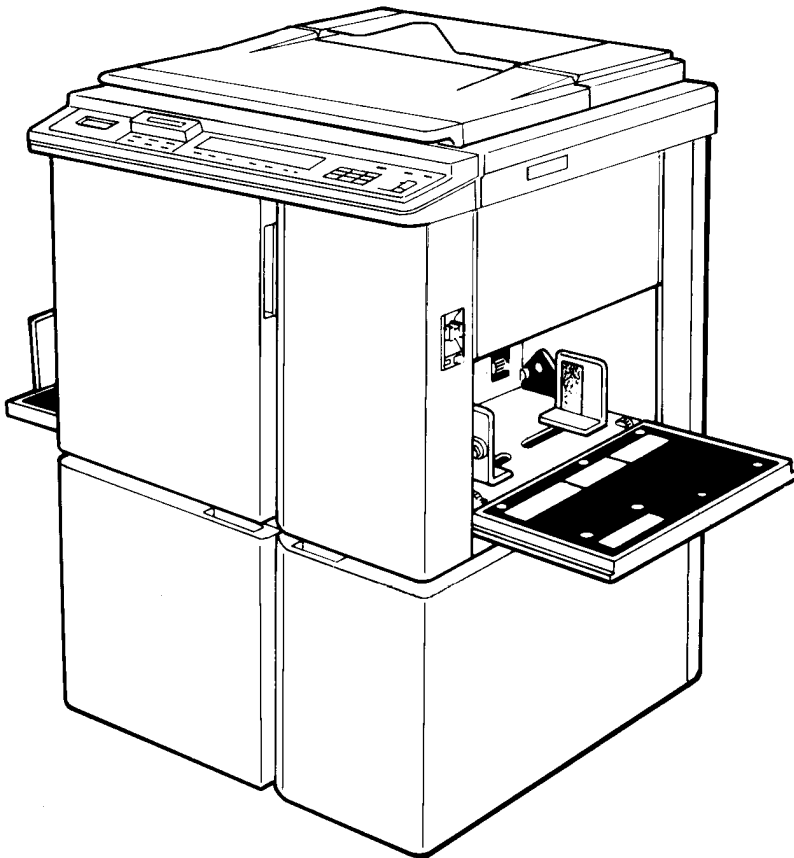# RICOH PRIPORT
VT3600/2600

SERVICE MANUAL

IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the power cord is unplugged.

2. The wall outlet should be near the copier and easily accessible.

3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.

HEALTH SAFETY CONDITIONS

1. If you get ink in your eyes by accident, try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

2. If you ingest ink by accident, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The printer and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Dispose of replaced parts in accordance with local regulations.

2. Used ink and master should be disposed of in an environmentally safe manner and in accordance with local regulations.

– CAUTION –

The RAM pack has a lithium battery which can explode if handled incorrectly. Replace only with same RAM pack. Do not recharge or burn this battery. Used RAM packs must be handled in accordance with local regulations.

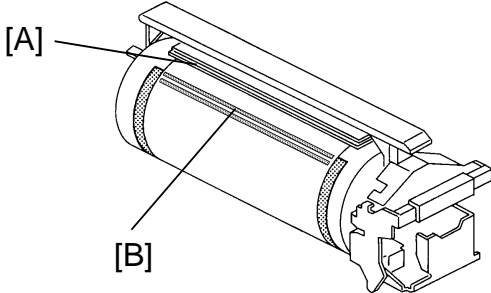# SECTION 1

OVERALL MACHINE INFORMATION

1. SPECIFICATIONS

	C218 Model	C219 Model
Configuration:	Desk top	
Master Processing:	Digital	
Printing Process:	Fully automatic one-drum stencil system	
Original Type:	Sheet/Book	
Original Scan Area Size:	Maximum: 307 mm x 432 mm (12.0" x 17.0")	
Reduction Ratio:	LT version: 93%, 77%, 74%, 65% A4 version: 93%, 87%, 82%, 71%	
Enlargement Ratio:	LT version: 155%, 129%, 121% A4 version: 141%, 122%, 115%	
Image Mode:	Line/Photo/Sharpen	
Zoom:	From 50% to 200% in 1% steps	
Color Printing:	Drum unit replacement system (red, blue, green and brown)	
Master Feed/Eject:	Roll master automatic feed/eject	
Leading Edge Margin:	8 ± 3 mm (0.32" ± 0.12")	5 ± 3 mm (0.20" ± 0.12") mm
Print Paper Size:	Maximum: 325 mm x 447 mm (12.7" x 17.5") Minimum: 90 mm x 148 mm (3.6" x 5.8")	
Printing Area:	Maximum: 290 mm x 412 mm (11.4" x 16.2") at 23°C/65% RH (A3/DLT drum) Maximum: 290 mm x 204 mm (11.4" x 8.0") at 23°C/65% RH (A4/LT drum)	Maximum: 250 mm x 355 mm (9.8" x 14.0") at 23°C/65% RH (for Europe, Asia) Maximum: 210 mm x 355 mm (8.3" x 14.0") at 23°C/65% RH (For N.America)
Print Paper Weight:	47.1 g/m^2 to 209.3 g/m^2 (12.5 lb to 55.6 lb)	
Printing Speed:	60, 75, 90, 105, 120 sheets/minute (5 steps)	60, 75, 90, 110, 130 sheets/minute (5 steps)
First Print Time:	38 s/A3/DLT (with "L" drum) 35 s/A4/LT (lengthwise with "L" drum) 26 s/A4/LT (with "S" drum)	36 s/B4 (with "M" drum) 33 s/A4 (lengthwise)
Paper Feed Table Capacity:	1000 sheets (75 g/m^2, 20 lb)	
Paper Delivery Table Capacity:	1000 sheets (75 g/m^2, 20 lb)	
Power Source:	120 V, 60 Hz, 4.1 A (for N.America) 220/240 V, 50 Hz, 2.1 A (for Europe, Asia)	120 V, 60 Hz, 3.6 A (for N.America) 220/240 V, 50 Hz, 2.0 A (for Europe, Asia)
Power Consumption:	120 V, 60 Hz, 374 W (for N.America) 220/240 V, 50 Hz, 380 W (for Europe, Asia)	120 V, 60 Hz, 325 W (for N.America) 220/240 V, 50 Hz, 322 W (for Europe, Asia)
Weight:	128 kg (282.2 lb) Cabinet: 23.5 kg (51.8 lb)	120 kg (265.0 lb) Cabinet: 23.5 kg (51.8 lb)

	C218 Model	C219 Model
Dimensions (W x D x H):	Stored: 719 x 698 x 644 mm (28.3" x 27.5" x 25.4") Set up: 1331 x 698 x 644 mm (52.4" x 27.5" x 25.4") Cabinet: 1331 x 698 x 1070 mm (52.4" x 27.5" x 42.1")	Stored: 719 x 698 x 644 mm (28.3" x 27.5" x 25.4") Set up: 1331 x 698 x 644 mm (52.4" x 27.5" x 25.4") Cabinet: 1331 x 698 x 1070 mm (52.4" x 27.5" x 42.1")
Original Scanning Time:	3 ms/line	
Pixel Density:	400 dpi	
Master Eject Box Capacity:	50 masters with "L" drum 90 masters with "S" drum	35 masters
Paper Separation:	Friction roller/center separation system	Friction roller/center separation system
Feed Table Side Plate Movement Distance:	88 mm to 336 mm (3.46" to 13.2")	88 mm to 336 mm (3.46" to 13.2")
Paper Feed Roller Pressure:	Normal position 300 g Thick paper position 600 g	Thin paper position 250 g Normal position 400 g Thick paper position 550 g
Separation Roller Pressure:	Normal position 125 g Weak position 50 g	Normal position 125 g Weak position 50 g
Separation Plate Pressure:	Weak 10 g Normal 20 g Strong 1 40 g Strong 2 60 g	Weak 10 g Normal 20 g Strong 1 40 g Strong 2 60 g
Side Registration:	±10 mm	
Vertical Registration:	±20 mm	
Paper Table Raising/Lowering Speed:	22 mm/s (50 Hz) 26 mm/s (60 Hz)	
Ink Supply:	Automatic ink supply system	
Press Roller Pressure:	12.5 ± 0.5 kg	10.5 ± 0.5 kg (for B4 drum) 10.0 ± 0.5 kg (for LG drum)
Paper Delivery:	Air knife/vacuum delivery	
Delivery Side Plate Movement Distance:	80 mm to 327 mm (31.5" to 12.9")	
Print Counter:	7 digits	

Noise Emission:	Less than 74 dB
	Printing (Average):
	   60 rpm less than 64 dB
	   90 rpm less than 67 dB
	   120 rpm less than 72 dB
		Printing (Average):
		   60 rpm less than 64 dB
		   90 rpm less than 69 dB
		   130 rpm less than 74 dB

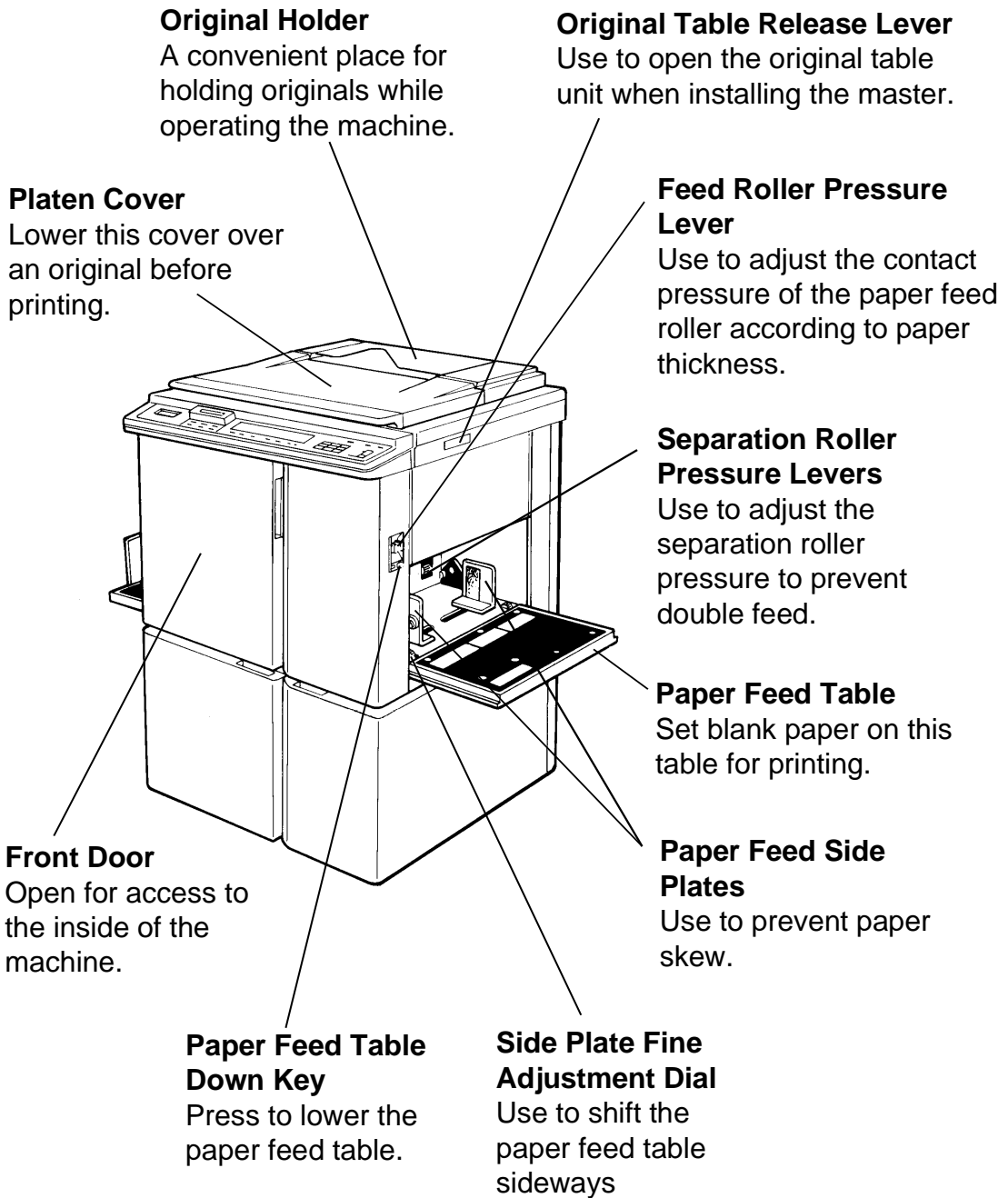|	C218 Model	C219 Model
Supplies:	Master 　Thermal master 320 mm width 　225 masters/roll 　Master length 540 mm/master 　Max run length 2000 prints Ink 　800 cc ink pack (black) 　500 cc ink pack 　(red, blue, green, brown)	Master 　Thermal master 280 mm width 　250 masters/roll 　(VT-II M master) 　Thermal master 240 mm width 　250 masters/roll 　(VT-II S master) 　Master length 480 mm/master 　Max run length 2000 prints Ink 　800 cc ink pack (black) 　500 cc ink pack 　(red, blue, green, brown)

Overall Information

2. DIFFERENCES BETWEEN THE #C210 MODEL AND #C218/C219 MODELS

No.	Item	Remarks
1	Scanner	A book type scanner is used (A3 size exposure glass).
2	Operation Panel	The image shift key has been changed to the margin erase key, which is a new feature added for the C218/C219 models.
3	Thermal Head	The thermal elements used in C218/219 models are finer than those used in the C210 model. This is to reduce ink set-off on the back sides of copies.
4	Printing Speed	The print speed of 40 cpm is not used in C218 /C219 models. This reduces ink set-off, which is most likely to occur at low printing speeds.
5	Drum Connector	To ensure drum connection, a drum lock lever is added inside the front door. To remove the drum from the machine, the drum release lever must be pulled up to disconnect the drum connector.
6	Drum	The rubber strip [A] has been added to the master clamper and the master stopper [B] (2 strips for C218, 1 strip for C219) has been added to the surface of the drum. This is to reduce master slipping when a high volume is printed from the same master.
7	Ink Detection Board	The location of the ink detection board has been changed from the upper side to the right side of the drum shaft. The ink type switch which was not used (it was always set to the oil type setting) has been removed.
8	Paper Feed Table	The paper table and the delivery table open/close detection is done separately to enable paper table lowering regardless of whether the delivery table is open or closed (C218 model). Delivery table open/close detection is not available for the C219 model.

Printing Speed table (item 4):

Model	Printing Speed				
	1	2	3	4	5
C210	40	60	80	100	120
C218	60	75	90	105	120
C219	60	75	90	110	130

[A]

[B]

9	SP Mode (Thermal Paper Mode)	To test the thermal head, SP Mode 92 has been added to make a test print on the thermal paper without the master clamp process.

SP-MODE PROGRAM	92	Thermal Paper Mode 0: No 1: Yes 1

10	SP Mode (Sensor Voltage)	SP modes 135 to 138 have been added to indicate the sensor voltage on the operation display. SP Mode No. 135: First Paper Exit Sensor SP Mode No. 136: Second Paper Exit Sensor SP Mode No. 137: Master Eject Sensor SP Mode No. 138: Drum Master Detection Sensor
11	Make-up Mode	The image make-up mode has been made into an option. To enable this mode, the IPU board must be replaced. For the C218 model, up to 4 command sheets can be given for an original. For the C219 model, up to 2 command sheets can be given for an original.

The following item is a difference only for the #C218 model.

12	Photo Mode	The Photo Data Compensation Processor has been changed to improve image quality in the Photo mode.

The following items are differences only for the #C219 model.

13	Original Size Detection	The original size detection is eliminated for the C219 model.
14	Paper Return Mechanism	The paper return mechanism has been eliminated for the C219 model.
15	Paper Feed	The paper feed pressure can be adjusted in three steps for the C219 model.
16	Wing Guide (Delivery)	The wing guide adjustment mechanism has been eliminated for the C219 model.
17	Air Knife Motor	The number of air knife motors has been changed from 3 to 2.
18	Second Feed Roller	The number of rollers on the second feed roller shafts has been changed from 5 to 3.
19	Master Eject Roller	The number of rollers on the master eject roller shafts has been changed from 5 to 4.

3. GUIDE TO COMPONENTS

Original Holder
A convenient place for holding originals while operating the machine.

Original Table Release Lever
Use to open the original table unit when installing the master.

Platen Cover
Lower this cover over an original before printing.

Feed Roller Pressure Lever
Use to adjust the contact pressure of the paper feed roller according to paper thickness.

Separation Roller Pressure Levers
Use to adjust the separation roller pressure to prevent double feed.

Paper Feed Table
Set blank paper on this table for printing.

Front Door
Open for access to the inside of the machine.

Paper Feed Side Plates
Use to prevent paper skew.

Paper Feed Table Down Key
Press to lower the paper feed table.

Side Plate Fine Adjustment Dial
Use to shift the paper feed table sideways

Master Eject Unit Open Button
Press to remove misfed paper or a misfed master.

Main Switch
Use to turn the power on or off.

Master Eject Container Cover
Open when removing the master eject box.

Paper Delivery Side Plates
Use to align the prints on the paper delivery table.

Paper Delivery End Plate
Use to align the leading edge of prints larger than A4, 81/2" x 11".

Small Size Paper Delivery End Plate
Use to align the leading edge of prints that are A4, 81/2" x 11" or smaller.

Original Table
Place the originals on this table.

Paper Delivery Table
Completed prints are delivered here.

Master Cut Button
Press this button to cut the master paper leading edge after installing a new master roll.

Pressure Release Lever
Use to install the master roll.

Operation Panel
Operator controls and indicators are located here.

Drum Rotation Button
Press to replace the drum.
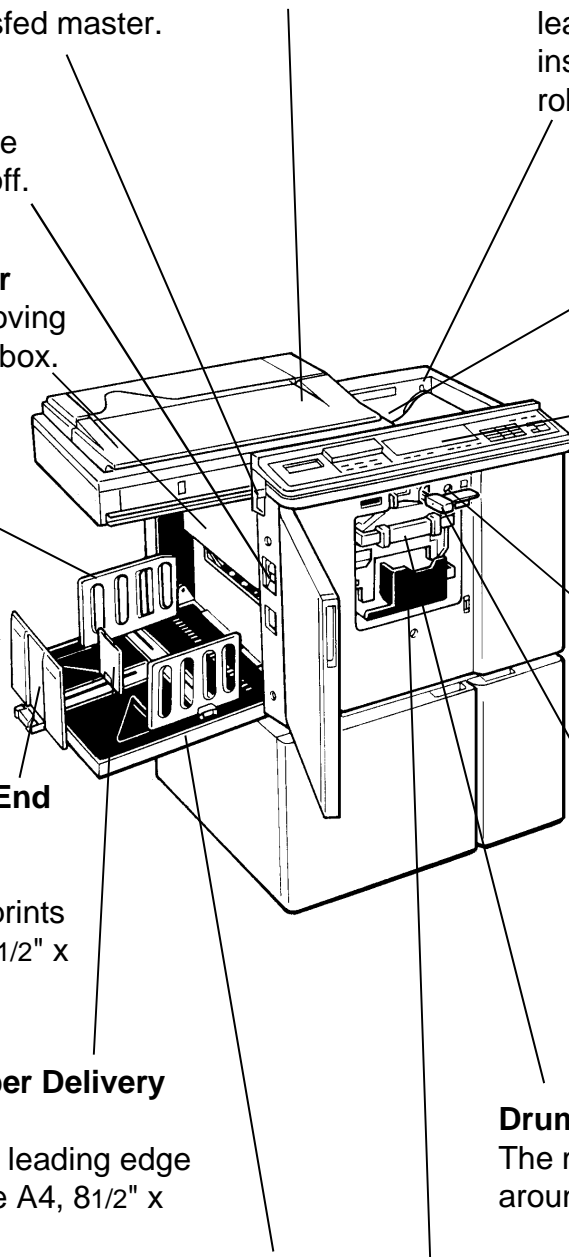
Drum Unit Lock Lever
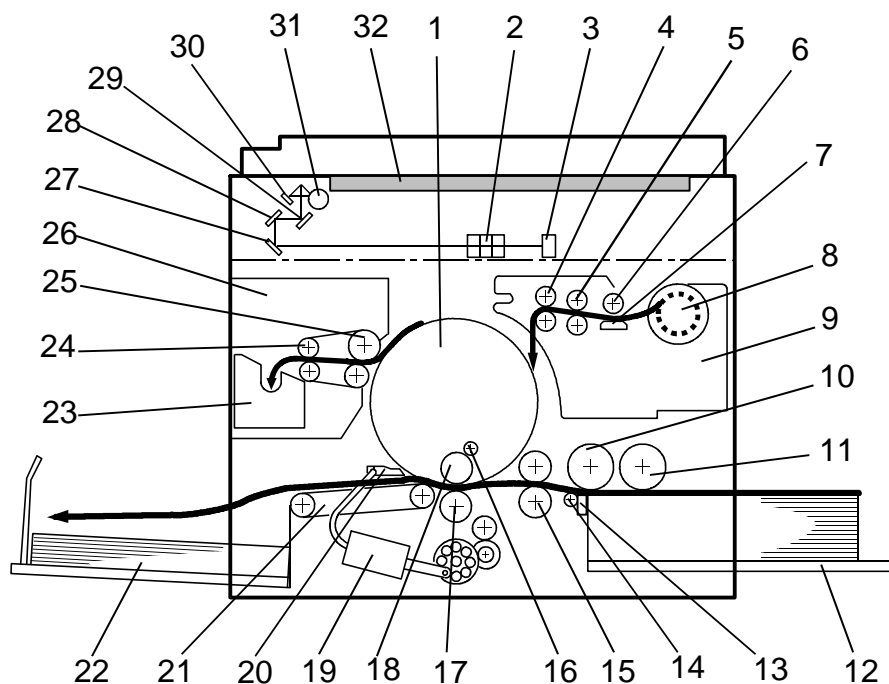Lift to unlock and pull out the drum unit.

Drum Unit
The master is wrapped around this unit.

Ink Holder
Set the ink cartridge in this holder.

4. MECHANICAL COMPONENT LAYOUT

1. Drum Unit	17. Press Roller
2. Lens	18. Ink Roller
3. CCD	19. Paper Exit Pawl Air Pump
4. Reverse Roller	20. Paper Exit Pawl
5. Master Feed Roller	21. Transport Unit
6. Platen Roller	22. Paper Delivery Table
7. Thermal Head	23. Master Eject Box
8. Master Roll	24. 2nd Eject Roller
9. Plotter Unit	25. 1st Eject Roller
10. Upper Separation Roller	26. Master Eject Unit
11. Paper Feed Roller	27. 3rd Mirror
12. Paper Table	28. 2nd Mirror
13. Separation Plate	29. 1st Mirror
14. Lower Separation Roller	30. Reflector
15. 2nd Feed Roller	31. Fluorescent Lamp
16. Doctor Roller	32. Exposure Glass

# 5. ELECTRICAL COMPONENT LAYOUT
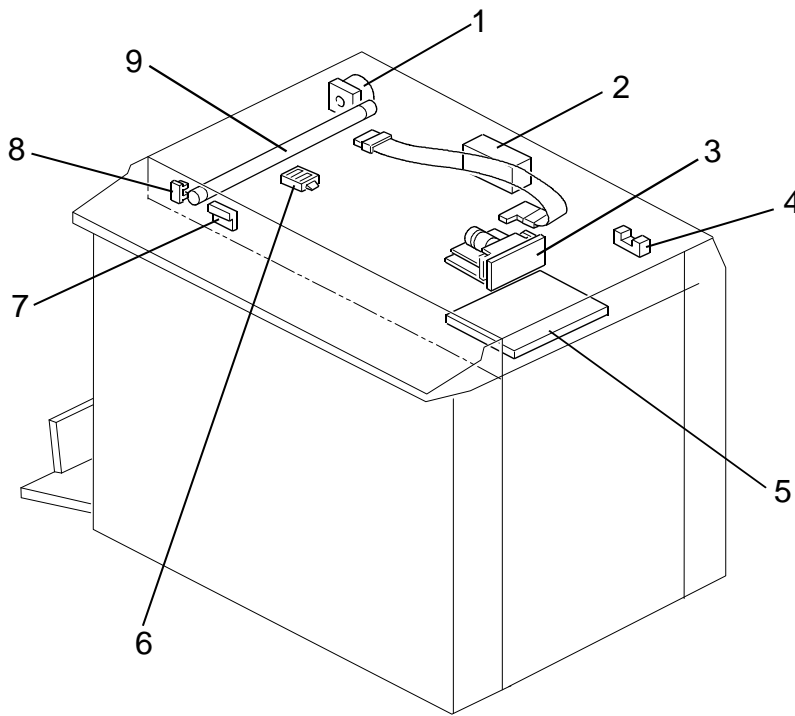
1. Scanner Motor
2. Fluorescent Lamp Stabilizer
3. CCD PCB
4. Platen Cover Position Sensor
5. A/D Conversion PCB
6. Original Sensor
7. ADF Set Sensor
8. Scanner Home Position Sensor
9. Fluorescent Lamp

COMPONENT DESCRIPTIONS

| Index No.	Name	Function
1	Scanner Motor	Drives the scanner (1st and 2nd).
4	Platen Cover Position Sensor	Detects when the platen cover is opened about 25° above the exposure glass.
6	Original Sensor	Detects if an original is placed on the exposure glass.
7	ADF Set Sensor	Detects when the optional document feeder is closed.
8	Scanner Home Position Sensor	Informs the CPU when the 1st scanner is at the home position.

