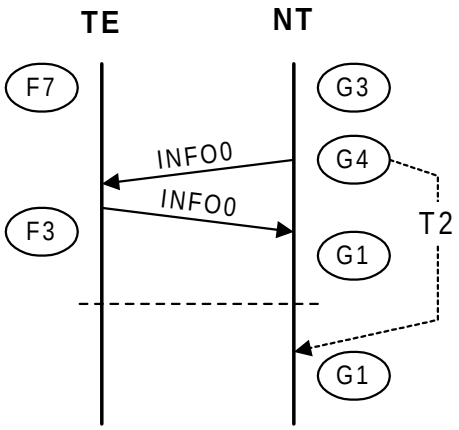
After the TE has synchronized to the signal, it sends INFO3 signal to the NT and changes to the “F6” status.
The NT then changes to “G3” status and sends INFO4 signal back to the TE to inform that a physical link has been established.
The timers T1 and T2 are used to reset the NT if a correct response has not received before the timers expire.



Termination Procedure from the NT

The termination procedure starts from synchronized status (“F7”status for the TE and “G3” status for the NT).

To terminate the physical connection, the NT just stops sending signals and changes to “G1” status. (The INFO0 signal means no signal is sent from the NT.) Then, the TE also stops sending signals and changes to “F3” status.



APPENDIX B

1. G4 PARAMETER LOCATIONS

1.1 INITIAL PROGRAMMING ITEMS COMPARISON LIST

NOTE: The model "CGO" is only for the US and Taiwan markets.

Item	CFO/LHO/ CGO	FX4	Type 250	Type 450
Country code	**U:** F-61			
Own analog number	**U:** F-61	**U:** F-61	**U:** Key Op.	**U:** Key Op.
Area code prefix	**U:** F-61			
Own ISDN-G4 number	**U:** F-61	**U:** F-61	**U:** Key Op.	**U:** Key Op.
Own ISDN-G3 number	**U:** F-61	**U:** F-61	**U:** Key Op.	**U:** Key Op.
Next transfer station	**U:** F-61			
G4 internal switches	**S:** F-18-01	**S:** F-17-01	**S:** F-01-6	**S:** F-01-6
G4 parameter switches	**S:** F-18-02	**S:** F-17-02	**S:** F-01-7	**S:** F-01-7
Data network international prefix	**S:** F-18-03			
ISDN international prefix	**S:** F-18-04	**S:** F-17-03	**S:** F-12-1	**S:** F-12-1
G4 subscriber number 1	**S:** F-18-05	**S:** F-17-04	**S:** F-12-2	**S:** F-12-2
G4 subscriber number 2	**S:** F-18-06	**S:** F-17-05	**S:** F-12-3	**S:** F-12-3
IG3 subscriber number 1	**S:** F-18-07	**S:** F-17-06	**S:** F-12-4	**S:** F-12-4
IG3 subscriber number 2	**S:** F-18-08	**S:** F-17-07	**S:** F-12-5	**S:** F-12-5
Internal Access Unit 1	**S:** F-18-09			
Internal Access Unit 2	**S:** F-18-10			
G4 subaddress	**S:** F-18-11	**S:** F-17-08	**S:** F-12-6	**S:** F-12-6
IG3 subaddress	**S:** F-18-12	**S:** F-17-09	**S:** F-12-7	**S:** F-12-7
G4 terminal ID	**S:** F-18-13	**U:** F-61	**U:** Key Op.	**U:** Key Op.
IG3 CSI	**S:** F-18-14	**U:** F-61	**U:** Key Op.	**U:** Key Op.
G4 dump 1 (RAM dump)	**S:** F-18-15	**S:** F-17-10	**S:** F-06-4	**S:** F-06-4
G4 dump 2 (Protocol dump)	**S:** F-18-16	**S:** F-17-11	**S:** F-05-2	**S:** F-05-2
G4 parameter list	**S:** F-18-17	**S:** F-17-12	**S:** F-02-2	**S:** F-02-2
Service level password	1991	1995	1988-Start	C/S – 1 – 0 – 7 – Stop (3 s)

U: User level function
S: Service level function
Key Op.: Key operator mode (User Tools - Fax - 6 - #)

1.2 SWITCH LOCATIONS COMPARISON LIST

NOTE: The model ”CGO” is only for the US and Taiwan markets.

Communication Parameter Display

Model	Switch Location	Setting
CFO	Bit switch 00, bit 7	0: Off, 1: On
LHO/CGO	Bit switch 00, bit 7	0: Off, 1: On
FX4/Type 250/450	System switch 00, bit 5	0: Off, 1: On

Default Communication Mode

Model	Switch Location	Setting
CFO	000153(H), bit 2	0: G3, 1: G4
LHO/CGO	080053(H), bit 2	0: G3, 1: G4
FX4/Type 250/450	System switch 0A, bit 0	0: G3, 1: G4

Network Used for G3 Transmission

Model	Switch Location	Setting
CFO	000153(H), bit 3	0: PSTN, 1: ISDN
LHO/CGO	080053(H), bit 3	0: PSTN, 1: ISDN
FX4/Type 250/450	System switch 0A, bit 6	0: PSTN, 1: ISDN

Network Used for G3 transmission in G4-to-G3 Fallback

Model	Switch Location	Setting
CFO	000153(H), bit 3	0: PSTN, 1: ISDN
LHO/CGO	080053(H), bit 3	0: PSTN, 1: ISDN
FX4/Type 250/450	System switch 0A, bit 7	0: PSTN, 1: ISDN

Automatic G4-to-G3 Fallback

Model	Switch Location	Setting
CFO	00015C(H), bit 0	0: Enabled, 1: Disabled
LHO/CGO	08005C(H), bit 0	0: Enabled, 1: Disabled
FX4/Type 250/450	Communication switch 07, bit 0	0: Enabled, 1: Disabled

Specified Two Step Transfer

Model	Switch Location	Setting
CFO	00015C(H), bit 1	0: Disabled, 1: Enabled
LHO/CGO	08005C(H), bit 1	0: Disabled, 1: Enabled
FX4/Type 250/450	Function not available	

Cable Equalizer for ISDN Transmission

Model	Switch Location	Setting		
CFO	Bit switch 08, bits 6 and 7	**Bit 7**	**Bit 6**	**Setting**
		0	0	None
		0	1	Low
LHO/CGO		1	0	Medium
		1	1	High
FX4/Type 250/450	G3 switch 09, bits 0 and 1	**Bit 1**	**Bit 0**	**Setting**
		0	0	None
		0	1	Low
		1	0	Medium
		1	1	High

Cable Equalizer for ISDN Reception

Model	Switch Location	Setting		
CFO	Bit switch 0A, bits 6 and 7	**Bit 7**	**Bit 6**	**Setting**
		0	0	None
		0	1	Low
LHO/CGO		1	0	Medium
		1	1	High
FX4/Type 250/450	G3 switch 09, bits 2 and 3	**Bit 3**	**Bit 2**	**Setting**
		0	0	None
		0	1	Low
		1	0	Medium
		1	1	High

APPENDIX C

1. CONDITIONS FOR RECEIVING A CALL

BC: Bearer Capability
HLC: Higher Layer Compatibility
SA: Subaddress

Tx	Setup			Response	Condition
Terminal	**BC**	**HLC**	**Called No./ Called SA**		
G4 Fax	Digital	G4	Not included	G4 reception	
	Digital	G4	Included	G4 reception	If called no. and called subaddress match the G4 subscriber no.
				No response	If called no. and called subaddress do not match the G4 subscriber no.
	Digital	N/A	Not included	G4 reception	If G4 Parameter Switch 01, Bot 1 = 0
				No response	If G4 Parameter Switch 01, Bot 1 = 0
	Digital	N/A	Included	G4 reception	If called no. and called subaddress match the G4 subscriber no.
				No response	If called no. and called subaddress do not match the G4 subscriber no.
G3 Fax	3.1k	G2/G3	Not included	G3 reception	
	3.1k	G2/G3	Included	G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.
	3.1k	N/A	Not included	G3 reception	If G4 Parameter Switch 01, Bot 1 = 0
				No response	If G4 Parameter Switch 01, Bot 1 = 0
	3.1k	N/A	Included	G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.
	Speech	G2/G3	Not included	G3 reception	
	Speech	G2/G3	Included	G3 reception	If called no. and called subaddress match the IG3 subscriber no.

Tx	Setup			Response	Condition
Terminal	**BC**	**HLC**	**Called No./ Called SA**		
G3 Fax	Speech	G2/G3	Included	No response	If called no. and called subaddress do not match the IG3 subscriber no.
	Speech	N/A	Not included	No response	If G4 Internal Switch 14, Bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
				G3 reception	If G4 Internal Switch 14, Bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
				No response	If G4 Internal Switch 14, Bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
				No response	If G4 Internal Switch 14, Bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
	Speech	N/A	Included	G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.
Telephone	Speech	TEL	Not included	No response	
	Speech	TEL	Included	No response	
	Speech	N/A	Not included	No response	If G4 Internal Switch 14, Bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
				G3 reception	If G4 Internal Switch 14, Bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
				No response	If G4 Internal Switch 14, Bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
				No response	If G4 Internal Switch 14, Bit 0 = 0, and G4 Parameter Switch 01, bit 1 = 1.
	Speech	N/A	Included	G3 reception	If called no. and called subaddress match the IG3 subscriber no.

Tx	Setup			Response	Condition
Terminal	**BC**	**HLC**	**Called No./ Called SA**		
Telephone	Speech	N/A	Included	No response	If called no. and called subaddress do not match the IG3 subscriber no.
	3.1k	TEL	Not included	No response	
	3.1k	TEL	Included	No response	
	3.1k	N/A	Not included	G3 reception	If G4 Parameter Switch 01
				No response	If G4 Parameter Switch 01
	3.1k	N/A	Included	G3 reception	If called no. and called subaddress match the IG3 subscriber no.
				No response	If called no. and called subaddress do not match the IG3 subscriber no.

TECHNICAL SERVICE BULLETINS

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 001 **07/28/98**

APPLICABLE MODEL:
GESTETNER - 3235S/3235/3245
RICOH - AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945P

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the pages(s) supplied. Each bulletin package contains 1 set of replacement pages.

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• xv ~ xxiii	Updated Information (Table of Contents)
• Tab Position Page	Updated Information on page
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• 19-1 ~ 19-11	SwapFTL™ Binary Utility Operation Manual

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3,000-SHEET FINISHER A697

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SwapFTL™ and SwapFTL™ Installation Manual

1 INTRODUCTION

1.1 PRECAUTIONS

1.1.1 SWAPBOX AND SOFTWARE

If you purchase SwapBox from an authorized SCM Microsystems dealer, do not use the software enclosed with the SwapBox. You need to purchase the required software and license additionally from Ricoh.
The software part number is: **A2309353**

1.1.2 SOFTWARE LICENSE AGREEMENT

Before you use the software, you must agree to the SCM software license agreement that is enclosed in either the SwapBox or the software.
Users must be responsible for the agreement with SCM Microsystems Inc. Ricoh Co., Ltd. is not responsible for any legal problems caused by user's actions contrary to the agreement.

1.2 SYSTEM REQUIREMENTS

- An IBM PC-AT compatible computer with ISA Plug & Play BIOS
- One empty ISA bus slot (SBI-C2P and SBI-D2P)
- One empty 3.5" drive bay (SBI-D2P)
- Microsoft ® Windows ® 95 operating system 4.00.950a or later version installed (Refer to section 1.4 for more details.)
- At least 2MB of free disk space on the system partition (the partition where Windows 95 is installed) for SwapFTL software installation

1.3 ITEMS TO PREPARE BEFORE INSTALLATION

- Computer hardware user's manual
- Windows 95 installation disks or CD-ROM
- Windows 95 service pack (Refer to section 1.4 for more details.)
- SCM SwapBox SBI-C2P or SBI-D2P

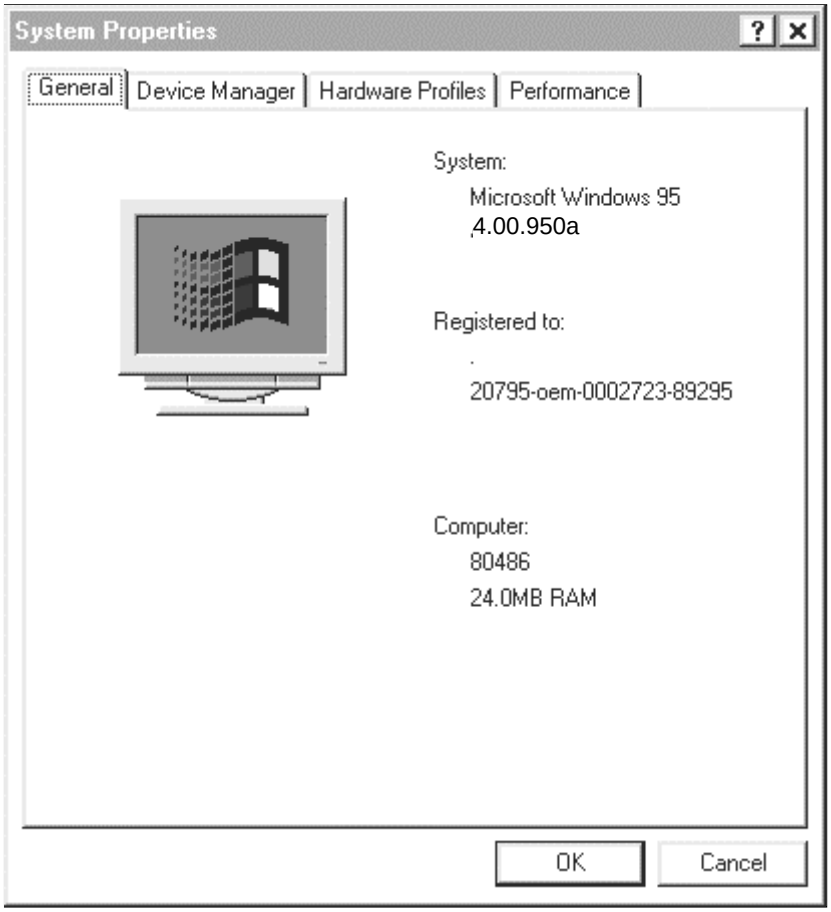
SCM/RCH SwapFTL + SwapUTI (rev. 2.01 or later) software diskette, and a software license

1.4 WINDOWS 95 VERSION CONFIRMATION

Windows 95 has several different versions as shown in the following table.

Version	Description	Remarks
4.00.950	First version	**Not suitable for SwapBox and SwapFTL installation.**
4.00.950a	First version (4.00.950) plus service pack 1	Install service pack 1 (SP1) into Windows 95 version 4.00.950. SP1 is available from Microsoft's web site.
4.00.950B	So called "OSR2 (OEM Service Release 2)"	Only computers with Windows 95 pre-installed have had this version since 1997.
4.00.950C	So called "OSR2.5 (OEM Service Release 2.5)"	Only computers with Windows 95 pre-installed have had this version since 1998.

Check the Windows 95 version first, just by clicking the "System" icon in the Windows Control Panel. If you see 4.00.950 in the box shown below, though the example version is 4.00.950a, install "Service Pack 1" into the current Windows operating system. Refer to the next page for how to get "Service Pack 1".



If the version is 4.00.950B or 4.00.950C, install SwapBox and SwapFTL without updating Windows.

"Service Pack 1" is available from the Microsoft web site.

For the detailed information, refer to the following Internet address.
http://www.microsoft.com/windows95/info/service-packs.htm

The service pack file can be downloaded from the following Internet location. Choose the one that is suitable for your Windows version.

Language	Internet Location
US English	http://www.microsoft.com/windows95/info/service-packs.htm
Chinese (Simplified)	Not available.
Chinese (Traditional)	http://www.microsoft.com/windows/software/localize/tw-eu.htm
Czech	http://www.microsoft.com/windows/software/localize/cz-eu.htm
Danish	http://www.microsoft.com/windows/software/localize/dan-eu.htm
Dutch	http://www.microsoft.com/windows/software/localize/dut-eu.htm
Finnish	http://www.microsoft.com/windows/software/localize/fin-eu.htm
German	http://www.microsoft.com/windows/software/localize/frn-eu.htm
Greek	http://www.microsoft.com/windows/software/localize/ger-eu.htm
Hungarian	http://www.microsoft.com/windows/software/localize/grk-eu.htm
Italian	http://www.microsoft.com/windows/software/localize/itn-eu.htm
Japanese (PCAT)	http://www.microsoft.com/windows/software/localize/jpcat-eu.htm
Korean	http://www.microsoft.com/windows/software/localize/kr-eu.htm
Norwegian	http://www.microsoft.com/windows/software/localize/nor-eu.htm
Pan-European	http://www.microsoft.com/windows/software/localize/pan-eu.htm
Polish	http://www.microsoft.com/windows/software/localize/pl-eu.htm
Portuguese (Brazilian)	http://www.microsoft.com/windows/software/localize/brz-eu.htm
Portuguese (Iberian)	http://www.microsoft.com/windows/software/localize/pt-eu.htm
Russian	http://www.microsoft.com/windows/software/localize/ru-eu.htm
Slovenian	http://www.microsoft.com/windows/software/localize/slv-eu.htm
Spanish	http://www.microsoft.com/windows/software/localize/spa-eu.htm
Swedish	http://www.microsoft.com/windows/software/localize/swe-eu.htm
Thai	http://www.microsoft.com/windows/software/localize/thai2.htm
Turkish	http://www.microsoft.com/windows/software/localize/trk-eu.htm

2 SWAPBOX INSTALLATION

2.1 HARDWARE INSTALLATION

CAUTION: 1) Before installing the SwapBox in a computer, turn off the computer and disconnect the power cable.
2) This manual does not explain how to install an ISA board in your computer. Refer to your computer's users manual for how to do it.

Install the SwapBox as explained in Chapter 1 to 3 of the SwapBox Manual that is enclosed in the SwapBox package.
Then go on to the next section below for the driver installation.

2.2 DRIVER INSTALLATION

CAUTION: 1) Do not use the software disks that are enclosed with the SwapBox.
2) Ensure that you have Windows 95 - 4.00.950a or a later version installed in your computer. (Refer to section 1.4 for more details.)

1. Turn on the computer. "SCM SwapBox" may appear during boot-up.
2. When Windows 95 starts, it finds the SwapBox automatically and installs the necessary driver files from the Windows installation diskette(s) or CD-ROM.
3. After Windows starts, choose "PCCard" from the Control Panel.
   - If PCCard Properties is displayed, driver installation has finished. You can go on to the next section.
   - If PCCard Wizard is displayed, go on to the next step.
4. In the PCCard Wizard, choose all the default settings to finish the wizard, then reboot the computer.
5. After Windows 95 has restarted, choose "System" from the Control Panel.
6. Choose "Device Manager" and confirm that "SCM SwapBox Family Plug and Play PCMCIA Controller" is listed in the PCMCIA socket category.
7. Double-click "SCM SwapBox Family Plug and Play PCMCIA Controller" and confirm that the SwapBox is working properly.

3 SOFTWARE (SWAPFTL) INSTALLATION

CAUTION: 1) If you purchased SwapBox from an authorized SCM dealer, do not use the software diskettes that are enclosed in the SwapBox package.
2) Use the software diskette which is labeled “SwapBox Software/ RCH SwapFTL + SwapUTI”.
3) A software license is required to **install** a software package on a computer.
4) The SwapFTL software may not work with some PC Card (PCMCIA), CardBus, or ZV port controllers installed in notebook computers.

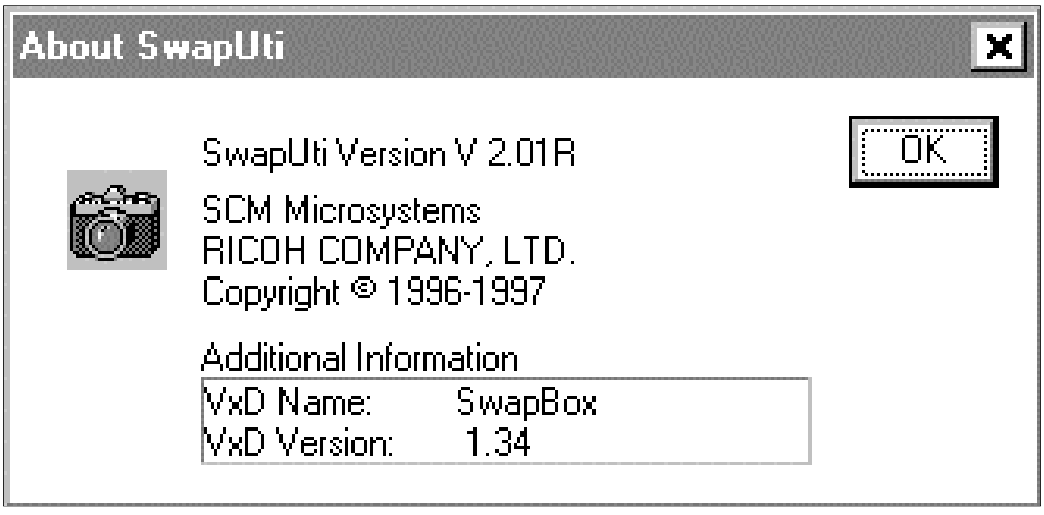
3.1 SWAPFTL SOFTWARE INSTALLATION

1. Ensure that the SwapBox has been installed and configured under the Windows 95 environment.
2. Insert the software diskette in the floppy disk drive.
3. Choose “Run” from the Start menu.
4. Type “A:\setup” and click OK.
5. Follow the instructions on the display.
6. Reboot the computer after installation has finished.

3.2 VERIFICATION

3.2.1 SOFTWARE VERSION

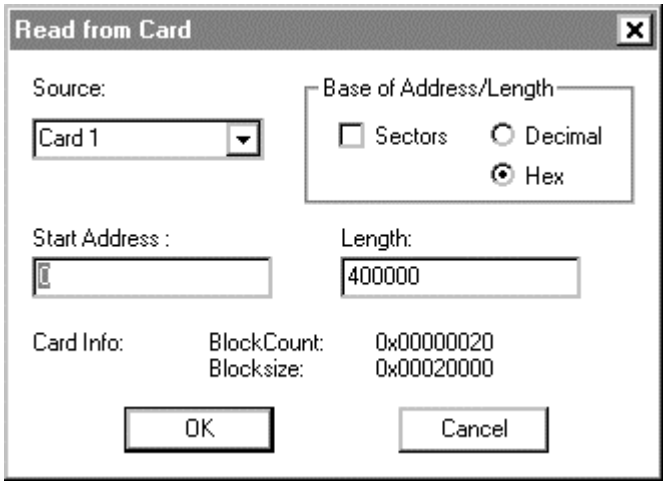
1. Choose “SwapFTL Binary Utility” from the “SCMSwapFTL” program group.
2. After the utility starts, choose [Help] – [About SwapUti..].
3. Confirm that the version information is as follows:



3.2.2 FLASH MEMORY CARD AUTOMATIC DETECTION

1. Insert the 4MB flash memory card supplied from Ricoh into a card slot.
2. Windows 95 automatically detects the card, if this is the first time a flash card has been used, Windows 95 installs the necessary drivers, and the “Found new hardware” dialog box should appear automatically.
3. Wait about 30 s, then choose “SwapFTL Binary Utility” from the “SCMSwapFTL” program group.

4. After the utility software starts, choose [Image] – [Read].
   If “Failed to open PCCard” appears, see Troubleshooting.



5. Click OK to read the card.
   If this works successfully, a new file is created as a temporary file, and this can be stored on the computer.

4 TROUBLESHOOTING

4.1 SWAPBOX RESOURCE CONFLICT

An ISA device must not share resources (IRQ, I/O address, and memory address) with another device.
ISA plug and play BIOS automatically assigns necessary resources to ISA boards. However, this could cause a problem if an ISA board requires specific resources. The SwapBox requires a specific memory address range to activate card services. So, if another ISA device or PCI device occupies this memory address range, the SwapBox and SwapFTL will not work.

4.1.1 IRQ AND I/O ADDRESS

To identify whether an IRQ or I/O address has a conflict with another device, check the SwapBox properties in the Windows device manager. If you find a conflict, follow the instructions given by Windows Help.

4.1.2 MEMORY ADDRESS

The SwapBox and card services require a memory Window between 0xC8000 to 0xD3FFF.
The SwapBox properties do not tell you if the memory address is in conflict with others. To identify whether the memory address is in conflict with another device, do the following:

1. Choose “Computer” in the Windows device manager, and click “Properties”.
2. Choose “Memory” in the “View resources” tab.
3. Check if any other device is using the address range from **0xC8000** to **0xD3FFF**. If it is a PCI device, you need to adjust the plug and play BIOS settings. If it is an ISA device, you need to remove the device from the system.

Conflict with a PCI device

1. Shut down Windows and reboot the computer.
2. Enter BIOS setup during system boot-up.
   NOTE: How to enter BIOS setup and BIOS setup options depends on your system.
3. Find the ISA plug and play settings in the BIOS setup.
4. Adjust the settings so that the BIOS does not allocate the SwapBox memory range to PCI devices.

Example: Award BIOS

1. Press the “DEL” key during boot-up to gain access to BIOS setup.
2. Choose “PNP AND PCI SETUP” from the main menu.

3 Change the “ISA MEM BLOCK BASE” setting as follows:
   - ISA MEM BLOCK BASE: No/ICU → **D000**
   - ISA MEM BLOCK SIZE: **8k**

4 Press “Esc” to exit “PNP AND PCI SETUP”.

5 Choose “SAVE & EXIT SETUP”.

Conflict with a plug and play ISA device

1. Shut down the computer.
2. Remove the ISA device that is in conflict with the SwapBox.
3. Restart the computer and see if the SwapBox and the SwapFTL work under the Windows environment.

Conflict with a legacy ISA device

Either remove the ISA device that is in conflict with the SwapBox to change its jumper settings, or run the setup utility of the device to change the setting.

4.2 “FAILED TO OPEN PCCARD” ERRORS

4.2.1 TIMELAG TO LOADING DRIVER

Windows requires a certain time, which depends on system performance, to enable card services for a flash memory card after inserting it in a PC card socket.
If you try to read, erase, or write to the card before the card service is ready, you receive a “Failed to open PCCard” error.
Wait for about 30 s, then try again.

4.2.2 PCCARD NOT CONFIGURED

If the PCCard icon in the Windows Control Panel is not configured, you receive a “Failed to open PCCard” error when you try to access the card.
Configure the PCCard icon using Control Panel as explained in the driver installation procedure.

4.2.3 RESOURCE CONFLICT

If you receive a “Failed to open PCCard” error even if the SwapBox looks correctly configured in the device manager, a memory address conflict is causing the error.
Refer to section 4.1.2 to solve the problem.

4.3 ”INVALID DYNAMIC LINK CALL FROM SWAPENUM…” ERROR

A blue screen error with a message *“Invalid dynamic link call from SwapEnum to device xxxx service x”* may happen, if SwapFTL software was installed before SwapBox had been activated.
Once this happens, follow the procedure below.

1. Uninstall SwapFTL (choose “SwapFTL Uninstall” from “SCM SwapFTL” program menu).
2. Reboot the computer.
3. After Windows has restarted, double-click “System” icon in the Control Panel.
4. Choose “Device Manager” tab and double-click “SCM SwapBox” in the “PCMCIA sockets” category.
5. If the device was not activated, activate it.
6. Reboot the computer.
7. After Windows has restarted, re-install SwapFTL.

4.4 SWAPFTL PROBLEM WITH NOTEBOOK COMPUTERS

4.4.1 WINDOWS AND PC CARD DRIVER VERSION

Before installing the SwapFTL software into a notebook computer, ensure the following.

- Windows 95 OSR2 is installed or Service Pack 1 is installed.
  For how to identify the version of Windows 95, refer to section 1.4 for details.
- The latest PC Card driver is installed.
  Contact your computer manufacturer or PC Card controller vender.

4.4.2 SYSTEM SUMMERY

If you still have problems after updating Windows and the drivers, send your computer’s system summary to the support database.
To prepare the system summary as a PostScript file, do the following.

1. Install a PostScript printer (e.g., HP LaserJet 4 PS).
2. Double-click the “System” icon in the Control Panel.
3. Choose the “Device manager” tab, and select “Computer” in the device map.
4. Click the “Print” button.
5. Choose the PostScript printer using the “Setup” button, choose “All devices and system summary” as the report type, and check the “Print to file” box.
6. Click OK to make a PostScript print file.

4.5 COMPLETE UNINSTALL

If the SwapBox and the SwapFTL software do not work due to unsuccessful configuration, the following process helps you to restart Windows plug and play from the beginning.
This procedure uninstalls all the software and drivers that were installed for the SwapBox, as well as deleting the Windows registry settings.

1. Uninstall the SCM SwapFTL programs.
   Choose “SwapFTL uninstall” from the Start menu.
2. Delete the following files from the \Windows\System directory.
   - SOCKETSV.VXD
   - FLS2MTD.VXD
   - FLS1MTD.VXD
   - SRAMMTD.VXD
   - CARDDRV.EXE
   - CSMAPPER.SYS
   - PCCARD.VXD
3. Delete “SCM SwapBox Family Plug and Play PCMCIA Controller” from the Windows device manager.
   (Choose ‘System” from the Control panel to access the device manager.)
4. Shutdown and restart Windows.
   Windows starts the plug & play process again to install the SwapBox.

SwapFTL™ Binary Utility
Operation Manual

Microsoft and Windows are registered trademarks of Microsoft Corp.
SwapBox and SwapFTL are trademarks of SCM Microsystems Inc.

1. OVERVIEW

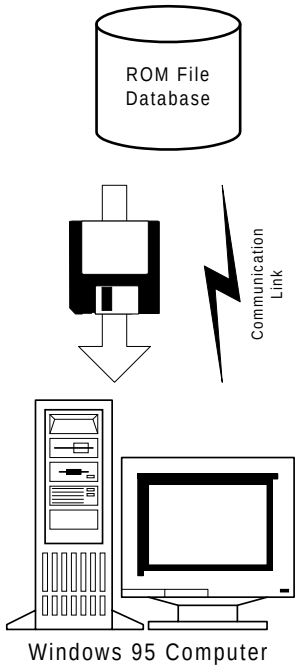
This software allows a flash memory card to be used as an intermediate medium between a flash ROM (or RAM) on the machine and a Windows 95 based computer.

The basic procedure is as follows:

1. You receive ROM files from a database either via network or via physical medium, and save them onto your computer's local hard disk.

   NOTE: Your computer works as a flash memory card programmer after you install SwapBox and SwapFTL software (this software).

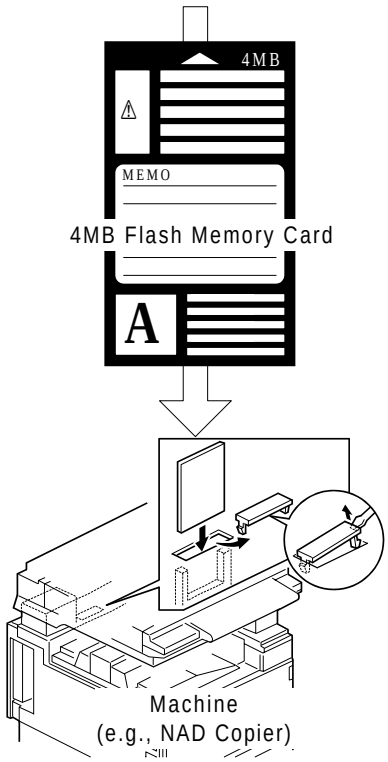
2. You program the ROM file to a flash memory card using this software.



3. You carry the programmed card to a machine site and download the ROM data from the card to the machine's internal flash ROM.

   NOTE: The 4MB flash memory card that is customized for this application is available from SPC.
   You cannot use other types of flash memory card.

4. After downloading ROM data to one machine, you can use the same card with another machine of the same type.



2. OPERATION

2.1. PROGRAMMING A FLASH MEMORY CARD

2.1.1 GETTING A SOURCE FILE

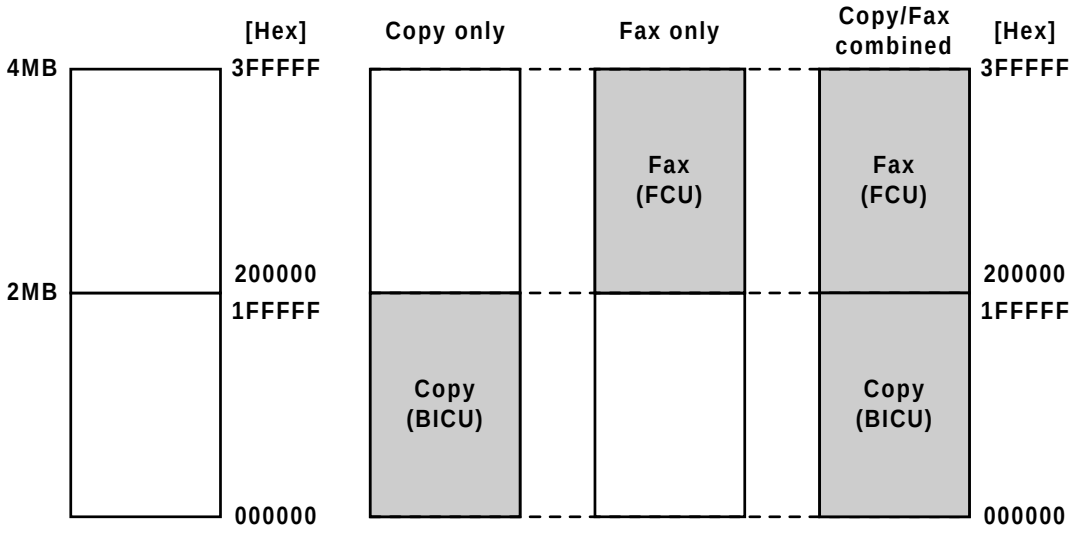
You can (or will be able to) obtain the source firmware file(s) in one of the following ways.

- Notes mail or through a Notes database
- Internet-mail
- BBS
- Floppy disk
- Flash memory card (you need to save the data on the card as a file on a PC before using the data.)
- Others (as yet unspecified)

2.1.2 PROGRAMMING A CARD WITH THE SOURCE

A230/A231/A232 Copy and Fax Main Firmware

You can program copy and fax firmware together onto one 4MB flash memory card, as shown below.



Start Address (Hex)	0	200000
Length (Hex)	200000	200000
Size (kB)	2,000 (2MB)	2,000 (2MB)

A230/A231/A232 Fax Modem Firmware and Fax SRAM Backup

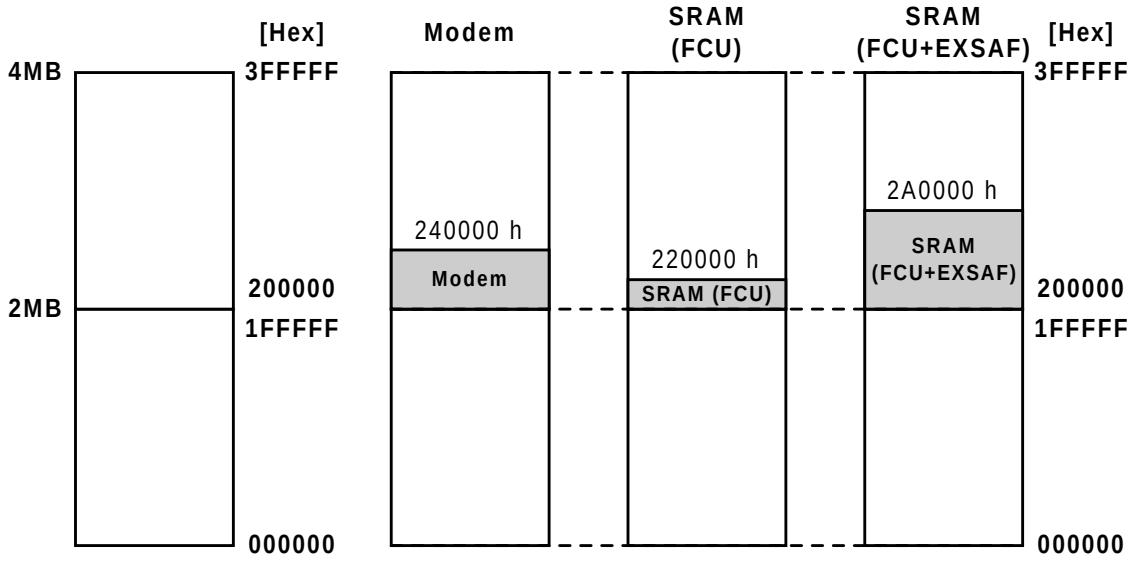
Modem

Program modem firmware using the address and length settings as shown below. You cannot program other data on the card once the modem firmware has been programmed.

SRAM

Using Fax SP mode, you can make a backup of SRAM data onto the 4MB flash memory card. This will help you set up multiple machines with fax options with the same settings, or will help you restore user data if the SRAM data has been erased accidentally.

To save the SRAM backup data from a fax unit on a 4MB flash memory card as a file, or to program a backup file from a PC onto a 4MB flash memory card, use the address and length settings as shown below.



Start Address (Hex)	200000	200000	200000
Length (Hex)	40000	20000	A0000
Size (kB)	256	128	128 + 512

2.2 DOWNLOADING TO A MACHINE

Refer to the machine's service manual for how to download its firmware to the flash ROM inside it.

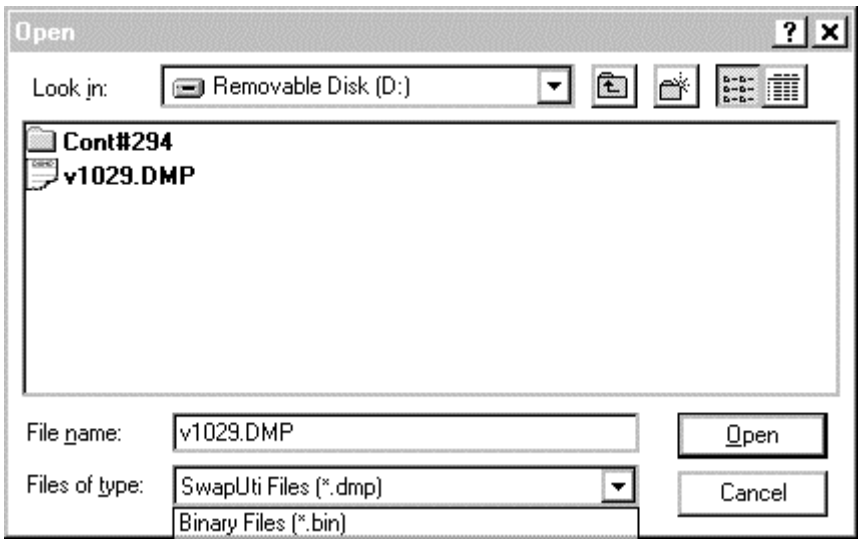
2.3 SAVING DATA TO A FILE

Some machines can upload an internal flash ROM image to a flash memory card. To save the image on the flash memory card as a computer file, read the card with a specific address range setting that was mentioned in section 2.1.2, and save the read data as a file.

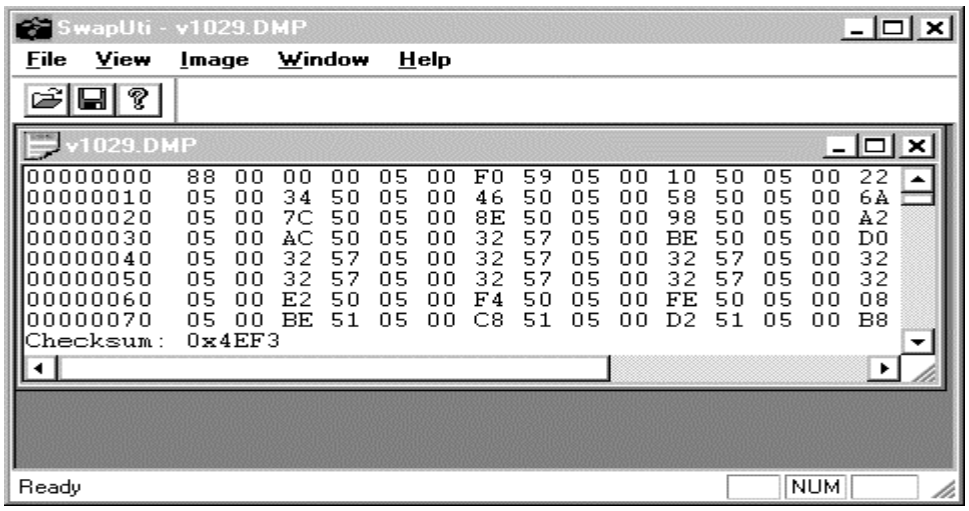
3. FUNCTIONS

3.1 FILE MENU

3.1.1 [FILE] – [OPEN]



This opens a binary file.
Use “Binary Files (*.bin)” or “SwapUti Files (*.dmp). Do not use the others.
The default setting is “Binary Files (*.bin).



An 8-bit checksum is displayed at the lower left corner of the opened file.

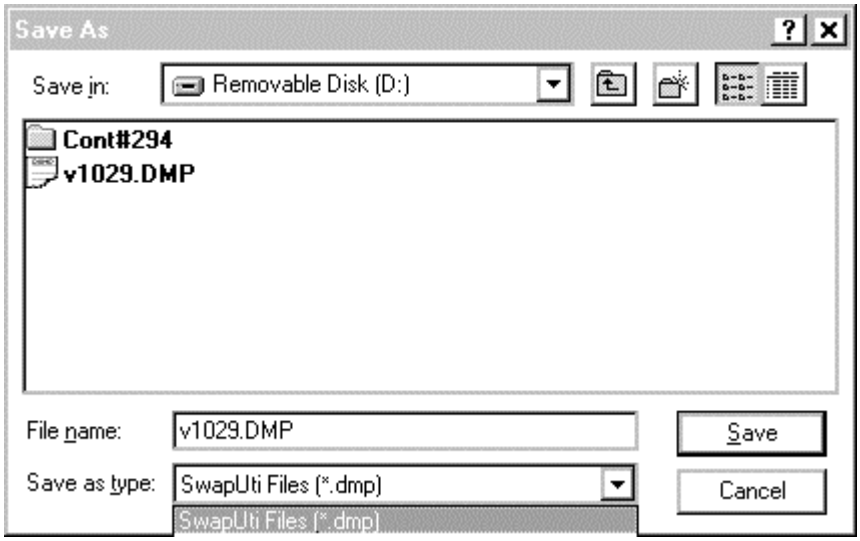
3.1.2 [FILE] – [CLOSE]

This closes an active file that has been opened.

3.1.3 [FILE] – [SAVE]

This saves an active file with the same name.

3.1.4 [FILE] – [SAVE AS]



This saves an active file with a different name from the original.

3.2 VIEW MENU

3.2.1 [VIEW] – [TOOLBAR]

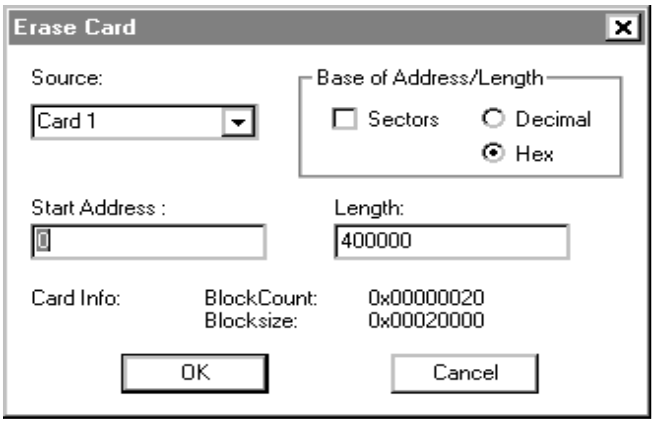
This switches on the toolbar display.

3.2.2 [VIEW] – [STATUS BAR]

This switches on the status bar display.

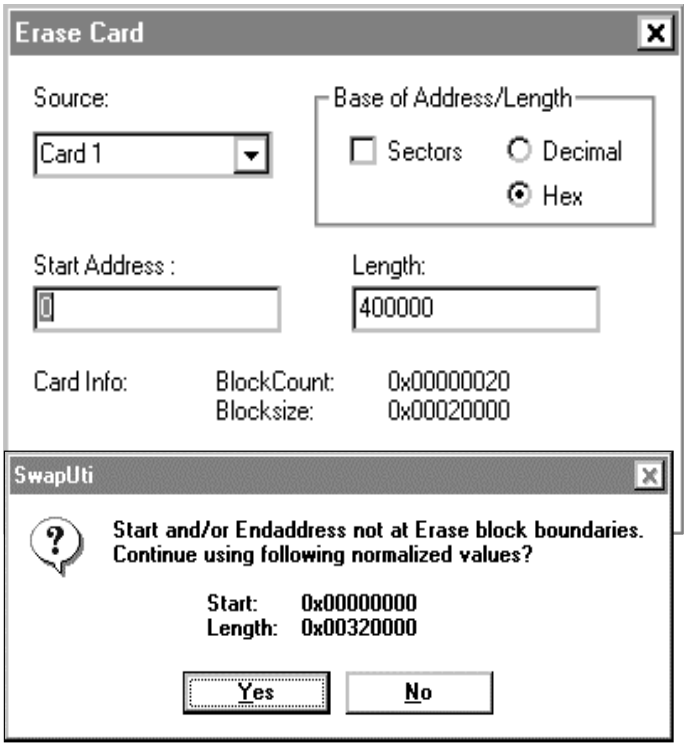
3.3 IMAGE MENU

3.3.1 [Image] – [Erase]

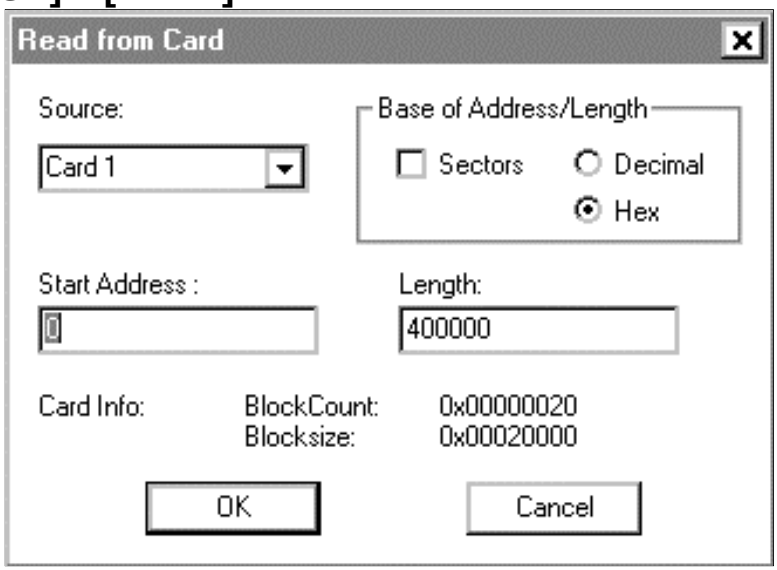


Field	Description
Source	Card slot number that has a flash memory card currently installed.
Start Address	A “0 (zero)” appears at default. To erase the whole card, do not change the setting
Length	Hexadecimal length of the card appears at default. To erase the whole card, do not change the setting
Base of Address/ Length	Do not change the settings. The default setting is “Hex”.

NOTE: If the specified start address and length do not coincide with block boundaries on the flash memory card, the message below appears.

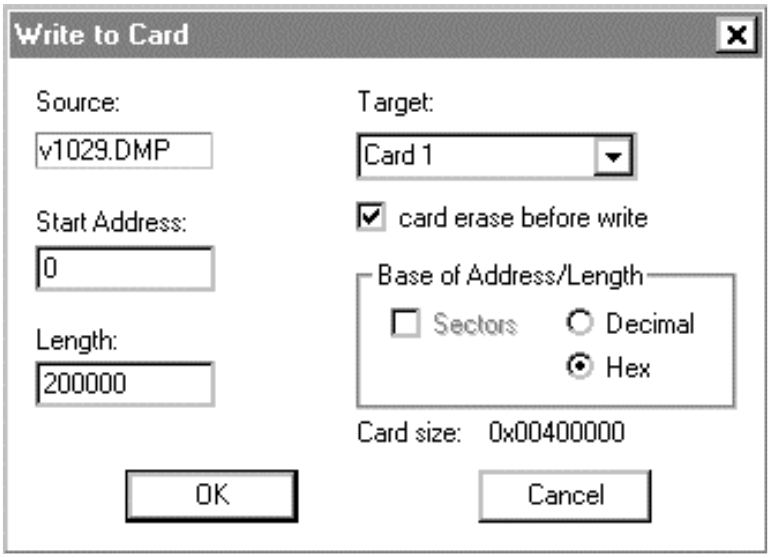


3.3.2 [IMAGE] – [READ]

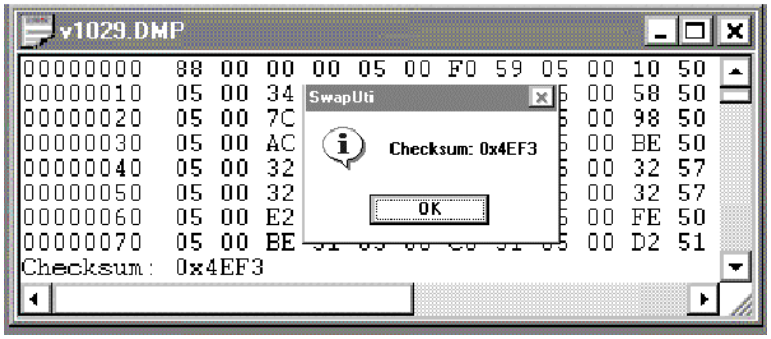


Field	Description
Source	Card slot number that has a flash memory card currently installed.
Start Address	A “0 (zero)” appears at default. Change this setting if necessary.
Length	Hexadecimal length of the card appears at default. Change this setting if necessary.
Base of Address/ Length	Do not change the settings. The default setting is “Hex”.

3.3.3 [IMAGE] – [WRITE]

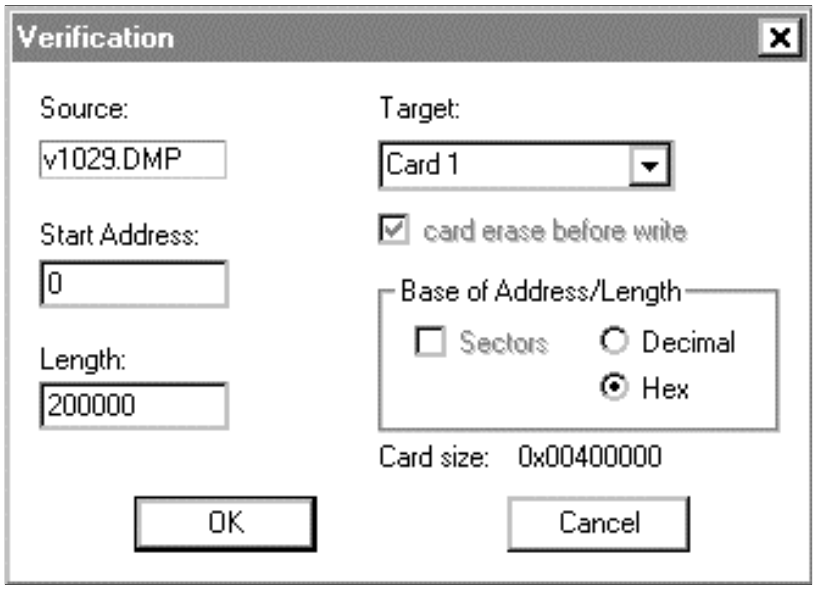


Field	Description
Source	Source file name that is currently active in the application.
Target	Card slot number that has a flash memory card currently installed.
Card erase before write	If this is checked, the application erases the whole card before writing data from the source file. The default setting is checked (= erase).
Start Address	A “0 (zero)” appears at default. Change this setting if necessary.
Length	Hexadecimal length of the source file appears at default. Do not change the setting.
Base of Address/ Length	Do not change the settings. The default setting is “Hex”.



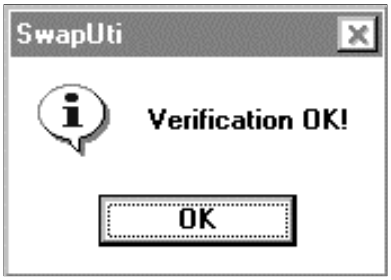
After writing the data to a flash memory card, an 8-bit checksum ① pops up, so that you can compare it with the checksum ② of the source file.

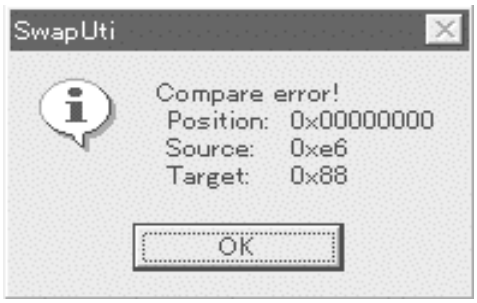
3.3.4 [Image] – [Verification]



Field	Description
Source	Source file name that is currently active in the application.
Target	Card slot number that has a flash memory card currently installed.
Start Address	A “0 (zero)” appears at default. Change this setting if necessary.
Length	Hexadecimal length of the source file appears at default. Do not change the setting.
Base of Address/ Length	Do not change the settings. The default setting is “Hex”.

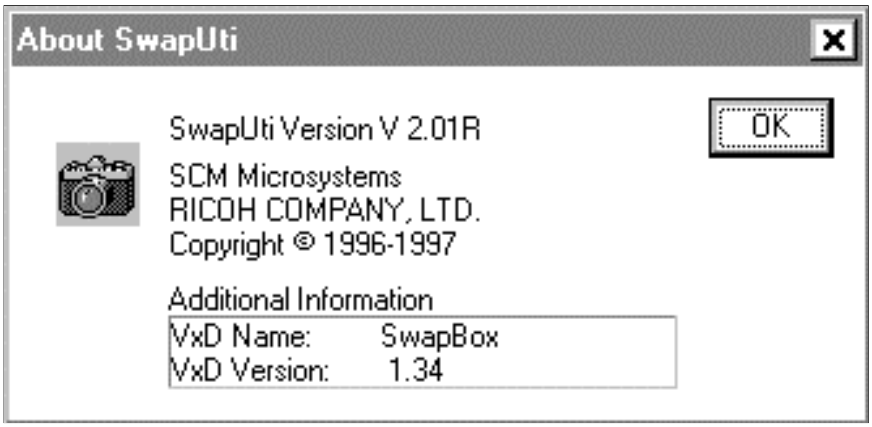
If verification was successful, a ‘Verification OK!” message pops up.
If verification was not successful, a “Compare error !” message pops up with the source and target addresses.





3.4 HELP MENU

3.4.1 [HELP] – [ABOUT SWAPUTI…]



TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 002 **08/12/98**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

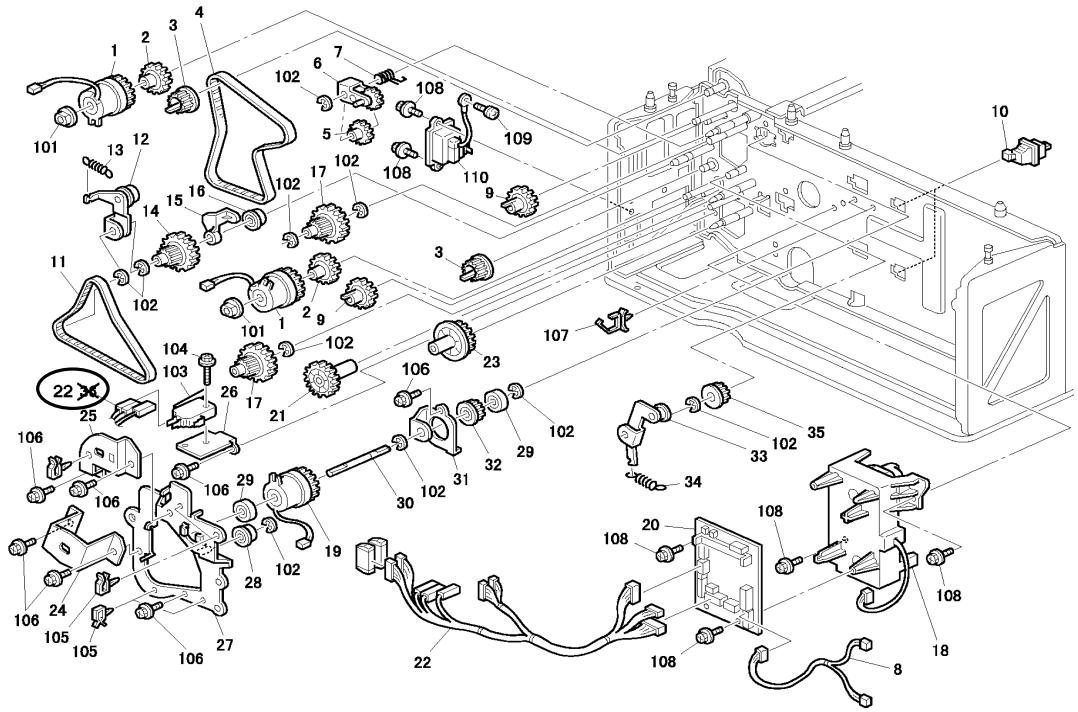
SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs.

- **UPDATE 1:** INTERFACE SWITCH HARNESS – The Interface Switch Harness item number was incorrectly labeled as Item 36. Delete Item 36 from your Parts Catalog. The correct Item number is 22, Main Harness- Paper Feed.

DRIVE SECTION 2 (A230/A231/A232)

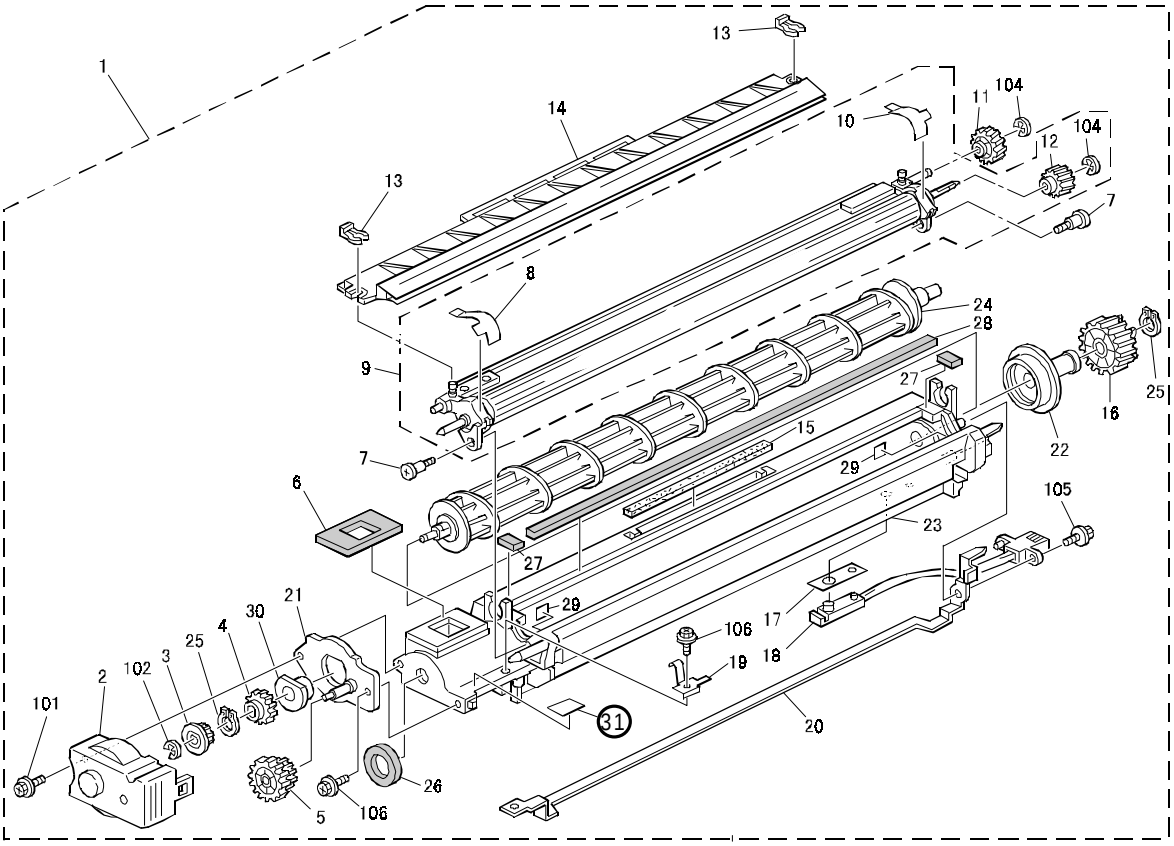


			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2325522	Harness – Interface Switch	1→0	58	36 *

* Denotes that item has been deleted.

