

RC TECHNICAL MANUAL

- 1 RC 4000
- 2 RC 4500 / 5600 / 5600D
- 3 RC 5800
- 4 RC 6300

RC4000

TECHNICAL MANUAL

VERSION 1.0
NOVEMBER, 1991

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— PREFACE —

This manual provides Technical Service Information for RISOGRAPH Model RC4000 duplicators, which you are kindly advised to use together with "RC4500/5600/5600D Technical Manual".

This manual is published as a reference guide for use by RISO Group (RISO Kagaku Corp./RISO, INC./RISO EUROPE Ltd.) Certified Technical Representatives experienced in duplicator repair.

This manual also provides procedures for removing and installing major components, and following these procedures will minimize machine malfunctions. This information and format will also increase technical representatives' awareness and experience regarding repairs necessary to insure end-user satisfaction.

If in need, please contact the followings. _____

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NOTE: Before attempting to correct machine malfunctions, study the Technical Manual and make sure all questions and/or concerns have been satisfied.
If necessary, please use the Technical Hotline:

TECHNICAL HOTLINE

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(Technical Help Information only)

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I. SPECIFICATIONS

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1. RC4000

- Master-making system: High-speed Digital Scanning and Thermal Screening system
- Printing system: Automatic Stencil Duplicating system
- Image scanning system: Fixed-scanner & Original-feed system
- Original type: Sheets
- Original size: Maximum/A3(297mm × 431mm) size(11.7" × 17")
Minimum/A6(100mm × 148mm) size(4" × 5.8")
- Paper size: Maximum/A3(297mm × 431mm) size (11.7" × 17")
Minimum/A6(100mm × 148mm) size(4" × 5.8")
- Paper weight: Maximum/210 g/m² (115.8 lbs Index)
Minimum/46 g/m² (12.4 lbs Bond)
- Print area: Legal Drum/208 × 350 mm (8.2" × 13.7")
A4 Drum/208 × 290 mm
B4 Drum/245 × 350 mm
- Print speed: Selectable/5-speed positions
(50, 60, 80, 100, 120 copies/min.)
- First copy time: A4 (8.3" × 11.7") original size/About 21 sec. (size-to-size)
- Print position adjustment: Vertical positioning/±20 mm
Horizontal positioning/±20 mm
[±5 mm for A3 (11.7" × 17") paper]
[±10 mm for A6 (4" × 5.8") paper]
- Scanning resolution: 400 dots/inch in vertical direction
300 dots/inch in horizontal direction
* Line and photograph modes changeable
- Maximum paper capacity: 1000 sheets
[Based on 64 g/m² (17 lbs Bond) paper]
- Machine dimensions: In storage/ 650(W) × 631(D) × 589(H) mm
25.6" × 24.9" × 23.2"
In use/ 1360(W) × 631(D) × 589(H) mm
53.6" × 24.9" × 23.2"

SPECIFICATIONS

1. RC4000

2. Supplies

- Machine weight: 88 kg (194 lbs)
- Power requirements: 220 to 240 VAC, 50/60 Hz, 3A
90 to 132 VAC, 50/60 Hz, 3.5A
- Reduction percentages: Size-to-size/ 100%
Reduction/ 64% (U.S.)
71% (other than U.S.)
- Original mode selection: Line-copy, Photograph
- Auxiliary function: Confidential, Two-up function, Memory program, Automatic idling, ADF
- Liquid crystal display: 240 × 64 dot graphic display (with self-diagnosis function)
- Color change: Cartridge-type drum replacement
6 colors/black, red, blue, green, brown, and yellow

2. Supplies

(1) **Ink:** Risograph RC Ink (Emulsion type)

- Capacity: 1000 cc
- Ink bottle: Cylinder following piston method
- Color: 6 color/ black, red, blue, green, brown, and yellow
- Ink package unit: Two bottles per box, five boxes per carton

(2) **Master:** Risograph RC Master 55

- Length: Approx. 100m (328 ft.)
Legal drum/ About 200 masters
A4 drum/ About 232 masters
B4 drum/ About 200 masters
- Width: Legal/227 mm (8.9")
A4/ 227 mm
B4/ 270 mm
- Master package unit: Two master rolls per box, 10 boxes per carton

II. IMAGE SCANNER & THERMAL PRINT HEAD

CONTENTS

[Removal Procedures & Precautions for Installation]

- 1. Image Scanner Unit II-1
- 2. Thermal Print Head II-2

[Adjustment Procedures]

- 1. Thermal Power of Thermal Print Head III-3

[Removal Procedures & Precautions for Installation]

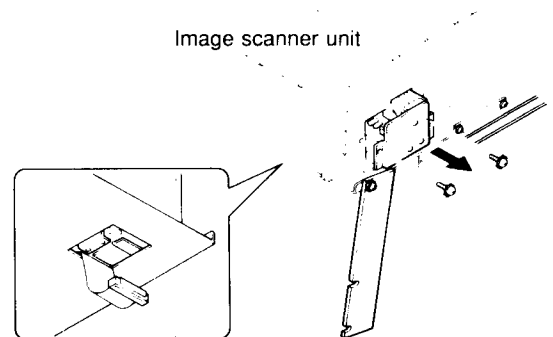
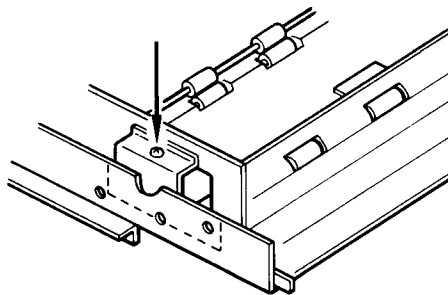
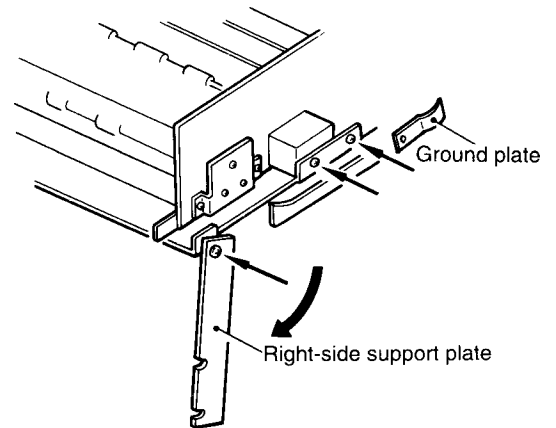
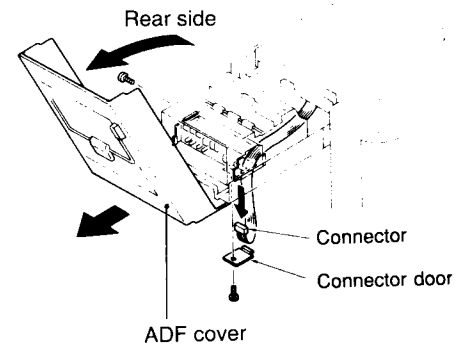
1. Image Scanner Unit

- Removal Procedures -

- 1) Slide the Image scanning section towards the paper feed side and open the ADF cover.
- 2) Loosen the screw on the Connector door on the bottom of the ADF section and slide the door off.
- 3) Disconnect the connector coming into the Image scanner unit.
- 4) Remove the mounting screw of the Ground plate and loosen the other 3 mounting screws on the right-side support plate on the front panel side. Then remove the Ground plate and unhook the plate from the screws to let it hang free.
- 5) Remove the screw securing the Image scanner unit to the mounting plate on the rear side (opposite to the operation panel).
[This screw is accessed from above the Image scanner.]
- 6) Remove the two screws securing the mounting plate of the Image scanner unit on the front panel side.
- 7) Slide the Image scanner unit slowly towards the front panel side out of the ADF unit, taking care not to catch the wire harness underneath.

- Precautions for Installation -

- When sliding the Image scanner back in, be sure the Image scanner wire harness is out of the way.



REMOVAL & INSTALLATION

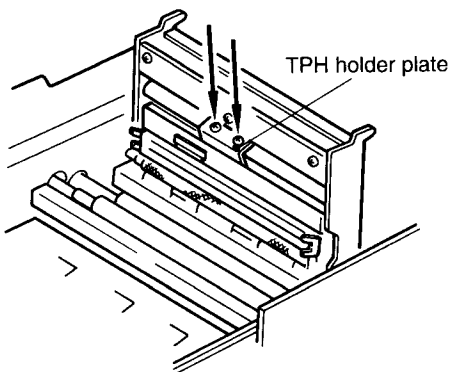
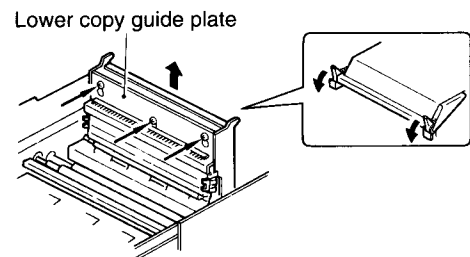
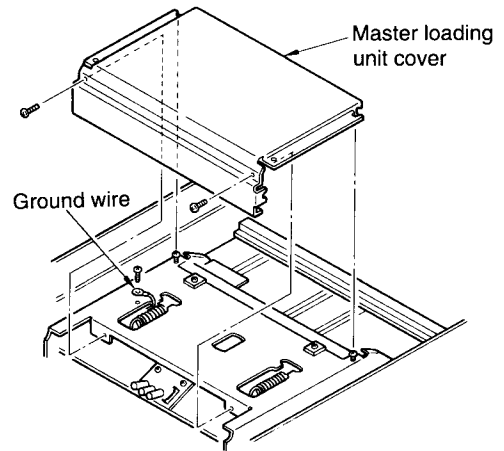
2. Thermal Print Head

2. Thermal Print Head

- Removal Procedures -

- 1) Slide the Image scanning section towards the paper feed side.
- 2) Remove the Master loading unit cover by loosening 2 screws on the top and removing 2 screws on the front side.
- 3) Remove the screw securing the ground wire from the Thermal print head.
- 4) Release the Master loading unit from locks by pulling down the release levers.
- 5) Loosen the 3 mounting screws of the Lower copy guide plate and slide the plate off the Master loading unit.
- 6) Remove 2 screws on the TPH holder plate, holding the Thermal print head from under not to let it slip down.
- 7) Disconnect the connectors (2 or 3 pcs.) coming into the Thermal print head.
- 8) Take out the Thermal print head slowly, taking care not to give it any hits.

- * Be careful not to damage the heating area of the Thermal print head.
- * Take extra precautions not to allow any static electricity to pass through the connectors on the Thermal print head when removed. It will damage the Thermal print head.



[Adjustment Procedures]

1. Thermal Power of Thermal Print Head

- Check & Adjustment -

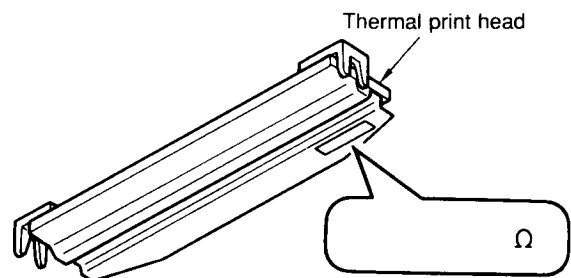
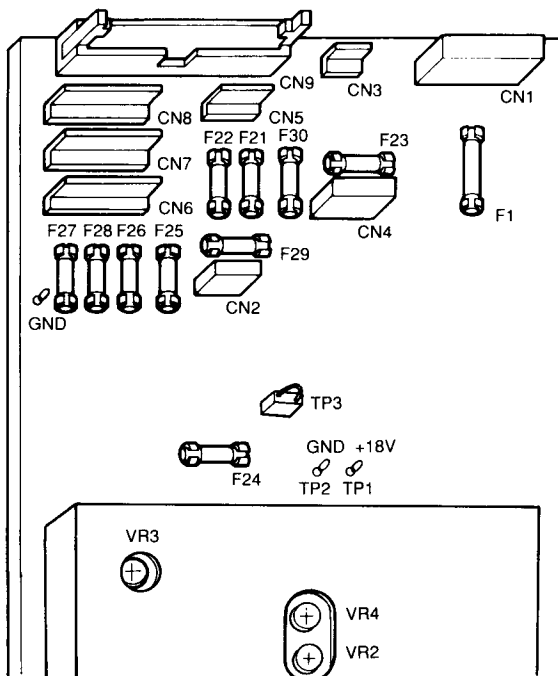
- 1) Turn off the power if it is on.
- 2) Remove the Front right cover.
- 3) Connect the positive terminal of the voltmeter to **TP1 (+18V)** and the negative one to **TP2 (GND)** on the **Power supply PCB**.
- 4) Remove the jumper connector from **TP3** on the **Power supply PCB**.
- 5) Turn on the power and check if the voltage value indicated on the voltmeter is $20.0 \pm 0.1V$ (for 3-connector Thermal print head) or $21.8 \pm 0.1V$ (for 2-connector one).
- 6) If not, adjust the voltage to the above-mentioned value with **VR4** (for wide-range adjustment) and **VR2** (for short-range one) on the **Power supply PCB**.
- 7) Next, to check the thermal pulse setting, remove the Original feed table cover and locate **SW3** and **SW4** on the **Image Processing PCB**.
- 8) Read the value of resistance labeled on the Thermal print head and check if the setting of SW3 and SW4 are correct, referring to the correlation table on the next page.
[**Chart 1** for 3-connector Thermal print head & **Chart 2** for 2-connector one]
- 9) If they are not set correctly, reset **SW3** for **HP1** and **SW4** for **HP2**.

[Note]

Never forget to put back the jumper connector to **TP3** after the voltage adjustment.

- Results of Misadjustment -

- 1) If the heating time for **HP2** is too short (not enough heat); ➡
thin horizontal lines can not be reproduced clearly.
- 2) If the heating time for **HP1** is too long (too much heat); ➡
the solid print image will be deformed and the Thermal print head may be damaged.



ADJUSTMENT PROCEDURES

1. Thermal Power of Thermal Print Head

Correlation Charts

[Chart 1]

- For 3-connector -

Resistance value R(Ω)	Switch setting	
	SW3	SW4
1570 - 1573	9	A
1574 - 1609	A	B
1610 - 1630	B	C
1631 - 1662	9	A
1663 - 1694	A	C
1695 - 1715	8	A
1716 - 1750	9	B
1751 - 1760	A	C
1761 - 1768	7	9
1769 - 1803	8	B
1804 - 1828	9	C
1829 - 1856	7	A
1857 - 1874	8	B
1875 - 1900	9	D
1901 - 1909	6	A
1910 - 1945	7	B
1946 - 1974	8	C
1975 - 1998	6	A
1999 - 2033	7	B
2034 - 2050	8	D
2051 - 2086	6	B
2087 - 2121	7	C
2122 - 2130	8	D

[Chart 2]

- For 2-connector -

Resistance value R(Ω)	Switch setting	
	SW3	SW4
1505 - 1521	8	9
1522 - 1561	9	A
1562 - 1571	A	B
1572 - 1576	7	8
1577 - 1611	8	9
1612 - 1638	9	A
1639 - 1666	7	9
1667 - 1701	8	A
1702 - 1705	9	B
1706 - 1713	6	8
1714 - 1756	7	9
1757 - 1772	8	B
1773 - 1806	6	9
1807 - 1838	7	A
1839 - 1861	5	8
1862 - 1896	6	9
1897 - 1904	7	A
1905 - 1916	4	8
1917 - 1952	5	9
1953 - 1970	6	A
1971 - 2007	4	8
2008 - 2035	5	B

III. DATA

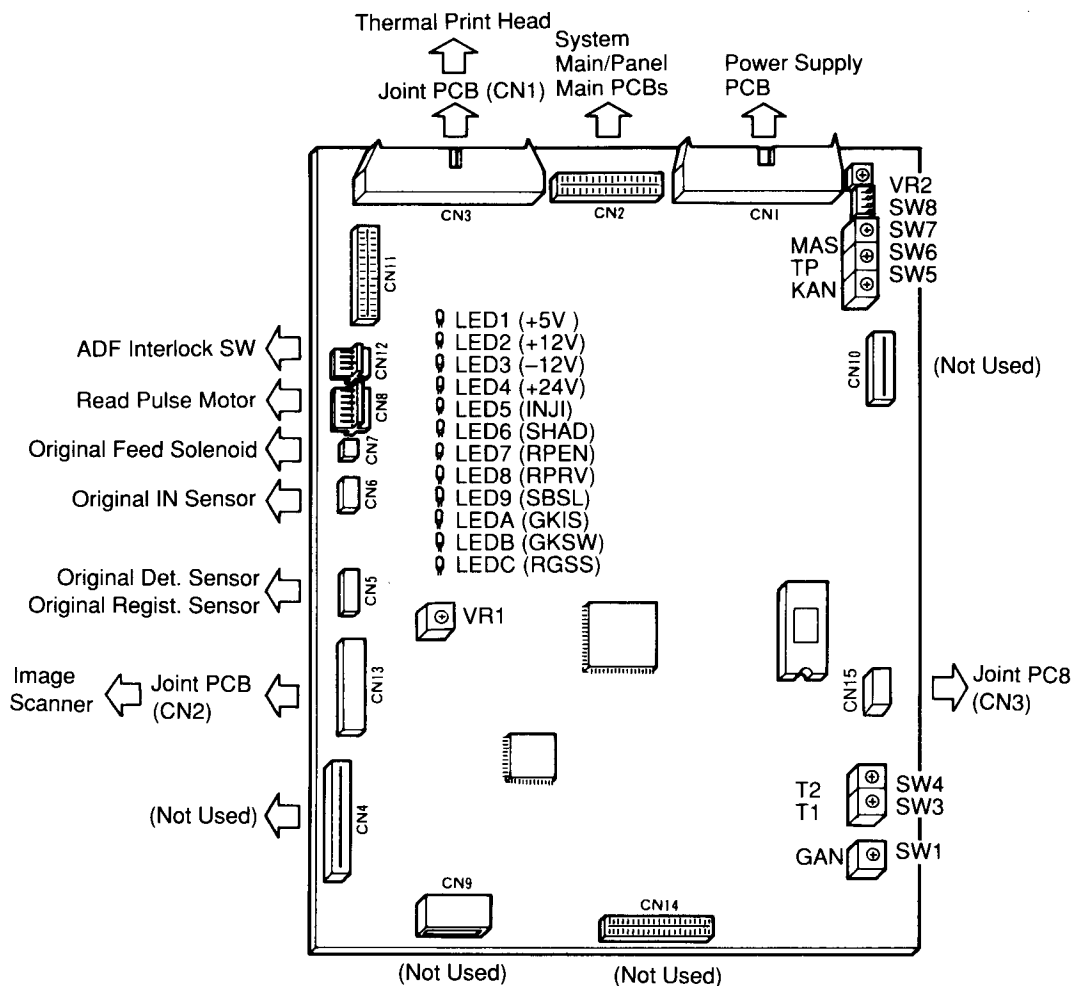
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1. Description of PCBs

1. Image Processing PCB III (GA)	III-1
2. System Main PCB II	III-3
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4. Panel Main PCB	III-10
5. Power Supply PCB	III-13

1. Description of PCBs

1. IMAGE PROCESSING PCB III (GA)



LED

- When LED is ON -

- LED1 (+5V) : +5V is supplied into PCB.
- LED2 (+12V) : +12V is supplied into PCB.
- LED3 (-12V) : -12V is supplied into PCB.
- LED4 (+24V) : +24V is supplied into PCB.
- LED5 (INJI) : "Read/Write Start Signal" is output.
- LED6 (SHAD) : "Shading Compensation Signal" is output.
- LED7 (RPEN) : Read Pulse Motor is ON.
- LED8 (RPRV) : Read Pulse Motor is rotating CCW.
- LED9 (SBSL) : Original Feed Solenoid is ON.
- LEDA (GKIS) : Original IN Sensor is activated.
- LEDB (GKSW) : Original Det. Sensor is activated.
- LEDC (RGSS) : Original Regist. Sensor is activated.

DESCRIPTION OF PCBs

1. Image processing PCB III (GA)

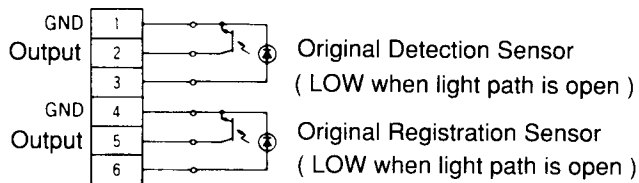
VR

- VR1 (GNE) : For detection sensitivity adjustment of Original IN Sensor
(The sensitivity goes up by turning it clockwise.)
- VR2 (NDD) : For contrast level adjustment in image scanning
(The contrast will be darker by turning it clockwise.)

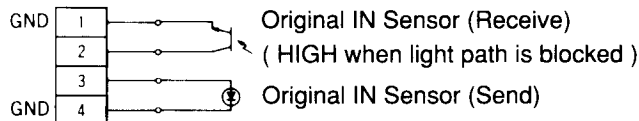
SW

- SW1 (GAN) : For contrast balance (Γ compensation) adjustment in image scanning
- SW3 (T1) : For adjustment of heating power (HP1) of Thermal Print Head
- SW4 (T2) : For adjustment of heating power (HP2) of Thermal Print Head
- SW5 (KAN) : Not Used
- SW6 (TP) : Not Used
- SW7 (MAS) : For adjustment of "Line-copy mode slice level"
- SW8 (Dip SW) : Used only for adjustment in factory (All 4 DIP switches must be OFF.)

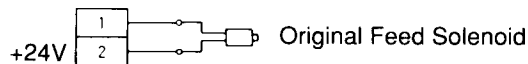
CN5 6 pins



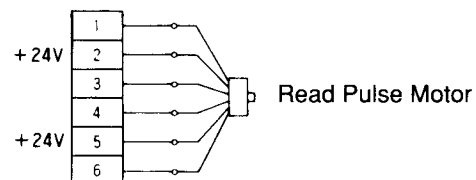
CN6 4 pins



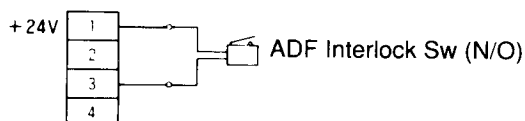
CN7 2 pins



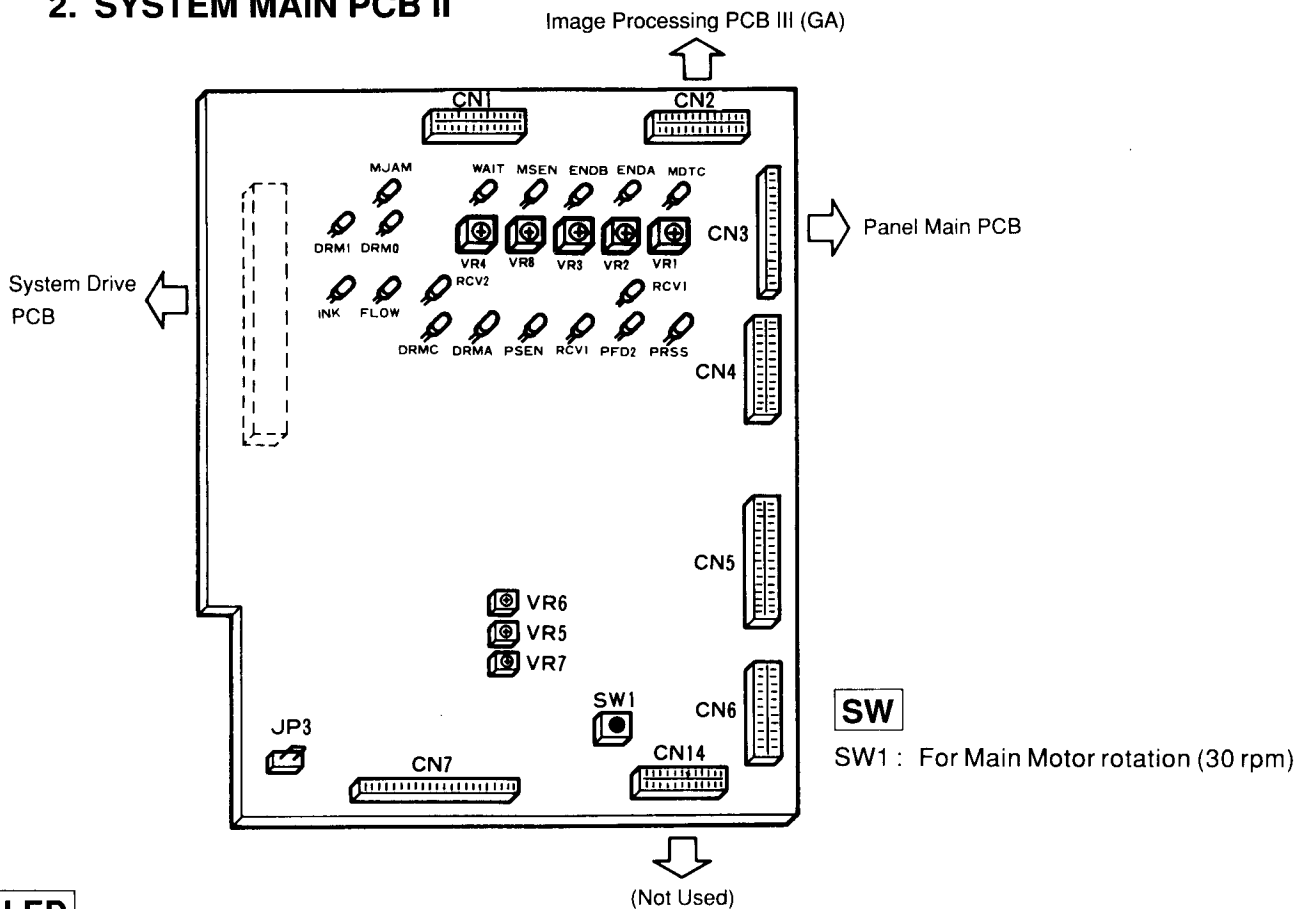
CN8 6 pins



CN12 4 pins



2. SYSTEM MAIN PCB II

**LED****- When LED is ON -**

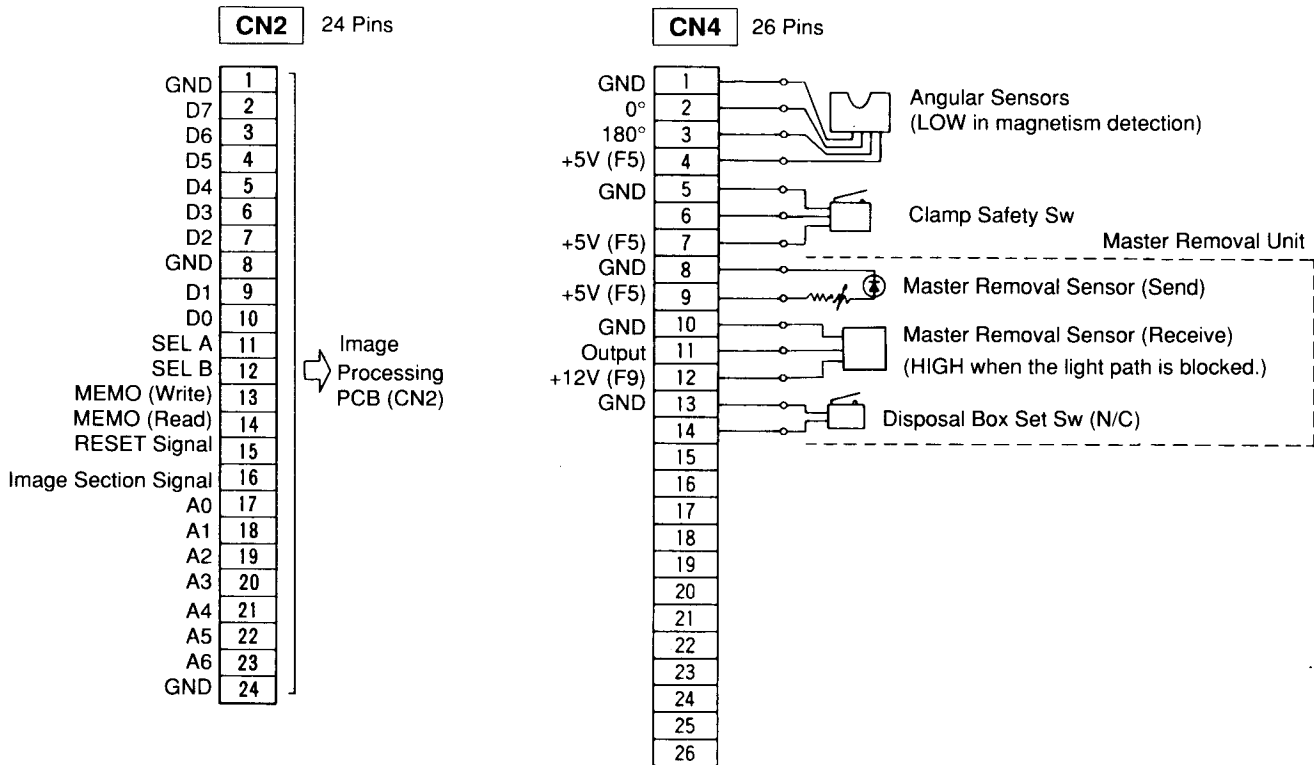
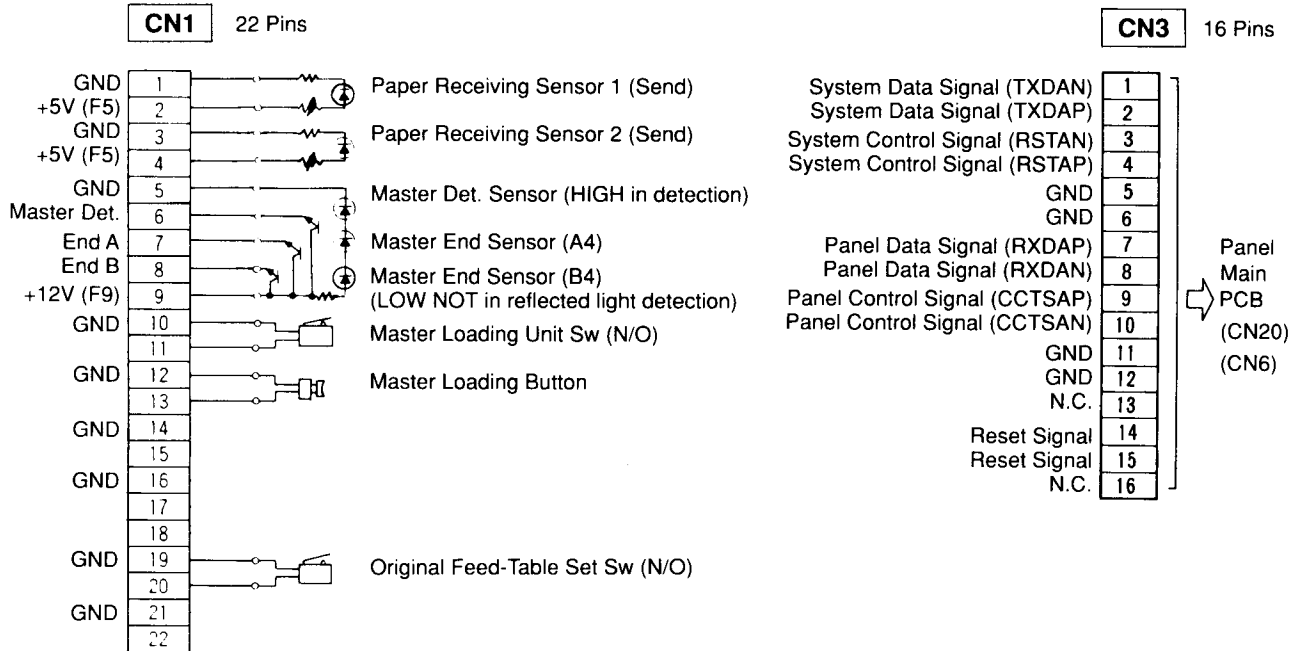
- MDTC : Master Det. Sensor is detecting reflected light (Master).
- ENDA : Master End Sensor (A4) is NOT detecting reflected light.
- ENDB : Master End Sensor (B4) is NOT detecting reflected light.
- MSEN : Master Sensor is detecting reflected light (Master).
- WAIT : Master Positioning Sensor is detecting reflected light (Master).
- MJAM : The light path of Master Removal Sensor is blocked.
- DRM0 : 0° Angular Sensor is detecting magnetism (Angular Magnet).
- DRM1 : 180° Angular Sensor is detecting magnetism (Angular Magnet).
- PFD1 : The actuator of Paper Buckle Det. Sensor is raised to open the light path.
- RCV2 : The light path of Paper Receiving Sensor 2 is blocked.
- FLOW : Overflow Sensor is detecting ink.
- INK : Ink Sensor is NOT detecting ink.
- PRSS : The light path of Pressure Detection Sensor is blocked.
- PFD2 : The light path of Paper Feed Clutch Sensor is open.
- RCV1 : The light path of Paper Receiving Sensor 1 is blocked.
- PSEN : The light path of Paper Sensor is blocked.
- DRMA : Magnet A Detection Sensor is detecting magnetism (Magnet A).
- DRMC : Magnet C Detection Sensor is detecting magnetism (Magnet C-1 or -2).

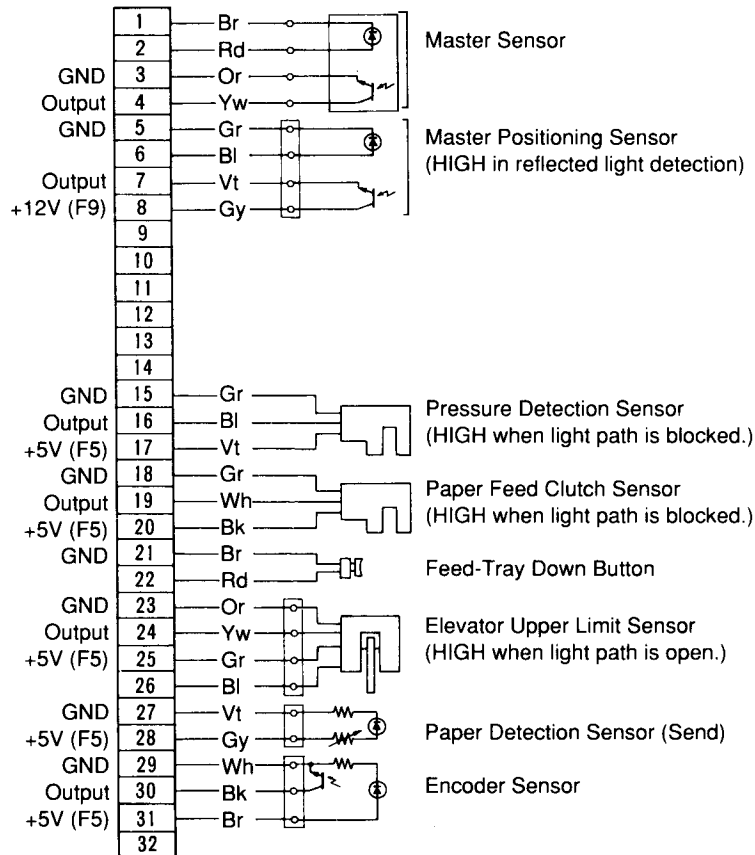
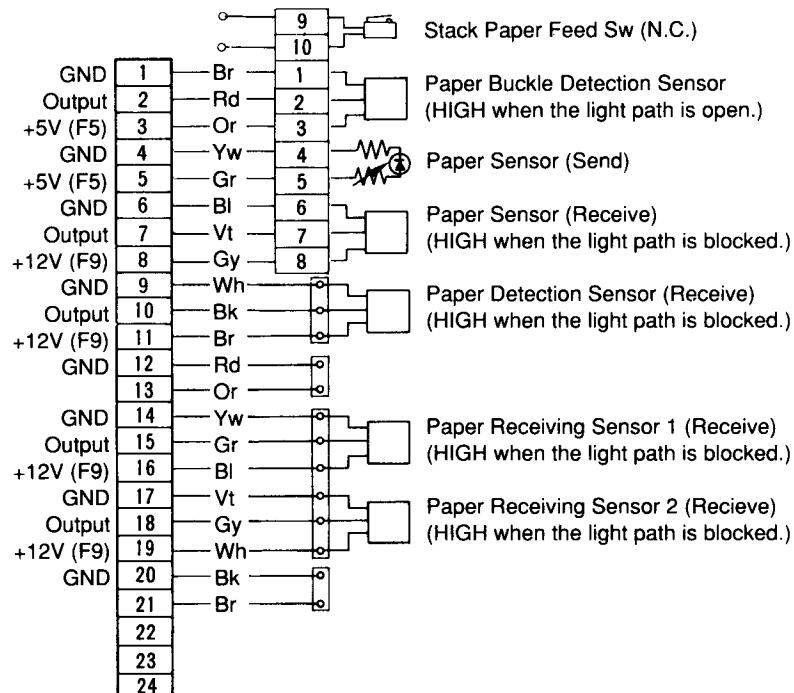
VR

- VR1 : For detection sensitivity adjustment of Master Det. Sensor (Sensitivity goes up by clockwise rotation.)
- VR2 : For detection sensitivity adjustment of Master End Sensor-A4 (Sensitivity goes up by clockwise rotation.)
- VR3 : For detection sensitivity adjustment of Master End Sensor-B4 (Sensitivity goes up by clockwise rotation.)
- VR4 : For detection sensitivity adjustment of Master Positioning Sensor (Sensitivity goes up by clockwise rotation.)
- VR5 : For adjustment of "Free rotation speed" (30 rpm) (The speed goes up by clockwise rotation.)
- VR6 : For adjustment of "Master loading speed" (15 rpm) (The speed goes up by clockwise rotation.)
- VR7 : For adjustment of "Print speed" (130 rpm) (The speed goes up by clockwise rotation.)
- VR8 : For detection sensitivity adjustment of Master Sensor (Sensitivity goes up by clockwise rotation.)

DESCRIPTION OF PCBs

2. System Main PCB II



CN5 32 Pins**CN6** 24 Pins

DESCRIPTION OF PCBs

2. System Main PCB II

CNA 96 Pins

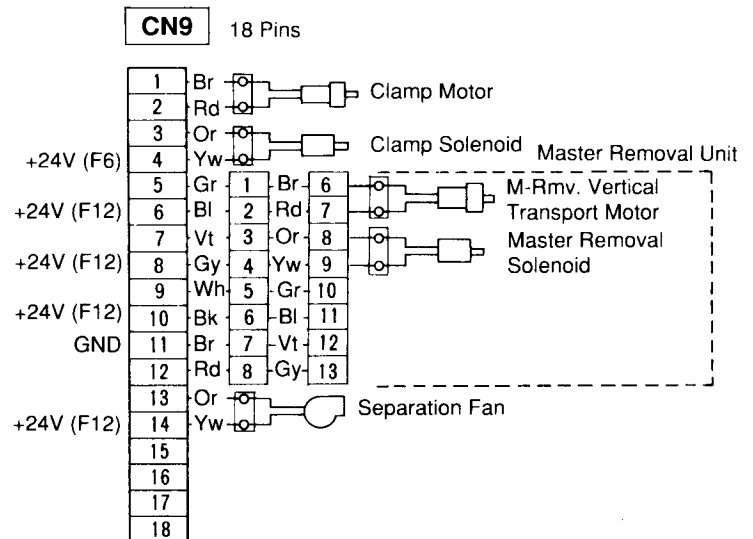
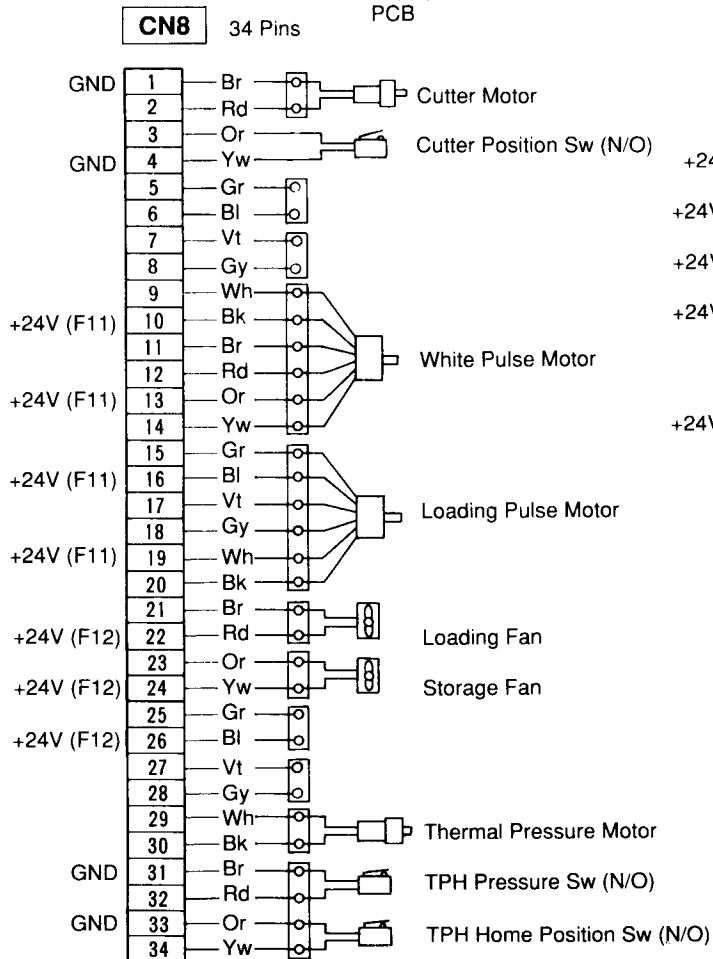
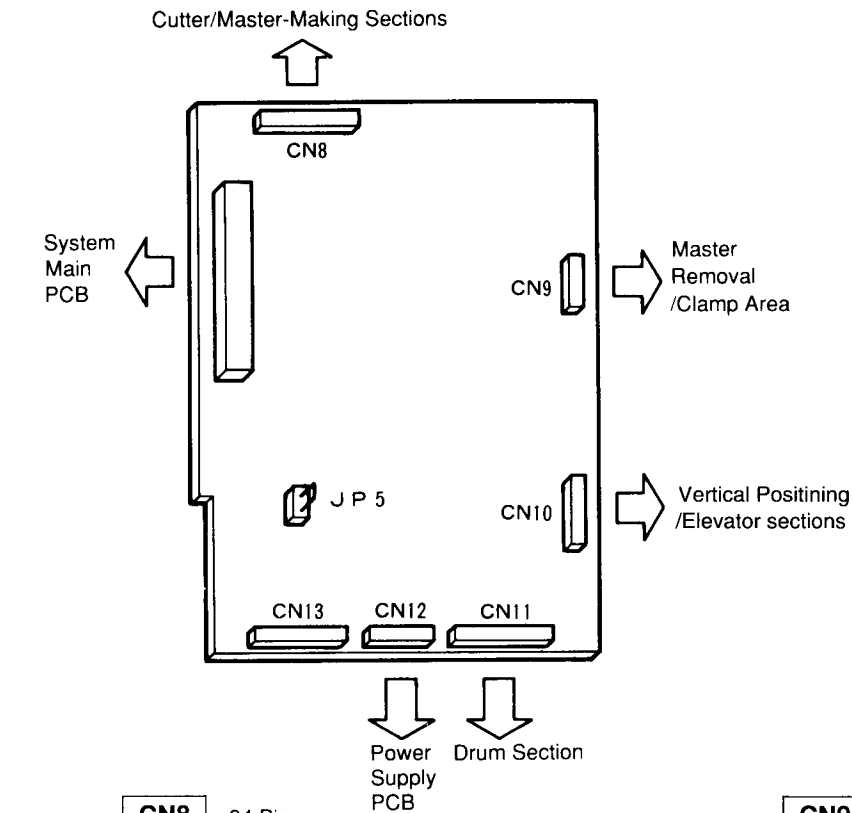
System
Drive
PCB
(CNA)

1	GND
2	GND
3	GND
4	GND
5	GND
6	GND
7	+5V (F5)
8	+5V (F5)
9	+5V (F5)
10	Sorter Connect Signal
11	Ink Sensor
12	Overflow Sensor
13	Ink Data Signal
14	Drum Home Position SW
15	Ink Bottle SW
16	Drum Set SW
17	Drum Data Signal
18	Tape End Signal
19	Vertical Centering Sensor
20	
21	
22	
23	Paper Full Stack Signal
24	Sorter Set Signal
25	Print Position Motor Busy
26	Write Pulse Motor CW/CCW
27	Write Pulse Motor (Enable Signal)
28	Loading Pulse Motor (Enable Signal)
29	Separation Fan
30	
31	Inking Motor
32	Lock Solenoid
33	Drum Home Position Lamp
34	Master Count Signal
35	Copy Count Signal
36	Storage Fan
37	Thermal Pressure Motor
38	Suction Fan Control
39	Loading Fan
40	Reset
41	Cutter Motor
42	Clamp Motor CW/CCW
43	Clamp Motor ON/OFF
44	Print Position Motor TRIGGER
45	Print Position Motor CW/CCW
46	Print Signal
47	Pressure Solenoid
48	M.-Rmv. Vertical Transport Motor
49	
50	Elevator Lower Limit SW

System
Drive
PCB
(CNA)

51	Elevator Motor UP/DOWN
52	Elevator Motor ON/OFF
53	Clamp Solenoid
54	Pressure Control Motor CTL 3
55	N.C.
56	Master-make Start/Stop Signal
57	Print Start/Stop Signal
58	Pressure Control Motor CTL 2
59	Pressure Control Motor CTL 1
60	Cluster Signal A
61	Cluster Signal B
62	Status 1
63	Status 2
64	Magnet A Det. Sensor
65	Paper Sensor
66	Paper Receiving Sensor 2
67	Counter Set Signal
68	TXDB
69	Main Motor Pulse K
70	Magnet C Det. Sensor
71	RXDB
72	Main Motor Pulse A
73	Magnet A Det. Sensor
74	RTSB
75	Main Motor Brake A
76	Power Fail
77	CTSB
78	Main Motor Brake K
79	Clock
80	Write Pulse Motor Clock
81	Front Cover Set Signal
82	P.-F. Clutch/Paper Buckle Det. Sensor
83	N.C.
84	N.C.
85	+12V (F9)
86	+12V (F9)
87	+12V (F9)
88	-12V (F10)
89	-12V (F10)
90	-12V (F10)
91	+24V (F6)
92	+24V (F6)
93	+24V (F6)
94	GND
95	GND
96	GND

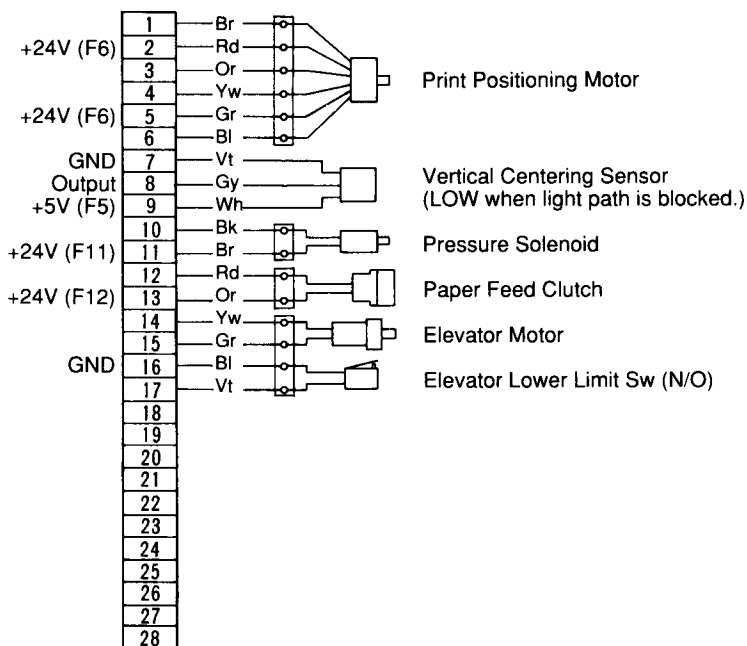
3. SYSTEM DRIVE PCB II



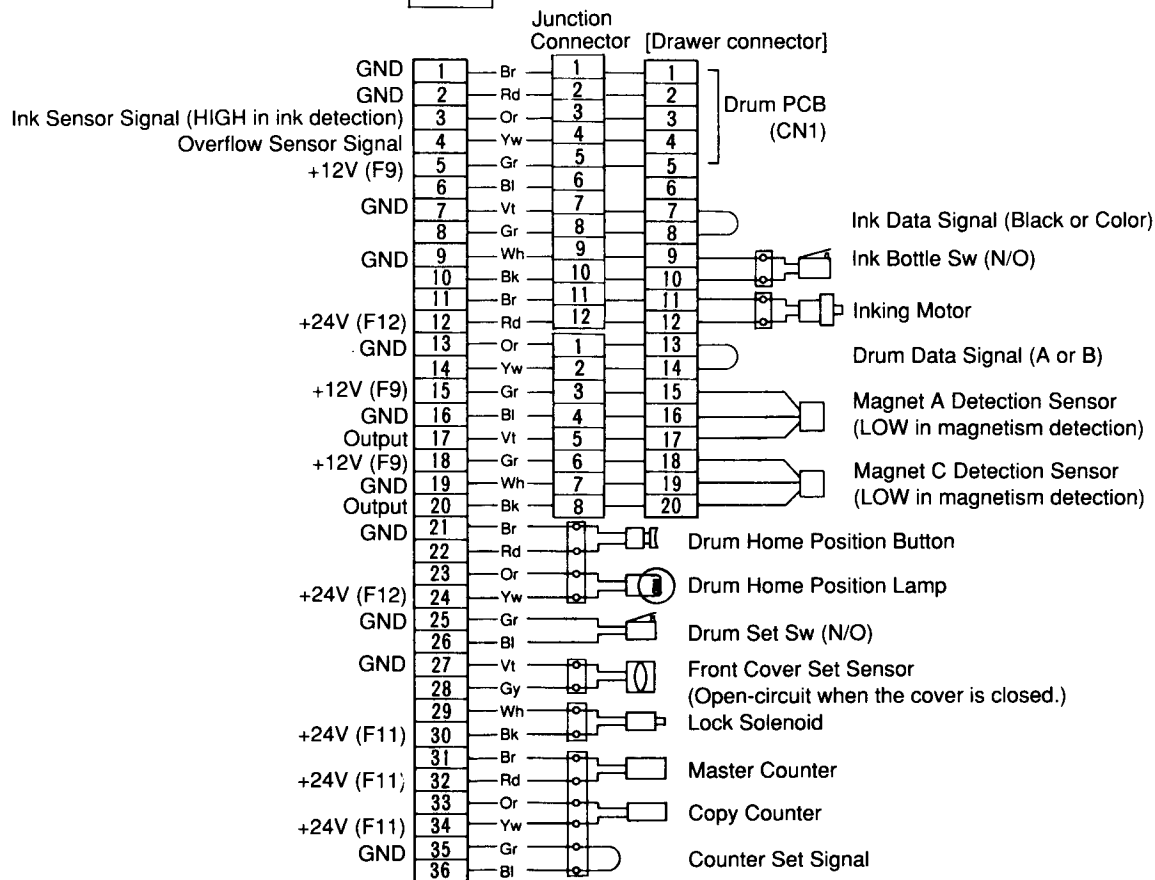
DESCRIPTION OF PCBs

3. System Drive PCB II

CN10 28 Pins



CN11 36 Pins



CN12 22 Pins

1	Br	1	GND	
2	Rd	2	GND	
3	Or	3	GND	
4	Yw	4	GND	
5	Gr	5	+5V (F5)	
6	Bl	6	+5V (F5)	
7	Vt	7	System Reset Signal	
8	Gy	8	Power Fail Signal	
9	Wh	9	-12V (F10)	
10	Bk	10	+12V (F9)	
11	Br	11	GND	
12	Rd	12	+24V (F6)	
13	Or	1	Thermal Print Head Control Signal	
14	Yw	2	Suction Fan Control Signal	
15	Gr	3	Main Motor Control Signal	
16	Bl	4	Main Motor Control Signal	
17	Vt	5	Main Motor Control Signal	
18	Gy	6	Main Motor Control Signal	
19	Wh	7	+24V (F12)	
20	Bk	8	+24V (F11)	
21	Br	9	GND	
22	Rd	10	GND	

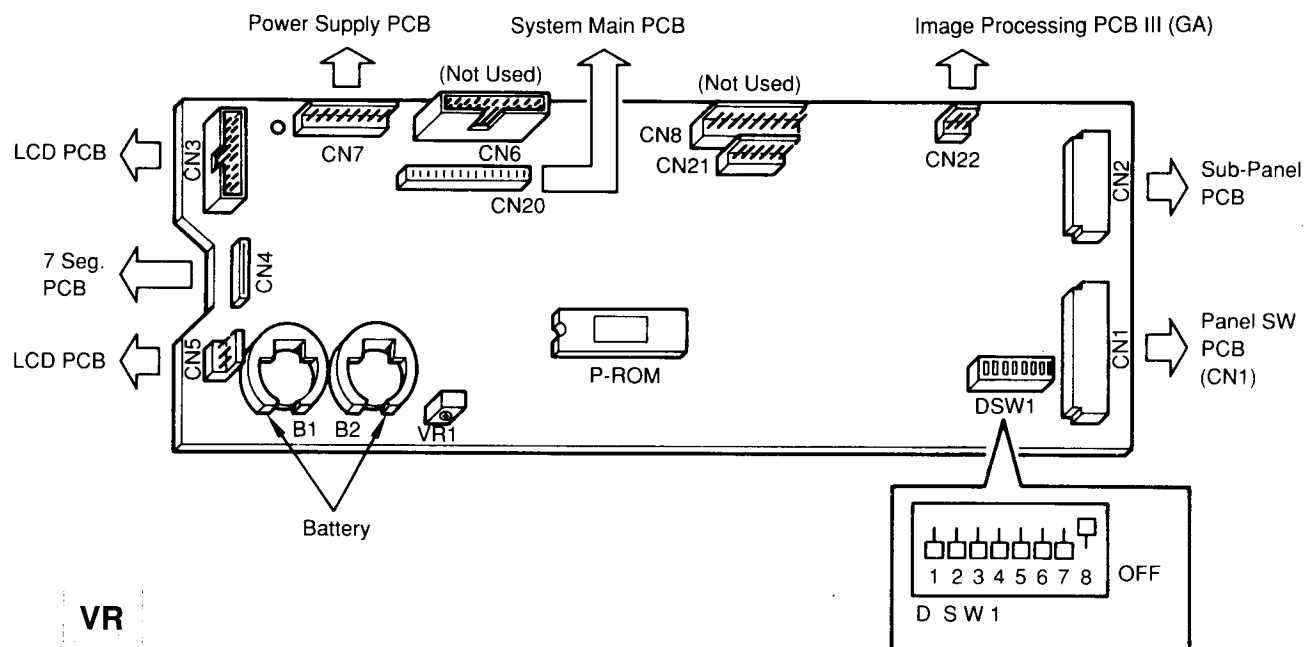
Power Supply
PCB (CN8)

Power Supply
PCB (CN5)

DESCRIPTION OF PCBs

4. Panel Main PCB

4. PANEL MAIN PCB



VR

VR1 : For luminosity adjustment of LCD panel

SW

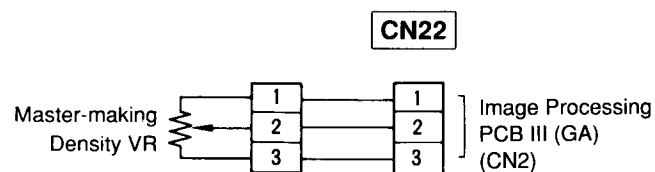
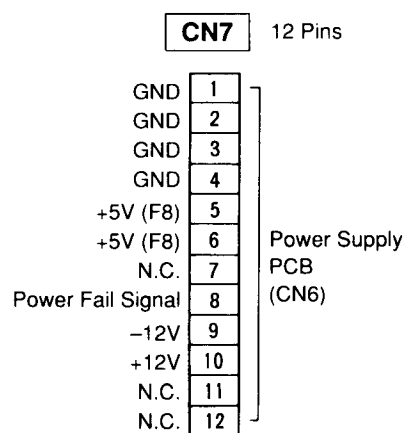
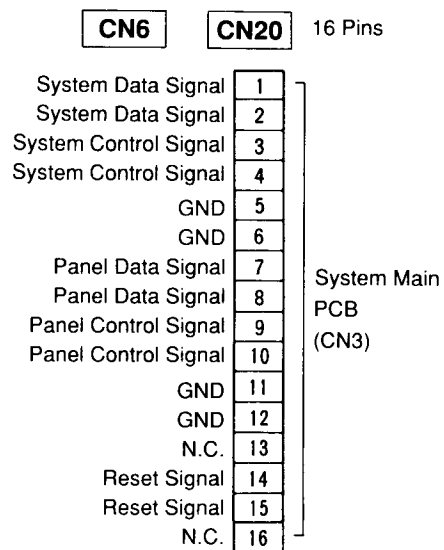
SW	FUNCTION	OFF	ON
DSw1-1	The initial print speed selection *1	100 rpm	60 rpm
DSw1-2	The initial ADF setting selection	ADF OFF	ADF ON
DSw1-3	Selection of the timer for Auto-idling	12 hours	6 hours
DSw1-4	Priority selection between Density- and Speed-Change modes *2	Density-Change	Speed-Change
DSw1-5	*3		
DSw1-6			
DSw1-7			
DSw1-8			

*1 Functions only in Speed-Change mode.

*2 Functions only in RC5600.

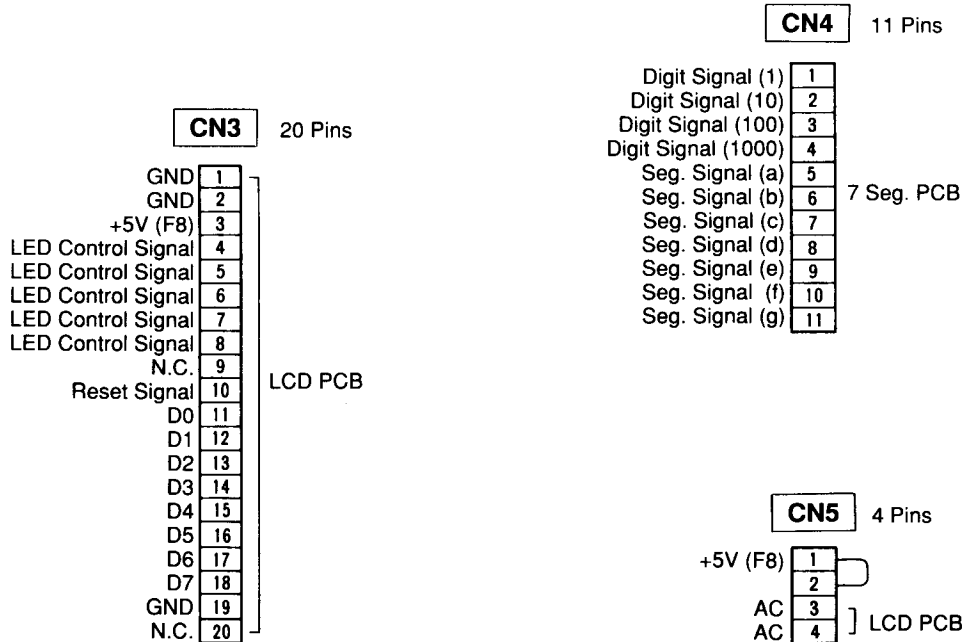
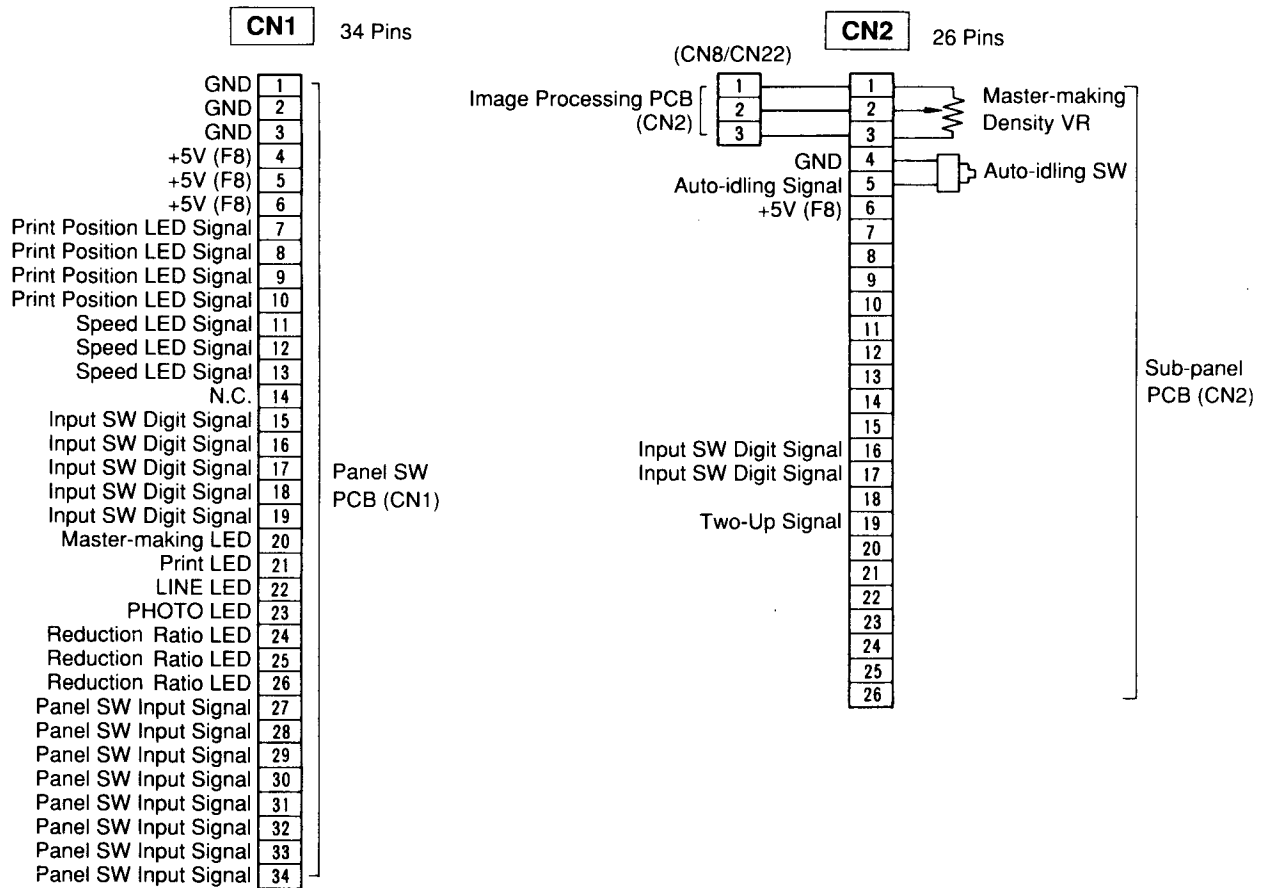
*3 **Model Selection**

Sw No.	56/US	45/US	56/A4	56/B4	45/A4	45/B4	40/US	40/A4	40/B4
DSw1-5	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
DSw1-6	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
DSw1-7	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
DSw1-8	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

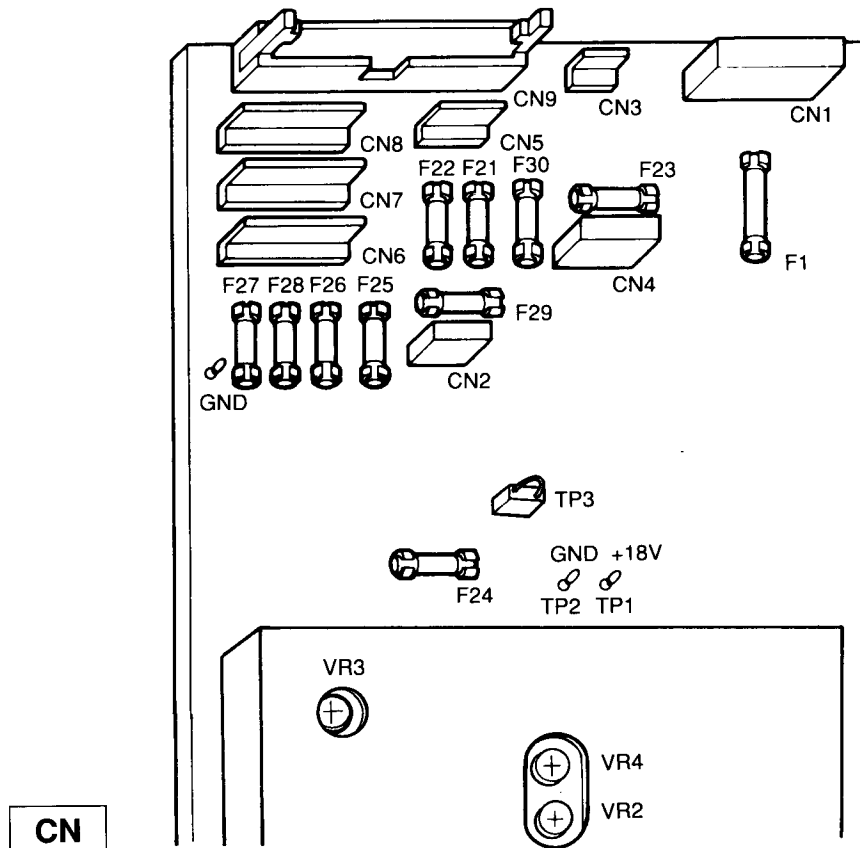


DESCRIPTION OF PCBs

4. Panel Main PCB



5. POWER SUPPLY PCB

**CN**

- CN1 : From Main Power Sw
- CN2 : To Main Motor
- CN3 : To Suction Fan
- CN4 : To Thermal Print Head (via Capacitor PCB)
- CN5 : From System Drive PCB
- CN6 : Not Used
- CN7 : To Panel Main PCB
- CN8 : To System Drive PCB
- CN9 : To Image Processing PCB III (GA)
- *TP3 : Jumper connector for Thermal power voltage adjustment

TP

- TP1 (+18V) : For Check of Thermal power voltage
- TP2 (GND) : For Check of Thermal power voltage

VR

- VR1 : Used only for adjustment in factory
- VR2 : For short-range adjustment of Thermal power voltage
- VR3 : Used only for adjustment in factory
- VR4 : For wide-range adjustment of Thermal power voltage

DESCRIPTION OF PCBs

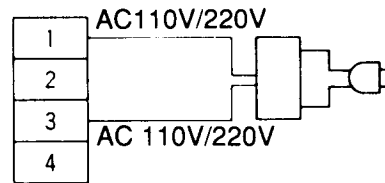
5. Power Supply PCB

FUSE

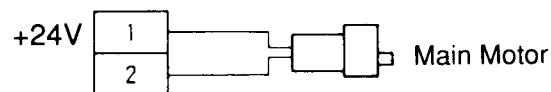
No.	Rate	Protected line	Symptoms in case of open-circuited fuse	Relevant components
F1	10A (110V) 5A (220V)	Main Power	No Power	Main Power Sw
F21	3.15A	DC24V	No problem in printing. Master mis-feed in master-making or confidential operation.	Loading pulse motor, Loading fan, Storage fan, Thermal pressure motor, Cutter motor, Write pulse motor
F22	3.15A	DC24V	[T2: Call Service], Paper feed jam, Master removal error	M.-Rmv. vertical transport motor, Master removal solenoid, Separation fan, Pressure solenoid, Paper feed clutch, Elevator motor, Lock solenoid, Inking motor, Counters, Drum home position lamp
F23	1A	DC24 – 18V	Paper receiving jam	Suction fan
F24	8A	DC24V	[T1: Call Service]	Main Motor
F25	3.15A	DC+12V	[T4: Call Service]	Various sensors
F26	3.15A	DC-12V	No LCD indication	
F27	5A	DC5V	No Background light in LCD panel & No Print quantity indication	
F28	5A	DC5V	No power except for Suction fan	
F29	3.15A	DC24V		For optional equipments
F30	3.15A	DC24V	[T5: Call Service]	Clamp motor, Clamp solenoid, Print positioning motor, Read pulse motor

CN1

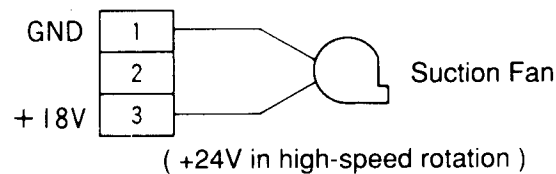
4 pins

**CN2**

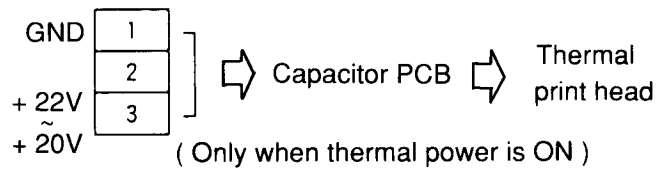
2 pins

**CN3**

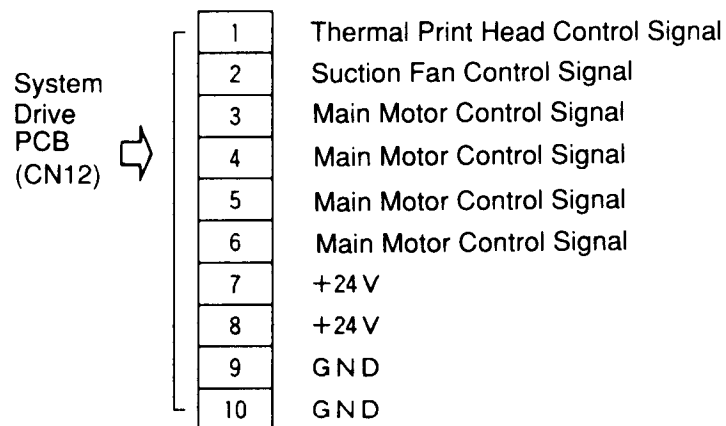
3 pins

**CN4**

3 pins

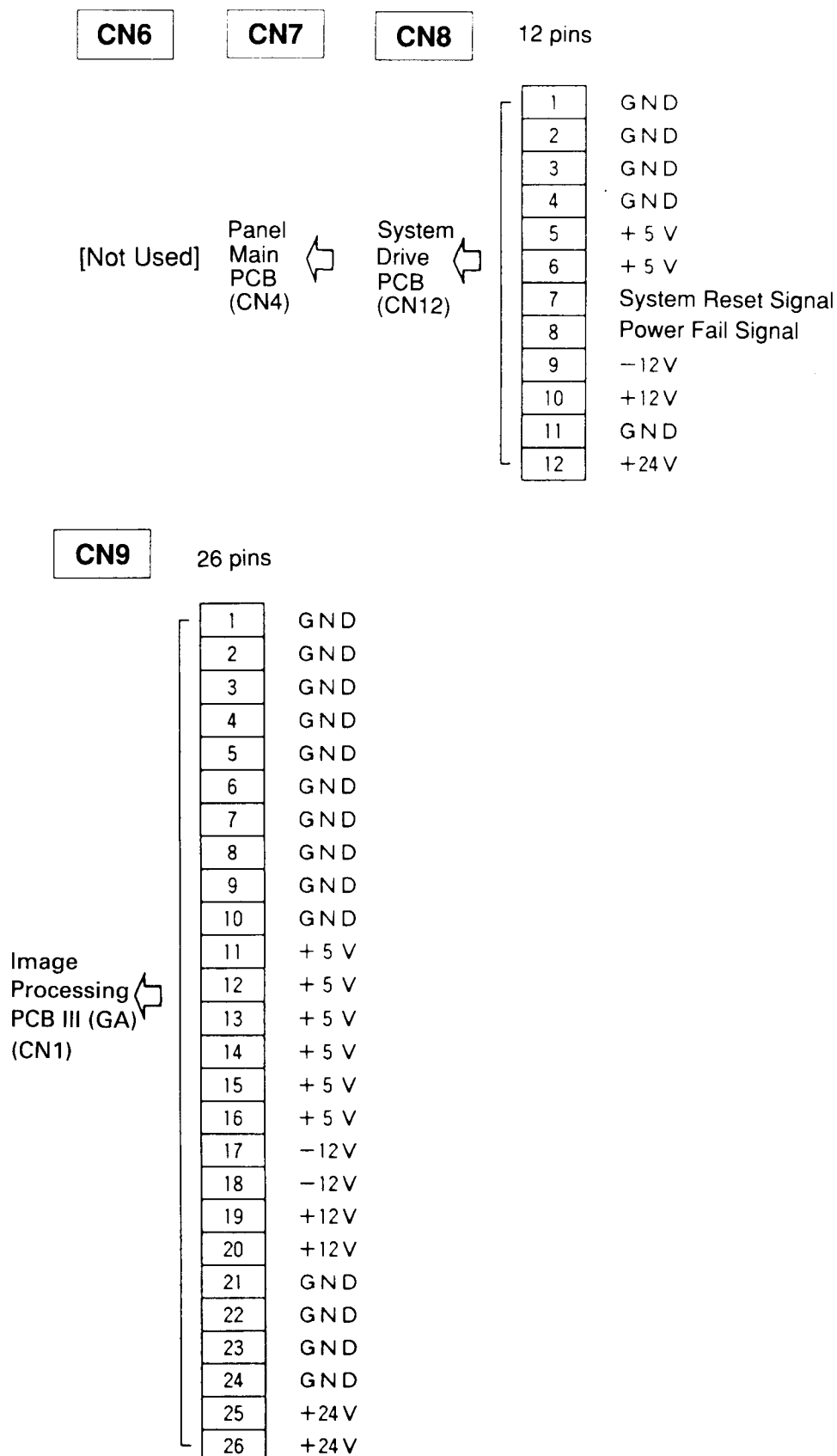
**CN5**

10 pins



DESCRIPTION OF PCBs

5. Power Supply PCB



RC4500/5600/5600D

TECHNICAL MANUAL

VERSION 2.5
SEPTEMBER, 1990

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I. SPECIFICATIONS

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1. RC4500/5600/5600D	I-1
2. Supplies	I-3
3. Optional Equipment	I-3

1. RC4500/5600/5600D

- **Printing system:** Automatic Digital Scanning, Thermal Screening
- **Original sizes:** Maximum/ A3(297mm x 431mm)size (11.7" x 17")
Minimum/ A6(100mm x 148mm)size (4" x 5.8")
- **Paper sizes:** Maximum/ A3(297mm x 431mm)size (11.7" x 17")
Minimum/ A6(100mm x 148mm)size (4" x 5.8")
- **Paper weight:** Maximum/ 210 g/m² (115.8 lbs Index)
Minimum/ 46 g/m² (12.4 lbs Bond)
- **Print area:** Legal Drum/ 208 x 350 mm(8.2" x 13.7")
A4 Drum / 208 x 290 mm
B4 Drum / 245 (at center) x 350 mm
- **Print speed:** Selectable/ 5-speed positions (60, 80, 100, 120, 130 sheets/min.)
- **First copy time:** A4(8.3" x 11.7")original size / About 21 sec.(size-to-size)
- **Print position adjustment:** Vertical positoning/ ±20 mm
Horizontal positioning/ ±20 mm
[±5 mm for A3 (11.7"x 17")paper]
- **Scanning resolution:** 400 dots/inch
Line and photograph modes changeable
- **Maximum paper capacity:** 1000 sheets
[Based on 64 g/m² (17 lbs Bond) paper]
- **Machine dimentions:** In storage/ 650 (W) x 631 (D) x 589 (H) mm
25.6" x 24.9" x 23.2"
In use/ 1360 (W) x 631 (D) x 589 (H) mm
53.6" x 24.9" x 23.2"
- **Mechine weight:** 5600D/ 91 kg (200 lbs)
5600/ 89 kg (196 lbs)
4500/ 88 kg (194 lbs)
- **Power requirements:** 220 to 240 VAC, 50/60 Hz, 3A
90 to 132 VAC, 50/60 Hz, 3.5A
- **Reduction/Enlargement percentages:** Size-to-size/ 100%
Reduction/ RC5600(u.s.) 96%, 77%, 74%, 64%
RC4500(u.s.) 77%, 64%
RC5600 95%, 87%, 82%, 71%
RC4500 87%, 82%, 71%
Enlargement/ RC5600(u.s.) 121%, 127%, 141%
RC4500(u.s.) 127%
RC5600 116%, 122%, 141%
RC4500 122%

SPECIFICATIONS

1. RC4500/5600/5600D

- Auxiliary function:
 - RC4500/5600/5600D
Confidential, ADF, Two-up function, Memory program, Automatic idling, Integrated sorter control
 - RC5600/5600D
Dot-photo, Sharpen-image
 - RC5600D
Digitizer
- Liquid crystal display: 240 x 64 dot graphic display
- Color change: Cartridge-type drum replacement
6 colors/ Black, Red, Blue, Green, Brown, and Yellow

2. Supplies

- (1) Ink:** Risograph RC Ink (Emulsion type)
- Capacity: 1000 cc
 - Ink bottle: Cylinder following piston method
 - Color: 6 colors/ Black, Red, Blue, Green, Brown, and Yellow
 - Ink package unit: Two bottles per box, five boxes per carton
- (2) Master:** Risograph RC Master 55
- Length: Approx. 100 m(328 ft.)
 Legal Drum/ About 200 masters
 A4 Drum/ About 232 masters
 B4 Drum/ About 200 masters
 - Width: Legal/ 227 mm(8.9")
 A4/ 227 mm
 B4/ 270 mm
 - Master package unit: Two master rolls per box, 10 boxes per carton

3. Optional Equipment

- RCI Board - For computer interface
- Job Separator
- Key/Card Counter
- RC Sorter
- Color Drum(6 Colors)

II. MECHANICAL OVERVIEW

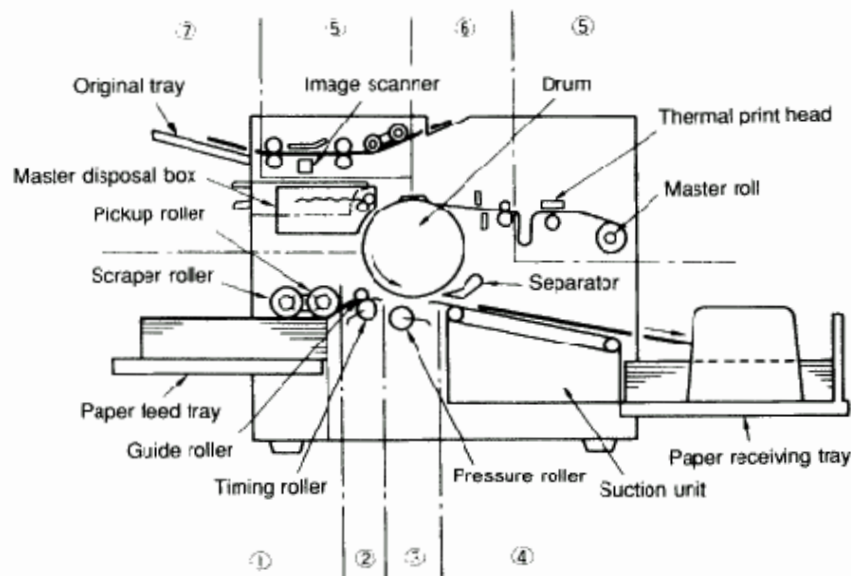
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1. Cross Sectional View

Risograph RC models can be divided into eight areas according to function:

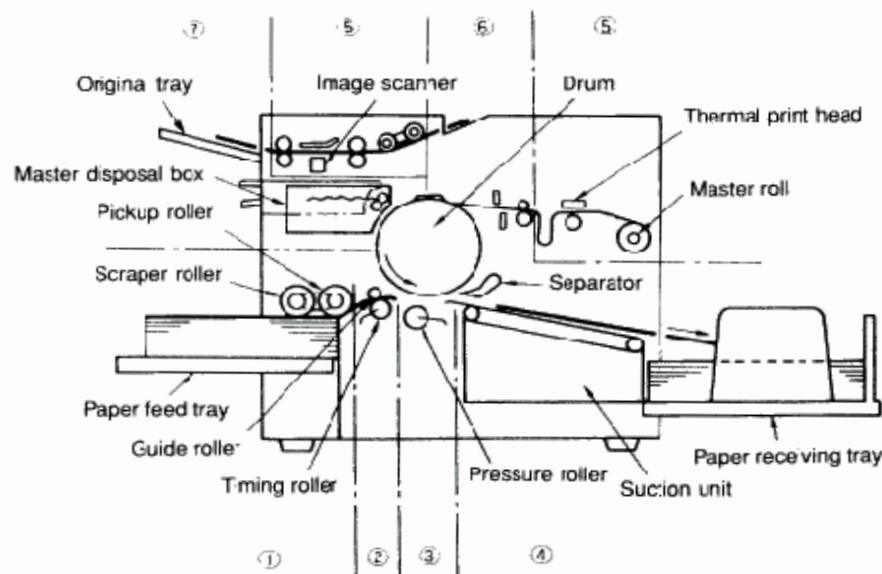
- ① **First Paper Feed Area:** Feeds single sheets of paper to the second paper feed area via the Scraper, Pickup roller, and Stripper plate.
- ② **Second Paper Feed Area:** Controls the vertical print position and feeds paper to the print area via the Timing and Guide rollers.
- ③ **Print Area:** Uses the Pressure roller to press paper against the master on the Drum. The Drum rotates with the Pressure roller and prints an image on the paper.
- ④ **Paper Receiving Area:** Separates the printed paper from the Drum, and transports the paper onto the Paper receiving tray.
- ⑤ **Master Making Area:** Carries an original and scans that original with the Image scanner. Converts the image information into digital data, and makes the master with the Thermal print head.
- ⑥ **Carrier And Clamp Area:** Feeds the prepared master material to the Drum, loads it on the Drum, and cuts it to an appropriate length.
- ⑦ **Master Disposal Area:** Separates the used master from the Drum and disposes it into the Master disposal box.
- ⑧ **Drive Mechanism Area:** Drives all operations other than those in the master making area.