6. DRIVE LAYOUT
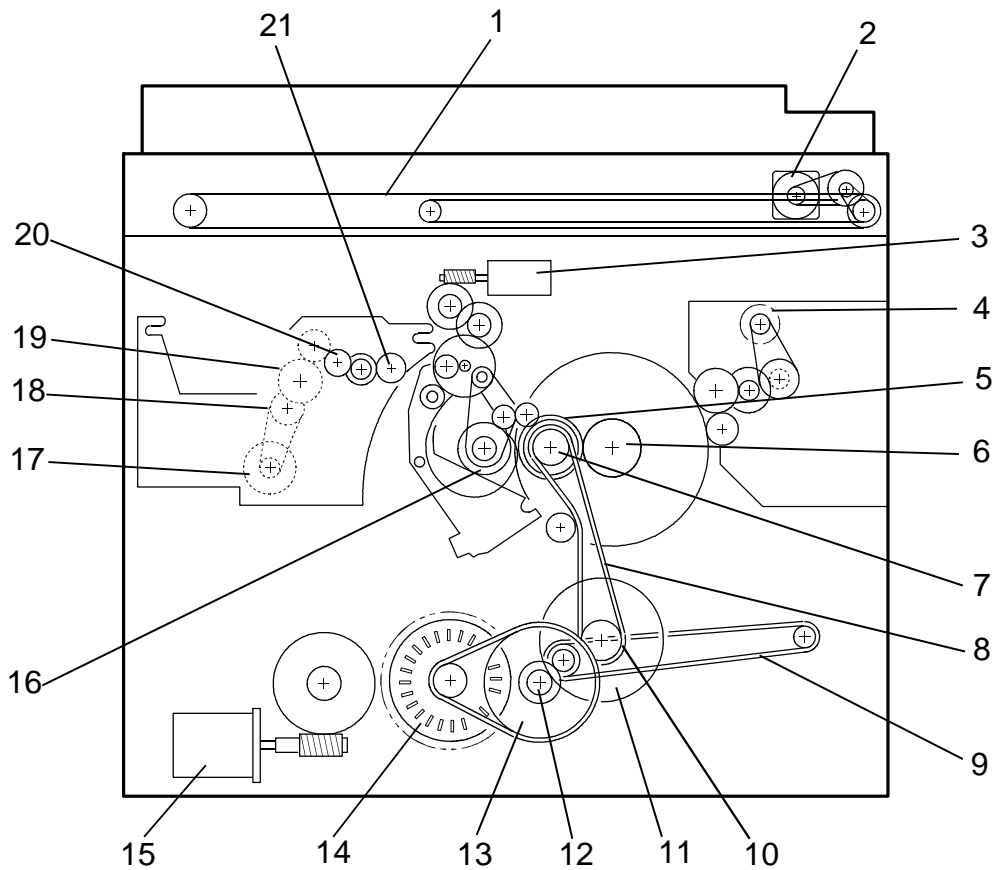
1. Scanner Belt
2. Scanner Motor
3. Image Position Motor
4. Master Eject Motor
5. Drum Drive Gear
6. Drum Unit Gear
7. Drum Drive Pulley
8. Main Drive Belt
9. Transport Belt
10. Printing Pressure Pulley
11. Printing Pressure Gear
12. Idle Gear
13. Idle Pulley
14. Main Motor
15. Paper Table Drive Motor
16. Paper Feed Cam Gear
17. Master Feed Motor
18. Timing Belt
19. Platen Roller Gear
20. Master Transport Roller Gear
21. Reverse Roller Gear

SECTION 2

DETAILED SECTION DESCRIPTIONS

1. MASTER EJECT

## 1.1 ELECTRICAL TIMING: #C218 MODELS
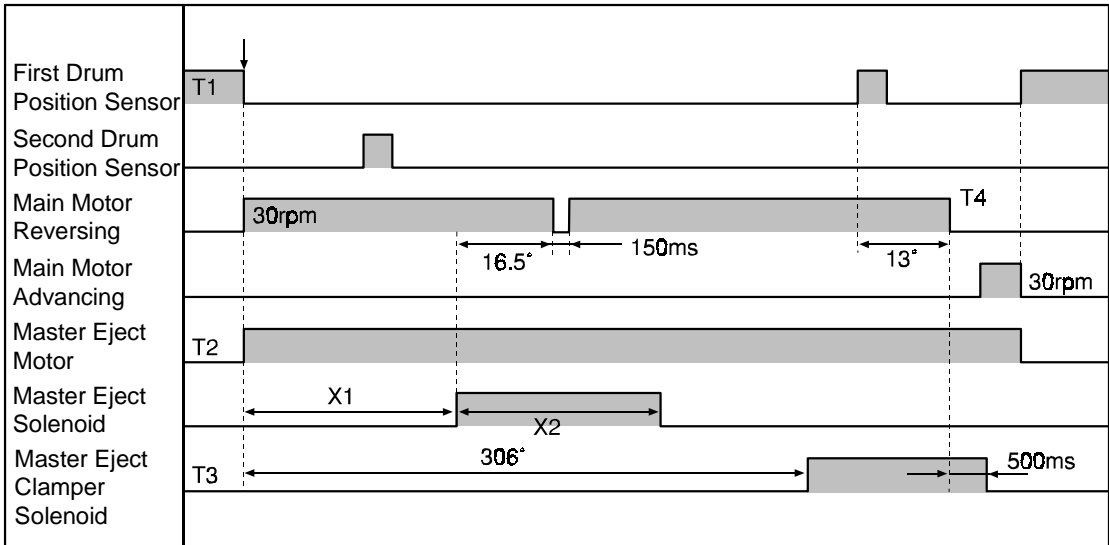
Detailed Descriptions

The drum stops its reverse rotation for 150 ms when the trailing edge of the master is about 5 millimeters away from the master eject rollers to ensure that the master eject process is successful (only for #C218 models).

Drum Type	#C218 Models	
	A3/DLT	A4/LT
X1 (degrees)	70	174
X2 (degrees)	39	55

1.2 ELECTRICAL TIMING: #C219 MODELS
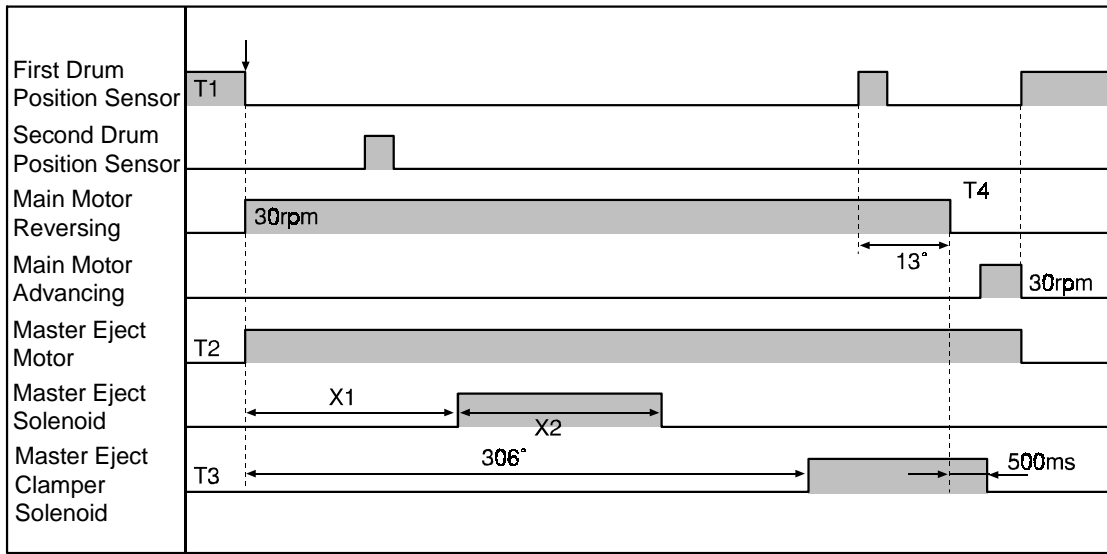
| Drum Type	#C219 Models	
	B4	LG
X1 (degrees)	85	85
X2 (degrees)	55	55

2. SCANNER

2.1 OVERALL

A book type scanner is used for the #C218/#C219 models. There are 2 modes for scanning originals.

Platen Cover Mode: The original is placed on the exposure glass, and the scanner motor drives the scanner to scan the original.

ADF Mode: When an optional Document Feeder is installed, the original is fed onto the exposure glass. The scanner moves 24 mm away from the CCD and remains still as it scans the original. The scanner comes back to the home position when the scanning is finished.

Detailed Descriptions
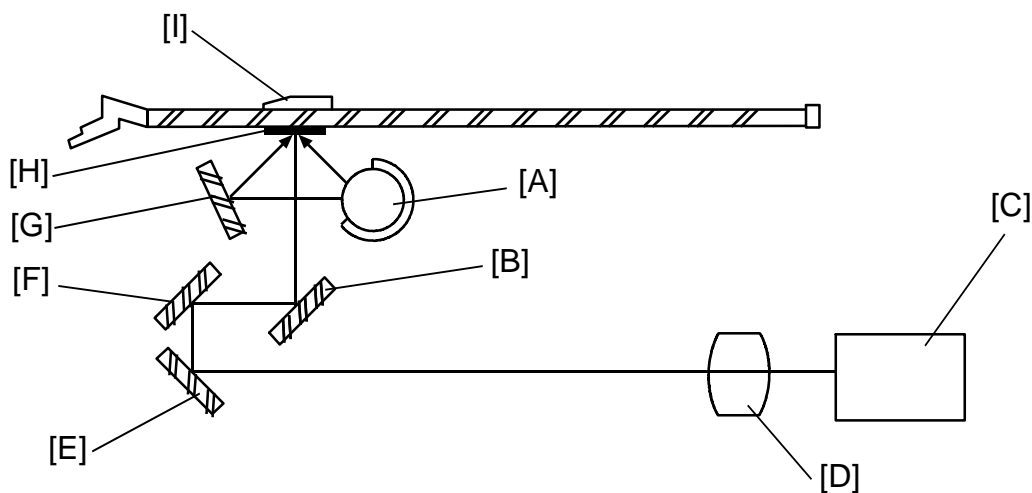
[G]: Reflector

The light from the fluorescent lamp [A] is reflected from the original, by the first [B], second [F], and third [E] mirrors and goes through the lens [D] into the CCD [C].

In the Platen Cover Mode, the CCD reads the white plate [H] on the back of the original scale [I] each time before scanning to obtain a standard white level. The standard white data are used to correct distortion. The scanner is at its home position when it reads the white level.

In the ADF mode, as the scanner moves 24 mm, the CCD reads the white plate installed on the ADF.

2.2 SCANNER MECHANISM
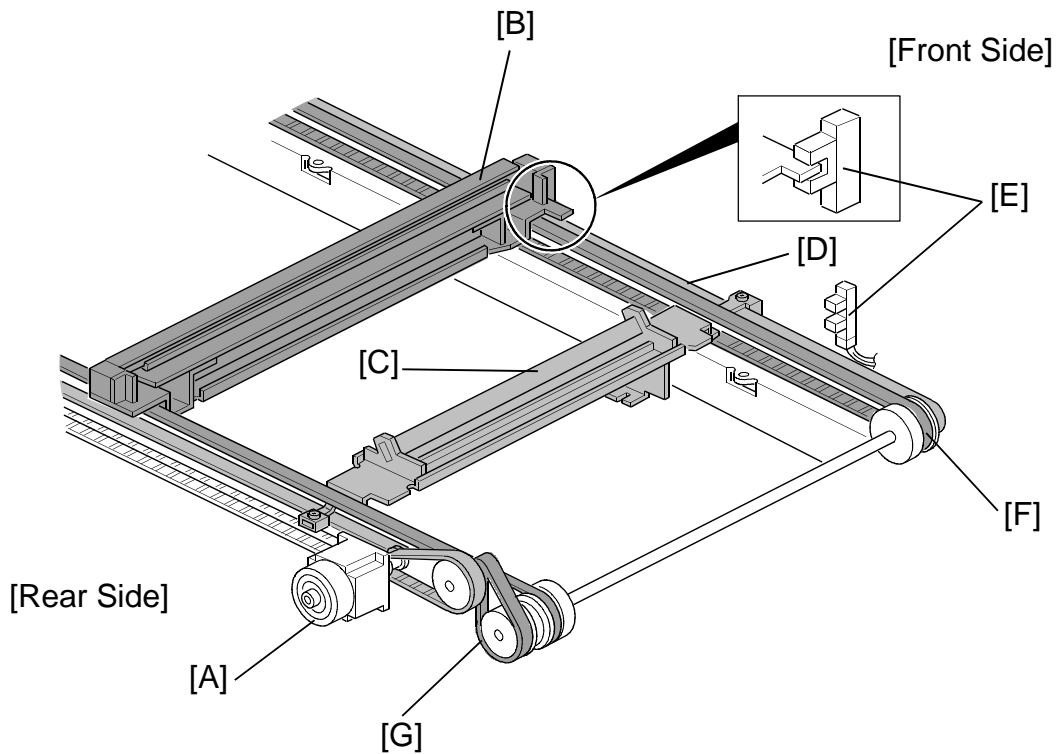
A stepper motor is used for the scanner motor [A] to drive the scanners. The first scanner [B], which consists of the exposure lamp and the first mirror, is driven by the first scanner belt [F]. The second scanner [C], which consists of the second and the third mirror, is driven by the second scanner belt [D]. Both scanners move along the guide rails.

The timing belt [G] moves the second scanner at half the velocity of the first scanner. This is to maintain the focal distance between the original and the lens during scanning.

The scanner home position is detected by the home position sensor [E]. In the Platen Cover Mode, the scanner scans the original on the exposure glass for the full A3 length, then returns until the scanner home position sensor is activated. In the ADF Mode, the scanner moves 24 mm backwards (away from the CCD), to scan the original which is fed by the ADF. When the master making process is finished and the ADF motor stops, the scanner goes back to the home position.

2.3 PLATEN COVER POSITION DETECTION

[B]

[A]
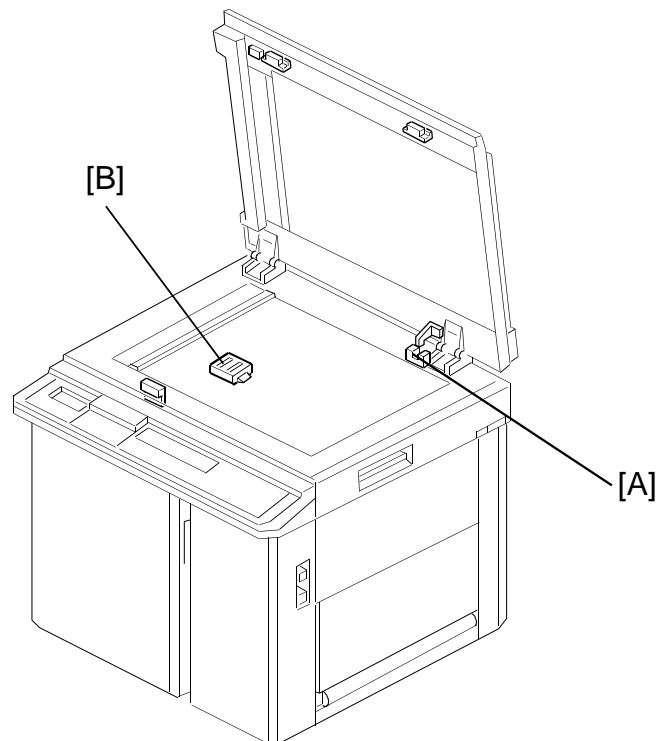
When the platen cover is opened about 25 degrees, the Platen Cover Position Sensor [A] is deactivated. When this sensor is deactivated, the Original Sensor [B] is able to detect the original on the exposure glass.

When the Platen Cover Position Sensor is deactivated and the Original Sensor detects no original on the exposure glass, the machine indicates "SET THE ORIGINALS" on the operation display. This is to prevent wasting of the master that would occur when the Master Making key is pressed with no original placed on the exposure glass.

When the original is placed on the exposure glass and the Master Making key is pressed with the platen cover opened more than 25 degrees (as the Platen Cover Position Sensor is deactivated), the shadow erase function is enabled.

Notes regarding the shadow erase function:

- Margins of 1 mm, 0.02" on all four sides of the original will be erased. The width of the margins will change depending on the reproduction ratios.

- Shadows near the book edge might not be erased completely.

- If the shape of the originals are as shown below, shadows might appear on the prints. In this case, make the master with the platen cover closed.

Shadow

Scanning direction
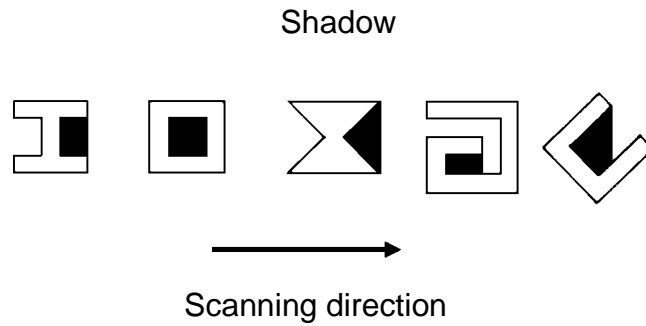
- If a line or solid image is on the margin at the center and at the edges being erased, the image might be erased as shown below.

Scanning direction
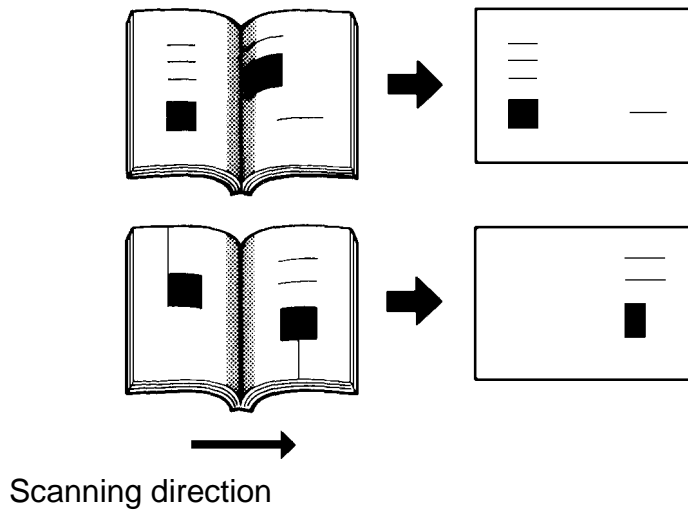
2.4 ELECTRICAL TIMING
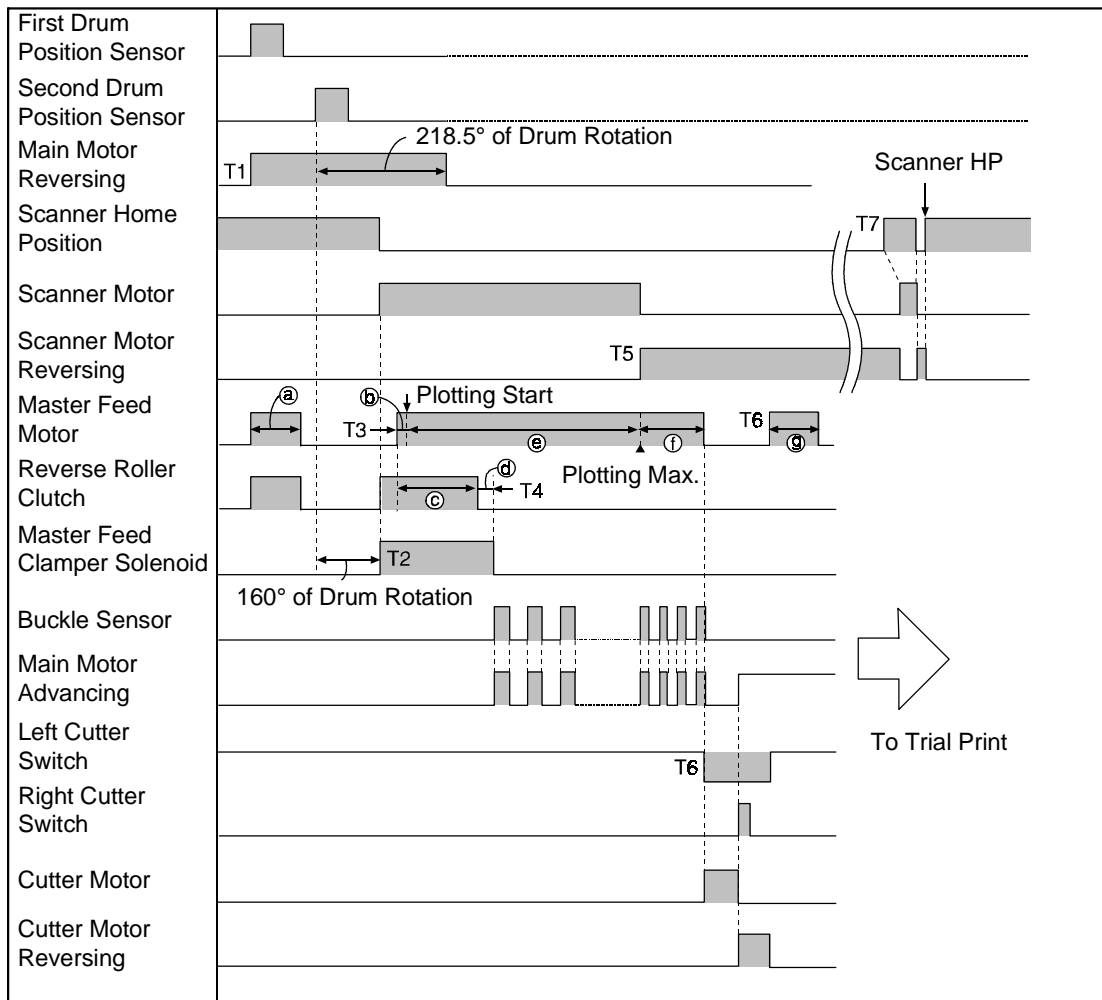
For C218 model	a: 21.5 mm	b: 0.9 mm	For C219 model	a: 18.5 mm	b: 1.0 mm
	e: 412 mm	f: 60 mm		e: 359 mm	f: 61 mm
	g: 40 mm	c: 38 mm		g: 40 mm	c: 41 mm
	d: 5 mm			d: 5 mm	

T1: After the master eject process is completed, the main motor starts reverse rotation at 30 rpm. At the same time, the master feed motor and the reverse roller magnetic clutch turn on to feed the master 21.5 millimeters (18.5 mm for the C219 model).

T2: The master feed clamper solenoid is energized when the drum rotates 160 degrees past the second drum position sensor (162 degrees for the C219 model). At the same time, the reverse roller magnetic clutch is turned on and the scanner motor starts to rotate.

T3: When the scanner has moved 20 millimeters from its home position (17 mm for the C219 model), the master starts to be fed. When the master has been fed 0.9 millimeters (1.0 mm for the C219 model), the thermal head starts plotting on the master.

The leading edge is zero when the scanner is 12 millimeters from its home position. The leading edge margin can be adjusted within the range of 4 to 10 millimeters by SP mode No.33.

T4: When the master has been fed 38 millimeters (41 mm for C219 models), the reverse roller magnetic clutch turns off. Then the master is fed 5 millimeters more and the master feed clamper solenoid is de-energized to close the master clamper. The master is fed in the same way as in #C210 models. The original transport and the master feed motors speed up once the master plotting is done. The master feeding lengths for plotting are:

For #C218 models
   412 millimeters: A3/DLT drum
   204 millimeters: A4/LT drum
For #C219 models
   355 millimeters: for both B4 and LG drums

T5: When the scanner has scanned the full scanning length (the same length as the master feeding length), the scanner motor starts its reverse rotation to bring back the scanner to the home position.

T6: The master feed motor stops when the master has been fed 534.4 millimeters (479.5 mm for the C219 model). At the same time, the cutter motor starts rotating to cut the master. The cutter motor changes its rotation direction when the cutter holder pushes the right cutter switch. The cutter motor stops when the cutter holder goes back to the home position to activate the left cutter switch (the same way as in #C210 models).

When the right cutter switch is activated, the drum starts rotating to go back to its home position. When the left cutter switch is activated (when the cutter comes back to its home position), the master feed motor turns on again to feed the master 40 millimeters.

T7: When the scanner motor stops its reverse rotation, the scanner motor rotates forward until the scanner home position sensor is activated.

2.5 CIRCUIT

AD Conversion PCB   Image Processing PCB   Main PCB
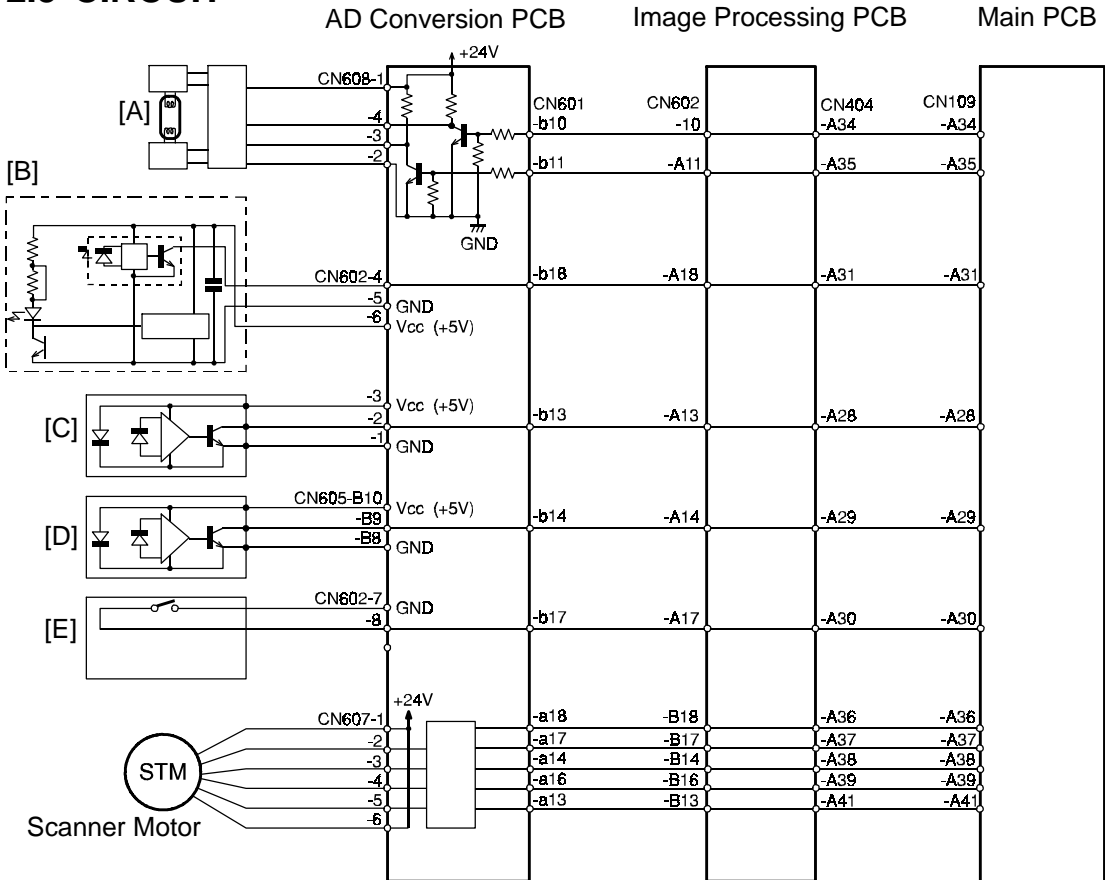
Component Name	I/O	A/D Conversion PCB		Description
		CN No.	Signal Level	
Fluorescent Lamp [A]	Out	601-b10	0V ___⌐‾ 5V	Signal goes high when the lamp on signal turns on.
Fluorescent Lamp [A]	Out	608-3	24V ‾⌐___ 0V	Signal goes low when the lamp on signal turns on.
Original Sensor [B]	In	602-4	0V ___⌐‾ 5V	Signal goes high when the sensor detects an original.
Scanner HP Sensor [C]	In	602-2	0V ___⌐‾ 5V	Signal goes high when the sensor detects an original.
Platen Cover Position Sensor [D]	In	605-B9	0V ___⌐‾ 5V	Signal goes high when the sensor detects an original.
ADF Set Sensor [E]	In	602-8	5V ‾⌐___ 0V	Signal goes low when the lead switch is turned on.

