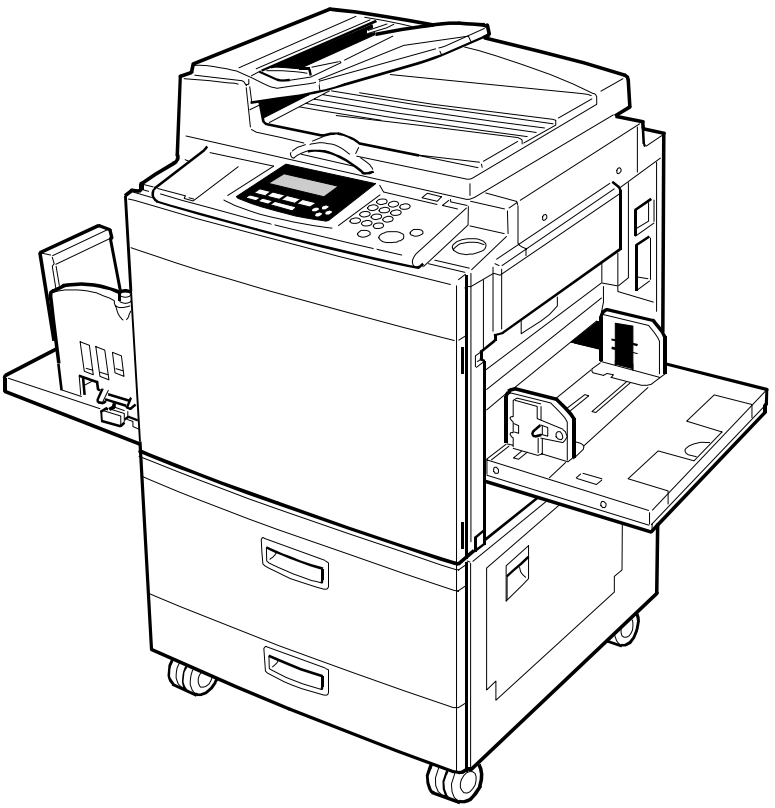
SERVICE MANUAL

(Machine code: C232)



C232V500.WMF

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

HEALTH SAFETY CONDITIONS

1. If you get ink in your eyes by accident, try to remove it 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 a finger down your 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.

⚠CAUTION

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

⚠ATTENTION

La carte RAM comporte une pile au lithium qui présente un risque d'explosion en cas de mauvaise manipulation. Remplacer la pile uniquement par une carte RAM identique. Ne pas recharger ni brûler cette pile. Les cartes RAM usagées doivent être éliminées conformément aux réglementations locales.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Dispose of replaced parts in accordance with local regulations.
2. Used ink and masters should be disposed of in an environmentally safe manner and in accordance with local regulations.
3. When keeping used lithium batteries (from the main processing units) in order to dispose of them later, do not store more than 100 batteries (from the main processing units) per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

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1. OVERALL INFORMATION

1.1 ESSENTIAL DIFFERENCES BETWEEN C232 AND C229 MODELS

No.	Item	Remarks
1	Thermal Head, Thermal Head Power Supply, MPU, I/O Board, PSU	Some related parts are also changed.
2	Paper Table	Paper table capacity is changed from 1,000 sheets (C229) to 500 sheets (C232).
3	Paper Tray	Two drawer-type paper trays are added. The maximum capacity of the paper tray unit is 2,500 sheets.
4	Paper Delivery Table	The side and end plates are automatically adjusted to the print paper size.
5	Energy Saving (New Function)	Energy saving modes cut down the energy consumption below 10 W. Only the LED at the clear mode key stays on. Other keys and the LCD remain standing by until the clear mode key is touched.
6	Drum Home Position Indicator	New LEDs are added to indicate when the drum is at home position. Green LED: Indicates the drum is at home position. Red LED: Indicates that drum is not at home position.
7	JS Sorter Connection	The new JS 40 sorter can be connected.
8	Friction Pad (Paper Table)	A newly designed friction pad is used.
9	New SP modes	New SP modes are added for the paper tray and JS 40 sorter.
10	Tray Feed Start Sensor	A new sensor is added to detect paper fed from the paper trays.
11	Torque Limiter	The torque limiter is added to prevent damage to the main motor when torque from the drum or pressure cylinder gets too high and may lock it.
12	Paper Feed Length Adjustment	The paper feed length adjustment is changed. Refer to the PAPER FEED LENGTH ADJUSTMENT in the replacement and adjustment section.
13	Firmware Update Method	The firmware on the MPU can be upgraded using a flash memory card. It is not necessary to use the card interface board. Refer to LOAD PROGRAM (SP8-20) in the service tables section.

1.2 SPECIFICATIONS

Configuration:	Floor type
Master Processing:	Digital
Scanning (Pixel Density):	400 dpi CCD
Printing Process:	Pressure cylinder system
Original Type:	Sheets, Books
Original size (Platen Mode):	Maximum 304.8 x 432 mm [12.0" x 17.0"] Thickness: Less than 30 mm Weight: Do not place objects weighing more than 10 kg on the exposure glass
Original size (ADF Mode):	Maximum 297 x 864 mm [11.7" x 34.0"] Minimum 105 x 128 mm [4.2" x 5.0"] Weight: 52.3 – 104.7 g/m^2 [14 - 28 lb] Capacity: 30 sheets (using 20 lb or 80 g/m^2 paper)

Reproduction Ratios:

	Inch versions	Others
Full Size:	100%	100%
Reduction:	65%	71%
	74%	82%
	77%	87%
	93%	93%
Enlargement:	121%	115%
	129%	122%
	155%	141%

Zoom: 50 - 200% (in 1% steps) in Platen mode
50 - 155% (in 1% steps) in ADF mode

Directional Magnification:
50 - 200% (in 1% steps)

Image Modes: Letter, Photo, Letter/Photo, Pencil

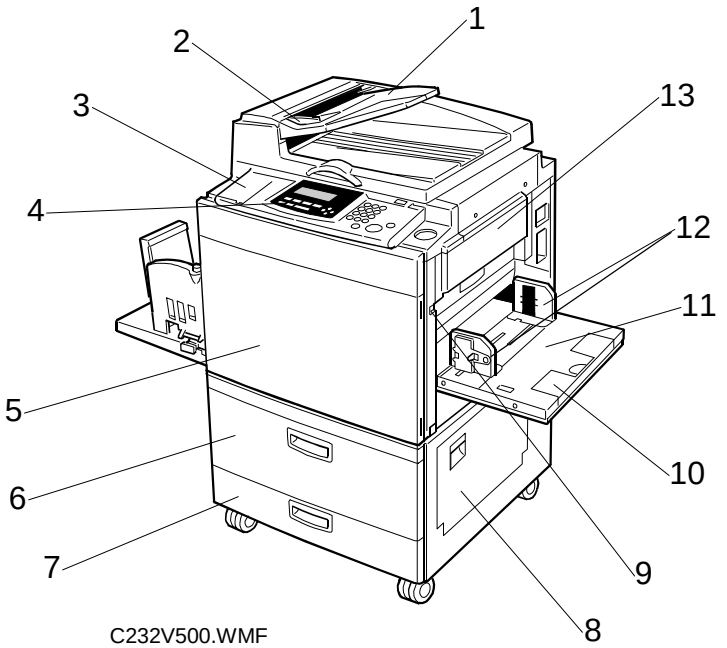
Printing Area: (At 20 °C/ 65 % RH)	Metric size version models: 290 mm x 409 mm Inch size version models: 290 mm x 419 mm [11.4" x 16.5"] With optional A4 drum: 290 mm x 204 mm [11.4" x 8.0"]
Edge Margins:	Leading edge: 10 mm (At the "0" position of Image Shift mode) Trailing edge: 2 mm
Print Paper Size (Paper table):	Minimum: 70 mm x 148 mm [2.8" x 5.8"] Maximum: 325 mm x 447 mm [12.8" x 17.6"]
Print Paper Size (Paper trays):	Tray 1 (tandem): A4,LT,B5 Tray 1: B5, A4, LT, LG, B4, A3, DLT Tray 2: B5, A4, LT, LG, B4, A3, DLT
Print Paper Weight (Paper table):	47.1 g/m^2 to 209.3 g/m^2 [12.5 lb to 55.6 lb]
Print Paper Weight (Paper trays):	52.3 g/m^2 to 104.7 g/m^2 [13.9 lb to 27.8 lb]
Printing Speed:	60, 75, 90, 105, 120 sheets/minute (5 steps)
Master Process Time:	Platen mode: Less than 16 seconds (A3 paper) Less than 12 seconds (A4 paper) ADF mode: Less than 19.5 seconds (A3 paper) Less than 16 seconds (A4 paper)
Master Eject Box Capacity:	60 masters / A3 size (Normal conditions)
Side Registration Adjustable Range:	± 10 mm
Vertical Registration Adjustable Range:	Inch size version models: ± 10 mm Metric size version models: ± 15 mm

Paper Feed Table Capacity:	500 sheets (80 g/m^2 / 20 lb)
Paper Tray Capacity:	Tray 1 (tandem): 1,000 x 2 sheets (80 g/m^2 / 20 lb) Tray 1: 1,000 sheets (80 g/m^2 / 20 lb) Tray 2: 500 sheets (80 g/m^2 / 20 lb)
Paper Delivery Table Capacity:	1,000 sheets (80 g/m^2 / 20 lb)
Power Source:	110/120 V, 50/60 Hz: 220 - 240 V, 50/60 Hz:
Power Consumption:	110/120 V version: Maximum: 300 W Standby: 47 W Energy Saving: 10 W 220 - 240 V version: Maximum: 310 W Standby: 55 W Energy Saving: 10 W
Noise Emission: (At operation position)	At 60 rpm printing speed: 59 dB At 90 rpm printing speed: 61 dB At 120 rpm printing speed: 64 dB
Weight:	153 kg [337.7 lb] 160 kg [353.2 lb] with ADF
Dimensions: (Width x Depth x Height)	Trays closed: With ADF and paper trays: 625 mm x 700 mm x 1120 mm With paper trays: 625 mm x 700 mm x 1010 mm Trays open: With ADF and paper trays: 1405 mm x 700 mm x 1120 mm With paper trays: 1405 mm x 700 mm x 1010 mm

Master Type:	Thermal master roll type: 320 mm width, 110 m / roll Yield: 200 masters/roll (at A3 size) Max run length per master: 2,000 prints
Master Storage Conditions:	Temperature: 0 °C to 40 °C Humidity: 10% to 95% RH Recommended maximum storage period: One year after production date * Avoid locations exposed to direct sunlight.
Ink Type:	1000 ml cartridge type Available colors: Black, Red, Blue, Green, Brown, Purple, Yellow, Navy, Marron, Teal, Orange, Gray, Violet, Hunter green, Burgundy, Gold
Ink Storage Conditions:	Temperature: -5 °C to 40 °C (Optimum conditions: 15 °C to 25 °C) Humidity: 10% to 95% RH (Optimum conditions: 20% to 70% RH) Recommended maximum storage period: One year after production date * Avoid locations exposed to direct sunlight.
Available Options:	• A3 Drum • A4 Drum • Document Feeder • Key Counter • Memory Board (Editing Function) • PC Controller • Interface Board (Option for the China and Ricoh Asia versions, standard for the U.S.A and Europe versions)

1.3 GUIDE TO COMPONENTS AND THEIR FUNCTIONS

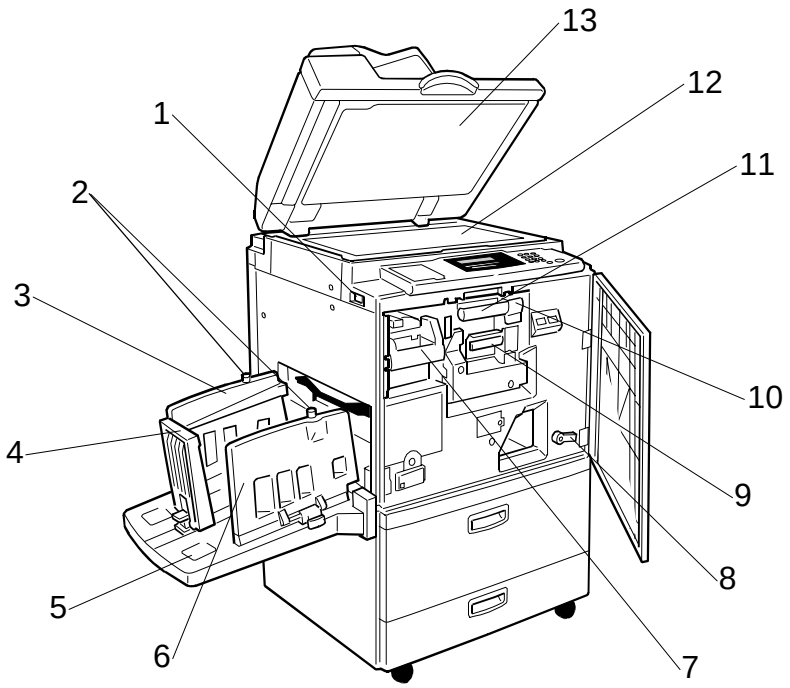
1.3.1 MACHINE EXTERIOR



C232V500.WMF

1. Platen Cover or Document Feeder (Option)	Lower the platen cover over a single original placed on the exposure glass for copying. If you have the optional document feeder, insert a stack of originals here. They will be fed automatically. (The illustration shows the document feeder.)
2. Guide	Prevents originals being fed skewed.
3. Flip up Cover	Flip up to access the keys underneath.
4. Operation Panel	See → "1-5 Operation Panel."
5. Front Door	Open to access the inside of the machine.
6. Tray 1	Set paper here.
7. Tray 2	Set paper here.
8. Right Cover	Open to remove jammed paper.
9. Paper Tray Down Key	Press to lower the paper tray.
10. Extender	Pull out this extender when setting paper larger than A4 , 8 1/2" x 11"
11. Paper Feed Table	Set paper here.
12. Paper Feed Side Plates	Prevent paper being fed skewed.
13. Master Tray	Open this unit when installing the master.

1.4 MACHINE INTERIOR



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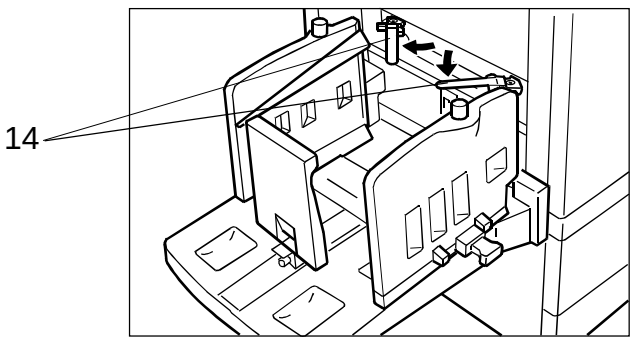
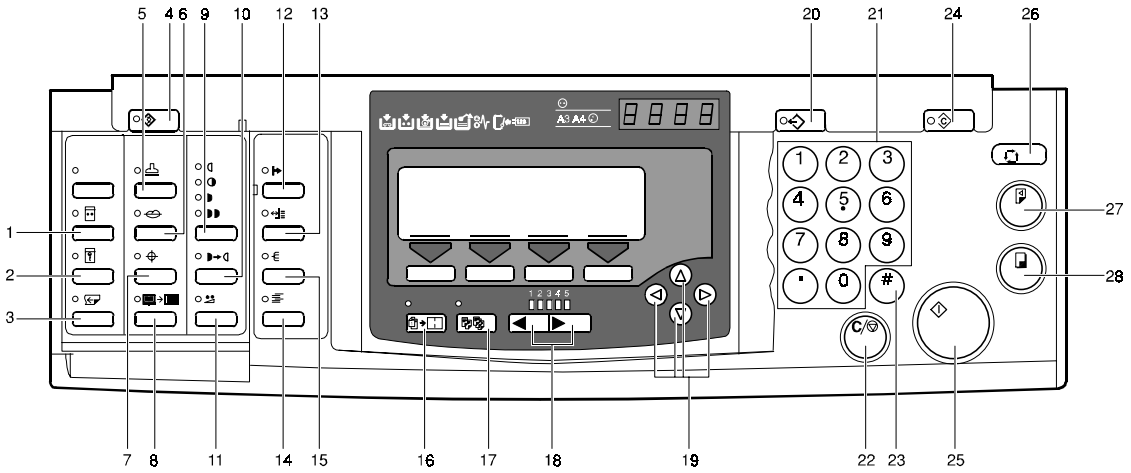


C232V503.WMF

1. Main Switch	Use to turn the power on or off.
2. Paper Alignment Wing Knobs	Use to lift or lower the paper alignment wings.
3. Paper Alignment Wings	Lift or lower the wings depending on the type of paper being used.
4. Paper Delivery End Plate	This plate aligns the leading edge of prints.
5. Paper Delivery Tray	Completed prints are delivered here.
6. Paper Delivery Side Plates	These plates align the prints on the paper delivery tray.
7. Handle E1	Use to pull out the master eject unit.
8. Guide Plate Lever	Turn to remove misfed paper.
9. Ink Holder	Set the ink cartridge in this holder.
10. Drum Unit Lock Lever B1	Lower to unlock and pull out the drum unit.
11. Drum Unit	The master is wrapped around this unit.
12. Exposure Glass (also called the Contact Glass)	Position originals here face down for printing.
13. Platen Cover or Document Feeder (Option)	Lower this cover over an original on the exposure glass.
14. Trailing Edge Guides	Swing out these guides when you use A4, 8 1/2" x 11" ▱, or B5 ▱ paper.

1.5 OPERATION PANEL

1.5.1 KEYS



C232V506.wmf

1. **Quality Start key**
2. **Security key**
3. **Skip Feed key**
   Press to select skip feed printing.
4. **User Tools key**
   Press to change the default settings to meet your requirements.
5. **Stamp key**
   Press to select the optional Stamp function.
6. **Make-up key**
   Press to select the optional Make-up function.
7. **Overlay key**
   Press to select the optional Image Overlay mode.
8. **Edge Erase key**
   Press to select Edge Erase mode.
9. **Image Density key**
   Press to make prints darker or lighter.
10. **Tint key**
    Press to reproduce tinted images.
11. **Economy Mode key**
    Press to save ink.
12. **On Line key**
13. **Auto Delivery Adjust key**
    Press to adjust the position of the paper delivery end plate and paper delivery side plates.
14. **Job Separator key**
15. **Sorter key**
    Press to select the optional Sort, Class Sort or Staple function.
16. **Combine key**
    Press to combine originals onto 1 print.
17. **Class key**
    Press to select All Class, Auto Class, Manual Class, or Class mode.
18. **Speed keys**
    Press to adjust the printing speed.
19. **Scroll keys**
    Press to shift the image forward, backward, right, or left.
    Also use to highlight items you wish to select on the panel display.

20. Program key
Press to input or recall programs.

21. Number keys
Press to enter the desired number of prints and data for selected modes.

22. Clear/Stop key
Press to stop printing.

23. [#] key
Use to enter data in selected modes.

24. Clear Modes/Energy Saver key
Press to clear any previously entered job settings.

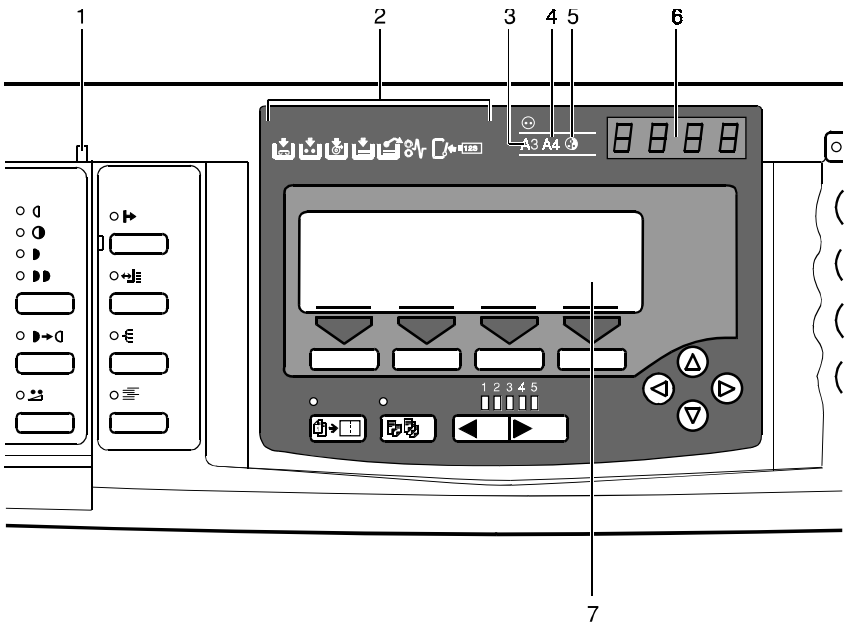
25. Start key
Press to make a master.

26. Auto Cycle key
Use to process the master and make prints in one operation.

27. Proof key
Press to make a proof print.

28. Print key
Press to start printing.

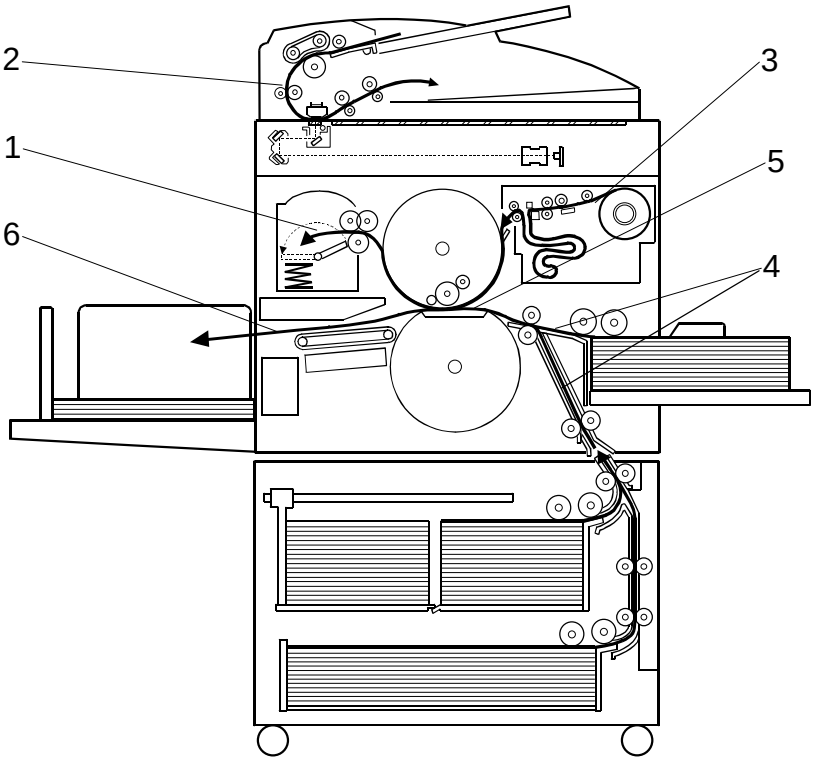
1.5.2 INDICATORS



C232V510.wmf

1. **Special Feature indicators**
   Light to indicate the special features that have been selected. To access the special features, lift the cover on the left side of the operation panel.
2. **Monitor indicators**
   These indicators light to inform you of the status of the machine.
3. **A3/11" x 17" Drum indicator**
   Lights when the A3, 11” x 17” drum unit is installed.
4. **A4/81/2" x 11" Drum indicator**
   Lights when the A4, 81/2” x 11” drum unit is installed.
5. **Color Drum indicator**
   Lights when the color drum unit is installed.
6. **Counter**
   Displays the number of prints entered. While printing, it shows the number of prints remaining.
7. **Panel Display**

1.6 PRINTING PROCESS OVERVIEW

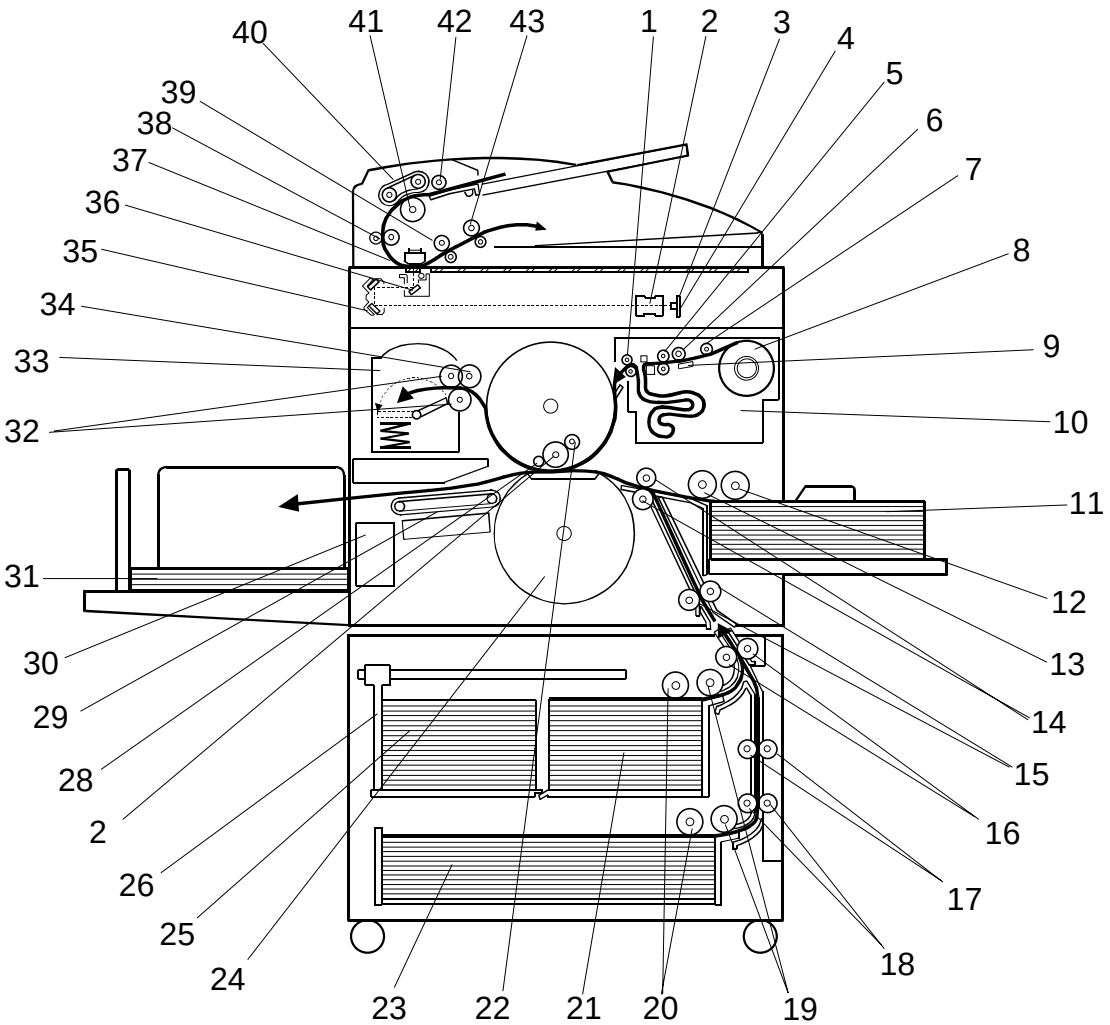


C232V505.WMF

1. Master Ejecting: Ejects the used master wrapped around the drum into the master eject box.
2. Scanning: Scans the original image with the CCD through the mirrors and the lens.
3. Master Feeding: Converts the image signal read by the CCD into digital signals and sends them to the thermal head to develop the image on the master. The master then wraps around the drum.
4. Paper Feeding: Sends paper to the drum section.
5. Printing: Presses the paper fed from the paper feed section against the drum. This transfers ink to the paper through the drum screen and the master.
6. Paper Delivering: Peels off the printed paper with the exit pawls and air knife, and ejects the paper onto the paper delivery table.

NOTE: Some parts of the master eject, scanning, and master feeding processes are carried out at the same time. Paper feeding also starts before the master feeding process has finished.

1.7 MECHANICAL COMPONENT LAYOUT

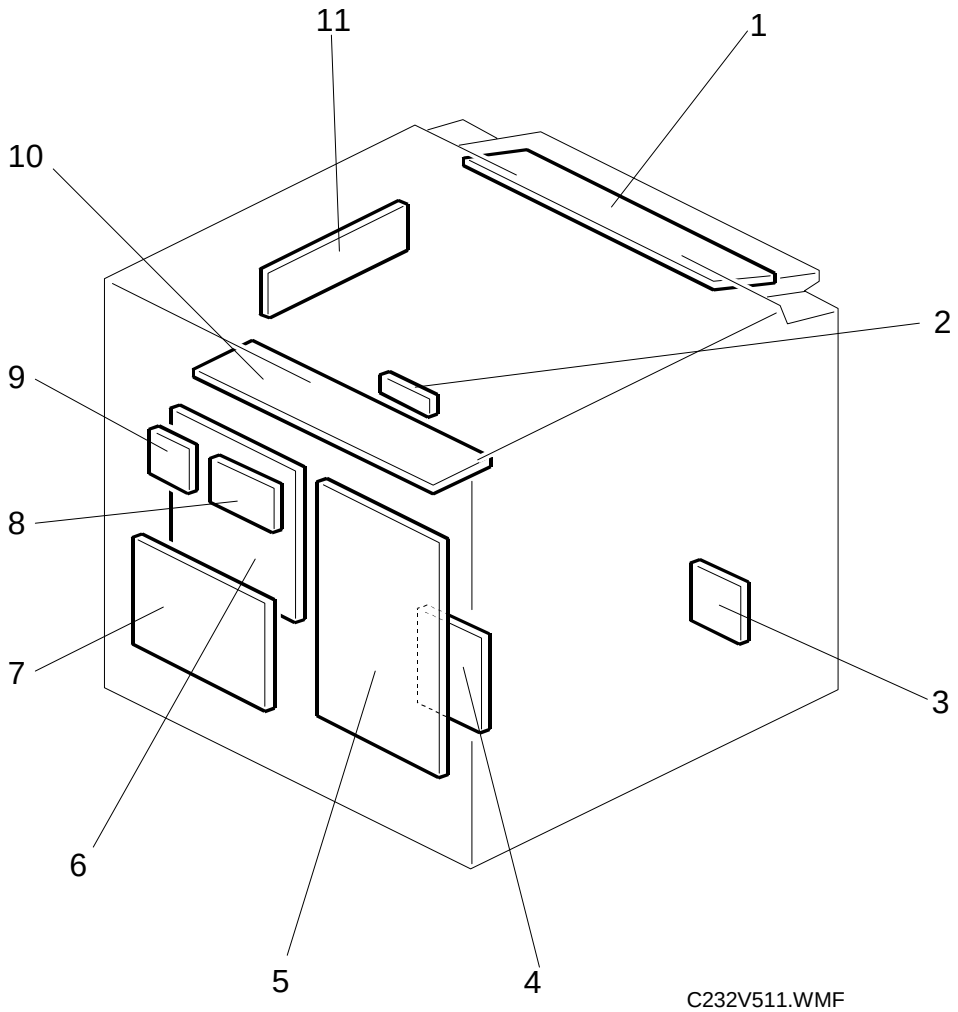


C232V505.WMF

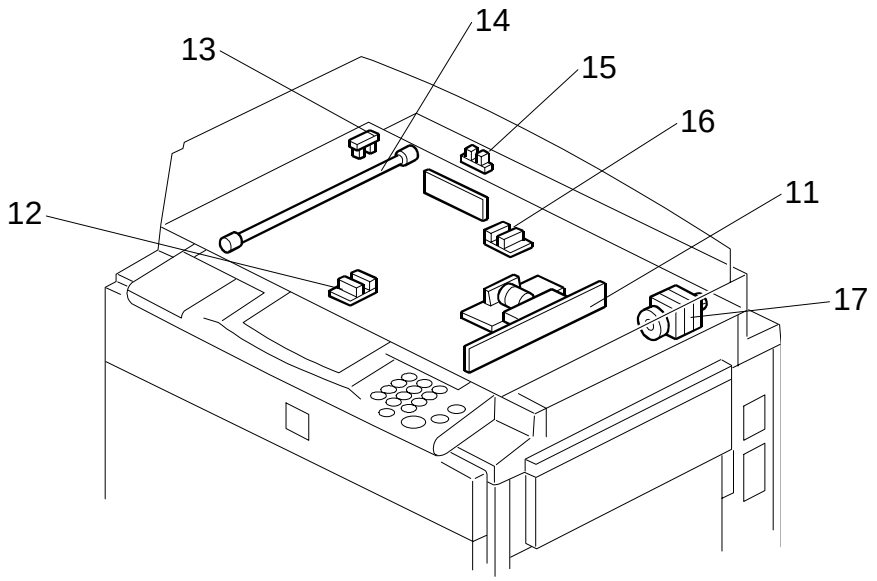
1. Master Feed Control Rollers
2. Lens
3. CCD
4. SBU
5. Tension Rollers
6. Platen Roller
7. Master Set Roller
8. Master Roll
9. Thermal Head
10. Master Buffer Duct
11. Paper Table
12. Paper Pick-up Roller
13. Paper Feed Roller
14. Registration Rollers
15. 3rd Relay Rollers
16. Tray Registration Rollers
17. 2nd Relay Rollers
18. 1st Relay Rollers
19. Paper Feed Rollers
20. Paper Pick-up Rollers
21. Right Tandem Tray
22. Doctor Roller
23. Tray 2
24. Pressure Cylinder
25. Left Tandem Tray
26. Back Plate (Tandem Tray)
27. Ink Roller
28. Idling Roller
29. Transport Belts
30. Job Separator Unit
31. Paper Delivery Table
32. Master Eject Rollers
33. Master Eject Box
34. Master Pick-up Rollers
35. 2nd Scanner
36. 1st Scanner
37. DF Exposure Glass
38. 1st Transport Rollers
39. 2nd Transport Rollers
40. Original Feed Belt
41. Separation Roller
42. Pick-up Roller
43. Original Exit Rollers

1.8 ELECTRICAL COMPONENT LAYOUT

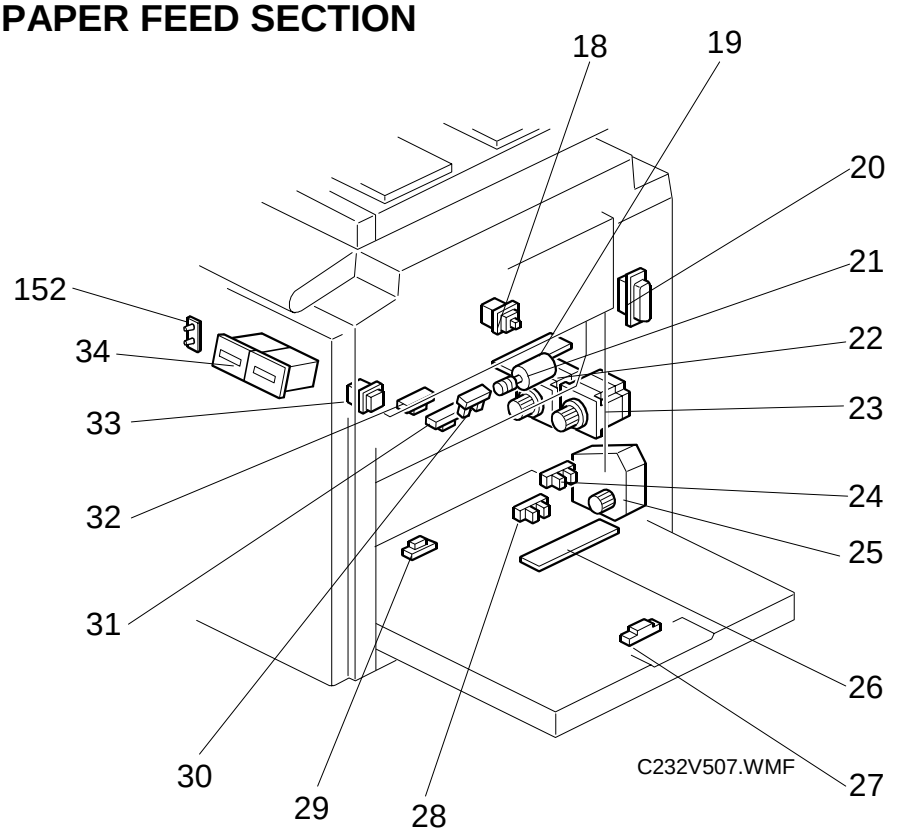
1.8.1 PRINTED CIRCUIT BOARD LAYOUT



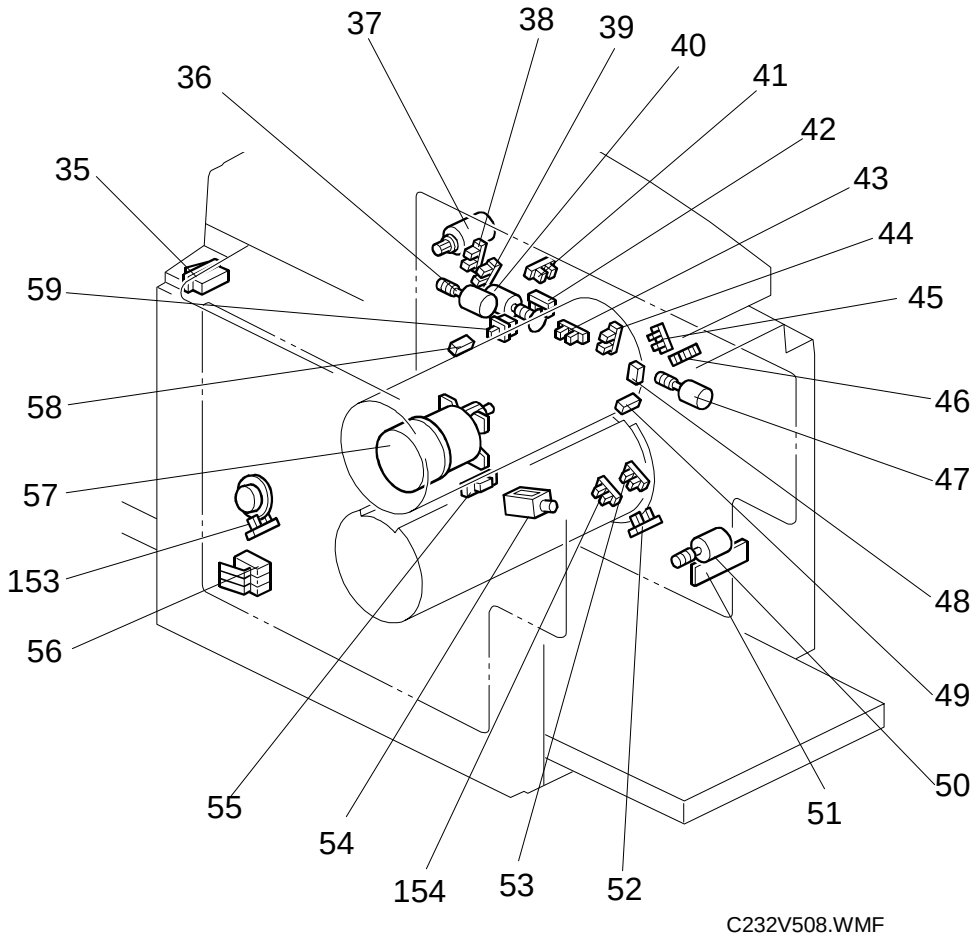
1.8.2 SCANNER SECTION



1.8.3 PAPER FEED SECTION



1.8.4 MASTER EJECT, PRESSURE CYLINDER, AND OTHER SECTIONS



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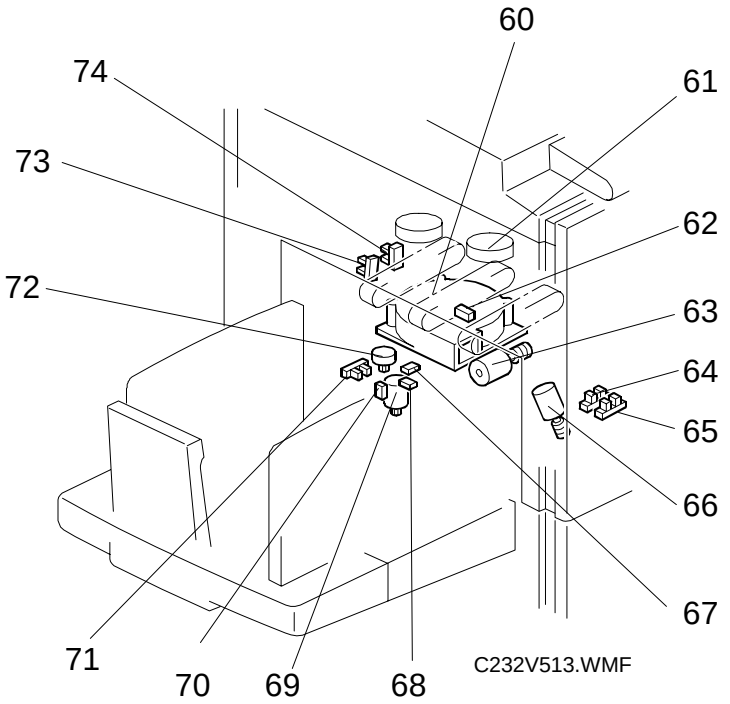
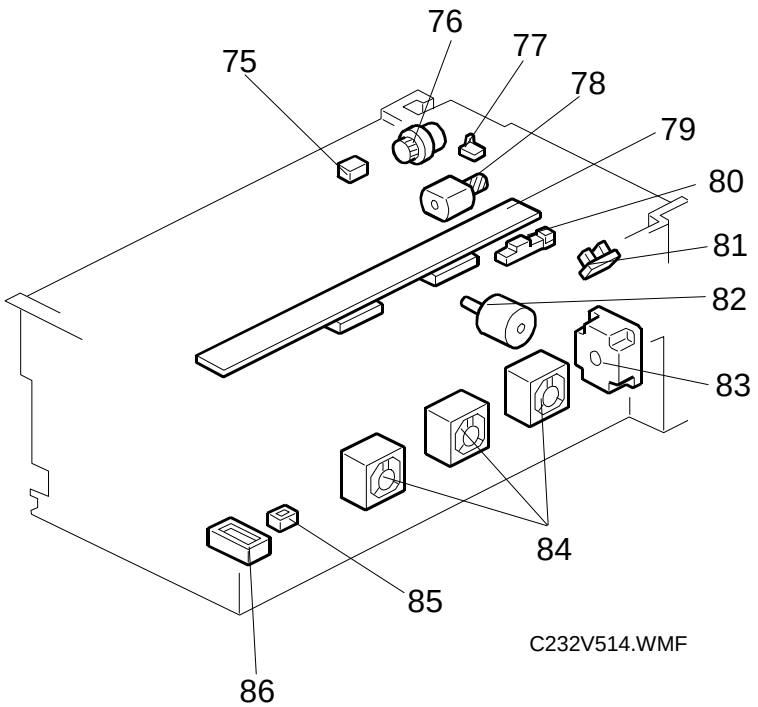
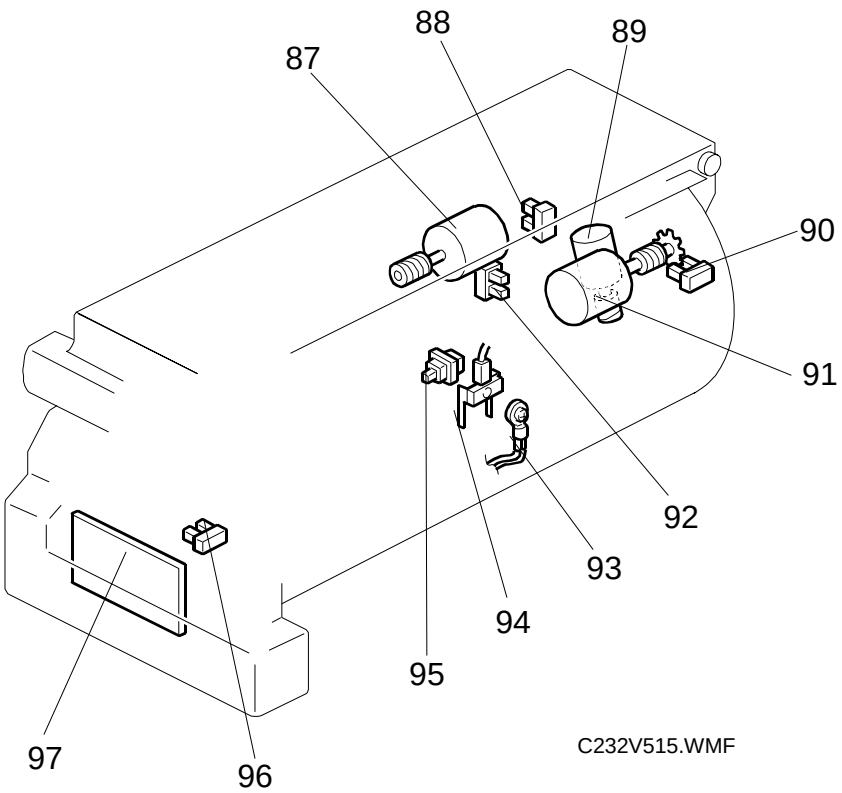
1.8.5 PAPER DELIVERY SECTION