1. Cross Sectional View

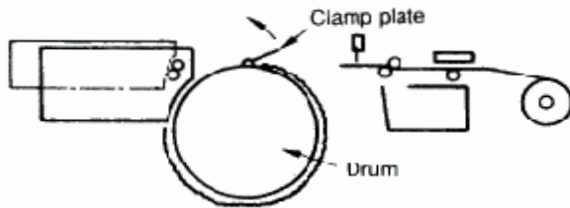
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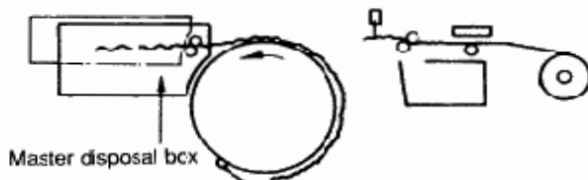


3. Master Removal and Feed

Master Removal

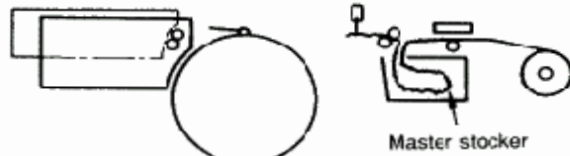


When the "START" button is pressed for master-making, the Drum is rotated to the home position and the Clamp plate is opened.

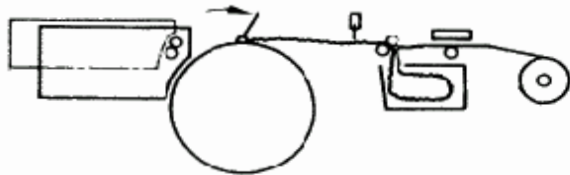


The Master removal hooks activate, and the Drum is rotated a turn to remove the used master into the Master disposal box.

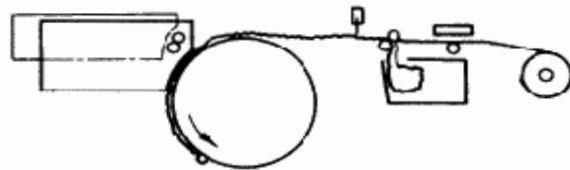
Master Feed



The new master is fed into the Master stocker, waiting for the used master to be removed from the Drum.



The lead edge of the master advances to the Drum, and the Clamp plate is closed to hold the master.



The Drum is rotated to load the master onto itself.



Master continues loading until the prime surface of the Drum is covered, and then the Cutter cuts the master (without a stop).

III. PAPER FEED AREA

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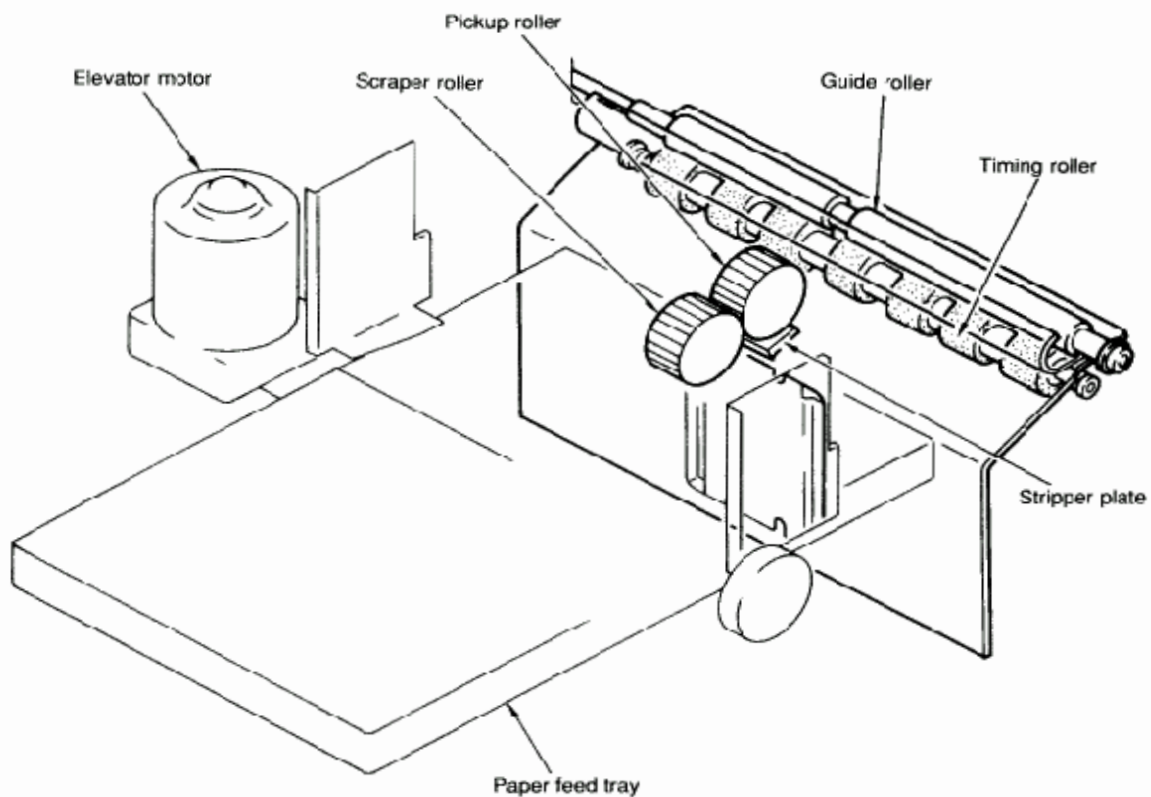
Operation and Function

The Paper feed tray is elevated by the Elevator motor. During printing;the tray is continuously raised to apply an appropriate pressure to the paper against the Scraper and Pickup rollers.

The raised position and function of the tray is controlled by the Elevator upper limit sensor. When the Scraper and Pickup rollers are rotated, a single sheet of paper is separated from paper stack by the Stripper plate and fed to the second paper feed section.

Before the paper enters this section, the Timing roller rises up to the Guide roller to block the paper for re-feed. By changing the start-time of this re-feed, the vertical print position is adjusted.

The status of paper is checked by the Paper sensor in the above feed and re-feed operations.



1. Paper Feed Section

[Theory of Operation]

1. Paper Feed Tray Elevation System

- Basic

The Paper feed tray can elevate up and down depending upon the function that is selected or required.

- Elevation of Feed Tray

When paper is loaded onto the Paper feed tray, the light path of the Paper detection sensor is blocked.

If paper is present and the print "START" button is pressed, the Elevator motor starts to rotate counter-clockwise, causing the Elevator shaft to rotate clockwise via the Elevator bevel gears.

This rotation drives the Elevator pinion gears located on the left and right ends of the Elevator shaft. Therefore when the Elevator shaft rotates clockwise, the Elevator pinion gears clockwise on the Elevator rack and raise the Paper feed tray.

As the Paper feed tray elevates up, paper contacts and pushes up the actuator of the Elevator upper limit sensor.

This causes the light path of the sensor to open. The Elevator motor is then turned off and the Paper feed tray stops.

- Elevation during printing

As the paper supply decreases during printing, the actuator of the Elevator upper limit sensor lowers and blocks the light path of the sensor.

The Elevator motor is then activated to raise the Paper feed tray until the light path of the Elevator upper limit sensor opens.

This operation is repeated to maintain the paper feed tray at the appropriate height until the paper supply is depleted.

- Lowering of Feed Tray

As the last sheet is fed from the Paper feed tray, the Paper detection sensor detects that the paper has run out.

The Elevator motor then rotates clockwise to lower the Paper feed tray.

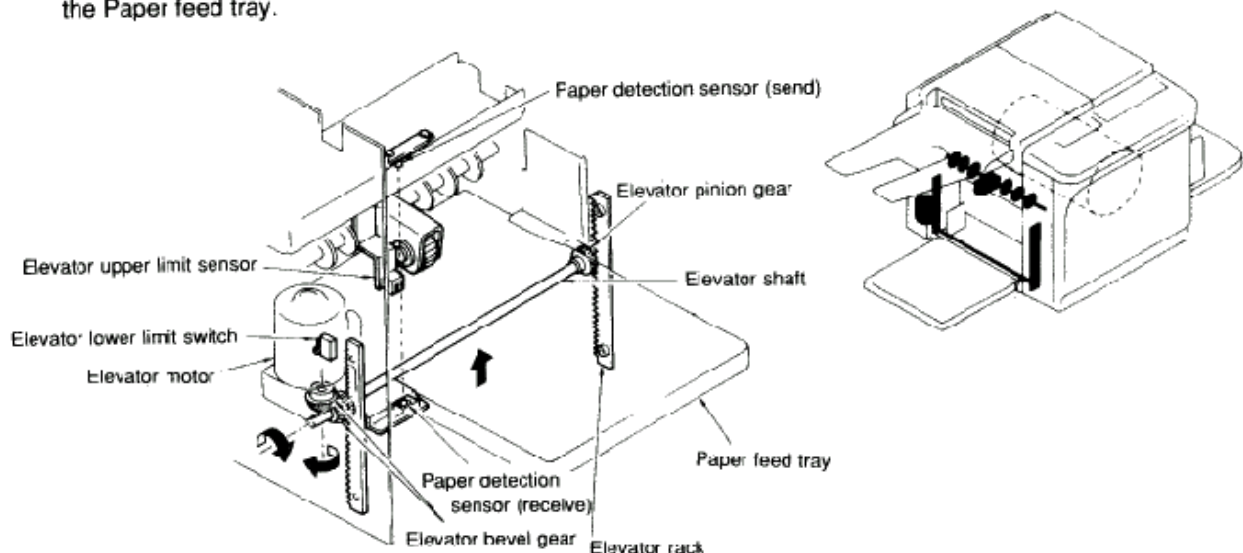
As the Elevator motor is lowered, the Lower limit plate presses against the actuator of the Elevator lower limit switch and the Elevator motor is turned off.

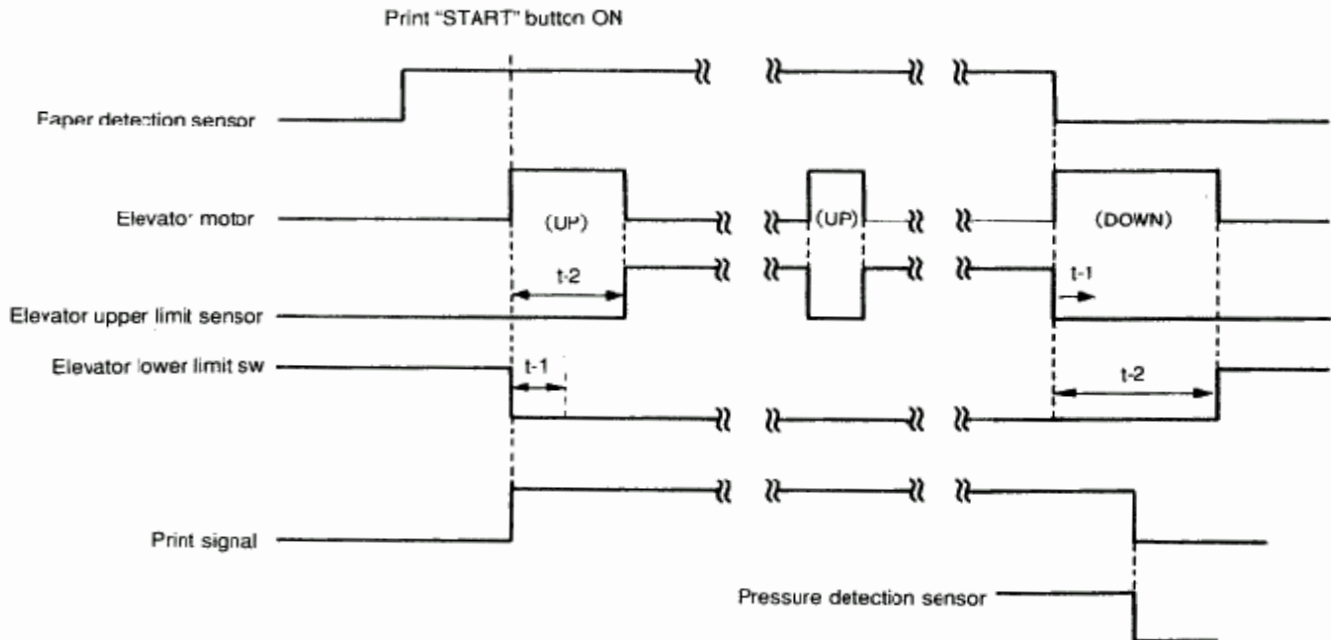
- In case Paper Feed Jam

If the paper jams in the paper feed area, the elevator motor is activated and rotates clockwise for 2 seconds to lower the Paper feed tray.

- Manual Lowering of Feed Tray

If the Feed-tray down button is being pressed, the Elevator motor rotates clockwise to completely lower the Paper feed tray.



Paper Feed Tray Elevation System

In both of the following cases, the display panel will indicate
 "T2:CALL SERVICE"

- t-1: An error has occurred, if the actuator of the Elevator lower limit switch was not released as the Paper feed tray started to rise; or that the Elevator upper limit sensor's actuator did not block the light path of the sensor as the Paper feed tray started to lower, within **2 seconds** after the Elevator motor starts.
- t-2: An error has occurred, if the actuator of the Elevator lower limit switch was not pressed on as the Paper feed tray started to lower; or that the Elevator upper limit sensor's actuator did not open the light path of the sensor as the Paper feed tray started to rise, within **7 seconds** after the elevator motor starts.

THEORY OF OPERATION

2. First Paper Feed Section Rotary System

2. First Paper Feed Section Rotary System

- Basic

The Scraper and Pickup rollers are started by the operation of the Paper feed clutch.

- Paper feed clutch sensor & Paper buckle detection sensor

The Paper feed clutch is activated by the Paper feed clutch sensor.

When the main motor rotates during the print cycle, the P disc rotates through the Paper feed detection sensor.

If the light path of the Paper feed clutch sensor is opened during printing, the Paper feed clutch engages.

If the light path of the Paper feed clutch sensor is blocked, the Paper feed clutch disengages.

[NOTE]

When the Paper buckle detection sensor detects the ridge of the buckled paper, it will override the Paper feed clutch sensor and turn the Paper feed clutch OFF.

- Transmission of Rotation Power

The driving components of the Paper feed clutch are rotated by the main belt, and the driven components are connected to the Pickup shaft.

When the Paper feed clutch engages, the driving and driven components are engaged by the electro-magnet in the Paper feed clutch, transmitting the rotation of the main belt to the Pickup roller.

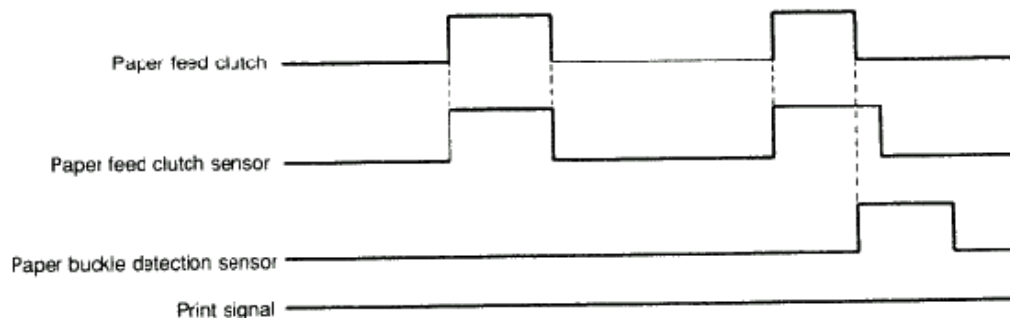
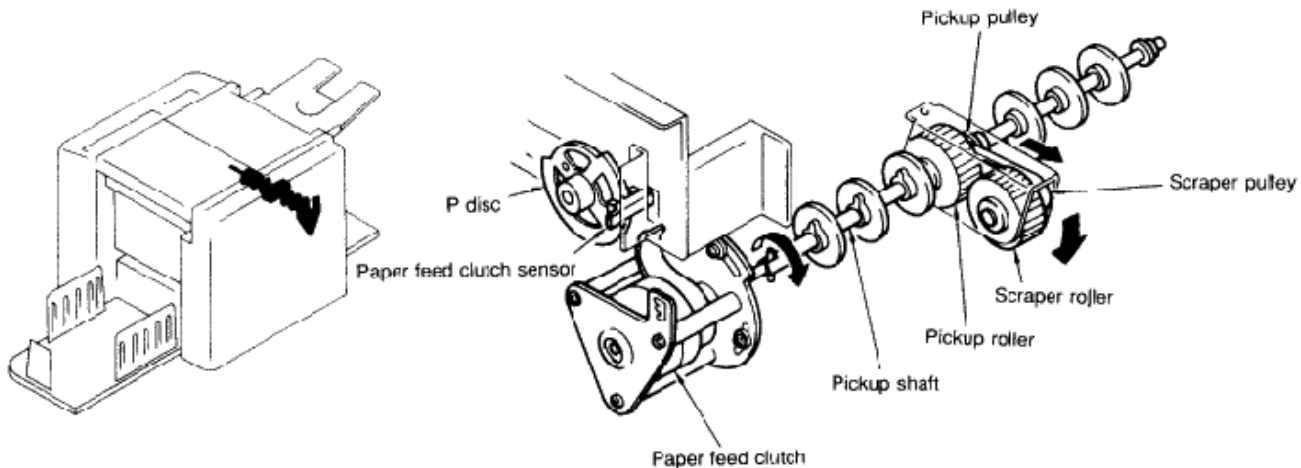
By this rotation transmission, the Pickup and Scraper rollers are driven to feed the paper up to the second paper feed section.

[NOTE]

The drive of the Scraper roller is provided by the Scraper pulley and belt, which is driven by the Pickup pulley attached to the Pickup shaft.

- Prevention of brake effect by Pickup and Scraper rollers

The Pickup and Scraper rollers have one-way bearings that allow the rollers to rotate freely as the paper is fed further from the second paper feed section.



3. Paper Pickup System

- Feeding

The paper on the Paper feed tray is fed by the Pickup roller.

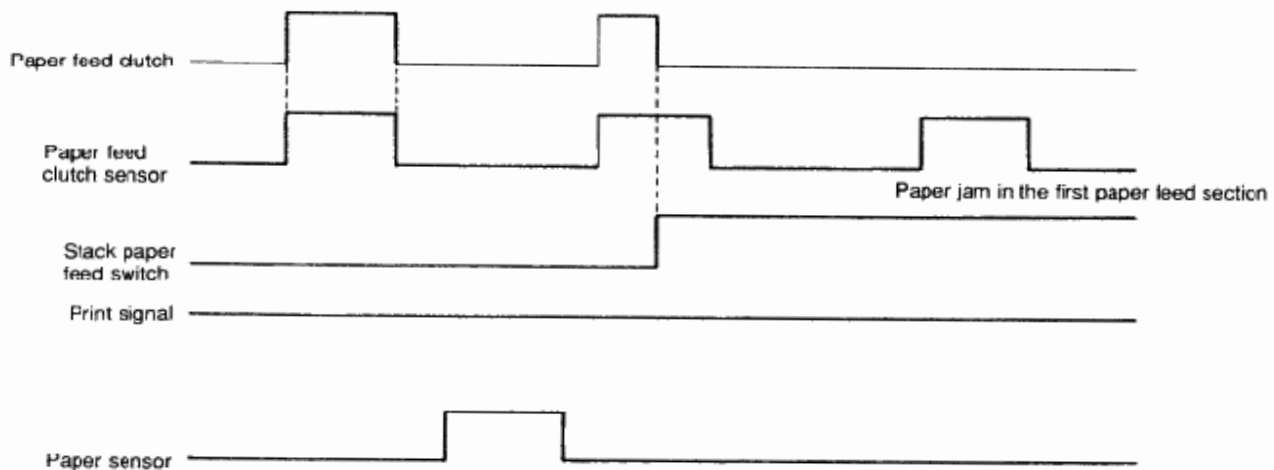
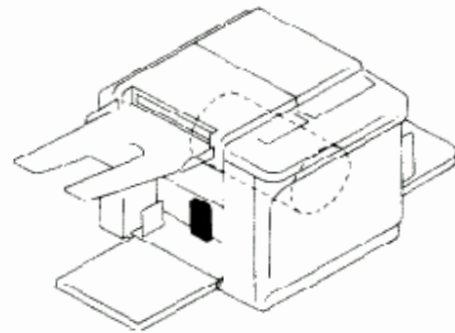
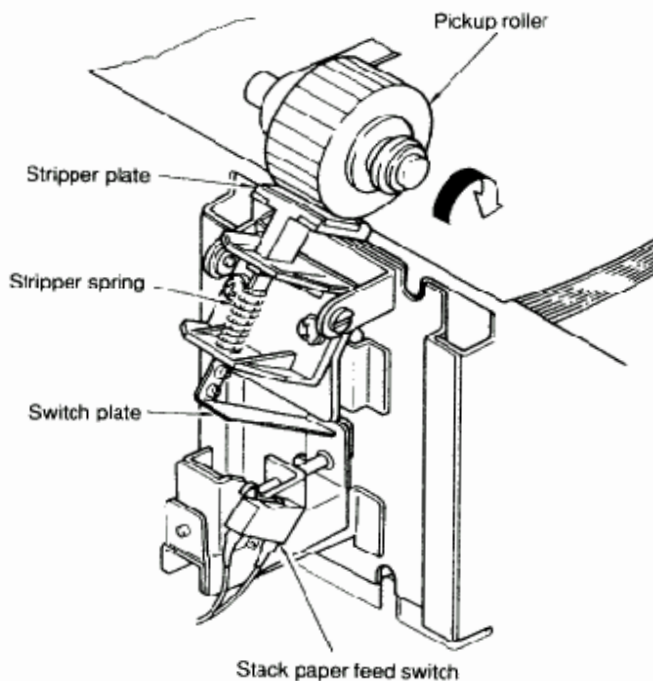
- Pick-up

The Stripper plate is pressed against the Pickup roller by the Stripper spring to provide resistance against paper feed, by which only a single sheet of paper is fed from the paper stack.

- Detection of Stack paper feed

If multiple sheets of paper are fed, the Stripper plate is pushed down, causing the switch plate to contact the actuator of the Stack paper feed switch.

When the Stack paper feed switch is pressed, the Paper feed clutch is turned off to stop paper feeding.



THEORY OF OPERATION

4. Second Paper Feed System

4. Second Paper Feed System

- Rotation of the Guide roller

The Guide roller cam attached to the Cam pulley rotates clockwise when the Main motor rotates clockwise.

As the Guide roller cam rotates, the Guide cam follower, pressed against the cam by the Sector gear spring, follows the cam and is shifted up and down on the cam.

When the cam follower follows the Guide roller cam from the low point to the high one in the cam's rotation, the Sector gear is driven to rotate the Guide roller gear clockwise.

The Guide roller gear incorporates a one-way spring clutch to rotate the Guide roller only when the Guide roller gear is driven clockwise and not to transmit rotation to the Guide roller when the Guide roller gear rotates counter-clockwise.

- Rotation of Timing Roller

The Timing roller, which is raised and lowered against the Guide roller, is driven by the Drive gear A on the Guide roller and the Drive gear B on the Timing roller.

When the Timing roller is raised, the gear A and B engage and rotate simultaneously to feed the paper to the print area when the Guide roller is rotated.

- Rise and Lowering of the Timing roller

The Timing cam attached to the Cam pulley rotates clockwise when the Main motor rotates clockwise.

As the Timing cam rotates, the Timing cam follower on the Timing lever, pressed against the Timing cam by the Timing spring, follows the cam and is shifted up and down on the cam.

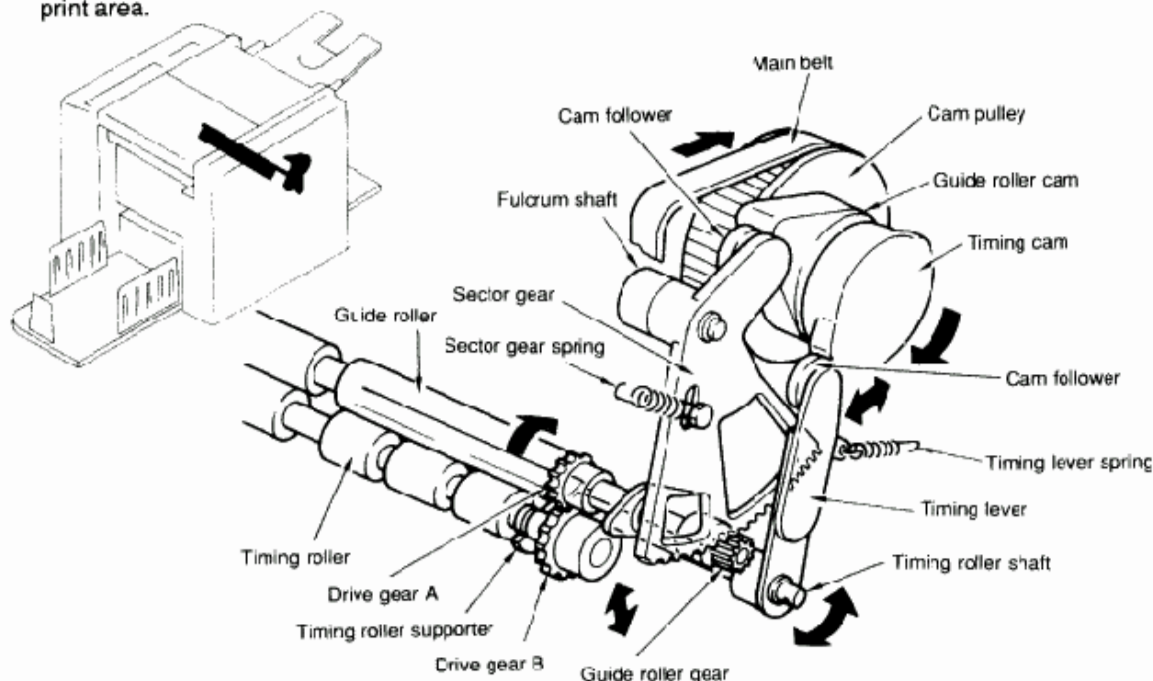
When the cam follower follows the Timing cam from the low point to the high one in the cam's rotation, the Timing lever is driven to rotate the Timing roller shaft counter-clockwise, lowering the Timing roller supporter.

On the other hand, when it follows the cam from the high to low, the Timing lever is driven to rotate the Timing roller shaft clockwise, raising the Timing roller supporter.

The Timing roller is mounted on the Timing roller supporter.

Therefore, when the Timing roller shaft rotates clockwise, the Timing Roller is raised to the Guide roller and is held in that position by the Timing lever spring.

As the Timing roller is raised to the Guide roller, the Drive gear A and B on the two rollers engage and the paper fed by the first paper feed is stopped by the rollers to create a buckle and then is fed to the print area.



5. Paper Feed Check System

<There are two kinds of check system for paper transportation in the paper feed area.>

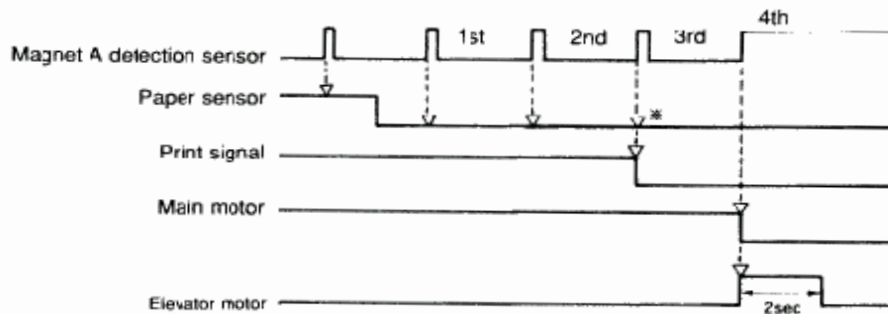
(1) Check of the paper jam in the first paper feed section

- ① During printing, it is checked at each detection of Magnet A if the light path of the Paper receiving sensor 1 is blocked.
- ② If the light path of the Paper sensor is opened before Magnet A detection, it is checked that the light path of the Paper receiving sensor 1 is opened at Magnet A detection position. (The Clamp plate points up.)
- ③ If the light path of the Paper sensor has been opened until Magnet A was detected twice after the above was checked, it is judged that paper has jammed in the first paper feed section, and paper feed is stopped with the interruption of the Print signal.
- ④ At the next detection of Magnet A, the Drum is stopped and the Elevator motor is rotated for two seconds to lower the Paper feed tray, after which the paper feed jam message is displayed on the panel.

(2) Check of the paper jam in the second paper feed section

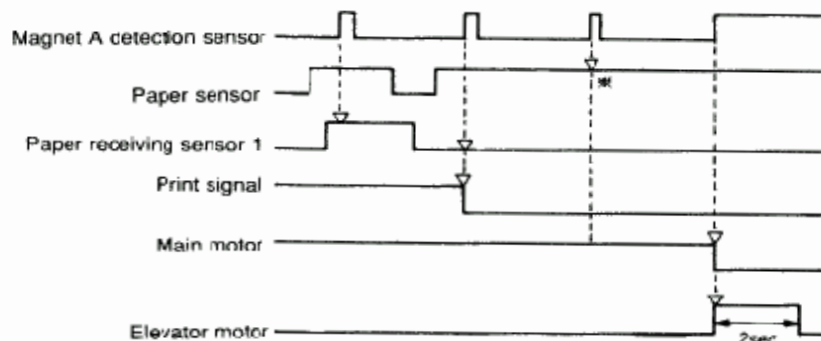
- ① During printing, it is checked at each detection of Magnet A if the light path of the Paper receiving sensor 1 is blocked.
- ② If at a detection of Magnet A, the light path of the Paper receiving sensor 1 is not blocked but that of the Paper sensor is, paper feed is immediately stopped with the interruption of the Print signal.
- ③ At the next detection of Magnet A, it is checked if the light path of the Paper sensor is blocked. If it is blocked, it is judged that paper has jammed in the second paper feed section and the paper feed jam message is displayed on the panel.
- ④ At the next detection of Magnet A, the drum is stopped and the Elevator motor is rotated for two seconds to lower the Paper feed tray.

(1) Paper Jam in the first paper feed section



* Where concluded that paper has jammed in the first paper feed section.

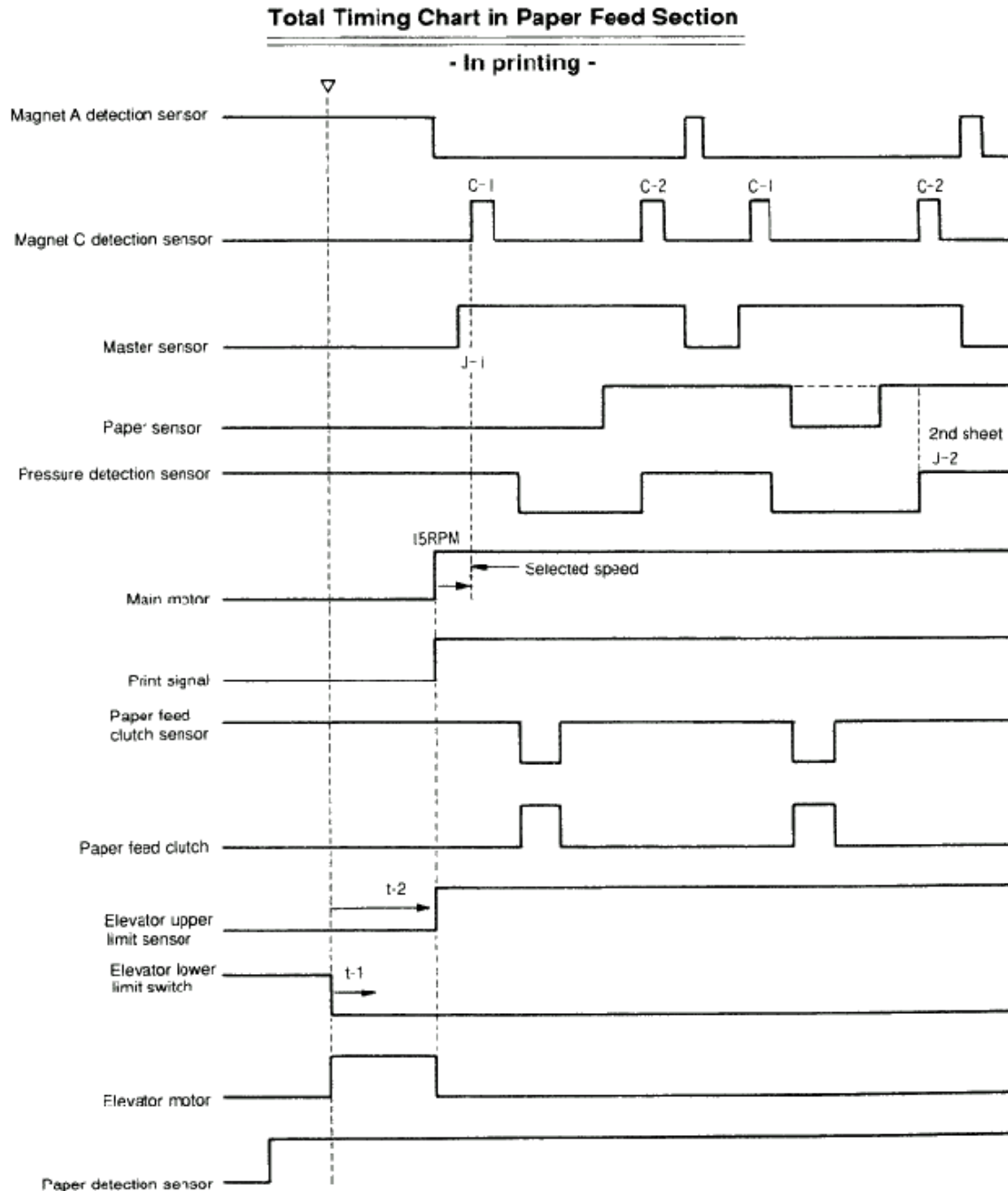
(2) Paper Jam in the second paper feed section



* Where concluded that paper has jammed in the second paper feed section.

THEORY OF OPERATION

Total Timing Chart in Paper Feed Section



- J-1: If the Master sensor does not detect the master at the first Magnet C detection (C-1) in printing, the print signal is turned OFF. At the next Magnet A detection, the drum is stopped and the error message **"NO MASTER ON DRUM/ SET ORIGINAL IN PLACE AND PRESS START BUTTON"** is displayed on the panel.
- J-2: If the light path of the Pressure detection sensor is blocked twice while the light path of the Paper sensor remains blocked, paper feed is stopped with the interruption of the Print signal and the Drum is stopped after the double detections of Magnet A, after which the jam message **"PAPER JAM/ CHECK PAPER FEED AREA"** is displayed on the panel.
- t-1: The trouble message **"T2:CALL SERVICE"** is displayed if the Elevator lower limit switch's actuator is not released within **2 seconds** after the Elevator motor starts to rise.
- t-2: The trouble message **"T2:CALL SERVICE"** is displayed if the light path of the Elevator upper limit sensor is not opened by the actuator within **7 seconds** after the Elevator motor starts to rise.

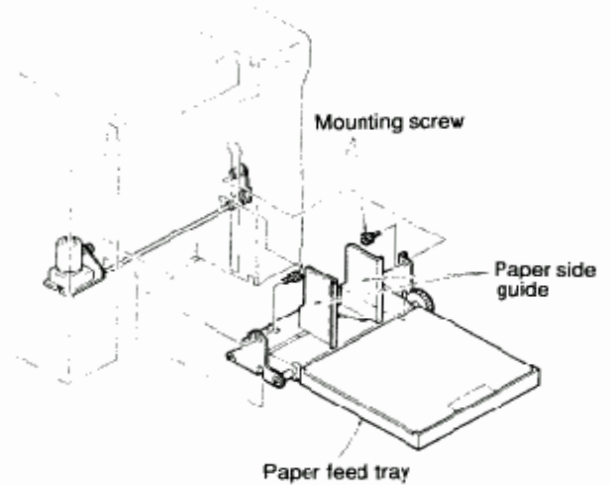
1. Paper Feed Tray Unit
2. Stripper Unit

[Removal Procedures & Precautions for Installation]

1. Paper Feed Tray Unit

– Removal Procedures –

- 1) Open the Paper feed tray, and slide the Paper side guides as close together as possible.
- 2) Remove the two mounting screws (cap screws) on the Paper feed tray unit.
- 3) Gently lift the Paper feed tray up and out.



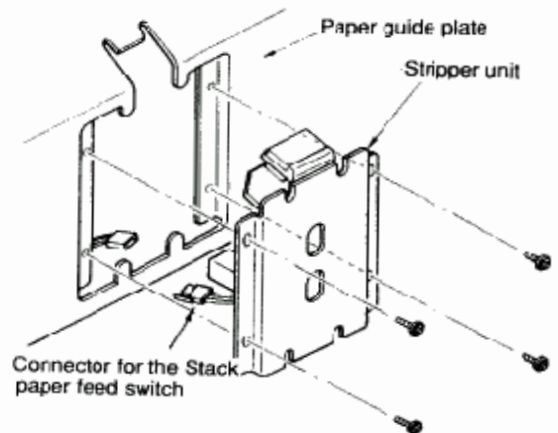
2. Stripper Unit

– Removal Procedures –

- 1) Remove the four mounting screws fixing the Stripper unit to the Paper guide plate.
- 2) Gently pull the Stripper unit away from the Paper guide plate and disconnect the connector for the Stack paper feed switch.

– Precautions for Installation –

- Do not forget to connect the Stack paper feed switch.
- The Stripper pressure will differ depending on the mounting position of the unit.



REMOVAL & INSTALLATION

3. Scraper Unit

4. Guide Roller Unit

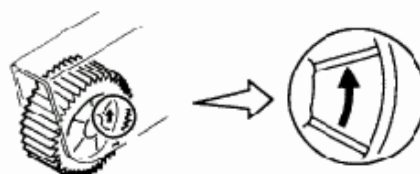
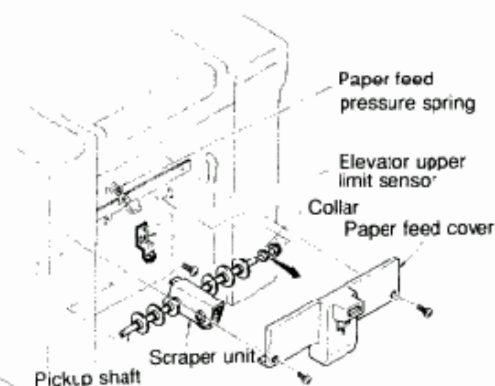
3. Scraper Unit

– Removal Procedures –

- 1) Remove the two cover mounting screws and remove the Paper feed cover.
- 2) Remove the mounting screw and remove the Elevator upper limit sensor.
- 3) Gently remove the Paper feed pressure spring to avoid stretching the spring.
- 4) Loosen the screw on the retaining collar on the operator side of the Pickup shaft.
- 5) Slide the Scraper unit toward the operator side to release the Pickup shaft from the Paper feed clutch and remove the unit.

– Precautions for Installation –

- Always check/adjust the position of the Elevator upper limit sensor.
- Be careful not to attach the Scraper and Pickup rollers in the wrong direction.
(These rollers can rotate one-way only.)



4. Guide Roller Unit

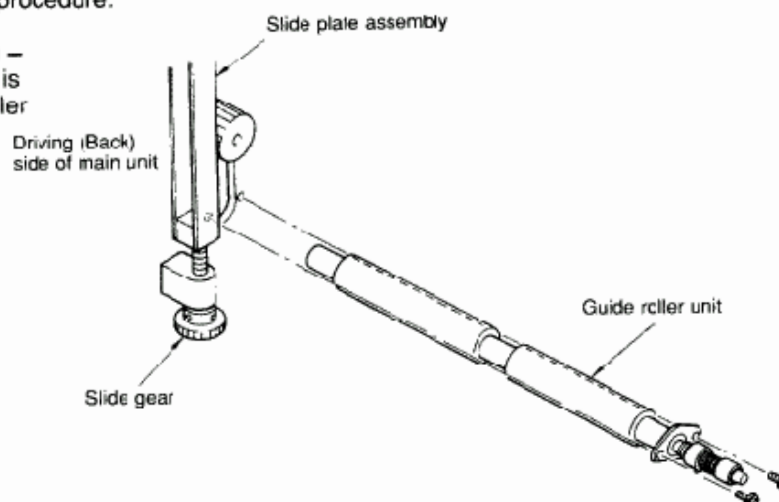
– Removal Procedures –

- 1) Remove the Back cover and rotate the Drum to the position where the Timing roller is lowered.
(If necessary, remove the Pressure control motor.)
- 2) Remove the two Guide roller unit's mounting screws located on the driving side.
- 3) Pull the Guide roller unit out through the opening on the driving side.

Note: It may be necessary to remove the Sector gear if it complicates the above procedure.

– Precautions for Installation –

- Make sure the Sector gear is engaged with the Guide roller gear with some clearance.



[Put on the Pickup Roller in this way]

[Adjustment Procedures]

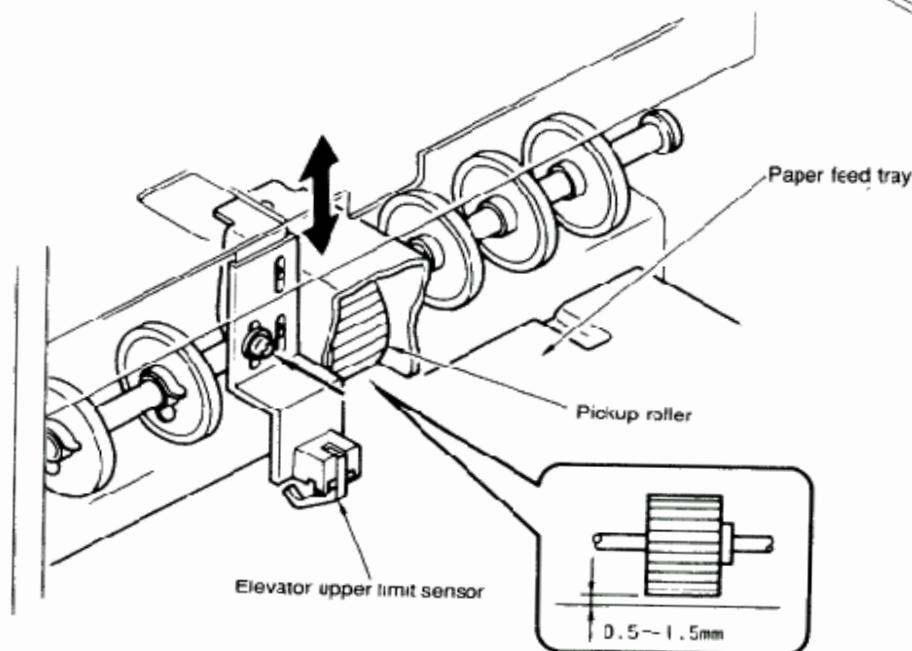
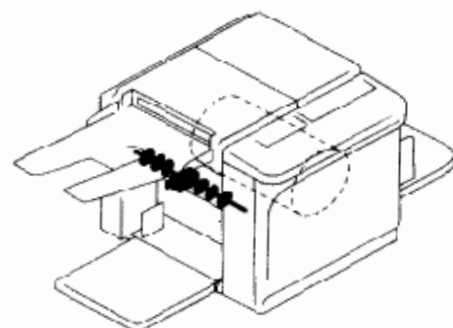
1. Position of Elevator Upper Limit Sensor

– Check & Adjustment –

- 1) Enter Test mode **No.70** and raise the Paper feed tray.
- 2) Check that The tray should stop with a clearance of **0.5 to 1.5mm** between the Pickup roller and the Paper feed tray.
- 3) If the above condition is not satisfied, remove the Paper feed cover and move the Elevator upper limit sensor together with the bracket to obtain the appropriate clearance.

– Results of Misadjustment –

- 1) If the Elevator upper limit sensor detects the feed tray elevation too early; ➡
the Paper feed tray is stopped at a lower position, causing the paper feed pressure to be so weak that paper will be liable to skip feed or misfeed.
- 2) If the Elevator upper limit sensor detects the feed tray elevation too late; ➡
the Paper feed tray is stopped at a higher position, causing the paper feed pressure to be so strong that multiple sheets will be liable to be fed. In this case, the Stack paper feed switch will be activated and the Paper feed clutch will be turned off.
- 3) If the Elevator upper limit sensor can not detect the feed table elevation 7 seconds after the Elevator motor starts; ➡
it is judged that the Elevator motor has been locked and the trouble message "T2:CALL SERVICE" is displayed on the panel.



ADJUSTMENT PROCEDURES

2. Stripper Plate Pressure

2. Stripper Plate Pressure

– Procedure –

- 1) Remove the Scraper unit.
- 2) Turn the Angle adjustment screw so the Stripper plate is parallel to the Paper guide plate.
- 3) Loosen the Stripper unit's four mounting screw and position the unit in the center of the oval holes. Then tighten the screws.

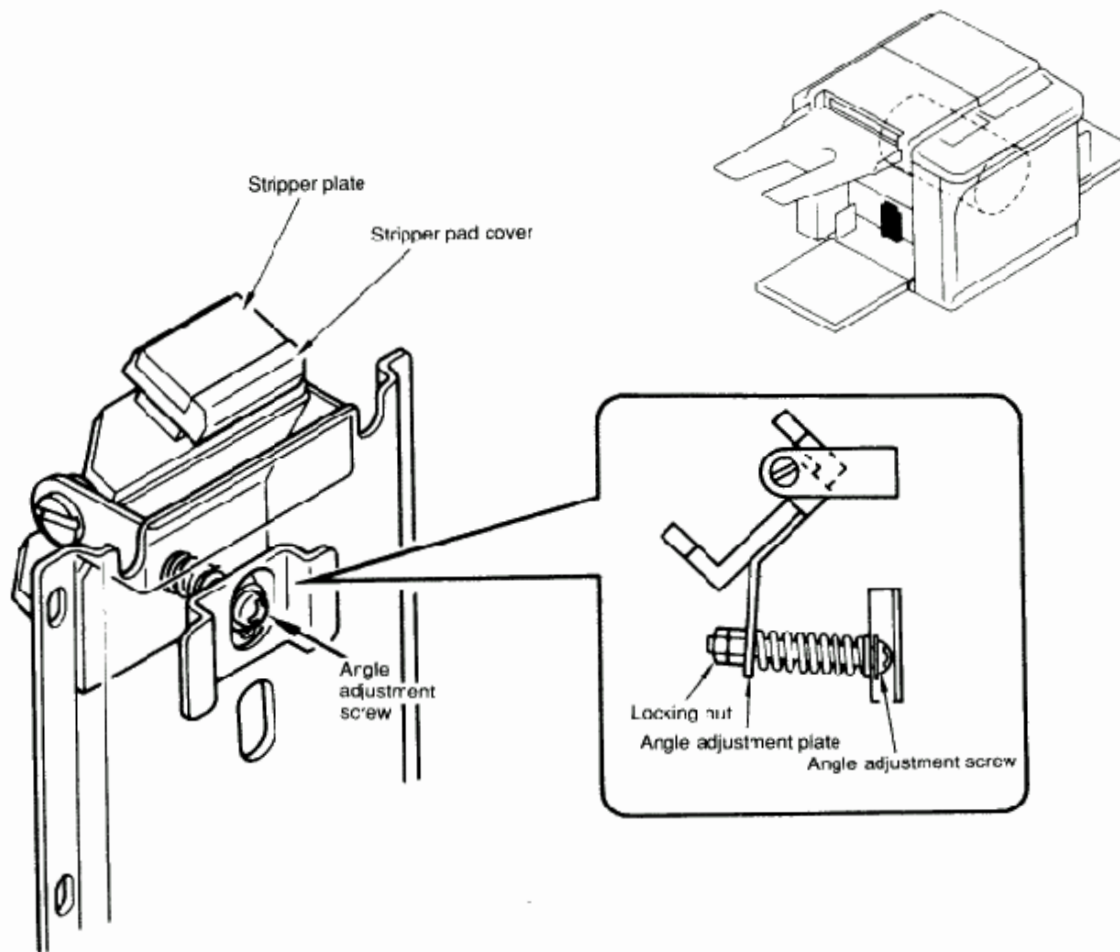
Note: Always check the Stack paper feed switch after each adjustment.

– Check & Adjustment –

- 1) Check by feeding paper that paper is fed well without such troubles as slip feed and multiple-sheet feed.
- 2) If paper slips, rotate the Angle adjustment screw clockwise or lower the mounting position of the Stripper unit.
- 3) If multiple sheets of paper are fed, rotate the Angle adjustment screw counterclockwise or raise the mounting position of the Stripper unit

– Results of Misadjustment –

- 1) If the angle of the Stripper plate is too steep; ➡
the Stripper pressure is too high and paper will slip or not feed.
- 2) If the angle is too flat; ➡
the Stripper pressure is too low, causing multiple sheets of paper to be fed, or the edge of paper strikes the Stripper pad cover, causing the paper to wrinkle.



3. Position of Stack Paper Feed Switch

– Procedure –

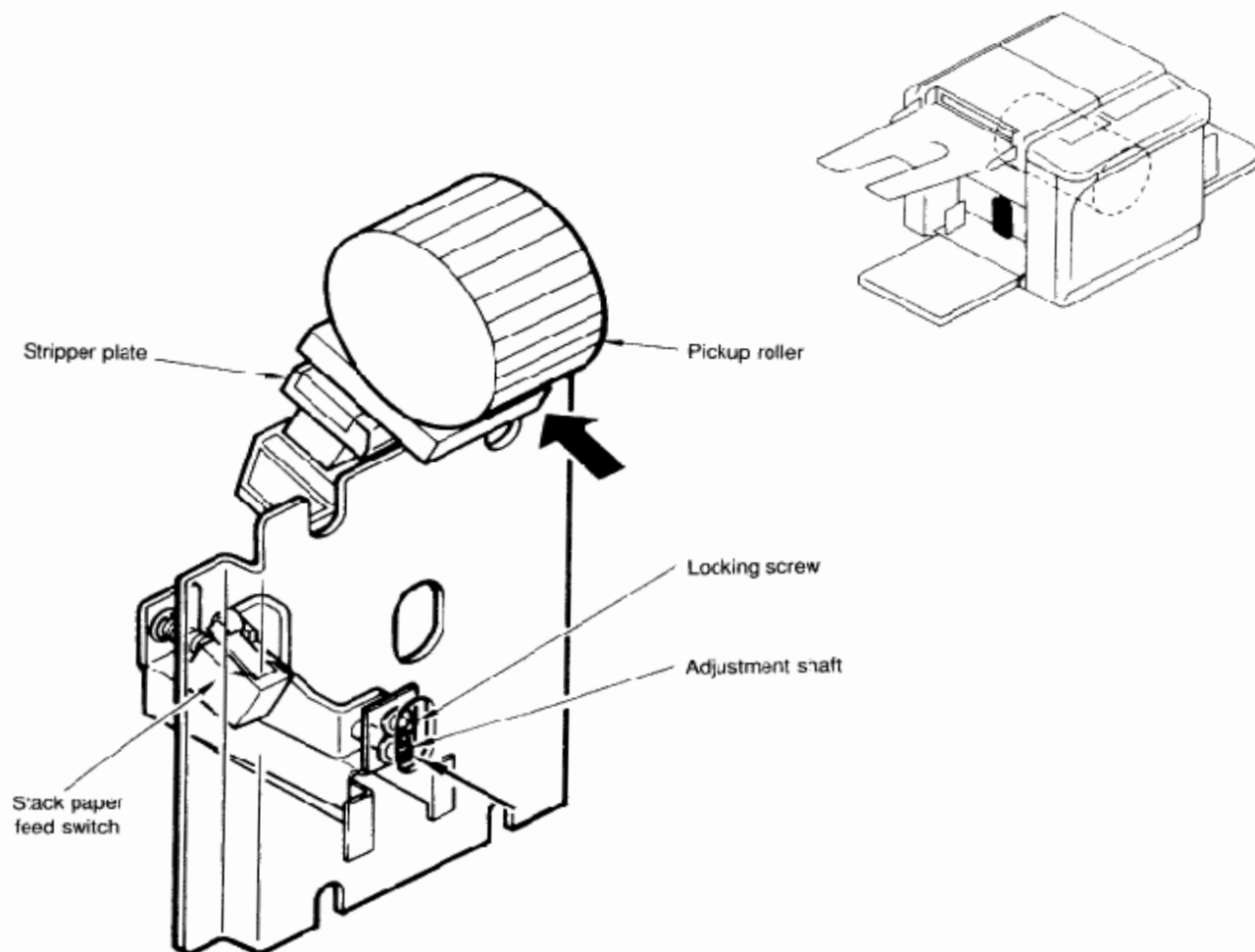
- 1) Loosen the locking screw and rotate the adjustment shaft completely counterclockwise.
- 2) Insert a gauge **1.5 mm** thick between the Pickup roller and the Stripper plate.
- 3) Rotate the adjustment shaft clockwise until the actuator of the Stack paper feed switch has just been pressed ON.
- 4) Tighten the locking screw to secure the adjustment.

– Check –

- 1) Check that the Paper feed clutch does not work when printing is started, with the **1.5-mm-thick** sheets inserted between the Pickup roller and the Stripper plate.
- 2) Then remove the sheet and print paper to check that the Stack paper feed switch is not pressed.

– Results of Misadjustment –

- 1) If the Stack paper feed switch detects that multiple sheets of paper are fed, too late; ➡ multiple sheets will jam around the second paper feed section and, in the worst case, the main belt may be disengaged from the driving pulleys.
- 2) If the Stack paper feed switch detects that multiple sheets of paper are fed, too early or has already been actuated before operation; ➡ it is misjudged that multiple sheets of paper have been fed, causing false paper jams, which will stop the Paper feed clutch and have the paper feed jam message displayed on the panel.



ADJUSTMENT PROCEDURES

4. Position of P Disk (Start-time of First Paper Feed)

- Procedure -

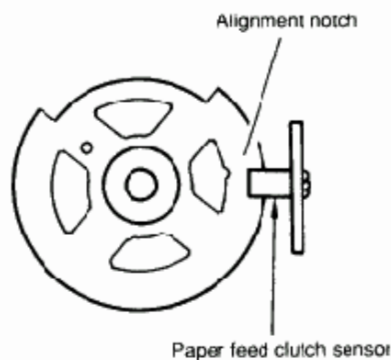
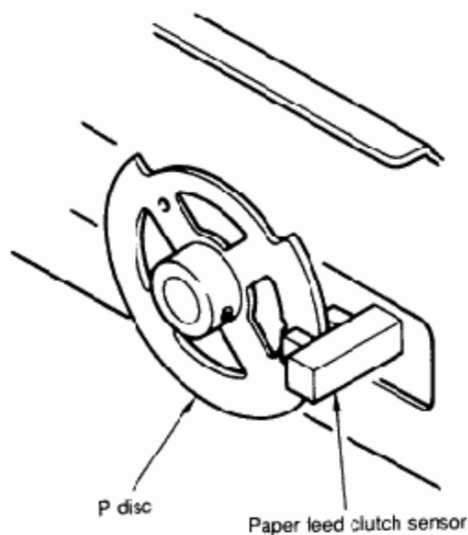
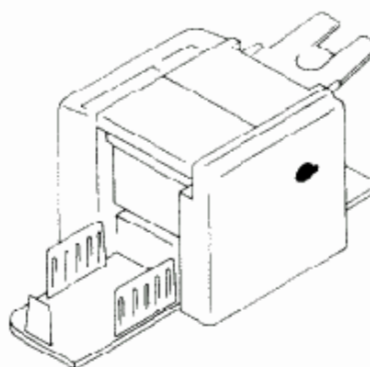
- 1) Check that the vertical print position is in the center position and the Drum at the Magnet A detection position.
- 2) Loosen the allen screw on the P disc and turn the P disc so that its alignment notch is in the top half of the Paper feed clutch sensor.
(Refer to the figure below.)
- 3) Tighten the allen screw on the P disc.

- Check -

Rotate the drum and check that the P disc does not contact the inner side of the Paper feed clutch sensor at any position.

- Results of Misadjustment -

- 1) If the P disc is mounted and adjusted incorrectly; ➡
the paper will not feed correctly, causing paper feed errors.



5. Position of Timing Lever

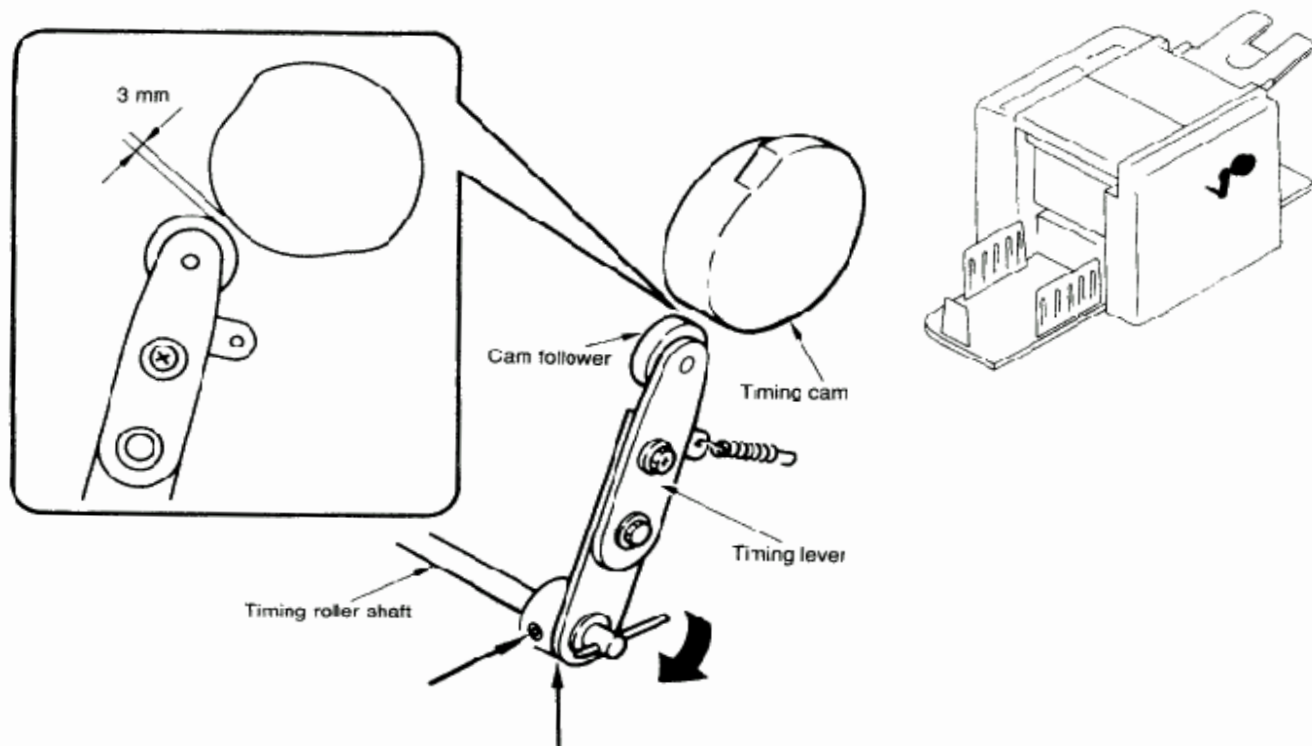
- Check & Adjustment -

- 1) Remove the Back cover.
- 2) Rotate the drive system so that the Timing cam does not touch the cam follower on the Timing lever.
- 3) Check that the gap between the Timing Cam and the cam follower on the Timing lever should be **3 mm**.
- 4) If the gap is incorrect, loosen the Timing lever's allen screws on the Timing roller shaft. Then insert an allen key into the hole of the Timing roller shaft and rotate the shaft clockwise (to raise the Timing roller into contact with the Guide roller). Holding the shaft in that position, move the Timing lever to obtain the 3mm gap, and tighten the allen screws.

- Results of Misadjustment -

- 1) If the gap between the Timing cam and the cam follower on the Timing lever is too small; ➡
the feed pressure of the Guide and Timing rollers will be so weak that paper slips between the rollers, which will result in a paper jam or the irregularity of the registration of the print position.
- 2) If there is no gap between the Timing cam and the cam follower on the timing lever; ➡
The Driving gear B on the Timing roller can't be engaged with the Driving gear A on the Guide roller, which will result in a paper jam.
- 3) If the gap between the Timing cam and the cam follower on the Timing lever is too big; ➡
the Timing roller will not be lowered enough to allow the rollers to separate. This will cause "Ghosting" and misfeeds.

Note: "Ghosting" is a print displacement (trails) caused by the grip of paper with the rollers in the second paper feed section when the paper is being pulled in the print area.



ADJUSTMENT PROCEDURES

6.Parallelism of Timing Roller

6. Parallelism of Timing Roller

– Check & Adjustment –

[CHECK 1]

- 1) Open the front door and slide the drum out.
- 2) Check visually that the Timing roller is parallel with the Guide roller.