3. DRUM

3.1 DRUM CONNECTION MECHANISM
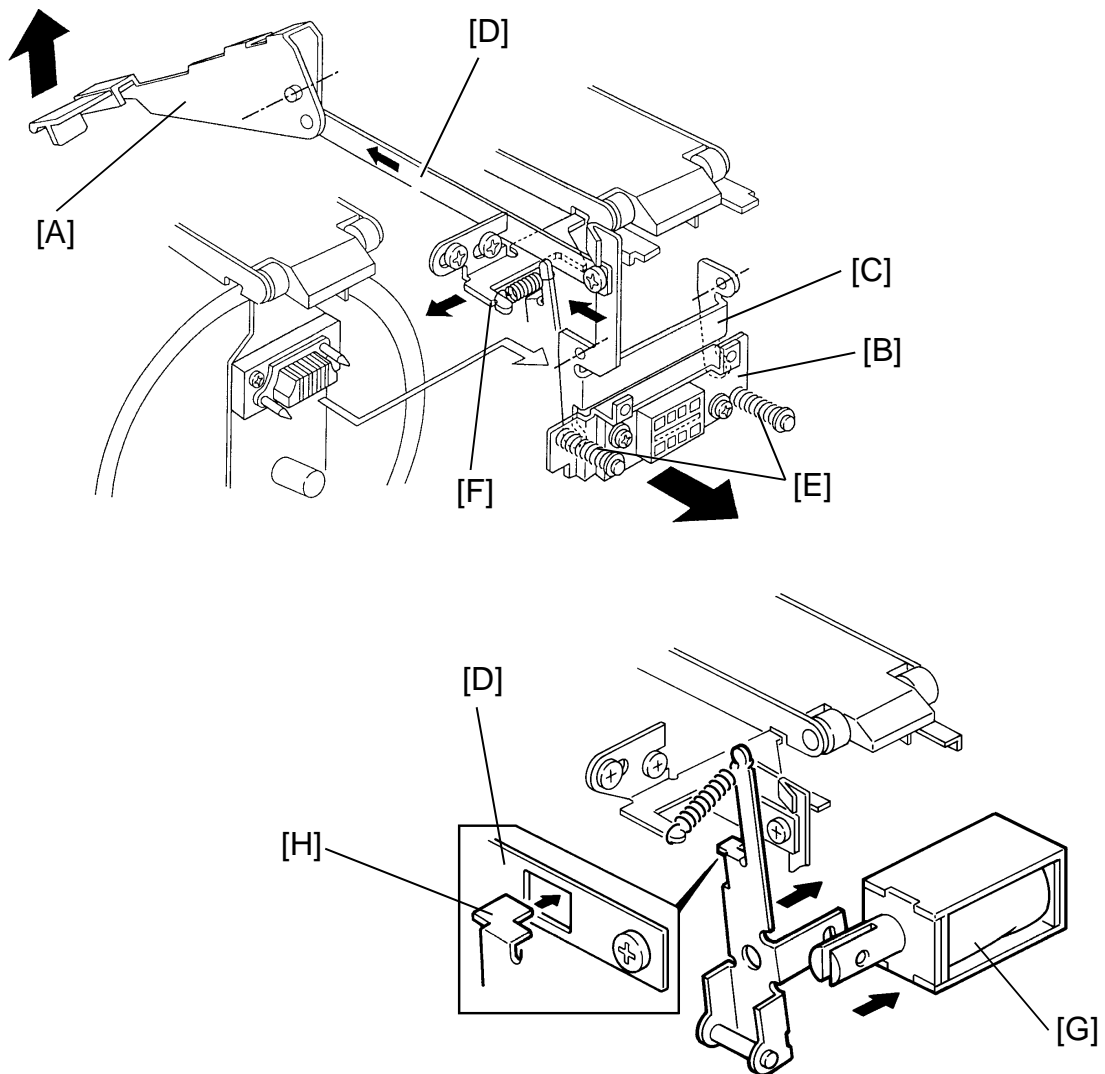
When the drum release lever [A] in front of the machine is raised, the connector [B] is pushed away from the drum by the bracket [C] through the link [D], and is disconnected. The bracket [C] also pushes the drum lock lever [F] to release the drum lock allowing the drum to be removed. While the drum is away from its home position, the drum lock solenoid [G] is energized and the stopper [H] locks the link [D] to prevent the drum from being pulled out. The solenoid is de-energized when the drum stops at the home position (when the 1st drum position sensor is actuated).

3.2 CIRCUIT FOR #C218 MODELS

Component Name	I/O	Main PCB		Description
		CN No.	Signal Level	
Drum Detection Switch [A]	In	105-26	24V ⌐_ 0V	Signal goes Low when the drum unit is slid out.
Drum Rotation LED (Red) [B]	Out	105-18	2.8V 0V _⌐	Signal goes High when the drum is not in the home position. (The LED lights red.)
Drum Rotation LED (Green) [B]	Out	105-19	2.8V 0V _⌐	Signal goes High when the drum is in the home position. (The LED lights green.)
Drum Rotation Button (N.C.) [C]	In	105-21	24V ⌐_ 0V	Signal goes Low when the button is pressed.
Drum Rotation Button (N.O.) [C]	In	105-22	24V 0V _⌐	Signal goes High when the main switch is turned on.
Drum Master Detection Sensor [D]	In	TP102	2.5V 0V _⌐	The voltage between TP102 and ground becomes more than 2 volts when a master is on the drum.
Ink Supply Solenoid [E]	Out	104-17	24V ⌐_ 0V	Signal goes Low when the solenoid is energized.

Component Name	I/O	Main PCB		Description
		CN No.	Signal Level	
Drum Lock Solenoid [F]	Out	104-18	24V ⌐_ 0V	Signal goes Low when the solenoid is energized.
Ink Detection [G]	In	104-20 (TP105)	0V _⌐ -12V	Signal goes High when there is no ink.
Color Drum Detection [H]	In	104-14	5V ⌐_ 0V	Signal goes Low when the color drum is installed. (CN118-2 and -3 are shorted.) The Color Drum indicator will light.
Drum Size Detection [H]	In	104-15	5V ⌐_ 0V	Signal goes Low when the drum is installed. (CN118-2 and -4 are shorted.) The A3 or DLT Drum indicator will light when CN118-2 and -5 are open.
A4/LT Drum Detection [H]	In	104-16	5V ⌐_ 0V	Signal goes Low when the A4/LT drum is installed. (CN118-2 and -5 are shorted.) The A4 or LT Drum indicator will light.
Drum Unit Safety Switch	Out	118-7 (Drum Unit)	24V _⌐ 0V	CN118-7 of the drum unit connector becomes 24 volts when the drum unit is set.

3.3 CIRCUIT FOR #C219 MODELS

Main PCB

(Drum Unit Connector)

Ink Detection PCB

| Component Name	I/O	Main PCB		Description
		CN No.	Signal Level	
Drum Detection Switch [A]	In	105-4	24V → 0V	Signal goes Low when the drum unit is slid out.
Drum Rotation LED (Red) [B]	Out	105-18	0V → 2.8V	Signal goes High when the drum is not in the home position. (The LED lights red.)
Drum Rotation LED (Green) [B]	Out	105-19	0V → 2.8V	Signal goes High when the drum is in the home position. (The LED lights green.)
Drum Rotation Button (N.C.) [C]	In	105-8	24V → 0V	Signal goes Low when the button is pressed.
Drum Rotation Button (N.O.) [C]	In	105-7	0V → 24V	Signal goes High when the main switch is turned on.
Drum Master Detection Sensor [D]	In	TP102	0V → 2.5V	The voltage between TP102 and ground becomes more than 2 volts when a master is on the drum.
Ink Supply Solenoid [E]	Out	104-16	24V → 0V	Signal goes Low when the solenoid is energized.
Drum Lock Solenoid [F]	Out	103-19	24V → 0V	Signal goes Low when the solenoid is energized.

Component Name	I/O	Main PCB		Description
		CN No.	Signal Level	
Ink Detection [G]	In	104-20 (TP105)	0V ⌐_ -12V	Signal goes Low when there is no ink.
Color Drum Detection [H]	In	104-18	5V ⌐_ 0V	Signal goes Low when the color drum is installed. (CN118-5 and -6 are shorted.) The Color Drum indicator will light.
Drum Unit Safety Switch	Out	118-7 (Drum Unit)	24V _⌐ 0V	CN118-7 of the drum unit connector becomes 24 volts when the drum unit is set.

4. DELIVERY

4.1 ELECTRICAL TIMING
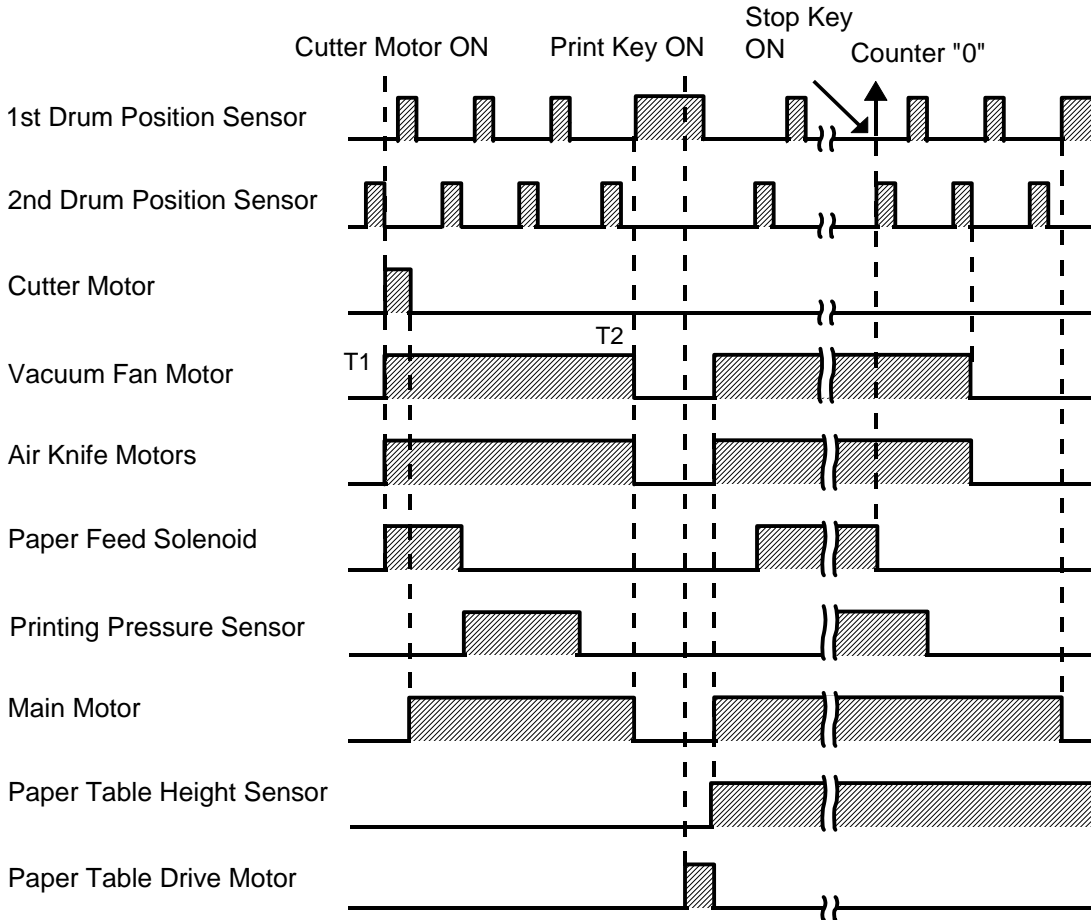
T1: The cutter motor, vacuum fan motor, and air knife motors turn on.
     The main motor turns on when the cutter motor stops rotating.

T2: The vacuum fan motor and the air knife motors turn off when the printing
     pressure sensor is deactivated and the 1st drum position sensor is
     activated.

• The on/off timing for the vacuum fan motor, air knife motors and the main
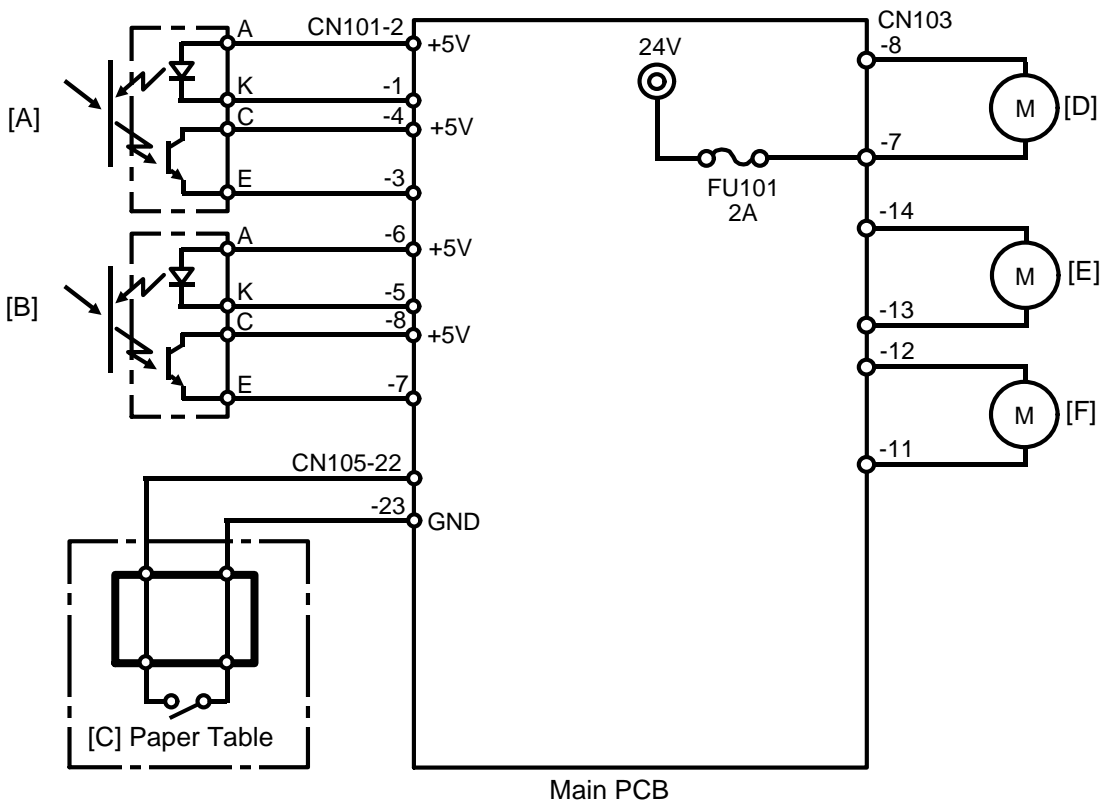   motor is different from the #210 model.

4.2 CIRCUIT FOR #C218 MODELS
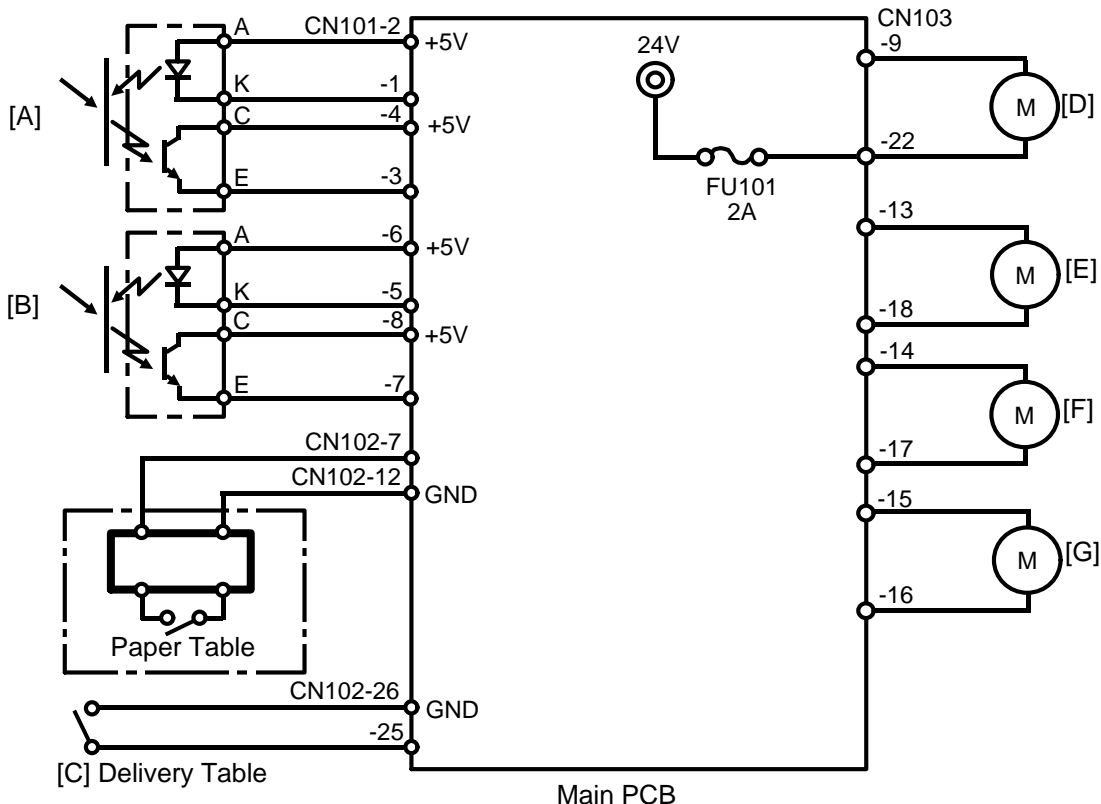
Component Name	I/O	Main PCB		Description
		CN No.	Signal Level	
1st Paper Exit Sensor [A]	In	TP101	0V / 3V	Signal goes High when the paper is on the sensor.
2nd Paper Exit Sensor [B]	In	TP103	0V / 3V	Signal goes High when the paper is on the sensor.
Delivery Table Open Switch [C]	In	102-25	5 msec, 7.5V / 0V	Pulse signal goes to Low when the delivery table is opened.
Vacuum Fan Motor [D]	Out	103-9	26V / 0V	Signal goes Low when the motor is energized.
Air Knife Motor [E]	Out	103-13	26V / 0V	Signal goes Low when the motor is energized.
Air Knife Motor [F]	Out	103-14	26V / 0V	Signal goes Low when the motor is energized.
Air Knife Motor [G]	Out	103-15	26V / 0V	Signal goes Low when the motor is energized.

The paper table and the delivery table open/close detection is done separately to enable paper table lowering regardless of whether the delivery table is open or closed.

4.3 CIRCUIT FOR #C219 MODELS

Main PCB

Component Name	I/O	Main PCB		Description
		CN No.	Signal Level	
1st Paper Exit Sensor [A]	In	TP101	0V ___/‾ 3V	Signal goes High when the paper is on the sensor.
2nd Paper Exit Sensor [B]	In	TP103	0V ___/‾ 3V	Signal goes High when the paper is on the sensor.
Paper Table Open Switch [C]	In	105-22	5 msec, 7.5V ⊓⊓, 0V	Pulse signal goes to Low when the paper table is opened.
Vacuum Fan Motor [D]	Out	103-8	26V ‾__ 0V	Signal goes Low when the motor is energized.
Air Knife Motor [E]	Out	103-12	26V ‾__ 0V	Signal goes Low when the motor is energized.
Air Knife Motor [F]	Out	103-14	26V ‾__ 0V	Signal goes Low when the motor is energized.

Delivery table open/close detection is not available for the #219 model.

5. CHANGES ONLY FOR C219 MODELS

The following items have been changed only for the #C219 model.

5.1 PAPER FEED
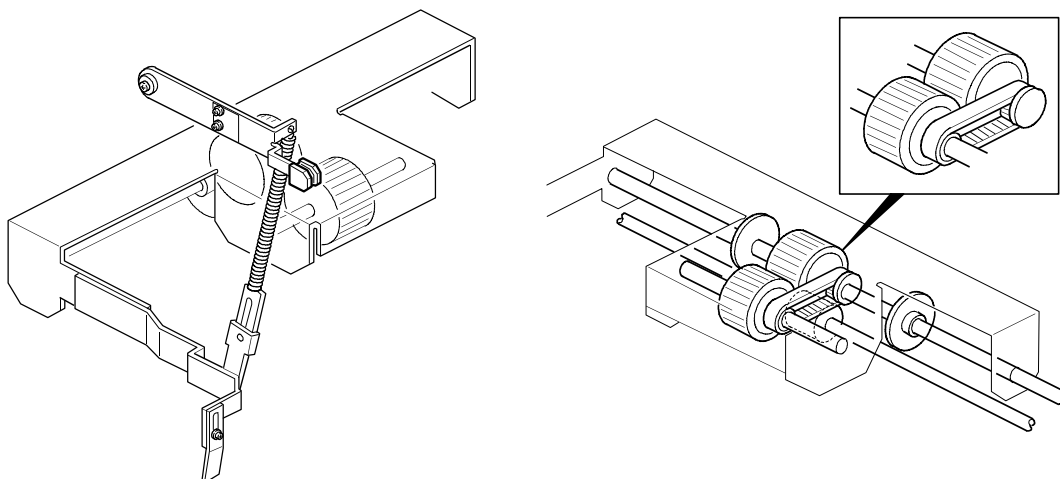
- The paper return mechanism has been eliminated.

- The Feed Roller pressure can be adjusted in 3 steps.

- The feed pressure lever on the feed roller assembly has been eliminated.

- The rubber material for the Paper Feed Roller and the Separation Roller has been changed to improve longevity, and ensure stable friction.

- The Paper Feed Roller shaft has been changed to a light-weight material. Therefore, the torque limiter in the Paper Feed Roller, which was there to prevent the roller from over-running, has been eliminated.

- The number of rollers on the second feed roller shafts has been changed from 5 to 3.
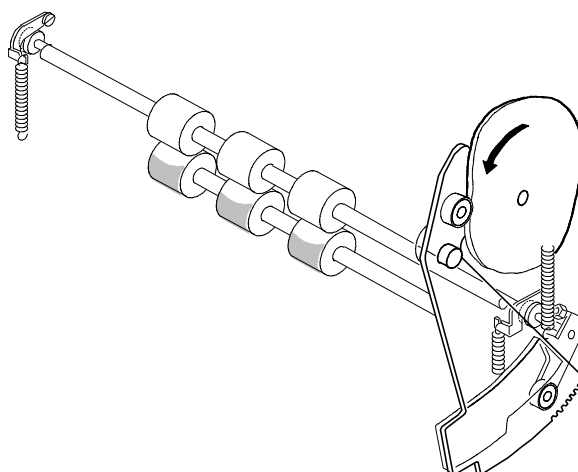
5.2 DELIVERY

- The number of transport belts has been changed from 3 to 2.