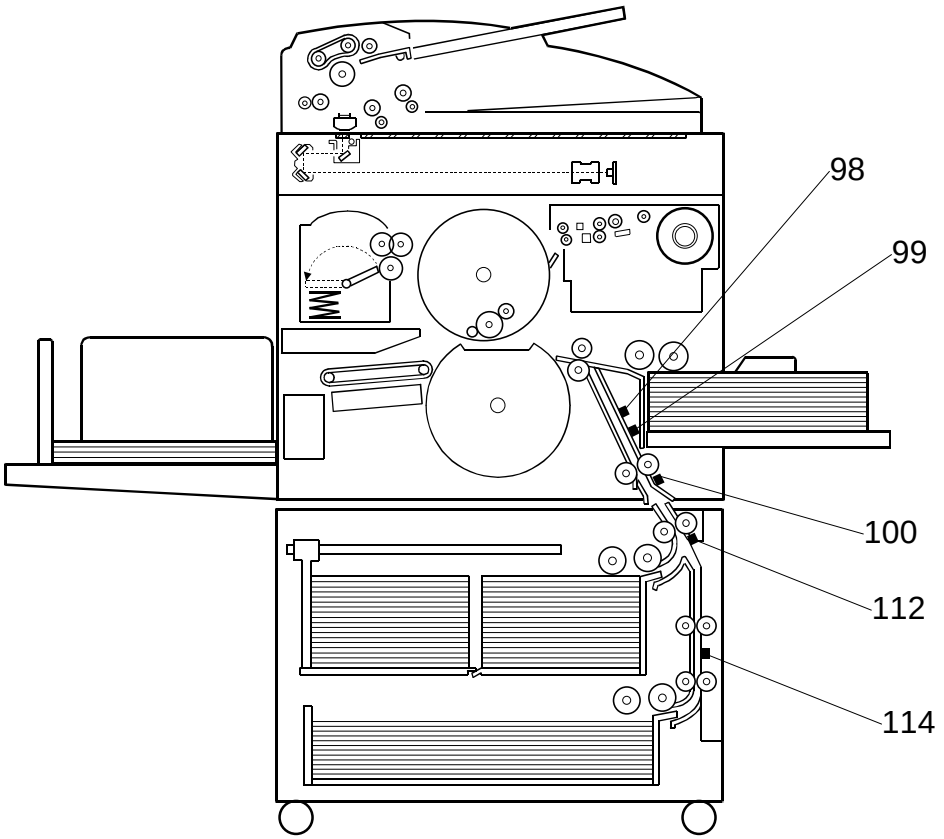
1.8.6 MASTER MAKING UNIT



1.8.7 DRUM UNIT



1.8.8 RELAY UNIT



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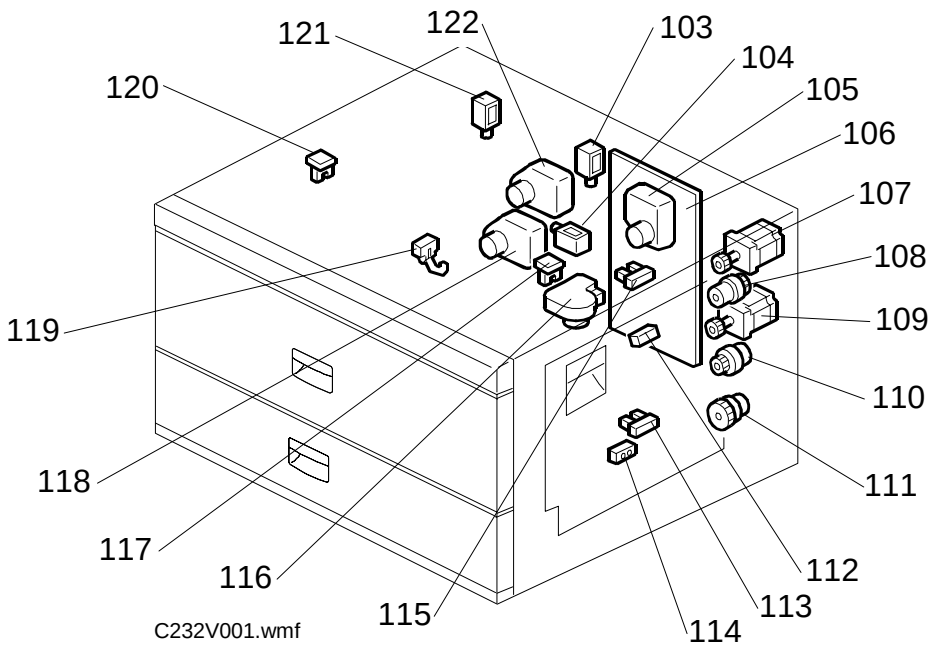
1.8.9 VERTICAL TRANSPORT UNIT, BACK PLATE UNIT, AND OTHER SECTIONS



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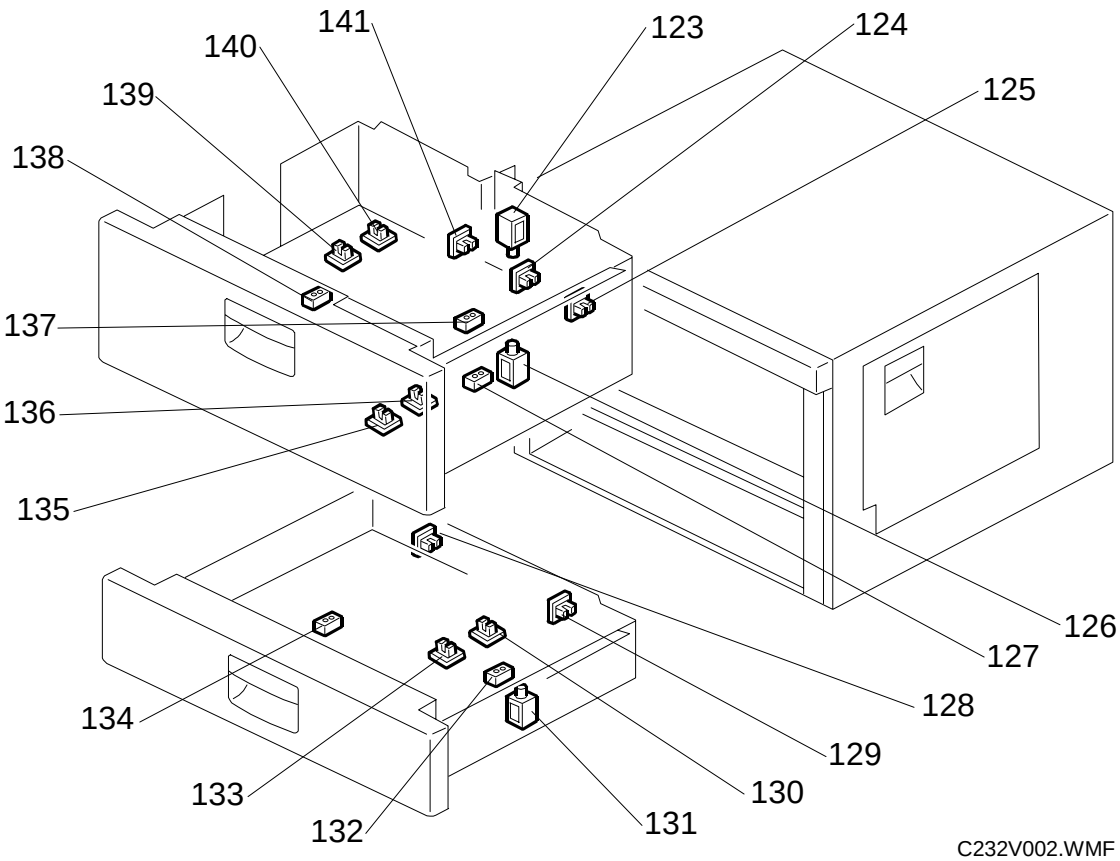
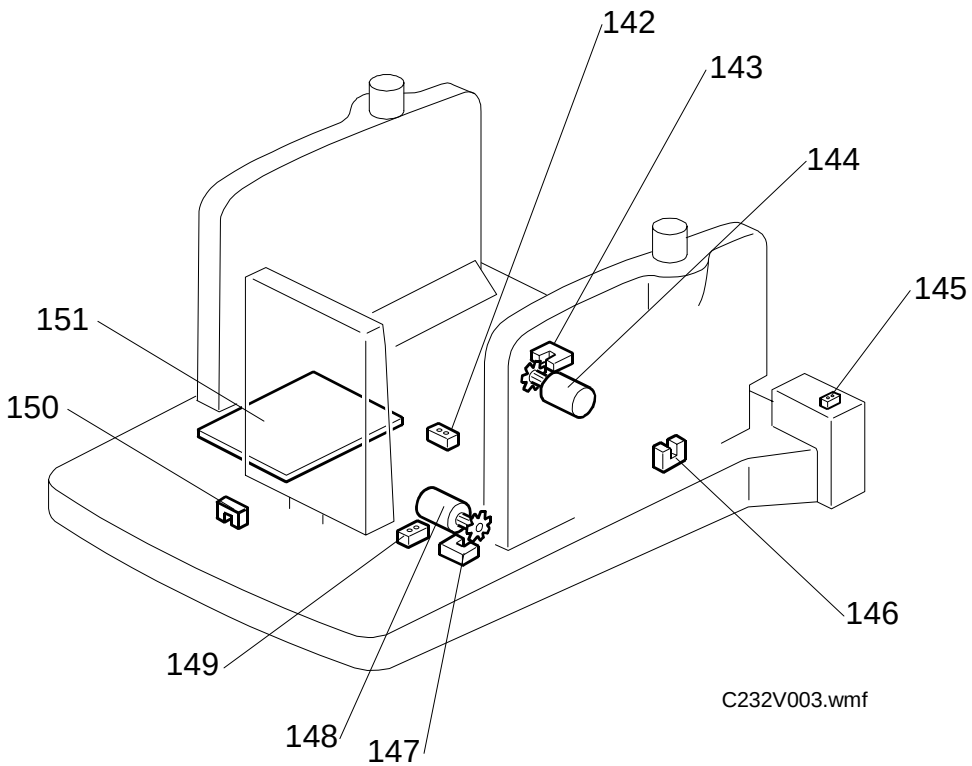
1.8.10 TRAY 1, TRAY 2



1.8.11 PAPER DELIVERY TABLE



1.8.12 TABLES OF ELECTRICAL COMPONENTS

Boards

Index No.	Name	Function
1	Operation Panel Board	Controls the operation panel.
2	Lamp Stabilizer	Provides dc power for the xenon lamp.
3	Job Separator Board	Controls the job separator.
4	Main Motor Control Board	Controls the main motor.
5	Power Supply Unit (PSU)	Provides dc power to the system.
6	Main Processing Unit (MPU)	Controls all machine functions both directly and through other boards.
7	I/O Board	Controls the mechanical components.
8	Memory Board	Enables the image editing function and data printout via SP mode. This is an option.
9	Interface Board	Enables the connection with the PC controller. This is an option for the China and Ricoh Asia versions, and a standard component for the U.S.A and Europe versions.
10	Thermal Head Power Supply Board	Provides dc power to the thermal head.
11	Sensor Board Unit (SBU)	Contains the CCD, and outputs a video signal to the MPU.
19	Feed Pressure Detection Board	Sends data about the paper feed pressure to the CPU.
26	Paper Width Detection Board	Sends data about the paper width on the paper table to the CPU.
51	Separation Pressure Detection Board	Sends data about the paper separation pressure to the CPU.
97	Ink Detection Board	Checks if there is ink in the drum.
106	Paper Tray Board	Controls the paper tray.
151	Paper Delivery Table Board	Controls the paper delivery table.

Solenoids

Index No.	Name	Function
54	Printing Pressure Release Solenoid	There are two solenoids: one at the front and one at the rear. They pull the release arms to apply the printing pressure against the drum.
86	Duct Entrance Solenoid	Opens or closes the plate at the entrance of the master buffer duct.
103	Tray 1 Right Lock Solenoid	Locks the right half of the tandem tray while paper is fed from that tray.
104	Tray 2 Lock Solenoid	Locks tray 2 while paper is fed from tray 2.
121	Tray 1 Left Lock Solenoid	Locks the left half of the tandem tray while the paper stack is moved from left to right.
123	Tray 1 Connection Solenoid	Locks the right and left halves of the tandem tray so that they don't separate.

Index No.	Name	Function
126	Tray 1 Friction Pad Solenoid	Controls the up-down movement of the friction pad unit in tray 1.
131	Tray 2 Friction Pad Solenoid	Controls the up-down movement of the friction pad unit in tray 2.

Switches

Index No.	Name	Function
33	Paper Table Lowering Switch	Lowers the paper table.
35	Main Switch	Turns the power on or off.
56	Cover Safety Switches	Checks if the front door is closed correctly.

Motors

Index No.	Name	Function
17	Scanner Drive Motor	Drives the scanner.
21	Feed Pressure Motor	Drives the paper feed pressure adjustment mechanism.
22	Registration Motor	Feeds the paper from the paper table to align it with the image on the master on the drum.
23	Paper Table Feed Motor	Feeds the paper from the paper table.
25	Paper Table Motor	Raises and lowers the paper table.
36	Pressure Plate Motor	Raises and lowers the pressure plate in the master eject box.
37	Master Eject Motor	Sends used masters into the master eject box.
40	Image Shift Motor	Makes a phase difference between the positions of the drum and pressure cylinder for the up/down image shifting mode.
47	Clamper Motor	Opens or closes the drum master clamper.
50	Separation Pressure Motor	Drives the paper separation pressure adjustment mechanism.
57	Main Motor	Drives the drum, pressure cylinder, and paper delivery unit components.
60	Transport Vacuum Fan	Provides suction so that paper is held firmly on the transport belts.
61	Air Knife Fan	Provides air to separate the paper leading edge from the drum.
63	Wing Guide Motor	Changes the position of the paper wing guides in the paper delivery unit.
66	Pressure Cam Shift Motor	Switches the cams for the small master and full size master to apply the appropriate printing pressure.
69	Slider Lift Motor	Moves the sliding arm in the job separator unit up or down.
72	Job Separator Motor	Drives the sliding arm in the job separator unit.
78	Cutter Motor	Cuts the master after the end of master making.
82	Platen Release Motor	Applies or releases the pressure between the platen roller and the thermal head.

Index No.	Name	Function
83	Master Feed Motor	Feeds the master to the drum.
84	Master Vacuum Fans	Provide suction to guide the master into the buffer duct.
87	Ink Pump Motor	Drives the ink pump to supply ink.
89	Idling Roller Motor	Presses or releases the idling roller against the drum screen.
91	Drum Shift Motor	Slides the drum screen position to the front or rear for the side-to-side image shifting mode.
105	Right Tray Lift Motor	Raises the bottom plate in tray 1 (right side).
107	Tray Registration Motor	Drives the tray registration rollers.
109	Tray Feed Motor	Feeds the paper out of the paper tray unit.
116	Back Plate Drive Motor	Drives the back plate in tray 1.
118	Tray 2 Lift Motor	Raises the bottom plate in tray 2.
122	Left Tray Lift Motor	Raises the bottom plate in the left side of tray 1.
144	Side Plate Drive Motor	Drives the side plate to a position suitable for the paper size.
148	End Plate Drive Motor	Drives the end plate to a position suitable for the paper size.

Sensors

Index No.	Name	Function
12	Original Width Sensor	Detects the width of the original on the exposure glass.
13	Scanner HP Sensor	Detects when the scanner is at home position.
15	Platen Cover Sensor	Detects if the platen cover is open or closed.
16	Original Length Sensor	Detects the length of the original on the exposure glass.
18	Master Making Unit Set Sensor	Checks if the master making unit is set.
24	Paper Table Lower Limit Sensor	Detects when the paper table is at its lower limit position.
27	Paper Table Length Sensor	Detects when there is long paper on the paper table.
28	Paper Table Set Sensor	Detects if the paper table is open or closed.
29	Paper Table End Sensor	Detects if paper is present on the paper table.
30	Paper Table Height Sensor	Detects if the top of the paper stack on the paper table is at the paper feed height.
31	Paper Registration Sensor	Detects paper approaching the registration roller.
32	Paper Feed Timing Sensor	Detects paper approaching the paper clamper on the pressure cylinder.
38	Pressure Plate HP Sensor	Detects when the pressure plate is at the home position.
39	Pressure Plate Limit Position Sensor	Detects when the pressure plate is at the lowest position.
41	Image Shift HP Sensor	Detects if the pressure cylinder is at the home position. (The up/down image shift is 0.)

Index No.	Name	Function
42	Image Position Encoder	Sends the image position data to the CPU for display on the operation panel.
43	2nd Drum Position Sensor	Checks the drum position.
44	1st Drum Position Sensor	Checks the drum position.
45	Clamper Close Position Sensor	Detects when the clamper is in the closed position.
46	Clamper Open Position Sensor	Detects when the clamper is in the open position.
48	2nd Drum Master Sensor	Detects if there is a master on the drum, to detect master clamping errors.
49	1st Drum Master Sensor	Detects if there is a master on the drum when the Start key is pressed.
52	Feed Encoder	Detects fluctuations in the pressure cylinder rotation.
53	Paper Table Feed Start Sensor	Checks the pressure cylinder position for the paper feed start timing from the paper table.
55	Lower Wrapping Jam Sensor	Detects paper wrapping jams on the pressure cylinder.
58	Master Eject Sensor	Detects master eject misfeeds.
59	Eject Box Set Sensor	Checks if the master eject box is installed.
62	Paper Exit Sensor	Detects paper misfeeds at the exit.
64	A3 Cam Sensor	Detects when the A3 printing pressure cam is used.
65	A4 Cam Sensor	Detects when the A4 printing pressure cam is used.
67	Slider Position Sensor	Detects when the job separator slider is fully moved toward the paper on the delivery table.
68	Slider HP Sensor	Detects when the job separator slider is at the home position.
70	Slider Paper Sensor	Detects when the job separator slider touches the paper on the delivery table.
71	Slider Upper Limit Sensor	Detects when the job separator slider is at the uppermost position.
73	Wing Upper Position Sensor	Detects when the paper wing guides are in the upper position.
74	Wing Lower Position Sensor	Detects when the paper wing guides are in the lower position.
75	Master Edge Sensor	Detects the leading edge of the master when a new master roll is installed.
77	Cutter HP Sensor	Detects when the cutter is at the home position.
80	Master Set Sensor	Detects whether a master roll is present.
81	Platen Release Sensor	Detects when the platen pressure is applied against the thermal head.
85	Master End Sensor	Detects when the master runs out.
88	Drum Shift HP Sensor	Detects when the drum screen is at the home position. (The side-to-side image shift is 0.)

Index No.	Name	Function
90	Drum Shift Sensor	Sends the image position data to the CPU for display on the operation panel.
92	Ink Pump Sensor	Monitors the operation of the ink pump to count how many cycles it has moved.
95	Ink Cartridge Set Sensor	Detects if the ink cartridge is in place.
96	Idling Roller HP Sensor	Detects when the idling roller is at home position.
98	3rd Relay Sensor	Detects misfeeds.
99	Relay Guide Set Sensor	Detects whether the relay guide plate is closed.
100	2nd Relay Sensor	Detects misfeeds.
112	Tray Registration Sensor	Detects misfeeds and controls the tray registration roller on-off timing.
113	Tray 2 Upper Limit Sensor	Detects when the paper in tray 2 is at the correct height for paper feed.
114	1st Relay Sensor	Detects misfeeds and controls the 2nd relay roller on-off timing.
115	Right Tray Upper Limit Sensor	Detects when the paper in the right side of tray 1 is at the correct height for paper feed.
117	Return Position Sensor	Informs when the back plate in tray 1 is in the return position.
119	Left Tray Upper Limit Sensor	Detects when the left tray lift motor has lifted the paper to the correct paper feed height. This is only used if tray 1 contains paper larger than A4/LT (when tray 1 is not being used as a tandem feed tray).
120	Back Plate Home Position Sensor	Detects when the back plate in tray 1 is at the home position.
124	Tray 1 Paper Volume Sensor	Informs the amount of paper inside tray 1.
125	Right Tray Lower Limit Sensor	Detects when the bottom plate in the right side of tray 1 is at its lower limit position.
127	Tray 1 Paper End Sensor	Informs when tray 1 runs out of paper.
128	Tray 2 Paper Volume Sensor	Informs the amount of paper inside tray 2.
129	Tray 2 Lower Limit Sensor	Detects when the bottom plate in tray 2 is at its lower limit position.
130	Rear Tray 2 Paper Width Sensor	Detects paper width in tray 2.
132	Tray 2 Paper End Sensor	Informs when tray 2 runs out of paper.
133	Front Tray 2 Paper Width Sensor	Detects paper width in tray 2.
134	Tray 2 Paper Length Sensor	Detects when there is long paper in tray 2.
135	Front Right Tray Paper Width Sensor	Detects paper width in the right side of tray 1.

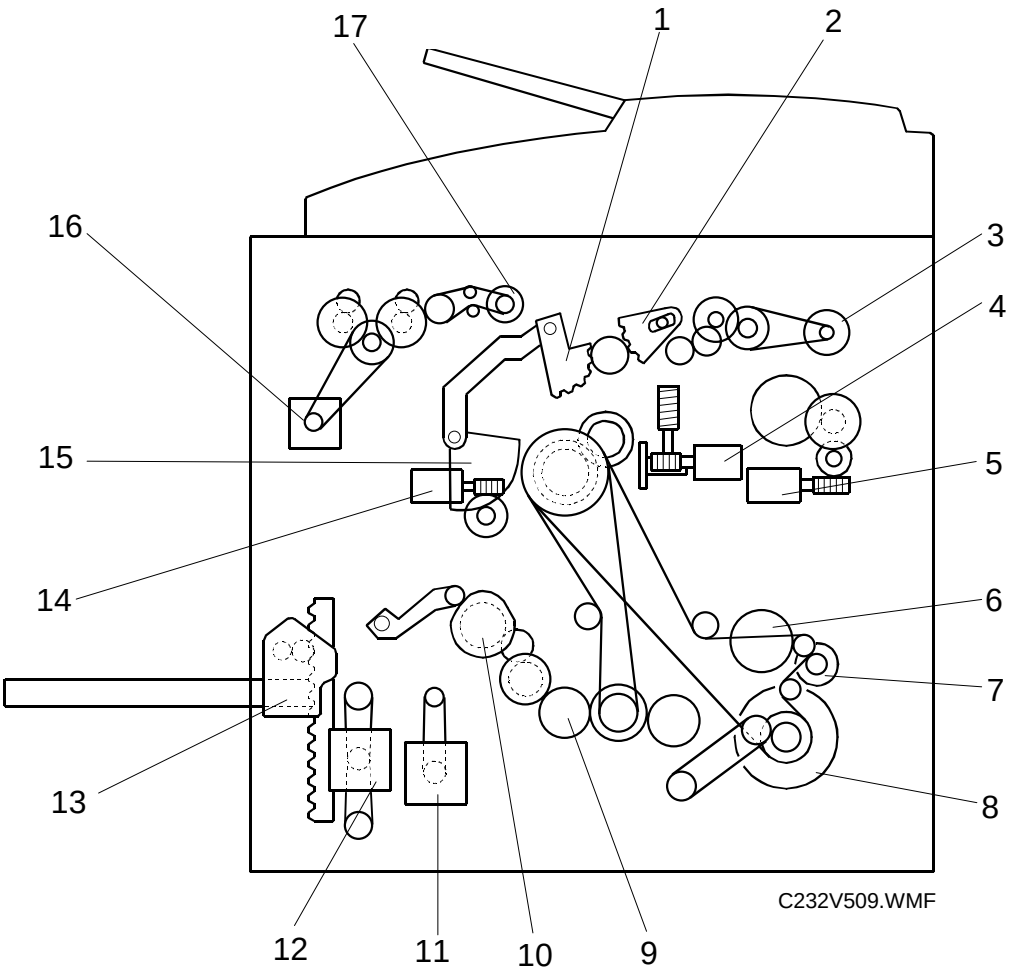
Index No.	Name	Function
136	Rear Right Tray Paper Width Sensor	Detects paper width in the right side of tray 1.
137	Tandem Tray Sensor	Informs whether tray 1 is a tandem tray or not.
138	Left Tray Paper Length Sensor	Detects when there is long paper in tray 1. Also detects whether there is a paper stack in the left side of the tandem tray.
139	Front Left Tray Paper Width Sensor	Detects paper width in the left side of tray 1.
140	Rear Left Tray Paper Width Sensor	Detects paper width in the left side of tray 1.
141	Left Tray Lower Limit Sensor	Detects when the bottom plate in the left side of tray 1 is at its lower limit position.
142	Delivery Table Paper Sensor	Detects whether there is paper on the paper delivery table.
143	Side Plate Pulse Generator Sensor	Checks the side plate position.
145	Side Plate Set Sensor	Informs whether the side plate is up or down.
146	Side Plate Home Position Sensor	Detects when the side plate is at the home position.
147	End Plate Pulse Generator Sensor	Checks the end plate position.
149	End Plate Set Sensor	Informs whether the end plate is in the up or down position.
150	End Plate Home Position Sensor	Detects when the end plate is at the home position.
153	Drum Home Position Sensor	Informs when the drum is at home position to turn on the green LED.
154	Tray Feed Start Sensor	Checks the pressure cylinder position for the paper feed start timing from the paper tray.

Others

Index No.	Name	Function
14	Xenon Lamp	Applies light to the original for exposure.
20	Interface Connector	Connects the machine to the PC controller.
34	Print and Master Counters	Keeps track of the total number of prints and masters.
76	Master Feed Clutch	Controls the master feed control roller operation to feed the master.
79	Thermal Head	Burns the image of the original onto the master.
93	Thermistor	Detects the temperature inside the drum to adjust various process.
94	Ink Detecting Pin	Detects if ink is present in the drum.
108	Tray Exit Clutch	Controls the tray registration rollers.
110	Tray Relay Clutch	Controls the 2nd relay rollers.
111	Tray 2 Feed Clutch	Controls the paper feed and pick-up rollers in tray 2.
152	Drum Home Position Indicator (LEDs)	LEDs that indicates the drum position.

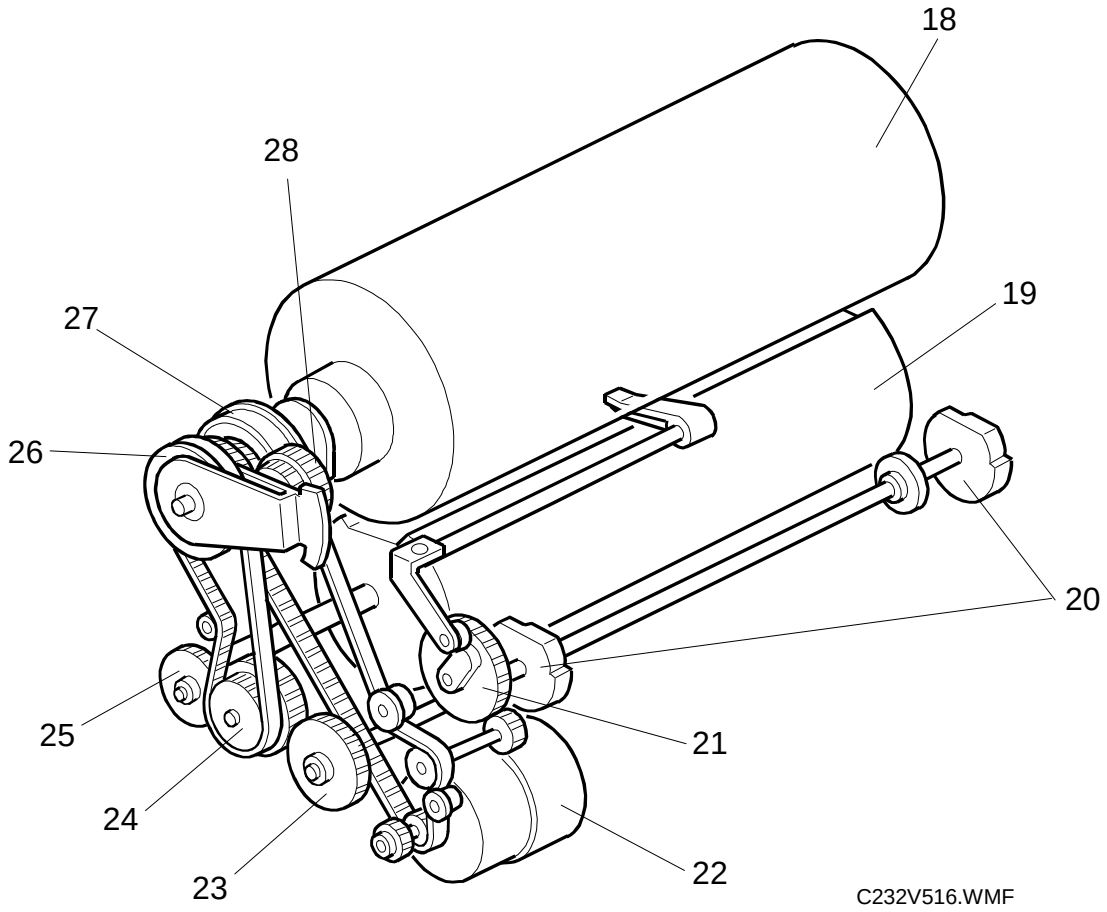
1.9 DRIVE LAYOUT

1.9.1 OVERVIEW



1. Clamper Opening Arm Sector Gear (for the master eject position)
2. Master Pick-up Roller Sector Gear
3. Master Eject Motor
4. Image Shift Motor
5. Pressure Plate Motor
6. Exit Pawl Drive Cam Gear
7. Paper Delivery Unit Drive Gear/Pulley
8. Main Motor
9. Pressure Cylinder Drive Gear (Including the Scissors Gear)
10. Registration Roller Lifting Cam Drive Gear
11. Registration Motor
12. Paper Feed Motor
13. Paper Table Motor
14. Clamper Motor
15. Drum Guide
16. Master Feed Motor
17. Master Feed Clutch

1.9.2 MAIN DRIVE

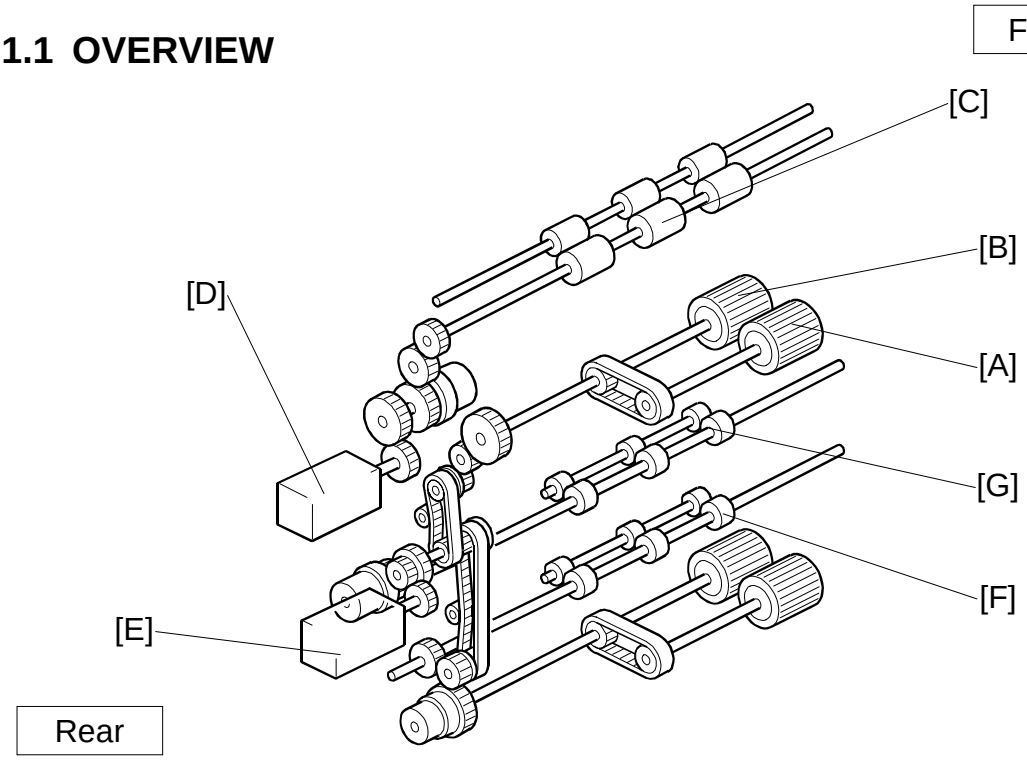


18. Drum
19. Pressure Cylinder
20. Printing Pressure Cam
21. Exit Pawl Drive Cam Gear
22. Main Motor
23. Printing Pressure Cam Drive Gear
24. Idler Gear/Pulley
25. Pressure Cylinder Drive Gear (including the Scissors Gear)
26. Primary Gear/Pulley
27. Drum Drive Gear/Pulley
28. Image Shift Gear

2. DETAILED SECTION DESCRIPTIONS

2.1 PAPER BANK

2.1.1 OVERVIEW



C232D000.WMF

This machine has a paper bank with two drawer-type trays. The following table shows the capacity of this paper bank.

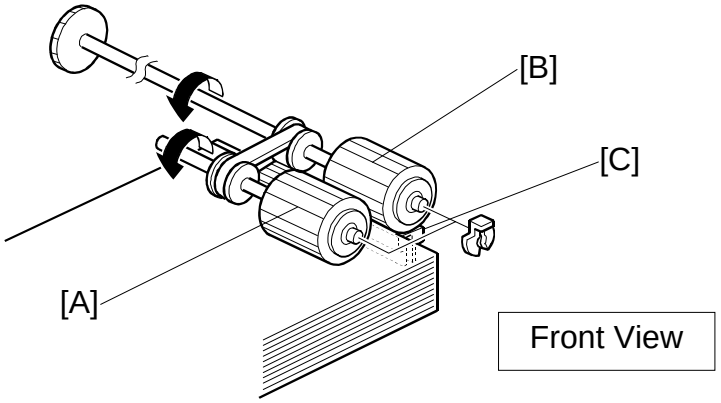
Paper Tray	Paper capacity
1st	1000 x 2 (tandem feed tray) or 1000 sheets
2nd	500 sheets (universal tray)

Paper can also be fed using the paper table, which has an independent feed mechanism. The paper table can hold 500 sheets of paper.

Rotation of the pick-up roller [A] drives the top sheet of paper from each tray to the feed roller [B] and the friction pad. The feed roller and friction pad then take over paper drive. If more than one sheet is fed by the pick-up roller, the friction pad prevents all but the top sheet from passing through to the tray registration rollers [C].

The tray registration motor [D] (a stepper motor) drives the tray registration rollers. The tray feed motor [E] (another stepper motor) drives the pick-up roller and paper feed roller of each tray and the 1st and 2nd relay rollers [F] and [G].

2.1.2 PAPER FEED

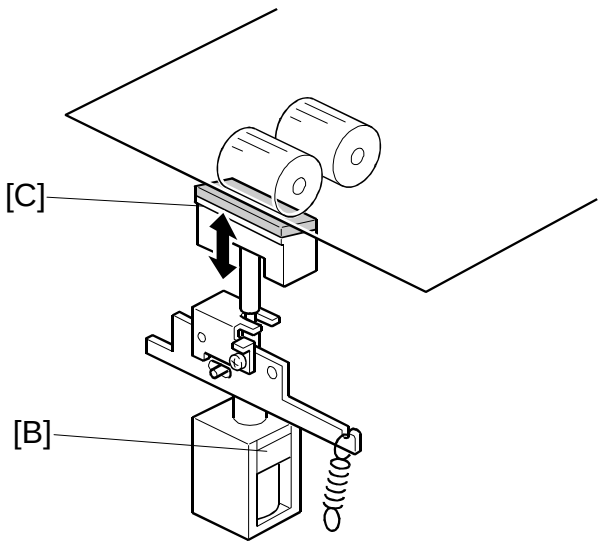


C232D001.WMF

The pick-up roller [A] and paper feed roller [B] are driven by the tray feed motor.

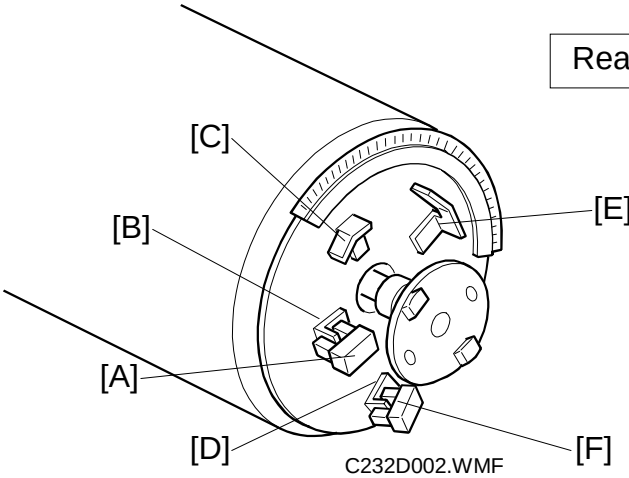
The pick-up roller picks up paper from the top of the stack. Friction between the feed rollers and the friction pad [C] allows only the top sheet to pass towards the tray exit rollers.

There is a one-way clutch in the paper feed roller. When the roller stops and paper is fed by the tray exit rollers, the one-way clutch ensures that the paper feed roller does not resist paper feed.



C232D003.WMF

The friction pad [C] is pulled away from the feed roller by energizing the friction pad solenoid [B] when a copy job finishes. It contacts the roller by energizing the solenoid again when a copy job starts. This eases paper jam removal if paper is caught between the roller and friction pad. Also, this mechanism helps to extend the life of the roller and friction pad.

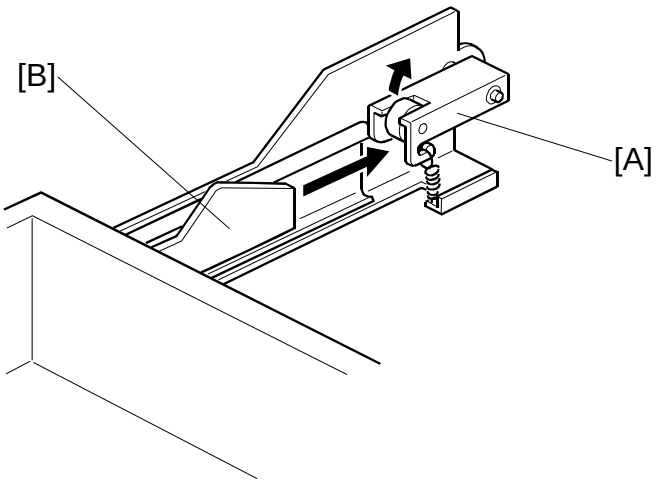


The tray feed start sensor [A] controls paper feed timing from the paper trays. The tray paper feed motor turns on a pre-determined duration after actuator [B] interrupts the tray feed start sensor. Similarly, the tray registration motor turns on using actuator [C].

NOTE: The paper feed timing from the paper feed table (towards the main body) is maintained by the paper table feed start sensor [F] in combination with actuators [D] and [E].

2.1.3 TANDEM TRAY MECHANISMS

Tray Positioning

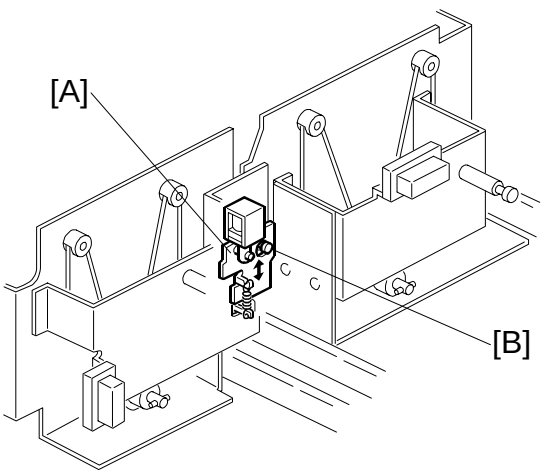


C232D009.WMF

When the tray is placed in the machine, the lock lever [A] drops behind the lock plate [B] on the slide rail support bracket to lock the tray in the proper position.

NOTE: The same type of mechanism is used also for tray 2.

Tandem Tray Connection/Disconnection

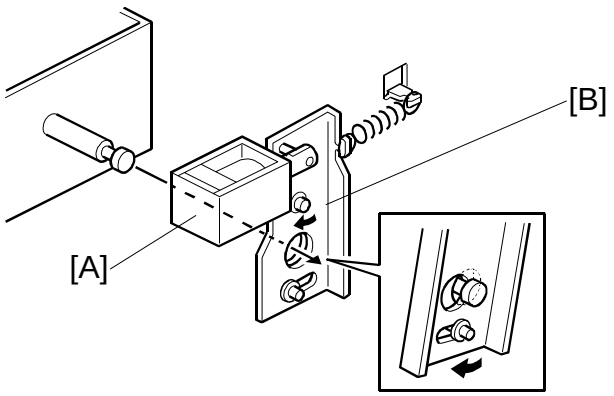


Rear View

C232D014.WMF

Normally the lock plate [A] in the right tandem tray catches the pin [B] in the left tandem tray. During printing, if there is no paper in the left tray, the tray 1 connection solenoid turns on to release the lock plate, and the left tray separates from the right tray. Therefore, only the left tandem tray can be pulled out when the user adds paper.

Tray Lock Mechanism



C232D013.WMF

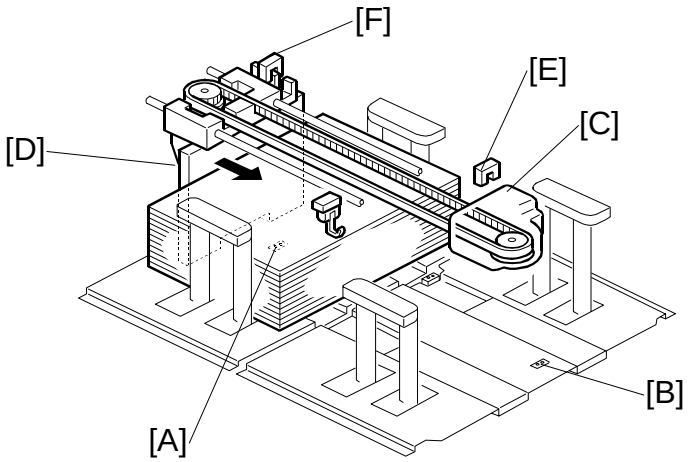
During printing, the tray lock solenoid [A] turns on and lock plate [B] locks the tray. This mechanism is the same in the right and left halves of the tandem tray.

NOTE: The same type of mechanism is used also for tray 2.

The tray lock timing for each mode is shown in the table.

	Tray 1 Left	**Tray 1 Right**	**Tray 2**
Paper feed from tray 1: Non-Tandem Mode	Locked	Locked	Unlocked
Paper feed from tray 1: Tandem Mode	Unlocked	Locked	Unlocked
Transferring paper from left to right in the tandem tray	Locked	Locked	Unlocked
Paper feed from tray 2	Unlocked	Unlocked	Locked

Tandem Back Plate Drive Mechanism

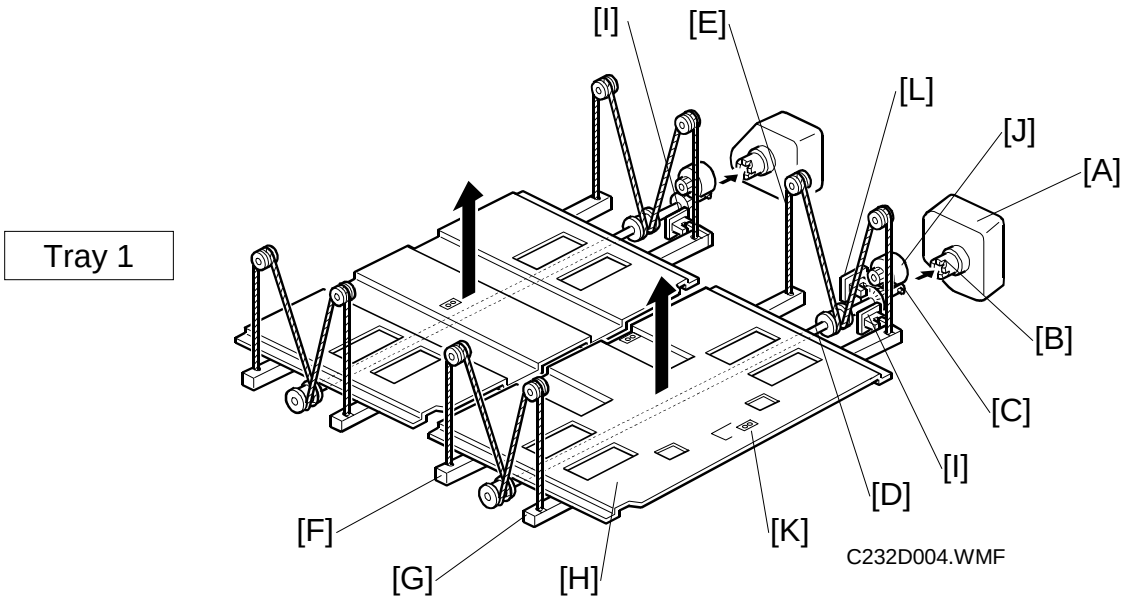


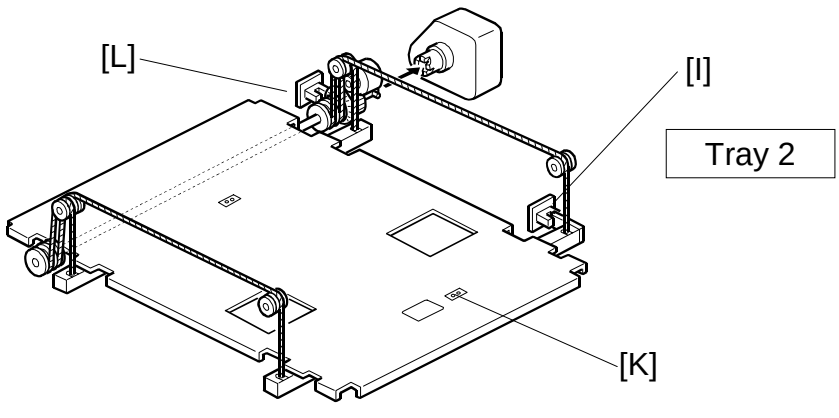
C232D010.WMF

When the left tray paper length sensor [A] detects paper and the tray 1 paper end sensor [B] detects no paper, the back plate drive motor [C] moves the back plate [D]. This motor pushes the stack of paper from the left half of the tandem tray into the right half of the tandem tray.

The actuator on the back plate activates the return position sensor [E] when the paper stack has reached the right side of the tray. Then, the back plate drive motor rotates until the actuator activates the back plate home position sensor [F].

2.1.4 PAPER LIFT





When the machine detects that the paper tray has been placed in the machine (detected by the connector at the rear of the tray), the lift motor [A] rotates and the coupling gear [B] on the tray lift motor engages the pin [C] on the lift arm shaft [D]. The tray wires [E] are attached to the tray support rods [F, G]. When the lift motor rotates clockwise, the tray wires [E] lift the tray support rods and the tray bottom plate [H].

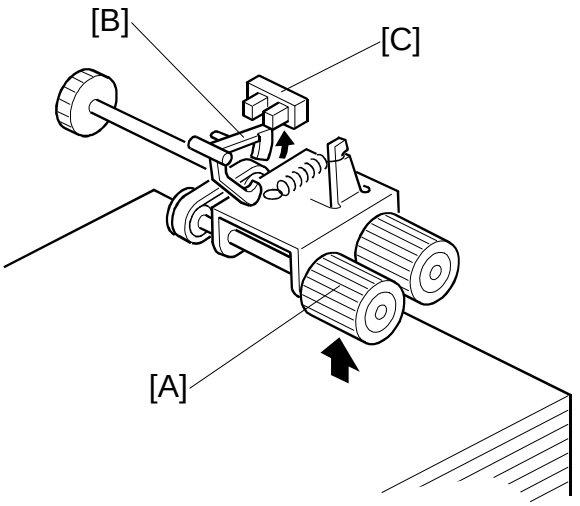
When the actuator on the tray support rod activates the tray lower limit sensor [I], the tray lower limit condition is detected.

When drawing out the tray, the coupling gear [B] separates from the pin [C], so that the tray bottom plate moves downward. Then the tray bottom plate drops. The damper [J] lets the tray bottom plate drop slowly.

The paper end sensors [K] check whether there is paper on the tray.