[CHECK 2]

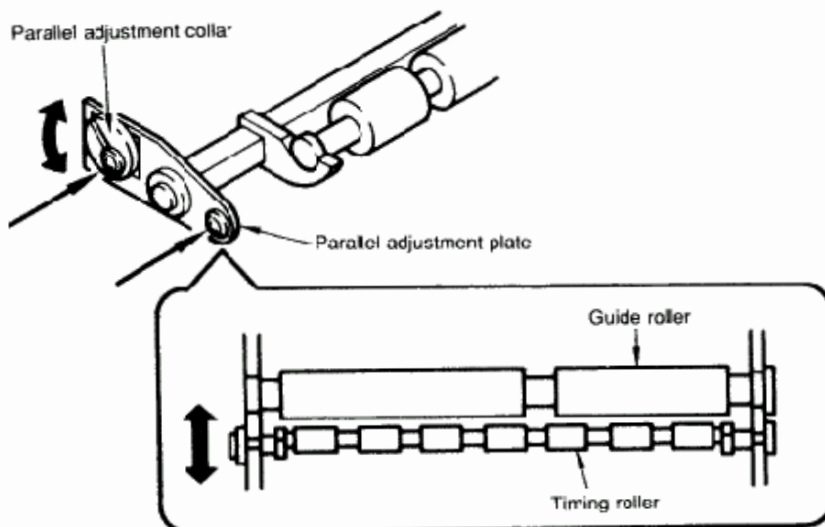
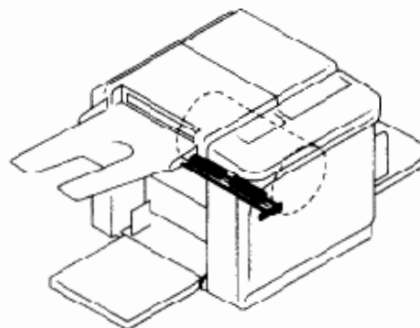
- 1) Remove the paper from the feed tray and cut two strips of paper 8 1/2" long.
- 2) Place the strips through the Paper guide plate and into between the Guide and Timing rollers (one on each side.)
- 3) Rotate the drive system till the strips start to feed. Then check the tension on each strip of paper.

[ADJUSTMENT]

If the Timing roller is not parallel with the Guide roller, loosen the Parallel adjustment plate and collar mounting screws, and turn the adjustment collar to adjust the angle of the Timing roller.

– Results of Misadjustment –

- 1) If the Timing and Guide rollers are not parallel: ➡
the paper may be pulled to one side, causing it to skew or to be wrinkled.

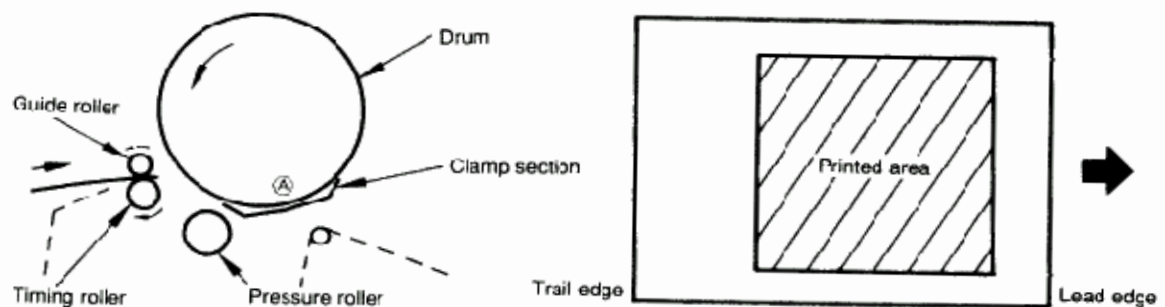


2.Vertical Position Control Section

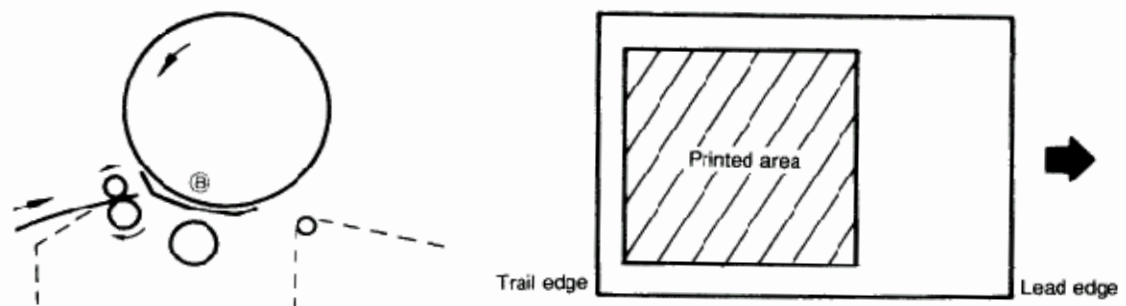
Overview

When pressing the print position button on the operation panel, the Print positioning motor rotates and change the vertical print position in steps on the printed copy to a maximum of ± 20 mm.

- ① Suppose the Guide roller starts rotating and feeding the paper to the print area when the clamp section on the Drum is rotated to point A in the figure.
In this case, the print area on the paper is as shown in the figure below.



- ② Next Suppose the Guide roller starts rotating and feeding the paper to the print area when the clamp section on the Drum is rotated to point B in the figure below.
In this case, the paper is fed earlier and the print area goes down to the bottom of the paper as shown in the figure below.
The print position in the vertical direction is determined by the start time of the rotation of the Guide roller.



THEORY OF OPERATION

1. Vertical Position Control System

[Theory of Operation]

1. Vertical Position Control System

- Rotation of Print positioning motor

Pressing the print position button "DOWN" on the operation panel for the shift-down of print position causes the Print positioning motor to rotate clockwise.

This rotates the Slide shaft counter-clockwise via the Slide gear to elevate the Slide shaft bracket, which is fixed to the Slide plate.

- Movement of Main belt

Two Slide idlers are also attached to the Slide plate to provide tension on the Main belt.

If the Slide shaft bracket is elevated, the Slide idlers are also elevated.

This loosens the tension of the Main belt on the upper idler and tightens it on the lower idler.

As a result, the Main belt is moved clockwise.

- Rotation of Guide roller cam

When the Main belt is moved clockwise, the Cam pulley is rotated clockwise and the Guide roller cam as well is rotated clockwise.

By the above movement, the Sector gear is started to move earlier, causing the Guide roller as well to start rotating earlier to feed paper to the print area (the Drum) earlier.

As a result, the print area is shifted down to the bottom of the paper.

- Shift-up of Print position

Pressing the print position button "UP" on the operation panel for the shift-up of print position causes the Print positioning motor to rotate counterclockwise.

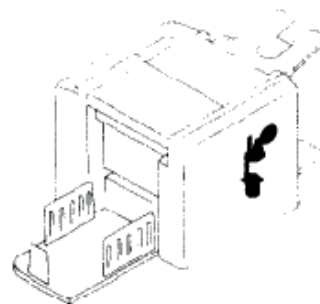
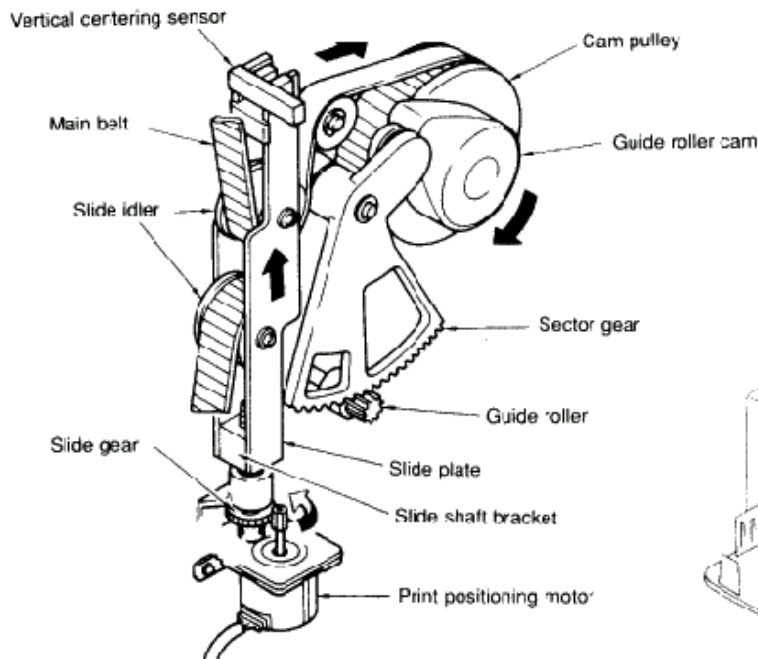
This causes the Guide roller to start rotating later to shift up the print area to the top of the paper.

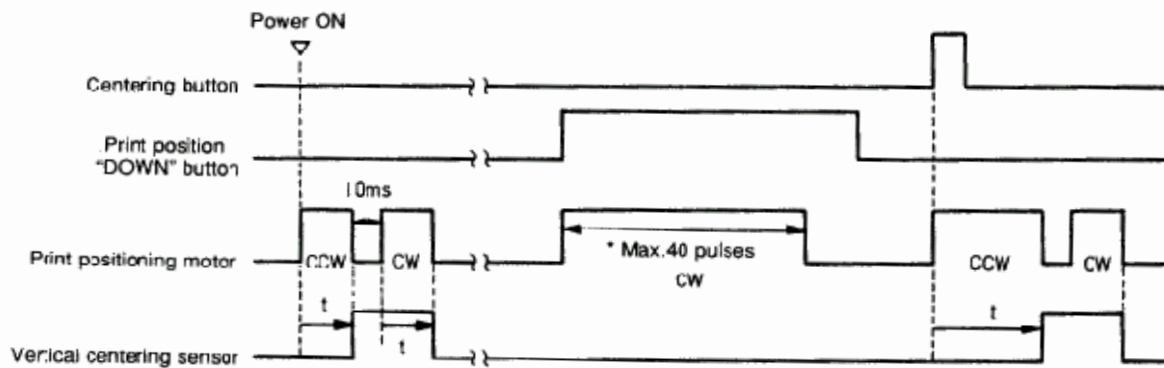
- Automatic Centering

The print position is automatically returned to the center position (only vertically) by Print positioning motor in the following cases: 1) when the power switch is turned ON, 2) when the "Centering" button is pressed, and 3) when the "RESET" button is pressed.

The operation of automatic centering is as follows:

- 1) The light path of the Vertical centering sensor is blocked by the Slide plate, which is raised by the Print positioning motor.
- 2) The Slide plate is lowered until the light path of the sensor has been opened, and the print position is located at the center.



Vertical Position Control System

t: If the condition of the Vertical centering sensor does not change from CN to OFF (or OFF to ON) within **12 seconds** after the power is turned on or after the Centering button is pressed, the trouble message "T5:CALL SERVICE" is displayed.

- * Even if the Print position button remains pressed, the Print positioning motor will be only rotated in each direction from each (top or bottom) end by a maximum of **40 pulses** and turned off.

REMOVAL & INSTALLATION

1. Print Positioning Motor Unit

[Removal Procedures & Precautions for Installation]

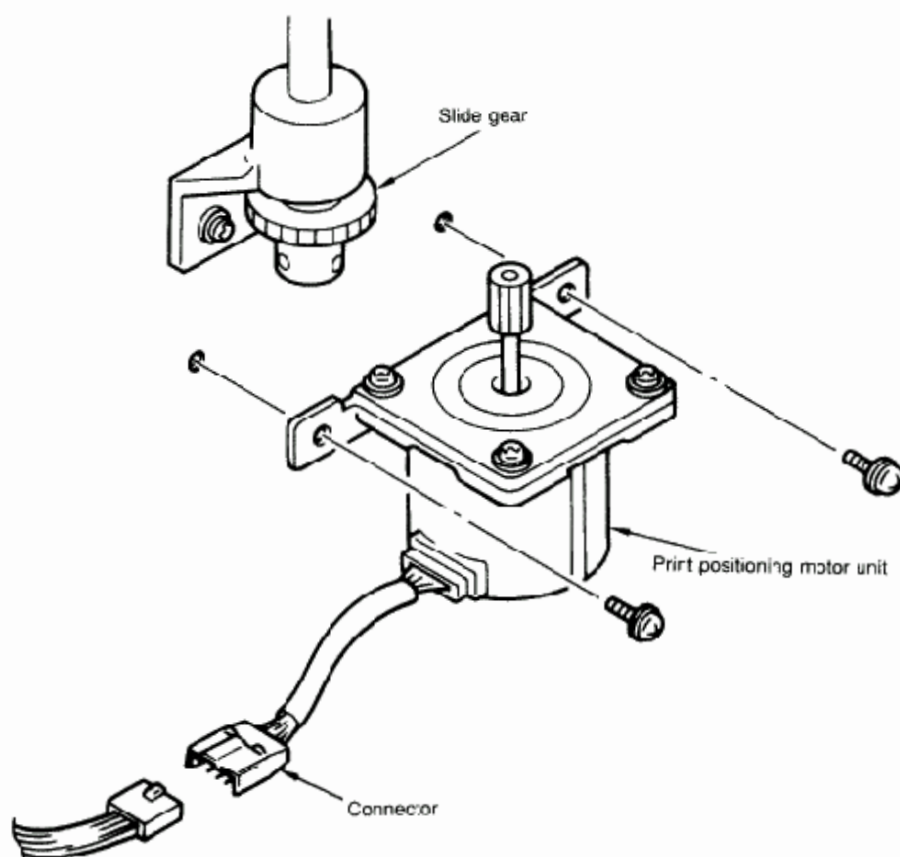
1. Print Positioning Motor Unit

– Removal Procedures –

- 1) Remove the Back cover.
- 2) Disconnect the connector (6P) connected to the Print positioning motor.
- 3) Remove the two mounting screws of the Print positioning motor unit and remove the unit.

– Precautions for Installation –

- Make sure the Slide gear is well engaged with the gear on the motor.



[Adjustment Procedures]

1. Vertical Print Position

There are two kinds of adjustment procedures for the vertical print position depending on the degree of difference in image position between an original and a printed copy as follows.

(Remember that the following adjustment should be applied only when the master making and loading positions are correct.)

- | | |
|--|---|
| <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> If the difference is less than 12mm ; ➡ | Adjust (1) Position of Guide Roller Cam |
| <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> If the difference is 12mm or more ; ➡ | Adjust (2) Installation Position of Main Belt (Cam Pulley) |

(1) Position of Guide Roller Cam

– Check & Adjustment –

- 1) After checking that the master making and loading positions are correct, use test chart **No. 8** for an original and make a master.
- 2) After moving the print position toward the bottom by the print position button, return it to the center by the "Centering" button and print at **speed 3**.
- 3) Check that the print registration of the original image to the copy is within **2mm** in the vertical direction.
- 4) If it is incorrect and **less than 12mm**, loosen two Guide roller cam's mounting screws and adjust the installation position of the cam.

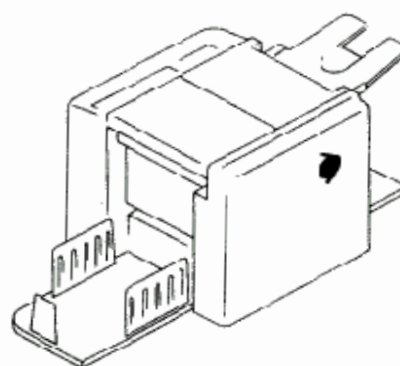
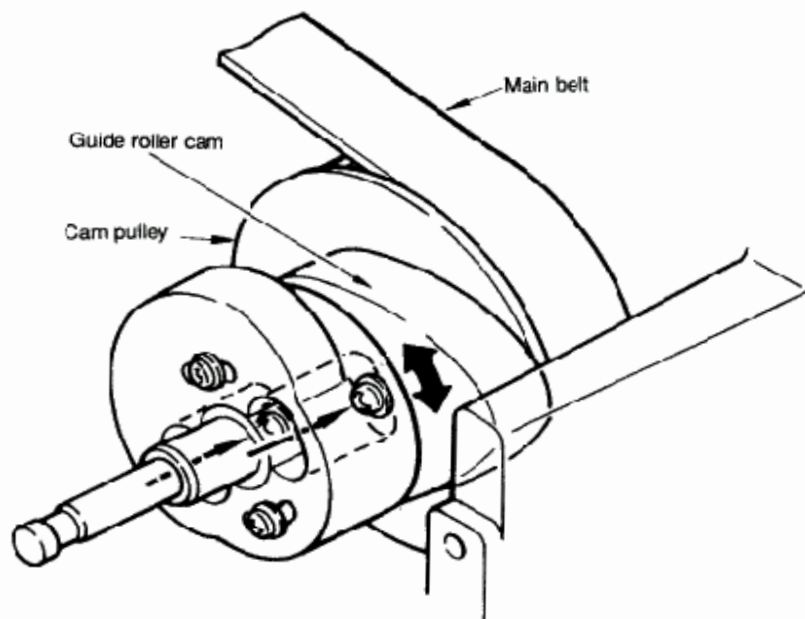
Note: If the cam is moved clockwise, ➡ the print area is shifted toward the bottom.
 If the cam is moved counterclockwise, ➡ the print area is shifted toward the top.

– Check –

- 5) After tightening the Guide roller cam's mounting screws, repeat the operations from **step 2**).

– Results of Misadjustment –

- If the Guide roller cam is not positioned correctly; ➡
 - 1) the print registration will still be incorrect.
 - 2) paper will not feed properly.
 - 3) shifting the print area too close to the top may cause the paper to jam on the Drum.



ADJUSTMENT PROCEDURES

1. Vertical Print Position

(2) Installation Position of Main Belt (Cam Pulley)

– Procedure –

- 1) Return the print position to the center by the "Centering" button and rotate the Drum to the Magnet A detection position.
- 2) Loosen three mounting screws on the Paper feed clutch base to release the tension of the Main belt.
- 3) Turn the Cam pulley so that the hole on the Top face plate are directly aligned with that on the Cam pulley.
- 4) Rotate the Paper feed clutch base counterclockwise to apply tension to the Main belt and tighten three mounting screws on the clutch base while applying tension.

Note: When applying tension to the Main belt, the Cam pulley alignment hole will move down a little.

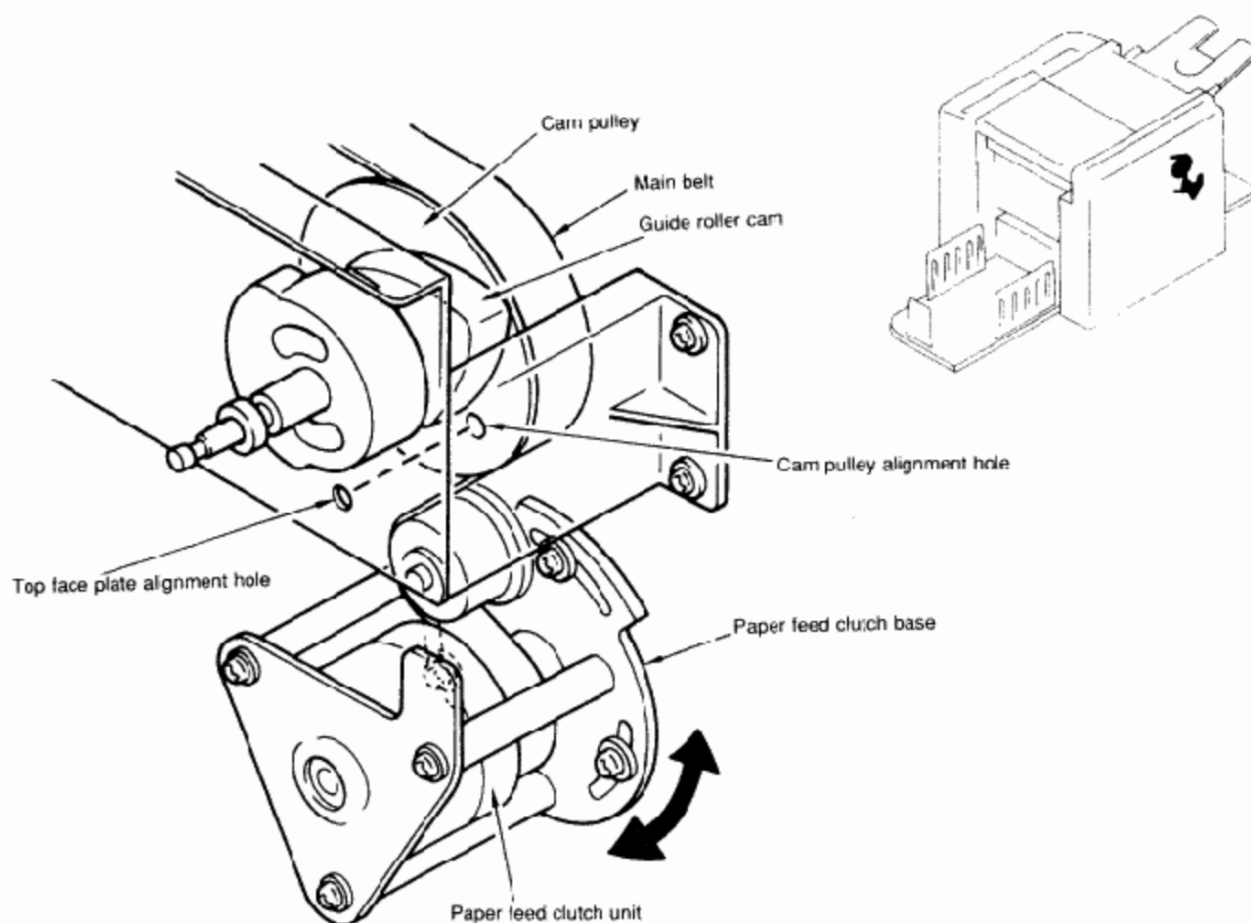
– Check –

- 5) Re-check the print registration following the adjustment procedures of the Guide roller cam position.

– Results of Misadjustment –

Note: The print area is shifted about 12 mm for each one-gear-tooth shift of the Main belt on the Cam pulley.

- 1) If the print area is shifted too close to the top; ➡
the printed paper will wind around the Drum.
- 2) If the Cam pulley is too further out of position; ➡
not only the second paper feed but also the first paper feed will be incorrect due to the misalignment of P Disc, which will result in paper jam.



4. PRINT AREA

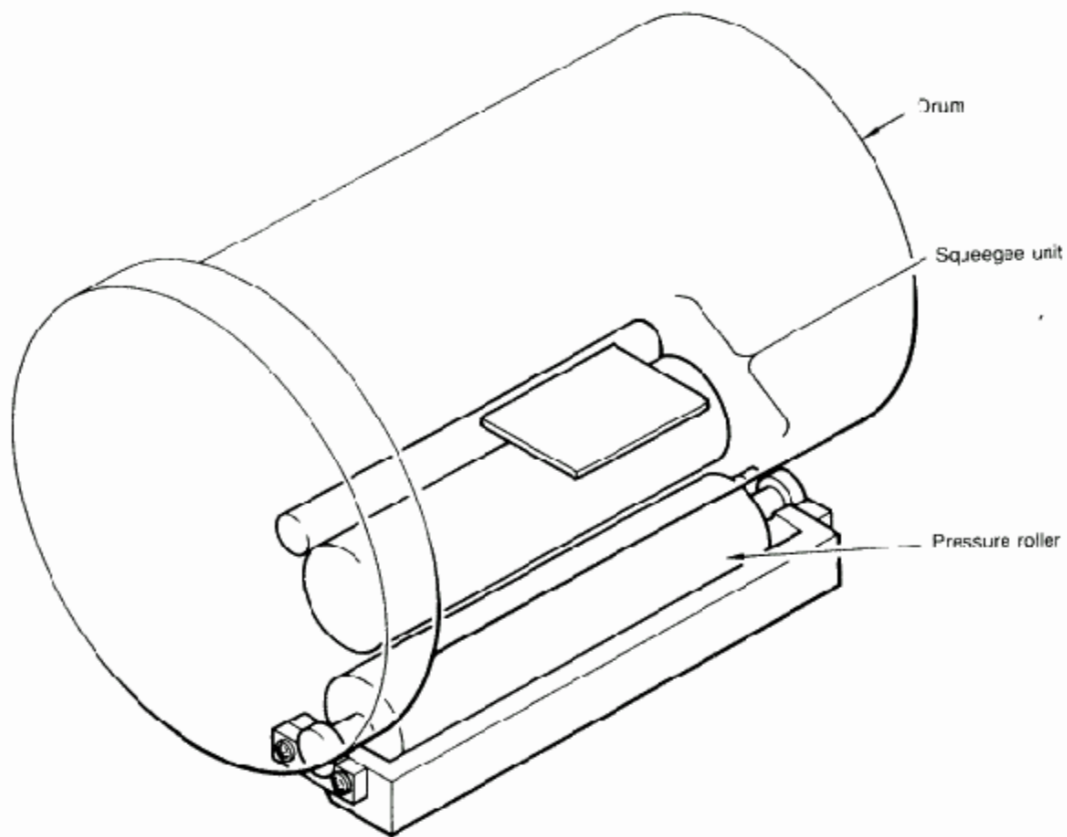
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Operation and Function

The Drum contains the Squeegee unit system, which applies ink to the inner surface of the Drum. The drum image area is perforated, which allows ink to flow through to the drum surface where a master will be attached.

When print paper is fed, the Pressure roller is lifted, pressing the paper against the master on the drum surface. The ink is then transferred to the paper through image areas (holes) of the master.



THEORY OF OPERATION

1. Drum Locking System

1. Drum Section

[Theory of Operation]

1. Drum Locking System

- Locking

The Drum is supported by the Drum holder which is mounted on the Drum rails.

The Lock plate locks the drum rotation when the Drum is removed from the machine.

When the Drum is slid into the machine, the Lock key engages with the Lock lever, and the Drum is locked in position.

The side frame contact releases the Drum lock plate allowing rotation.

- Check of Drum Installation

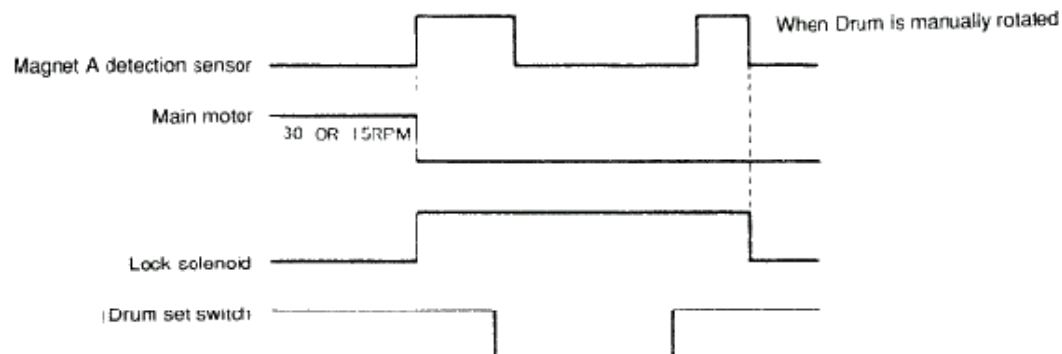
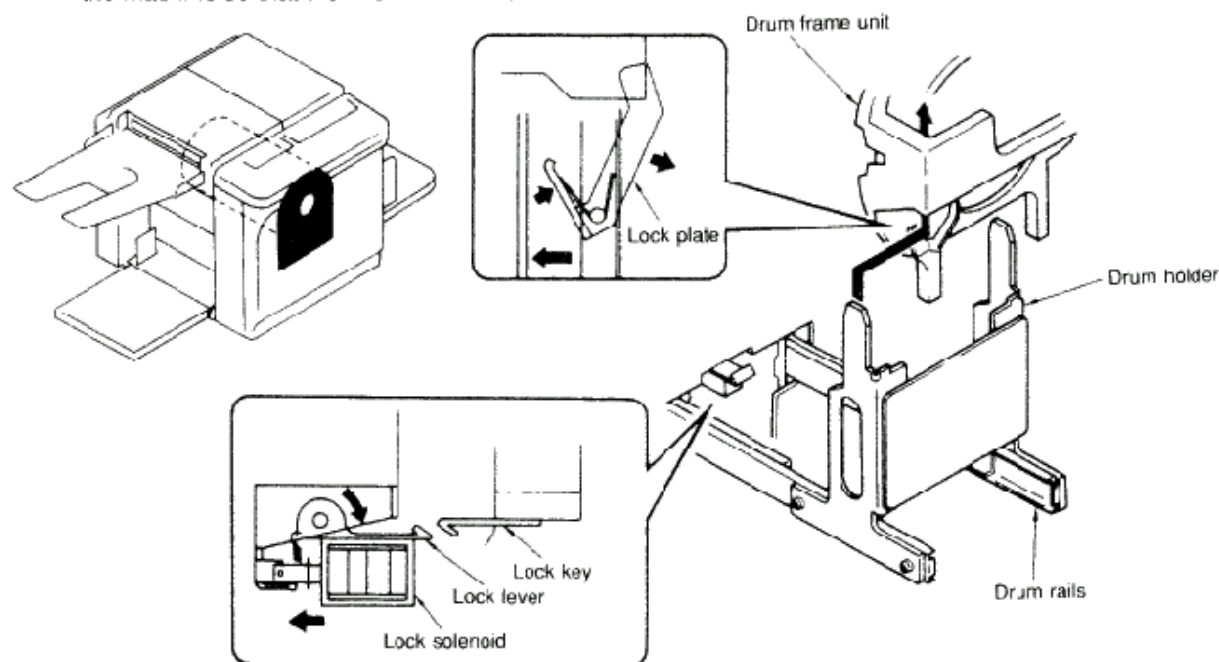
When the Drum handle is pushed down in this status, the actuator of the Drum set switch is pressed, indicating that the Drum has been set in position correctly.

- Lock Release

The Lock solenoid is controlled by the Magnet A detection.

When the Magnet A is detected, the Lock solenoid is turned on, and the Lock lever is pulled, releasing the lock.

The Lock plate is inserted into the slit of the right-side Drum body support; as the Drum is slid out of the machine so that the Drum will not rotate.



2. Drum Rotation Control System

- Rotation of Main pulley

The Main motor provides the drive rotation for the Main pulley via the Cam pulley and Main belt.

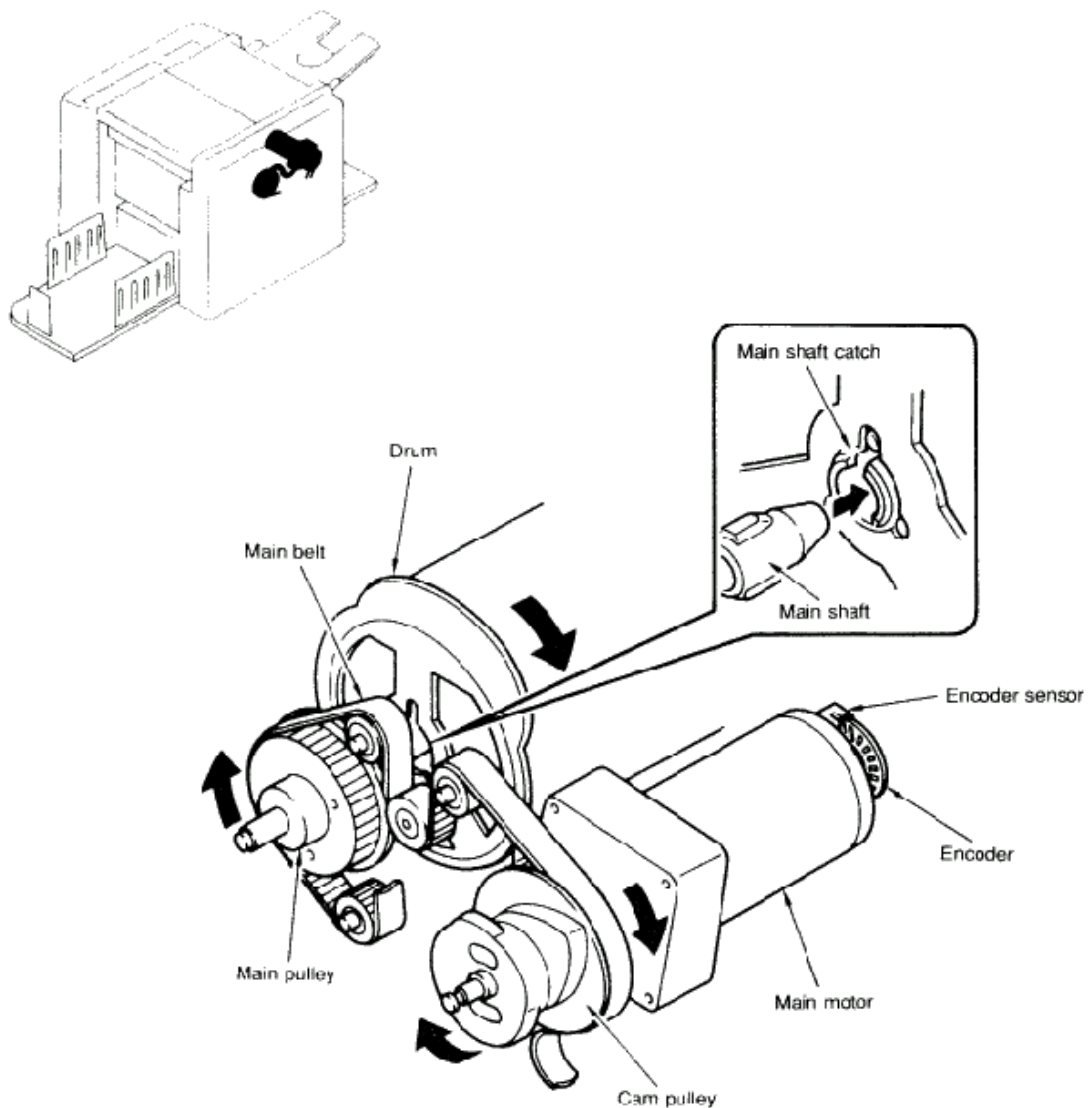
- Rotation of Drum

The Main shaft attached to the Main pulley is engaged with the Main shaft catch on the Drum, which provides the drive rotation to the Drum.

- Control of Rotation speed

The Main motor speed is controlled by the Encoder and Encoder sensor.

The Encoder sensor counts the number of slits on the Encoder in a given period, and controls the actual drum rotation speed.



THEORY OF OPERATION

3. Drum Position Check System

3. Drum Position Check System

- Magnet detection system

The drum position is checked by the Magnet A and C detection sensors attached to the Drum frame unit.

These sensors detect the magnetism of 3 magnets built in the right-side Drum body support.

The drum position is checked at the following three points.

[**Note:** Other types of detection (determination) are also performed by other sensors simultaneously.]

(1) Magnet A detection position

The Magnet A is detected when the Clamp section on the Drum points up.

This is the home position for many operations such as master removal, master loading, printing, etc., and plays an important part in detecting paper jams.

The Magnet A detection sensor also detects a Main motor lock trouble.

(2) Magnet C-1 detection position

The Magnet C-1 is detected when the U sheet on the Drum points up.

When in this position, the Magnet C detection sensor detects the master status on the Drum in conjunction with the Master sensor for the following detections or judgment:

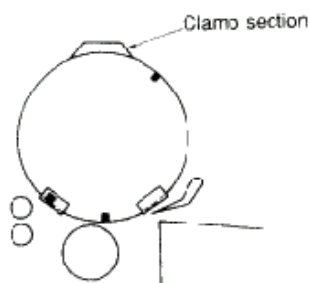
① Inhibition of Master removal error detection, ② Master misfeed detection, ③ Detection of the absence of master on the Drum

(3) Magnet C-2 detection position

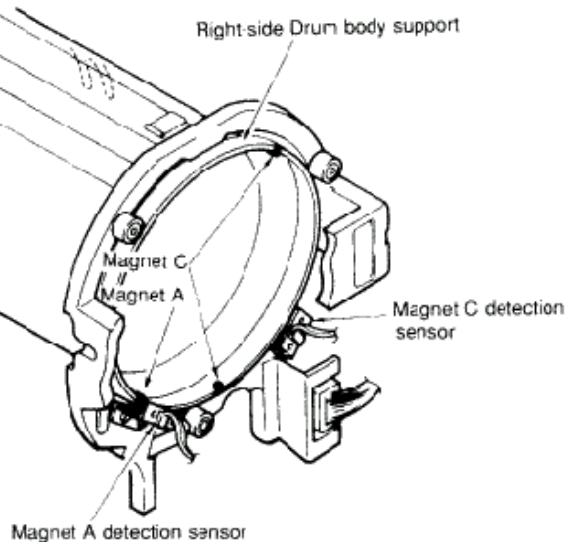
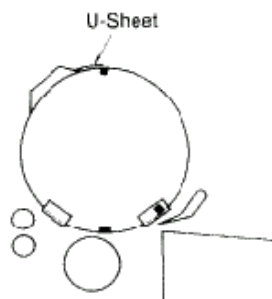
The Magnet C-2 is detected by the Magnet C detection sensor when the Clamp section on the Drum is under the Cutter unit.

When detected, the Cutter motor rotates the Rotary cutter to cut the loaded master.

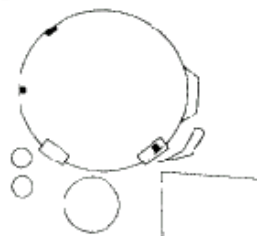
[Magnet A detection position]



[Magnet C-1 detection position]



[Magnet C-2 detection position]



4. Ink Supply System

- Rotation of Ink driving shaft and Squeegee roller.

When the Main shaft catch is rotated, it rotates the Squeegee belt, which causes the Ink driving shaft to rotate via the Ink driving shaft axis, and the Squeegee roller to rotate via the Squeegee Pulley.

[**Note:** The Squeegee roller rotates clockwise while the Ink driving shaft rotates counterclockwise.]

- Ink supply to the Drum

The Squeegee roller is positioned very close to the fixed Doctor roller.

When the Squeegee roller rotates, the ink passing through the crevice between the rollers covers the Squeegee roller with a thin film of ink.

The ink film is then transferred to the inside surface of the Drum.

Excess ink between the Squeegee and Doctor rollers is rolled by the Ink driving shaft to form an ink bead which will be used by the Squeegee roller during printing.

- Ink supply to the Squeegee section

When printing is performed and ink is used, the ink bead becomes smaller and exposes the tip of the Ink sensor attached to the Drum PCB, by which the Inking motor is turned on, driving the piston in the Inking pump.

This operation pumps ink out of the ink bottle (see the figure indicating the ink flow with pump action), and supplies ink to the Squeegee section through holes in the ink distributor.

- Detection of Ink volume

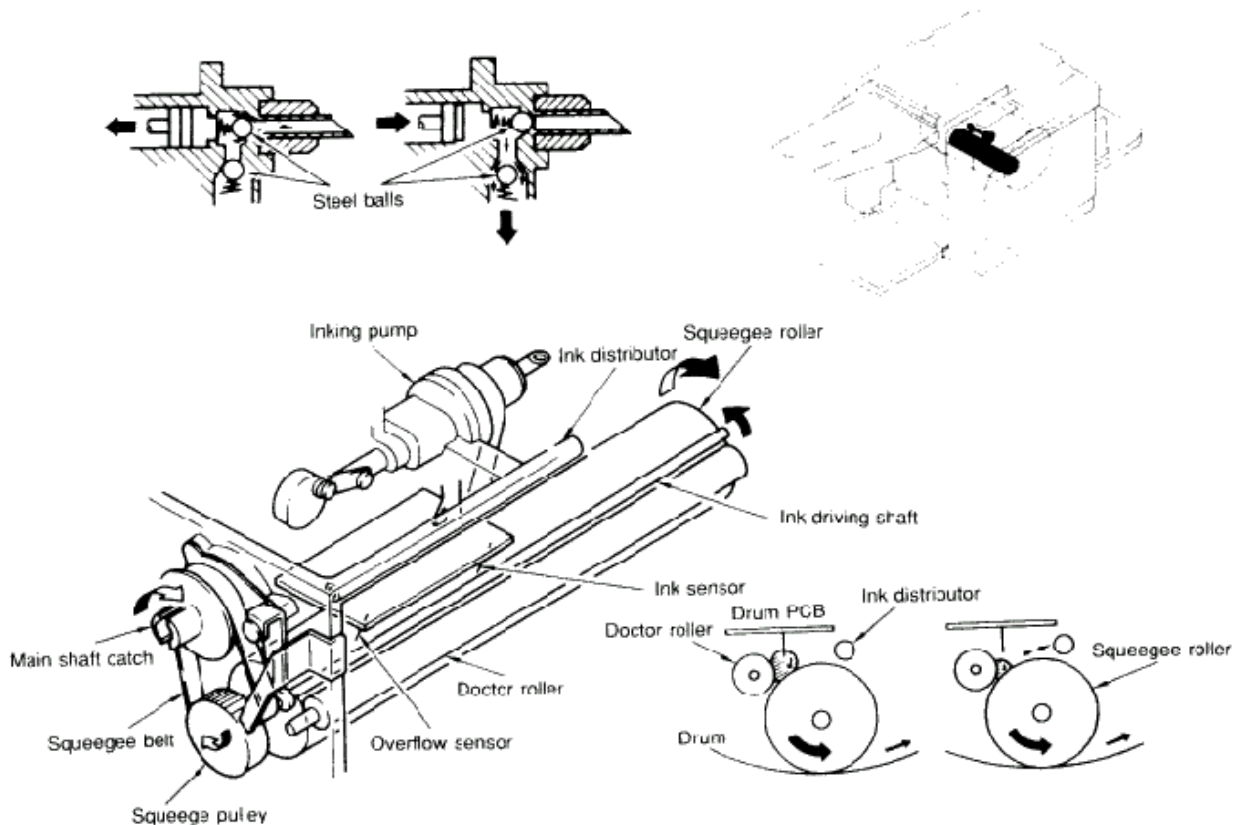
When ink is supplied, the ink bead becomes larger.

As the ink bead contacts the Ink sensor, the Inking motor is turned off to stop the ink supply from the ink bottle.

- Detection of Ink overflow

If ink increases abnormally in the Squeegee unit, it will contact the Overflow sensor to activate the sensor, which turns the Inking motor off to stop the ink supply (if it is in operation).

Then the trouble message "T4:CALL SERVICE" is displayed on the panel and prompts the user to contact service.

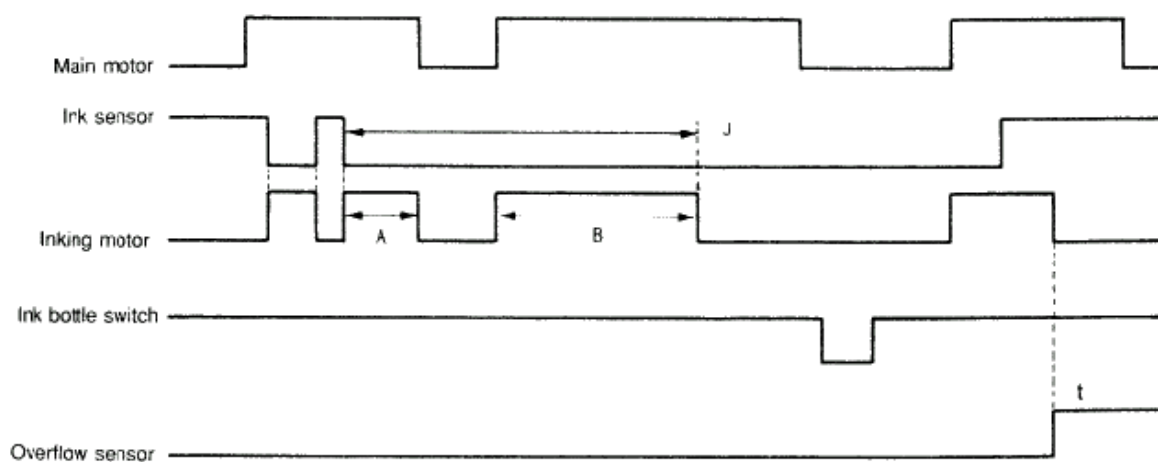


THEORY OF OPERATION

4. Ink Supply System

Timing Chart

Ink Supply System



- J: If the Inking motor has been in operation for **30 seconds** (A + B) without ink detection by the Ink sensor, it is judged that no ink can be supplied from an ink bottle and the advice message **"REPLACE INK BOTTLE"** is displayed after the finish of printing.
- t: When the Overflow sensor detects ink, the Inking motor is turned off to stop the ink supply if it is in operation, and the trouble message **"T4:CALL SERVICE"** is displayed.

[Removal Procedures & Precautions for Installation]

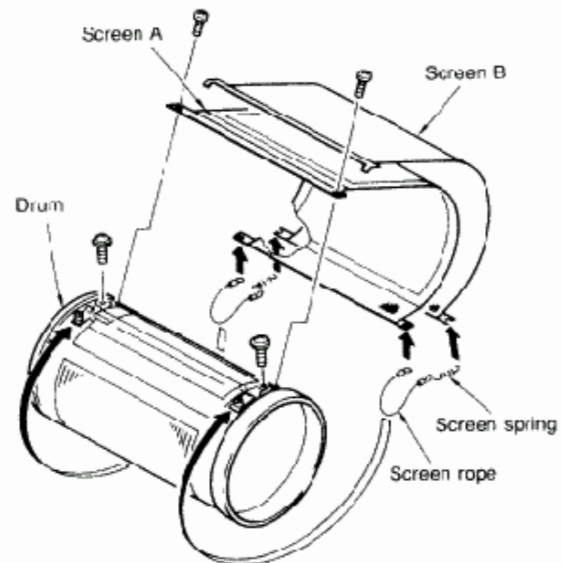
1. Screen

– Removal Procedures –

- 1) Open the Front cover, and remove the Drum from the machine.
- 2) Remove the Screen spring and rope assemblies from the Drum.
- 3) Loosen the two mounting screws on the Clamp section on the Drum.
- 4) Remove the two mounting screws from the screen, then remove the screens.

– Precautions for Installation –

- Mount the screens carefully so that they are aligned properly (not slantwise).



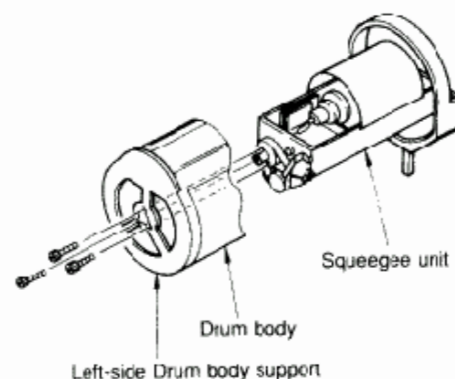
2. Squeegee Unit

– Removal Procedures –

- 1) Open the Front cover, and remove the Drum from the machine.
- 2) Remove the three cap screws on the left-side Drum body support which fasten the Squeegee unit to the Drum.
- 3) Push on the black shaft, and pull out the Squeegee unit carefully so that the Drum may not be scratched or dented.

– Precautions for Installation –

- Be careful not to damage the Drum inside or to crush the Support rollers of the Drum frame.
- Install the unit so that the thinner slit of the Main shaft catch points up to the Clamp section on the Drum.



REMOVAL & INSTALLATION

- | |
|-------------------------------------|
| 3. Inking Pump Unit |
| 4. Drum PCB |
| 5. Magnet A and C Detection Sensors |

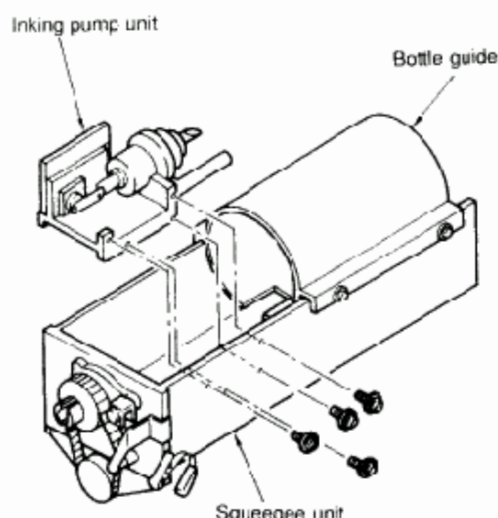
3. Inking Pump Unit

– Removal Procedures –

- 1) Remove the Squeegee unit.
- 2) Disconnect the connectors of the Inking pump and Drum PCB from the Drum wire harness.
- 3) Remove the four mounting screws from the Inking pump unit, and remove the Inking pump unit.

– Precautions for Installation –

- Mount the Inking pump unit square with the frame of the Squeegee unit.
- Check that the ink bottle can be installed correctly.
(Confirm it by pulling the ink bottle in and out.)



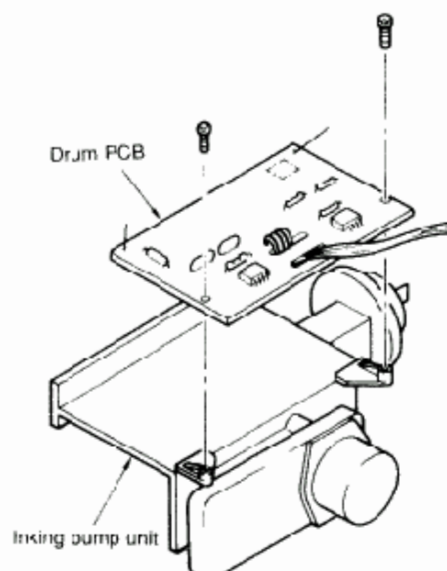
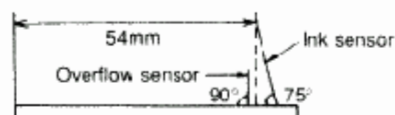
4. Drum PCB

– Removal Procedures –

- 1) Remove the Inking pump unit.
- 2) Remove the two mounting screws on the Drum PCB, and remove the Drum PCB.

– Precautions for Installation –

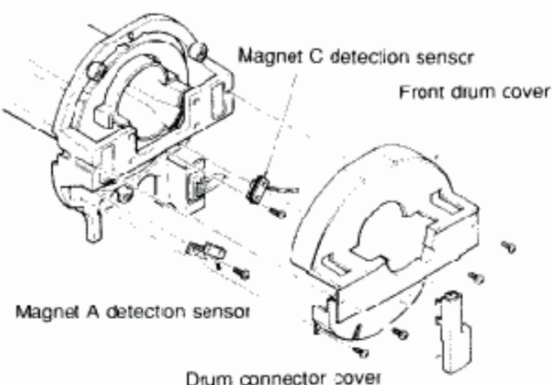
- Fix the screws so that they are positioned nearest to the connector on the Drum PCB.
- Check that the Ink sensor and Overflow sensor are correctly positioned.



5. Magnet A and C Detection Sensors

– Removal Procedures –

- 1) Open the Front cover, and remove the Drum from the machine.
- 2) Remove the four mounting screws of the Front drum cover, and remove the Front drum cover.
- 3) Remove the mounting screw of the Magnet A detection sensor, and remove the sensor.
- 4) Remove the mounting screw of the Magnet C detection sensor, and remove the sensor.



[Adjustment Procedures]

1. Squeegee Gap

– Procedure & Check –

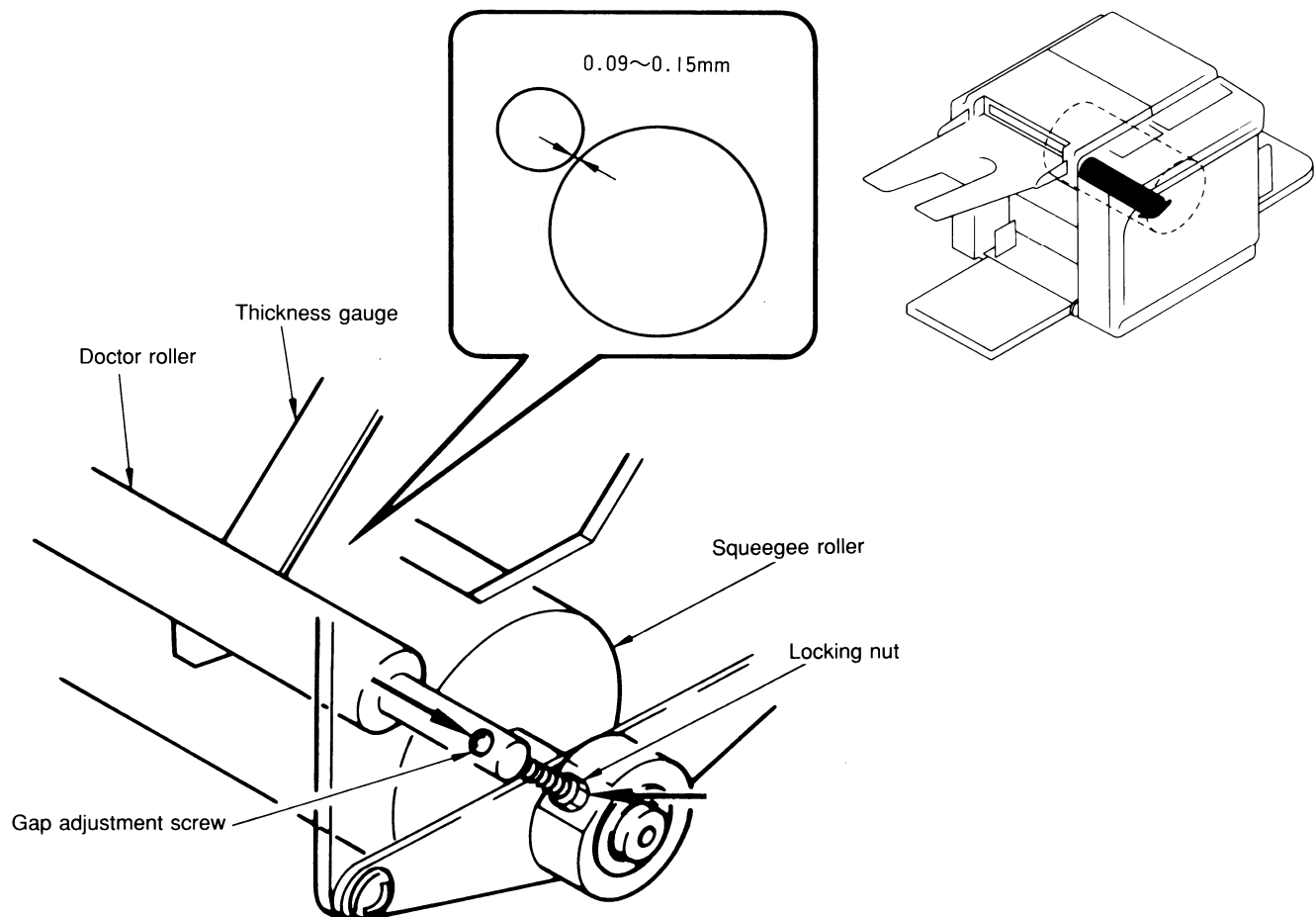
- 1) Remove the Squeegee unit.
- 2) Clean ink from the inside of the Squeegee unit.
- 3) Loosen the locking nuts of the gap adjustment screws on both ends of the Squeegee roller.
- 4) Insert a thickness gauge between the Doctor roller and Squeegee roller, and turn the gap adjustment screws so that the gap between the Doctor roller and Squeegee roller is **0.09 to 0.15 mm** at any test point.
- 5) Tighten the locking nuts, holding the gap adjustment screws in this condition with a screw-driver, and then check the gap again.

Note:

- * When the locking nuts are fastened, the gap will be slightly widened.
- * Be sure to check copy quality after gap adjustment.

– Results of Misadjustment –

- 1) If the gap is too wide; ➡
ink does not bead correctly, which may provide too much ink into the Squeegee section, causing an overflow.
- 2) If the gap is too narrow; ➡
ink does not spread over the surface of the Squeegee roller well, causing uneven printing.



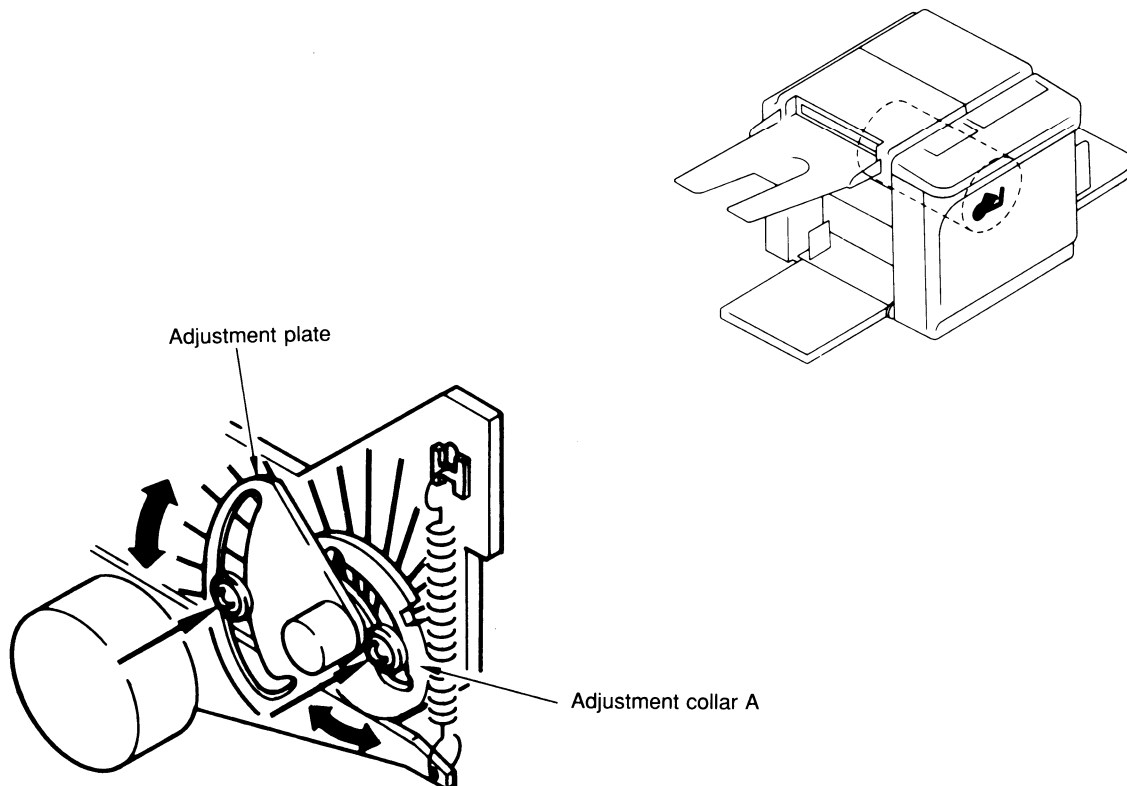
2. Squeegee Pressure

– Check & Adjustment –

- 1) Perform master making with Test Chart **No.8** as the original.
- 2) Print with the highest speed and check if the print density is the same on right and left sides.
- 3) If the print density is uneven, remove the Front drum cover to access the Adjustment plate and Adjustment collar A in the Squeegee unit.
- 4) If the density is darker on the non-operator side, loosen the screw on the **Adjustment plate**, and turn the plate counterclockwise.
If the density is darker on the operator side, loosen the screw on the **Adjustment collar A**, and turn the collar A counterclockwise.
- 5) If the whole print is too light, turn both the **Adjustment plate and Adjustment collar A** clockwise in steps to adjust the entire density.
- 6) When the adjustment is completed, check the distance from the Drum body to the Squeegee roller. The gap of **0.5 to 1.0 mm** on both sides must be maintained. To check, press the Drum surface on both sides under the Squeegee roller.
- 7) Perform confidential operation to place a blank master on the Drum, and print **500 blank sheets of paper at a low speed**. Then check that there is no ink leakage from the sides or bottom of master.

– Results of Misadjustment –

- 1) If the Squeegee pressure differs much between the right and left sides; ➡
the print density will be uneven on both sides.
- 2) If the Squeegee pressure is too high; ➡
ink leakage will occur.
- 3) If the Squeegee pressure is too low; ➡
the print density will be too weak.



3. Position of Ink Blocking Plates

– Check & Adjustment –

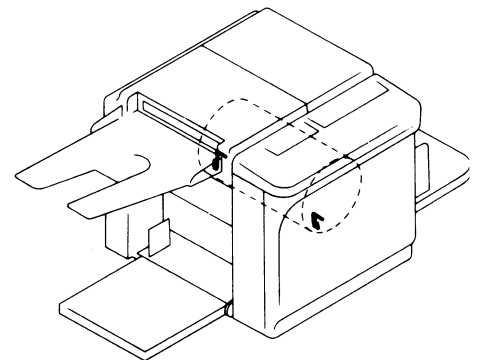
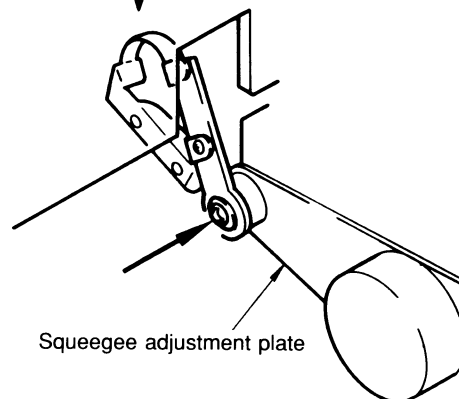
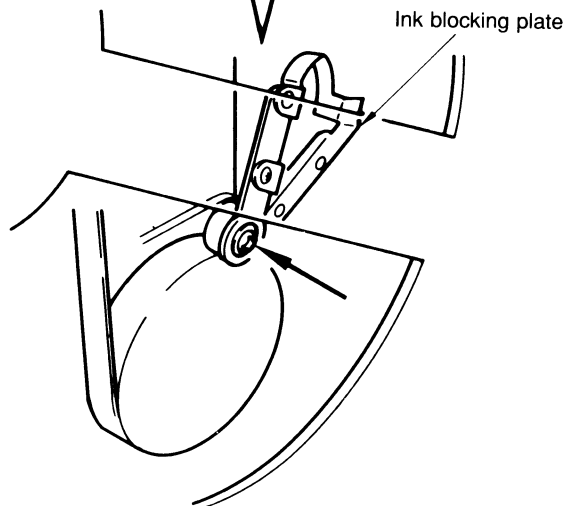
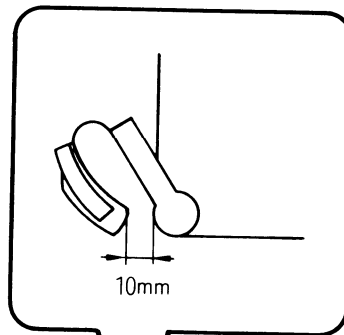
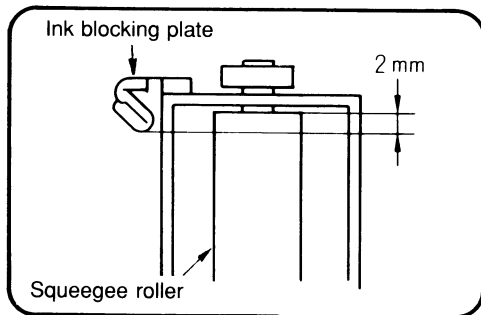
- 1) Remove the Squeegee unit.
- 2) Check that the tip of the Ink blocking plate (right & left) is **10mm** away from the mounting screw and is beyond **2mm** away from the end of the Squeegee roller.
- 3) If not, loosen the mounting screw of the Ink blocking plate, and adjust the position as above.

Function

The Ink blocking plates prevent ink from spreading sideways and keep ink within the print area.

– Results of Misadjustment –

- 1) If the Ink blocking plates are set too inward; ➡
ink may not be supplied correctly to the edges of printed copies.
- 2) If the Ink blocking plates are set too outward or not in contact with the inside surface of the Drum; ➡
ink may leak from the side of the Drum.



The Main motor rotation speed can be set to three levels.

– Speed adjustments should be made in sequence as described below. –

– Check & Adjustment –

(1) Print speed

- 1) Select Test mode **No. 42**, and set the drum rotation speed to the lowest level (1).
- 2) Check that the rotation speed is **60 rounds/minute**.
- 3) If not, remove the Back cover, and turn **VR8** on the **System Main PCB** to adjust the speed.

(2) Master loading speed

- 1) Select Test mode **No. 40**, and check that the drum rotation speed is **15 rounds/minute**.
- 2) If not, remove the Back cover, and turn **VR7** on the **System Main PCB** to adjust the speed.

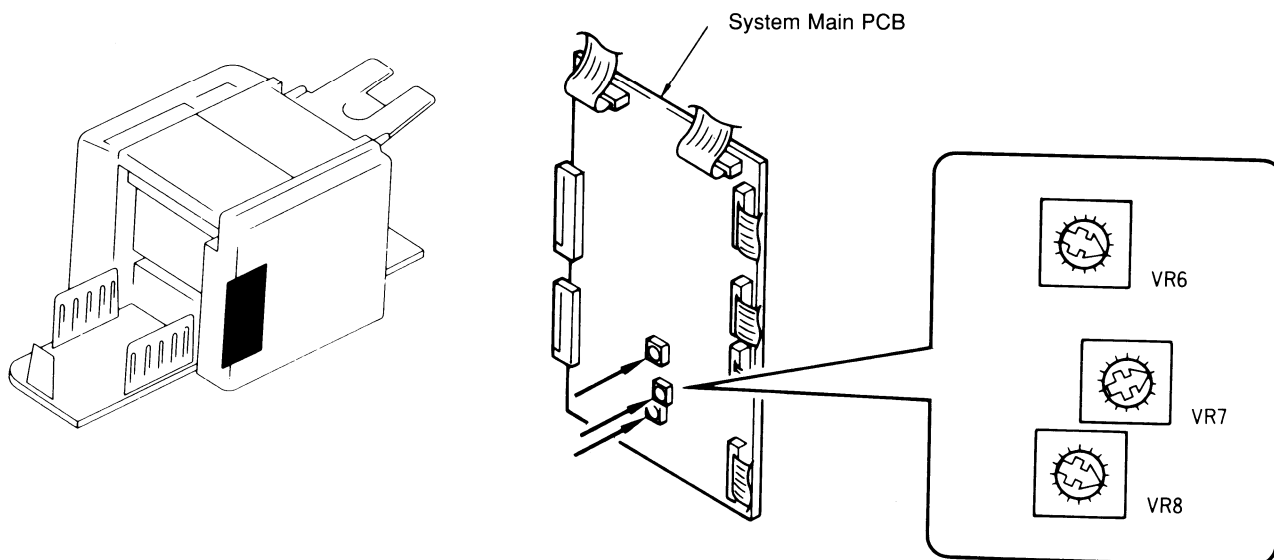
(3) Free rotation speed

- 1) Select Test mode **No. 41**, and check that the drum rotation speed is **30 rounds/minute**.
- 2) If not, remove the Back cover, and turn **VR6** on the **System Main PCB** to adjust the speed.

The drum rotation speed is increased if a potentiometer (VR) is turned clockwise, and is decreased if turned counterclockwise.

– Results of Misadjustment –

- 1) If the Print speed is set too high or too low; ➡
there comes the difference between the actual print speed and the speed indicated on the display panel.
- 2) If the Master loading speed or Free rotation speed is set too much off the specified value; ➡
the volume of inertial rotations (which rotates the Drum a little further after the Main motor stops) is also changed, causing poor contact with the Clamp motor. As a result, the trouble message “**T3:CALL SERVICE**” may be displayed, prompting the user to contact the service staff.



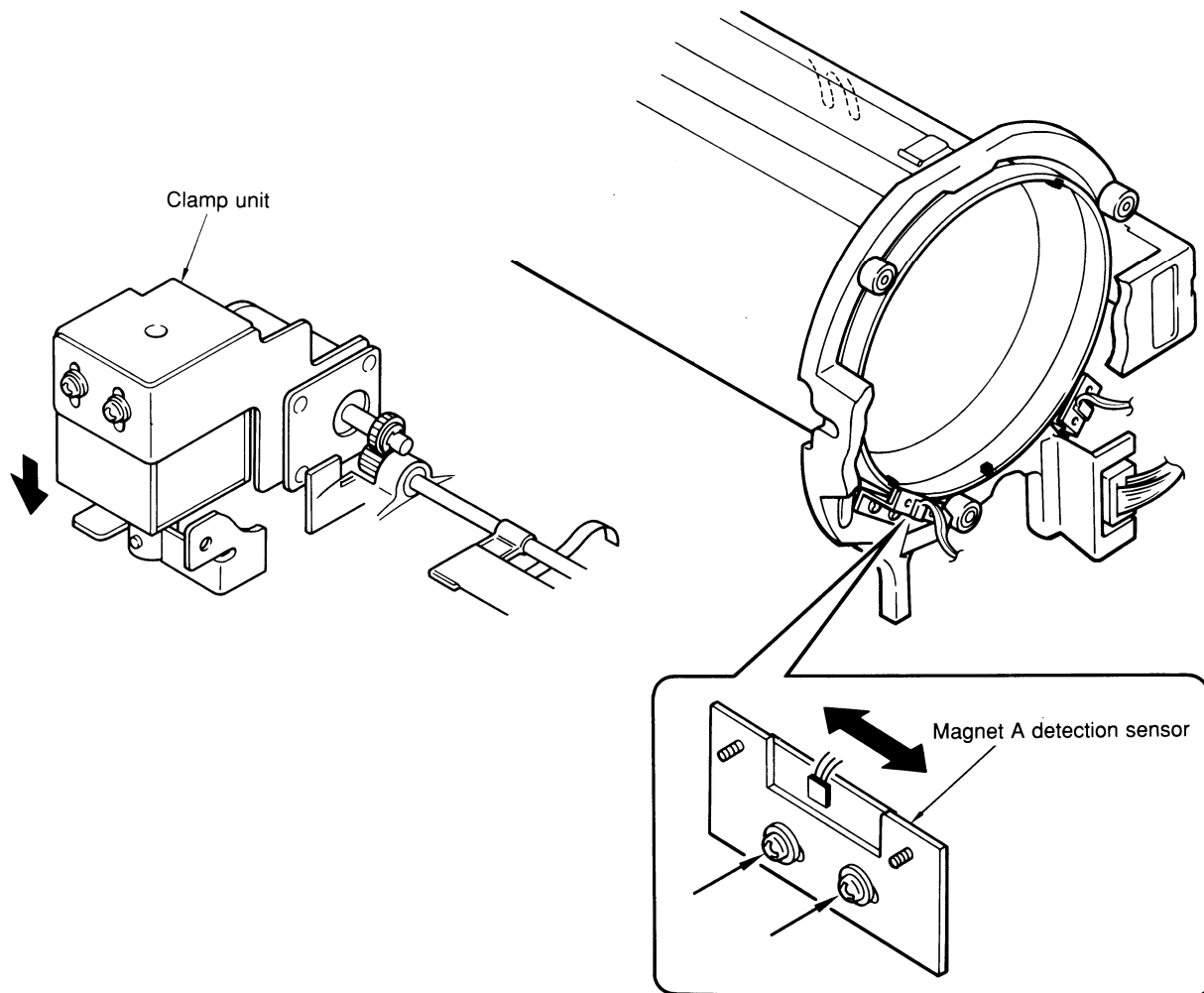
5. Position of Magnet A Detection Sensor (Drum Home Position)

– Procedure & Check –

- 1) Remove the Front drum cover.
- 2) Rotate the Drum so that the Clamp section is on top.
- 3) Press the Clamp unit down manually and check that the Clamp motor gear engages the Clamp gear correctly.
If incorrect, move the Drum and ensure the correct engagement.
- 4) Select Test mode **No.08** and loosen the mounting screw of the Magnet A detection sensor bracket to move the Magnet A detection sensor and bracket until the sensor detects the Magnet A. (The beep sound changes.)
Then tighten the sensor mounting screw.
- 5) Press the Drum home position button and press the Clamp unit down manually when the Drum stops to check that the Clamp motor gear engages the Clamp gear correctly.

–Results of Misadjustment –

- 1) If the Magnet A detection sensor is not set correctly; ➡
the Drum will not stop at the specified home position, causing poor clamp operation.
As a result, the trouble message “**T3:CALL SERVICE**” will be displayed on the panel to prompt the user to contact service.
- 2) If the Magnet A detection sensor cannot detect magnetism due to out-of-position or faulty part; ➡
the trouble message “**T10:CALL SERVICE**” will be displayed on the panel after the drum rotates about twice to prompt the user to contact service.



2. Press Section

[Theory of Operation]

1. Press System

- Conversion of rotation to Up-and-down motion via Pressure cam

The Pressure cam, which is attached to the Main pulley and contained in the mechanical drive system, continuously rotates clockwise via the Main belt driving the Main pulley when the Main motor rotates. The rotation of the Pressure cam provides the drive for the Linking plate.

As the cam follower of the Linking plate contacts the Pressure cam, the high and low points of the cam convert the rotation movement of the cam to an up-and-down motion of the Linking plate.

- The Up-and-down motion of Pressure Hook

The up-and-down motion of the Linking plate is conveyed to the Pressure hook through the Pressure link. The Pressure hook moves up and down with the Pressure shaft as the fulcrum.