- The wing guide has been eliminated for the #C219 model.
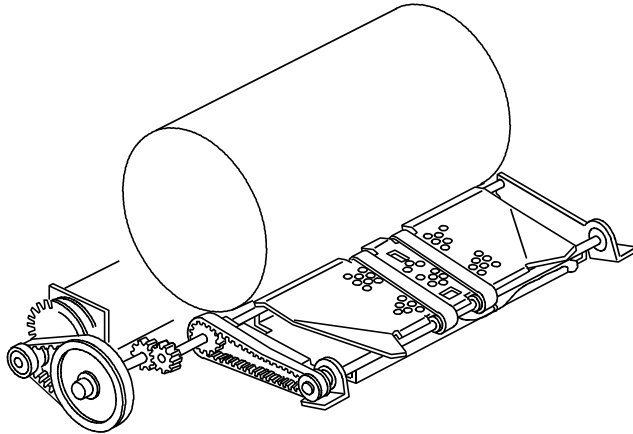
SECTION 3

INSTALLATION

1. INSTALLATION PROCEDURE

1.1 ACCESSORY CHECK

Make sure that you have all the accessories listed below.
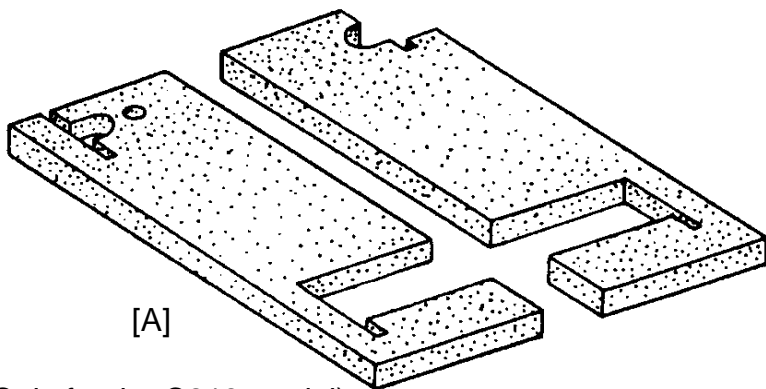
[A]

(Only for the C218 model)

[B]
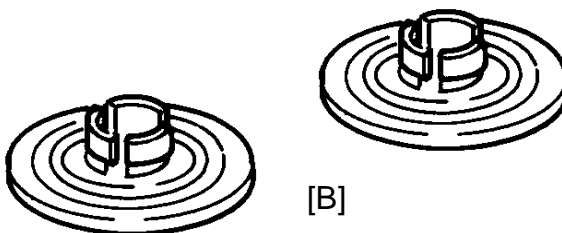
A. Base Pad (Only for the C218 model) 2

B. Master Spool 2

Operating Instructions

2. INSTALLATION PROCEDURE

MAIN BODY
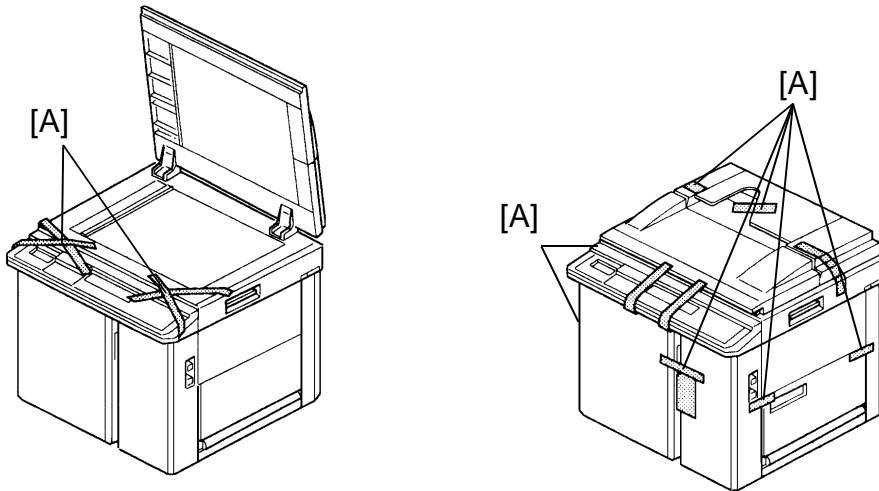
CAUTION: Do not hold the scanner unit when pushing the machine or the scanner unit safety switch may be damaged.

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1. Place the machine on the table.

NOTE: The screw holes in the bottom plate of the machine must line up with the screw holes in the table.

2. Remove the strips of tape [A] securing the covers and units shown above.
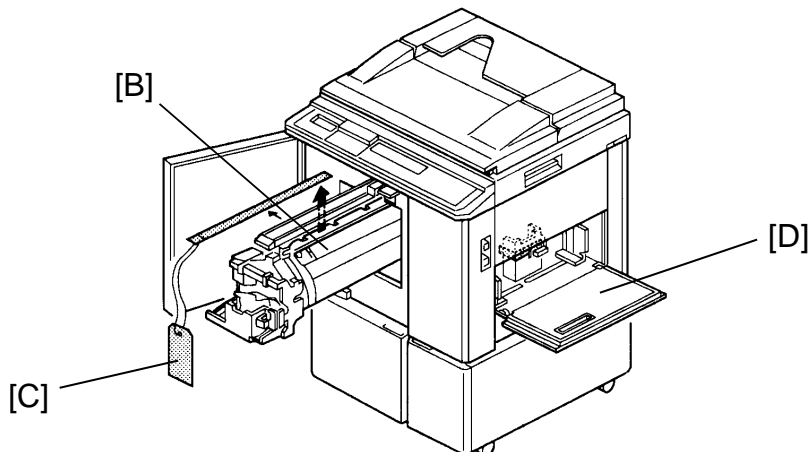
3. Open the front door and slide out the drum unit [B].

4. Open the master clamper and remove the clamp [C].

5. Open the paper feed table and remove the cardboard cover [D] protecting the paper feed roller.
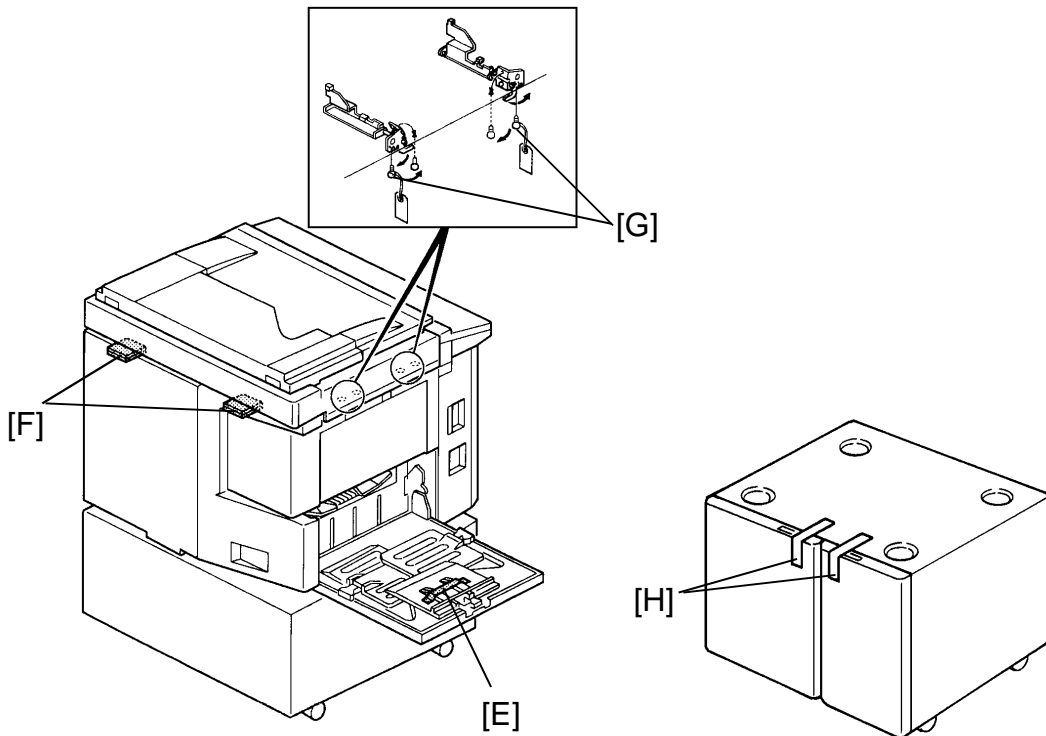
6. Open the paper delivery table and remove the strip of tape [E] protecting the end fence.

7. Remove the cardboard [F] under the scanner unit.

8. Open the scanner unit and change the position of screws [G] from transport position to operating position.

9. Open the doors (2 strips of tape [H]) of the optional table and take out the plastic bag containing 2 screws.
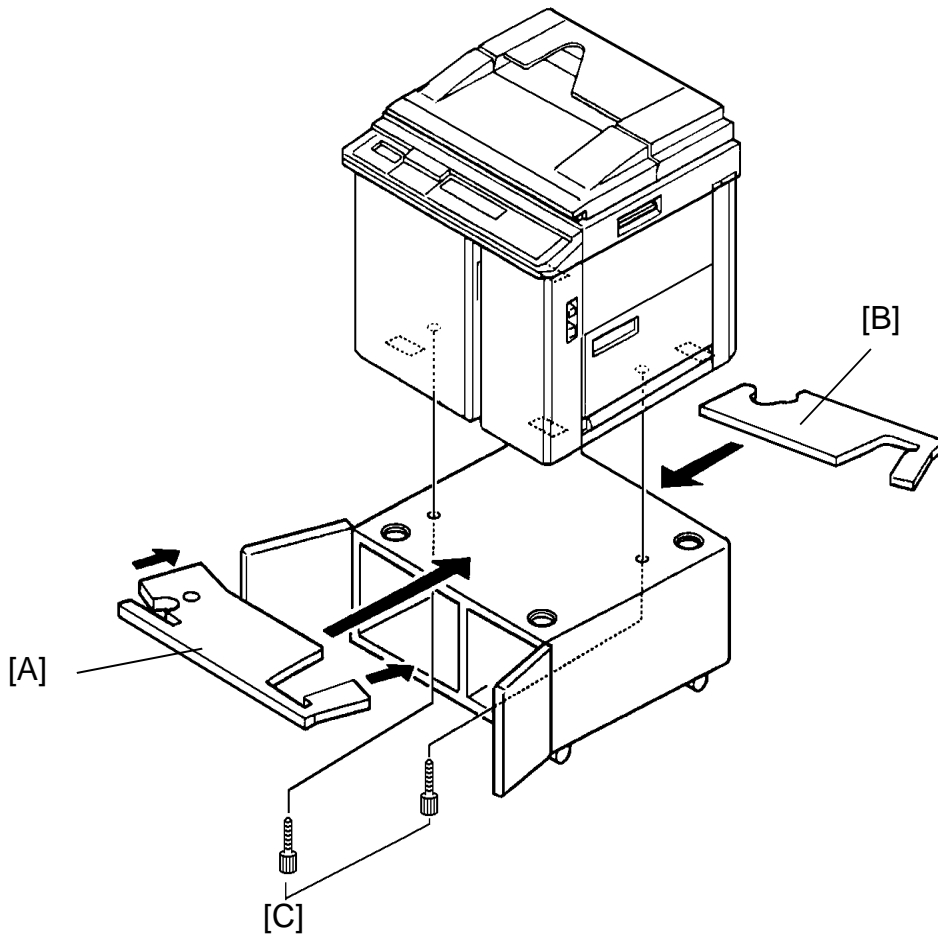
10. Raise the front side of the machine and position the base pad [A] under the machine. Then raise the rear side of the machine and position the other base pad [B] under the machine. (This procedure is necessary only for the C218 model.)

11. Secure the machine to the table with the two screws [C] packed with the table.

NOTE: Make sure the machine legs fit through the cutouts in the base pads.

12. Open the paper feed table [A] and neatly stack the printing paper on the table.

13. Slide the paper feed side plates [B] gently up against the paper stack.

[B]

[A]
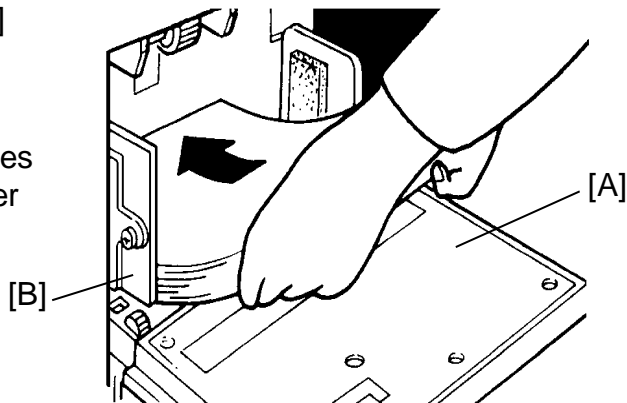
14. Open the paper delivery table [C] and adjust the position of the end plate [D] and the side plates [E] according to the printing paper size. Refer to the paper size scale on the table.

[E]

[D]

[C]

[A3]

Installation
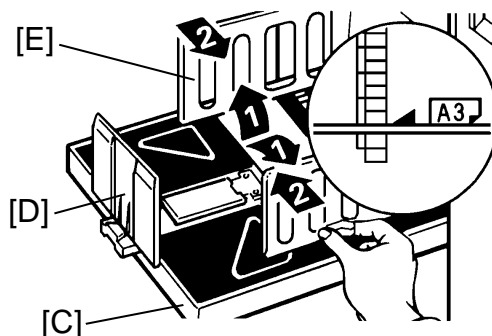
15. Install the ink cartridge [F].

    a. Open the front door and lower the ink holder [G].

    b. Remove the ink cartridge cap.

    c. Insert the ink cartridge in the ink holder and raise the ink holder to the original position.

    d. Close the front door.

[F]

[G]
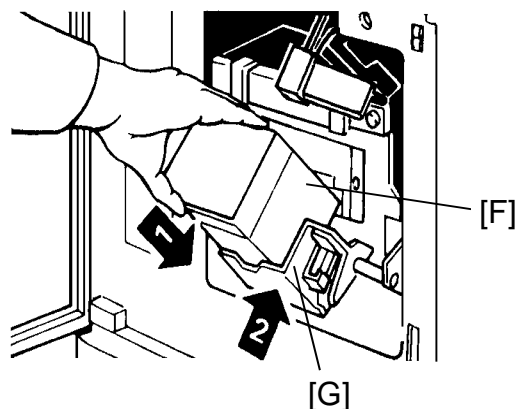
16. Install the master roll.

    a. Slide the scanner unit all the way to the left.

    b. Attach a spool [A] to each end of the master roll [B].

    c. Push the pressure release lever [C] to the left.
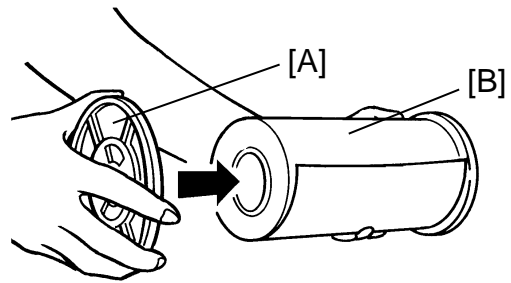
    d. Set the master roll in the machine as shown in the illustration.

    e. Insert the leading edge of the master roll under the platen roller.

    f. Return the pressure release lever to the original position.

    g. Plug in the power cord and turn on the main switch.
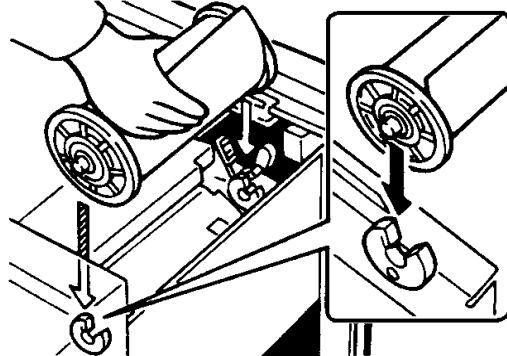
    h. Press the master cut button [D].
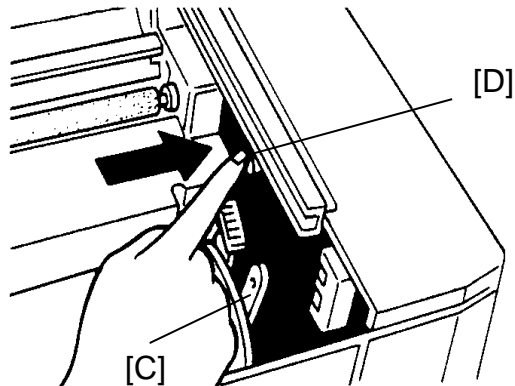
    i. Remove the cut strip [E] of master paper.

NOTE: Confirm that the paper on the master roll is not bent or creased.

    j. Close the scanner unit.

[C]
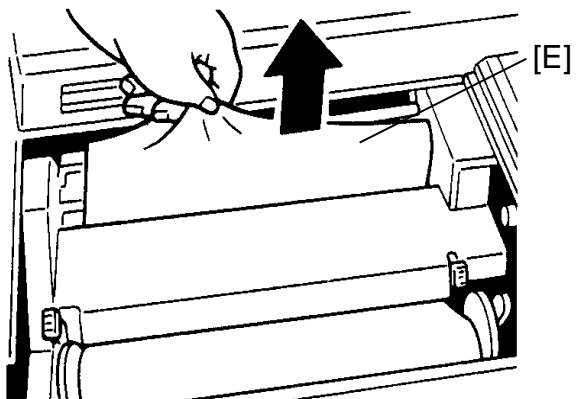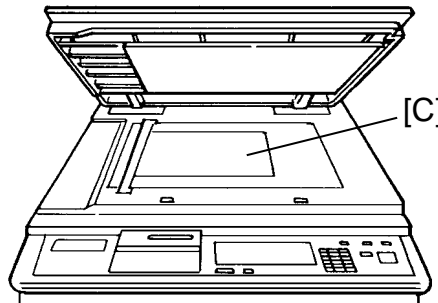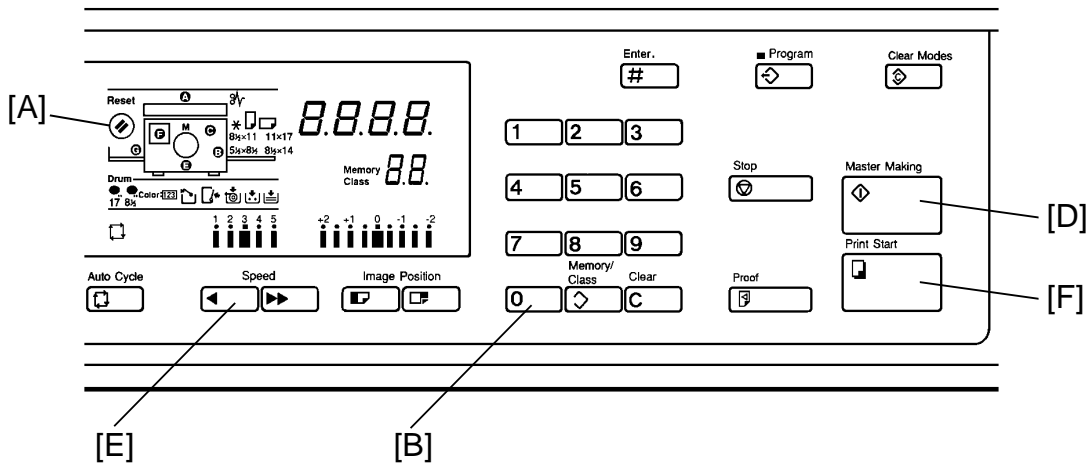
17. Idle the machine to distribute ink on the drum.

    a. Press the Reset key [A] while holding down the "0" key [B] on the operation panel.

    b. If ⬆ blinks on the operation panel when the machine stops, press the Reset key again.

17. Make some test prints to check the machine.

    a. Raise the platen cover and place the original face down on the exposure glass [C]. Make sure the original is flush with the left scale and aligned with the proper paper size marks.

    b. Press the Master Making key [D].

    c. Select the lowest print speed (1) with the Speed key [E] and press the Print Start key [F]. Make prints at this speed until the print image density stabilizes.

  NOTE: 1. Usually, about 100 prints are made before the image fully stabilizes.

         2. Check the image quality after the print image density is stabilized.

SECTION 4

SERVICE TABLES

1. SERVICE TABLES

1.1 MAINTENANCE TABLES

1.1.1 Lubrication Points

Lubricate after removing adhering ink and paper dust at yearly intervals.

Section	Lubrication Point	Type	Location
Drive	Speed Reduction Gears of the Main Motor	Grease (Shell Albania No. 2)	(Fig.1- E)
	Gears of the Drum Drive Shaft		Inside and outside of the machine (Fig.1- B)
Image Positioning	Spiral Track of the Cam Gear		(Fig.1- K)
Paper Feed	Paper Feed Sector Gear		(Fig.1- J)
	Second Feed Sector Gear		(Fig.1- F)
	Gear of the Paper Feed Cam Shaft		(Fig.1- A)
	Paper Table Slide Groove		Both front side and rear side (Fig.1- H)
	Paper Table Drive Gear		(Fig.1- G)
	Bearings for the Upper Separation Roller Shaft	Motor oil (SAE No. 20)	(Fig.1- I)
	Bearings for the Paper Feed Roller Shaft		(Fig.2- L)
Drum	Drum Drive Gear	Grease (Shell Albania No. 2)	(Fig.3- N)
	Master Clamper Sector Gear		(Fig.3- O)
	Master Clamper Pinion Gear		(Fig.3- P)
	Ink Pump Drive Gear		(Fig.3- M)
Printing Pressure	Printing Pressure Arm and Printing Pressure Stay		Both front side and rear side (Fig.4- Q)
	Pressure Spring Link		(Fig.1- C)

Section	Lubrication Point	Type	Location
Master Eject	Master Pressure Plate Grooves	Grease (Shell Albania No. 2)	Both front side and rear side (Fig.5- S)
	Edges of the Master Pressure Plate Drive Arms		(Fig.5- R)
Paper Exit	Air Pump Drive Gears		(Fig.6- T)
	Inside of the Air Pump Piston	Grease (Mobil Ep-1)	(Fig.6- U)
ADF	Bearings for the Feed Roller Shaft	Motor oil (SAE No. 20)	Both front and rear side (Fig.7- V)
Others	Edge of Each Cam	Grease (Shell Albania No. 2)	(Fig.1- D)

[Fig 1]

[K] [A] [B] [D] [C] [D] [J] [I] [H] [G] [F] [E]

[Fig 2]

[L]

[Fig 3]

[P] [M] [O] [N]

[Fig 4]

[Q]

[Fig 5]

[R]

[S]

[Fig 6] [U]

[T]

[Fig 7]

[V]
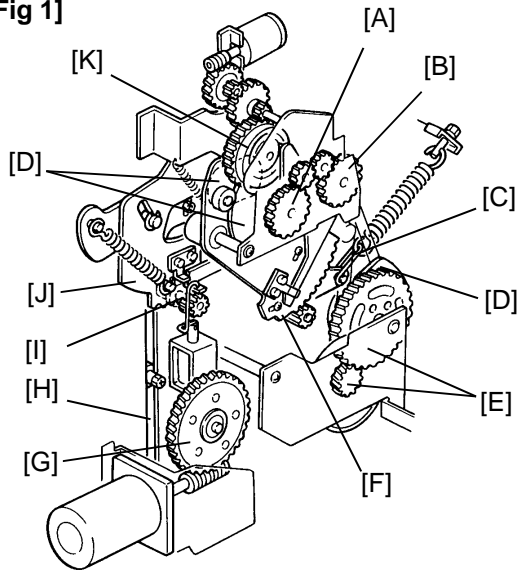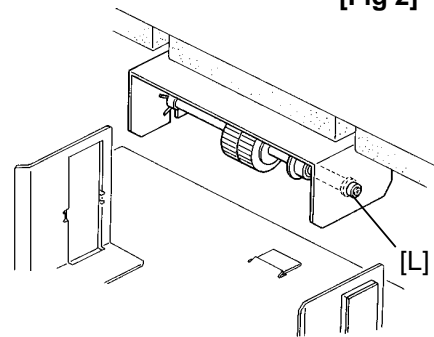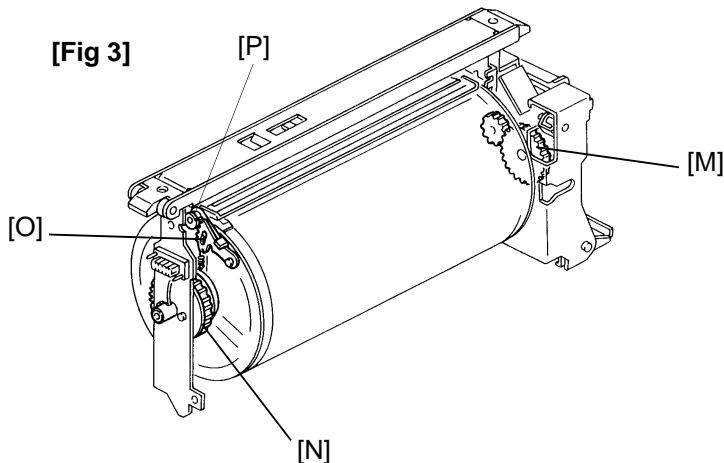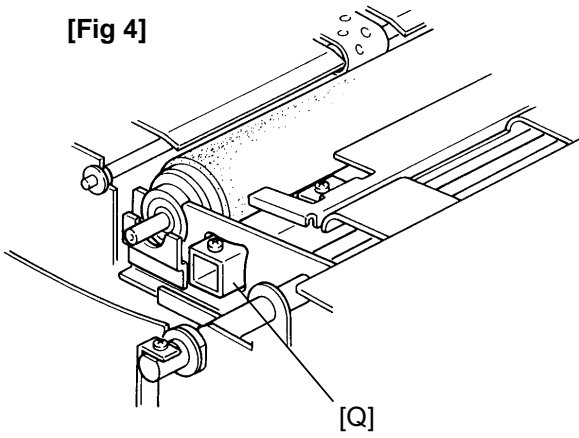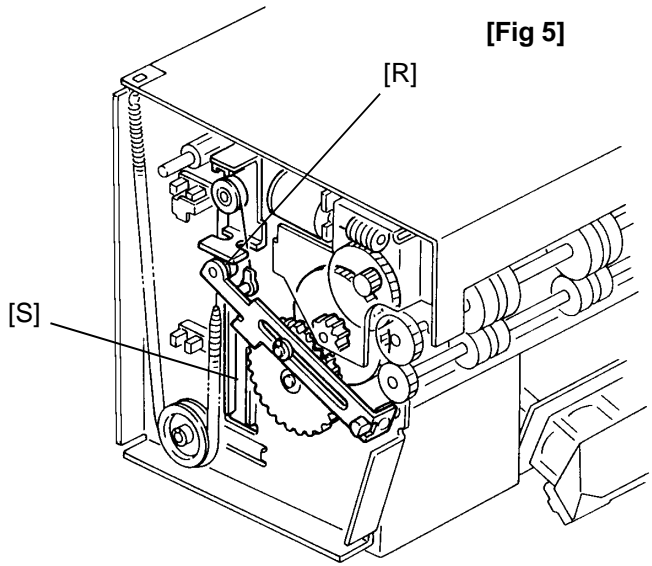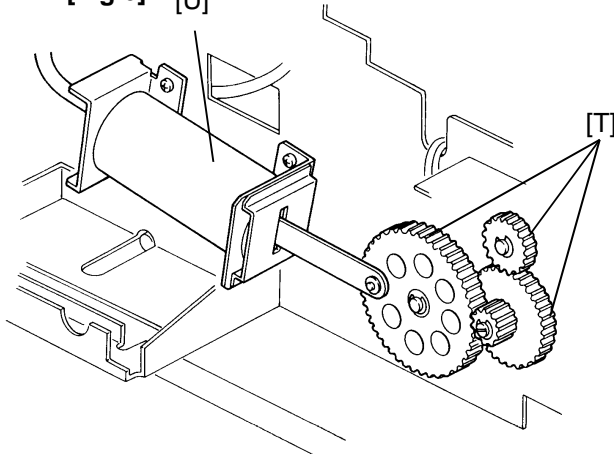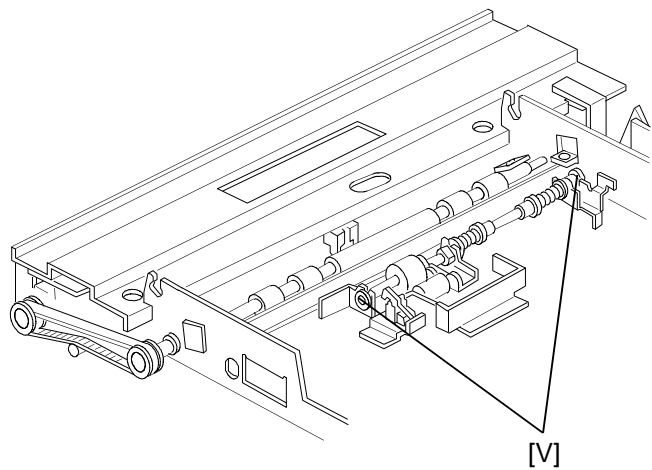
1.1.2 User's Maintenance

Advise the customer to clean each item regularly. Clean the following items at every EM call if necessary.