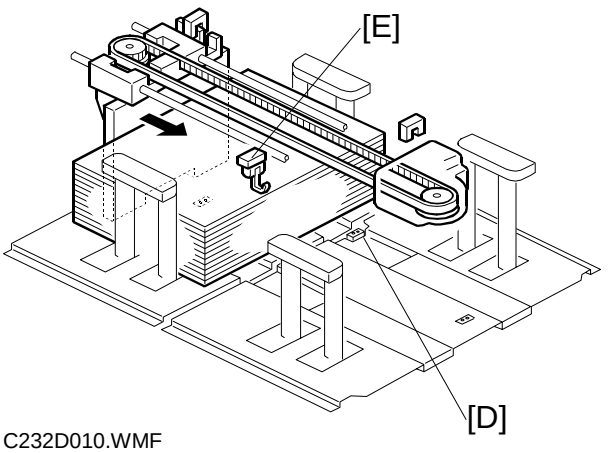
The paper volume sensors [L] detect the amount of paper remaining in the tray by monitoring the encoder, which detects the amount of lift motor rotation (this mechanism is not present in the left side of the tandem tray).

2.1.5 TRAY UPPER LIMIT DETECTION AND PAPER HEIGHT CONTROL



C232D006.WMF

The tray goes up until the top of the paper stack pushes up the paper pick-up roller [A] and the actuator [B] activates the upper limit sensor [C] to stop the tray lift motor.



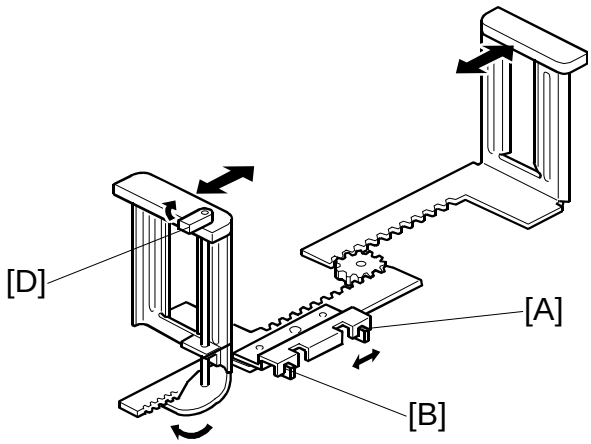
C232D010.WMF

When tray 1 contains a large paper size (such as A3), the tandem tray sensor [D] is covered and the machine detects that this tray is not being used as a tandem tray.

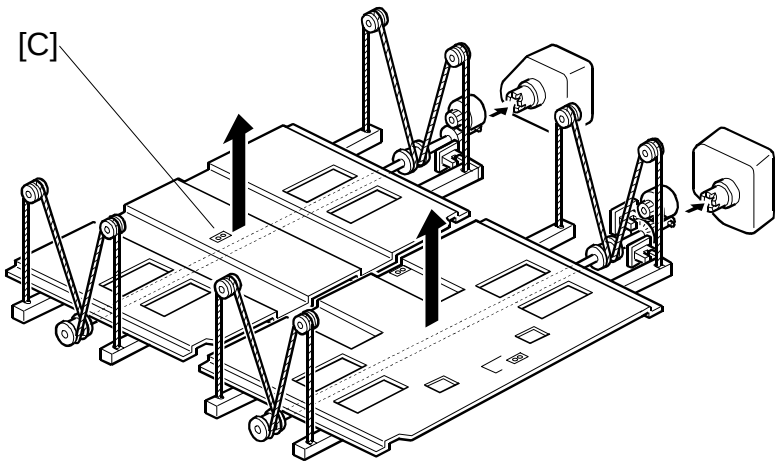
In such a case, the left and right bottom plates both must lift the paper to the correct feed height. The right tray upper limit sensor operates as explained above ([C] in the top diagram). However, for the left bottom plate, the left tray upper limit sensor [E] detects when the stack is at the correct height. (The actuator is curved so that it is not damaged when a paper stack is moved from left to right when the tray is in tandem mode.) This sensor is only used when tray 1 is not being used as a tandem tray.

2.1.6 SIDE FENCE POSITIONING AND PAPER SIZE DETECTION

Tray 1



C232D011.WMF

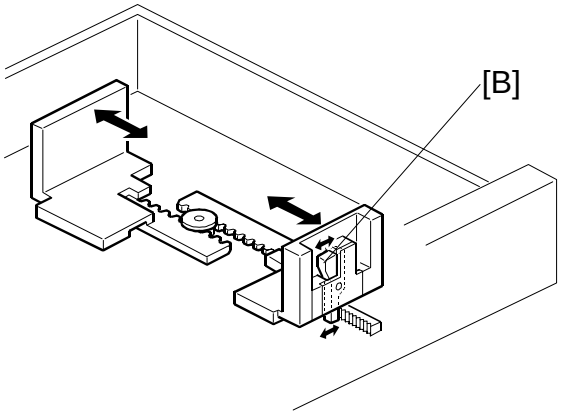


C232D004.WMF

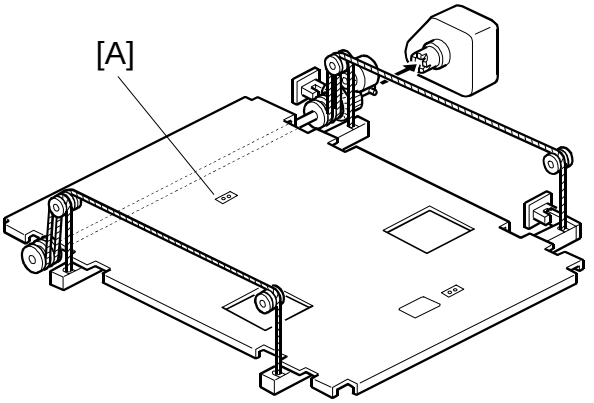
The front and rear tray paper width sensors [A] and [B] monitor the paper width. These sensors detect the paper size in tray 1, in combination with the reading from the left tray paper length sensor [C].

By turning side fence lock lever [D] clockwise, the side fence is locked.

Tray 2



C232D012.WMF

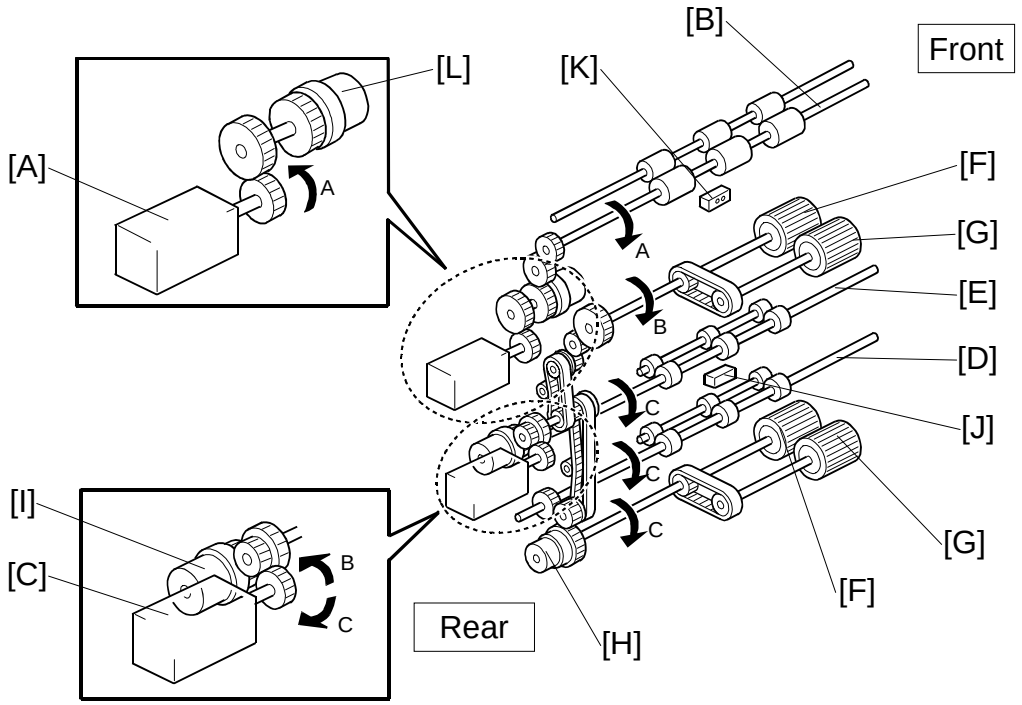


C232D005.WMF

The paper width in tray 2 is monitored in the same way as tray 1. The width sensors detect the paper size in tray 2, in combination with the reading from the tray 2 paper length sensor.

The side fence release lever [B] can be slid while it is squeezed.

2.1.7 VERTICAL TRANSPORT



C232D500.WMF

The tray registration motor [A] drives the tray registration rollers [B]. The tray feed motor [C] drives the 1st relay rollers [D], 2nd relay rollers [E], the paper feed rollers [F], and the paper pick-up rollers [G]. (See the arrows marked A in the diagram.)

To feed from tray 1, the tray feed motor turns counter-clockwise (as viewed from the rear side), and the paper feed roller and paper pick-up roller in tray 1 rotate. (See the arrows marked B in the diagram.)

To feed from tray 2, the tray feed motor turns clockwise, and the 1st relay rollers turn. When the tray 2 feed clutch [H] is on, the paper feed roller and paper pick-up roller in tray 2 also turn.To turn the 2nd relay rollers, the tray relay clutch [I] is energized. (See the arrows marked C in the diagram.)

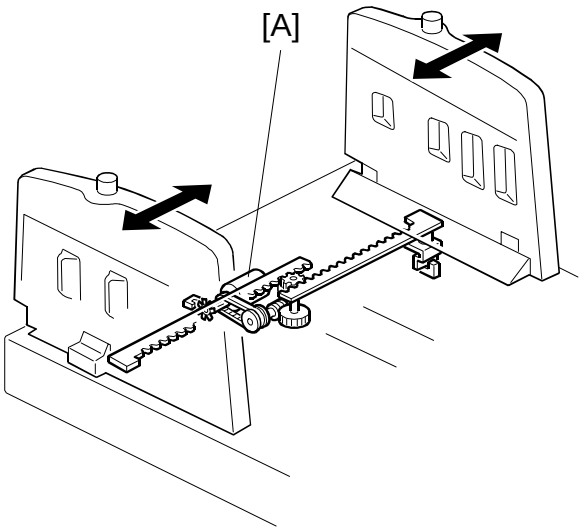
During feed from tray 1 (when the tray feed motor turns counter-clockwise), the tray relay clutch stays off and the 2nd relay rollers do not rotate. This is to prevent the tray feed motor from being overloaded. (When paper is being fed from tray 1, the 1st and 2nd relay rollers are not needed.)

The 1st relay sensor [J] is used to detect paper jams. The tray registration sensor [K] detects paper arriving at the tray registration rollers.

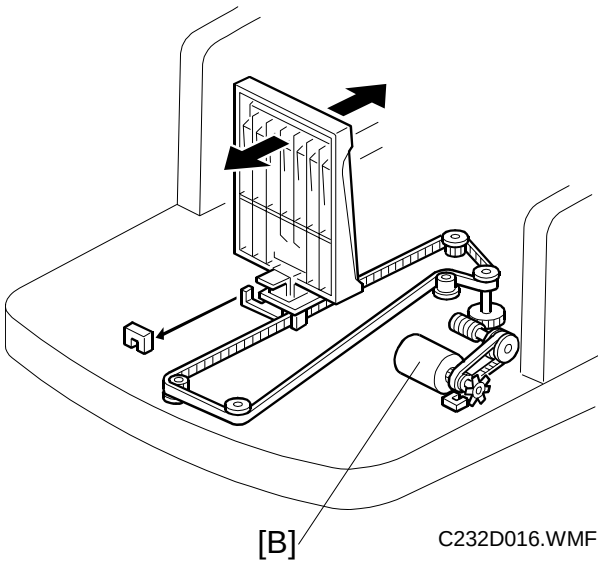
When the next set of rollers (3rd relay rollers in the main frame) catch the paper, the tray exit clutch [L] energizes to disengage the drive to the tray registration rollers. This allows the tray registration rollers to turn freely, and only the 3rd relay rollers feed the paper.

2.2 PAPER DELIVERY TABLE

2.2.1 SIDE AND END PLATE DRIVE



C232D015.WMF



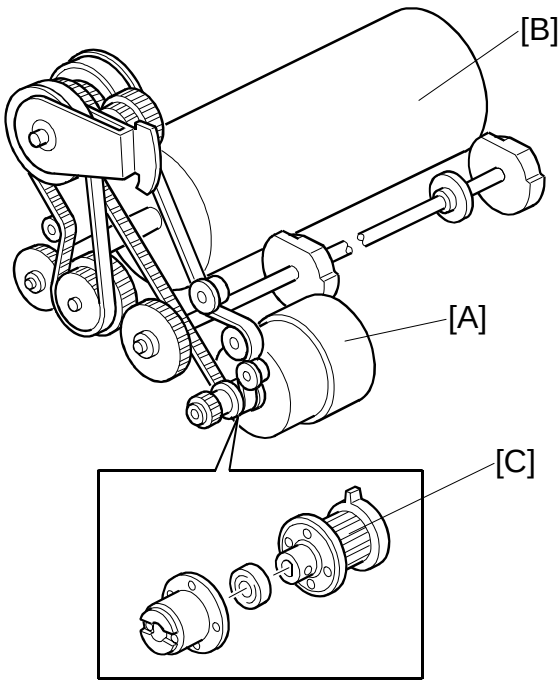
C232D016.WMF

The side plate drive motor [A] moves the left and right side plates using a rack and pinion mechanism. The end plate drive motor [B] moves the end plate via a timing belt and pulleys.

When the print start key is pressed, the fences move to fit the print paper size in accordance with the paper size detected at the paper table or the paper trays.

2.3 MAIN MOTOR PROTECTION MECHANISM

The main motor [A] drives the pressure cylinder [B] and the drum. When the pressure cylinder or drum is locked, the torque limiter [C] stops drive from the main motor gear from being transmitted to these parts. This prevents the mechanism from being overloaded.



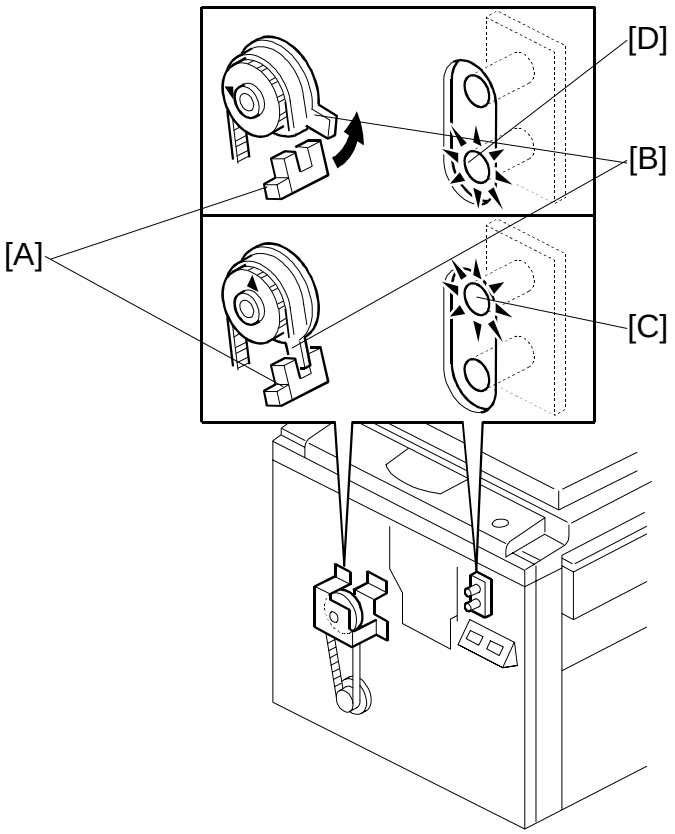
C233D010.WMF

When the mechanism is locked, the LCD indicates SC-05-00, SC05-01, or SC05-03. However, there are no damaged parts or changes in drum and pressure cylinder position.

To recover the machine, eleminate the cause of the problem then turn the main switch off/on.

CAUTION: 1) These service call codes can appear in different situations.
2) Make sure jammed paper and masters are removed before switching off/on.

2.4 DRUM HOME POSITION DETECTION



C232D020.WMF

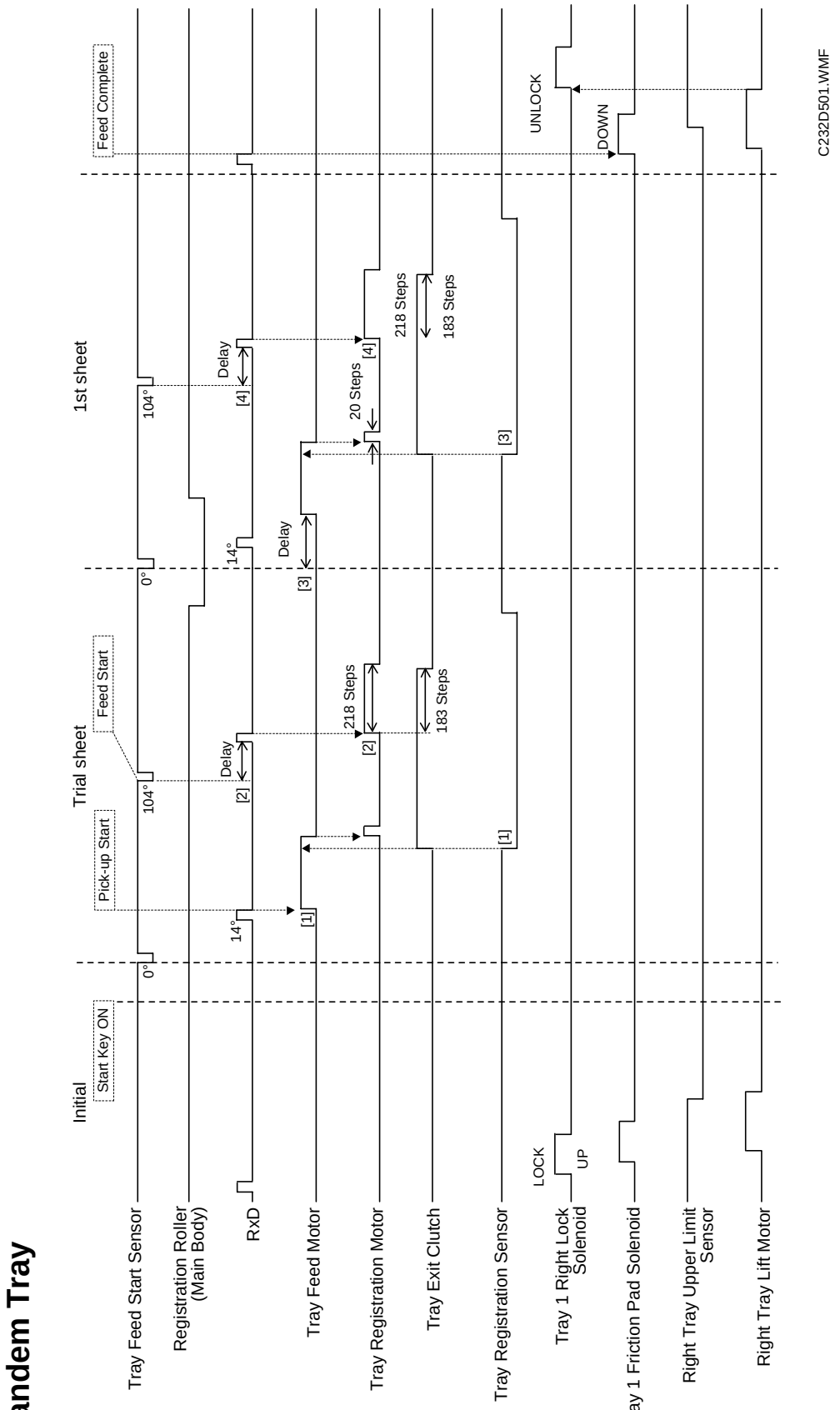
LEDs are added to inform the operator when the drum is at the exact home position and can be pulled out. The drum home position is monitored by the drum home position sensor [A], which is newly added for the actuator disk [B] on the pressure cylinder.

Green LED [C] turns on when the drum is at the home position.

Red LED [D] warns that the drum is not at the home position.

NOTE: If the red LED lights when the machine is in standby mode, the drum is not at the home position and the front door must be closed to reset the drum position.

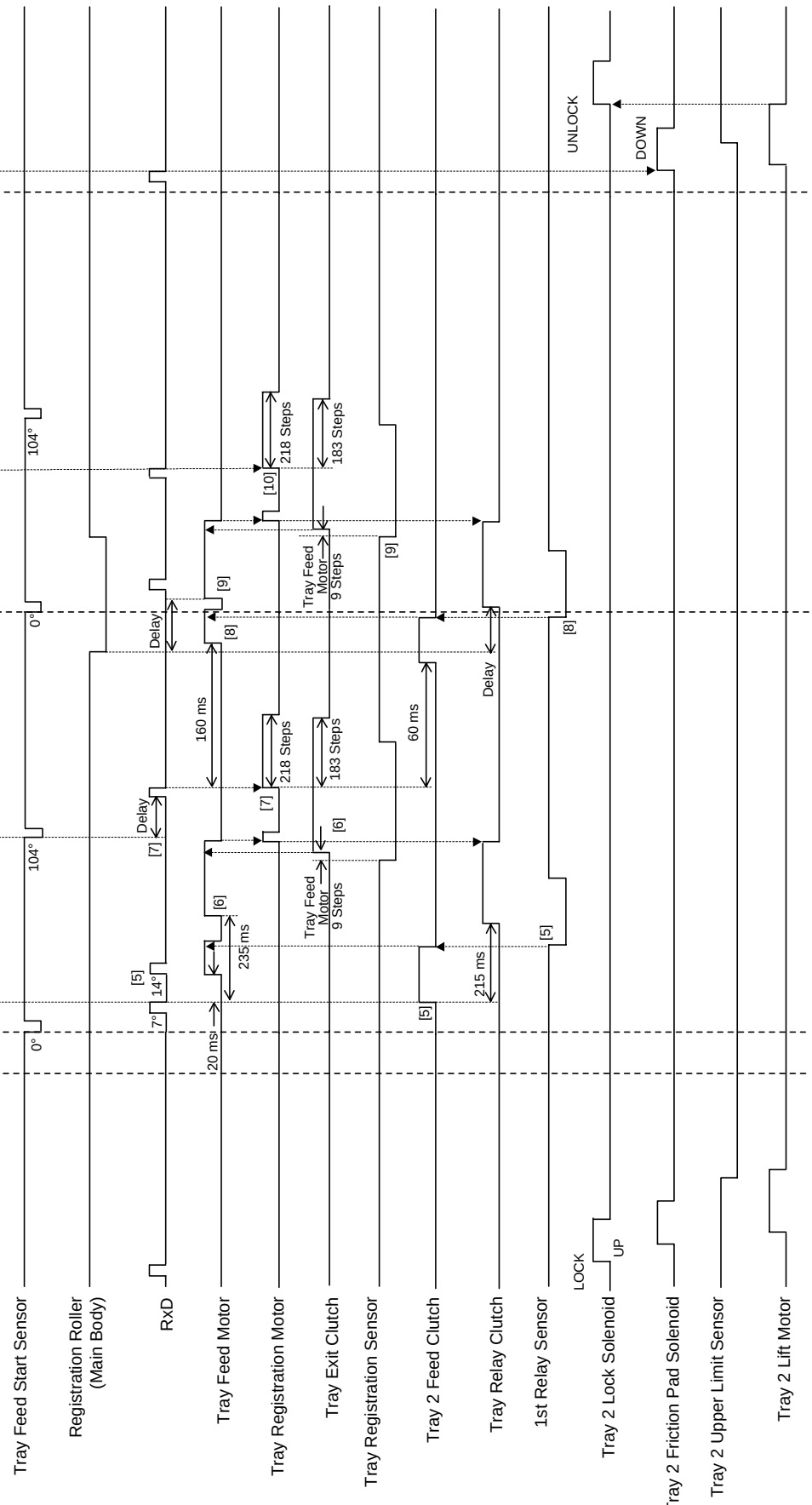
2.5 TIMING CHART



1) When the paper bank receives the pick-up start command, it turns on the tray feed motor in the paper bank, and this starts the tray registration roller. Then, it turns on the tray exit clutch and stops the tray feed motor. At that time, the trial sheet has been sent to the tray registration roller and is held there.
2) When the paper bank receives the feed start command, after a certain delay, the tray registration motor feeds 218 steps. This feeds the paper into the main body, and the main body paper feed mechanisms take over.
3) When the tray feed start sensor detects the 0-degree actuator, the tray feed motor operates until the tray registration sensor activates. At that time, the next sheet of paper is held at the tray registration roller.
4) When the tray feed start sensor detects the 104-degree actuator, the tray registration motor turns 218 steps after a certain delay. The tray registration roller feeds the paper from the paper bank to the main body.

RxD: Command signals from the main body to the paper bank.

Tray 2


Initial
Start Key ON
Trial sheet
Pick-up Start
Feed Start
1st Sheet
Feed Start
Feed Complete
Tray Feed Start Sensor
Registration Roller (Main Body)
RxD
Tray Feed Motor
Tray Registration Motor
Tray Exit Clutch
Tray Registration Sensor
Tray 2 Feed Clutch
Tray Relay Clutch
1st Relay Sensor
Tray 2 Lock Solenoid
Tray 2 Friction Pad Solenoid
Tray 2 Upper Limit Sensor
Tray 2 Lift Motor
0°
104°
0°
104°
0°
7°
14°
20 ms
[5]
Delay
[7]
235 ms
[6]
Delay
[8]
160 ms
[9]
[7]
218 Steps
[10]
218 Steps
[6]
183 Steps
Tray Feed Motor
9 Steps
183 Steps
Tray Feed Motor
9 Steps
[9]
60 ms
[5]
Delay
215 ms
[5]
[8]
LOCK
UP
UNLOCK
DOWN
C232D502.WMF

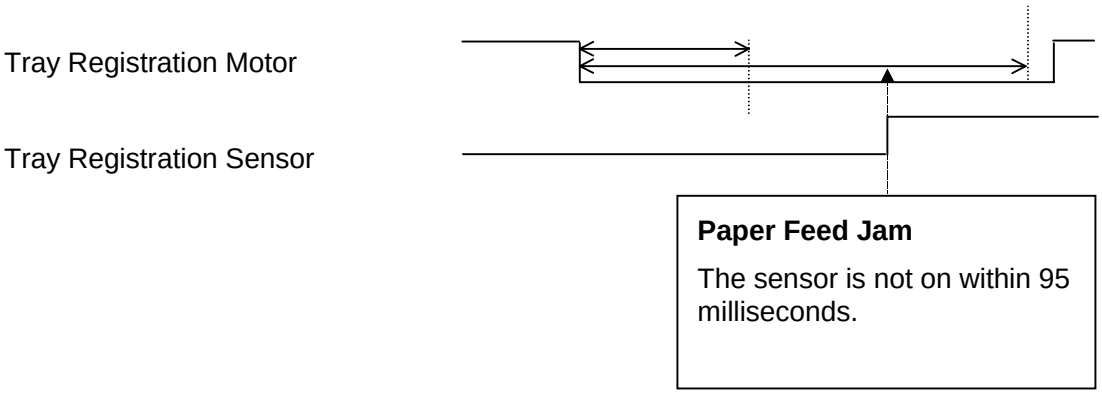
5) When the paper bank receives the pick-up command, it turns on the tray 2 feed clutch. 20 ms after receiving the pick-up command, the tray feed motor starts. This feeds the trial sheet until it activates the 1st relay sensor. At that time, the paper is at the 2nd relay roller.
6) 235 ms after receiving the pick-up command, the tray feed motor starts. The tray registration roller stops 9 steps after the tray registration sensor activates.
7) When the paper bank receives the feed start command, the tray registration motor turns 218 steps (after a certain delay). These steps relay the trial sheet from the paper bank to the main body. The main body now takes over feed for this sheet of paper.
8) 160 ms after receiving the feed start command (plus a certain delay), the tray feed motor operates until the 1st relay sensor activates. At that time, the next sheet of paper has reached the 2nd relay roller from tray 2.
9) The registration roller (main body) starts to feed the previous sheet. After a delay, the tray feed motor turns on until 9 steps after the tray registration sensor is activated.
10) When the paper bank receives the paper feed command, the tray registration motor turns 218 steps. This feeds the next sheet of paper from the paper bank to the main body.

RxD: Command signals from the main body to the paper bank.

2.6 ERROR DETECTION

2.6.1 PAPER FEED ERROR DETECTION IN THE PAPER BANK

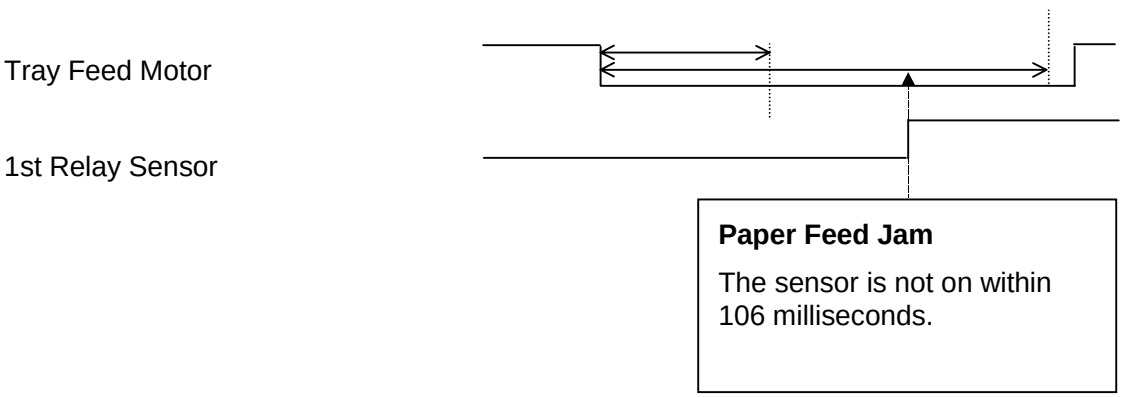
Error during Paper Feed from the Tandem Tray



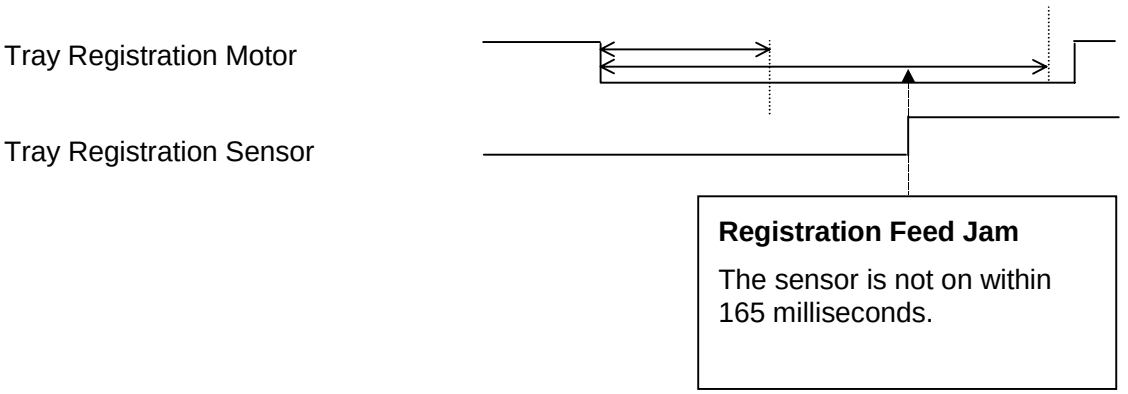
Error when Moving the Paper Stack in the Tandem Tray

- The tandem tray sensor stays on after the paper has moved from the left tandem tray to the right tandem tray.
- The left tray paper length sensor stays on after the paper has moved from the left tandem tray to the right tandem tray.

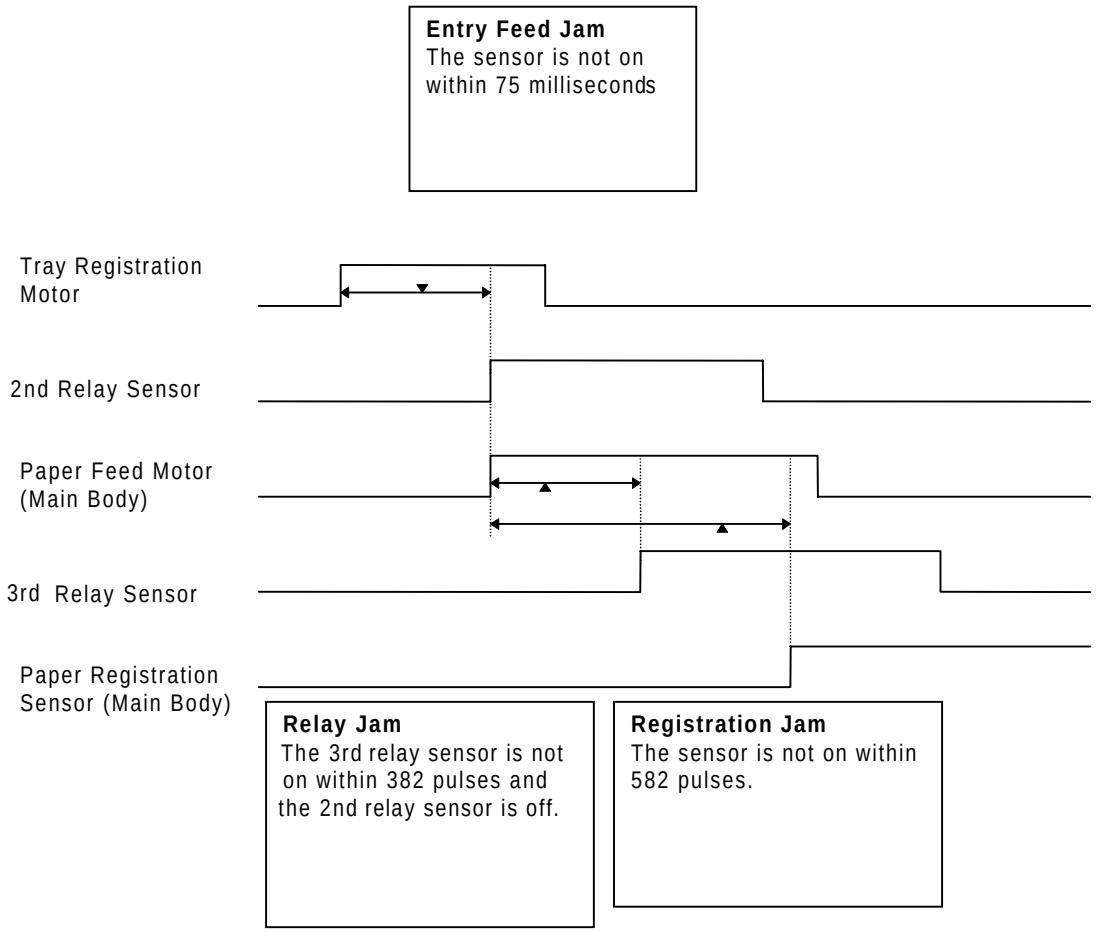
Error during Paper Feed from Tray 2



Error during Paper Registration from Tray 2



Paper Relay Error



C232D503.WMF

3. INSTALLATION

3.1 INSTALLATION REQUIREMENTS

The installation location should be carefully chosen, because the environmental conditions could greatly affect the performance of the machine.

3.1.1 REQUIRED ENVIRONMENTAL CONDITIONS

1. Temperature –10 to 30°C (50 to 86°F)
2. Humidity –20 to 90 % RH
3. Place the machine on a strong and level base. The machine must be leveled within 5 mm both front to rear and left to right.

3.1.2 ENVIRONMENTS TO AVOID

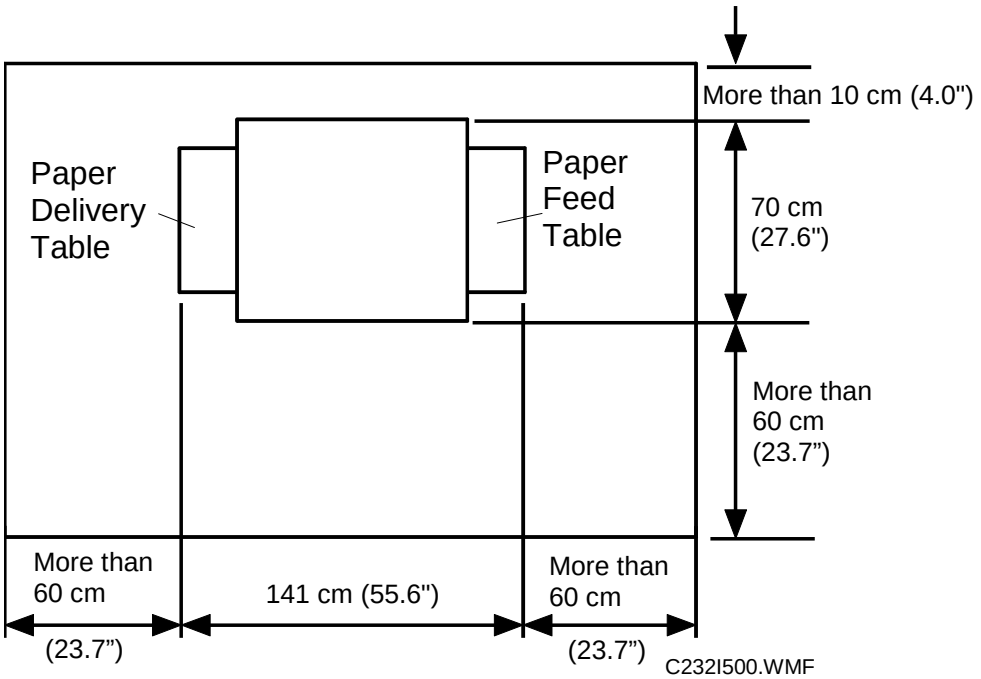
1. Locations exposed to direct sunlight or strong light (more than 1,500 lux).
2. Areas with corrosive gases.
3. Dusty areas.
4. Locations directly exposed to cool air from air conditioners or reflected heat from space heaters. (Sudden temperature changes from low to high or vice versa may cause condensation within the machine.)

3.1.3 POWER CONNECTION

1. Securely connect the power cord to a power source.
2. Make sure that the wall outlet is near the machine and easily accessible.
3. Make sure the plug is firmly inserted in the outlet.
4. Avoid multi-wiring.
5. Voltage must not fluctuate more than 10%.
6. Do not press anything on the power cord.
7. Always plug the power cord into a properly grounded outlet.
8. Power Source: 220-240V, 50/60Hz, 1.6A or more. Please be sure to connect the power cord to a power source of this type.

3.1.4 ACCESS TO THE MACHINE

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



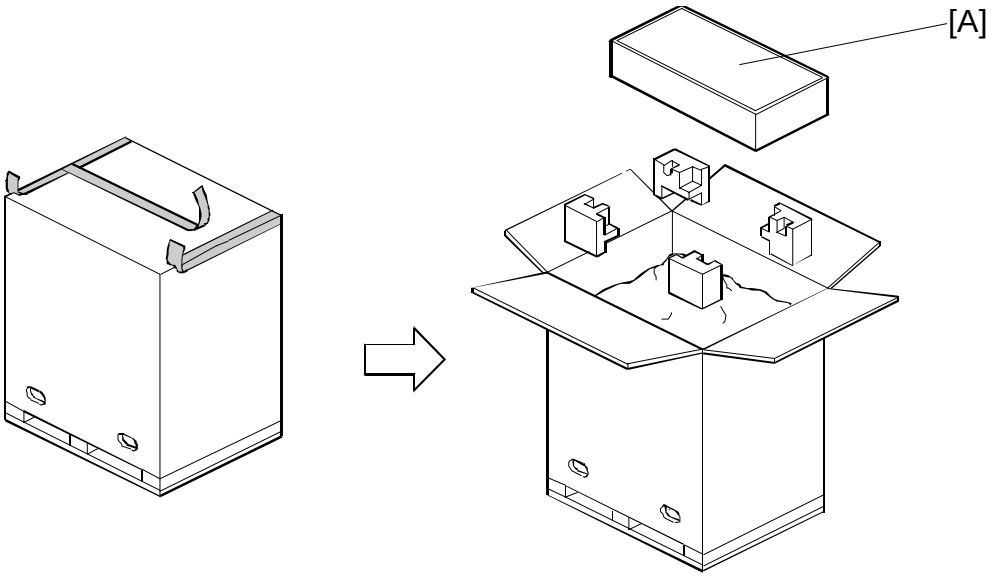
3.2 INSTALLATION PROCEDURE

3.2.1 ACCESSORY CHECK

Make sure that you have all the accessories listed below.

Operating Instructions (Expect for Ricoh European Version)..... 1
NECR (Ricoh version only) 1
Brand Decals
(OEM version only) ..... 1 set
Model Name Plates
(OEM version only) ..... 1 set
Paper Delivery Table ..... 1 set

3.2.2 INSTALLATION PROCEDURE



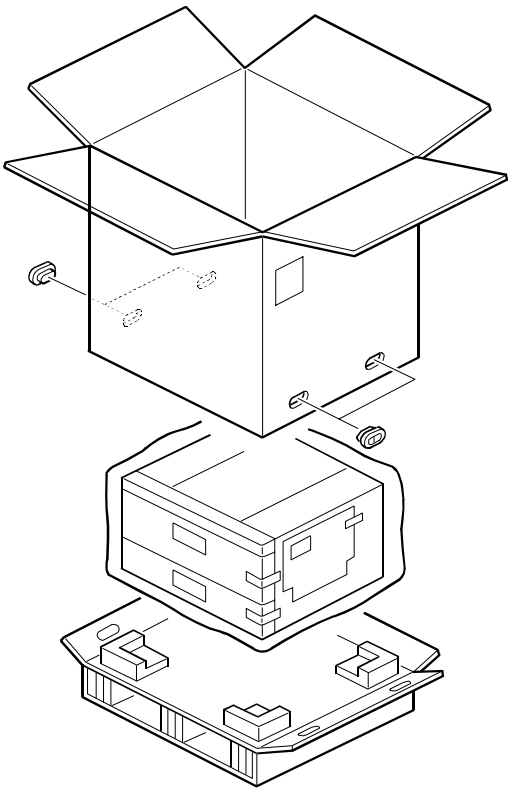
C232I001.WMF

⚠CAUTION

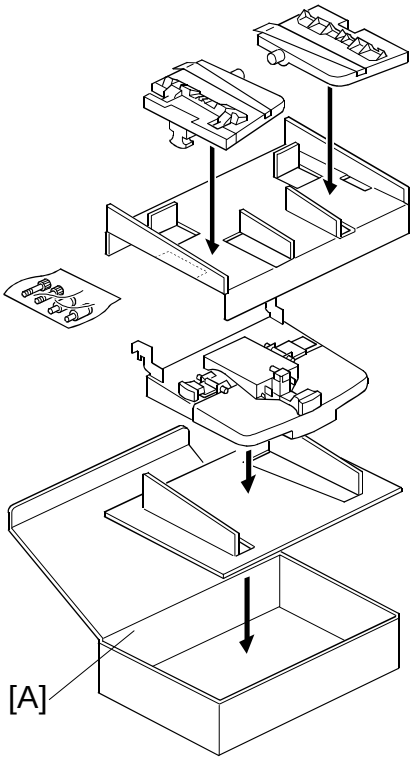
Open the box from the top. If the box is lifted off the machine from the bottom, the paper delivery table may be damaged.

1. Unpack the paper bank. Take out the small box [A] which contains the paper delivery table.

CAUTION: First, open the upper opening of the box, and remove the small box inside [A]. This prevents the paper delivery table (inside the box [A]) from being damaged.