- Operation of Pressure Solenoid

The Pressure solenoid, which is attached to the Pressure hook and Hook lever assembly, is used to engage the Hook lever assembly with the Pressure lever.

- Control of Pressure Solenoid

The Pressure solenoid is OFF except during the printing operation and ON when the paper is detected by the Paper sensor with the Print signal output.

When the solenoid is turned ON, the Hook lever assembly is directly engaged with the Pressure lever.

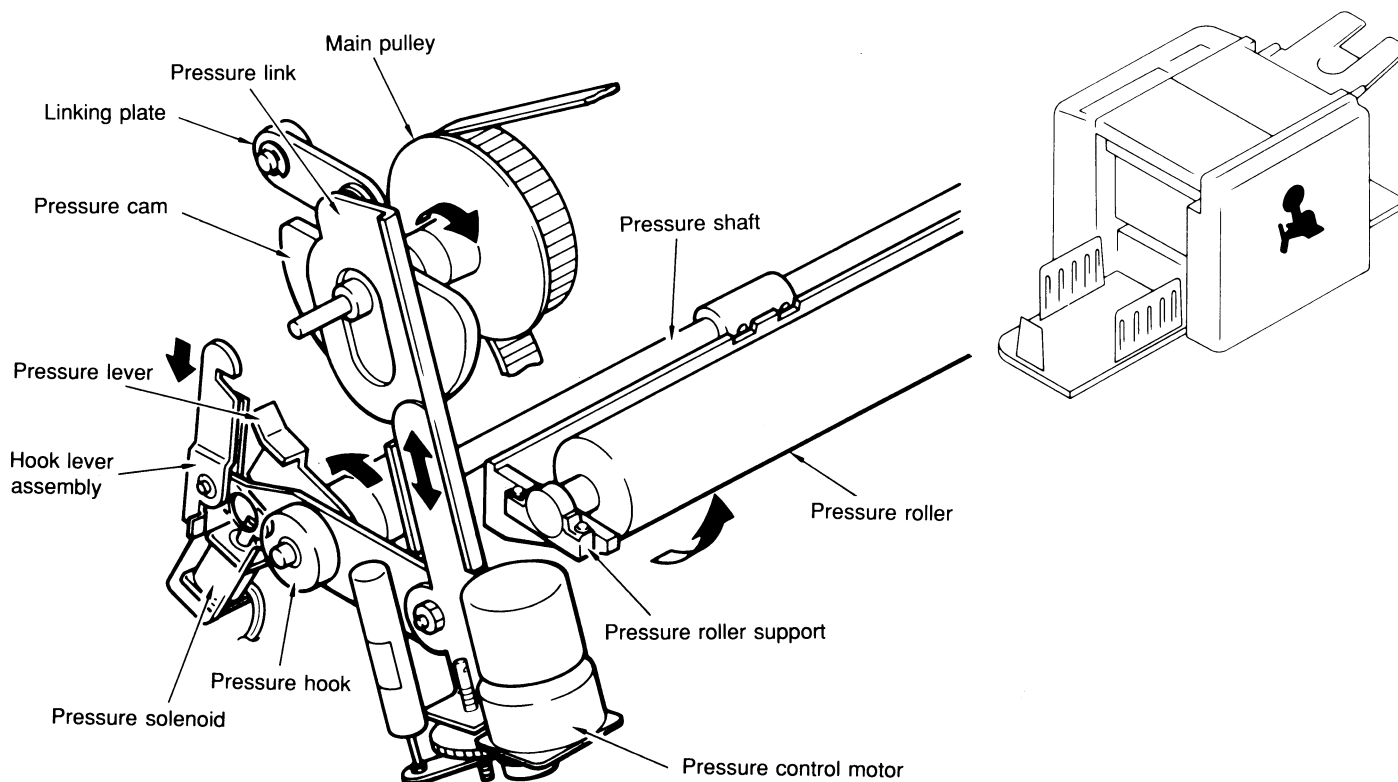
Note: The Pressure solenoid is turned OFF when the light path of the Pressure detection sensor has just been opened by the Pressure Disc.

- Lifting up of Pressure roller

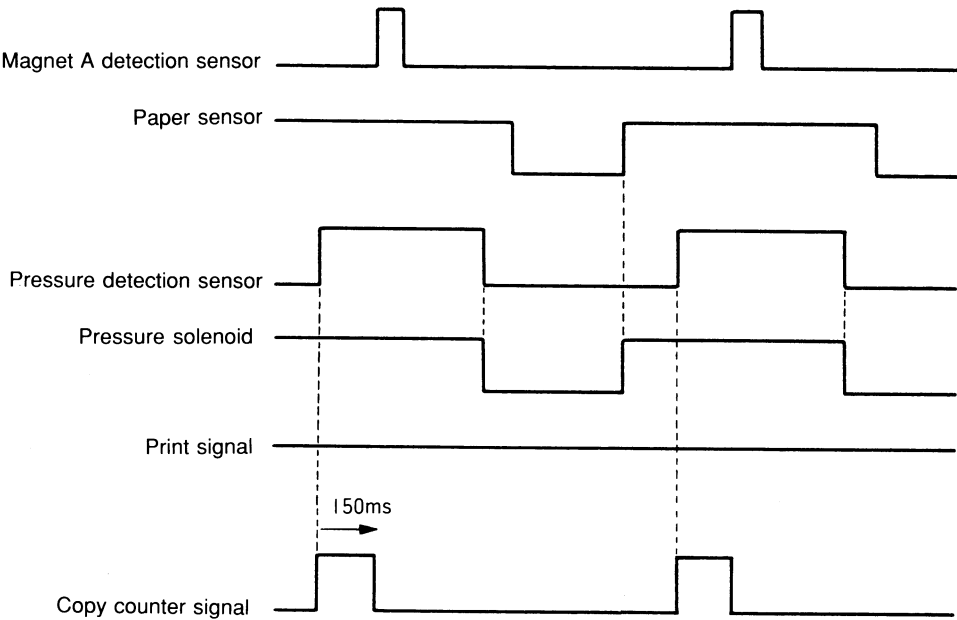
The Pressure lever is connected to the Pressure shaft.

Therefore when the Hook lever assembly is engaged with the Pressure lever by the Pressure solenoid and the downward motion of the Hook lever pulls down the Pressure lever, the Pressure shaft turns counterclockwise.

To the Pressure shaft is attached the Pressure roller support on which the Pressure roller is placed. Therefore, when the Pressure shaft rotates counterclockwise, the Pressure roller is lifted up, pressing a sheet of paper against the Drum.



Press System



2. Pressure Regulation System

- Speed-change mode

In the speed-change mode, if the print speed is changed, the Pressure control motor is automatically activated, changing the print pressure to five levels to regulate consistent density regardless of difference in the print speed.

The print (roller) pressure is reduced when the speed is reduced, and is increased when it is increased.

- Density-change mode

In the density-change mode, the print speed is automatically reset and remains in the medium speed (**100 copies per minute**).

The user can then select five levels of print density with the buttons on the control panel.

The selection activates the Pressure control motor, which increases or decreases the pressure of the Pressure roller against the Drum depending on the setting selected.

- Pressure regulation system

The Pressure control motor rotates up or down to a specified position.

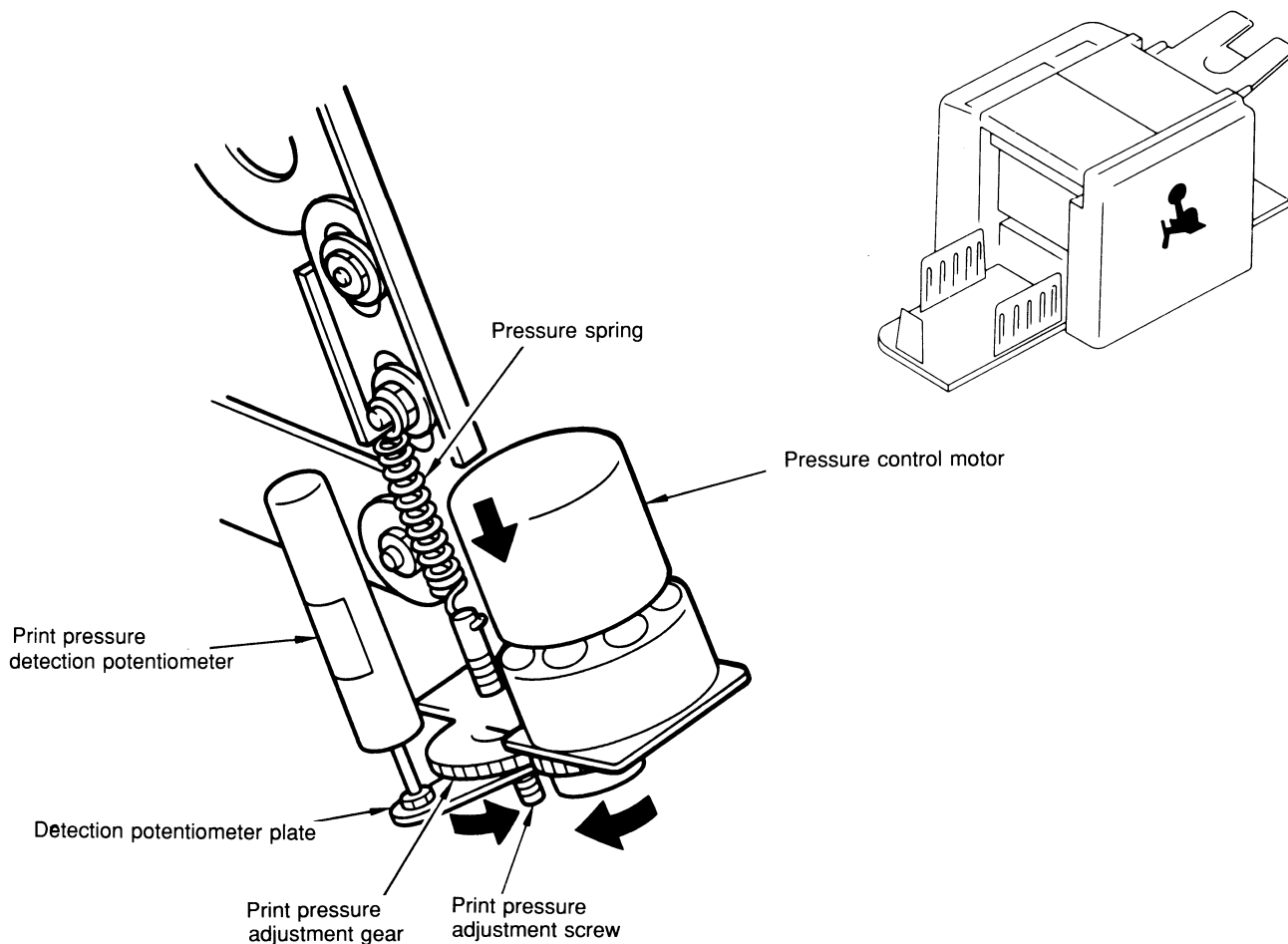
This motion is conveyed to the Print-pressure adjustment screw via the Print-pressure adjustment gear, changing the tension (pull power) of the Pressure spring, which changes the print pressure.

Example: If the density or speed selection is increased, the Pressure control motor rotates clockwise to apply more tension to the Pressure spring. As a result, the pressure of the Pressure roller increases.

- Detection of the set rotation quantity of Pressure control motor

The rotation quantity of the Pressure control motor is detected by the Print pressure detection potentiometer through the up-and-down motion of the Detection potentiometer plate driven by the rotations of the Print pressure adjustment gear and screw.

When a specified quantity of rotations is detected by the Print pressure detection potentiometer, the Pressure control motor is turned off.



[Adjustment Procedures]

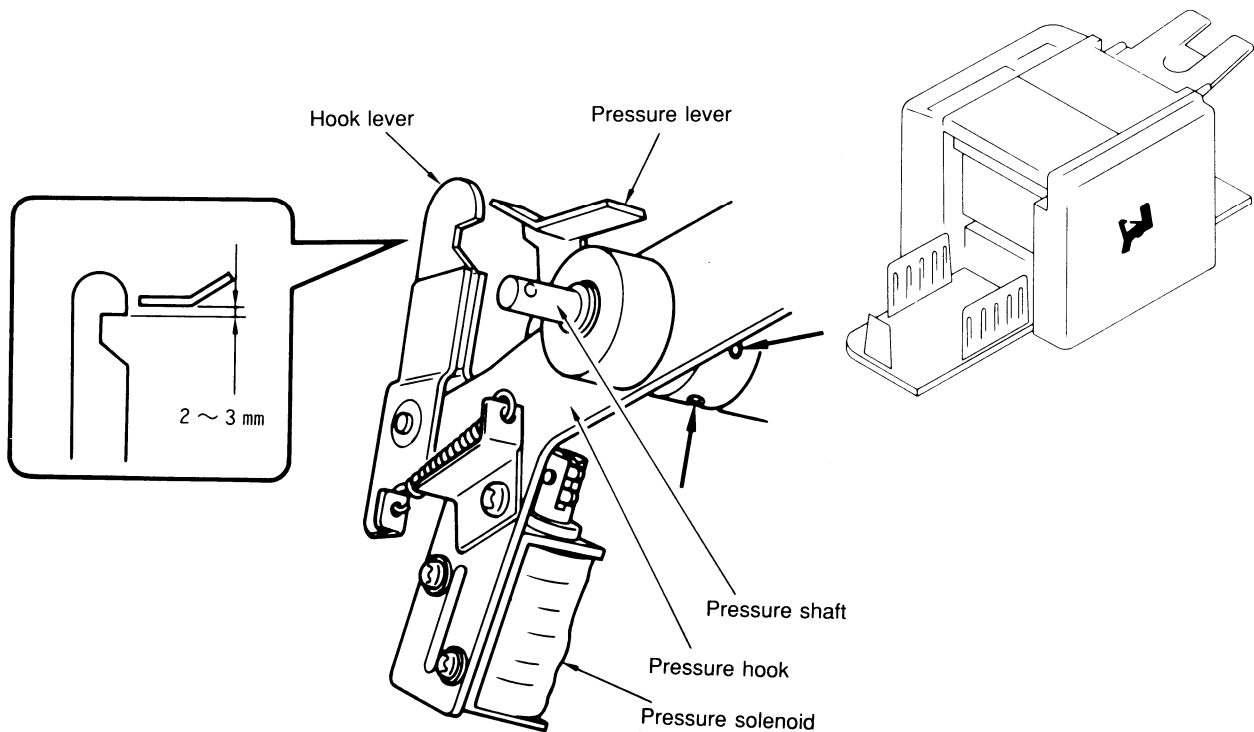
1. Position of Pressure Lever

– Procedure & Check –

- 1) Put a blank master on the Drum.
(Select confidential master making.)
- 2) Remove the Back cover, and rotate the Drum so that the Pressure solenoid on the Pressure hook comes down to the lowest position.
- 3) Turn the main power off, and loosen the allen screws that secure the Pressure lever.
- 4) Insert a bar into the hole on the end of the Pressure shaft, and turn the shaft counterclockwise with the bar to lift and press the Pressure roller firmly against the Drum.
- 5) With the Pressure roller firmly against the drum, move the Pressure lever so that the distance between the top edge of the cut-out on the Hook lever and the bottom of the Pressure lever hook is **2 to 3 mm**.
- 6) When the 2 to 3 mm is obtained, tighten the allen screws on the Pressure lever.
When completed, press the Pressure lever down manually to check the adjustment.

– Results of Misadjustment –

- 1) If the Pressure lever is adjusted too high (the distance is **much more than 3 mm**); ➡
the Hook lever cannot engage the Pressure lever properly, and the Pressure roller will not be lifted properly, causing a paper jam in the print area.
- 2) If the Pressure lever is adjusted too low (the distance is **much less than 2 mm**); ➡
the pressure of the Pressure roller will be too weak against the Drum, which causes the printed copies to be light.
Or the Pressure roller will not contact the Drum with enough pressure to transport printed copies through the print area causing a paper jam.



2. Resting Position of Pressure Roller

– Procedure & Check –

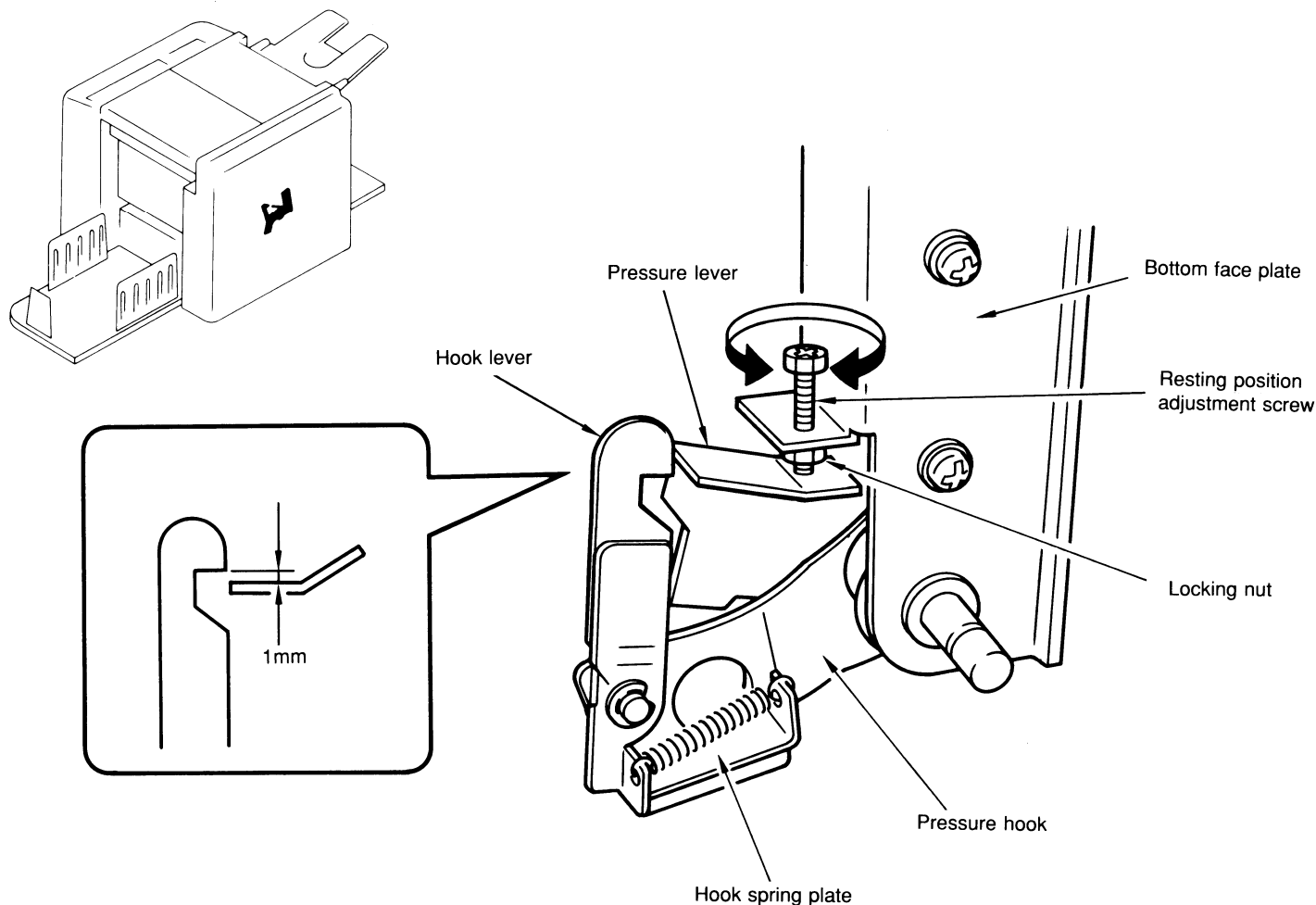
- 1) Remove the Back cover.
- 2) Rotate the Drum so that the Pressure solenoid on the Pressure hook comes up to the highest position.
- 3) Loosen the locking nut on the Resting position adjustment screw located on the Bottom face plate, and loosen the adjustment screw.
- 4) Tighten the Resting position adjustment screw gradually until the distance between the top edge of the cut-out portion of the Hook lever and the top of the Pressure lever hook measures **1 mm**, and tighten the locking nut.
- 5) Check the adjustment by pushing the Hook lever in manually to confirm that it engages the Pressure lever hook correctly.

– Results of Misadjustment –

- 1) If the Pressure roller's resting position is set too high (the distance is **much more than 1mm**); ➡ the Clamp section on the Drum may contact the Pressure roller, which can cause the Clamp section damaged, or the Pressure roller damage.
- 2) If the Pressure roller's resting position is set too low (the distance is **much less than 1mm**); ➡ the Pressure lever and the Hook lever will not engage properly, which may cause the Pressure and Hook levers to lock or slip during operation.

If the levers lock, the Pressure roller will contact the Drum even during the non-printing operation causing the ink on the Drum to be transferred to the Pressure roller.

If the levers slip during operation, it will cause paper misfeeds in the print area.



3. Position of Pressure Solenoid

– Procedure –

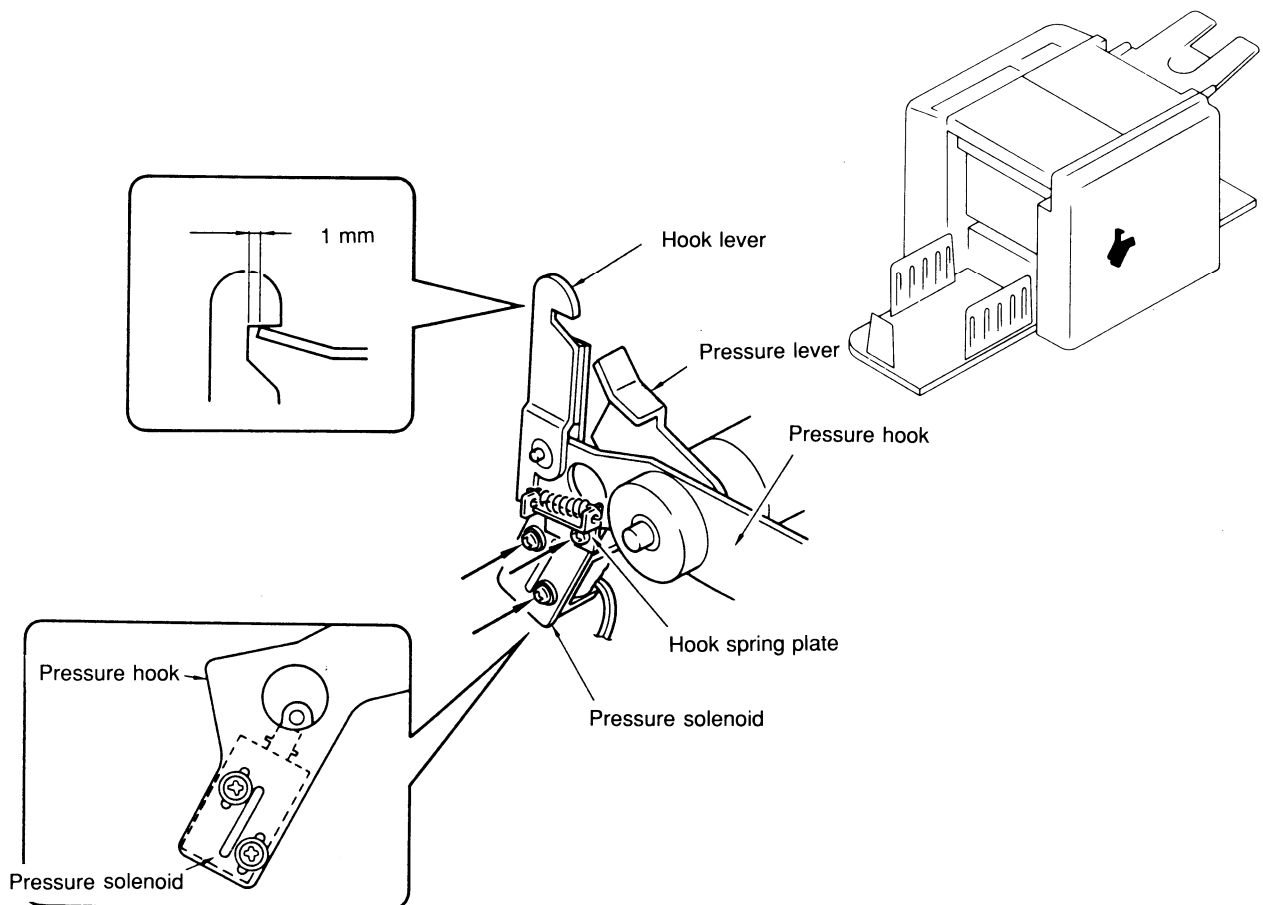
- 1) Remove the Back cover.
- 2) Rotate the Drum so that the Pressure solenoid on the Pressure hook comes up to the highest position.
- 3) Select Test mode **No.48**, which will activate the Pressure solenoid.
- 4) Adjust the Pressure solenoid so that the gap between the deepest point of the cut-out of the Hook lever and the Pressure lever measures **1 mm or less**.

– Check –

- Perform printing at the highest and lowest speeds, and check that the Pressure lever firmly and properly engages with the Hook lever.

– Results of Misadjustment –

- 1) If the Pressure lever gap is too loose (the gap is **much more than 1mm**); ➡
the Hook lever will slip off the Pressure lever and the Pressure roller will not go up, causing a paper jam in the print area.
This condition may eventually cause damage to the Hook lever and the Pressure lever.
- 2) If the Pressure lever gap is too tight (there is **no gap**); ➡
the plunger of the Pressure solenoid will pull on an angle and the Pressure solenoid will be locked.
As a result, the Pressure roller will not go up, causing a paper jam in the print area.



ADJUSTMENT PROCEDURES

4. Position of Hook Lever

– Procedure –

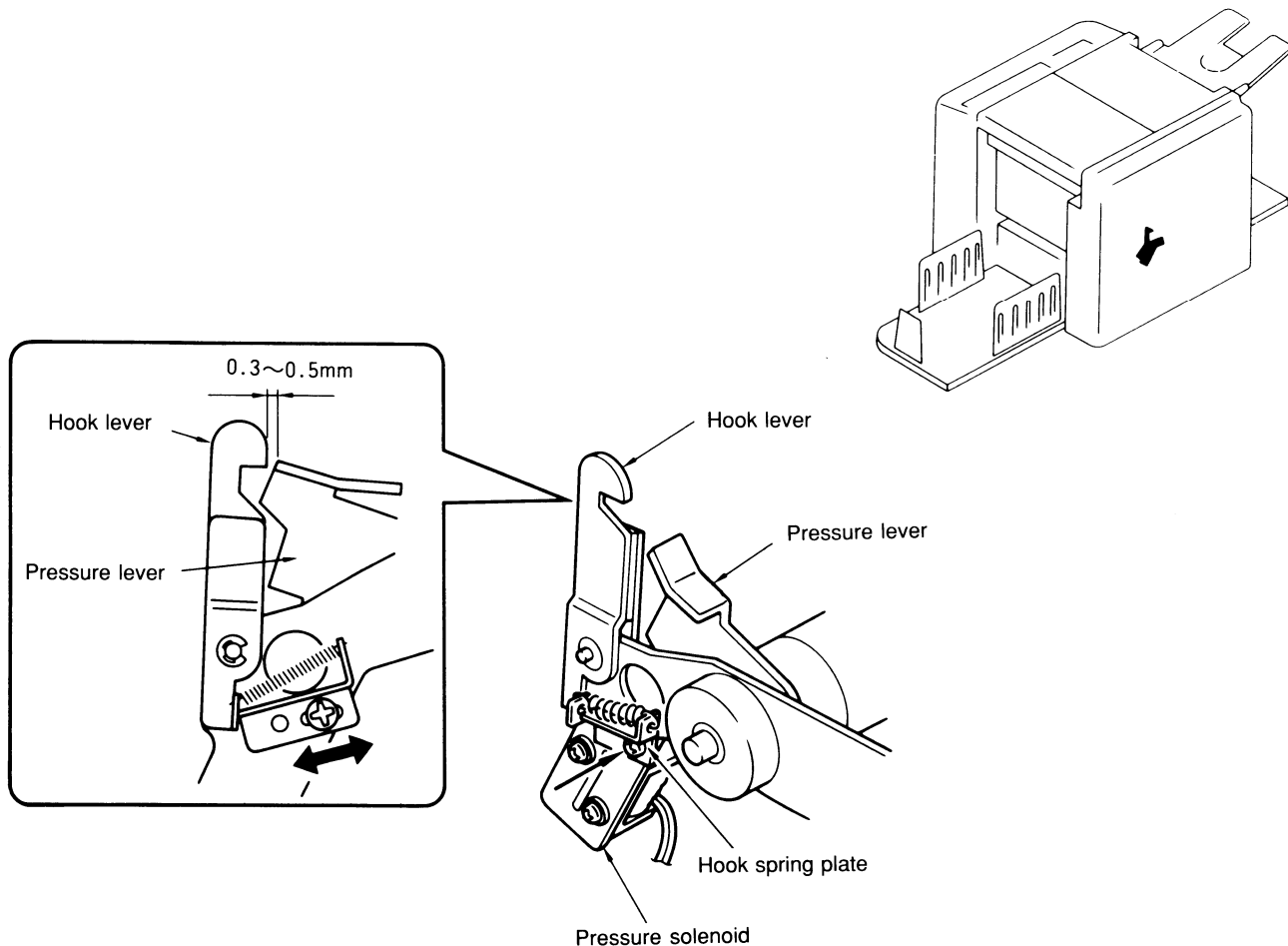
- 1) Remove the Back cover.
- 2) Rotate the Drum so that the top edge of the Hook lever cut-out and the bottom of the Pressure lever are even.
- 3) Loosen the Hook spring plate's mounting screw and adjust the position of the hook spring plate so that the minimum distance between the Pressure lever and the Hook lever is **0.3 to 0.5 mm**.

– Check –

- Perform printing at the highest and lowest speeds, and check that the Pressure lever is firmly engaged with the Hook lever during printing.

– Results of Misadjustment –

- 1) If the distance is too wide; ➡
the Hook lever cannot engage the Pressure lever enough when the Pressure solenoid is activated, and the Pressure roller will not go up, causing a paper jam in the print area.
- 2) If the distance is too narrow; ➡
the Hook lever will touch the Pressure lever, which may lock the levers, causing the Pressure roller to contact the drum even during the non-printing operation.



5. Standard Pressure Position

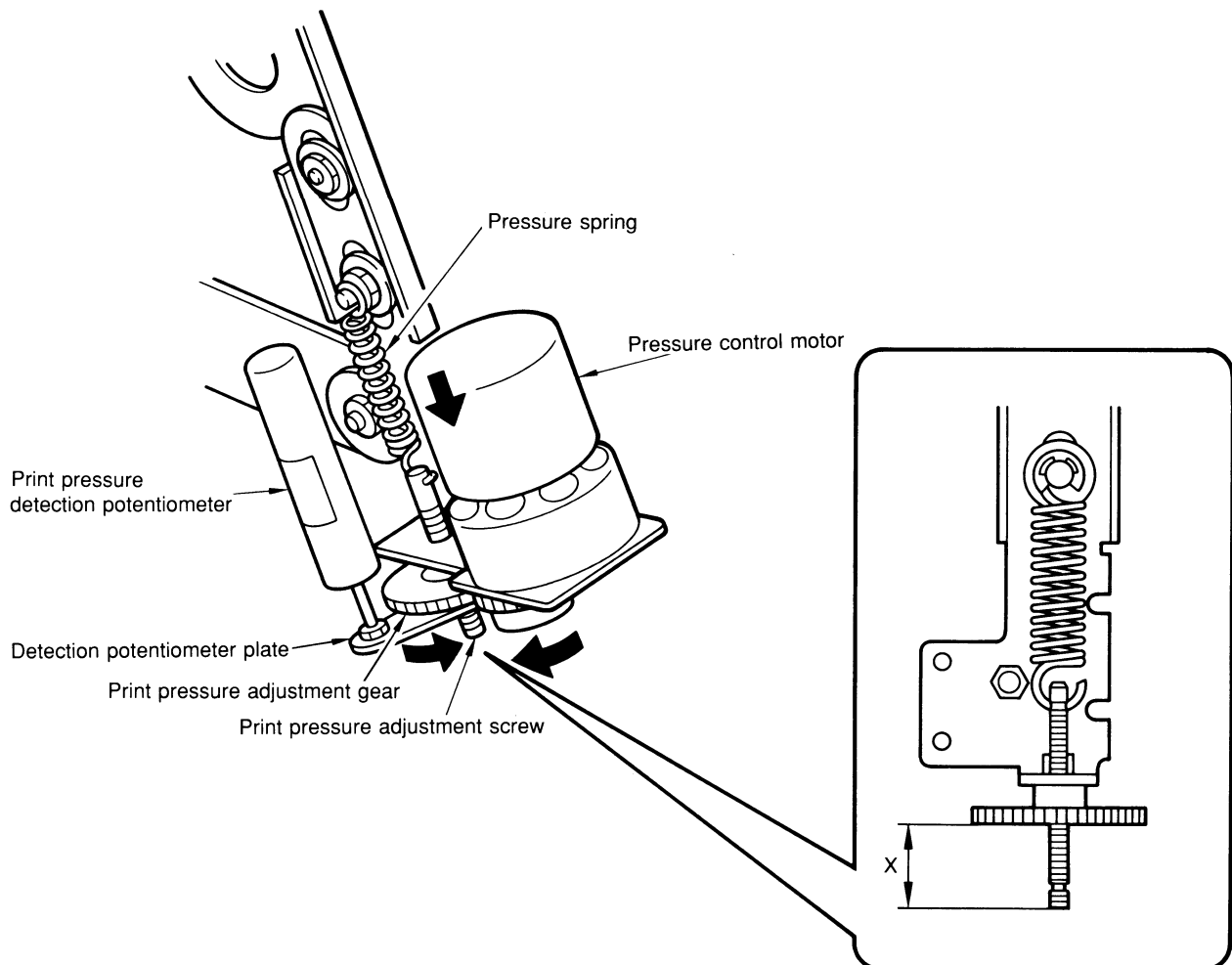
– Check & Adjustment –

- 1) Remove the Back cover.
- 2) Press “RESET” button on the Main panel to set the print density mode to **(3)**, and turn off the power switch.
- 3) Check that the length from the end of the Print pressure adjustment screw to the bottom face of the Print pressure adjustment gear **[X]** should be as shown in the chart to the right.
- 4) If not, loosen the mounting screws of the Print pressure detection potentiometer and shift up or down the potentiometer along with the bracket. Then fix it.
- 5) Turn on the power and recheck by repeating **step(2)** that the value is correct.

Drum Type	Standard Value	
Legal/A4	X=16mm	$\begin{smallmatrix} -0 \\ +2 \end{smallmatrix}$
B4	X=18mm	$\begin{smallmatrix} -0 \\ +2 \end{smallmatrix}$

– Results of Misadjustment –

- 1) If the length **[X]** is much more than the standard value; ➡
the print density will be too heavy even in the print density mode(1).
In some cases, the Pressure spring may be pulled too much to recover to the original shape. As a result, the spring will lose tension, causing the print density too weak. In this case, the spring must be replaced.
- 2) If the length **[X]** is much less than the standard value; ➡
the print density will be too weak even in the print density mode(5).



5. PAPER RECEIVING AREA

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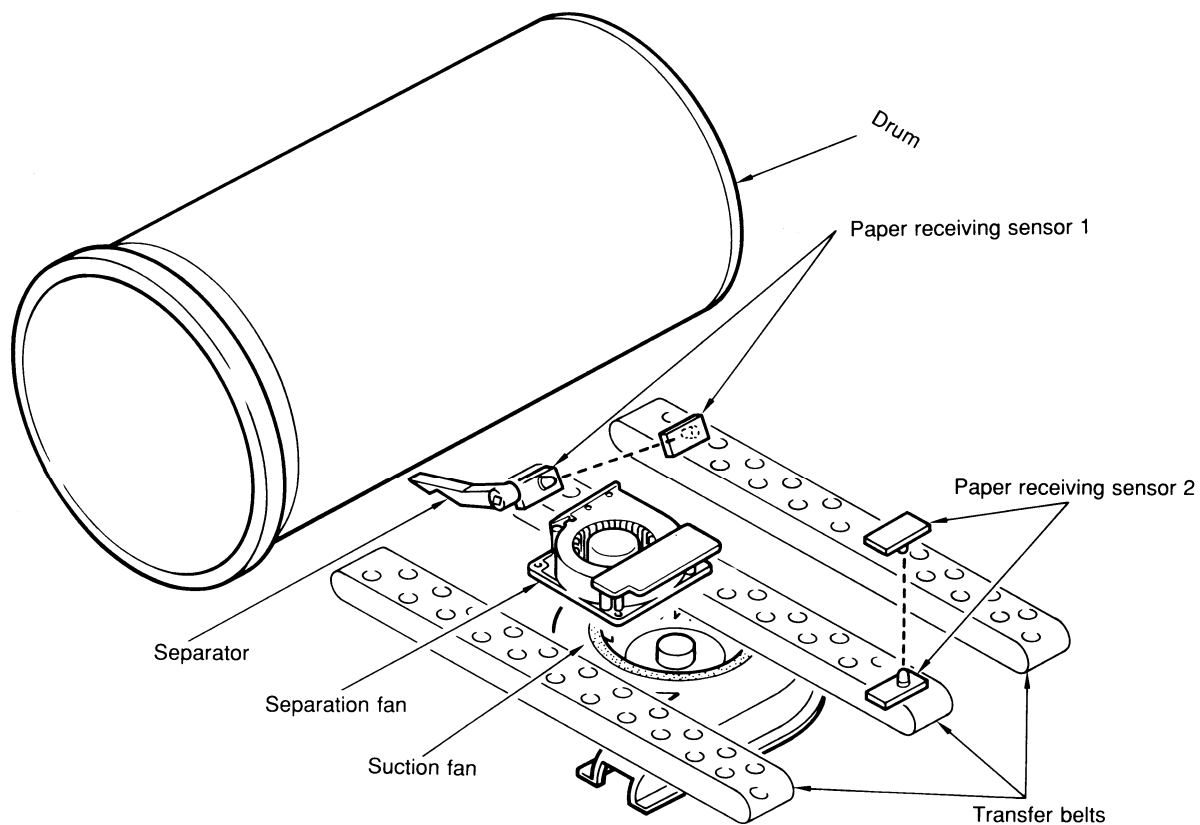
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Operation and Function

The Separator and Separation fan are used in the paper ejection section to separate the printed paper from the Drum.

Once the printed paper is separated, the Suction fan attracts the paper to the Transfer belts, and the belts transport the paper to the Paper receiving tray.

During this process, the Paper receiving sensor 1 and Paper receiving sensor 2 in the paper receiving section check paper status for correct paper transportation to the receiving tray.



1. Paper Ejection Section

[Theory of Operation]

1. Separator Positioning System

- Motion of Separator

The Separator, which is mounted on the Separator shaft is normally in a position close to the Drum screen to remove a printed paper.

The Separator moves down and away from the Drum in order to provide clearance for the Clamp section on the Drum.

During operation, this downward motion of the Separator is produced by the rotation of the Separator shaft, which is driven by the Separator lever.

- Home position of Separator

The Separator lever, which is attached to the end of the Separator shaft, has a collar on the left end which is held close to the left-side Drum body support, and on the right end the lever is kept pressed on the Separator adjustment cam by spring tension.

The left-side Drum body support functions as a cam for the Separator collar, which operates the Separator lever.

- Positioning for the clearance for the Clamp section

When the Drum rotates and the Clamp section approaches the Separator, the high point on the left-side Drum body support pushes the Separator collar downward, shifting the Separator down and away from the Drum.

When the Clamp section clears, the spring tension on the Separator lever raises the Separator to the Drum to remove a printed paper.

- Motion of Separator in Drum removal

The Separator must also be lowered when the Drum is removed to avoid damage to the screen.

When the Drum is locked into position, the Drum frame presses against the Release lever and the Separator can operate as described above.

When the Drum is removed, the Release lever is pulled back by the Release spring.

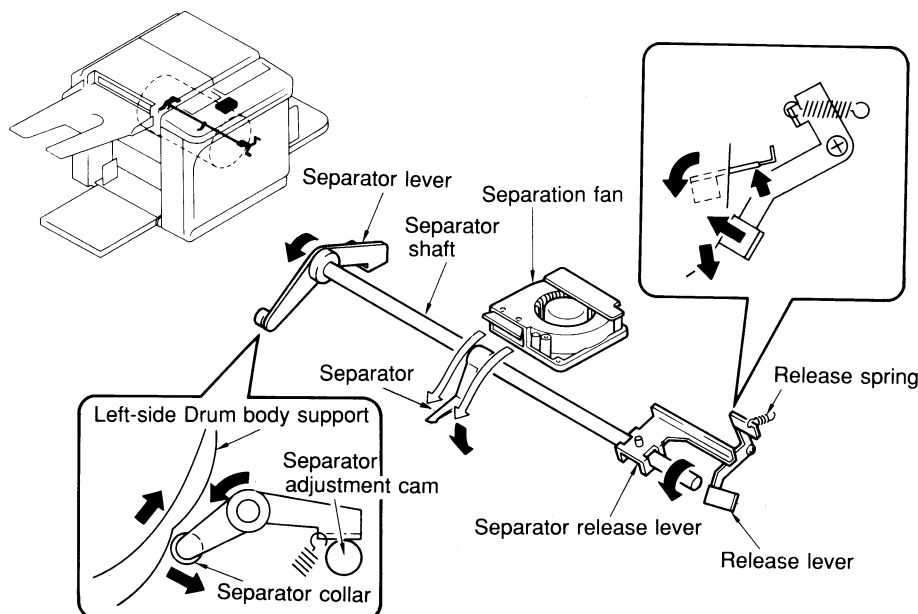
This causes the Release lever to rise contacting the Separator release lever, which moves the Separator release lever in an upward motion.

This action rotates the Separator shaft down (counterclockwise) lowering the Separator.

- Function of Separation fan

During printing, the Separation fan blows air to the lead edge of the printed paper on the Drum from above the Separator.

This blow of air assists the Separator to separate the printed paper from the Drum.



2. Paper Ejection System

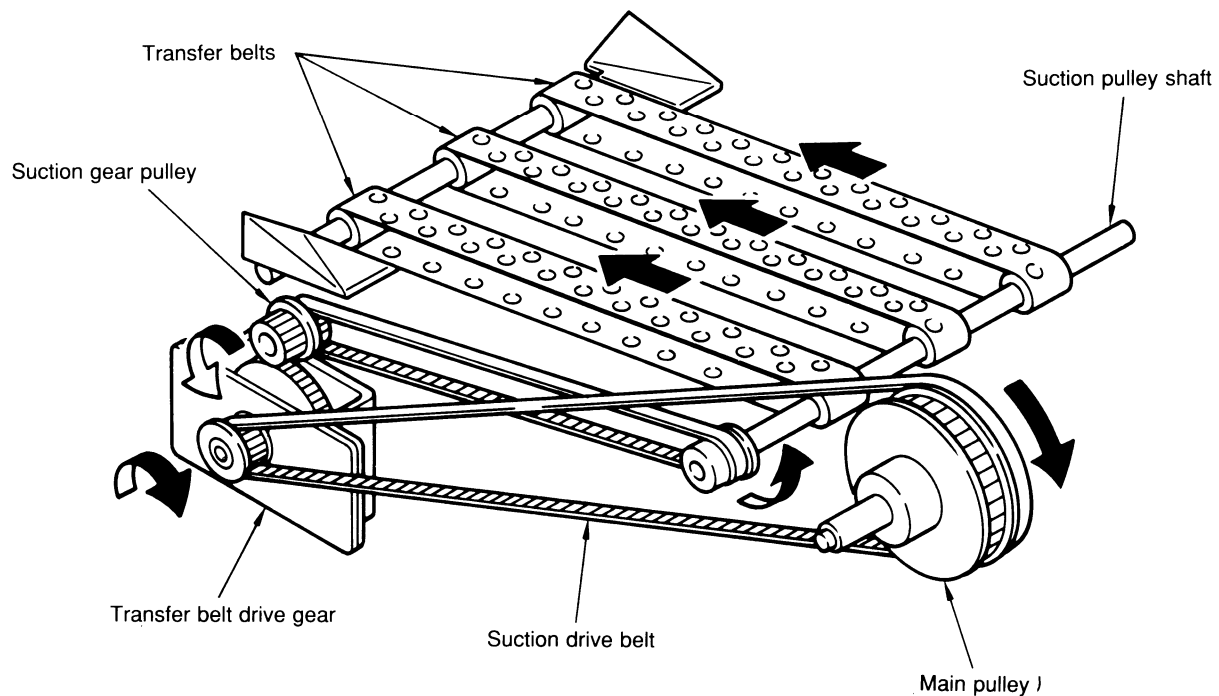
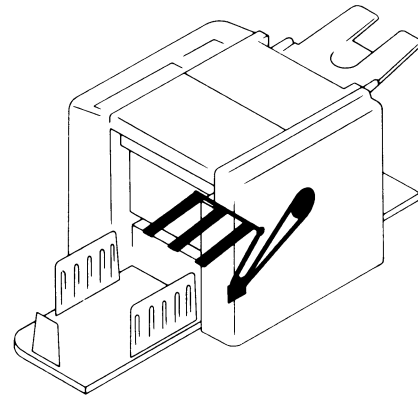
- Paper transfer by belts

When the Main pulley rotates, the Transfer belt drive gear rotates via the Suction drive belt.

The rotation drives the Suction gear pulley of the Suction unit and the Suction pulley shaft which drives the Transfer belts to transport the printed paper to the Paper receiving tray.

- Function of Suction fan

The Suction fan unit draws the printed paper to the Transfer belts and the paper being held to the Transfer belts by suction is delivered to the Paper receiving tray.



3. Paper Ejection Check System

The following 3 kinds of paper ejection troubles are detected in the paper receiving area.

1. [Paper can't be separated from the Drum but stuck onto it.]

During printing, the status of the Paper receiving sensor 1 is checked at each detection of Magnet A.

– Check system –

- 1) If the light path of the Paper sensor is blocked but that of the Paper receiving sensor 1 isn't at a Magnet A detection, paper feed is immediately stopped with interruption of the Print signal.
- 2) At the next Magnet A detection, it is checked if the light path of the Paper sensor is blocked. If not, it is judged that the paper was not separated from the Drum but stuck onto it, and the paper ejection jam message is displayed on the panel.
- 3) The Elevator motor turns on lowering the paper feed tray for 2 seconds, and the drum stops on the third Magnet A detection.

2. [Paper jam around Paper receiving sensor 1]

– Check system –

- 1) If the light path of the Paper receiving sensor 1 is blocked when that of the Pressure detection sensor has just been blocked by the Pressure disc during printing, it is judged that paper jammed around the Paper receiving sensor 1, and paper feed is immediately stopped.
- 2) At the next Magnet A detection, the Drum stops and the paper ejection jam message is displayed on the panel.

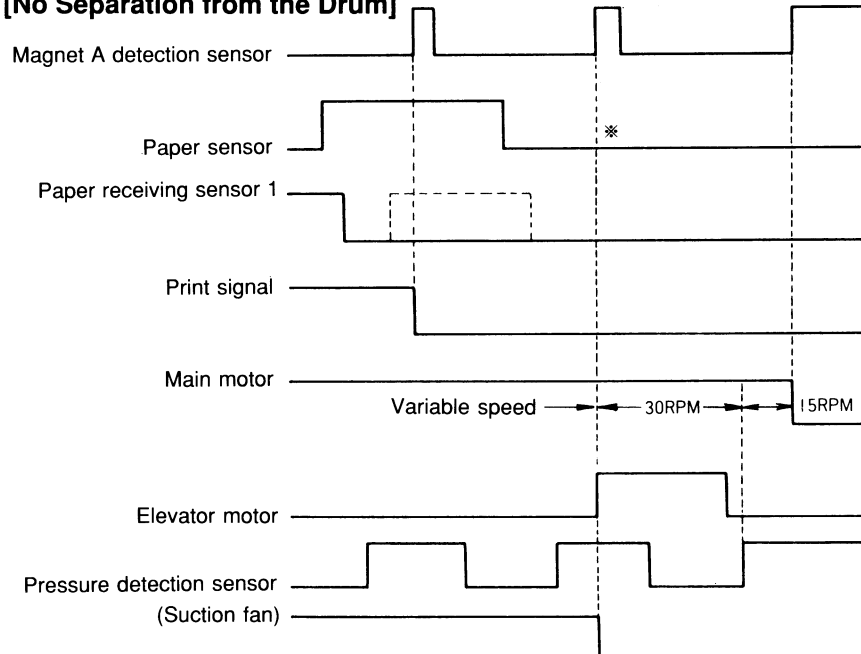
3. [Paper jam around Paper receiving sensor 2]

– Check system –

- 1) If the light path of the Paper receiving sensor 2 has been blocked until that of the Paper receiving sensor 1 was blocked twice, it is judged that paper has jammed around the Paper receiving sensor 2 and paper feed is immediately stopped.
- 2) At the next Magnet A detection, the Suction fan is stopped, and at the third one, the Drum is stopped and the paper ejection jam message is displayed on the panel.

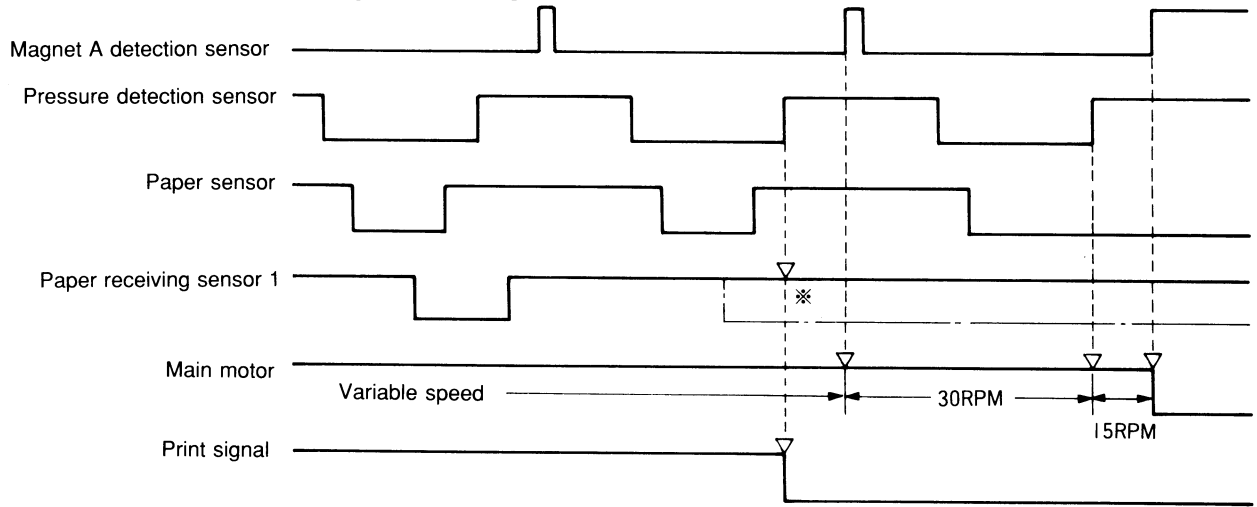
Paper Ejection Check System

(1) [No Separation from the Drum]



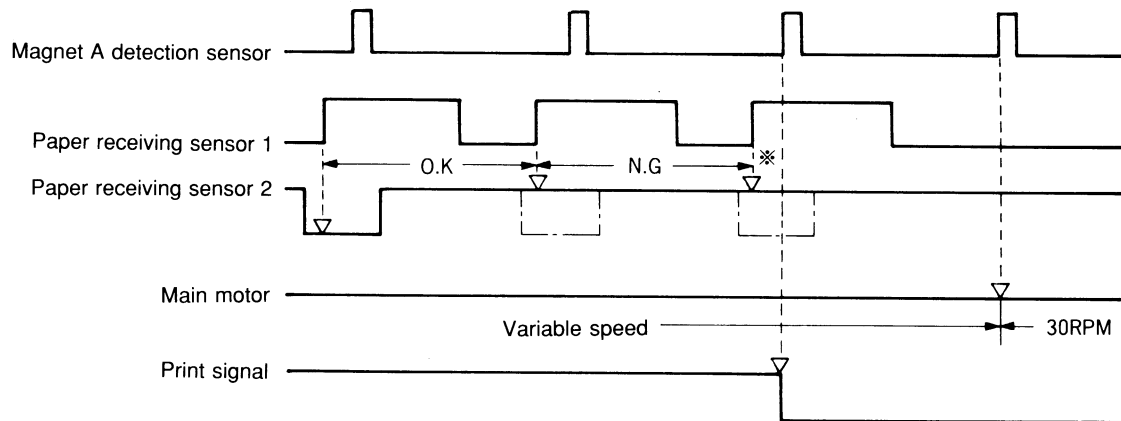
Paper Ejection Check System

(2) [Paper Jam around Paper receiving sensor 1]



※ Where concluded that paper has jammed around the Paper receiving sensor 1.

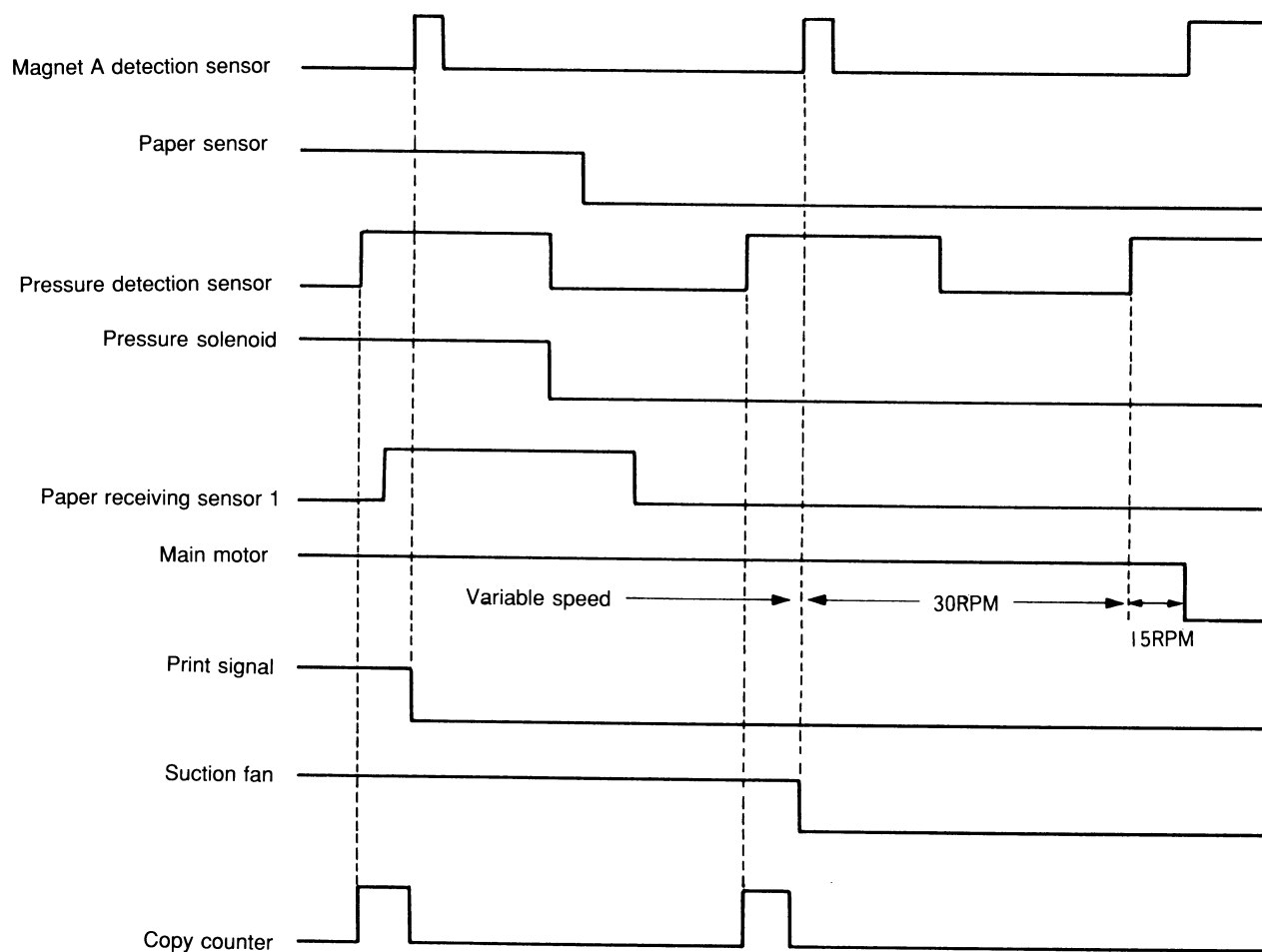
(3) [Paper Jam around Paper receiving sensor 2]



※ Where concluded that paper has jammed around the Paper receiving sensor 2.

Total Timing Chart in Paper Ejection Section

– End of print cycle –



1. Paper Receiving Tray
2. Suction Unit
3. Transfer Belts

[Removal Procedures & Precautions for Installation]

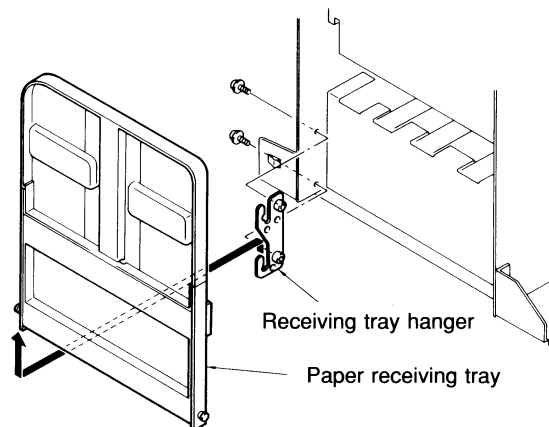
1. Paper Receiving Tray

– Removal Procedures –

- 1) Fold the guides and paper stop on the Paper receiving tray and close the tray.
- 2) Lift the Paper receiving tray straight up and remove.

– Precautions for Installation –

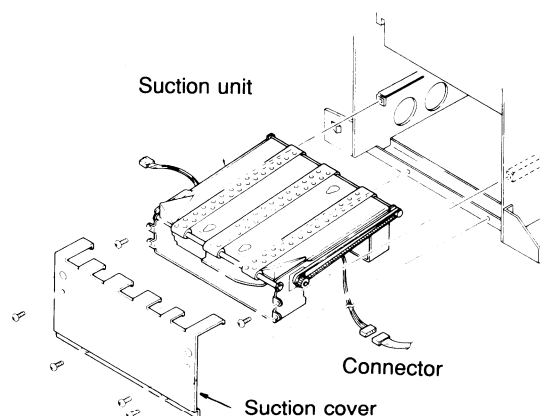
- There are two positions provided to install the Paper receiving tray according to the type of paper. Be sure to install it at the lower position before folding the Paper receiving tray.



2. Suction Unit

– Removal Procedures –

- 1) Remove the Back cover and disconnect the connectors of the Paper receiving sensors.
- 2) Remove the Paper receiving tray and the front right cover.
- 3) Remove the side cover on the Power supply PCB, and remove the two mounting screws on the Receiving tray hanger on the front side.
- 4) Disconnect the connector (2-pin/black-blue) of the Suction fan on the Power supply PCB.
- 5) Remove the four mounting screws from the Suction cover, remove the cover, and disconnect the connector (4 pin) of the Paper receiving sensors (send).
- 6) Remove the two mounting screws from the Suction unit.



Note: As there is a wire harness under the Suction unit, remove the unit carefully.

– Precautions for Installation –

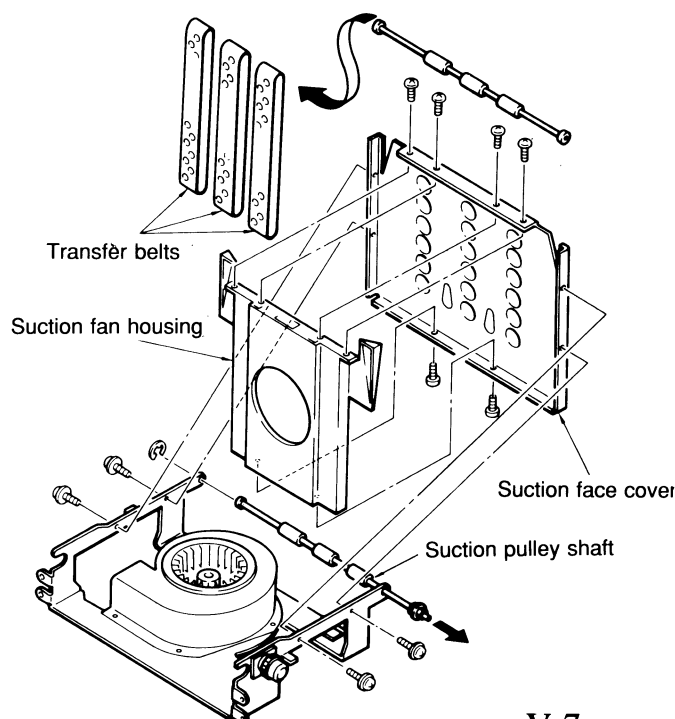
- When installing the Suction unit, position the unit and check if abnormal noise arises from the gears and drive unit. Reposition the unit if necessary.

3. Transfer Belts

(Disassembly Procedures of Suction Unit)

– Removal Procedures –

- 1) Remove the Suction unit.
- 2) Remove the four screws from the Suction face cover, and remove the Suction pulley shaft by removing the E-ring on one side and sliding the shaft out.
- 3) Remove the Suction face cover and remove the two outermost Transfer belts.
- 4) Remove the Suction fan housing and remove the center Transfer belt.



1. Position of Separator

1. Position of Separator

- 1) Loosen the mounting screw on the Separator adjustment plate and move the adjustment plate so that the distance from the tip of the Separator to the surface of the Drum is **0.5mm to 1.0mm**. (No part of the Separator tip should contact the Drum.)
- 2) Tighten the mounting screw of the Separator adjustment plate.

- Perform printing and check that a printed paper is separated from the Drum when the paper has a **10-mm margin** at the top of the printed copy and that there are no separator tip marks in the center of the printed paper.

- 1) If the tip of the Separator is set too close to the Drum or in contact with the Drum; ➡ it will scratch the surface of the master, creating black lines in the center of the printed paper or will damage the screens.
- 2) If the tip of the Separator is set too far from the Drum; ➡ it cannot separate the paper from the Drum, causing paper jams.



2. Tension of Suction Drive Belt

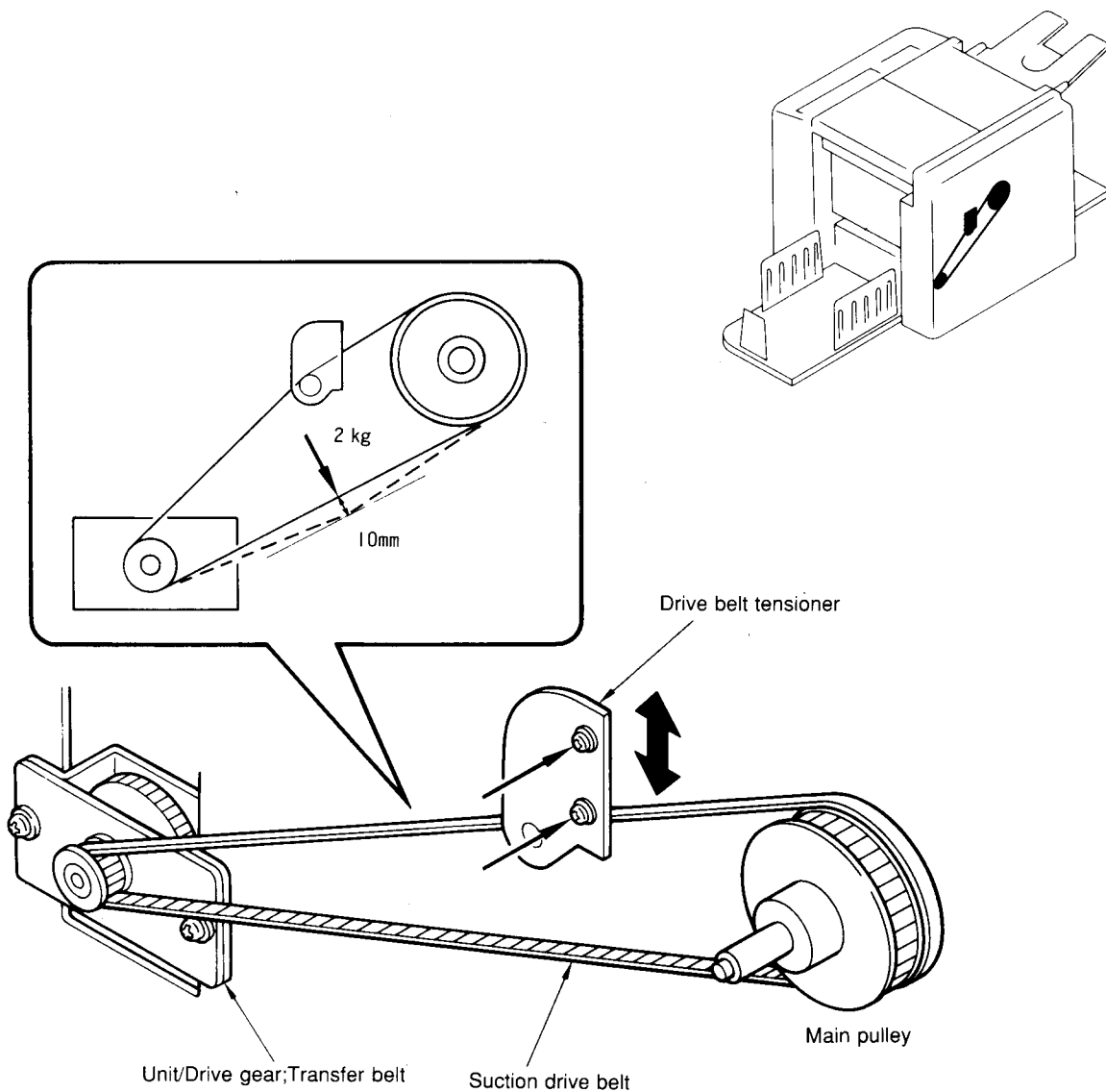
– Check & Adjustment –

- 1) Remove the Back cover and check the tension of the Suction drive belt.
The tension should read **2 kg** on the tension gauge when pushing the tension gauge down **10mm** in the middle of the belt.
- 2) If the tension is incorrect, loosen the two mounting screws on the Drive belt tensioner and adjust the tensioner for proper tension.

Note: After adjusting the Drive belt tensioner, check the gear alignment with the gear pulley of the Suction unit.

– Results of Misadjustment –

- 1) If the tension is not adjusted correctly; ➡
the belt rotation may cause vibration and/or noise, which could result in paper jams due to improper paper transportation in the paper receiving area and damage to the gears and belts.



6. MASTER MAKING AREA

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Operation and Function

– Image Scanning Section –

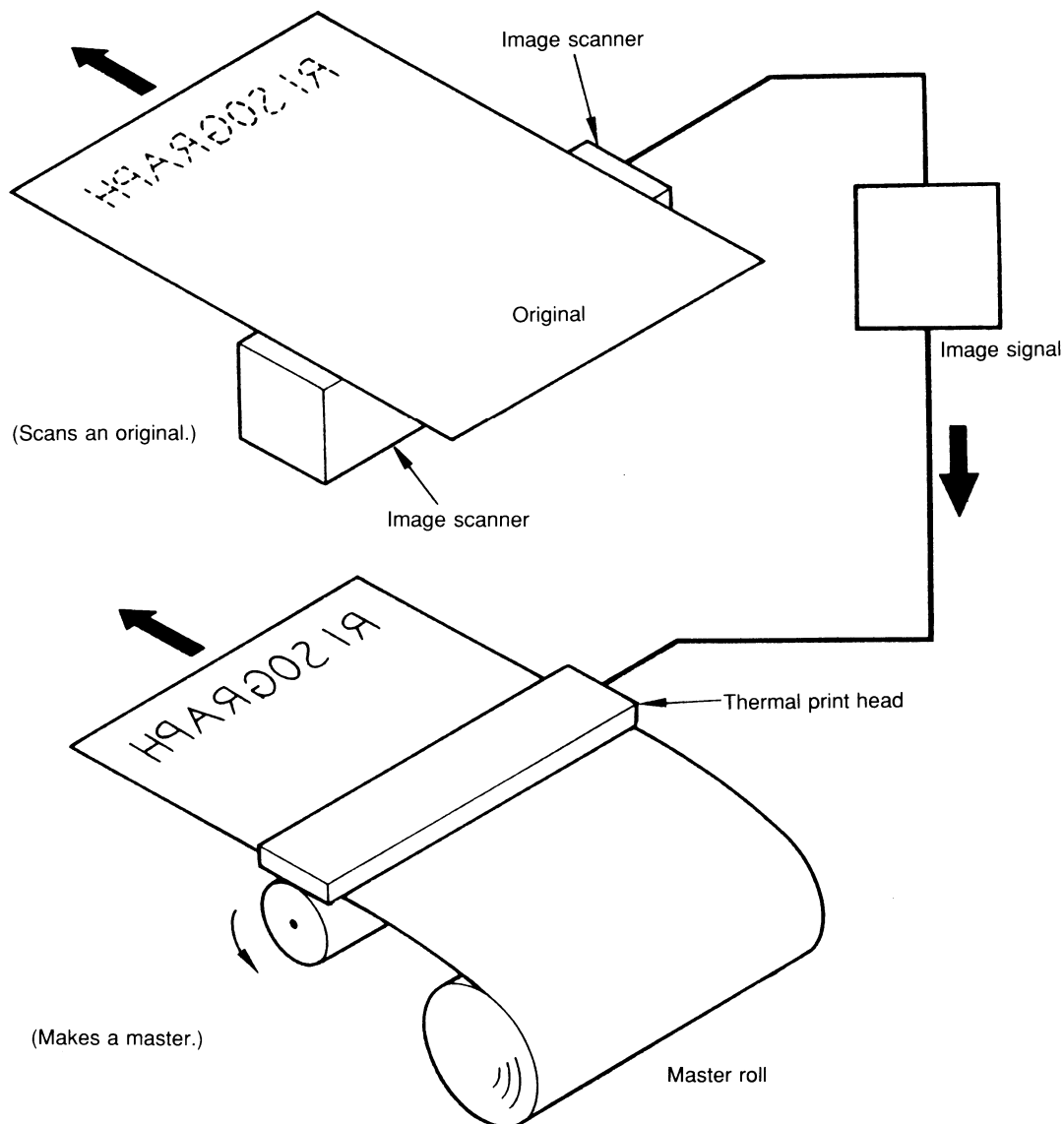
Scans an original with a contact-type image scanner, while the Read pulse motor transports the original through the section.

The Image scanner converts the scanned density of the image into electronic signals, which are processed in various ways by the Image processing PCBs.

– Master Making Section –

Creates an image on a master as the master material is fed to the Thermal print head by the Write pulse motor.

The signals from the Image processing PCBs control the heating of the Thermal print head, and the heated areas of the Thermal print head make holes in the master material to recreate the same image as an original on the master.



1. Image Scanning Section

[Theory of Operation]

1. Original Feed System

- Pick-up of Original

When the "START" button is pressed while the Original detection sensor is detecting an original, the Original feed solenoid is activated, causing the Original stopper to lower and release the original, and simultaneously the Original feed roller lowers onto the original.