Section	Cleaning Point	Cleaner	Interval
Optics	Original Platen Cover	Cloth and water	At every EM call
	Exposure Glass	Cloth and glass cleaner	
Paper Feed	Paper Feed Roller	Cloth and soap and water	
	Paper End Sensor	Dry cloth	
	Paper Length Sensor		
Printing	Press Roller	Cloth and soap and water	
ADF	Original Feed Rollers		
Plotter	Thermal Head	Thermal head cleaner	500 masters

1.1.3 Table of Periodic Inspection (every 6 months)

Section	Item	Standard Procedure
Optics	Original Platen Cover	Wipe off the stains using a soft cloth moistened with ethyl alcohol.
	Exposure Glass	Wipe with a dry cloth.
Paper Feed	Paper Feed Roller	Wipe off the ink and paper powder using a cloth moistened with ethyl alcohol.
	Upper and Lower Second Feed Rollers	
	Upper and Lower Separation Rollers	
Printing	Press Roller	
ADF	Pick-up Roller Feed Roller Separation Roller	Wipe off paper powder using a cloth moistened with water.

1.1.4 Table of Periodic Inspection (every 12 months)

Section	Item	Standard Procedure
Optics	Back side of the Exposure Glass	Wipe with a dry cloth.
	Back side of the Mirror and Sub Mirror	Use a blower brush.
	Back side of the Fluorescent Lamp	Wipe with a dry cloth.

Section	Item	Standard Procedure
Master Eject	Upper and Lower Master Eject Rollers	Wipe off the ink and paper powder using a cloth moistened with ethyl alcohol.
	Master Eject Box	Wipe off the ink using a cloth moistened with ethyl alcohol.
Drum	Inside and outside of Drum	Wipe off the built up ink and paper powder using a cloth moistened with ethyl alcohol.
	Ink Holder	
Plotter	Platen Roller	Wipe off the paper powder using a cloth moistened with water.
Others	First and Second Paper Exit Sensors Master Eject Sensor Drum Master Detection Sensor	Check the performance of all the sensors. Remove the stains from the sensors using a dry cloth.

Service Tables

1.2 TABLE OF SERVICE CALL CODES

Code	Problem	Possible Causes
E-01	Neither the right nor the left cutter switch turns off within 3 seconds of the cutter motor starting.	1) Drive wire cut 2) Drive section malfunction 3) Defective cutter switch
E-02	Malfunction in the paper table drive section. The lower limit sensor or paper table height sensor does not turn on within 7 seconds.	1) Drive worm gear broken 2) Mounting screw of the worm gear broken 3) No power supply
E-04	Temperature of the thermal head is greater than 54°C when the Master Making key is pressed.	1) Excessive thermal head temperature 2) Thermistor short
E-05	Malfunction in the image shifting section.	1) Image position sensor connector disconnected 2) Defective image position sensor
E-06	The drum rotation sensor detects an incorrect motor speed.	1) Drum lock 2) No power supply
E-07	Malfunction in the program. When the main switch is turned on, "E-07" lights up if the ROM is defective.	Defective ROM
E-08	Temperature of the power supply unit is greater than 85°C when the Master Making key is pressed.	Excessive power supply unit temperature
E-09	The signal level between CN109-A8 and GND is over 4.9 volts.	1) Thermistor open. 2) Related connectors are not connected (Main PCB CN109-A8, image processing PCB CN404-B8/ CN403-22, or thermal head drive PCB CN705-22/ CN703-10).

Code	Problem	Possible Causes
E-10	The CPU detects an abnormality in the pulse from the thermal head drive PCB (ENR 1 to 4). This pulse determines the energy applied to the thermal heating elements.	1) Defective thermistor 2) Related connectors are not connected (Main PCB CN109-A7, image processing PCB CN404-B7/ CN403-20, or thermal head drive PCB CN705-20). 3) No power supply for ICs (Vcc) from power supply unit to image processing PCB (disconnection of image processing PCB CN701-7/14, or power supply unit CN503-12/13).
E-11	Encoder output does not change within 3 seconds of the main switch being turned on or the Clear Mode key being pressed.	1) Defective image position motor 2) No power supply
E-12	1. The upper or lower pressure plate sensor remains activated for more than 4 seconds after the pressure plate motor starts turning. 2. The lower pressure plate sensor is not activated within 8 seconds of the pressure plate motor starting to turn even though the upper pressure plate sensor is de-activated. 3. The upper pressure plate sensor is not activated for more than 8 seconds after the pressure plate motor starts to turn even though the lower pressure plate sensor is de-activated.	Pressure plate drive mechanism malfunction.

Service Tables

Code	Problem	Possible Causes
E-13	While the scanner is going back to the home position: - The home position sensor remains activated for more than 4 seconds. - The home position sensor is not activated within 2 seconds. - The home position sensor is not activated within 7 seconds when the scanner returns after finishing making the master or scanning.	1) Defective Home Position Sensor 2) Scanner Motor Lock

1.3 TABLE OF DIP SW, LED, VR, TP (ON THE MAIN CONTROL PCB)

1.3.1 DIP SW

No. DIP SW	Function	Remarks
DIP SW101	—	Not used. Must be OFF.
DIP SW102	Sets the initial setting for the counter to increment by two counts per print when the A3 drum is used. (This setting can be changed by SP mode No.86)	Turn on to make the initial setting for the counter increment by two counts. Normal: OFF for Ricoh/ AB Dick ON for NRG

1.3.2 Photodiode

No. LED	Component	Remarks
LED101	1st Paper Exit Sensor	When paper is detected, the LED lights.
LED102	Drum Master Detection Sensor	When the master is on the drum, the LED lights.
LED103	2nd Paper Exit Sensor	When paper is detected, the LED lights.
LED104	Master Eject Sensor	When the master is under the master eject sensor, the LED lights.

No. LED	Component	Remarks
LED105	Ink Detection	When ink is present, the LED lights.
LED106	Main Motor	When the main motor turns on, the LED lights.

1.3.3 VR

No. VR	Function
VR101	1st Paper Exit Sensor Adjustment
VR102	Drum Master Detection Sensor Adjustment
VR103	2nd Paper Exit Sensor Adjustment
VR104	Master Eject Sensor Adjustment

1.3.4 TP

No. TP	Function	Standard Voltage
TP101	1st Paper Exit Sensor Voltage	ON: More than 2 V OFF: 0.9 V
TP102	Drum Master Detection Sensor Voltage	ON: More than 2 V OFF: 0.9 V
TP103	2nd Paper Exit Sensor Voltage	ON: More than 2 V OFF: 0.9 V
TP104	Master Eject Sensor Voltage	ON: More than 2 V OFF: 0.9 V
TP105	Ink Detection Voltage	ON (ink is present): 0 V OFF: – 12 V
TP106	Drum Rotation Sensor Voltage	ON: 0 V OFF: 5 V
TP107	GND	

Service
Tables

1.4 EXPECTED LIFE OF PARTS

Section	Part Description	Expected Life
Scanner	Fluorescent Lamp	15,000 originals
	1st and 2nd Lower Original Transport Rollers	1 year or 60,000 originals
Plotter/Master Feed	Thermal Head	30,000 masters
	Platen Roller	30,000 masters
	Upper Master Feed Roller	1 year or 30,000 masters
Drum	Drum Tetron Screen	2 years or 1,200,000 prints
Paper Feed	Paper Feed Rubber Side Plate	1,200,000 prints
	Paper Feed Roller	6 months or 300,000 prints
	Upper Separation Roller	1 year or 600,000 prints
	Lower Separation Roller	2,000,000 prints
	2nd Feed Roller Brake Belt	1,000,000 prints
	Separation Plate	1 year or 600,000 prints
Printing	Press Roller	2 years or 1,200,000 prints
Delivery	Transport Belt	2 years or 1,200,000 prints
ADF	Pick-up Roller	60,000 originals
	Original Feed Roller	30,000 originals
	Separation Roller	60,000 originals

1.5 SPECIAL TOOLS

Description	Part Number
Test Chart R-21	99992131
Resolution Chart	A0129110
Drum Gauge	C2009001
Image Shifting Gauge	C2009002

2. SERVICE PROGRAM MODE

2.1 SERVICE PROGRAM MODE OPERATION

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

2.1.1 Service Program Mode Access Procedure (for engineers)

All service program modes can be accessed with this procedure.

1. Press the following keys on the operation panel in the following order:

   Case 1:
   a) Clear Modes key
   b) Clear key
   c) Combine 2 Originals key
   d) Enter key

   Case 2:
   a) Turn off the power switch
   b) Press the Enter key, Stop key, and Clear key simultaneously
   c) Turn on the power

2. The following is displayed on the LCD when the SP mode is accessed.

> SP–MODE
>   PROGRAM No.   0

3. Using the number keys, enter the desired SP mode number (listed in the service program table.)

NOTE: The SP mode number can be shifted up or down by pressing the Zoom key ("+" or "–").

4. To cancel the SP mode, press the Clear Modes key.

Service Tables

2.1.2 Service Program Mode Access Procedure (for users)

This procedure allows users to access only the service program modes that are marked with an asterisk in the service program table.

1. Press the following keys on the operation panel in the following order:
   a) Clear Modes key
   b) Clear key
   c) Enter key

2. The following is displayed on the LCD when the SP mode is accessed.

```
┌─────────────────────────────┐
│  SP–MODE                    │
│    PROGRAM No.        0      │
└─────────────────────────────┘
```

3. Using the number keys, enter the desired SP mode number (listed in the service program table).

4. To cancel the SP mode, press the Clear Modes key.

2.1.3 Change Adjustment Values or Modes

1. After entering the desired SP mode number, press the Enter key. The value or mode set at the factory will be displayed on the LCD (at the end of the second line).

2. Enter the desired value or mode using the number keys (listed in the service program table).

3. Press the Enter key to store the desired value or mode.

4. To cancel the SP mode, press the Clear Modes key.

2.2 DIFFERENCE IN SP MODES BETWEEN THE #C210 MODEL AND THE #C218/C219 MODELS

2.2.1 NEW SP MODES

SP mode No.5	Setting the number of EMF sorters.
SP mode No. 24	Character Emphasis setting. (Only for the C219 model.)
SP mode No. 36	Sub-scan magnification adjustment (ADF mode).
SP mode No. 37	Threshold value adjustment for shadow erase.
SP mode No. 38	ADF scan line adjustment
SP mode No. 39	Image center adjustment.
SP mode No. 84	Initial mode for Combine 2 Originals.
SP mode No. 85	Master full detection at power-up.
SP mode No. 86	Counter setting for the A3 drum. (Only for the C218 model.)
SP mode No. 87	Mode setting for Memory mode.
SP mode No. 88	Setting the print mode.
SP mode No. 92	Thermal Paper Mode.
SP mode No. 93	Shadow erase area check.
SP mode No. 95	Scanner free run mode.
SP mode No. 96	ADF original feed test mode.
SP mode No. 115	ADF mode counter.
SP mode No. 116	Platen mode counter.
SP mode No. 117	Color drum counter.
SP mode No. 118	Each paper size counter.
SP mode No. 119	All total counter clear mode.
SP mode No. 135	1st paper exit sensor voltage.
SP mode No. 136	2nd paper exit sensor voltage.
SP mode No. 137	Master eject sensor voltage.
SP mode No. 138	Drum master sensor voltage.
SP mode No. 142	Paper size detection On/Off.
SP mode No. 147	ADF set detection On/Off.
SP mode No. 160 to 170	Margin erase dimension settings.

2.2.2 ELIMINATED SP MODES

SP mode No. 50	Settings for directional magnification mode.
SP mode No. 109	Directional magnification counter.
SP mode No. 112	Clear Total Master/Print counter.

Service Tables

2.3 SERVICE PROGRAM TABLE

*: Accessible by a customer   ♥: A4 version   ♦: LT version

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
1.	On line	Enables On Line key operation.	0: No 1: Yes	0		O	O
2.	FDC Type 10	Used only in Japan	0: No 1: Yes	0	Keep at 0.	O	O
3.	Key Counter	Enables key counter operation.	0: No 1: Yes	0		O	O
4.	Key Card	Used only in Japan.	0: No 1: Yes	0		O	O
5.	EMF Sorter	Selects the number of sorters.	0: No sorters 1, 2, 3, 4, or 5: Sorters present	0	Input 1 to 5 to indicate the number of sorters.	O	O
*10.	Min. Print	Limits the minimum print quantity that can be entered.	0 to 9999	0		O	O
*11.	Max. Print	Limits the maximum print quantity that can be entered.	0 to 9999	9999		O	O
*12.	♥: A4 → A3 Mag. Ratio ♦: HLT → LG Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From A4 to A3 ♦: From 5$1/2$" x 8$1/2$" to 8$1/2$" x 14"	50 to 200%	♥: 141% ♦: 155%		O	
*12.	♥: B5 → B4 Mag. Ratio ♦: HLT → LG Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From B5 to B4 ♦: From 5$1/2$" x 8$1/2$" to 8$1/2$" x 14"	50 to 200%	♥: 141% ♦: 155%			O
*13.	♥: A4 → B4 Mag. Ratio ♦: LT → DLT Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From A4 to B4 ♦: From 5$1/2$" x 8$1/2$" to 11" x 17"	50 to 200%	♥: 122% ♦: 129%		O	O
*14.	♥: B4 → A3 Mag. Ratio ♦: LG → DLT Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From B4 to A3 ♦: From 8$1/2$" x 14" to 11" x 17"	50 to 200%	♥: 115% ♦: 121%		O	
*14.	♥: B5 → A4 Mag. Ratio ♦: LG → DLT Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From B5 to A4 ♦: From 8$1/2$" x 14" to 11" x 17"	50 to 200%	♥: 115% ♦: 121%			O

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
*15.	Full Size	Adjusts the full size magnification ratio.	50 to 200%	100%		O	O
*16.	Page Margin	Adjusts the create margin magnification ratio.	50 to 200%	93%		O	O
*17.	♥: A3 → B4 Mag. Ratio ♦: LG → LT Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From A3 to B4 ♦: From 8 1/2" x 14" to 8 1/2" x 11"	50 to 200%	♥: 87% ♦: 77%		O	O
*18.	♥: B4 → A4 Mag. Ratio ♦: ** → LT Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From B4 to A4 ♦: From 11" x 15" to 8 1/2" x 11"	50 to 200%	♥: 82% ♦: 74%		O	O
*19.	♥: A3 → A4 Mag. Ratio ♦: DLT → LT Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From A3 to A4 ♦: From 11" x 17" to 8 1/2" x 11"	50 to 200%	♥: 71% ♦: 65%		O	
*19.	♥: B4 → B5 Mag. Ratio ♦: DLT → LT Mag. Ratio	Adjusts the fixed magnification ratio. ♥: From B4 to B5 ♦: From 11" x 17" to 8 1/2" x 11"	50 to 200%	♥: 71% ♦: 65%			O
*20.	Buzzer On	Turns the beeper ON or OFF	0: No 1: Yes	0		O	O
*21.	Prints/Master Cost	Adjusts the ratio of masters to prints. For accounting purposes.	0 to 50	0	The set number (0 to 50) is automatically added to the key counter each time a master is used.	O	O
22.	Read Image Area	Not used	—	0	Not used	O	O
*23.	Online Paper Size	Used only in Japan	0: A6 1: A5	0	Not used		O
*24.	Character Emphasis	Use this to make text more clear when using Photo mode.	0: No 1: Slightly High 2: High	0			O

Service Tables

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
30.	Sub Scan Mag. Adjust	Adjusts the sub-scan magnification.	−1.9 to +1.9%	(0)	The factory setting depends on the machine.	O	O
31.	MTF Level	Adjusts the MTF level.	0: Low 1: Standard 2: High 3: Maximum	1		O	O
32.	Image Density Rank	In line mode, adjusts the image density level.	0: Light 1: Standard 2: Dark	1		O	O
33.	Lead Edge Margin	Adjusts the lead edge margin.	4 to 10 mm	8 mm		O	O
35.	Head Energy Adjust	Adjusts the thermal head energy.	0 to −99%	−7%	1% steps	O	O
36.	Sub Scan Mag. Adjust (ADF)	Adjusts the ADF sub-scan magnification.	-1.9 to 1.9%	0	0.1% steps	O	O
37	Shadow Erase Level	Use to adjust the threshold levels for shadow erase in the various image modes.	0: Line 1: Photo 2: Clear			O	O
37-0	Line	Use to adjust the threshold value for shadow erase in Line mode. There are four numbers. Each represents the threshold value for an image density. Input the required value for the one that is blinking, then press Enter to move on to the next one. The lower the value, the darker the printout will be. The factory settings are 27 for Light, 23 for Standard, 21 for Dark, and 17 for Darker.				O	O
37-1	Photo	Use to adjust the threshold values for each of the contrast settings for shadow erase in Line mode. There are three sub-menus to choose from. These are 0: Standard (Normal), 1: Light Tone, and 2: Dark Tone (see below).				O	O
37-1 -0	Std (Normal)	Adjusts the shadow erase threshold level for the Normal contrast setting in Line mode	Defaults 31: Light 25: Standard 17: Dark 15: Darker			O	O
37-1 -1	Lt (Light Tone)	Adjusts the shadow erase threshold level for the Light Tone contrast setting in Line mode	Defaults 31: Light 25: Standard 17: Dark 15: Darker			O	O

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
37-1 -2	Dk (Dark Tone)	Adjusts the shadow erase threshold level for the Dark Tone contrast setting in Line mode	Defaults 17: Light 13: Standard 7: Dark 3: Darker			O	O
37-2	Clear	Returns all the settings for SP mode 37 to the defaults.				O	O
38.	ADF Scan Line Adjust	Adjusts the ADF scanning start position.	-4.9 to 4.9 mm	0	0.1 mm steps See remarks (1).	O	O
39	Image Center Adjustment	Adjusts the center position of copies in the ADF and platen modes.	0: Scanner 1: ADF	0	See remarks (2).	O	O
39-0	Image Center Adjustment: Scanner	Adjusts the center position of copies in platen mode.	-0.9 to 0.9 mm	0	0.1 mm steps	O	O
39-1	Image Center Adjustment: ADF	Adjusts the center position of copies in ADF mode.	-4.9 to 4.9 mm	0	0.1 mm steps	O	O
*40.	Original	Specifies the image mode at power-up.	0: Photo 1: Line 2: Sharpen	1		O	O
*41.	Image Density	Specifies the image density at power-up.	0: Light 1: Standard 2: Dark 3: Darker	1		O	O
42.	Print Speed	Specifies the printing speed at power-up.	[C218 model] 0: 60 rpm 1: 75 rpm 2: 90 rpm 3: 105 rpm 4: 120 rpm [C219 model] 0: 60 rpm 1: 75 rpm 2: 90 rpm 3: 110 rpm 4: 130 rpm	2		O	O
*43.	Auto Cycle Mode	Specifies whether Auto Cycle mode is selected at power-up.	0: No 1: Yes	0		O	O

Service Tables

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
*44.	Memory/Class Mode	Specifies the initial job memory feature (Memory or Class mode) at power-up.	0: Class 1: Memory	1		O	O
45.	Std. Image Position	Specifies the image position at power-up	0: –20 mm 1: –15 mm 2: –10 mm 3: –5 mm 4: 0 mm 5: +5 mm 6: +10 mm 7: +15 mm 8: +20 mm	4		O	O
*46.	Make Up	Specifies the initial make-up background pattern when the Image Make-up mode is selected.	1 to 40 51 to 90 101 to 140 150 to 190	0	0: No background pattern is selected.	O	O
47.	Contrast	Specifies the initial contrast when the Photo mode is selected.	0: Standard 1: Light 2: Dark	0		O	O
48.	Photo	Specifies the initial screen when the Photo mode is selected.	0: Standard 1: Fine 2: Coarse	0		O	O
60.	Clear All Memory	Returns all SP modes to the factory settings.	0: No 1: Yes	0		O	O
70.	Original Feed Jam (A)	Displays the total number of original jams.		0		O	O
71.	Paper Feed Jam (B)	Displays the total number of paper feed jams.		0		O	O
72.	Paper Wrap Jam (E)/(B)(E)	Displays the total number of times that paper has wrapped around the drum.		0		O	O
73.	Paper Delivery Jam (G)	Displays the total number of paper delivery jams.		0		O	O
74.	Master Feed Jam (C)	Displays the total number of master feed jams.		0		O	O

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
75.	Master Delivery Jam (F)	Displays the total number of master delivery jams.		0		O	O
76.	Clear Jam Counters	Clears all jam counters.	0: No 1: Yes	0		O	O
81.	Proof Print No.	Specifies how many trial prints are made after making the master.	0 to 2 sheets	1		O	O
*82. -1	Skip Feed No.	Selects the feed interval.	1 to 5	1	1: Normal operation 2 to 5: One sheet fed every two to five drum rotations	O	O
-2	Long Sheet	Specifies whether a long sheet is used.	0: No 1: Yes	0	Displays only when no. 2, 3, 4, or 5 are selected in 82-1.	O	O
*83.	Auto Reset Time	Specifies the auto reset time.	0: No 1: 3 min. 2: 5 min.	0		O	O
*84.	Auto Combine 2 Orig.	Specifies the initial mode for Combine 2 Originals.	0: Normal 1: Auto (Two identical images are made if the Master Making key is pressed once.)	0		O	O
*85.	Initial Full Check	Specifies whether master full detection is made at power-up.	0: No 1: Yes	0		O	O
86.	A3 Drum 2 Count Up	Specifies whether the counter increments by two counts per print when the A3 drum is used.	0: No 1: Only the master counter 2: Both the master and the copy counter	0 Ricoh, AB Dick 2 NRG	See Remarks (3)	O	

Service Tables

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
87.	Memory Print	Specifies the print mode when in Memory mode.	0: Normal (Memory Print Mode) 1: Stack Mode	0	See Remarks (4)	O	O
88	Auto Memory/ Class	Specifies the print mode.	0: Normal 1: Auto Class (Memory) Print	0	See Remarks (5)	O	O
90.	Thermal Head Test	Selects the background pattern for the copy made in the thermal head test; performs the test.	1 to 40 51 to 90 101 to 140 150 to 190	7	See the Thermal Head Test section.	O	O (Only one pattern)
91.	Command Sheet Check	Prints the command sheet image (designated area) together with the original image.	0: No 1: Yes	0	See the Command Sheet Check section.	O	O
92.	Thermal Paper Mode	Use this mode to test the thermal head.	0: No 1: Yes	0	See Remarks (6)	O	O
93.	Erase Area Check	Checks the erase area.	0: No 1: Yes	0	See Remarks (7)	O	O
95. -1	Scanner Free Run	Selects free running of the scanner.	0: With the lamp off 1: With the lamp on	0	See Remarks (8)	O	O
-2	Scanner Free Run	Carries out the scanner free run. (The speed can be changed: see remarks (8).)	Start with the Print Start key. Stop with the Stop key.		Displays by pressing #, after selecting 0 or 1 in 95-1.	O	O
96.	ADF Original Feed Check	Carries out the ADF original feed check. (The speed can be changed; see remarks (9).)	Start with the Print Start key. Stop with the Stop key.		See Remarks (9)	O	O
100.	Combine 2 Originals Count	Displays the total number of masters made in Combine 2 Original mode.		0		O	O
101.	Make Up Count	Displays the total number of masters made in Make-up mode.		0		O	O

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
102.	Make Up Photo Count	Displays the total number of masters made in Make-up Photo mode.		0		O	O
103.	Area Mask Count	Displays the total number of masters made with the Margin Erase key.		0		O	O
104.	On line Count	Displays the total number of masters made in On Line mode.		0		O	O
105.	Overlay Count	Used only in Japan.		0		O	O
106.	Enlarge Count	Displays the total number of masters made in Fixed Enlargement mode.		0		O	O
107.	Reduction Count	Displays the total number of masters made in Fixed Reduction mode.		0		O	O
108.	Zoom Count	Displays the total number of masters made in Zoom mode.		0		O	O
110.	Power On Time	Displays the total amount of time the machine has been turned on.		0	xxxxx Hour xx Min. xx Sec.	O	O
111.	Total Count	Displays the total number of masters and prints.		0	M: Master count P: Print count	O	O
*113.	Resettable Count	Used by the customer to display the total number of masters and prints.		0	M: Master count P: Print count	O	O
*114.	CLR Reset table Count	Clears the resettable total master/print counters.	0: No 1: Yes	0		O	O
115.	ADF Mode Count	Displays the total number of sheets fed in the ADF mode.		0		O	O