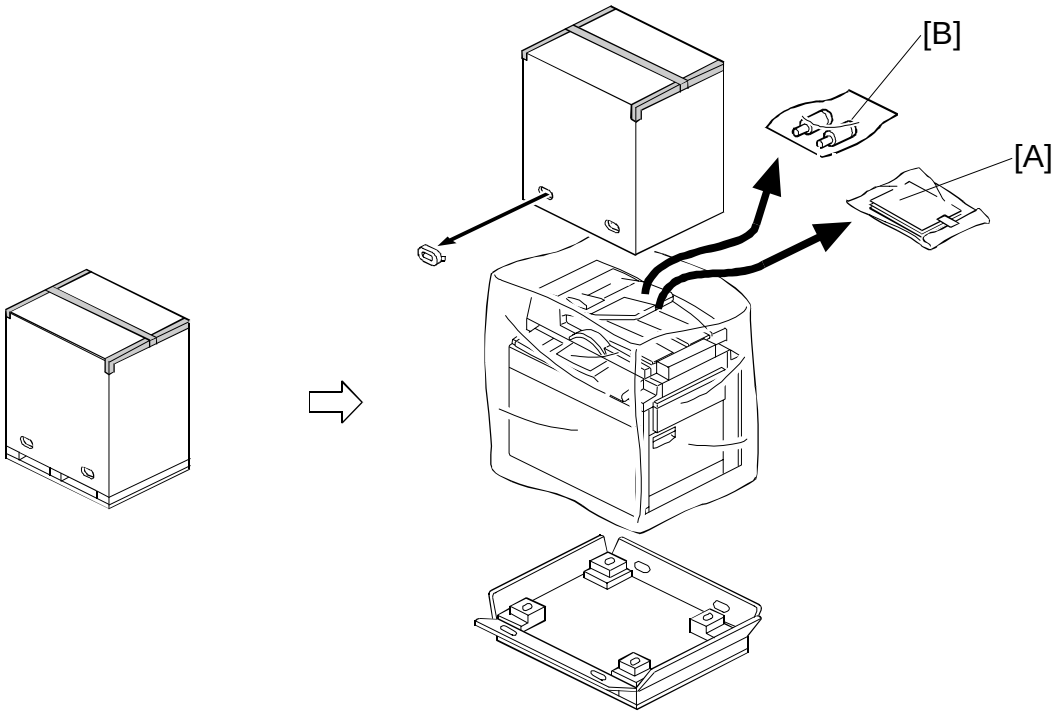


C232I004.WMF



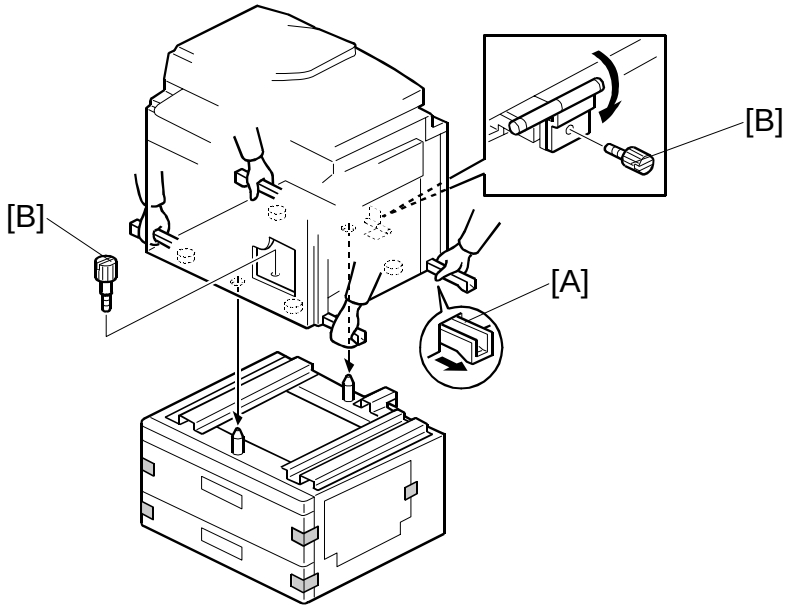
C232I501.WMF

2. Continue to unpack the paper bank. Make sure that there is a paper delivery unit inside the small box [A].

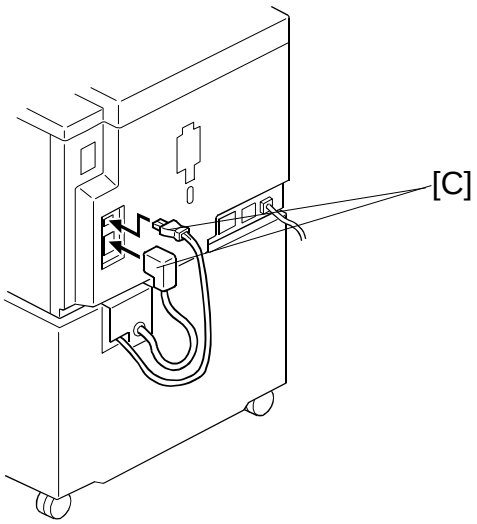


C232I030.WMF

3. Unpack the main body. Take out the accessory bags [A] and [B].



C232I006.WMF

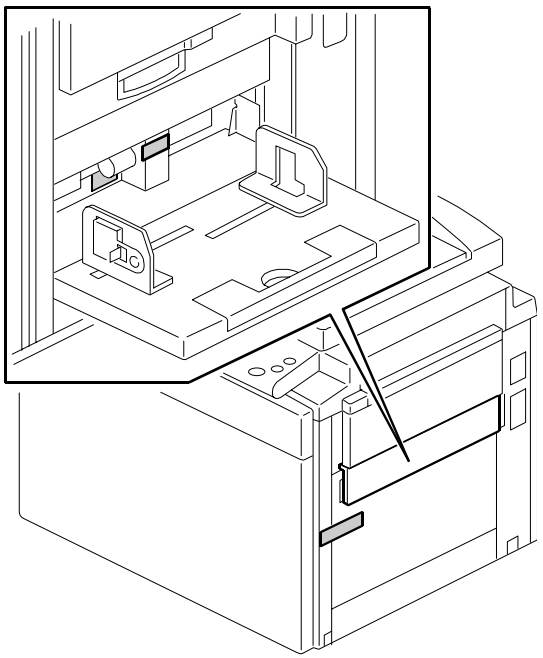


C232I023.WMF

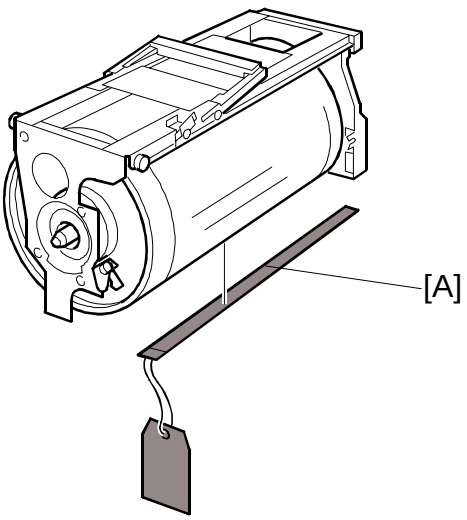
⚠CAUTION

Only handle using the carrying handles [A] on the bottom of the machine. Your fingers could be caught during installation if you hold the bottom edge of the machine. (There is only a very narrow space between the two units.)

4. Tightly secure 2 screws [B] using a screw driver to ensure that duplicator and paper bank are firmly connected.
5. Connect the 2 connectors [C] to the main body.

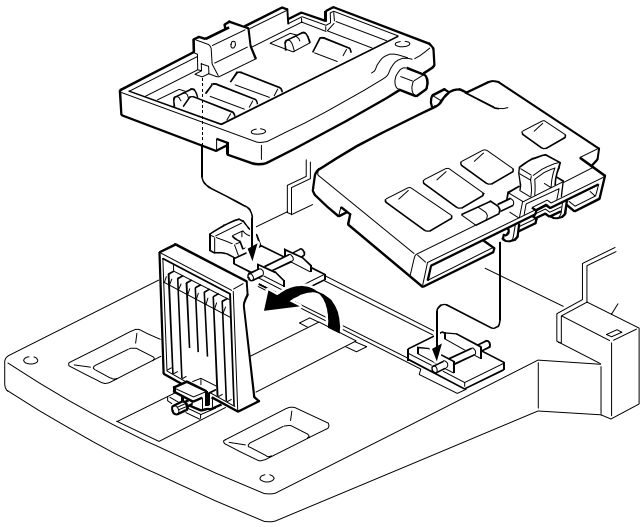


C232I009.WMF



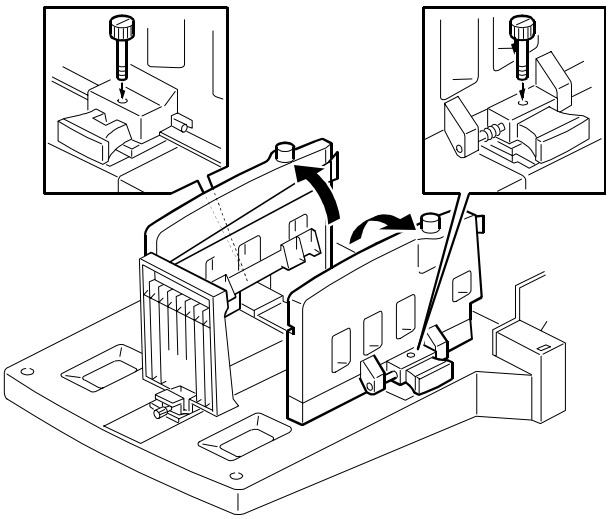
C232I031.WMF

6. Remove the tape securing the covers and units. Open the front cover, and slide out the drum unit. Then, remove the master clamper protective sheet [A].



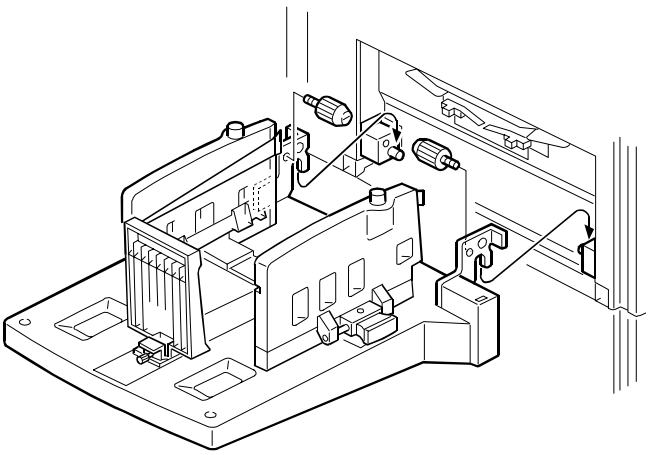
C232I027.WMF

7. Take out the paper delivery table from the box.
8. Put up the front and rear side fences, as shown.



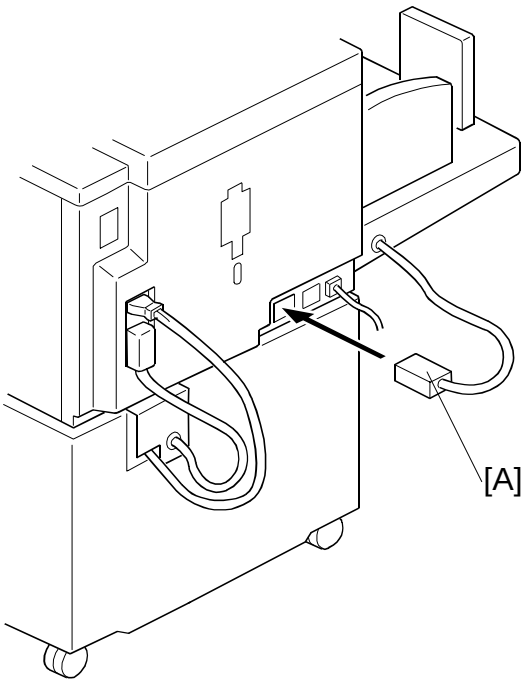
C232I028.WMF

9. Assemble the paper delivery table, with a screw for each side.



C232I029.WMF

10. Attach the paper delivery table (2 screws).



C232I032.WMF

11. Connect the connector [A] to the main body.

12. Install a master roll.
13. Install an ink cartridge.
14. Firmly insert the plug in the wall outlet.

CAUTION: Make sure that the wall outlet is near the machine and easily accessible.

15. Turn on the main switch.
16. Press the “Economy Mode” key while holding down the “0” key, to supply ink to the drum.
17. Input the main body, paper bank, and paper delivery table serial numbers with SP 3-070.
18. Make test copies.

4. SERVICE TABLES

4.1 DIP SW, LED, VR, TP, AND FUSE TABLES

4.1.1 TEST POINTS

Ink Detection Board

Number	Usage
TP1	Ink Level
TP2	Ink Level
TP-12V	-12V

4.1.2 DIP SWITCHES

Ink Detection Board

Number	Standard A3 Drum	Optional A3 Drum	Optional A4 Drum	Not used
DPS901-1	ON	OFF	ON	OFF
DPS901-2	ON	ON	OFF	OFF

4.1.3 POTENTIOMETERS

I/O Board

Number	Usage
VR303	Master Eject Sensor Adjustment
VR304	Master End Sensor Adjustment (Do not adjust.)
VR305	1st Drum Master Sensor Adjustment
VR306	2nd Drum Master Sensor Adjustment
VR307	Master Edge Sensor Adjustment

Thermal Head Power Supply Board

Number	Usage
VR1	Thermal Head Voltage Adjustment

Ink Detection Board

Number	Usage
VR901	Ink Detection Board Adjustment

4.1.4 LED'S

MPU

Number	Function
LED101	Monitors the CPU operation. Usually, this LED is blinking.
LED102	Monitors power supplied to the MPU. Usually, this LED is lit.

I/O Board

Number	Function
LED300	Not used.
LED301	Not used.
LED302	Monitors the Master Eject Sensor.
LED303	Monitors the Master Edge Sensor.
LED304	Monitors the feed control CPU operation. Usually, this LED is blinking.
LED305	Monitors power supplied to the I/O board. Usually, this LED is lit.

4.1.5 FUSES

Power Supply Unit

Fuse	Rated Current	Protect
FU700	10A	Power Supply Unit
FU701	5A	Main Motor Drive Board
FU702	5A	Main Motor Drive Board
FU703	5A	I/O Board
FU704	5A	Thermal Head Power Supply Board, I/O Board
FU706	2A	Power Supply Unit

Thermal Head Power Supply Board

Fuse	Rated Current	Protect
FU750	2A	Thermal Head

Main Motor Control Board

Fuse	Rated Current	Protect
FUSE	10A	Main Motor

4.2 SERVICE CALL CODES

Code	Title	Conditions	Possible Causes
SC02-00	Scanner motor lock (the HP sensor remains off)	After the scanner has left home position, it does not return there for more than 7 seconds.	• Defective scanner HP sensor • Scanner wire slip-off • Defective scanner motor
SC02-01	Scanner motor lock (the HP sensor remains on)	At power on or when the Start key is pressed, the scanner does not move from the home position towards the scanning direction for more than 2 seconds.	• Defective scanner HP sensor • Scanner wire slip-off • Defective scanner motor
SC02-02	Scanner motor lock (the scanner does not return to HP)	At power on, the scanner does not return to the home position within 2 seconds after it left.	• Defective scanner HP sensor • Scanner wire slip-off • Defective scanner motor
SC03-00	Thermal head ID error	The CPU detects an abnormal ID signal from the thermal head.	• Defective thermal head • Defective MPU
SC03-01	Thermal head energy pulse error	The CPU detects an abnormal thermal head energy control pulse.	• Defective MPU • Defective PSU
SC03-02	Thermal head thermistor short	The signal from the thermal head thermistor reaches 4.88 volts.	• Thermistor open circuit • Related connector disconnected
SC03-03	Thermal head temperature abnormal	When the Start key is pressed, a temperature of 54 °C or more is detected at the thermal head.	• Thermistor short • Defective thermal head
SC04-00	Cutter HP sensor remains on	The cutter does not leave the home position for more than 3 seconds after the cutter motor on signal is generated.	• Defective sensor • Defective motor • Jammed master
SC04-01	Cutter HP sensor remains off	After leaving home position , the cutter does not return there for more than 3 seconds.	• Defective sensor • Defective motor • Jammed master
SC04-10	Platen release sensor remains on	The sensor is not de-activated for more than 5 seconds after the platen release motor on signal is generated.	• Defective sensor • Defective motor
SC04-11	Platen release sensor remains off	The sensor is not activated for more than 5 seconds after the platen release motor on signal is generated.	• Defective sensor • Defective motor

Code	Title	Conditions	Possible Causes
SC04-20	Master cut error	The master edge sensor remains on even after the first master cut recovery operation. (Normally, the master is cut if the master edge sensor detects a mis-cut master the first time.)	• Defective master edge sensor • Defective cutter unit • Defective master vacuum fans • Jammed master
SC05-00	Main motor lock (1st drum position sensor does not turn on)	At power on or when the drum returns to home position, the 1st drum position sensor is not activated for more than 5 seconds after the main motor on signal is generated.	• Defective sensor • Defective main motor
SC05-01	Main motor lock (motor control signal error)	The CPU on the motor control board detects an abnormal signal from the main motor encoder.	• Defective main motor • Jammed master
SC05-02	Drum HP sensor remains off	The sensor is not activated after the main motor on signal is generated.	• Defective sensor
SC05-10	Image shift HP sensor remains on	At power on, the sensor is not de-activated for more than 25 seconds after the image shift motor on signal is generated.	• Defective sensor • Defective motor
SC05-11	Image shift HP sensor remains off	At power on, the sensor is not activated for more than 25 seconds after the image shift motor on signal is generated.	• Defective sensor • Defective motor
SC05-12	No image position encoder pulse	At power on or when the image up/down shift mode is selected, the CPU detects no encoder pulse from the sensor for more than 25 seconds after the image shift motor on signal is generated.	• Defective sensor
SC05-20	Drum shift HP sensor remains on	At power on, the sensor is not de-activated for more than 6 seconds after the drum shift motor on signal is generated.	• Defective sensor • Defective motor
SC05-21	Drum shift HP sensor remains off	At power on, the sensor is not activated for more than 6 seconds after the drum shift motor on signal is generated.	• Defective sensor • Defective motor
SC05-22	No drum shift sensor pulse	At power on or when the image side-to-side shift mode is selected, the CPU detects no encoder pulse from the sensor for more than 6 seconds after the drum shift motor on signal is generated.	• Defective sensor

Code	Title	Conditions	Possible Causes
SC05-30	Drum thermistor open	The signal from the thermistor beside the ink detecting pins reaches 4.5 volts.	• Thermistor circuit open • Related connector disconnected
SC05-31	Drum thermistor short	The thermistor beside the ink detecting pins detects an excessively high temperature (96 °C).	• Thermistor short
SC05-32	Ink pump sensor remains on	The sensor is not de-activated after the ink pump motor on signal is generated.	• Defective sensor • Defective motor • Jammed ink pump drive
SC05-33	Ink pump sensor remains off	The sensor is not activated after the ink pump motor on signal is generated.	• Defective sensor • Defective motor • Jammed ink pump drive
SC05-40	A4 cam sensor remains on	The sensor does not de-activate for more than 6 seconds after the pressure cam shift motor on signal is generated.	• Defective sensor • Defective motor
SC05-41	A3 cam sensor remains off	The sensor does not activate for more than 6 seconds after the pressure cam shift motor on signal is generated.	• Defective sensor • Defective motor
SC05-42	A3 cam sensor remains on	The sensor does not de-activate for more than 6 seconds after the pressure cam shift motor on signal is generated.	• Defective sensor • Defective motor
SC05-43	A4 cam sensor remains off	The sensor does not activate for more than 6 seconds after the pressure cam shift motor on signal is generated.	• Defective sensor • Defective motor
SC05-50	Clamper close position sensor remains on when opening the clamper	When the master clamper is being opened, the sensor is not de-activated for more than 4 seconds after the clamper motor on signal is generated.	• Defective sensor • Defective motor • Jammed drum guide drive • Defective 2nd drum position sensor • Defective MPU • Defective main motor
SC05-51	Clamper open position sensor remains off when opening the clamper	When the master clamper is being opened, the sensor is not activated for more than 4 seconds after the clamper motor on signal is generated.	• Defective sensor • Defective motor • Jammed drum guide drive • Defective 2nd drum position sensor

Code	Title	Conditions	Possible Causes
SC05-52	Clamper open position sensor remains on when opening the clamper	When the master clamper is being opened, the sensor is not de-activated for more than 4 seconds after the clamper motor on signal is generated.	• Defective sensor • Defective motor • Jammed drum guide drive
SC05-53	Clamper open position sensor remains off when closing the clamper	When the master clamper is being closed, the sensor is not activated for more than 4 seconds after the clamper motor on signal is generated.	• Defective sensor • Defective motor • Jammed drum guide drive
SC05-54	Clamper open position sensor remains on when closing the clamper	When the master clamper is being closed, the sensor is not de-activated for more than 4 seconds after the clamper motor on signal is generated.	• Defective sensor • Defective motor • Jammed drum guide drive
SC05-55	Clamper close position sensor remains off when closing the clamper	When the master clamper is being closed, the sensor is not activated for more than 4 seconds after the clamper motor on signal is generated.	• Defective sensor • Defective motor • Jammed drum guide drive
SC05-60	Idling HP sensor remains on	The sensor does not de-activate after the idling roller motor on signal is generated.	• Defective sensor • Defective motor
SC05-61	Idling HP sensor remains off	The sensor does not activate after the idling roller motor on signal is generated.	• Defective sensor • Defective motor
SC06-00	Pressure plate does not move from home to the master eject ready position	The pressure plate does not reach the master eject ready position after it has left home for more than 3 seconds after the pressure plate motor on signal is generated.	• Defective sensor • Defective motor • Jammed master
SC06-01	Pressure plate does not return to the home position	The pressure plate does not reach the home position for more than 6 seconds after the pressure plate motor on signal is generated.	• Defective sensor • Defective motor • Jammed master
SC06-02	Pressure plate does not move to the compression position	The pressure plate does not reach home while traveling from the master eject ready position to the compression position for more than 6 seconds after the pressure plate motor on signal is generated.	• Defective sensor • Defective motor • Jammed master
SC07-00	Sensor 0 in the feed pressure detection board remains on	The sensor does not change status.	• Defective feed pressure detection board • Defective feed pressure motor

Code	Title	Conditions	Possible Causes
SC07-01	Sensor 0 in the feed pressure detection board remains off	The sensor does not change status.	• Defective feed pressure detection board • Defective feed pressure motor
SC07-02	Sensor 1 in the feed pressure detection board remains on	The sensor does not change status.	• Defective feed pressure detection board • Defective feed pressure motor
SC07-03	Sensor 1 in the feed pressure detection board remains off	The sensor does not change status.	• Defective feed pressure detection board • Defective feed pressure motor
SC07-04	Sensor 2 in the feed pressure detection board remains on	The sensor does not change status.	• Defective feed pressure detection board • Defective feed pressure motor
SC07-05	Sensor 2 in the feed pressure detection board remains off	The sensor does not change status.	• Defective feed pressure detection board • Defective feed pressure motor
SC07-06	Sensor 3 in the feed pressure detection board remains on	The sensor does not change status.	• Defective feed pressure detection board • Defective feed pressure motor
SC07-07	Sensor 3 in the feed pressure detection board remains off	The sensor does not change status.	• Defective feed pressure detection board • Defective feed pressure motor
SC07-10	Sensor 0 in the separation pressure detection board remains on	The sensor does not change status.	• Defective separation pressure detection board • Defective separation pressure motor
SC07-11	Sensor 0 in the separation pressure detection board remains off	The sensor does not change status.	• Defective separation pressure detection board • Defective separation pressure motor

Code	Title	Conditions	Possible Causes
SC07-12	Sensor 1 in the separation pressure detection board remains on	The sensor does not change status.	• Defective separation pressure detection board • Defective separation pressure motor
SC07-13	Sensor 1 in the separation pressure detection board remains off	The sensor does not change status.	• Defective separation pressure detection board • Defective separation pressure motor
SC07-14	Sensor 2 in the separation pressure detection board remains on	The sensor does not change status.	• Defective separation pressure detection board • Defective separation pressure motor
SC07-15	Sensor 2 in the separation pressure detection board remains off	The sensor does not change status.	• Defective separation pressure detection board • Defective separation pressure motor
SC07-16	Sensor 3 in the separation pressure detection board remains on	The sensor does not change status.	• Defective separation pressure detection board • Defective separation pressure motor
SC07-17	Sensor 3 in the separation pressure detection board remains off	The sensor does not change status.	• Defective separation pressure detection board • Defective separation pressure motor
SC07-20	Feed encoder error	The CPU detects an abnormal signal from the feed encoder.	• Defective I/O board • Defective sensor
SC07-21	Paper table feed start sensor error	The sensor is not activated for more than 5 seconds after the main motor on signal is generated.	• Defective sensor
SC07-22	Tray feed start sensor error	The sensor is not activated for more than 5 seconds after the main motor on signal is generated.	• Defective sensor
SC07-50	Wing lower position sensor remains on	When the wing guide moves upwards, the sensor is not de-activated for more than 6 seconds after the wing guide motor on signal is generated.	• Defective sensor • Defective motor

Code	Title	Conditions	Possible Causes
SC07-51	Wing upper position sensor remains off	When the wing guide moves upwards, the sensor is not activated for more than 6 seconds after the wing guide motor on signal is generated.	• Defective sensor • Defective motor
SC07-52	Wing upper position sensor remains on	When the wing guide moves downwards, the sensor is not de-activated for more than 6 seconds after the wing guide motor on signal is generated.	• Defective sensor • Defective motor
SC07-53	Wing lower position sensor remains off	When the wing guide moves downwards, the sensor is not activated for more than 6 seconds after the wing guide motor on signal is generated.	• Defective sensor • Defective motor
SC07-60	Slider paper sensor (in the job separator) remains on	When the slider moves upwards, the sensor is not de-activated for more than 9 seconds after the slider lift motor on signal is generated.	• Defective sensor • Defective motor • Defective job separator board
SC07-61	Slider upper limit sensor remains off	When the slider moves upwards, the sensor is not activated for more than 9 seconds after the slider lift motor on signal is generated.	• Defective sensor • Defective motor • Defective job separator board
SC07-62	Slider upper limit sensor remains on	When the slider moves downwards, the sensor is not de-activated for more than 9 seconds after the slider lift motor on signal is generated.	• Defective sensor • Defective motor • Defective job separator board
SC07-63	Slider paper sensor (in the job separator) remains off	When the slider moves downwards, the sensor is not activated for more than 9 seconds after the slider lift motor on signal is generated.	• Defective sensor • Defective motor • Defective job separator board
SC07-70	Slider HP sensor remains on	When the slider moves toward the delivery table, the sensor is not de-activated for more than 6 seconds after the job separator motor on signal is generated.	• Defective sensor • Defective motor • Defective job separator board
SC07-72	Slider position sensor remains on when the slider returns	When the slider returns, the sensor is not de-activated for more than 6 seconds after the job separator motor on signal is generated.	• Defective sensor • Defective motor • Defective job separator board
SC07-73	Slider HP sensor remains off when the slider returns	When the slider returns, the sensor is not activated for more than 6 seconds after the job separator motor on signal is generated.	• Defective sensor • Defective motor • Defective job separator board

Code	Title	Conditions	Possible Causes
SC30-00	Paper table lower limit sensor remains on	When the table moves upwards, the sensor is not de-activated for more than 7.5 seconds after the paper table motor on signal is generated.	• Defective sensor • Defective motor
SC30-01	Paper table height sensor remains off	When the table moves upwards, the sensor is not activated for more than 7.5 seconds after the paper table motor on signal is generated.	• Defective sensor • Defective motor
SC30-02	Paper table height sensor remains on	When the table moves downwards, the sensor is not de-activated for more than 7.5 seconds after the paper table motor on signal is generated.	• Defective sensor • Defective motor
SC30-03	Paper table lower limit sensor remains off	When the table moves downwards, the sensor is not activated for more than 7.5 seconds after the paper table motor on signal is generated.	• Defective sensor • Defective motor
SC31-10	Abnormal right tandem tray bottom plate position detection	When the bottom plate moves upwards, the sensor is not activated for more than 7.5 seconds after the right tray lift motor on signal is generated.	• Defective sensor in the right side of tray 1 • Defective motor • Detective tray wires
SC31-11	Abnormal left tandem tray bottom plate position detection	When the bottom plate moves upwards, the sensor is not activated for more than 7.5 seconds after the left tray lift motor on signal is generated.	• Defective sensor in the left side of tray 1 • Defective motor • Detective tray wires
SC31-12	Abnormal back plate position detection	When the back plate moves, the sensor is not activated for more than 7.6 seconds after the back plate drive motor on signal is generated.	• Defective back plate home position or return sensor • Defective motor
SC31-13	Abnormal right tandem tray position detection	When the tandem tray is being drawn out, the sensor is not activated for more than 1 second.	• Defective connector
SC31-20	Abnormal tray 2 bottom plate position detection	When the bottom plate moves upwards, the sensor is not activated for more than 4 seconds after the tray 2 lift motor on signal is generated.	• Defective sensor in tray 2 • Defective motor • Detective tray wires
SC31-40	Master ROM error	Checksum error in the paper tray board	• Defective master ROM • Defective paper tray board
SC31-41	Master RAM error	Signal transmission error in the paper tray board	• Defective paper tray board

Code	Title	Conditions	Possible Causes
SC31-50	Slave ROM error	Checksum error in the paper tray board	• Defective slave ROM • Defective paper tray board
SC31-51	Slave RAM error	Signal transmission error in the paper tray board	• Defective paper tray board
SC31-52	Slave CPU error	The slave CPU is out of control.	• Defective paper tray board
SC31-60	Communication error	The master CPU does not communicate with the slave CPU	• Defective paper tray board
SC41-00	Side plate pulse generator sensor remains off	When the side plate in the delivery table moves, the sensor is not activated for more than 10 milliseconds after the side plate drive motor on signal is generated.	• Defective motor • Defective sensor • Defective paper delivery table board
SC41-01	Side plate home position sensor remains off	When the side plate in the delivery table moves, the sensor is not activated for more than 1,207 pulses after the side plate drive motor on signal is generated.	• Defective motor • Defective sensor • Defective paper delivery table board
SC41-10	End plate pulse generator sensor remains off	When the end plate in the delivery table moves, the sensor is not activated for more than 10 milliseconds after the end plate drive motor on signal is generated.	• Defective motor • Defective sensor • Defective paper delivery table board
SC41-11	End plate home position sensor remains off	When the end plate in the delivery table moves, the sensor is not de-activated for more than 2,379 pulses after the end plate drive motor on signal is generated.	• Defective motor • Defective sensor • Defective paper delivery table board
SC45-00	Relay transport switching motor lock	When the relay transport unit moves, the delivery table position and sort position sensors do not detect it for more than 2 seconds.	• Relay transport switching motor • Delivery table position sensor • Sort position sensor
SC45-10	Lower turn gate motor overrun - low	The turn gate unit overruns its lower limit, and the lower low turn gate limit switch turns on.	• Lower low turn gate limit switch • Lower turn gate HP sensor • Lower turn gate motor
SC45-11	Lower turn gate motor overrun - high	The turn gate unit overruns its upper limit, and the lower high turn gate limit switch turns on.	• Lower high turn gate limit switch • Lower turn gate HP sensor • Lower turn gate motor

Code	Title	Conditions	Possible Causes
SC45-12	Upper turn gate motor overrun - low	The turn gate unit overruns its lower limit, and the upper low turn gate switch turns on.	• Upper low turn gate limit switch • Upper turn gate HP sensor • Upper turn gate motor
SC45-13	Upper turn gate motor overrun - high	The turn gate unit overruns its upper limit, and the upper high turn gate switch turns on.	• Upper high turn gate limit switch • Upper turn gate HP sensor • Upper turn gate motor
SC45-20	Lower side jogger lock	When the side jogger moves, it does not return for more than 4 seconds. When the side jogger moves from home position, the sensor does not de-activate for more than 2 seconds.	• Lower side jogger HP sensor • Lower side jogger motor
SC45-21	Lower end jogger lock	When the end jogger moves, it does not return for more than 4 seconds. When the end jogger moves from home position, the sensor does not de-activate for more than 2 seconds.	• Lower end jogger HP sensor • Lower end jogger motor
SC45-22	Upper side jogger lock	When the side jogger moves, it does not return for more than 4 seconds. When the side jogger moves from home position, the sensor does not de-activate for more than 2 seconds.	• Upper side jogger HP sensor • Upper side jogger motor
SC45-23	Lower end jogger lock	When the end jogger moves, it does not return for more than 4 seconds. When the end jogger moves from home position, the sensor does not de-activate for more than 2 seconds.	• Upper end jogger HP sensor • Upper end jogger motor
SC45-30	Lower turn gate motor lock	After the turn gate motor operates for 150 ms, there have been fewer than 100 encoder pulses from the motor.	• Lower turn gate motor • MPU board
SC45-31	Upper turn gate motor lock	After the turn gate motor operates for 150 ms, there have been fewer than 100 encoder pulses from the motor.	• Upper turn gate motor • MPU board
SC80-00	PC controller interface signal error	Signal transmission error in the interface board	• Defective interface board

4.3 SPECIAL TOOLS

The following are the special tools used for service.

Description	Part Number	Application
Main Drive Securing Tool Kit (Drum securing tool and two positioning shafts as a set)	C229 9000	For main drive positioning
Scanner Positioning Pin Kit (4 pins as a set)	A006 9104	For scanner wire installation
Flash Memory Card	A230 9352	For updating firmware

4.4 SERVICE PROGRAM MODE

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

4.4.1 ACCESS PROCEDURE

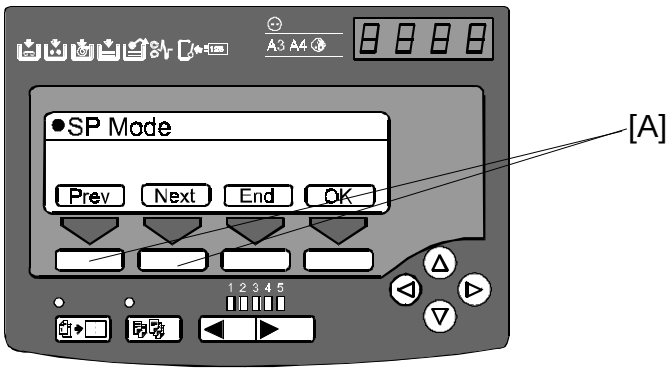
Service Program Mode Access Procedure (For Engineers)

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

   Clear Modes ⇒ 1 ⇒ 0 ⇒ 7 ⇒ Clear/Stop

   Note: Hold down the Clear/Stop key for more than 3 seconds.

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



C232M500.WMF

3. Using the **number keys**, enter the desired **Main Menu Number** (listed below and in the service program table), then press the **OK** key on the bottom of the LCD (or the **Enter (#)** key).

   NOTE: The main menu number can be shifted up or down by pressing the **Prev.** or **Next** key [A] on the bottom of the LCD.

Main Menu Number List

1. Data Logging
2. Basic Settings
3. User Custom Settings
4. Input Test Mode
5. Output Test Mode
6. System Adjustment
7. Memory Data Clear
8. System Test

4. Using the **number keys**, enter the desired **Sub Menu Number** (listed in the service program table), then press the **OK** key on the bottom of the LCD (or the **Enter (#)** key).

   NOTE: The sub menu number can be shifted up or down by pressing the **Prev.** or **Next** key [A] on the bottom of the LCD.

5. Some sub menu items (but not all of them) have menus below them. Using the **Prev.** or **Next** key [A] on the bottom of the LCD, select the desired menu item.

   NOTE: These menus are not accessible by entering the number with the number keys.

6. Follow the "Change Adjustment Values or Modes" procedure below.

   NOTE: To cancel the SP mode, press the **Clear Modes key** or the **Return** (or **End**) key on the bottom of the LCD.

Change Adjustment Values or Modes

1. After entering the desired SP mode, pressing the **OK** key on the bottom of the LCD (or the **Enter (#)** key). The current value or mode 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).

   NOTE: Use the ⊡ key to toggle between + and -.
3. Press the **OK** key to store the desired value or mode.
4. To cancel the SP mode, press the **Clear Modes key** or the **Return** (or **End**) key on the bottom of the LCD.

4.4.2 SERVICE PROGRAM TABLE

Main Menu Number List

1. Data Logging
2. Basic Settings
3. User Custom Settings
4. Input Test Mode
5. Output Test Mode
6. System Adjustment
7. Memory Data Clear
8. System Test

1. Data Logging

SP No.	Display	Function	Default	User Tools
1-001-1	Total Master Counter	Master counters 1-001-1: Total count 1-001-2: User counter 1-001-3 to 28: Counters for various copy modes	0	-
1-001-2	Resettable Master Count		0	1-2
1-001-3	M Counter ADF Mode		0	-
1-001-4	M Counter Economy Mode		0	-
1-001-5	M Counter Combine 2		0	-
1-001-6	M Counter Combine 4		0	-
1-001-7	M Counter Enl. Mode		0	-
1-001-8	M Counter Red. Mode		0	-
1-001-9	M Counter Zoom Mode		0	-
1-001-10	M Counter Dir. Mag.		0	-
1-001-11	M Counter Auto Mag.		0	-
1-001-12	M Counter Make-up Mode		0	-
1-001-13	M Counter Make-up Photo		0	-
1-001-14	M Counter Margin Erase		0	-
1-001-15	M Counter Online Mode		0	-
1-001-16	M Counter Online Overlay		0	-
1-001-17	M Counter Overlay Mode		0	-
1-001-18	M Counter Format Overlay		0	-
1-001-19	M Counter Memory Combine		0	-
1-001-20	M Counter Date Stamp		0	-
1-001-21	M Counter Page Number		0	-
1-001-22	M Counter Default Stamp		0	-
1-001-23	M Counter User Stamp		0	-
1-001-24	M Counter Letter Mode		0	-
1-001-25	M Counter Ltr/Pht Mode		0	-
1-001-26	M Counter Photo Mode		0	-
1-001-27	M Counter Pencil Mode		0	-

SP No.	Display	Function	Default	User Tools
1-001-28	M Counter Tint Mode	Master counters 1-001-29 to 35: Original sizes 1-001-43 to 47: Various copy modes 1-001-38 to 42: Various types	0	-
1-001-29	M Counter A3/DLT		0	-
1-001-30	M Counter B4/LG		0	-
1-001-31	M Counter A4-L/LT-L		0	-
1-001-32	M Counter A4/LT		0	-
1-001-33	M Counter B5-L		0	-
1-001-34	M Counter B5		0	-
1-001-35	M Counter Other Sizes		0	-
1-001-36	M Counter Short Master		0	-
1-001-37	M Counter Image Rotation		0	-
1-001-38	M Counter Special		0	-
1-001-39	M Count Standard Paper		0	-
1-001-40	M Counter Thick Paper		0	-
1-001-41	M Counter User 1 Paper		0	-
1-001-42	M Counter User 2 Paper		0	-
1-001-43	M Counter Same-No. Class		0	-
1-001-44	M Counter By-Class Class		0	-
1-001-45	M Counter Manual Class		0	-
1-001-46	M Counter Job Separator		0	-
1-001-47	M Counter Autocycle		0	-
1-001-48	M Counter Tray Auto Sel.		0	-
1-001-49	M Counter 3 Tray Mode		0	-
1-001-50	M Counter Online Sort		0	-
1-001-51	M Counter Sort		0	-
1-001-52	M Counter Class Sort		0	-
1-002-1	Total Print Counter	Print counters '-L': Lengthwise 1-002-4 to -13: Paper sizes 1-002-14 to -25: Trays V: Longedge feed Oth: Other paper sizes	0	-
1-002-2	Resettable Print Counter		0	1-2
1-002-3	P Counter Color Drum		0	-
1-002-4	P Counter Over A3/DLT		0	-
1-002-5	Print Counter A3/DLT		0	-
1-002-6	Print Counter B4/LG		0	-
1-002-7	Print Counter A4-L/LT-L		0	-
1-002-8	Print Counter A4/LT		0	-
1-002-9	Print Counter B5-L		0	-
1-002-10	Print Counter B5		0	-
1-002-11	Print Counter A6-L		0	-
1-002-12	Print Counter Under A6-L		0	-
1-002-13	P Counter Other Sizes		0	-
1-002-14	P Cnt. Tray1 A3 Speed1-3		0	-
1-002-15	P Cnt. Tray1 A3 Speed4-5		0	-
1-002-16	P Cnt.Tray1A4B5Vspeed 1-3		0	-
1-002-17	P Cnt.Tray1A4B5Vspeed 4-5		0	-

SP No.	Display	Function	Default	User Tools
1-002-18	P Cnt.Tray1 Oth.Speed1-3	Print counters '-L': Lengthwise 1-002-4 to -13: Paper sizes 1-002-14 to -25: Trays V: Longedge feed Oth: Other paper sizes	0	-
1-002-19	P Cnt.Tray1 Oth.Speed4-5		0	-
1-002-20	P Cnt.Tray2 A3.Speed1-3		0	-
1-002-21	P Cnt.Tray2 A3 Speed4-5		0	-
1-002-22	P Cnt.Tray2 A4B5Vspeed 1-3		0	-
1-002-23	P Cnt.Tray2A4B5Vspeed 4-5		0	-
1-002-24	P Cnt.Tray2 Oth.Speed1-3		0	-
1-002-25	P Cnt.Tray2 Oth Speed4-5		0	-
1-003	Set Master Counter		0	-
1-004	Ejected Master Counter		0	-
1-005	Ink Pump Rotation Count		0	-
1-006	Master End Counter		0	-
1-007	Ink End Counter		0	-
1-008	Master Full Counter		0	-
1-020	Original Counter ADF		0	-
1-021	Original Counter Platen		0	-
1-030-1	UC M Counter: Code 1	Master and printer counters for each user code	0	-
1-030-2	UC P Counter: Code 1		0	-
1-030-3	UC M Counter: Code 2		0	-
1-030-4	UC P Counter: Code 2		0	-
1-030-5	UC M Counter: Code 3		0	-
1-030-6	UC P Counter: Code 3		0	-
1-030-7	UC M Counter: Code 4		0	-
1-030-8	UC P Counter: Code 4		0	-
1-030-9	UC M Counter: Code 5		0	-
1-030-10	UC P Counter: Code 5		0	-
1-030-11	UC M Counter: Code 6		0	-
1-030-12	UC P Counter: Code 6		0	-
1-030-13	UC M Counter: Code 7		0	-
1-030-14	UC P Counter: Code 7		0	-
1-030-15	UC M Counter: Code 8		0	-
1-030-16	UC P Counter: Code 8		0	-
1-030-17	UC M Counter: Code 9		0	-
1-030-18	UC P Counter: Code 9		0	-
1-030-19	UC M Counter: Code10		0	-
1-030-20	UC P Counter: Code10		0	-
1-030-21	UC M Counter: Code11		0	-
1-030-22	UC P Counter: Code11		0	-
1-030-23	UC M Counter: Code12		0	-
1-030-24	UC P Counter: Code12		0	-
1-030-25	UC M Counter: Code13		0	-
1-030-26	UC P Counter: Code13		0	-
1-030-27	UC M Counter: Code14		0	-

SP No.	Display	Function	Default	User Tools
1-030-28	UC P Counter: Code14	Master and printer counters for each user code	0	-
1-030-29	UC M Counter: Code15		0	-
1-030-30	UC P Counter: Code15		0	-
1-030-31	UC M Counter: Code16		0	-
1-030-32	UC P Counter: Code16		0	-
1-030-33	UC M Counter: Code17		0	-
1-030-34	UC P Counter: Code17		0	-
1-030-35	UC M Counter: Code18		0	-
1-030-36	UC P Counter: Code18		0	-
1-030-37	UC M Counter: Code19		0	-
1-030-38	UC P Counter: Code19		0	-
1-030-39	UC M Counter: Code20		0	-
1-030-40	UC P Counter: Code20		0	-
1-031-1	UC Total Master Counter		0	-
1-031-2	UC Total Print Counter		0	-
1-040	ROM Part Number		-	-
1-041-1	Serial Number	Use this to view the serial numbers input with SP 3-070	0	-
1-041-2	Bank Serial Number		0	-
1-041-3	PDTable Serial Number		0	-
1-042	ROM Version		-	-
1-043	Feed ROM Version		0	-
1-044-1	Bank ROM1 Version		0	-
1-044-2	Bank ROM2 Version		0	-
1-045	PDTable ROM Version		0	-
1-046	JSSorter ROM Version		0	-
1-050	Service Telephone Number	Enter data with SP3-72 at installation if required.	0	-
1-051	Last Service Call Code		0	-
1-060	Power On Time		0	-
1-070-1	1 - 3 Prints	Copies-per-original counters	0	-
1-070-2	4 - 5 Prints		0	-
1-070-3	6 - 10 Prints		0	-
1-070-4	11 - 20 Prints		0	-
1-070-5	21 - 30 Prints		0	-
1-070-6	31 - 50 Prints		0	-
1-070-7	51 - 70 Prints		0	-
1-070-8	71 - 100 Prints		0	-
1-070-9	101 - 200 Prints		0	-
1-070-10	201 - 500 Prints		0	-
1-070-11	501 - 1000 Prints		0	-
1-070-12	Over 1000 Prints		0	-

SP No.	Display	Function	Default	User Tools
1-080	Misfeed Setting Counter	Number of times the user changed the 'Misfeed' or 'Multifeed' settings for paper feed or separation pressures	0	-
1-081	Multifeed Setting Count		0	-
1-082	Start Error Message Cnt.	Number of times an error message appeared when the Start key was pressed	0	-
1-090	Move Counter Back Plate	This shows how many times the back plate in the tandem tray has moved.	0	-
1-091	Adjust Counter PDTable	This shows how many times the side and end plates in the delivery table have moved.	0	-
1-100	OpenCounter Cover On Move	Counts how often the sorter cover is open and shut	0	-
1-102-1	Jam DF Feed-in Error	Counters for various types of jams	0	-
1-102-2	Jam DF Feedout Error		0	-
1-104-1	Jam Master Set Error		0	-
1-104-2	Jam Master Clamp Error		0	-
1-104-3	Jam Master Cut Error		0	-
1-106-1	Jam Master Eject ON Chk		0	-
1-106-2	Jam Pressure Plate Error		0	-
1-106-3	Jam Master Eject OFF Chk		0	-
1-107-1	Jam Regist ON Check		0	-
1-107-2	Jam Feed Timing ON Check		0	-
1-107-3	Jam Feed Timing OFF Chk		0	-
1-107-4	Jam Paper Upper Wrapping		0	-
1-107-5	Jam Paper Lower Wrapping		0	-
1-107-6	Jam Paper Exit OFF Check		0	-
1-202-1	Jam% DF Feed-in Error	Jam ratios for various types of jam	0	-
1-202-2	Jam% DF Feed-out Error		0	-
1-204-1	Jam% Master Set Error		0	-
1-204-2	Jam% Master Clamp Error		0	-
1-204-3	Jam% Master Cut Error		0	-
1-206-1	Jam% Master Eject ON Chk		0	-
1-206-2	Jam% Press Plate Error		0	-
1-206-3	Jam% M Eject OFF Check		0	-
1-207-1	Jam% Regist ON Check		0	-
1-207-2	Jam% Feed Timing ON Chk		0	-
1-207-3	Jam% Feed Timing OFF Chk		0	-
1-207-4	Jam% Paper Upper Wrap		0	-

SP No.	Display	Function	Default	User Tools
1-207-5	Jam% Paper Lower Wrap		0	-
1-207-6	Jam% Paper Exit OFF Chk		0	-
1-300-1	Jam P0 Standard	Feed-in jams and registration roller jams for various paper sizes and paper types '-L': Lengthwise	0	-
1-300-2	Jam P0 Thick		0	-
1-300-3	Jam P0 Others		0	-
1-301-1	Jam P1 Standard	Registration roller jams (when the paper feed timing sensor stays on) for various paper sizes and paper types '-L': Lengthwise	0	-
1-301-2	Jam P1 Thick		0	-
1-301-3	Jam P1 Others		0	-
1-302-1	Jam P2 A3/B4 Standard	Upper wrap, lower wrap, and feed-out jams for various paper sizes and paper types '-L': Lengthwise	0	-
1-302-2	Jam P2 A3/B4 Thick		0	-
1-302-3	Jam P2 A3/B4 Others		0	-
1-303-1	P Count A3/B4 Standard		0	-
1-303-2	P Count A3/B4 Thick		0	-
1-303-3	P Count A3/B4 Others		0	-
1-304-1	M Set Error Low Temp		0	-
1-304-2	M Set Error Normal Temp		0	-
1-304-3	M Set Error High Temp		0	-
1-305-1	M Clamp Error Low Temp		0	-
1-305-2	M Clamp Error Nor. Temp		0	-
1-305-3	M Clamp Error High Temp		0	-
1-306-1	M Cut Error Low Temp	Master error counters for different temperature conditions (temperature detected by the thermistor in the drum)	0	-
1-306-2	M Cut Error Normal Temp		0	-
1-306-3	M Cut Error High Temp		0	-
1-307-1	M Eject ON Jam Low Temp		0	-
1-307-2	M Eject ON Jam Nor Temp		0	-
1-307-3	M Eject ON Jam High Temp		0	-
1-308-1	Press Plate Error Low		0	-
1-308-2	Press Plate Error Normal		0	-
1-308-3	Press Plate Error High		0	-
1-309-1	M Eject OFF Jam Low Temp		0	-
1-309-2	M Eject OFF Jam Nor Temp		0	-
1-309-3	M Eject OFF Jam High Tem		0	-
1-310-1	Tray1 MisFeed Counter A3	Feed-in jams and tray registration roller jams for various paper sizes for the	0	-
1-310-2	Tray1 MisFeed Cnt. A4B5V		0	-
1-310-3	Tray1 MisFeed Cnt. Other		0	-