Continued…

- **UPDATE 2:** DECAL DEVELOPMENT UNIT – The Decal – Development Unit was omitted from the original parts list. Please add Item 31 Decal- Development Unit to your Parts Catalog.



			REFERENCE	
NEW PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2323066	Decal – Development Unit	0→1	45	31 *

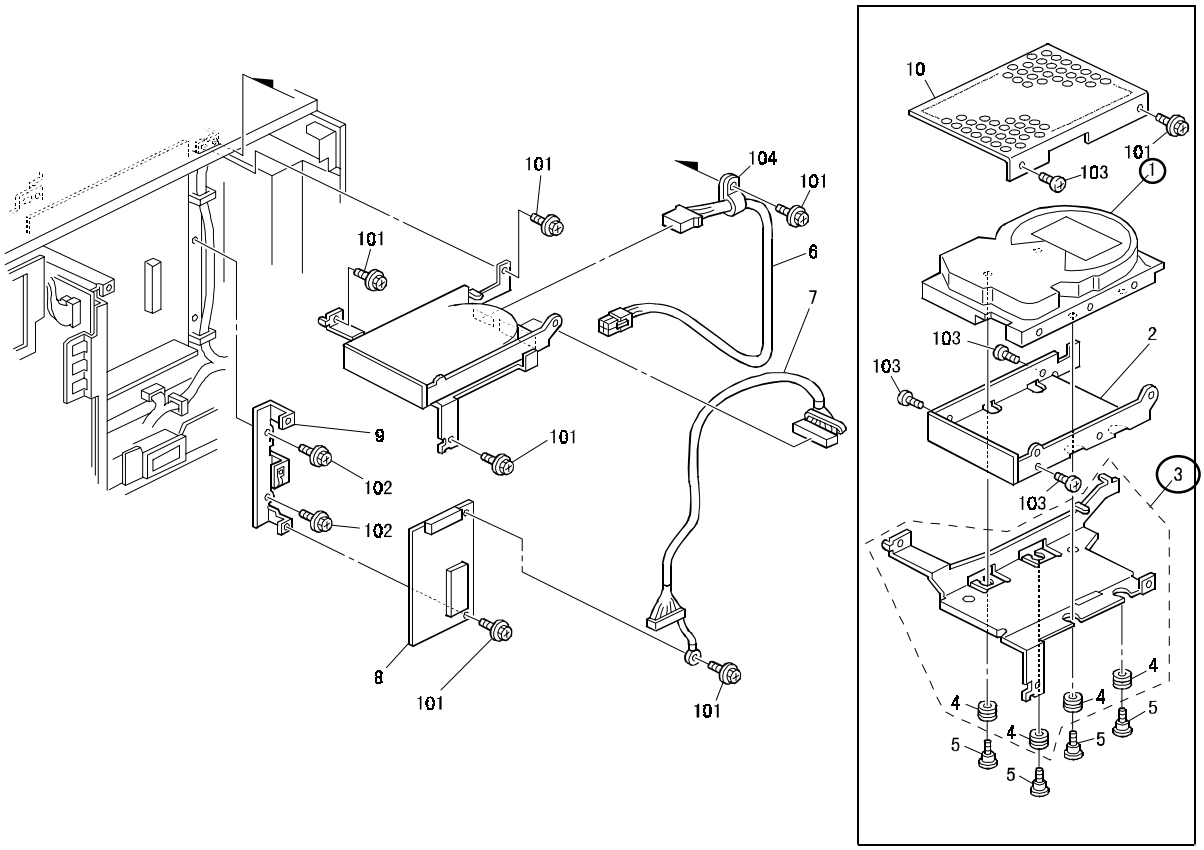
* Denotes new Item Number.

- **UPDATE 3:** PARTS CATALOG CORRECTIONS – The following part numbers have been revised. Please update your Parts Catalog with the new numbers.

				REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
AA080231	AA080246	Bushing – Bias Roller	1	41	26
A2325441		Harness – LDDR	1→0	61	15
	▶ A2325522	Harness – Interlock Switch	0→1	61	15
11070979	11070879	Fuse – 8A 250V	1	61	114

Continued…

- **UPDATE 4:** NEW HDD PART NUMBERS – The following HDD part numbers have been revised. Please update your Parts Catalog with the new numbers.



				REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A6915871	A6915876	1.6G Byte HDD	1	69	1
A6915892	A6915891	HDD Bracket	1	69	3

UNITS AFFECTED:

A230, A231 and A232 Serial Number cut-ins were not available at time of publication.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 003 **08/21/98**

APPLICABLE MODEL:
GESTETNER 3235S/3235/3245
RICOH AFICIO 340/350/450
SAVIN 9935D/9935DP/9945DP

Note: This copy intended as master original for reproduction of additional bulletins.

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

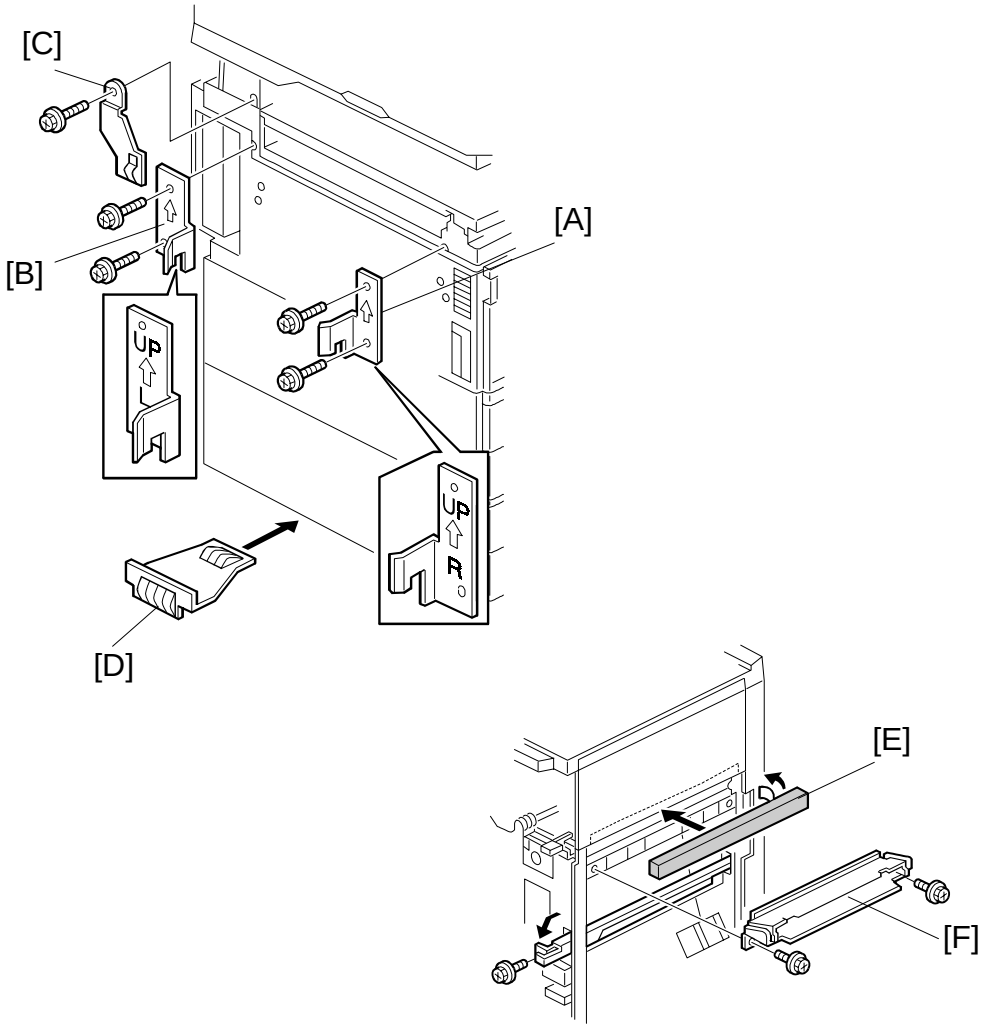
The revised areas have been highlighted by an arrow ⇒.

A230/A231/A232

- 3-50 Corrected Information (Entrance Guide Plate)
- 6-18 Corrected Information (Laser Beam Pitch 600DPI)
- 7-18 Additional Information (SC630 Definition)

A693

- 3-2 ~ 3-5 Corrected Information (Installation Instructions)



2. Install the front joint bracket [A] and rear joint bracket [B] (2 screws each).
3. Attach the upper grounding plate [C] (1 screw).
4. Peel off the backing of the double-sided tape that is attached to the lower grounding plate [D].
5. Attach one lower grounding plate to the bottom edge of the paper tray unit as shown.
6. Attach the cushion [E] to the plate as shown.
7. ⟹ Install the entrance guide plate [F] (2 screws).

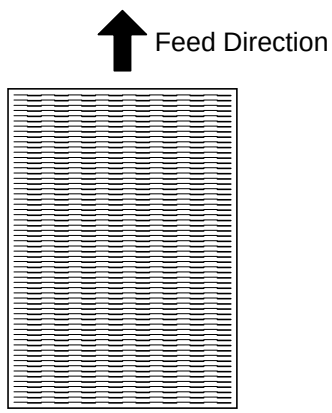
Laser beam pitch adjustment

There are two laser beam pitch adjustment procedures: one for 400 dpi, and one for 600 dpi. These adjustments use the following SP modes.

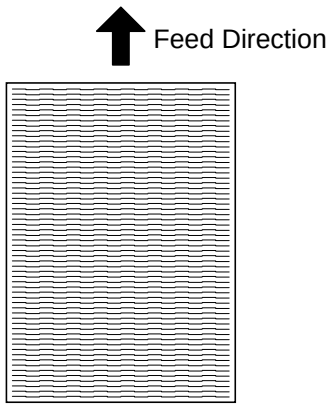
- SP2-109-1: LD Beam Pitch Adjustment – 400 dpi
- SP2-109-2: LD Beam Pitch Adjustment – 600 dpi
- SP2-109-3: LD Initial Setting – 400 dpi
- SP2-109-4: LD Initial Setting – 600 dpi
- SP2-902-2, no.12: IPU Test Pattern – Cross Stitch – 400 dpi
- SP2-902-2, no.13: IPU Test Pattern – Cross Stitch – 600 dpi

1. Do SP 2-109-8.
2. Input the value “144” into SP2-109-1.
3. Perform SP2-109-3.
4. Print the 400-dpi test pattern onto A3 (11”x17”) paper using SP2-902-2 no.12. (See Service Tables - Test Pattern Printing).
5. Write the value of SP2-109-1 on the test pattern (in this case “144”).
6. Change the value of SP2-109-1 and print another test pattern, repeating steps 2 to 4. Print about 5 patterns with different values for SP2-109-1 (e.g. “48”, “96”, “192”, “240”).
7. Check these test patterns. If the laser beam pitch is not correct, the image looks like a black vertical strip pattern.
   NOTE: As an example, if the pattern made with the value “192” has less obvious strips than the other print outs, the correct value is near “192”.
8. Adjust the laser beam pitch position until the thin lines are of uniform thickness (no striping effect should appear on the printout) by doing steps 2, 3, and 4. In step 2, input a value that is estimated to be correct. Then do steps 3 and 4, and then if necessary go back to step 2 and try another value.

⇒ 9. After adjusting the laser beam pitch for 400 dpi, adjust the laser beam pitch for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi). When starting the adjustment for 600 dpi, input a value for SP2-109-2 between 24 and 48 points higher than the result for 400 dpi.



Adjustment not complete



Adjustment complete

SC621: Communication error between BICU and finisher

-Definition- [B']

The BICU cannot communicate with the finisher properly.

- Possible causes -

- Poor connection between the BICU board and the finisher main board
- Finisher main board defective
- BICU board defective

SC623: Communication error between BICU and paper tray unit

-Definition- [B']

The BICU cannot communicate with the paper tray unit properly.

- Possible causes -

- Poor connection between the BICU board and the paper tray unit main board
- Paper tray unit main board defective
- BICU board defective

SC624: Communication error between BICU and LCT

-Definition- [B']

The BICU cannot communicate with the LCT properly.

- Possible causes -

- Poor connection between the BICU board and the LCT main board
- LCT main board defective
- BICU board defective

⟹ **SC630: CSS (RSS) communication error between line adapter and CSS center**

-Definition- [D']

CSS (RSS) communication error between the line adapter and CSS center [D].

SC700: ADF original pick-up malfunction

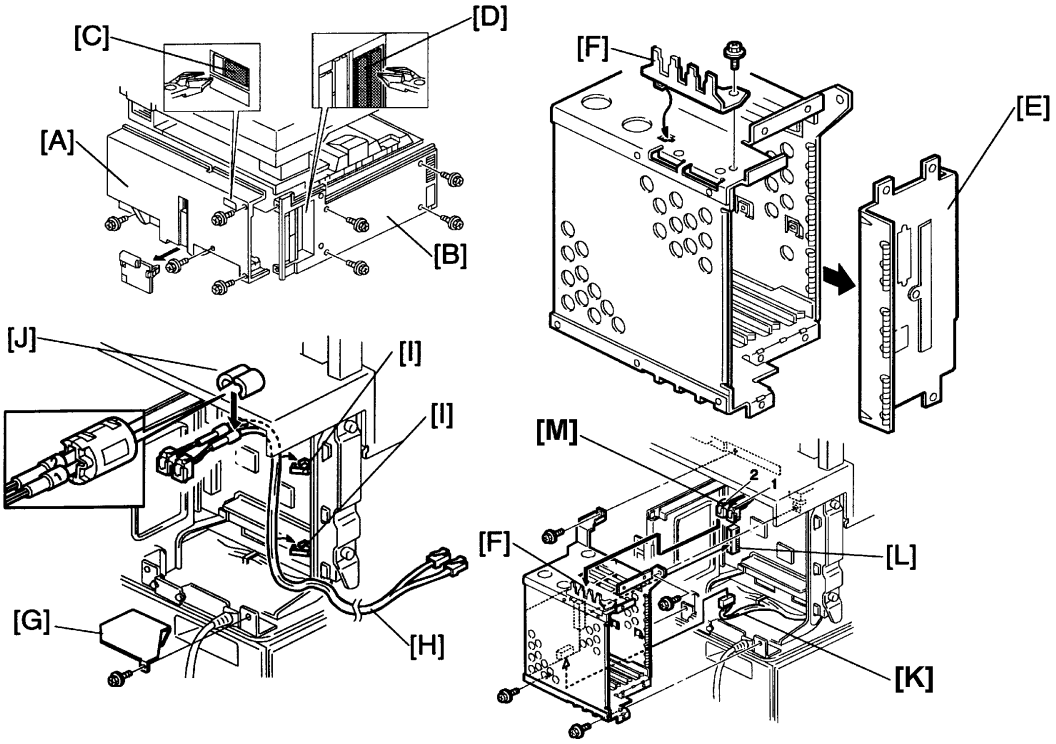
-Definition- [B']

The original stopper H.P sensor does not activate three times consecutively after the pick-up motor has turned on.

- Possible causes -

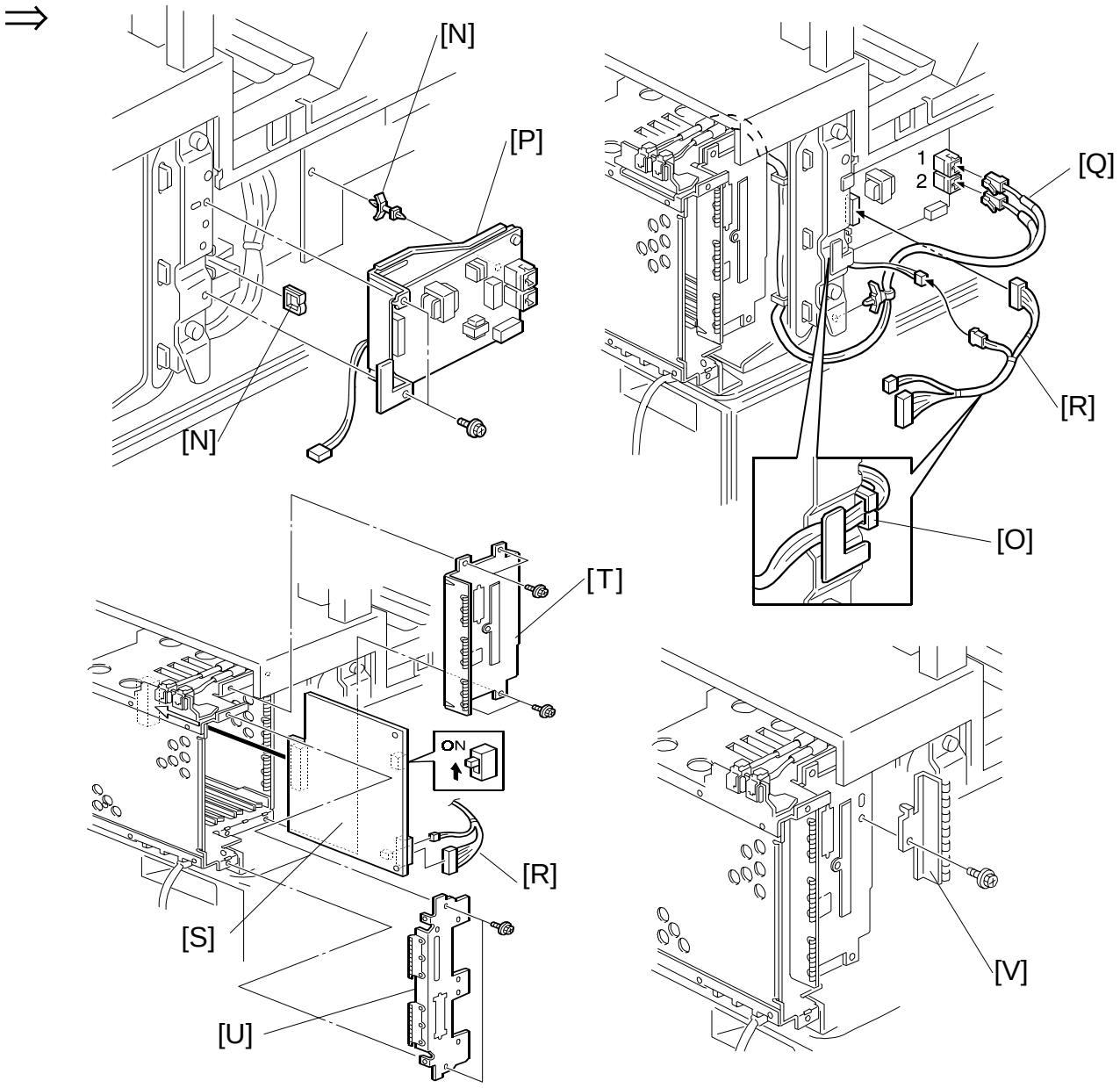
- Original stopper H.P sensor defective
- Pick-up motor defective
- Timing belt out of position
- ADF main board defective

NOTE: To install the fax unit, the Expansion Box Type 450 is required in addition. The following procedure is written on the premise that the Expansion Box has not been installed. If the copier hard disk was installed prior to the installation of the fax option, disconnect and remove the copier hard disk. Reinstall the copier hard disk at the completion of the fax option installation.

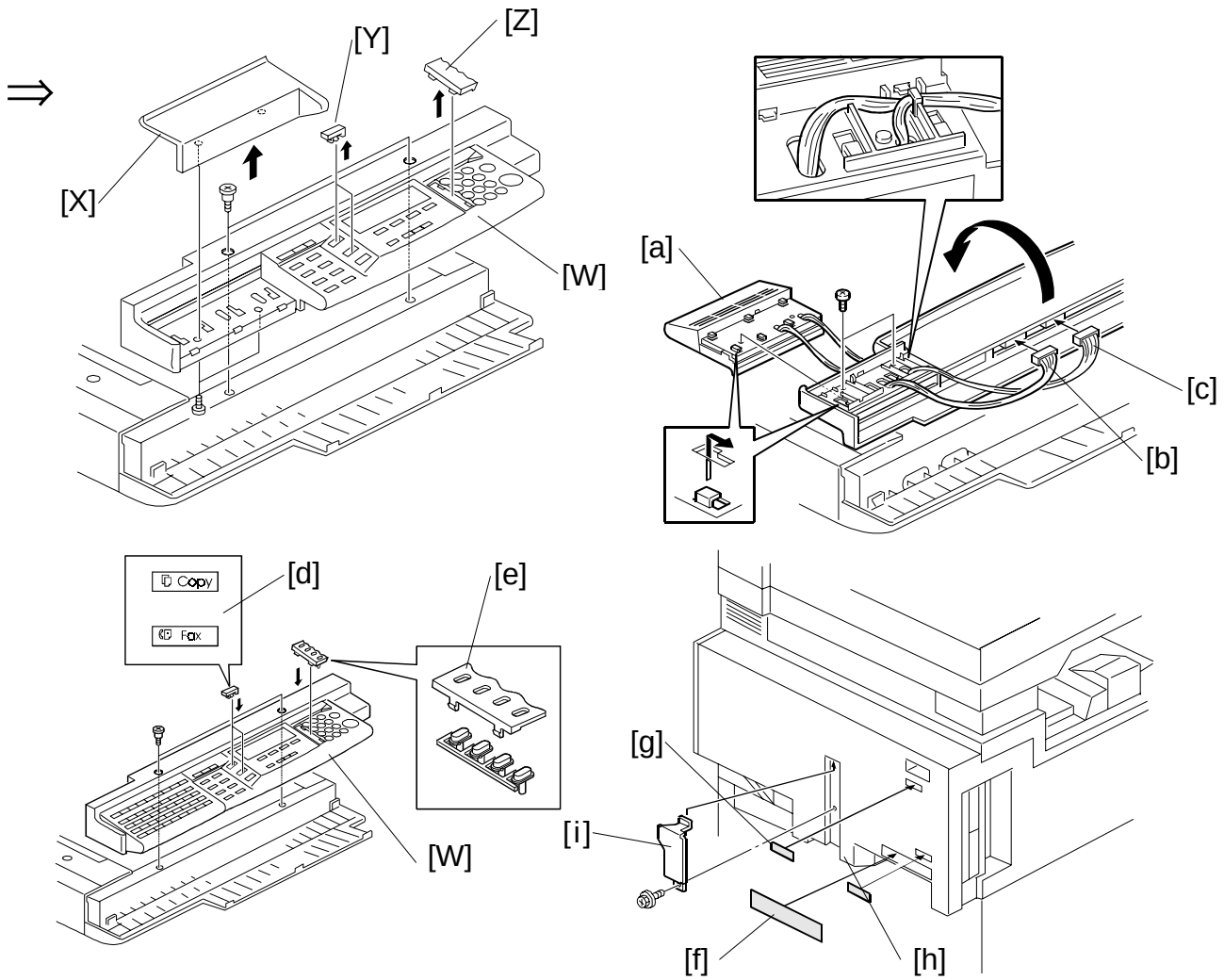


⇒

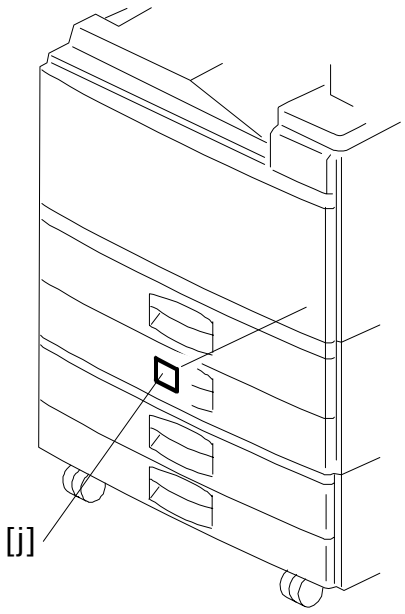
1. Remove the rear cover [A] (4 screws) and the left side cover [B] (4 screws), as shown.
2. Cut away the covers [C] and [D] (shaded parts), as shown.
   NOTE: If installing the fax hard disk option at the same time, refer to the hard disk installation procedure before going on to the next step.
3. Remove the cover [E] from the expansion box, then install the FCU cover bracket [F] (1 screw) as shown.
   NOTE: The bracket [F] is included in the fax unit.
4. Remove the bracket [G], and run the cable [H] through the clamps [I], then install a metal core [J] as shown.
5. Connect the harness [K] to CN355 on the expansion box, then install the expansion box (4 screws) so that the CN350 fits in CN304 [L] on the BiCU.
   NOTE: Use a magnetic screwdriver so as not to drop any screws inside the machine.
6. Attach the modular jacks [M] to the bracket [F] as indicated on the bracket.



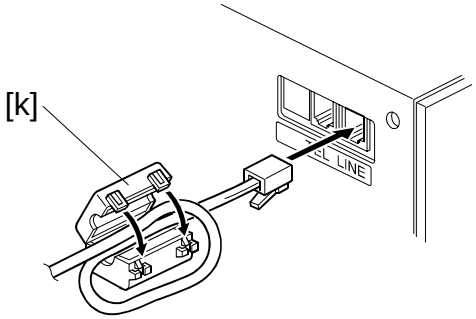
7. Set the locking support [N] and the edge saddle [O] as shown, then install the NCU/Speaker assembly [P] (2 screws).
8. Connect the cable [Q] and the harness [R] as shown. The harness [R] must run through the edge saddle [O] as shown.
9. Turn on the battery switch (SW1) on the FCU [S] then insert the board into the tracks for the right-most slot of the expansion box as shown. Connect the harness [R] to the FCU (CN328 and CN330), then slide the FCU [S] all the way in (1 connector).
10. Install the bracket [T] (3 screws), [U] (2 screws) and [V] (1 screw) as shown. **NOTE:** The bracket [U] is installed only on the model for TAIWAN.



11. Remove the operation panel [W], then carefully remove parts [X], [Y], and [Z].
12. Install part [a], then connect the harnesses [b] and [c] to the operation panel as shown.
13. Re-install the operation panel [W], then install the parts [d] and [e], as shown.
14. Re-install the left side cover (4 screws) and the rear cover (4 screws).
15. Attach the serial number label [f], the LINE/TEL label [g] and the appropriate approval label [h] onto the rear cover. Then install the bracket [i] (1 screw).
16. Attach the “Super G3” label [j] to the front cover.



⇒



17. Wrap the phone line around the core [k] as shown and connect the telephone line to the “LINE” jack at the rear of the machine.
18. Plug in the machine and turn on the main power switch.
19. Press the ‘Facsimile’ key and check the facsimile LED lights.
    At this time, the display reads: SC1201 - Functional problem with the fax. Data should be initialized.
    NOTE: This is not a functional problem. The machine shows this message only when the fax unit is first installed. If the same message appears at the next power-on, check whether the battery switch (SW1) on the FCU has been turned on.
20. Press “Yes” to initialize the fax unit.
21. Set up and program the items required for fax communications as shown below. If the user function keys (F1, F2, F3, F4, and F5) need to be programmed, attach the label.

    The default settings of the user function keys are as follows:
    - F1: Start Manual Rx
    - F2: Tx Result Display
    - F3: TEL Mode
    - F4: Not programmed
    - F5: Not programmed

    NOTE: Be sure to set the clock (date and time).
22. Program the serial number into the fax unit (service function 10). The serial number can be found on the serial number label [f] (attached to the machine in step 15).

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 004 **9-22-98**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

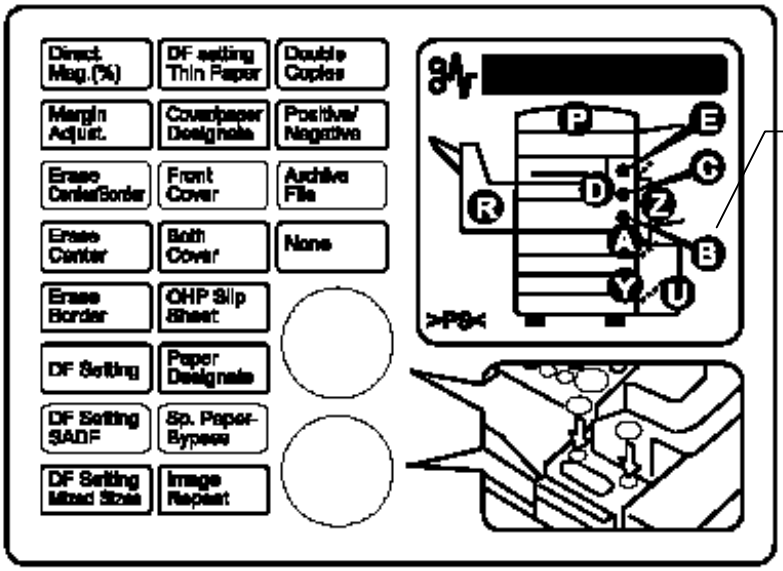
SUBJECT: JAM LOCATION DECAL

GENERAL:

This bulletin is to clarify the function of the Jam Location Decal in the Option Decal Sheet (P/N A2327380 for LT and P/N A2327780 for A4).

The jam location is indicated in the Jam Removal Sheet (P/N A2321380) located inside the copier front cover. However, the Jam Location Decal in the Option Decal Sheet is provided so that the customer can determine the jam location without opening the front cover.

The position of the Jam Location Decal is not pre-determined. You may place it wherever it stands out after installing all peripherals.



Option Decal Sheet

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 005 **09/25/98**

APPLICABLE MODEL:

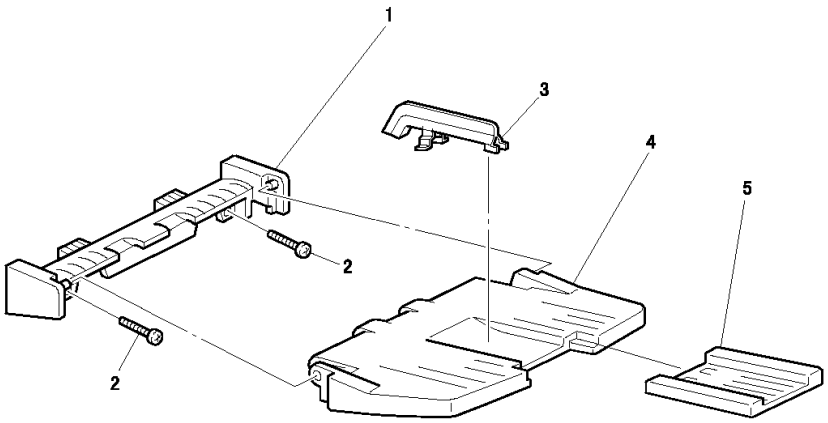
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: EXIT TRAY OPTION (A825*)*

GENERAL:

Please correct your parts catalog because the description and Item numbers for the listed components were reversed. The following Parts Corrections are being issued for all A230/A231/A232 Parts Catalogs.



Part Number	Old Description	New Description	Page	Old Item	New Item
A6804331	Exit Tray Holder	Exit Tray	71	1	4
A6804321	Exit Tray	Exit Tray Holder	71	4	1

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 006 **09/30/98**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

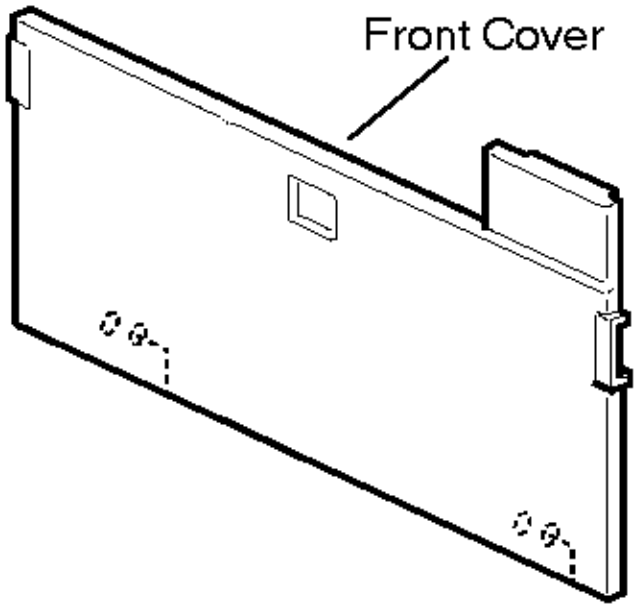
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs.

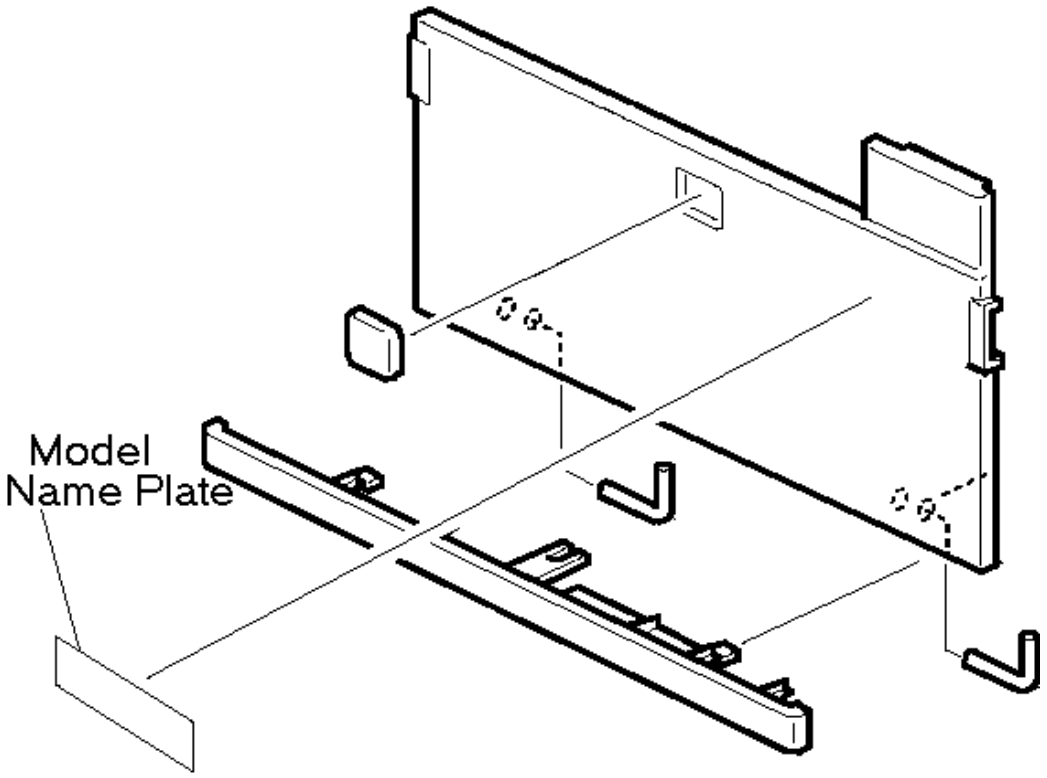
- **UPDATE 1:** **FRONT COVER –** The Front Cover part number has been corrected. Please update your Parts Catalog with the updated part numbers.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2321261		Front Cover (RIC/INF/LAN)	1		11	8
	A2307228	Front Cover (RIC-A230)	1	1	11	8
	A2317228	Front Cover (RIC-A231)	1	1	11	8
	A2327228	Front Cover (RIC-A232)	1	1	11	8
	A2307828	Front Cover (INF-A230)	1	1	11	8
	A2317828	Front Cover (INF-A231)	1	1	11	8
	A2327828	Front Cover (INF-A232)	1	1	11	8
	A2317617	Front Cover (RIC-A231-Gov)	1	1	11	8
	A2327617	Front Cover (RIC-A232-Gov)	1	1	11	8
	A2327428	Front Cover (GES -230V)	1		11	8
A2327021		Front Cover (GES/SAV/LAN)	1		11	8

Continued…

- **UPDATE 2:** **MODEL NAME PLATE –** The Model Name Plate part number has been corrected. Please update your Parts Catalog with the updated part numbers.



				REFERENCE	
NEW PART NUMBER	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2307071	Model Name Plate (GES-A230)	1		11	37
A2317071	Model Name Plate (GES-A231)	1		11	37
A2317073	Model Name Plate (GES-A231-Gov)	1		11	37
A2327073	Model Name Plate (GES-A232-Gov)	1		11	37
A2307571	Model Name Plate (NST-A230)	1		11	37
A2317571	Model Name Plate (NST-A231)	1		11	37
A2307572	Model Name Plate (REX-A230)	1		11	37
A2317572	Model Name Plate (REX-A231)	1		11	37
A2307072	Model Name Plate (SAV-A230)	1		11	37
A2317072	Model Name Plate (SAV-A231)	1		11	37
A2306371	Model Name Plate (LAN-A230)	1		11	37
A2316371	Model Name Plate (LAN-A231)	1		11	37
A2326371	Model Name Plate (LAN-A232)	1		11	37

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 007 **10/13/98**

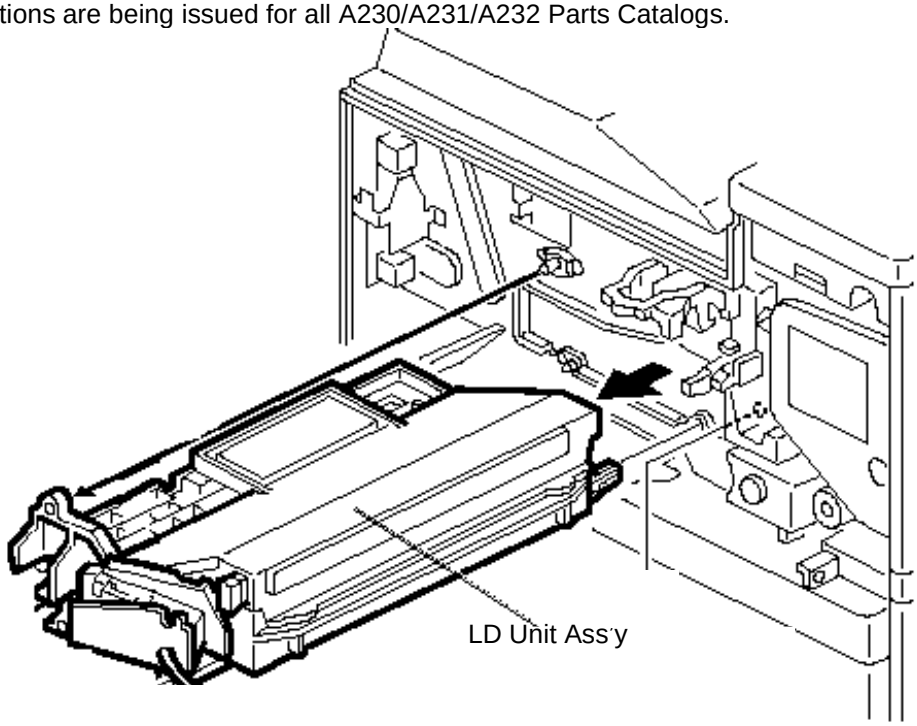
APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: LD UNIT ASSEMBLY

GENERAL:

As per field request, the entire LD Unit Assembly has been assigned a service part number. The following Parts Corrections are being issued for all A230/A231/A232 Parts Catalogs.



			REFERENCE	
NEW PART NO.	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2327301	LD Unit Ass'y (A232) - NA	1	23	*
A2337301	LD Unit Ass'y (A230/A231) - NA	1	23	*

*** Denotes new item**

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 008 **11/04/98**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SERVICE MANUAL

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the pages(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 4-60A & 4-60B Updated Information (Copier Jam History Display)

A230 OVERALL MACHINE INFORMATION
- LARGE CAPACITY TRAY A683
- 3,000 SHEET FINISHER A697
- OVERALL MACHINE INFORMATION A693
- ISDN UNIT A816

A230 DETAILED SECTION DESCRIPTIONS
- BY-PASS A689
- DETAILED DESCRIPTIONS A693
- SwapBox ä and SwapFTL ä

A230 INSTALLATION
- 1 BIN TRAY A684
- INSTALLATION A693

A230 SERVICE TABLES
- AUTO DOCUMENT FEEDER A680
- SERVICE TABLES A693

A230 PREVENTIVE MAINTENANCE
- INTERCHANGE UNIT A690
- REPLACEMENT AND ADJUSTMENT A693

A230 REPLACEMENT AND ADJUSTMENT
- DUPLEX A687
- TROUBLESHOOTING A693

A230 TROUBLE SHOOTING
- BRIDGE UNIT A688

PAPER TRAY UNIT A682
- 1000-SHEET FINISHER A681

TAB POSITION 1

TAB POSITION 2

TAB POSITION 3

TAB POSITION 4

TAB POSITION 5

TAB POSITION 6

TAB POSITION 7

TAB POSITION 8

Rev. 12/98

Version	Item	Machine Code	No.	
Copy	Copier (A230)	A230	8	
	Copier (A231)	A231	8	
	Copier (A232)	A232	8	
	ARDF (Option)	A680	2	
	Platen Cover (Option)	A381	1	
	Paper Tray Unit (Option)	A682	9	
	LCT (Option)	A683	7	
	By-pass Feed Unit (Option – A230 only)	A689	5	
	Duplex Unit (Option – A230 only)	A687	6	
	Interchange Unit (Option – A230 only)	A690	4	
	1-bin Tray (Option)	A684	3	
	Bridge Unit (Option)	A688	13	
	1000-sheet Finisher (Option)	A681	11	
	3000-sheet Finisher (Option – A232 only)	A697	10	
	Punch Unit (Option for 3000-sheet Finisher)	A812-17 (3 holes) A812-27 (2 holes)		
	External Output Tray (Option)	A825	12	
	Electrical Sort Kit – 8 MB Memory (Option – A230 only)	A818		
	Image Enhancement Kit – HDD (Option)	A691		
	Key Counter Bracket (Option)	A674	14	
	Expansion Box (Option)	A692		
Fax	Fax Unit (Option)	A693		
	ISDN Unit (Option)	A816		
	SAF Memory – HDD (Option)	A818-11		⇐
	Fax Feature Expander (Option)	A818-10		⇐
	400-dpi High Resolution (Option)	A818-12		
	Handset (Option – North America only)	A646		
	Stamp Unit (Option)	A813		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 009 **11/06/98**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TONER OVERFLOW CONDITION

SYMPTOM:

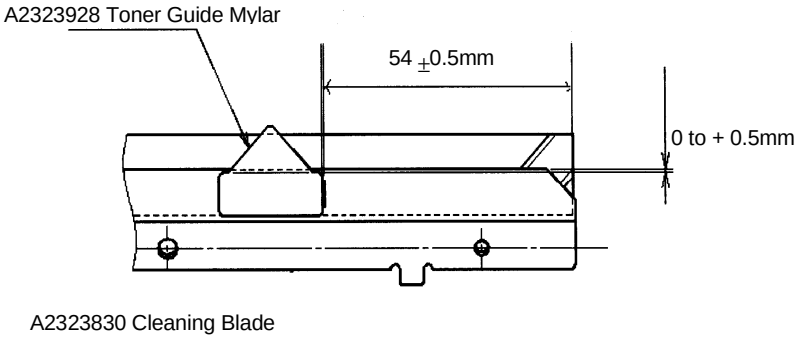
A toner overflow condition is detected prematurely.

CAUSE:

When high volume copy jobs are made consecutively, waste toner scraped off by the Transfer Belt Cleaning Blade may cause some toner to collect / accumulate on the Toner Overflow Sensor. In the worst case, this may cause the Toner Overflow Sensor to prematurely detect an overflow condition.

SOLUTION:

1. Install the Toner Guide Mylar (P/N A2323928) on the Transfer Belt Cleaning Blade, as shown in the figure below. The Toner Guide Mylar will prevent the used toner from prematurely building up on the Toner Overflow Sensor.



2. Replace the old style Transfer Belt Cleaning Blade with the new style Transfer Belt Cleaning Blade (P/N A2323830) which has the Toner Guide Mylar mounted on it.

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs.

				REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
	A2323928	Toner Guide Mylar	1	41	39 *
A2323930	A2323830	Cleaning Blade – Transfer Belt	1	41	21

* Denotes new item number.

UNITS AFFECTED:

A230, A231, and A232 Serial Number cut-ins were not available at time of publication.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 009 REISSUE ★ **12/21/98**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TONER OVERFLOW CONDITION

SYMPTOM:

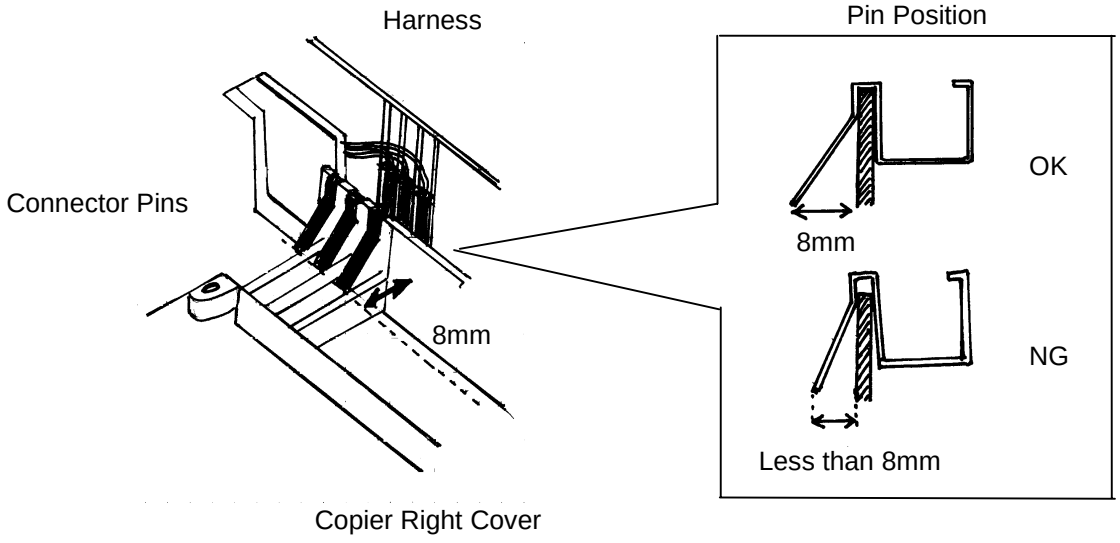
A toner overflow condition is detected prematurely.

★ CAUSE 1:

If the Connector Pins are bent or out of position, poor electrical contact between the metal plates on the Transfer Belt Unit and the Connector Pins on the copier Right Cover may occur.

SOLUTION 1:

Adjust the Connector Pins to the proper position by bending the Connector Pins so that the distance between the edge of the Pin and the Cover Rib is 8mm.



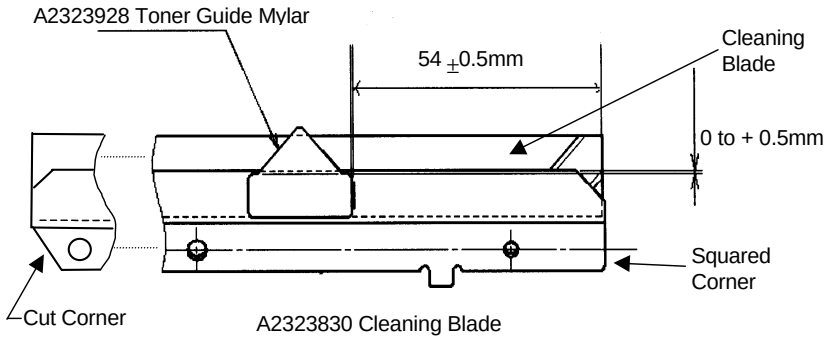
Continued…

★ CAUSE 2:

When high volume copy jobs are made consecutively, waste toner scraped off by the Transfer Belt Cleaning Blade may cause some toner to collect / accumulate on the Toner Overflow Sensor. In the worst case, this may cause the Toner Overflow Sensor to prematurely detect an overflow condition.

SOLUTION 2:

1. Install the Toner Guide Mylar (P/N A2323928) to the metal surface of the Transfer Belt Cleaning Blade, as shown in the figure below. The Toner Guide Mylar will prevent the used toner from prematurely building up on the Toner Overflow Sensor.



2. Replace the old style Transfer Belt Cleaning Blade with the new style Transfer Belt Cleaning Blade (P/N A2323830) which has the Toner Guide Mylar mounted on it.

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs.

				REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
	A2323928	Toner Guide Mylar	1	41	39 *
A2323930	A2323830	Cleaning Blade – Transfer Belt	1	41	21

* Denotes new item number.

UNITS AFFECTED:

A230, A231, and A232 Serial Number cut-ins were not available at time of publication.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 009 REISSUE ★ **01/28/2003**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TONER OVERFLOW CONDITION

SYMPTOM:

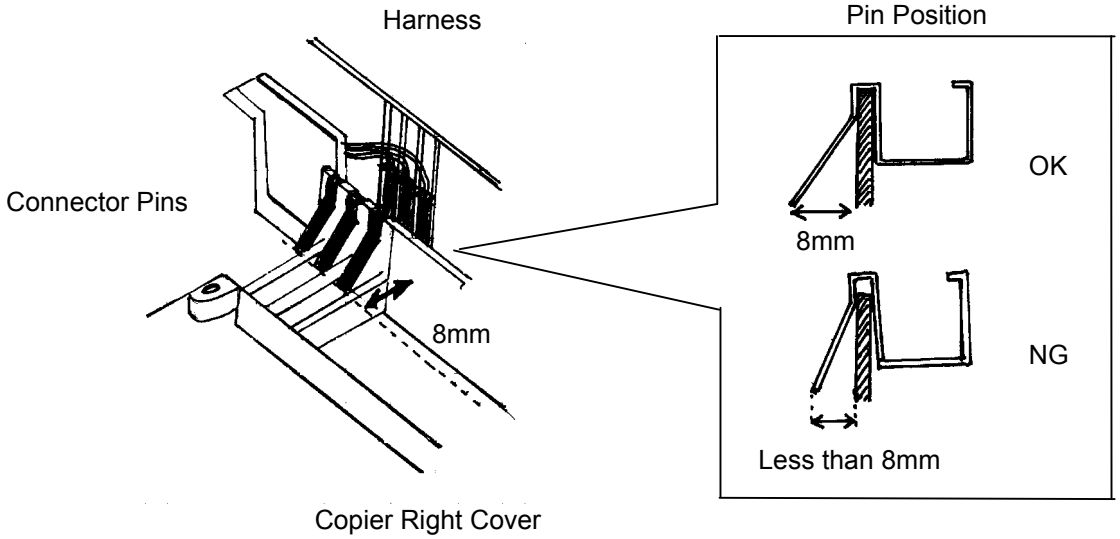
A toner overflow condition is detected prematurely.

CAUSE 1:

If the Connector Pins are bent or out of position, poor electrical contact between the metal plates on the Transfer Belt Unit and the Connector Pins on the copier Right Cover may occur.

SOLUTION 1:

Adjust the Connector Pins to the proper position by bending the Connector Pins so that the distance between the edge of the Pin and the Cover Rib is 8mm.



Continued…

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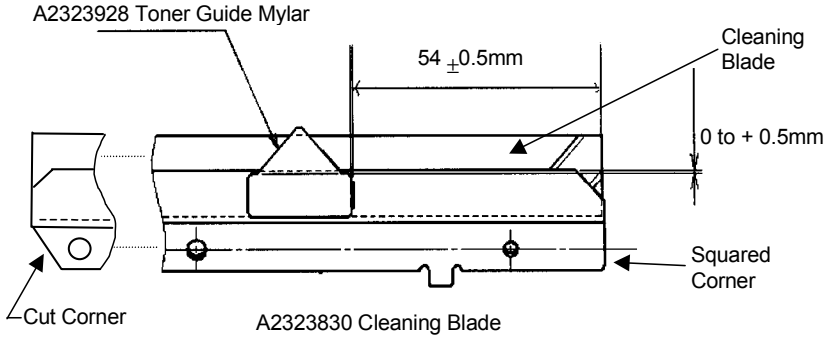
CAUSE 2:

When high volume copy jobs are made consecutively, waste toner scraped off by the Transfer Belt Cleaning Blade may cause some toner to collect / accumulate on the Toner Overflow Sensor. In the worst case, this may cause the Toner Overflow Sensor to prematurely detect an overflow condition.

SOLUTION 2:

1. Install the Toner Guide Mylar (P/N A2323928) to the metal surface of the Transfer Belt Cleaning Blade, as shown in the figure below. The Toner Guide Mylar will prevent the used toner from prematurely building up on the Toner Overflow Sensor.



2. Replace the old style Transfer Belt Cleaning Blade with the new style Transfer Belt Cleaning Blade (P/N A2323830) which has the Toner Guide Mylar mounted on it.

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs.

					REFERENCE	
	OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
★		A2323928	Toner Guide Mylar	1	41	43 *
	A2323930	A2323830	Cleaning Blade – Transfer Belt	1	41	21

* Denotes new item number.

UNITS AFFECTED:

A230, A231, and A232 Serial Number cut-ins were not available at time of publication.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 010 **11/13/98**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SC322/SC326

SYMPTOM:

SC322 and SC326 code.

CAUSE:

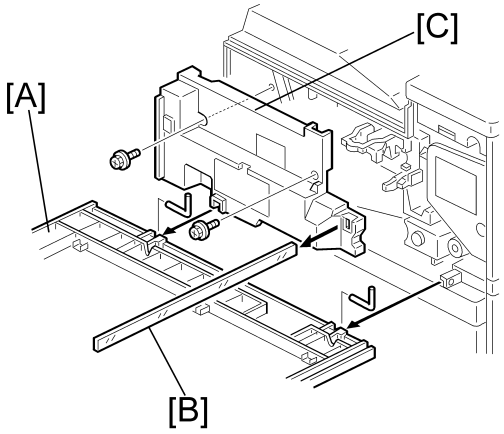
The Laser Synchronization Detector Board cannot properly receive the laser beam.

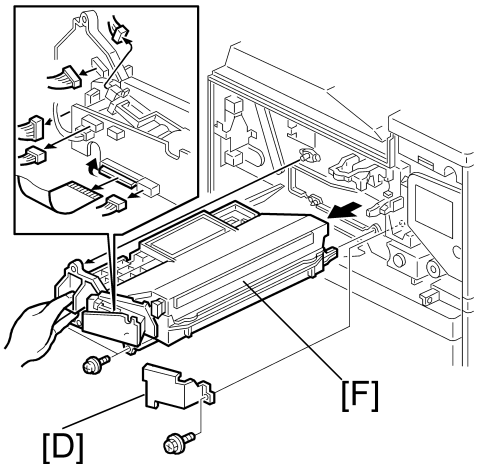
SOLUTION:

TEMPORARY FIELD COUNTER MEASURE:

Read The Entire Procedure Before Performing.

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

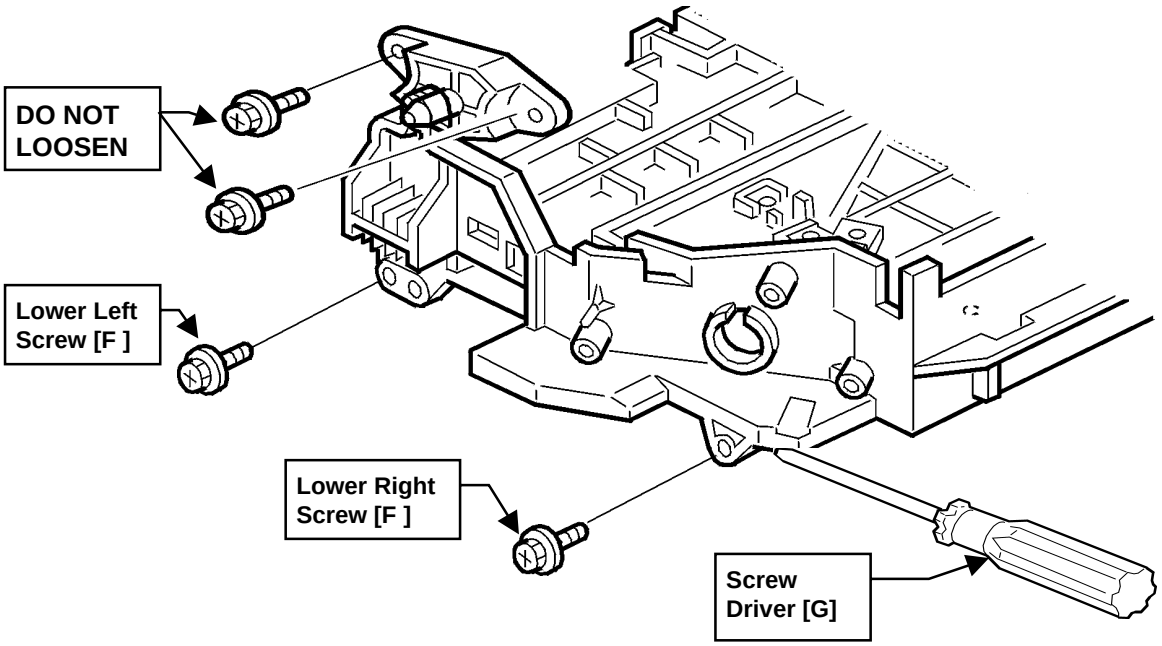




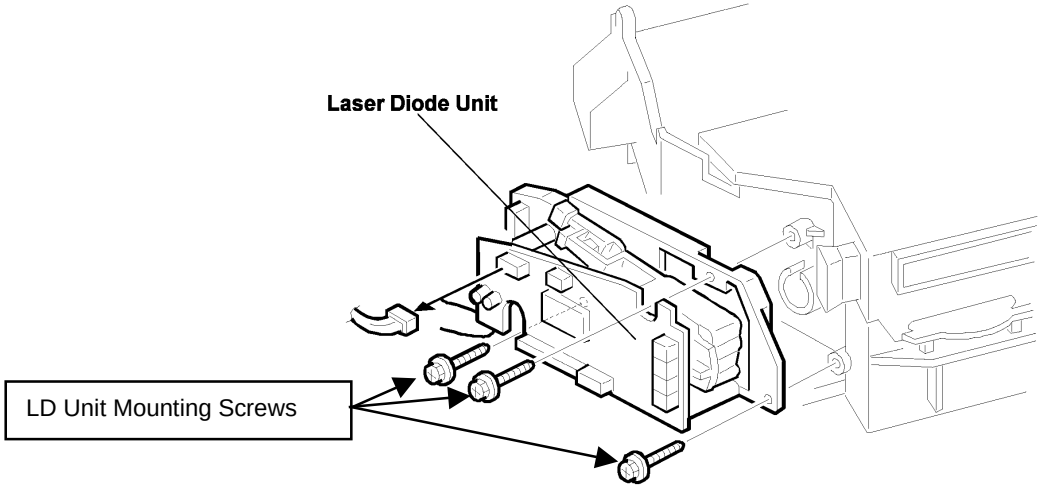
Continued…

1. Remove the front cover [A] (2 pins).
2. Remove the shield glass [B].
3. Remove the inner cover [C] (2 screws, 1 connector - mechanical counter).
4. Remove the shield plate [D] (1 screw).
5. Loosen the Laser Diode Unit Assembly Lower Mounting screws [F](2 screws).