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Tables

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No.	Display	Function	Data	Factory Setting	Comments	C218	C219
116.	Platen Mode Count	Displays the total number of originals set in platen mode.		0		O	O
117.	Color Drum Count	Displays the total number of prints when using the color drum.		0		O	O
118.	Paper Size Count	Displays the total number of prints made in each paper size. See Remarks (10).		0	Display counters for each paper size by pressing the # key.	O	O
119.	CLR All Total Count	Clears the following counters: Nos. 111, 115, 116, 117, and 118.	0: No 1: Yes	0		O	O
*120. -1	User Code Mode	Selects user code mode, and displays the total number of prints made in the User Code mode.	0: No 1: Yes	0	See the user code mode section.	O	O
-2	Auto Reset Time	Selects the auto reset time.	0: Unlimited 1: 3 min. 2: 5 min.	0	Displays only when "Yes" is selected in 120-1.	O	O
*121.	UC Count	Displays the total number of masters and prints made by each user code.		0	Press the # key to shift to another user code.	O	O
*122.	Clear UC Count	Clears every user code counter.	0: No 1: Yes	0	Same as above.	O	O
*123.	Total UC Count	Displays the total number of masters and prints for up to 20 user codes.		0		O	O
*124.	Clear Total UC Count	Clears the total user code counter.	0: No 1: Yes	0		O	O
130.	Input Check Mode	Displays the input from sensors and switches.			See the input check table.	O	O
131.	Output Check Mode	Turns on the electrical components.			See the output check table.	O	O

| No.	Display	Function	Data	Factory Setting	Comments	C218	C219
132.	All Indicators ON	Turns on all the indicators on the operation panel.			Press the # key to light all the indicators.	O	O
135.	SN: 1st Paper Exit	Displays the 1st paper exit sensor voltage.			Unit: Volts	O	O
136.	SN: 2nd Paper Exit	Displays the 2nd paper exit sensor voltage.			Unit: Volts	O	O
137.	SN: Master Eject	Displays the master eject sensor voltage.			Unit: Volts	O	O
138.	SN: Drum Master	Displays the drum master sensor voltage.			Unit: Volts	O	O
140.	Ink Detection	Specifies whether ink detection is done.	0: No 1: Yes	1		O	O
141.	Paper Detection	Specifies whether paper end detection is done.	0: No 1: Yes	1		O	O
*142. -1	Paper Size Detection	Selects paper size detection.	0: Yes 1: Width detection only 2: Length detection only 3: No detection	0		O	O
-2	Size Indication Off	Specifies whether the paper size indication on the operation panel is erased.	0: No 1: Yes	0	Displays only when 1, 2, or 3 is selected in 142-1.	O	O
*143.	Orig. Size Detection	Specifies whether original size detection is done.	0: No 1: Yes	1		O	
145.	Drum Mast. Detection	Specifies whether drum master detection is done.	0: No 1: Yes	1		O	O
146.	ADF Cover Detection	This mode disables the ADF Cover Sensor detection.	0: Disabled 1: Enabled	1		O	O
147.	Platen Set Detection	This mode disables the ADF Set Sensor detection.	0: Disabled (the ADF is always set) 1: Enabled	1		O	O

Service Tables

No.	Display	Function	Data	Factory Setting	Comments	C218	C219
150.	Control ROM No.	Displays the ROM part number and the ROM manufacturing date.		P/No.	1994/10/07 = YYYY/MM/DD	O	O
151.	Machine No.	Displays the machine serial number and the installation date.		0	Input the serial number and the installation date.	O	O
152.	Service Tel. No.	Input the service representative's telephone number, which is displayed with the service call code.		0	Use the number keys to input the telephone number at installation. Press the Memory/ Class key to add a space between the digits.	O	O
153.	Last Service Code	Displays the last service call.		0		O	O
*160.	♥: Area Mask A3 ❑ ♦: Area Mask 11x17❑	Adjust the margin erase area. ♥: A3 ♦: 11" x 17"	(50 to 307) x (50 to 432) mm	♥: 289 x416mm ♦: 271 x428mm		O	O
*161.	♥: Area Mask B4 ❑ ♦: Area Mask 8.5x14❑	Adjust the margin erase area. ♥: B4 ♦: 8$1/2$" x 14"	(50 to 307) x (50 to 432) mm	♥: 249 x360mm ♦: 208 x352mm		O	O
*162.	♥: Area Mask A4 ❑ ♦: Area Mask 8.5x11 ❑	Adjust the margin erase area. ♥: A4 Landscape ♦: 8$1/2$" x 11" Landscape	(50 to 307) x (50 to 432) mm	♥: 202 x293mm ♦: 208 x275mm		O	O

| No.	Display	Function	Data	Factory Setting	Comments	C218	C219
*163.	♥: Area Mask A4 ❑ ♦: Area Mask 8.5x11 ❑	Adjust the margin erase area. ♥: A4 Portrait ♦: 81/2" x 11" Portrait	(50 to 307) x (50 to 432) mm	♥: 289 x206mm ♦: 271 x212mm		O	O
*164.	♥: Area Mask B5 ❑ ♦: Area Mask 5.5x8.5 ❑	Adjust the margin erase area. ♥: B5 Landscape ♦: 51/2" x 81/2" Landscape	(50 to 307) x (50 to 432) mm	♥: 174 x253mm ♦: 132 x212mm		O	O
*165.	♥: Area Mask B5 ❑ ♦: Area Mask 5.5x8.5 ❑	Adjust the margin erase area. ♥: B5 Portrait ♦: 51/2" x 81/2" Portrait	(50 to 307) x (50 to 432) mm	♥: 249 x178mm ♦: 208 x136mm		O	O
*166.	♥: Area Mask A5 ❑ ♦: Area Mask **1 ❑	Adjust the margin erase area. ♥: A5 Landscape ♦: 2" x 2"	(50 to 307) x (50 to 432) mm	♥: 140 x206mm ♦: 50x 50mm		O	O
*167.	♥: Area Mask A5 ❑ ♦: Area Mask **2 ❑	Adjust the margin erase area. ♥: A5 Portrait ♦: 2" x 2"	(50 to 307) x (50 to 432) mm	♥: 202 x144mm ♦: 50x 50mm		O	O
*168.	♥: Area Mask A6 ❑ ♦: Area Mask **3 ❑	Adjust the margin erase area. ♥: A6 Landscape ♦: 2" x 2"	(50 to 307) x (50 to 432) mm	♥: 97x 144mm ♦: 50x 50mm		O	O
*169.	♥: Area Mask A6 ❑ ♦: Area Mask **4 ❑	Adjust the margin erase area. ♥: A6 Portrait ♦: 2" x 2"	(50 to 307) x (50 to 432) mm	♥: 140 x101mm ♦: 50x 50mm		O	O
*170.	♥: Area Mask ** ❑ ♦: Area Mask **5 ❑	Adjust the margin erase area. ♥: Others ♦: 2" x 2"	(50 to 307) x (50 to 432) mm	♥: 92x 144mm ♦: 50x 50mm		O	O

Service
Tables

Remarks

1) SP-Mode No. 38 − ADF Scan Line Position
   The printing position moves as shown below.

← Direction

Original Position

+X: Inputs +X mm

Printing Position

-X: Inputs -X mm

Printing Position

X mm
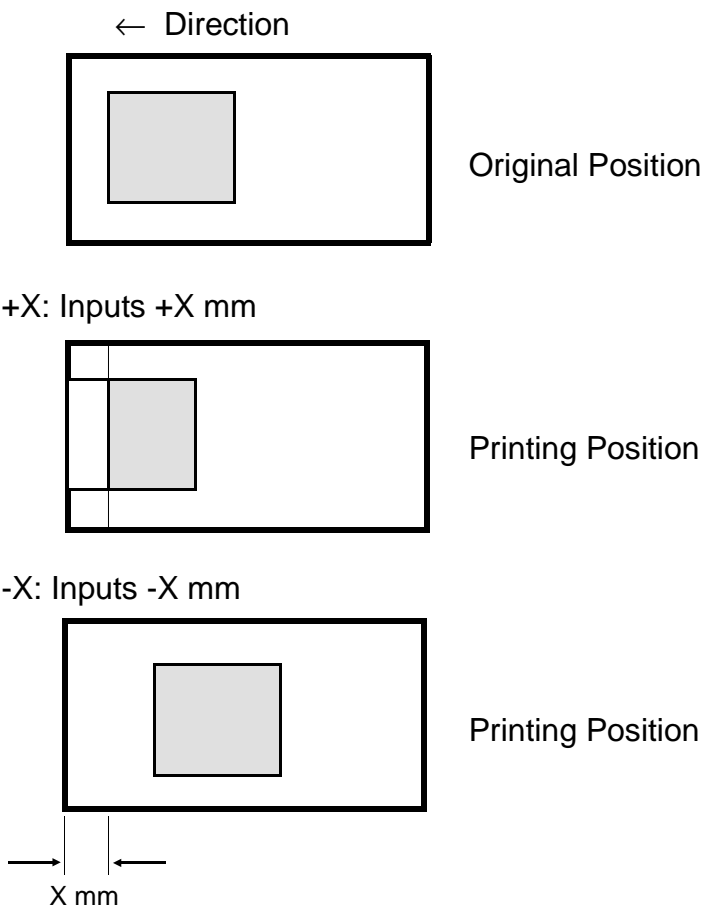
2) SP-Mode No. 39 – Image Center Position
   The printing position moves as shown below.

← Direction

Original Position

X mm

+X: Inputs +X mm

Printing Position

-X: Inputs -X mm

Printing Position
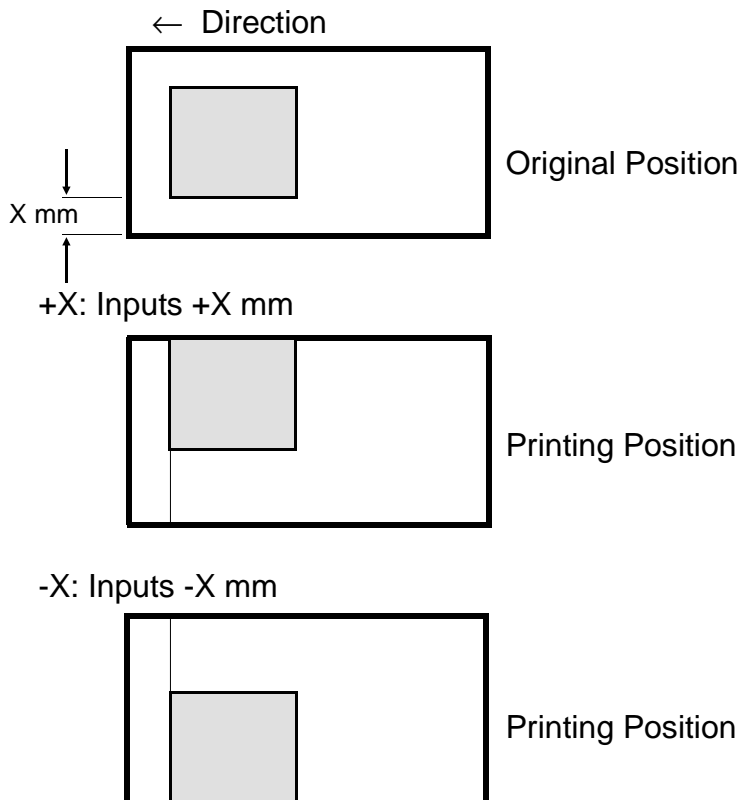
Note: In the case of image position adjustment of the scanner, input "0" first;
      Example)   X = 0.9 mm → "0", "9", and then press the # key.

3) SP-Mode No. 86 – A3 Drum 2 Count Up

The counter increment goes up by 2 if an A3 drum is installed, regardless of the size of paper.
The default setting is changed with DIP switch 102. See page 4-8 for details.

4) SP-Mode No. 87 – Memory Print

Set this mode to Memory to print a different number of prints from each original. The machine stops after printing each group. You must press the Print Start key each time to go on to print the next group. When all printing is finished, the input data is cleared.
Set this mode to Stack to print a different number of prints from only one original. The machine prints all printing groups continuously, without feeding tape from the tape dispenser. When all printing is finished, the input data is stored in the machine.

5) SP-Mode No.88 – Auto Memory/Class

Set this mode to Yes to let the machine print all groups continuously without installing a tape dispenser.

6) SP Mode 92 – Thermal Paper Mode

You can use this mode to test the thermal head.

Place the thermal paper in the plotter face down and change this SP Mode to 1. Place an original on the exposure glass and press the Master Making key. The machine starts plotting on the thermal paper without doing the master clamp process.

You can also enable SP Mode 90 and press the Master Making key to do the same procedure without placing an original on the exposure glass.

7) SP Mode 93 – Erase Area Check

This checks the erased area for shadow erase (Center and Edge Margin Erasing). If you make a master and print an image with this mode, the machine makes a background pattern on the area to be erased.

8) SP-Mode No. 95 – Scanner Free Run
  - It is possible to change the first scanner speed by changing the magnification ratio:
      25 to 200 % (Maximum speed = 25 %)
  - To start scanner free run, press the Print Start key after selecting "Lamp On/Off" using the # key.
    Input a magnification ratio if you wish to change the first scanner speed, before you press the Start key. (Factory setting = 25 %)
  - To stop the scanner free run, press the Stop key. The scanner returns to home position, then stops.
  - The machine does not exit SP mode until the scanner returns to home position correctly.

9) SP-Mode No. 96 – ADF Original Feed Check
  - It is possible to change the original feed speed, by changing the magnification ratio:
      25 to 200 % (Maximum speed = 25 %)
  - To start original feed, press the Print Start key after placing originals in the ADF.
    Input a magnification ratio if you wish to change the original feed speed, before you press the Start key. The ADF starts feeding until all originals are fed.
  - To stop feeding, press the Stop key. The original stops at this moment.
  - If the original feed fails, or if the Stop key is pressed, the "A + Jam" indicator turns on.
    If the failed originals are removed from the ADF, the jam indicator turns off and the failure is reset.
  - The machine does not exit SP mode during feeding.

10) SP-Mode No. 118 – Print Size Count
  - The print size counter indicates the following paper sizes:

A4 version	**LT version**
• A3	• DLT
• B4	• LG
• A4 Landscape	• LT Landscape
• A4 Portrait	• LT Portrait
• B5 Landscape	• HLT
• B5 Portrait	• * (Others)
• * (Others)	

11) Others
  - Use the Memory/Class key if you wish to change +/-.

**Service
Tables**

2.4 THERMAL HEAD TEST

This function is used to determine which printer component is causing an image problem on the master.

In this mode, the background pattern that is printed covers the entire sheet of paper.

Procedure
1. Place paper on the paper table.

NOTE: To reduce thermal head load, use the smallest paper size possible, i.e. the smallest size on which the area with the image problem can be printed.

2. Access SP mode.

3. Input No. 90 and press the Enter key.

NOTE: The factory setting is pattern No. 7. If necessary, input another background pattern with the Number keys.

4. Press the Master Making key (an original is not necessary).

5. Make prints and check the image.

Assessment

   If the pattern image is normal, a Part A component is defective.

   If the pattern image is abnormal, a Part B component is defective.
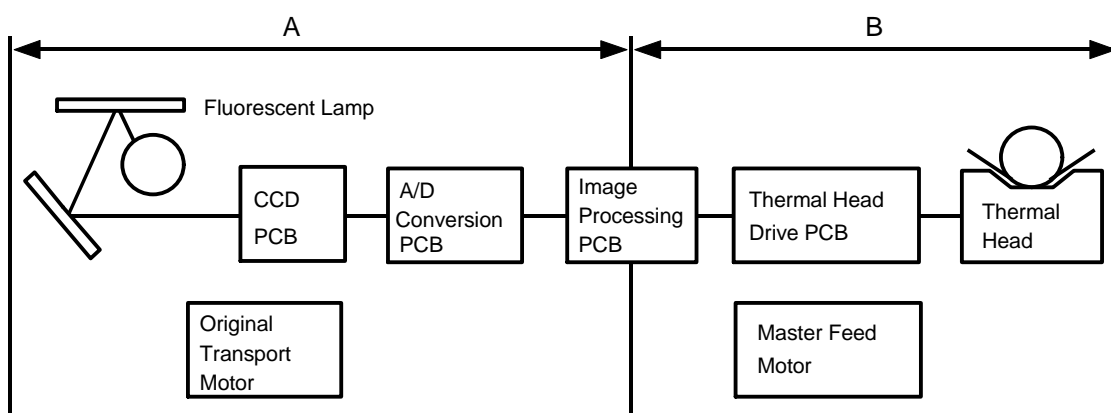
•   This mode can be used in combination with the SP mode No. 92, Thermal Paper Mode. See Page 4-20 for details.

2.5 COMMAND SHEET CHECK

Normally, Fn 9 or Fn 19 cannot be input in Make-up mode.

By changing the data of SP mode #91 from 0 to 1, Fn 9 or Fn 19 can be input.

Command No.	Display	Function
Fn 9	OVERLAY	Prints both the original image and designated area of the command sheet on the paper.
Fn 19	OVERLAY	

This function is used to check the position of the designated area on the command sheet. It is checked in relation to the original image to make sure that the command sheet is being read correctly.

Procedure

1. Access SP mode.

2. Input 91 and press the Enter key.

3. Input 1 with the number keys and press the Enter key.

4. Press the Clear Modes key to leave SP mode.

5. Place the command sheet and the original on the ADF.

6. Press the Make-up key and input Fn 9 or Fn 19 (these commands have the same function).

7. Input 1 for the undesignated area.

8. Press the Master Making key and then check the print to make sure that the area designated by the command sheet is in the correct position on the original image.

NOTE: 1. Only one command sheet can be stored in memory. If two or more command sheets are read, only the last command sheet is output.

2. Make sure to return the SP mode to its original setting after checking the designated area position.

Service
Tables

2.6 INPUT/OUTPUT CHECK MODE

This program checks the electrical components. The procedure for accessing the program is as follows:

2.6.1 Input Check Mode Access Procedure

1. Access SP mode. (See the SP mode access procedure.)

2. Enter 130 (SP mode number) with the number keys.

3. Press the Enter key.

4. Enter the desired input number. (See the input check table.)

NOTE: The input number can be shifted up or down by pressing the Zoom key.

5. Press the Enter key.

NOTE: In the input check mode, all image position LEDs and printing speed LEDs turn on when a sensor or switch that is being tested is actuated. A beep will also be heard.

6. Press the Enter key to return the display to the initial input check menu.

7. Press the Clear Modes key to leave SP mode.

2.6.2 Output Check Mode Access Procedure

1. Access SP mode. (See the SP mode access procedure.)

2. Enter 131 (SP mode number) with the number keys.

3. Press the Enter key.

4. Enter the desired output number. (See the output check table.)

NOTE: The output number can be shifted up or down by pressing the Zoom key ("+" or "−").

5. Press the Enter key.

6. Press the Print Start key to turn on the component.

7. Press the Enter key to return the display to the initial output check menu.

8. Press the Clear Modes key to leave the SP mode.

2.6.3 Input Check Table

Code	LCD Display	Component Checked	C218	C219
1.	SN: ADF Cover In- 1	ADF Cover Sensor	O	O
2.	SN: 1st Original (ADF) In- 2	Original Set Sensor	O	O
3.	SN: 2nd Original (ADF) In- 3	Original Registration Sensor	O	O
4.	SN: 3rd Original (ADF) In- 4	Scan Line Sensor	O	O
5.	SN: Original Size 0 In- 5	Original Width Sensor – 0	O	
6.	SN: Original Size 1 In- 6	Original Width Sensor – 1	O	
7.	SN: Original Size 2 In- 7	Original Width Sensor – 2	O	
8.	SN: Original Size 3 In- 8	Original Width Sensor – 3	O	
9.	SN: Cassette Size 0 In- 9	Cassette Size Switch – 4	O	
10.	SN: Cassette Size 1 In-10	Cassette Size Switch – 3	O	
11.	SN: Cassette Size 2 In-11	Cassette Size Switch – 2	O	
12.	SN: Cassette Size 3 In-12	Cassette Size Switch – 1	O	
13.	SN: Paper Size 0 In-13	Paper Width Sensor – 0	O	O
14.	SN: Paper Size 1 In-14	Paper Width Sensor – 1	O	O
15.	SN: Paper Size 2 In-15	Paper Width Sensor – 2	O	O
16.	SN: Paper Size 3 In-16	Paper Width Sensor – 3	O	O
17.	SN: Paper Size 4 In-17	Paper Length Sensor	O	O
18.	SN: Paper End In-18	Paper End Sensor	O	O
19.	SW: Paper Table Open In-19	Paper Table Open Switch	O	O
20.	SN: Paper Table Low Limit In-20	Paper Table Lower Limit Sensor	O	O
21.	SN: Paper Table Height In-21	Paper Table Height Sensor	O	O
22.	KEY: Lower Paper Feed Table In-22	Paper Table Down key	O	O

Service Tables

Code	LCD Display	Component Checked	C218	C219
23.	SW: Right Cutter In-23	Right Cutter Switch	O	O
24.	SW: Left Cutter In-24	Left Cutter Switch	O	O
25.	SN: Master Buckle In-25	Master Buckle Sensor	O	O
26.	SN: Master End In-26	Master End Sensor	O	O
27.	SIG: Ink In-27	When the Ink Detecting Pin detects ink	O	O
28.	SIG: Color Drum In-28	When a color drum is set	O	O
29.	SIG: Drum Size 0 In-29	When an A3/DLT or A4/LG drum is set	O	
30.	SIG: Drum Size 1 In-30	When an A4/LT drum is set	O	
30.	SIG: Drum Set In-30	When an A4/LT drum is set		O
31.	SN: Pressure Plate High Position In-31	Upper Pressure Plate Sensor	O	O
32.	SN: Pressure Plate Low Position In-32	Lower Pressure Plate Sensor	O	O
33.	SW: Master Eject Box In-33	Master Eject Box Switch	O	O
34.	SN: Full Master In-34	Full Master Detection Sensor	O	O
35.	SN: Printing Pressure In-35	Printing Pressure Sensor	O	O
36.	SN: 1st Drum Position In-36	First Drum Position Sensor	O	O
37.	SN: 2nd Drum Position In-37	Second Drum Position Sensor	O	O
38.	SW: Manual Master Cut In-38	Master Cut Switch	O	O
39.	SIG: Key Counter In-39	When a key counter is set	O	O
40.	SIG: Power Supply Temp. Detect In-40	When the power supply unit temperature is over 85°C	O	O
41.	SN: 1st Paper Exit In-41	First Paper Exit Sensor	O	O
42.	SN: 2nd Paper Exit In-42	Second Paper Exit Sensor	O	O
43.	SN: Master Eject In-43	Master Eject Sensor	O	O
44.	SN: Drum Master In-44	Drum Master Detection Sensor	O	O

Code	LCD Display	Component Checked	C218	C219
45.	SN: Scanner Home Position In-45	Scanner Home Position Sensor	O	O
46.	SN: Platen Angle (Scanner) In-46	Platen Cover Position Sensor	O	O
47.	SN: Platen Set (Scanner) In-47	ADF Set Sensor	O	O
48.	SN: Platen Original (Scanner) In-48	Original Sensor	O	O
49.	SN: 4th Original (ADF) In-49	Original Exit Sensor	O	O
50.	SW: Delivery Table Open In-50	Delivery Table Open Switch	O	

**Service
Tables**

2.6.4 Output Check Table

Code	LCD Display	Description	C218	C219
2.	MOTOR: ADF Drive Out- 2	Turns on the ADF drive motor.	O	O
3.	MOTOR: Master Eject Out- 3	Turns on the master eject motor.	O	O
4.	MOTOR: Pressure Plate Up/Down Out- 4	Turns on the pressure plate up/down motor.	O	O
5.	MC: Master Reverse Roller Out- 5	Turns on the master reverse roller magnetic clutch.	O	O
6.	MOTOR: Vacuum Out- 6	Turns on the vacuum fan motor.	O	O
7.	MOTOR: Air Knife Out- 7	Turns on the air knife motor.	O	O
8.	SIG: Key Counter Out- 8	Increments the key counter.	O	O
9.	COUNTER: Master Out- 9	Increments the master counter.	O	O
10.	COUNTER: Paper Out-10	Increments the total counter.	O	O
11.	SOL: Paper Separation Release Out-11	Turns on the separation plate release solenoid.	O	
12.	SOL: Ink Supply Out-12	Turns on the ink supply solenoid.	O	O
13.	SOL: Drum Lock Out-13	Turns on the drum lock solenoid.	O	O
14.	SOL: Paper Feed/Print Pressure Out-14	Turns on the paper feed solenoid and the printing pressure solenoid.	O	O
15.	SOL: Master Feed Clamper Out-15	Turns on the master feed clamper solenoid.	O	O
16.	SOL: Master Eject Clamper Out-16	Turns on the master eject clamper solenoid.	O	O
17.	SOL: Master Eject Out-17	Turns on the master eject solenoid.	O	O
18.	RELAY: Paper Table Down Out-18	Turns on the paper table drive motor (down).	O	O
19.	RELAY: Paper Table Up Out-19	Turns on the paper table drive motor (up).	O	O
20.	RELAY: Main Motor Reverse Out-20	Turns the drum in the direction opposite to the printing direction.	O	O
21.	SIG: Fluorescent Lamp Out-21	Turns on the fluorescent lamp if the Print key is pressed. Turns off the lamp if the Print key is pressed again.	O	O
22.	MOTOR: Cutter + Direction Out-22	Turns on the cutter motor (moves it to the rear of the machine).	O	O
23.	MOTOR: Cutter – Direction Out-23	Turns on the cutter motor (moves it to the front of the machine).	O	O

Code	LCD Display	Description	C218	C219
24.	MOTOR: Image Shift + Direction Out-24	Turns the image position motor in the "+" direction.	O	O
25.	MOTOR: Image Shift – Direction Out-25	Turns the image position motor in the "–" direction.	O	O
26.	MOTOR: Main (10 rpm) Out-26	Turns on the main motor (10 rpm).	O	O
27.	MOTOR: Main (30 rpm) Out-27	Turns on the main motor (30 rpm).	O	O
28.	MOTOR: Main (1st Speed) Out-28	Turns on the main motor (1st speed).	O	O
29.	MOTOR: Main (2nd Speed) Out-29	Turns on the main motor (2nd speed).	O	O
30.	MOTOR: Main (3rd Speed) Out-30	Turns on the main motor (3rd speed).	O	O
31.	MOTOR: Main (4th Speed) Out-31	Turns on the main motor (4th speed).	O	O
32.	MOTOR: Main (5th Speed) Out-32	Turns on the main motor (5th speed).	O	O
33.	MOTOR: Original Feed Out-33	Turns on the original transport motor.	O	O
34.	MOTOR: Master Feed Out-34	Turns on the master feed motor.	O	O
35.	MOTOR: Paper Reverse Out-35	Turns on the paper return motor.	O	
36.	Turn on drum, feed/ pressure SOLs Out-36	Turns on the main motor (10 rpm), the paper feed solenoid, and the printing pressure solenoid.	O	O
37.	MOTOR: Scanner	Turns on the scanner motor. Starts by the Print Start key. Stops by the Print Start key again. Then the scanner (carriage) returns to home position by pressing the Print Start key.	O	O
38.	EMF Sorter Mode 1 Out-38	Turns on test mode 1. (Available only when the EMF sorter is installed.) Starts with the Print Start key. Stops with the Stop key.	O	O
39.	EMF Sorter Mode 2 Out-39	Turns on test mode 2. (Available only when the EMF sorter is installed.) Starts with the Print Start key. Stops with the Stop key.	O	O
40.	EMF Sorter Mode 3 Out-40	Turns on test mode 3. (Available only when the EMF sorter is installed.) Starts with the Print Start key. Stops with the Stop key.	O	O
41.	EMF Sorter Mode 4 Out-41	Turns on test mode 4. (Available only when the EMF sorter is installed.) Starts with the Print Start key. Stops with the Stop key.	O	O

Service Tables

2.7 USER CODE MODE

2.7.1 User Codes

With the user code function, operators must input an authorized code before the machine will operate. The machine keeps track of the number of prints made under each code.