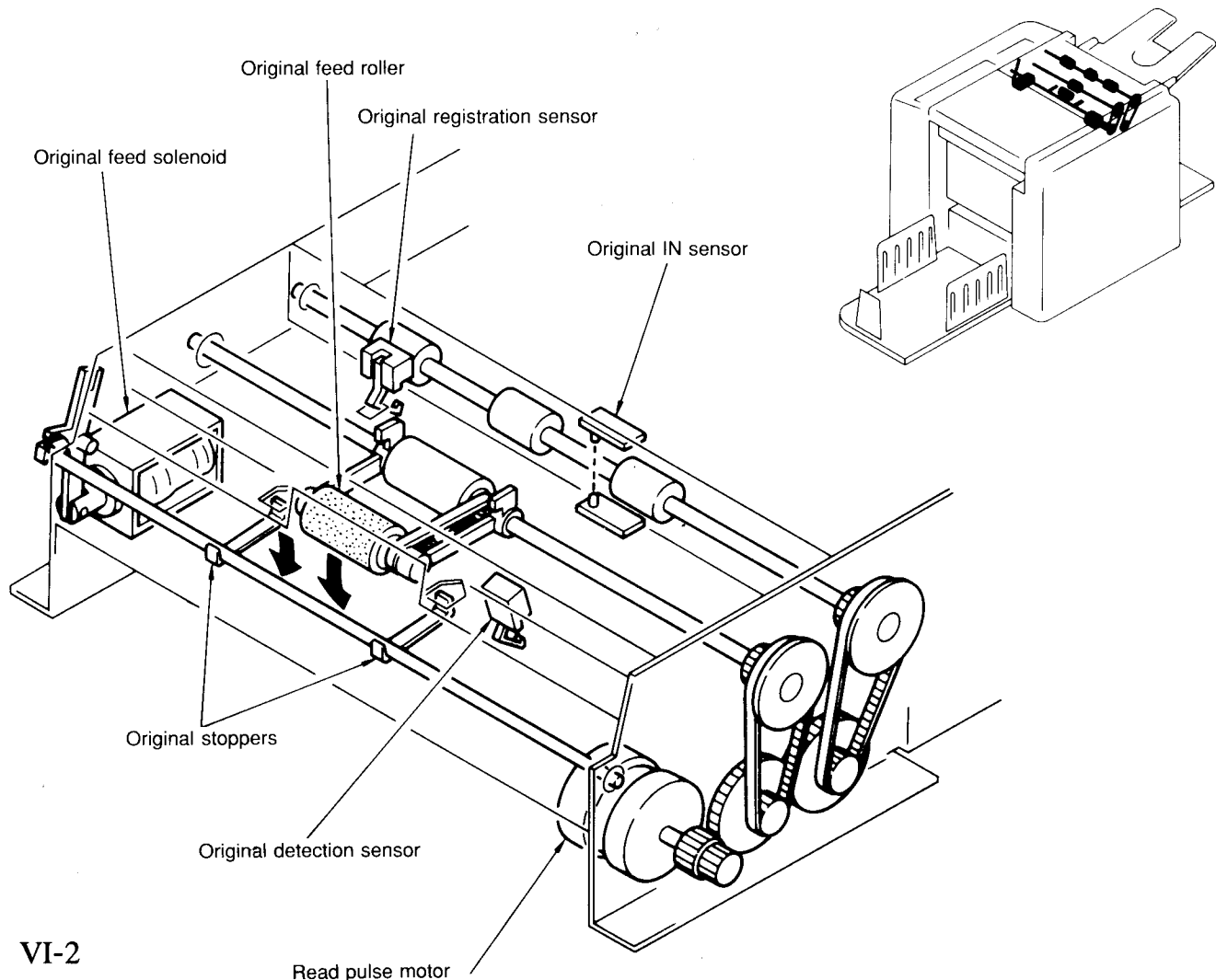
After a **200-ms delay**, the originals, when a stack is set on the original table, are separated by the braking action, caused by an one-way clutch spring of the Lower original pickup roller when it is in contact with the Upper one, and the Read pulse motor starts rotating counterclockwise to feed one sheet of originals.

- Original feed to Image scanner

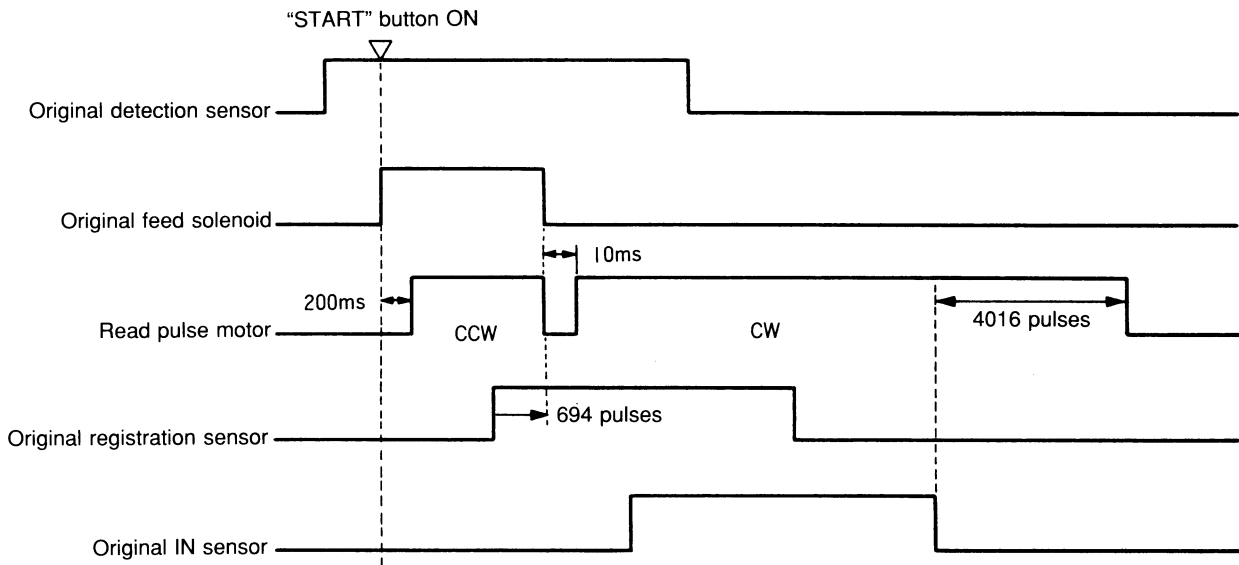
For the scanning registration, the lead edge of the fed original is detected by the actuator of the Original registration sensor (the light path of the sensor is opened). When the Read pulse motor rotates **694 pulses** after the above original registration (sensor detection), the Original feed solenoid is turned off and the Read pulse motor reverses the rotation direction to clockwise, to continue feeding the original.

- Finish of Original feed

When the trail edge of the original has passed through the light path of the Original IN sensor, the Read pulse motor keeps on rotating **4016 pulses** to finish the transportation of the original to the Original tray, and then stops.



Original Feed System



2. Original Feed Check System

The following 3 kinds of original feed troubles are detected by the Original registration sensor and Original IN sensor.

1. [No original feeds or Original slips.]

– Check system –

If the actuator of the Original registration sensor has not been pushed up, to open the light path, within **2646 pulses** rotation after the start of the Read pulse motor, it is judged that the original has not been fed.

When this occurs, the master making operation stops and the jam message “**ORIGINAL MISFEED/RESET ORIGINAL**” is displayed on the panel for two seconds.

2. [Original jam before the Image scanner]

– Check system –

If the light path of the Original IN sensor is not blocked by the original within **677 pulses** after the Read pulse motor started rotating clockwise, it is judged that the original has not been fed to the Image scanner.

When this occurs, the master making operation stops and the jam message “**ORIGINAL JAM/RESET ORIGINAL**” is displayed on the panel.

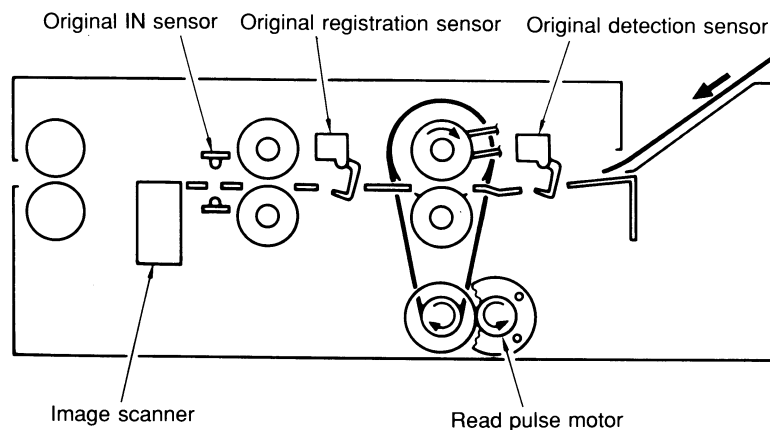
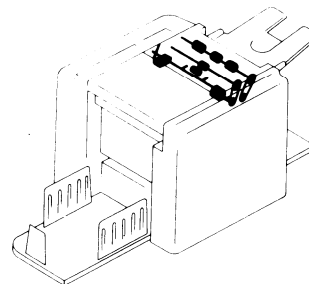
3. [Original oversize or jam over the Image scanner]

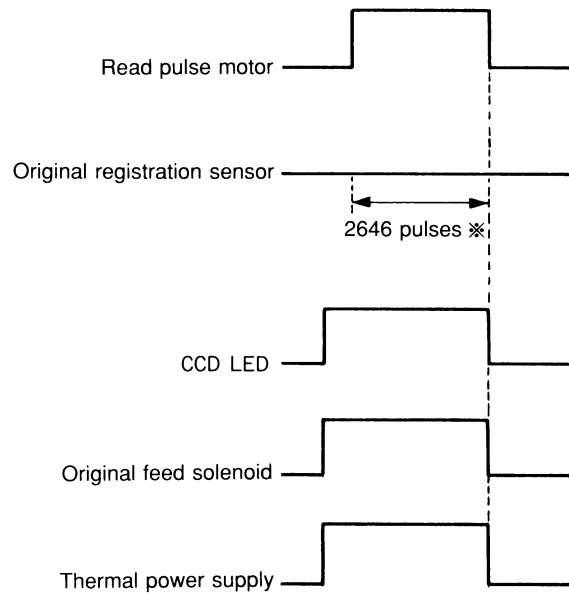
– Check system –

If the light path of the Original IN sensor has not been opened within **14331 pulses** after it was blocked, it is judged that the original is too long or that it has misfed over the Image scanner.

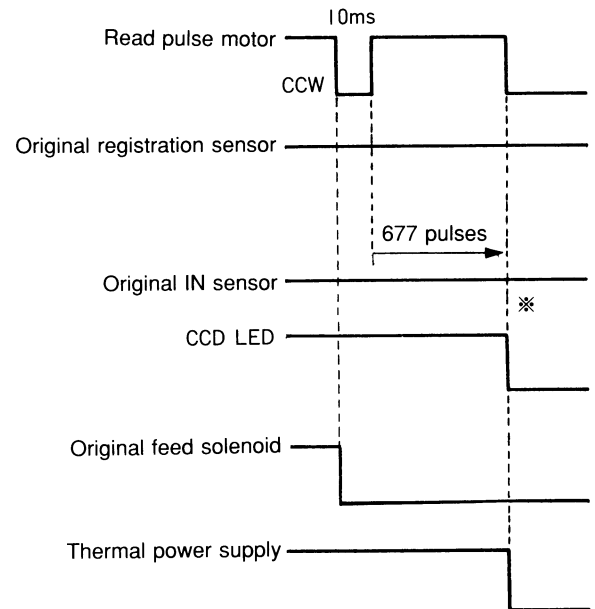
When this occurs, the master making process is interrupted and the master will be loaded onto the Drum.

The Drum will then rotate once and stop, and the jam message “**ORIGINAL JAM OR OVERSIZE/REMOVE JAMMED ORIGINAL**” will be displayed on the panel.

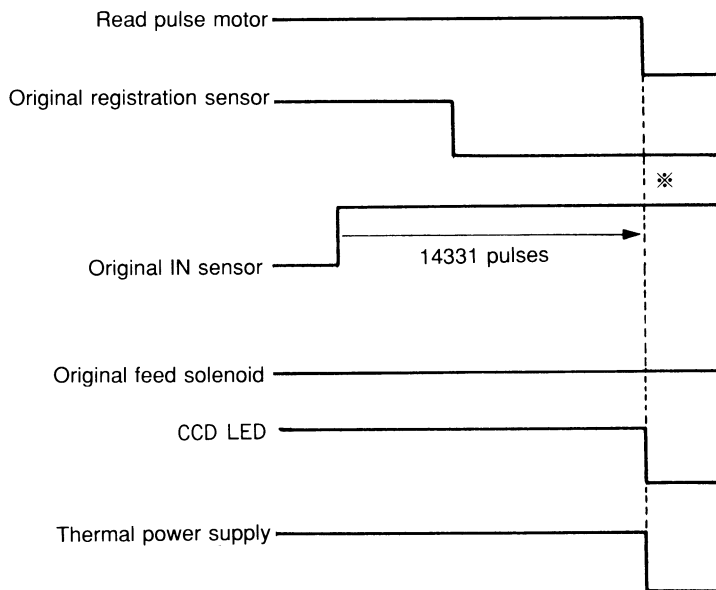


Original Feed Check System**[No original feeds or Original slips]**

※ Where concluded that an original hasn't been fed.

[Original jam before Image scanner]

※ Where concluded that an original has jammed before Image scanner.

[Original oversize or jam over Image scanner]

Starts loading the master onto the Drum.

※ Where concluded that an original is too long or has jammed over Image scanner

3. Image Scanning System

- Construction and Function of Image Scanner

The Risograph RC series uses a contact-type image scanner to read the image of an original during scanning.

The Image scanner consists of numerous yellowish-green LEDs, arranged in parallel rows.

These LEDs provide the light source which will illuminate the original during the "Read" operation.

The light reflected according to the contrast of the original is passed back through the converging rod lens array (optical fibers) in the Image scanner to the CCDs (Charged Coupled Devices) and converted into an electrical signal.

- Time for Shading Compensation

When the "START" button is pressed with an original detected by the Original detection sensor, the LED array lights and the Original feed solenoid are turned on simultaneously.

In a short time (**200ms**), the original starts to be fed and a little later the Original feed solenoid is turned off.

10ms later, the shading signal has been output for **200ms** to perform "Shading Compensation" operation.

- The Start of Scanning

Image scanning is started by the Read and Write start signal, which is output **900 pulses** after the lead edge of the original was first detected by the Original IN sensor.

- The Finish of Scanning

Image scanning is completed by turning off the LED arrays and the Read and Write start signal **819 pulses** after the trail edge of the original is detected by the Original IN sensor.

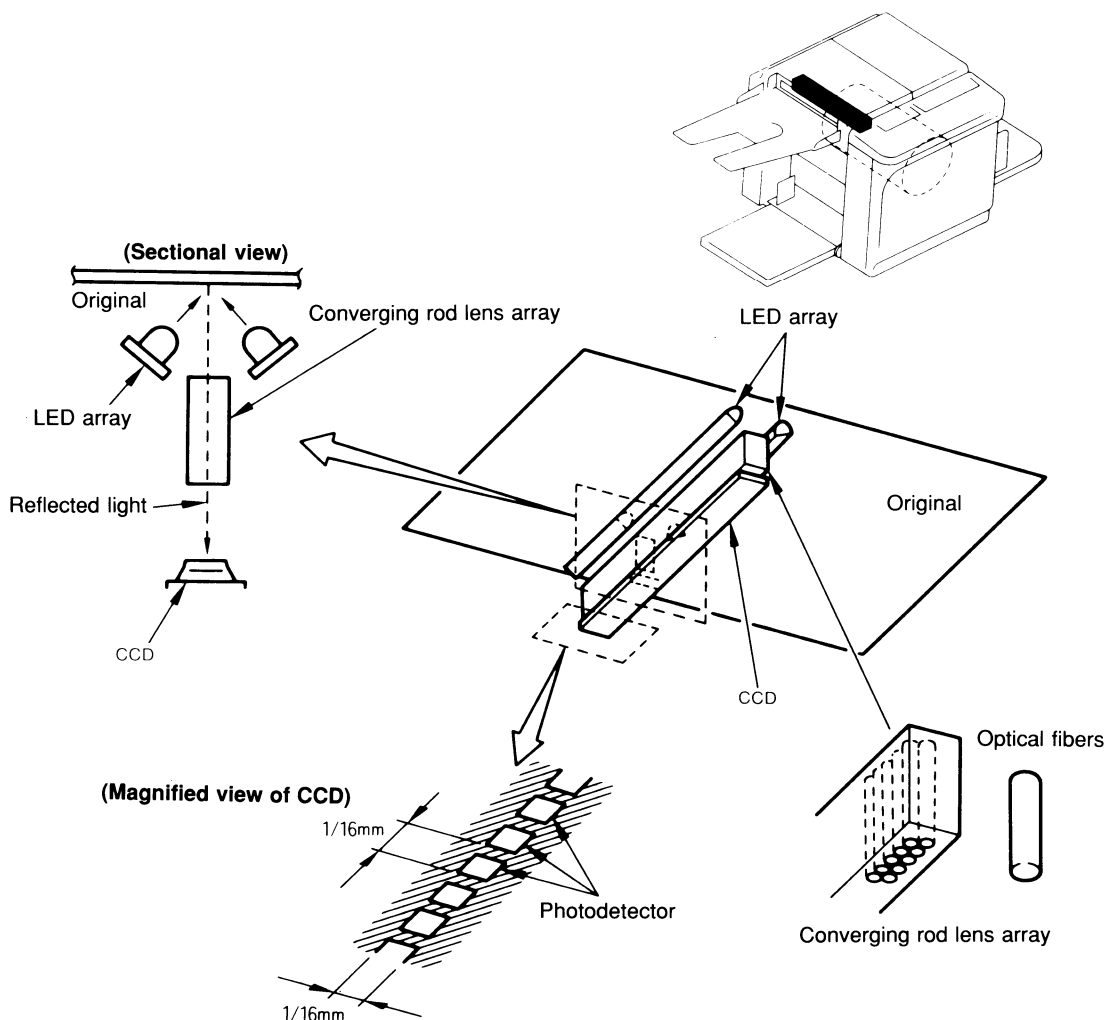
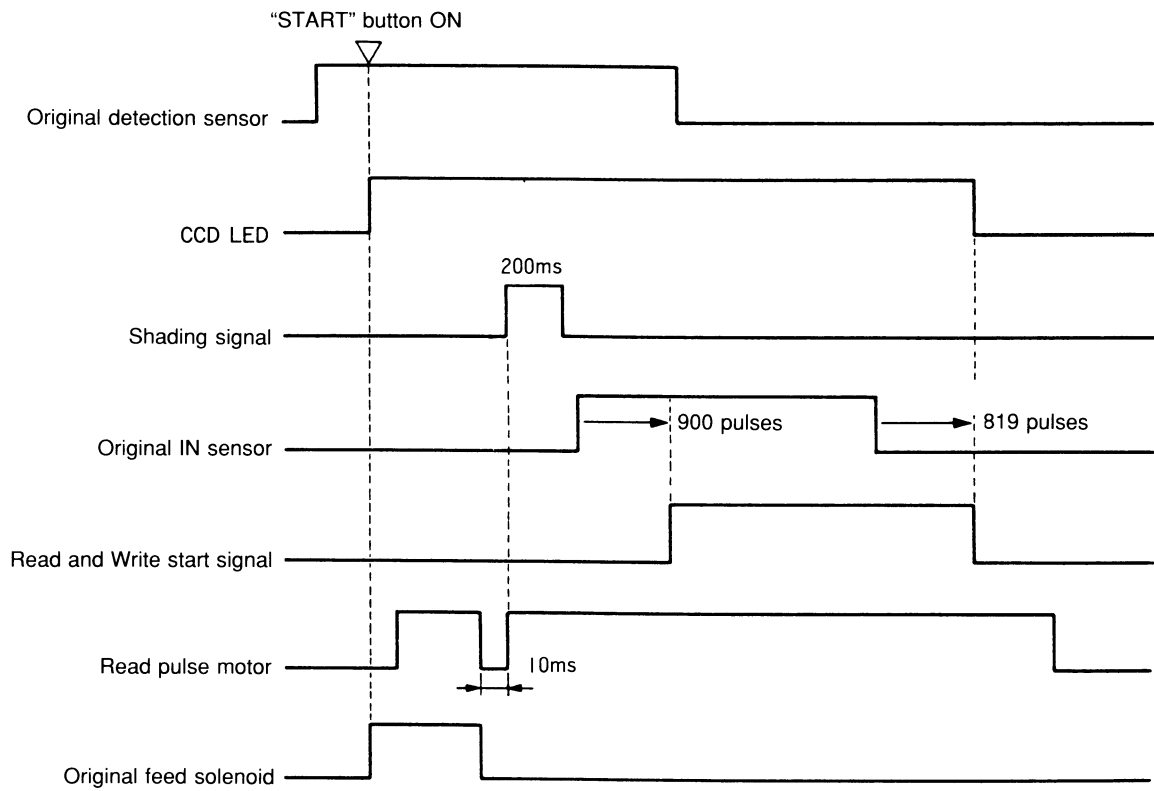


Image Scanning System



1. Image Scanner Unit

2. ADF Unit

[Removal Procedures & Precautions for Installation]

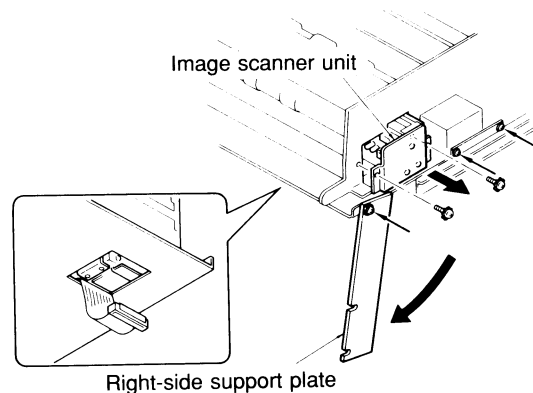
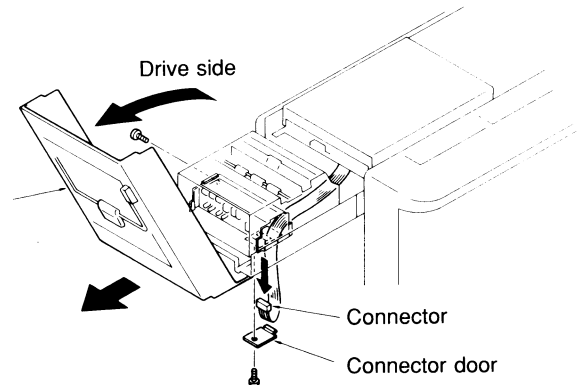
1. Image Scanner Unit

– Removal Procedures –

- 1) Slide the Image scanning section towards the paper feed area and open the ADF cover.
- 2) Loosen the screw on the Connector door on the bottom of the ADF section and slide the door off. Disconnect the connector of the Image scanner unit.
- 3) Remove the mounting screw of the Ground plate and loosen the other three mounting screws on the right-side support plate on the front panel side, and then remove the Ground plate, and unhook the plate from the screws and set it aside.
- 4) Remove the two mounting screws of the Image scanner unit on the non-operator side and the two mounting screws on the bracket of the Image scanner on the front panel side and then slide the Image scanner out.

– Precautions for Installation –

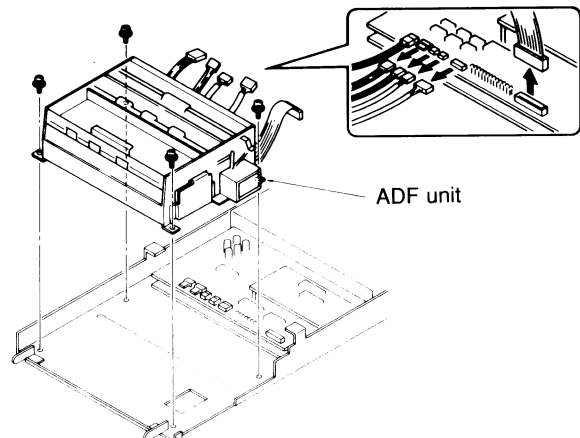
- When sliding the Image scanner back in, be sure the Image scanner wire harness is out of the way.



2. ADF Unit

– Removal Procedures –

- 1) Remove the Top cover.
(In RC5600D, remove the Digitizer unit.)
- 2) Open the ADF cover and remove the four mounting screws from the ADF unit.
- 3) Disconnect the five connectors (CN 4, CN 5, CN 6, CN 7, and CN 8) from the Image processing PCB.
- 4) Gently lift up and remove the ADF unit.

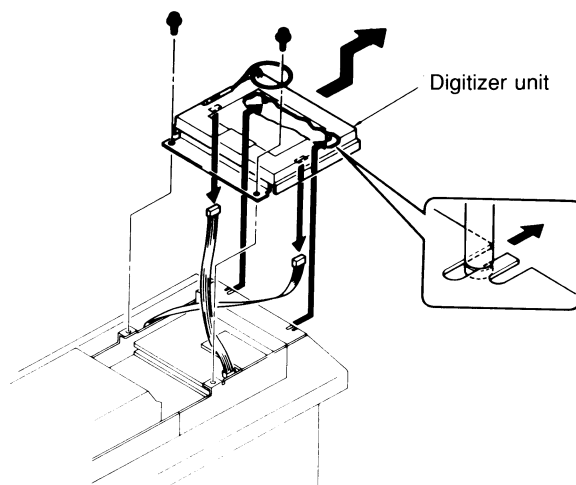


3. Digitizer Unit
4. Image Processing PCBs
5. Image Scanning Section

3. Digitizer Unit

– Removal Procedures –

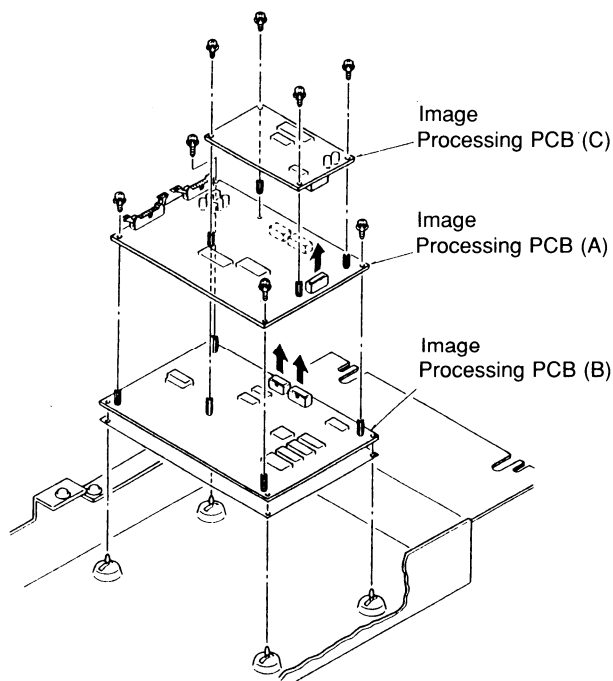
- 1) Open the ADF cover and remove the two mounting screws from the Digitizer unit.
- 2) Slide the Digitizer unit towards the paper receiving area and unhook the Digitizer unit from the base plate.
- 3) Disconnect two connectors on the Digitizer PCB and remove the Digitizer unit.



4. Image Processing PCBs

– Removal Procedures –

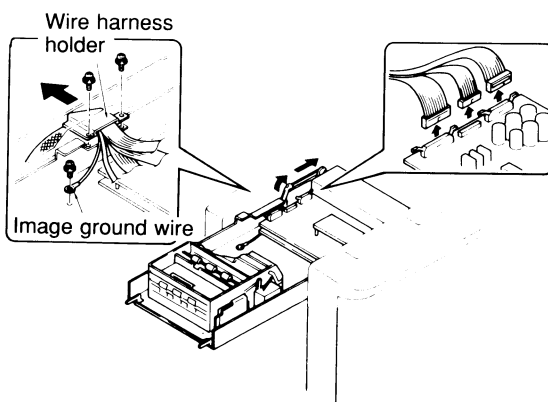
- 1) Open the ADF cover and remove the Digitizer unit.
- 2) Disconnect all connectors from the Image processing PCBs.
Release the PCBs from the bushings and remove the PCBs.



5. Image Scanning Section

Removal Procedures -

- 1) Open the ADF cover and remove the Digitizer unit.
- 2) Disconnect the three connectors (CN 1, CN 2, and CN 3) from the Image processing PCBs and remove the mounting screw of the Image ground wire.
- 3) Slide the Image scanning section toward the paper feed area so that the wire harness holder is positioned at the widest part of the Guiding slit of the Scanner guiding frame that is attached to the left side frame.
- 4) Remove the two mounting screws from the wire harness holder and pull out the wire harnesses and Image ground wire, together with the wire harness holder through the slit.
- 5) Remove the two mounting screws on the Scanner stopper plate and slide off the Image scanning section.



ADJUSTMENT PROCEDURES

1. Sensitivity of Original IN Sensor

[Adjustment Procedures]

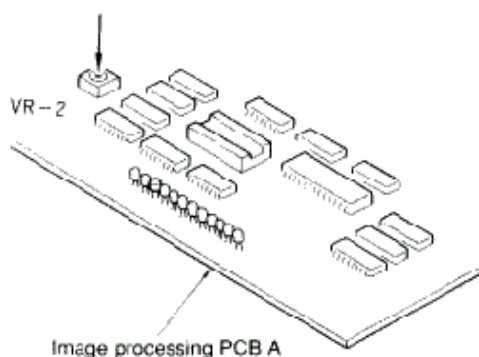
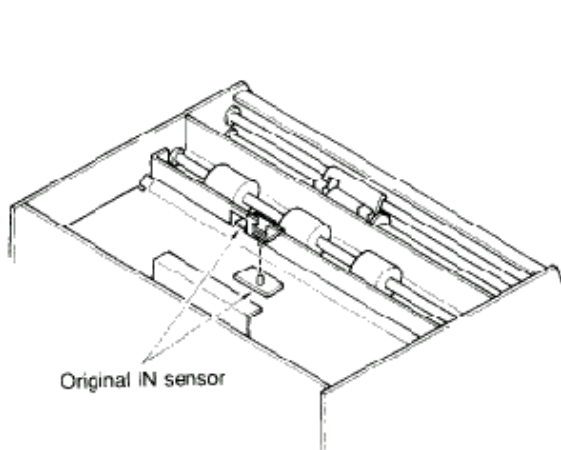
1. Sensitivity of Original IN Sensor

– Check & Adjustment –

- 1) Remove the Digitizer unit.
- 2) Close the ADF cover and turn the power switch on.
Then check that the **LED (GKIS)** on the **Image processing PCB A** is not lit.
- 3) If the **LED (GKIS)** is lit, turn **VR2** on the **Image processing PCB A** counterclockwise until the LED is not lit.
- 4) Check that the **LED (GKIS)** is lit when the light path of the Original IN sensor is blocked with a standard paper.
- 5) If the **LED (GKIS)** is not lit, turn **VR2** clockwise until the **LED (GKIS)** is lit.
- 6) Check that both conditions as described in steps 2) and 4) are satisfied.
If not, repeat the adjustment of VR2 until they are satisfied.

– Results of Misadjustment –

- 1) If the sensitivity is too low; ➡
it is judged that an original is already or still jammed before master making and the original jam message will be displayed on the panel.
- 2) If the sensitivity is too high; ➡
the Original IN sensor cannot detect the original fed to the Image scanner even if the original is actually fed, and it is judged that the original has jammed before the Image scanner.
As a result, the original jam message will be displayed on the panel.



2. Position of ADF Interlock Switch

– Procedure –

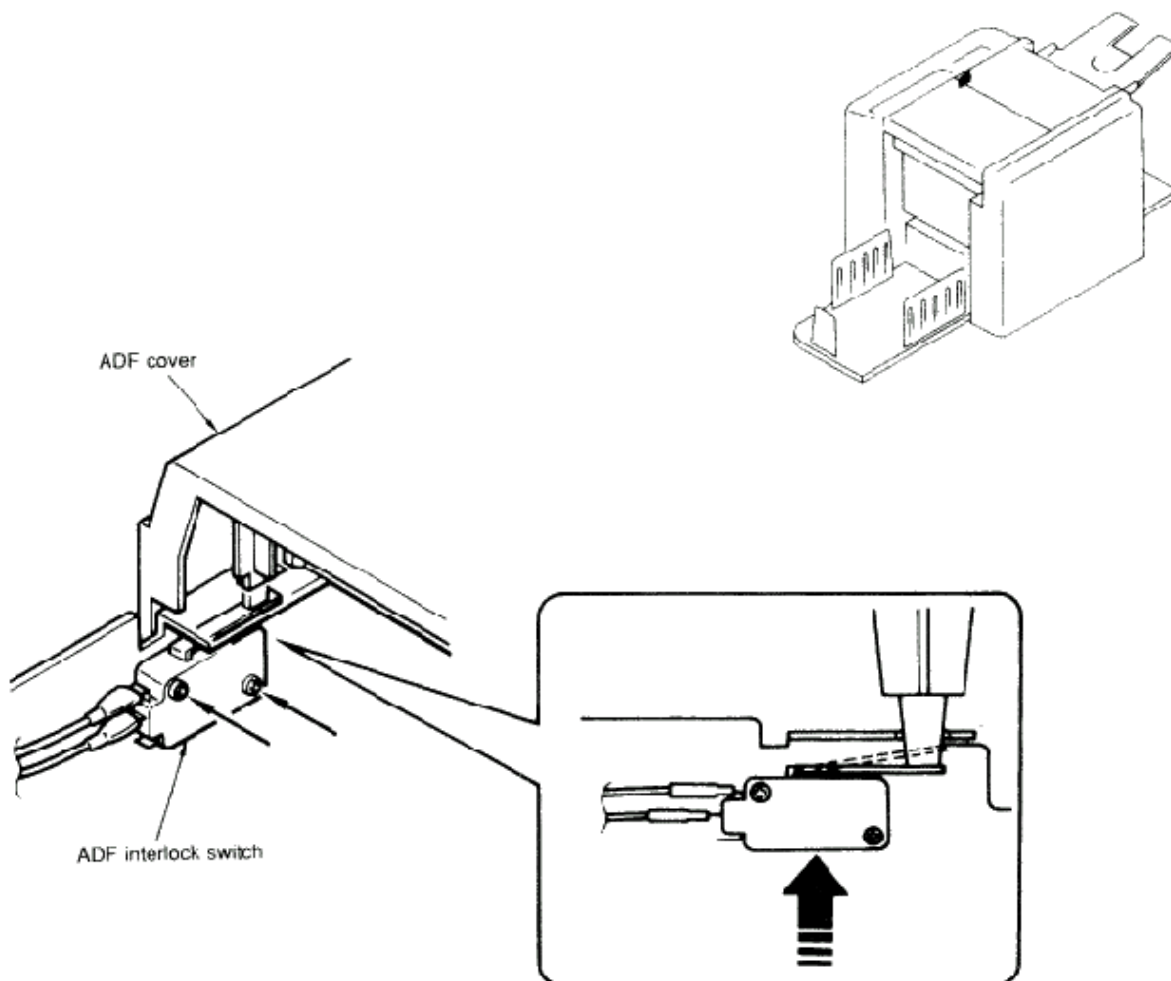
- 1) Remove the Digitizer unit.
- 2) Close the ADF cover.
- 3) Loosen the mounting screws of the ADF interlock switch.
Shift up the interlock switch **1 to 2 mm** from where it is switched-on and tighten the screws.

– Check –

- Check that the message **"ORIGINAL MISFEED / RESET ORIGINAL"** is displayed one second after the "START" button is pressed for master making with the ADF cover open.
Also check that the master making is normally operated when the ADF cover is closed.

– Results of Misadjustment –

- 1) If the ADF interlock switch cannot be pressed ON by the ADF cover; ➡
the message **"ORIGINAL MISFEED / RESET ORIGINAL"** will be displayed one second after the "START" button is pressed.
- 2) If the ADF interlock switch is pressed ON with the ADF cover open; ➡
no problem occurs. However, no problem can be detected.
Remember that the switch system is designed to protect the operator's safety.



2. Master Making Section

[Theory of Operation]

1. Master Making System

- Function of Thermal print head

The Thermal print head heats up according to the signals sent from the Image processing PCBs and creates holes on the master.

- Preparation for Master-making

When an original is detected by the Original registration sensor, the Thermal pressure motor rotates lowering the Thermal print head until the TPH pressure switch is pressed on.

The master material is now pressed between the Write roller and the Thermal print head.

- Start of Master-making

900 pulses after the lead edge of the original has been detected by the Original IN sensor, the Read and Write start signal is turned ON and starts the Write roller (the Write pulse motor) rotation.

- Master Feeding

When the Write pulse motor starts rotating, it rotates the Write roller clockwise via the Write idler, belt, and Write pulley.

The master is then fed at the same speed as the original (size-to-size setting).

- Heating up of Thermal print head

When the Read and Write start signal is turned on, the Thermal print head is heated up and the master is created.

- Finish of Master-making

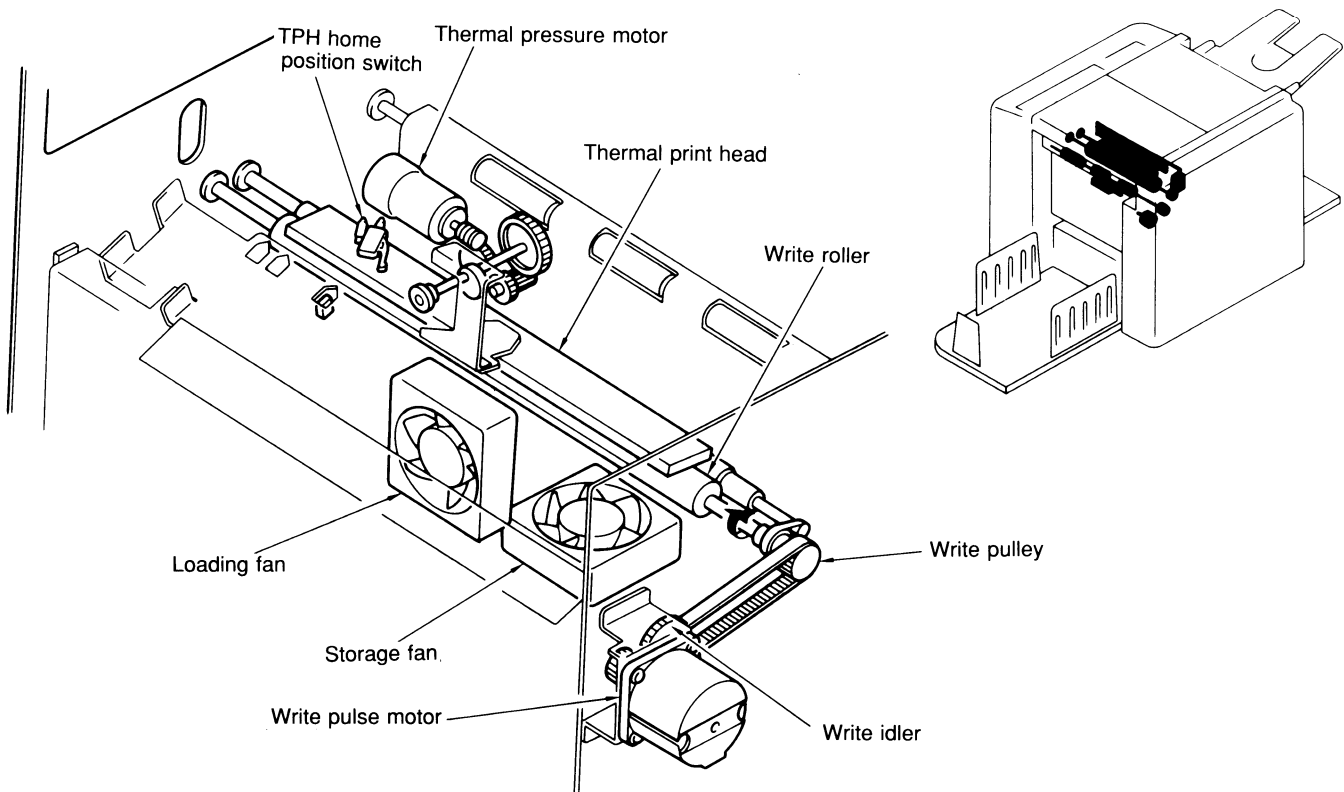
819 pulses after the trail edge of the original is detected by the Original IN sensor, the Read and Write start signal and Write pulse motor go off.

At the same time, the Thermal pressure motor is rotated and starts raising the Thermal print head away from the master until the TPH home position switch is pressed on.

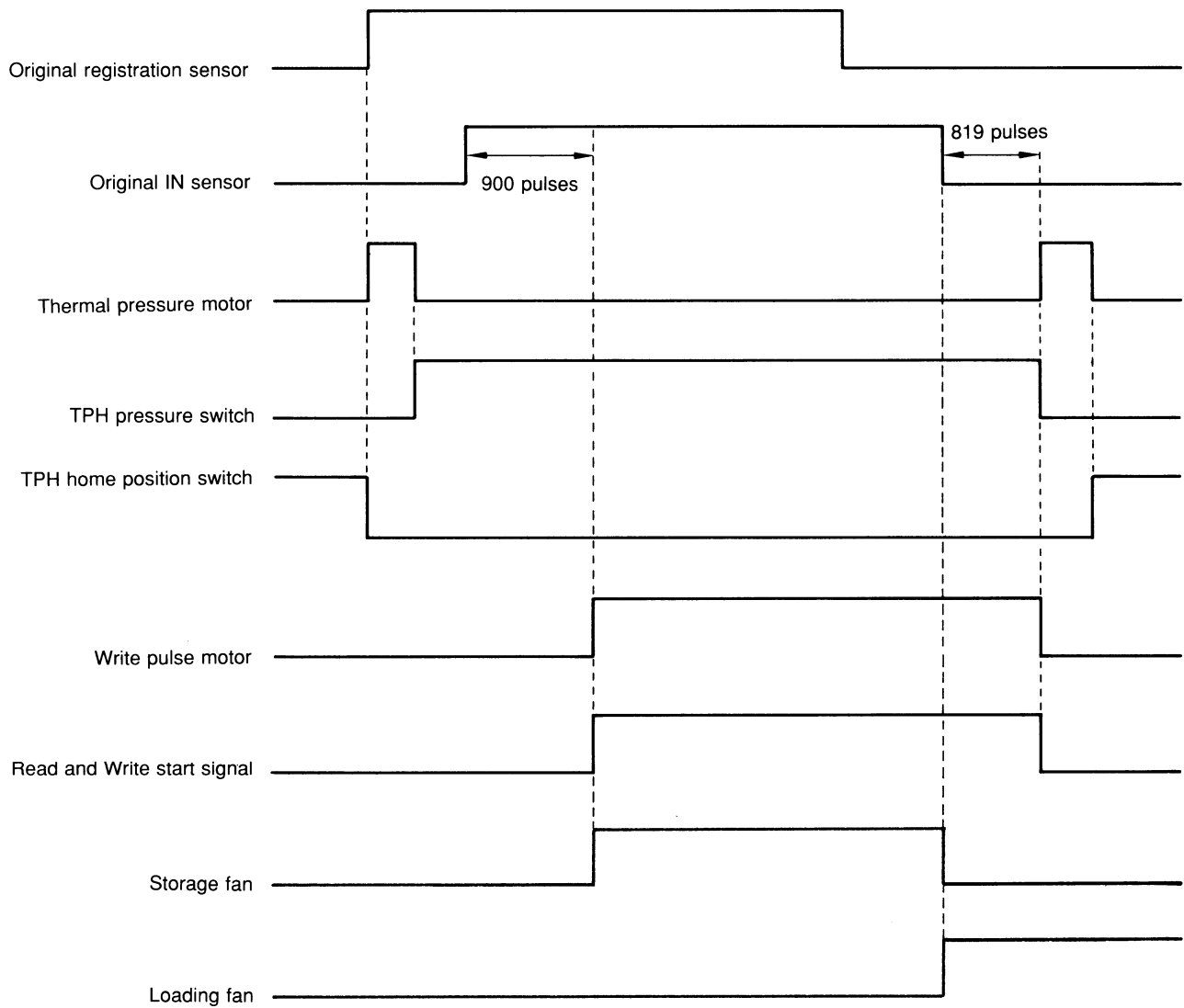
- Storage of a new master after TPH

The new master is fed into the Master stocker while the previous master is removed from the Drum.

While in the stocker, the new master is suspended by a suction created by the Storage fan to await loading to the Drum.



Master Making System



2. Master Loading System

- Lowering of Thermal Print Head

When the Master loading unit is closed, the Master loading unit switch is pressed, causing the Thermal pressure motor to rotate until the TPH pressure switch has been pressed.

The Thermal print head is now pressing the master material onto the Write roller so that the material can be fed.

- Start of Master loading

When the TPH pressure switch has been pressed, the Write and Loading pulse motors start to rotate clockwise, causing the Write roller to rotate via the Write idler, belt, and Write pulley and to feed the master.

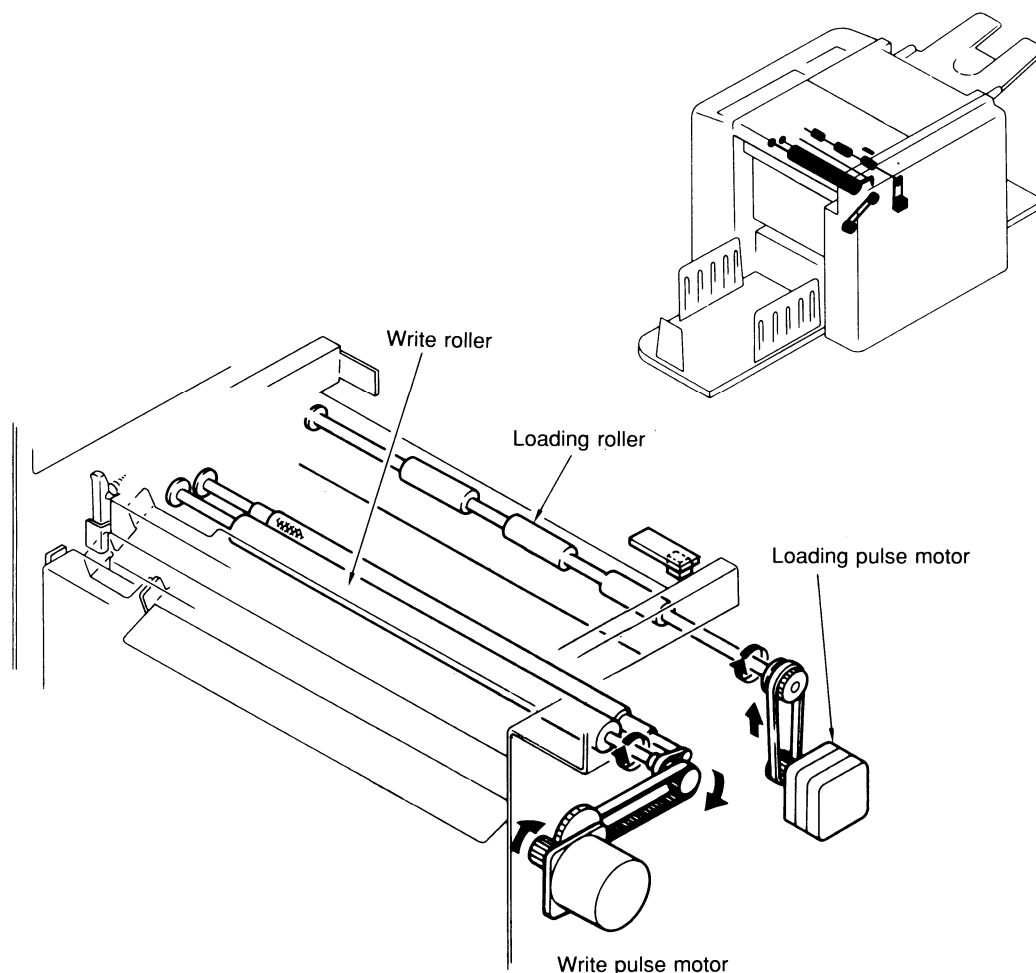
The master is fed further by the loading rollers, which are rotated by the Loading pulse motor via the belt and the Loading pulley.

- Finish of Master loading

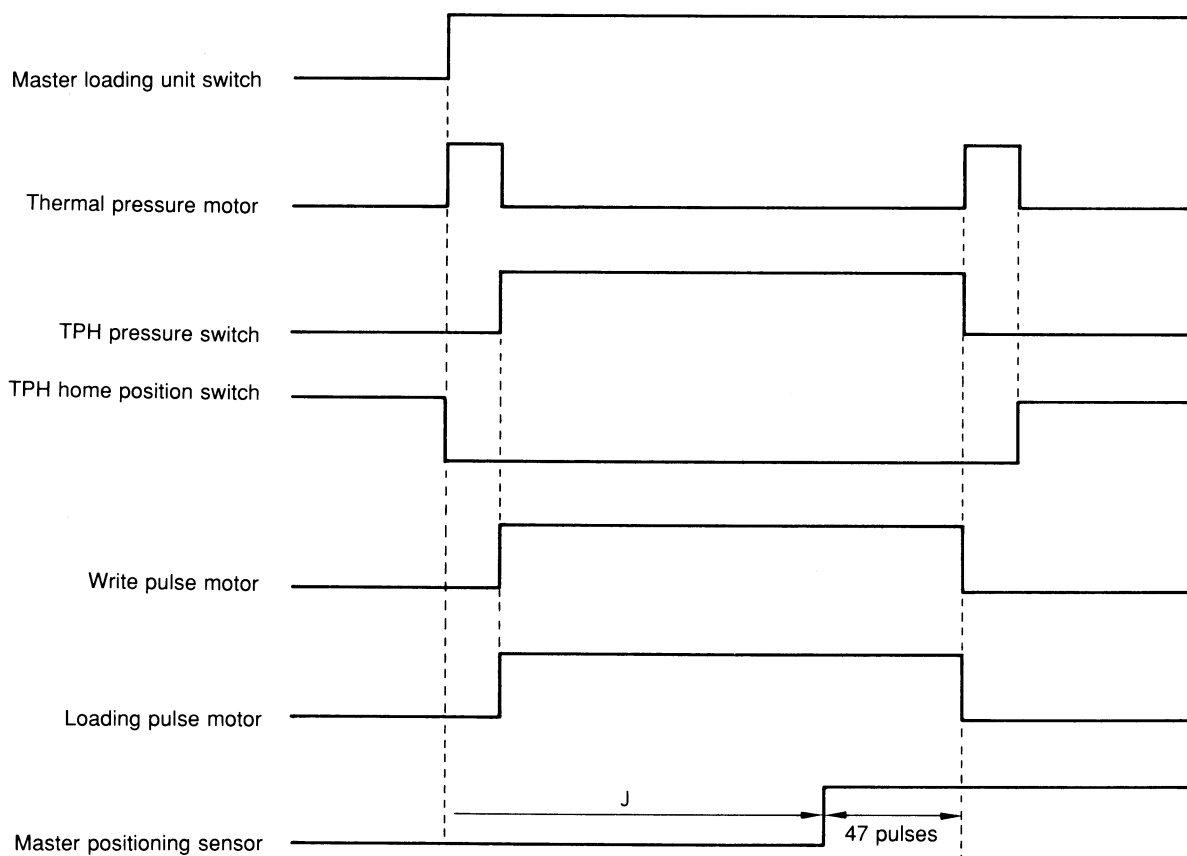
The Write and Loading pulse motors are turned off to finish the master loading **47 pulses** after the lead edge of the master is detected by the Master positioning sensor.

- Retreat of Thermal Print Head

When the master loading is completed, the Thermal pressure motor is activated and the Thermal print head rises until the TPH home position switch is pressed on.



Master Loading System



- J: If the Master positioning sensor has not detected the lead edge of the fed master material (the reflected light) **within 2426** pulses after the actuator of the Master loading unit switch was pressed on, the error message **“MASTER MIS-FEED/ RESET MASTER”** is displayed on the panel.

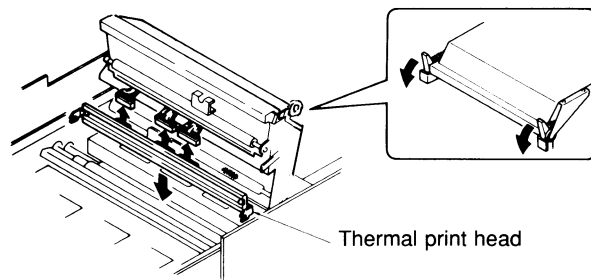
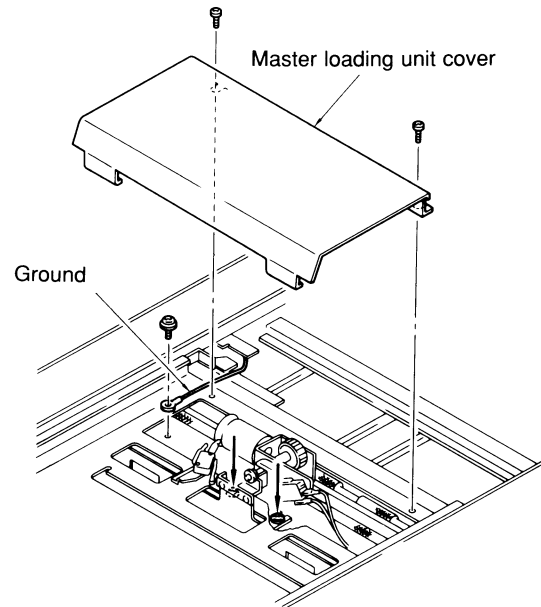
[Removal Procedures & Precautions for Installation]

1. Thermal Print Head

– Removal Procedures –

- 1) Slide the Image scanning section towards the paper feed side.
- 2) Loosen the two mounting screws of the Master loading unit cover and remove the cover.
- 3) Remove the mounting screw for the ground wire from the Thermal print head.
- 4) Loosen the two screws on the TPH bracket just enough to unhook.
- 5) Unlock and open the Master loading unit while holding the Thermal print head to prevent it from falling.
- 6) Slide the Thermal print head a little bit towards the Drum and disconnect all three connectors.
- 7) Gently slide off the Thermal print head from the holder and remove.

- * Be careful not to damage the heating area of the Thermal print head.
- * Take extra precautions not to allow any static electricity to pass through the connectors on the Thermal print head when removed. It will damage the Thermal print head.



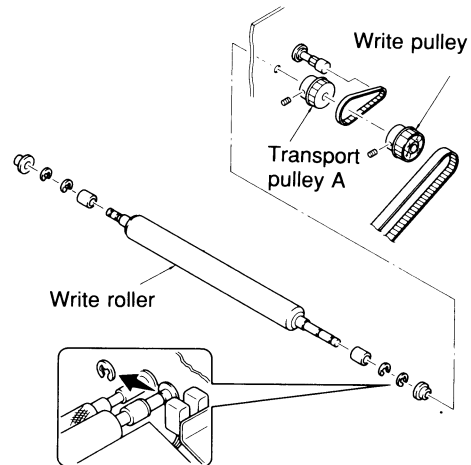
2. Write Roller

– Removal Procedures –

- 1) Remove the Back cover.
- 2) Loosen the tension of the belt by shifting the Write pulse motor to the right after loosening the mounting screws and remove the belt from the Write pulley.
- 3) Loosen the allen screw on the Write pulley and remove the pulley.
- 4) After removing the belt from the Transport pulley A, loosen the allen screw on the pulley and remove the pulley as well .
- 5) Slide the Image scanning section towards the paper feed side, and unlock and open the Master loading unit.
- 6) Remove an E ring at the right end of the Write roller and push the Write roller towards the drive mechanism side to release it from the hole on the side frame.
Then slide it out from the other.

– Precautions for Installation –

- Do not put collars and bearings on the shaft in the wrong order.
- Align the Transport pulley A and Write pulley so that the belt and pulleys are even.
- Remember to adjust the tension of the belt of the Write pulse motor.
- Take extra precautions not to let the Write roller hit the edges of the frame, which could cause damage to the roller.



[Adjustment Procedures]

1. Sensitivity of Master Detection Sensor

– Procedure –

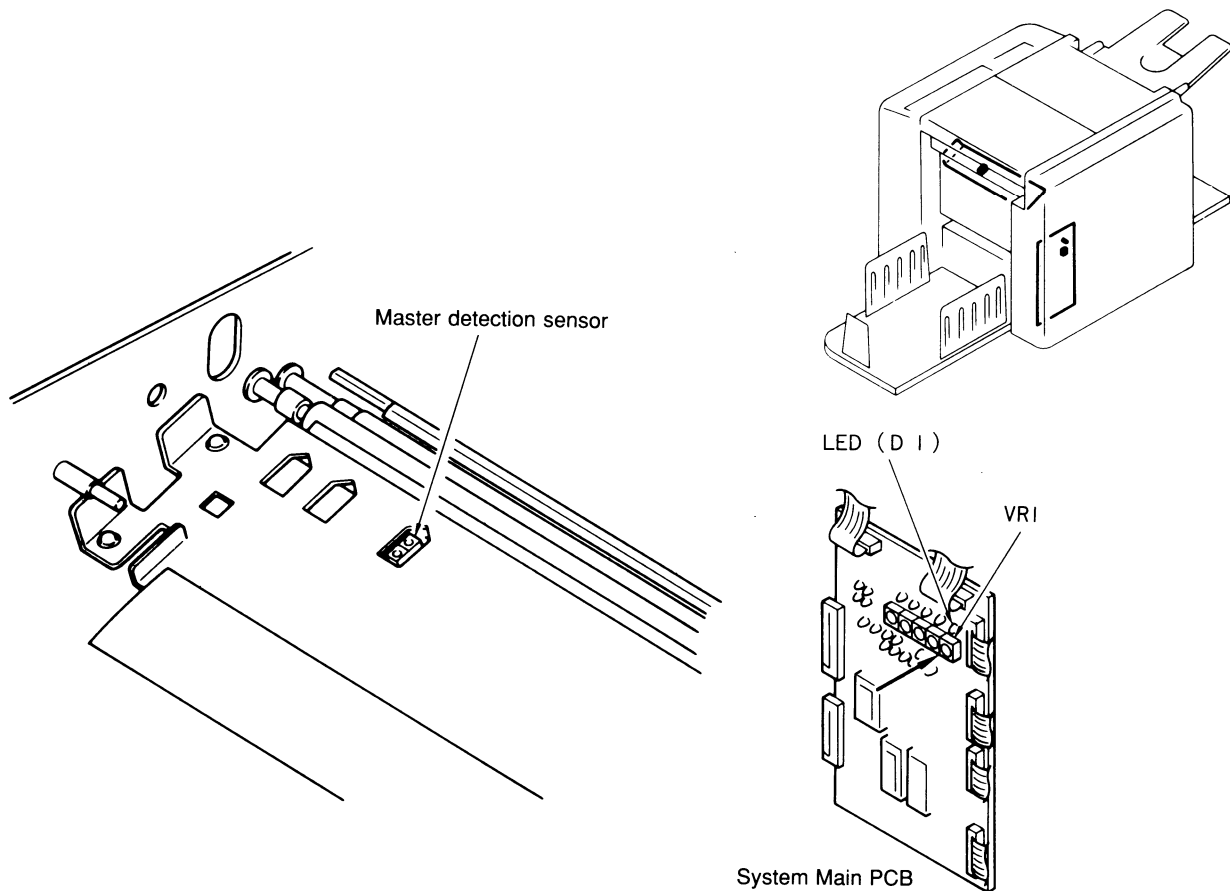
- 1) Slide the Image scanning section towards the paper feed side, and unlock and open the Master loading unit.
- 2) Load the master correctly and close the Master loading unit.
- 3) Remove the Back cover and turn **VR1** on the **System Main PCB** counterclockwise all the way.
- 4) Turn **VR1** clockwise gradually while watching **LED (D1)** on the **System Main PCB**. After the **LED (D1)** has lit up, turn **VR1** 3 to 4 more steps clockwise.

– Check –

- Reload the master material several times and check that the **LED (D1)** on the **System Main PCB** lights when the master is present and that it does not light when the master is removed.

– Results of Misadjustment –

- 1) If the sensitivity is too low; ➡
the sensor cannot detect the master even when present.
This will cause the message “**SET LEAD EDGE OF MASTER UNDER GREEN FILM**” to be displayed on the panel, preventing the operation.
- 2) If the sensitivity is too high; ➡
there will be no trouble in operation with the master present, but it is judged that the master is present even when not, causing the Loading pulse motor to rotate to feed the master.
As a result, the Master positioning sensor can't detect the master, causing the message “**MASTER MIS-FEED/RESET MASTER**” to be displayed on the panel.



2. Sensitivity of Master End Sensor

– Procedure –

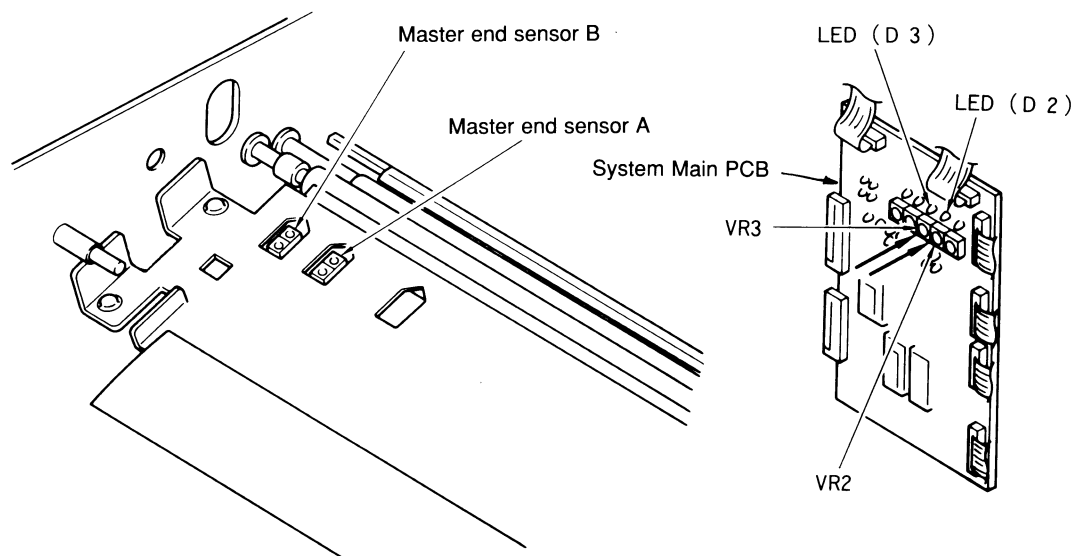
- 1) Slide the Image scanning section towards the paper feed side, and unlock and open the Master loading unit.
- 2) Reset the master material and close the Master loading unit.
- 3) Remove the Back cover and turn **VR 2** and **3** on the **System Main PCB** counterclockwise all the way.
- 4) Turn **VR2** clockwise gradually while watching the **LED (D2)** on the **System Main PCB**.
After the **LED (D2)** goes off, Turn **VR2** 3 to 4 more steps clockwise.
- 5) Turn **VR3** clockwise gradually while watching the **LED (D3)** on the **System Main PCB**.
After the **LED (D3)** goes off, turn **VR3** 3 to 4 more steps clockwise.

– Check –

- Check that the LEDs (**D2** and **D3**) on the **System Main PCB** are on when a black tape is placed on the Master end sensor and that they are off when the master is in place.

– Results of Misadjustment –

- 1) If the sensitivity is too high; ➡
the sensor cannot detect the master end mark (the black tape), causing a new master to be attached to the Drum without the full length.
As a result, the first print paper may not be separated from the Drum and wind around it, or the Pressure roller may be smudged with ink due to the absence of master material on the print area of the Drum.
Besides, The Write roller may be damaged because the master runs out during master making.
- 2) If the sensitivity is too low; ➡
the message “**REPLACE MASTER ROLL**” will be displayed on the panel even when the master roll is not used up.



ADJUSTMENT PROCEDURES

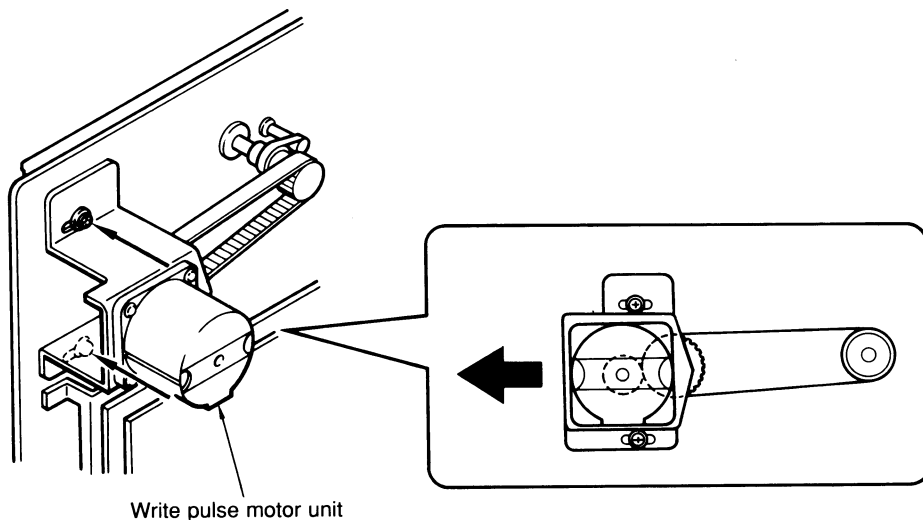
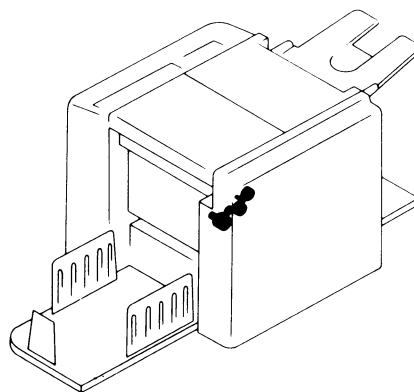
3. Tension of Write Pulse Motor Belt

– Procedure –

- 1) Remove the Back cover and loosen the two mounting screws of the Write pulse motor unit.
- 2) Pull the Write pulse motor all the way to the left and tighten the screws.

– Results of Misadjustment –

- 1) If the belt tension is not tight enough; ➡
the belt could skip on gears during master making, causing the Write roller to stop.
As a result, the image on the master will be reduced in length (vertically).
This could also cause damage to the belt.
- 2) If the belt tension is too tight; ➡
too much load will be on the Write pulse motor and lock the motor, causing the Write roller to stop rotating, and the image on the master will be reduced in length (vertically).
This could also cause damage to the pulley or the pulse motor.



Write pulse motor unit

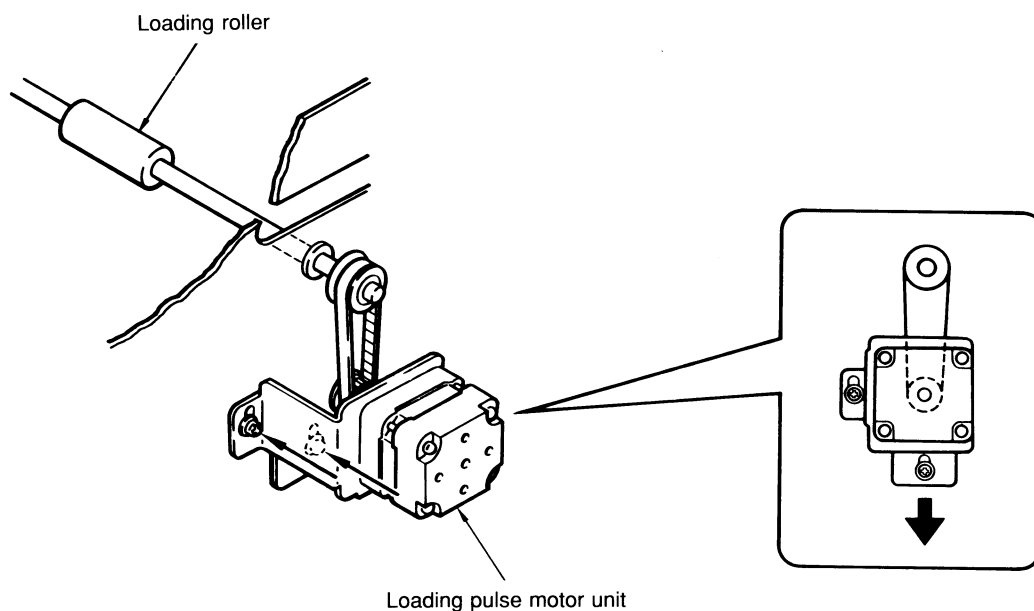
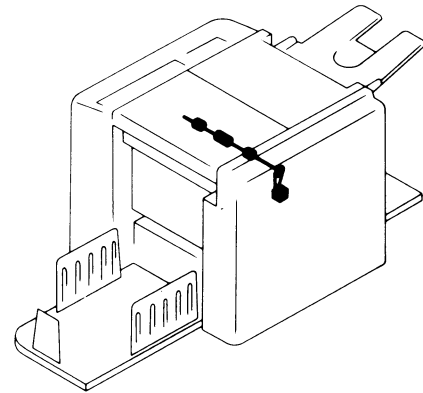
4. Tension of Loading Pulse Motor Belt

– Procedure –

- 1) Remove the Back cover and loosen the two mounting screws of the Loading pulse motor unit.
- 2) Let the Loading pulse motor hang by its own weight on the belt and tighten the screws.

– Results of Misadjustment –

- 1) If the belt tension is not tight enough; ➡
the belt could skip on gears during master transporting, causing the Loading pulse motor to stop, and the maste cannot be transported properly, which results in mis-loading.
This could also cause damage to the belt.
- 2) If the belt tension is too tight; ➡
too much load will be on the Loading pulse motor and lock the motor, and the master cannot be transported properly, which results in mis-loading.
This could also cause damage to the pulley and Loading pulse motor.



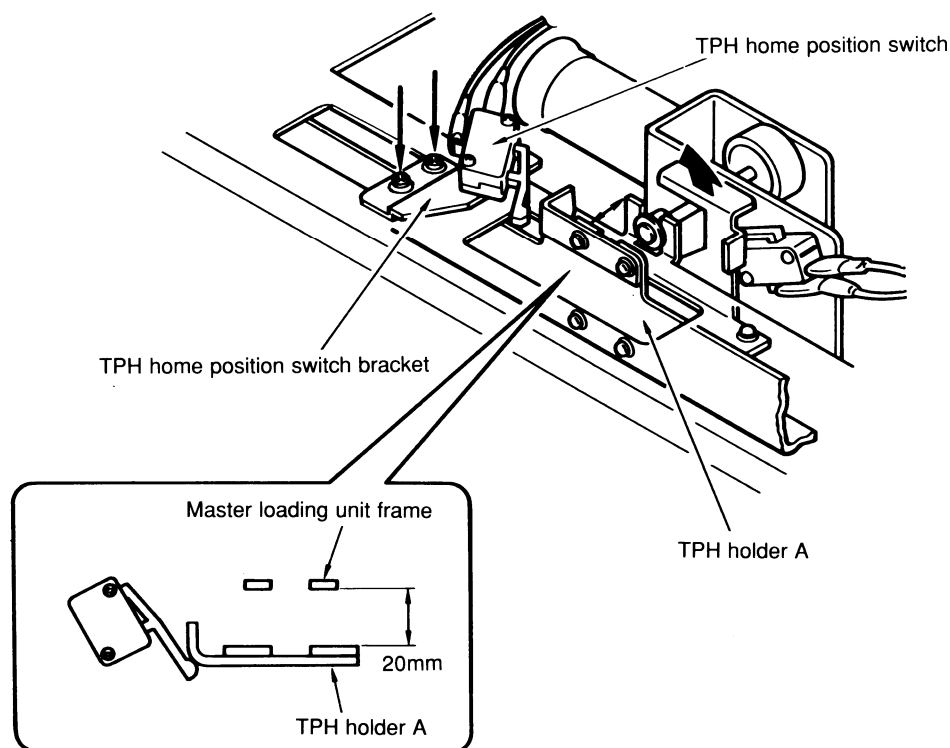
5. Position of TPH Home Position Switch

– Check & Adjustment –

- 1) Slide the Image scanning section towards the paper feed side and remove the Master loading unit cover.
- 2) Manually pull the TPH holder A towards the master roll.
Then check that the distance from the Master loading unit frame to the TPH holder A is **20 mm** when the actuator of the TPH home position switch is pressed.
- 3) If the distance is not 20 mm, loosen the mounting screws on the bracket of the TPH home position switch and move the switch and bracket to the correct position and tighten the screws.