NOTE: *Do not loosen the LD Unit Positioning Bracket Screws (upper left side of LD Unit Assembly).*



6. Raise the right side of the LD Unit Assembly approximately 1~2 mm using a screw driver [G].
7. While keeping the LD Unit raised, tighten the Lower Right Screw [F] than tighten the Lower Left Screw [F].
8. Make sure the three mounting screws of the Laser Diode Units have not loosened.



Continued…

9. Perform SP2-109-3: LD Initial Setting – 400 dpi and SP2-109-4: LD Initial Setting – 600 dpi.
10. Test for SC322 or SC326 codes.
11. Reassemble the unit.

NOTE: If the SC322/SC326 codes are still indicated after performing the above procedure replace the Laser Unit with a **Brand New Unit**.

			REFERENCE	
NEW PART NUMBER.	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2327301	LD Unit Ass'y (A232) – NA	1	23	*
A2337301	LD Unit Ass'y (A230/A231) – NA	1	23	*

*** Denotes New Item**

PRODUCTION COUNTERMEASURE:

This bulletin will be reissued when a production countermeasure becomes available.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 010 REISSUE ★ **04/02/99**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SC322/SC326

SYMPTOM:

SC322 and SC326 code.

CAUSE:

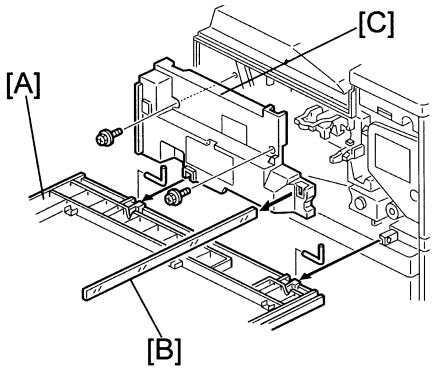
The Laser Synchronization Detector Board cannot properly receive the laser beam.

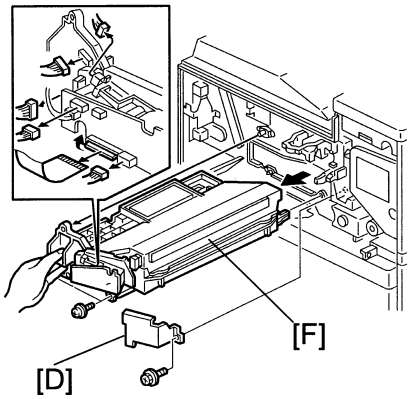
SOLUTION:

TEMPORARY FIELD COUNTER MEASURE:

Read The Entire Procedure Before Performing.

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

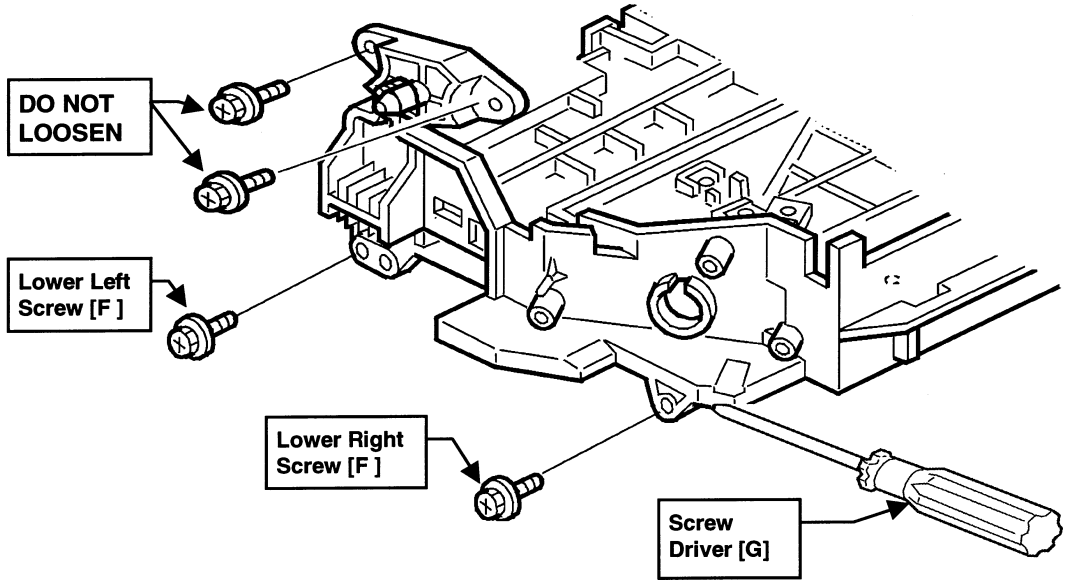




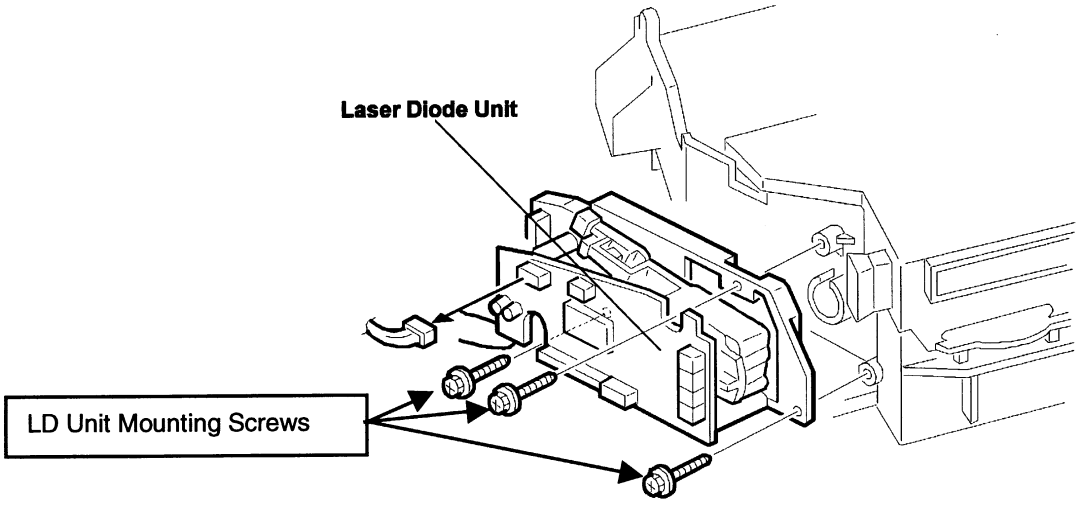
Continued…

1. Remove the front cover [A] (2 pins).
2. Remove the shield glass [B].
3. Remove the inner cover [C] (2 screws, 1 connector - mechanical counter).
4. Remove the shield plate [D] (1 screw).
5. Loosen the Laser Diode Unit Assembly Lower Mounting screws [F](2 screws).

NOTE: *Do not loosen the LD Unit Positioning Bracket Screws (upper left side of LD Unit Assembly).*



6. Raise the right side of the LD Unit Assembly approximately 1~2 mm using a screw driver [G].
7. While keeping the LD Unit raised, tighten the Lower Right Screw [F] than tighten the Lower Left Screw [F].
8. Make sure the three mounting screws of the Laser Diode Units have not loosened.



Continued…

★ 9. Perform Laser Beam Pitch Adjustment for 400dpi; SM Page 6-18, Steps 1 through 8.

10. Test for SC322 or SC326 codes.

11. Reassemble the unit.

NOTE: If the SC322/SC326 codes are still indicated after performing the above procedure replace the Laser Unit with a **Brand New Unit**.

			REFERENCE	
NEW PART NUMBER.	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2327301	LD Unit Ass'y (A232) – NA	1	23	*
A2337301	LD Unit Ass'y (A230/A231) – NA	1	23	*

*** Denotes New Item**

★ **PRODUCTION COUNTERMEASURE:**

A quality procedural check has been implemented at the factory to ensure the laser is properly focused to the Laser Sync Detect PCB.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 011 **01/19/99**

APPLICABLE MODEL:
GESTETNER Model 3235S/3235/3245
RICOH AFICIO 340/350/450
SAVIN 9935D/9935DP/9945DP

Note: This copy intended as master original for reproduction of additional bulletins.

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the pages(s) supplied. Each bulletin package contains 1 set of replacement pages.

- PAGES:

- 1-7 Updated Information

- 4-49 Updated Information

An arrow has highlighted the revised areas ⇒

Version	Item	Machine Code	No.	
Copy	Copier (A230)	A230	8	
	Copier (A231)	A231	8	
	Copier (A232)	A232	8	
	ARDF (Option)	A680	2	
	Platen Cover (Option)	A381	1	
	Paper Tray Unit (Option)	A682	9	
	LCT (Option)	A683	7	
	By-pass Feed Unit (Option – A230 only)	A689	5	
	Duplex Unit (Option – A230 only)	A687	6	
	Interchange Unit (Option – A230 only)	A690	4	
	1-bin Tray (Option)	A684	3	
	Bridge Unit (Option)	A688	13	
	1000-sheet Finisher (Option)	A681	11	
	3000-sheet Finisher (Option – A232 only)	A697	10	
	Punch Unit (Option for 3000-sheet Finisher)	A812-17 (3 holes) A812-27 (2 holes)		
	External Output Tray (Option)	A825	12	
	Electrical Sort Kit – 8 MB Memory (Option – A230 only)	A818		
	Image Enhancement Kit – HDD (Option)	A691		
	Key Counter Bracket (Option)	A674	14	
	Expansion Box (Option)	A692		
Fax	Fax Unit (Option)	A693		
	ISDN Unit (Option)	A816		
	SAF Memory – HDD (Option)	A818-11		⇐
	Fax Feature Expander (Option)	A818-10		⇐
	400-dpi High Resolution (Option)	A818-12		
	Handset (Option – North America only)	A646		
	Stamp Unit (Option)	A813		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-801	9	ROM Version Display (Mail Box)	Displays the ROM versions.	
	10	ROM Version Display (FAX)		
	11	ROM Version Display (Printer Controller)		
	12	ROM Version Display (Scanner Controller)	**Japanese version only.**	
	13	ROM Version Display (ANITA)		
7-803*		PM Counter Display	Displays the PM counter since the last PM.	
7-804		PM Counter Reset	Resets the PM counter. Press “1” to reset.	1: Start
7-807		SC/Jam Counter Reset	Resets the SC and jam counters. Press “1” to reset.	1: Start
7-808		Resets Counters	Resets all counters except for the following: Press “1” to reset. • All counters of SP7-003 • All counters of SP7-006 • All counters which are listed on the counter list (UP1-19-2)	1: Start
7-810		Key Operator Code Number Reset	Resets the key operator code. Press “1” to reset.	1: Start
7-816	1	Reset the total Copy Counter by Paper Tray (1st Paper Tray)	Resets the total copy counter by paper tray. Press “1” to reset. Use these SP modes when replacing the pick-up, feed, and separation rollers in the paper feed stations	1: Start
	2	Reset the total Copy Counter by Paper Tray (2nd Paper Tray)		1: Start
	3	Reset the total Copy Counter by Paper Tray (3rd Paper Tray)		1: Start
	4	Reset the total Copy Counter by Paper Tray (4th Paper Tray)		1: Start
	5	Reset the Total Copy Counter by Paper Tray (LCT)		1: Start

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 012 **01/27/99**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SERVICE MANUAL

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

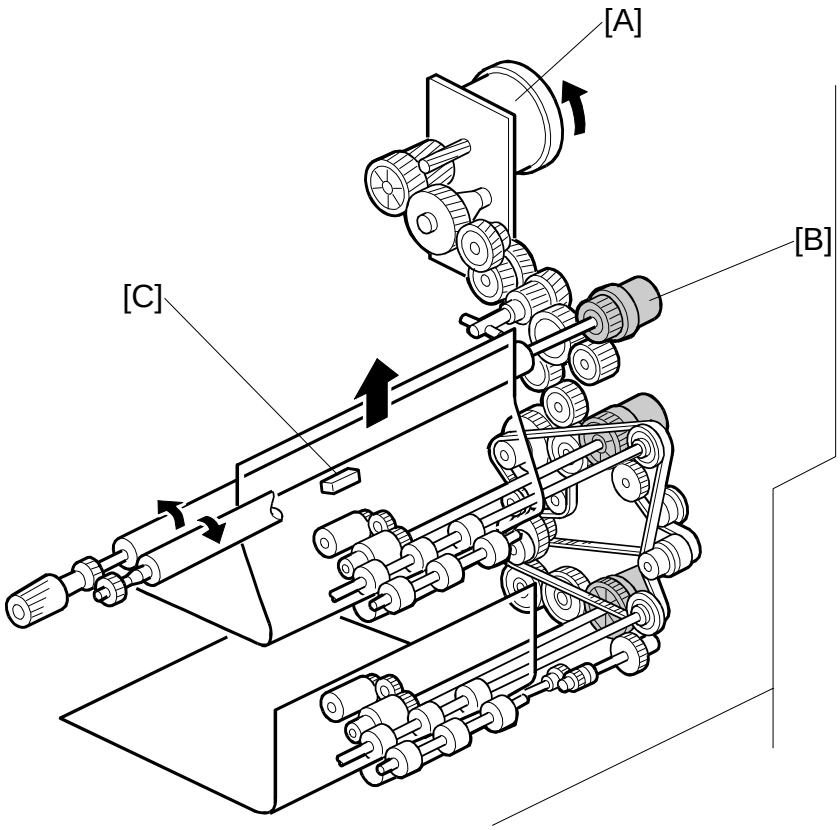
The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 2-55 Updated Information
- 3-10 Updated information

2.8.6 PAPER REGISTRATION

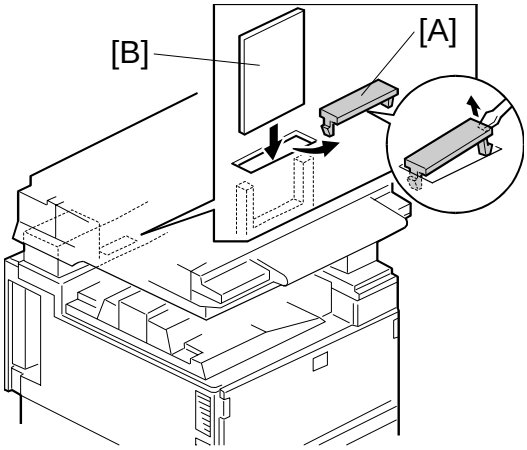


⇒ Main motor [A] rotation is transmitted to the registration clutch [B] (located on the lower registration roller shaft) through a train of gears.

The registration sensor [C] is positioned just before the registration rollers.

When the paper leading edge activates the registration sensor, the registration clutch is off and the registration rollers are not turning. However, the relay clutch stays on for a bit longer. This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew. Then, the registration clutch energizes and the relay clutch re-energizes at the proper time to align the paper with the image on the drum. The registration and relay rollers feed the paper to the image transfer section.

The registration sensor is also used for paper misfeed detection.



⟹ **- Steps 19 to 21 are for only Europe versions when the required language is other than English, French, and German -**

19. Remove the IC card cover [A] and plug the IC card [B] which includes the appropriate language into the IC socket.
    NOTE: When setting the IC card, the surface of the card which has “B” printed on it should be facing the front of the machine.
20. Plug in the machine and turn on the main power switch, then press the “Yes” key. The machine automatically downloads the software.
21. After the software has been downloaded, turn off the main power switch and remove the IC card.
22. Turn on the main power switch.
23. After the fusing warm-up period, enter the SP mode.
    1) Press the “Clear Mode” key.
    2) Enter “107” using the numeric keys.
    3) Hold down the “Clear/Stop” key for more than 3 seconds.
    4) Select “1” (copier).
    NOTE: Do not enter SP mode during the fusing warm-up period (the LED of the start key is red during this period)
24. Perform the TD sensor initial setting as follows:
    1) Enter “2-801” and press the “Enter” key.
    2) Press “1” to start the TD sensor initial setting.
    NOTE: The machine will automatically stop when TD sensor initial setting is completed, and the TD sensor output voltage will appear on the LCD.
25. Perform the Developer Initialization setting using SP2-805.
26. **Europe:** Select the correct language using SP 5-009.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/231/A232 - 013 **02/01/99**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

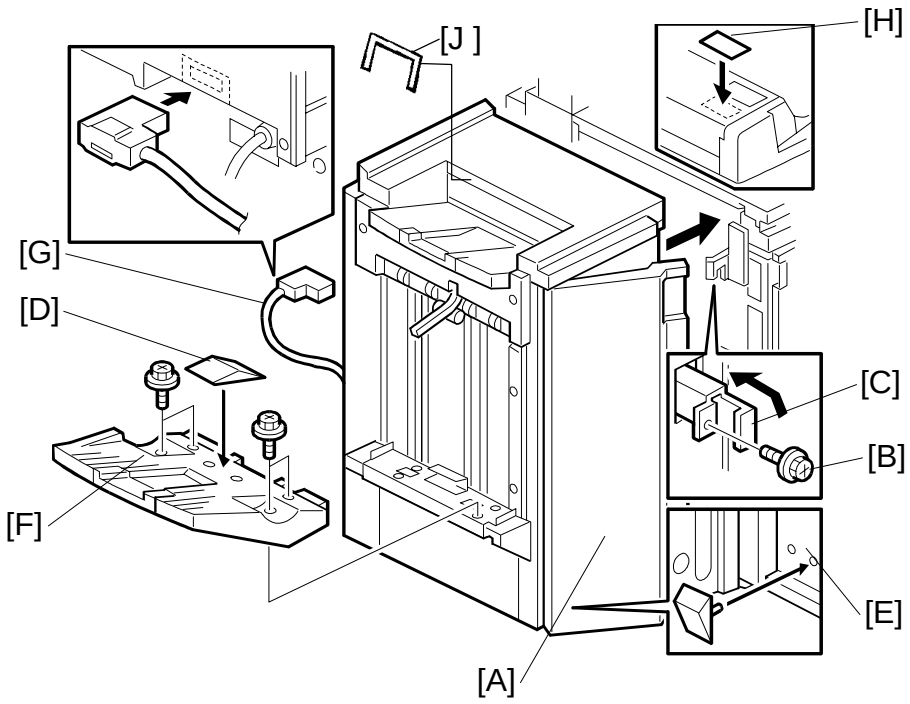
The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 3-51 – 3-52 Updated Information
- 7-21, 22, 23, 23A,23B Updated Information (Additional SC Codes)

Note: This copy is intended as a master original for reproduction of additional bulletins.



8. If the customer requires the punch unit, install it now, before attaching the finisher to the machine. See Punch Unit Installation.
9. Open the front door of the finisher [A], and remove the screw [B] which secures the locking lever [C]. Then pull the locking lever.
10. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever.
11. Secure the locking lever (1 screw [B]) and close the front door.
12. ⟹ Attach the exit guide mylar [J] to the anti-static brush bracket located above the upper tray exit roller as shown.
13. Install the shift tray guide [D] on the shift tray. If the customer does not wish to install it on the shift tray, store it at location [E].
    NOTE: The shift tray guide is required to assist in proper paper stacking. However, it reduces the capacity of the shift tray by 50, from 3000 to 2950.
14. Install the shift tray [F] (4 screws).
15. Connect the finisher cable [G] to the main machine.
16. Attach the staple position decal [H] to the ARDF or platen cover as shown.
17. Turn on the main power switch and check the finisher operation.

3.14 PUNCH UNIT INSTALLATION

3.14.1 ACCESSORY CHECK

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

Description	Q'ty
1. Spacer – 2 mm	1
2. Spacer – 1 mm	2
3. Stepped Screw – Short	1
4. Stepped Screw – Long	1
5. Punch Unit Knob	1
6. Spring	1
7. Harness – Long	1
8. Harness – Short	1
9. Hopper	1
10. Punch Position Decal	1
11. Tapping Screw – M4x10	2
12. Screw with Flat Washer – M4x6	1
13. NECR	1

SC900: Electrical total counter error

-Definition- [A]

The value of the total counter has already exceeded 9,999,999

- Possible causes -

- NVRAM defective

⇒ **SC900 - 01: Mechanical total counter error**

-Definition- [B']

Total counter is not working properly.

- Possible causes -

- Mechanical total counter defective
- Mechanical total counter disconnected
- Poor connection at total counter.

SC951: F-gate signal error 2

-Definition- [B']

When the IPU has already received the F-gate signal, the IPU receives another F-gate signal.

- Possible causes -

- BICU defective

SC954: Printer image setting error

-Definition- [B']

The settings that are required for image processing using the printer controller are not sent from the IPU.

- Possible causes -

- Software defective

SC955: Memory setting error

-Definition- [B']

The settings that are required for image processing using the memory are not sent from the IPU.

- Possible causes -

- Software defective

SC959: Printer setting ID error

-Definition- [B']

The ID that is required for image processing using the printer is not sent from the IPU.

- Possible causes -

- Software defective

SC960: Printer return ID error

-Definition- [B']

The ID that is sent from the printer controller after finishing the printout is incorrect.

- Possible causes -

- Software defective

SC961: Printer ready ID error

-Definition- [B']

The ID that is sent from the printer controller in the printer controller printing ready condition is incorrect.

- Possible causes -

- Software defective

SC962: Memory setting ID error

-Definition- [B']

The ID that is sent from the memory when the IPU sent the memory ready signal is incorrect.

- Possible causes -

- Software defective

SC963: Memory finishing ID error

-Definition- [B']

The ID that is sent from the memory when the IPU sent the memory finish signal is incorrect.

- Possible causes -

- Software defective

SC964: Printer ready error

-Definition- [B']

The print ready signal is not generated for more than 17 seconds after the IPU received the print start signal.

- Possible causes -

- Software defective

SC980: HDD access error

-Definition- [B']

Incorrect parameter sent from the BICU to the MSU.

- Possible causes -

- Software defective
- Poor connection between BICU and MSU.

SC981: HDD response error

-Definition- [B']

The HDD control board does not generate any response when the IPU sends a read/write signal to the MSU.

- Possible causes -

- Software defective
- Poor connection between BICU and MSU
- HDD defective

SC982: HDD construction error

-Definition- [B']

1) The HDD has been installed without the electric sort kit (SIMM memory).
2) A HDD that does not have the correct specifications has been installed.

- Possible causes -

- Hard disk defective
- Incorrect hard disk type
- The electric sort kit is not installed

SWAPBOX™ AND SWAPFTL™ INSTALLATION MANUAL

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SWAPFTL™ BINARY UTILITY OPERATION MANUAL

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 014 **02/24/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: DEFORMED RIGHT UPPER INNER COVER

SYMPTOM:

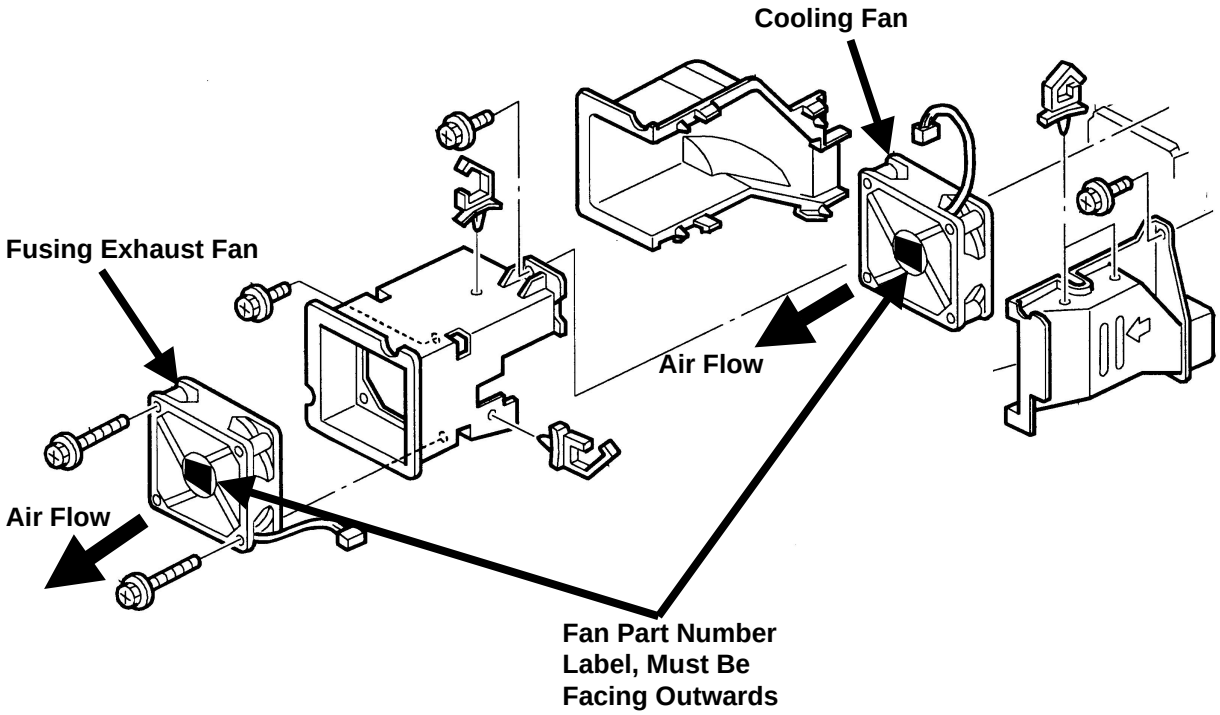
The Right Upper Inner Cover (P/N A2321371) may become deformed due to high temperatures. No Service Codes are displayed.

CAUSE:

The Fusing Exhaust Fan and / or the Cooling Fan are install backwards.

SOLUTION:

Ensure that the Fusing Exhaust Fan and the Cooling Fan are installed with the Part Number Label facing outward (airflow's is in the exhaust direction).



TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 015 **02/26/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: FUSING PRESSURE ROLLER DAMAGE

SYMPTOM:

The Pressure Roller Strippers damage the Fusing Pressure Roller.

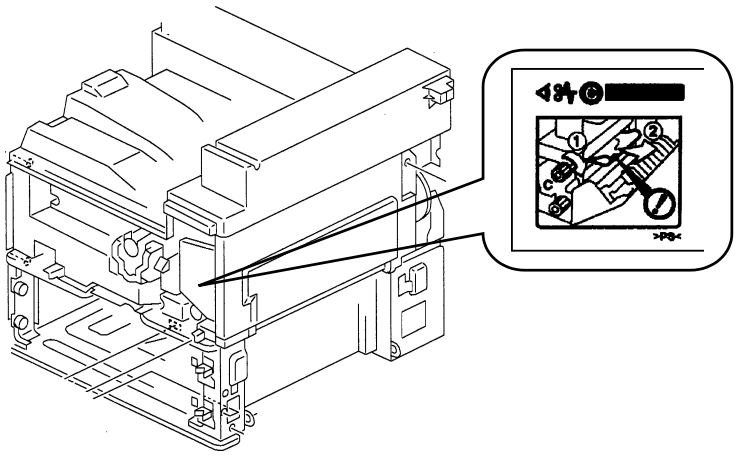
CAUSES:

- Improper jam removal.
- If the Hot Roller Strippers catch the lead edge of the paper, the remaining portion of the paper will accordion into the Hot Roller area.
- If the customer does not remove the paper from the Fuser Unit, the subsequent copies from the reset copy job will accumulate in the Fuser Unit.
- The Fusing Rollers are designed to rotate in one direction to feed paper out of the machine in case of a paper jam. When only the front cover is opened and the Fusing Knob is turned, the paper is forced into the Hot Roller area and may become inaccessible to the customer.
- The pressure of several sheets of jammed paper in the Fusing Unit, will causes the Pressure Roller Strippers to flip and gouge the Press Roller.

SOLUTIONS:

1. Instruct the customer to open the right cover when a paper jam occurs. The customer must remove any paper in the Fusing Unit before restarting a copy job.

NOTE: *A new Jam Removal Instruction Decal has been made available. Please install the Fusing Jam Removal Decal (**P/N A2321386)**. See Illustration below. The Decal has been added from the February 1999 production run.*



Continued…

2. The Pressure Roller Strippers have been modified from August 1998 Production. The Part Number has remained the same. Please install the new style Pressure Roller Strippers **(P/N AE044024)**.

3. Confirm that the Lead Edge Erase Margin is within specification.
Note 1: SP2101-1 Lead Edge Erase Margin- Specification 3.0 ± 2.0mm.
Note 2: If your customer runs copies with heavy black areas at the lead edge, increase the Lead Edge Blank Margin to an acceptable amount for the customer.

4. Adjust the Fusing Unit Entrance Guide to the thick position. Refer to the A230/A231/A232 Service Manual page 2-66.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 016 **04/05/99**

APPLICABLE MODEL:
GESTETNER – N/A
RICOH – AFICIO 355/455
SAVIN – 2035DP/2045DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: UNITED STATES GOVERNMENT VERSION INFORMATION

GENERAL:

1. Model Names:

The United States Government model names are as follows:

Brand	Ricoh		Savin		Gestetner	
Machine/Product Codes	A231	A232	A231	A232	A231	A232
Model Name	Aficio 355	Aficio 455	2035DP	2045DP	N/A	N/A

2. Parts Information:

The followings are the unique parts for the government version machines.

		REFERENCE	
NEW PART NUMBER	**DESCRIPTION**	**PAGE**	**ITEM**
AX400077	DC Motor – 3W	59	18
AZ230074	Power Supply Unit – 115V	61	14
A2321289	Lower Rear Cover	13	16
G0201964	Mirror	23	16

NOTE: The above parts except the mirror are interchangeable with the parts for the standard US version machines. If the above Mirror is replaced with the standard version mirror (P/N: AC030115), the laser beam pitch adjustment must be performed.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 017 **05/03/99**

APPLICABLE MODEL:

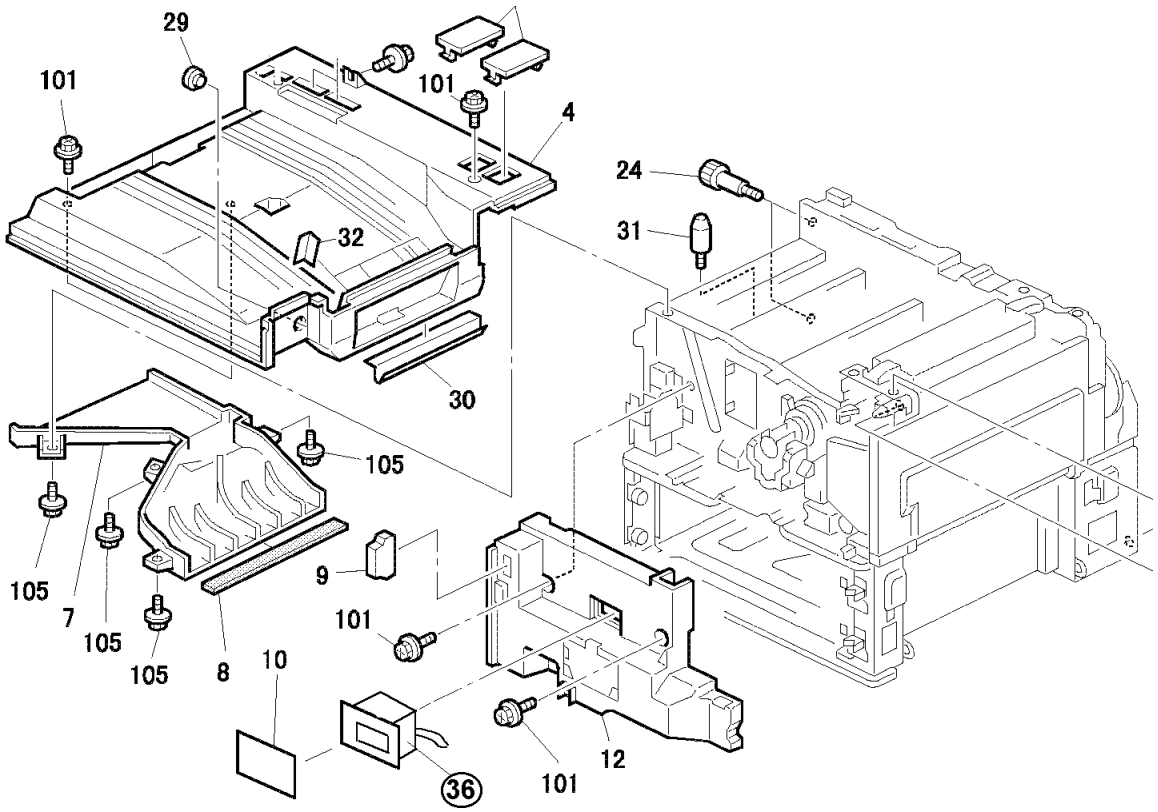
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TOTAL COUNTER

GENERAL:

The following part update is being issued for all A230/A231/A232 Parts Catalogs. Please update your Parts Catalog with the following information.



			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
AX310035	Total Counter	1	13	36 *

* Denotes new item.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 018 **05/03/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: HOT ROLLER SCRATCHED BY THERMISTOR

SYMPTOM:

The Hot Roller is scratched by hard toner stuck on the Thermistor. A black line may appear on the copy in cases where the scratch is deep.

CAUSE:

The toner mixes with paper dust and adheres to the surface of the Thermistor. This mixture hardens as the fusing temperature increases and decreases. The amount and the hardness of the toner/paper dust mixture adhered to the Thermistor are affected by the type of paper and operating conditions. Therefore these conditions may only exist on a limited number of machines.

SOLUTION:

Replace the old style Thermistor with the new style Thermistor. The thickness of the Teflon cover on the new style Thermistor has been increased. This will reduce the pressure on the Hot Roller in the event that a toner/paper dust mixture adheres to the Thermistor. See Diagram A below.

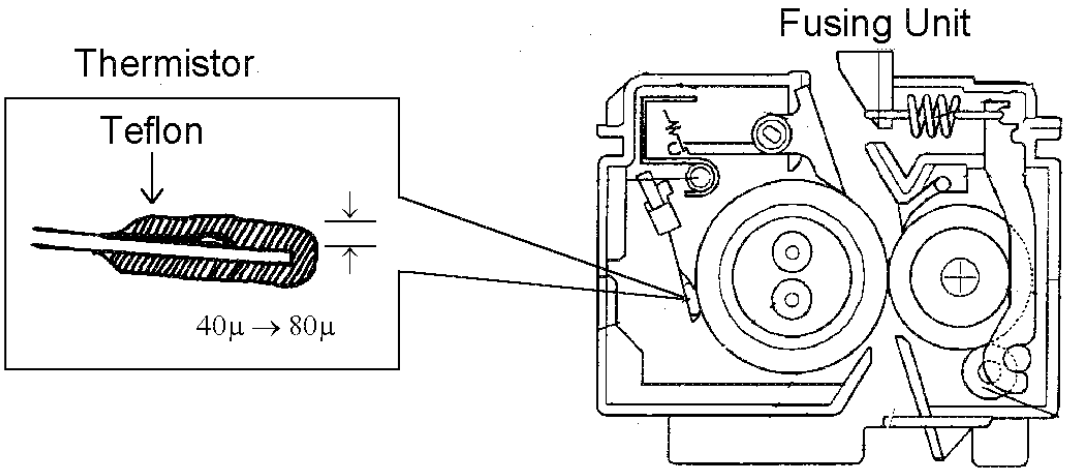


Diagram A

Continued…

GENERAL:

The following part update is being issued for all A230/A231/A232 Parts Catalogs.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AW100042	AW100051	Thermistor	1	1	47	11

UNITS AFFECTED:

All A230/A231/A232 copiers manufactured after December 1998 will have the new style Thermistor installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235S	1B89810001
Gestetner 3235	1B98920001
Gestetner 3245	2B18920001
Ricoh Aficio 340	A7688920001
Ricoh Aficio 350	A7698920133
Ricoh Aficio 450	A7708920378
Savin 9935D	1B89810001
Savin 9935DP	1B98920001
Savin 9945DP	2B18920001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 019 **05/03/99**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

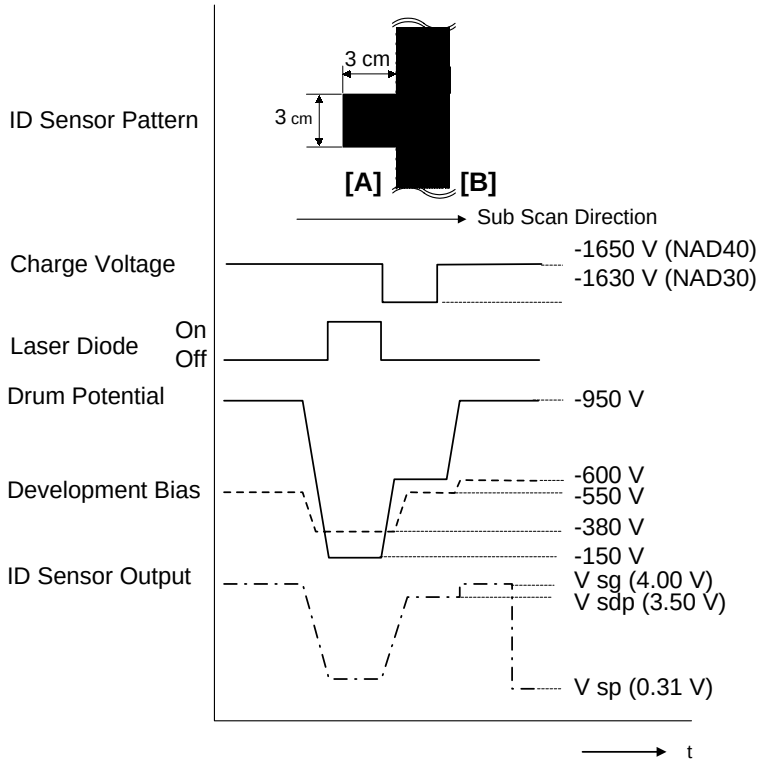
The revised areas have been highlighted by an arrow ⇒.

- 2-31 Updated Information
- 4-19 Updated Information

Note: This copy is intended as a master original for reproduction of additional bulletins.

2.5.2 CHARGE ROLLER VOLTAGE CORRECTION

Correction for Environmental Conditions



⇒ In the 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.

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 drops so that drum potential is reduced to -600V. At the same time, development bias goes back to -550V. 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).

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-011 *		Side-to Side Registration (Scanning)	Adjusts the side-to-side registration for scanning. *(-): The image disappears at the left side.* *(+): The image appears at the left side.* *Use the ●/✻ key to toggle between + and -. See "Replacement and Adjustment - Copy Adjustments" for details.*	- 6.0 ~ + 6.0 0.1 mm/step **+ 1.0 mm**
4-012 *	1 *	Leading Edge Erase Margin (Scanning)	Adjusts the leading edge erase margin for scanning. *Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	2 *	Trailing Edge Erase Margin (Scanning)	Adjusts the trailing edge erase margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	3 *	Right Side Erase Margin (Scanning)	Adjusts the right side erase margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
	4 *	Left Side Erase Margin (Scanning)	Adjusts the left side erase margin for scanning. *See the comment for SP 4-012-1.*	0.0 ~ 0.9 0.1 mm/step **0.5 mm**
4-013		Scanner Free Run	Performs a scanner free run with the exposure lamp off.	0: Stop 1: Start
4-301		APS Sensor Output Check	Displays the APS sensor output signals when an original is placed on the exposure glass. Bit 0: Width sensor 1 Bit 1: Width sensor 2 Bit 2: Length sensor 1 Bit 3: Length sensor 2 Bit 4: Length sensor 3 See “Detailed Section Descriptions – Original Size Detection in Platen Mode” for more details.	00000000 0: Not detected 1: Detected
⇒ 4-303 *		APS Small Size Original Detection	Selects whether or not the copier determines that the original is A5/HLT size when the APS sensor does not detect the size. (Screen Display LT) *If "A5 length/5 1/2" x 8 1/2" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise or 5 1/2" x 8 1/2".* *If "Not detected" is selected, "Cannot detect original size" will be displayed.*	**0: Not detected** 1: A5 length / 5 1/2" x 8 1/2"
4-428*	1*	Standard White Level Adjustment Flag	Displays whether or not the standard white level adjustment has been done.	0: Performed 1: Not performed

Service Tables

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 020 **05/11/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 7-21 through 7-23 Updated Information

SC900: Electrical total counter error

-Definition- [A]

The value of the total counter has already exceeded 9,999,999

- Possible causes -

- NVRAM defective

⇒ **SC900 - 01: Mechanical total counter error**

-Definition- [B']

Total counter is not working properly.

- Possible causes -

- Mechanical total counter defective
- Mechanical total counter disconnected
- Poor connection at total counter.

SC951: F-gate signal error 2

-Definition- [B']

When the IPU has already received the F-gate signal, the IPU receives another F-gate signal.

- Possible causes -

- BICU defective

⇒ **SC953: Scanner image setting error**

-Definition- [B']

The settings that are required for image processing using the scanner are not sent from the IPU.

- Possible causes -

- Software defective

SC954: Printer image setting error

-Definition- [B']

The settings that are required for image processing using the printer controller are not sent from the IPU.

- Possible causes -

- Software defective

SC955: Memory setting error

-Definition- [B']

The settings that are required for image processing using the memory are not sent from the IPU.

- Possible causes -

- Software defective

SC959: Printer setting ID error

-Definition- [B']

The ID that is required for image processing using the printer is not sent from the IPU.

- Possible causes -

- Software defective

SC960: Printerreturn ID error

-Definition- [B']

The ID that is sent from the printer controller after finishing the printout is incorrect.

- Possible causes -

- Software defective

SC961: Printerready ID error

-Definition- [B']

The ID that is sent from the printer controller in the printer controller printing ready condition is incorrect.

- Possible causes -

- Software defective

SC962: Memory setting ID error

-Definition- [B']

The ID that is sent from the memory when the IPU sent the memory ready signal is incorrect.

- Possible causes -

- Software defective

SC963: Memory finishing ID error

-Definition- [B']

The ID that is sent from the memory when the IPU sent the memory finish signal is incorrect.

- Possible causes -

Software defective

SC964: Printerready error

-Definition- [B']

The print ready signal is not generated for more than 17 seconds after the IPU received the print start signal.

- Possible causes -

- Software defective

SC980: HDD access error

-Definition- [B']

Incorrect parameter sent from the BICU to the MSU.

- Possible causes -

- Software defective
- Poor connection between BICU and MSU.

SC981: HDD response error

-Definition- [B']

The HDD control board does not generate any response when the IPU sends a read/write signal to the MSU.

- Possible causes -

- Software defective
- Poor connection between BICU and MSU
- HDD defective

SC982: HDD construction error

-Definition- [B']

1) The HDD has been installed without the electric sort kit (SIMM memory).
2) A HDD that does not have the correct specifications has been installed.

- Possible causes -

- Hard disk defective
- Incorrect hard disk type
- The electric sort kit is not installed

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 021 **05/14/99**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: BEND IN UPPER FUSING ENTRANCE GUIDE

SYMPTOM:

The Fusing Cleaning Roller may fall out when the Upper Fusing Entrance Guide is removed.

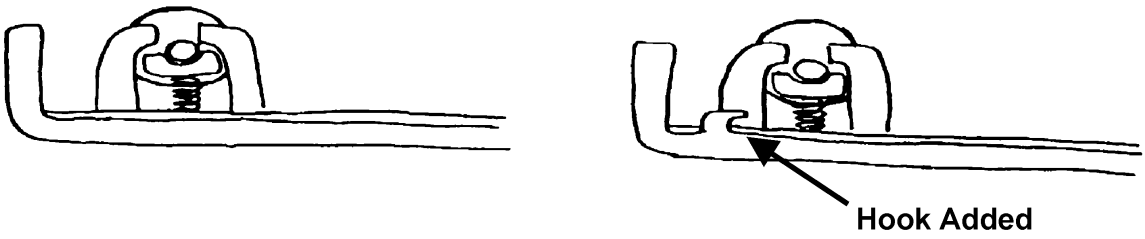
CAUSE

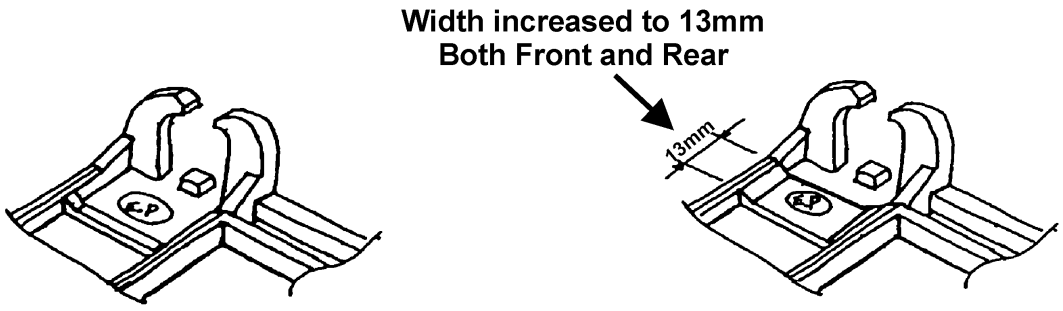
If the Upper Fusing Entrance Guide becomes deformed by heat, the hook section on the Roller Bushing may expand so that the Roller Bushing is no longer secured.

SOLUTION:

The following modifications were implemented to prevent deformation caused by heat of the Upper Fusing Entrance Guide.

1. A hook has been added to prevent deformation.
2. The width of the plate near the point where the Fusing Cleaning Roller is attached has been increase to 13mm.





Old Style

New Style

Continued…

Field replacement procedure for Upper Fusing Entrance Guide

Even if the Upper Entrance Guide is deformed, the Cleaning Roller will still properly clean the Pressure Roller. However, if the Upper Entrance Guide is removed/installed with the Fusing Unit positioned so that the Upper Entrance Guide is on top (shown below in figure A), the Cleaning Roller may fall off and the Hot Roller and Pressure Roller may be scratched.
When installing/removing the Upper Fusing Entrance Guide, please make sure the Fusing Unit is positioned as shown below in figure B.

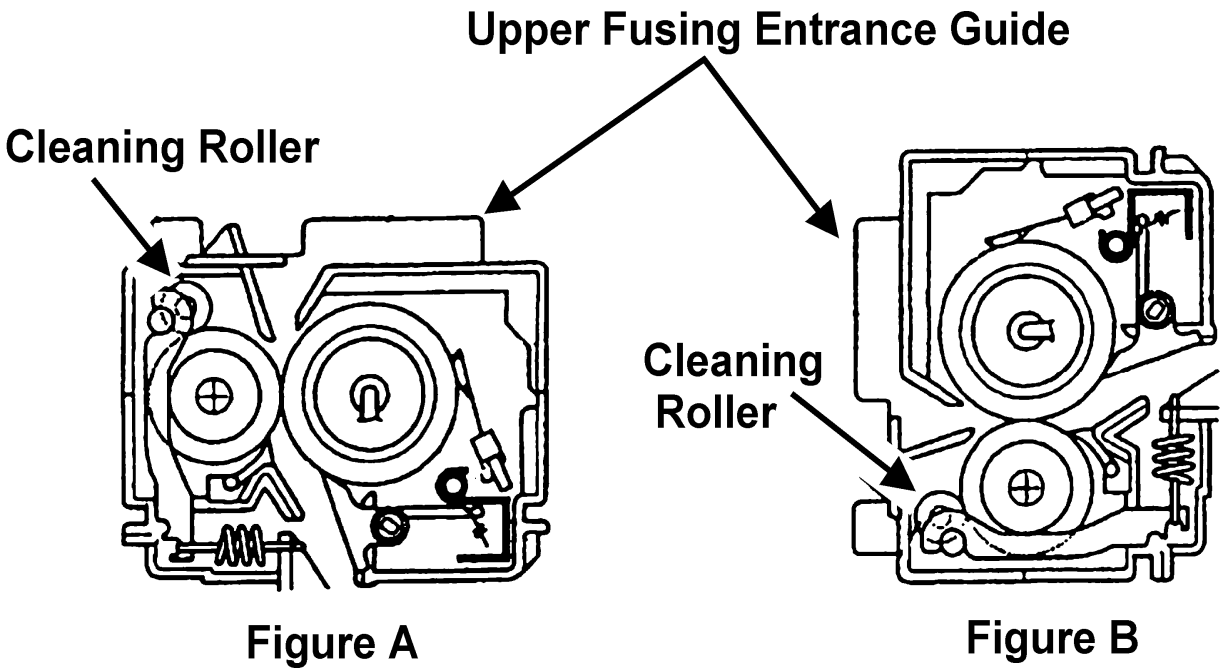


Figure A

Figure B

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Upper Fusing Entrance Guide installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235S	1B88850001
Gestetner 3235	1B88850001
Gestetner 3245	2B18850001
Ricoh Aficio340	A768885096
Ricoh Aficio350	A7698850855
Ricoh Aficio450	A7708850612
Savin 9935D	1B88850001
Savin 9935Dp	1B88850001
Savin 9945DP	2B18850001

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 022 **05/14/99**

APPLICABLE MODEL:
GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

Note: This copy is intended as a master original for reproduction of additional bulletins.

GENERAL:

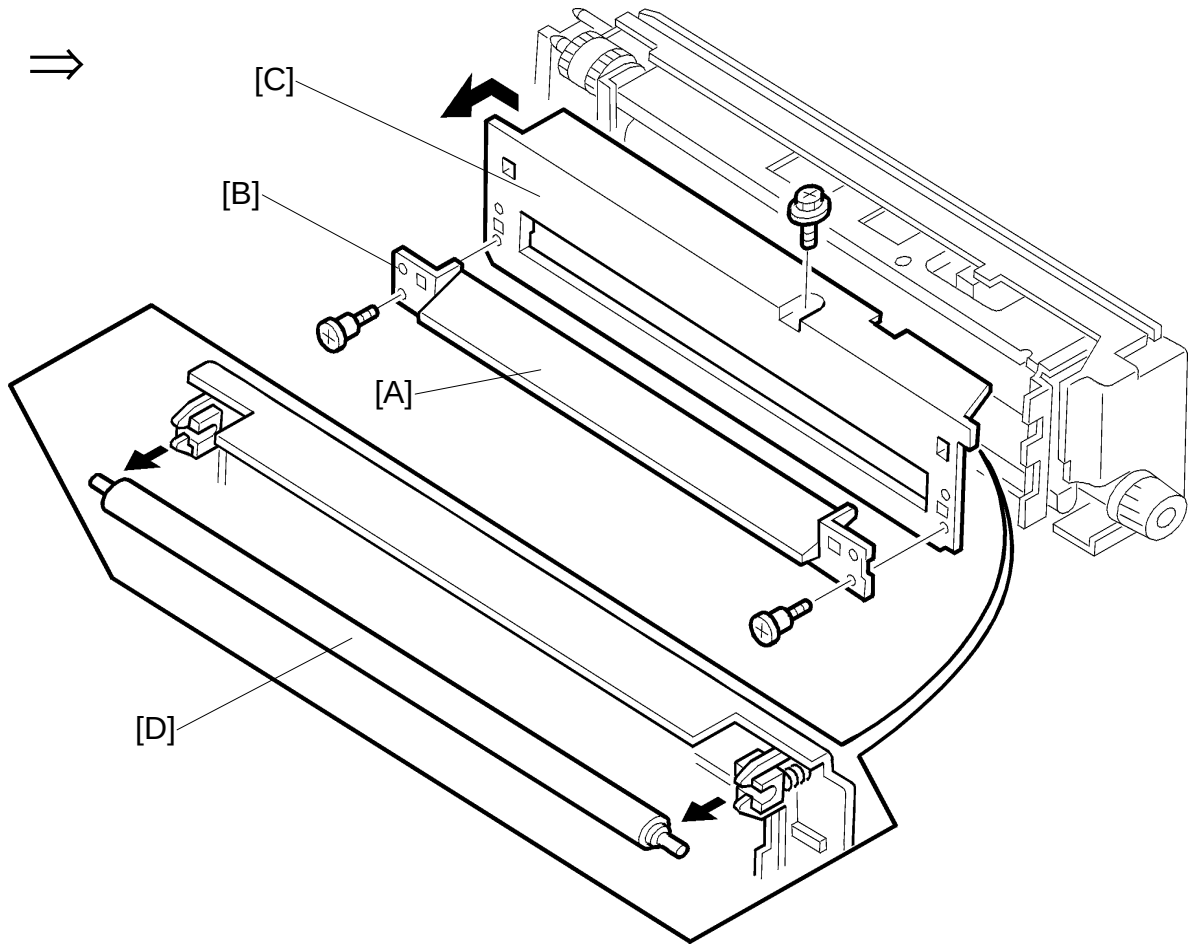
The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 6-42 Updated Information

6.7.4 CLEANING ROLLER



1. Remove the fusing unit.
2. Remove the fusing entrance guide [A] (2 screws).
   NOTE: The standard position of the fusing entrance guide is the upper position, using the lower screw holes [B]
3. Remove the lower fusing cover [C] (1 screw).
   NOTE: When removing the lower fusing cover, be careful not to drop the cleaning roller onto the hot roller.
4. Replace the cleaning roller [D].