SP No.	Display	Function	Default	User Tools
1-311-1	Tray2 MisFeed Counter A3	paper trays in the paper bank unit V: Longedge feed Tray 1 Misfeed: Jam at the tray registration rollers when feeding from tray 1 Tray2 Misfeed: Jam at the 2nd relay rollers Trans Misfeed: Jam at the tray registration rollers when feeding from tray 2 Tandem: Jam in the tandem tray Regist Feed: Includes the following – paper detected at power-up at the 3rd relay roller, between the 3rd relay roller and main body registration roller, and at the tray registration roller; jams at the main body registration roller, opening the cover during a job, and paper wrapping jams (upper and lower) Ent: Jams at the 3rd relay roller Mid Trns.: Includes the following – jam between the 3rd relay roller and main body registration roller, jam in the vertical transport section in the paper bank unit, jams at the tray registration roller	0	-
1-311-2	Tray2 MisFeed Cnt. A4B5V		0	-
1-311-3	Tray2 MisFeed Cnt. Other		0	-
1-312-1	Trans.MisFeed Counter A3		0	-
1-312-2	Trans.MisFeed Cnt. A4B5V		0	-
1-312-3	Trans.MisFeed Cnt. Other		0	-
1-313	Jam Counter Tandem		0	-
1-314-1	Jam Cnt. RegistFeed A3		0	-
1-314-2	Jam Cnt.RegistFeed A4B5V		0	-
1-314-3	Jam Cnt.RegistFeed Other		0	-
1-315-1	Tray1 Jam Cnt.Ent. A3		0	-
1-315-2	Tray1 Jam Cnt.Ent. A4B5V		0	-
1-315-3	Tray1 Jam Cnt.Ent. Other		0	-
1-316-1	Tray2 Jam Cnt.Ent. A3		0	-
1-316-2	Tray2 Jam Cnt.Ent. A4B5V		0	-
1-316-3	Tray2 Jam Cnt.Ent. Other		0	-
1-317-1	Tray1 Jam Cnt.MidTrns.A3		0	-
1-317-2	Tray1JamCnt.MidTrnsA4B5V		0	-
1-317-3	Tray1JamCnt.MidTrnsOther		0	-
1-318-1	Tray2 Jam Cnt.MidTrns.A3		0	-
1-318-2	Tray2JamCnt.MidTrnsA4B5V		0	-
1-318-3	Tray2JamCnt.MidTrnsOther		0	-
1-320-1	1Master Print Cnt. 1-20	Master counters for sorter mode. For details, see the sorter service manual.	0	-
1-320-2	1Master Print Cnt. 21-40		0	-
1-320-3	1Master Print Cnt. 41-50		0	-
1-320-4	1Master Print Cnt. 51-80		0	-
1-320-5	1Master Print Cnt.81-		0	-
1-321-1	Master Cnt.on Sort 1-5	Job counters for sorter mode. For details, see the sorter service manual.	0	-
1-321-2	Master Cnt.on Sort 6-10		0	-
1-321-3	Master Cnt.on Sort 11-20		0	-
1-321-4	Master Cnt.on Sort 21-30		0	-
1-321-5	Master Cnt.on Sort 31-50		0	-
1-321-6	Master Cnt.on Sort 51-		0	-

SP No.	Display	Function	Default	User Tools
1-322-1	Cnt.SortPrint over A4	Print counters for sorter mode. For details, see the sorter service manual.	0	-
1-322-2	Cnt.SortPrint under A4		0	-
1-322-3	Cnt.SortPrint Table		0	-
1-322-4	Cnt.SortPrint Tray1		0	-
1-322-5	Cnt.SortPrint Tray2		0	-
1-323-1	Jam Cnt. MidTrans.	Counters for various location jams. For details, see the sorter service manual.	0	-
1-323-2	Jam Cnt. HoriTrans.		0	-
1-323-3	Jam Cnt.EndTip VertTrans.		0	-
1-323-4	Jam Cnt.EndTip Rest.Low		0	-
1-323-5	Jam Cnt.EndTip Rest.Upper		0	-
1-400-1	Chk.Sales2-002SetKey Counter	Japan only	-	-
1-400-2	Chk.Sales2-003SetKeyCard		-	-
1-400-3	Chk.Sales2-006PCCont.Set		-	-
1-400-4	Chk.Sales2-007PDTable		-	-
1-400-5	Chk.Sales2-016SwapStart Key		-	-
1-400-6	Chk.Sales2-050Sharpen ImageMode		-	-
1-400-7	Chk.Sales2-370InkSupply PrePrt		-	-
1-400-8	Chk.Sales2-380JapanDisp. Type		-	-
1-400-9	Chk.Sales2-420Feed FrictionPadType		-	-

2. Basic Settings

SP No.	Display	Function	Default	Setting	User Tools
2-002	Set Key Counter	Also see 2-291.	No	No/Yes	-
2-003	Set Key Card	Japan only	No	No/Yes	-
2-004	Sorter Select	0:None 1:DS (Japan only) 2:JS (C592)	0	0 to 2	-
2-005	Disable Paper Bank		No	Yes/No	-
2-006	PC Controller Settings	Do not adjust.	AUTO	AUTO / 10PS	1-9
2-007	Disable Paper Exit Tray	Disables the automatic paper delivery table for testing purposes	No	Yes/No	-
2-010	Sizes in Metric or Inch		-	0:JPN 1:mm 2:Inch	1-6
2-011	Select Language Type	See Note 1.	-	0 to 6	-
2-015	Machine Destination	See Note 2.	0	0: Other 1: Japan	-
2-016	Swap Start Key	See Note 3.	No	Yes/No	-
2-020-1	Default Original Mode	Defaults for various user settings See Notes 4 to 13.	0	0 to 3	3-3
2-020-2	Default Tint Mode		OFF	ON/OFF	3-8
2-020-3	Default Paper Type		1	0 to 4	3-1
2-020-4	Default Master Density		1	0 to 3	3-2
2-020-5	Default Print Speed		3	1 to 5	-
2-020-6	Default Auto Cycle Mode		ON	ON/OFF	4-1
2-020-7	Def Image Position Tp/Btm		0	-15.0 to 15.0	-
2-020-8	Def Image Position Lt/Rt		0	-10.0 to 10.0	-
2-020-9	Default Photo/Lightness		1	0 to 2	3-6
2-020-10	Default Photo/Screen		0	0 to 4	3-7
2-020-11	Def On-line Paper Size		14	0 to 14	3-10
2-020-12	Default Make-up Pattern1		0	0 to 43	-
2-020-13	Default Make-up Pattern2		0	0 to 43	-
2-020-14	Default Make-up Pattern3		0	0 to 43	-
2-020-15	Default Make-up Pattern4		0	0 to 43	-
2-020-16	Default Ratio		4	0 to 8	3-11
2-020-17	Default Eco Ink		1	0 to 3	-
2-030	Panel Beeper	See Note 14.	1	0 to 2	2-5
2-031	Background Correction	See Note 15.	No	No/Yes	4-6
2-032-1	TH Egy Temp Ctl - Black	See Note 16.	ON	ON/OFF	-
2-032-2	TH Egy Temp Ctl - Color		OFF	ON/OFF	

SP No.	Display	Function	Default	Setting	User Tools
2-040	Ink Detection	Enables/disables various sensors for test purposes 2-042-2: OFF means that the indicators are on.	ON	ON/OFF	-
2-041	Paper Length Detection		ON	ON/OFF	-
2-042-1	Paper Width Detection		ON	ON/OFF	4-3
2-042-2	Paper Size Indicators		OFF	ON/OFF	-
2-043	Drum Master Detection		ON	ON/OFF	-
2-044	Platen Cover Set Detect		ON	ON/OFF	-
2-045	ADF Close Detection		ON	ON/OFF	-
2-046-1	Platen Orig. Size Detect		ON	ON/OFF	4-5
2-046-2	ADF Orig. Size Detect	See Note 17.	ON	ON/OFF	4-4
2-050	Sharpen Image Mode	See Note 18.	OFF	ON/OFF	-
2-060	Long Paper Mode	See Note 19.	OFF	ON/OFF	-
2-070	Auto Combine Originals	See Note 20.	NO	YES/NO	4-8
2-080	A3 Master 2 Count Up	See Note 21.	0	0 to 2	-
2-090	APS A5 Size Detection	See Note 22.	NO	YES/NO	-
2-100	User Code Mode		OFF	ON/OFF	1-4
2-110	Auto Quality Start		ON	ON/OFF	4-13
2-120	Exit Wing Position	See Note 23.	0	0 to 2	4-15
2-125	Drum Idling	See Note 24.	Fast	Fast/ Slow	-
2-140	Auto Tray Switching		Yes	Yes/No	4-23
2-150	Auto Image Rotation	See Note 25.	Yes	Yes/No	4-20
2-170	Auto Master Save Select	OFF: A3 master always used regardless of original size.	AUTO	AUTO / OFF	4-21
2-210	Ink Master Left	Also for master roll. See Note 26.	OFF	ON/OFF	4-18
2-220	Key Card Setting	Japan only	1	0 to 3	1-5
2-230	Copy Count Display		Down	Up / Down	2-3
2-240	Class Display Select	Japan only	School	School/ Normal	
2-241	Class Entry Per Orig.		Normal	By Orig / Normal	4-2
2-250	Combine Orig. Sep. Line	See Note 27.	0	0 to 4	4-9
2-260	Auto Combine Mode Reset		No	Yes/No	4-10
2-270	Print Restart in Class	See Note 28.	2	1 to 2	4-16
2-271	Job Sep. At Class Mode		Yes	Yes/No	4-17
2-280	Paper Tray Priority	See Note 29.	0	0 to 2	4-22
2-281	Tray Mode Select	See Note 30.	0	0 to 1	4-24
2-282	Paper Tray Auto Select		ON	ON/OFF	4-26
2-290	Key Operator Code		OFF	ON/OFF	6-6
2-291	Restricted Access	See Note 31.	OFF	ON/OFF	6-8
2-300	Stamp Type	See Note 32.	0	0 to 6	5-1

SP No.	Display	Function	Default	Setting	User Tools
2-301	Default Stamp Size	See Note 33.	0	0 to 3	5-2
2-302	Default Stamp Density	See Note 34.	0	0 to 2	5-3
2-303	Default Stamp Position	See Note 35.	0	0 to 9	5-4
2-304	User Stamp Size	See Note 36.	0	0 to 3	5-5
2-305	User Stamp Density		0	0 to 2	5-6
2-306	User Stamp Position		0	0 to 9	5-7
2-307	Date Stamp Type		m.d.'y	d.m.'y / m.d.'y	5-9
2-308	Date Stamp Position	See Note 37.	0	0 to 3	5-10
2-309	Page Numbering Type	See Note 38.	0	0 to 2	5-12
2-310	Default Page Position	See Note 39.	0	0 to 3	5-13
2-320	Skip Feed Mode Display		Yes	Yes/No	4-11
2-370	Ink Supply w/Trial Print	ON: Ink is supplied while a trial print is made after making a new master.	OFF	ON/OFF	-
2-380	Japanese Display Type	Do not use.	0	0 to 2	-
2-390	A3/DLT Drum Selection	See Note 40.	-	DLT/A3	-
2-400	User1 Paper Type	See Note 41.	0	0 to 5	4-19
2-401	User2 Paper Type		0	0 to 5	4-19
2-410	Auto On-line Mode	YES: The on-line mode is automatically activated when data is sent from a PC (needs the optional PC controller)	No	Yes/No	-
2-420	Feed Friction Pad Type	Do not use.	Normal	Normal / Custom	-
2-422	Ink Auxiliary Supply	See Note 42.	0	0 to 2	-
2-660-1	Set Jogger Mode Normal	For details, refer to the sorter service manual.	1	0 to 1	4-25
2-660-2	Set Jogger Mode Class		0	0 to 1	4-25
2-661	JS Sorter Speed Setting		OFF	ON/OFF	-
2-662	JS Sorter PaperVolmeLimit		No	Yes/No	-
2-663	JS Sorter Set Unit		Upper & lower	Upper & lower Upper Lower	-
2-664	Save Ink in Sorter Modes	Yes: The Ink Save mode is activated when a sorter mode is selected	OFF	ON/OFF	-

Notes

1: 2-011 (Display language)

0: Japanese, 1: English, 2: German, 3: French, 4: Italian, 5: Spanish, 6: Dutch

2: 2-015 (Machine Destination)

Always set this mode as 'Other.' If 'Japan' is selected, User Tools 1-5 that are not used for other versions are displayed.

3: 2-016 (Swap Start Key)

Enables swapping *the Start (master making) key function* and *the Print key function* depending on the end user's preference. ('No' is the default setting.)

4: 2-020-1 (Default original mode)

0: Letter, 1: Letter/Photo, 2: Photo, 3: Pencil

5: 2-020-3 (Default paper type)

0: Special, 1: Standard, 2: Thick, 3: User 1, 4: User 2

6: 2-020-4 (Default master density)

0: Pale, 1: Normal, 2: Fairly dark, 3: Dark

7: 2-020-5 (Default print speed, cpm)

1: 60, 2: 75, 3: 90, 4: 105, 5: 120

8: 2-020-9 (Default Photo/Lightness)

This is the default brightness in photo or letter/photo mode.

0: Dark, 1: Normal, 2: Light

9: 2-020-10 (Default Photo/Screen)

This is the default screen type for photo mode.

0: Standard, 1: Coarse 1, 2: Coarse 2, 3: Coarse 3, 4: Coarse 4 (coarsest)

10: 2-020-11 (Default On Line paper size)

This is the default paper size when the On Line key is pressed,

0: A3, 1: B4, 2: A4, 3: A4 lengthwise, 4: B5, 5: B5 lengthwise, 6: A5,
7: A5 lengthwise, 8: A6, 9: A6 lengthwise, 10 to 12: Not used, 13: Free, 14: Auto

Free – The master size is determined by the paper size sent from the PC.

Auto – The master size is determined by the paper size on the paper feed table. If the data from the PC is for a larger paper size, the excess data is lost.

Other settings: For example, if the setting is 0 (A3), the machine always makes an A3 master.

11: 2-020-12 to -15 (Default make-up patterns 1 to 4)

0 to 39: Preset patterns, from 1 to 40
40 to 43: User-created patterns A to D

12: 2-020-16 (Default Ratio)

U.S. version
0: 65%, 1: 74%, 2: 77%, 3: 93%, 4: 100%, 5: 121%, 6: 129%, 7: 155% 8: Auto

Other versions
0: 71%, 1: 82%, 2: 87%, 3: 93%, 4: 100%, 5: 115%, 6: 122%, 7: 141% 8: Auto

Selects a magnification ratio at power on or when the Modes Clear key is pressed. The same function has also been assigned to User Tool 3-11.

13: SP2-20-17 (Default Eco Ink)

By selecting ON in this mode, the Economy mode, which conserves ink during printing, can be set as the default at power on.

14: 2-030 (Panel beeper)

0: Disabled, 1: Enabled (except for when keys pressed), 2: Enabled fully

15: 2-031 (Background correction)

This can be used in letter/photo, photo, and tint modes to prevent the background of an original from appearing on copies. See Detailed Section Descriptions – Image Processing for more details.

16: 2-032 (Thermal head energy control with temperature)

If this is switched on, the energy supplied to the thermal head will depend on the temperature measured by the thermistor in the drum.

	Less than 18 °C	18 – 28 °C	More than 28 °C
Standard	SP 3-020-1 value (Default: -7%)	SP 3-020-1 – 5% (Default: -12%)	SP 3-020-1 – 10% (Default: -17%)
Economy	SP 3-020-2 value (Default: -25%)		

17: 2-046-2 (ADF original size detection)

Disabling ADF original size detection allows the ADF to scan originals within the following range.

Width: 105 to 297 mm
Length: 128 to 864 mm

18: 2-050 (Sharpen Image Mode)

When this SP mode is on, fine details become more apparent in letter mode. But the edges of paper pasted onto the original might appear on the print.

19: 2-060 (Long paper mode)

This disables trailing edge detection to allow long printer paper to be fed. This is not within specifications, so the machine's performance cannot be guaranteed using this mode.

20: 2-070 (Auto Combine Original mode)

This SP mode determines the use of the Combine key.

0: Normal – The Combine key accesses the Combine feature, in which two originals can be combined onto one copy

1: Automatic – The Combine key accesses the Auto Combine feature, in which the same original is printed twice or four times on the copy

This SP mode is only referred to when using the exposure glass. From the ADF, Auto Combine is always used if more than one original is placed.

The default is Normal.

21: 2-080 (Double count-up for A3 masters)

0: The counters go up by 1 only.

1: The master counter goes up by 2.

2: The master and print counters both go up by 2.

22: 2-090 (APS A5 Size Detection)

This determines how the machine behaves if the APS sensors cannot detect the original because it is too small

0: No original detected, 1: A5 assumed

Default: 0

23: 2-120 (Exit Wing Position)

This determines the position of the wings on the paper delivery table.

0: Auto (determined by the setting of SP6-100 for the currently-used paper type)

1: Always Up (regardless of SP6-100), 2: Always Down (regardless of SP6-100)

24: 2-125 (Drum Idling)

This mode has two options: “Fast” and “Slow”. Fast is the default setting and is used with the new 16-kgf printing pressure setting. (See Pearl RTB No. 3 for more details about the new printing pressure setting.)

Fast mode skips the 30-rpm drum rotation speed at the beginning of printing. Consequently, the drum rotation speed increases as shown in the table below. Slow mode does not skip the 30-rpm drum rotation speed. Note that there are two cases depending on the temperature inside of the drum, detected by the thermistor. With the ‘Slow’ setting, paper wrapping jams become more likely unless the printing pressure is reduced to 14 kgf.

SP2-125 Setting	Drum Temperature	Trial Print	1st Print	2nd Print	3rd Print	4th Print	5th Print	6th Print	7th Print
Slow	Below 15 °C	16	16	***30***	60	75	90	105	120
	15 °C or above	16	***30***	60	75	90	105	120	120
Fast	Below 15 °C	16	16	60	75	90	105	120	120
	15 °C or above	16	60	75	90	105	120	120	120

* These figures apply to the highest printing speed (120-rpm).

25: 2-150 (Auto Image Rotation)

If enabled, this feature rotates the scanned image if the original and printing paper are of the same size but different orientations.

0: Disabled, 1: Enabled

Default: Enabled

26: 2-210 (Ink Near-end Detection)

This SP mode enables and disables the display for ink and master roll near-end detection.

The machine determines how much of the master roll is remaining by subtracting the length of each master that is made.

In addition, it determines how much ink is left by counting the number of ink pump strokes that have been made.

The default is 0 (disabled). In this condition, the master and ink consumption is still monitored, but if a near-end condition occurs, it will not be displayed.

If this SP mode is changed to 1 (enabled), near-end will be displayed, but only for a few seconds when the machine has just been switched on.

27: 2-250 (Separation lines for Combine Original mode)

This can only be used with Memory Combine mode, using the optional memory board.

This determines the type of separation line printed on copies between the images of the different originals.

0: None (default), 1: Solid, 2: Broken line type A, 3: Broken line type B, 4: Crop marks

28: 2-270 (Print Restart in Class)

This determines how the machine behaves if the Job Separator feature is not used.

1: Auto Start – After printing for one class has been finished, there is a pause of a few seconds, then printing for the next class begins automatically. The short break allows the user to take the stack of prints off the delivery table.

2: Disabled (Default) – After printing for one class has been finished, the machine stops. The user must press Print to start printing for the next class.

29: 2-280 (Paper Tray Priority)

0: Tray 1, 1: Tray 2, 2: Paper feed table

30: 2-281 (Tray Mode Select)

0: Only trays 1 and 2 will be used for the auto select feature (this is known as 'two-tray mode'.

1: The paper feed table will be used for the auto select feature, as well as trays 1 and 2 (this is known as 'three-tray mode'.

This SP mode is only used if Tray Auto Select is turned on (SP 2-282).

31: 2-291 (Restricted Access)

When the key counter is installed, the technician enables the key counter with SP 2-002. However, the user can override this setting with SP 2-291 (which is also user tool 6-8).

OFF: Copies can be made even if the user has no key counter, regardless of SP 2-002.

ON: The user must have a key counter, if SP2-002 has been switched on.

The default is OFF, so to use the key counter, the user must switch 2-291 on using the equivalent user tool (6-8).

32: 2-300 (Stamp type)

This determines what the Stamping function (Stamp key) puts on the printouts.

33: 2-301 (Default stamp size)

This determines the size of the stamp.

0: Normal (about 32 x 64 mm), 1: x 2, 2: x 4, 3: x 8

34: 2-302 (Default Stamp Density)

0: Solid fill (default), 1: Fine pattern, 2: Coarse pattern

35: 2-303 (Default Stamp Position)

0: Upper left, 1: Upper middle, 2: Upper right, 3: Center left, 4: Center,
5: Center right, 6: Lower left, 7: Lower middle, 8: Lower right,
9: Everywhere (repeated)

User tool 5-4 (SP 3-120 to 128) can be used to adjust the co-ordinates of types 0 to 8.

36: 2-304 to 2-306 (User Stamp Size, Density, and Position)

These settings are the same as SP 2-301 to 2-303, except that they are for the user stamp. User stamps are stored using user tool 5-8.

User tool 5-7 (SP 3-130 to 138) can be used to adjust the co-ordinates of types 0 to 8.

37: 2-308 (Date Stamp Position)

0: Upper left (horizontal), 1: Lower right (horizontal), 2: Lower left (vertical),
3: Upper right (vertical)

38: 2-309 (Page Numbering Type)

0: P1, P2, P3, . . 1: 1/5, 2/5, 3/5, . . 2: - 1 -, - 2 -, - 3 -, . . .

39: 2-310 (Default Page Number Stamping Position)

0: Upper right (horizontal), 1: Upper left (vertical), 2: Bottom middle (horizontal),
3: Center right (vertical)

Settings 0 and 1 determine the default for the ‘P1, P2’ and ‘1/5, 2/5’ types of page numbering.

Settings 2 and 3 determine the default for the ‘- 1 -, - 2 -‘ types of page numbering.

40: 2-390 (Drum Size – A3 or DLT)

This setting changes the master making area. It also affects the available range for the default image position shift (top/bottom, SP2-020-7).

A3: -15 mm to + 15 mm
DLT: -10 mm to + 10 mm

41: 2-400, 401 (Paper types for User 1 and User 2)

The user can customize two paper types (User 1 and User 2) in addition to the three usual paper types (Normal, Thick, Special).

These SP modes give the machine a rough idea of what type of paper the user is using as types User 1 and User 2.

0: This paper type is not being used at present
1: Standard, no feed (Standard paper type, non feed likely)
2: Standard, double feed (Standard paper type, double feed likely)
3: Thick, no feed (Thick paper type, non feed likely)
4: Thick, double feed (Thick paper type, double feed likely)
5: Thick, medium (Thick paper type, with intermediate chances of double and non-feed)

42: 2-422 (Ink Auxiliary Supply)

This mode determines when ink is detected and supplied. There are three possible settings.

- '0: After': Ink detection and supply are done when a print job finishes.
- '1: Before': They are done when the Print Start key is pressed (and before starting printing).
- '2: No': Ink is not added except during normal printing.

Note that if the machine detects a low ink condition during printing, ink is supplied regardless of this setting.

To minimize the wait time for drum idling, ink supply prior to starting printing has been eliminated by setting this mode to '0: After' as the default. With older firmware, when the Print Start key is pressed, the machine carries out the ink detection and (if low ink is detected) starts to supply ink before starting printing. (This ink detection is likely only when an operator cancels the Auto-cycle mode, which is selected by default. In the Auto-cycle mode, the machine enters the printing process without detecting the ink after making a master.)

3. User Custom Settings

SP No.	Display	Function	Default	Setting	User Tools
3-001	Minimum Print Quantity		0	0 to 9999%	2-1
3-002	Maximum Print Quantity		9999	0 to 9999%	2-2
3-010-1	Magnification (A3 to A4)	Allows the user to change the default reproduction ratios	71	50 to 200%	3-4
3-010-2	Magnification (B4 to A4)		82	50 to 200%	3-4
3-010-3	Magnification (A3 to B4)		87	50 to 200%	3-4
3-010-4	Magnification (Margins)		93	50 to 200%	3-4
3-010-5	Magnification (Standard)		100	50 to 200%	3-4
3-010-6	Magnification (B4 to A3)		115	50 to 200%	3-4
3-010-7	Magnification (A4 to B4)		122	50 to 200%	3-4
3-010-8	Magnification (A4 toA3)		141	50 to 200%	3-4
3-020-1	T Head Energy - Standard	Thermal head energy in standard and economy modes, as percentage of full power. Also see SP 2-032.	-7	0 to -99%	-
3-020-2	T Head Energy - Economy		-25	0 to -99%	-
3-030	Auto Reset Time	Determines how long it takes for the machine to return to the defaults.	0	0, 1 to 5	1-1
3-051	Number of Skip Feeds		2	2-9	4-11
3-060-1	MarginErase A3 MainScan	Determines the edge erase margins. For example, for A3 main scan, the width of the original is 297 mm, and the erase margin is set at 293. This means that only the central 293 mm will be scanned.	293	50-297	3-9
3-060-2	MarginErase A3 SubScan		420	50-420	3-9
3-060-3	MarginErase B4/LG-L Main		253	50-257	3-9
3-060-4	MarginErase B4/LG-L Sub		360	50-364	3-9
3-060-5	MarginErase A4/LT-L Main		206	50-216	3-9
3-060-6	MarginErase A4/LT-L Sub		293	50-297	3-9
3-060-7	MarginErase A4 MainScan		293	50-297	3-9

SP No.	Display	Function	Default	Setting	User Tools
3-060-8	MarginErase A4 SubScan	Determines the edge erase margins. For example, for A3 main scan, the width of the original is 297 mm, and the erase margin is set at 293. This means that only the central 293 mm will be scanned.	206	50-216	3-9
3-060-9	MarginErase B5-L Main		178	50-182	3-9
3-060-10	MarginErase B5-L Sub		253	50-257	3-9
3-060-11	MarginErase B5 MainScan		253	50-257	3-9
3-060-12	MarginErase B5 SubScan		178	50-182	3-9
3-060-13	MarginErase A5-L Main		144	50-148	3-9
3-060-14	MarginErase A5-L Sub		206	50-210	3-9
3-060-15	MarginErase A5 MainScan		206	50-210	3-9
3-060-16	MarginErase A5 SubScan		144	50-148	3-9
3-060-17	MarginErase Card-L Main		96	50-105	3-9
3-060-18	MarginErase Card-L Sub		144	50-148	3-9
3-060-19	MarginErase Card Main		144	50-148	3-9
3-060-20	MarginErase Card Sub		96	50-105	3-9
3-060-21	MarginErase Custom Main	This allows the user to input a custom size. SP3-060-21 and 22 specify edge erase margins for this original size.	66	50-300	3-9
3-060-22	MarginErase Custom Sub		161	50-432	3-9
3-061-1	Set Custom Size - Main		70	50-300	3-9
3-061-2	Set Custom Size - Sub		165	50-432	3-9

SP No.	Display	Function	Default	Setting	User Tools
3-070-1	Serial Number	Use these to input the serial numbers Serial number locations: Main body: Open front cover, on the left of the machine (master eject box area) Bank: Rear cover Paper delivery table: On the base Do these at installation if required. The data is used in the data printout mode in the system test. (SP3-70 and -72 can be seen in SP1-41 and -50.)	0	-	-
3-070-2	Bank Serial Number		0	-	-
3-070-3	PDTable Serial Number		0	-	-
3-071	Installation Date		0	-	-
3-072	Service Telephone Number		0	-	-
3-073	Clock		-	-	1-8
3-074	First Power On Date		-	-	-
3-090	Manual Idling Rotation	This determines the number of drum idling rotations when the user has selected Quality Start with the Quality Start key.	45	0-90	4-12
3-091-1	Auto Idling 0-4h	These determine the number of drum idling rotations in Auto Quality Start mode, depending on the length of time the machine has been unused. 3-091: 18 to 28 °C 3-092: Below 18 °C 3-093: Above 28 °C	0	0-90	4-14
3-091-2	Auto Idling 4-24h		0	0-90	4-14
3-091-3	Auto Idling 24-72h		15	0-90	4-14
3-091-4	Auto Idling 72h-Over		15	0-90	4-14
3-092-1	AutoIdling 0-4h Low Temp		0	0-90	4-14
3-092-2	Auto Idling 4-24h Low		0	0-90	4-14
3-092-3	Auto Idling 24-72h Low		45	0-90	4-14
3-092-4	Auto Idling 72h-Over Low		45	0-90	4-14
3-093-1	AutoIdling 0-4h HighTemp		0	0-90	4-14
3-093-2	Auto Idling 4-24h High		0	0-90	4-14
3-093-3	Auto Idling 24-72h High		0	0-90	4-14
3-093-4	AutoIdling 72h-Over High		15	0-90	4-14

SP No.	Display	Function	Default	Setting	User Tools
3-100 (-1 to -12)	Register Class 1-1 to 1-12	The number of students in each class. No. of grades: Up to 9 No. of classes per grade: Up to 12 No. of students per class: Program with these SP modes Defaults for each grade Classes 1 to 4: 30 Classes 5 to 12: 0	0	0-9999	3-5
3-101 (-1 to -12)	Register Class 2-1 to 2-12		0	0-9999	3-5
3-102 (-1 to -12)	Register Class 3-1 to 3-12		0	0-9999	3-5
3-103 (-1 to -12)	Register Class 4-1 to 4-12		0	0-9999	3-5
3-104 (-1 to -12)	Register Class 5-1 to 5-12		0	0-9999	3-5
3-105 (-1 to -12)	Register Class 6-1 to 6-12		0	0-9999	3-5
3-106 (-1 to -12)	Register Class 7-1 to 7-12		0	0-9999	3-5
3-107 (-1 to -12)	Register Class 8-1 to 8-12		0	0-9999	3-5
3-108 (-1 to -12)	Register Class 9-1 to 9-12		0	0-9999	3-5
3-110	Register User Code	These are for administering the user codes and the key operator code.	-	-	6-3
3-111	Change User Code		-	-	6-4
3-112	Register Key Operator		0000	0000 to 9999	6-7
3-113	Clear User Code		-	-	6-5
3-120-1	Stamp Top Rt - Side	These specify the co-ordinates of the eight possible positions for the preset stamp.	24	8 to 144	5-4
3-120-2	Stamp Top Rt - UpDown		24	8 to 104	5-4
3-121-1	Stamp Top Mdl - Side	These specify the co-ordinates of the eight possible positions for the preset stamp.	0	-72 to 72	5-4
3-121-2	Stamp Top Mdl - UpDown		24	8 to 104	5-4
3-122-1	Stamp Top Lft - Side		24	8 to 144	5-4
3-122-2	Stamp Top Lft - UpDown		24	8 to 104	5-4
3-123-1	Stamp Btm Rt - Side		24	8 to 144	5-4
3-123-2	Stamp Btm Rt - UpDown		24	8 to 104	5-4
3-124-1	Stamp Btm Mdl - Side		0	-72 to 72	5-4
3-124-2	Stamp Btm Mdl - UpDown		24	8 to 104	5-4
3-125-1	Stamp Btm Lft - Side		24	8 to 144	5-4
3-125-2	Stamp Btm Lft - UpDown		24	8 to 104	5-4
3-126-1	Stamp Rt Mdl - Side		24	8 to 144	5-4

SP No.	Display	Function	Default	Setting	User Tools
3-126-2	Stamp Rt Mdl - UpDown	These specify the co-ordinates of the eight possible positions for the preset stamp.	0	-52 to 52	5-4
3-127-1	Stamp Center - Side		0	-72 to 72	5-4
3-127-2	Stamp Center - UpDown		0	-52 to 52	5-4
3-128-1	Stamp Lft Mdl - Side		24	8 to 144	5-4
3-128-2	Stamp Lft Mdl - UpDown		0	-52 to 52	5-4
3-130-1	UserStamp Top Rt - Side	These specify the co-ordinates of the eight possible positions for the user stamp.	24	8 to 144	5-7
3-130-2	UserStamp Top Rt - UpDn		24	8 to 104	5-7
3-131-1	U Stamp Top Mdl - Side		0	-72 to 72	5-7
3-131-2	U Stamp Top Mdl - UpDown		24	8 to 104	5-7
3-132-1	U Stamp Top Lft - Side		24	8 to 144	5-7
3-132-2	U Stamp Top Lft - UpDown		24	8 to 104	5-7
3-133-1	User Stamp Btm Rt - Side		24	8 to 144	5-7
3-133-2	User Stamp Btm Rt - UpDn		24	8 to 104	5-7
3-134-1	U Stamp Btm Mdl - Side		0	-72 to 72	5-7
3-134-2	U Stamp Btm Mdl - UpDown		24	8 to 104	5-7
3-135-1	U Stamp Btm Lft - Side		24	8 to 144	5-7
3-135-2	U Stamp Btm Lft - UpDown		24	8 to 104	5-7
3-136-1	User Stamp Rt Mdl - Side	These specify the co-ordinates of the eight possible positions for the preset stamp.	24	8 to 144	5-7
3-136-2	User Stamp Rt Mdl - UpDn		0	-52 to 52	5-7
3-137-1	User Stamp Center - Side		0	-72 to 72	5-7
3-137-2	User Stamp Center - UpDn		0	-52 to 52	5-7
3-138-1	U Stamp Lft Mdl - Side		24	8 to 144	5-7
3-138-2	U Stamp Lft Mdl - UpDown		0	-52 to 52	5-7

SP No.	Display	Function	Default	Setting	User Tools
3-140-1	Date Top Lft - Side	These specify the co-ordinates of the four possible positions for the date stamp.	20	8-40	5-11
3-140-2	Date Top Lft - UpDown		8	8-40	5-11
3-141-1	Date Btm Rt - Side		20	8-40	5-11
3-141-2	Date Btm Rt - UpDown		8	8-40	5-11
3-142-1	Date Btm Lft - Side		12	8-40	5-11
3-142-2	Date Btm Lft - UpDown		20	8-40	5-11
3-143-1	Date Top Rt - Side		8	8-40	5-11
3-143-2	Date Top Rt - UpDown		20	8-40	5-11
3-150-1	Page Top Rt - Side	These specify the co-ordinates of the four possible positions for the page number stamp.	12	8-40	5-14
3-150-2	Page Top Rt - UpDown		8	8-40	5-14
3-151-1	Page Top Lft - Side		12	8-40	5-14
3-151-2	Page Top Lft - UpDown		12	8-40	5-14
3-152-1	Page Btm Mdl - Side		0	0	5-14
3-152-2	Page Btm Mdl - UpDown		8	8-40	5-14
3-153-1	Page Mdl Rt - Side		8	8-40	5-14
3-153-2	Page Mdl Rt - UpDown		0	0	5-14
3-161	Num of Master Eject Trial	This specifies the number of master eject attempts before an error is indicated.	2	1 to 3	-
3-400	Low Power Setting		3min	OFF/1 to 120 min	1-11
3-540	PDTable Capacity Limit	Capacity of the delivery table	1000	0 to 1000 (0: No limit)	2-7
3-541-1	PDTablePos. A3-L S-Plate	Default side and end plate positions on the delivery table for standard paper types	0	-10 to 10 mm	3-12
3-541-2	PDTablePos. A3-L E-Plate		0	-10 to 10 mm	3-12
3-541-3	PDTablePos. B4-L S-Plate		0	-10 to 10 mm	3-12
3-541-4	PDTablePos. B4-L E-Plate		0	-10 to 10 mm	3-12
3-541-5	PDTablePos. A4-L S-Plate		0	-10 to 10 mm	3-12
3-541-6	PDTablePos. A4-L E-Plate		0	-10 to 10 mm	3-12

SP No.	Display	Function	Default	Setting	User Tools
3-541-7	PDTablePos. A4 SidePlate	Default side and end plate positions on the delivery table for standard paper types	0	-10 to 10 mm	3-12
3-541-8	PDTablePos. A4 EndPlate		0	-10 to 10 mm	3-12
3-541-9	PDTablePos. B5-L S-Plate		0	-10 to 10 mm	3-12
3-541-10	PDTablePos. B5-L E-Plate		0	-10 to 10 mm	3-12
3-542-1	PDTablePos. A3-L S-Plate	Default side and end plate positions on the delivery table for thick paper types	0	-10 to 10 mm	3-12
3-542-2	PDTablePos. A3-L E-Plate		0	-10 to 10 mm	3-12
3-542-3	PDTablePos. B4-L S-Plate		0	-10 to 10 mm	3-12
3-542-4	PDTablePos. B4-L E-Plate		0	-10 to 10 mm	3-12
3-542-5	PDTablePos. A4-L S-Plate		0	-10 to 10 mm	3-12
3-542-6	PDTablePos. A4-L E-Plate		0	-10 to 10 mm	3-12
3-542-7	PDTablePos. A4 S-Plate		0	-10 to 10 mm	3-12
3-542-8	PDTablePos. A4 E-Plate		0	-10 to 10 mm	3-12
3-542-9	PDTablePos. B5-L S-Plate		0	-10 to 10 mm	3-12
3-542-10	PDTablePos. B5-L E-Plate		0	-10 to 10 mm	3-12
3-542-11	PDTablePos. B5 S-Plate		0	-10 to 10 mm	3-12
3-542-12	PDTablePos. B5 E-Plate		0	-10 to 10 mm	3-12
3-543-1	PDTablePos.DLT-L S-Plate	Default side and end plate positions on the delivery table for standard paper types	0	-0.4 to 0.4 inch	3-12
3-543-2	PDTablePos.DLT-L E-Plate		0	-0.4 to 0.4 inch	3-12
3-543-3	PDTablePos. LG-L S-Plate		0	-0.4 to 0.4 inch	3-12
3-543-4	PDTablePos. LG-L E-Plate		0	-0.4 to 0.4 inch	3-12
3-543-5	PDTablePos. LT-L S-Plate		0	-0.4 to 0.4 inch	3-12
3-543-6	PDTablePos. LT-L E-Plate		0	-0.4 to 0.4 inch	3-12

SP No.	Display	Function	Default	Setting	User Tools
3-543-7	PDTablePos. LT S-Plate	Default side and end plate positions on the delivery table for standard paper types	0	-0.4 to 0.4 inch	3-12
3-543-8	PDTablePos. LT E-Plate		0	-0.4 to 0.4 inch	3-12
3-544-1	PDTablePos.DLT-L S-Plate	Default side and end plate positions on the delivery table for thick paper types	0	-0.4 to 0.4 inch	3-12
3-544-2	PDTablePos.DLT-L E-Plate		0	-0.4 to 0.4 inch	3-12
3-544-3	PDTablePos. LG-L S-Plate		0	-0.4 to 0.4 inch	3-12
3-544-4	PDTablePos. LG-L E-Plate		0	-0.4 to 0.4 inch	3-12
3-544-5	PDTablePos. LT-L S-Plate		0	-0.4 to 0.4 inch	3-12
3-544-6	PDTablePos. LT-L E-Plate		0	-0.4 to 0.4 inch	3-12
3-544-7	PDTablePos. LT S-Plate		0	-0.4 to 0.4 inch	3-12
3-544-8	PDTablePos. LT E-Plate		0	-0.4 to 0.4 inch	3-12
3-660	JSSorter Bin Capacity Limit		50	1 to 50 sheets	-
3-661-1	JSSorter Joger Int.Num Normal	For details, refer to the sorter service manual.	2	1 to 3	-
3-661-2	JSSorterJoger Int.Num Class		2	1 to 3	-

4. Input Test Mode

SP No.	Display
4-020	Scanner HP Sensor
4-021-1	Original Length SN 0
4-021-2	Original Length SN 1
4-021-3	Original Width SN 2
4-021-4	Original Width SN 3
4-021-5	Original Length SN 4
4-021-6	Original Length SN 5
4-022	Platen Cover Sensor
4-040	Master Unit Set Sensor
4-041	Cutter HP Sensor
4-042	Master Set Sensor
4-043	Master End Sensor
4-044	Master Edge Sensor
4-046	Platen Release Sensor
4-060	Eject Box Set Sensor
4-061	Paper Eject Sensor
4-062	Pressure Plate HP Sensor
4-063	Pressure Plate Limit SN
4-080	Paper Table Lowering SW
4-081	Paper End Sensor
4-082	Table Lower Limit Sensor
4-083	Paper Table Height SN
4-084	Paper Registration SN
4-085	Paper Feed Timing Sensor
4-086-1	Paper Feed Pressure 0
4-086-2	Paper Feed Pressure 1
4-086-3	Paper Feed Pressure 2
4-086-4	Paper Feed Pressure 3
4-087-1	Separation Pressure 0
4-087-2	Separation Pressure 1
4-087-3	Separation Pressure 2
4-087-4	Separation Pressure 3
4-088	Paper Table Set Sensor
4-089	Paper Feed Start Sensor
4-090-1	Paper Width Detection 0
4-090-2	Paper Width Detection 1
4-090-3	Paper Width Detection 2
4-090-4	Paper Width Detection 3
4-090-5	Paper Width Detection 4
4-090-6	Paper Width Detection 5
4-091	Paper Length Sensor
4-092	Relay Guide Set Sensor
4-100	Paper Exit Sensor

SP No.	Display
4-101-1	Wing Upper Position SN
4-101-2	Wing Lower Position SN
4-120-1	1st Drum Position Sensor
4-120-2	2nd Drum Position Sensor
4-120-3	Drum Home Position Sensor
4-122-1	Drum Type Check 0
4-122-2	Drum Type Check 1
4-123	Ink Pump Sensor
4-124	Ink Cartridge Set Sensor
4-125	Ink Detection
4-126	Drum Idling Roller HP SN
4-127-1	1st Drum Master Sensor
4-127-2	2nd Drum Master Sensor
4-128	Lower Wrapping Jam SN
4-129-1	A3 Cam Sensor
4-129-2	A4 Cam Sensor
4-131	Main Motor Lock Detect
4-140	Image Shift HP Sensor
4-141	Drum Shift HP Sensor
4-142-1	Clamp Close Position SN
4-142-2	Clamper Open Position SN
4-143	P Cylinder Feed Encoder
4-144	Tray Feed Start Sensor
4-400	Front Door Open Detect
4-500	DF Installation Detect
4-501	DF Cover Open Sensor
4-502	DF Registration Sensor
4-503	DF Original Set Sensor
4-504-1	DF Original Width SN 1
4-504-2	DF Original Width SN 2
4-504-3	DF Original Width SN 3
4-504-4	DF Original Length SN 1
4-504-5	DF Original Length SN 2
4-505	DF Position Sensor
4-506	DF APS Start Sensor
4-520	Slider Upper Limit SN
4-521	Job Separator Paper SN
4-522	Slider Position Sensor
4-523	Slider HP Sensor
4-540-1	PDTable Paper End (Delivery table paper sensor)
4-540-2	PDTable S-Plate Position (Side plate set sensor)
4-540-3	PDTable S-Plate Pulse SN
4-540-4	PDTable S-Plate HP SN
4-540-5	PDTable E-Plate Position (End plate set sensor)
4-540-6	PDTable E-Plate Pulse SN

SP No.	Display
4-540-7	PDTable E-Plate HP SN
4-580	Key Card Detection
4-660-1	JS Sorter Lower Unit SN
4-660-2	JS Sorter Lower Entry SN
4-660-3	JS Sorter Upper Unit SN
4-660-4	JS Sorter Upper Entry SN
4-660-5	JS Sorter Midd. Transport SN
4-660-6	JS Sorter Horz. Transport SN
4-660-7	Set Non-Sort Position
4-660-8	Set Sort Position
4-660-9	Side Jogger HP for L-Unit
4-660-10	Side Jogger HP for U-Unit
4-660-11	End Jogger HP for L-Unit
4-660-12	End Jogger HP for U-Unit
4-660-13	Lead Cam Lwr Limit For L-Unit
4-660-14	Lead Cam Lwr Limit For U-Unit
4-660-15	Paper Exit Pawl SN for L-Unit
4-660-16	Paper Exit Pawl SN for U-Unit
4-660-17	Set Lower Unit F-Cover
4-660-18	Set Upper Unit F-Cover
4-660-19	Set Non-Sort Tray
4-660-20	Set Vert. Transport Cover
4-660-21	Set Horz. Transport Cover
4-660-22	Set Stapler Cover (Japan only)
4-660-23	Upper Bin for Lower Unit
4-660-24	Upper Bin for Upper Unit
4-660-25	Stapler HP
4-660-26	Stapler Detection SN
4-660-27	Stapler Cartridge SN
4-660-28	Paper SN for Stapler
4-700	1st Relay Sensor (2nd relay sensor)
4-701	2nd Relay Sensor (3rd relay sensor)
4-710-1	R-Tray1 Tray Set SN
4-710-2	R-Tray1 Paper End SN
4-710-3	R-Tray1 Paper Volume SN
4-710-4	R-Tray1 Paper Width SN1 (front right tray paper width sensor)
4-710-5	R-Tray1 Paper Width SN2 (rear right tray paper width sensor)
4-710-6	R-Tray1 Upper Limit SN
4-710-7	R-Tray1 Lower Limit SN
4-710-8	Set Tandem Tray (tandem tray sensor)
4-711-1	L-Tray1 Tray Set SN
4-711-2	L-Tray1 Paper End SN (left tray paper length sensor)
4-711-3	L-Tray1 Paper Width SN1 (front left tray paper width sensor)
4-711-4	L-Tray1 Paper Width SN2 (rear left tray paper width sensor)
4-711-5	L-Tray1 Upper Limit SN

SP No.	Display
4-711-6	L-Tray1 Lower Limit SN
4-712-1	Back-Plate HP SN
4-712-2	Back-Plate SN (return position sensor)
4-713-1	Tray2 Tray Set SN
4-713-2	Tray2 Paper End SN
4-713-3	Tray2 Paper Volume SN
4-713-4	Tray2 Paper Width SN1 (front tray 2 paper width sensor)
4-713-5	Tray2 Paper Width SN2 (rear tray 2 paper width sensor)
4-713-6	Tray2 Paper Length SN
4-713-7	Tray2 Upper Limit SN
4-713-8	Tray2 Lower Limit SN
4-714-1	Vertical Cover Set SN
4-714-2	2nd Tray Feed Sensor (1st relay sensor)
4-714-3	Tray Exit Sensor (tray registration sensor)
4-900	Key Counter Detection