– Results of Misadjustment –

- 1) If the actuator of the TPH home position switch is not actuated (the distance is **much more than 20 mm**); ➡
the Thermal pressure motor can not stop. This will cause damage to the motor and/or gears.
- 2) If the actuator of the TPH home position switch is contacted too early (the distance is **much less than 20 mm**); ➡
it will stop the Thermal print head from rising away from the Write roller, causing errors in master loading on the Drum or in confidential operation.



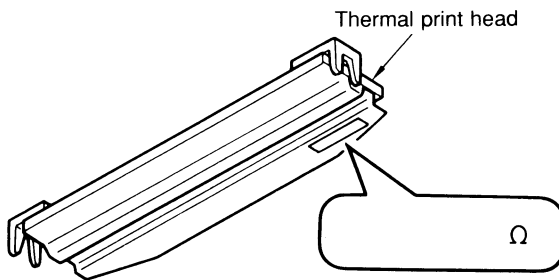
6. Thermal Power of Thermal Print Head

– Check & Adjustment –

- 1) Open the ADF cover and remove the Digitizer unit.
- 2) Remove the Front right cover.
- 3) Slide the Image scanning section towards the paper feed side, and unlock and open the Master loading unit.
Then read the resistance value (Ω) marked on the Thermal print head.
- 4) Measure the voltage between the **TP GND** and **TP +18V** on the **Power supply PCB** using a voltmeter, and then check the table below.
If the value does not match, adjust **VR +18ADJ.**
- 5) Check that the settings of **SW5** and **SW8** on the **Image processing PCB A** are correct referring to the correlation table below.
- 6) If they are not set correctly, reset **SW5** for **TP1** and **SW8** for **TP2**.

– Results of Misadjustment –

- 1) If the heating time for **TP2** is too short (not enough heat); ➡
thin horizontal lines can not be reproduced clearly.
- 2) If the heating time for **TP1** is too long (too much heat); ➡
the solid print image will be deformed and the Thermal print head may be damaged.



Voltage VTPH (V)	Resistance value \bar{R} (Ω)	Switch setting SW5 / SW8
17.0	1520 – 1558	A / 9
	1559 – 1592	B / A
	1593 – 1601	C / B
17.0	1602 – 1643	A / 9
	1644 – 1686	B / B
17.5	1687 – 1724	7 / 6
	1725 – 1760	8 / 7
	1761 – 1775	9 / 9
17.5	1776 – 1814	7 / 7
	1815 – 1851	8 / 8
	1852 – 1870	9 / 9
18.0	1871 – 1901	4 / 4
	1902 – 1939	5 / 5
	1940 – 1969	6 / 6
18.0	1970 – 1997	4 / 4
	1998 – 2035	5 / 6
	2036 – 2074	6 / 7
18.0	2075 – 2093	4 / 5
	2094 – 2131	5 / 6
	2132 – 2169	6 / 7
	2170 – 2184	7 / 9
18.0	2185 – 2208	5 / 7
	2209 – 2265	6 / 8
	2266 – 2300	7 / 9

7. MASTER CARRIER AND CLAMP AREA

CONTENTS

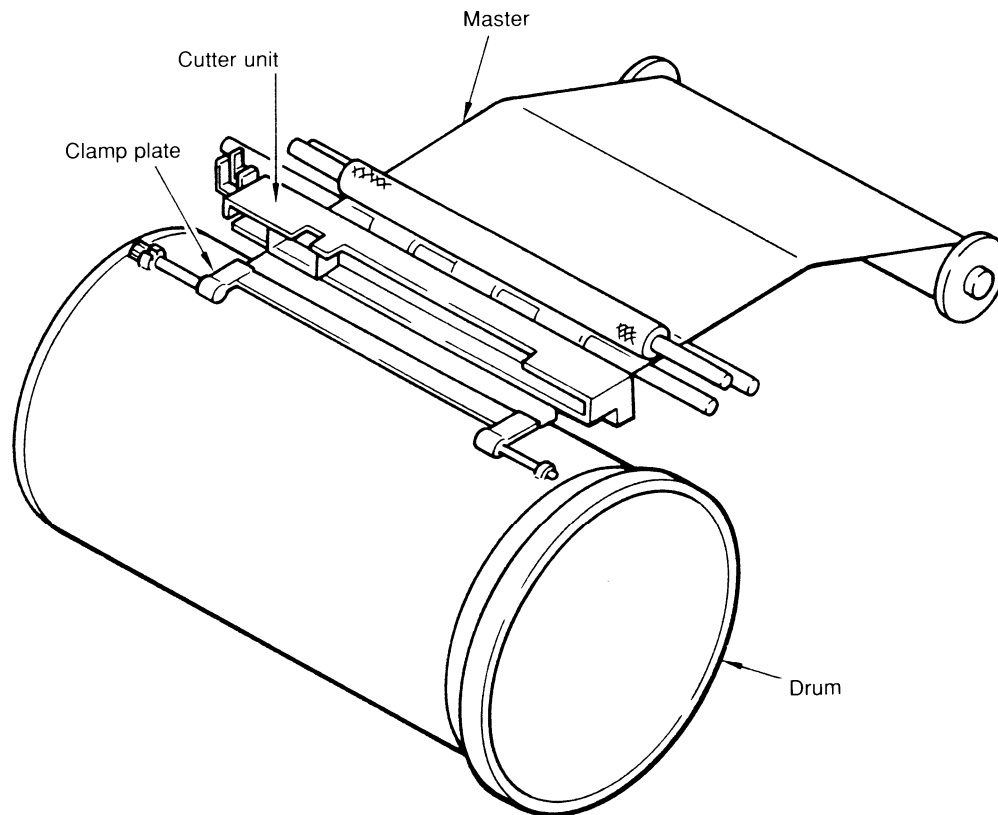
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Operation and Function

The Master carrier section operates and controls the advance, feed, and loading of master material to the Drum.

The Clamp section operates and controls the Clamp plate which secures the master to the Drum.

Also in this area, the Cutter unit operates and controls the Rotary cutter which cuts a new master to a specified length when a new master is loaded onto the Drum.



1. Master Carrier and Clamp Sections

[Theory of Operation]

1. Master Feed System

- Lowering of Clamp Unit

When the Magnet A, on the Drum, is detected by the Magnet A detection sensor during the master removal process, the Main motor is turned off and the Drum stops at the home position.

The Clamp solenoid is activated simultaneously by the Magnet A detection, causing the Clamp unit to lower and the gear on the Clamp motor to engage with that of the Clamp plate on the Drum.

[Note: In the above process the Clamp plate has already been opened by the master removal process.

- Start of Loading roller rotation

As the Clamp unit is lowered, the Clamp safety switch is released, by which the Loading pulse motor is turned on, causing the Lower loading roller to rotate clockwise via the Loading PM pulley, belt, and Loading pulley.

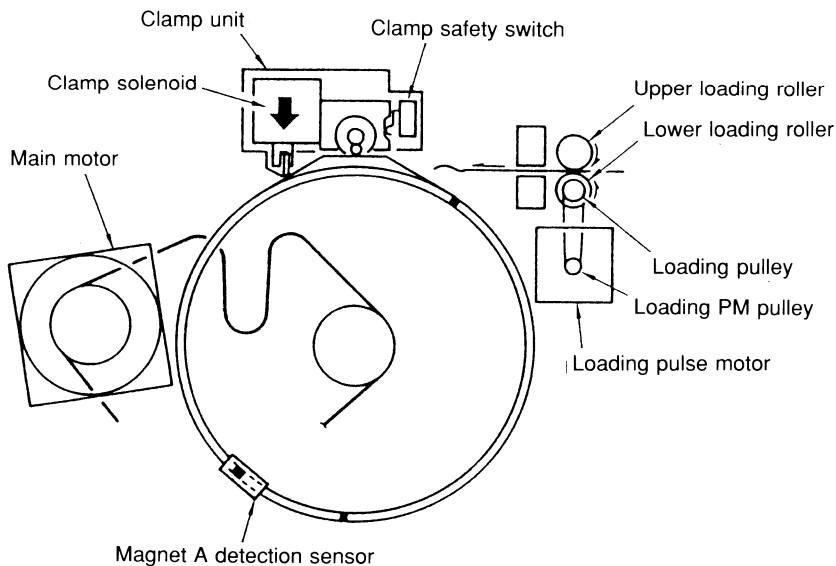
- Master feed to the Drum

The weight of the Upper loading roller presses the master material to the Lower loading roller.

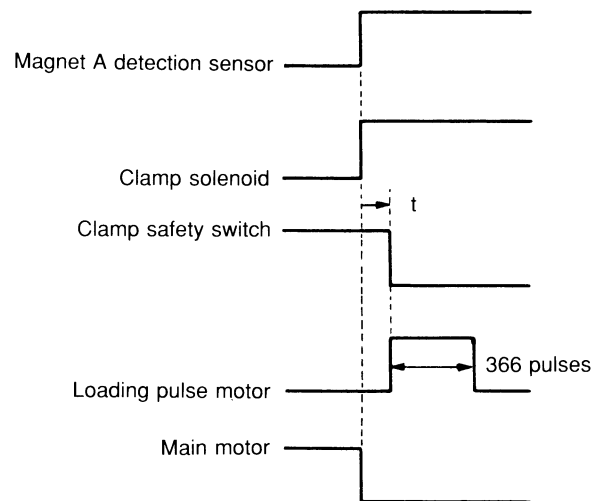
Therefore, the rotation of the Lower loading roller feeds the master material to the Drum.

- Finish of Master feed

The Loading pulse motor is automatically turned off **366 pulses** after its start to finish the master feed process.



Master Feed System



- t: If the Clamp safety switch is still engaged even **4 seconds** after the Clamp solenoid has been turned on, the trouble message “**T3:CALL SERVICE**” will be displayed on the panel.

2. Master Clamp System

- Preoperations for Master clamp

In the next process (Master clamp operation), the following steps have already been completed.

1. The Main motor has been stopped and the Drum is at the home position.
2. The Clamp solenoid has been activated and lowered the Clamp unit to the Drum, causing the gear on the Clamp motor to engage with that of the Clamp plate.
3. The Clamp unit has released the Clamp safety switch.
4. The Loading pulse motor was activated by the Clamp safety switch for master feeding.
5. The Loading rollers has fed the master material to the Drum.
6. The Loading pulse motor has been stopped.(366 pulses after its start)

- Closing of the Clamp plate

When the Loading pulse motor has been stopped, the Clamp motor rotates the Clamp motor gear counterclockwise, causing the Clamp plate to rotate clockwise to close it on the lead edge of the fed master.

- Return of the Clamp unit

When the Clamp plate has been rotated clockwise, the 0° Angular sensor detects the magnetism of the Angular magnet on the Angular magnet plate attached to the end of the Clamp plate shaft, by which the Clamp motor and Clamp solenoid are simultaneously turned off.

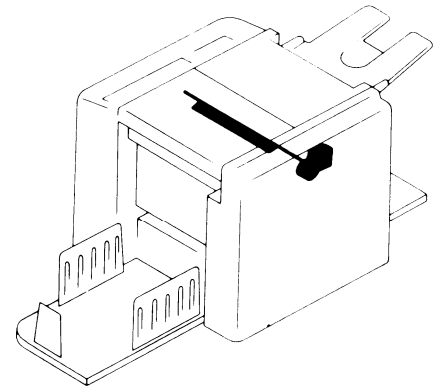
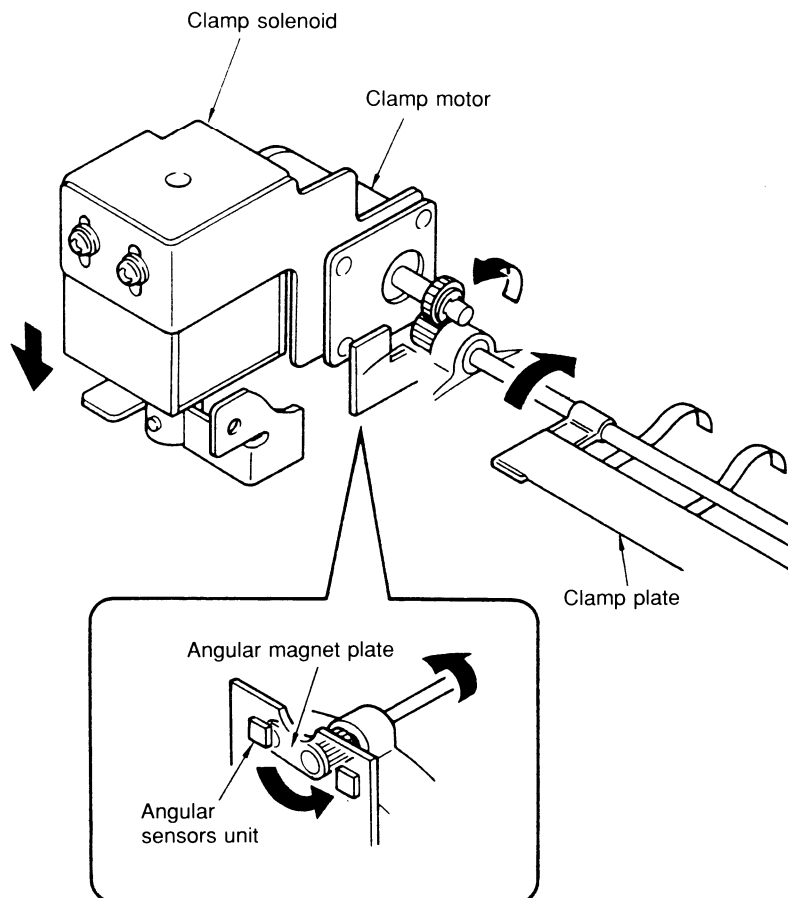
The lead edge of the master is now secured by the Clamp plate.

- Motion Check of the Clamp unit

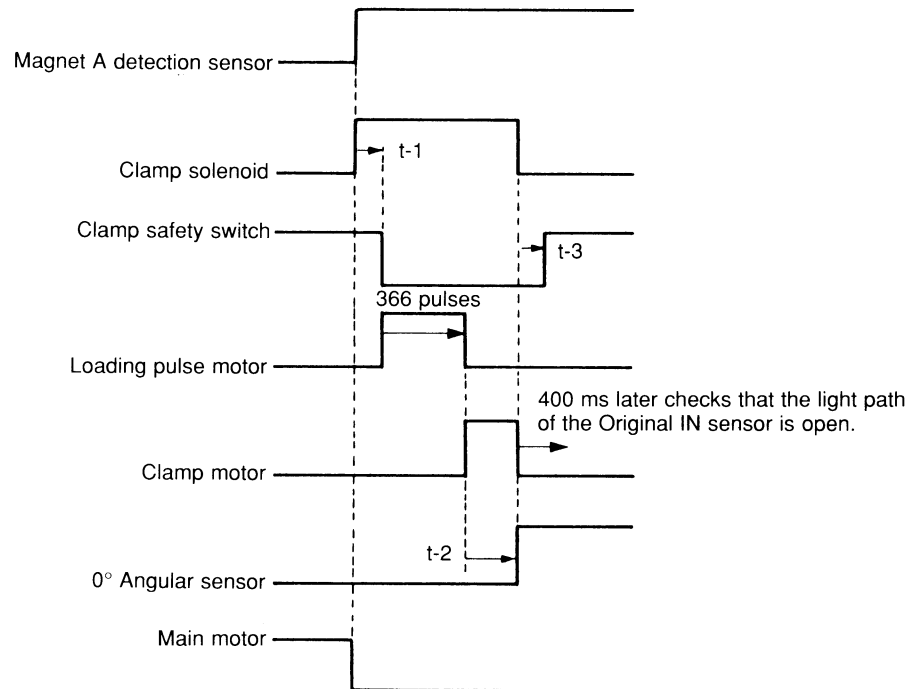
The Clamp safety switch checks that the Clamp unit goes down and returns correctly.

- Protection of the Clamp solenoid

When the Clamp solenoid is activated and the Range setting switch is engaged, the current to the solenoid is reduced to protect the solenoid from overheating.



Master Clamp System



- t-1: If the Clamp safety switch is still actuated **4 seconds** after the Clamp solenoid is turned on, the trouble message "**T3:CALL SERVICE**" will be displayed on the panel.
- t-2: If the 0° Angular sensor does not detect the Angular magnet **within 8 seconds** after the Clamp motor is turned on, the trouble message "**T3:CALL SERVICE**" will be displayed on the panel.
- t-3: If the Clamp safety switch is not actuated **within 4 seconds** after the Clamp solenoid is turned off, the trouble message "**T3:CALL SERVICE**" will be displayed on the panel.

3. Master Loading (On the Drum) System

- Start of Master loading (on the Drum)

The Original IN sensor status is checked after the Clamp plate operation is completed to ensure that the scanning of the original is close to the end.

When it is confirmed that the trail edge of the original has passed through the Original IN sensor (that the light path of the Original IN sensor is opened), the Main motor and Print signal are turned on, causing the Drum to rotate and paper to start feeding.

- Check of Master on-drum loading error

[Magnet C-1 Detection Position]

As the Drum rotates and the C-1 Magnet is detected by the Magnet C detection sensor, the Master sensor is activated to check the master status on the Drum to determine if a master (on-drum) loading error has occurred.

- Master cutting & Lowering of Thermal print head

[Magnet C-2 Detection Position]

As The Drum rotates further and the C-2 Magnet is detected by the Magnet C detection sensor, the Cutter motor is turned on cutting the master with the Rotary cutter and simultaneously the Thermal pressure motor rotates until the TPH pressure switch is depressed to apply pressure on the master material.

- Check of Master cut error

[Magnet A Detection Position]

As the Drum rotates further and the Magnet A is detected by the Magnet A detection sensor, the Master positioning sensor is activated to determine if a master cut error has occurred.

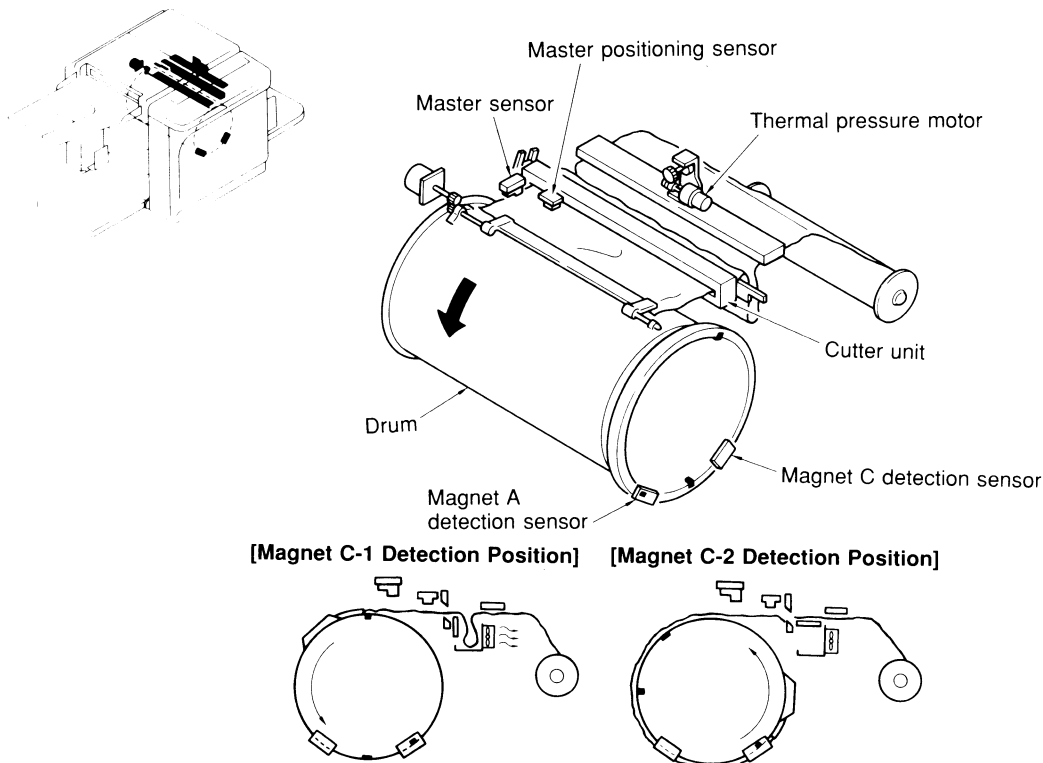
If the master material is detected by the Master positioning sensor at the Magnet A detection position, it is judged that a master cut error has occurred.

- Advance of Master for the next master-making

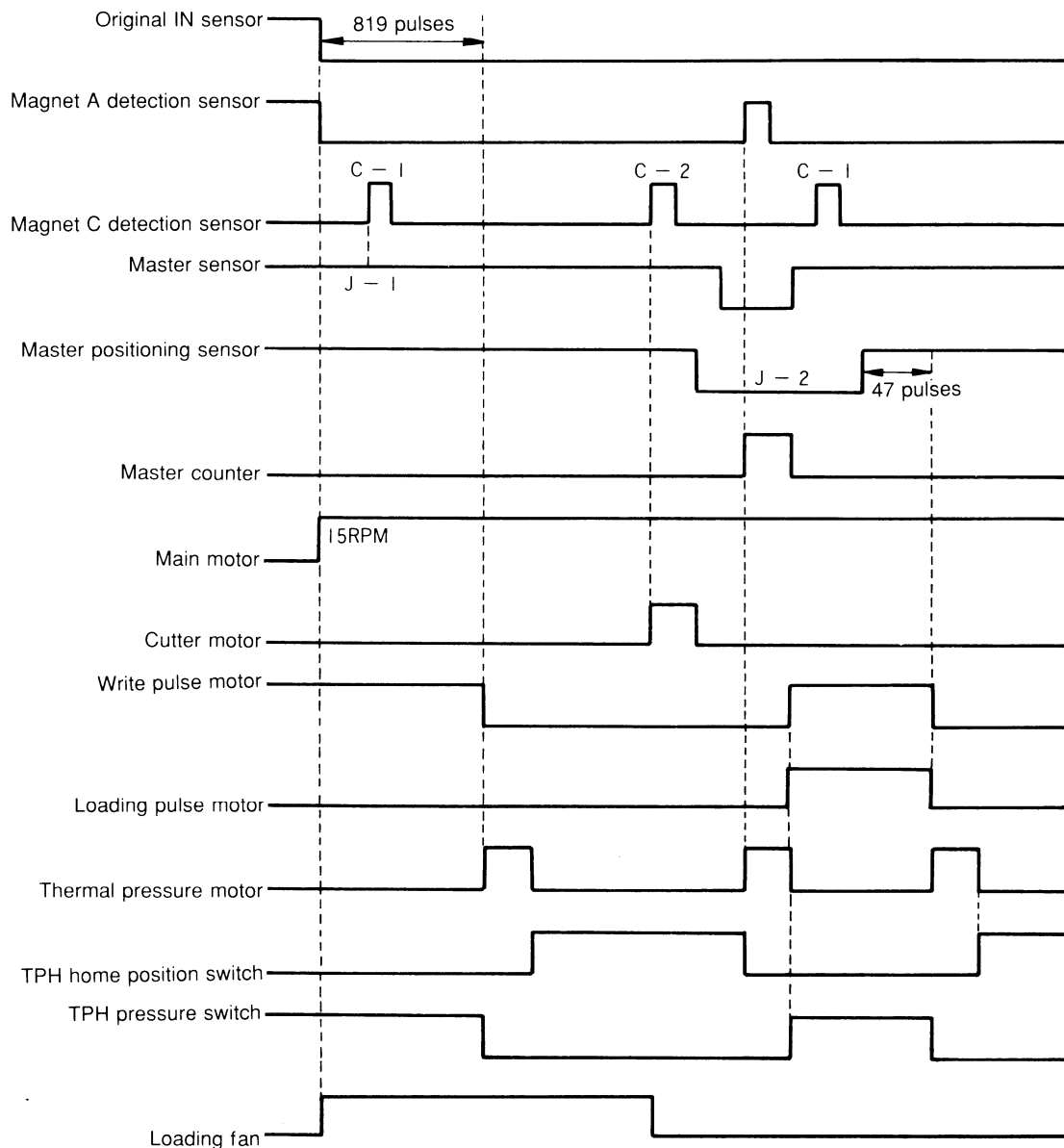
If it is determined that no master cut error has occurred, the Write and Loading pulse motors rotate to advance the master material into position for the next master making operation, and the new master is closely loaded on the Drum, feeding a sheet of paper.

- Function of the Loading fan

During the master feed and on-drum loading process, the Loading fan rotates and attracts the master waiting in the Master stocker to secure the correct master feed and loading to the Drum.



Master Loading (On the Drum) System



- J-1: If the Master sensor detects no master on the Drum at the Magnet C-1 detection position, paper feed operation is stopped with the interruption of the Print signal, and the Cutter motor rotates at the Magnet C-2 detection position cutting the master. Then the Drum stops at the Magnet A detection position (home position). If the Master positioning sensor detects the master when the Drum has stopped, the message **"REMOVE CUT MASTER STRIP"** will be displayed on the panel. When the above message is cleared, the message **"MASTER CLAMP ERROR/PRESS RESET BUTTON"** is displayed on the panel.
- J-2: If the Master positioning sensor detects the master at the Magnet A detection position, the message **"MASTER CUT MALFUNCTION/PRESS RESET BUTTON"** is displayed on the panel.

4. Master Cut System

- Start time of the Cutter motor

When the Magnet C-2 is detected by the Magnet C detection sensor during the master on-drum loading operation, the Cutter motor is turned on and rotates clockwise.

- Rotation transmission to the Rotary cutter

The Cutter joint A is fixed at the end of the Cutter motor shaft.

When the Cutter motor rotates, the Cutter joint A, which is connected to the Cutter joint B by a connecting pin, is rotated, causing the Rotary cutter to rotate clockwise to cut the master.

- Stop of the Cutter motor rotation

The Cutter joint A functions as a cam for the Cutter position switch.

When the Cutter motor rotates, the Cutter position switch is depressed and the Rotary cutter makes one rotation.

When the position switch is released by the notch in the Cutter joint A, the Cutter motor is turned off.

- Advance of the master material

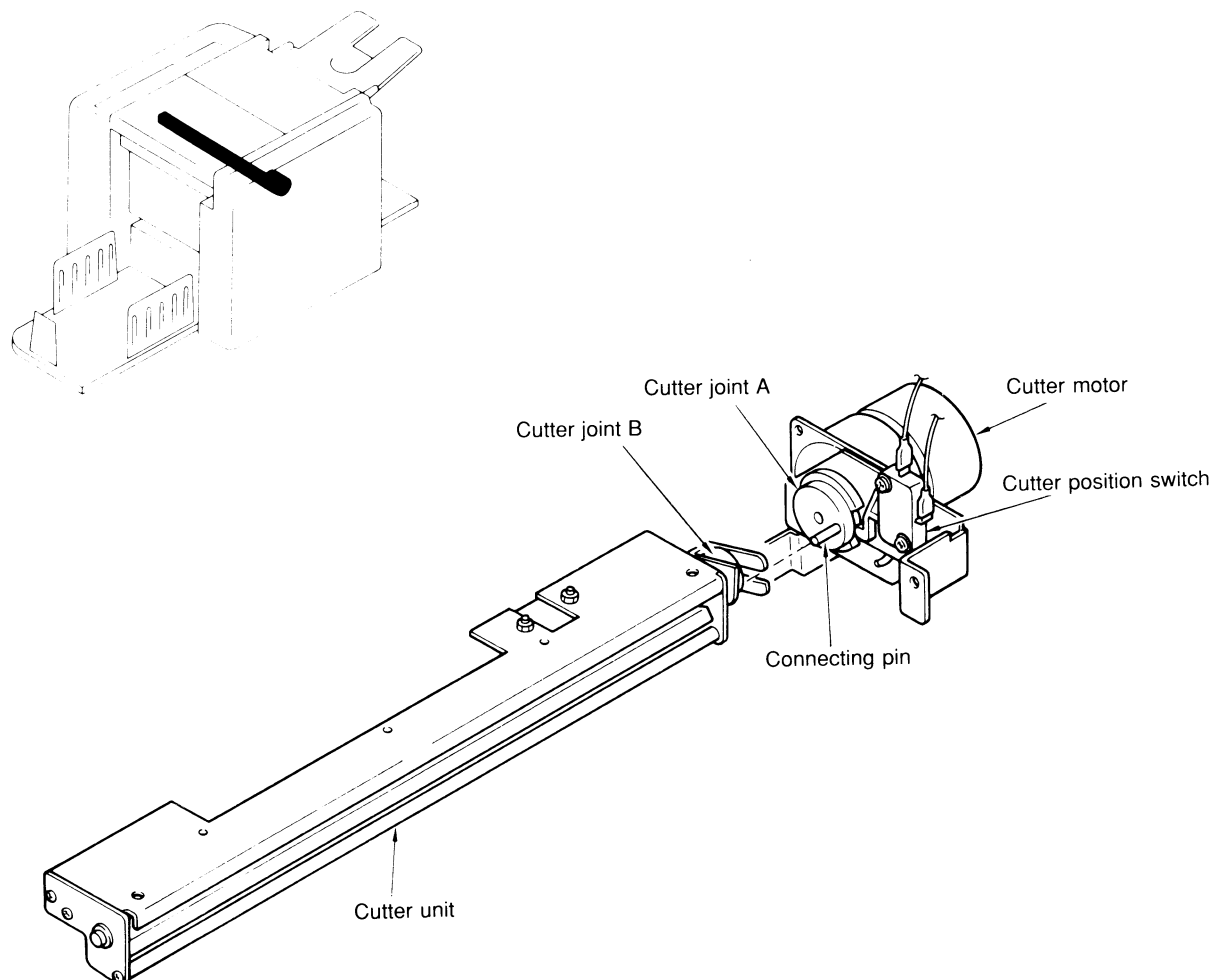
When the Cutter motor is turned off, the master material advances about **2 mm** into the Rotary cutter so that the master feed does not fail in the next master making operation.

When the Magnet A is detected by the Magnet A detection sensor after the Cutter motor is turned off, the Loading and Write pulse motors are turned on and rotate clockwise to advance the master.

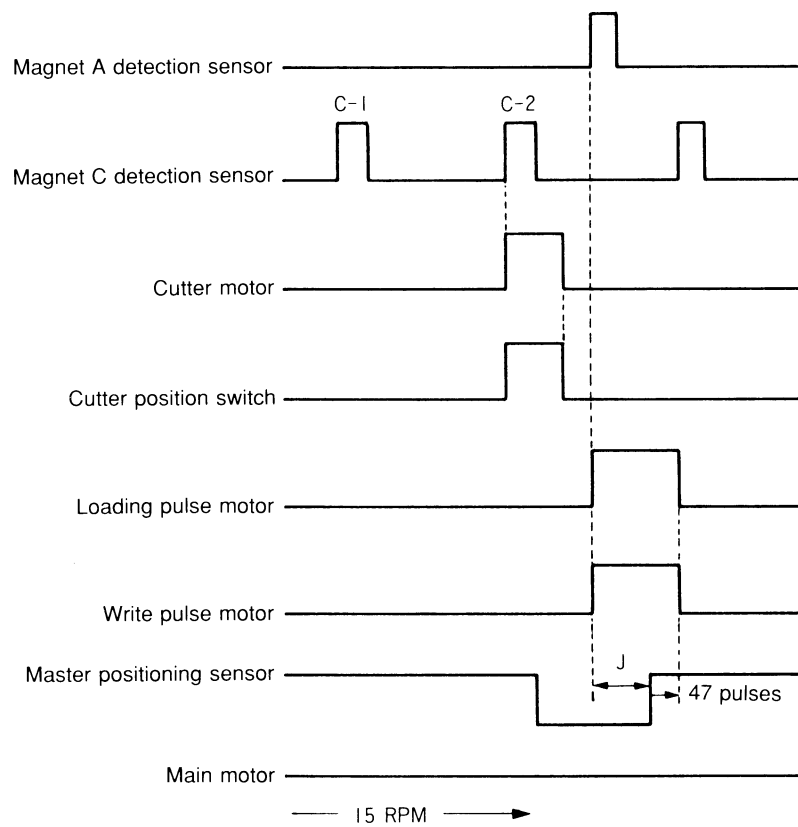
After the Master positioning sensor detected the lead edge of the advancing master, the master advances further by **47 pulses** and the Loading and Write pulse motors are turned off.

- Check of Master advance error

If the Master positioning sensor doesn't detect the advancing master within **536 pulses** after the Loading and Write pulse motors have been turned on, it is judged that a master advance error has occurred and the error message "**MASTER MIS-FEED/RESET MASTER**" is displayed on the panel



Master Cut System



J: If the Master positioning sensor did not detect the master **within 536 pulses** after the Loading pulse motor was turned on, the error message **“MASTER MIS-FFED/RESET MASTER”** is displayed.

REMOVAL & INSTALLATION

- | |
|----------------|
| 1. Cutter Unit |
| 2. Clamp Unit |

[Removal Procedures & Precautions for Installation]

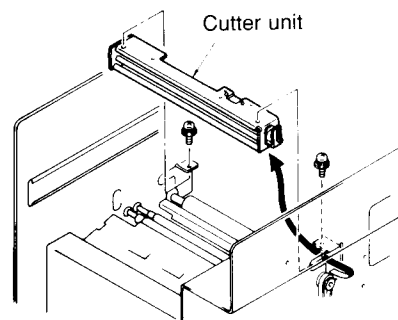
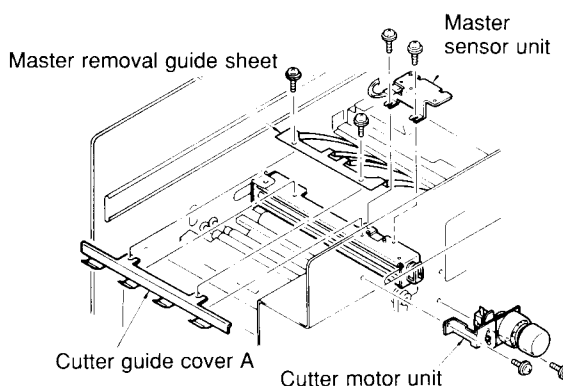
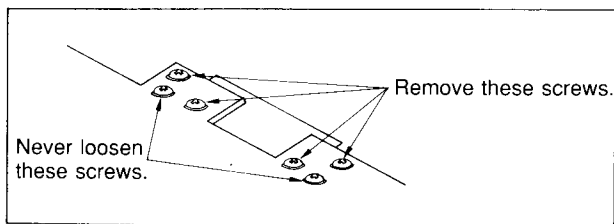
1. Cutter Unit

– Removal Procedures –

- 1) Remove the Drum from the machine.
- 2) Remove the Back cover.
- 3) Remove the two mounting screws from the Cutter motor unit and remove it.
- 4) Slide the Image scanner section to the paper feed side, remove the two mounting screws of the Cutter guide cover A, and remove the Cutter guide cover A and the Master removal guide sheet.
- 5) Remove each two mounting screws from the Master sensor unit and the Master positioning sensor, and place them aside.
- 6) Remove the two Cutter unit mounting screws holding the unit and extract the Cutter unit from the opening for the Drum replacement in the machine.

– Precautions for Installation –

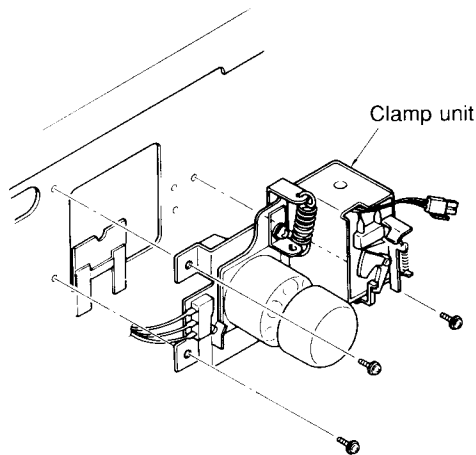
- When installing the Cutter unit, make sure the unit is properly placed on the top of the support tabs on the front and back side frames.
- Never loosen the 2 screws fixing the Cutter cover on the Cutter unit because the misplaced Cutter cover may block the Rotary cutter rotation.



2. Clamp Unit

– Removal Procedures –

- 1) Remove the Back cover.
- 2) Disconnect the Clamp motor, Clamp solenoid, and Clamp safety switch connectors.
- 3) Remove the four Clamp unit mounting screws and remove the Clamp unit.



[Adjustment Procedures]

1. Sensitivity of Master Sensor

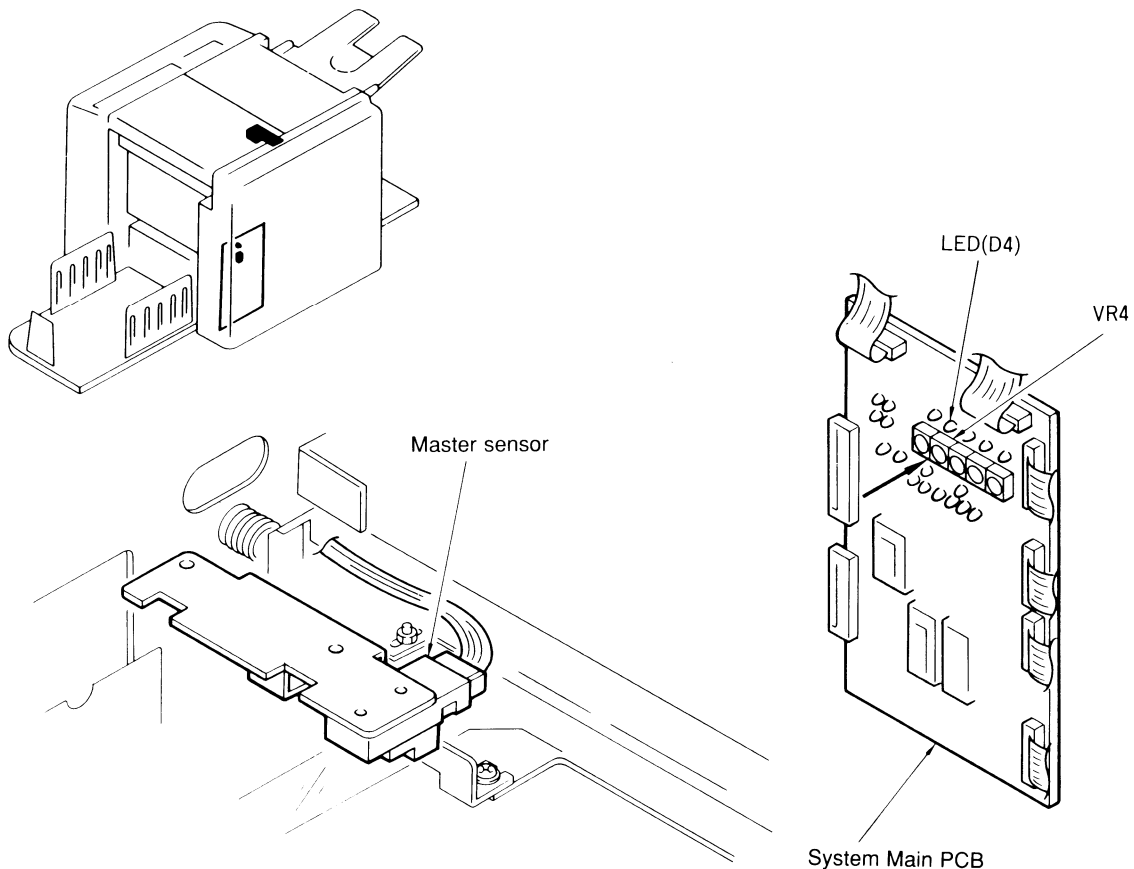
– Procedure & Check –

- 1) Slide the Drum out of the machine.
Remove the master and slide the Drum back into the machine.
- 2) Rotate the Drum to the Magnet C-1 detection position.
- 3) Remove the Back cover and turn **VR4** on the **System Main PCB** fully clockwise.
- 4) If the **LED (D4)** on the **System Main PCB** is on, turn **VR4** counterclockwise until the LED goes off.
- 5) Perform master making and printing to check that no error occurs.

– Results of Misadjustment –

[The Master sensor detects the master status on the Drum.]

- 1) If the sensitivity is too low; ➡
the Master sensor judges that there is no master on the Drum and the message “**NO MASTER ON THE DRUM**” is displayed during printing, or judges that a master on-drum loading error has occurred during master making.
- 2) If the sensitivity is too high; ➡
the Master sensor always judges that there is a master on the Drum, and various types of errors will occur when no master is on the Drum.



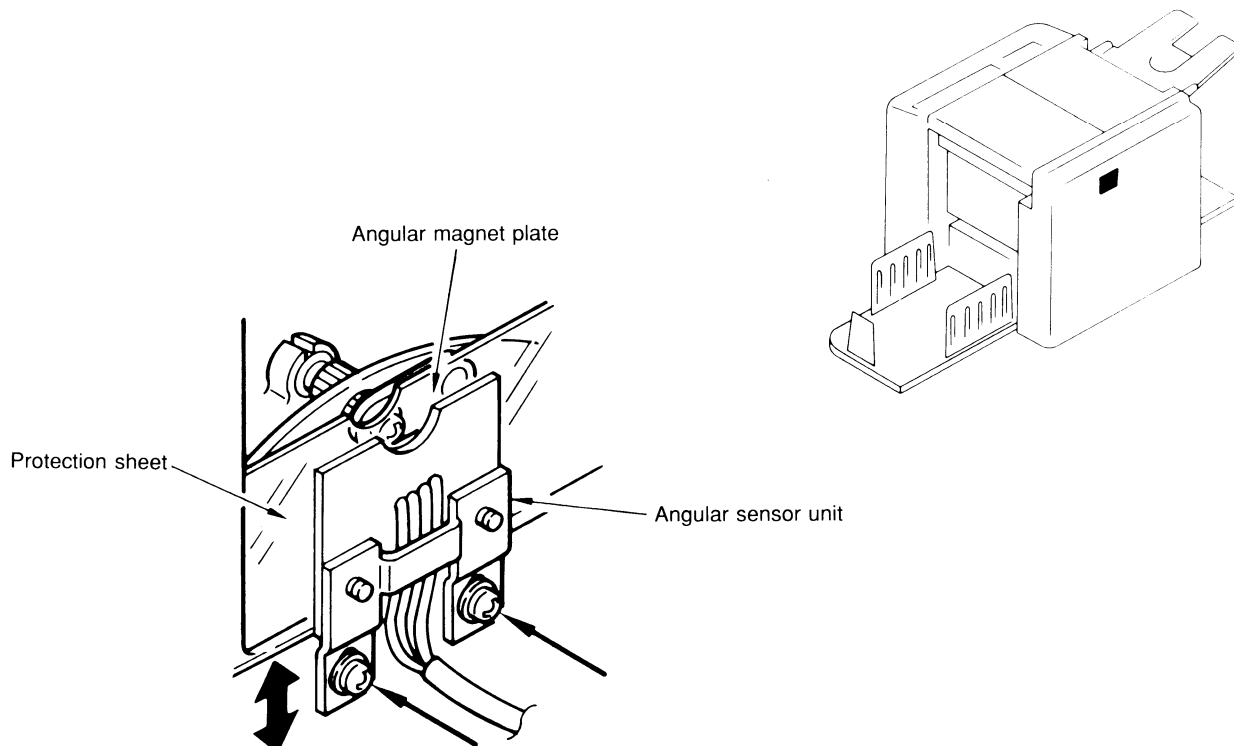
2. Position of 0°/180° Angular Sensors

– Procedure –

- 1) Slide the Drum out of the machine.
- 2) Open and close the Clamp plate and check that the Angular magnet plate and Clamp plate are always aligned on a straight line.
If not, loosen the mounting screw on the Angular magnet plate and align it so that they are in a straight line.
And then slide the Drum back into the machine.
- 3) Position the Drum at the Magnet A detection position.
- 4) Remove the Back cover and then the two mounting screws from the Angular sensor unit to place the unit aside.
- 5) Manually push the Clamp unit down until the Compensator plate and the Compensator are engaged.
Then mark the position of the Angular magnet (for both 0° and 180°) behind the transparent Protection sheet with a felt marker.
- 6) Remove the Drum to view the felt markings and mount the Angular sensor unit.
Position the Hall ICs on the Angular sensors over the felt markings.

– Results of Misadjustment –

- If the Angular sensor unit is not aligned with the Angular magnet plate; ➡
the position of the Angular magnet will not be detected and it will be judged that the clamp error has occurred.
As a result, the trouble message “T3:CALL SERVICE” will be displayed on the panel, interrupting the operation.



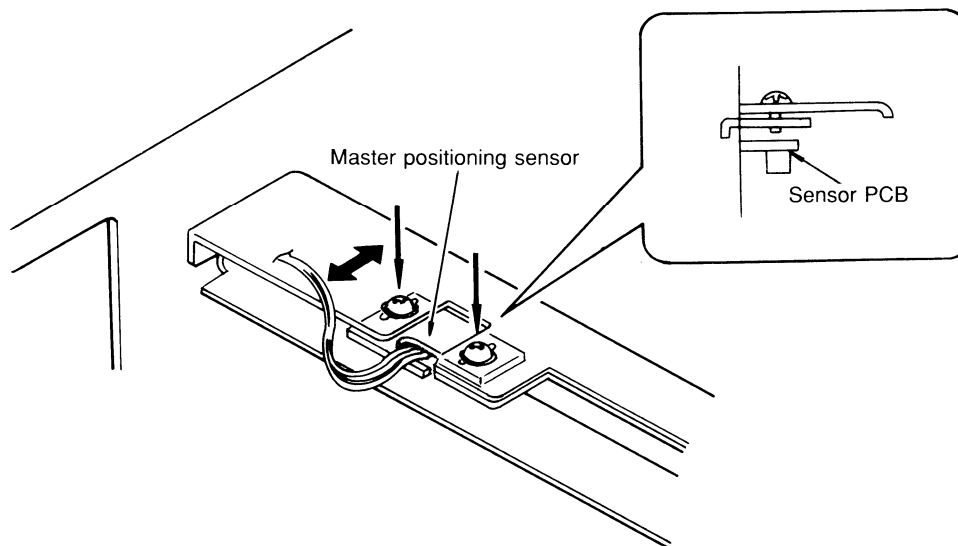
3. Position of Master Positioning Sensor

– Procedure & Check –

- 1) Slide the Image scanning section to the paper feed side.
- 2) Loosen the nuts of the mounting screws on the Master positioning sensor.
- 3) Position the sensor so that the edge of the sensor PCB is lined with the edge of the cutter unit frame and tighten the nuts.
- 4) Perform master on-drum loading operation and check that the lead edge of the master is protruding **0 to 2 mm** above the Clamp plate.

– Results of Misadjustment –

- 1) If the Master positioning sensor is adjusted too close to the Drum; ➡
the margin at the top of the master will be increased.
This will also cause excessive use of the master material, which will decrease the amount of masters available from one master roll.
- 2) If the Master positioning sensor is adjusted too close to the Cutter; ➡
the lead edge of the master will not feed into the Clamp plate properly and the master may fall off the Clamp plate during printing.



4. Sensitivity of Master Positioning Sensor

– Procedure –

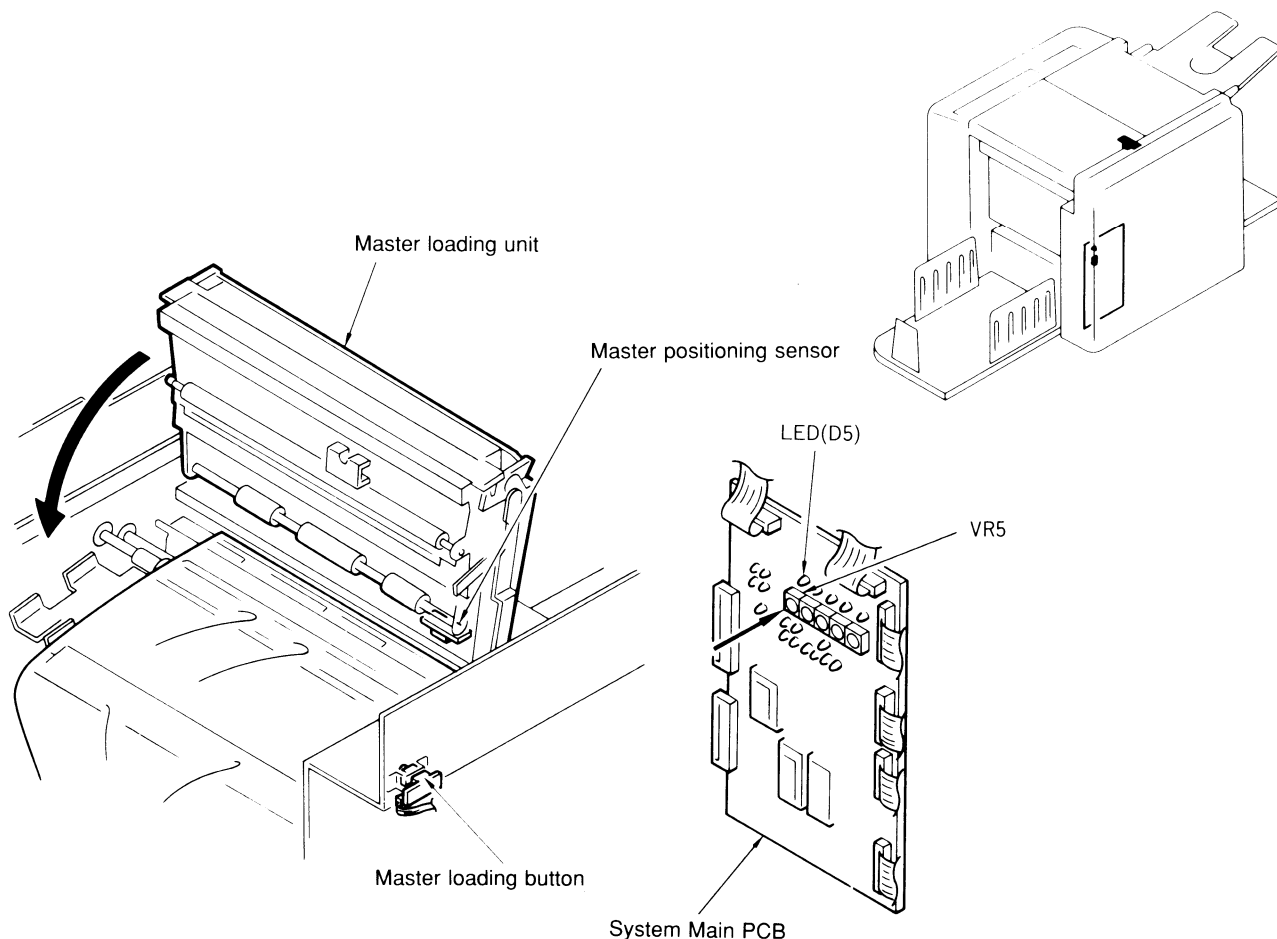
- 1) Slide the Image scanning section to the paper feed side and, unlock and open the Master loading unit.
- 2) Reset the master material and close the Master loading unit.
Then press the Master loading button.
- 3) Remove the Back cover and turn **VR5** on the **System Main PCB** fully counterclockwise.
- 4) Turn **VR5** clockwise gradually, watching **LED (D5)** on the **System Main PCB**.
After **LED (D5)** goes on, turn **VR5** clockwise 2 to 3 steps more.

– Check –

- Repeat the operation of Step 2) in “Procedure” watching **LED (D5)** on the **System Main PCB**, and check that the **LED (D5)** should be **OFF** when the master is out of position and **ON** when detected by the Master positioning sensor.

– Results of Misadjustment –

- 1) If the sensitivity is too low; ➡
the sensor cannot detect the advancing master and it is judged that the master feed error has occurred.
As a result, the error message “**MASTER MIS-FEED/RESET**” is displayed on the panel.
- 2) If the sensitivity is too high; ➡
the sensor can't detect the cutting operation during the master on-drum loading and it is judged that the master cut error has occurred.
As a result, the error message “**MASTER CUT MALFUNCTION/PRESS RESET BUTTON**” is displayed on the panel.



5. Position of Clamp Solenoid

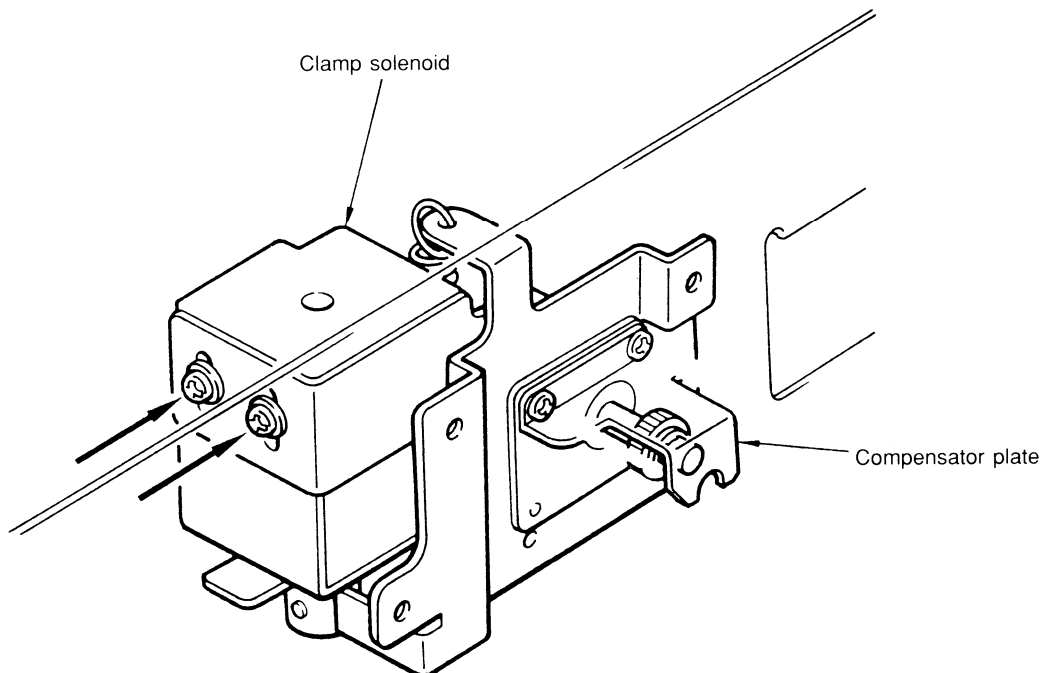
– Check & Adjustment –

- 1) Remove the Back cover and rotate the Drum to stop it at the Magnet A detection position.
- 2) Select Test mode **No.53** and turn the Clamp solenoid ON to check the gear engagement and the alignment of the Compensator plate to the Compensator.
- 3) If the gear engagement is not correct, loosen the Clamp solenoid mounting screws, and adjust the Clamp solenoid up or down in the adjustment slots. Retest with Test mode **No.53** after adjustment.

Note: Normally the mounting screws are fixed so that they reach the top of the oval hole on the bracket.

– Results of Misadjustment –

- If the Clamp motor gear and Clamp plate gear are not correctly engaged; ➡ the rotation of the Clamp motor can't be transmitted correctly to the Clamp plate, disabling the Clamp plate to be opened and closed.
As a result, The trouble message “**T3:CALL SERVICE**” will be displayed on the panel, prompting the user to contact service.



ADJUSTMENT PROCEDURES

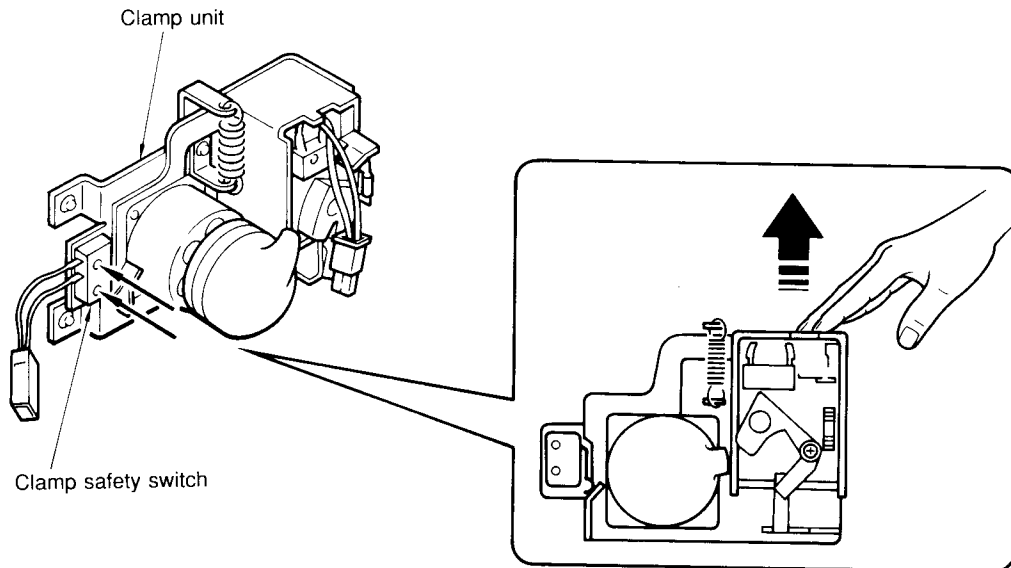
6. Position of Clamp Safety Switch

– Check & Adjustment –

- 1) Slide the Image scanning section toward the paper feed side.
- 2) Open the Front cover and press the Drum home position button to rotate the Drum.
During the rotation, manually press the Clamp unit down and check that the display panel indicates **“T3:CALL SERVICE”**, causing the Drum to stop.
- 3) If the message is not displayed and the drum is not stopped by the above operation, remove the Back cover, loosen the Clamp safety switch mounting screws, and adjust the position of the Clamp safety switch.

– Results of Misadjustment –

- 1) If the Clamp safety switch is not depressed; ➡
it is judged that the Clamp motor is lowered even when the Clamp solenoid isn't activated, and the trouble message **“T3:CALL SERVICE”** will be displayed.
- 2) If the Clamp safety switch is depressed when the Clamp solenoid is on; ➡
it is judged that the Clamp motor can't be lowered, and the trouble message **“T3:CALL SERVICE”** will be displayed.

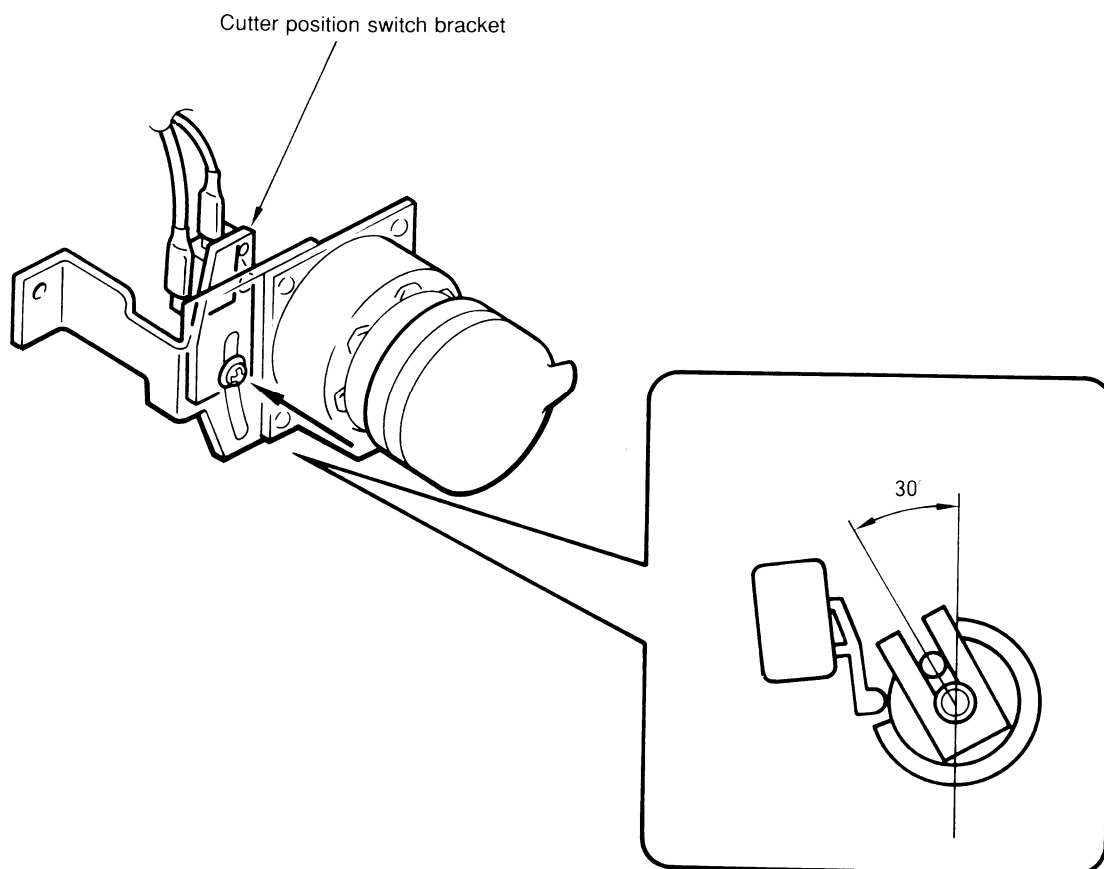


7. Position of Cutter Position Switch (Stop Position of Cutter Motor)**– Check & Adjustment –**

- 1) Remove the Back cover.
- 2) Select Test mode **No.84** and rotate the Cutter motor.
- 3) When the Cutter motor stops, check that the slit of the Cutter joint B is **30°** to the left from the center of the Cutter unit shaft when viewed from the non-operator side of the machine.
- 4) If not, to adjust the position, loosen the mounting screw of the Cutter position switch bracket, and move the Cutter position switch to change the stop position.

– Results of Misadjustment –

- 1) If the Cutter position switch is not correctly positioned; ➡
the rotary cutter may stop on the way in cutting process and cut only a part of the master, causing a master cut error.



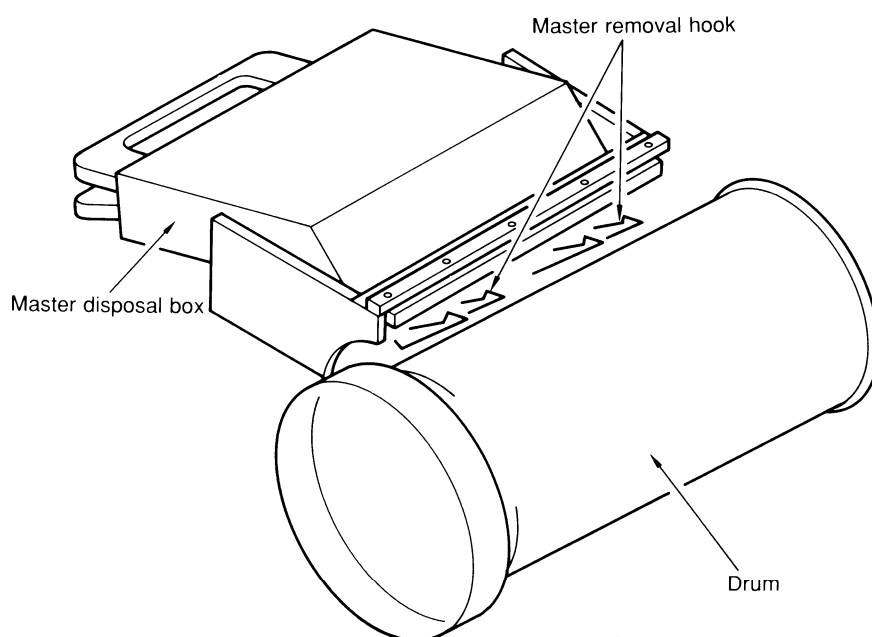
8. MASTER DISPOSAL AREA

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Operation and Function

Removes the used master from the Drum with the Master removal hook and disposes it into the Master disposal box, rotating the Drum.



1. Master Removal Section

[Theory of Operation]

1. Clamp Plate Open System

- Opening of the Clamp plate

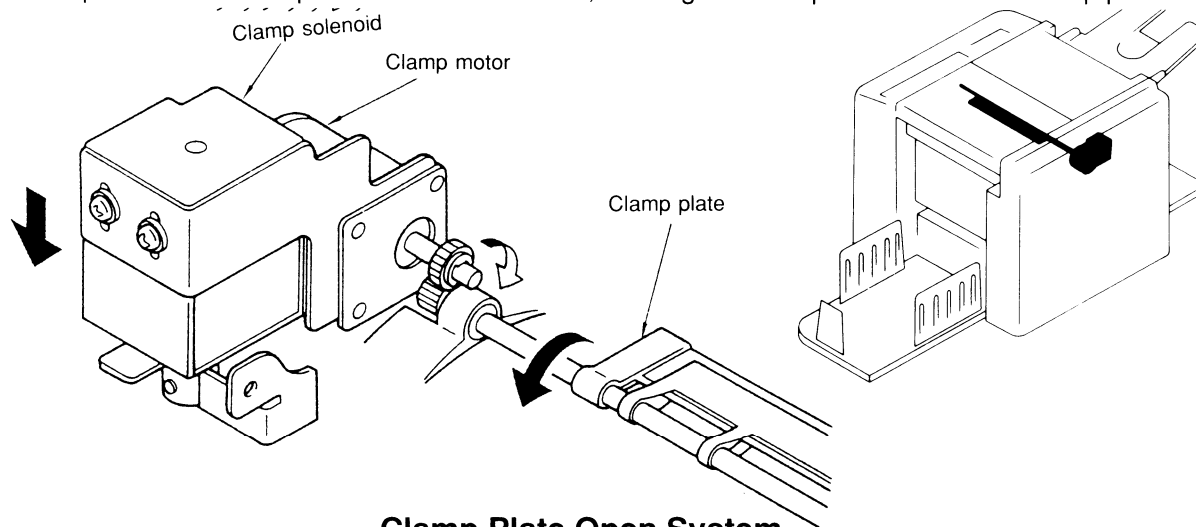
When the "START" button is pressed for master-making operation, the Drum rotates once to the Magnet A detection position (even if it is at the Magnet A detection position).

When the light path of the Original IN sensor has been blocked by the lead edge of an original while the Magnet A is detected by the Magnet A detection sensor (or when the Drum has returned to the Magnet A detection position while the light path of the Original IN sensor is blocked by an original), the Clamp solenoid is activated and the Clamp unit is lowered, releasing the actuator of the Clamp safety switch. **200 ms later**, the Clamp motor rotates and opens the Clamp plate, rotating it counterclockwise.

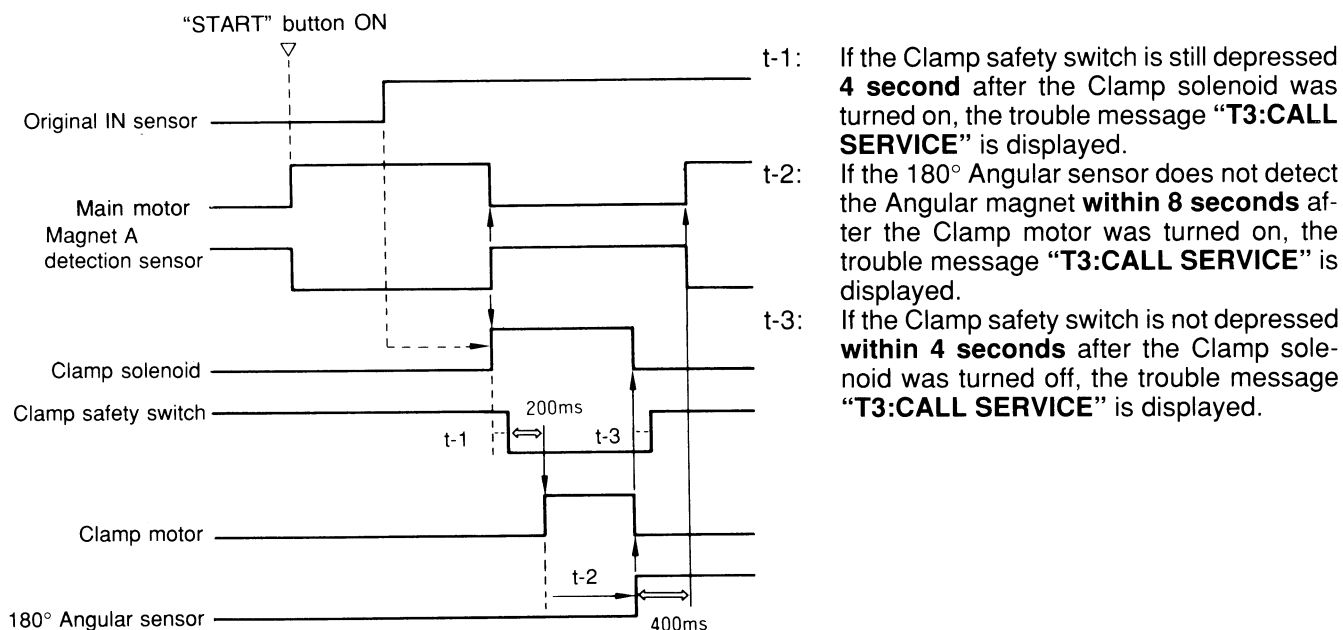
- Finish of the Opening operation

The Angular magnet is attached on the Angular magnet plate attached at the end of the Clamp plate shaft.

When the 180° Angular sensor detects the Angular magnet during the rotation of the Clamp plate, the Clamp motor and Clamp solenoid are turned off, causing the Clamp unit to return to the up position.



Clamp Plate Open System



2. Master Removal and Disposal System

- Start of Master removal

When the 180° Angular sensor detects the Angular magnet during the Clamp plate opening operation, the Master removal solenoid and Master removal vertical transport motor are turned on.

Note: The Clamp motor and Clamp solenoid are simultaneously turned off, releasing the Clamp plate on the Drum to allow the drum rotation.

- Function of the Master removal solenoid

When the Master removal solenoid is activated, the linking plate is pulled along with the plunger, causing the Master removal hook shaft to rotate clockwise.

This causes the Master removal hooks, attached to the Master removal hook shaft, to turn clockwise and to project.

- Function of the Master removal vertical transport rollers

When the Master removal vertical transport motor rotates counterclockwise, it rotates the Lower vertical transport roller counterclockwise via the Duct pulley, Vertical transport belt, and Vertical transport pulley.

This also causes the Upper vertical transport roller to rotate clockwise via the Vertical transport gears fixed at the end of the Lower and Upper vertical transport rollers.

- Master removal from the Drum and disposal into the box

The Main motor is activated to rotate the Drum **400 ms** after the Master removal solenoid was activated.

This causes the lead edge of the used master released from the Clamp plate to advance to the Master disposal box, floating over the Drum.

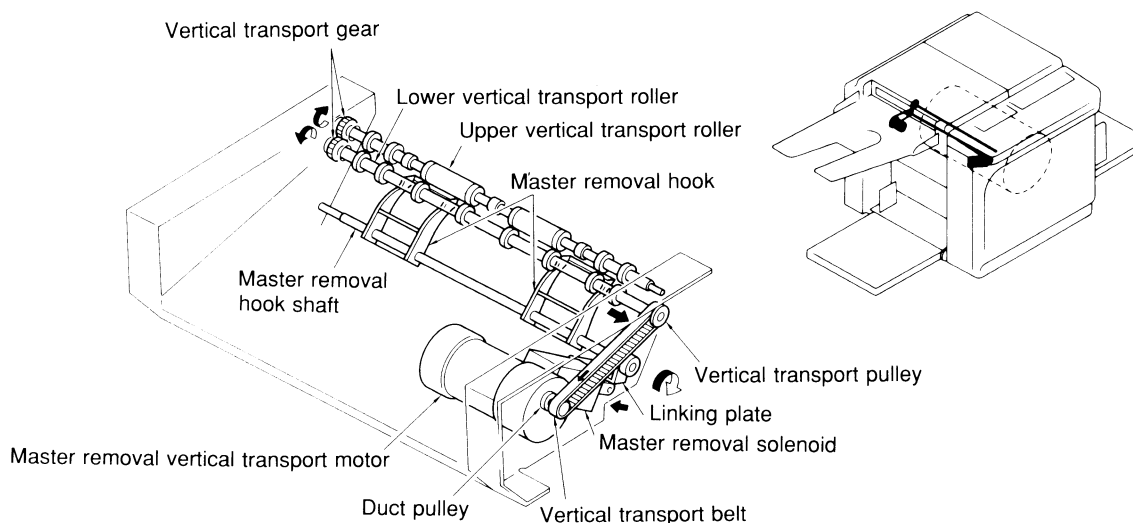
The released lead edge of the used master floats further to over the tips of the projected Master removal hooks and is led into between the Vertical transport rollers.