There are 20 user codes as follows:

No.	User Code No.
1	382
2	191
3	182
4	173
5	164
6	155
7	146
8	137
9	128
10	119
11	482
12	291
13	282
14	273
15	264
16	255
17	246
18	237
19	228
20	219

2.7.2 How To Use a User Code

1. Enter the user code (3 digits) with the number keys.

2. Press the Enter key.

3. Press the Master Making key to start printing.

NOTE: The user code mode is reset if the Clear Modes key and the Stop key are pressed together.

3. DRUM/MASTER INTERCHANGEABILITY

O: Standard combination

Δ: Usable under certain conditions

X: Cannot be used

		C210 Model	C218 Model	C219 Model
Masters	VT-M	X	X	X (NOTE 1)
	VT-L	O	X (NOTE 1)	X
	VT-M II	X	X	O
	VT-L II	O	O	X
Color Drums	VT2000-B4 (C533)	X	X	Δ (NOTE 2, 3)
	VT2000-LG (C535)	X	X	Δ (NOTE 2, 3)
	VT2000II-M (C558)	X	X	O
	VT2000II-LG (C557)	X	X	O
	VT3000-L (C526)	O	Δ (NOTE 2, 3, 5)	X
	VT3000-S (C528)	O	Δ (NOTE 2, 3)	X
	VT3000II-L (C556)	X (NOTE 4)	O	X
	VT3000II-S (C559)	X (NOTE 4)	O	X

NOTES: 1. The VT master can be installed in the C218/C219 models. However, a weak image (sometimes a blank image) will appear. This is because the VT II master is more sensitive than the VT master.

2. The modified clamper and the tetron screen must be installed.

3. For the U.S. version of the machine, the modified Drum Unit Rail End must be installed (for safety standard reasons).

4. Ink leakage may occur at the trailing edge.

5. The A3 size print area for the C218 model is longer than that of the C210 model.

Service Tables

SECTION 5

REPLACEMENT AND ADJUSTMENT

1. EXTERIOR

NOTE: The replacement and adjustment procedures not mentioned in the following pages are identical to those of the C210 machine.

1.1 EXTERIOR COVERS
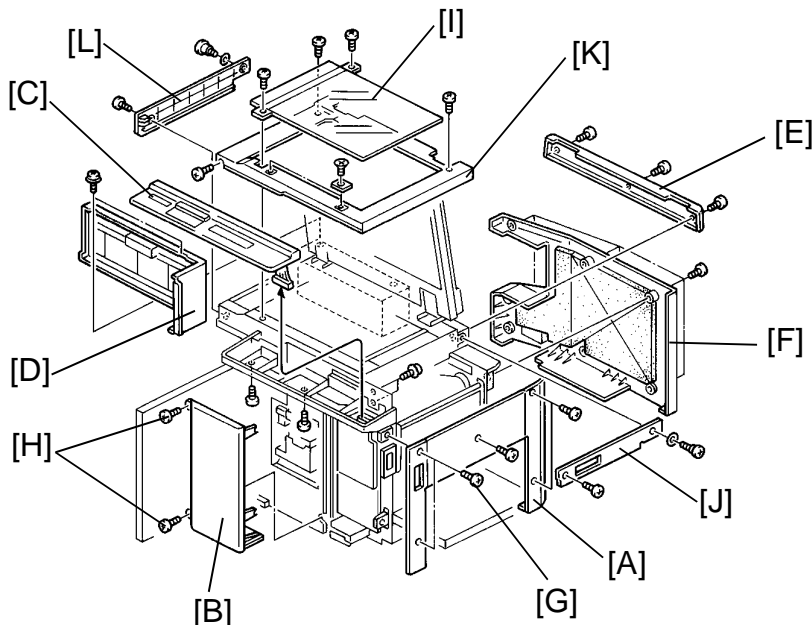
When adjusting or disassembling each section, refer to the following procedures on how to remove exterior covers.

[A] Right Cover (5 screws)

[B] Right Front Cover: Open the front door, loosen the 2 screws [G], remove the 2 screws [H].

[C] Operation Panel: Open the front door, slide the scanner unit to the left and remove the 4 screws.

[D] Master Eject Cover: Open the master eject unit and remove the 2 screws.

[E] Upper Rear Cover: Remove the 3 screws.

[F] Rear Cover: Remove the 7 screws.

[K] Upper Cover
    1: Remove the exposure glass [I] (2 screws).
    2: Remove the right upper cover [J] (Front: 1 screw /Rear: 1 stepped screw, 1 washer)
    3: Remove the upper cover [K] (5 screws)

[L] Left Upper Cover (Front: 1 screw /Rear: 1 stepped screw, 1 washer).

2. SCANNER SECTION

2.1 ADJUSTING THE SCANNER POSITION
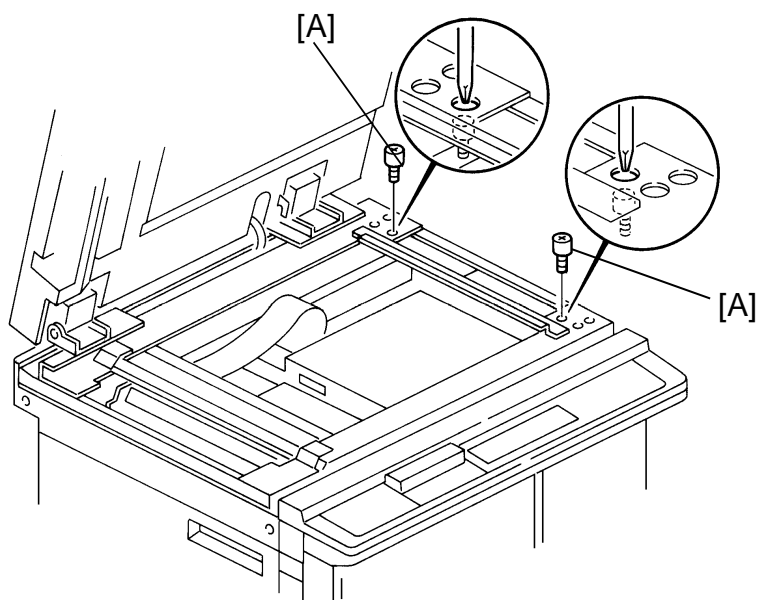
Purpose: To make the position of the first and second scanners parallel to the scan line position.

1. Restart the machine with the main switch, so that the scanners move to the home position. Then, enter the scanner home position check mode (SP no.130, Mode no. 45; see section 4-2).

2. Remove two positioning pins [A] that are located in the right side of the scanner.
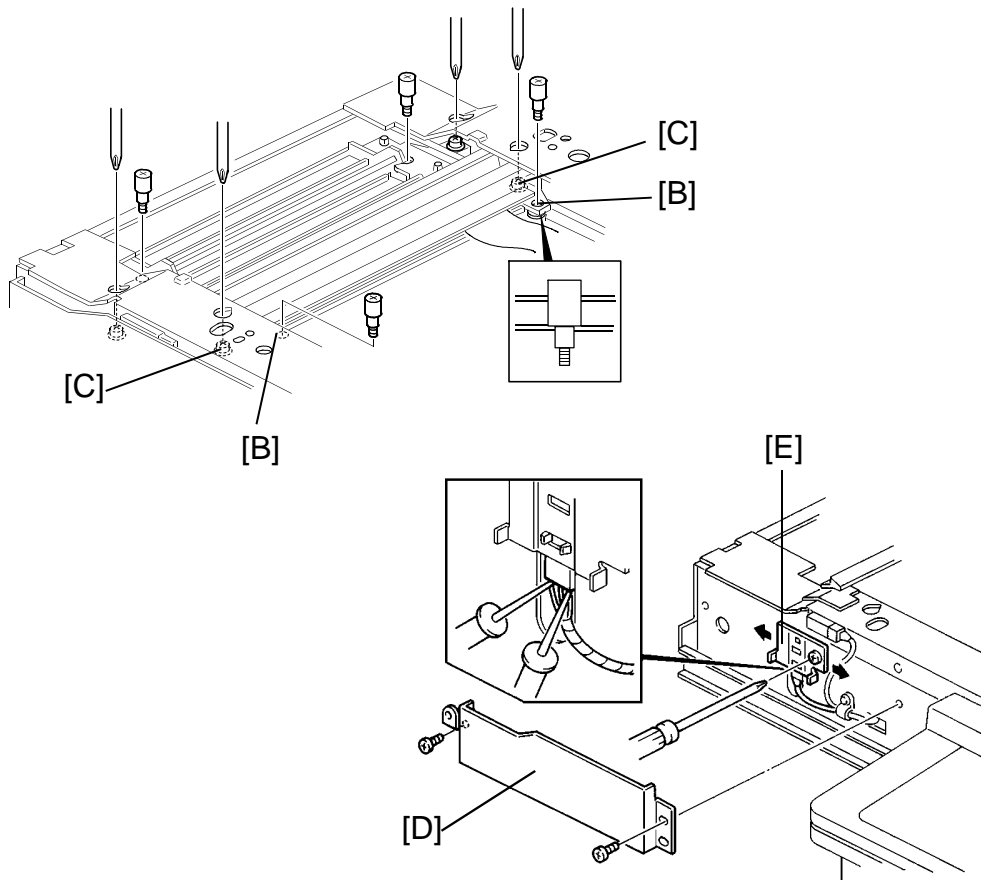
3. Put the positioning pins in the front and rear holes [B] of the first scanner. Make sure that the positioning pin can be set in the holes smoothly.

4. If the pins did not fit smoothly, adjust the position of the first scanner with the screws [C].

5. Check and adjust the position of the second scanner using the same procedure as in steps 3 and 4.

6. Slide the scanner unit and remove the sensor cover [D] (2 screws).

7. Connect the probes of the multimeter to the sensor's connector.
   CN1: +5V
   CN2: GND
   CN3: Scanner H.P (Signal)

8. Slide the sensor bracket [E] and tighten the bracket when the sensor output goes to low (5 V to 0 V).

9. Check the optics adjustments and adjust them if necessary (see section 3).

Replacement
Adjustment

2.2 **FLUORESCENT LAMP**
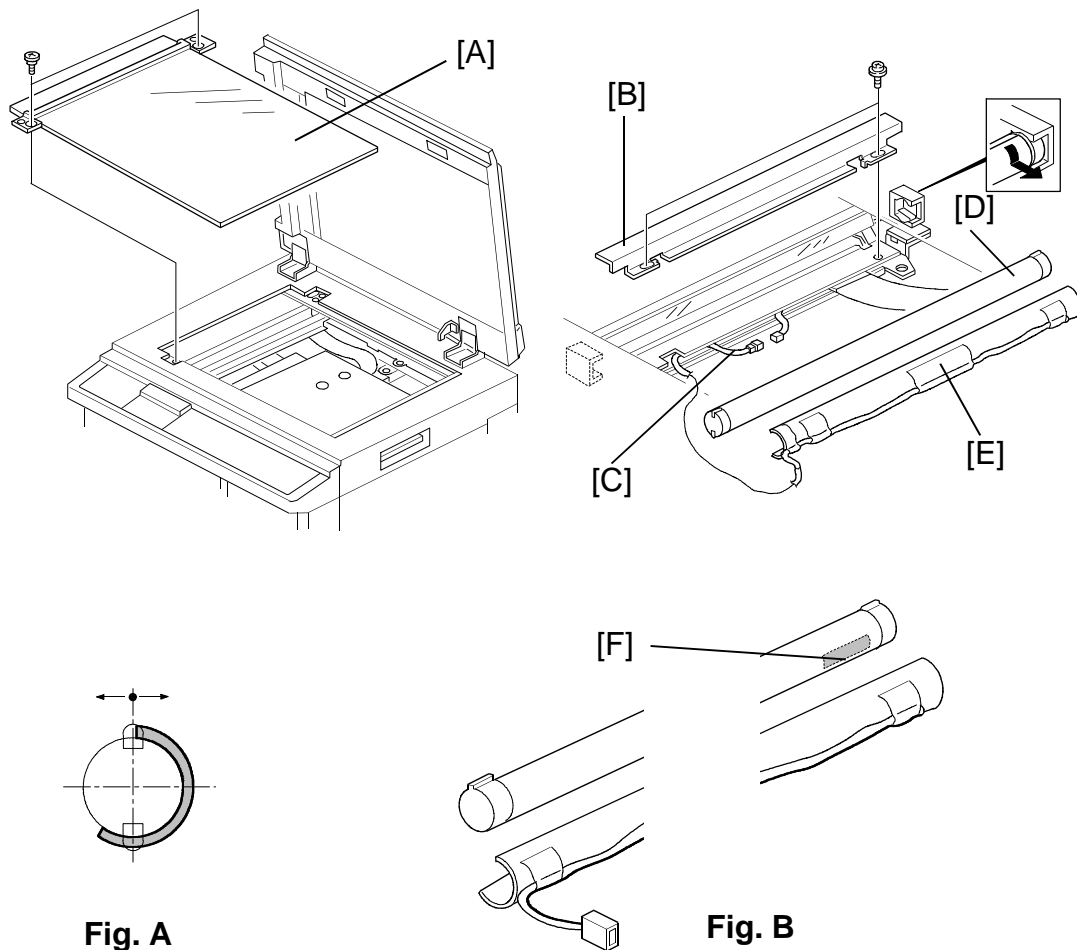
Fig. A

Fig. B

1. Remove the exposure glass [A] (2 screws).

2. Remove the lamp cover [B] (2 screws).

3. Disconnect the lamp heater harness [C].

4. Remove the fluorescent lamp [D].

5. Remove the lamp heater [E].

NOTE: When you reinstall the lamp heater, make sure of the following items.
   * The edge of the heater should be in the same position as the lamp bias terminal as shown in figure A.
   * The maker name [F] of the lamp should be covered with the heater as shown in figure B.

2.3 A/D CONVERSION PCB
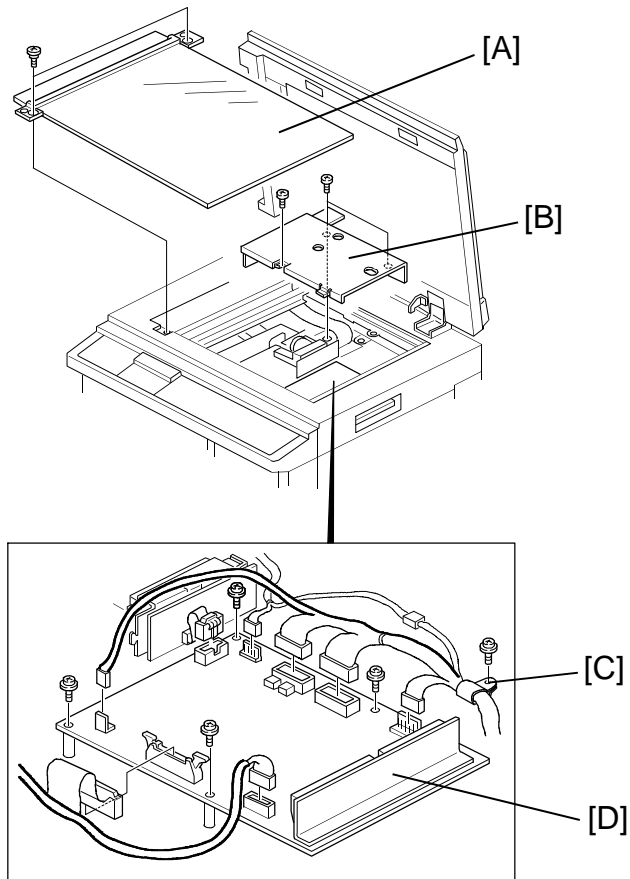
1. Remove the exposure glass [A] (2 screws).

2. Remove the lens block cover [B] (3 screws).

3. Remove the harness clamp [C] (1 screw).

4. Remove the A/D conversion PCB [D] (4 screws, 7 connectors).

**Replacement
Adjustment**

2.4 SCANNER TIMING BELTS
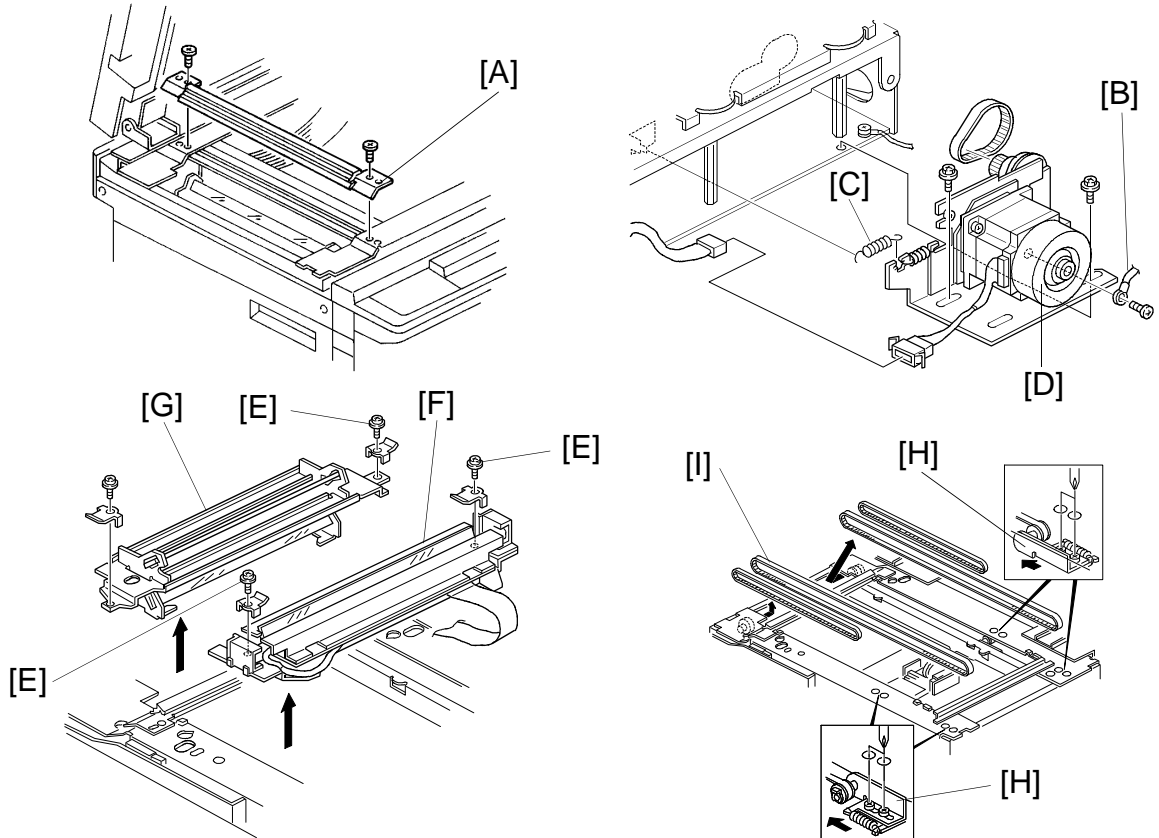
1. Remove the exposure glass (see section 1-1).

2. Remove the upper cover (see section 1-1).

3. Remove the exit guide [A] (2 screws).

4. Remove the upper rear cover (see section 1-1).

5. Remove the grounding wire [B] (1 screw).

6. Remove the spring [C].

7. Remove the scanner motor assembly [D] (2 screws, 1 connector, 1 timing belt).

8. Loosen the screws [E] securing both the 1st scanner [F] and 2nd scanner [G]. Then, take out these scanners.

9. Loosen the screws securing the belt tension brackets [H].

10. Remove the timing belts [I].

NOTE: After replacing the scanners, the scanner position adjustment must be performed (see section 2-1).

3. OPTICS SECTION

3.1 OVERVIEW

The method of optics adjustment is similar to the C210 model.
Necessary Tools

1) Facsimile Test Chart R-21   (99992131)
2) Resolution Chart   (A0129110)
3) Oscilloscope

Oscilloscope	Test Pin
CH1	TP603 (SIGNAL)
CH1	TP604 (OFFSET)
CH2	TP602 (TRIG)
GND	TP601 (GND-A)
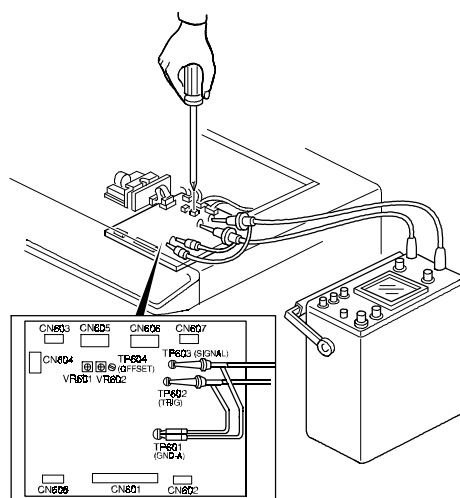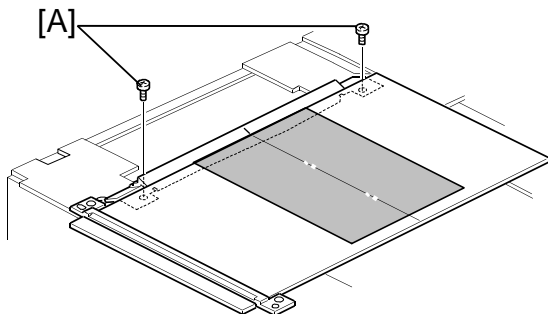
3.2 PREPARATION FOR ADJUSTMENT

1. Remove the upper cover (see section 1-1).

2. Remove the lens block cover.

3. Connect the terminals of the oscilloscope to the above mentioned test pins on the A/D conversion board.

4. Turn on the main switch and access the I/O Check Mode (SP-131).

5. Enter 21 with the number keys, then press the Print Start key to turn on the fluorescent lamp.

   NOTE: Before adjusting, leave the fluorescent lamp on for 5 minutes to stabilize the light intensity.

6. Remove the screws [A] then take off the exposure glass, rotate it 90 degrees, and position it as shown above.

3.3 ADJUSTING THE REDUCTION RATIO (MOIRE ADJUSTMENT)
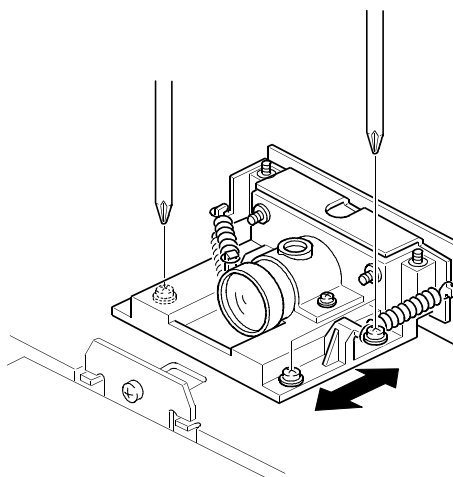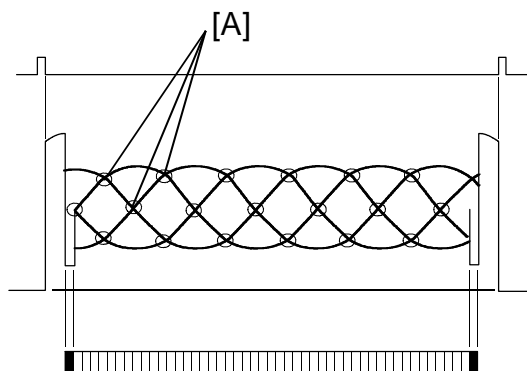
Position the resolution chart so that the area concerning 200 dpi on the test chart can be read.
Adjust the lens block position so that there are fewer than 30 cross points [A].
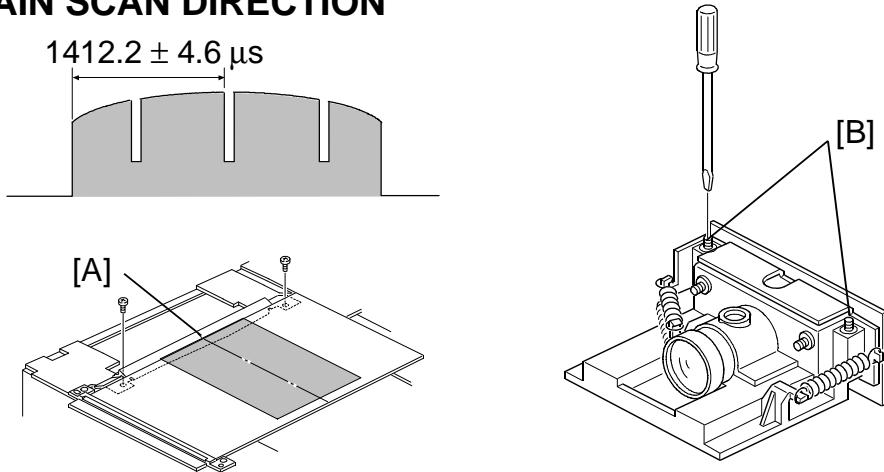
3.4 ADJUSTING THE FOCUS (MTF ADJUSTMENT)
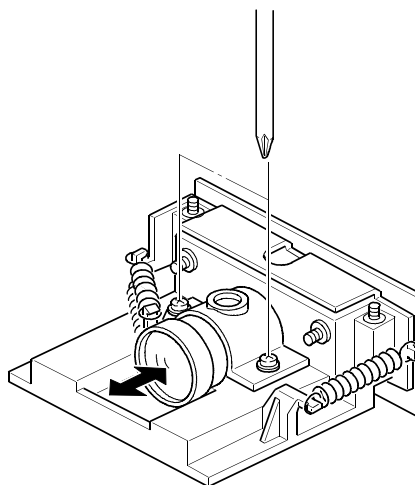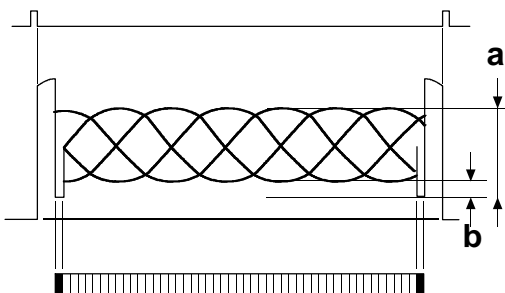
$$\frac{a-b}{a+b} \times 100 \geq 60\%$$

Position the resolution chart so that the area concerning 200 dpi on the test chart can be read. Adjusting the lens position until the waveform's dimensions are as shown above.