5. Output Test Mode

SP No.	Display
5-001	All Indicators On
5-020	Xenon Lamp
5-021-1	Move Scanner - Scan
5-021-2	Move Scanner - Return
5-021-3	Move Scanner to HP
5-040	Master Feed Clutch
5-041	Master Vacuum Fan
5-042-1	Cutter Motor Forward
5-042-2	Cutter Motor Reverse
5-042-3	Move Cutter to HP
5-043-1	Platen Release Motor
5-043-2	Apply Platen Pressure
5-043-3	Release Platen Pressure
5-044	Master Duct Entrance Sol
5-060-1	Pressure Plate to Limit
5-060-2	Press Plate to Eject Pos
5-060-3	Pressure Plate to HP
5-061-1	M Eject Motor Forward
5-061-2	M Eject Motor Reverse
5-080-1	Paper Table Motor Up
5-080-2	Paper Table Motor Down
5-081-1	Paper Pressure Motor Up
5-081-2	Paper Press Motor Down
5-082-1	Sep. Pressure Motor Up
5-082-2	Sep. Pressure Motor Down
5-083-1	Paper Feed Motor Slowest
5-083-2	Paper Feed Motor 30 rpm
5-083-3	Paper Feed Motor 1st
5-083-4	Paper Feed Motor 2nd
5-083-5	Paper Feed Motor 3rd
5-083-6	Paper Feed Motor 4th
5-083-7	Paper Feed Motor 5th
5-083-8	Paper Feed Motor Revs. Slowest (Revs. = reverse rotation)
5-083-9	Paper Feed Motor Revs. 30 rpm
5-083-10	Paper Feed Motor Revs. 1st
5-083-11	Paper Feed Motor Revs. 2nd
5-083-12	Paper Feed Motor Revs. 3rd
5-083-13	Paper Feed Motor Revs. 4th
5-083-14	Paper Feed Motor Revs. 5th
5-084-1	Regist Motor Slowest
5-084-2	Regist Motor 30 rpm
5-084-3	Registration Motor 1st
5-084-4	Registration Motor 2nd

SP No.	Display
5-084-5	Registration Motor 3rd
5-084-6	Registration Motor 4th
5-084-7	Registration Motor 5th
5-084-8	Regist. Motor Revs. Slowest
5-084-9	Regist. Motor Revs. 30 rpm
5-084-10	Regist. Motor Revs. 1st
5-084-11	Regist. Motor Revs. 2nd
5-084-12	Regist. Motor Revs. 3rd
5-084-13	Regist. Motor Revs. 4th
5-084-14	Regist. Motor Revs. 5th
5-100-1	Wing Guide Motor Up
5-100-2	Wing Guide Motor Down
5-101	Air Knife Fan
5-102	Transport Vacuum Fan
5-120-1	Drum Rotation Slowest
5-120-2	Drum Rotation 1st Speed
5-120-3	Drum Rotation 2nd Speed
5-120-4	Drum Rotation 3rd Speed
5-120-5	Drum Rotation 4th Speed
5-120-6	Drum Rotation 5th Speed
5-121	Printing Pressure Sol.
5-123-1	Shift Pressure Cam to A3
5-123-2	Shift Pressure Cam to A4
5-124-1	Drum Idling Roller ON
5-124-2	Idling Roller Return
5-125-1	Drum Home Pos. LED GREEN
5-125-2	Drum Home Pos. LED RED
5-140-1	Clamper Motor - Open
5-140-2	Clamper Motor - Close
5-141-1	Image Shift Motor - •
5-141-2	Image Shift Motor - •
5-142-1	Drum Shift Motor - •
5-142-2	Drum Shift Motor - •
5-400	Print Counter Up
5-401	Master Counter Up
5-402	Thermal Head ON
5-500	DF Feed Motor
5-501	DF Feed Clutch
5-502	DF Pick-up Solenoid
5-520-1	Slider Lift Motor - Up
5-520-2	Slider Lift Motor - Down
5-521-1	Job Separator Motor Fwd.
5-521-2	Job Separator Motor Rev.
5-540-1	Move S-Plate-Extension
5-540-2	Move S-Plate-Retraction
5-540-3	Move E-Plate-Retraction

SP No.	Display
5-540-4	Move E-Plate-Extension
5-580-1	Count-up Key Card
5-580-2	Key Card Motor
5-660-1	Lead Cam Motor Up For L-Unit
5-660-2	Lead Cam Motor Down For L-Unit
5-660-3	Lead Cam Motor Up For U-Unit
5-660-4	Lead Cam Motor Down For U-Unit
5-660-5	Middle Transport Motor
5-660-6	Horiz. Transport Motor
5-660-7	Lower Vert. Transport Motor
5-660-8	Upper Vert. Transport Motor
5-660-9	ShiftNon/SortMotor To Sort
5-660-10	ShiftNon/SortMotor To Non
5-660-11	S-Jogger For L-Unit Forward
5-660-12	S-Jogger For L-Unit Reverse
5-660-13	S-Jogger For U-Unit Forward
5-660-14	S-Jogger For U-Unit Reverse
5-660-15	E-Jogger For L-Unit Forward
5-660-16	E-Jogger For L-Unit Reverse
5-660-17	E-Jogger For U-Unit Forward
5-660-18	E-Jogger For U-Unit Reverse
5-660-19	Stapler Motor : Forwad
5-660-20	Stapler Motor : Reverse
5-660-21	Mid. Transport Fan Motor
5-660-22	Horz. Transport Fan1 Motor
5-660-23	Horz. Transport Fan2 Motor
5-660-24	Vrt Trans. Fan1 Mtr For L Unit
5-660-25	Vrt Trans. Fan2 Mtr For L Unit
5-660-26	Vrt Trans. Fan1 Mtr For U Unit
5-660-27	Vrt Trans. Fan2 Mtr For U Unit
5-660-28	Wing Guide Solenoid
5-660-29	Non Sort Tray Lock Sol.
5-660-30	Paper Exit Pawl For L-Lnit
5-660-31	Paper Exit Pawl For U-Lnit
5-660-32	JS Sorter Free Rum
5-710-1	R-Tray1 Lift Motor : Up
5-710-2	R-Tray1 Lift Motor : Down
5-710-3	R-Tray1 UnLock Sol. (tray 1 right lock solenoid)
5-710-4	Tray1 Separation Pad Sol (tray 1 friction pad solenoid)
5-710-5	Tray1 Connection Sol.
5-711-1	L-Tray1 Lift Motor : Up
5-711-2	L-Tray1 Lift Motor : Down
5-711-3	L-Tray1 UnLock Sol. (tray 1 left lock solenoid)
5-712-1	Move TrayB-Plate-Right (move back plate drive motor-right)
5-712-2	Move TrayB-Plate-Left (move back plate drive motor-left)

SP No.	Display
5-713-1	Tray2 Lift Motor : Up
5-713-2	Tray2 Lift Motor : Down
5-713-3	Tray 2 UnLock Sol. (tray 2 lock solenoid)
5-713-4	Tray2 Separation Pad Sol (tray 2 friction pad solenoid)
5-714-1	Tray Paper Feed Motor For. (tray feed motor-forward)
5-714-2	Tray Paper Feed Motor Rev. (tray feed motor –reverse)
5-714-3	Tray Feed Motor (tray registration motor)
5-714-4	Tray Transport Clutch (tray 2 feed clutch)
5-714-5	Tray Mid. Transport Clutch (tray relay clutch)
5-714-6	Tray Feed Clutch (tray exit clutch)
5-900	Count-up Key Counter
5-901	PSU Fan Motor

6. System Adjustment

SP No.	Display	Function	Default	Settings
6-001-1	Main Scan Pos. - Platen	Side-to-side registration adjustment; see Note 1.	0	-5.0 to 5.0 mm
6-001-2	Main Scan Position - DF		0	-5.0 to 5.0 mm
6-002-1	Scan Start Pos. - Platen	Scanning start line adjustment; see Note 2.	0	-5.0 to 5.0 mm
6-002-2	Scan Start Position - DF		0	-5.0 to 5.0 mm
6-010	Master Writing Speed	See Note 3.	0	-5.0 to 5.0%
6-011-1	Scanning Speed - Platen	See Note 4.	0	-5.0 to 5.0%
6-011-2	Scanning Speed - DF		0	-5.0 to 5.0%
6-012	Master Writing Length	Do not use in the field.	0	-5.0 to 5.0 %
6-020-1	V&Thresh Master Eject SN	The use of these SP modes is explained in various parts of the Replacement and Adjustment section. (C229 service manual)	2.5	0.0 to 5.0V
6-020-2	V&Thresh DrumMaster 1 SN		2.5	0.0 to 5.0V
6-020-3	V&Thresh DrumMaster 2 SN		2.5	0.0 to 5.0V
6-020-4	V & Thresh Master End SN		0.9	0.0 to 5.0V
6-020-5	V & Thresh Paper Exit SN		2.5	0.0 to 5.0V
6-020-6	V&Thresh Master Edge SN		1.5	0.0 to 5.0V
6-032-1	SBU Auto Calibration	Refer to the Replacements and Adjustments section. (C229 service manual)	-	-
6-032-2	SBU Gain Setting	Do not adjust.	-	-
6-032-3	SBU DC Count Setting		-	-
6-032-4	SBU Reference Value		-	-
6-032-5	SBU Offset Value		-	-
6-050	LCD Contrast Adjustment	See Note 5.	6	0 to 7
6-070	Master Making Density	See Note 6.	1	0 to 2
6-082-1	MTF Filter Letter Mode	See Note 7.	0	0 to 11
6-082-2	MTF Filter Ltr/Pht Mode		5	0 to 11
6-082-3	MTF Filter Pencil Mode		6	0 to 11
6-082-4	MTF Filter Photo Mode		2	0 to 11

SP No.	Display	Function	Default	Settings
6-090-1	FeedPressure Std Special	See Note 8.	3	0 to 6
6-090-2	Freq - Special Paper		5	0 to 6
6-090-3	V Freq - Special Paper		6	0 to 6
6-091-1	FeedPressure Std Nor Ppr		3	0 to 6
6-091-2	Freq - Normal Paper		5	0 to 6
6-091-3	V Freq - Normal Paper		6	0 to 6
6-092-1	FeedPressure Std Thick		5	0 to 6
6-092-2	Freq - Thick Paper		6	0 to 6
6-092-3	V Freq - Thick Paper		6	0 to 6
6-093-1	FeedPressure Std User 1		5	0 to 6
6-093-2	Freq - User 1 Paper		6	0 to 6
6-093-3	V Freq - User 1 Paper		6	0 to 6
6-094-1	FeedPressure Std User 2		1	0 to 6
6-094-2	Freq - User 2 Paper		2	0 to 6
6-094-3	V Freq - User 2 Paper		3	0 to 6
6-095-1	SepPressure Std Special		1	0 to 6
6-095-2	Freq - Special Paper		3	0 to 6
6-095-3	V Freq - Special Paper		4	0 to 6
6-096-1	SepPressure Std Nor Ppr		3	0 to 6
6-096-2	Freq - Normal Paper		4	0 to 6
6-096-3	V Freq - Normal Paper		6	0 to 6
6-097-1	SepPressure Std Thick		2	0 to 6
6-097-2	Freq - Thick Paper		3	0 to 6
6-097-3	V Freq - Thick Paper		4	0 to 6
6-098-1	SepPressure Std User 1		4	0 to 6
6-098-2	Freq - User 1 Paper		5	0 to 6
6-098-3	V Freq - User 1 Paper		6	0 to 6
6-099-1	SepPressure Std User 2		1	0 to 6
6-099-2	Freq - User 2 Paper		2	0 to 6
6-099-3	V Freq - User 2 Paper		3	0 to 6
6-100-1	Wing Angle - Special Ppr	See Note 9.	Low	High/Low
6-100-2	Wing Angle - Normal Ppr		High	High/Low

SP No.	Display	Function	Default	Settings
6-100-3	Wing Angle - Thick Paper	See Note 9.	Low	High/Low
6-100-4	Wing Angle - User1 Paper		High	High/Low
6-100-5	Wing Angle - User2 Paper		Low	High/Low
6-101-1	Paper Clamp - Spl Paper	See Note 10.	OFF	Enable/OFF
6-101-2	Paper Clamp - Nor Paper		Enable	Enable/OFF
6-101-3	Paper Clamp - Thk Paper		OFF	Enable/OFF
6-101-4	Paper Clamp - U1 Paper		Enable	Enable/OFF
6-101-5	Paper Clamp - U2 Paper		OFF	Enable/OFF
6-110-1	PaperFeed Delay - 16 rpm	Do not adjust. (Changes the feed motor on timing after the feed start timing sensor is activated.)	200	0 to 255
6-110-2	Feed Delay - 20 rpm		200	0 to 255
6-110-3	Feed Delay - 30 rpm		200	0 to 255
6-110-4	Feed Delay - 60 rpm		219	0 to 255
6-110-5	Feed Delay - 75 rpm		147	0 to 255
6-110-6	Feed Delay - 90 rpm		100	0 to 255
6-110-7	Feed Delay - 105 rpm		53	0 to 255
6-110-8	Feed Delay - 120 rpm		26	0 to 255
6-111-1	Thick Feed Delay - 16 rpm	Do not adjust. (Changes the feed motor on timing in thick and special paper modes after the feed start timing sensor is activated.)	200	0 to 255
6-111-2	Feed Delay - 20 rpm		200	0 to 255
6-111-3	Feed Delay - 30 rpm		200	0 to 255
6-111-4	Feed Delay - 60 rpm		199	0 to 255
6-111-5	Feed Delay - 75 rpm		130	0 to 255
6-111-6	Feed Delay - 90 rpm		78	0 to 255
6-111-7	Feed Delay - 105 rpm		40	0 to 255
6-111-8	Feed Delay - 120 rpm		16	0 to 255
6-112-1	Regist Delay - 16 rpm	Do not adjust. (Changes the registration motor on timing after the feed start timing sensor is activated.)	34	0 to 255
6-112-2	Regist Delay - 20 rpm		34	0 to 255
6-112-3	Regist Delay - 30 rpm		34	0 to 255
6-112-4	Regist Delay - 60 rpm		31	0 to 255
6-112-5	Regist Delay - 75 rpm		28	0 to 255
6-112-6	Regist Delay - 90 rpm		24	0 to 255
6-112-7	Regist Delay - 105 rpm		19	0 to 255
6-112-8	Regist Delay - 120 rpm		14	0 to 255

SP No.	Display	Function	Default	Settings
6-113-1	Thick Regist Delay - 16	Do not adjust. (Changes the registration motor on timing in thick and special paper modes after the feed start timing sensor is activated.)	43	0 to 255
6-113-2	Regist Delay - 20 rpm		43	0 to 255
6-113-3	Regist Delay - 30 rpm		43	0 to 255
6-113-4	Regist Delay - 60 rpm		40	0 to 255
6-113-5	Regist Delay - 75 rpm		35	0 to 255
6-113-6	Regist Delay - 90 rpm		30	0 to 255
6-113-7	Regist Delay - 105 rpm		25	0 to 255
6-113-8	Regist Delay - 120 rpm		20	0 to 255
6-114-1	A4 Regist Delay - 16 rpm	Do not adjust. (Changes the registration motor on timing in the use of the A4 drum after the feed start timing sensor is activated.)	33	0 to 255
6-114-2	Regist Delay - 20 rpm		33	0 to 255
6-114-3	Regist Delay - 30 rpm		33	0 to 255
6-114-4	Regist Delay - 60 rpm		30	0 to 255
6-114-5	Regist Delay - 75 rpm		28	0 to 255
6-114-6	Regist Delay - 90 rpm		24	0 to 255
6-114-7	Regist Delay - 105 rpm		19	0 to 255
6-114-8	Regist Delay - 120 rpm		13	0 to 255
6-115-1	A4 Thick Regist Delay 16	Do not adjust. (Changes the registration motor on timing in thick and special paper modes in combination with the use of the A4 drum after the feed start timing sensor is activated.)	43	0 to 255
6-115-2	Regist Delay - 20 rpm		43	0 to 255
6-115-3	Regist Delay - 30 rpm		43	0 to 255
6-115-4	Regist Delay - 60 rpm		40	0 to 255
6-115-5	Regist Delay - 75 rpm		35	0 to 255
6-115-6	Regist Delay - 90 rpm		30	0 to 255
6-115-7	Regist Delay - 105 rpm		25	0 to 255
6-115-8	Regist Delay - 120 rpm		20	0 to 255
6-116-1	Paper Clamp Timing Pulse	See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.	145	0 to 255
6-116-2	Paper Clamp - Thick Paper	See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.	148	0 to 255
6-116-3	Paper Clamp Pls - A4 Cam	Do not adjust.	145	0 to 255
6-116-4	Feed Timing Pulse	Do not adjust.	113	0 to 255
6-116-5	Feed Stop Timing Pulse	See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.	21	0 to 255

SP No.	Display	Function	Default	Settings
6-116-6	Print Position 2 Setting	Do not adjust.	103	0 to 255
6-116-7	Print Position 1 Setting	Do not adjust.	140	0 to 255
6-117-1	Skip Regist Delay 16 rpm	Do not adjust. (Changes the registration motor on timing (when using the skip feed mode) after the feed start sensor is activated.)	33	0 to 255
6-117-2	Skip Regist Delay - 20 rpm		33	0 to 255
6-117-3	Skip Regist Delay - 30 rpm		33	0 to 255
6-117-4	Skip Regist Delay - 60 rpm		31	0 to 255
6-117-5	Skip Regist Delay - 75 rpm		28	0 to 255
6-117-6	Skip Regist Delay - 90 rpm		24	0 to 255
6-117-7	Skip Regist Delay - 105 rpm		19	0 to 255
6-117-8	Skip Regist Delay - 120 rpm		13	0 to 255
6-118-1	A4 Skip Regist Delay 16 rpm	Do not adjust. (Changes the registration motor on timing in the use of the A4 drum after the feed start timing sensor is activated.)	33	0 to 255
6-118-2	A4 Skip Regist Delay - 20 rpm		33	0 to 255
6-118-3	A4 Skip Regist Delay - 30 rpm		33	0 to 255
6-118-4	A4 Skip Regist Delay - 60 rpm		30	0 to 255
6-118-5	A4 Skip Regist Delay - 75 rpm		28	0 to 255
6-118-6	A4 Skip Regist Delay - 90 rpm		24	0 to 255
6-118-7	A4 Skip Regist Delay - 105 rpm		19	0 to 255
6-118-8	A4 Skip Regist Delay - 120 rpm		13	0 to 255
6-130	Drum Master Clamp Regist	See Note 11.	0	-10.0 to 10.0mm
6-140-1	BankRegistDelay – 16rpm	Do not adjust. (Changes the tray registration motor on timing after the tray registration sensor is activated.)	172	0 to 255
6-140-2	BankRegistDelay – 20rpm		200	0 to 255
6-140-3	BankRegistDelay – 30rpm		200	0 to 255
6-140-4	BankRegistDelay – 60rpm		200	0 to 255
6-140-5	BankRegistDelay – 75rpm		200	0 to 255
6-140-6	BankRegistDelay – 90rpm		128	0 to 255

SP No.	Display	Function	Default	Settings
6-140-7	BankRegistDelay – 105rpm	Do not adjust. (Changes the tray registration motor on timing after the tray registration sensor is activated.)	72	0 to 255
6-140-8	BankREgistDelay – 120rpm		29	0 to 255
6-141-1	Trans.Assist.Delay-16rpm	Do not adjust. (Changes the 3rd relay roller start timing after the registration roller starts)	3	0 to 255
6-141-2	Trans.Assist.Delay-20rpm		3	0 to 255
6-141-3	Trans.Assist.Delay-30rpm		3	0 to 255
6-141-4	Trans.Assist.Delay-60rpm		3	0 to 255
6-141-5	Trans.Assist.Delay-75rpm		3	0 to 255
6-141-6	Trans.Assist.Delay-90rpm		3	0 to 255
6-141-7	Trans.Assist.Delay-105rpm		3	0 to 255
6-141-8	Trans.Assist.Delay-120rpm		2	0 to 255
6-142-1	Tray1FeedStop TimingPulse	See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.	14	0 to 255
6-142-2	Tray1 Feed Speed	Do not adjust. (Changes the registration roller speed before the paper is clamped.)	140	0 to 255
6-142-3	Tray1 Mid. Roller Speed	Do not adjust. (Changes the 3rd relay roller speed before the paper is clamped.)	136	0 to 255
6-142-4	Tray1Mid.Roller Speed - %	Do not adjust. (Changes the 3rd relay roller speed after the paper is clamped.)	90	0 to 255
6-142-5	Tray1Mid.Roller Speed – t	Do not adjust. (Changes the length of time that the 3rd relay roller stays on after clamping [with the speed set with SP6-142-4].)	100	0 to 255
6-142-6	Tray1Feed StopTimingPulseA3	See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.	14	0 to 255
6-143-1	Tray2FeedStop TimingPulse	See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.	14	0 to 255

SP No.	Display	Function	Default	Settings
6-143-2	Tray2 Feed Speed	Do not adjust. (Changes the registration roller speed before the paper is clamped.)	140	0 to 255
6-143-3	Tray2 Mid. Roller Speed	Do not adjust. (Changes the 3rd relay roller speed before the paper is clamped.)	136	0 to 255
6-143-4	Tray2Mid. Roller Speed - %	Do not adjust. (Changes the 3rd relay roller speed after the paper is clamped.)	90	0 to 255
6-143-5	Tray2Mid.Roller Speed – t	Do not adjust. (Changes the length of time that the 3rd relay roller stays on after clamping [with the speed set with SP6-143-4].)	100	0 to 255
6-144-1	Tray1stPrntRgstDly-16rpm	Do not adjust. (Changes the tray registration motor on timing after the tray feed start sensor is activated.)	172	0 to 255
6-144-2	Tray1stPrntRgstDly-20rpm		200	0 to 255
6-144-3	Tray1stPrntRgstDly-30rpm		200	0 to 255
6-144-4	Tray1stPrntRgstDly-60rpm		100	0 to 255
6-145-1	Bank1 RegistDelay 16rpm	Do not adjust. (Changes the tray registration motor on timing in tray 1 after the tray feed start sensor is activated.)	33	0 to 255
6-145-2	Bank1 RegistDelay 20rpm		33	0 to 255
6-145-3	Bank1 RegistDelay 30rpm		33	0 to 255
6-145-4	Bank1 RegistDelay 60rpm		32	0 to 255
6-145-5	Bank1 RegistDelay 75rpm		29	0 to 255
6-145-6	Bank1 RegistDelay 90rpm		25	0 to 255
6-145-7	Bank1 RegistDelay 105rpm		20	0 to 255
6-145-8	Bank1 RegistDelay 120rpm		15	0 to 255
6-146-1	Bank2 RegistDelay 16rpm	Do not adjust. (Changes the tray registration motor on timing in tray 2 after the tray feed start sensor is activated.)	33	0 to 255
6-146-2	Bank2 RegistDelay 20rpm		33	0 to 255
6-146-3	Bank2 RegistDelay 30rpm		33	0 to 255
6-146-4	Bank2 RegistDelay 60rpm		32	0 to 255

SP No.	Display	Function	Default	Settings
6-146-5	Bank2 RegistDelay 75rpm	Do not adjust. (Changes the tray registration motor on timing in tray 2 after the tray feed start sensor is activated.)	29	0 to 255
6-146-6	Bank2 RegistDelay 90rpm		25	0 to 255
6-146-7	Bank2 RegistDelay 105rpm		20	0 to 255
6-146-8	Bank2 RegistDelay 120rpm		15	0 to 255
6-147-1	Bank RegistDelayA4 16rpm	Do not adjust. (Changes the tray registration motor on timing (when using the A4 drum) after the tray feed start sensor is activated.)	33	0 to 255
6-147-2	Bank RegistDelayA4 20rpm		33	0 to 255
6-147-3	Bank RegistDelayA4 30rpm		33	0 to 255
6-147-4	Bank RegistDelayA4 60rpm		31	0 to 255
6-147-5	Bank RegistDelayA4 75rpm		28	0 to 255
6-147-6	Bank RegistDelayA4 90rpm		24	0 to 255
6-147-7	Bank RegistDelayA4 105rpm		19	0 to 255
6-147-8	Bank RegistDelayA4 120rpm		13	0 to 255
6-148-1	Bank1 SkipRestDelay 16rpm	Do not adjust. (Changes the tray registration motor on timing in tray 1 (when using the skip feed mode) after the tray feed start sensor is activated.)	33	0 to 255
6-148-2	Bank1 SkipRgstDelay 20rpm		33	0 to 255
6-148-3	Bank1 SkipRgstDelay 30rpm		33	0 to 255
6-148-4	Bank1 SkipRgstDelay 60rpm		32	0 to 255
6-148-5	Bank1 SkipRgstDelay 75rpm		28	0 to 255
6-148-6	Bank1 SkipRgstDelay 90rpm		25	0 to 255
6-148-7	Bank1 SkipRgstDelay 105rpm		20	0 to 255
6-148-8	Bank1 SkipRgstDelay 120rpm		14	0 to 255
6-149-1	Bank2 SkipRgstDelay 16rpm	Do not adjust. (Changes the tray registration motor on timing in tray 2 (when using the skip feed mode) after the tray feed start sensor is activated.)	33	0 to 255
6-149-2	Bank2 SkipRgstDelay 20rpm		33	0 to 255
6-149-3	Bank2 SkipRgstDelay 30rpm		33	0 to 255
6-149-4	Bank2 SkipRgstDelay 60rpm		32	0 to 255
6-149-5	Bank2 SkipRgstDelay 75rpm		28	0 to 255

SP No.	Display	Function	Default	Settings
6-149-6	Bank2 SkipRgstDelay 90rpm	Do not adjust. (Changes the tray registration motor on timing in tray 2 (when using the skip feed mode) after the tray feed start sensor is activated.)	25	0 to 255
6-149-7	Bank2 SkipRgstDelay 105rpm		20	0 to 255
6-149-8	Bank2 SkipRgstDelay 120rpm		14	0 to 255
6-150-1	Bank SkipRgstDelay A4 16rpm	Do not adjust. (Changes the tray registration motor on timing (when using the A4 drum and the skip feed mode) after the tray feed start sensor is activated.)	33	0 to 255
6-150-2	Bank SkipRgstDelay A4 20rpm		33	0 to 255
6-150-3	Bank SkipRgstDelay A4 30rpm		33	0 to 255
6-150-4	Bank SkipRgstDelay A4 60rpm		31	0 to 255
6-150-5	Bank SkipRgstDelay A4 75rpm		28	0 to 255
6-150-6	Bank SkipRgstDelay A4 16rpm		24	0 to 255
6-150-7	Bank SkipRgstDelay A4 105rpm		19	0 to 255
6-150-8	Bank SkipRgstDelay A4 120rpm		13	0 to 255
6-151-1	Bank1 Clamp Timing Pulse	The SP is used to feed from tray 1 (similar to 6-116-1). See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.	145	0 to 255
6-151-2	Bank2 Clamp Timing Pulse	The SP is used to feed from tray 2 (similar to 6-116-1). See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.	145	0 to 255
6-151-3	Bank ClampTiming Pulse A4	Do not adjust.	145	0 to 255

SP No.	Display	Function	Default	Settings
6-660-1	Timing Delay A3	For details, refer to the sorter service manual.	0	-10 to 10
6-660-2	Timing Delay B4 Sideways		0	-10 to 10
6-660-3	Timing Delay A4 Sideways		0	-10 to 10
6-660-4	Timing Delay A4 Lengthwise		0	-10 to 10
6-660-5	Timing Delay B5 Sideways		0	-10 to 10
6-660-6	Timing Delay DLT Sideways		0	-10 to 10
6-660-7	Timing Delay LG Sideways		0	-10 to 10
6-660-8	Timing Delay LT Sideways		0	-10 to 10
6-660-9	Timing Delay LT Lengthwise		0	-10 to 10
6-660-10	Timing Delay F Sideways		0	-10 to 10
6-660-11	Timing Delay Other Size		0	-10 to 10
6-661-1	Move Jogger – Sideways		0	-10 to 10
6-661-2	Move Jogger – Lengthwise		0	-10 to 10
6-662-1	JS Sorter Feed Speed 1st		0	-50 to 100
6-662-2	JS Sorter Feed Speed 2st		0	-50 to 100
6-662-3	JS Sorter Feed Speed 3st		0	-50 to 100
6-662-4	JS Sorter Feed Speed 4st		0	-50 to 100
6-662-5	JS Sorter Feed Speed 5st		0	-50 to 100

Notes

1: 6-001 (Main scan position)

Inputting a positive number moves the image away from the operation side of the machine. Use the point (**.**) key to switch between + and –.

2: 6-002 (Scan start position)

Inputting a positive number moves the image away from the leading edge of the printer paper. Use the point (**.**) key to switch between + and –.

3: 6-010 (Master writing speed)

This changes the master feed motor speed.

Inputting a positive value stretches the image on the master. Inputting a negative value shrinks it.

Normally, do not use this SP mode to adjust the vertical magnification. Use it only if the vertical magnification is not satisfactory by adjusting Scanning Speed (SP6-011).

4: 6-011 (Scanning speed)

Inputting a positive value stretches the image on the master. Inputting a negative value shrinks it.

5: 6-050 (Operation panel LCD contrast)

0: Palest, 7: Darkest

6: 6-070 (Master making density)

0: Pale, 1: Normal, 2: Dark

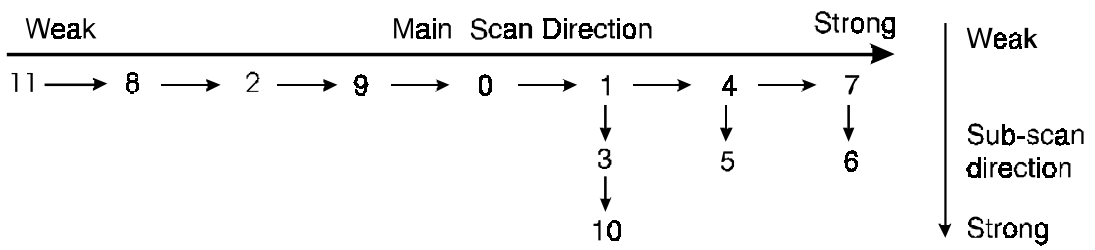
The default is 1: Normal. Changing this moves the user's image density settings up or down one notch.

7: 6-082 (MTF filters)

A stronger filter leads to a sharper image, but moiré can become more apparent.

Refer to the following diagram for the relationship between this SP mode and filter strength (the relationship is not linear). Do not use a value of 1; this is for designer's tests only.

- MTF Filter -



Note: The value is the filter number

C229D505.WMF

8: 6-90 to 99 (Paper feed and separation pressures for different paper types)

These SP modes determine the paper feed and separation pressures that are automatically applied during paper feed. The user adjusts these pressures by selecting a paper type (normal, thick, special, user 1, user 2), and then by selecting how often non-feeds and double feeds are occurring.

The user customizes the user 1 and user 2 types by selecting from 5 choices. These choices can be seen in the description for SP 2-400 and 2-401. Each of these 5 choices has a set of feed and separation pressures (refer to Detailed Section Descriptions – Paper Feed).

6-090: Special paper, feed pressure
6-091: Normal paper, feed pressure
6-092: Thick paper, feed pressure
6-093: User 1 paper, feed pressure
6-094: User 2 paper, feed pressure
6-095: Special paper, separation pressure
6-096: Normal paper, separation pressure
6-097: Thick paper, separation pressure
6-098: User 1 paper, separation pressure
6-099: User 2 paper, separation pressure

The settings for user 1 and user 2 depends on the type of paper that the user has set these up for (see SP 2-400 and 2-401).

9: 6-100 (Paper delivery table wing angle)

The machine lifts or lowers the wings depending on the paper type selected by the user (standard, special, thick, user 1, user 2).

The settings for user 1 and user 2 depends on the type of paper that the user has set these up for (see SP 2-400 and 2-401).

10: 6-101 (Paper clamping)

Whether the machine clamps the paper or not depends on the paper type selected by the user (standard, special, thick, user 1, user 2).

The settings for user 1 and user 2 depends on the type of paper that the user has set these up for (see SP 2-400 and 2-401).

11: 6-130 (Drum master clamper registration)

This determines how far after the leading edge the master is clamped.

A larger value clamps the master further away from the leading edge, and moves the image closer to the leading edge of the paper.

Do not use this SP to adjust leading edge registration. Use SP6-2 for that.

7. Memory Data Clear

SP No.	Display	User Tools
7-001	Clear Factory Settings	-
7-010	Clear Jam/Error Logging	-
7-011	Clear Resettable Counter	1-3
7-012	Clear Total Counter	-
7-020-1	Clear U-Counter: Code 1	6-2
7-020-2	Clear U-Counter: Code 2	6-2
7-020-3	Clear U-Counter: Code 3	6-2
7-020-4	Clear U-Counter: Code 4	6-2
7-020-5	Clear U-Counter: Code 5	6-2
7-020-6	Clear U-Counter: Code 6	6-2
7-020-7	Clear U-Counter: Code 7	6-2
7-020-8	Clear U-Counter: Code 8	6-2
7-020-9	Clear U-Counter: Code 9	6-2
7-020-10	Clear U-Counter: Code 10	6-2
7-020-11	Clear U-Counter: Code 11	6-2
7-020-12	Clear U-Counter: Code 12	6-2
7-020-13	Clear U-Counter: Code 13	6-2
7-020-14	Clear U-Counter: Code 14	6-2
7-020-15	Clear U-Counter: Code 15	6-2
7-020-16	Clear U-Counter: Code 16	6-2
7-020-17	Clear U-Counter: Code 17	6-2
7-020-18	Clear U-Counter: Code 18	6-2
7-020-19	Clear U-Counter: Code 19	6-2
7-020-20	Clear U-Counter: Code 20	6-2
7-021	Clear All User Counters	6-2
7-022	Clear User Code	-
7-023	Clear Key Operator Code	-
7-050	Clear User Program	-
7-051	Clear User Custom Default	-
7-052	Reset Make-up Pattern	-
7-062	Reset MTF Filter (SP6-82)	-
7-070	Reset Feed Pressure (SP6-90, 91, 92, 93, 94)	-
7-071	Reset Sep. Pressure (SP6-95, 96, 97, 98, 99)	-
7-072	Reset Wing Guide Angle (SP6-100)	-
7-073	Reset Paper Clamping Data (SP6-101)	-
7-074	Reset Feed Control Data (SP6-111, 112, 113, 114, 115, 117, 118)	-
7-075	Reset Feed Control Pulse Data (SP6-116)	-
7-400	Clear Change Sales Flag (Japan only)	
7-660	Clear JS Sorter Settings (feed control data, etc)	
7-700	Clear Bank Settings (feed control data, etc)	

8. System Test

SP No.	Display (Comments)
8-010-1	Scanner Free Run M
8-010-2	Magnification at FreeRun
8-011-1	ADF Free Run Mode
8-011-2	Mag. at ADF Free Run
8-020	Load Program (See "4.5.4 Load Program" section.)
8-020-1	Load Program
8-020-2	Load Program-ProgramData (factory use only)
8-020-3	Load Program-Font Data (factory use only)
8-020-4	Load Program-ExceptUStamp (factory use only)
8-021	UpLoad Program
8-030	APS Sensor Check Mode
8-040	TH Test Pattern Select (Patterns 0 to 9, 0: No pattern)
8-050-1	Make Master with Pattern
8-050-2	Make-up Pattern Number
8-070-1	Logging Data Printout (Needs the optional memory board)
8-070-2	User Code Counters Only (Needs the optional memory board)
8-070-3	Jam & SC Counters Only (Needs the optional memory board)
8-070-4	Jams/Errors Details (Needs the optional memory board)
8-071	Basic Settings Printout (Needs the optional memory board)
8-072-1	UserCustomSettings Print, excludes class mode (Needs the optional memory board)
8-072-2	Class Mode Settings (Needs the optional memory board)
8-073-1	Input Test Item Printout (Needs the optional memory board)
8-073-2	OutputTest Item Printout (Needs the optional memory board)
8-074-1	System Adjustment Print (Needs the optional memory board)
8-074-2	Paper Feed Adjustments (prints a list of SP values from 6-90 to 6-118)
8-074-3	Option Adjustment Print (prints a list of SP values from 6-140 to 6-151, and 6-660 to 6-662)
8-080	Not used
8-100-1	Register User Stamp A (UP Mode 5-8)
8-100-2	Register User Stamp B (UP Mode 5-8)
8-100-3	Register User Stamp C (UP Mode 5-8)
8-100-4	Register User Stamp D (UP Mode 5-8)
8-110	Register Makeup Pattern (UP Mode 5-15)

4.4.3 CLEARING THE FACTORY SETTINGS (SP7-1)

⚠CAUTION

Performing "Clear factory settings" (SP7-1) resets a part of the settings stored in the RAM to their default settings. Normally, this SP mode should not be used. This procedure is required only after replacing the RAM on the MPU or when the machine malfunctions due to a damaged RAM.

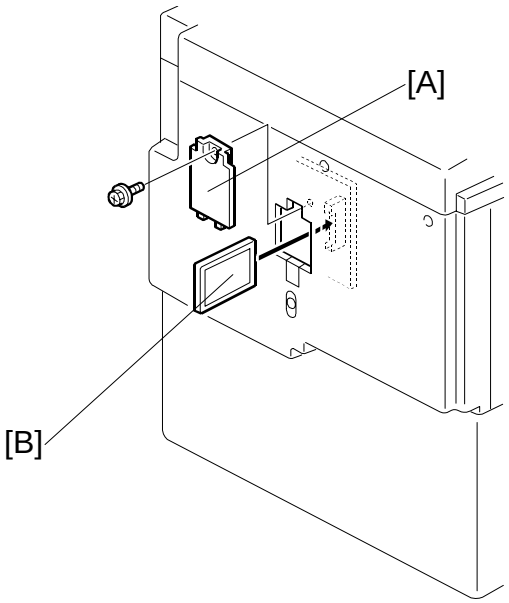
The following data is not cleared even after performing "Clear factory settings" (SP7-1).

- SP2-10: Sizes in Metric or Inch
- SP2-11: Select Language Type
- SP2-380: Japanese Display Type (Do not use.)
- SP2-390: A3/DLT Drum Selection
- SP2-421: Type of Thermal Head (Do not use.)
- SP3-70: Machine Serial Number
- SP3-73: Clock
- SP6- All : System Adjustment

1. Save the data SP mode in order to restore it later.
   NOTE: If possible, print out all system parameter lists using SP8-70, 71, 72, 73, and 74. The optional memory board is required to use the data printout function.
2. Enter SP7-1.
3. Press the Enter (#) key while holding the “0” key.
   NOTE: When the sequence is successful, “**Cleared**” is displayed.

4.4.4 LOAD PROGRAM (SP8-20)

The firmware in the flash ROM on the MPU can be upgraded using a flash memory card, as follows.



C232R024.WMF

1. Before downloading new software, check the current version with SP1-42.
2. Turn off the main switch and disconnect the power plug.
3. Remove the cover [A].
4. Plug the flash memory card [B] into the connector on the MPU.
5. Connect the power plug and turn on the main switch.
6. Access SP8-20-1 and press the **OK** key. Press the **Enter (#)** key to start downloading (the LCD displays '**Processing**').
7. After completing the download (the LCD displays '**Completed**'), leave the SP mode.
8. Turn off the main switch, then remove the flash memory card.
9. Turn on the main switch, then enter the SP mode again and check the updated ROM version with SP1-42.

4.4.5 USER TOOLS

Some items in the SP mode can be accessed with the User Tools by users. The User Tools key on the operation panel accesses these.

The following table shows all the user tools.

User Tools Table

No.	Display	Equivalent SP No.
1-1	Auto Reset Time	3-030
1-2	R. Counter Display	1-001-2, 1-002-2
1-3	Reset R. Counter	7-011
1-4	Set User Code	2-100
1-5	Key Card Setting	2-220
1-6	Sizes in Metric or Inch	2-010
1-7	Select Language Type	2-011
1-8	Time Setting	3-073
1-9	Auto On-line	2-410
1-10	Data Print	8-070-2, 8-072-2
1-11	Set Energy Saving	3-400
2-1	Minimum Print Quantity	3-001
2-2	Maximum Print Quantity	3-002
2-3	Copy Count Display	2-230
2-5	Panel Beeper	2-030
2-6	LCD Contrast Adjustment	6-050
2-7	Set Delivery Capacity	3-540
3-1	Default Paper Type	2-020-3
3-2	Default Master Density	2-020-4
3-3	Default Original Mode	2-020-1
3-4	Magnification Ratio Settings	3-010-1 to -8
3-5	Class Mode Settings	3-100
3-5	Class Entry Number Settings	3-100 to 3-108
3-6	Default Photo/Lightness	2-020-9
3-7	Default Photo/Screen	2-020-10
3-8	Default Tint Mode	2-020-2
3-9	Margin Erase Area Settings	3-060-1 to -22
3-9	Custom Margin Erase Area Settings	3-061-1 to -2
3-10	Default On-line Paper Size	2-020-11
3-11	Ratio Priority	2-020-16
3-12	Delivery Tray Position	3-541 to 544
4-1	Default Auto Cycle Mode	2-020-6
4-2	Class Entry Per Orig.	2-241
4-3	Paper Width Detection	2-042-1
4-4	ADF Orig. Size Detect	2-046-2
4-5	Platen Orig. Size Detect	2-046-1
4-6	Background ON/OFF	2-031

No.	Display	Equivalent SP No.
4-7	Long Paper Mode	2-060
4-8	Auto Combine Originals	2-070
4-9	Combine Orig. Sep. Line	2-250
4-10	Default Auto Cycle Mode	2-260
4-11	Skip Feed Mode Display	2-320
4-11	Number of Skip Feeds	3-051
4-12	Manual Idling Rotation	3-090
4-13	Auto Quality Start	2-110
4-14	Quality Start Mode Settings	3-091 to 3-093
4-15	Exit Wing Position	2-120
4-16	Print Restart in Class	2-270
4-17	Job Sep. At Class Mode	2-271
4-18	Ink/Master Left	2-210
4-19	User1 Paper Type	2-400
4-19	User2 Paper Type	2-401
4-20	Auto Image Rotation	2-150
4-21	Master Cut Length	2-170
4-22	Tray Priority	2-280
4-23	Limitless Feeding	2-140
4-24	Tray Display	2-281
4-25	Jogger Setting	2-660-1 to 2
4-26	Auto Paper Selection	2-282
5-1	Stamp Type	2-300
5-2	Default Stamp Size	2-301
5-3	Default Stamp Density	2-302
5-4	Default Stamp Position	2-303
5-4	Stamp Position Adjustments	3-120 to 3-128
5-5	User Stamp Size	2-304
5-6	User Stamp Density	2-305
5-7	Default User Stamp Position	2-306
5-7	User Stamp Position Adjustments	3-130 to 3-138
5-8	Register User Custom Stamps	8-100-1 to -4
5-9	Date Stamp Type	2-307
5-10	Default Date Stamp Position	2-308
5-11	Date Stamp Position Adjustments	3-140 to 3-143
5-12	Page Numbering Type	2-309
5-13	Default Page Stamping Positions	2-310-1 to -2
5-14	Page Stamping Position Adjustments	3-150 to 3-153
5-15	Register Makeup Pattern	8-110
6-1	Master and Print Counters for Each User Code	1-030 to 1-040
6-1	Master Counter for All User Codes	1-031-1
6-1	Print Counter for All User Codes	1-031-2
6-2	Clear Counters for Each User Code	7-020-1 to -20
6-3	Register User Code	3-110
6-4	Change User Code	3-111

No.	Display	Equivalent SP No.
6-5	Clear User Code	3-113
6-6	Key Operator Code	2-290
6-7	Register Key Operator	3-112
6-8	Restricted Access	2-291

5. PREVENTIVE MAINTENANCE

5.1 MAINTENANCE TABLE

The following items should be maintained periodically. There are two sets of intervals - one based on time and the other based on print count. For maintenance items with entries in both of them, use whichever comes first.

C: Clean, R: Replace, L: Lubricate, A: Adjust

Interval / Item	Time				Print Counter					EM	NOTE
	6M	1Y	2Y	3Y	300K	600K	1M	1.2M	2M		
Scanner/Optics											
Exposure Lamp	C	C	C	C							Dry Cloth
Mirror/Reflector	C	C	C	C							Soft Cloth
Scanner Guide Rail	C	C	C	C							Dry Cloth
Platen Cover / White Plate	C	C	C	C							Damp Cloth
Exposure Glass	C	C	C	C							Dry Cloth
Master Feed											
Thermal Head										C	Alcohol
Platen Roller	C	C	C	R							Expected life is 6K masters.
Master Eject Rollers	C	C	C	C							Alcohol
Master Eject Box	C	C	C	C							Alcohol
1st and 2nd Drum Master Sensors										C	Dry Cloth
Paper Table											
Paper Pick-up Roller	C	C	R	C				R			Damp Cloth
Paper Feed Roller	C	C	R	C				R			Damp Cloth
Paper Feed and Pick-up Roller One-way Clutches			R					R			
Friction Pad	C	C	R	C				R			Damp Cloth
Feed Roller and Transport Belt Roller Bushings		L	L	L							Motor Oil (SAE #20)
Feed Drive Gears		L	L	L							Grease (Alvania #2)
Paper Delivery Transport Belts			R					R			
Paper End Sensor	C	C	C	C							Dry Cloth

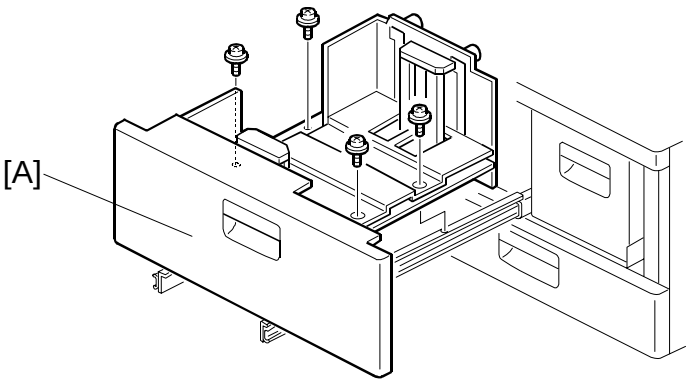
Interval / Item	Time				Print Counter					EM	NOTE
	6M	1Y	2Y	3Y	300K	600K	1M	1.2M	2M		
Registration/Feed Timing/Exit Sensors	C	C	C	C							Dry Cloth
Registration Roller	C	C	C	C							Dry Cloth
Drum and Ink Supply											
Cloth Screen			R					R			
Drum Drive Gears and Cam		L	L	L							Grease (Alvania #2)
Drum Flange Bushing		L	L	L							Motor Oil (SAE #20)
In/Outside of Drum	C	C	C	C							Alcohol
Ink Nozzle	C	C	C	C							Alcohol
Paper Tray											
Paper Feed Rollers	C	R				R					Damp Cloth
Paper Pick-up Rollers	C	R				R					Damp Cloth
Tray Registration Rollers	C	C	C	C							Dry Cloth
Friction Pads	C	R	C	C		R					Damp Cloth
Paper End Sensor	C	C	C	C							Dry Cloth
1st and 2nd Relay Rollers	C	C	C	C							Dry Cloth
Tray Registration/Relay Sensor	C	C	C	C							Dry Cloth
Paper Dust Remover Pads	C	C	C	C							Dry Cloth Vacuum Cleaner
Others											
Pressure Cylinder	C	C	C	C				C			Damp Cloth
Paper Clamper (on Pressure Cylinder)	C	C	C	C				C			Dry Cloth
Timing Belt Tension			A								
ADF (Option)											
DF Feed Rollers	C	C	C	C							Dry Cloth

6. REPLACEMENT AND ADJUSTMENT

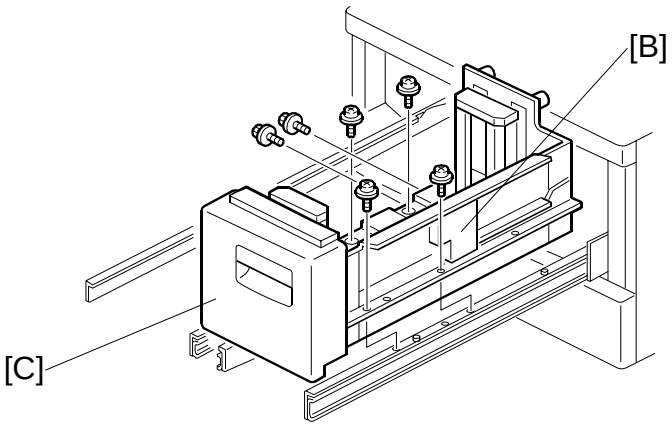
6.1 PAPER TRAY

6.1.1 PAPER TRAY REMOVAL

Tandem Tray Removal



C232R000.WMF

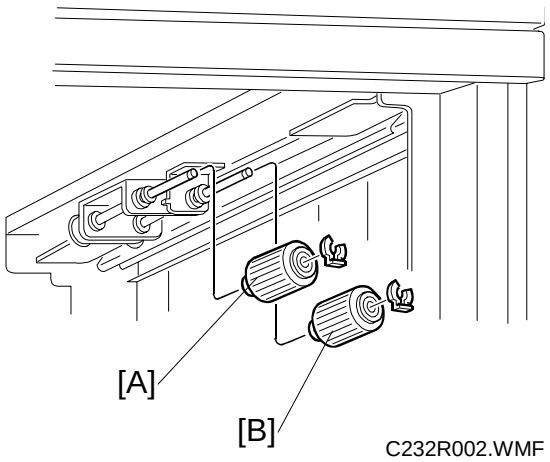


C232R001.WMF

1. Draw out the left tandem tray [A].
2. Remove the left tandem tray (4 screws).
3. Draw out the right tandem tray, then remove the friction pad unit [B] from the tandem right tray (2 screws).
4. Remove the right tandem tray [C] (4 screws).