The Vertical transport rollers then catch the advancing lead edge of the used master and dispose it into the Master disposal box, removing it from the Drum during one Drum rotation.

- Finish of Master removal and disposal

When the whole of the used master is disposed into the Master disposal box, the Master removal solenoid and Master removal vertical transport motor are turned off **2 seconds** after the Main motor (the Drum) stops with the detection of the Magnet A by the Magnet A detection sensor.

Note: The Clamp solenoid is activated at the above Magnet A detection to lower the Clamp unit for the master clamp operation during master on-drum loading.



3. Master Removal and Disposal Check System

- Check of the Master presence on the Drum

When the master removal operation is started and the Drum rotates, the Master sensor checks the master status on the Drum.

When the Magnet C-1 is detected by the Magnet C detection sensor during master removal, the Master sensor checks if the master is present on the Drum.

And if the master presence is confirmed by the Master sensor, the Master removal sensor is activated to check a master removal error.

- Detection of Master removal error

If the light path of the Master removal sensor has not been blocked by the lead edge of the released used master by the time the Magnet A is detected by the Magnet A detection sensor, after the confirmation of the master presence on the Drum at the Magnet C-1 detection position, it is judged that a master removal error has occurred and the master removal and disposal operation is interrupted, causing the display panel to indicate the message **“USED MASTER NOT DISCHARGED/PULL OUT DRUM AND CHECK”**.

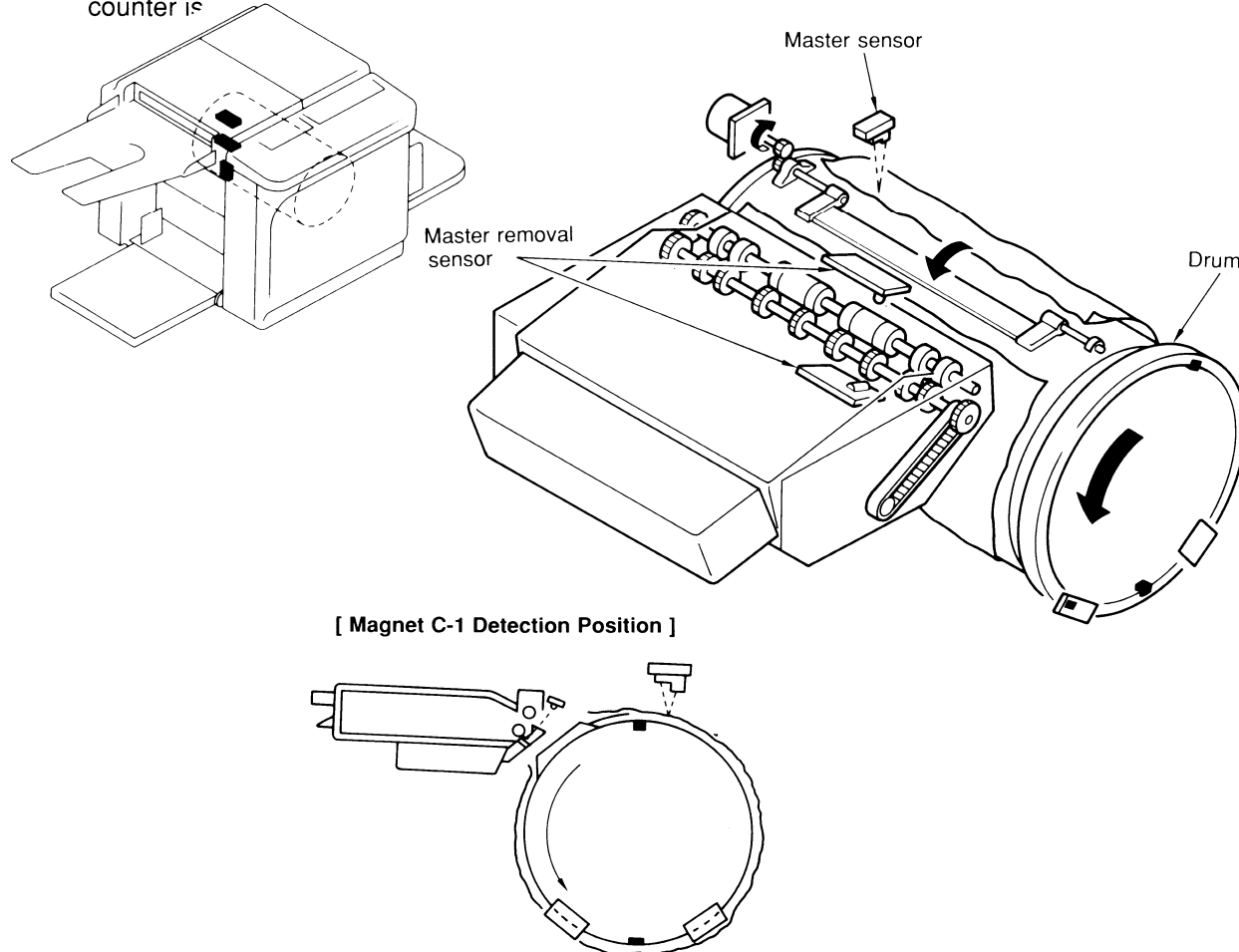
- Detection of the Master disposal box's fullness

The number of the used masters which have been disposed into the Master disposal box is counted by the Master removal sensor.

If the light path of the Master removal sensor is blocked by an used master during master removal, the internal counter (for disposed masters) in the Panel Main PCB increases 1 digit.

When the internal counter reaches **30**, the message **“EMPTY DISPOSAL BOX”** is displayed on the panel.

When the Disposal box set switch is released from depression by the removal of the Master disposal box and the **“RESET”** button on the panel is pressed, the above message disappears and the internal counter is



[Removal Procedures & Precautions for Installation]

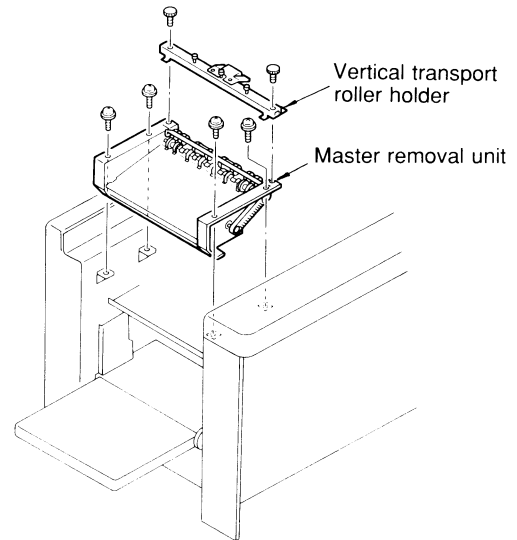
1. Master Removal Unit

– Removal Procedures –

- 1) Remove the Drum from the machine and the Master disposal box from the Master removal unit.
- 2) Slide the Image scanning section toward the paper receiving side and remove the two straight knurl screws fixing the Vertical transport roller holder to the Master removal unit. Then place the roller holder aside.
- 3) Remove the four mounting screws on the Master removal unit.
- 4) Disconnect the connectors of the Master removal wire harness (15P), and lift up the unit out of the machine with a tilt to the paper feed side.

– Precautions for Installation –

- Position the Master removal unit nearer to the non-operator and drum sides so that the unit does not contact the operator side frame of the machine.



[Adjustment Procedures]

1. Projected Position of Master Removal Hooks

– Procedure –

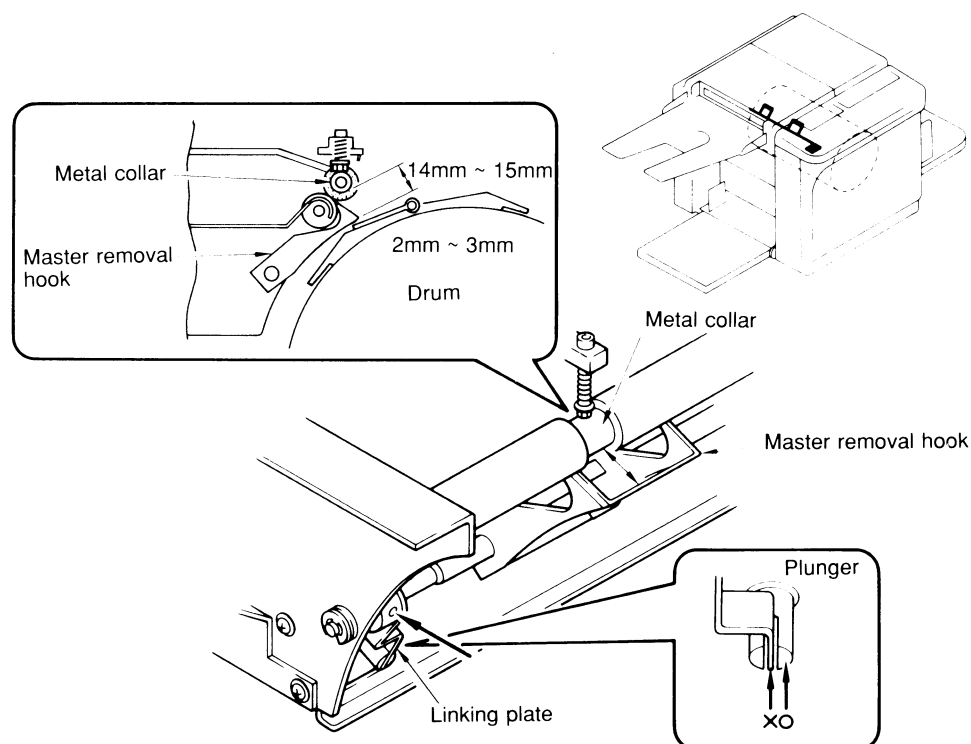
- 1) Remove the Master removal unit from the machine.
- 2) Check that the plunger can move smoothly inside the Master removal solenoid.
If not, adjust the position of the Master removal solenoid.
- 3) Loosen the allen screw fixing the Linking plate on the Master removal hook shaft.
- 4) Pressing the plunger of the Master removal solenoid (but not the Linking plate) with your finger, push out the Master removal hooks manually to obtain the gap of **14mm to 15mm** between the tips of the Master removal hooks and the metal collar on the Upper vertical transport roller.
- 5) In the above condition, tighten the allen screw on the Linking plate, taking care not to release the plunger and hooks.

– Check –

- After installing the Master removal unit into the machine, select Test mode **No.51** to project the Master removal hooks.
Then check by manually rotating the Drum that the tip of the projected Master removal hooks is **2 to 3 mm** off the Clamp plate on the Drum.

– Results of Misadjustment –

- 1) If the Master removal hooks are not projected enough (the gap is adjusted to be **much less than 14mm**); ➡
the used master can't be removed from the Drum into the Master disposal box, causing a master removal error.
- 2) If the Master removal hooks are projected too much (the gap is adjusted to be **much more than 15mm**); ➡
the tip of the hooks will contact the Clamp plate, causing the hooks and/or Clamp plate to be deformed, or the Clamp plate may be caught between the Vertical transport rollers, causing the Drum to be stuck in rotation, which will result in the trouble message "**T1:CALL SERVICE**" indication on the panel.



9. DATA

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1. Test Mode

1. Operational Procedures

The Test mode program in the machine is to enable a service technician to check the operation of each electrical component.

1. [Starting Up Test Mode]

Turn on the power pressing down both the "P/M" and "ORIGINAL" buttons on the main panel.

If the Test mode has been started up, the following indication will be displayed in the LCD panel and print quantity displays.

- This is the initial condition of Test mode.-

TEST MODE			
RDM	Ver	0.	00 P
	Ver	0.	00 M
	Ver	0.	00 S

0		0	0
---	--	---	---

2. [Checking the Operation of A Component]

To check the operation of a component, select a test No. using panel keys and then press the "START" button to start the test.

The figures in the print quantity display mean:

- The right-side two digits: The test No. selected
- The left-side one digit: 0 for the "Test OFF" status
1 for the "Test ON" status

If the test is an one-cycle operation test, it will be automatically stopped after one check.
To stop the test, press the "START" button again.

[Print quantity display]

[Example] - In selecting Test mode No.69

0		0	0
---	--	---	---



Select test No.69 using panel keys.

0		6	9
---	--	---	---



Press the "START" button.

1		6	9
---	--	---	---

TEST MODE

1. Operational Procedures

Press the **START** button again.



3. [Selecting another Test mode and Exiting the Test mode]

To select another Test mode, clear the set Test No. by pressing the "C" or "STOP" button and select another Test No..

- To exit the Test mode, turn off the power or perform the following operations:

- 1) Press the "START" button to stop the test if in operation.
- 2) Press the "C" or "STOP" button to return to the initial condition.
- 3) Press the "RESET" button.

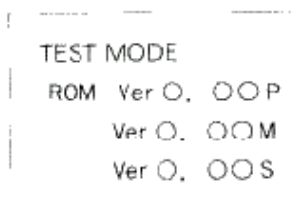
- 1) Press the "START" button.



- 2) Press the "C" or "STOP" button



- 3) Press the "RESET" button.



2. Test Items and Operations

1) Sensor/SW Test

A beep sounds in two ways to tell the current condition.

Detection: 0.1 seconds interval beep
No detection: 0.5 seconds interval beep

No.	Test Component	Detection Status	No.	Test Component	Detection Status
01	Paper detection sensor	Light path is blocked.	18	Drum set switch	The actuator is depressed.
02	Elevator upper limit sensor	The actuator is raised to open the light path.	19	Paper receiving sensor 1	Light path is blocked.
03	Elevator lower limit switch	The actuator is depressed.	20	Paper receiving sensor 2	Light path is blocked.
05	Master loading button	The button is pressed.	21	Front cover set sensor	Metal plate is attached.
06	Paper sensor	Light path is blocked.	22	Vertical centering sensor	Light path is NOT blocked.
07	Pressure detection sensor	Light path is blocked.	23	Master end sensor	No reflected light
08	Magnet A detection sensor	Magnetism is detected.	25	Master detection sensor	Reflected light is detected.
09	0° Angular sensor	Magnetism is detected.	26	Original feed-table set switch	The actuator is depressed.
10	180° Angular sensor	Magnetism is detected.	29	Master loading unit switch	The actuator is depressed.
11	Magnet C detection sensor	Magnetism is detected.	31	Master removal sensor	Light path is blocked.
12	Feed-tray down button	The button is pressed.	33	Disposal box set switch	The actuator is depressed.
13	Clamp safety switch	The actuator is pressed.	34	Original detection sensor	The actuator is raised to open the light path.
14	Master sensor	Reflected light is detected.	35	Original registration sensor	The actuator is raised to open the light path.
15	Master positioning sensor	Reflected light is detected.	36	Original IN sensor	Light path is blocked.
16	Drum home position button	The button is pressed.	37	Ink sensor	Ink is detected.
17	Ink bottle switch	The actuator is depressed.	38	Overflow sensor	Ink is detected.

TEST MODE

- 2. Test Items and Operations
- 2) Motor/Solenoid Test

2) Motor/Solenoid Test

To start a test, select a **Test No.** and press the **"START"** button.

To stop the test, press the **"START"** button again.

No.	Test Item	No.	Test Item
40	15 rpm Drum rotation	56	Original feed solenoid (ADF Interlock switch must be on.)
41	30 rpm Drum rotation	57	Read pulse motor CCW (Pick-up)
42	Variable speed Drum rotation	58	Read pulse motor CW (Feed)
47	Paper feed clutch	59	LED arrays in Image scanner ON
48	Pressure solenoid	60	Write pulse motor CCW (Backward)
49	Suction motor (fan)	61	Write pulse motor CW (Feed)
50	Inking motor	62	Thermal pressure motor Up and Down
51	Master removal solenoid and Vertical transport motor	63	Loading pulse motor
53	Clamp solenoid	64	Loading fan
54	Clamp motor CCW (0°)	66	Thermal power supply CTL ON and Storage fan
55	Clamp motor CW (180°)	67	Lock solenoid
		69	Separation fan

[Note]

- 1) The Inking motor (No. 50) operates only when the ink sensor is out of touch with ink.
- 2) The Feed-tray interlock Sw operates even in the Test mode.
- 3) The Paper feed clutch (No. 47) operates only when the light path of the Paper feed clutch sensor is open.
- 4) The ADF interlock switch must be pressed ON in Test mode No. 56, 57, and 58.

3) Operation Test

To start an operation test, select a **Test No.** and then press the **"START"** button.

To stop the operation test, press the **"START"** button again.

No.	Test Item
70	Elevator motor Up/Down operation The following operations will be repeated while pressing down the Feed-tray down button. Go DOWN ⇨ Elevator lower limit switch detection ⇨ Go UP ⇨ Elevator upper limit sensor detection ⇨ Go DOWN
71	Print positioning motor CW/CCW rotation (one-cycle check) Return to vertical center position ⇨ One second halt ⇨ CW (+) direction rotation ⇨ One second halt ⇨ CCW (-) direction rotation ⇨ One second halt ⇨ Return to vertical center position ⇨ Stop
72	Clamp plate Open/Close operation Rotate Drum to Home position ⇨ Open Clamp plate (180°) ⇨ One second halt ⇨ Close Clamp plate (0°) ⇨ Rotate Drum to Home position (Then go back to the first step.)
73	Original feed operation Pick-up one original ⇨ Feed original ⇨ Eject original Original detection sensor ON ⇨ Pick-up one original ⇨ (Go back to the first step.) Original detection sensor OFF ⇨ Stop
75	Confidential operation (Repeated by five cycles) Confidential operation ⇨ Pressure solenoid ON ⇨ Three times Drum rotation ⇨ Confidential operation ⇨ (This cycle will be repeated) ⇨ Three times Drum rotation ⇨ Stop

TEST MODE

2. Test Items and Operations
3) Operation Test
4) Others

3) Operation Test

No.	Test Item
77	Paper feed & Printing operation The Paper feed tray raises and the paper is continuously fed until paper supply runs out. Note: <ul style="list-style-type: none"> • The Copy counter doesn't operate and paper jam is not detected. • Paper feed tray will be automatically lowered without paper. • Ink can be supplied by Inking motor.
78	Shading compensation operation Image scanner LED arrays ON ⇄ One second ⇄ Shading compensation 200 ms
79	Machine aging operation 130 rpm Drum rotation ⇄ 5000 times Magnet A detection ⇄ Stop
81	Thermal print head check operation 1 Making Master of test pattern #1 memorized in the Image processing PCB.
82	Thermal print head check operation 2 Making Master of test pattern #2 memorized in the Image processing PCB.
83	Thermal print head check operation 3 Making Master of test pattern #3 memorized in the Image processing PCB.
84	Cutter motor ON [One-cut operation]

4) Others (Auxiliary Modes)

No.	Contents
90	Clearing of Memory All RAM contents on the System Main and Panel Main PCBs will be initialized. (The same operation as when the Memory back-up battery is removed off.)
91	Input of Telephone No. The telephone No., which will be displayed in the LCD panel in case of the trouble messages (T#:CALL SERVICE), can be input. [Procedures for Inputting Tel.No.] <ol style="list-style-type: none"> 1. Press the "C" button. 2. Input Tel. No. using panel keys. 3. Terminate the Test mode. <p>* If the Test mode No.90 is selected, the telephone No. will be cleared.</p>
92	Prevention of the Master count, Copy count, and Key/card counter set signals output <ul style="list-style-type: none"> • In normal operation, the Master count and Copy count signals will not be output, allowing a service technician to print without increasing the digit of the Master and Copy counters. • The Key/card counter set signal will not be checked, allowing a service technician to print without inserting a counter card into the Key/card counter. <p>* The machine will be released from this condition when the power is turned off.</p>

2. Advice Displays & the Conditions for Display

1."CALL SERVICE" indication

T1
CALL SERVICE

- Main Motor Lock -

Displayed to interrupt the machine operation:

- 1) If the Magnet A is still detected by the **Magnet A detection sensor** **2 seconds** after the Main motor started.
- 2) If the Magnet A hasn't been detected by the **Magnet A detection sensor** **within 5 seconds** after the Main motor started.

T2
CALL SERVICE

- Elevator Motor Lock -

Displayed to interrupt the machine operation:

- 1) If the actuator of the **Elevator upper limit sensor** has not been raised to open the light path **within 7 seconds** after the Elevator motor started to rise.
- 2) If the actuator of the **Elevator lower limit switch** has not been depressed **within 7 seconds** after the Elevator motor started to lower.
- 3) If the actuator of the **Elevator lower limit switch** is still depressed **2 seconds** after the Elevator motor started to rise.
- 4) If the actuator of the **Elevator upper limit sensor** is still raised to open the light path **2 seconds** after the Elevator motor started to lower.

T3
CALL SERVICE

- Clamp Error -

Displayed to interrupt the machine operation:

- 1) If the actuator of the **Clamp safety switch** is still depressed **4 seconds** after the Clamp solenoid was activated(turned on).
- 2) If the actuator of the **Clamp safety switch** has not been depressed **within 4 seconds** after the Clamp solenoid was released(turned off).
- 3) If the Angular magnet has not been detected by the **Angular sensor** (either 0° or 180°) **within 8 seconds** after the Clamp motor started rotating.

Displayed to prevent the machine operation:

- 4) If the actuator of the **Clamp safety switch** is not depressed when the Clamp solenoid is not in operation.

T4
CALL SERVICE

- Ink Overflow -

Displayed after the machine operation finished, immediately stopping the Inking motor:

- 1) If the **Overflow sensor** detects excessive ink in the Squeegee unit.

T5
CALL SERVICE

- Print Positioning Motor Lock -

Displayed after the machine operation finished, immediately stopping the Print positioning motor:

- 1) If the **Vertical centering sensor** status has not been changed from ON to OFF (or OFF to ON) **within 12 seconds** after the Print positioning motor started rotating.

ADVICE DISPLAYS

1. "CALL SERVICE"

T6
CALL SERVICE

- **Communication Error between Panel and System PCBs -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the Panel and System PCBs.

T7
CALL SERVICE

- **Communication Error between Panel and Digitizer PCBs -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the Panel and Digitizer PCBs.

T8
CALL SERVICE

- **Communication Error between System PCBs and Interface Accessories -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the System PCBs and the interface accessories.

T9
CALL SERVICE

- **Communication Error between System PCBs and RC Sorter -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the System PCBs and the RC sorter

T10
CALL SERVICE

- **Malfunction of the Magnet A Detection Sensor -**
Displayed to interrupt the machine operation:
1) If the **Magnet A detection sensor** has not detected the Magnet A by the time the Pressure detection sensor status has changed twice from OFF to ON (the light path of the sensor has been blocked twice by the Pressure Disc) after the Main motor started.

T11
CALL SERVICE

- **Pressure Control Motor Lock-**
Displayed to interrupt the machine operation:
1) If the resistance value of the **Print pressure detection potentiometer** has not changed to a specified value within **20 seconds** after the Pressure control motor started.

T13
CALL SERVICE

- **Cutter Motor Lock -**
Displayed:
1) If the error message "**MASTER CUT MALFUNCTION/PRESS RESET BUTTON**" has been displayed twice in master making operation.

2. "JAM or ERROR" indication

PAPER JAM
CHECK PAPER FEED AREA

- Paper Jam in the Paper Feed Area -

[In Master-making]

Displayed after the master has been loaded on the Drum:

- 1) If the light path of the **Paper sensor** is blocked at the second Magnet A detection after cutting operation.

Note:

- If the light path of the **Paper receiving sensor 1** was open at the first Magnet A detection after cutting, it is judged that the first sheet is stuck in the second paper feed area.
- If the light path of the **Paper receiving sensor 1** was blocked at the first Magnet A detection after cutting, it is judged that some sheets have been fed with lead and trail edges stuck to each other.

[In Printing]

Displayed in the following cases:

- 1) If the light path of the **Paper receiving sensor 1** is open at the first Magnet A detection after the light path blocking of the **Paper sensor**, and if the light path of the **Paper sensor** is still blocked at the second Magnet A detection.

Note:

- At the first Magnet A detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
- Judged that paper is stuck in the second paper feed area.

- 2) If the light path of the **Pressure detection sensor** has been blocked twice while that of **Paper sensor** is kept blocked from the first blocking after the start of printing.

The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the light path blocking of the Pressure detection sensor, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
- Judged that some sheets have been fed with lead and trail edges stuck to each other.

- 3) If the light paths of the **Paper receiving sensor 1** and **Paper sensor** are both open at a Magnet A detection, and if the light path of the **Paper sensor** has been open during the following 2 Magnet A detections.

The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the first Magnet A detection following the above (at the fourth one counted from the beginning), the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
- Judged that paper has misfed or slipped in feeding.

PAPER JAM UNDER DRUM PULL OUT DRUM

- Paper Jam under the Drum or in the Paper Receiving Area -

[In Master-making]

Displayed after the master has been loaded on the Drum:

- 1) If the light path of the **Paper receiving sensor 1** is blocked at the start of the light path blocking of the **Pressure detection sensor**.

Note:

- Judged that the previous jammed paper still remains under the Drum.

- 2) If the light path of the **Paper receiving sensor 1** was open at the first Magnet A detection after cutting, and if the light path of the **Paper sensor** is also open at the second Magnet A detection.

Note:

- Judged that the first copy was not separated from the Drum and has stuck onto it.

[In Printing]

Displayed in the following cases:

- 1) If the light path of the **Paper receiving sensor 1** is blocked at the start of the light path blocking of the **Pressure detection sensor**.
The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the start of the light path blocking of the Pressure detection sensor, the Print signal is immediately interrupted to stop the first paper feed (Paper feed clutch's operation).
Judged that the printed copy has jammed around the Separator.

- 2) If the light path of the **Paper receiving sensor 1** is open at the first Magnet A detection after the light path blocking of the **Paper sensor**, and if the light path of the **Paper sensor** is open at the second Magnet A detection.

Note:

- At the first Magnet A detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
Judged that the printed copy was not separated from the Drum and has stuck onto it.

- 3) If the light path of the **Paper receiving sensor 2** has been kept blocked while that of the **Paper receiving sensor 1** has been blocked twice.

The jam message will be displayed when the Drum stops after the Magnet A has been detected three times by the detection sensor following the above.

Note:

- At the first Magnet A detection following the above, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
- Judged that the printed copy has jammed around the exit of the paper receiving side or on the Paper receiving tray.

MASTER CLAMP ERROR
PRESS RESET BUTTON

- The Master has Not been Loaded onto the Drum -

Displayed in master-making and confidential processes after the following display message is cleared:

[REMOVE CUT MASTER STRIP]

Note: The above message will be displayed:

- 1) If the **Master sensor** did not detect the master on the Drum at the Magnet C-1 detection in master loading process (preventing the first paper feed-Paper feed clutch's operation), and then if the **Master positioning sensor** detects the master at the Magnet A detection after master-cutting operation at the Magnet C-2 detection.

If the **Master positioning sensor** does not detect the master at the Magnet A detection after master-cutting operation, the above message **[REMOVE CUT MASTER STRIP]** will not be displayed.

MASTER CUT
MALFUNCTION
PRESS RESET BUTTON

- Master Cut Error -

Displayed to interrupt the machine operation in master-making and confidential processes:

- 1) If the **Master sensor** detected the master on the Drum at the Magnet C-1 detection in master loading process, and then if the **Master positioning sensor** detects the master at the Magnet A detection after master-cutting operation (the Magnet C-2 detection).

MASTER MIS-FEED
RESET MASTER

- Master has Not been Properly Fed or Loaded -

Displayed after the master has been loaded onto the Drum in master making or confidential process:

- 1) If the **Master positioning sensor** has not detect the master material **within 536 pulses** after the Loading pulse motor started rotating following the master cutting operation.

Note:

- The Loading and Write pulse motors are turned off following the above.

Displayed to interrupt the machine operation when the Master loading button was pressed:

- 2) If the **Master positioning sensor** has not detected the master material **within 2426 pulses** after the Loading pulse motor was turned on.
- 3) If the **Master positioning sensor** has not detected the master **within 536 pulses** after the Loading pulse motor was turned on following the operation of the Cutter motor.

USED MASTER NOT
DISCHARGED
PULL OUT DRUM
AND CHECK

- The Used Master has Not been Removed from the Drum -

Displayed after the Image scanning and Master making operations are completed or in the confidential operation:

- 1) If the light path of the **Master removal sensor** has been open until the Magnet A detection sensor detects the Magnet A after the detection of the master by the Master sensor at the Magnet C-1 detection, during master removal.

Note:

- If the Master sensor does not detect the master at the Magnet C-1 detection, in the above case, the Master removal sensor is prevented from operating and the message will not be displayed.

ADVICE DISPLAYS

2. "JAM or ERROR"

ORIGINAL MISFEED
RESET ORIGINAL

- Original has Not Fed -

Displayed for **2 seconds** to immediately interrupt the machine operation:

- 1) If the actuator of the **Original registration sensor** has not been raised to open the light path **within 2646 pulses** after the Read pulse motor was turned on by pressing the "START" button for master making.

ORIGINAL JAM
RESET ORIGINAL

- Original has Jammed before Image Scanning Area -

Displayed to immediately interrupt the machine operation:

- 1) If the light path of the **Original IN sensor** is still open **677 pulses** after the Read pulse motor was switched from counterclockwise to clockwise rotation.

ORIGINAL JAM OR OVERSIZE
REMOVE JAMMED ORIGINAL

- Original is Oversized or has Jammed in Image Scanning Area -

Displayed after the master has been loaded onto the Drum:

- 1) If the light path of the **Original IN sensor** has been kept blocked for **14331 pulses** since it was blocked.

NO MASTER ON DRUM
SET ORIGINAL IN PLACE AND
PRESS START BUTTON

- The Master is Not Attached to the Drum -

Displayed for **2 seconds** after the Drum has stopped at the Magnet A detection:

- 1) If the **Master sensor** does not detect the master (the reflected light) when the Magnet C-1 has been detected by the Magnet C detection sensor just after the print started.

Note:

- * At the Magnet C-1 detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).

MASTER JAM IN
MASTER DISPOSAL UNIT

- The Used Master is Jammed and Blocked at the entrance of Master disposal box -

Displayed when "START" button is pressed for master-making operation.

- 1) If the light path of the **Master removal sensor** is blocked at the start of master-making operation.

3. "CHECK SETTING" indication

SET DRUM IN PLACE

Displayed to prevent the machine operation:

- If the actuator of the **Drum set switch** is not depressed.

SET INK BOTTLE IN PLACE

Displayed to prevent the machine operation:

- If the actuator of the **Ink bottle switch** is not depressed.

ADD PAPER

Displayed to interrupt the Print signal (the first paper feed) in printing:
1) If the light path of the **Paper detection sensor** is open when that of the Pressure detection sensor has been opened in printing.

Displayed to prevent the machine operation:

- 2) If the light path of the **Paper detection sensor** is open.

SET LEAD EDGE OF
MASTER UNDER
GREEN FILM

Displayed to prevent the machine operation:

- If the **Master detection sensor** does not detect the master material (the reflected light).

CLOSE FRONT COVER

Displayed to prevent the machine operation:

- If the metal plate is not attached to the **Front cover set sensor**.

SET MASTER DISPOSAL
BOX IN PLACE

Displayed to prevent the machine operation:

- If the actuator of the **Disposal box set switch** is not depressed.

SET ORIGINAL FEED
TABLE IN PLACE

Displayed to prevent the machine operation:

- If the actuator of the **Original-feed table set switch** is not depressed.

CLOSE MASTER
LOADING UNIT

Displayed to prevent the machine operation:

- If the actuator of the **Master loading unit switch** is not depressed.

SET ORIGINAL IN PLACE

Displayed:

- If the actuator of the **Original detection sensor** is not raised to open the light path when the "START" button is pressed for master making.

4. Others

REPLACE INK BOTTLE

Displayed after the machine operation is finished:

- If the **Ink sensor** has not detected ink in the Squeegee unit **within 30 seconds** after the Inking motor was started rotating by the detection of scarce ink in the unit.

REPLACE MASTER ROLL

Displayed after the machine operation is finished:

- If the black tape attached at the end of the Master roll has been detected by the **Master end sensor** during master making or the confidential operation.

EMPTY DISPOSAL BOX

Displayed after the machine operation is finished:

- If the **internal counter** for disposed masters on the **Panel PCB** has counted **30** through the detection of disposed masters by the **Master removal sensor**.

REMOVE CUT MASTER STRIP

Displayed:

- If the **Master positioning sensor** detects the master material (the reflected light) just after the master cut operation is completed.

SELECT PRINT QUANTITY

Displayed:

- If the "START" button is pressed for printing when the print quantity is set to **0**.

PRESS RESET BUTTON

Displayed:

- When jam has occurred.

TO RESUME
PRESS START BUTTON

Displayed:

- If the "RESET" button has been pressed after the error or jam occurred.

3. Location and Function of Electrical Parts

1. Photo Sensors

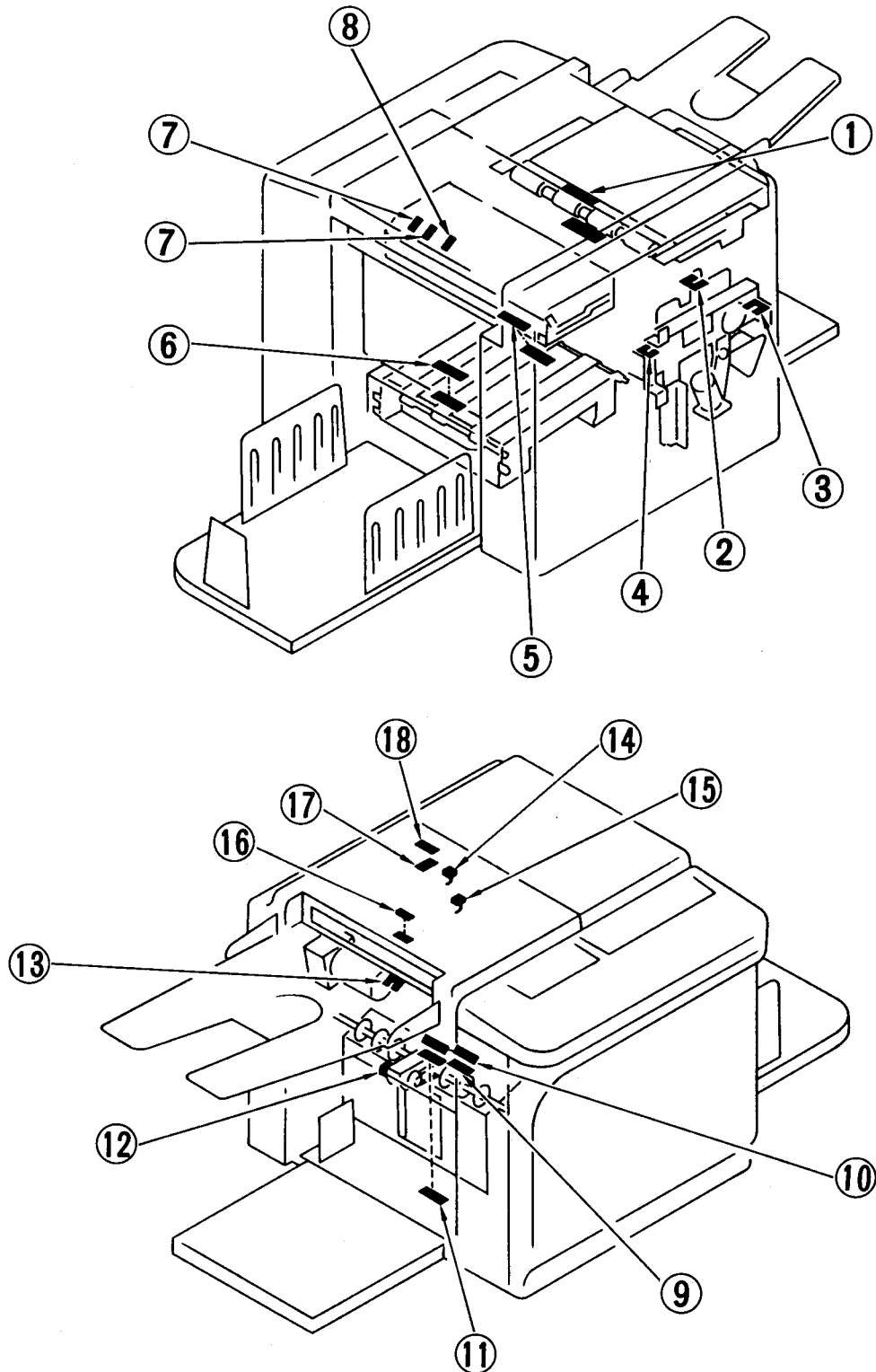
No.	Name and Type	Function	Display
1	Master removal sensor (Transmission type)	To check the advance of used masters into the Disposal box	"USED MASTER NOT DISCHARGED PULL OUT DRUM AND CHECK" "MASTER JAM IN MASTER DISPOSAL UNIT"
2	Vertical centering sensor (Photointerrupt type)	To reset the vertical print position to the center	"T5 CALL SERVICE"
3	Paper feed clutch sensor (Photointerrupt type)	To control the operation of the Paper feed clutch	
4	Pressure detection sensor (Photointerrupt type)	1) To support other sensors to check paper jams 2) To change rotation speed of the Main motor to 15 rpm 3) To turn the Pressure solenoid off 4) To increase the Copy counter a digit	
5	Paper receiving sensor 1 (Transmission type)	To check the paper transfer under the Separator	"PAPER JAM UNDER DRUM / PULL OUT DRUM" "PAPER JAM / CHECK PAPER FEED AREA"
6	Paper receiving sensor 2 (Transmission type)	To check the paper transport to the Paper receiving tray	"PAPER JAM UNDER DRUM PULL OUT DRUM"
7	Master end sensor (Reflective type)	To check the end of the master roll	"REPLACE MASTER ROLL"
8	Master detection sensor (Reflective type)	To check the loading of master material	"SET LEAD EDGE OF MASTER UNDER GREEN FILM"
9	Paper buckle detection sensor (Actuator type)	To determine the amount of first paper feed (buckle)	
10	Paper sensor (Transmission type)	1) To check the paper transport in the paper feed area 2) To turn the Pressure solenoid on	"PAPER JAM UNDER DRUM / PULL OUT DRUM" "PAPER JAM / CHECK PAPER FEED AREA"
11	Paper detection sensor (Transmission type)	To check the status of the paper on the Paper feed tray "ADD PAPER"	"ADD PAPER"
12	Elevator upper limit sensor (Actuator type)	To determine the stop position of the Paper feed tray elevation	"T2 CALL SERVICE "

FUNCTION OF ELECTRICAL PARTS

1.Photo Sensors

No.	Name	Function	Display
13	Encoder sensor (Photointerrupt type)	To detect the rotation speed of the Main motor	
14	Original detection sensor (Actuator type)	To check the placing of originals into the Original-feed table	"SET ORIGINAL IN PLACE"
15	Original registration sensor (Actuator type)	To check the transport of an original before the Image scanning area	"ORIGINAL MISFEED RESET ORIGINAL"
16	Original IN sensor (Transmission type)	To check the transport of an original through the Image scanning area	"ORIGINAL JAM / RESET ORIGINAL" "ORIGINAL JAM OR OVER- SIZE / REMOVE JAMMED ORIGINAL"
17	Master sensor (Reflective type)	To check the status of the master on the drum	"NO MASTER ON DRUM/ SET ORIGINAL IN PLACE AND PRESS START BUT- TON" "MASTER CLAMP ERROR / PRESS RESET BUTTON"
18	Master positioning sensor (Reflective type)	1) To check the advance and feed of master material 2) To check the presence of master material under the cutter unit	"MASTER CUT MALFUNC- TION / PRESS RESET BUTTON" "MASTER MIS-FEED / RESET MASTER" "REMOVE CUT MASTER STRIP"

[Location of Photo Sensors]



FUNCTION OF ELECTRICAL PARTS

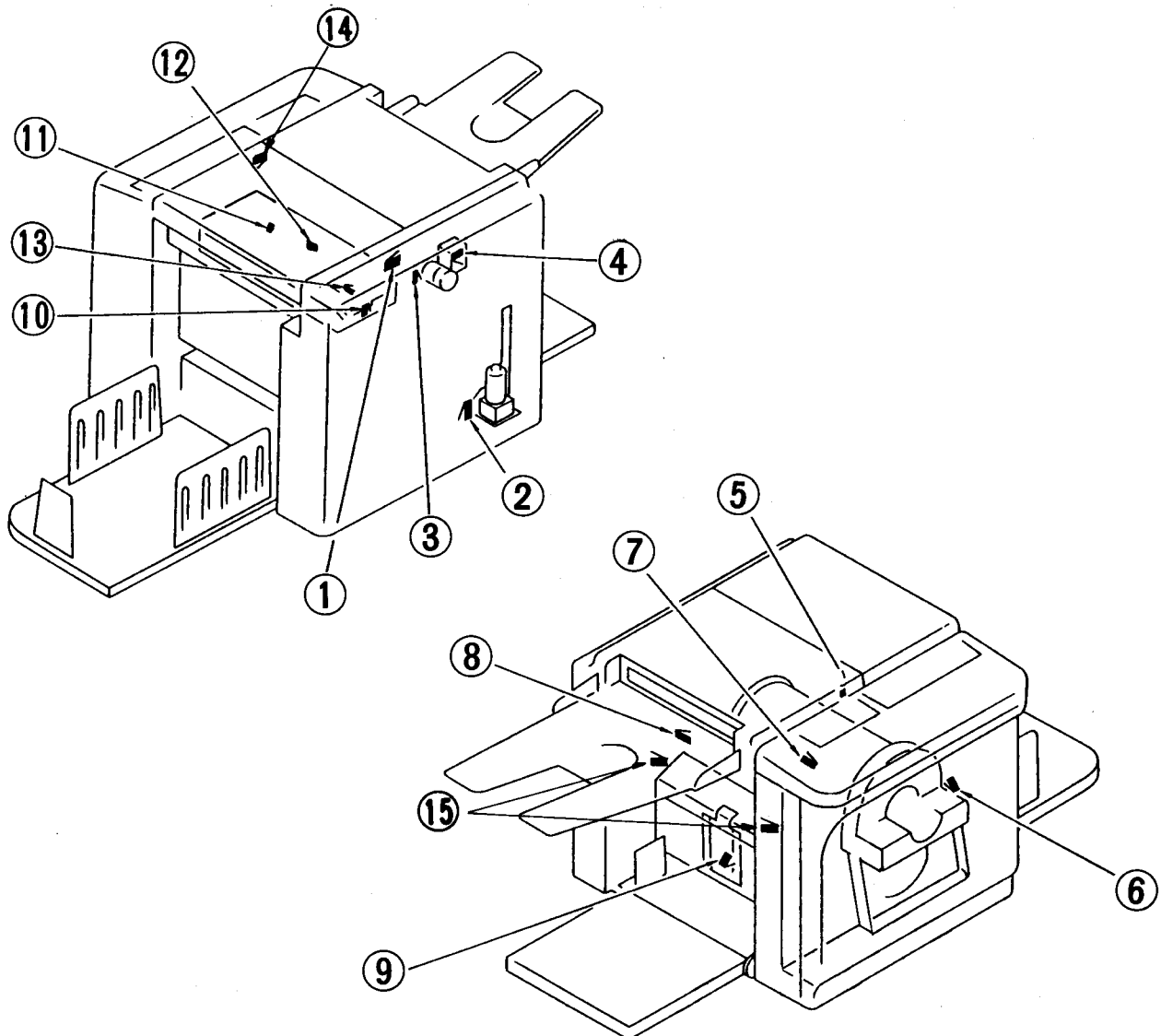
2. Micro Switches

2. Micro Switches

No.	Name	Function	Display
1	Original-feed table set switch	To check the setting of the Original-feed table	"SET ORIGINAL FEED TABLE IN PLACE"
2	Elevator lower limit switch	To determine the lowest stop position of the paper feed tray	"T2:CALL SERVICE"
3	Clamp safety switch	To check the operation of the Clamp solenoid	"T3:CALL SERVICE"
4	Range setting switch	To detect the Clamp solenoid operation to reduce the current flowing to the solenoid for the prevention of overheating	
5	ADF Interlock switch	To check the status of the ADF cover If not pressed, the operation of the Image scanning section is prohibited.	
6	Drum set switch	To check the status of the Drum	"SET DRUM IN PLACE"
7	Ink bottle switch	To check the status of an ink bottle	"SET INK BOTTLE IN PLACE"
8	Disposal box set switch	To check the status of the Master disposal box	"SET MASTER DISPOSAL BOX IN PLACE"
9	Stack paper feed switch	1) To detect multiple-sheet feed 2) To interrupt the Paper feed clutch during multiple feeding	
10	Cutter position switch	To determine the stop position of the Rotary cutter	
11	TPH home position switch	To determine the home position status of the Thermal print head	
12	TPH pressure switch	To determine the pressure of the Thermal print head against the Write roller during master making	
13	Master loading unit switch	To check the status (open/close) of the Master loading unit	"CLOSE MASTER LOADING UNIT"

No.	Name	Function	Display
14	Original-feed table interlock switch	To check the status of the Original-feed table If not pressed, the operation of the Main motor is prohibited and the power to the thermal print head is interrupted.	T1 : CALL SERVICE
15	Feed tray safety switch	To protect an operator from the danger of catching hands with paper side guides. If not pressed, the operation of the Elevator motor is prohibited.	T2 : CALL SERVICE

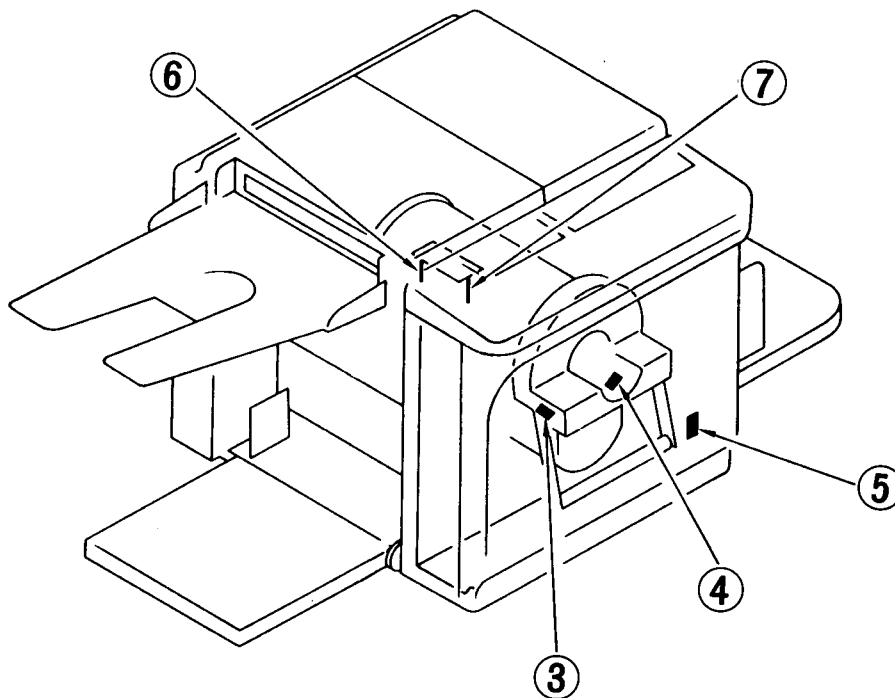
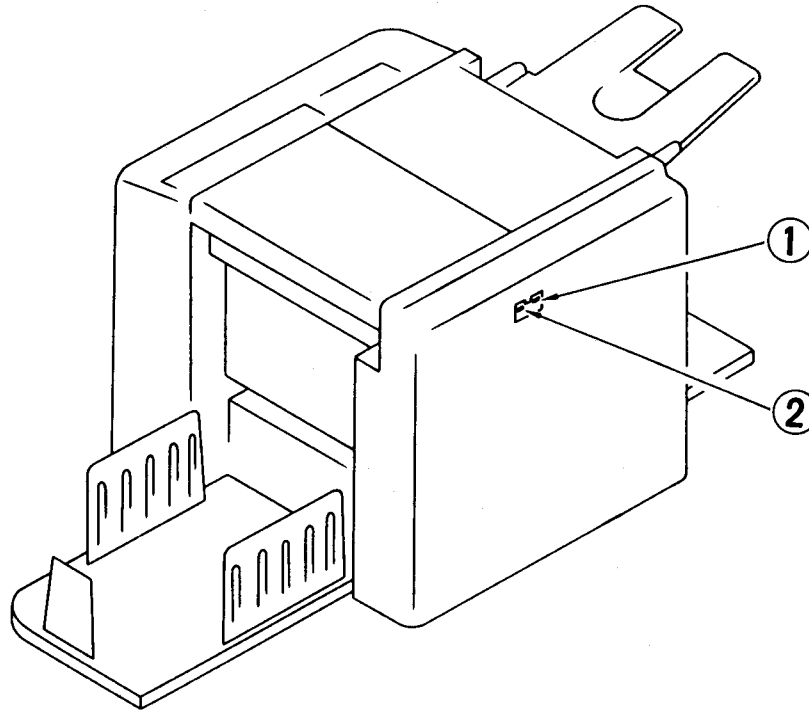
[Location of Micro Switches]



3. Other Sensors

No.	Name and Type	Function	Display
1	0° Angular sensor (Hall IC)	To check the closing operation and closed condition of the Clamp plate	"T3 CALL SERVICE"
2	180° Angular sensor (Hall IC)	To check the opening operation and open condition of the Clamp plate	"T3 CALL SERVICE"
3	Magnet A detection sensor (Hall IC)	To check the home position of the Drum This sensor functions with the other sensors in order to detect several operations.	"T1 CALL SERVICE"
4	Magnet C detection sensor (Hall IC)	To check the Drum positions during rotation C-1: To detect errors with the Master sensor C-2: To determine the position of master cutting	"MASTER CLAMP ERROR / PRESS RESET BUTTON" "NO MASTER ON DRUM/ SET ORIGINAL IN PLACE AND PRESS START BUTTON"
5	Front cover set sensor (Magnetic reed switch)	To check the status (open/close) of the Front cover	"CLOSE FRONT COVER"
6	Overflow sensor (Static capacitance sensor-antenna)	To detect the overflow of ink in the Squeegee unit	"T4 CALL SERVICE"
7	Ink sensor (Static capacitance sensor-antenna)	To check the amount of ink in the Squeegee unit	"REPLACE INK BOTTLE"

[Location of Other Sensors]



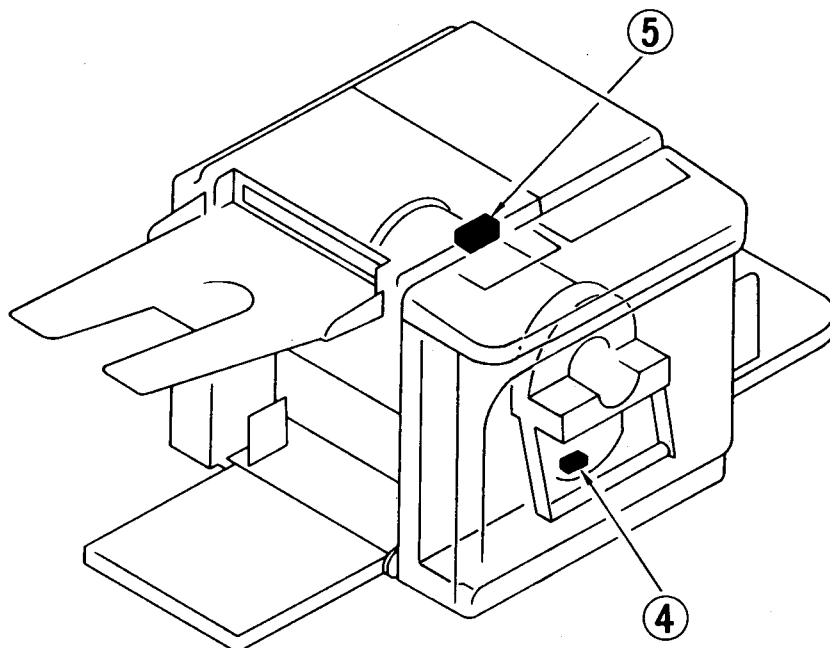
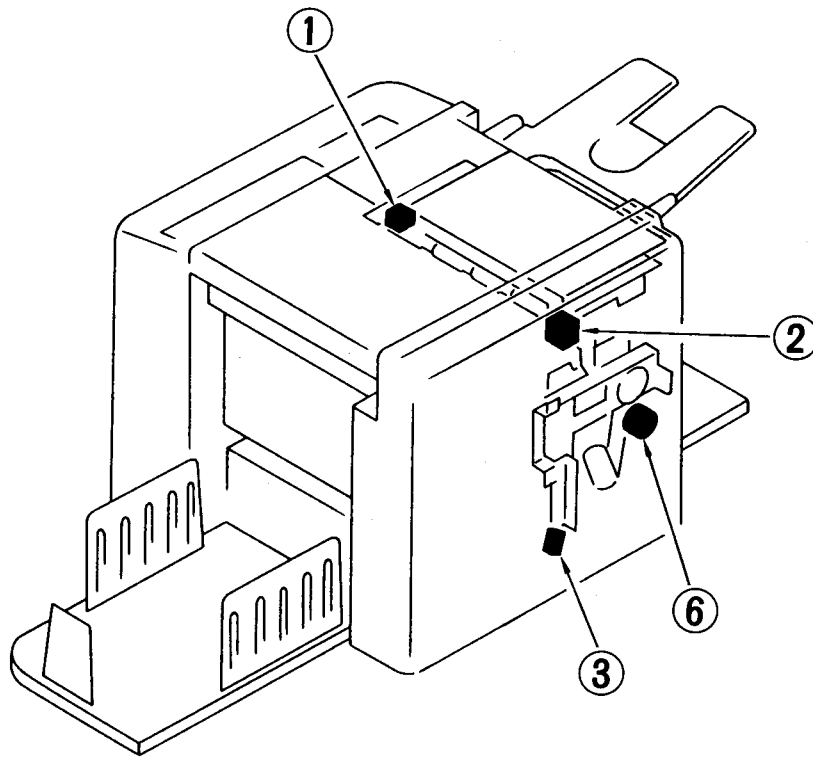
FUNCTION OF ELECTRICAL PARTS

4. Solenoids

4. Solenoids

No.	Name	Function
1	Master removal solenoid	To activate the Master removal hooks for removing an used master from the Drum
2	Clamp solenoid	To lower the Clamp motor unit to the Drum for opening/closing the Clamp plate
3	Pressure solenoid	To activate the Pressure hook for raising the Pressure roller
4	Lock solenoid	To release the Drum lock for replacement operation (at the Magnet A detection position)
5	Original feed solenoid	To lower the Original stopper and the Original feed roller
6	Paper feed clutch	To transmit the rotation of the Main motor to the Pickup and Scraper rollers

[Location of Solenoids]



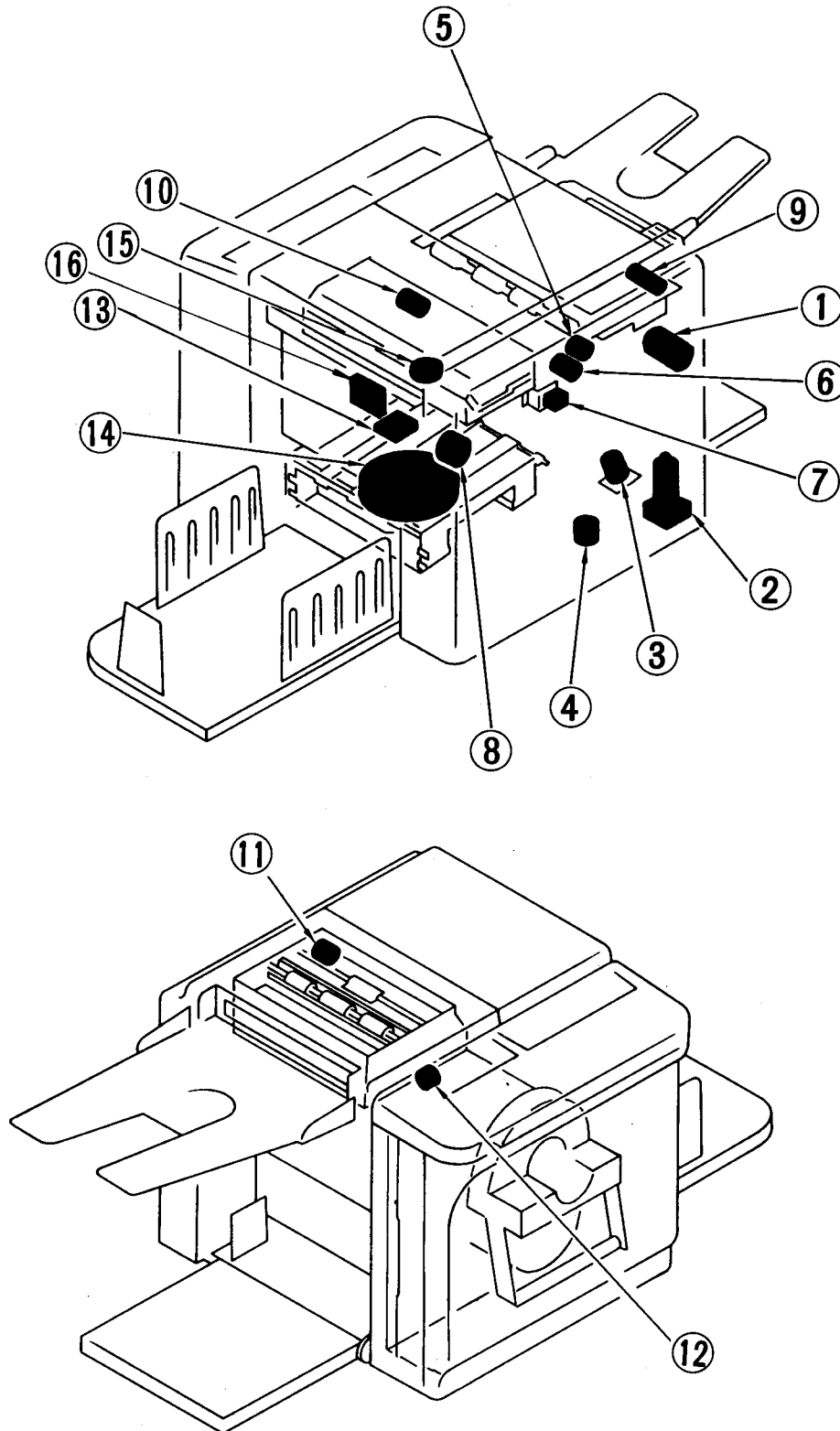
FUNCTION OF ELECTRICAL PARTS

5. Motors & Fans

5. Motors & Fans

No.	Name	Function
1	Main motor	To rotate the drive system
2	Elevator motor	To elevate the Paper feed tray (up and down)
3	Pressure control motor	To change the printing pressure of the Pressure roller
4	Print positioning motor	To change the vertical print position
5	Clamp motor	To open and close the Clamp plate
6	Cutter motor	To rotate the Rotary cutter for cutting master
7	Loading pulse motor	To advance and load master onto the Drum
8	Write pulse motor	To drive master material under the Thermal print head
9	Master removal vertical transport motor	To lead an used master into the Master disposal box
10	Thermal pressure motor	To drive the Thermal print head (up and down)
11	Read pulse motor	To drive original through the Image scanning area
12	Inking motor	To pump ink from the Ink bottle into the Squeegee unit
13	Storage fan	To Draw master into the Master stocker during master making
14	Suction fan	To draw paper to the Paper receiving transfer belts
15	Separation fan	To assist in the operation of separating paper from the Drum
16	Loading fan	To prevent master wrinkle during loading master onto the Drum

[Location of Motors & Fans]



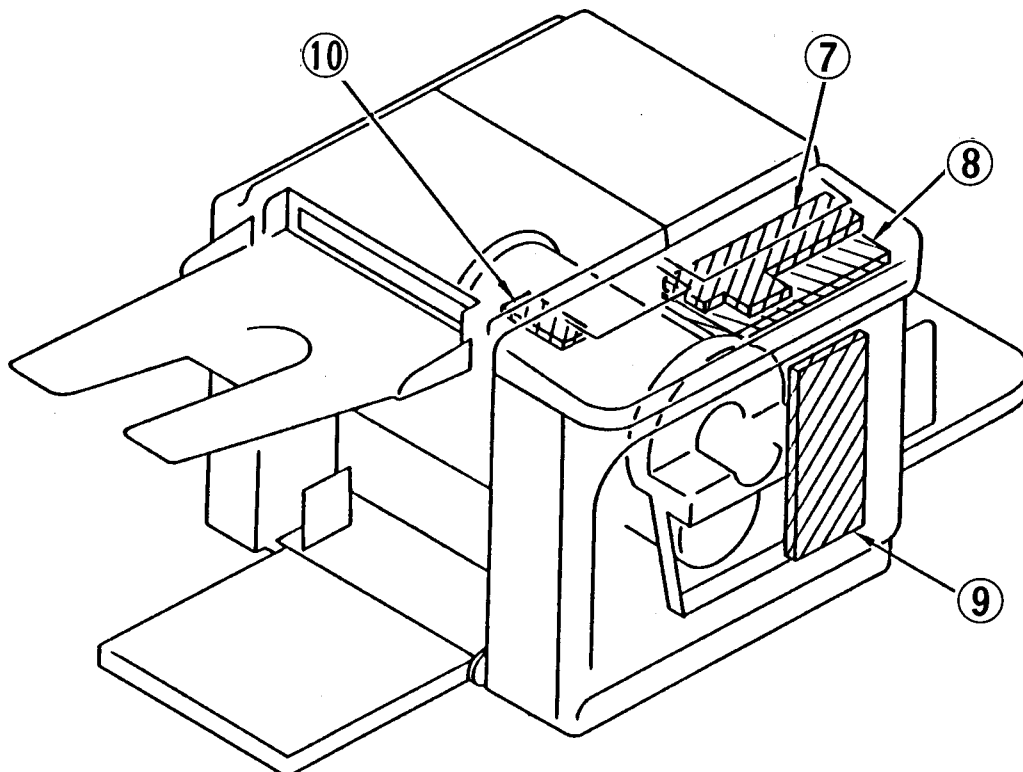
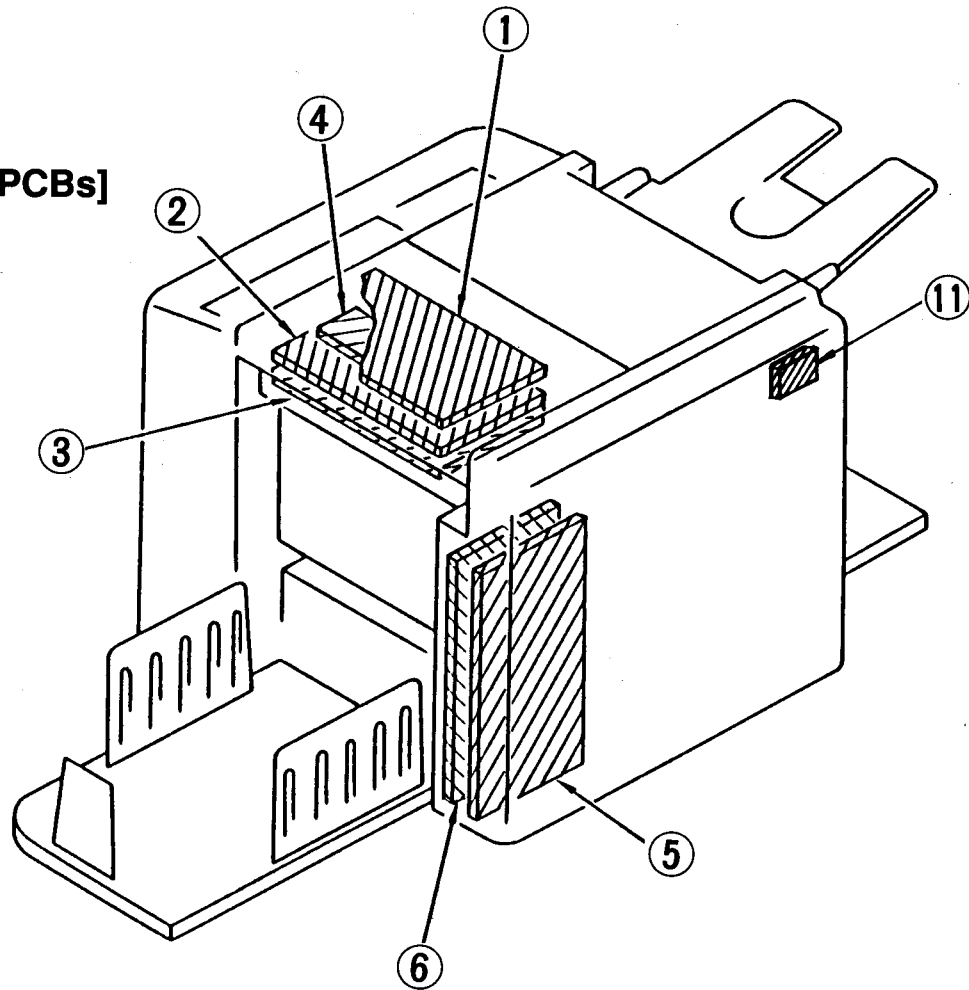
FUNCTION OF ELECTRICAL PARTS

6.PCBs

6. PCBs

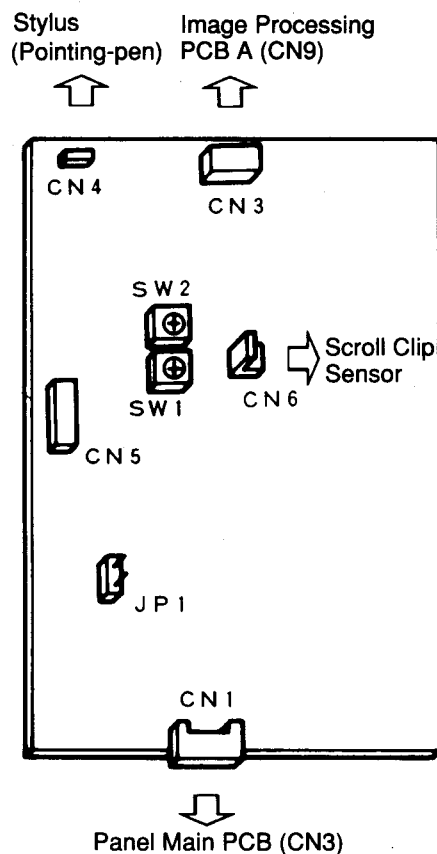
No.	Name	Function
1	Digitizer PCB (In RC5600D)	To control the editing functions of the Digitizer
2	Image processing PCB A	} For image processing
3	Image processing PCB B	
4	Image processing PCB C (In RC5600 & 5600D)	
5	System Main PCB	To control the Main motor and to process the signals from sensors
6	System drive PCB	To control the operation to drive the motors and solenoids
7	Panel switch PCB	To accept the input signal from the Operation panel keys
8	Panel Main PCB	To control machine operations
9	Power supply PCB	To convert the input power to 5V,+12V,and 24V and supply them to circuitry
10	Drum PCB	To control the Ink sensor and Overflow sensor in the Drum
11	Pressure control PCB (In RC5600 & 5600D)	To control the Pressure control motor

[Location of PCBs]



4. Description of PCBs

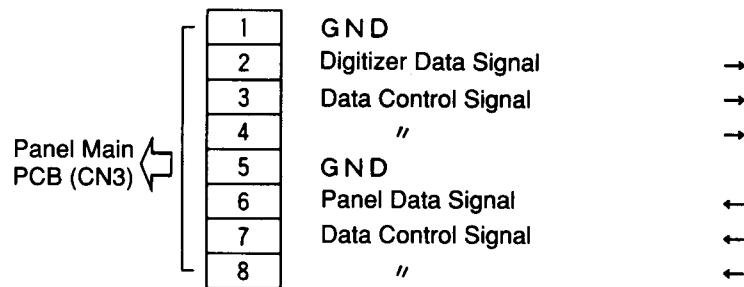
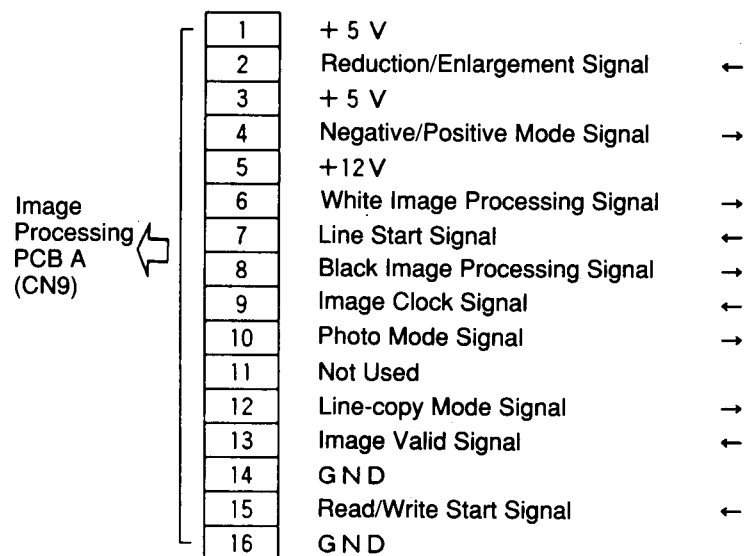
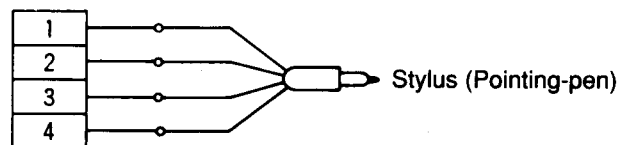
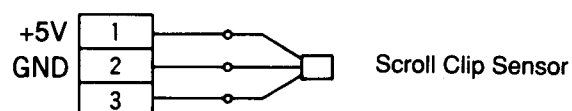
1. DIGITIZER PCB (In RC5600D)



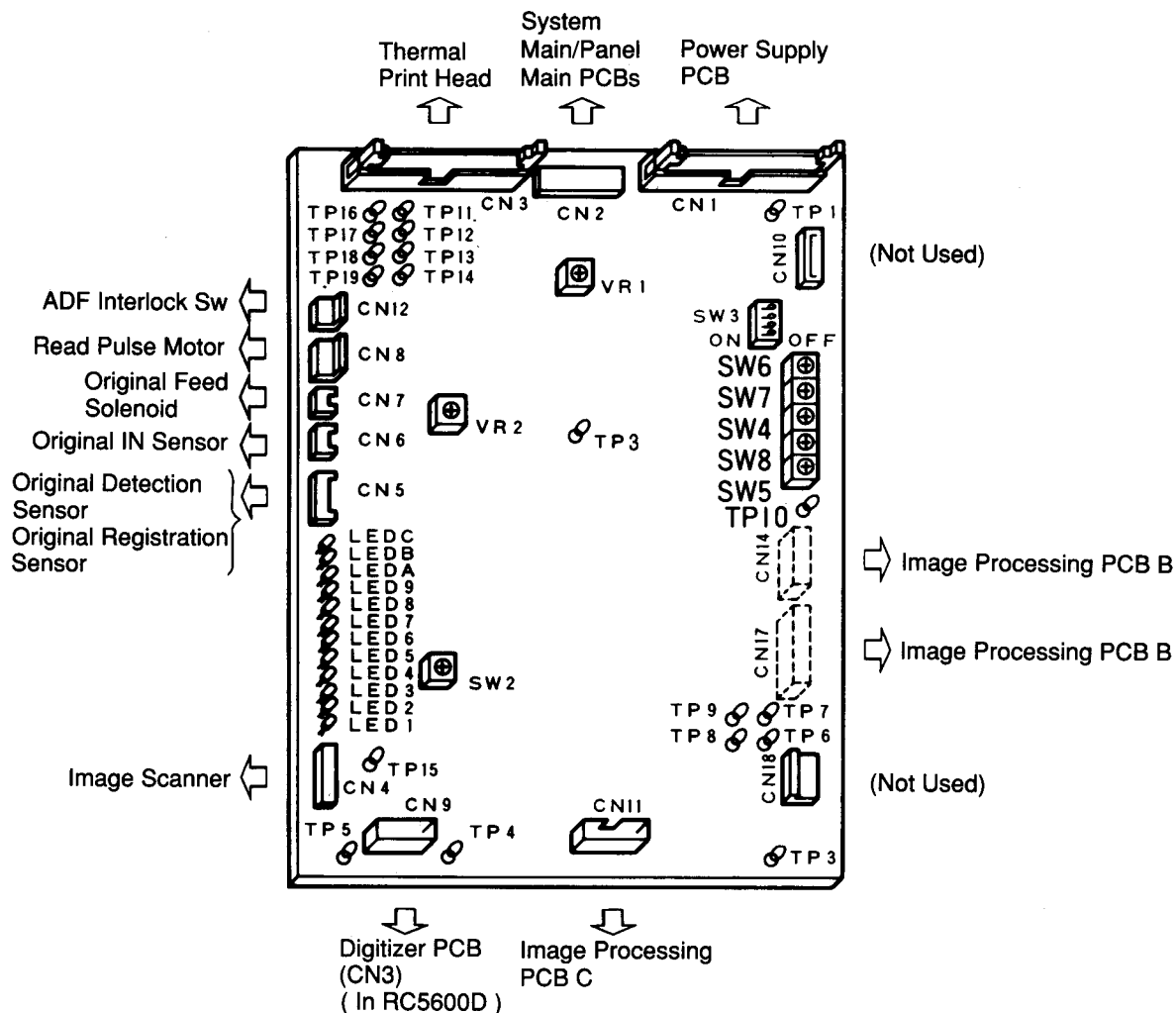
SW1 For compensation of the position discrepancy in the main scanning direction (laterally)

SW2 For compensation of the position discrepancy in the sub scanning direction (vertically)

JP1 Used only for adjustment in factory

CN1**CN3****CN4****CN6**

2. IMAGE PROCESSING PCB A



LED

LED1:+5V

LED2:+12V

LED3:-12V

LED4:+24V

LED5:INJI

LED6:SHAD

LED7:RPEN

LED8:RPRV

LED9:SBSL

LEDA:GKIS

LEDB:GKSW

LEDC:RGSS

– When LED is ON –

+5V is supplied into PCB.