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 023 **06/07/99**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be added with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

- 7-27 ~ 7-31 Additional Information (ROM History)

SERVICE MANUAL

7.3 ROM HISTORY

A230/A231/A232 Firmware Modification History (Copier)			
Description of Modification	**Firmware Level**	**Serial Number**	**Firmware Version**
Version A, B, & C were for pre-production machines.	A2325113 D	From initial production.	13.1.7 na
Corrects the following: • Machine may stall when making a combined copy after printing the archive file list. • The "Menu" key LED stays on even if the copy job is finished. • When pressing the "+" after 400% when using the Zoom key, "* maximum" is displayed. If this condition continues until the auto reset time, a SC990 may occur. • When the copier HDD is defective and the main power switch is turned on, the machine does not generate a SC condition but may stall. • The description of SP 5803-6 has been corrected. • When an original is stored as an archive file, two archive files will be made. • Memory clear procedure corrected. Enter SP5801. Hold down the "1" for over 3 s. • SP2213 display corrected. • Change the determination of the paper size when the machine detects a non-standard original size. Specification change: • If TD Sensor Initialization is preformed during warm-up – SC 542 will occur. Change – TD Initialization can not be performed until warm up is complete.	A2325113 E	April 1998 production.	13.1.8 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • To improve copy quality (Medaka), the default value of the following SP modes has been changed. Sp2001-1 1650v to 1620v and SP2005-3 1650v to 1620v. • Machine may not reach stand-by mode condition after main switches are turned on of after jam removal due to no zero cross signal detection. Fix - SC547 or SC542 will be generated. • When changing the value of SP6105 (staple position adjustment) and SP6113 (punch hole position adjustment) to a minus value, then turning the machine OFF and ON, the data is not sent to the finisher. • If the electrical counter value is a minus condition, the counters for the fax option do not increment. Specification change: • When A3 or B4 paper size is selected in rotate sort (or stack) mode, the machine will copy with normal sort (or Stack) mode. • Electrical total counter value of brand-new machine has been changed from –2000 to –5000. • During multiple copying and no HDD option installed, the machine can scan originals for fax transmission. • Improved copy quality of light original mode. Gamma curve for the original mode has been changed. • SC900-01 will be generated when the mechanical counter is disconnected.	A2325113 G	May 1998 production.	13.6.3 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • In the Power Saver Mode, if the front cover is left open for long period, SC542 may appear. • If the front cover is kept open for more than 125 sec. When adjusting SP1-105-01, SC542 occurs.	A2325113 H	June 1998 production.	13.6.3.1 na
Corrects the following: • If there is an A3/11x17 jam in the duplex unit, the jam location indicator “C” may also light although there is no paper there. • Fusing lamp may not turn off when a non-feed jam occurs.	A2325113 J	August 1998 production.	13.6.4.1 na
Corrects the following: • SP5001 – SP5401 will not print out on SMC printout. • In a SC condition – Memory All Clear (SP5801) does not function. • After a jam condition has been cleared, pressing the Start key does not resume copying	A2325113 K	N/A	13.6.8 na
For factory purpose only. Not released.	A2325113 L	N/A	13.6.9 na
Corrects the following: • After resetting a SC condition, incoming Fax messages will not print. • A false fusing SC may be detected after resetting a fusing SC condition. • Registration roller may not stop rotating if the leading edge of the copy is detected twice at the registration sensor.	A2325113 M	N/A	13.6.11 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • Printing image improved in smoothing mode and the printing speed has been increased in the Electronic Sort Mode when printing with 300DPI. • SC321 may be displayed due to incorrect timing of image transfer from the main frame to the printer controller. • A printing error may occur when printing 250 sheets or more to the SR720. • The ADF can not function when SP 4303 is set to 1. • The LED for the original set sensor lights when a fax message is received in night mode. • The paper end indicator erratically lights in the Enhanced Image Mode with no HDD installed.	A2325113 N	Not cut into production.	13.6.19 na
• Required from proper Print Controller operation. • Incoming fax messages cannot be printed out in Night Mode. • Can not reset “Original on glass” indication when SP4303 is set to ‘1”.	A2325113 P	January 1999 production.	13.6.20 na

Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • Jam Reset - When a "C" jam occurs, opening doors other than the front or right door can reset the jam. Modified 'so that the "C" jam can only be reset by opening the front or right door. • Bin Tray Motor abnormal operation - The Exit Motor Off signal is misread as ON so the motor continues to switch ON/OFF. • Incorrect detection of Door Open - The serial data from the 1st bin tray is misdetected as door open/closed so machine initialization occurs, if this misdetection occurs when paper is fed, a jam occurs. • Online added - [Online] has been added for the printer fonts for the China/Taiwan machines. Please install this version when adding the printer for the China/Taiwan machines. • Characters from registered fonts cannot be displayed - The registered fonts are not displayed on the Chinese machines during 4-line displays. Please install this version when adding the Scanner option on the Chinese/Taiwan/Asian machines. • English display errors in SP Mode - SP2301, 2309: Changed "Toner" to "Trans." SP2209-002: Changed "Tonert" to "Toner."	A2325113 Q	N/A	13.6.23 na

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 024 **07/09/99**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PARTS CATALOG UPDATES

- **UPDATE 1:** SCANNER ARM UNIT -When assembling the Scanner Arm Unit, place a spacer between the Scanner Arm Unit and the Guide Plate to adjust the position. To facilitate the adjustment, the shapes of the following parts have been modified. The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2321096	A2321046	Scanner Arm Unit	1	3	13	25
A2321098	A2321048	Support Plate – Scanner Arm	1	3	13	26
A2321097	A2321047	Guide Plate – Scanner Unit	1	3	13	27

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Scanner Arm Unit installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88910001
Gestetner 3235	1B98910001
Gestetner 3245	2B18910001
Ricoh Aficio 340	A7688910001
Ricoh Aficio 350	A7698910265
Ricoh Aficio 450	A7708910194
Savin 9935D	1B88910001
Savin 9935DP	1B98910001
Savin 9945DP	2B18910001

Continued…

- **UPDATE 2:** SPONGE SEAL – To prevent developer leakage from both ends of the Development Unit, the thickness of the sponge has been increased from 1 mm to 2 mm. See Figure A below for placement of the Sponge Seal. The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

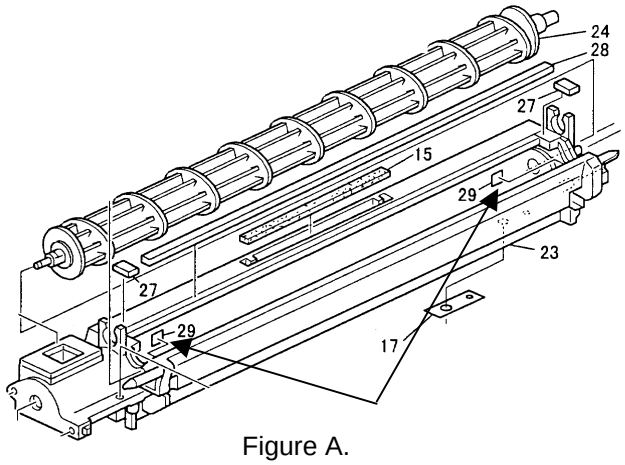


Figure A.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AA153059	AA153077	Sponge 8 x 8 x 2	2	1	45	29

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Sponge Seal installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88910001
Gestetner 3235	1B98910001
Gestetner 3245	2B18910001
Ricoh Aficio 340	A7688910001
Ricoh Aficio 350	A7698910265
Ricoh Aficio 450	A7708910194
Savin 9935D	1B88910001
Savin 9935DP	1B98910001
Savin 9945DP	2B18910001

Continued…

- **UPDATE 3:** PRESSURE SPRING – To reduce the wear on the Drum caused by the Pick-Off Pawls, the tension of the Pressure Springs has been reduced from 5.5 mN (Brown) to 4.0 mN (Silver). See Figure B below. The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

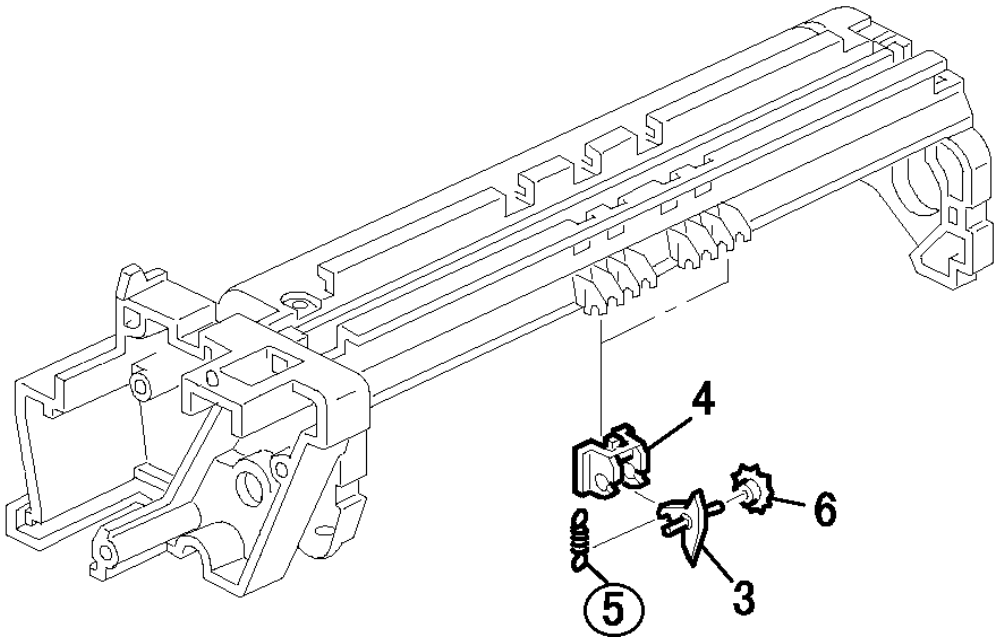


Figure B.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AA062302	AA062310	Pressure Spring	2	1	39	5

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Pressure Spring installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B89810065
Gestetner 3235	1B9982xxxx
Gestetner 3245	2B1982xxxx
Ricoh Aficio 340	A768982xxxx
Ricoh Aficio 350	A769982xxxx
Ricoh Aficio 450	A7708910001
Savin 9935D	1B89810065
Savin 9935DP	1B9982xxxx
Savin 9945DP	2B1982xxxx

Continued…

- **UPDATE 4:** CLEANING PAD – To prevent the Charge Roller from vibrating, the shape and position of the Cleaning Pad has been changed. See Figure C below. The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

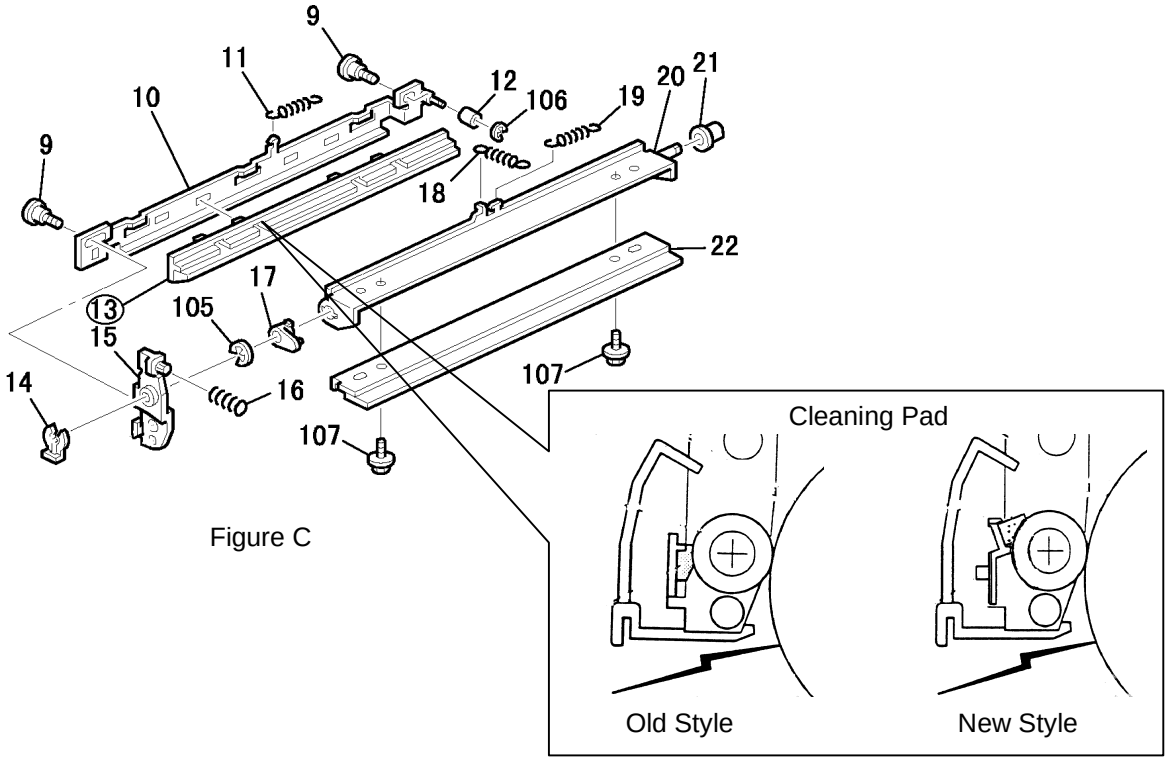


Figure C

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2322301	A2322430	Cleaning Pad	1	1	39	13

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Cleaning Pad installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B8981xxxx
Gestetner 3235	1B9981xxxx
Gestetner 3245	2B18920001
Ricoh Aficio 340	A7688920001
Ricoh Aficio 350	A769981xxxx
Ricoh Aficio 450	A7708920001
Savin 9935D	1B8981xxxx
Savin 9935DP	1B9981xxxx
Savin 9945DP	2B18920001

Continued…

- **UPDATE 5:** SBU HARNESS – To meet the standard for EMI (Electromagnetic Interference), a ferrite core has been added to the SBU Harness. The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2325491	A2325490	SBU Harness	1	1	19	19

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style SBU Harness installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B8981xxxx
Gestetner 3235	1B9981xxxx
Gestetner 3245	2B18920001
Ricoh Aficio 340	A7688920001
Ricoh Aficio 350	A769981xxxx
Ricoh Aficio 450	A7708920001
Savin 9935D	1B8981xxxx
Savin 9935DP	1B9981xxxx
Savin 9945DP	2B18920001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 025 **08/25/99**

APPLICABLE MODEL:

GESTETNER – 3535S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

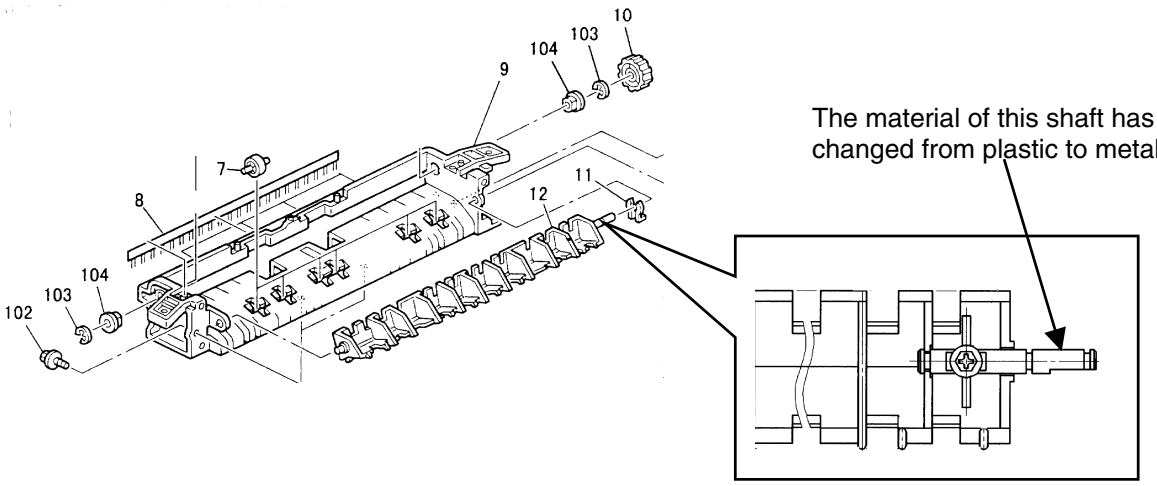
SUBJECT: PARTS CATALOG UPDATES

Note: This copy is intended as a master original for reproduction of additional bulletins.

GENERAL:

The following Parts Updates are being issued for all A230/A231/A232 Parts Catalogs.

- **UPDATE 1:** **Entrance Junction Gate –** To prevent the junction gate shaft from being broken, the material of the junction gate shaft has been changed from plastic to metal.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2324467	A2324452	Entrance Junction Gate	1-1	1	12	12

Continued…

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Entrance Junction Gate installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B89820001
Gestetner 3235	1B99810001
Gestetner 3245	2B19810001
Ricoh Aficio 340	A7689810001
Ricoh Aficio 350	A7699810120
Ricoh Aficio 450	A7709810216
Ricoh Aficio 345	Not Available At Release
Ricoh Aficio 355	Not Available At Release
Ricoh Aficio 455	Not Available At Release
Savin 9935D	1B89820001
Savin 9935DP	1B99810001
Savin 9945DP	2B19810001
Savin 2035DP	Not Available At Release
Savin 2045DP	Not Available At Release

- **UPDATE 2:** **Left Scale / Harness –** Due to parts standardization the Front Cover Scanner Harness and the Left Scale Bracket have been changed.

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2321342	A2841342	Front Cover – Scanner Harness	1	0	13	21
A2321675	A2841675	Bracket – Left Scale	1	0	19	1

UNITS AFFECTED:

Serial Number cut-in not available at time of publication.

Continued…

- **UPDATE 3:** **Parts Updates –** To facilitate assembly in the factory, the following parts have been changed.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2321096	A2321046	Scanner Arm Unit	1	3	13	25
A2321098	A2321048	Support Plate – Scanner Arm	1	3	13	26
A2321097	A2321047	Guide Plate – Scanner Unit	1	3	13	27
A2321090	A2841090	Scanner Unit Plate	1	0	9	10
12041537	12041543	Dip Switch	1	0	79	122
15030261	15030865	Oscillator – 9.8304MHZ	1	0	79	142

UNITS AFFECTED:

Serial Number cut-in not available at time of publication.

- **UPDATE 4:** **Hard Disk Drive –** The hard disk drive part number A6915871 has been discontinued The manufacturer has been changed from Western digital to Quantum.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A6915871 (Western)	A6915877 (Quantum)	Hard Disk Drive	1-1	0	69	1

UNITS AFFECTED:

Serial Number cut-in not available at time of publication.

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 026 **09/08/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: DEVELOPMENT UNIT UPDATES

- **UPDATE 1:**

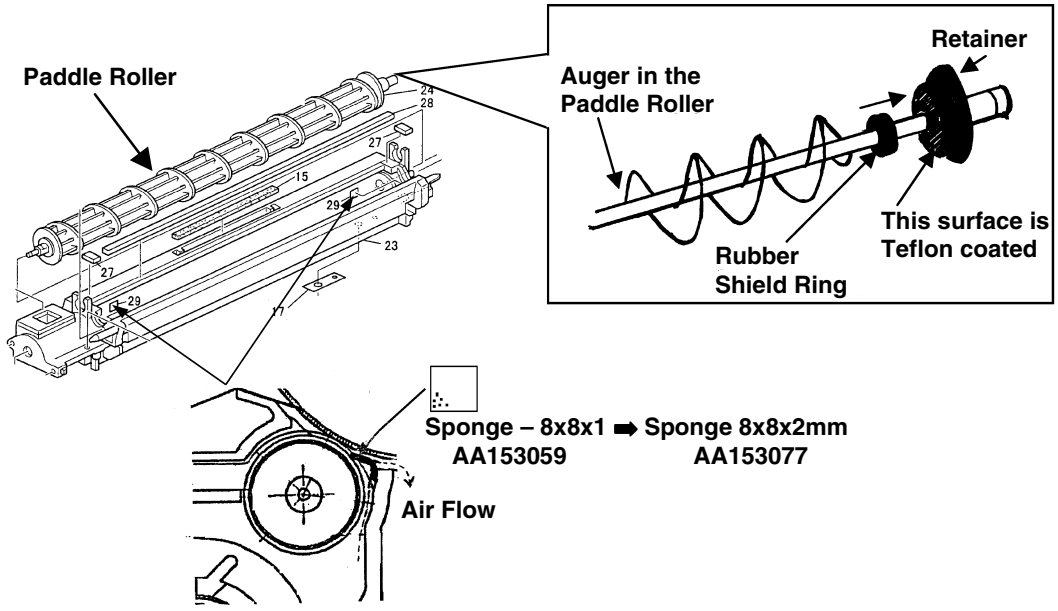
SYMPTOMS:

1. Developer is leaking only from the front of the Development Unit.
2. Noise from the Development Unit may occur in a copy mode (more than 40 sheets).
3. Developer is leaking from both ends of the Development Unit.

CAUSES:

1. When a large number of copies are made, the temperature in the Paddle Bushing area increases. This increased heat causes a deformation of the V-ring, which is designed to act as a developer shield. The deformation of the V-ring results in developer leaking from the front of the Development Unit.
2. The temperature of the rubber shield ring in the paddle roller increases as copies are made. This results in increased friction between the rubber ring shield and the retainer causing noise from the development unit. See figure 1 below.
3. A gap may develop between the Sponge Seal and the Case of the Development Unit, this gap may cause air to flow from inside of the Development Unit to the outside. This outward flowing air may push developer out of both sides of the Development Unit. See figure 1 below.

Figure 1



Continued…

SOLUTIONS:

Production Counter Measures:

1. To increase the heat handling characteristics, the material of the Flange-Side Plate has been changed from plastic to aluminum. The change in material will prevent damage or deformation of the V-ring.
2. The surface of the retainer in the Paddle Roller (See Figure 1) has been Teflon coated to reduce the friction against the Rubber Shield Ring when the temperature of the ring increases.
3. The Sponge Seal has been increased from 8x8x1 mm to 8x8x2 mm (See Figure 1).

Field Counter Measure:

Due to the difficulties of replacing these part in the field it is recommenced to replace the entire Development Unit.

NOTE: Refer to the Service Manual (page 6-26) when replacing the Developer. If the Developer Replacement Procedure is not followed, Damage to the Development Unit may occur.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2327260	A2327460	Development Unit	1	1	45	1
AA153059	AA153077	Sponge 8x8x2	2-2	1	45	29
A2323091	A2323096	Flange – Side Plate	1	1	45	21

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Development Unit and new Teflon coated Retainer installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B89810001
Gestetner 3235	1B98920001
Gestetner 3245	2B18920001
Ricoh Aficio 340	A7689810001
Ricoh Aficio 350	A7698910721
Ricoh Aficio 450	A7708920378
Ricoh Aficio 345	Not available at release
Ricoh Aficio 355	Not available at release
Ricoh Aficio 455	Not available at release
Savin 9935D	1B89810001
Savin 9935DP	1B98920001
Savin 9945DP	2B18920001
Savin 2035DP	Not available at release
Savin 2045DP	Not available at release

Continued…

UNITS AFFECTED - Continued:

All copiers manufactured after the Serial Numbers listed below will have the new style Flange – Side Plate installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88910001
Gestetner 3235	1B98910001
Gestetner 3245	2B18910001
Ricoh Aficio 340	A7688910001
Ricoh Aficio 350	A7698910265
Ricoh Aficio 450	A7708910194
Ricoh Aficio 345	Not available at release
Ricoh Aficio 355	A7698080001
Ricoh Aficio 455	A7708080001
Savin 9935D	1B88910001
Savin 9935DP	1B98910001
Savin 9945DP	2B18910001
Savin 2035DP	1B98080001
Savin 2045DP	2B18080001

All copiers manufactured after the Serial Numbers listed below will have the new style Sponge Seals installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88910001
Gestetner 3235	1B98910001
Gestetner 3245	2B18910001
Ricoh Aficio 340	A7688910001
Ricoh Aficio 350	A7698910265
Ricoh Aficio 450	A7708910194
Ricoh Aficio 345	Not available at release
Ricoh Aficio 355	Not available at release
Ricoh Aficio 455	Not available at release
Savin 9935D	1B88910001
Savin 9935DP	1B98910001
Savin 9945DP	2B18910001
Savin 2035DP	Not available at release
Savin 2045DP	Not available at release

Continued…

• UPDATE 2: PADDLE ROLLER DRIVE GEAR

SYMPTOM

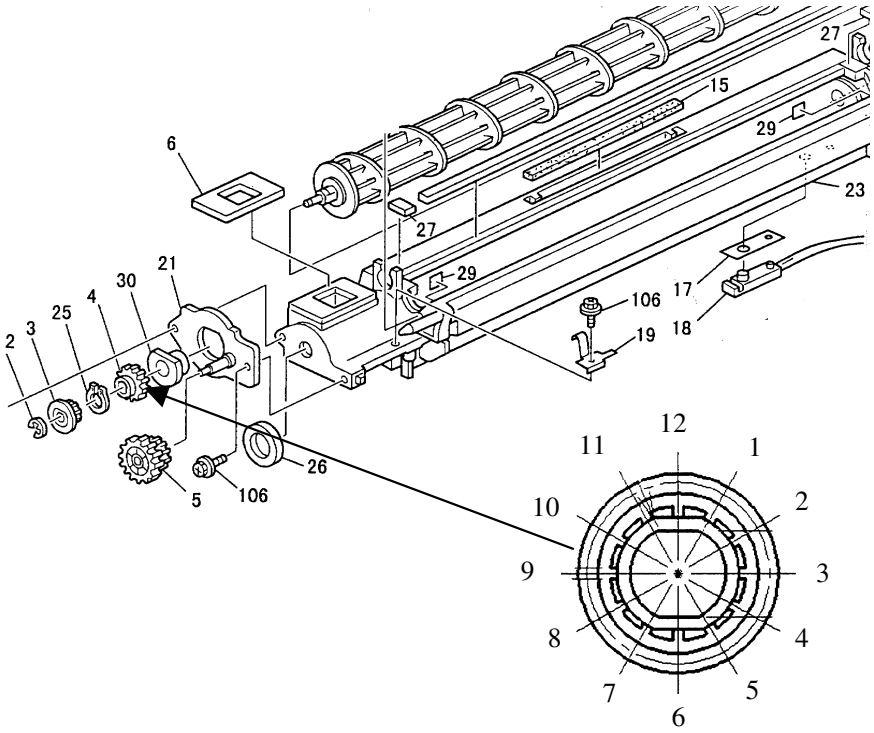
No image is developed on the rear side of the copy. All developer has moved to the front side of the Development Unit.

CAUSE

The Paddle Roller Drive Gear is deformed and the Developer Transportation Roller inside the Paddle Roller does not rotate properly.

SOLUTION

The paddle roller drive gear has been strengthened by adding ribs. The part number of the gear has not been changed. The difference between the old style and new style gear is the number the ribs: (Old: 6 ribs, New: 12 ribs)



New Gear 21Z
with 12ribs

Continued…

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Gear 21z with 12 ribs installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88880001
Gestetner 3235	2B18880001
Gestetner 3245	2B18880001
Ricoh Aficio 340	A7688880001
Ricoh Aficio 350	A7698880011
Ricoh Aficio 450	A7708870271
Ricoh Aficio 345	Not available at release
Ricoh Aficio 355	Not available at release
Ricoh Aficio 455	Not available at release
Savin 9935D	1B88880001
Savin 9935DP	2B18880001
Savin 9945DP	2B18880001
Savin 2035DP	Not available at release
Savin 2045DP	Not available at release

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

Gestetner® RICOH® savin®

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 027 **09/08/99**

APPLICABLE MODEL:

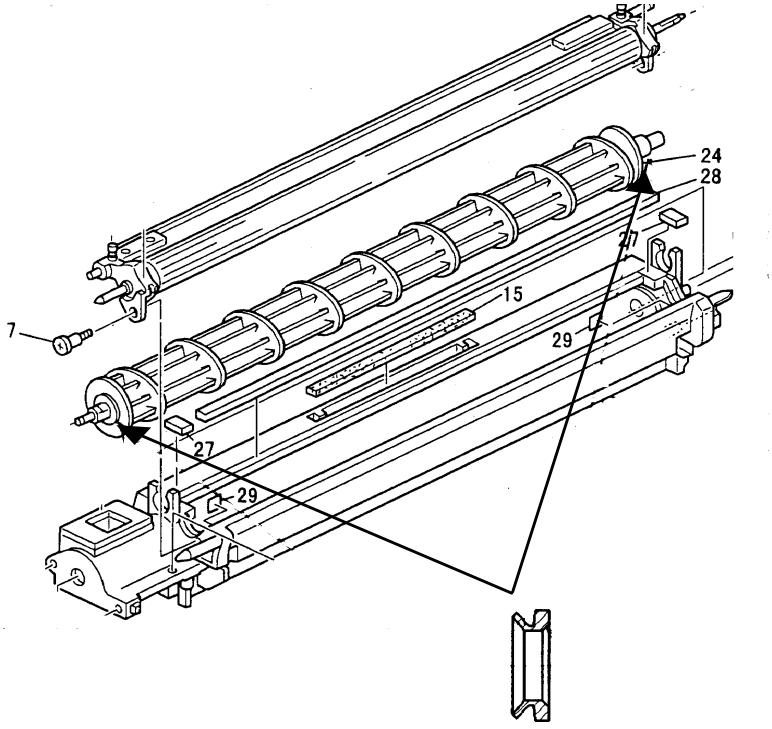
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: DEVELOPMENT UNIT V – SEAL RINGS

GENERAL:

The V-Seals Rings were omitted from the Parts Catalog.
The following Parts Catalog Addition is being issued for all A230/231/232 Parts Catalogs.



V – Seal Ring – M12
AA152283

			REFERENCE	
NEW PARTS NUMBER	DESCRIPTION	QTY	PAGE	ITEM
AA152283	Ring – M12	2	45	32

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 028 **09/20/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: DEVELOPMENT LEAK/TONER DUSTING

SYMPTOM:

Developer leakage or toner dusting from the Development Unit.

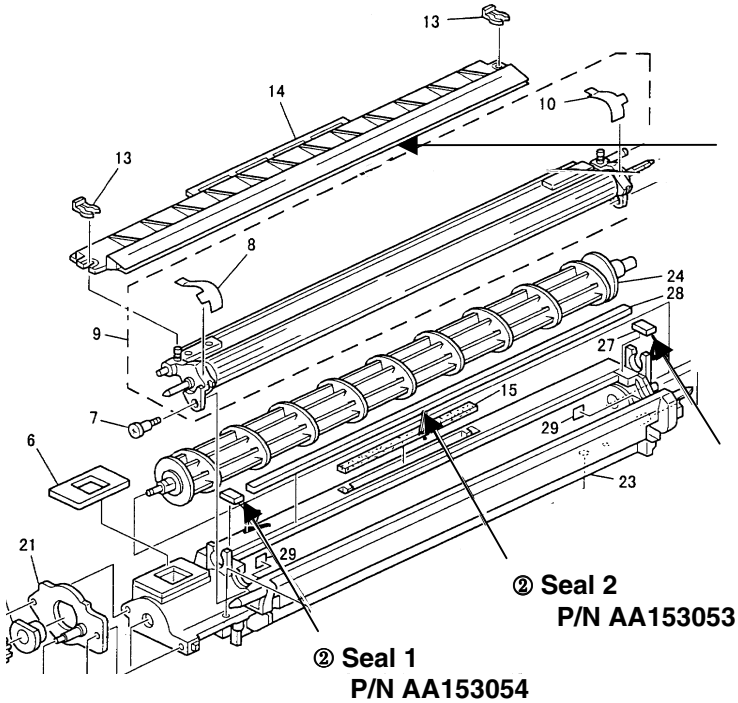
CAUSES:

1. Small clearance between the Entrance Seal Assembly and Development Unit casing due to the bowing of the Entrance Seal Assembly.
2. Small clearance between the sponge seals.

SOLUTION:

1. The width of the Entrance Seal Ass'y has been changed as shown in the illustration.
2. The width of the Side Sponge Seals has been changed as shown in the illustrations.

NOTE: *The part numbers of these parts have not been changed.*



① Entrance Seal Ass'y
A2323150

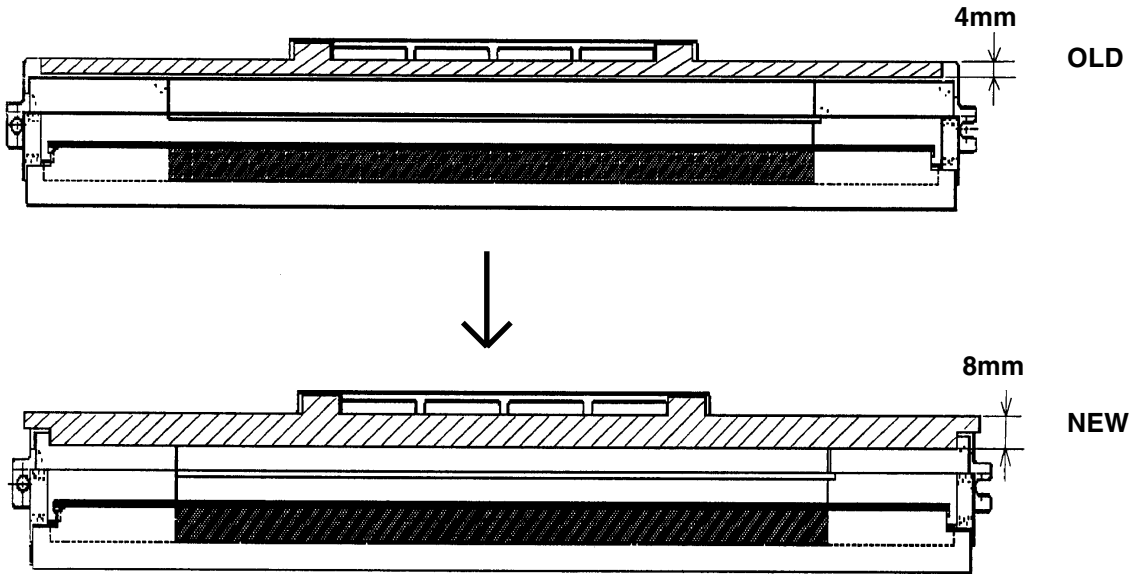
② Seal 1
P/N AA153054

② Seal 2
P/N AA153053

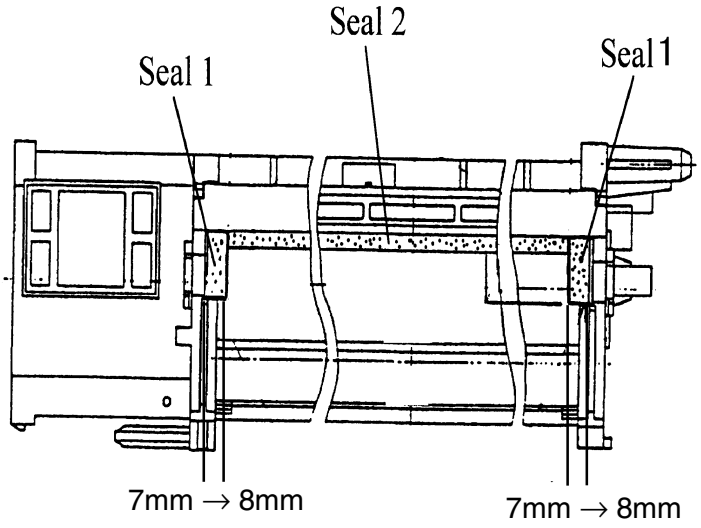
② Seal 1
P/N AA153054

Continued…

① : Entrance Seal Ass'y



② : The width of the seal 1 has been changed from 7mm to 8mm.



UNITS AFFECTED:

Serial Number cut-in not available at time of publication.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 029 **09/20/99**

APPLICABLE MODEL:

GESTETNER – 3535S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SC 543 FUSING UNIT OVER HEAT ERROR

SYMPTOM:

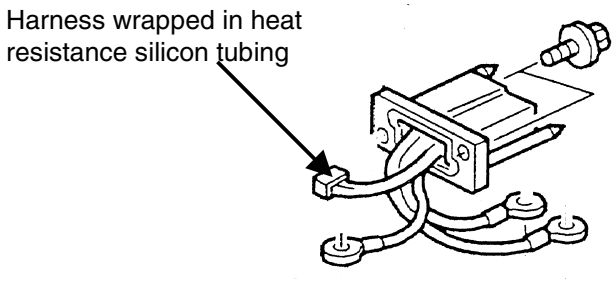
SC 543 is displayed on the operational panel.

CAUSE:

The Fusing Unit Harness may contact the Rear Lamp Terminal. This can cause the insulation to melt over time and allow the wiring harness to short to the Lamp Terminal causing a SC543 code.

SOLUTION:

The fusing unit harness has been wrapped in heat resistance silicon tubing.



NOTE: *The part number for the Fusing Unit Harness 115V (A2324094) has not been changed.*

Continued…

UNITS AFFECTED:

All A230, A231, and A232 copiers manufactured after the Serial Numbers listed below will have the new style Fusing Unit Harness installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88890001
Gestetner 3235	1B98890001
Gestetner 3245	2B19810001
Ricoh Aficio 340	A7688890001
Ricoh Aficio 350	A7698880566
Ricoh Aficio 450	A7708910194
Ricoh Aficio 345	Not Available At Release
Ricoh Aficio 355	Not Available At Release
Ricoh Aficio 455	Not Available At Release
Savin 9935D	1B88890001
Savin 9935DP	1B98890001
Savin 9945DP	2B19810001
Savin 2035DP	Not Available At Release
Savin 2045DP	Not Available At Release

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 030 **09/21/99**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual page(s) listed below must be added with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

- 7 – 32 Additional Information (ROM History)
- 7 – 33 Additional Information (ROM History)
- 7 – 34 Additional Information (ROM History)

SERVICE MANUAL

An arrow has highlighted the revised areas ⇒.

Description of Modification	Firmware Level	Serial Number	Firmware Version
⇒ Corrects the following: • When a “C” jam occurs, opening the front or right door can clear the jam message display. **After modification** the “C” jams can only be cleared by opening the right door. Note: As part of the modification, one right door interlock switch has been added and one front door interlock switch has been removed. In addition, an SP5957 has been added to allow usage of either the old or new interlock switches. If using the old interlock switch, please set the SP5957 to 0. If using the new switch, please set SP5957 to 1. If SP5957 is not set properly, the ‘door open’ Panel display may not function properly and the toner may not be fed properly after toner bottle replacement. • FALSE TONER OVERFLOW CONDITION: When the sensor detects Toner, the “Near Full” message is immediately displayed. After the Toner signal has been on for 1000 copies, the machine shuts off. Once the Toner signal disappears, the “Near Full” message is no longer displayed and the counter is reset. **After modification:** After the toner signal has been on for 500 consecutive copies, the “Near Full” message is displayed. After the “Near Full” message has been displayed for 1000 copies, the machine shuts off. Once the toner signal disappears, the counter is reset. • Dirty background There is a tendency for a ‘dirty’ background or leading edge to develop after the machine has not been used for a long while There is also a tendency for increased image density. These tendencies are due to the	A2325113 R	N/A	14.1

	decreased turboelectric charge of the Toner. • The initial machine warm-up operations stop if one or more of the doors to the option units are open (e.g.1 bin tray, finisher). The machine warm-up does not restart after closing the doors. • When in user code mode, after entering the power save mode and then exiting, the counter does not count the number of copies the user makes. • Using the Norwegian Language, when the machine should display 'Copying will start after warm up' in Norwegian, it is displayed in French. Conditions: - switching on the machine in cold condition, - setting original and pressing start key during machine warm-up. The French message then appears in the display. • SP2207 displayed a spelling error. Modification: Corrected spelling to “Forced”.			
⇒	Corrects the following • When SC101 occurs during a Fax transmission the machine prints a blank page. The transmission results are then reported as normal. The first page is blank and an SC101 message is displayed. **Countermeasure:** No actual transmission will take place during memory transmission. In the case of immediate transmission, the transmission will be interrupted and an error will be reported. • The Scanner software was also modified so that the driver in use displays an error message. • When a fusing jam occurs, the jammed paper may not be visible to the operator and a service call result. **Countermeasure:** The detection of fusing jams has been modified so that the paper will stop at a point where the trailing edge is visible.	A2325113 T		14.3

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 031 10/01/99

APPLICABLE MODEL:
GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: BLANK IMAGE ON FIRST COPY / SC101

Note: This copy is intended as a master original for reproduction of additional bulletins.

SYMPTOM:

The following may occur just after powering on the unit:
Copying A blank image appears on the 1st page and an SC101 message is displayed.
Faxing A blank image appears on the 1st page and an SC101 message is displayed. However, the transmission results are reported as being normal.
These symptoms are limited to the first copy after turning on the power. These symptoms may not occur every time power is turned on, even on units that demonstrate this symptom.

CAUSE:

The Exposure Lamp does not generate sufficient light during the first copy. While making a copy, the Exposure Lamp may be abnormally slow in reaching ready status. Therefore, the Lamp is not able to produce the required amount of light within the given time period. The source of this symptom has been identified as defective internal components in the Exposure Lamps that were produced in March, 1999.

SOLUTION:

The Exposure Lamps produced in March, 1999 were installed in some machines manufactured in March, April and May, 1999. Please check the Exposure Lamp lot number by following the procedure outlined below, on units that are listed in the UNITS AFFECTED area of this bulletin. If the Exposure Lamp's lot number begins with "39", the Lamp should be replaced. The lot number can be found on the black lamp cap on the rear side of the lamp. The lot number is also in black and therefore it may be difficult to read.

Procedure for checking the Exposure Lamp lot numbers (and replacement, if necessary):
1. Remove the Exposure Glass.
2. Slide the 1st Scanner to the cutout in the rear Scanner Frame.
3. Read the lot number printed on the Exposure Lamp cap.
4. If the first two digits of the lot number are 39, replace the Exposure Lamp (either Field Replacement P/N A2829450 or New P/N AX500068). Follow the Replacement and Adjustment procedure on page 6-5 of the Service Manual.

GENERAL:

The following part update is being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

					REFERENCE	
OLD PART NO.	**FIELD REPLACEMENT NO.**	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
AX500061	A2829450	AX500068	Exposure Lamp	1	21	8

Continued…

UNITS AFFECTED:

MODEL NAME	MARCH SERIAL NUMBER	APRIL SERIAL NUMBER	MAY SERIAL NUMBER
Gestetner 3235s	1B89830001 - 150	1B89840001 - 50	-
Gestetner 3235	1B99830001 - 910	1B99840001 -655	-
Gestetner 3245	2B19830448 - 655	2B19840001 -855	-
Ricoh AFICIO 340	-	-	-
Ricoh AFICIO 350	A7699830075 - 1769	A7699840092 - 1551	-
Ricoh AFICIO 450	A7709830123 - 1197	AA770984001 - 1267	-
Savin 9940DP	1B89830001 - 150	1B89840001 - 50	-
Savin 9940DPC	1B99830001 - 910	1B99840001 -655	-
Savin 9950DPC	2B19830448 - 655	2B19840001 -855	-

NOTE: An allocation for 100% of the affected machines will be shipped to their respective locations.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 032 **10/30/99**

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: RIGHT DOOR SWITCH ENHANCEMENT

TOPICS:

- **General Discussion on a Product Enhancement**
- **Clearing Paper from the "C" Area**
- **Solutions for Preventing a "C" Area Paper Jam Condition**
- **Additional Technical Information**
- **Right Door Switch Enhancement Kit**

General Discussion:

The A230/A231/A232 product family incorporates a vertical paper transport design to minimize the distance that the paper travels from the Drum Processing section to the Fusing Unit. This shorter paper path maximizes paper handling efficiency and increases the product's reliability related to paper transport through the machine. The paper handling characteristics in the A230, A231, and A232 is significantly different than the traditional horizontal paper path configuration used on other models. As with any Fusing Unit, proper maintenance techniques are critical to ensure optimum product reliability. Given there are many factors that affect Fusing Unit performance, this bulletin will provide the most current information to assist the technician when servicing or troubleshooting the Fusing area.

Clearing Paper from the "C" Area:

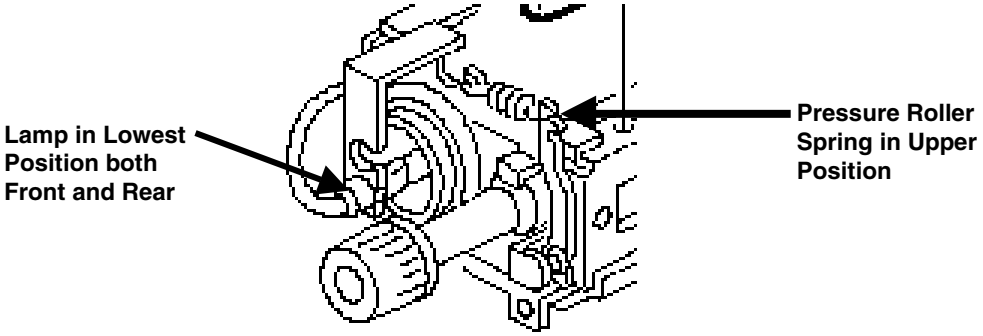
A Key Operator enhancement was developed to access paper in the "C" area. All A230, A231, and A232 Copiers manufactured after 8/1/99 (refer to the chart under Production Countermeasure) will utilize a Right Door Switch to reset a paper jam condition instead of the original Front Cover Switch. A directional decal and the wrap spring has been changed to allow the rotation of the Fusing Rollers in both directions along with a decal to direct the Key Operator to the "C" area. Additionally, Firmware revision "T" released in August 1999 (available @ tsc.ricohcorp.com) changed the paper timing to sense an abnormal paper condition sooner, thus providing the Key Operators to easily view and locate the paper to be cleared.
A Right Door Switch Kit has been developed and will be offered to enhance the existing field population of A230/A231/A232 products.

Solutions for Preventing a "C" Area Paper Jam Condition:

1. First check the paper type and weight as outlined in the Service Manual (pg. 1-1). Make sure the natural curl of the paper is facing down for the internal paper trays and up for the LCT.
2. Check the value of the Lead Edge Erase Margin in SP Mode 101-1, this should be at least 3 mm. If heavy solids are being copied, a larger lead edge may be necessary or the original orientation changed to place the solid area at the trail edge.
3. Check and adjust the Nip Band by following the procedure on pg. 4-58 of the Service Manual. The Fusing Pressure Roller Springs must be set to the **Upper** position.

Continued…

4. Improper Fusing temperature may result in increased paper curl, decreased Hot Roller life and Toner accumulation on the Hot Roller. This may result in Offsetting or Hot Roller paper wraps. Ensure the machine is placed properly to allow proper ventilation. Check the Fusing Exhaust Fan operation to ensure the fan is blowing air out of the machine. Verify that the Fuser Lamp is in the **Lowest** Lamp Terminal Holder position on both the Front and Rear Terminals. Adjust the Fusing Unit Temperature to specification with SP Mode1-105- 1 & 2. Clean the Fusing Thermistor on EM calls and apply a drop of silicon oil to the surface of the Thermistor.



5. Check the operation of the Junction Gate. Confirm that the solenoid allows for a smooth and unobstructed movement. Ensure that all the fingers are intact and that the shaft is not cracked. Replace the Junction Gate as required with part number A2324452 (TSB A230/A231/A231- 025).
6. The Hot Roller Strippers, Springs and the Mounting Bracket may become damaged from improper paper removal. The Hot Roller Strippers should evenly contact the Hot Roller. A mixture of Toner and paper dust on the Hot Roller strippers may cause the strippers to position away from the Hot Roller's surface. Clean the strippers and confirm that the tension is equal for each stripper on every EM call. An improved Teflon coating has been applied to the strippers to minimize any adhesion of toner and paper dust on the strippers. Additionally, stronger springs are being implemented in production to reduce the occurrence of paper wrapping around the Hot Roller. The new type strippers and springs are provided as part of the Right Door Switch Kit.
7. Inspect the Hot Roller for deep scratches (core visible) and replace as necessary with P/N AE011041. Utilize only the recommended Hot Roller on the A230/A231/A232 product family to prevent Offsetting or other issues that will impact product reliability.
8. The Pressure Roller Strippers must be installed. They are designed to prevent thin paper or OHP sheets from wrapping around the Pressure Roller. If the Pressure Roller Strippers are worn or damaged, replace them (quantity 2) with part number AE044024 (TSB A230/A231/A232-015). It is not recommended to operate the A230, A231, and A232 models with the strippers removed.

Additional Technical Information:

1. The Fusing Entrance Guide is set from the factory in the "Thin" position. For some types of paper or if paper creasing is observed, the Entrance Guide should be moved to the Thick position. Reference pg. 2-66 of the Service Manual.
2. The coating of the Pressure Roller will appear wrinkled when the roller is below operating temperature. This occurs by design due to the manufacturing process of applying the Teflon Sleeve coating over the pre-heated rubber roller. Replace the Pressure Roller only if it is physically damaged (coating broken, gouged) or at the recommended interval (150k).
3. The Right Door Switch Kit includes a Relay harness for the Transfer Belt Waste Toner Sensor. The contacts for the Relay Harness are improved (February 1999 production) to prevent the occurrence of a False "Empty Used Toner" condition.

Continued…

- **Right Door Switch Kit Enhancement:**

Kit Contents (P/N A2309903):

DESCRIPTION	QUANTITY	PART NUMBER
Right Door Switch	1 each	12042466
Screw M3 x 45	2 each	AA143519
Relay Harness	1 each	A2309900
Hot Roller Strippers	5 each	AE044028
Tension Spring	5 each	AA060837
Knob Spring Clutch	1 each	A2324072
Decal, Knob Spring	1 each	A2309902
Decal Jam Removal	1 each	A2321386
Joint Harness	1 each	A2323995
Harness Clamp	2 each	11050109

Firmware:

Firmware revision "T" (or later) is required to activate SP Mode 5-957 for the Right Door Switch circuitry. The firmware is available from the TSC Web site @ tsc.ricohcorp.com and has been cut into production on A230, A231, and A232 copiers manufactured as of August 1, 1999.

Allocation:

Each authorized servicing location will receive an automatic allocation of Right Door Switch Kits for a percentage of the affected population. Additional kits can be obtained by completing the attached Request Form. **This Right Door Switch Kit will be available, at no charge, until 3/31/2000**. After 3/31/2000, the parts will be available as individual service parts for procurement through normal parts ordering procedures.

Affected Units:

The A230 and A231 models have a slower processing speed then the A232 model. A characteristic of the slower process speed is an increase in the reliability of paper handling through the Fusing Unit. The A230 and A231 models have a minimal occurrence of "C" area jams. Our internal testing and research of service histories has concluded that only a small percentage of the A230 and A231 population experienced a service call for Key Operator unclearable "C" area paper jam condition. "C" Area jams will be more apparent on the A232 model due to the faster engine process speed. A greater percentage of the A232 will experience service calls for key Operator unclearable "C" paper jam conditions. Consequently, the A232 will benefit most with a significant improvement in customer maintainability and usability when the Right Door Switch Kit is installed and proper maintenance techniques are implemented.

Continued…

Production Countermeasure Cut-ins:

Kit Contents	Part Number	Quantity	Ricoh Version	Savin Version	Gestetner Version
Right Door Switch	12042466	1	A7XX9X80001	XBX9X80001	XBX9X80001
Harness Clamp	11050109	2	A7XX9X80001	XBX9X80001	XBX9X80001
Joint Harness	A2323995	1	A7XX9X80001	XBX9X80001	XBX9X80001
Screw M3 x 45	AA143519	2	A7XX9X80001	XBX9X80001	XBX9X80001
Decal Jam Removal	A2321386	1	A7XX9X80001	XBX9X80001	XBX9X80001
Decal Knob Spring	A2309902	1	A7XX9X80001	XBX9X80001	XBX9X80001
Knob Spring Clutch	A2324072	1	A7XX9X80001	XBX9X80001	XBX9X80001
Hot Roller Strippers	AE044028	5	A7XX9X80001	XBX9X80001	XBX9X80001
Tension Spring	AA060837	5	A7XX9X00001	XBX9X00001	XBX9X00001
Relay Harness	A2309900	1	A7XX9X20001	XBX9X00001	XBX9X00001

Installation Instructions:

Refer to the attached pages for servicing convenience 0f the Right Door Switch Kit installation.

Continued…

ORDERING PROCEDURE:
To obtain additional Right Door Switch Kits (A2309903) at no charge, please complete and fax this form to Technical Services.

SUBJECT:
Fax this entire page in "DETAIL" mode ATTN.: Technical Services - Copier
Fax Number:

- USA 973-882-3960
- Canada 905-795-5659
- Latin America 305-597-1033

Allocation:

Each authorized servicing location will receive an automatic allocation of Right Door Switch Kits for a percentage of the affected population. Additional kits can be obtained by completing the attached Request Form. **This Right Door Switch Kit will be available, at no charge, until 3/31/2000**. After 3/31/2000, the parts will be available as individual service parts for procurement through normal parts ordering procedures.

NOTE: ***The Right Door Switch Kits will be available at no charge for until 3/31/2000.***

Affected Machines: Please identify any additional quantities of Right Door Switch Kits needed for units below the Serial Number cut-in.	Quantity Needed
A230 Models below SN A7689880001	
A230 Models below SN 1B89880001	
A231 Models below SN A7699880001	
A231 Models below SN 1B99880001	
A232 Models below SN A7709880001	
A232 Models below SN 2B19880001	
Total Quantity Needed	

Right Door Switch Kit - PN# A2309903

PLEASE TYPE OR PRINT CLEARLY

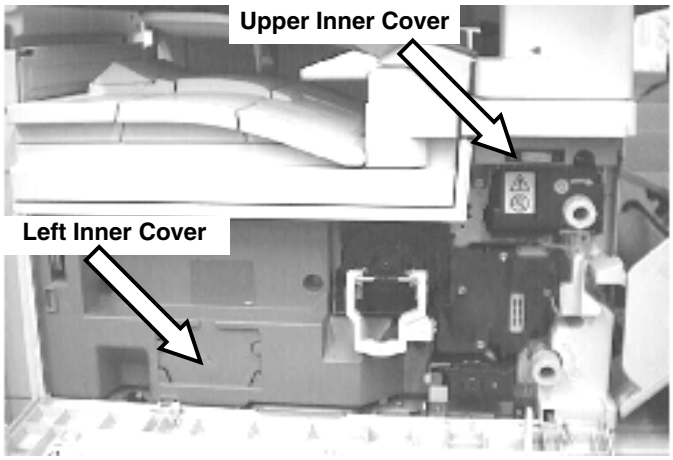
DEALER NAME:		
ADDRESS:		
CITY:	**STATE:**	**ZIP CODE:**
ATTENTION:	**DEPT:**	
PHONE #:	**FAX #:**	
DEALER ACCOUNT NUMBER:		

Continued…

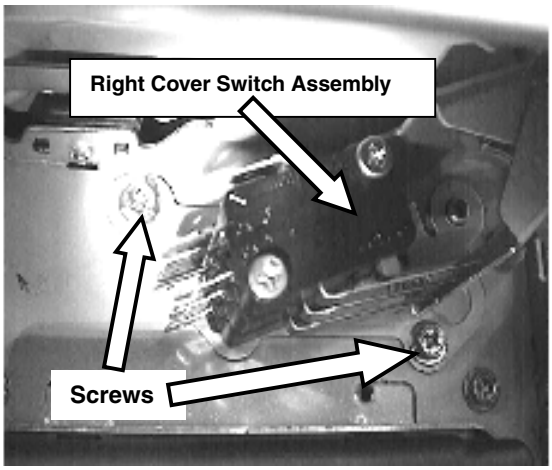
A230/A231/A232
Right Door Switch & Fuser Knob Spring Installation Procedure

1. Turn the main power switch off. Open the Front Cover and remove both the Upper and Left Inner Covers (2 screws each). The harness of the Total Counter is attached to the mainframe behind the Left Inner Cover.

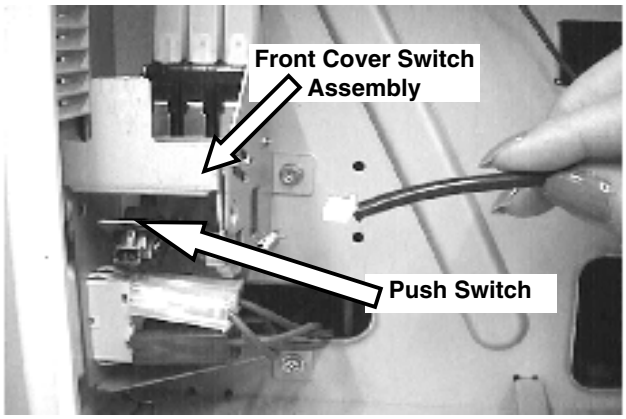
   NOTE: Remove the Total Counter connector before completely removing the Left Inner Cover to prevent damage to the connector.



2. Remove the connector of the Interlock Switch (inside the Upper Inner Cover) and the 2 screws that fasten the bracket to the mainframe. Notice the hook that engages to the frame of the copier. This will need to be re-engaged during reinstallation. Finally, remove the Right Cover Switch Assembly.

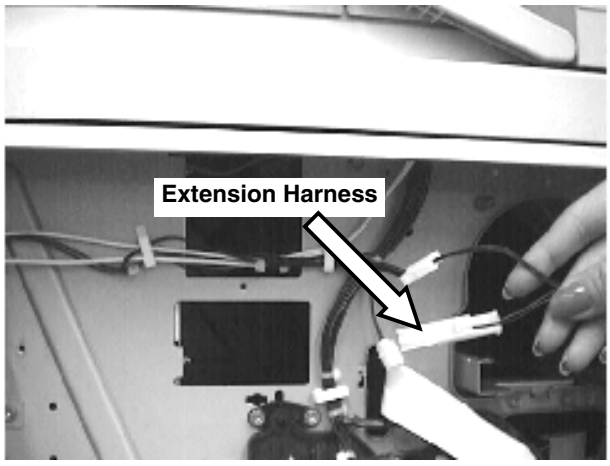


3. Remove the connector from the Push Switch that is attached to the Front Cover Switch assembly (located behind the Left Inner Cover). Remove the harness from the wire clamp.

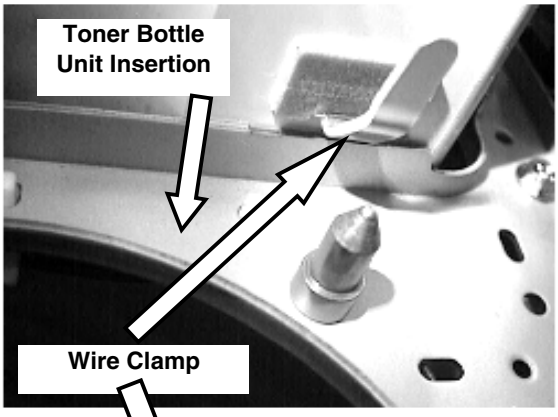


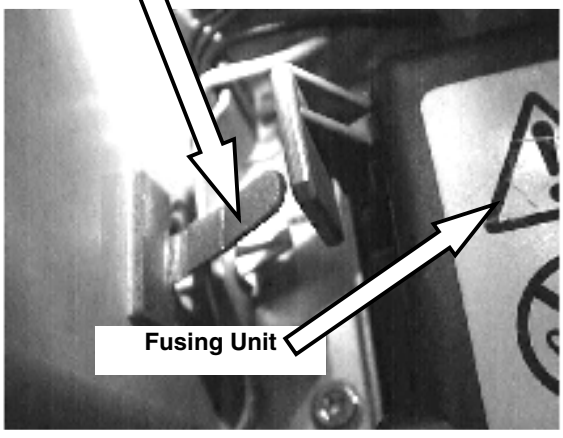
Continued…

4. Connect the Extension Harness to the connector that was detached from the Push Switch in step 3. Fix the harness in place with clamps (2 places).



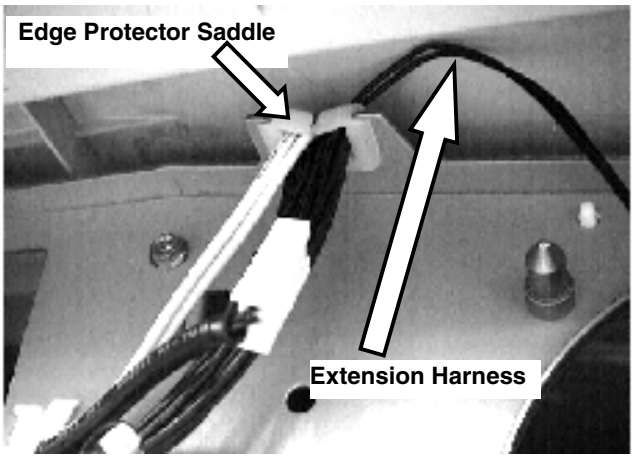
5. Remove the Toner Bottle Unit. Attach 1 clamp each to the bottom face of the Upper Cover located just above the Toner Bottle insertion area (middle right photograph) and to the Upper Cover of the surface located to the left of the Fusing Unit (lower right photograph). Clean the areas where the clamps are to be attached with alcohol.

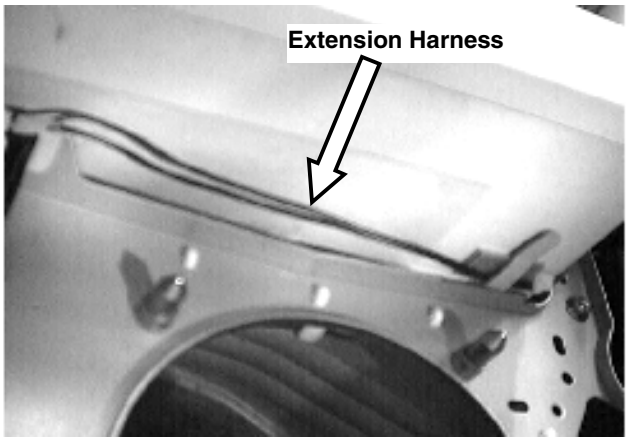




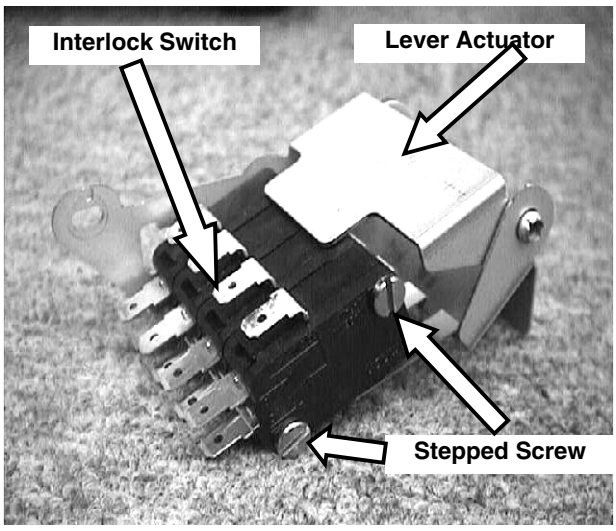
Continued…

6. To prevent the Extended Harness from moving freely inside the machine, clamp it to the Edge Protector Saddle (protective wire clamp) located above and to the left of the Toner Bottle insertion area.





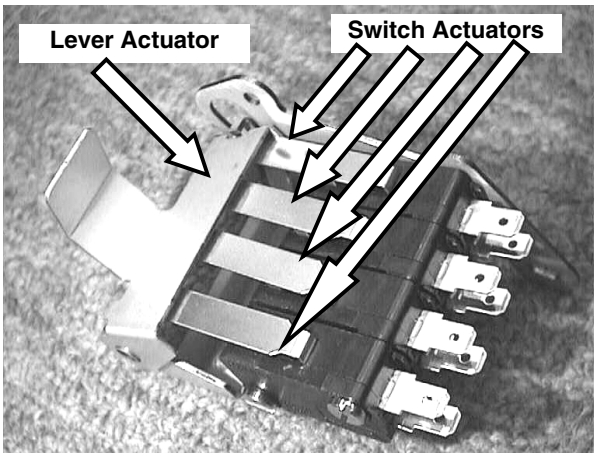
7. Since one Interlock Switch has been added to the new Right Cover Switch Assembly, it is necessary to replace the Step Screws with longer ones. At this time, confirm that the Interlock Switch Actuators are under the lever and confirm that the switch functions normally.



Continued…

8. Attach the new Right Cover Switch Assembly in the reverse order in which the old assembly was removed (in step2).

   NOTE: Be sure to engage the looped hook on the rear side of the Switch Bracket to the cut out on the Copier Frame. This ensures proper alignment of the Switch Bank. The attachment positions of the four connectors to the Interlock Switches are not critical.