3.5 ADJUSTING THE READING START POSITION IN THE MAIN SCAN DIRECTION

$1412.2 \pm 4.6\ \mu s$

[B]

[A]

Position the test chart so that the center line, located at the leading edge of the test chart, is positioned at the center mark [A] on the exit guide. Then scan the test chart.

Adjust the CCD board position by turning the screws [B] until waveform is as shown in the top diagram.

3.6 ADJUSTING THE SCAN LINE POSITION

[A]   Black line   [A]

1 mm
Black Line

Test Chart R21

[B]

Position the exposure glass so that the edge of the glass is placed across the center of the holes [A] and place the black line of the test chart just at the edge of the glass as shown in the above diagram.
Adjust the CCD board position by turning the screws [B] so that the shape of the wave is similar to that shown in the above diagram.

3.7 ADJUSTING THE SHADING PLATE
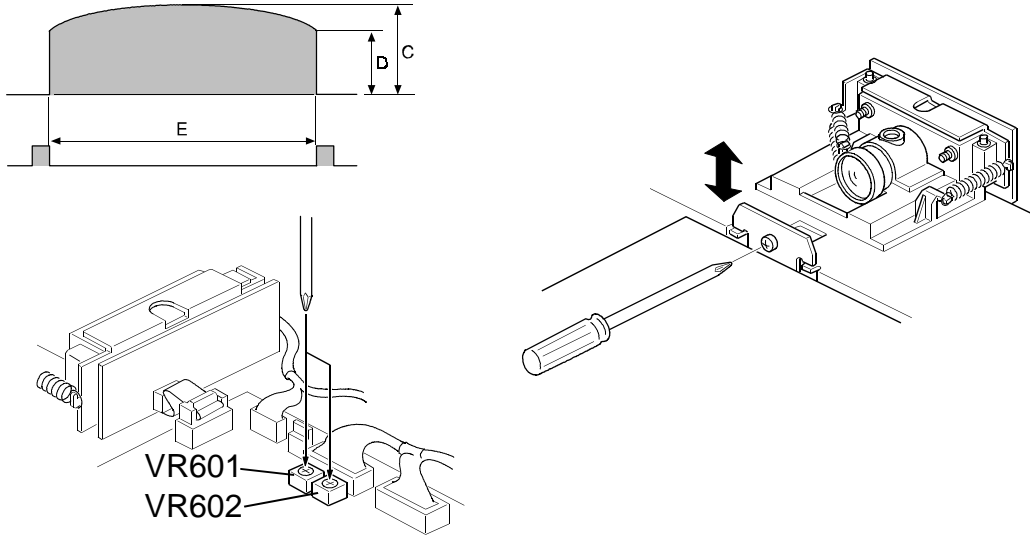
D> 0.7C   C< 1.0V   E< 3 ms
* The middle of the waveform should be higher than the ends.

Position the resolution chart so that the white area can be read, then turn VR601 counterclockwise until it stops (maximum white level). Adjust the shading plate position so that the wave is shaped as shown above.

3.8 ADJUSTING THE WHITE LEVEL AND BLACK LEVEL

Adjust VR601 on the A/D conversion board so that the maximum level is 3.4 ± 0.1V.

Check the standard black level at TP 604. It should be the same as that of the white level. If not, adjust the standard black level by turning VR602.

NOTE: When adjusting the standard black level, the GND level of CH1 and CH2 should be the same.

4. MASTER FEED SECTION

4.1 ADJUSTING THE THERMAL HEAD POSITION

This adjustment is only for the C218 model.

Purpose: To correct the skewed image on the master in the platen mode.

Adjustment standard: There is no skewed image appearing on the master.

Skewed image

Thermal head pin rotation
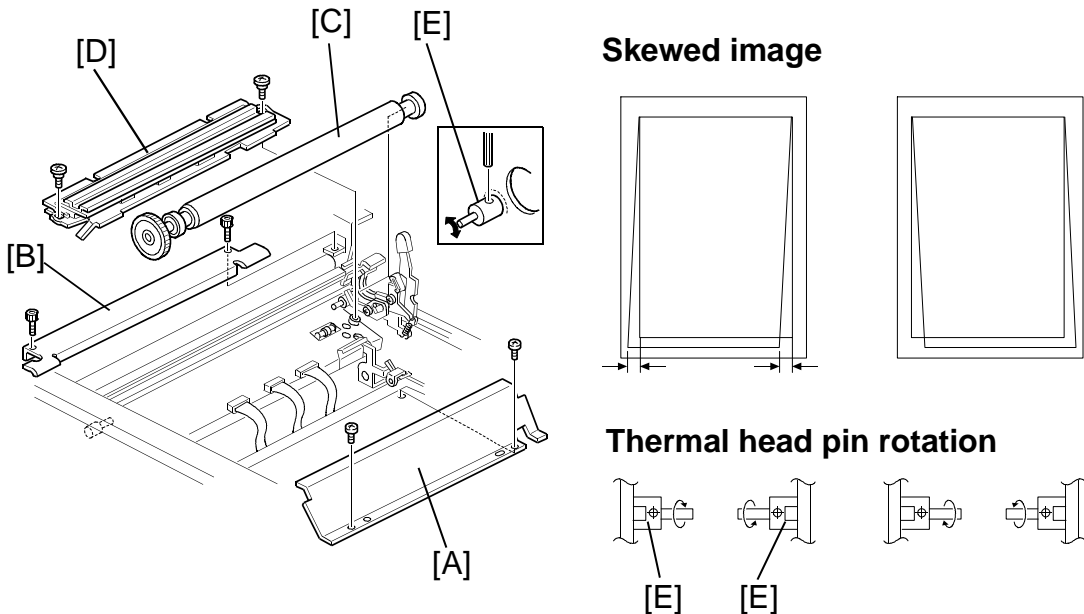
1. Make a copy in the platen mode and check that the image is without any skew.

2. If the image is skewed, perform the following steps.
   2-1. Take out the master roll.
   2-2. Remove the cover [A] (2 screws).
   2-3. Remove thermal head cover [B] (2 screws).
   2-4. Remove the platen roller [C].
   2-5. Remove the thermal head [D] (2 screws, 3 connectors).
   2-6. Loosen the set screw in each thermal head pin [E].
   2-7. Turn the pins in the opposite direction to each other at the same time by the same amount (0.3 mm/unit on the scale).
   2-8. Tighten the set screws, then check the image.

Replacement
Adjustment
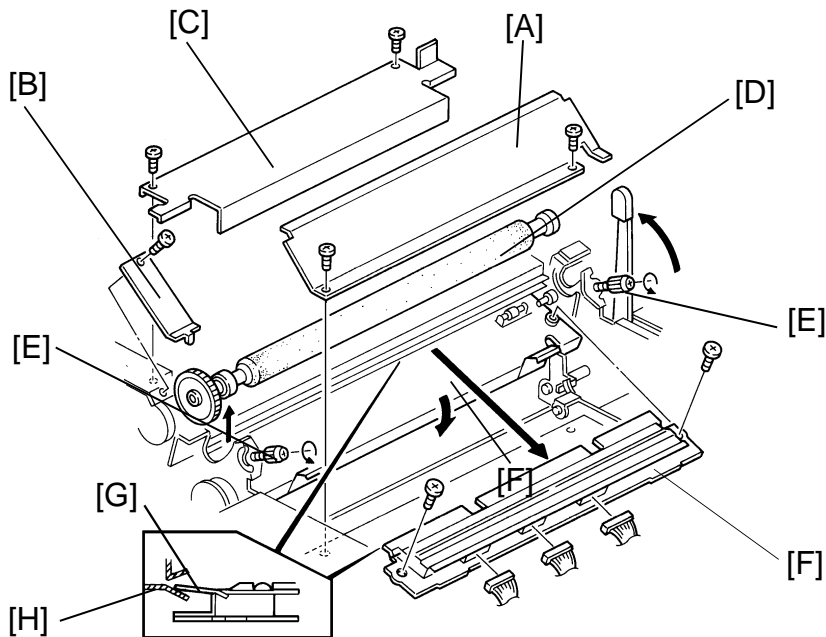
4.2 THERMAL HEAD

1. Slide the scanner unit to the left.

2. Remove the master roll.

3. Remove the thermal head cover [A] (2 screws).

4. Remove the gear cover [B] (1 screw).

5. Remove the platen roller cover [C] (2 screws).

6. Remove the platen roller [D] (loosen 2 screws [E]).

7. Remove the thermal head [F] (2 screws, 3 connectors).

NOTE • Make sure the thermal guide plate [G] is positioned above the
             lower cutter unit guide plate [H].
           • After replacing the thermal head, perform the thermal head voltage
             adjustment (see section 4-1 of the C210 manual).

4.3 OTHERS

NOTE: The purposes of the following items are identical to those of the C210 machines. However the specifications and or procedures for those items are different.

- **ADJUSTING THE MASTER EJECT SENSOR**
  The voltage of the sensor can be checked by SP mode No. 137.

- **ADJUSTING THE PAPER FEED ROLLER PRESSURE: C219 only**
  Adjust the paper feed roller pressure to 250 ± 10 grams.

- **ADJUSTING THE FEED TIMING OF THE SECOND FEED ROLLER: C219 only**
  Turn the cam so that the angle turned when the second feed roller sector gear starts returning counterclockwise is 157°.

- **ADJUSTING THE PAPER TABLE HEIGHT**
  Adjust the distance between the lower stay and the upper face of the table to 148.5 ± 0.5 mm.

- **ADJUSTING THE PRESSURE TIMING**
  Adjust the drum rotation angle when the press roller begins to touch the drum surface to $225 \pm 1°$.

- **ADJUSTING THE PRINTING PRESSURE: C219 only**
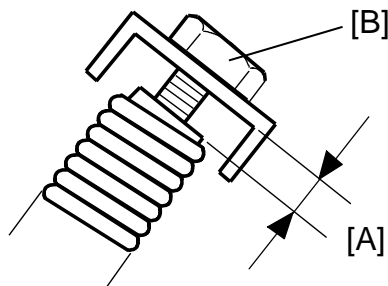
Adjust the clearance [A] to 8 ± 0.5 mm by turning the adjusting bolt [B].

- **ADJUSTING THE DRUM MASTER DETECTION SENSOR**
  The voltage of the sensor can be checked by SP mode No. 138.

- **ADJUSTING THE FIRST PAPER EXIT SENSOR: C218 only**
  The output voltage of the sensor should be 0.9 ~ 1.0 V. The voltage can be checked by SP mode No. 135 for both models.

Replacement Adjustment

- **ADJUSTING THE SECOND PAPER EXIT SENSOR**
  The voltage of the sensor can be checked by SP mode No. 136.

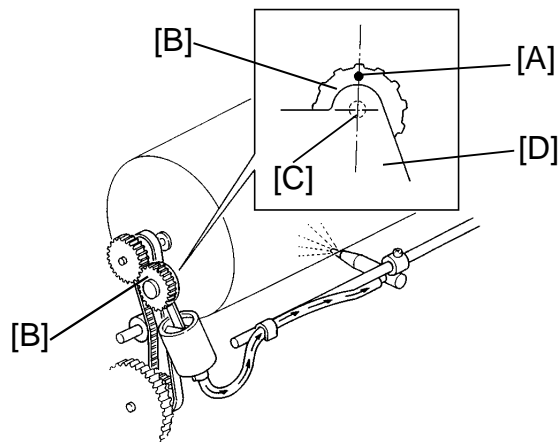- **ADJUSTING THE CLEARANCE OF THE EXIT PAWL**
  Adjust the exit pawl clearance so that the distance between the exit
  pawl and the drum is between 0.6 ~ 0.9 mm for the C218 machine
  and 0.3 ~ 0.7 mm for the C219 machine.

- **ADJUSTING THE PAPER EXIT PAWL AIR PUMP**

  [C218]
  Adjust the pump piston position so that it is at the upper dead point
  when the drum has rotated 341 ± 3 degrees.

  [C219]

  Reposition the mark [A] on the pump drive gear [B] to be right over the
  gear shaft [C] when the drum is at the home position.

- **ADJUSTING THE PRINTING SPEED: C219 only**
  Adjust the printing speed in the maximum printing speed mode to
 130 ± 5 rpm by turning VR105 on the main PCB.

5. IMAGE ADJUSTMENT

5.1 SUB SCAN MAGNIFICATION ADJUSTMENT

Purpose: To correct the sub scan magnification.
Adjustment Standard: $100 \pm 0.5\%$ in the full size mode.

1. Using a test chart, make a print using the platen cover mode.

2. Check that the sub scan magnification is within the specification.

3. If it is out of specification, adjust the sub scan magnification using SP No.30.

SP No. 30
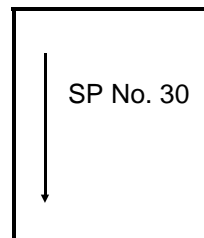
5.2 IMAGE CENTER ADJUSTMENT (Side to Side)

Purpose: To correct the center position of the print image.
Adjustment Standard: Less than 1 mm

1. Using a test chart, make a print using the platen cover mode.

   NOTE: The center line located at the leading edge of the test chart should be set at the center mark on the left scale.

2. Compare the original and the print image, then confirm that the difference between them is within 1mm.

3. If the difference is too great, adjust the image center using SP No. 39.

Replacement Adjustment
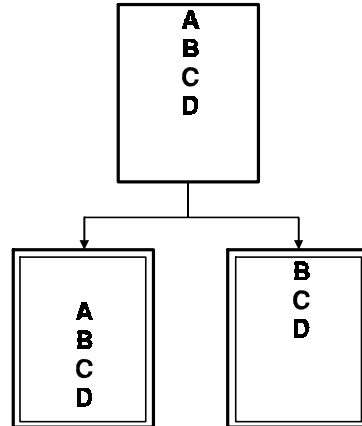
5.3 SCANNER LEADING EDGE REGISTRATION ADJUSTMENT

Purpose: To adjust the scanner start position according to the customer's
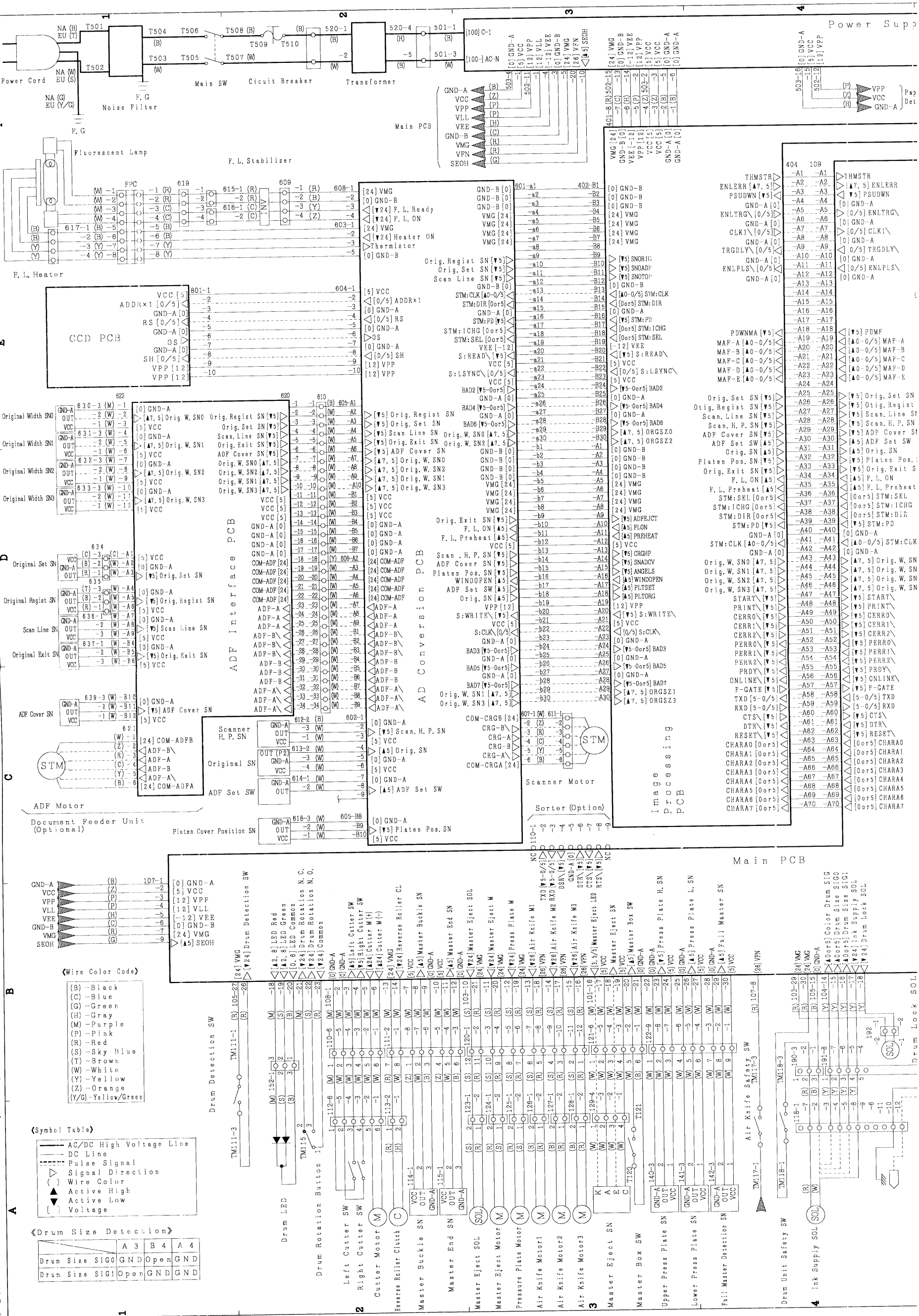   request.

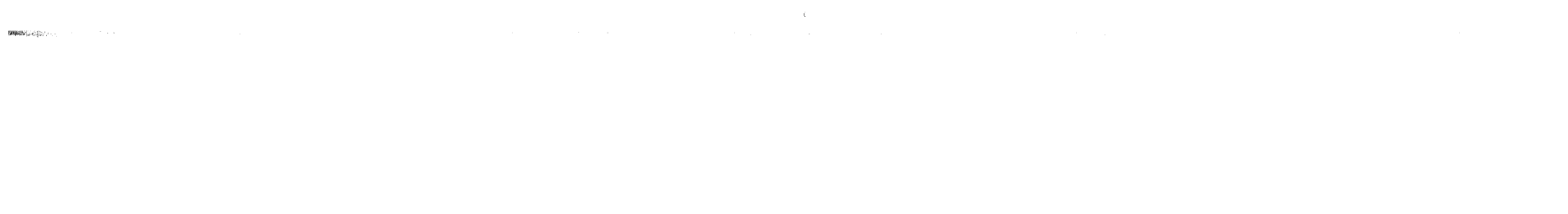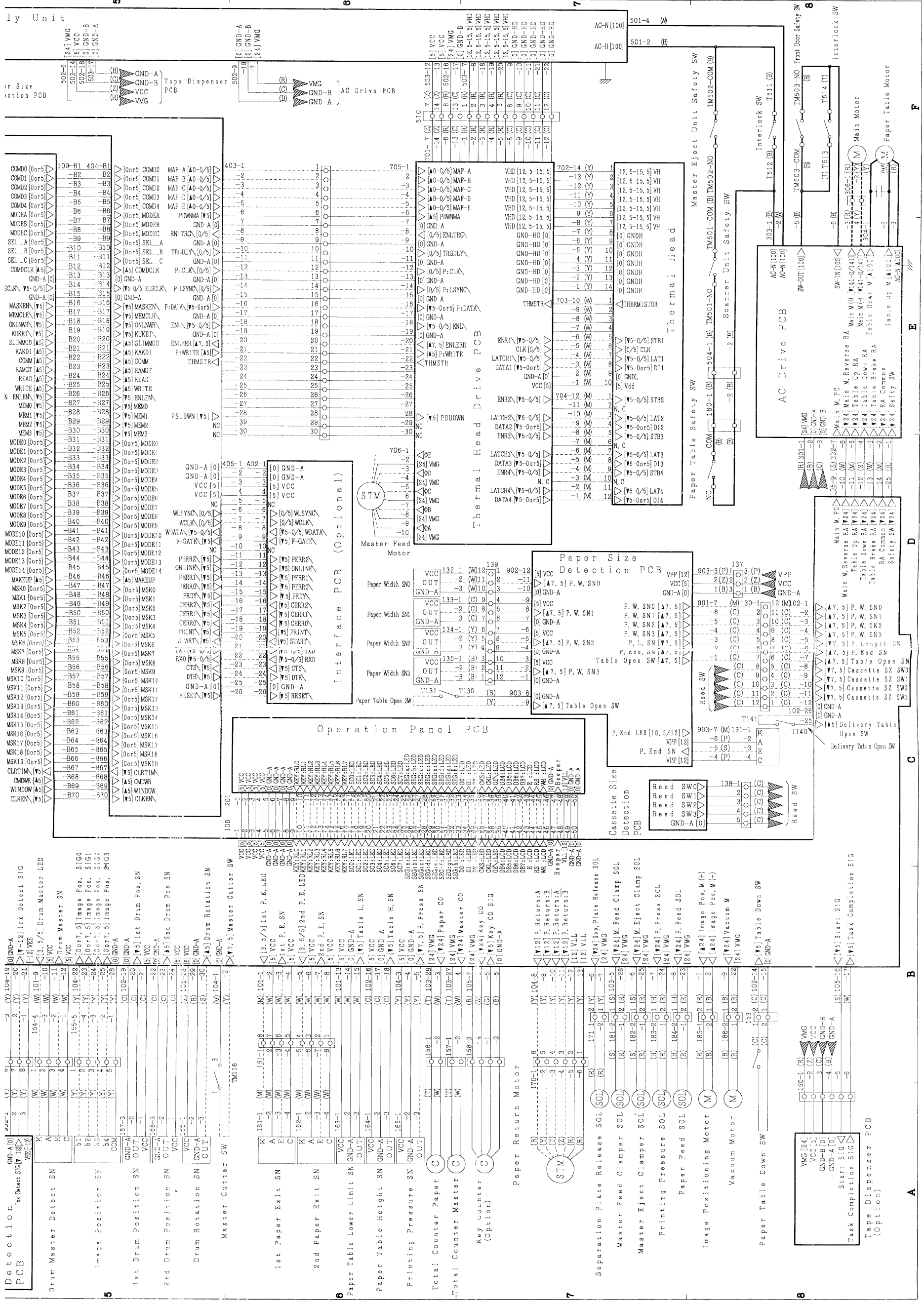Standard Position: Scanning starts at 8 mm after the leading edge.

NOTE: When performing this adjustment, set the print speed and the image
              position to the standard positions.

1. Using a test chart, make a print
   using the platen mode.

2. Check the scanner start position
   and adjust the scanner leading
   edge registration using SP No. 33.

POINT TO POINT DIAGRAM (C218)

3
4
5
6
Power Supply Unit
Paper Size Detection PCB
Tape Dispenser PCB
AC Drive PCB
Image Processing PCB
Interface PCB (Optional)
Thermal Head Drive PCB
Master Feed Motor
STM
Paper Width SN0
Paper Width SN1
Paper Width SN2
Paper Width SN3
Paper Table Open SW
Operation Panel PCB
Scanner Motor
Sorter (Option)
Main PCB
Pressure Plate Motor
Air Knife Motor1
Air Knife Motor2
Air Knife Motor3
Master Eject SN
Master Box SW
Upper Press Plate SN
Lower Press Plate SN
Full Master Detection SN
Air Knife Safety SW
Drum Unit Safety SW
Ink Supply SOL
Drum Lock SOL
Ink Detection PCB
Drum Master Detect SN
Image Position SN
1st Drum Position SN
2nd Drum Position SN
Drum Rotation SN
Master Cutter SW
1st Paper Exit SN
2nd Paper Exit SN
Paper Table Lower Limit SN
Paper Table Height SN
Printing Pressure SN
Total Counter Paper
Total Counter Master
Key Counter (Option)

POINT TO POINT DIAGRAM (C219)

Power Supply Unit

Main PCB

Scanner Motor

Image Processing PCB

Master Feed Motor

Thermal Head Drive PCB

Interface Board PCB (Optional)

Operation Panel PCB