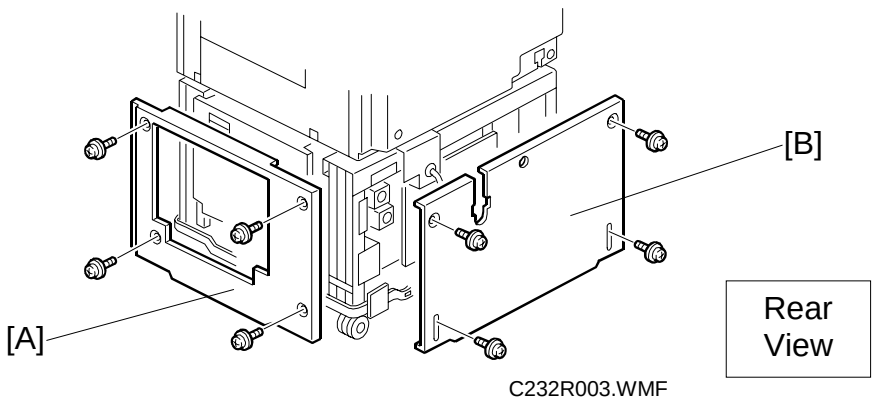
NOTE: Removing tray 2 is similar to the tandem tray.

6.1.2 PAPER FEED ROLLER AND PICK-UP ROLLER REMOVAL

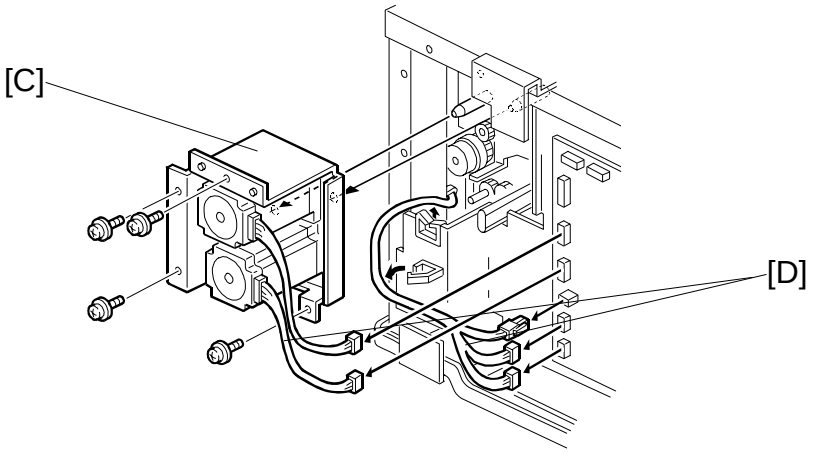


1. Turn off the main switch.
2. Remove the tandem tray. (Refer to Paper Tray Removal, section 6.1.1)
3. Draw out tray 2.
4. Remove the pick-up roller [A] (1 snap ring).
5. Remove the paper feed roller [B] (1 snap ring).

6.1.3 VERTICAL TRANSPORT UNIT REMOVAL

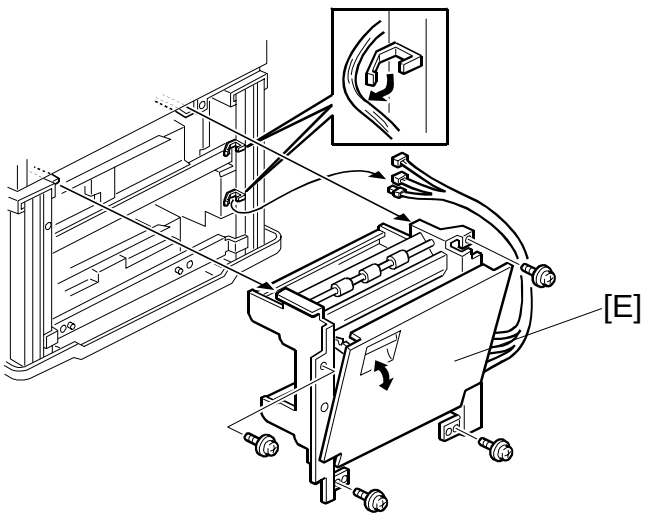


1. Remove the lower right cover [A] and the lower rear cover [B], as shown.



C232R004.WMF

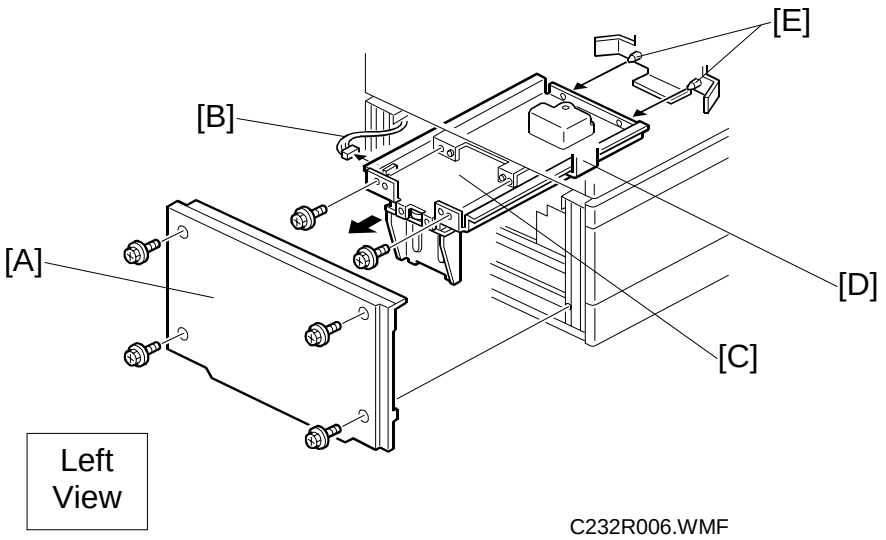
2. Remove the drive unit [C].
3. Disconnect the connectors [D].



C232R005.WMF

4. Remove the vertical transport unit [E] (4 screws).

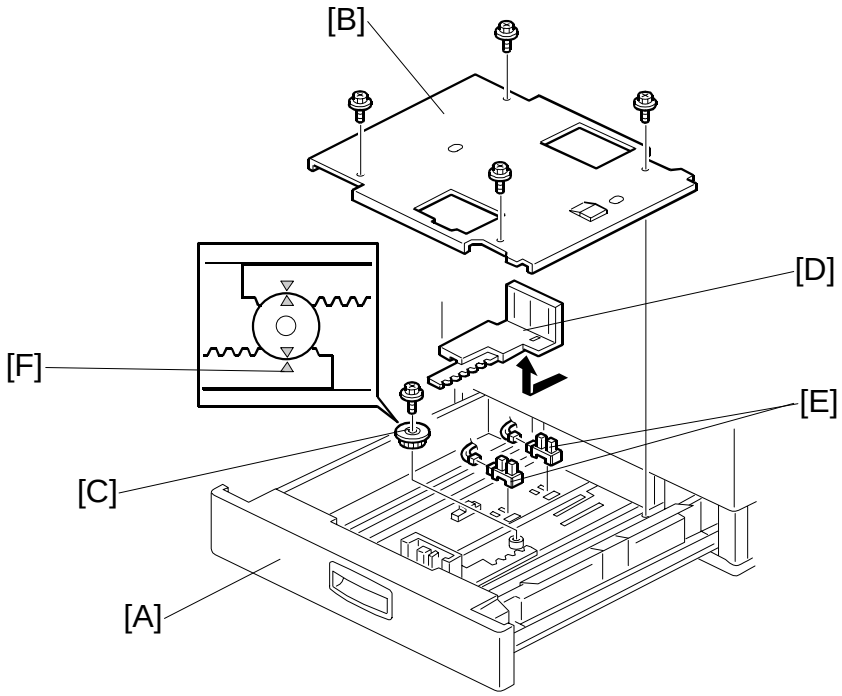
6.1.4 TANDEM BACK PLATE DRIVE UNIT REMOVAL



1. Remove the lower left cover [A] (4 screws).
2. Disconect the connector [B].
3. Pull out the back plate drive unit [C].

NOTE: When installing the back plate drive unit, hook the bracket [D] onto the back plate drive unit, then slide it in. Finally, firmly push it onto the 2 pins [E].

6.1.5 PAPER WIDTH SENSOR REPLACEMENT



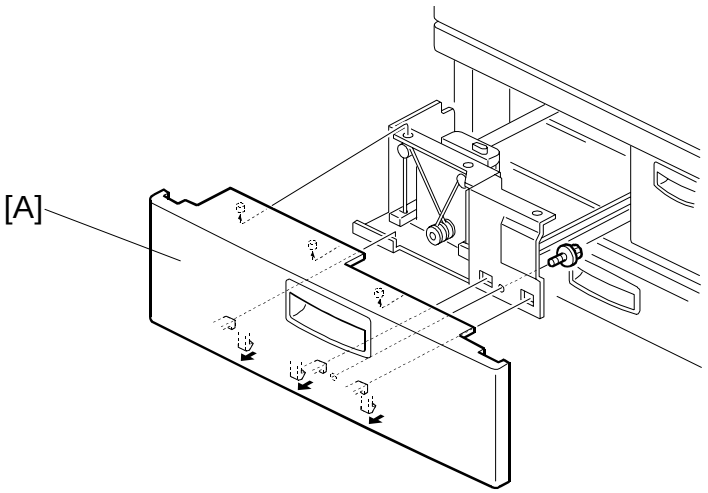
C232R007.WMF

1. Remove the tray [A].
2. Remove the bottom plate [B] (4 screws).
3. Remove the pinion [C] and rack [D].
4. Replace the paper width sensors [E].

NOTE: To re-install the pinion, position each point [F] as shown.

6.1.6 TRAY COVER REMOVAL

Left tandem tray cover

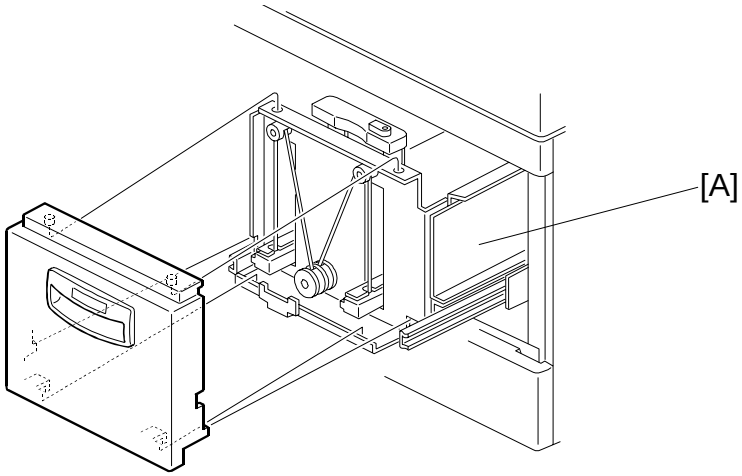


C232R008.WMF

1. Draw out the left tandem tray [A].
2. Remove the left tandem tray cover, as shown (1 screw).

NOTE: When re-installing the left tandem tray cover, set the hooks in the holes in the frame.

Right tandem tray cover

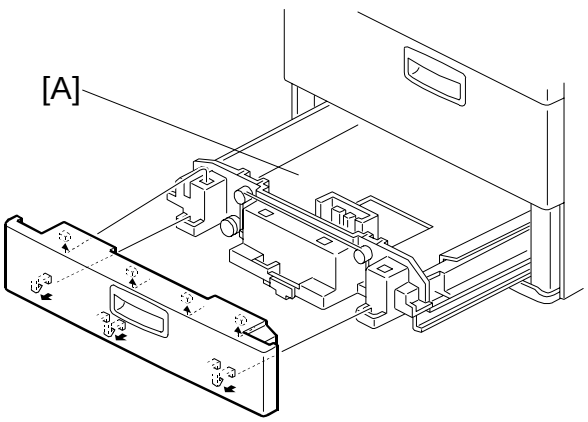


C232R009.WMF

1. Draw out the right tandem tray [A].
2. Remove the right tandem tray cover, as shown.

NOTE: When re-installing the right tandem tray cover, set the hooks in the holes in the frame.

Tray 2 cover



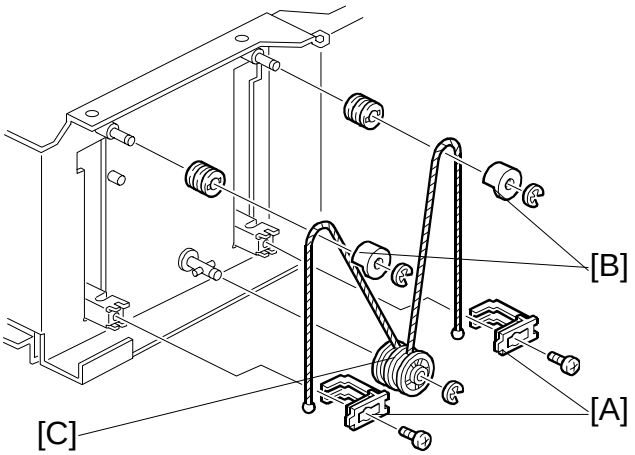
C232R010.WMF

1. Draw out tray 2 [A].
2. Remove the tray 2 cover, as shown.

NOTE: When re-installing the tray 2 cover, set the hooks in the holes in the frame.

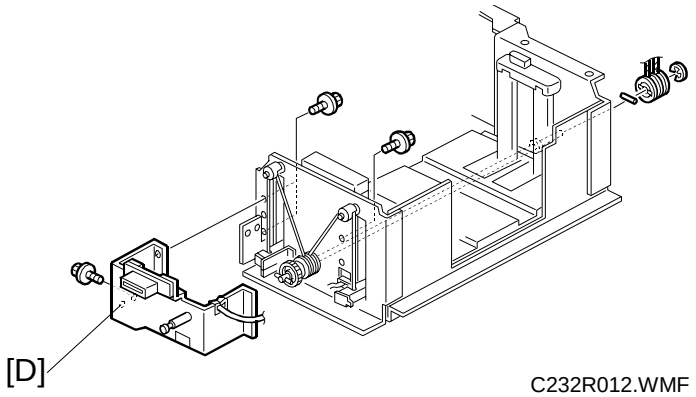
6.1.7 BOTTOM PLATE LIFT WIRE REPLACEMENT

NOTE: Before replacing the rear bottom plate lift wire, remove the front bottom plate lift wire. It is necessary to remove the shaft for replacing the rear bottom plate lift wire.

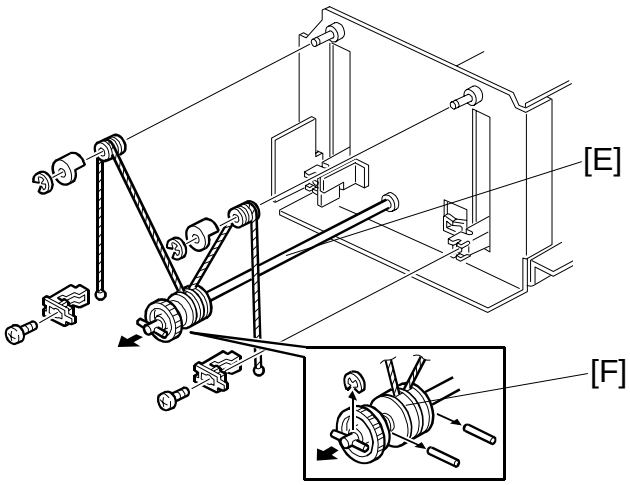


C232R011.WMF

1. Remove the right tandem tray. (Refer to Paper Tray Removal, section 6.1.1)
2. Remove the tandem tray cover.
3. Remove the wire stoppers [A] (2 screws).
4. Remove the wire covers [B] (1 E-ring each).
5. Replace the front bottom plate lift wire [C] (1 E-ring).



C232R012.WMF

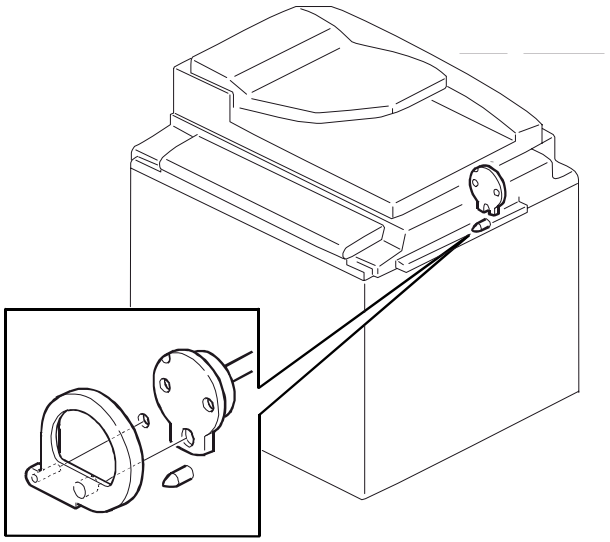


C232R013.WMF

6. Remove the bracket [D] (4 screws).
7. Remove the wire stoppers.
8. Remove the wire covers.
9. Remove the shaft [E], then replace the rear bottom plate lift wire [F] (1 E-ring, 2 pins).

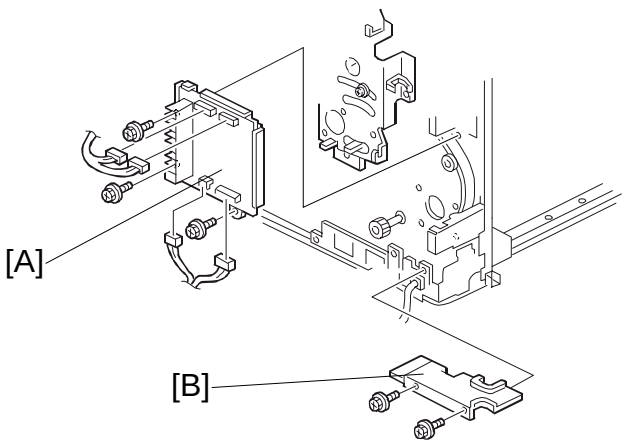
6.2 PRINTING SECTION

6.2.1 TORQUE LIMITER



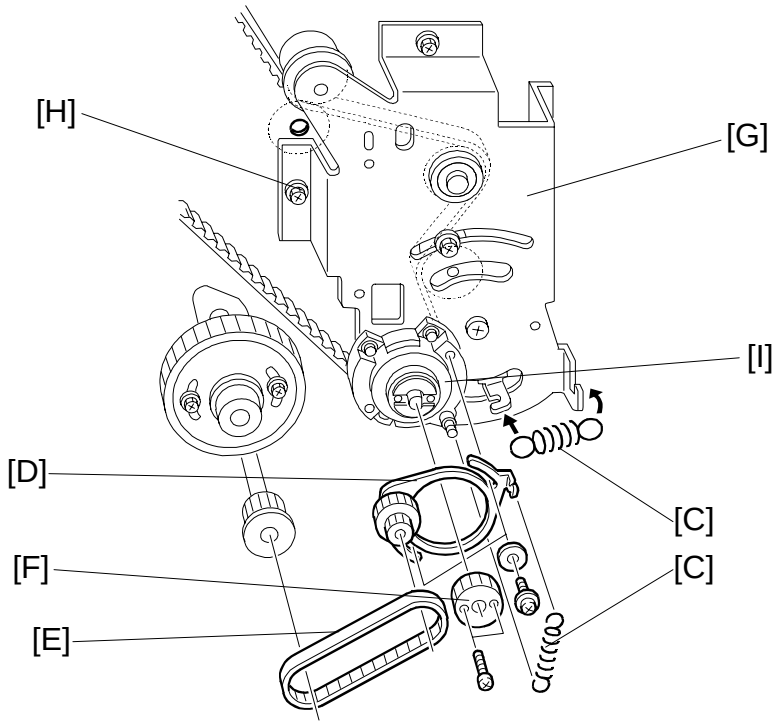
C232R505.WMF

1. Turn off the main switch and remove the drum.
2. Set the drum drive-securing tool.
3. Remove the rear cover and swing out the PSU (see the C229 service manual).



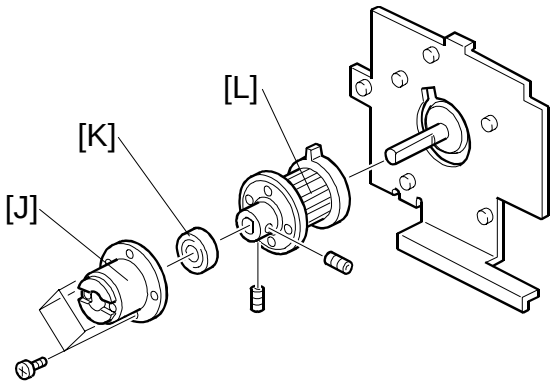
C232R503.WMF

4. Remove the main motor control board [A].
5. Remove the wire protection cover [B].



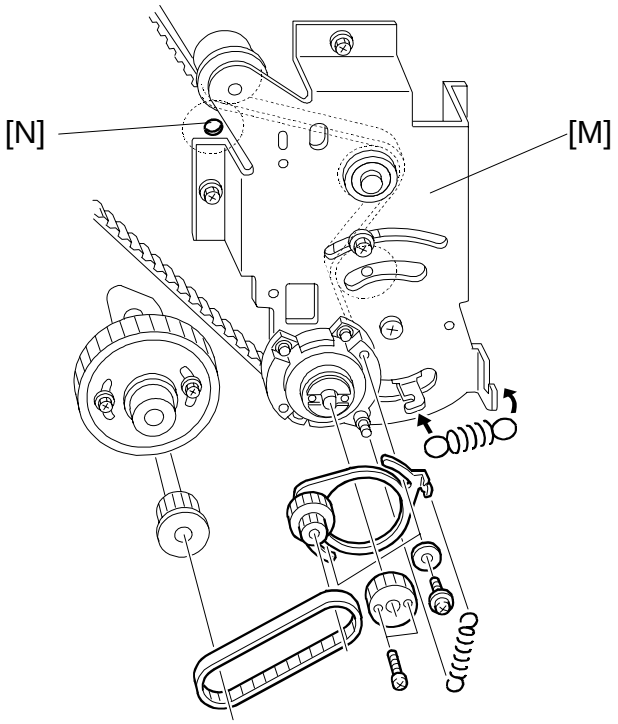
C232R506.WMF

6. Remove the 2 springs [C].
7. Remove the pulley bracket [D].
8. Remove the timing belt [E].
9. Remove the gear [F].
10. Remove the bracket [G].
    CAUTION: Screw [H] is located under the main wire harness. Take care not to damage the wire harness when removing it.
11. Remove the bearing [I] on the bracket.

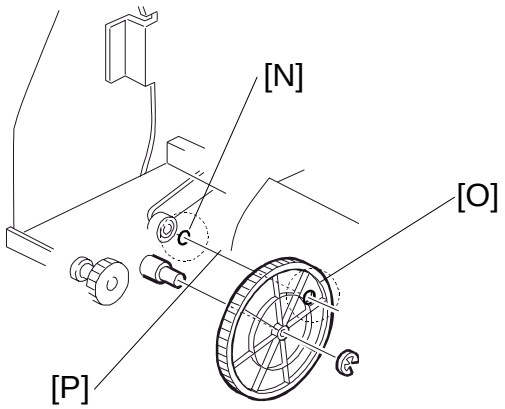


C232R507.WMF

12. Remove the bracket [J] (4 screws).
13. Remove the bearing [K].
14. Remove the torque limiter [L] (2 allen screws).



C232R506.WMF

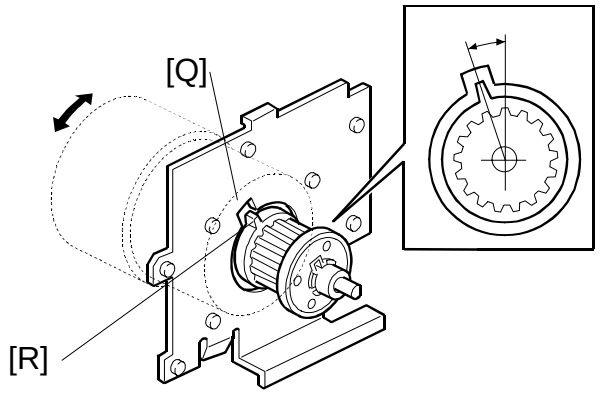


C232R508.WMF

15. Install the bracket [M]

CAUTION: Make sure that the positioning holes in the rear frame [N] and the drive gear [O] are in line [P] as shown. If the holes are in line, the paper exit pawl drive timing is OK. If they are not, make sure that the holes are in line again.

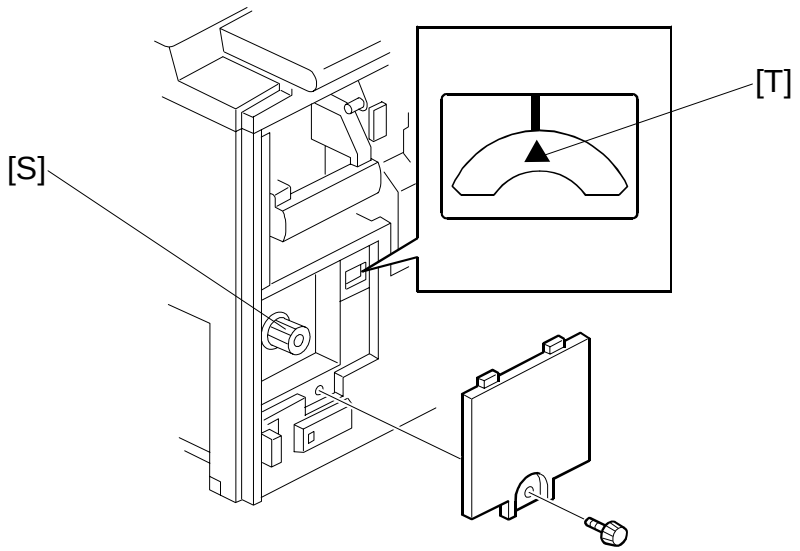
16. Install the bearing (removed in step 11) on the bracket.



C232R509.WMF

17. Align the cutout in the bracket [Q] with the pawl on the torque limiter [R] as shown.
18. Install the spring.

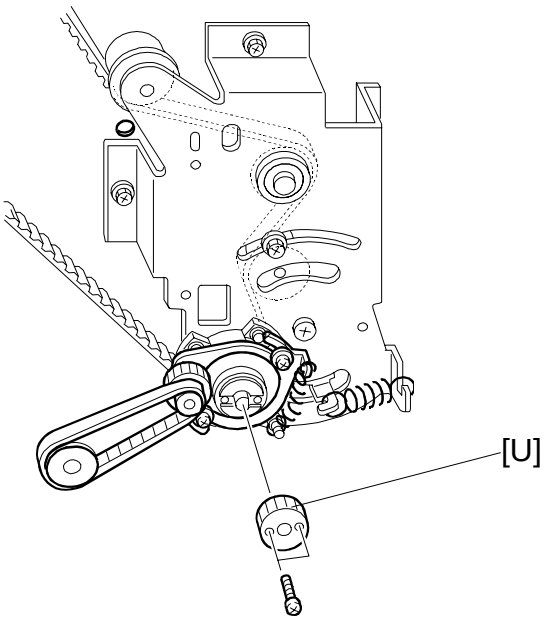
CAUTION: If the cutout and pawl are in line, the main motor drive timing is OK. If they are not, remove the spring, then make sure that the cutout and pawl are in line again.



C232R510.WMF

19. Install the timing belt and pulley bracket.

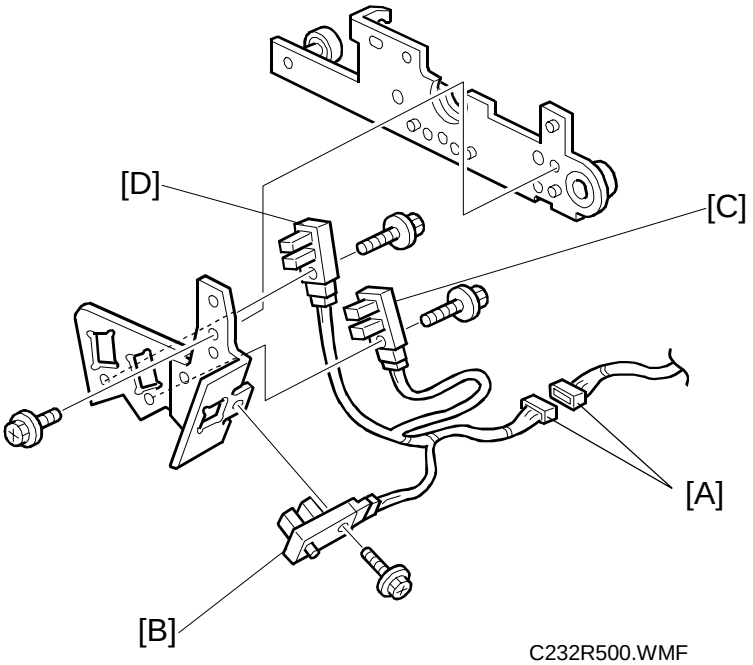
CAUTION: When you install the pulley bracket, adjust with the knob [S] until the line and arrow on the indicator disk are in line [T].



C232R504.WMF

20. Install the gear [U].
21. Install the wire protection cover.
22. Install the main motor control board.
23. Install the rear cover.
24. Remove the drum drive securing tool.

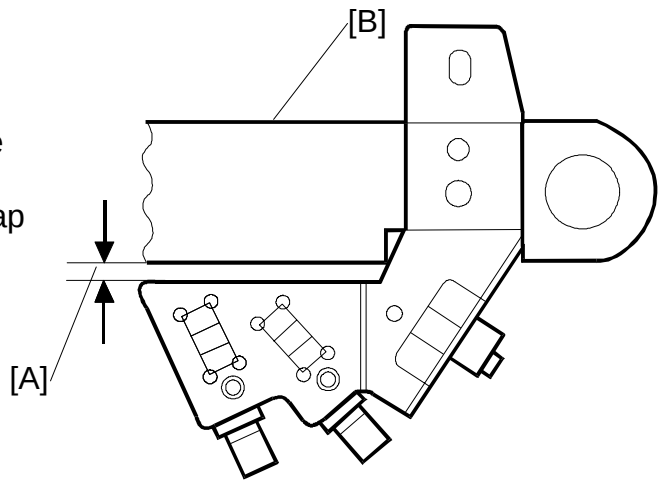
6.2.2 FEED START SENSORS AND FEED ENCODER



C232R500.WMF

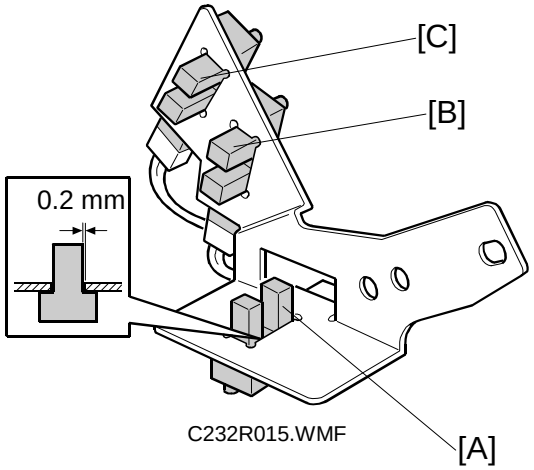
1. First, remove the pressure cylinder (see the C229 service manual).
2. From the rear of the machine, swing out the MPU.
3. Disconnect the connectors [A] from the rear of the machine.
4. Remove the feed encoder [B], paper table feed start sensor [C], and paper tray feed start sensor [D].

CAUTION: Check if there is a gap [A] between the sensor bracket and the printing pressure release arm [B]. There must be no gap or less than 0.2 mm.



C232R502.WMF

CAUTION: Make sure that the distance between the feed encoder sensor [A] and the sensor bracket is less than 0.2 mm.



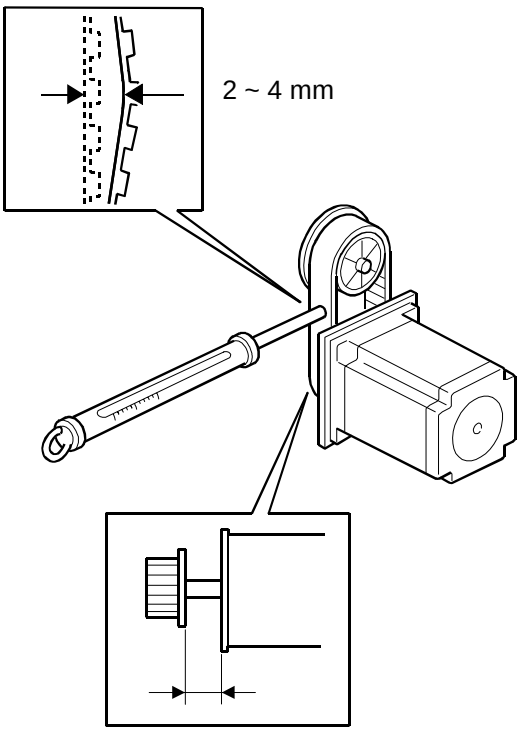
C232R015.WMF

B: Paper table feed start sensor

C: Paper tray feed start sensor

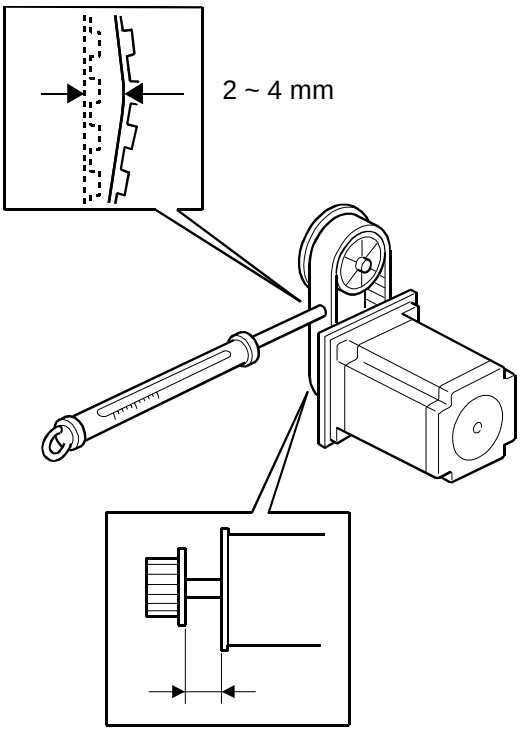
6.3 PAPER FEED SECTION (MAIN BODY)

6.3.1 TIMING BELT TENSION ADJUSTMENT FOR THE REGISTRATION MOTOR



1. Make sure that the distance between the motor and the flange is 8 ± 0.5 mm.
2. Apply a 500g load to the center of the belt using a tension gauge. Make sure that the belt deflects between 2 to 4 mm. If the tension is incorrect, move the motor up or down.

6.3.2 TIMING BELT TENSION ADJUSTMENT FOR THE PAPER TABLE FEED MOTOR



C232R014.WMF

1. Make sure that the distance between the motor and the flange is 5.5 ± 0.3 mm.
2. Apply a 500g load to the center of the belt using a tension gauge. Make sure that the belt deflects between 2 to 4 mm. If the tension is incorrect, move the motor up or down.

6.3.3 PAPER FEED LENGTH ADJUSTMENT

CAUTION: The last digits of the SP numbers for this adjustment are different from the C229 model. Please refer to the chart below and note the changes in the numbers.

C229: Pearl			C232: Ruby		
SP No.	**Display**	**Default**	**SP No.**	**Display**	**Default**
6-116-1	Paper Clamp Timing Pulse	143	6-116-1	Paper Clamp Timing Pulse	145
6-116-2	Regist Timing Pulse	113	6-116-2	Paper Clamp - Thick Paper	148
6-116-3	Feed Stop Timing Pulse	25	6-116-3	Paper Clamp Pls - A4 Cam	145
6-116-4	Regist Speed Ctl Pulse	20	6-116-4	Regist Timing Pulse	113
6-116-5	Paper Clamp – Thick Paper	150	6-116-5	Feed Stop Timing Pulse	21
6-116-6	Regist – Thick Paper	213	6-116-6	Print Position 2 Setting	103
6-116-7	Paper Clamp Pls – A4 Cam	143	6-116-7	Print Position 1 Setting	140

Paper Feed Motor Stop Timing Adjustment

For the Paper Feed Table

To ensure that the paper reaches the registration roller (main body) properly. Changing the paper feed motor stop timing with SP 6-116-5 changes the paper feed length for the paper feed roller.

CAUTION: Do not change SP6-110 and 6-111 (these change the paper feed start timing)

1. Turn on the main switch, then access the SP mode.
2. Enter SP6-116-5.
3. Increase or decrease the value on the display.
   NOTE: 1) Before changing the value, check the current setting, in case you need to recover the previous setting. (Default for SP6-116-5: “21”)
   2) Changing the value by +1 increases the paper feed motor’s on-time and feeds the paper an extra 0.3 mm.
4. Leave the SP mode, then check the paper feed performance. If the problem still occurs, repeat the above steps.

For the Paper Bank Unit - Tandem Tray/Tray 1

To ensure that the paper reaches the registration roller (main body) properly. Changing the paper feed motor stop timing with SP 6-142-1 or 6-142-6 changes the paper feed length for the paper feed roller.

CAUTION: SP6-142-6 is used for A3 paper only. SP6-142-1 is used for other sizes of paper.

1. Turn on the main switch, then access the SP mode.
2. Enter SP6-142-1 or 6-142-6.
3. Increase or decrease the value on the display.
   NOTE: 1) Before changing the value, check the current setting, in case you need to recover the previous setting. (Defaults for SP6-142-1 and 6-142-6: “14”)
   2) Changing the value by +1 increases the paper feed motor’s on-time and feeds the paper an extra 0.3mm.
4. Leave the SP mode, then check the paper feed performance. If the problem still occurs, repeat the above steps.

For the Paper Bank Unit - Tray 2

To ensure that the paper reaches the registration roller (main body) properly. Changing the paper feed motor stop timing with SP6-143-1 changes the paper feed length for the paper feed roller.

1. Turn on the main switch, then access the SP mode.
2. Enter SP6-143-1.
3. Increase or decrease the value on the display.
   NOTE: 1) Before changing the value, check the current setting, in case you need to recover the previous setting. (Default for SP6-143-1: "14")
   2) Changing the value by +1 increases the paper feed motor's on-time and feeds the paper an extra 0.3mm.
4. Leave the SP mode, then check the paper feed performance. If the problem still occurs, repeat the above steps.

Paper Clamping Timing Adjustment

For the Paper Feed Table

To ensure that the paper reaches the paper clamper on the pressure cylinder properly. Changing the paper clamping timing with SP6-116-1 (or 6-116-2) changes the paper feed length for the paper registration roller (main body).

CAUTION: Do not change SP6-112 to 6-115 (these change the registration motor start timing). In addition, do not change SP6-116-3, -4, -6 or -7.

1. Turn on the main switch, then access the SP mode.
2. Enter SP6-116-1 (or 6-116-2).
   NOTE: The paper clamping timing depends on the paper type selected at the operation panel. SP6-116-1 is the adjustment for normal paper only. For thick paper, use SP6-116-2. (Note that in thick paper mode, paper clamping is not done.)
3. Increase or decrease the value on the display.
   NOTE: 1) Before changing the value, check the current setting, in case you need to recover the previous setting. (The default for SP6-116-1 is “145”, and for SP6-116-2 it is “148”.)
   2) Changing the value by +1 decreases the registration motor’s on-time and feeds the paper 0.3 mm less.
4. Leave the SP mode, then check the paper feed performance. If the problem still occurs, repeat the above steps.

For the Paper Bank Unit – Tray 1/Tandem Tray

To ensure that the paper reaches the paper clamper on the pressure cylinder properly. Changing the paper clamping timing with SP6-151-1 changes the paper feed length for the paper registration roller (main body).

CAUTION: Do not change SP6-144 to 6-150 (these change the registration motor start timing). In addition, do not change SP6-151-3.

1. Turn on the main switch, then access the SP mode.
2. Enter SP6-151-1.

NOTE: From the paper tray (see the previous page), paper clamping timing depends on the paper type selected at the operation panel. However, the paper bank unit takes normal paper only, so there is only one SP mode (it is for normal paper only).

3. Increase or decrease the value on the display.
   NOTE: 1) Before changing the value, check the current setting, in case you need to recover the previous setting. (Default for SP6-151-1: “145”)
   2) Changing the value by +1 decreases the registration motor’s on-time and feeds the paper 0.3 mm less.
4. Leave the SP mode, then check the paper feed performance. If the problem still occurs, repeat the above steps.

For the Paper Bank Unit – Tray 2

To ensure that the paper reaches the paper clamper on the pressure cylinder properly. Changing the paper clamping timing with SP6-151-2 changes the paper feed length for the paper registration roller (main body).

CAUTION: Do not change SP6-144 to 6-150 (these change the registration motor start timing). In addition, do not change SP6-151-3.

1. Turn on the main switch, then access the SP mode.
2. Enter SP6-151-2.

NOTE: From the paper tray (see the previous page), paper clamping timing depends on the paper type selected at the operation panel. However, the paper bank unit takes normal paper only, so there is only one SP mode (it is for normal paper only).

3. Increase or decrease the value on the display.
   NOTE: 1) Before changing the value, check the current setting, in case you need to recover the previous setting. (Default for SP6-151-2 “145”)
   2) Changing the value by +1 decreases the registration motor’s on-time and feeds the paper 0.3mm less.
4. Leave the SP mode, then check the paper feed performance. If the problem still occurs, repeat the above steps.