9. Reattach the Toner Bottle Unit, Upper Inner Cover and Left Inner Cover to their original locations. When reattaching the Left Inner Cover, be sure to set the connector of the Total Counter.

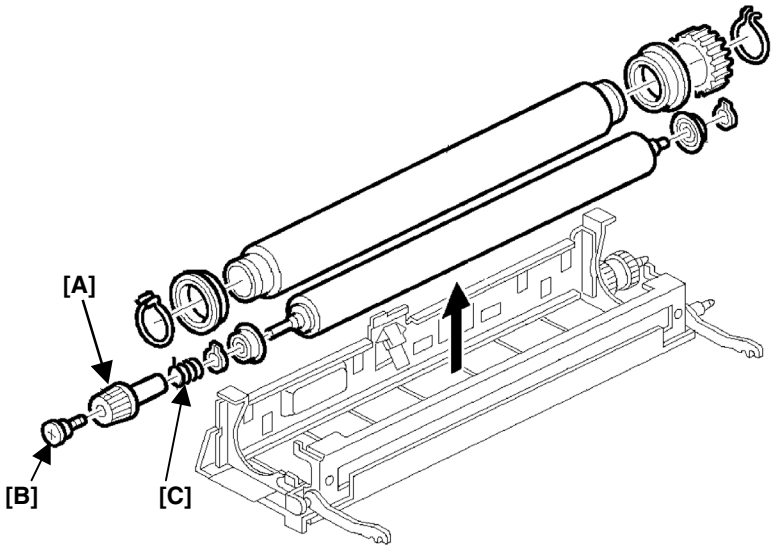
10. After adding the Interlock Switch as described in step 7, replace the mainframe ROM with revision "S" or higher.

11. After updating the mainframe ROM, enter the SP mode, select SP 5-957 and press 1 to enable the Right Cover Switch function. Press ENTER and exit the SP mode.

12. Turn the main switch “OFF” and then “ON”. The setting will not take unless the power is cycled “OFF” and “ON”.

Fusing Knob Spring Installation Procedure:

1. Remove the Fusing Unit.
2. Remove the Upper Fusing Cover (Refer to the Service Manual page 6-40).
3. Remove the Fusing Unit Knob (A) [1 screw (B)]
4. Remove the spring (C).
5. Set the new spring onto the Pressure Roller Shaft by rotating the spring.
6. Set the Fusing Unit Knob.
7. Install the new lock washer screw (M3x8).



TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 033 **11/05/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

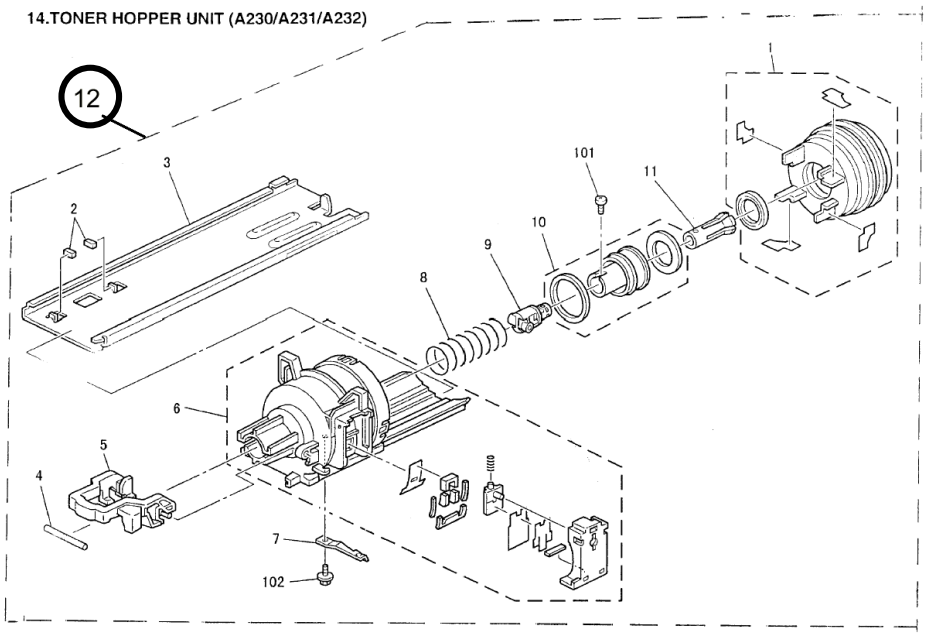
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following Parts Updates are being issued for all A230, A231, and A232 Parts Catalogs.

- **UPDATE 1:** **TONER SUPPLY UNIT** – The Toner Hopper Unit has been registered as a service part.



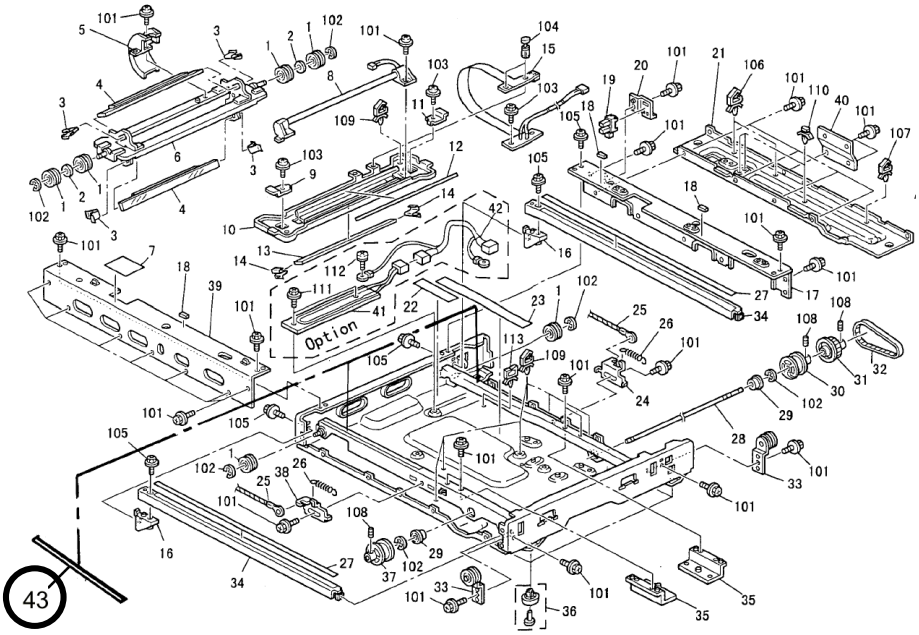
			REFERENCE	
NEW PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2327266	Toner Supply Unit (Ricoh NA)	0-1	35	12*
A2327466	Toner Supply Unit (OEM)	0-1	35	12*

*DENOTES NEW ITEM NUMBER

Continued…

- **UPDATE 2:** **SECOND SLIDE RAIL** – The Second Slide Rail has been registered as a service part.

7.OPTICS UNIT 2 (A230/A231/A232)



			REFERENCE	
NEW PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2321707	Second Slide Rail	2	21	43*

* Denote New Item

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 –034 **11/05/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

GENERAL:

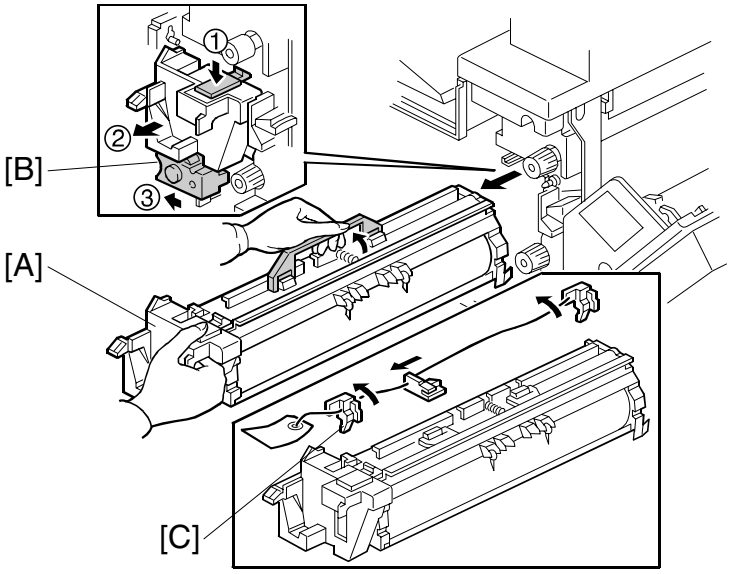
The Service Manual page(s) listed below must be replaced with the page(s) supplied. Each bulletin package contains 1 set of replacement pages.

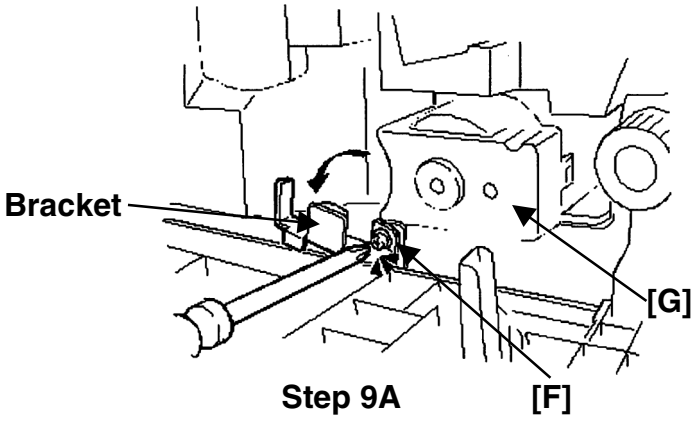
PAGES:

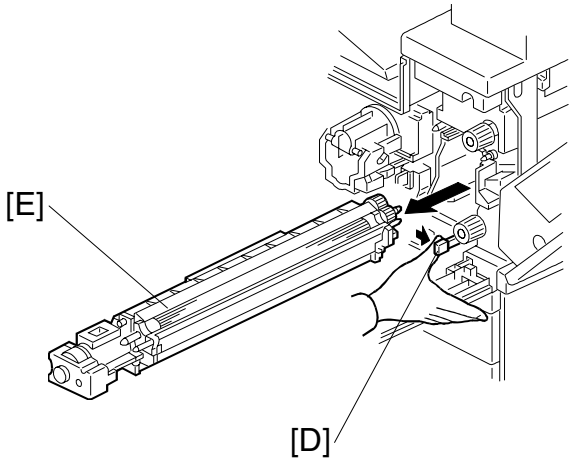
The revised areas have been highlighted by an arrow ⇒.

- 3-7 Updated Information
- 6-24 Updated Information

Note: This copy is intended as a master original for reproduction of additional bulletins.







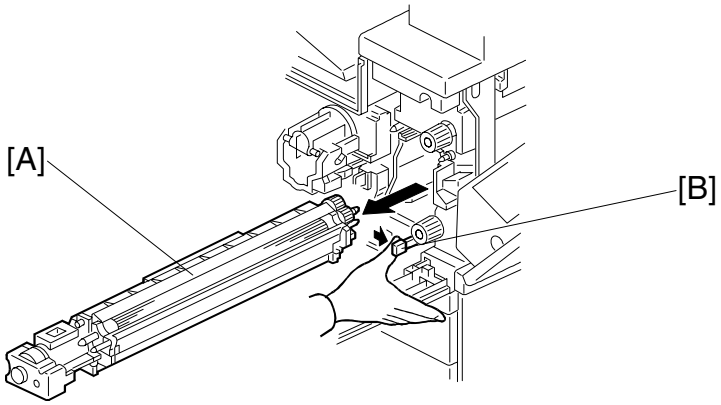
6. Open the front cover.
7. Push down the lever (1). Then pull the PCU [A] out a small distance (2), and move the development unit [B] to the left (3) so that the development unit is away from the drum, then slide out the PCU completely.
8. Remove three clamps [C].
9. Move the lever [D] to the right, then slide out the development unit [E].

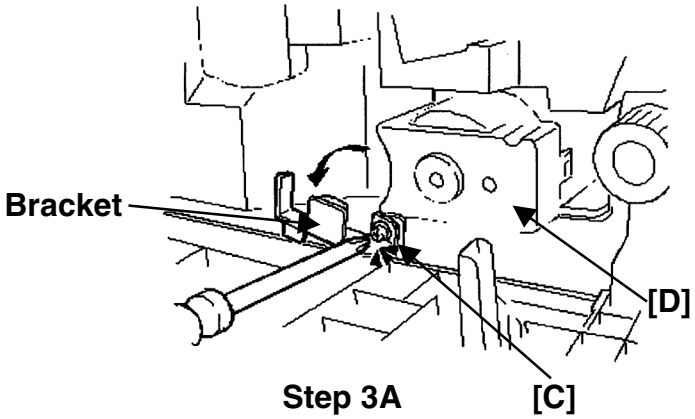
⟹ **Note:** *For machines produced after May 1999 follow Step 9A below.*

9A. While loosening screw [F] , turn the bracket counterclockwise, then remove the development unit [G].

6.4 DEVELOPMENT

6.4.1 DEVELOPMENT UNIT





1. Open the right upper cover and front cover.
2. Remove the PCU. (See Photoconductor Unit.)
3. Remove the development unit [A] while pushing the release lever [B] to the right.

⟹ **NOTE 1:** *For machines produced after May 1999 follow Step 3A below.*

3A. While loosening screw [C] , turn the bracket counterclockwise, then remove the development unit [D].

NOTE 2: Be careful not to nick or scratch the development roller.
If you are temporarily installing a used development unit for test purposes for a long time, perform SP2-220 and 2-802 after installation (see the SP mode table for details).

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 035 **11/17/99**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT:
- **RED WRENCH / OPEN DOOR / NO DISPLAY**
- **CONSTANT ADD TONER**

SYMPTOM:

1. A red wrench, open door indication, and no display are indicated on the control panel.
2. The unit is in a constant add toner condition.

CAUSE:

The Toner Bottle Motor and the IOB Board are both damaged. If a short circuit occurs in the Toner Bottle Motor, abnormally high current may flow through the IOB Board and consequently damages IC122.

SOLUTION:

The carbon brush of the Toner Bottle Motor and the internal circuits of IC122 have been changed to protect against excessive current flow. Replace the Toner Bottle Motor and IOB Board with the new style Toner Bottle Motor and IOB Board.

GENERAL:

			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
AX050117	Toner Bottle Motor (DC Motor 24W)	1	57	23
A2325125	IOB Board	1	63	4

UNITS AFFECTED:

All A232 series copiers manufactured after the Serial Numbers listed below will have the new style Toner Bottle Motor and IOB Board installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3225s	1B89830001
Gestetner 3235	1B99830001
Gestetner 3245	2B19830001
Ricoh AFICIO 340	Not available
Ricoh AFICIO 350	A7699830075
Ricoh AFICIO 450	A7709830123
Savin 9935D	1B89830001
Savin 9935DP	1B99830001
Savin 9945DP	2B19830001

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 036 **11/22/99**

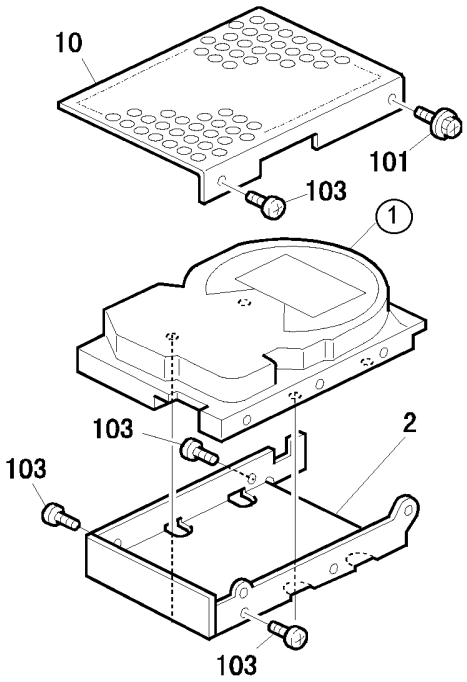
APPLICABLE MODEL:
GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: HARD DISK

GENERAL:

The Hard Disk for the Image Enhancement Kit has been changed because the old style Hard Disk has been discontinued. The following part update is being issued for all A230, A231, and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A6915877	A6915878	Hard Disk	1	0	69	1

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 037 **12/03/99**

APPLICABLE MODEL:
GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: D JAM (EXIT UNIT OR BRIDGE UNIT)

Note: This copy is intended as a master original for reproduction of additional bulletins.

SYMPTOM:

A paper jam may occur in the Exit Unit or the Bridge Unit under low humidity conditions. The paper is stopped in the Exit Unit or the Bridge Unit.

CAUSE:

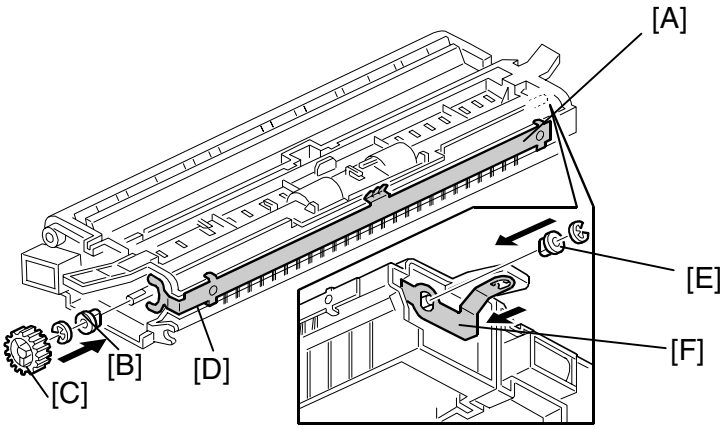
The jam occurs because static electricity builds up around the Sensor in the Exit Unit or the Bridge Unit.

SOLUTION:

A countermeasure to prevent the build up of static electricity has been created. The countermeasure consists of a Relay Harness and Metal Plates. Follow the countermeasure procedure outlined below.

COUNTERMEASURE:

Exit Unit Installation Procedure
NOTE: The following action should be taken when a paper jam occurs at the Exit Unit.

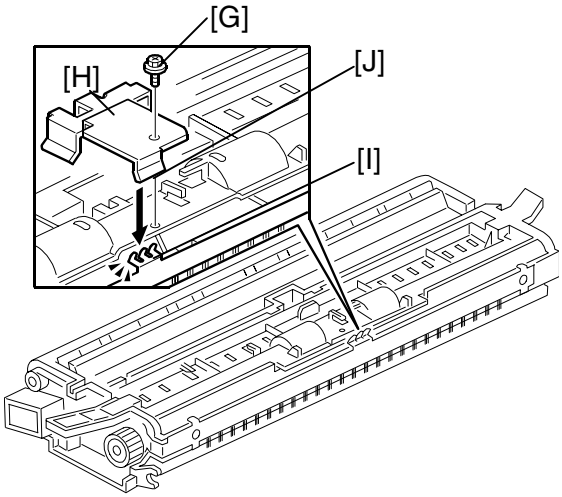


1. Replace the Anti-Static Brush Assembly with the new type [A] (A2844460) after removing the Bushing [B] (1 E-ring) and Gear [C].

NOTE: Although the groove of the frame can be located in both the front and back, the standard is for the groove to be located in back [D]. The Grounding Plate Pawls for the rear groove should be set first, followed by the setting of those for the front groove.

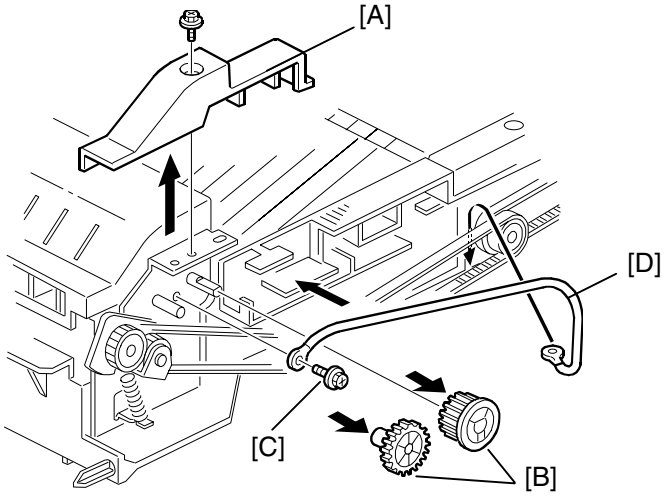
…Continued

2. Install the Bushing [B].
3. Remove the Bushing [E] (1 E-ring).
4. Attach the edge of the Grounding Plate [F] (A2844462) to the back of the attachment projection of the Exit Unit Frame.



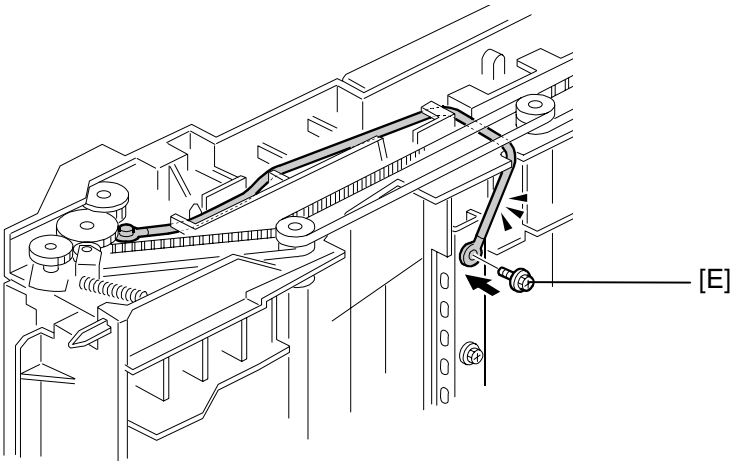
5. After removing the Screw [G] which secures the Exit Sensor, attach the Sensor Grounding Plate [H] (A2844463) to the Exit Sensor and secure it with the Screw [G].
   NOTE: Make sure that area [I] of the Anti-Static Brush Assembly is facing inward of area [J] of the Sensor Grounding Plate at the time of attachment.

Installation Procedure for Bridge Unit
NOTE: The following action should be taken when a paper jam occurs at the Bridge Unit.

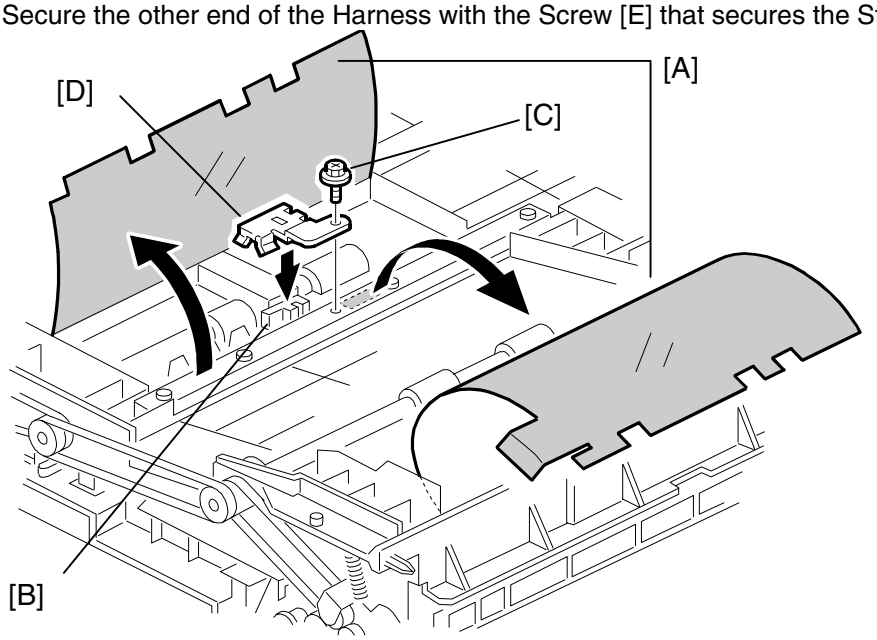


1. Remove the Bridge Unit. Remove the small cover of the drive section [A] (1 Screw).
2. Remove the two Gears [B] and Screw [C].
3. Secure the new Harness [D] (A2845510) with the Screw [C].
   NOTE: Make sure that the Harness does not touch the Gear.
4. Attach the two Gears and the small cover. Route the Harness, taking up any slack.

Continued…



5. Route the Harness under the Drive Belt as shown in the illustration, taking up any slack.
6. Secure the other end of the Harness with the Screw [E] that secures the Stay.



7. Peel back the 2 strips of Mylar [A] attached to the Stay as shown in the illustration above.
8. Peel back the two-sided tape remaining on the Stay (approximately 4cm total, centered around the Sensor [B]).
9. Remove the Screw [C] (securing the Stay) that is closest to the Sensor.
10. Place the new Plate Spring [D] (A6883914) over the Sensor, return the Mylar and fasten with the Screw removed in step 9.

NOTE: Since there is a possibility of the roller slipping, clean the three Transport Rollers with alcohol or a damp cloth.

Continued…

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AA120089	A2844460	Antistatic Brush	1	1	49	8
	A2844463	Grounding Plate –Paper Feed Sensor	1	-	49	32 *
	A2844462	Grounding Plate –Exit Roller	1	-	49	31 *

***** Denotes new item number.

UNITS AFFECTED:

All A230, A231 and A232 series copiers manufactured after the Serial Numbers listed below will have the new style Grounding Plates and Antistatic Brush installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B19890029
Gestetner 3235	2B19890021
Gestetner 3245	2B19890001
Ricoh AFICIO 340	A768990xxxx
Ricoh AFICIO 350	A7699890137
Ricoh AFICIO 450	A7709890002
Savin 9935D	1B19890029
Savin 9935DP	2B19890021
Savin 9945DP	2B19890001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 037 REISSUE ★ **12/23/99**

APPLICABLE MODEL:
GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: D JAM (EXIT UNIT OR BRIDGE UNIT)

Note: This copy is intended as a master original for reproduction of additional bulletins.

SYMPTOM:

A paper jam may occur in the Exit Unit or the Bridge Unit under low humidity conditions. The paper is stopped in the Exit Unit or the Bridge Unit.

CAUSE:

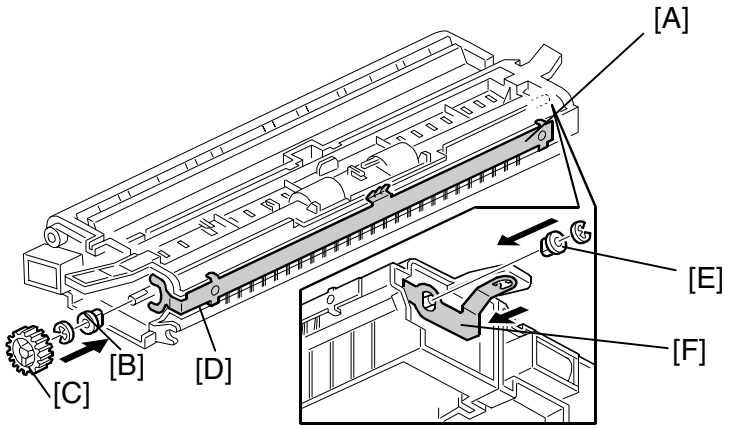
The jam occurs because static electricity builds up around the Sensor in the Exit Unit or the Bridge Unit.

SOLUTION:

A countermeasure to prevent the build up of static electricity has been created. The countermeasure consists of a Relay Harness and Metal Plates. Follow the countermeasure procedure outlined below.

COUNTERMEASURE:

Exit Unit Installation Procedure
NOTE: The following action should be taken when a paper jam occurs at the Exit Unit.

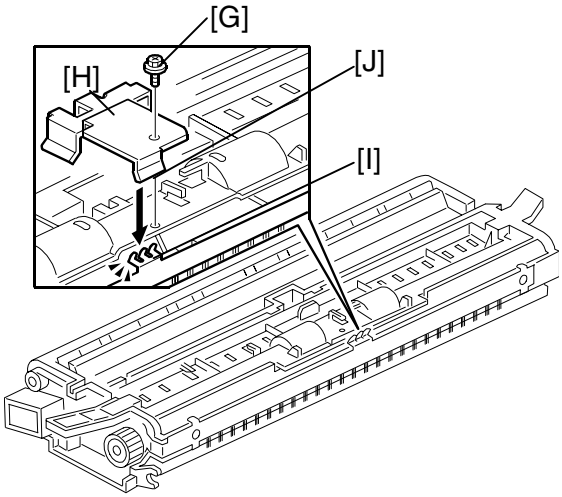


1. Replace the Anti-Static Brush Assembly with the new type [A] (A2844460) after removing the Bushing [B] (1 E-ring) and Gear [C].

NOTE: Although the groove of the frame can be located in both the front and back, the standard is for the groove to be located in back [D]. The Grounding Plate Pawls for the rear groove should be set first, followed by the setting of those for the front groove.

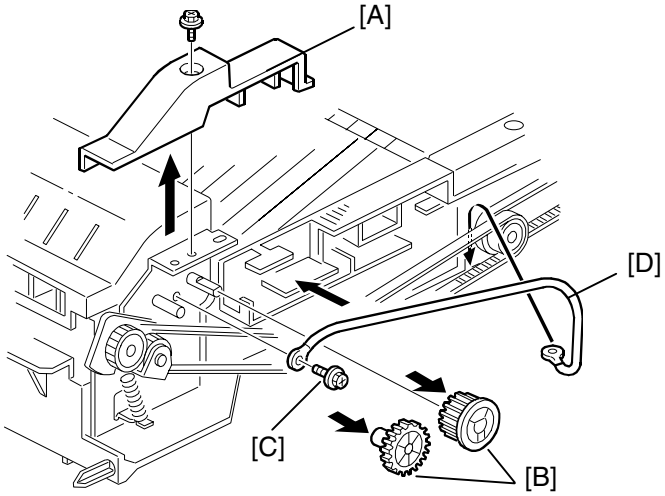
…Continued

2. Install the Bushing [B].
3. Remove the Bushing [E] (1 E-ring).
4. Attach the edge of the Grounding Plate [F] (A2844462) to the back of the attachment projection of the Exit Unit Frame.



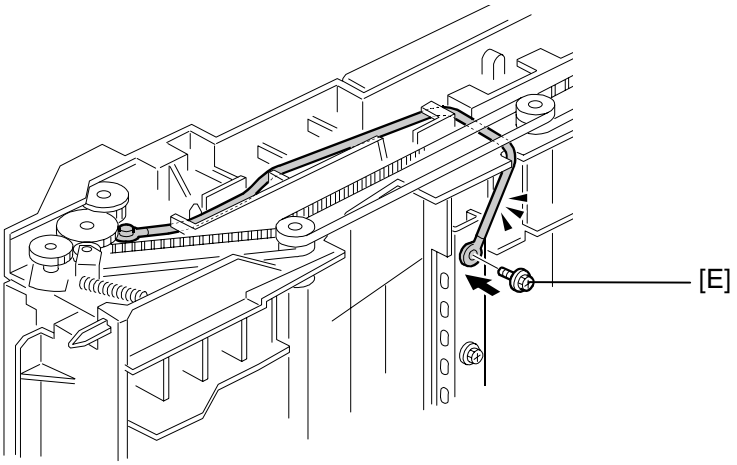
5. After removing the Screw [G] which secures the Exit Sensor, attach the Sensor Grounding Plate [H] (A2844463) to the Exit Sensor and secure it with the Screw [G].
   NOTE: Make sure that area [I] of the Anti-Static Brush Assembly is facing inward of area [J] of the Sensor Grounding Plate at the time of attachment.

Installation Procedure for Bridge Unit
NOTE: The following action should be taken when a paper jam occurs at the Bridge Unit.

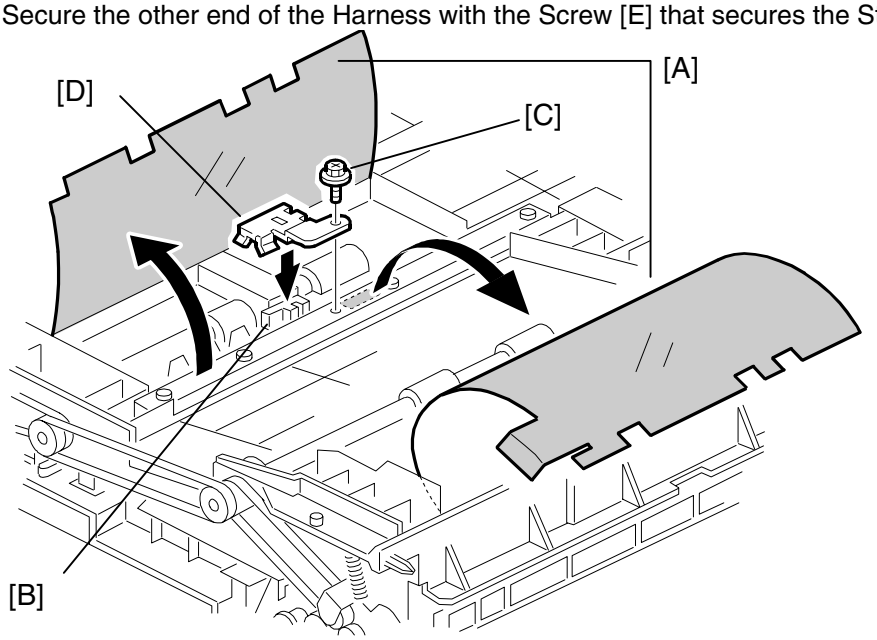


1. Remove the Bridge Unit. Remove the small cover of the drive section [A] (1 Screw).
2. Remove the two Gears [B] and Screw [C].
3. Secure the new Harness [D] (A2845510) with the Screw [C].
   NOTE: Make sure that the Harness does not touch the Gear.
4. Attach the two Gears and the small cover. Route the Harness, taking up any slack.

Continued…



5. Route the Harness under the Drive Belt as shown in the illustration, taking up any slack.
6. Secure the other end of the Harness with the Screw [E] that secures the Stay.



7. Peel back the 2 strips of Mylar [A] attached to the Stay as shown in the illustration above.
8. Peel back the two-sided tape remaining on the Stay (approximately 4cm total, centered around the Sensor [B]).
9. Remove the Screw [C] (securing the Stay) that is closest to the Sensor.
10. Place the new Plate Spring [D] (A6883914) over the Sensor, return the Mylar and fasten with the Screw removed in step 9.

NOTE: Since there is a possibility of the roller slipping, clean the three Transport Rollers with alcohol or a damp cloth.

Continued…

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AA120089	A2844460	Antistatic Brush	1	1	49	8
	A2844463	Grounding Plate –Paper Feed Sensor	1	-	49	32 *
	A2844462	Grounding Plate –Exit Roller	1	-	49	31 *

***** Denotes new item number.

The following parts updates are being issued for all A688 Parts Catalogs Section. Please update your Parts Catalogs with the following information.

★

				REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2845510	Grounding Wire	1	-	3 & 5	29 *
A6883914	Spring Plate	1	-	5	30 *

***** Denotes new item number.

UNITS AFFECTED:

All A230, A231 and A232 series copiers manufactured after the Serial Numbers listed below will have the new style Grounding Plates and Antistatic Brush installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B19890029
Gestetner 3235	2B19890021
Gestetner 3245	2B19890001
Ricoh AFICIO 340	A768990xxxx
Ricoh AFICIO 350	A7699890137
Ricoh AFICIO 450	A7709890002
Savin 9935D	1B19890029
Savin 9935DP	2B19890021
Savin 9945DP	2B19890001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 037 REISSUE ★ **04/17/2000**

APPLICABLE MODEL:
GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

★ SUBJECT: C JAM (EXIT SECTION) or D JAM (BRIDGE UNIT)

Note: This copy is intended as a master original for reproduction of additional bulletins.

SYMPTOM:

A paper jam may occur in the Exit Unit or the Bridge Unit under low humidity conditions. The paper is stopped in the Exit Unit or the Bridge Unit.

★ **NOTE:** *Jam Code 66 (Exit Sensor) or Jam Code 68 (Bridge Relay Sensor) will be recorded in the Jam History (SP 7507).*

CAUSE:

The jam occurs because static electricity builds up around the Sensor in the Exit Unit or the Bridge Unit.

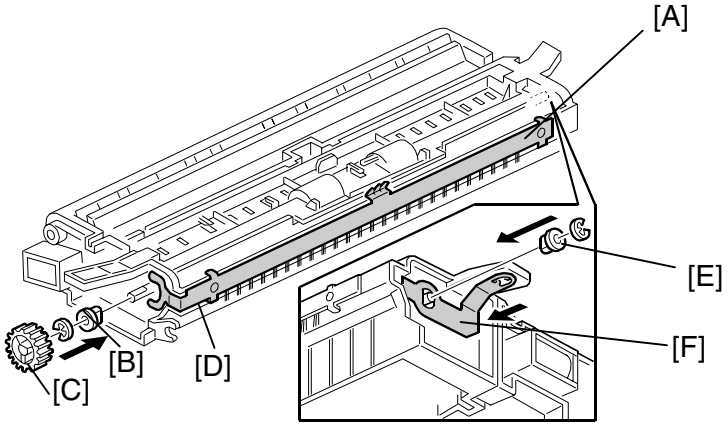
SOLUTION:

A countermeasure to prevent the build up of static electricity has been created. The countermeasure consists of a Relay Harness and Metal Plates. Follow the countermeasure procedure outlined below.

COUNTERMEASURE:

Exit Unit Installation Procedure

NOTE: *The following action should be taken when a paper jam occurs at the Exit Unit.*



1. Replace the Anti-Static Brush Assembly with the new type [A] (A2844460) after removing the Bushing [B] (1 E-ring) and Gear [C].

NOTE: *Although the groove of the frame can be located in both the front and back, the standard is for the groove to be located in back [D]. The Grounding Plate Pawls for the rear groove should be set first, followed by the setting of those for the front groove.*

…Continued

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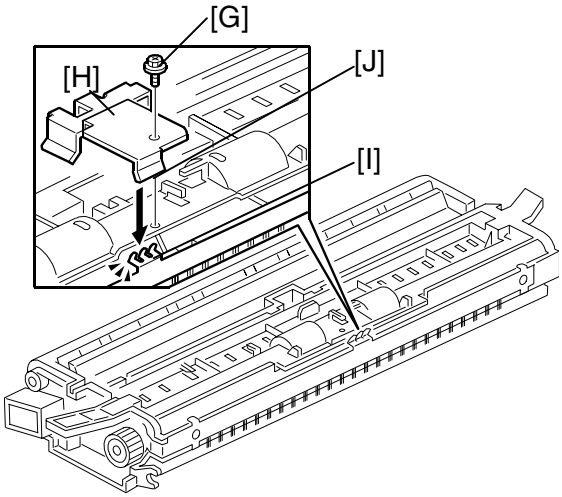
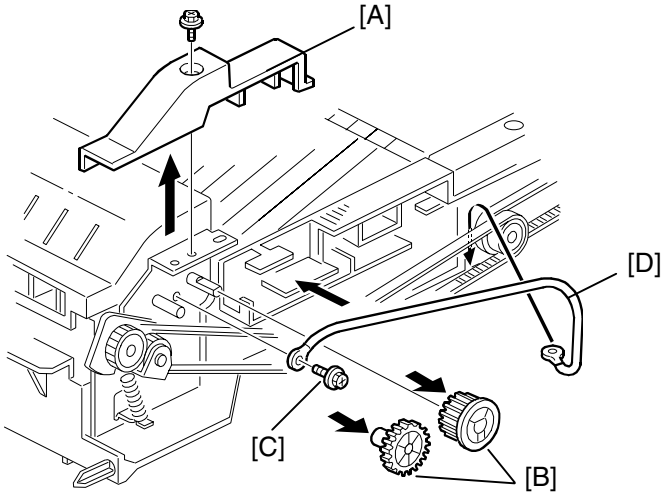
2. Install the Bushing [B].
3. Remove the Bushing [E] (1 E-ring).
4. Attach the edge of the Grounding Plate [F] (A2844462) to the back of the attachment projection of the Exit Unit Frame.



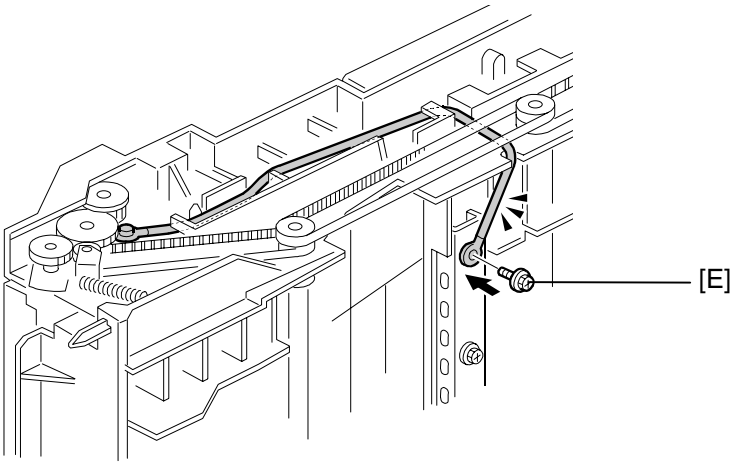
5. After removing the Screw [G] which secures the Exit Sensor, attach the Sensor Grounding Plate [H] (A2844463) to the Exit Sensor and secure it with the Screw [G].
   NOTE: Make sure that area [I] of the Anti-Static Brush Assembly is facing inward of area [J] of the Sensor Grounding Plate at the time of attachment.

Installation Procedure for Bridge Unit
NOTE: The following action should be taken when a paper jam occurs at the Bridge Unit.

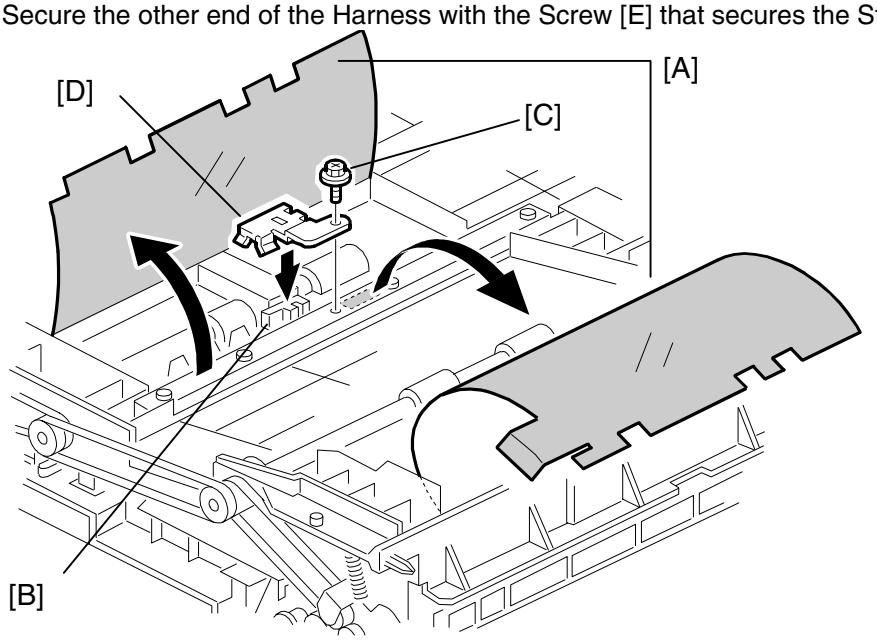


1. Remove the Bridge Unit. Remove the small cover of the drive section [A] (1 Screw).
2. Remove the two Gears [B] and Screw [C].
3. Secure the new Harness [D] (A2845510) with the Screw [C].
   NOTE: Make sure that the Harness does not touch the Gear.
4. Attach the two Gears and the small cover. Route the Harness, taking up any slack.

Continued…



5. Route the Harness under the Drive Belt as shown in the illustration, taking up any slack.
6. Secure the other end of the Harness with the Screw [E] that secures the Stay.



7. Peel back the 2 strips of Mylar [A] attached to the Stay as shown in the illustration above.
8. Peel back the two-sided tape remaining on the Stay (approximately 4cm total, centered around the Sensor [B]).
9. Remove the Screw [C] (securing the Stay) that is closest to the Sensor.
10. Place the new Plate Spring [D] (A6883914) over the Sensor, return the Mylar and fasten with the Screw removed in step 9.

NOTE: Since there is a possibility of the roller slipping, clean the three Transport Rollers with alcohol or a damp cloth.

Continued…

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AA120089	A2844460	Antistatic Brush	1	1	49	8
	A2844463	Grounding Plate –Paper Feed Sensor	1	-	49	32 *
	A2844462	Grounding Plate –Exit Roller	1	-	49	31 *

***** Denotes new item number.

The following parts updates are being issued for all A688 Parts Catalogs Section. Please update your Parts Catalogs with the following information.

				REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2845510	Grounding Wire	1	-	3 & 5	29 *
A6883914	Spring Plate	1	-	5	30 *

***** Denotes new item number.

UNITS AFFECTED:

All A230, A231 and A232 series copiers manufactured after the Serial Numbers listed below will have the new style Grounding Plates and Antistatic Brush installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B19890029
Gestetner 3235	2B19890021
Gestetner 3245	2B19890001
Ricoh AFICIO 340	A768990xxxx
Ricoh AFICIO 350	A7699890137
Ricoh AFICIO 450	A7709890002
Savin 9935D	1B19890029
Savin 9935DP	2B19890021
Savin 9945DP	2B19890001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 037 REISSUE ★ **11/28/2000**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: C JAM (EXIT SECTION) or D JAM (BRIDGE UNIT)

Note: This copy is intended as a master original for reproduction of additional bulletins.

SYMPTOM:

A paper jam may occur in the Exit Unit or the Bridge Unit under low humidity conditions. The paper is stopped in the Exit Unit or the Bridge Unit.

NOTE: *Jam Code 66 (Exit Sensor) or Jam Code 68 (Bridge Relay Sensor) will be recorded in the Jam History (SP 7507).*

CAUSE:

The jam occurs because static electricity builds up around the Sensor in the Exit Unit or the Bridge Unit.

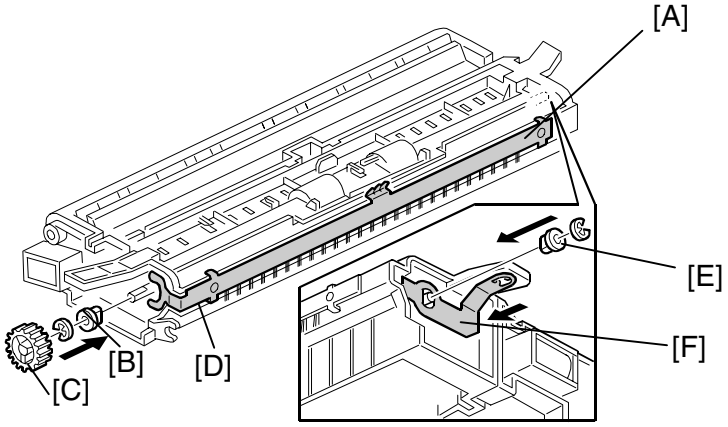
SOLUTION:

A countermeasure to prevent the build up of static electricity has been created. The countermeasure consists of a Relay Harness and Metal Plates. Follow the countermeasure procedure outlined below.

COUNTERMEASURE:

Exit Unit Installation Procedure

NOTE: *The following action should be taken when a paper jam occurs at the Exit Unit.*



1. Replace the Anti-Static Brush Assembly with the new type [A] (A2844460) after removing the Bushing [B] (1 E-ring) and Gear [C].

NOTE: *Although the groove of the frame can be located in both the front and back, the standard is for the groove to be located in back [D]. The Grounding Plate Pawls for the rear groove should be set first, followed by the setting of those for the front groove.*

…Continued

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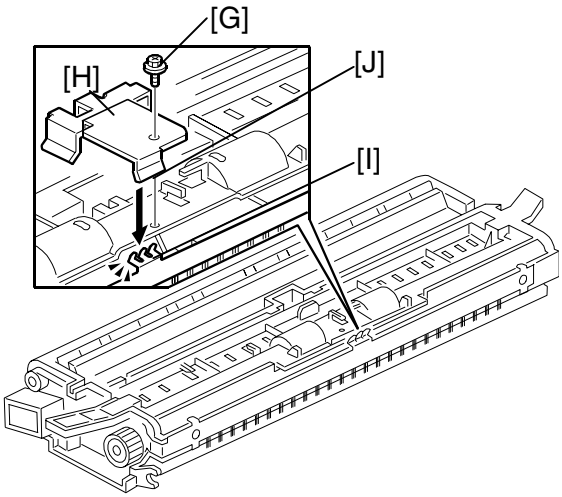
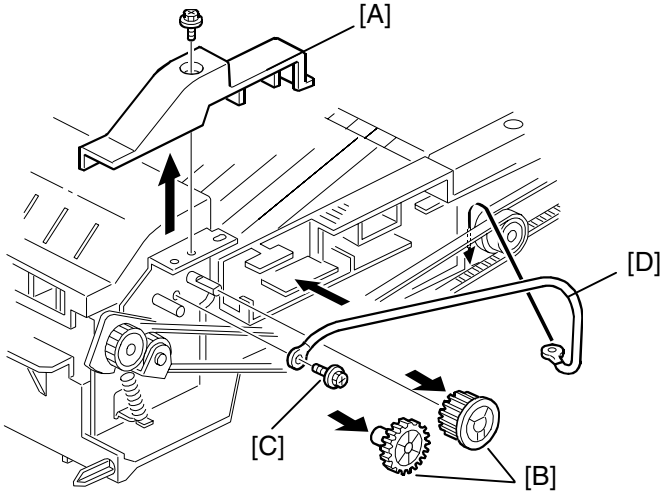
2. Install the Bushing [B].
3. Remove the Bushing [E] (1 E-ring).
4. Attach the edge of the Grounding Plate [F] (A2844462) to the back of the attachment projection of the Exit Unit Frame.



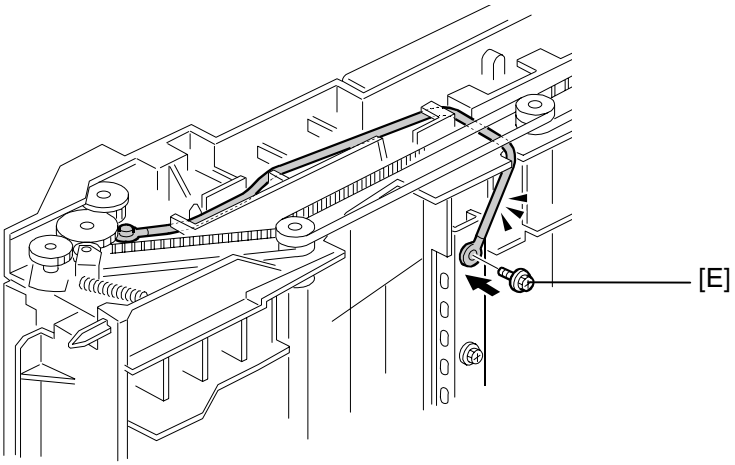
5. After removing the Screw [G] which secures the Exit Sensor, attach the Sensor Grounding Plate [H] (A2844463) to the Exit Sensor and secure it with the Screw [G].
   NOTE: Make sure that area [I] of the Anti-Static Brush Assembly is facing inward of area [J] of the Sensor Grounding Plate at the time of attachment.

Installation Procedure for Bridge Unit
NOTE: The following action should be taken when a paper jam occurs at the Bridge Unit.

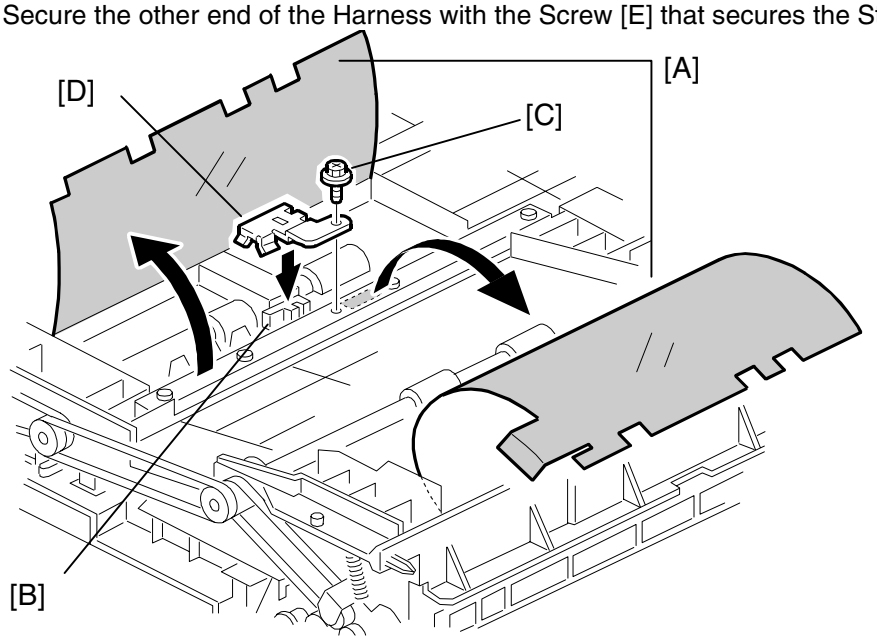


1. Remove the Bridge Unit. Remove the small cover of the drive section [A] (1 Screw).
2. Remove the two Gears [B] and Screw [C].
3. Secure the new Harness [D] (A2845510) with the Screw [C].
   NOTE: Make sure that the Harness does not touch the Gear.
4. Attach the two Gears and the small cover. Route the Harness, taking up any slack.

Continued…



5. Route the Harness under the Drive Belt as shown in the illustration, taking up any slack.
6. Secure the other end of the Harness with the Screw [E] that secures the Stay.



7. Peel back the 2 strips of Mylar [A] attached to the Stay as shown in the illustration above.
8. Peel back the two-sided tape remaining on the Stay (approximately 4cm total, centered around the Sensor [B]).
9. Remove the Screw [C] (securing the Stay) that is closest to the Sensor.
10. Place the new Plate Spring [D] (A6883914) over the Sensor, return the Mylar and fasten with the Screw removed in step 9.

NOTE: Since there is a possibility of the roller slipping, clean the three Transport Rollers with alcohol or a damp cloth.

Continued…

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

★ **NOTE:** *All the parts listed below for the A230/A231/A232 and A688 are now available as a kit (A2309803 Grounding Parts Kit).*

						REFERENCE	
	OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
	AA120089	A2844460	Antistatic Brush	1	1	49	8
		A2844463	Grounding Plate –Paper Feed Sensor	1	-	49	32*
		A2844462	Grounding Plate –Exit Roller	1	-	49	31*
★		A2309803	Grounding Parts Kit	1	-	49	33*

*** Denotes new item number.**

The following parts updates are being issued for all A688 Parts Catalogs Section. Please update your Parts Catalogs with the following information.

				REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2845510	Grounding Wire	1	-	3 & 5	29*
A6883914	Spring Plate	1	-	5	30*

*** Denotes new item number.**

UNITS AFFECTED:

All A230, A231 and A232 series copiers manufactured after the Serial Numbers listed below will have the new style Grounding Plates and Antistatic Brush installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B19890029
Gestetner 3235	2B19890021
Gestetner 3245	2B19890001
Ricoh AFICIO 340	A768990xxxx
Ricoh AFICIO 350	A7699890137
Ricoh AFICIO 450	A7709890002
Savin 9935D	1B19890029
Savin 9935DP	2B19890021
Savin 9945DP	2B19890001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 038 **12/14/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

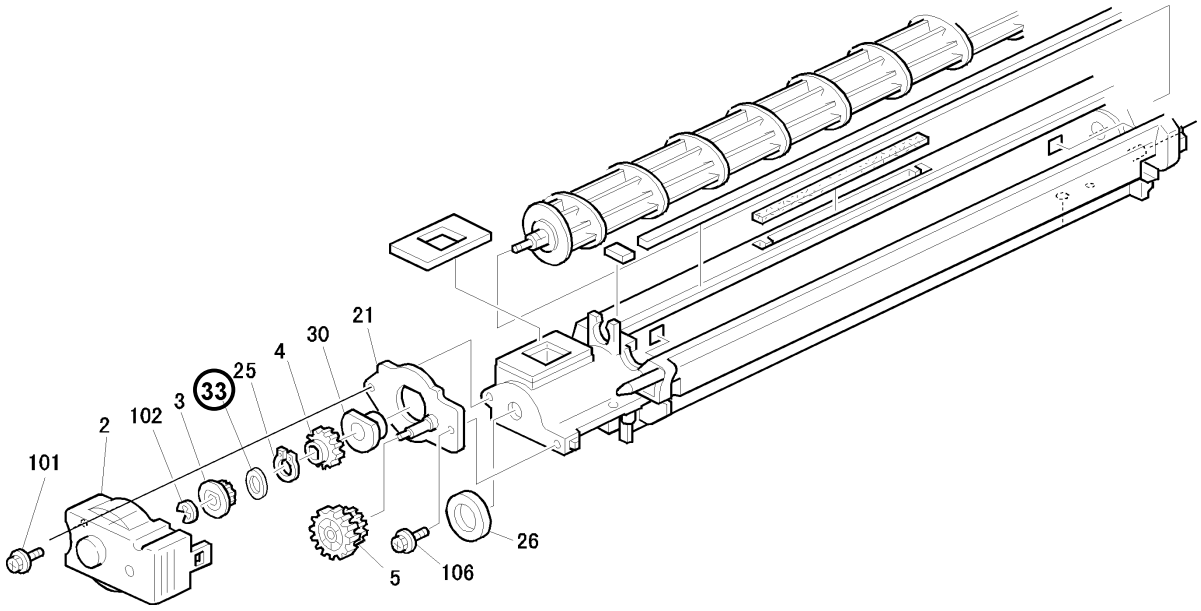
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following Parts Updates are being issued for all A230, A231, and A232 Parts Catalogs.

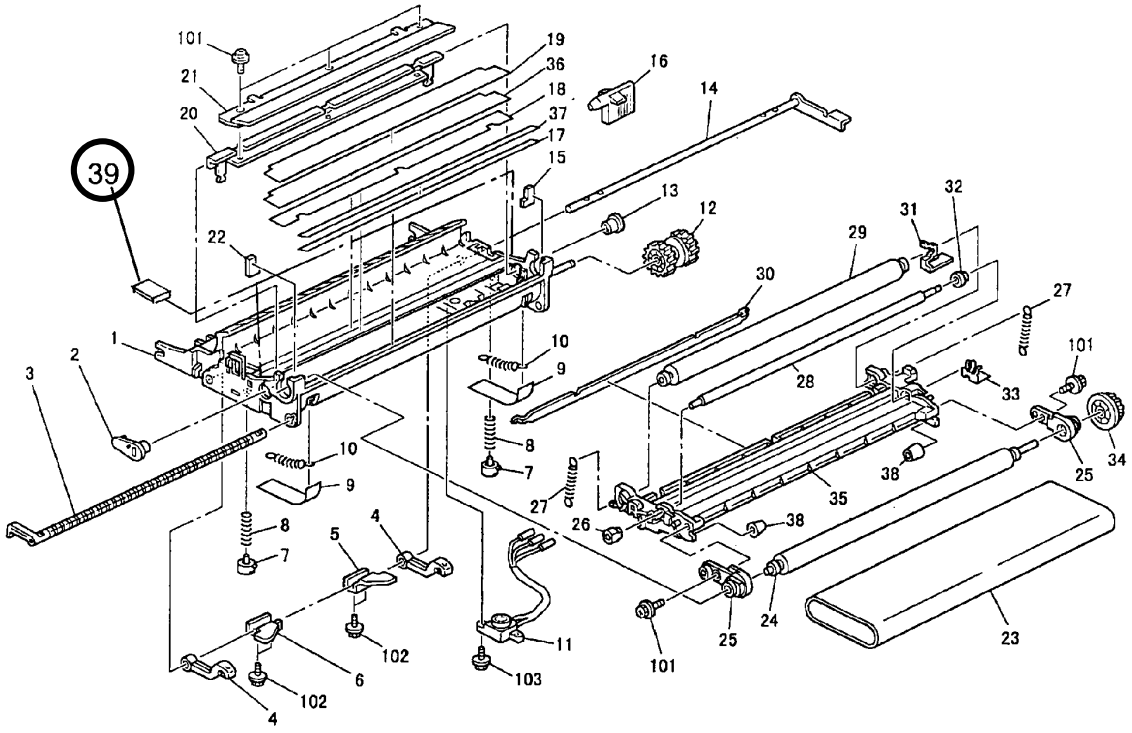
- **UPDATE 1:** **Spacer – M5** - The following part has been registered as a service part. Please add this to your Parts Catalog.



			REFERENCE	
NEW PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2323077	Spacer – M5	1	45	33

Continued…

- **UPDATE 2:** **Side Plate Seals –** To prevent Toner leakage from both sides of the Transfer Unit, two seals have been added to the Side Plate of the Transfer Unit.



			REFERENCE	
NEW PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2323927	Seal – Side Plate	2	41	39*

* DENOTE NEW ITEM

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new Side Plate Seals installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88870001
Gestetner 3235	1B98860001
Gestetner 3245	2B18860001
Ricoh Aficio 340	A7688860030
Ricoh Aficio 350	A7698860044
Ricoh Aficio 450	A7708860001
Savin 9935D	1B88870001
Savin 9935DP	1B98860001
Savin 9945DP	2B18860001

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 039 **12/20/99**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PREMATURE TONER OVERFLOW DETECTION

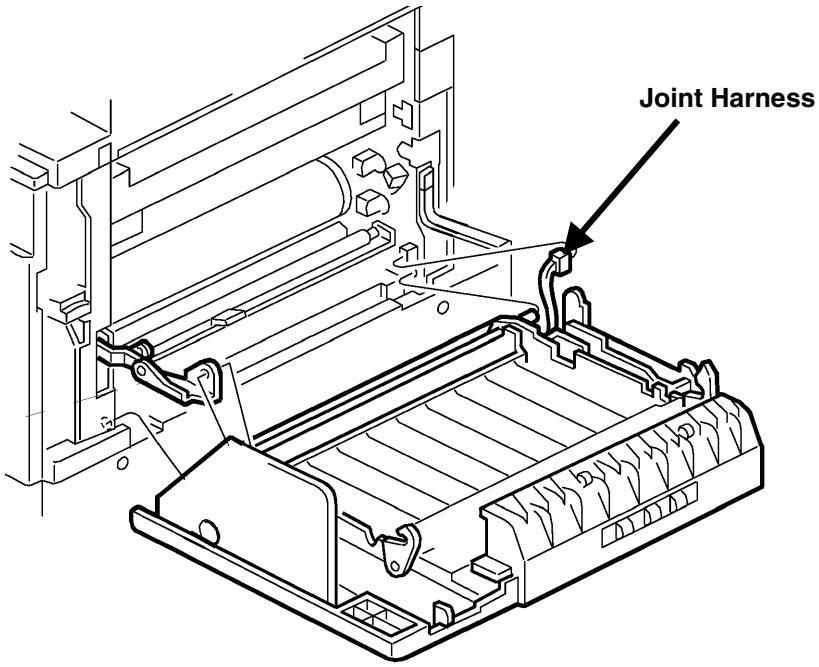
SYMPTOM:

False toner overflow condition.

CAUSES:

1. The sensor was designed to report a near full condition immediately after detecting the presence of toner (even if the actual condition is not near full).

2. The electrical contact between the metal plates on the Transfer Belt Unit and connector pins on the Copier Right Cover is poor because the pins are bent.



Continued…

SOLUTIONS:

1. Install firmware “level R” or later. To increase the reliability of accurate toner overflow detection, the “Near Full” message is displayed after the toner signal is ON for 500 consecutive copies.

2. To prevent the connector pins from being damaged the material of the pins has been changed. The part number of the Joint Harness (A2323995) has not been changed.

NOTE: *The new style Joint Harness has been included with the Right Door Switch Enhancement Kit. Refer toTechnical Service Bulletin – A230/A231/A232 - 032.*

UNITS AFFECTED:

All copiers manufactured after the Serial Numbers listed below will have the new style Joint Harness installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B89820001
Gestetner 3235	1B99820403
Gestetner 3245	2B19820001
Ricoh Aficio 340	A7689820001
Ricoh Aficio 350	A7699820001
Ricoh Aficio 450	A7709820001
Savin 9935D	1B89820001
Savin 9935DP	1B99820403
Savin 9945DP	2B19820001

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 040 **12/20/99**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual pages listed below must be replaced with the page supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 7-32 through 7-35 Updated Information (ROM History)

Description of Modification	Firmware Level	Serial Number	Firmware Version
⇒ Corrects the following: • C" jam occurs, opening the front or right door can clear the jam message display. *After modification* The "C" jams can only be cleared by opening the right door. Note: As part of the modification, one right door interlock switch has been added and one front door interlock switch has been removed. In addition, SP5957 has been added to allow usage of either the old or new interlock switches. If using the old interlock switch, please set the SP5957 to 0. If using the new switch, please set SP5957 to 1. If SP5957 is not set properly, the 'door open' Panel display may not function properly and the toner may not be fed properly after toner bottle replacement. • FALSE TONER OVERFLOW CONDITION: When the sensor detects Toner, the "Near Full" message is immediately displayed. After the Toner signal has been on for 1000 copies, the machine shuts off. Once the Toner signal disappears, the "Near Full" message is no longer displayed and the counter is reset. *After modification:* After the toner signal has been on for 500 consecutive copies, the "Near Full" message is displayed. After the "Near Full" message has been displayed for 1000 copies, the machine shuts off. Once the toner signal disappears, the counter is reset. Continued…	A2325113 R	N/A	14.1

Description of Modification	Firmware Level	Serial Number	Firmware Version
• **Dirty Background:** There is a tendency for a 'dirty' background or leading edge to develop after the machine has not been used for a long while. There is also a tendency for increased image density. These tendencies are due to the decreased turboelectric charge of the Toner. • The initial machine warm-up operations stop if one or more of the doors to the option units are open (e.g.1 bin tray, finisher). The machine warm-up does not restart after closing the doors. • When in user code mode, after entering the power save mode and then exiting, the counter does not count the number of copies the user makes. • Using the Norwegian Language, when the machine should display 'Copying will start after warm up' in Norwegian, it is displayed in French.			
⇒ Conditions: • The toner collection bottle becomes full with toner, causing toner to spill out. <u>Countermeasure:</u> Shortening of the time that the transfer belt is in contact with the drum. • The default value for recovery time for low-power mode has been changed from 30 to 20 sec (Machine temp. 145° to 157°C). Since recovery starts at a higher temperature, the machine has more leeway in attaining ready status. • Occasional occurrence of SC542 after the power is turned on in cold conditions. <u>Countermeasure:</u> Change in the timing of the detection of the fusing temperature. *35CPM machines: from 125 to 135 sec.* *45CPM machines: from 125 to 145 sec.*	A2325113S	NA	14.2

Trouble shooting

Description of Modification	Firmware Level	Serial Number	Firmware Version
⇒ Conditions: - Switching on the machine in cold condition. - Setting original and pressing start key during machine warm-up. The French message then appears in the display. • SP2207 displayed a spelling error. *After modification* Corrected spelling to “Forced”. Corrects the following • When SC101 occurs during a Fax transmission the machine prints a blank page. The transmission results are then reported as normal. The first page is blank and an SC101 message is displayed. <u>Countermeasure:</u> No actual transmission will take place during memory transmission. In the case of immediate transmission, the transmission will be interrupted and an error will be reported. • The Scanner software was also modified so that the driver in use displays an error message. • When a fusing jam occurs, the jammed paper may not be visible to the operator and a service call may result. <u>Countermeasure:</u> The detection of fusing jams has been modified so that the paper will stop at a point where the trailing edge is visible. Wrong language displayed. When in French mode the display for a one bin open cover is in German	A2325113 T	NA	14.3

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 041 **12/23/99**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TONER SPILLING ONTO TONER SUPPLY UNIT

SYMPTOM:

Toner spills out onto the Toner Supply Unit and sometimes onto the Front Cover.

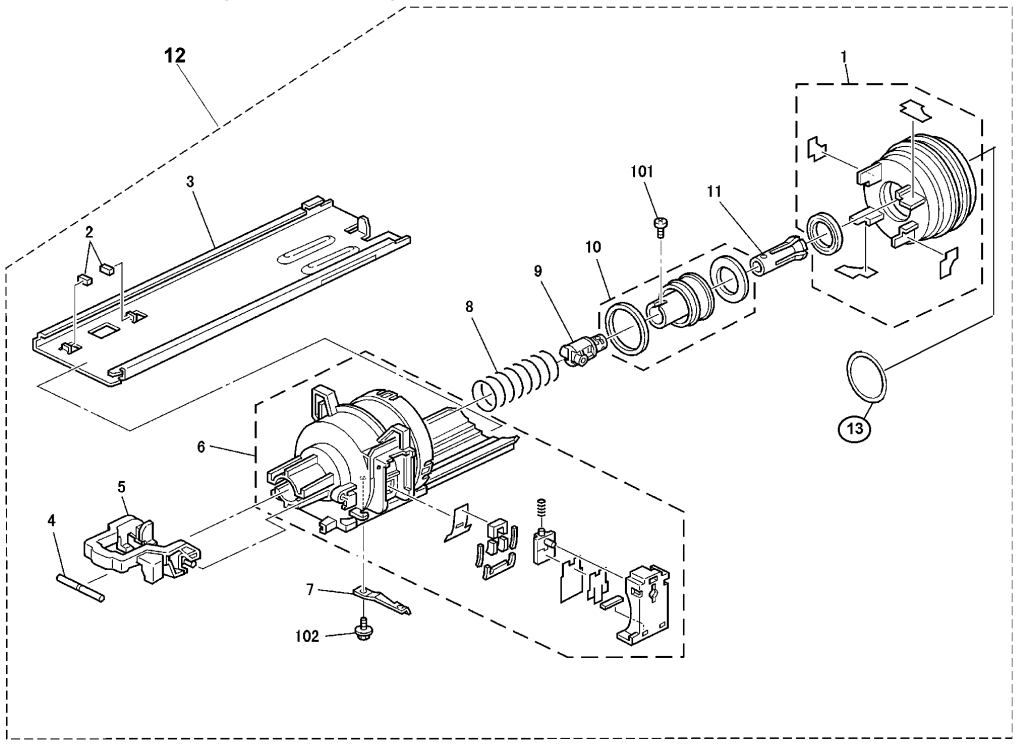
CAUSE:

The connection between the Toner Supply Unit and Toner Bottle is loose, which causes the unit to separate from the Toner Bottle when the unit is pulled out. Toner then spills out onto the Toner Supply Unit and sometimes onto the Front Cover.

SOLUTION:

A Seal has been added to the inside of the Toner Supply Unit to minimize the movement of the Toner Bottle. This will tighten the connection of the Toner Supply Unit and the Toner Bottle, preventing any separation of the Toner Bottle from the Toner Supply Unit.

TONER HOPPER UNIT (A230/A231/A232)



Continued…

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
AA153083	Seal – Toner Supply Unit Cover (Ricoh - NA)	1	35	13 *
AA153084	Seal – Toner Supply Unit Cover (OEM)	1	35	13 *

* Denotes new item.

UNITS AFFECTED:

All A230, A231 and A232 copiers manufactured after the Serial Numbers listed below will have the new style Seal – Toner Supply Unit Cover installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B89860001
Gestetner 3235	1B99860001
Gestetner 3245	2B19860001
Ricoh AFICIO 340	A768991xxxx
Ricoh AFICIO 350	A7699860557
Ricoh AFICIO 450	A7709860464
Savin 9935D	1B89860001
Savin 9935DP	1B99860001
Savin 9945DP	2B19860001

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 041REISSUE ★ **03/28/2000**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TONER SPILLING ONTO TONER SUPPLY UNIT

SYMPTOM:

Toner spills out onto the Toner Supply Unit and sometimes onto the Front Cover.

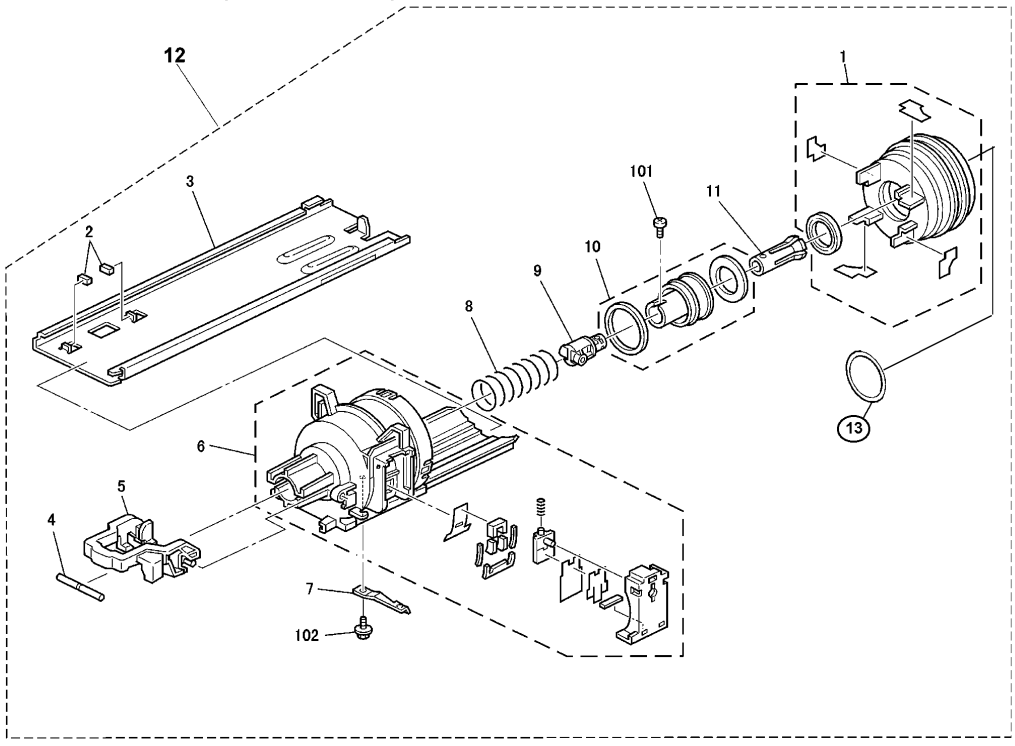
CAUSE:

The connection between the Toner Supply Unit and Toner Bottle is loose, which causes the unit to separate from the Toner Bottle when the unit is pulled out. Toner then spills out onto the Toner Supply Unit and sometimes onto the Front Cover.

SOLUTION:

A Seal has been added to the inside of the Toner Supply Unit to minimize the movement of the Toner Bottle. This will tighten the connection of the Toner Supply Unit and the Toner Bottle, preventing any separation of the Toner Bottle from the Toner Supply Unit.

TONER HOPPER UNIT (A230/A231/A232)



Continued…

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

				REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
AA080231	AA080246	Bushing – Bias Roller	3/S	41	26
A2323882	A2323882	Frame – Transfer Belt	3/S	41	35

NOTE: *The description for the Transfer Belt Frame was listed as "Flange – Transfer Belt". Please correct "Flange" to "Frame"*

NOTE: *The old style Frame is not available. You must visually inspect the Frame to see which style you have . See Diagram B on previous page. If you have the old style Frame, you must replace as a set.*

UNITS AFFECTED:

All A230, A231 and A232 copiers manufactured after the Serial Numbers listed below will have the new style Bias Roller Bushing and Transfer Belt Frame installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88850001
Gestetner 3235	1B998850001
Gestetner 3245	2B18850001
Ricoh AFICIO 340	A7688850096
Ricoh AFICIO 350	A7698850855
Ricoh AFICIO 450	A7708850642
Savin 9935D	1B88850001
Savin 9935DP	1B998850001
Savin 9945DP	2B18850001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 042 **12/23/99**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: BIAS ROLLER SEPARATES FROM BUSHING

■ MECHANICAL

■ PARTS

SYMPTOM:

The Bias Roller separates from the Bias Roller Bushing.

CAUSE:

The Transfer Belt Frame bends sufficiently to allow the Bias Roller to separate from the Bushing.

SOLUTION:

1. The length of the Bias Roller Bushing has been changed from 8.5 mm to 11 mm. See Diagram A below.
2. The area on the Transfer Belt Frame where the Bias Roller Bushing is attached has been modified. See Diagram B below.

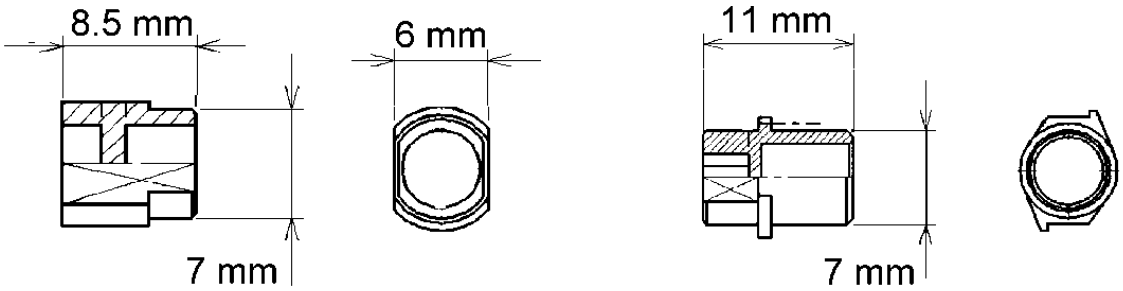


Diagram A

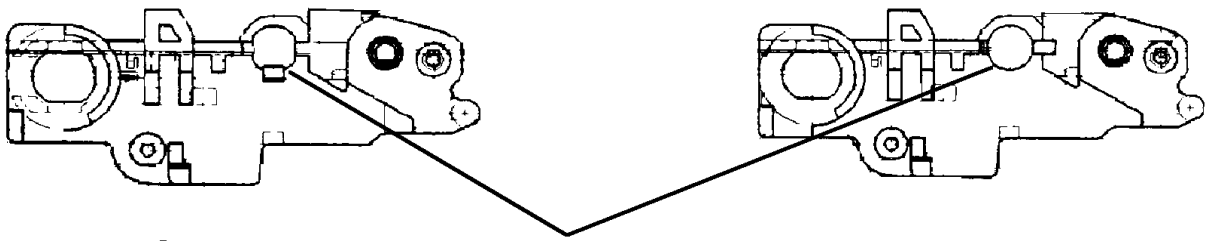


Diagram B

Continued…

GENERAL:

The following parts updates are being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

				REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
AA080231	AA080246	Bushing – Bias Roller	3/S	41	26
A2323882	A2323882	Frame – Transfer Belt	3/S	41	35

NOTE: *The description for the Transfer Belt Frame was listed as "Flange – Transfer Belt". Please correct "Flange" to "Frame"*

NOTE: *The old style Frame is not available. You must visually inspect the Frame to see which style you have . See Diagram B on previous page. If you have the old style Frame, you must replace as a set.*

UNITS AFFECTED:

All A230, A231 and A232 copiers manufactured after the Serial Numbers listed below will have the new style Bias Roller Bushing and Transfer Belt Frame installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B88850001
Gestetner 3235	1B998850001
Gestetner 3245	2B18850001
Ricoh AFICIO 340	A7688850096
Ricoh AFICIO 350	A7698850855
Ricoh AFICIO 450	A7708850642
Savin 9935D	1B88850001
Savin 9935DP	1B998850001
Savin 9945DP	2B18850001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 043 **01/12/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945D

Note: This copy is intended as a master original for reproduction of additional bulletins.

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The following is an announcement of the BICU board firmware modification. Version 14.2 was never actually used in mass-produced machines, as version 14.3 was developed and released before the beginning of mass-production. Therefore, the software upgrade for machines in production has taken the form of ver 14.1 to ver 14.3 (which has already been implemented).

The Service Manual page(s) listed below must be replaced with the page(s) supplied.
Each bulletin package contains 1 set of replacement pages.

PAGES:

- 4-36 Updated Information
- 7-15 Updated Information

An arrow has highlighted the revised areas ⇒.

Mode No.			Function	Settings
Class 1 and 2	Class 3			
-907		Plug & Play Brand Name and Production Name Setting	Selects the brand name and the production name for Windows 95 Plug & Play. This information is stored in the NVRAM. If the NVRAM is defective, these names should be registered again. *After selecting, press the "Original Type" key and # at the same time. If the setting is completed, a "*" mark will be displayed before the selection.*	
5-914		Printer Counter Display	Selects whether or not the total printer counter is displayed in the UP mode.	**0: No** 1: Yes
5-915		Mechanical Counter Detection	Checks whether the mechanical counter inside the inner cover is connected or not.	0: Not detected 1: Detected 2: Unknown
⇒ 5-920*		Recovery Time for Low Power Mode	The default recovery time is 20s (machine temp. 145 to 157C). Since recovery starts at a higher temperature with this setting, it provides the machine more leeway in reaching the ready status temperature on time.	**0: 20 s** 1: 30 s
5-990	1	SMC Printing (All Data)	Prints all the system parameter lists. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	2	SMC Printing (SP Mode Data)	Prints the SP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	3	SMC Printing (UP Mode Data)	Prints the UP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	4	SMC Printing (Machine Status Data)	Prints the machine status history data list. See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	5	SMC Printing (UP Mode - Copy)	Prints the Copy Mode list (UP Mode No.10) See the "System Parameter and Data Lists" section for how to print the lists.	1: Start
	6	SMC Printing (Large Font Size)	Prints the SP mode data list with a large font size. See the "System Parameter and Data Lists" section for how to print the lists. *This SP mode is used when the SMC list is sent by fax to the number stored with SP5-812.*	1: Start

⟹ SC542: Fusing temperature warming-up error

-Definition- [A]

The fusing temperature does not reach the fusing standby temperature within 135 sec (35CPM machines) or 145 seconds (45CPM machines) after the main power switch is turned on.

- Possible causes -

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- BICU defective
- Power supply board defective
- Poor fusing unit connection

SC543: Fusing overheat error 1

-Definition- [A]

A fusing temperature of over 231°C is detected for 5 seconds by the fusing thermistor.

- Possible causes -

- Fusing thermistor defective
- BICU defective
- I/O board (IOB) defective

SC545: Fusing overheat error 2

-Definition- [A]

The fusing lamp stays on at full power for 30 seconds while in the stand-by condition after warming-up is completed.

- Possible causes -

- Fusing thermistor out of position

SC546: Fusing ready temperature malfunction

-Definition- [A]

The fusing temperature goes 20 °C below or 20 °C over the stand-by temperature after warm-up is completed.

- Possible causes -

- Poor thermistor connector connection
- Poor fusing unit connection

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 044 **01/17/2000**

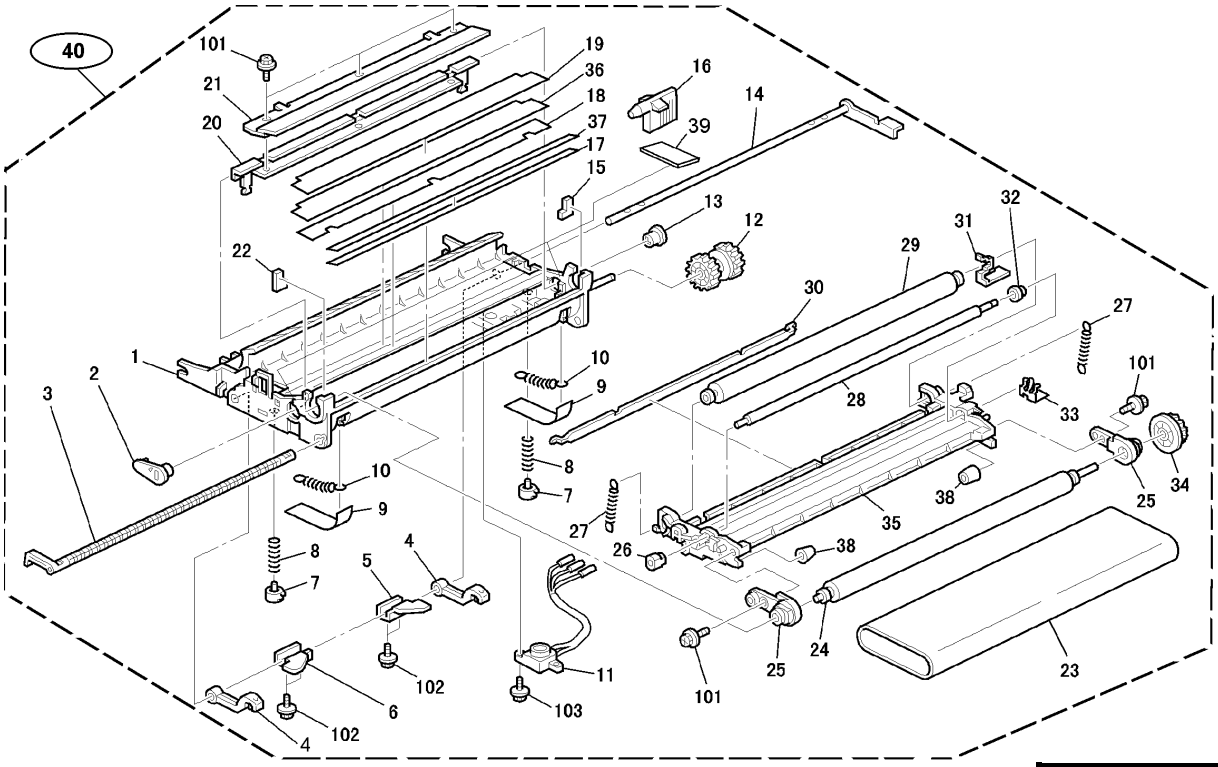
APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PARTS CATALOG UPDATES

- **UPDATE 1:** TRANSFER UNIT – The Transfer Unit has been registered as an assembly. The following part update is being issued for all A230/A231/A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

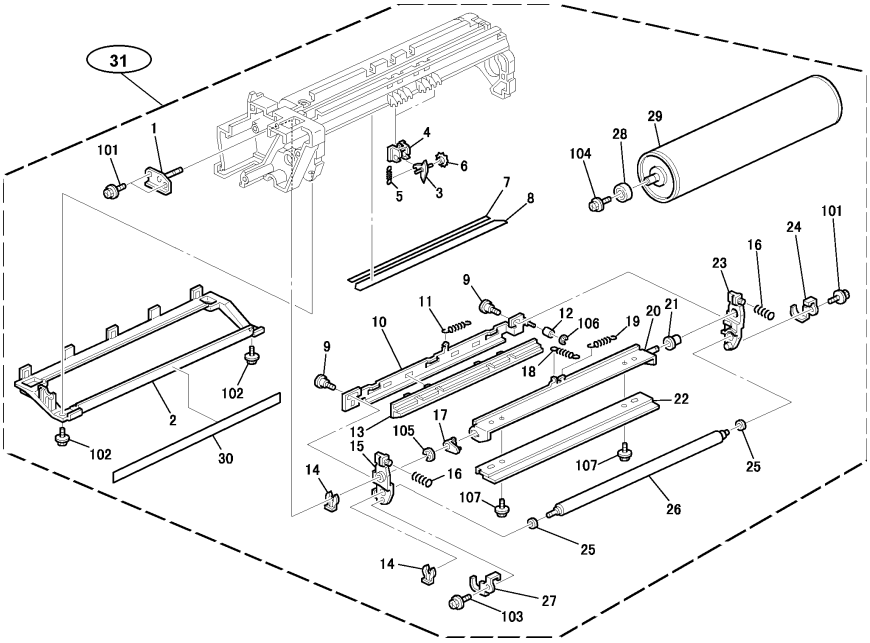


PART NUMBER	DESCRIPTION	QTY	REFERENCE PAGE	REFERENCE ITEM
A2307275	Transfer Unit	1	41	40 *

* Denotes new item number.

Continued…

- **UPDATE 2:** PCU ASSEMBLY – The PCU Assembly has been registered as an assembly. The following part update is being issued for all A230/A231/A232 Parts Catalogs. Please update your Parts Catalogs with the following information.

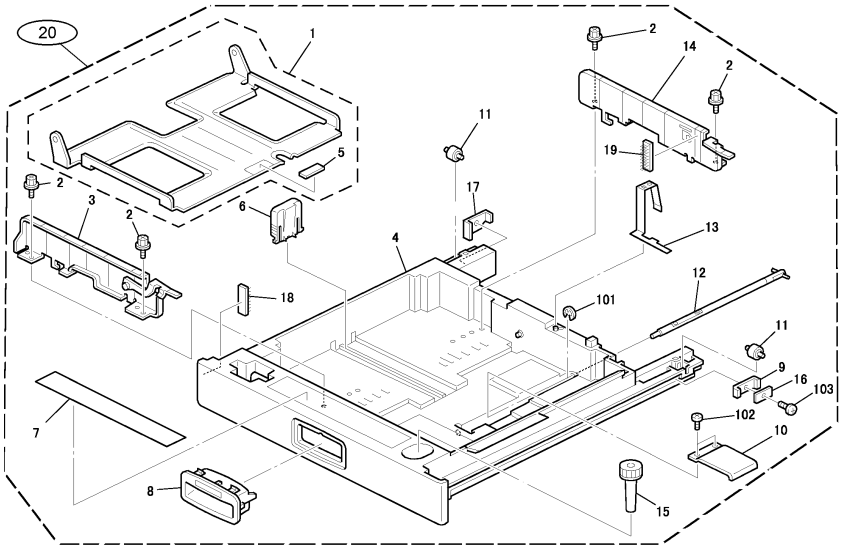


			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2327361	PCU Assembly	1	39	31 *

* Denotes new item number.

NOTE: *The PCU Assembly includes all parts on page 37 (PCU Unit 1).*

- **UPDATE 3:** PAPER TRAY – The Paper Tray has been registered as an assembly. The following part update is being issued for all A230/A231/A232 Parts Catalogs. Please update your Parts Catalogs with the following information.



			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2322951	Paper Tray	2	33	20 *

* Denotes new item number.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 045 **02/02/2000**

APPLICABLE MODEL:

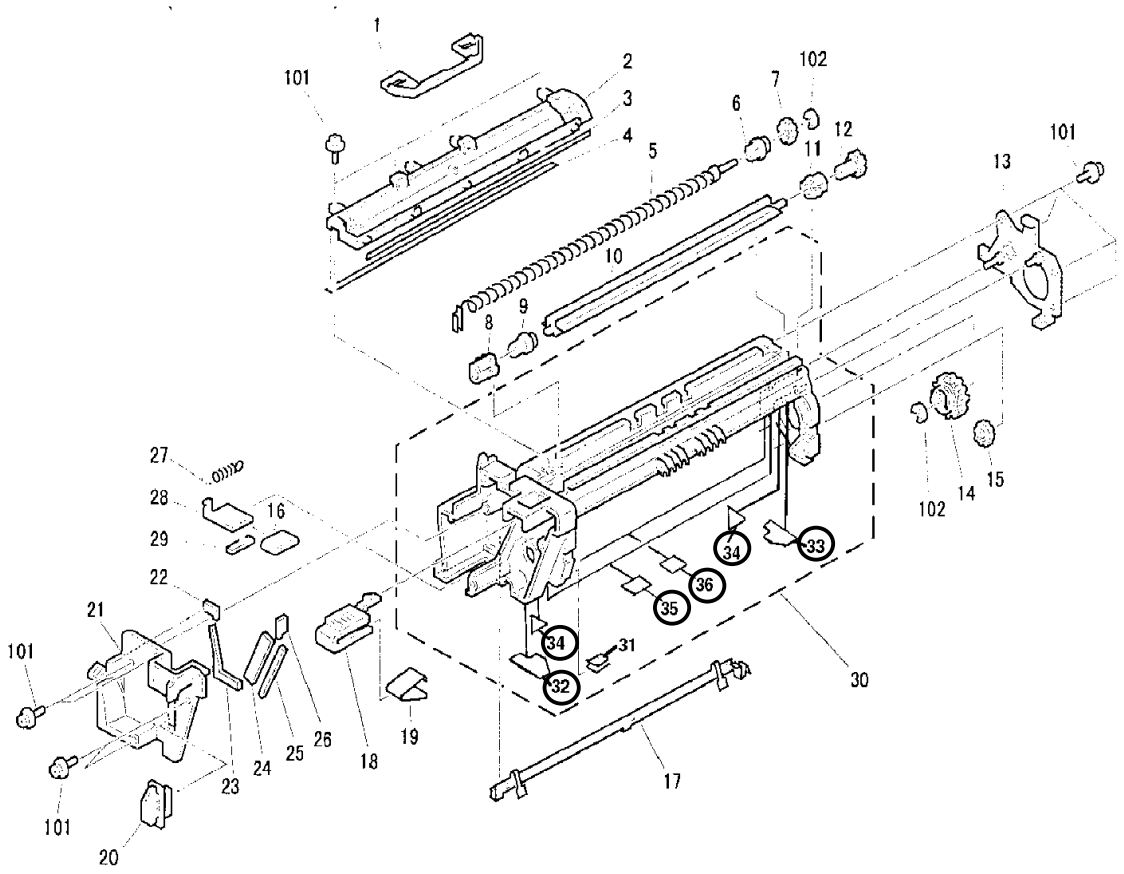
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PCU: SEAL REPLACEMENT PROCEDURE

GENERAL:

The following parts have been registered as service parts. If the Seals are not attached properly, it is possible for small gaps to form. Since this would allow Toner to leak out, please make sure to attach the Seals in the proper position and orientation



Continued...

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				REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
-	A2322277	Seal – Drum –Front	1	37	32*
-	A2322278	Seal – Drum – Rear	1	37	33*
-	A2322350	Seal - Entrance	2	37	34*
-	A2322399	Seal – Blade 13X9.5X3	2	37	35*
-	A2322348	Seal – Blade 12X7X3	2	37	36*

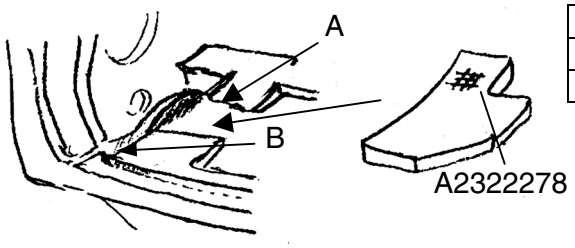
* Denotes new item

UNITS AFFECTED:

A230/A231/A232 Serial Number cut-ins not available at time of publication.

Seal Replacement procedure:

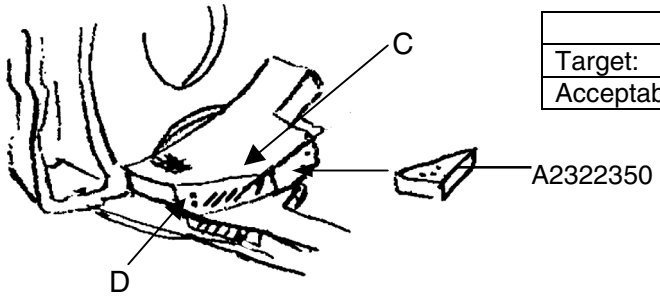
1. Remove the Seal and clean the surface to which the Seal will be affixed with alcohol.
2. Attach Seals to both the front and rear of the Drum Unit(A2322277, A2322278), as shown in the illustration below. Please note that the surface to which the Seal will be attached is curved. It is therefore necessary to reconfirm that the entire Seal is firmly attached.



	Area “A”	Area “B”
Target:	No gap	No gap
Acceptable gap:	0 to 0.5 mm	0 to 0.3 mm

3. Attach the Entrance Seal (A2322350) in between the Seal affixed in step 2 above and the frame.

4.

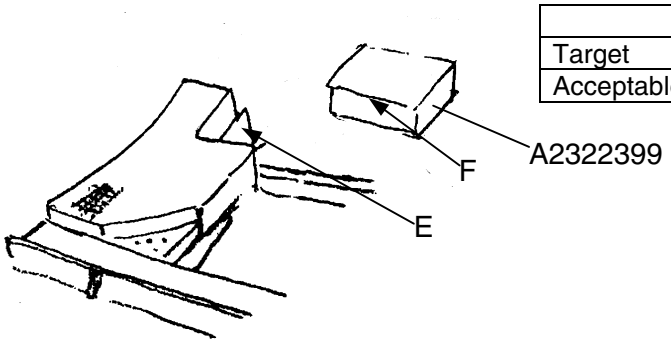


	Area “C”	Area “D”
Target:	No gap	No gap
Acceptable gap:	0 to 0.5 mm	0 to 0.5 mm

Continued…

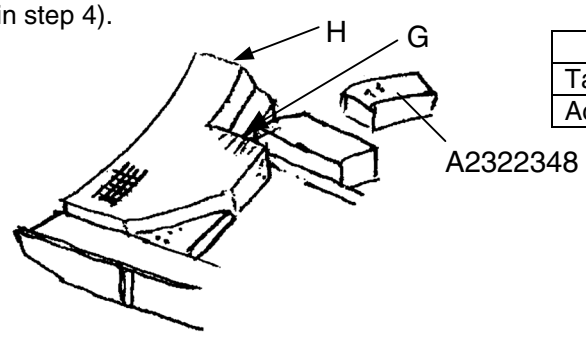
Seal Replacement procedure continued:

5. Line up the Blade Seal (A2322399) flush against both surfaces of the frame and attach it as shown in the illustration.



	Area “E”	Area “F”
Target	No gap	No gap
Acceptable gap	0 to 0.5 mm	0 to 0.5 mm

6. Attach the Seal (A2322348) to the frame on top of the Seal affixed in step 4 above. Please make sure to first line the Seal up flush against the two surfaces of the frame (as in step 4).



	Area “G”	Area “H”
Target	No gap	No gap
Acceptable gap	0 to 0.5 mm	0 to 0.5 mm

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 046 **02/02/2000**

APPLICABLE MODEL:

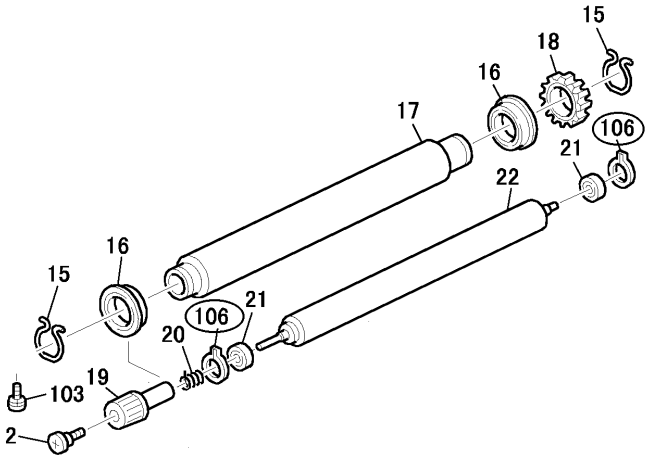
GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: RETAINING RING – M8

GENERAL:

The following part number correction is being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.



				REFERENCE	
INCORRECT PART NO.	**CORRECT PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
07200080E	07270080E	Retaining Ring – M8	1	47	106

UNITS AFFECTED:

A230, A231 and A232 Serial Number cut-ins were not available at time of publication.

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 047 **02/14/2000**

APPLICABLE MODEL:

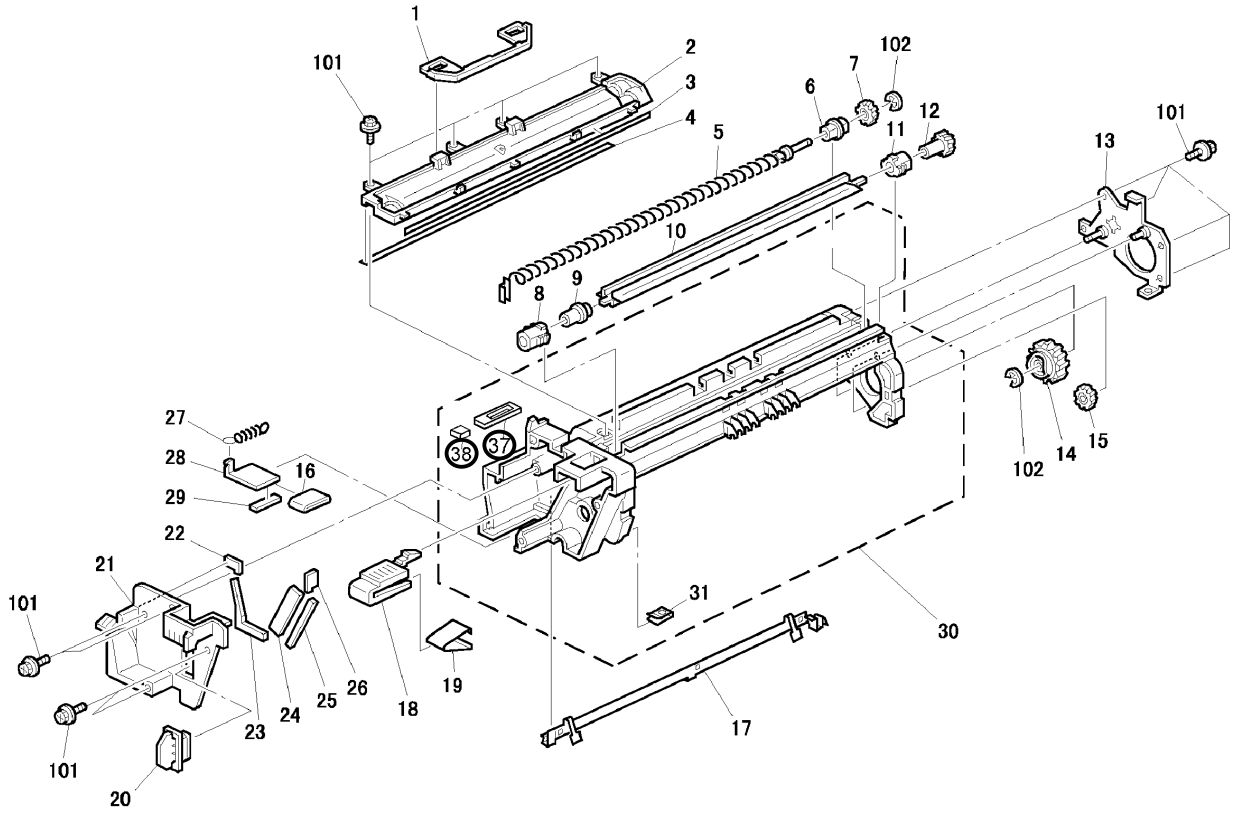
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TONER SUPPLY SEALS

GENERAL:

The Toner Supply Entrance Seal and Toner Supply Front Entrance Seal have been registered as a service part. Please add the following parts to your A230, A231, and A232 Parts Catalogs.



			REFERENCE	
NEW PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2322279	Seal Toner Supply - Entrance	0-1	37	37*
A2323267	Seal Toner Supply – Entrance Front	0-1	37	38*

***DENOTES NEW ITEM NUMBER**

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 048 **03/28/2000**

APPLICABLE MODEL:

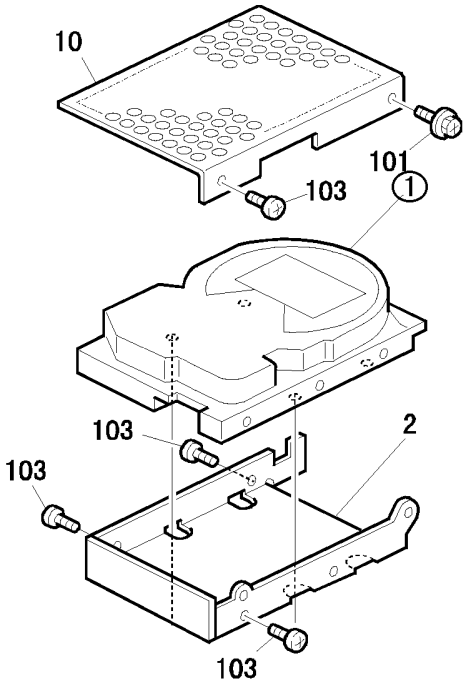
GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: IMAGE ENHANCEMENT KIT – HARD DISK

Note: This copy is intended as a master original for reproduction of additional bulletins.

GENERAL:

The Hard Disk for the Image Enhancement Kit has been changed. The following part update is being issued for all A230, A231 and A232 Parts Catalogs. Please update your Parts Catalogs with the following information.



						REFERENCE	
OLD PART NO.	INTERIM PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A6915878	A6915879	A6915860	Hard Disk	1	0	69	1

UNITS AFFECTED:

A230, A231 and A232 Serial Number cut-ins were not available at time of publication.

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A232/A231/A232 - 049 **04/17/2000**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/3235/3245
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 4-60A, 60B — Updated Information (Copy Jam History Display)
- 7-23A — Updated Information (SC990: Software performance error)

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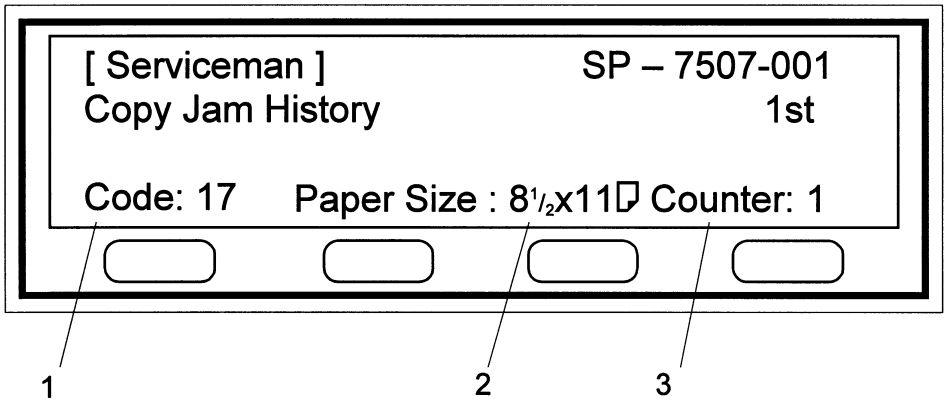
4.2.11 COPY JAM HISTORY DISPLAY (SP7-507)

The following message will be displayed.



1: Jam Code (See Table below) 2: Paper Size 3: Counter

Jam Code	Meaning
01	Jams at power on
03	1st paper tray : paper non-feed jam
04	2nd paper tray : paper non-feed jam
05	3rd paper tray: paper non-feed jam
06	4th paper tray: paper non-feed jam
07	LCT: Paper non-feed jam
08	Upper relay sensor: paper does not activate the sensor
09	Lower relay sensor: paper does not activate the sensor
10	Upper relay sensor – opt. PTU: paper does not activate the sensor
13	Registration sensor: paper does not activate the sensor
16	Exit sensor: paper does not activate the sensor
17	Bridge exit sensor: paper does not activate the sensor
18	Bridge relay sensor: paper does not activate the sensor
19	Duplex entrance sensor: paper does not activate the sensor
23	Duplex exit sensor: paper does not activate the sensor
24	1-bin tray entrance sensor: paper does not activate the sensor
⇒ 25	Finisher entrance sensor: paper does not activate the sensor
26	3000-sheet finisher upper tray exit sensor: paper does not activate the sensor
27	Finisher shift tray exit sensor: paper does not activate the sensor
28	Staple tray paper sensor: paper does not activate the sensor
29	Finisher stack feed-out belt HP sensor: paper does not activate the sensor
30	Mail box entrance sensor: paper does not activate the sensor
31	Mail box proof tray exit sensor: paper does not activate the sensor
32	Mail box relay sensor: paper does not activate the sensor
33	Mail box sensor: paper does not activate the sensor

Jam Code Table - Continued

Jam Code	Meaning
57	LCT: paper doe not activate the sensor
58	Upper Relay Sensor: paper stays at the sensor
59	Lower Relay Sensor: paper stays at the sensor
60	Upper Relay Sensor – opt. Paper Tray Unit: paper stays at the sensor
61	Lower Relay Sensor – opt. Paper Tray Unit: paper stays at the sensor
63	Registration sensor: paper stays at the sensor
66	Exit sensor: paper stays at the sensor
67	Bridge exit sensor: paper stays at the sensor
68	Bridge relay sensor: paper stays at the sensor
69	Duplex entrance sensor: paper stays at the sensor
73	Registration sensor: paper stays at the sensor
74	1-bin tray entrance sensor: paper stays at the sensor

4.2.12 Original Jam History Display (SP7-507- 011)

Jam Code	Meaning
01	Jams at power on
03	Jams in the feed-in area
04	Jams in the feed-out area

SC990: Software performance error

-Definition- [B']

The software performs an unexpected function.

- Possible causes -

- Software defective
- NVRAM Defective
- BICU Board Defective

Re-download copier firmware, if the service condition can not be cleared by cycling the machine 'OFF' and 'ON'.

When this SC occurs, the file name, address, and data will be stored in the NVRAM. This data can be checked by entering SP mode then pressing "0".

⇒ **NOTE:** The Hotline may request this information. Record and have this data and the conditions in which the service code occurs available when calling the Hotline.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 050 **04/20/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: HOT ROLLER STRIPPER AND TENSION SPRING

SYMPTOM:

Paper jams in the Fusing Unit.

CAUSE:

When a mixture of the toner and paper dust accumulates on the tip of the Hot Roller Strippers, a gap develops between the strippers and Hot Roller surface. Under this condition, the paper may not be separated and may be caught by the tip of the Hot Roller Strippers causing a fuser jam.

SOLUTION:

To reduce the mixture of the toner and paper dust attracted to the Hot Roller Strippers, the material of the strippers was changed. To increase the contact pressure between the Hot Roller and strippers, the tension of the Hot Roller Stripper Springs was changed from 150 mN to 300 mN.

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
AE044022	AE044028	Hot Roller Stripper	5	0	47	6
AA060701	AA060837	Tension Spring	5	0	47	7

UNITS AFFECTED:

All A230, A231, and A232 copiers manufactured after the Serial Numbers listed below will have the new style Hot Roller Strippers and Tension Springs installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235S	1B9910001
Gestetner 3235	1B99910001
Gestetner 3245	2B19910001
Ricoh Aficio 340	A768XXXXXXX
Ricoh Aficio 350	A7699901255
Ricoh Aficio 450	A7709900885
Savin 9935D	1B9910001
Savin 9935DP	1B99910001
Savin 9945DP	2B19910001

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Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 051 **05/18/2000**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

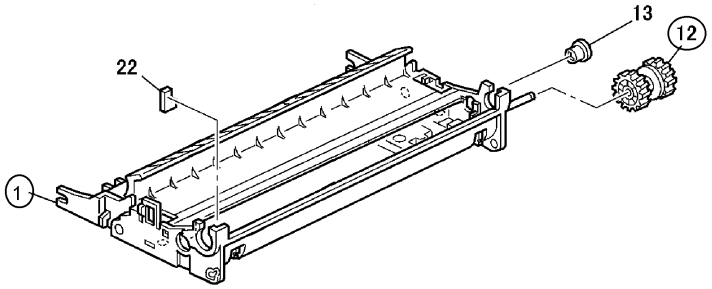
SUBJECT: PARTS CATALOG UPDATES

Note: This copy is intended as a master original for reproduction of additional bulletins.

GENERAL:

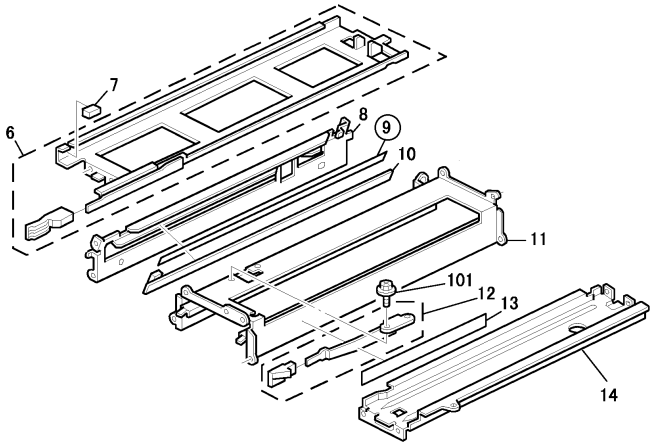
The following parts updates are being issued for all A230/A231/A232 Parts Catalogs.

- **UPDATE 1:** **Case – Transfer Unit & Gear – 27Z –** To standardize with other models, the Case – Transfer Unit and the Gear – 27Z have been changed. Please update your Parts Catalog with the following information.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2323900	G0353900	Case – Transfer Unit	1	0	41	1
AB017429	AB014189	Gear – 27Z	1	0	41	12

- **UPDATE 2:** **Magnet - Quenching Lamp –** To standardize with other models, Magnet – Quenching Lamp has been changed. Please update your Parts Catalog with the following information.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2322373	A2673455	Magnet – Quenching Lamp	1	0	65	9

Continued…

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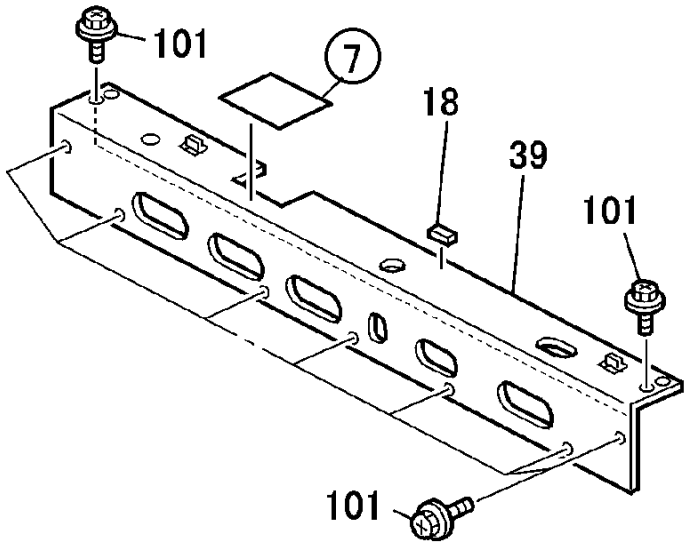
- **UPDATE 3:** **Front Shield Plate –** To standardize with other models, the Front Shield Plate has been changed. Please update your Parts Catalog with the following information.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
AA150667	AA150702	Front Shield Plate	1	0	21	7

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 052 **05/15/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935DP/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: BICU BOARD

GENERAL:

The part number suffix level was "Z" (Example: P/N A2325051**Z**) before the announcement of the new software change. It was necessary to assign a new part numbers because the suffix level can not be higher than "Z". The following part corrections are being issued for all A230, A231, and A232 Parts Catalogs.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2325051	A2325071	BICU Board (115V)	1	1	63	6
A2325052	A2325072	BICU Board (230V)	1	1	63	6

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 053 **05/15/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935DP/9935DP/9945DP

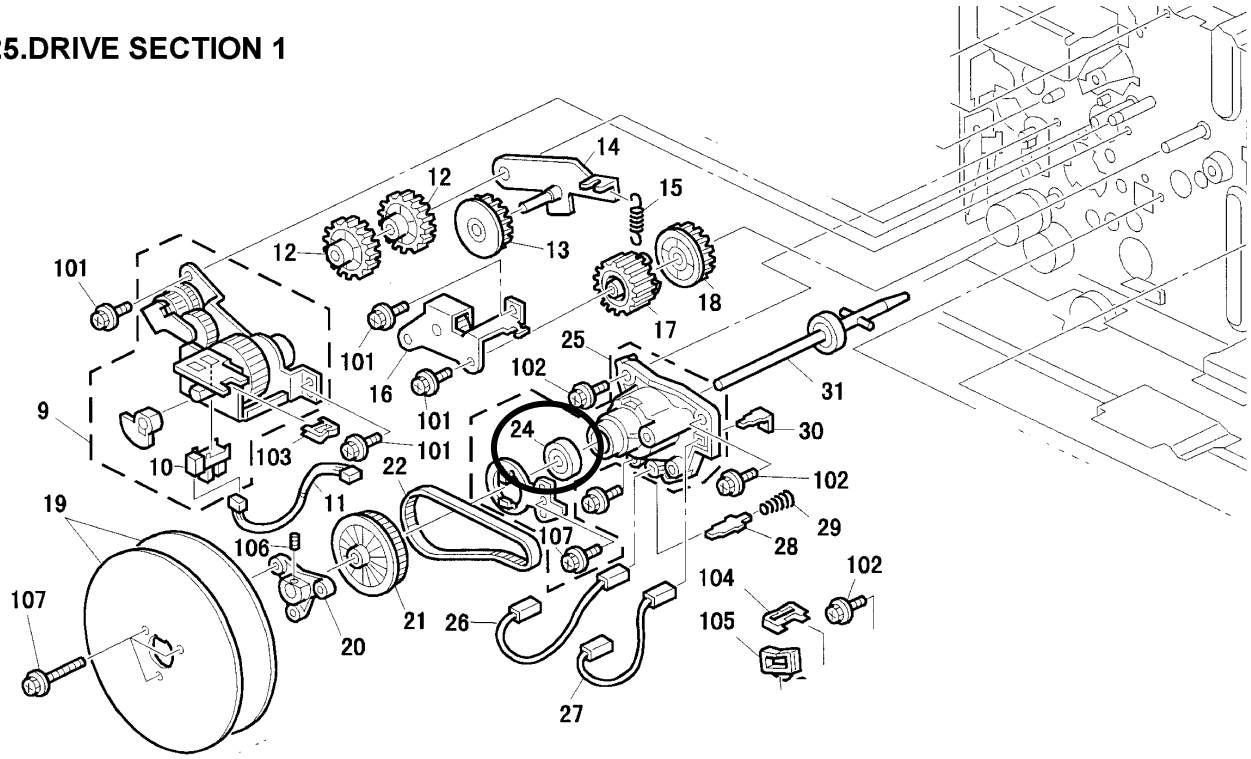
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: BEARING FOR DRUM HOLDER

GENERAL:

The following part correction is being issued for all A230, A231, and A232 Parts Catalogs.

25.DRIVE SECTION 1



				REFERENCE	
INCORRECT PART NO.	**CORRECT PART NO.**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2323552	A2323561	Ball Bearing – 8x22x7	1	57	24

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 054 **05/30/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: SERVICE MANUAL - INSERT

■ SERVICE MANUAL

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

- iv Table Of Contents Update
- 6-21 A693 Firmware Modification History

Note: This copy is intended as a master original for reproduction of additional bulletins.