7. POINT TO POINT DIAGRAM

7.1 DETAILS

Main Body

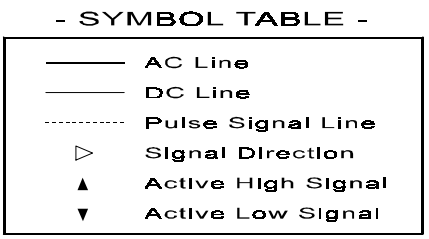
- Location Map
- Section A
- Section B
- Section C
- Section D
- Section E
- Section F

Paper Bank

- Location Map
- Section A
- Section B
- Section C
- Section D

Paper Delivery Table

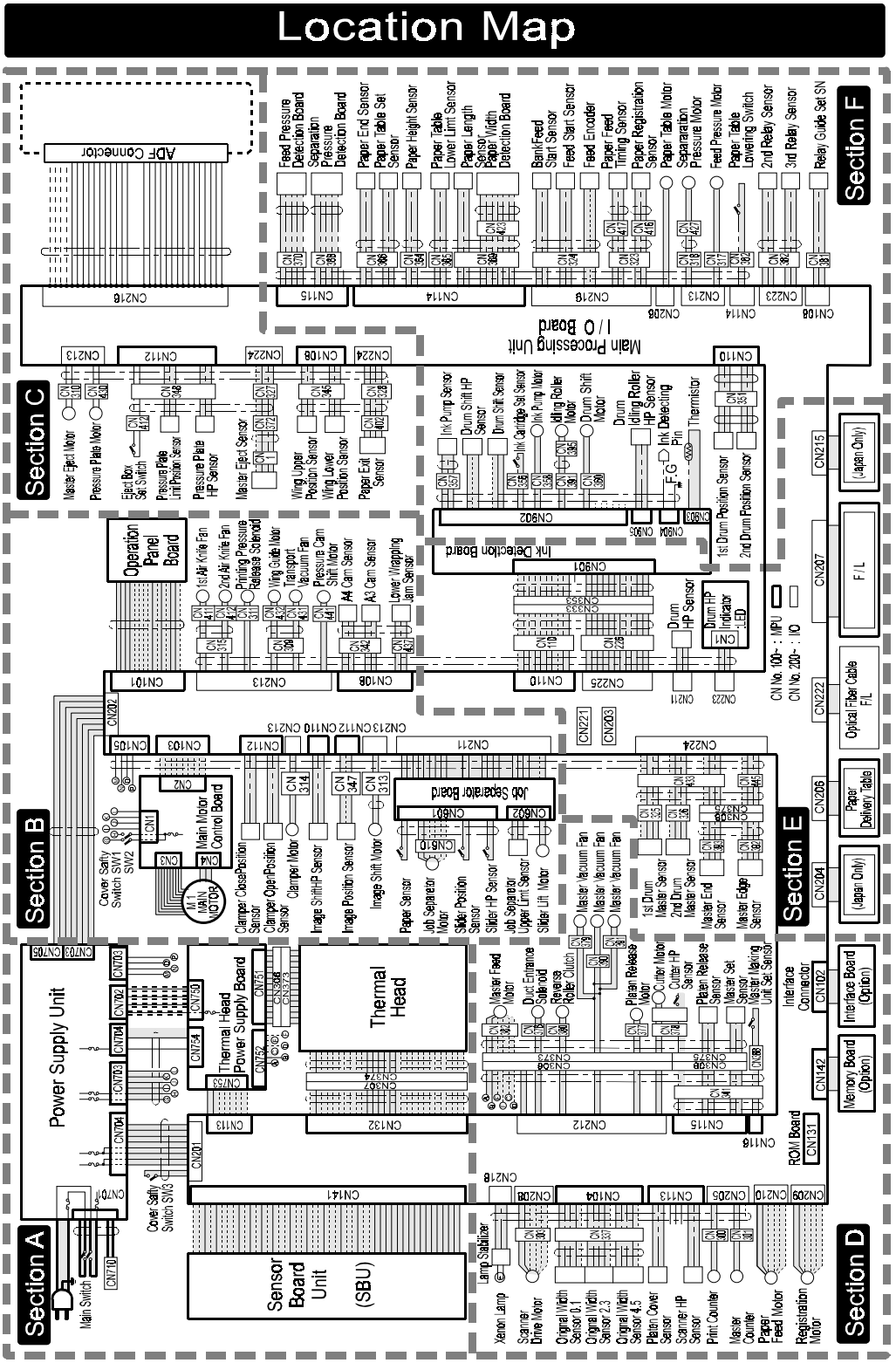
NOTE: The symbols used in the diagrams are as follows:



PP2.WMF

7.2 MAIN BODY

7.2.1 LOCATION MAP



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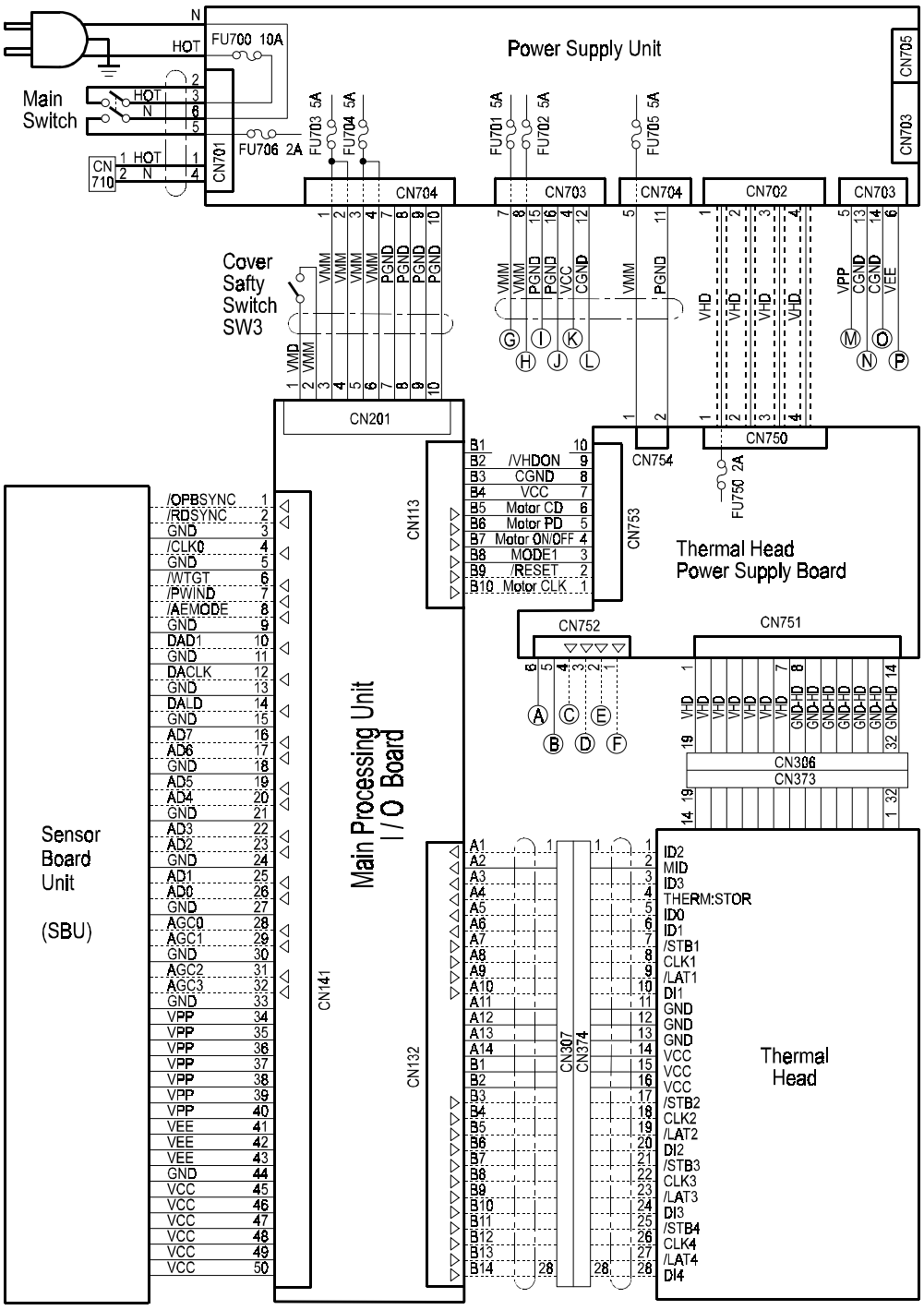
7.2.2 SECTION A

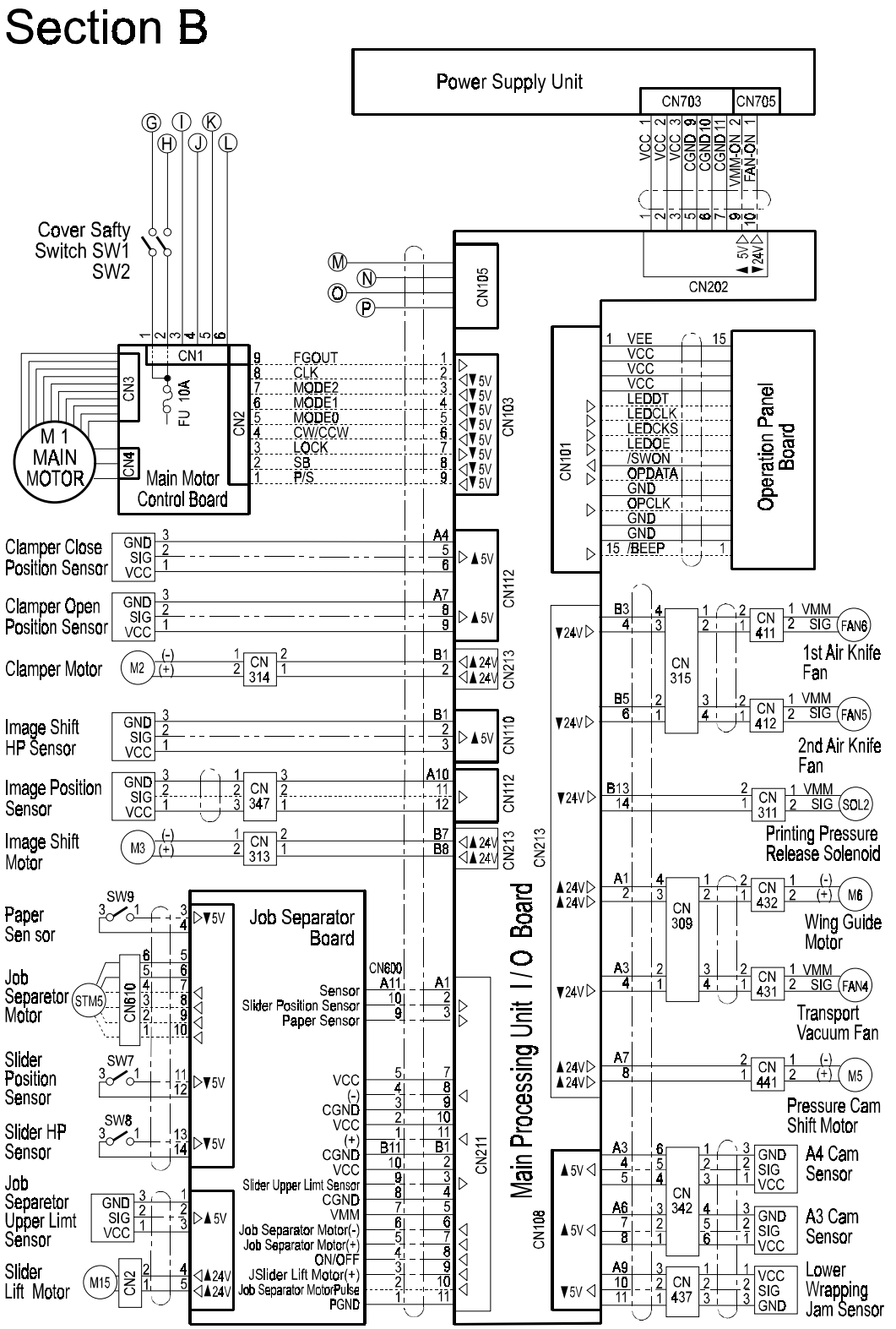
Section A



C232S501.WMF

P to P

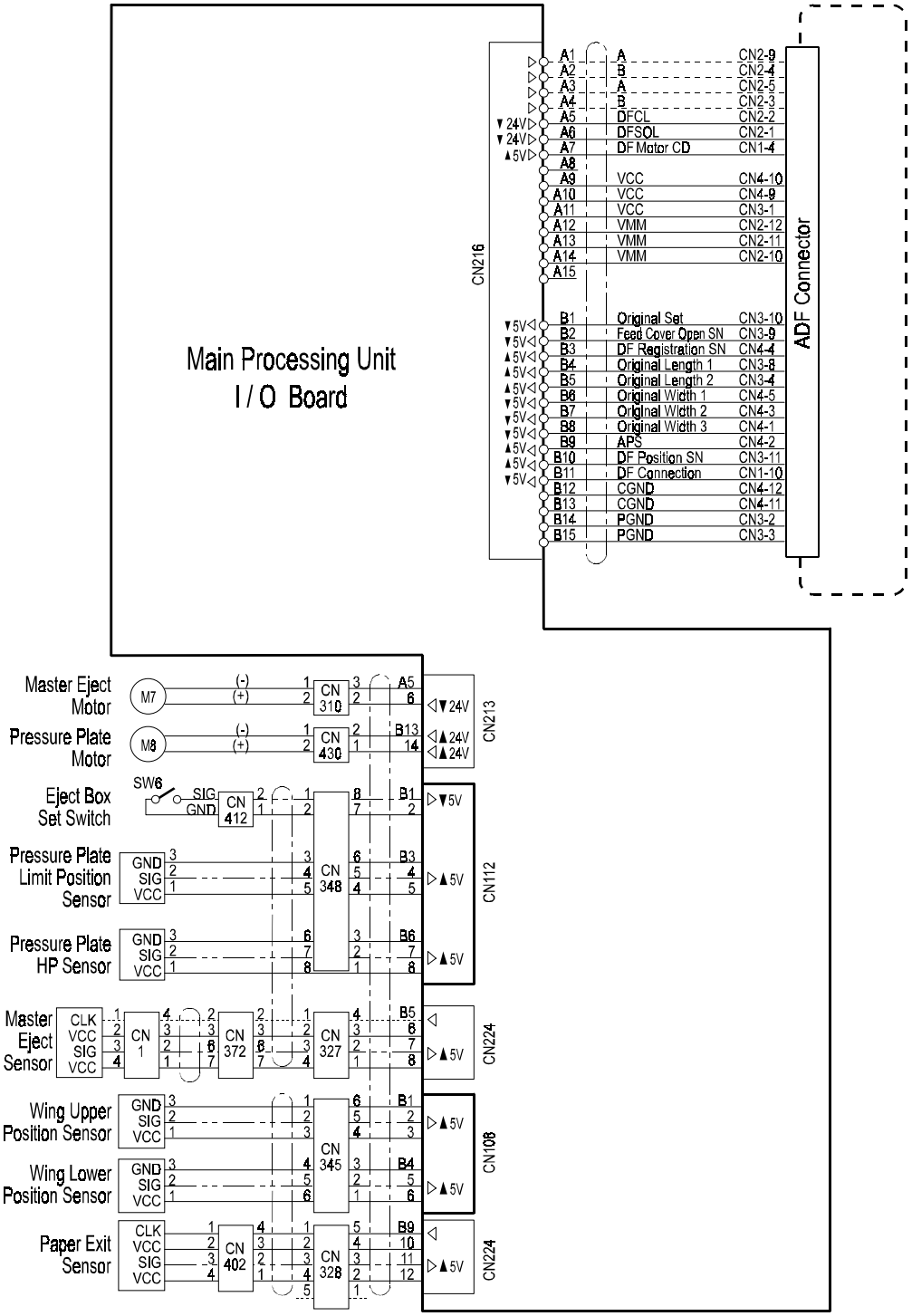
7.2.3 SECTION B



C232S502.WMF

7.2.4 SECTION C

Section C

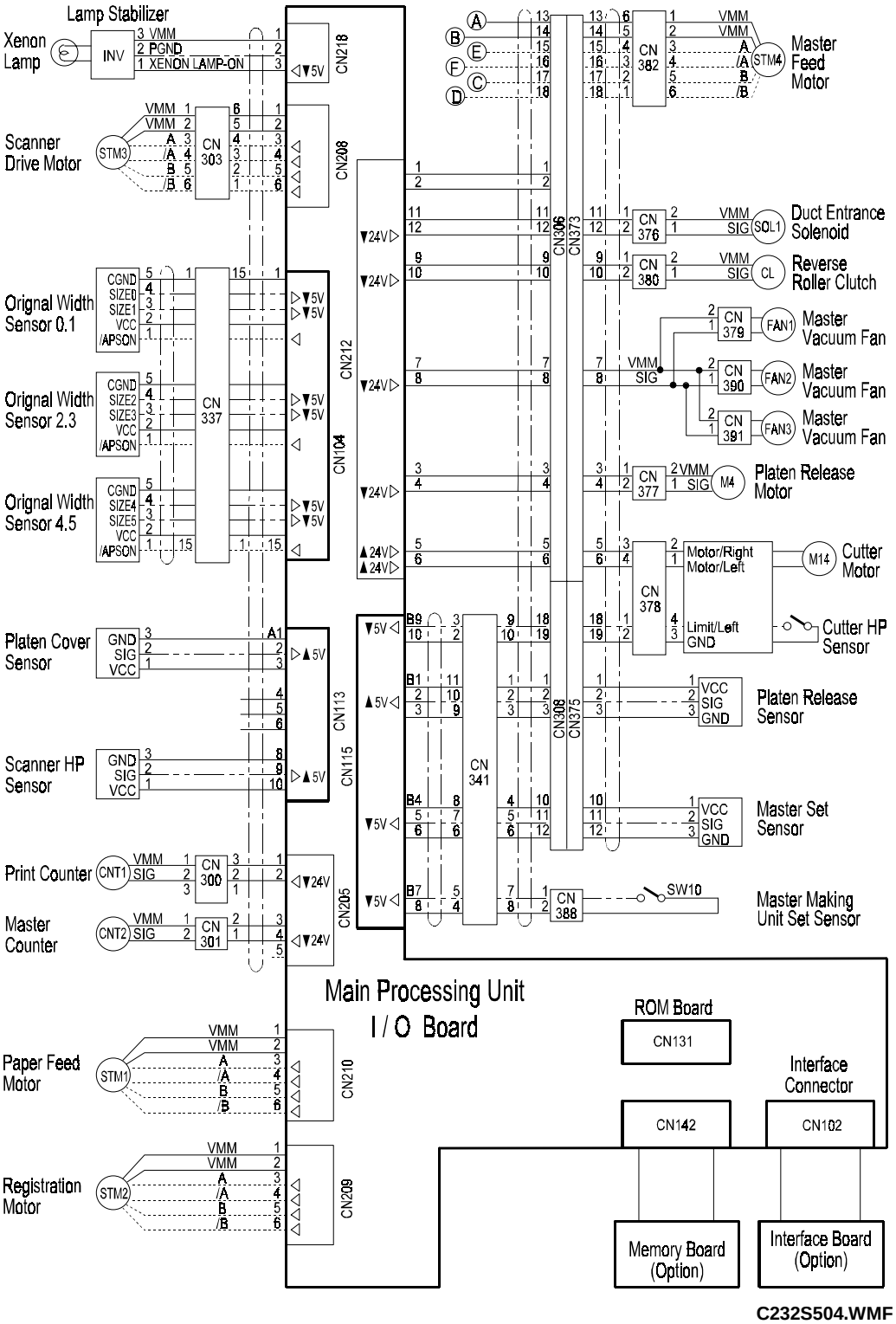


C232S503.WMF

P to P

7.2.5 SECTION D

Section D



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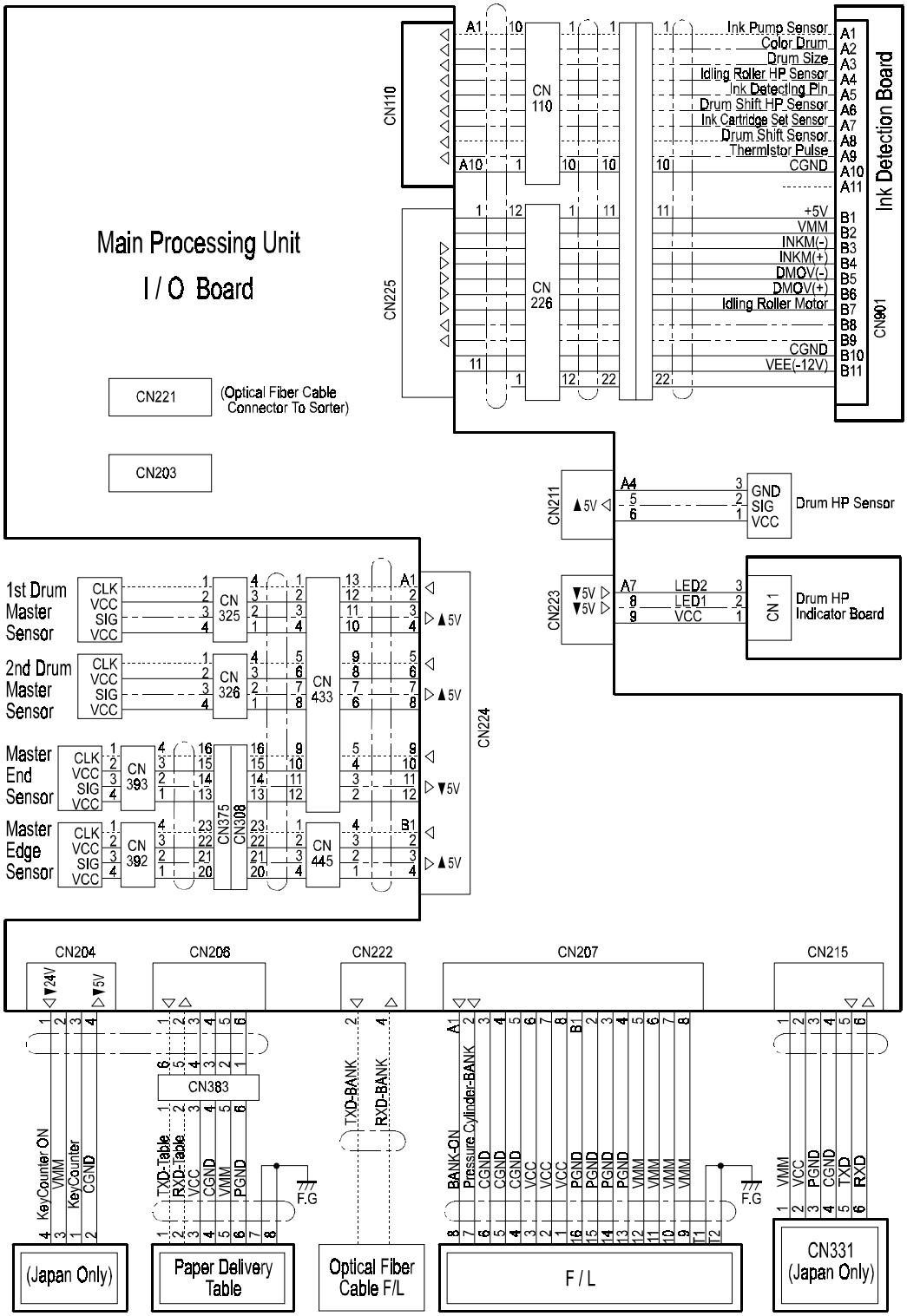
7.2.6 SECTION E

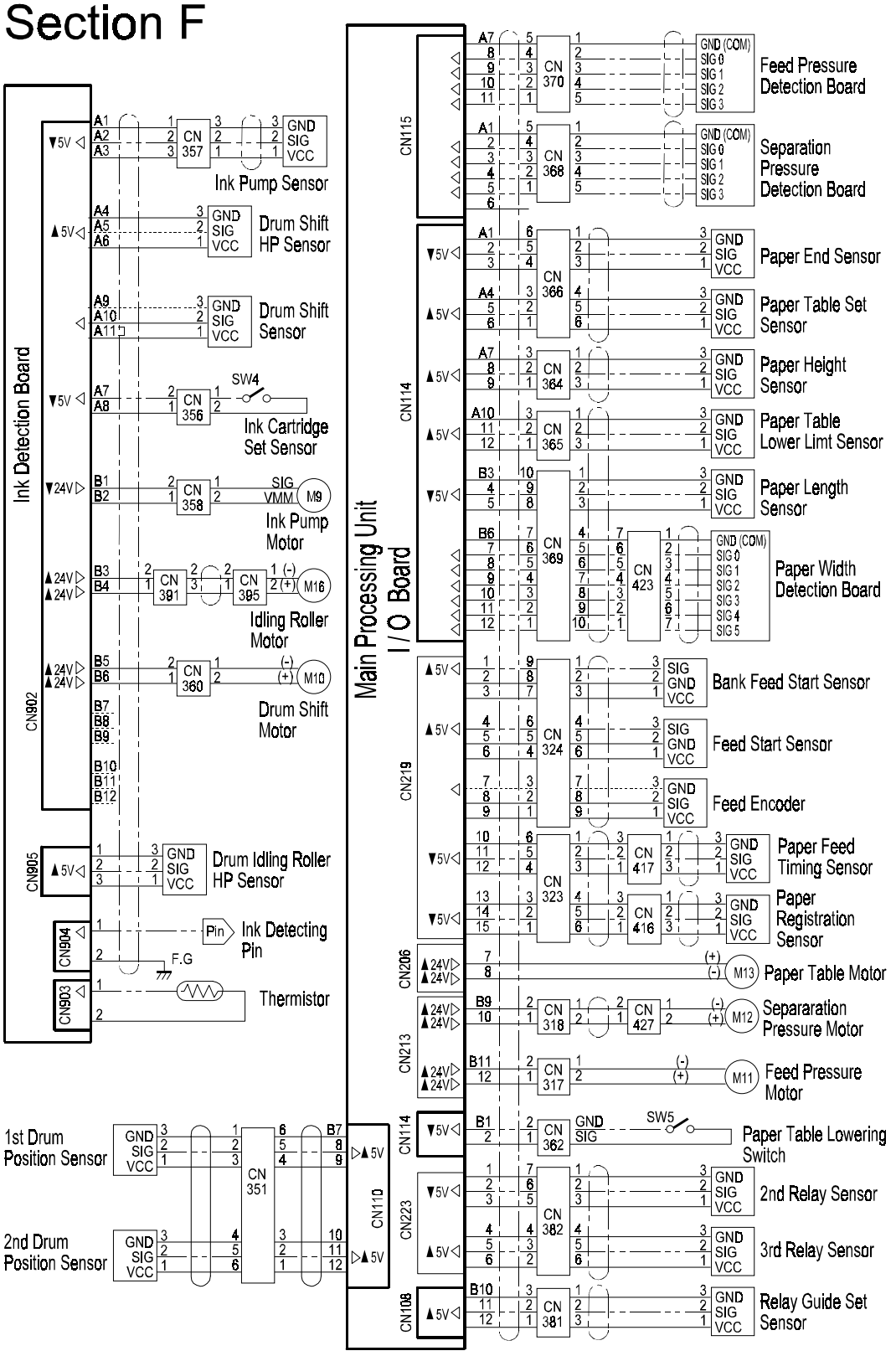
Section E



C232S505.WMF

P to P

7.2.7 SECTION F



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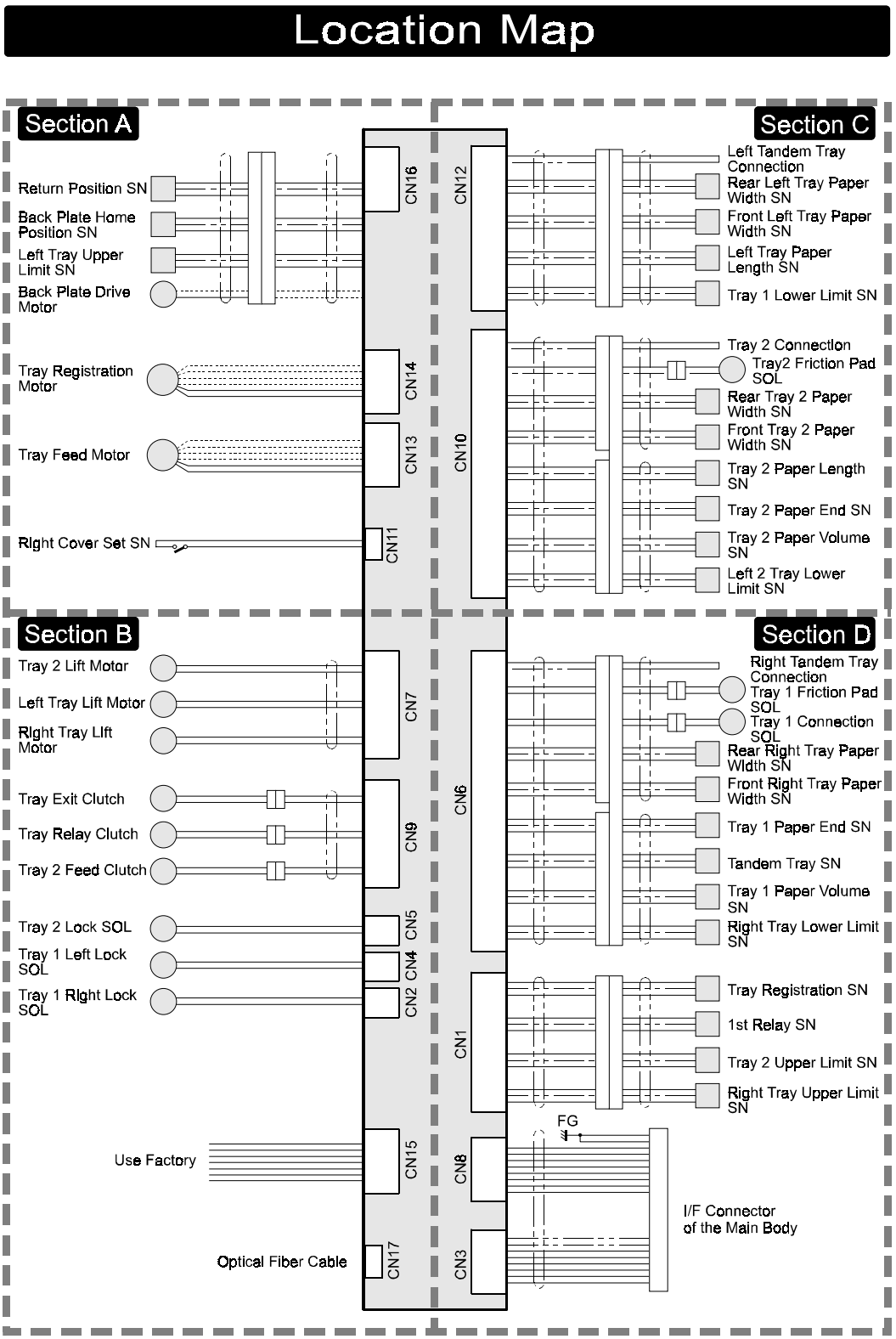
7.3 PAPER BANK

7.3.1 LOCATION MAP



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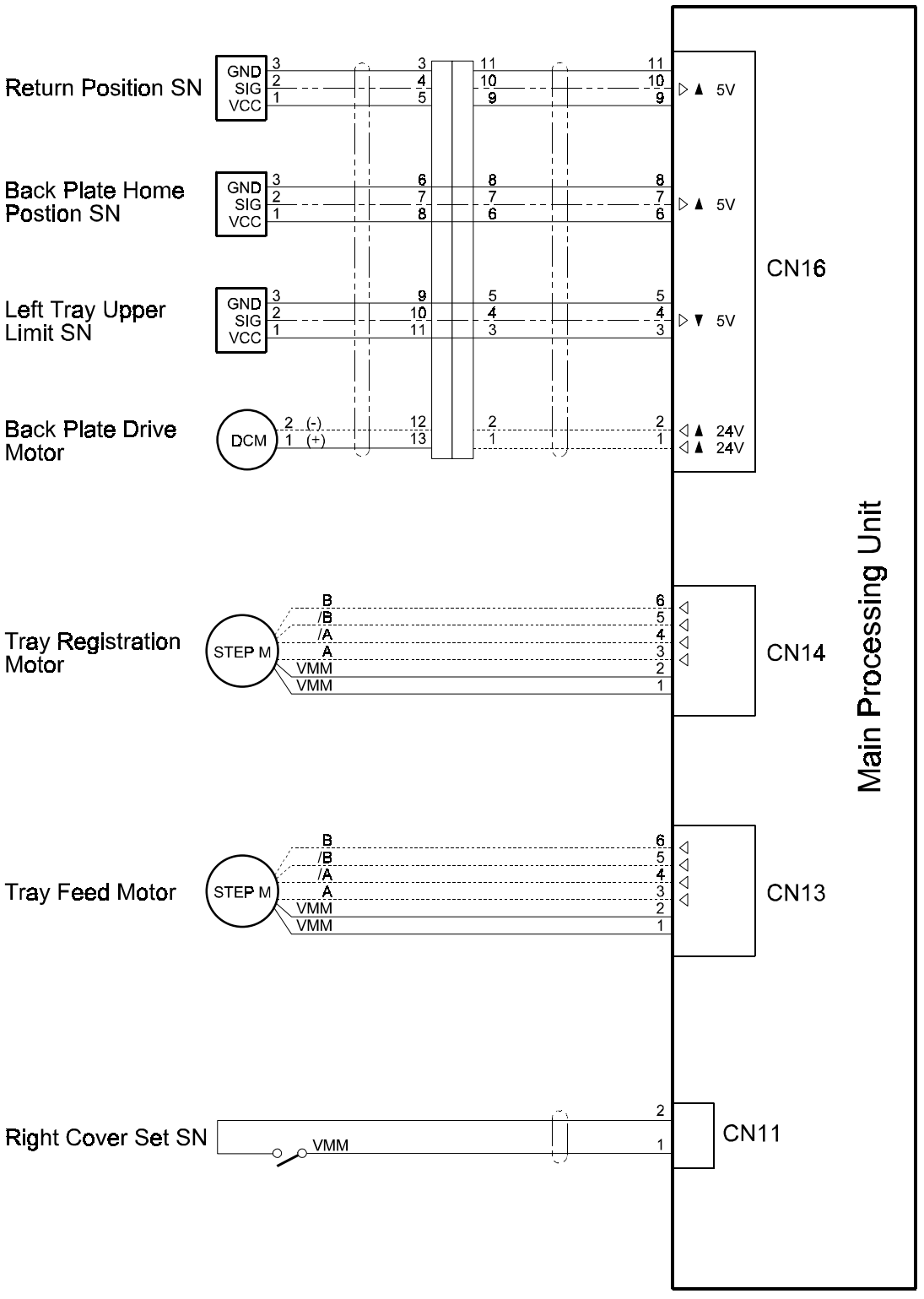
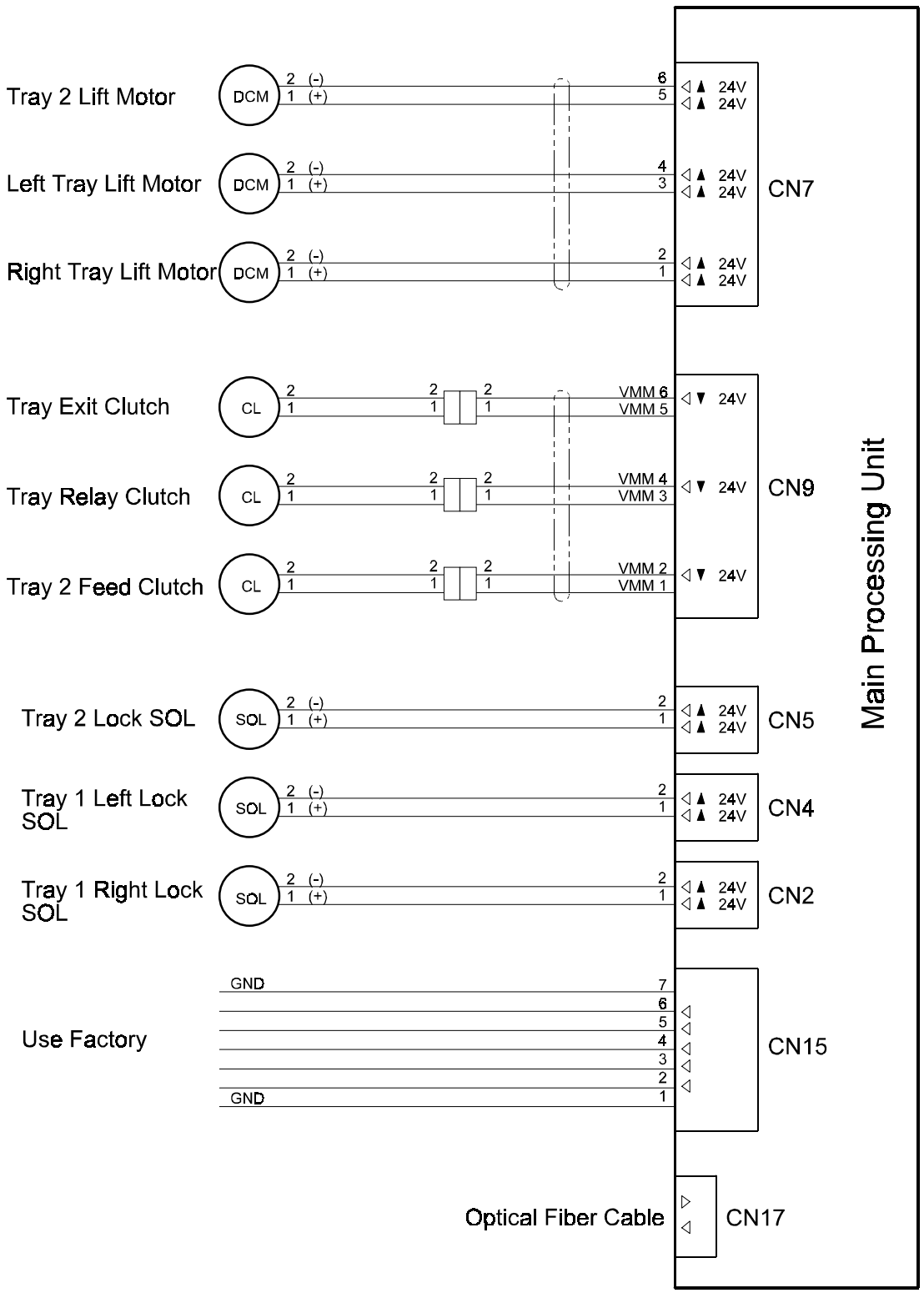
7.3.2 SECTION A



C232S508.WMF

7.3.3 SECITON B



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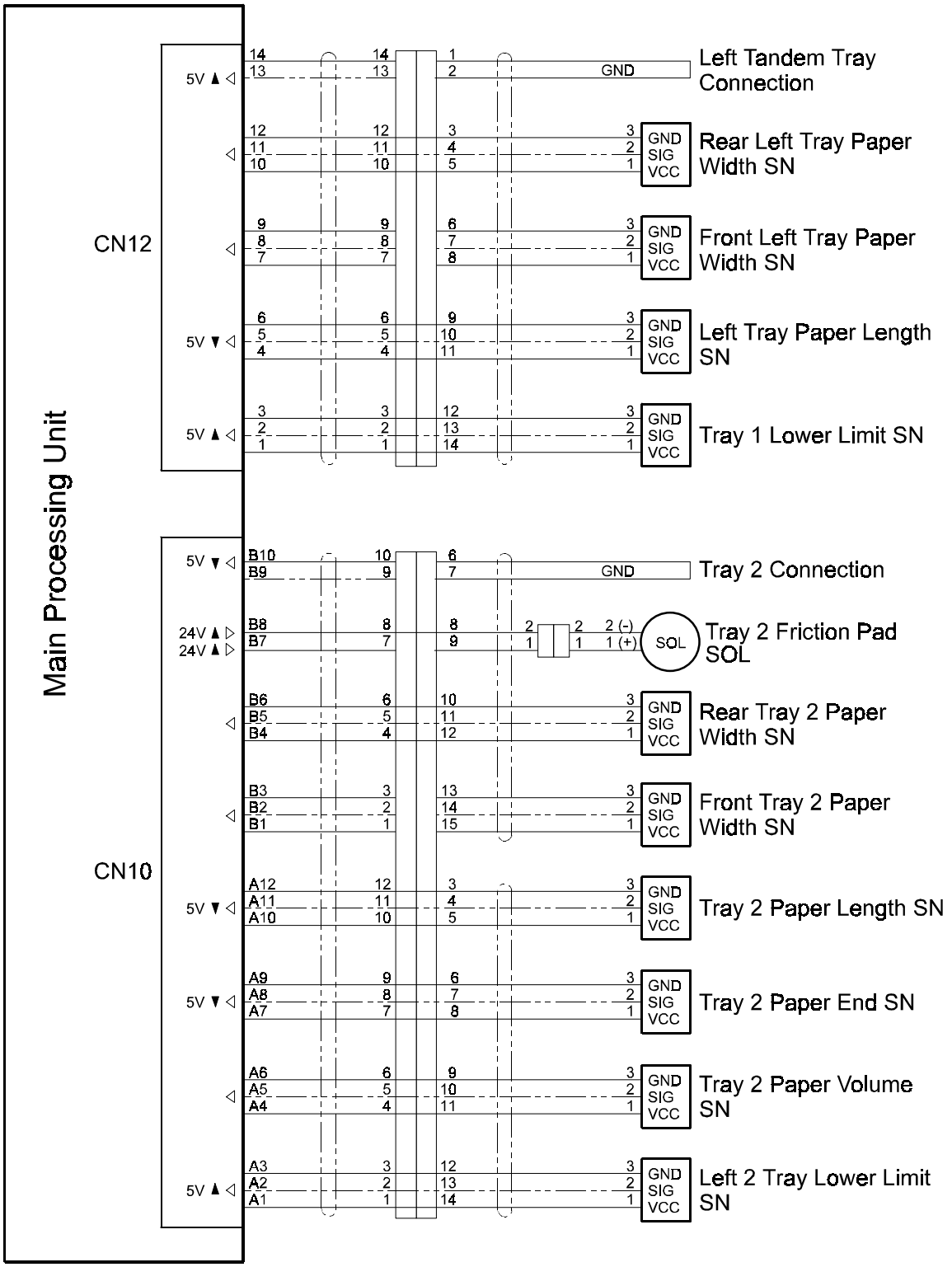
P to P

7.3.4 SECTION C

Section C



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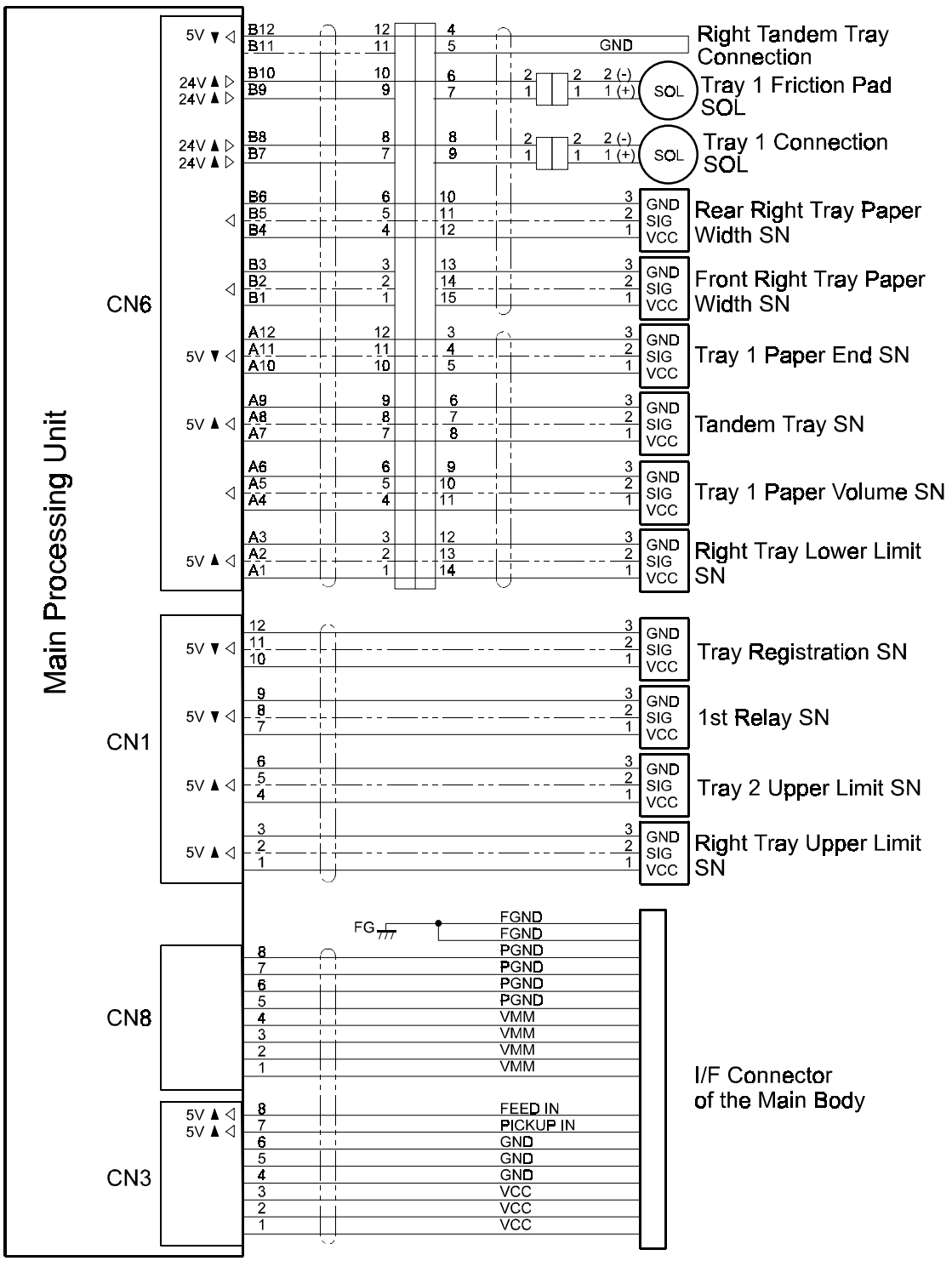
7.3.5 SECTION D

Section D



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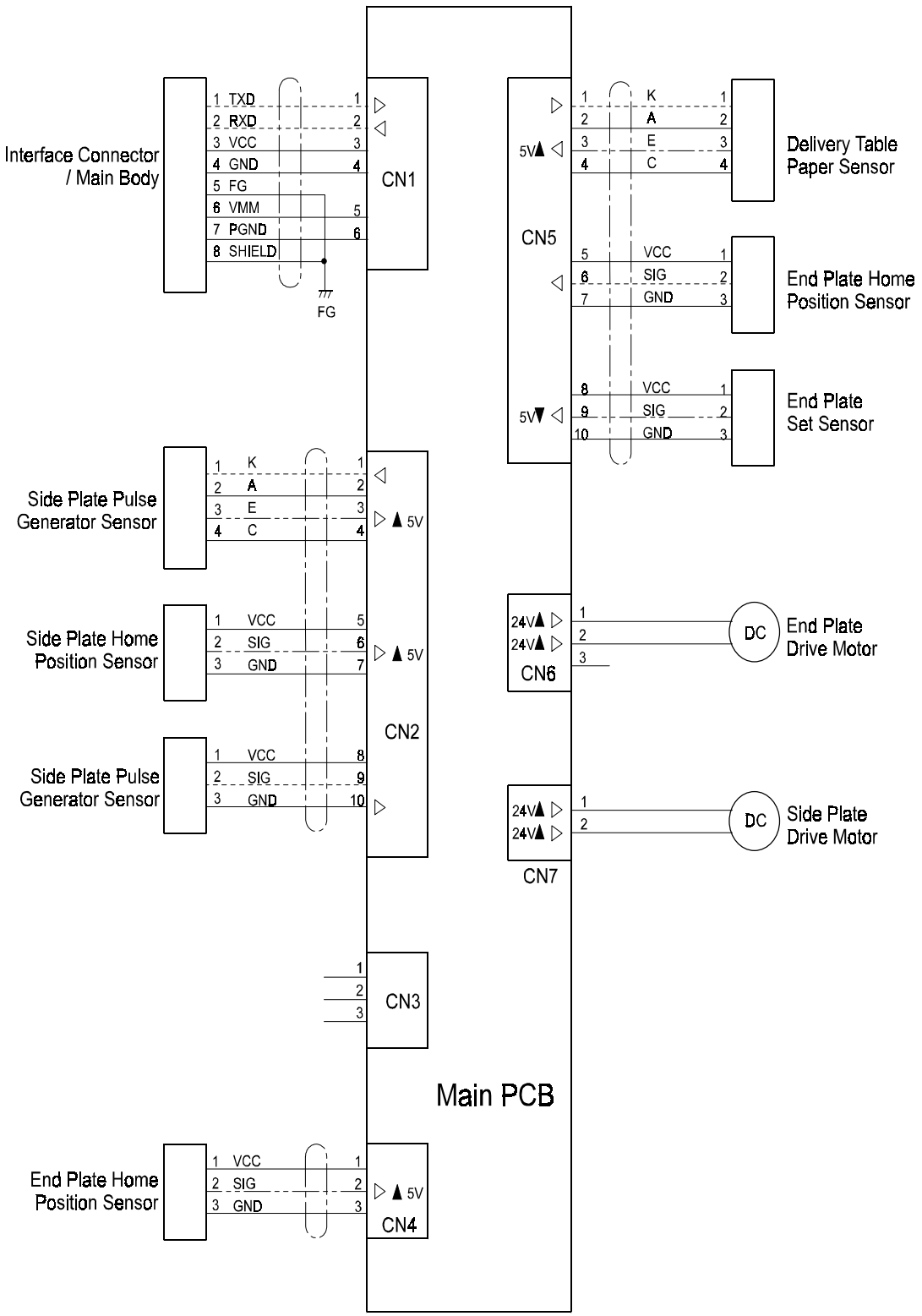
P to P

7.4 PAPER DELIVERY TABLE



C232S512.WMF