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6.4 FIRMWARE HISTORY

6.4.1 A693 FIRMWARE MODIFICATION HISTORY

A693 FAX OPTION FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	**FIRMWARE LEVEL**	**SERIAL NUMBER**	**FIRMWARE VERSION**
• **Cannot print out incoming fax.** Even if only one of the output trays has not been set properly, it is not possible to print out an incoming fax to any tray. • **System Switch** The default for System Switch 0A (Germany) has been changed from 00H to 30H. • **Print end buzzer** If fax printout and communication finish at the same time when using Direct Receive, the print end buzzer does not turn off. • **SC101 does not stop transmission** Transmission is not stopped even if SC101 occurs. • **Duplex Print** Page order is reversed in duplex mode if the page memory unit has not been installed (2/1, 4/3). The specifications have been changed so that the order will be 1/2, 3/4 (correct). As part of this modification, the default for Printer SW 0F bit 5 has been changed to 1. • **FCC Standards (86)** The following modification was made to comply with the changes made to FCC standards (86) and applies only to A2335581**G**: The default for communication SW10 has been changed to 02H. The default for communication SW12 has been changed to OAH.	A2335581 **G**	NA	10.00 11.00 12.00

Trouble-shooting

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 055 **06/29/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450/355/455
SAVIN – 9935D/9935DP/9945DP/2035DP/2045DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: CONSTANT ADD TONER CONDITION

SYMPTOM:

1. Add toner condition will not clear after replacing the Toner Bottle.
2. When the Front Door is open, the display indicates “Close Right Cover.”

CAUSE:

SP5-957 (Door Switch Type) is set incorrectly.

SOLUTION:

1. When the Right Door Switch kit is installed (Refer to TSB A230/A231/A232 – 032), SP5-957 must be set to a 1. Follow the procedure outlined below:
   - Enter SP Mode.
   - Set SP5-957 to 1.
   - Exit SP Mode.
   - Turn the Main Power Switch OFF then ON.
   - Open the Front Door and confirm that the display reads “Close Doors/Covers.”

2. If the Right Door Switch Kit is not installed, SP5-957 must be set to 0.

NOTE: *When performing a Memory All Clear (SP5-801) or replacing NVRAM, confirm that SP5-957 is set correctly. SP5-597 is available with firmware level “T” or higher.*

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 056 **09/13/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SERVICE MANUAL - INSERT

■ SERVICE MANUAL

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- vii Updated Information (Table of Contents - ROM History)
- 7-35 Updated Information (ROM History)

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Description of Modification	Firmware Level	Serial Number	Firmware Version
Corrects the following: • In machines without the Image Enhancement kit, the following can occur after the paper end condition is reached: - The machine waits for the next sheet of paper to be fed from the tray. - An SC321 occurs. • An SC990 occurs 1- No Hard Disk installed. 2- Firmware v 14.3 installed 3- Duplex Mode 4- Original on glass, press Start 5- Original in ADF, press Start • After making a copy from the glass, no copies could be made from the DF. "Original is left on glass…Remove original" is displayed when an original is set in the DF. • Some parts of "Adjust Image" screen are displayed in German even though Dutch is set as the language. • Some parts of "Adjust Image" screen are displayed in English even though Spanish is set as the language.	A2325113 V	December 1999 production	14.4
⇒ Corrects the following: • When the main power switch is turned on or the machine recovers from Energy Saver Mode, an SC990 (followed by SC542) occurs before the target fusing temperature is reached. • When the G909 Mailbox has been selected as the output tray when the machine recovers from Energy Saver Mode, a jam occurs at the G909 entrance. This is because the G909 is not recognized by the mainframe. • The thermistor output is unstable when the main power is turned on or the machine recovers from Energy Saver Mode in a low-temperature environment. This causes an SC546 to occur. • An SC990 occurs when a print job is cancelled at a certain point during the job.	A2325113 W	Not Available	14.5

Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 057 **09/13/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3535/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TONER BAND ON REAR SIDE OF DRUM

SYMPTOM:

A toner band develops on the rear side of the Drum outside of the image area. This toner band causes the Transfer Belt Assembly to over fill on the rear side and leak toner into the registration and vertical feed areas.

CAUSE:

The edge of the Development Unit Seal contacts the Drum surface, causing Drum wear.

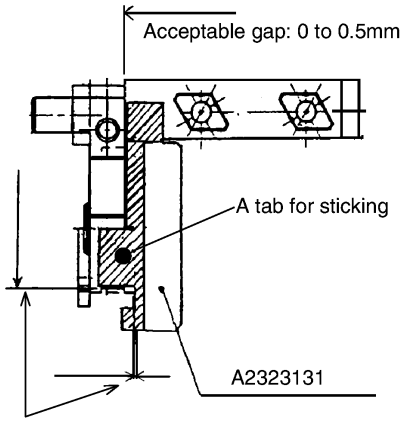
Occurrence process:

1. The edge of the Development Unit Seal contacts the Drum, causing wear on the Drum surface. As a result, extra toner sticks to this part of the Drum surface.
2. This toner then accumulates on the Charge Roller Cleaning Pad.
3. The toner on the Cleaning Pad then sticks to the Charge Roller, expanding in width and forming a thin film on the Roller surface.
4. The electric potential decreases in the area on the Charge Roller surface where the toner film has formed. A “band” of toner is then transferred to the Drum.
5. This toner band layer is then transferred to the surface of the Transfer Belt. This toner gradually builds up on the Belt surface, and the Transfer Belt Unit is unable to properly remove it for collection. Eventually, the accumulated toner falls off the Belt surface and drops toward the rear section of the machine.

COUNTERMEASURE:

The thickness of the Development Unit Seal has been reduced from 0.2 to 0.1mm. In addition, the Seal itself has been made softer/more flexible. This modification will prevent the Seal from contacting the Drum and causing wear on the Drum’s surface. See illustration below for placement.

NOTE: *Only the suffix of the part number has changed. The part number remains unchanged.*



Acceptable gap: 0 to 0.5mm

Continued…

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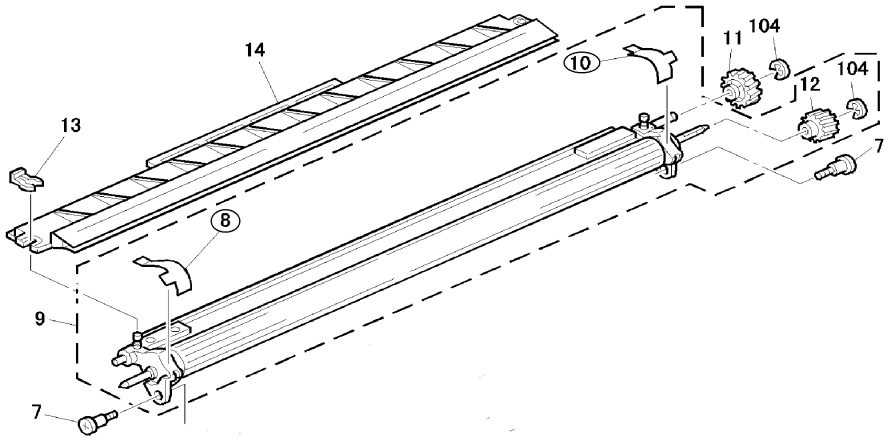
GENERAL:



				REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2323132	Rear Shield – Development Sleeve	1	1	45	8
A2323131	Front Shield – Development Sleeve	1	1	45	10

UNITS AFFECTED:

All A230/A231/A232 copiers manufactured after the Serial Numbers listed below will have the new style Development Sleeve Front and Rear Shields installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235S	1B8084xxxx
Gestetner 3235	1B90830001
Gestetner 3245	2B10830001
Ricoh AFICIO 340	A768084xxxx
Ricoh AFICIO 350	A769084xxxx
Ricoh AFICIO 450	A770084xxxx
Savin 9935D	1B8084xxxx
Savin 9935DP	1B90830001
Savin 9945DP	2B10830001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 058 **09/13/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3535/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: ADF and FINISHER CONNECTORS

Note: This copy is intended as a master original for reproduction of additional bulletins.

SYMPTOM:

During production inspections at the factory, it was discovered that the grounding pins of some ADF and Finisher Connectors were pushed in. All machines in stock at the factory were checked and the connectors replaced. However, it is possible that some machines released from the factory may contain these faulty connectors.

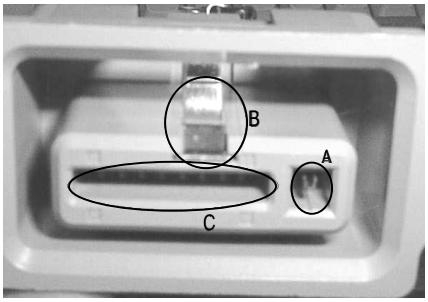
CAUSE:

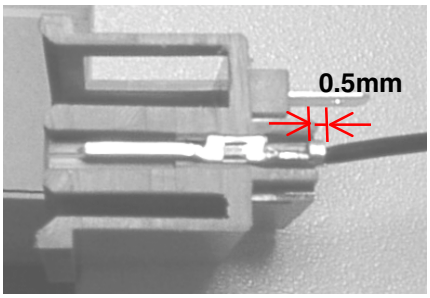
During the production process, specialized connectors are used to connect the ADF and Finisher Harnesses to the mainframe. It was confirmed that these connectors were slightly deformed, causing the grounding pins to be pushed in. If the connector is repeatedly inserted and pulled out, the pin will be pushed further inside and start to come out at the other end (0.5 to 8mm). However, this does not result in any abnormal machine operation.

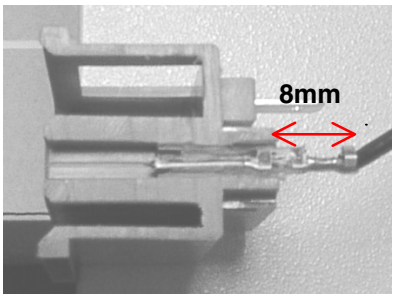
Through vibration tests, it was confirmed that the pin does not separate from the ADF or Finisher Connectors. The probability is extremely low but it is possible that the pin could separate from the connector, fall onto the Lamp Stabilizer and cause a short circuit. We have confirmed that even if this were to happen, there would be no damage to any components or the Lamp Stabilizer circuits. The Exposure Lamp would remain ON and/or an SC101 would occur.

SOLUTION:

At installation, please check the grounding pins of both connectors. If the pins are pushed-in or misaligned, please return them to the proper position.







Mainframe wiring:

	A : Grounding pin	B : Shield line	C : Signal Line
ADF	Connected to outer frame of mainframe	Connected to outer frame of mainframe	GND line present
Finisher	Connected to outer frame of mainframe	Not connected to outer frame of mainframe	GND line present

NOTE: *Lamp Stabilizer circuit malfunctions do not occur because there is a ground line connected to the signal line [C]. We have also confirmed that even if the grounding pin is not properly connected, there are no machine malfunctions or abnormal operations caused by static electricity.*

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 059 **09/13/2000**

APPLICABLE MODEL:

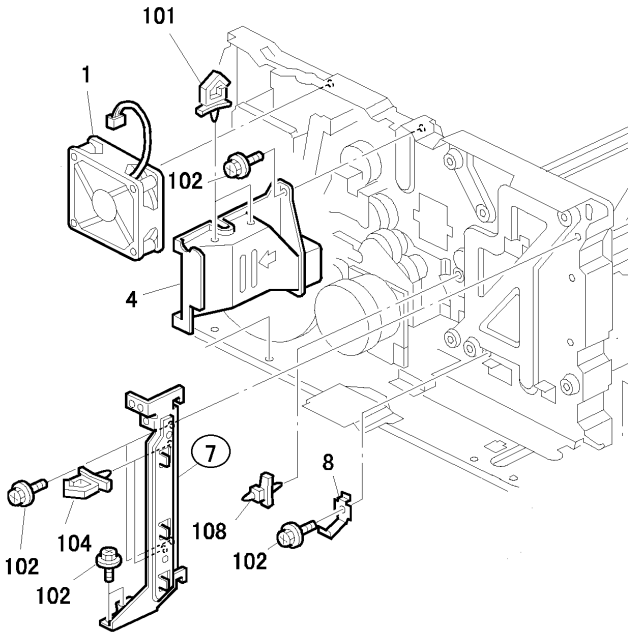
GESTETNER – 3235S/3535/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SUPPORT PLATE – SCANNER ARM

GENERAL:

To standardize the part with other models, the Support Plate – Scanner Arm has been changed from P/N A2321086 to P/N A2841086. The following part update is being issued for all A230/A231/A232 Parts Catalogs.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2321086	A2841086	Support Plate – Scanner Arm	1	0	61	7

UNITS AFFECTED:

A230/A231/A232 Serial Number cut-ins were not available at time of publication.

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 060 **09/13/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3535/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: LASER SYNC. DETECTOR

SYMPTOM:

An SC322 or SC326 is generated during installation.

CAUSE:

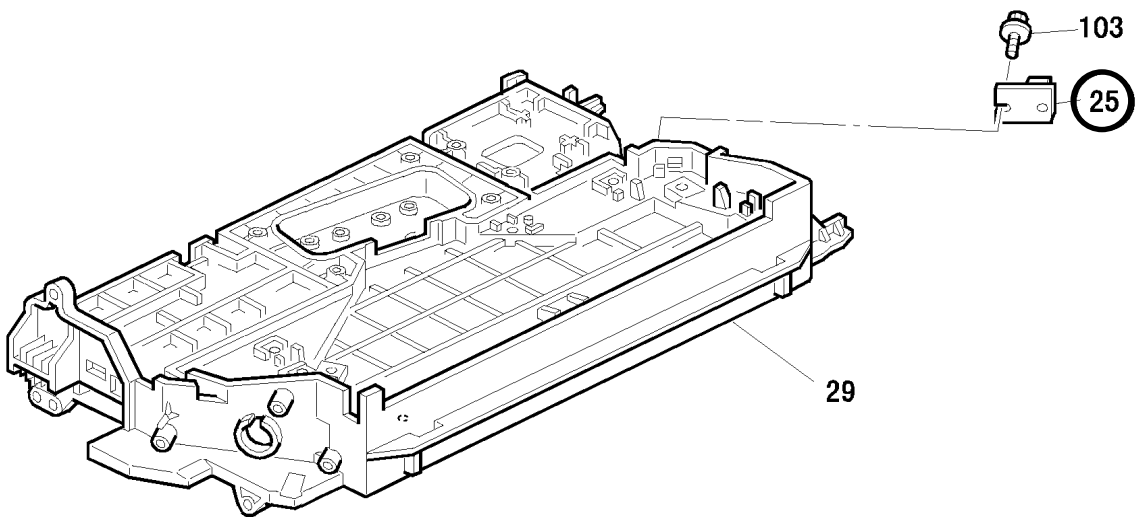
The Laser Unit may pass when tested at the factory, but the laser beam in some units may be near the lower edge of the Laser Sync. Detector. During transport of the unit, the LD Unit Housing may become slightly deformed or shifted due to some form of shock. As a result, the position of the Laser has shifted outside the detection range for the Laser Sync. Detector.

SOLUTION:

The detection width of the Laser Sync. Detector has been increased from 2.3 mm to 3.0 mm.

GENERAL:

The following part update is being issued for all A230/A231/A232 Parts Catalogs.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2325310	A2935310	Laser Sync. Detector	1	1	23	25

Continued…

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UNITS AFFECTED:

All A230/A231/A232 copiers manufactured after the Serial Numbers listed below will have the new style Laser Sync. Detector installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235S	1B8084xxxx
Gestetner 3235	1B90830001
Gestetner 3245	2B10830001
Ricoh AFICIO 340	A768084xxxx
Ricoh AFICIO 350	A769084xxxx
Ricoh AFICIO 450	A770084xxxx
Savin 9935D	1B8084xxxx
Savin 9935DP	1B90830001
Savin 9945DP	2B10830001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 061 **09/20/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3535/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: RIGHT DOOR SWITCH KIT

GENERAL:

The Right Door Switch Kit (P/N A2309901) has been registered as a service part. Please refer to TSC Bulletin A230/A231/A232 – 032 for more detailed information about the Right Door Switch Kit Enhancement.

- Right Door Switch Kit (P/N A2309901):

Kit Contents:

DESCRIPTION	QUANTITY	PART NUMBER
Right Door Switch	1 each	12042466
Screw M3 x 45	2 each	AA143519
Relay Harness	1 each	A2309900
Knob Spring Clutch	1 each	A2324072
Decal, Knob Spring	1 each	A2309902
Decal Jam Removal	1 each	A2321386
Harness Clamp	2 each	11050109
Screw – M3x8	1 each	09543008B

NOTE: *Initially, TSB A230/A231/A232 – 032 referenced (P/N A2309903) as the part number for the Right Door Switch Kit. A2309903 is no longer available and has been replaced by A2309901.*

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 062 **10/11/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3535/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

SUBJECT: DIRTY BACKGROUND / NO-FEED PAPER JAMS

Note: This copy is intended as a master original for reproduction of additional bulletins.

SYMPTOM:

- Dirty background on copies or prints
- No-feed paper jam

CAUSE:

A high toner concentration in the developer leads to toner scattering. In addition to dirty background, this causes the Paper Feed Roller to become dirty. As a result, paper is not fed smoothly by the Roller and jams.

SOLUTIONS:

1. Lower the image density if it is high. (See Procedure 1 below for De-toning)
2. If it is not high, attach the Lower Guide Mylar (P/N A2309103). The procedure is as follows (See Procedure 2):

Part number: A2309103
Description: Lower Guide Mylar – Development
Component parts: Mylar (1 sheet), Sponge (2 pcs), Tape (1 sheet)

PROCEDURE 1:

De-toning

1. Open the Right Door of the machine. Cheat the Right Door Switch and check the Drum surface while the ID pattern is developed. If the Drum surface is evenly coated with toner perform the following:
2. Remove the Toner Bottle.
3. Slide out the PCU Unit.
4. Cover the Toner inlet opening on the Development Unit with a piece of paper. (Refer to SM page 6-27)
5. Re-install the PCU Unit.
6. Run copies to de-tone the developer.
7. Verify the Drum surface to confirm the machine is running clean.
8. Perform SP2-801.
9. Check that SP2-220 is 4.00 or higher.
10. Check that SP2-802-1 is 4.00 or higher.
11. Remove the PCU Unit from the machine and clean out all the recycled toner that has collected in the front of the PCU Unit and vacuum the PCU Unit.
12. Adjust SP2-802-2 to 4.30 and SP2-802-3 to 3.90.

Continued…

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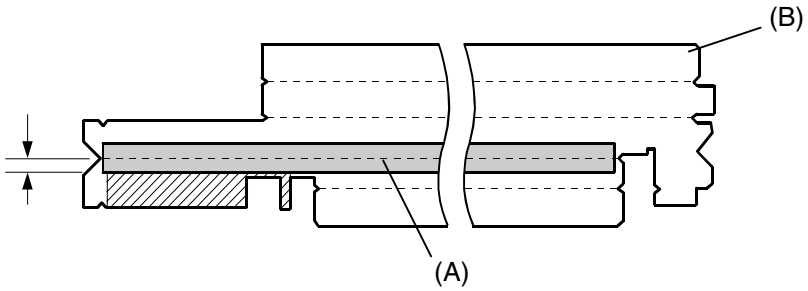
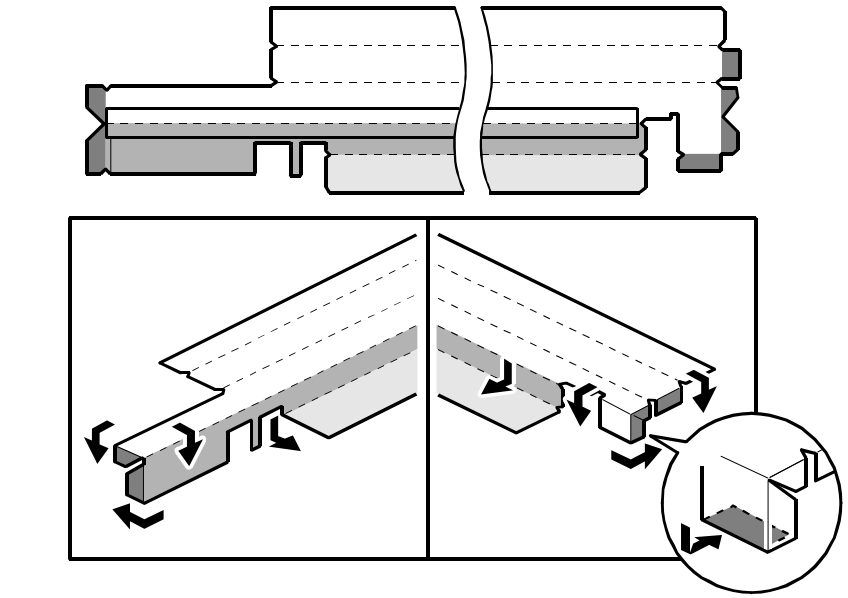
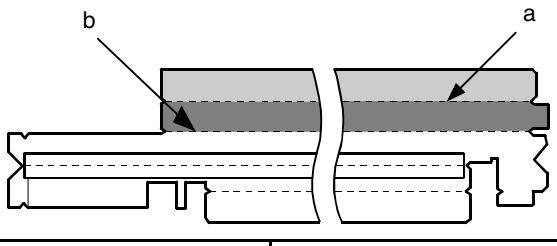
PROCEDURE 2:

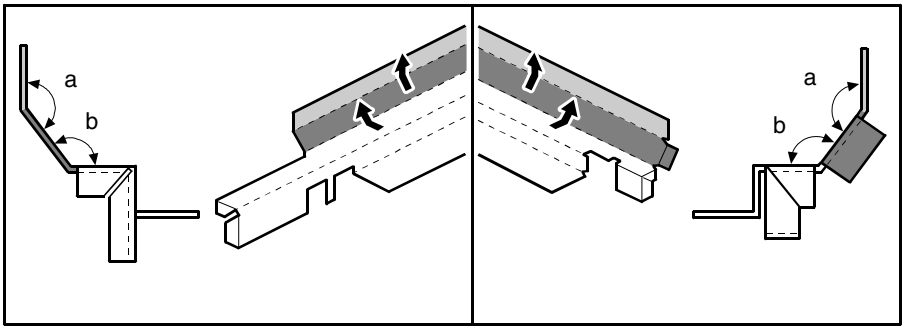
1. Attach the Accessory Tape (A) to the Mylar (B).



2. Fold the Mylar as shown in the illustration below.
   Fold angles (approx.):
   a = 140 degrees, b = 130 degrees, others = 90 degrees.

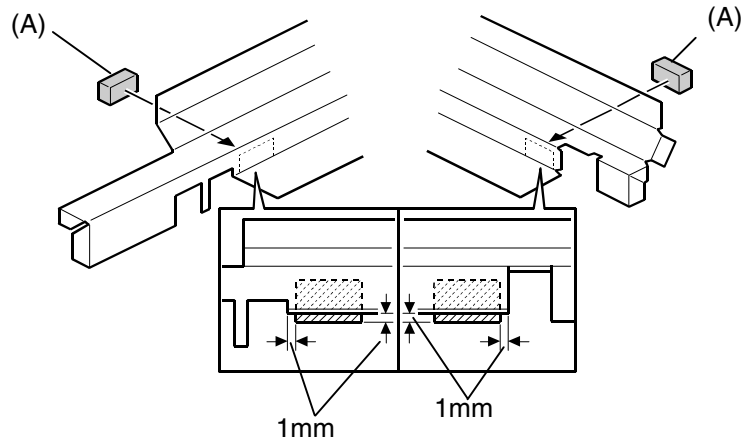






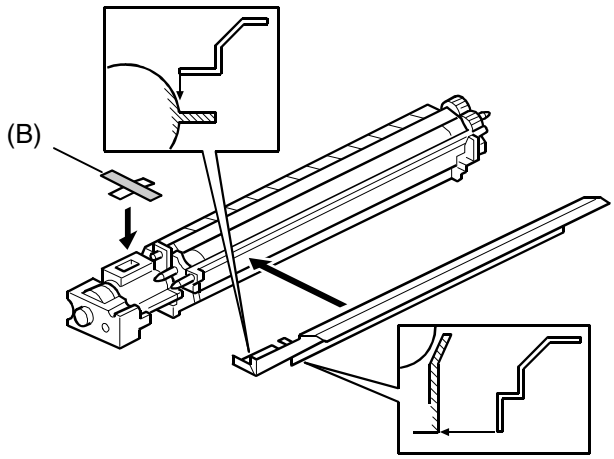
Continued…

3. Attach the 2 Sponges (A) to the Mylar as shown in the illustration below.



4. Remove the Development Unit.
5. Cover the recycled toner inlet temporarily with Tape (B) as shown illustration below.
6. Affix the Mylar modified in step 3 to the Development Unit.

NOTE: *First clean the attachment surface with alcohol or a damp cloth.*



TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 063 **11/28/2000**

APPLICABLE MODEL:

GESTETNER – 3235s/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

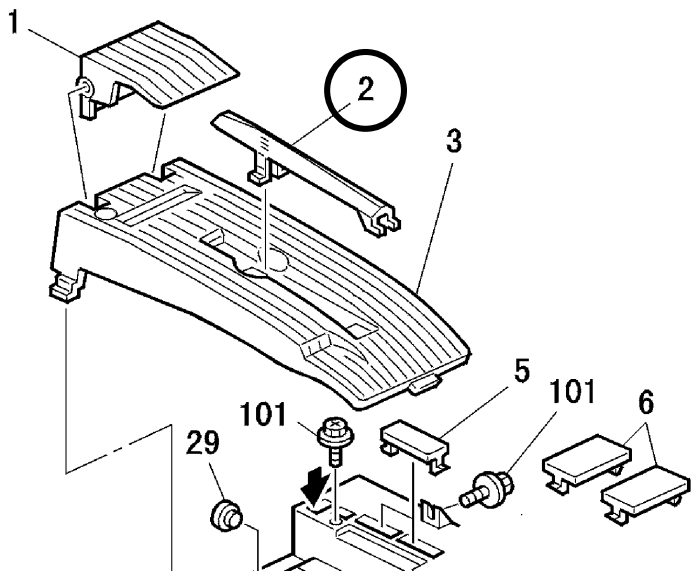
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following parts updates are being issued for all A230, A231, and A232 Parts Catalogs.

- **UPDATE 1:** **Copy Tray Guide –** To standardize with other models the Copy Tray Guide has been changed.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2324498	A2844498	Copy Tray Guide	1-1	0	13	2

Continued…

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- **UPDATE 1:** **Thermofuse –** Due to a vender change the part number for the Thermofuse has been changed and also the part number of the Fusing Unit Assembly has changed.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2324100	A2314100	Thermofuse	1	0	47	8
A2327320	A2317320	Fusing Unit Ass'y (115V)	1	0	47	1
A2327720	A2317720	Fusing Unit Ass'y (230V)	1	0	47	1

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 064 **12/12/2000**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: SERVICE MANUAL - INSERT

■ SERVICE MANUAL

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 7-36 Updated Information (ROM History)

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Description of Modification	Firmware Level	Serial Number	Firmware Version
⇒ Corrects the following: • The following SP mode displays have been changed: "Serviceman" → "Service". "Salesman" → "Sales". • In the following 2 cases, the leftover page of a 2 in 1 or 4 in 1 job (which should be blank) contains part of the image data of the previous page. *Case 1: SIMM Memory (8MB) not installed. Paper size is B4 or larger 2 in 1. Vertical transport of original. Amount of originals is an odd number. *Case 2: SIMM Memory (8MB) not installed. Paper size is B4 or larger 4 in 1. Vertical transport of original. The amount of originals are a multiple of 4. • The following occurrences of SC350-3 have been corrected: *After SP2210 (ID Detection Interval) is set to 1, and two sheets are individually set and fed from the bypass tray. *After SP2210 (ID Detection Interval) is set to 2 or 3. SC occurs at the 4th and 6th sheets, respectively. • One line of an SC message was displayed in German, even though the display language was set to French.	A2325113 X	Not Available	14.6

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232- 065 **02/22/2001**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935/9935DP/9945DP

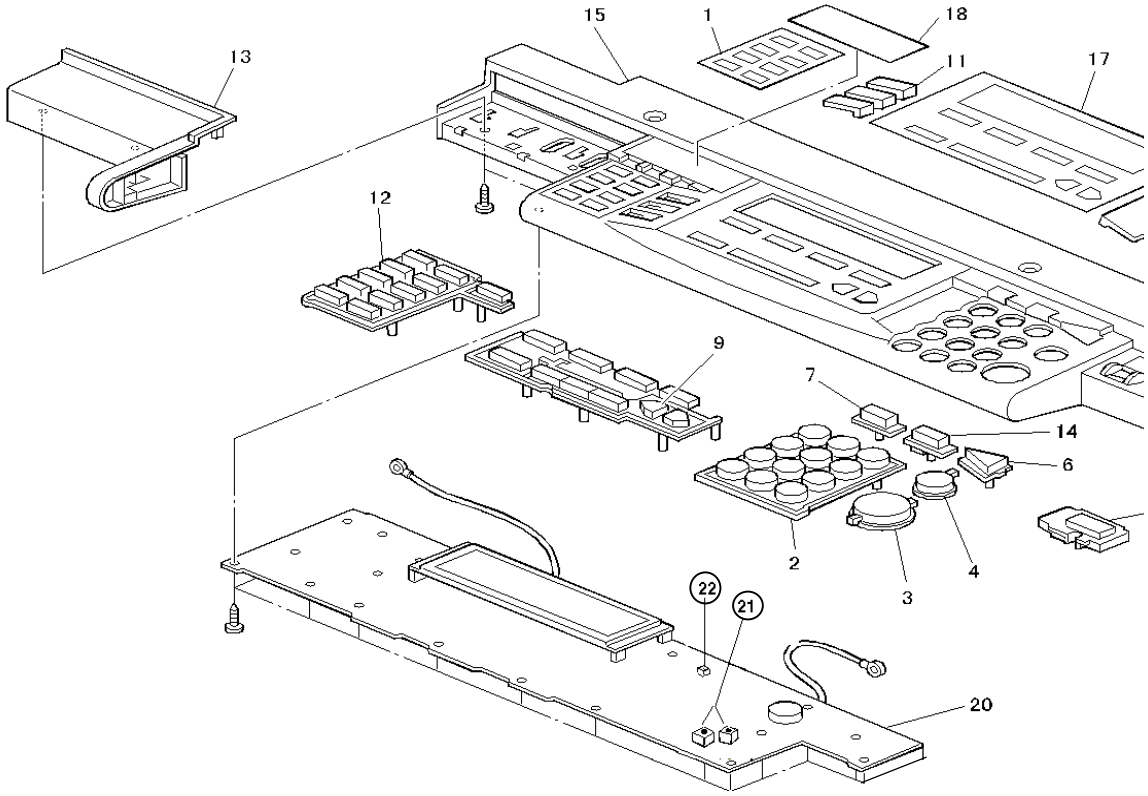
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: OPERATION PANEL SWITCH

GENERAL:

The Key Switch of the Operation Panel Board has been registered as a service part.
There are 2 types of switches used for the Operation Panel. One type is used for the Start Key (2pcs), and the second type is used for all the other keys on the panel.

The following parts additions are being issued for all A230 Parts Catalogs.



			REFERENCE	
NEW PART NO.	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
12042554	Key Switch : for Start Switch	2	17	21*
12042555	Key switch	45	17	22*

*** Denotes A New Item**

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Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 066 **07/13/2001**

APPLICABLE MODEL:

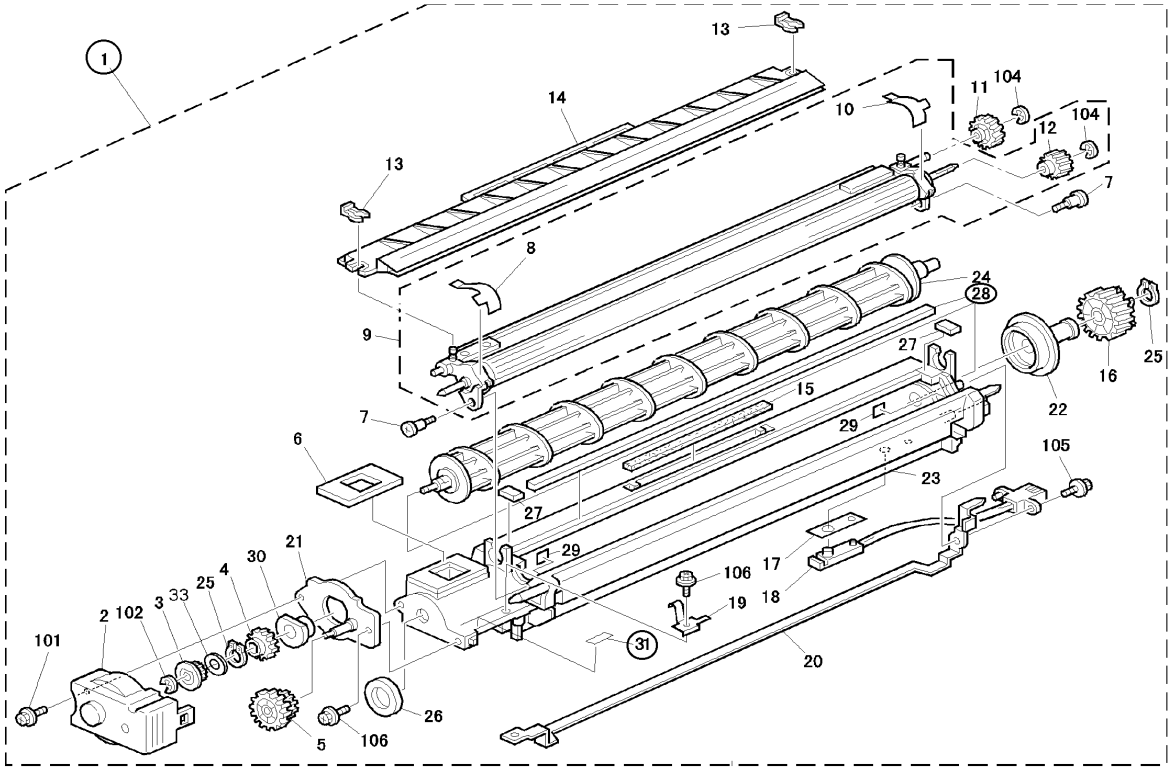
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: DEVELOPMENT UNIT

GENERAL:

The parts listed below have been modified to facilitate assembly at the factory and in the field. The following parts updates are being issued for all A230/A231/A232 Parts Catalogs.



					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2327460	A2327459	Development Unit	1	0	45	1
AA153053	AA153053	Sponge – 317X5X5	1	0	45	28
A2323066	A2323066	Decal – Development Unit	1	0	45	31

UNITS AFFECTED:

A230/A231/A232 Serial Number cut-in not available at time of publication.

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Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 067 **08/06/2001**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: LASER UNIT SPECIAL TOOLS

GENERAL:

Due to a Part/Number mismatch in the Parts Catalog, please make the following correction to Indexes 1 and 2 on page 89. Note that since this was a Parts Catalog listing error, the actual part numbers have not changed.

The following parts corrections are being issued for all A230 Parts Catalogs.

				REFERENCE	
Incorrect Part Number	**Correct Part Number**	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
A2309004	A2309003	Adjusting Cam – Laser Unit	1	89	1
A2309003	A2309004	Positioning Pin Laser Unit	1	89	2

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Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 068 **11/16/2001**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935/9935DP/9945DP

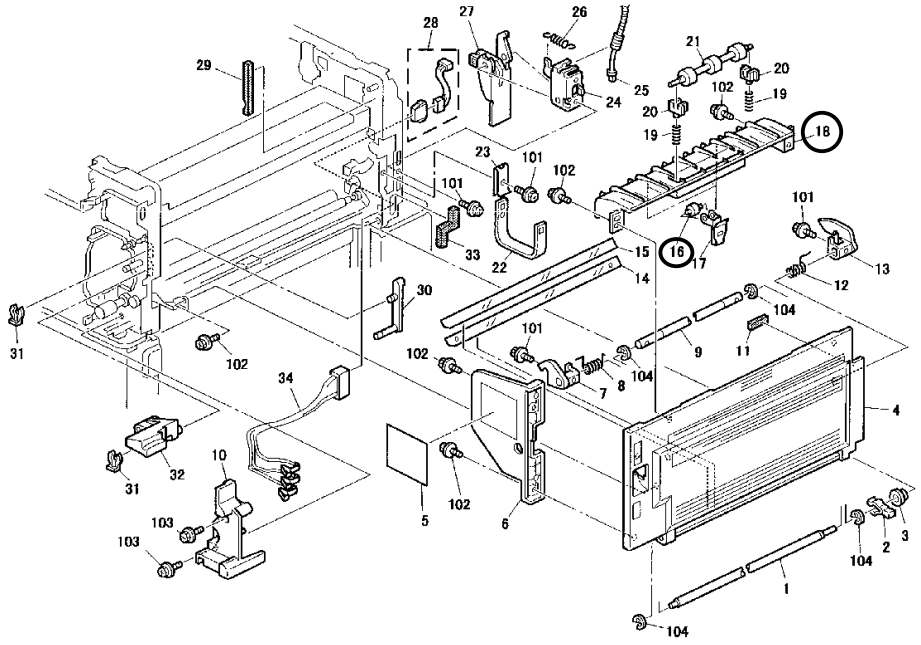
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: DRIVEN ROLLER AND GUIDE PLATE

GENERAL:

To prevent the Driven Roller and the Guide Plate from deforming due to heat, the material of both items have been changed. The following parts corrections are being issued for all A230/A231/A232 Parts Catalogs.

18. TRANSFER UNIT 2 (A230/A231/A232)



A230/A231/A232 42 Parts Location and List

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
AF040559	AF040575	Driven Roller – M9	2-2	1	43	16
A2324491	A2844491	Guide Plate – Fusing Unit	1-1	1	43	18

Continued…

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UNITS AFFECTED:

All A230/A231/A232 copiers manufactured after the Serial Numbers listed below will have the new style Driven Roller – M9 and Guide Plate – Fusing Unit installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B8085XXXX
Gestetner 3245	2B1085XXX
Gestetner 3235	1B9085XXXX
Ricoh Aficio 340	A76085XXXX
Ricoh Aficio 350	A769085XXXX
Ricoh Aficio 450	A770085XXXX
Savin 9945DP	2B1085XXX
Savin 9935DP	1B9085XXXX
Savin 9935D	1B8085XXXX

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 069 **11/16/2001**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TRANSFER BELT UNIT

GENERAL:

In response to the following symptom, one strip of mylar has been modified and two strips have been added as shown on the next page.

SYMPTOM:

The rear side of the copy is dirty.

NOTE: This has a particular tendency to occur when using paper with a large amount of paper dust.

CAUSE:

When paper dust accumulates on the transfer unit-cleaning blade, the blade can not effectively clean the toner off the transfer belt. As a result, the toner remaining on the belt is transferred to the rear side of the paper.

SOLUTION:

1. One strip of mylar (B0043911) has been added to scrape off the extra toner stuck to the transfer belt surface.
2. With the addition of the B0043911 mylar, the shape of the entrance mylar has been modified and its part number has been changed from A2323904 to B0043915.
3. One strip of mylar (B0043914) has been added to scrape off any toner stuck to the drive roller surface.

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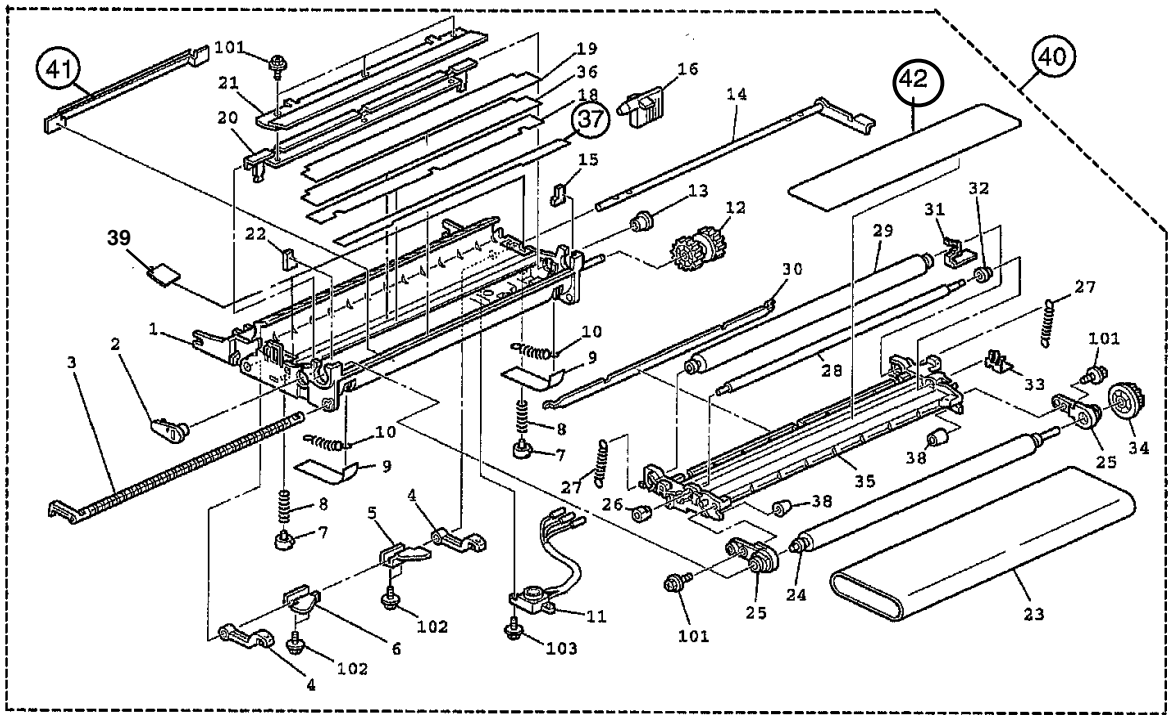
Continued…



The following parts addition and corrections are being issued for all A230/A231/A232 Parts Catalogs.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
	B0043911	Mylar - Remove Paper Dust	0-1	-	41	41*
A2323904	B0043915	Entrance Mylar–Transfer Unit	1-1	1	41	37
	B0043914	Mylar – Drive Roller - Entrance	0-1	-	41	42*

***DENOTES NEW ITEM NUMBER**

Continued…

UNITS AFFECTED:

All A230/231/232 copiers manufactured after the Serial Numbers listed below will have the new style **Mylar - Remove Paper Dust** , **Entrance Mylar–Transfer Unit and Mylar – Drive Roller - Entrance** Parts installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B9090XXXX
Gestetner 3245	2B1090XXXX
Gestetner 3235	1B9090XXXX
Ricoh Aficio 340	A768090XXXX
Ricoh Aficio 350	A769090XXXX
Ricoh Aficio 450	A770090XXXX
Savin 9945DP	2B1090XXXX
Savin 9935DP	1B9090XXXX
Savin 9935D	1B8090XXXX

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 069 REISSUE ★ 04/30/2002

APPLICABLE MODEL:
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TRANSFER BELT UNIT

GENERAL:

In response to the following symptom, one strip of mylar has been modified and two strips have been added as shown on the next page.

SYMPTOM:

The rear side of the copy is dirty.

NOTE: This has a particular tendency to occur when using paper with a large amount of paper dust.

CAUSE:

When paper dust accumulates on the transfer unit-cleaning blade, the blade can not effectively clean the toner off the transfer belt. As a result, the toner remaining on the belt is transferred to the rear side of the paper.

SOLUTION:

1. One strip of mylar (B0043911) has been added to scrape off the extra toner stuck to the transfer belt surface.
2. With the addition of the B0043911 mylar, the shape of the entrance mylar has been modified and its part number has been changed from A2323904 to B0043915.
3. One strip of mylar (B0043914) has been added to scrape off any toner stuck to the drive roller surface.

Continued…

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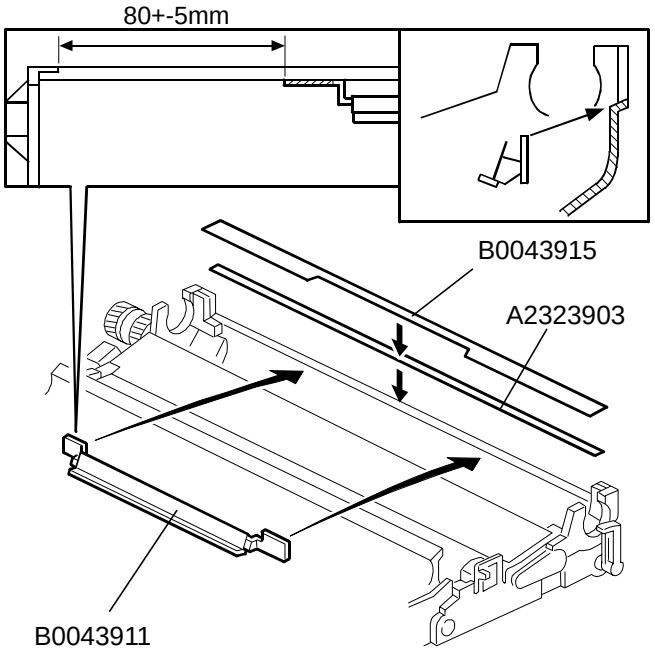
★ **Installation Procedure:**
Note: There is no double-sided tape attached to the Entrance Mylar (B0043915), so be sure to use the Tape – Entrance Mylar (A2323903) when installing this new Mylar

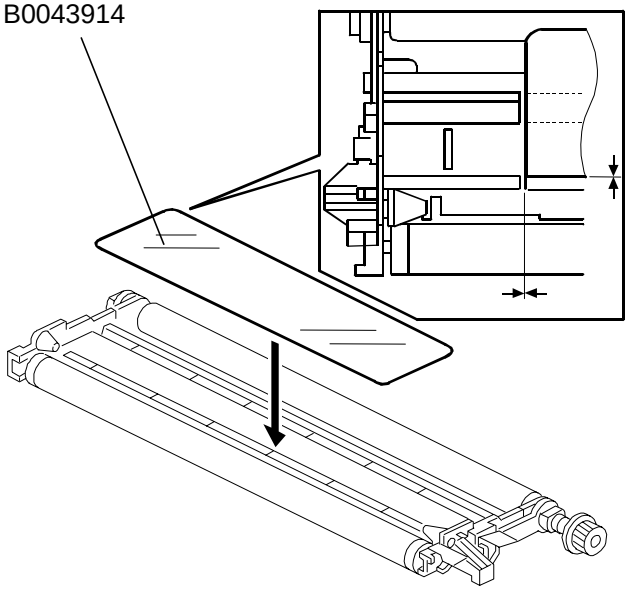
1. Remove the Transfer Unit, then the Transfer Belt and Cleaning Blade.
2. Peel off the old Entrance Mylar, then clean the surface of the attachment area underneath.
3. Clean out the inside of the Unit thoroughly.
4. Attach the Remove Paper Dust Mylar (B0043911) as shown in Fig. 1.
5. Attach the Tape – Entrance Mylar (A2323903) and Entrance Mylar (B0043915) as shown in Fig. 1.

Fig. 1:



6. Attach the Mylar - Drive Roller Entrance (B0043914) to the Transfer Unit Frame, as shown in Fig. 2.

Fig. 2:



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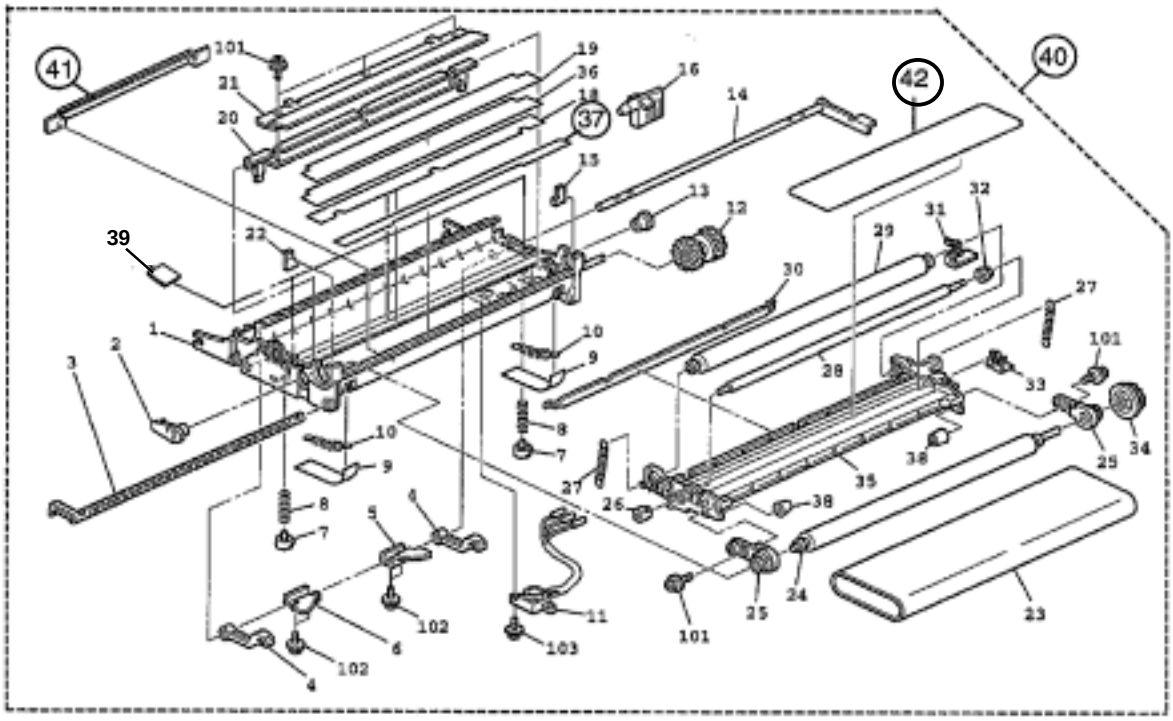

The following parts addition and corrections are being issued for all A230/A231/A232 Parts Catalogs.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
	B0043911	Mylar - Remove Paper Dust	0-1	-	41	41*
A2323904	B0043915	Entrance Mylar–Transfer Unit	1-1	1	41	37
	B0043914	Mylar – Drive Roller - Entrance	0-1	-	41	42*

***DENOTES NEW ITEM NUMBER**

UNITS AFFECTED:

All A230/231/232 copiers manufactured after the Serial Numbers listed below will have the new style (Mylar - Remove Paper Dust, Entrance Mylar–Transfer Unit and Mylar – Drive Roller - Entrance Parts installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B9090XXXX
Gestetner 3245	2B1090XXXX
Gestetner 3235	1B9090XXXX
Ricoh Aficio 340	A768090XXXX
Ricoh Aficio 350	A769090XXXX
Ricoh Aficio 450	A770090XXXX
Savin 9945DP	2B1090XXXX
Savin 9935DP	1B9090XXXX
Savin 9935D	1B8090XXXX

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 069 REISSUE ★ **02/06/2003**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: TRANSFER BELT UNIT

GENERAL:

In response to the following symptom, one strip of mylar has been modified and two strips have been added as shown on the next page.

SYMPTOM:

The rear side of the copy is dirty.

NOTE: This has a particular tendency to occur when using paper with a large amount of paper dust.

CAUSE:

When paper dust accumulates on the transfer unit-cleaning blade, the blade can not effectively clean the toner off the transfer belt. As a result, the toner remaining on the belt is transferred to the rear side of the paper.

SOLUTION:

1. One strip of mylar (B0043911) has been added to scrape off the extra toner stuck to the transfer belt surface.
2. With the addition of the B0043911 mylar, the shape of the entrance mylar has been modified and its part number has been changed from A2323904 to B0043915.
3. One strip of mylar (B0043914) has been added to scrape off any toner stuck to the drive roller surface.

Continued…

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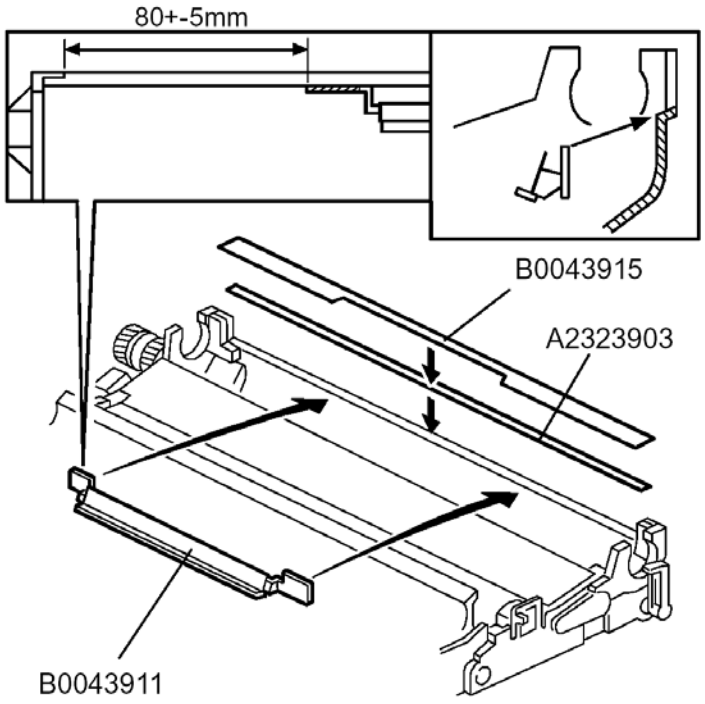
Installation Procedure:
Note: There is no double-sided tape attached to the Entrance Mylar (B0043915), so be sure to use the Tape – Entrance Mylar (A2323903) when installing this new Mylar.

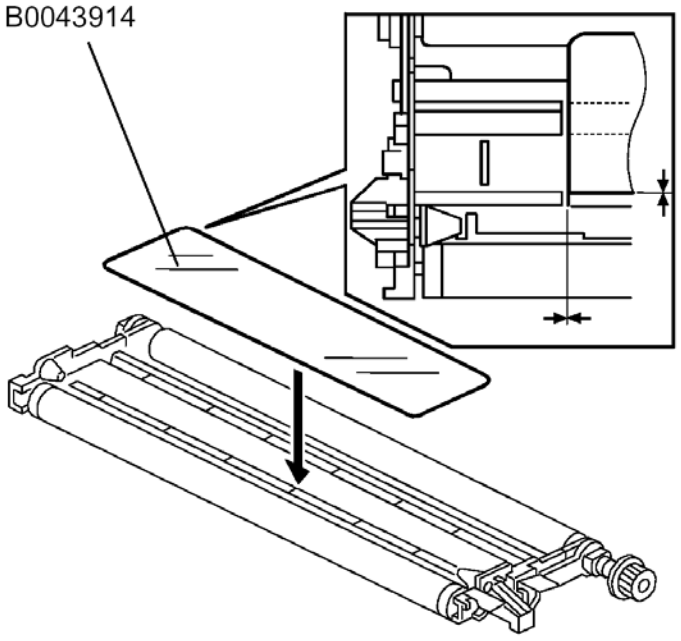
1. Remove the Transfer Unit, then the Transfer Belt and Cleaning Blade.
2. Peel off the old Entrance Mylar, then clean the surface of the attachment area underneath.
3. Clean out the inside of the Unit thoroughly.
4. Attach the Remove Paper Dust Mylar (B0043911) as shown in Fig. 1.
5. Attach the Tape – Entrance Mylar (A2323903) and Entrance Mylar (B0043915) as shown in Fig. 1.

Fig. 1:



6. Attach the Mylar - Drive Roller Entrance (B0043914) to the Transfer Unit Frame, as shown in Fig. 2.

Fig. 2:



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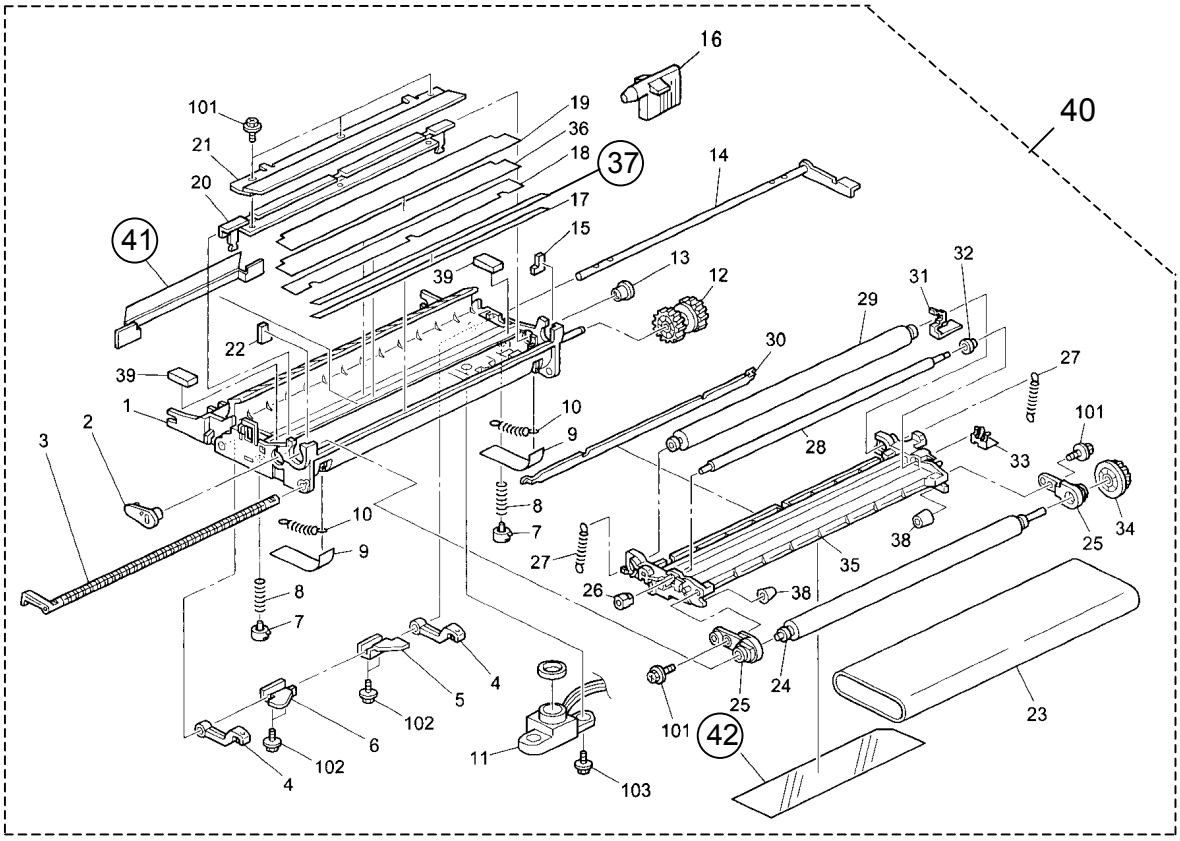
★



The following parts additions and corrections are being issued for all A230/A231/A232 Parts Catalogs.

					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
	B0043911	Mylar - Remove Paper Dust	0-1	-	41	41*
A2323904	B0043915	Entrance Mylar–Transfer Unit	1-1	1	41	37
	B0043914	Mylar – Drive Roller - Entrance	0-1	-	41	42*

***DENOTES NEW ITEM NUMBER**

UNITS AFFECTED:

All A230/A231/A232 copiers manufactured after the Serial Numbers listed below will have the new style (Mylar - Remove Paper Dust, Entrance Mylar–Transfer Unit and Mylar – Drive Roller - Entrance Parts installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s	1B9090XXXX
Gestetner 3245	2B1090XXXX
Gestetner 3235	1B9090XXXX
Ricoh Aficio 340	A768090XXXX
Ricoh Aficio 350	A769090XXXX
Ricoh Aficio 450	A770090XXXX
Savin 9945DP	2B1090XXXX
Savin 9935DP	1B9090XXXX
Savin 9935D	1B8090XXXX

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 070 **05/31/2002**

APPLICABLE MODEL:

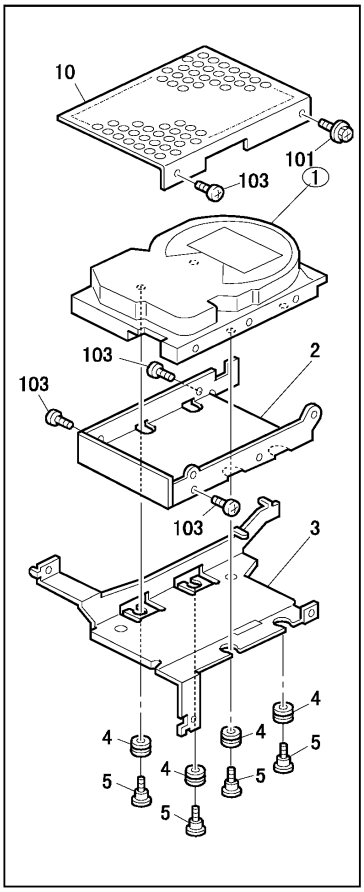
GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: HARD DISK

GENERAL:

The Hard Disk for the A230/A231/A232 has been changed. The following part update is being issued for all A230/A231/A232 Parts Catalogs. Please update your parts catalog with the following information.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A6915862	A6915863	Hard Disk	1-1	0	69	1

UNITS AFFECTED:

The Hard Disk is available as a service part only.

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 071 **10/29/2002**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 17-34 & 17-35 A697 Firmware History

Note: This copy is intended as a master original for reproduction of additional bulletins.

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4.8 ROM HISTORY

A697 Firmware Modification History (3000 Sheet Finisher)			
Description of Modification	**Level**	**Prod. Date**	**Ver.**
Corrects the following: • Modification to allow Chinese paper sizes. • Modification of the start of the shift tray in staple mode. • Corrected the problem of an SC not being displayed even though there was a problem with the paper exit pawl home position sensor during initialization. • If the diagonal staple mode was selected when there was a problem with the stapler rotation motor home position sensor an SC occurred.	A6975656 **A**	July 1998 Production	A
Corrects the following: • To improve the stacking in the shift tray during stapling, the following modifications were implemented. 1. The initial lowering timing of the shift tray is now faster and the stack start time has been modified to allow the shift tray to return to the top position first. 2. The line velocity for the exit roller has been changed from 600 mm/sec to 700 mm/sec. The paper exit pawl speed has also been changed. 3. The timing for lowering the shift tray has been changed to 50 mm/sec after the exit sensor has detected the leading edge of the paper.	A6975656 **B**	July 1998 Production	B
Corrects the following: • When a jam occurs in the finisher, if the jam is not removed, the staple movement motor will not shut off. • When the power save mode command from the main unit is received, the machine initializes.	A6975656 **C**	Sept. 1998 Production	C
Corrects the following: • Occurrences of SC990. • Defective paper exit for LG, DLT, A3 and B4 paper sizes. • Two staples missing when B5 size paper is selected. • Stacking problems occur when paper curls during manual staple mode. • During Shift mode, the exit roller rolls up the paper if the paper curl is large. Modification of the shift tray height in shift mode, exit roller rotation speed and shift tray lowering timing.	A6975656 **D**	Nov. 1998 Production	D
Corrects the following: • While receiving a fax in Energy Saver Mode, the A697 power comes on and initializes. • When stacking with curled paper, the tray will move up and down slightly while the stapler is waiting for the remaining page(s) of a staple set. This slight up and down movement from the tray will tend to align any paper that slides out from the stack.	A6975656 **E**	Not Available	E
Corrects the following: • When the G909 was connected, the main engine was unable to recognize the A697.	A6975656 **F**	Not Available	F
Corrects the following: • Jam codes were not defined for paper jams at or before the entrance sensor.	A6975656 **G**	Not Available	G
Corrects the following: • The stack height sensor mis-detects the height, which causes the exit motor to stop and a paper jam occurs.	A6975656 **H**	Not Available	H

A697 Firmware Modification History (3000 Sheet Finisher)			
Description of Modification	**Level**	**Prod. Date**	**Ver.**
Corrects the following: • If a finisher job is initiated from 5 to 105 seconds after the copier recovers from “Energy Saver Mode”, SC990 or a paper jam occurs.	A6975656 **J**	Not Available	J

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 072 **01/28/2003**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945

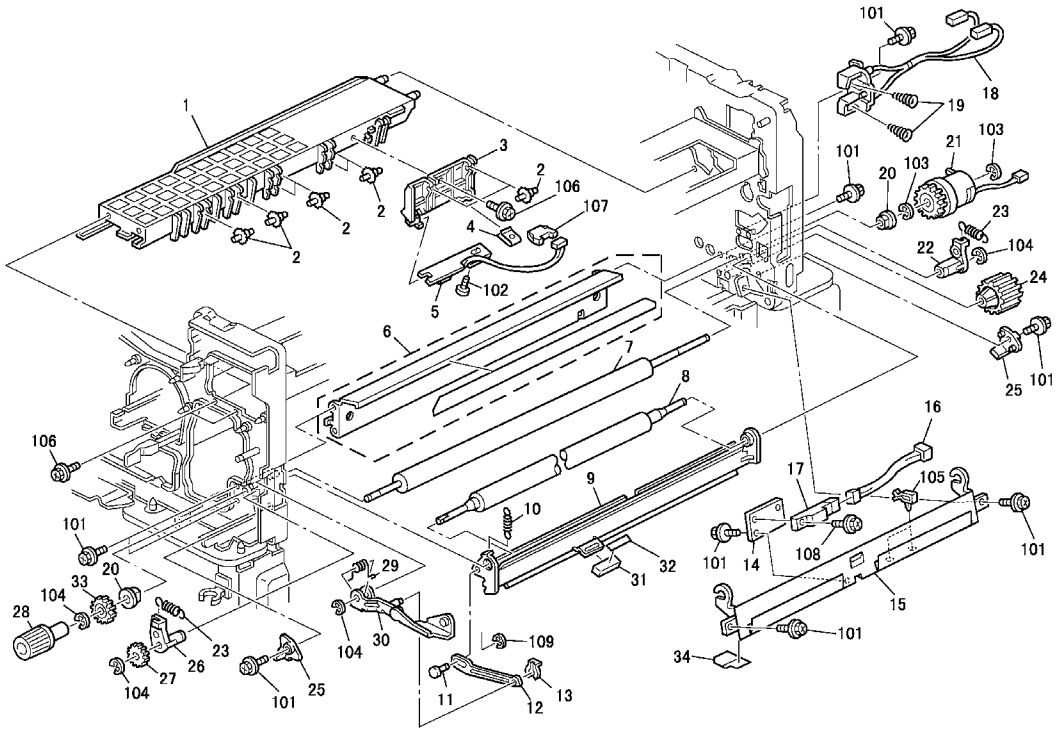
Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PARTS CATALOG UPDATES

GENERAL:

The following parts updates are being issued for all A230/A231/A232 Parts Catalogs.

- **UPDATE 1:** **Spur–** To prevent toner adhering to the spur, the material of the spur has been changed.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2322374	B0042310	Spur	10	0	31	2

Continued…

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UNITS AFFECTED:

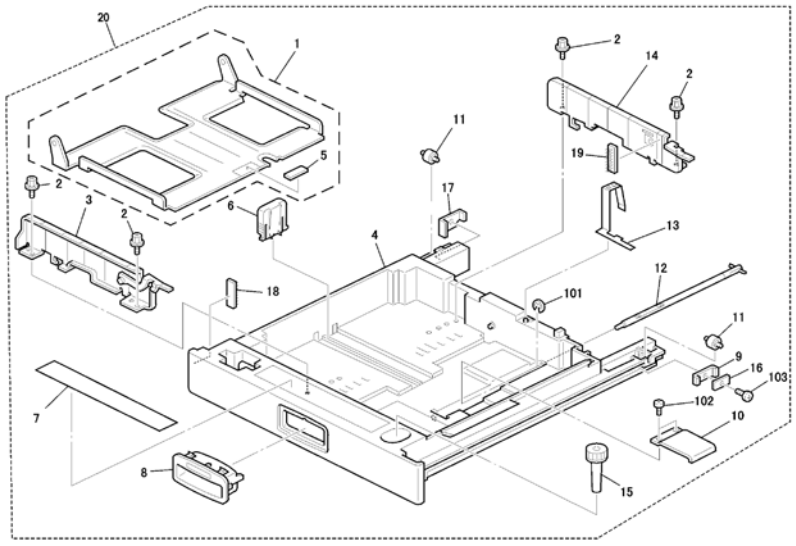
All A230/A231/A232 copiers manufactured after the serial numbers listed below will have the new style spur installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s Savin 9935D	1B8089XXXX
Gestetner 3235 Savin 9935DP	1B9089XXXX
Gestetner 3245 Savin 9945DP	2B1089XXXX
Ricoh Aficio 340	A768089XXXX
Ricoh Aficio 350	A769089XXXX
Ricoh Aficio 450	A770089XXXX

• UPDATE 2:

End Fence – 1. The shape of the end fence edge has been changed so that the user will pinch the hooks in the correct place, allowing the fence to be properly removed. This will ensure that the hook portions do not get caught and break when the user is trying to remove the end fence.

2. The material of the end fence has been changed to a durable type.



					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
AF017020	AF017026	End Fence	1	1	33	6

Continued…

UNITS AFFECTED:

All A230/A231/A232 copiers manufactured after the serial numbers listed below will have the new end fence installed during production.

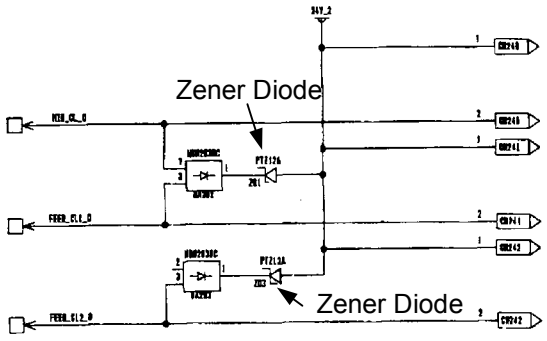
MODEL NAME	SERIAL NUMBER
Gestetner 3235s Savin 9935D	1B88088XXXX
Gestetner 3235 Savin 9935DP	1B9088XXXX
Gestetner 3245 Savin 9945DP	2B1088XXXX
Ricoh Aficio 340	A768088XXXX
Ricoh Aficio 350	A769088XXXX
Ricoh Aficio 450	A770088XXXX

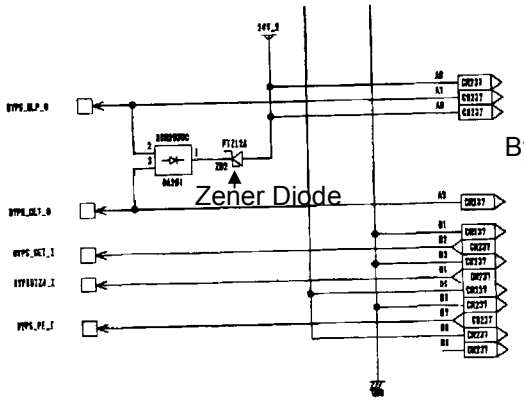
• UPDATE 3:

Paper Feed Board – If a counter electromotive force flows through clutch drive circuits, it can cause the off timing of the clutch to be delayed. This can result in a paper jam.

A zener diode has been added to the drive circuits of the PFB board for the following clutches to ensure that the counter electromotive force does not flow through the circuits:

1. Relay clutch
2. Upper Paper Feed Clutch
3. Lower Paper Feed Clutch
4. By-pass Tray Feed Clutch





					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A2325130	A2325135	PFB Board	1-1	1	59	20

Continued…

UNITS AFFECTED:

All A230/A231/A232 copiers manufactured after the serial numbers listed below will have the new paper feed board installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235s Savin 9935D	1B8087XXXX
Gestetner 3235 Savin 9935DP	1B9087XXXX
Gestetner 3245 Savin 9945DP	2B1087XXXX
Ricoh Aficio 340	A768087XXXX
Ricoh Aficio 350	A769087XXXX
Ricoh Aficio 450	A770087XXXX

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 - 073 **02/06/2003**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: CHARGE ROLLER CLEANING PAD/BRUSH

GENERAL:

The following parts corrections are being issued for all A230/A231/A232 Parts Catalogs.

To increase the efficiency of cleaning the charge roller, a brush roller has replaced the charge roller-cleaning pad. With the introduction of the charge cleaning brush the following parts have been modified.

- Charge Unit Front Arm
- Charge Unit Rear Arm
- Pressure Spring

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A2322356	-	Stepped Screw – M6	1-0	-	39	9
A2322298	-	Bracket – Charge Cleaning	1-0	-	39	10
AA062301	-	Tension Spring	1-0	-	39	11
A2322300	-	Roller - Cleaning	1-0	-	39	12
A2322430		Cleaning Pad	1-0	-	39	13
	G0652330	Brush Roller – Cleaning	0-1	3	39	13
A2322303	G0652321	Front Arm – Charge Unit	1-1	1	39	15
A2322305	G0652326	Rear Arm – Charge Unit	1-1	1	39	23
AA063561	AA063648	Pressure Spring	2-2	1	39	16
A2322403	G0652270	Receptacle – Charge Roller	1-1	3	37	17

NOTE 1: *This only affects PCU Units ordered as service parts.*

NOTE 2: *PCU Units with Cleaning Pads and PCU Units with Cleaning Brushes can be used in all field machines. However, the Cleaning Pad and Cleaning Brush are not interchangeable unless all the related parts are replaced at the same time.*

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

Continued…

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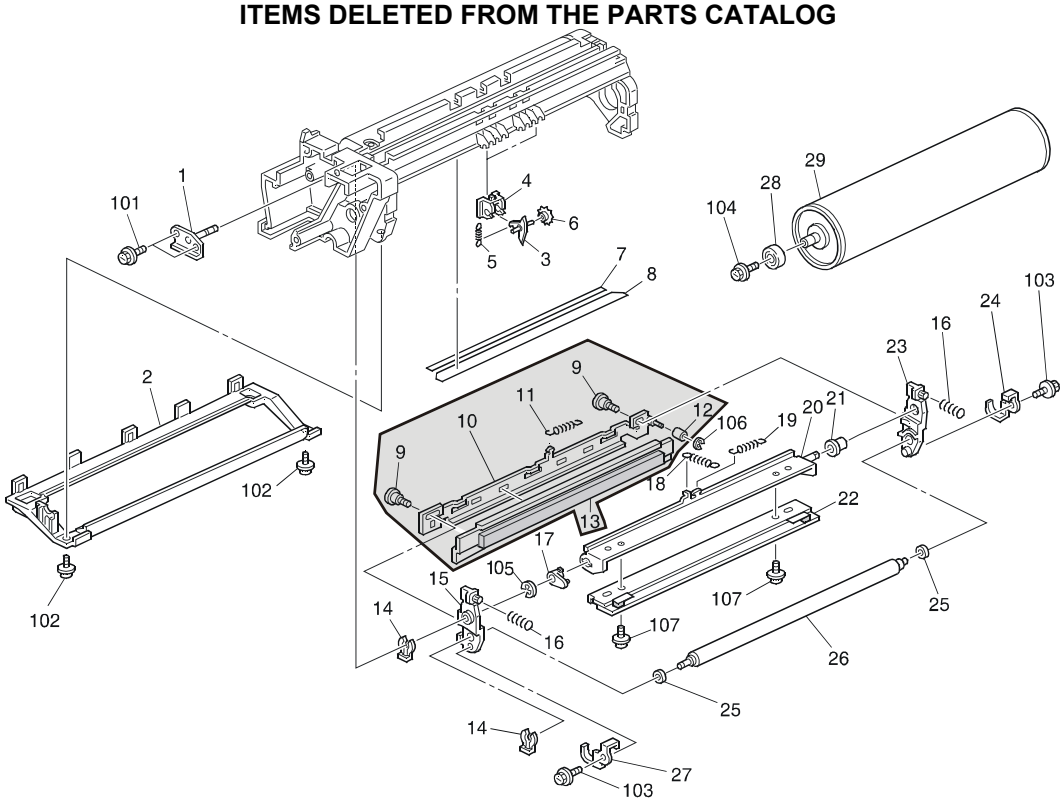
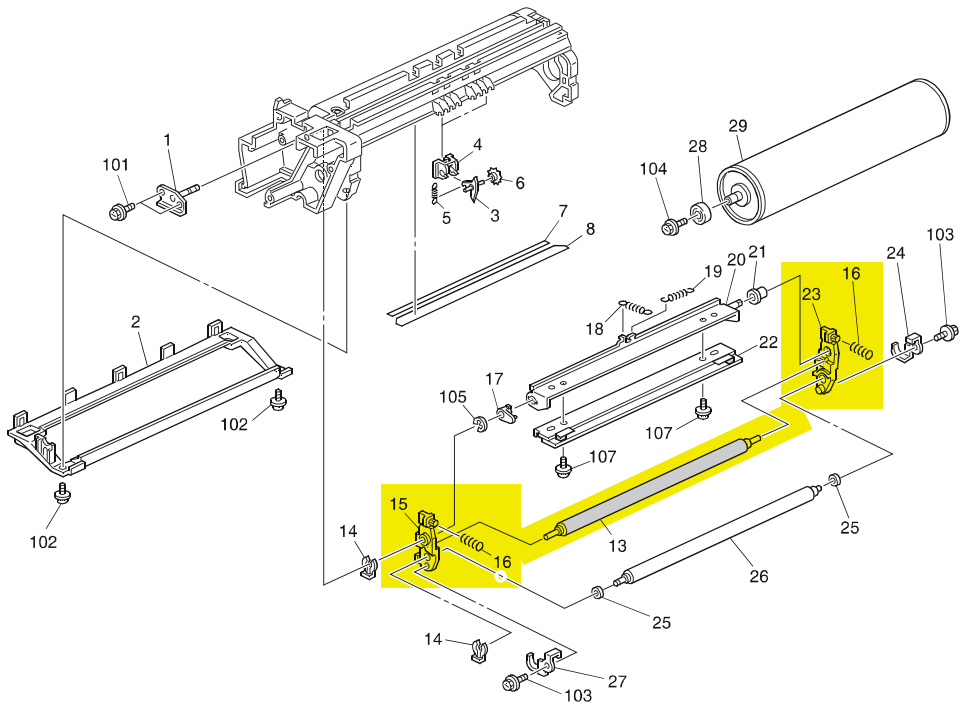
ITEMS DELETED FROM THE PARTS CATALOG

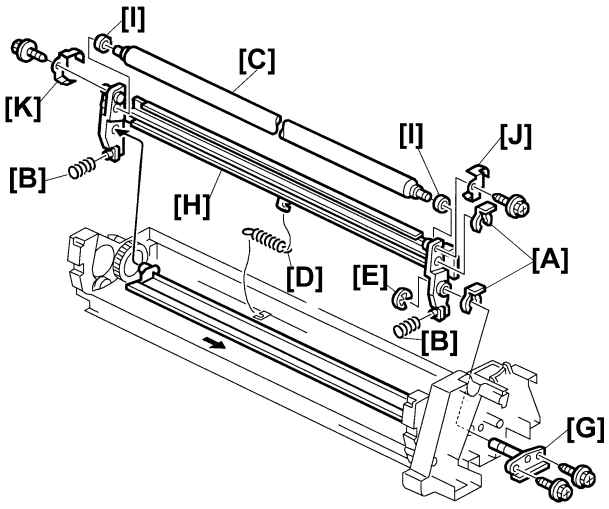


ITEMS ADDED TO THE PARTS CATALOG

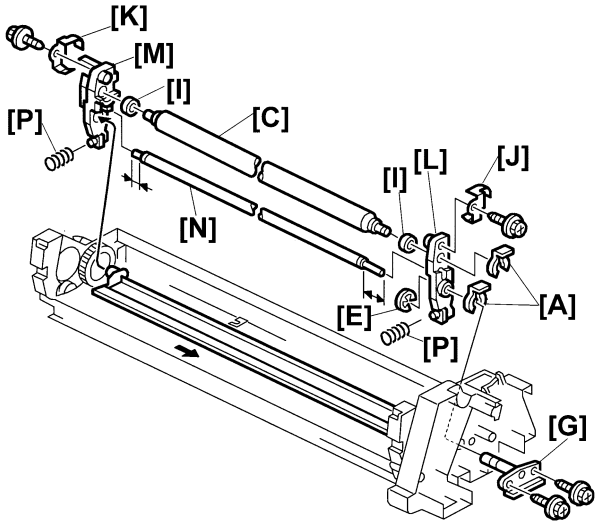


Continued…

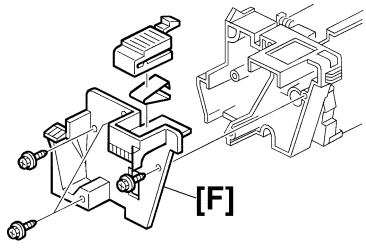
CLEANING ROLLER BRUSH REPLACEMENT PROCEDURE:



1. Remove the Drum. (Refer to 3.11.2 on the service manual)
2. Remove the snap rings [A].
3. Remove the springs [B].
4. Remove the charge roller [C].
5. Remove the spring [D].
6. Remove the E-ring [E]
7. Remove the cover [F].
8. Remove the stud [G].
9. Remove the cleaning pad Ass'y [H].



10. Remove the bushings [I], front terminal [J] and rear terminal [K].
11. Install the front terminal [J], rear terminal [K] and bushing [I] to the new front [M] and rear arm [L].
12. Install the new front arm [L], the rear arm [M], the stud [G], the new brush roller [N] and the charge roller [C]
13. Install the E-ring [E] and the snap rings [A].
14. Install the new springs [P].

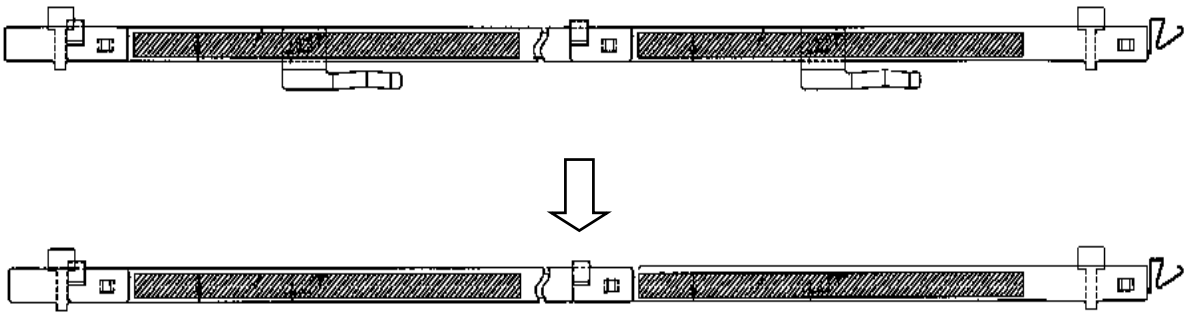


15. Put back the cover [F] and the Drum.

Continued…

Charge Roller Receptacle:

The Charge Cleaning Pad has been changed over to a Brush Roller. As a result, the Charge Cleaning Bracket has been deleted. The Charge Roller Receptacle has been modified to reflect this change.



UNITS AFFECTED:

Available as service parts only.

SERVICE MANUAL INSERT:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- vi & vii — TOC Page Updated Information
- 6-22 — Cleaning Roller Brush Replacement Procedure

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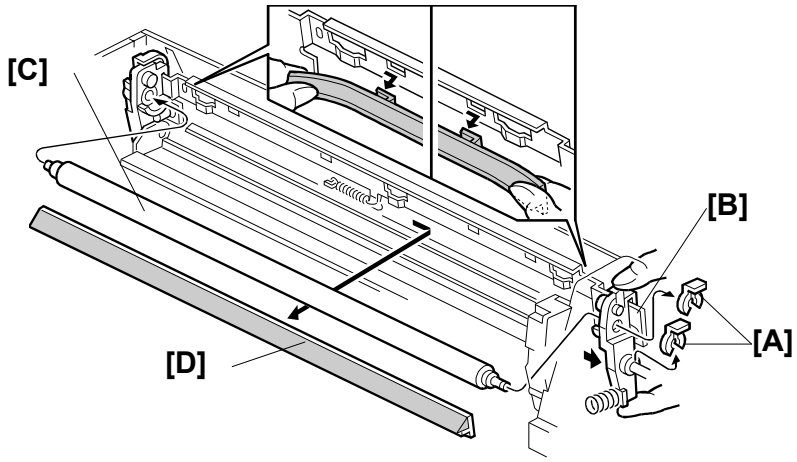
⇒ 6.3.4 CHARGE ROLLER/CHARGE ROLLER CLEANING PAD



1. Remove the drum. (See Drum.)
2. Remove two snap rings [A] and slide out the front charge roller holder [B].
3. Remove the charge roller [C].

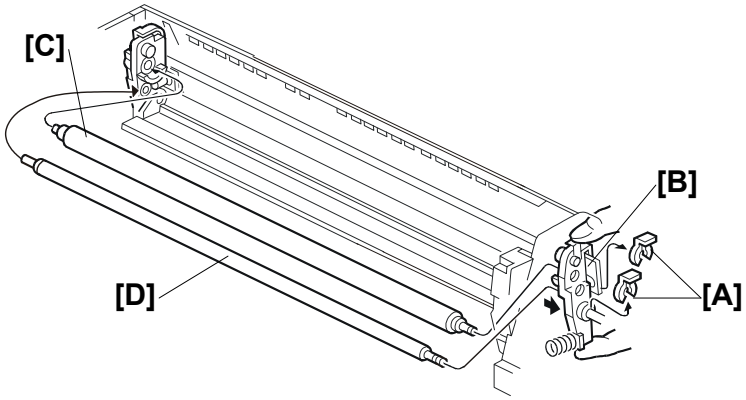
NOTE: Do not touch the charge roller with bare hands.

4. Remove the charge roller cleaning pad [D] (4 hooks).
5. After replacing the charge roller, check the value of SP2-001-1. If it is not at the standard value, change it to the standard value using SP2-001-1.

CAUTION: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.

Standard value: 1630V (A230/A231), 1650V (A232)

⇒ 6.3.4a CLEANING ROLLER BRUSH REPLACEMENT PROCEDURE



1. Remove the drum.
2. Remove two snap rings [A] and slide out the front charge roller holder [B].

NOTE: Do not touch the charge roller with bare hands.

3. Remove charge roller [C] and the charge roller cleaning brush [D].
4. After replacing the charge roller, check the value of SP2-001-1. If it is not at the standard value, change it to the standard value using SP2-001-1.

CAUTION: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.

Standard value: 1630V (A230/A231), 1650V (A232)

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A230/A231/A232 – 074 **03/14/2003**

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945

SUBJECT: SERVICE MANUAL – INSERT

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- 4-53 Updated Information (Service Program Mode)

SERVICE MANUAL

Note: This copy is intended as a master original for reproduction of additional bulletins.

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Class 3 no.	Bit no.	Description	Reading	
			0	1
3 (Registration & others)	7	Zero Cross Signal	Detected	Not detected
	6	Transfer Belt Unit H.P Sensor	Not at home position	At home position
	5	Exhaust Fan Lock Signal	Not locked	Locked
	4	Cooling Fan Lock Signal	Not locked	Locked
	3	Main Motor Lock Signal	Not locked	Locked
	2	Toner Overflow Sensor	Tank full	Tank not full
	1	Cover Open	Cover closed	Cover opened
	0	Registration Sensor	Paper detected	Paper not detected
4 (By-pass)	7	Not used		
	6	Paper End Sensor	Paper detected	Paper not detected
	5	Not used		
	4	Paper Size Sensor 4	See table 1	
	3	Paper Size Sensor 3		
	2	Paper Size Sensor 2		
	1	Paper Size Sensor 1		
	0	Unit Set Signal	Connected	Not connected
5 (Bridge Unit)	7	Not used		
	6	Unit Set Signal	Connected	Not connected
	5	Paper Sensor (Op. Printer Controller)	Paper detected	Paper not detected
⇒	4	Relay Sensor	Paper detected	Paper not detected
⇒	3	Exit Sensor	Paper detected	Paper not detected
	2	Left Cover Switch	Switch pressed (cover closed)	Switch not pressed
	1	Right Cover Switch	Switch pressed (cover closed)	Switch not pressed
	0	Tray Exit Unit Switch	Switch pressed (cover closed)	Switch not pressed
6 (Unit Set)	7	Not used		
	6	F gate Signal	Active	Not active
	5	Height Sensor (Op. Printer Controller)	At feed height position	Not at feed height position
	4	Paper Exit Sensor	Paper detected	Paper not detected
	3	Fusing Unit	Detected	Not detected
	2	Total Counter	Not detected	Detected
	1	Key Counter	Detected	Not detected
	0	Not used		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A681 - 001 **09-22-98**

APPLICABLE MODEL:

GESTETNER – SR720 for 3235S/3235/3245
RICOH – SR720 for Aficio 340/350/450
SAVIN – SR720 for 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: PAPER ROLLED ON SHIFT TRAY

SYMPTOM:

When creating stapled sets of approximately thirty or more originals, the bottom sheets in the stapled stack may curl exiting onto the shift tray.

CAUSE:

The leading edge of the stapled set may catch on the trailing edge of the set already on the tray, causing several of the bottom sheets to curl. Heavier paper sets will generate more friction on the paper set underneath, and cause more curl.

1. Non-staple mode copies will not exhibit this symptom because single sheets of paper are delivered to the shift tray one at a time.
2. Due to the nature of the copy job type in which this symptom occurs, this symptom would be more likely to occur with high volume users with finishing application such as copy shops, rather than with casual users.

SOLUTION:

Install the new version ROM revision E (filename A681FNIE.EXE) which can be downloaded through the Technical Services FTP Site. The new version ROM decreases the exit speed of the A4/11" x 8.5" sideways to drop the paper close to the right frame for easy switch back. (Applicable for more than 11 sheet stapling.).

NOTE: *For more information about the Ricoh Technical Services FTP Site, order the "TECHNOLOGY SOLUTION CENTER (TSC) FTP INTERNET SITE" through normal NSPC channels.*

UNITS AFFECTED:

All SR720 Finishers manufactured after the Serial Numbers listed below will have the new Finisher Main PCB ROM installed during production.

Gestetner SR720	1B48070001
Ricoh SR720	A7728070001
Savin SR720	1B48070001

Continued…

ORDERING PROCEDURE:

To obtain the SR720 Finisher "E" Level ROM kit P/N A6815103E at no charge, please complete and fax the attached form to Technical Services or download the Hex file for local programming via the Ricoh Technical Services FTP Site (refer to Service News and Information No. 428).

SUBJECT:

Fax this entire page in "DETAIL" mode ATTN: Technical Services – Copier

Fax Number: (973) 882-3960

Each serial number given will represent a request for one (1) ROM kit.

NOTE: The ROM kit will be available at no charge for 90 days (Until December 15, 1998).

Finisher Serial Number (s)	
1	
2	
3	

All serial number information will be verified before shipment is made.

NOTE: Ricoh will not issue additional ROM kits to locations that <u>do not</u> return old ROM kits.

NOTE: Old ROM's must be returned within five (5) days to:

Ricoh Corporation
Attn: Technical Services – Copier
155 Passaic Avenue
Fairfield, NJ 07004

PLEASE TYPE OR PRINT CLEARLY.

DEALER NAME:			
ADDRESS:			
CITY:	**STATE:**	**ZIP CODE:**	
ATTENTION:	**PHONE #:**		**FAX #:**
DEALER ACCOUNT NUMBER:			

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A681 - 002 **01/11/2000**

APPLICABLE MODEL:

GESTETNER – SR720 for 3235s/3235/3245
RICOH – SR720 for AFICIO 340/350/450
SAVIN – SR720 for 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SERVICE MANUAL

SUBJECT: SERVICE MANUAL - INSERT

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

• TOC xiv	Updated Information (Table of Contents)
• 16-25	New page (ROM History for A681)

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⇒4.7 ROM HISTORY

A681 Firmware Modification History (1000 Sheet Finisher)			
Description of Modification	**Level**	**Prod. Date**	**Ver.**
Corrects the following: • Paper jams due to an error in the vertical movement of the tray.	A6815103K	NA	K
Corrects the following: • Jams that occur when the door is opened during a staple job. • After the power is turned on, the copier reaches ready status even though the shift tray lower limit sensor is on (and the stack is full). A jam occurs if a copy job is started.	A6815103J	NA	J
Corrects the following: • The mainframe locks up during jam recovery. The frequency of occurrence is extremely low. • The user cancels the staple job when there is only one sheet in the staple tray and the sheet is automatically removed from the tray. A paper jam occurs when the next sheet is fed for stapling.	A6815103H	NA	H
Corrects the following: • The jam detection timing has been changed so the A681 can also be used with the A265 and A267. This change has no effect on the A232 series.	A6815103G	NA	G
Corrects the following: • Stapled paper did not stack straight.	A6815103F	NA	F
Corrects the following: • Paper rolling on the shift tray.	A6815103E	NA	E

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A681 - 003 **03/01/2000**

APPLICABLE MODEL:

GESTETNER – SR720 for 3222/3227/P7027
RICOH – SR720 for AFICIO 220/270/AP2700
SAVIN – SR720 for 9922DP/9927DP/SLP27

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: A681 COMPATIBILITY WITH A265, A267 OR G038

SYMPTOM:

Paper jams in the Bridge Unit of the A265, A267 or G038 when the A681 is installed.

CAUSE:

The incorrect EPROM level (below level "G") is installed in the A681 Finisher.

SOLUTION:

A level "G" EPROM (or higher) **must** be installed on the A681 Main Board when the A681 is installed on the A265, A267 or G038. See the A681 Firmware Modification History on the pages following this bulletin for a detailed list of Firmware modifications for the A681.

UNITS AFFECTED:

All A681 Finishers manufactured after the Serial Numbers listed below will have a "G" level EPROM or higher installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner SR720	1B49070001
Ricoh SR720	A7229061569
Savin SR720	1B49070001

NOTE: The A265/A267 does not require additional memory for installation of the A681 Finisher.

GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow ⇒.

- xiii Updated Information (A265/A267 TOC)
- 17-25 Updated Information (A265/A267 ROM History A681)
- ix, x Updated Information (G038 TOC)
- 15-25 Updated Information (G038 ROM History A681)

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⇒4.7 ROM HISTORY

A681 Firmware Modification History (1000 Sheet Finisher)			
Description of Modification	**Level**	**Prod. Date**	**Ver.**
Corrects the following: • Paper jams due to an error in the vertical movement of the tray.	A6815103K	NA	K
Corrects the following: • Jams that occur when the door is opened during a staple job. • After the power is turned on, the copier reaches ready status even though the shift tray lower limit sensor is on (and the stack is full). A jam occurs if a copy job is started.	A6815103J	NA	J
Corrects the following: • The mainframe locks up during jam recovery. The frequency of occurrence is extremely low. • The user cancels the staple job when there is only one sheet in the staple tray and the sheet is automatically removed from the tray. A paper jam occurs when the next sheet is fed for stapling.	A6815103H	NA	H
Corrects the following: • The jam detection timing has been changed so the A681 can also be used with the A265, A267 or G038. This change has no effect on the A232 series.	A6815103G	NA	G
Corrects the following: • Stapled paper did not stack straight.	A6815103F	NA	F
Corrects the following: • Paper rolling on the shift tray.	A6815103E	NA	E

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FOUR-BIN MAILBOX G518

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A681 Firmware Modification History (1000 Sheet Finisher)			
Description of Modification	**Level**	**Prod. Date**	**Ver.**
Corrects the following: • Paper jams due to an error in the vertical movement of the tray.	A6815103K	NA	K
Corrects the following: • Jams that occur when the door is opened during a staple job. • After the power is turned on, the copier reaches ready status even though the shift tray lower limit sensor is on (and the stack is full). A jam occurs if a copy job is started.	A6815103J	NA	J
Corrects the following: • The mainframe locks up during jam recovery. The frequency of occurrence is extremely low. • The user cancels the staple job when there is only one sheet in the staple tray and the sheet is automatically removed from the tray. A paper jam occurs when the next sheet is fed for stapling.	A6815103H	NA	H
Corrects the following: • The jam detection timing has been changed so the A681 can also be used with the A265, A267 or G038. This change has no effect on the A232 series.	A6815103G	NA	G
Corrects the following: • Stapled paper did not stack straight.	A6815103F	NA	F
Corrects the following: • Paper rolling on the shift tray.	A6815103E	NA	E

Gestetner RICOH SAVIN

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A681 - 004 **10/16/2001**

APPLICABLE MODEL:

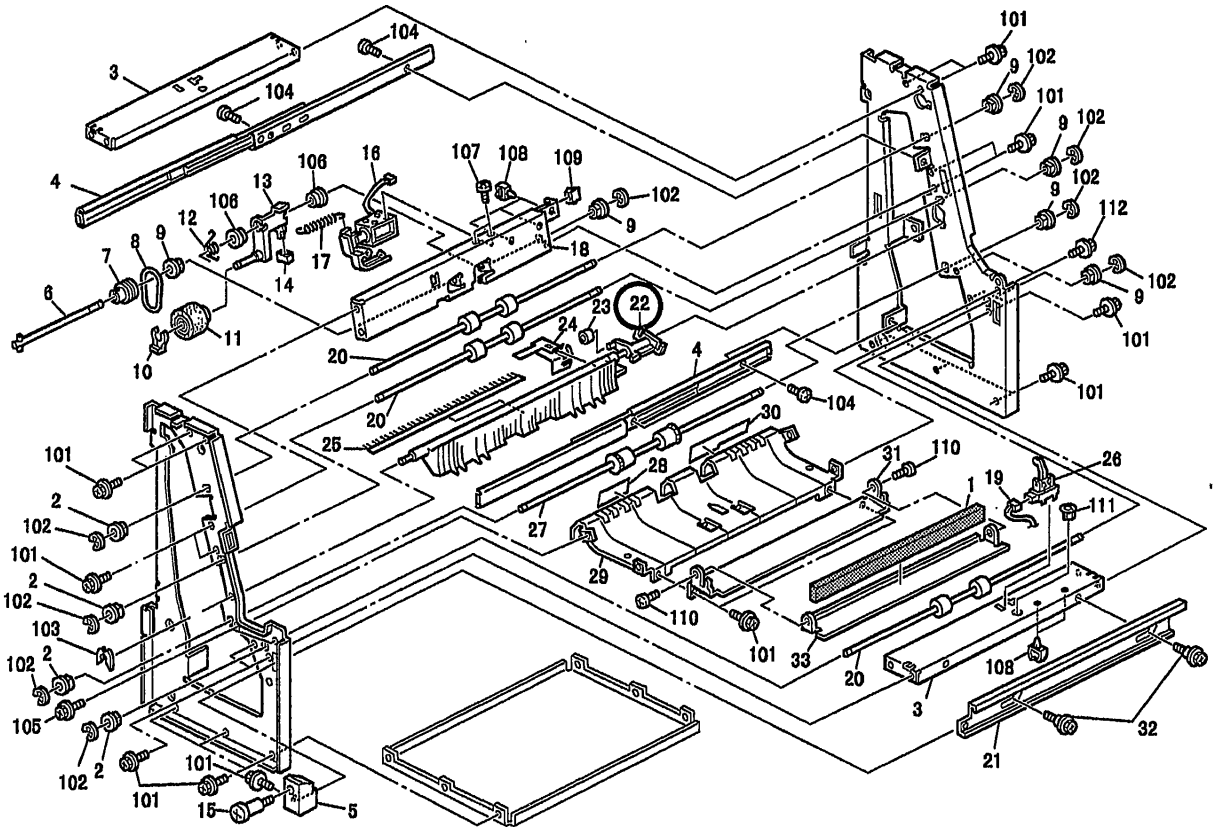
GESTETNER – SR720 Finisher for 3235S/3235/3245
RICOH – SR720 Finisher for AFICIO 340/350/450
SAVIN – SR720 Finisher for 9935D/9935DP/9945P

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: JUNCTION GATE

GENERAL:

The material of the junction gate shaft has been changed to improve its strength and durability. The following parts corrections are being issued for all A681 Parts Catalogs.



Continued…

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					REFERENCE	
OLD PART NO.	**NEW PART NO.**	**DESCRIPTION**	**QTY**	**INT**	**PAGE**	**ITEM**
A6812411	A6812412	Junction Gate	1-1	1	15	22

UNITS AFFECTED:

All A681 Finishers manufactured after the Serial Numbers listed below will have the new style Junction Gate installed during production

MODEL NAME	SERIAL NUMBER
Gestetner SR720 Finisher	A7729030001
Ricoh SR720 Finisher	A7729030001
Savin SR720 Finisher	A7729030001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A681 - 005 **09/23/2002**

APPLICABLE MODEL:

GESTETNER – SR720 Finisher for 3235S/3235/3245
RICOH – SR720 Finisher for Aficio 340/345/250/355/450/455
SAVIN – SR720 Finisher for 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

SUBJECT: STEPPING MOTOR – DC 18W

GENERAL:

The following part number should be corrected. The following part correction is being issued for all A681 Parts Catalogs.

				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
AX040096	AX040056	Stepping Motor – DC 18W	1	9	3

UNITS AFFECTED:

. A681Serial Number cut-in not available at time of publication.

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TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A681- 006 **09/23/2002**

APPLICABLE MODEL:

GESTETNER – SR720 Finisher for 3235S/3235/3245
RICOH – SR720 Finisher for Aficio 340/345/250/355/450/455
SAVIN – SR720 Finisher for 9935D/9935DP/9945DP

Note: This copy is intended as a master original for reproduction of additional bulletins.

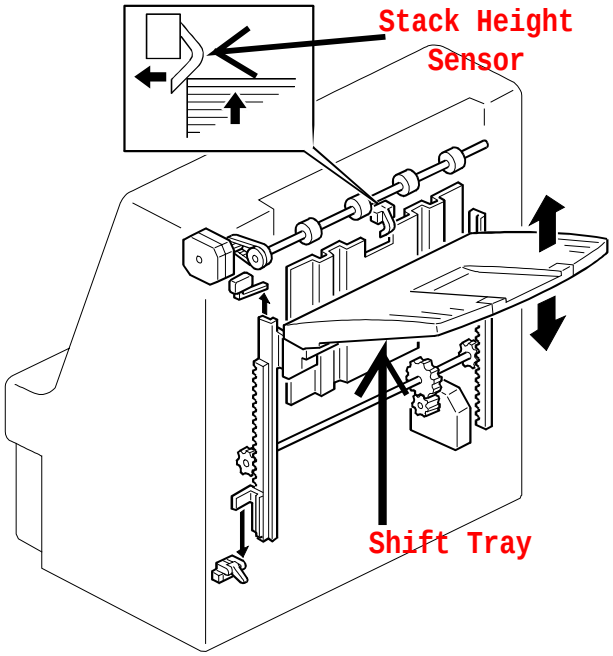
SUBJECT: SLIDER – SHIFT TRAY

GENERAL:

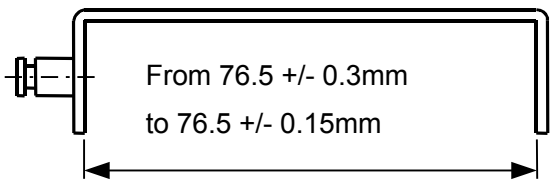
If the length of the Slider for the Shift Tray is near the specification maximum, it sometimes prevents the tray from activating the Stack Height Sensor. To ensure that the sensor is properly activated, the margin of error for the Slider length has been minimized from 76.5 +/- 0.30mm → +/- 0.15mm.

The following parts corrections are being issued for all A681 Parts Catalogs.

					REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	INT	PAGE	ITEM
A6662251	A6813426	Slider – Shift Tray	1-1	1	11	8



Slider – Shift Tray



Continued…

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UNITS AFFECTED:

All A681 finishers manufactured after the Serial Numbers listed below will have the new style Slider – Shift Tray installed during production.

MODEL NAME	SERIAL NUMBER
Gestetner 3235S/3235/3245	1B41020001
Ricoh Aficio 340/345/250/355/450/455	A7721011946
Savin 9935D/9935DP/9945DP	1B41020001

INTERCHANGEABILITY CHART:

0	OLD and NEW parts can be used in both OLD and NEW machines.	2	NEW parts CAN NOT be used in OLD machines. OLD parts can be used in OLD and NEW machines.
1	NEW parts can be used in OLD and NEW machines. OLD parts CAN NOT be used in NEW machines.	3	OLD parts CAN NOT be used in NEW machines. NEW parts CAN NOT be used in OLD machines.
3/S	Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or previously modified, use the new part numbers individually.		

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A681 – 007 **02/11/2003**

APPLICABLE MODEL:

GESTETNER – SR720 FINISHER for 3235S/3235/3245/3222/3227/P7027
RICOH – SR720 FINISHER for AFICIO 340/350/450/220/270/AP2700
SAVIN – SR720 FINISHER for 9935D/9935DP/9945P/9922DP/9927DP/SLP27

SUBJECT: FIRMWARE MODIFICATION

Note: This copy is intended as a master original for reproduction of additional bulletins.

GENERAL:

The latest firmware version can be downloaded at the Technology Solution Center FTP Site http://tsc.ricohcorp.com. Be sure to check the README file for important notes and explanations.

NOTE: *Refer to Facts Line Bulletin # FL002 and Publication Bulletin #023 for more information about the FTP Internet Web Site and EPROM/Flash Card Exchange program.*

A681 FIRMWARE MODIFICATION			
DESCRIPTION OF MODIFICATION	**FIRMWARE LEVEL**	**SERIAL NUMBER**	**FIRMWARE VERSION**
After the tray becomes full and the stack is removed (Stapling mode only), the machine begins feeding out the remaining copies before the tray can lift up to the proper position.	A6815120	Not Available at publication	2.20

NOTE: *The part number for the firmware has changed from A6815103 to A6815120.*

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FIRMWARE HISTORY

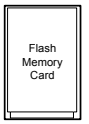
FIRMWARE HISTORY

PUBLISHED DATE: 05/27/2003

PRODUCT CODE: A230/A231/A232

APPLICABLE MODEL:

GESTETNER – 3235S/3235/3245
LANIER – N/A/5235/5245
RICOH – AFICIO 340/350/450
SAVIN – 9935D/9935DP/9945



GENERAL:

The latest firmware version can be downloaded at the Technology Solutions Center FTP Site at http://tsc.ricohcorp.com. Be sure to check the README file for important notes and explanations.

NOTE: *Refer to Facts Line Bulletin # FL002 and Publication Bulletin #023 for more information about the FTP Internet Web Site and EPROM/Flash Card Exchange program.*

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BICU FIRMWARE HISTORY:

DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION	CHECK SUM
Version A, B, & C were for pre-production machines.	A2325113 D	Initial production .	13.1.7 na	--
Corrects the following: • Machine may stall when making a combined copy after printing the archive file list. • The "Menu" key LED stays on even if the copy job is finished. • When pressing the "+" after 400% when using the Zoom key, "* maximum" is displayed. If this condition continues until the auto reset time, a SC990 may occur. • When the copier HDD is defective and the main power switch is turned on, the machine does not generate a SC condition but may stall. • The description of SP 5803-6 has been corrected. • When an original is stored as an archive file, two archive files will be made. • Memory clear procedure corrected. Enter SP5801. Hold down the "1" for over 3 s. • SP2213 display corrected. • Change the determination of the paper size when the machine detects a non-standard original size. Specification change: • If TD Sensor Initialization is preformed during warm-up – SC 542 will occur. Change – TD Initialization can not be performed until warm up is complete.	A2325113 E	April 1998 production .	13.1.8 na	--

DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION	CHECK SUM
Corrects the following: • To improve copy quality (Medaka), the default value of the following SP modes has been changed. Sp2001-1 1650v to 1620v and SP2005-3 1650v to 1620v. • Machine may not reach stand-by mode condition after main switches are turned on of after jam removal due to no zero cross signal detection. Fix - SC547 or SC542 will be generated. • When changing the value of SP6105 (staple position adjustment) and SP6113 (punch hole position adjustment) to a minus value, then turning the machine OFF and ON, the data is not sent to the finisher. • If the electrical counter value is a minus condition, the counters for the fax option do not increment. Specification change: • When A3 or B4 paper size is selected in rotate sort (or stack) mode, the machine will copy with normal sort (or Stack) mode. • Electrical total counter value of brand-new machine has been changed from –2000 to –5000. • During multiple copying and no HDD option installed, the machine can scan originals for fax transmission. • Improved copy quality of light original mode. Gamma curve for the original mode has been changed. • SC900-01 will be generated when the mechanical counter is disconnected.	A2325113 G	May 1998 production .	13.6.3 na	--
Corrects the following: • In the Power Saver Mode, if the front cover is left open for long period, SC542 may appear. • If the front cover is kept open for more than 125 sec. When adjusting SP1-105-01, SC542 occurs.	A2325113 H	June 1998 production .	13.6.3.1 na	--
Corrects the following: • If there is an A3/11x17 jam in the duplex unit, the jam location indicator “C” may also light although there is no paper there. • Fusing lamp may not turn off when a non-feed jam occurs.	A2325113 J	August 1998 production .	13.6.4.1 na	--

DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION	CHECK SUM
Corrects the following: • SP5001 – SP5401 will not print out on SMC printout. • In a SC condition – Memory All Clear (SP5801) does not function. • After a jam condition has been cleared, pressing the Start key does not resume copying	A2325113 K	N/A	13.6.8 na	--
For factory purpose only. Not released.	A2325113 L	N/A	13.6.9 na	--
Corrects the following: • After resetting a SC condition, incoming Fax messages will not print. • A false fusing SC may be detected after resetting a fusing SC condition. • Registration roller may not stop rotating if the leading edge of the copy is detected twice at the registration sensor.	A2325113 M	N/A	13.6.11 na	--
Corrects the following: • Printing image improved in smoothing mode and the printing speed has been increased in the Electronic Sort Mode when printing with 300DPI. • SC321 may be displayed due to incorrect timing of image transfer from the main frame to the printer controller. • A printing error may occur when printing 250 sheets or more to the SR720. • The ADF can not function when SP 4303 is set to 1. • The LED for the original set sensor lights when a fax message is received in night mode. • The paper end indicator erratically lights in the Enhanced Image Mode with no HDD installed.	A2325113 N	Not cut into production .	13.6.19 na	- -
• Required from proper Print Controller operation. • Incoming fax messages cannot be printed out in Night Mode. • Can not reset “Original on glass” indication when SP4303 is set to ‘1”.	A2325113 P	January 1999 production .	13.6.20 na	--

DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION	CHECK SUM
Corrects the following: • Jam Reset - When a "C" jam occurs, opening doors other than the front or right door can reset the jam. Modified 'so that the "C" jam can only be reset by opening the front or right door. • Bin Tray Motor abnormal operation - The Exit Motor Off signal is misread as ON so the motor continues to switch ON/OFF. • Incorrect detection of Door Open - The serial data from the 1st bin tray is misdetected as door open/closed so machine initialization occurs, if this misdetection occurs when paper is fed, a jam occurs. • Online added - [Online] has been added for the printer fonts for the China/Taiwan machines. Please install this version when adding the printer for the China/Taiwan machines. • Characters from registered fonts cannot be displayed - The registered fonts are not displayed on the Chinese machines during 4-line displays. Please install this version when adding the Scanner option on the Chinese/Taiwan/Asian machines. • English display errors in SP Mode - SP2301, 2309: Changed "Toner" to "Trans." SP2209-002: Changed "Tonert" to "Toner."	A2325113 Q	N/A	13.6.23 na	--
Corrects the following: • C" jam occurs, opening the front or right door can clear the jam message display. ***After modification*** The "C" jams can only be cleared by opening the right door. <u>Note:</u> As part of the modification, one right door interlock switch has been added and one front door interlock switch has been removed. In addition, SP5957 has been added to allow usage of either the old or new interlock switches. If using the old interlock switch, please set the SP5957 to 0. If using the new switch, please set SP5957 to 1. If SP5957 is not set properly, the 'door open' Panel display may not function properly and the toner may not be fed properly after toner bottle replacement.	A2325113 R	N/A	14.1	--

…continued

DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION	CHECK SUM
• CONDITION: When the sensor detects Toner, the “Near Full” message is immediately displayed. After the Toner signal has been on for 1000 copies, the machine shuts off. Once the Toner signal disappears, the “Near Full” message is no longer displayed and the counter is reset. *After modification:* After the toner signal has been on for 500 consecutive copies, the “Near Full” message is displayed. After the “Near Full” message has been displayed for 1000 copies, the machine shuts off. Once the toner signal disappears, the counter is reset. • Dirty Background: There is a tendency for a ‘dirty’ background or leading edge to develop after the machine has not been used for a long while. There is also a tendency for increased image density. These tendencies are due to the decreased turboelectric charge of the Toner. • The initial machine warm-up operations stop if one or more of the doors to the option units are open (e.g.1 bin tray, finisher). The machine warm-up does not restart after closing the doors. • When in user code mode, after entering the power save mode and then exiting, the counter does not count the number of copies the user makes. • Using the Norwegian Language, when the machine should display 'Copying will start after warm up' in Norwegian, it is displayed in French.				
Conditions: • The toner collection bottle becomes full with toner, causing toner to spill out. <u>Countermeasure:</u> Shortening of the time that the transfer belt is in contact with the drum. • The default value for recovery time for low-power mode has been changed from 30 to 20 sec (Machine temp. 145° to 157°C). Since recovery starts at a higher temperature, the machine has more leeway in attaining ready status.	A2325113S	NA	14.2	--

…continued

DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION	CHECK SUM
• Occasional occurrence of SC542 after the power is turned on in cold conditions. Countermeasure: Change in the timing of the detection of the fusing temperature. *35 CPM machines: from 125 to 135 sec.* *45 CPM machines: from 125 to 145 sec.*				
Conditions: - Switching on the machine in cold condition. - Setting original and pressing start key during machine warm-up. The French message then appears in the display. • SP2207 displayed a spelling error. *After modification* Corrected spelling to “Forced”. Corrects the following • When SC101 occurs during a Fax transmission the machine prints a blank page. The transmission results are then reported as normal. The first page is blank and an SC101 message is displayed. Countermeasure: No actual transmission will take place during memory transmission. In the case of immediate transmission, the transmission will be interrupted and an error will be reported. • The Scanner software was also modified so that the driver in use displays an error message. • When a fusing jam occurs, the jammed paper may not be visible to the operator and a service call may result. Countermeasure: The detection of fusing jams has been modified so that the paper will stop at a point where the trailing edge is visible. Wrong language displayed. When in French mode the display for a one bin open cover is in German	A2325113 T	NA	14.3	--

DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION	CHECK SUM
Corrects the following: • In machines without the Image Enhancement kit, the following can occur after the paper end condition is reached: - The machine waits for the next sheet of paper to be fed from the tray - An SC321 occurs. • An SC990 occurs 1- No Hard Disk installed. 2- Firmware v 14.3 installed 3- Duplex Mode 4- Original on glass, press Start 5- Original in ADF, press Start • After making a copy from the glass, no copies could be made from the DF. "Original is left on glass…Remove original" is displayed when an original is set in the DF. • Some parts of "Adjust Image" screen are displayed in German even though Dutch is set as the language. • Some parts of "Adjust Image" screen are displayed in English even though Spanish is set as the language.	A2325113 V	December 1999 production	14.4	--
Corrects the following: • When the main power switch is turned on or the machine recovers from Energy Saver Mode, an SC990 (followed by SC542) occurs before the target fusing temperature is reached. • When the G909 Mailbox has been selected as the output tray when the machine recovers from Energy Saver Mode, a jam occurs at the G909 entrance. This is because the G909 is not recognized by the mainframe. • The thermistor output is unstable when the main power is turned on or the machine recovers from Energy Saver Mode in a low-temperature environment. This causes an SC546 to occur. • An SC990 occurs when a print job is cancelled at a certain point during the job.	A2325113 W	Not Available	14.5	--

DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION	CHECK SUM
Corrects the following: • The following SP mode displays have been changed: "Serviceman" → "Service". "Salesman" → "Sales". • In the following 2 cases, the leftover page of a 2 in 1 or 4 in 1 job (which should be blank) contains part of the image data of the previous page. *Case 1: SIMM Memory (8MB) not installed. Paper size is B4 or larger 2 in 1. Vertical transport of original. Amount of originals is an odd number. *Case 2: SIMM Memory (8MB) not installed. Paper size is B4 or larger 4 in 1. Vertical transport of original. The amount of originals are a multiple of 4. • The following occurrences of SC350-3 have been corrected: *After SP2210 (ID Detection Interval) is set to 1, and two sheets are individually set and fed from the bypass tray. *After SP2210 (ID Detection Interval) is set to 2 or 3. SC occurs at the 4th and 6th sheets, respectively. • One line of an SC message was displayed in German, even though the display language was set to French.	A2325113 X	Not Available	14.6	--
Corrects the following: SC304. **NOTE:** It is necessary to change SP2001-2 (Charge Roller Bias Adjustment) from 350 400, and change SP2005-4 (Charge Roller Bias Correction) from 2000 1700.	A2325113 Z	Not Available	14.8	43E0

FIRMWARE HISTORY

PUBLISHED DATE: 06/12/2003

PRODUCT CODE: G909

APPLICABLE MODEL:

GESTETNER - CS360 MAILBOX for 3235S/3235/3245/3235E/3245E/3265/3255 /3355/3370/3502/4002/3502P/4502P/P7045/P7145

LANIER - CS360 MAILBOX for 5135/5235/5245/5435/5445/5265/5255/5455/5470 /5635/5645/NA/NA/2045/2145

RICOH - CS360 MAILBOX for AFICIO 340/350/450/350E/450E/650/550/551/700 /1035/1045/1035P/1045P/AP4500/AP4510

SAVIN - CS360 MAILBOX for 9935DS/9935DP/9945DP/9935DPE/9945DPE /9965DP/9955DP/2055DP/2070DP/2535/2545/2535P/2545P/SLP45

Flash Memory Card

FIRMWARE

GENERAL:

The latest firmware version can be downloaded at the Technology Solutions Center FTP Site at http://tsc.ricohcorp.com. Be sure to check the README file for important notes and explanations.

NOTE: *Refer to Facts Line Bulletin # FL002 and Publication Bulletin #023 for more information about the FTP Internet Web Site and EPROM/Flash Card Exchange program.*

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FIRMWARE HISTORY:

Part Number	Version	Check Sum	Production
G909 0339A	1.3		February 2000 production
G909 0339E	1.7	CB4D	February 2001 production
G909 0339F	1.9	1FB3	September 2001 production
G909 0339G	2.0	C8E9	February 2002 production

FIRMWARE MODIFICATIONS:

Symptom Corrected	Version
First lot of mass production	1.0
Changed to enable the CS360 to work on the A292/A293.	1.3
-When both the Finisher and the Mailbox are connected to the B003 series, the copier does not detect the finisher. -The Finisher motor does not stop following a jam at the Mailbox, causing SC990 and a Finisher jam to be generated.	1.7
When both the SR31 and Mailbox are connected to the A292/A293, sometimes a “Finisher jam” is generated by the chattering of the Mailbox exit sensor.	1.9
Machine does not return to Ready status even after the operator clears a proof-tray jam.	2.0