+12V is supplied into PCB.

–12V is supplied into PCB.

+24V is supplied into PCB.

“Read/Write Start Signal” is output.

“Shading Compensation Signal” is output.

“Read Pulse Motor ON Signal” is output.

“Read Pulse Motor CCW Signal” is output.

(CCW : The rotation direction in picking up an original)

“Original Feed Solenoid ON Signal” is output.

The light path of Original IN Sensor is blocked.

The actuator of Original Detection Sensor is raised to open the light path.

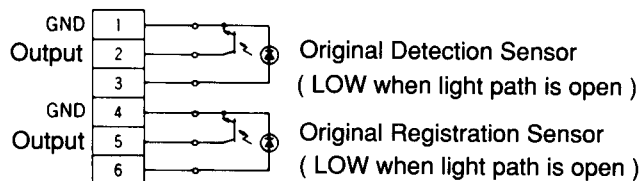
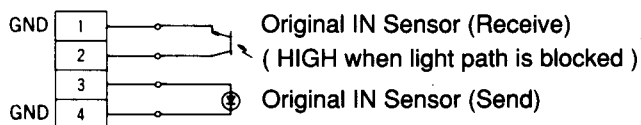
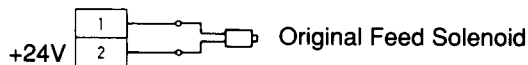
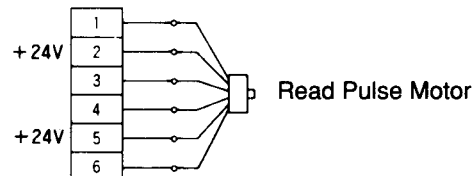
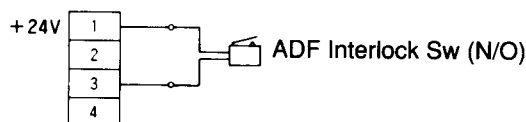
The actuator of Original Registration Sensor is raised to open the light path.

VR

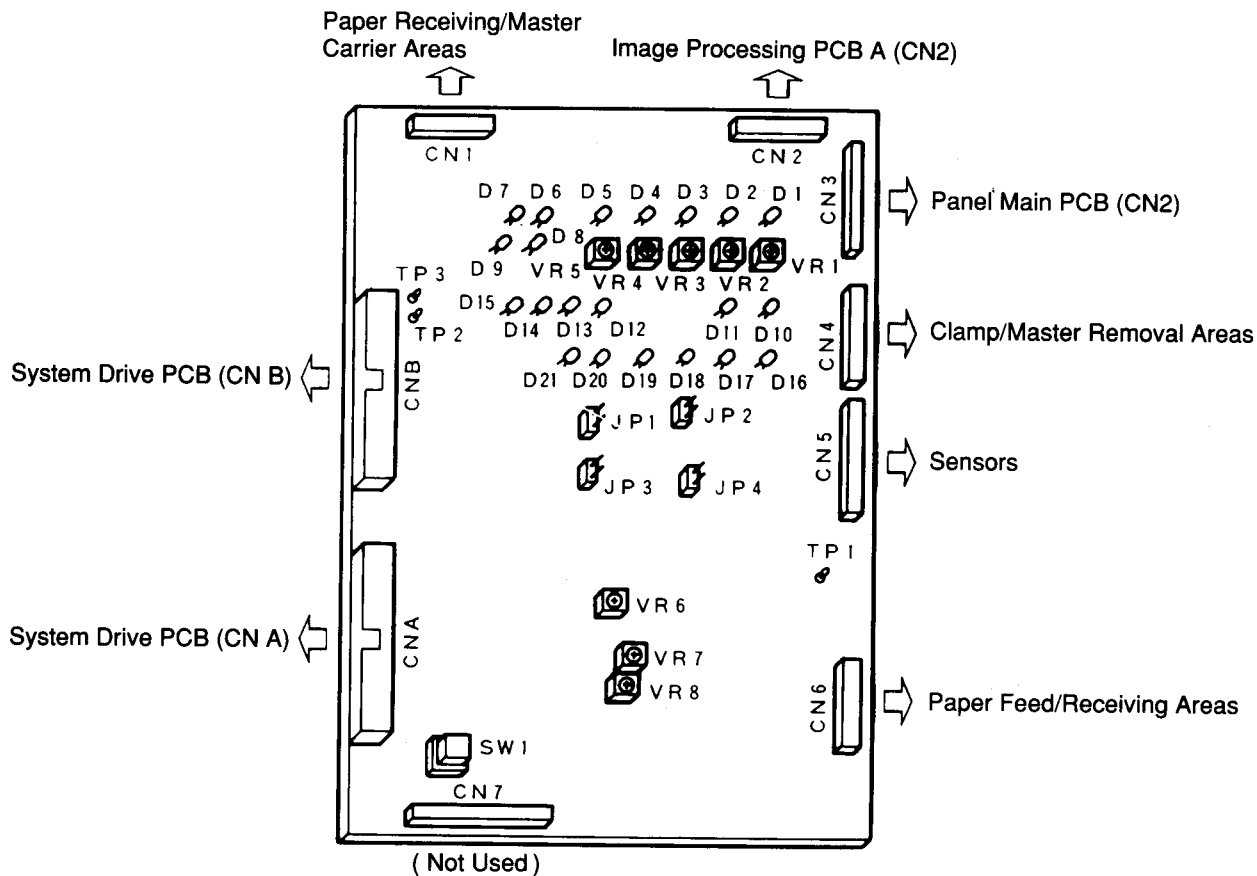
- VR1:NOD For contrast level adjustment in image scanning
(The contrast will be darker by turning it clockwise.)
- VR2:GEN For detection sensitivity adjustment of Original IN Sensor
(The sensitivity goes up by turning it counterclockwise.)

SW

- SW2:GAIN For contrast balance adjustment in image scanning
- SW3: Used only for adjustment in factory
(4 DIP Switches) (All 4 DIP Switches must be OFF.)
- SW4:KAN Not Used
- SW5:T1 For adjustment of heating power of Thermal Print Head
- SW6:MAS For adjustment of "Line-copy mode Slice Level"
- SW7:TP Not Used
- SW8:T2 For adjustment of heating power of Thermal Print Head

CN5 6 pins**CN6** 4 pins**CN7** 2 pins**CN8** 6 pins**CN12** 4 pins

3. SYSTEM MAIN PCB



JP

- JP1 Used only for adjustment in factory
- JP2 Used only for adjustment in factory
- JP3 For "Key/Card Counter" installation
(Opened in installing "Key/Card Counter")
- JP4 Used only for adjustment in factory

TP

- TP1:GND1 Ground
- TP2:GND1 Ground
- TP3:GND2 Ground for 24V lines

SW

- SW1: For Main Motor rotation (30 rpm)

VR

VR1	For detection sensitivity adjustment of Master Detection Sensor (The sensitivity goes up by turning it clockwise.)
VR2	For detection sensitivity adjustment of Master End Sensor (A4) (The sensitivity goes up by turning it clockwise.)
VR3	For detection sensitivity adjustment of Master End Sensor (B4) (The sensitivity goes up by turning it clockwise.)
- New -	
VR4 (VR8)	For detection sensitivity adjustment of Master Sensor (The sensitivity goes up by turning it clockwise.)
VR5 (VR4)	For detection sensitivity adjustment of Master Positioning Sensor (The sensitivity goes up by turning it clockwise.)
VR6 (VR5)	For adjustment of "Free rotation speed" (The speed goes up by turning it clockwise.)
VR7 (VR6)	For adjustment of "Master loading speed" (The speed goes up by turning it clockwise.)
VR8 (VR7)	For adjustment of "Print speed" (The speed goes up by turning it clockwise.)

LED**- When LED is ON -**

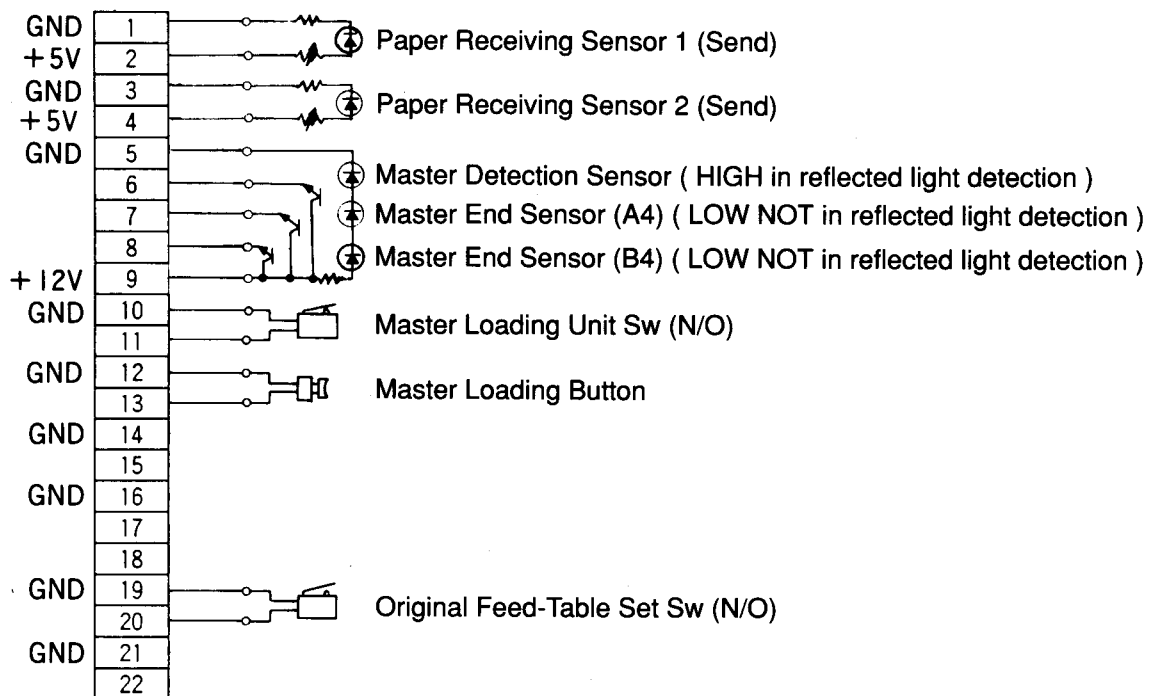
D1:MDTC	Master Detection Sensor is detecting reflected light (Master).
D2:ENDA	Master End Sensor (A4) is NOT detecting reflected light.
D3:ENDB	Master End Sensor (B4) is NOT detecting reflected light.
D4:MSEN	Master Sensor is detecting reflected light (Master).
D5:WAIT	Master Positioning Sensor is detecting reflected light (Master).
D6:MJAM	The light path of Master Removal Sensor is blocked. Not Used
D8:DRM0	0° Angular Sensor is detecting magnetism (Angular Magnet).
D9:DRM1	180° Angular Sensor is detecting magnetism (Angular Magnet). The actuator of Elevator Upper Limit Sensor is raised to open the light path.
D11:PFD1	The actuator of Paper Buckle Detection Sensor is raised to open the light path.
D12:PDTC	The light path of Paper Detection Sensor is blocked.
D13:RCV2	The light path of Paper Receiving Sensor 2 is blocked.
D14:FLOW	Overflow Sensor is detecting ink.
D15:INK	Ink Sensor is NOT detecting ink.
D16:PRSS	The light path of Pressure Detection Sensor is blocked.
D17:PFD2	The light path of Paper Feed Clutch Sensor is open
D18:RCV1	The light path of Paper Receiving Sensor 1 is blocked.
D19:PSEN	The light path of Paper Sensor is blocked.
D20:DRMA	Magnet A Detection Sensor is detecting magnetism (Magnet A).
D21:DRMC	Magnet C Detection Sensor is detecting magnetism (Magnet C-1 or -2).

DESCRIPTION OF PCBs

3.System Main PCB

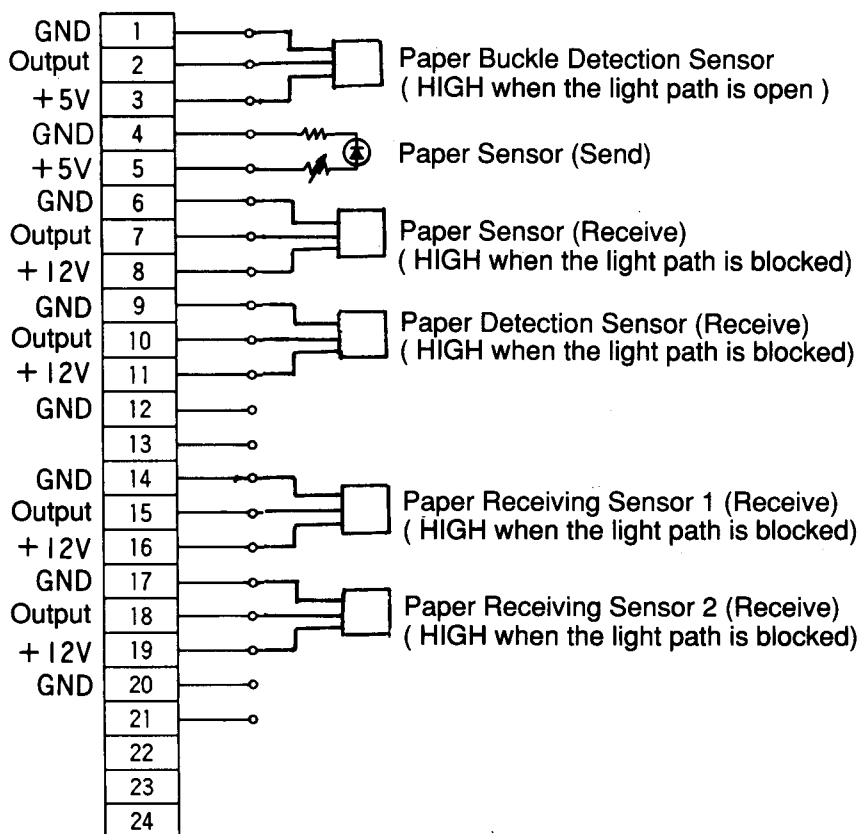
CN1

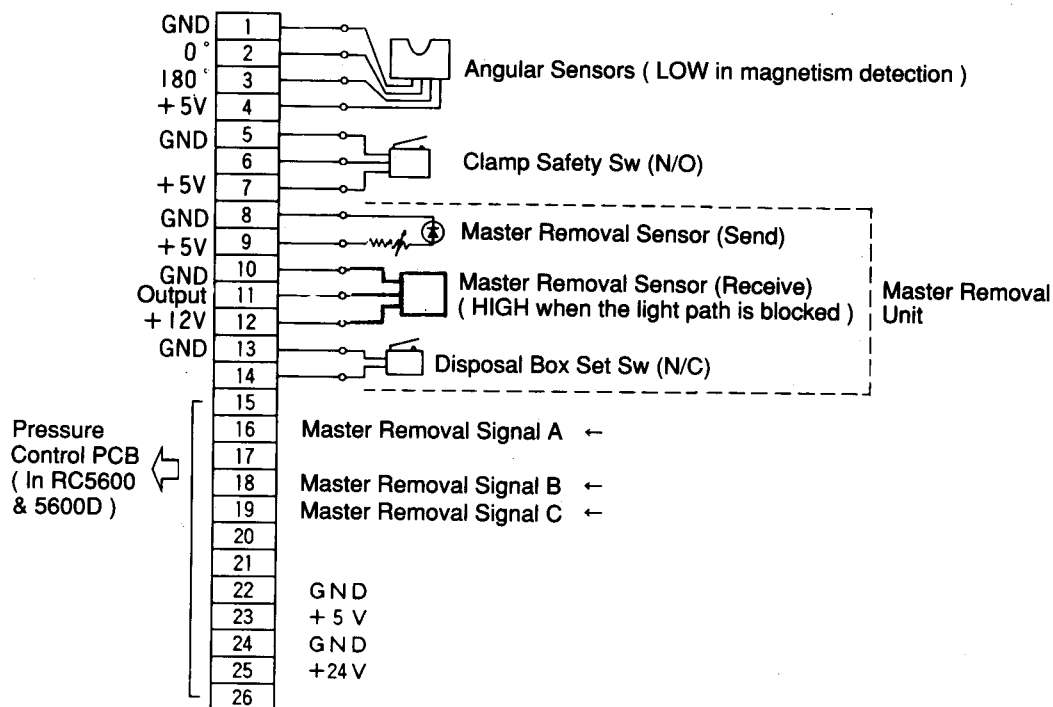
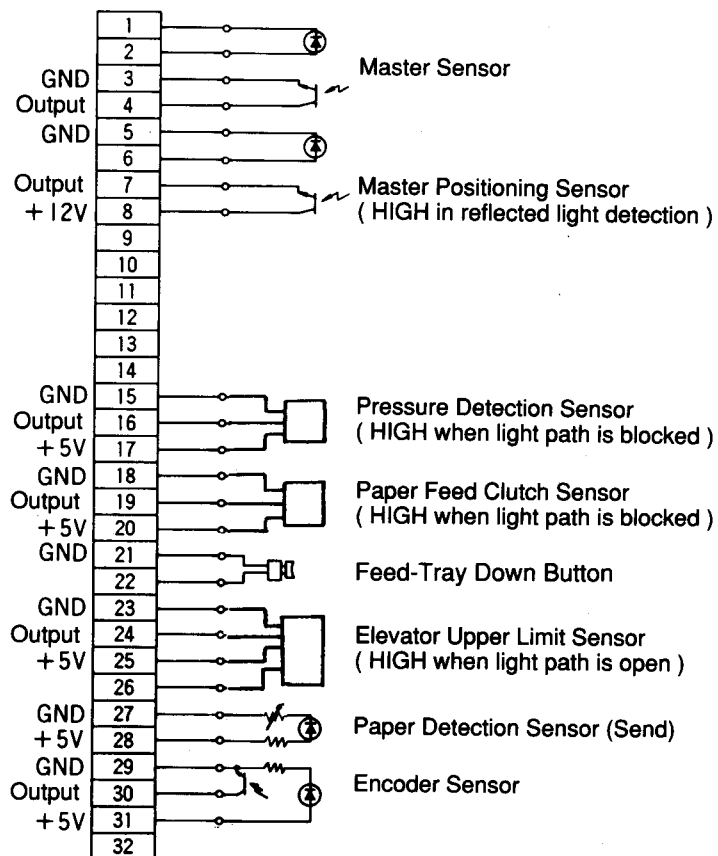
22 pins



CN6

24 pins

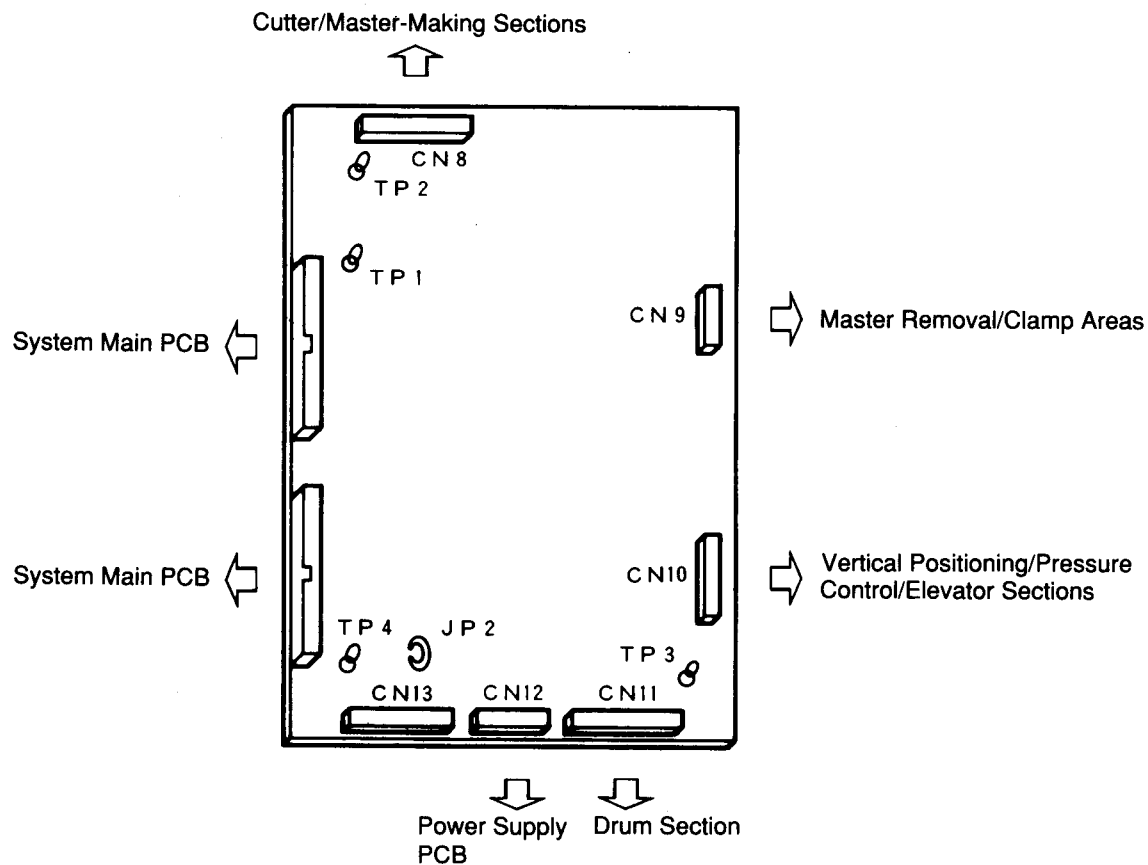


CN4 26 pins**CN5** 32 pins

DESCRIPTION OF PCBs

4. System Drive PCB

4. SYSTEM DRIVE PCB



TP

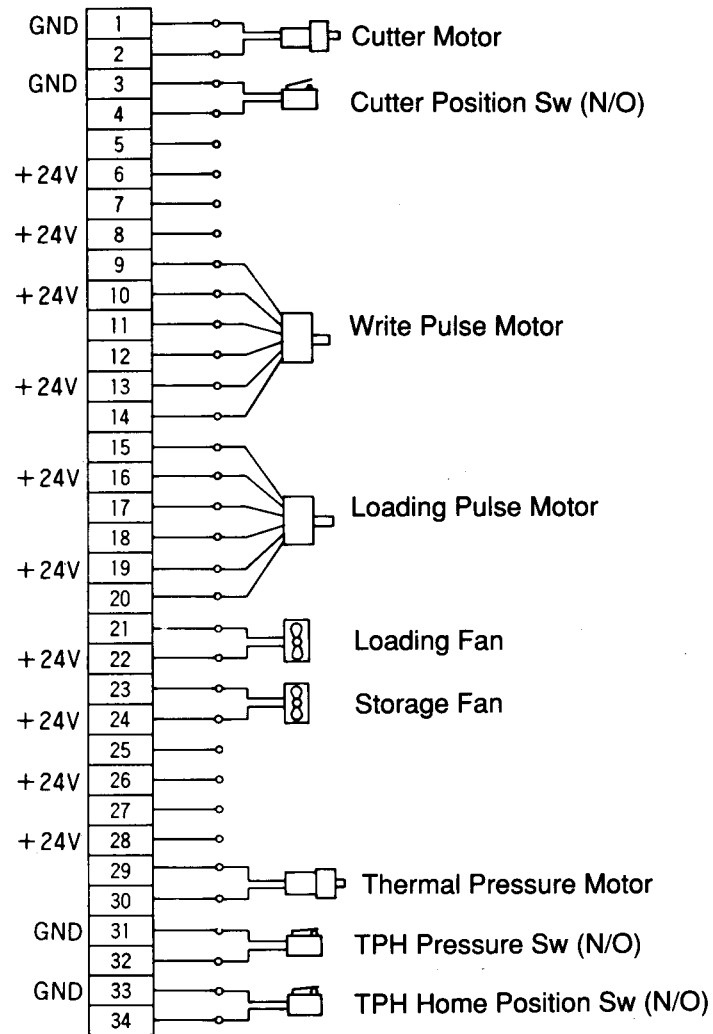
TP1:GND	Ground
TP2:GND	Ground
TP3:GND	Ground
TP4:GND	Ground

JP

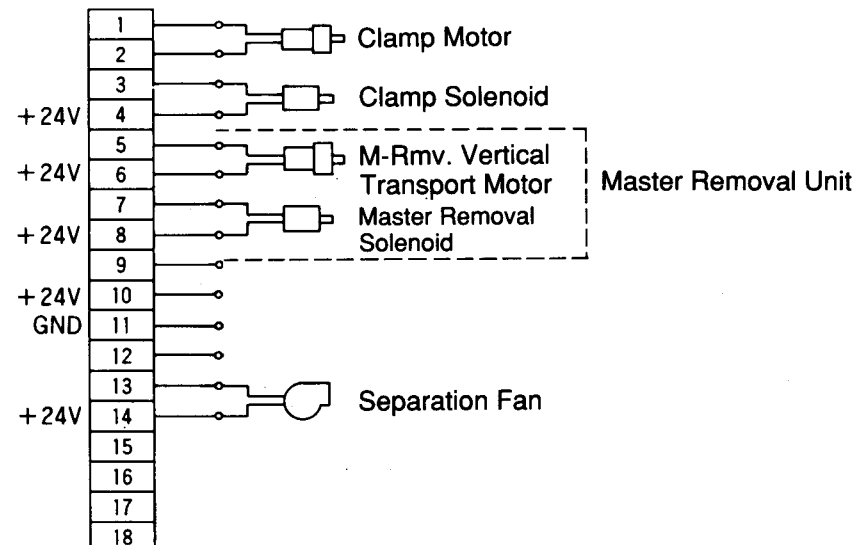
JP2	Cut in connecting to Sorter
-----	-----------------------------

CN8

34 pins

**CN9**

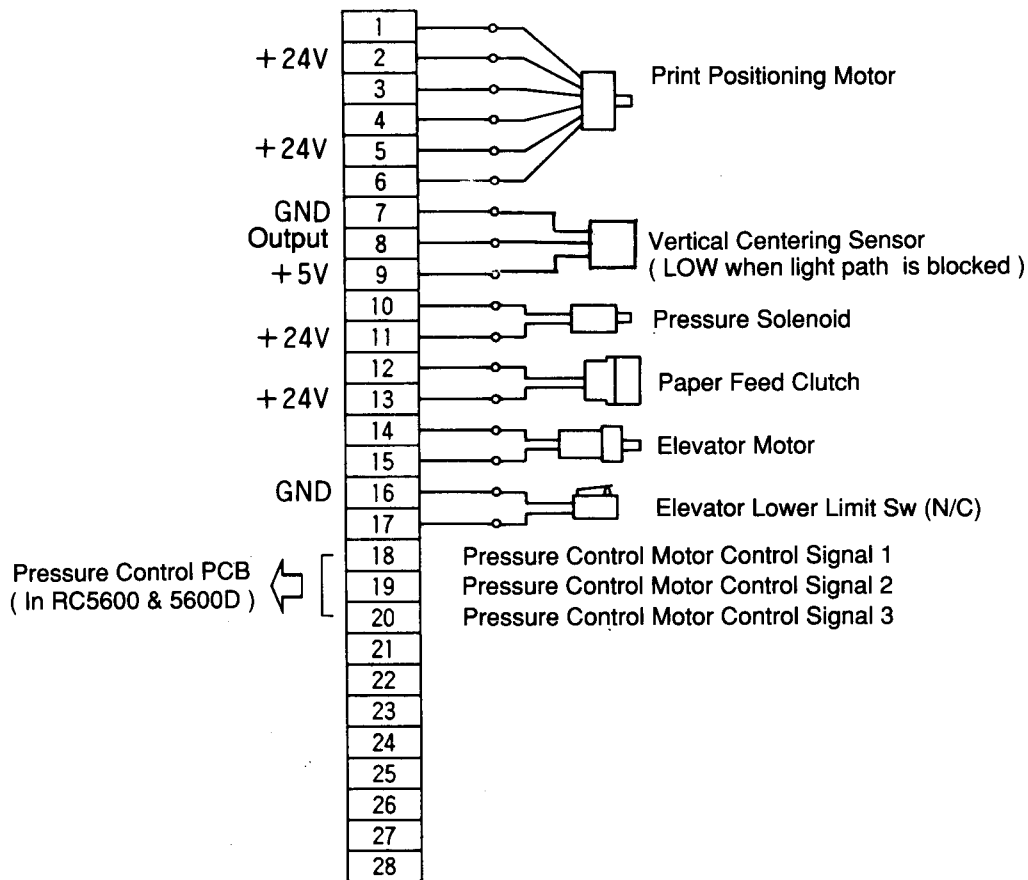
18 pins



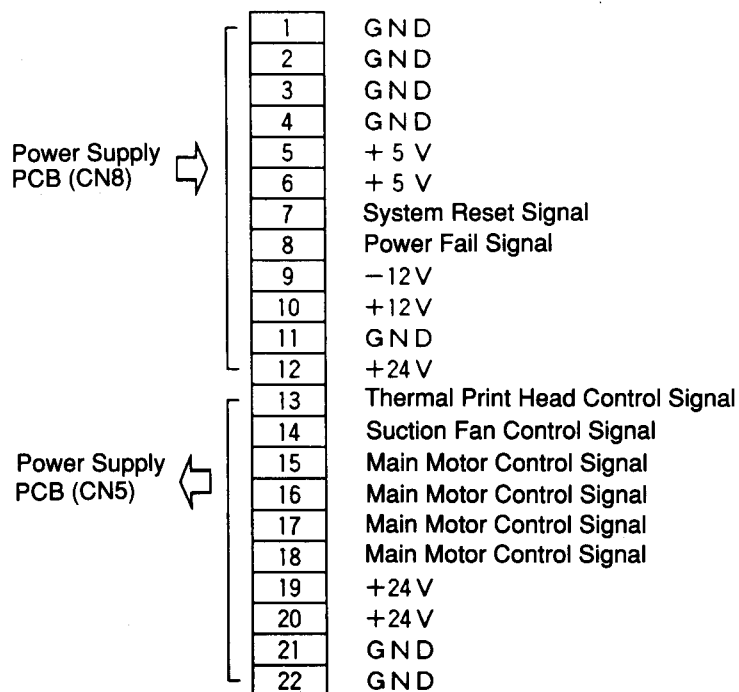
DESCRIPTION OF PCBs

4.System Drive PCB

CN10 28 pins

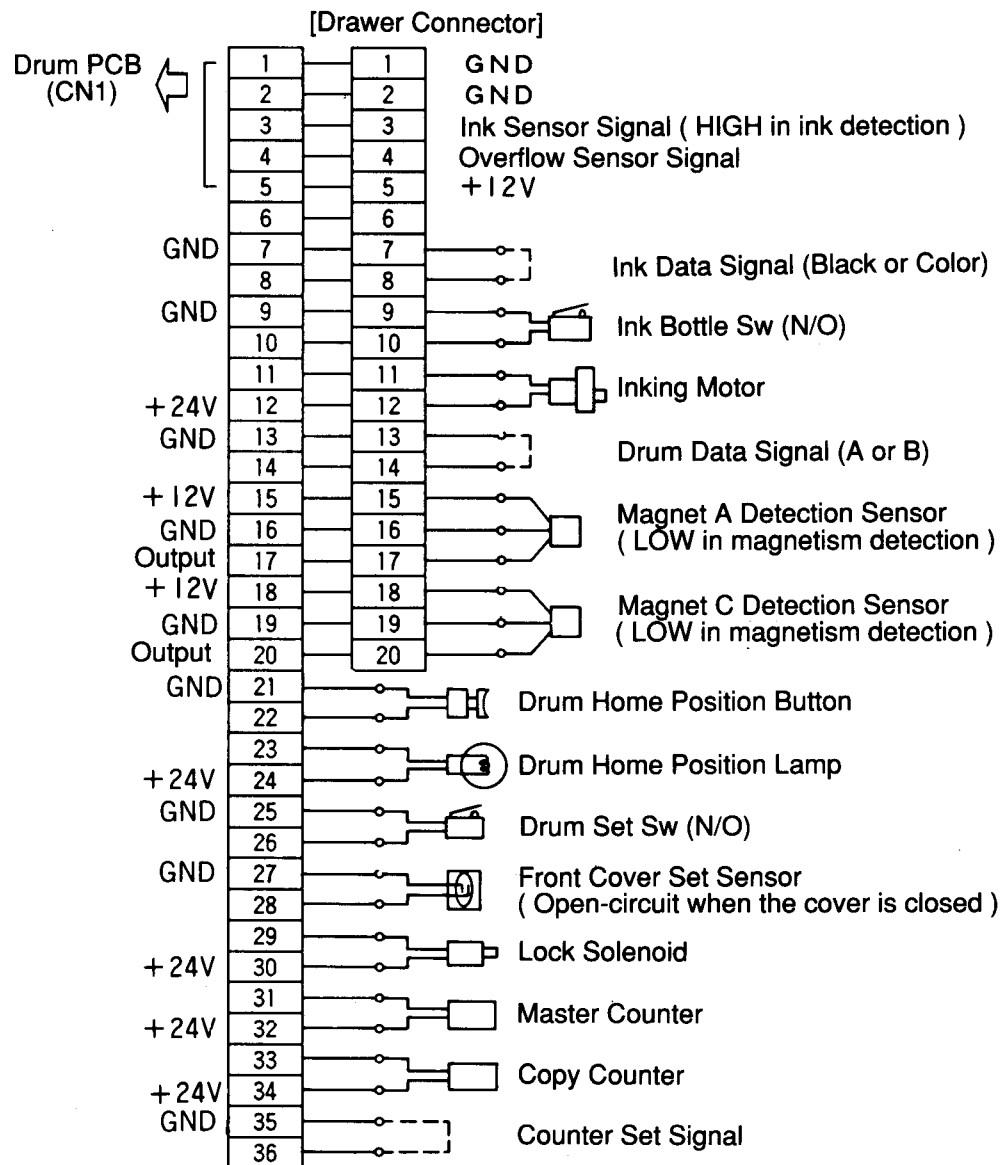


CN12 22 pins



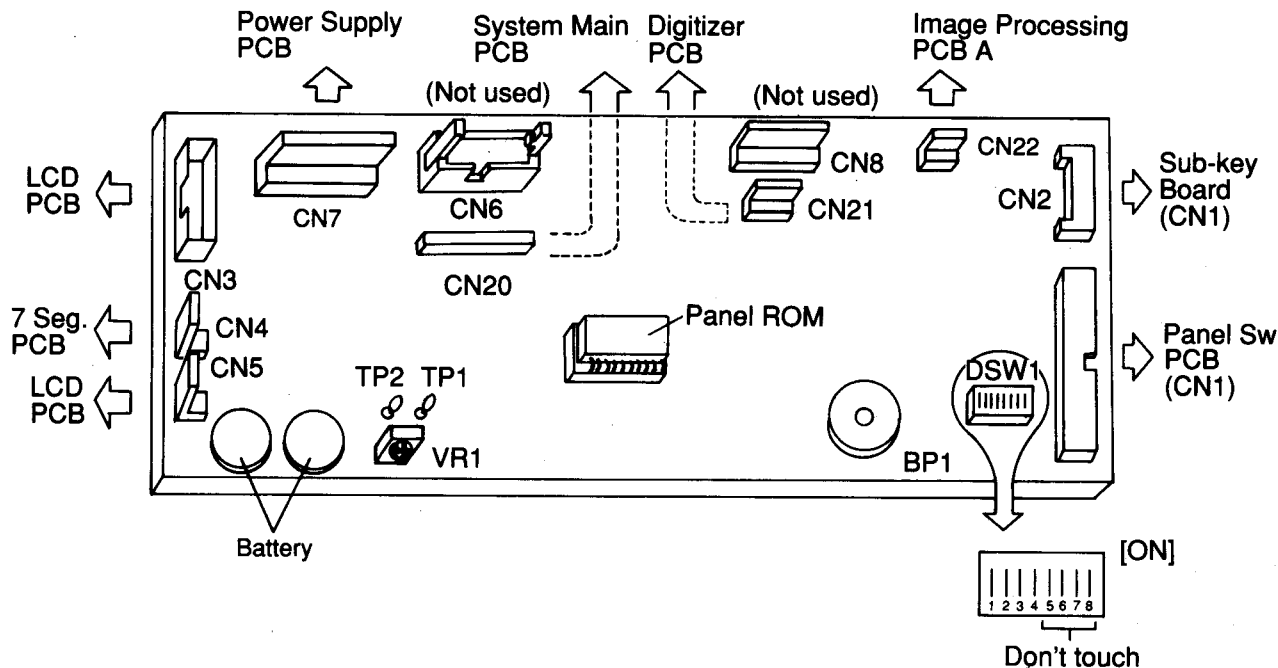
CN11

36 pins

**CN13**

For connection to Sorter

5. PANEL MAIN PCB



TP

TP1:GND Ground
 TP2: 8 ±2V (Variable according to VR1 adjustment)

VR

VR1 For luminosity adjustment of LCD panel

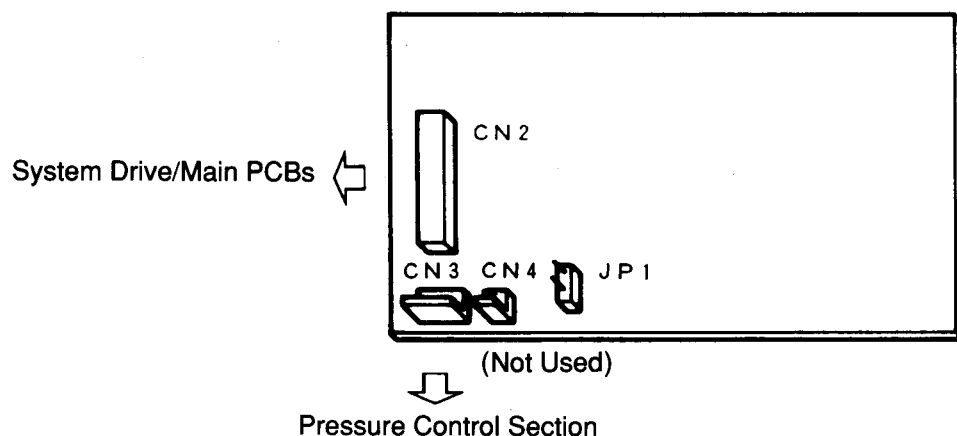
SW

		OFF	[ON]
DSw1-1	The initial print speed selection (※)	100RPM	60RPM
DSw1-2	The initial ADF setting selection	ADF OFF	ADF ON
DSw1-3	Selection of the timer for Auto-idling	12 hours	6 hours
DSw1-4	Priority selection between Density- and Speed-Change modes	Density-Change mode	Speed-Change mode
DSw1-5	Used only for adjustment in factory		
DSw1-6	Used only for adjustment in factory		
DSw1-7	Used only for adjustment in factory		
DSw1-8	Used only for adjustment in factory		

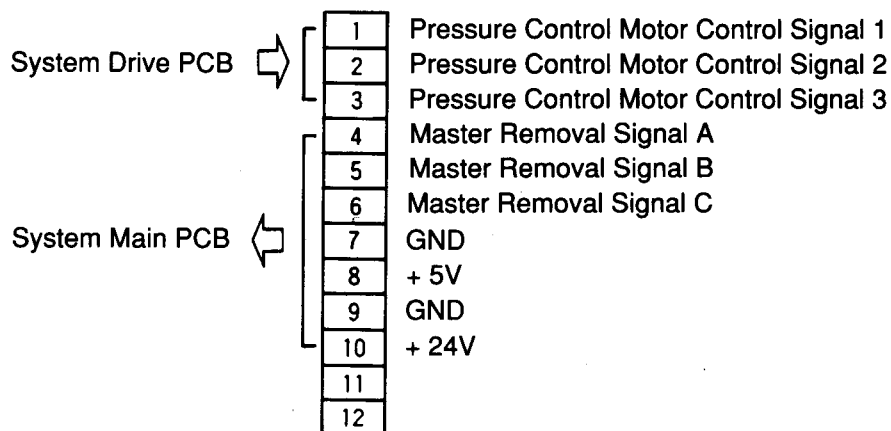
※ Functions only in Speed-Change mode.

In Density-Change mode, the print speed is fixed at 100 rpm.

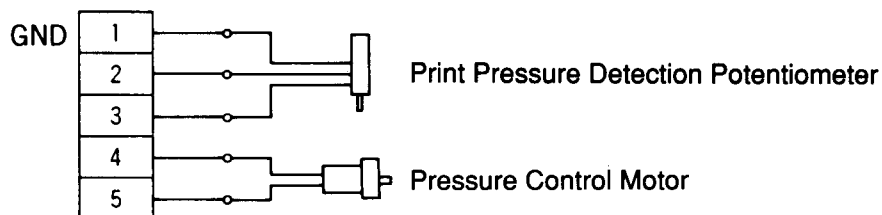
6. PRESSURE CONTROL PCB (In RC5600 & 5600D)



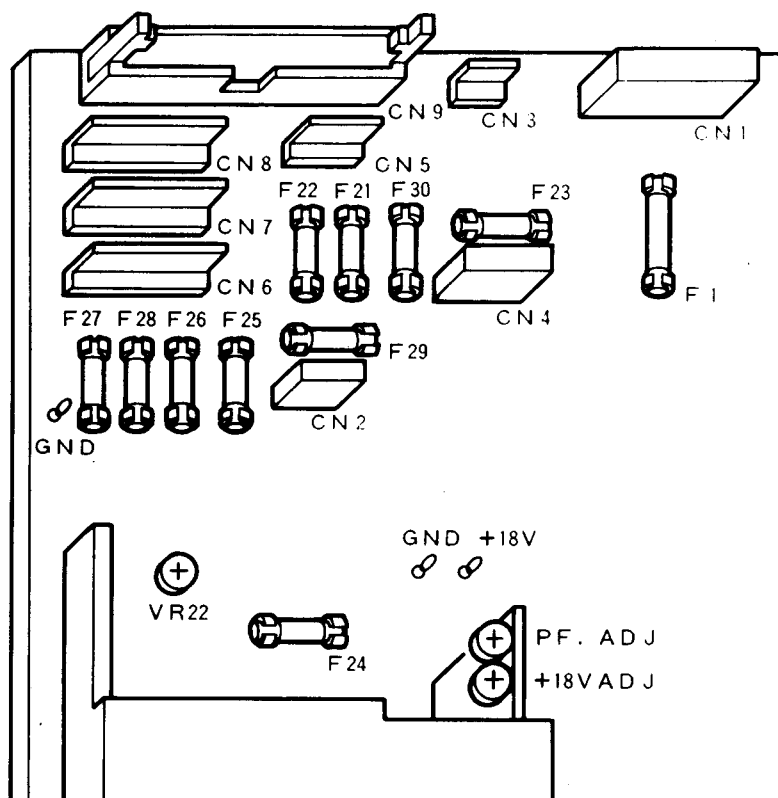
CN2



CN3



7. POWER SUPPLY PCB



CN	CN1	From Main Power Sw
	CN2	To Main Motor
	CN3	To Suction Fan
	CN4	To Thermal Print Head
	CN5	From System Drive PCB
	CN6	Not Used
	CN7	To Panel Main PCB
	CN8	To System Drive PCB
	CN9	To Image Processing PCB A
TP	GND	Ground
	+18V	For check of +18V output
VR	VR22	For adjustment of +5V output
	PFADJ	Used only for adjustment in factory
	+18VADJ	For adjustment of +18V output
		(TPH Input Voltage)

FUSE

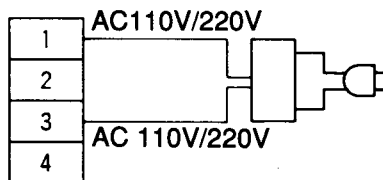
No.	Rate	Protected line	Symptoms in case of open-circuited fuse	Relevant components
F1	10A (110V) 5A (220V)	Main Power	No Power	Main Power Sw
F21	3.15A	DC24V	No problem in printing. Master mis-feed in master-making or confidential operation.	Loading pulse motor, Loading fan, Storage fan, Thermal pressure motor, Cutter motor, Write pulse motor
F22	3.15A	DC24V	[T2: Call Service], Paper feed jam, Master removal error	M.-Rmv. vertical transport motor, Master removal solenoid, Separation fan, Pressure solenoid, Paper feed clutch, Elevator motor, Lock solenoid, Inking motor, Counters, Drum home position lamp
F23	1A	DC24 – 18V	Paper receiving jam	Suction fan
F24	8A	DC24V	[T1: Call Service]	Main Motor
F25	3.15A	DC+12V	[T4: Call Service]	Various sensors
F26	3.15A	DC-12V	No LCD indication	
F27	5A	DC5V	No Background light in LCD panel & No Print quantity indication	
F28	5A	DC5V	No power except for Suction fan	
F29	3.15A	DC24V		For optional equipments
F30	3.15A	DC24V	[T5: Call Service]	Clamp motor, Clamp solenoid, Print positioning motor, Pressure control motor, Read pulse motor, Original feed solenoid

DESCRIPTION OF PCBs

7. Power Supply PCB

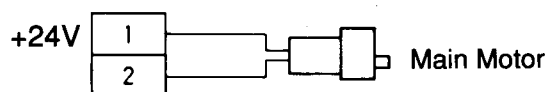
CN1

4 pins



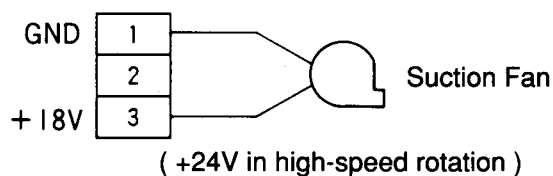
CN2

2 pins



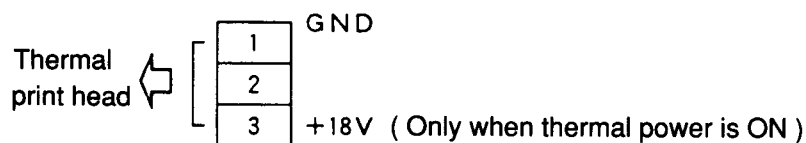
CN3

3 pins



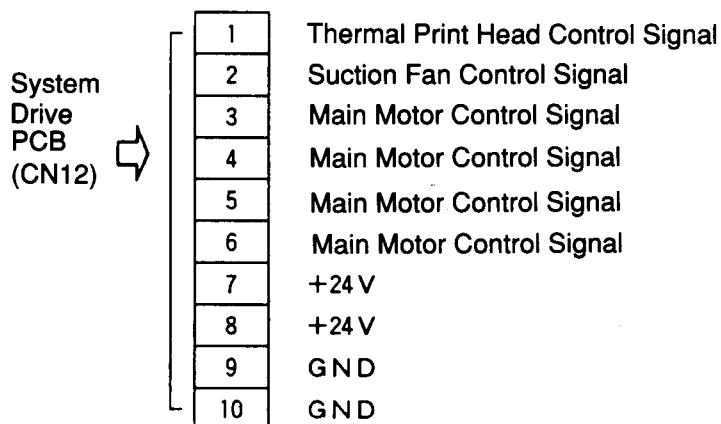
CN4

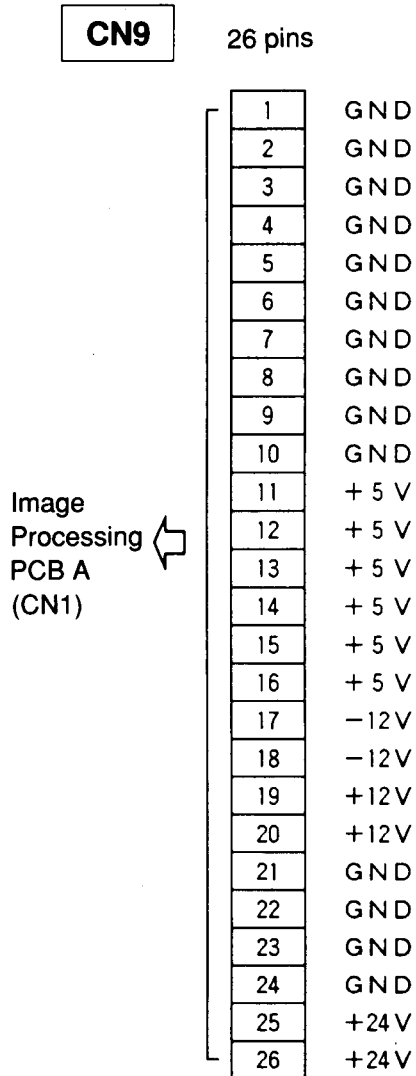
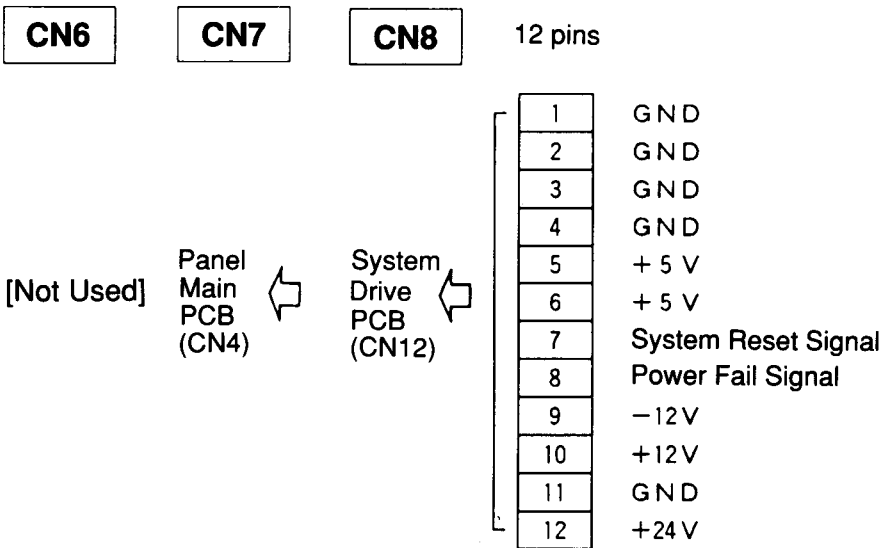
3 pins



CN5

10 pins





RC5800

TECHNICAL MANUAL

VERSION 1.2
JULY, 1991

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— PREFACE —

This manual provides Technical Service Information for RISOGRAPH Model RC5800 duplicators, which you are kindly advised to use together with "RC4500/5600/5600D Technical Manual".

This manual is published as a reference guide for use by RISO Group (RISO Kagaku Corp./RISO, INC./RISO EUROPE Ltd.) Certified Technical Representatives experienced in duplication for repair.

This manual also provides procedures for removing and installing major components, and following these procedures will minimize machine malfunctions. This information and format will also increase technical representatives' awareness and experience regarding repairs necessary to insure end-user satisfaction.

If in need, please contact the followings. _____

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Technical Department, International Division
2-20-15 Shimbashi, Minato-ku, Tokyo 105, Japan
TEL: (03)3572-8531 FAX: (03)3571-6224 TELEX: 252-2298RISO J

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1230 High Road, Whetstone, London N20 0LH, United Kingdom
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[RISO, INC.]

NOTE: Before attempting to correct machine malfunctions, study the Technical Manual and make sure all questions and/or concerns have been satisfied.
If necessary, please use the Technical Hotline:

TECHNICAL HOTLINE

800-777-9877

(Technical Help Information only)

REFERENCE	ADDRESSES	FOR
A	RISO, INC. 300 Rosewood Drive, Suite 210 Danvers, MA 04923	Correspondence and Technical Training
B	RISO, INC. REPAIR DEPT. 310 Andover Street Danvers, MA 01923	Repairs and Warranty Claims

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I. SPECIFICATIONS

II. IMAGE SCANNING SECTION

[Mechanical Overview]

[Theory of Operation]

[Removal Procedures & Precautions for Installation]

[Adjustment Procedures]

III. ADF 5800

[Mechanical Overview]

[Theory of Operation]

[Removal Procedures & Precautions for Installation]

[Adjustment Procedures]

IV. DATA

1. Test Mode
2. ADF 5800 Test Mode
3. Advice Displays & the Conditions for Display
4. Description of PCBs

APPENDIX

- Integral Circuit Diagram

CAUTION

[Handling of Lithium Battery]

- **Never fail to follow the following instructions when you discard the used lithium battery.**

1. Never let the battery short-circuited.

If the (+) and (–) terminals contact each other or metal materials, the battery will be short-circuited. If the batteries are collected and stored in disorderly or one upon another, the above-mentioned case will occur.

- DANGER -

If the battery is short-circuited, it will heat up and may in some case explode into fire.

2. Never heat up the battery.

- DANGER -

If you heat the battery up to more than 100°C or put it into the fire, it may burn dangerously or explode.

3. Never disassemble the battery or press it into deformation.

- DANGER -

If you disassemble the battery, the gas pouring out of the inside may hurt your throat or the negative lithium may heat up into fire.

If the battery is pressed into deformation, the liquid inside may leak out of the sealed part or the battery may be short-circuited inside and explode.

4. Never fail to keep the battery out of reach of children.

If you put the battery within reach of children, they may swallow it down.

Should they swallow the battery, immediately consult the doctor.

[Replacement of the Lithium Battery]

- 1. The lithium battery must be replaced by a trained and authorized service technician.**
- 2. The battery must be replaced only with the same or equivalent type recommended by the manufacturer.**
- 3. Discard used batteries according to the manufacturer's instructions.**

I. SPECIFICATIONS

CONTENTS

1. RC5800	I-1
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3. ADF 5800	I-4
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1. RC5800

- Master-making system: High-speed Digital Scanning and Thermal Screening system
- Printing system: Automatic Stencil Duplicating system
- Image scanning system: Flat-bed, Scanner-moving system
- Original type: Books & sheets
- Original size: Maximum/A3(297mm x 431mm)size(11.7" x 17")
Minimum/Business card(55mm x 90mm)size(2" x 3.5")
- Paper size: Maximum/A3(297mm x 431mm)size(11.7" x 17")
Minimum/A6(100mm x 148mm)size(4" x 5.8")
- Paper weight: Maximum/210 g/m² (115.8 lbs Index)
Minimum/46 g/m² (12.4 lbs Bond)
- Print area: Legal Drum/208 x 350 mm(8.2" x 13.7")
A4 Drum/208 x 290 mm
B4 Drum/245 x 350 mm
- Print speed: Selectable/5-speed positions
(60,80,100,120,130 copies/min.)
- First copy time: A4 (8.3" x 11.7") original size/About 30 sec. (size-to-size)
- Print position adjustment: Vertical positioning/±20 mm
Horizontal positioning/±20 mm
[±5 mm for A3 (11.7" x 17") paper]
[±10 mm for A6 (4" x 5.8") paper]
- Scanning resolution: 400 dots/inch
Line and photograph modes changeable
- Maximum paper capacity: 1000 sheets
[Based on 64 g/m² (17 lbs Bond) paper]

- Machine dimensions:
 - In storage/ 650(W)x660(D)x617(H)mm
25.6" x 26" x 24.3"
 - In use/ 1295(W)x660(D)x617(H)mm
51" x 26" x 24.3"
 - [With ADF 5800]-**
 - In storage/ 670(W)x685(D)x695(H)mm
26.4" x 27" x 27.4"
 - In use/ 1295(W)x685(D)x695(H)mm
51" x 27" x 27.4"
- Machine weight:
 - 95 kg (209 lbs)
 - [With ADF 5800]-**
 - 110 kg (243 lbs)
- Power requirements:
 - 220 to 240 VAC, 50/60 Hz, 3A
 - 90 to 132 VAC, 50/60 Hz, 3.5A
- Reduction/Enlargement percentages:
 - Size-to-size/ 100%
 - Reduction/ (U.S.) 96%,77%,74%,64%
95%,87%,82%,71%
 - Enlargement/ (U.S.) 121%,127%,141%
116%,122%,141%
- Original mode selection:
 - Line-copy, Photograph, Dot-photo, Sharpen-image,
Margin erasing, Shadowed book-center erasing
- Print density control:
 - 5 steps
- Auxiliary function:
 - Confidential, Two-up function, Memory program,
Automatic idling, Automatic printing, Automatic contrast
control, Computer interface, Integrated sorter control
 - Option -**
 - ADF, Digitizer
- Liquid crystal display:
 - 240 x 64 dot graphic display with self-diagnosis function)
- Color change:
 - Cartridge-type drum replacement
 - 6 colors/black, red, blue, green, brown and yellow

2. Supplies

(1) Ink:

Risograph RC Ink (Emulsion type)

- Capacity: 1000 cc
- Ink bottle: Cylinder following piston method
- Color: 6 color/ black, red, blue, green, brown, and yellow
- Ink package unit: Two bottles per box, five boxes per carton

(2) Master:

Risograph RC Master 55

- Length: Approx. 100m (328 ft.)
 - Legal drum/ About 200 masters
 - A4 drum/ About 232 masters
 - B4 drum/ About 200 masters
- Width: Legal/227 mm (8.9")
 - A4/ 227 mm
 - B4/ 270 mm
- Master package unit: Two master rolls per box, 10 boxes per carton

SPECIFICATIONS

3. ADF 5800
4. Optional Equipment

3. ADF 5800

- Original type: Sheets
- Original size: A3/B4/A4/A4(Wide)/B5/B5(Wide)/A5 sizes
- U.S. -
Ledger/Legal/Letter/Statement
- Maximum original capacity: 50 sheets
[Based on 64 g/m² (17 lbs Bond) paper]
- Original paper weight: 50 g/m² to 128 g/m² (13 lbs to 34 lbs)

4. Optional Equipment

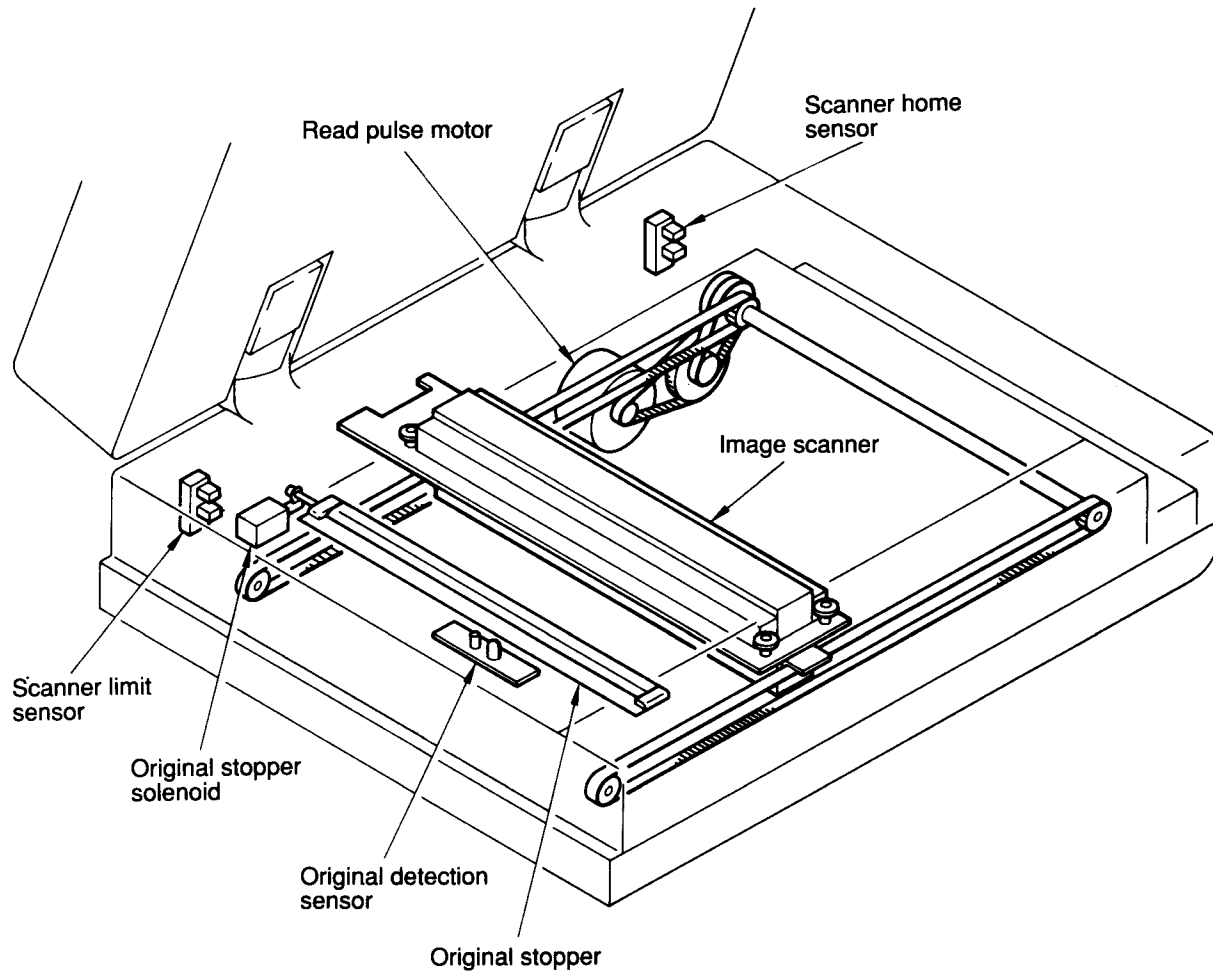
- ADF 5800
- Digitizer 5800
- RCI Board - For computer interface
- Job Separator
- Key/Card Counter
- RC Sorter
- Color Drum (6 colors - including "black")

II. IMAGE SCANNING SECTION

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8. Sensitivity of Original Detection Sensor	II-19
9. Thermal Power of Thermal Print Head	II-20

[Mechanical Overview]



Part name	Function
Read pulse motor	Moves the Image scanner to the left or right via belts in scanning operation.
Original stopper solenoid	Releases the Original stopper when using ADF to feed out a fed-in original after the original scanning finishes.
Image scanner	Scans an original placed on the Stage glass, moving below it.
Original detection sensor	Checks if an original is placed on the Stage glass.
Scanner home sensor	Checks the position of the Image scanner.
Scanner limit sensor	Same as above

[Theory of Operation]

1. Image Scanner Home Positioning System (Initialization)

- Checking the position of Image Scanner

When the power is turned ON, the position of the Image scanner is checked by the Scanner home sensor and Scanner limit sensor.

When the Scanner home sensor is activated, the Image scanner is ready to scan an original.
(The scanning operation can be started by pressing "Start" button on the operation panel.)

- Home Positioning Process

1) When the Scanner home sensor is open (not activated) and that of the Scanner limit sensor is activated; the Read pulse motor rotates clockwise to shift the Image scanner in the direction of <1> until the Scanner home sensor has been activated.

2) When both the Scanner home sensor and Scanner limit sensor are open (not activated); the Read pulse motor rotates counter-clockwise to shift the Image scanner in the direction of <2>. ➡

Then if the Scanner home sensor has been activated **within 315 pulses** after the Read pulse motor started, the Read pulse motor stops to set the Image scanner ready for scanning operation.

3) Then if not, the Image scanner is judged to be positioned between the Scanner home and limit sensors, and is shifted in the direction of <1> by the clockwise rotation of the Read pulse motor. After the above, when the Scanner home sensor has been activated, the Read pulse motor stops to set the Image scanner ready for scanning operation.

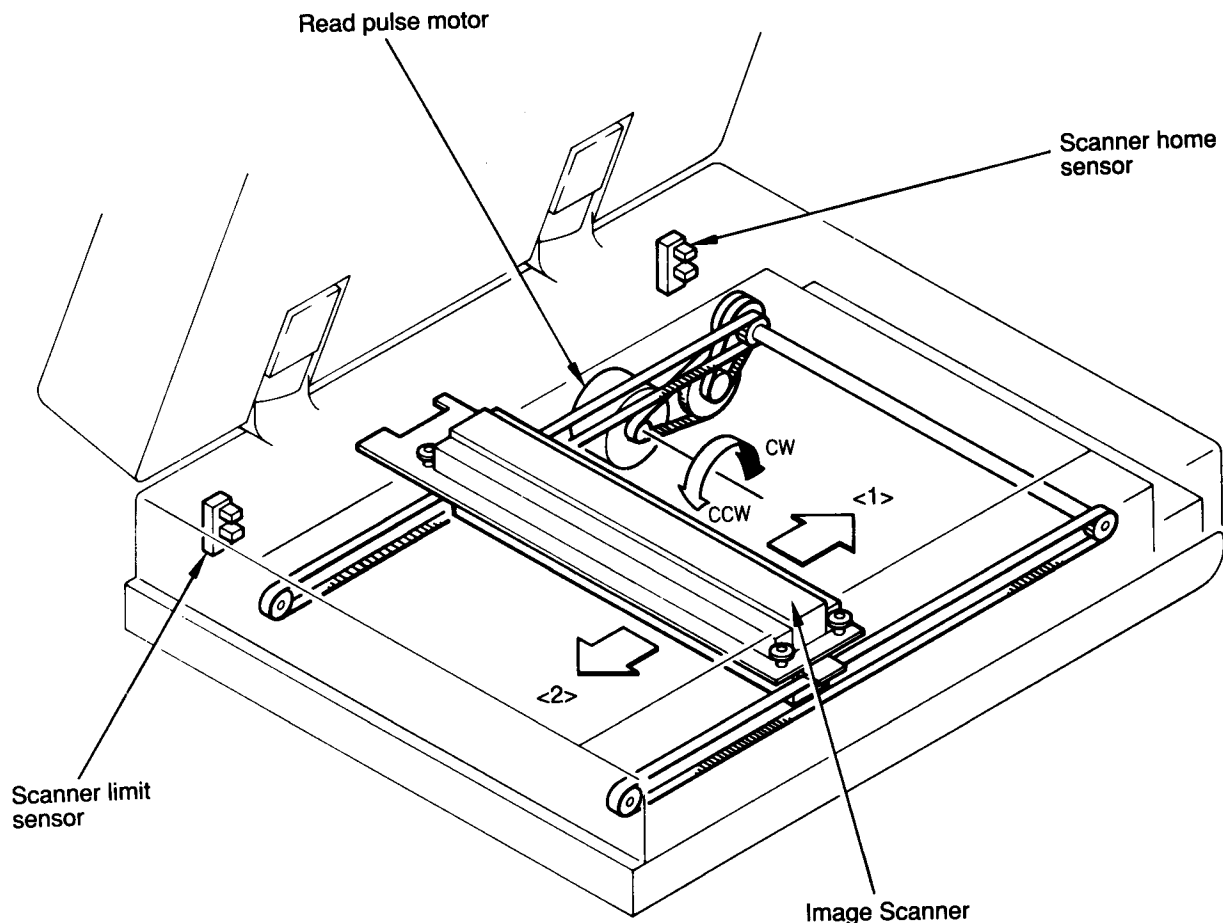
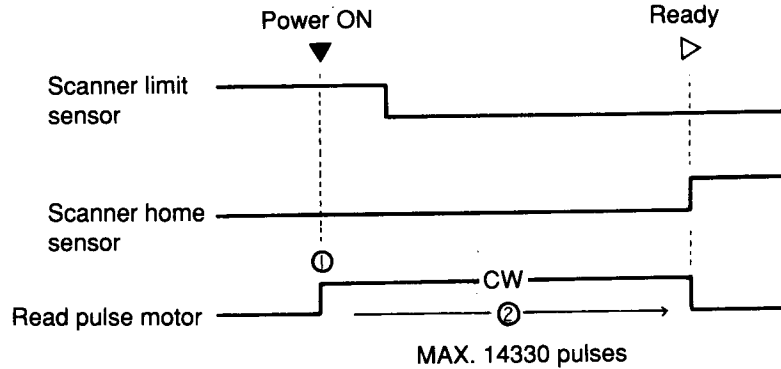
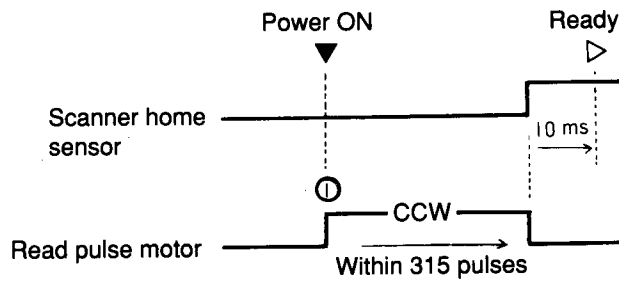


Image Scanner Home Positioning System

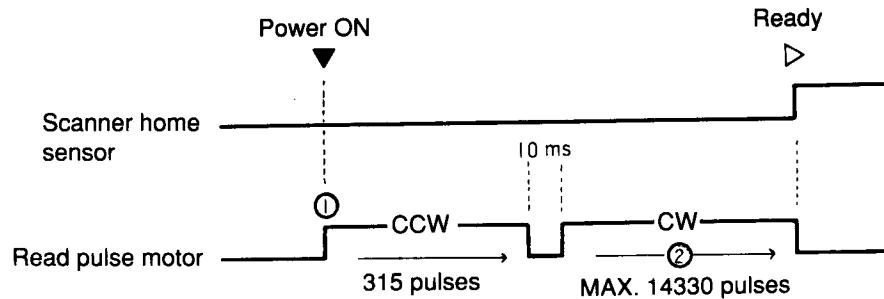
1)



2)



3)



- ① When the "Image scanner home positioning" operation is started, the message **"WAIT A MOMENT"** is displayed on the panel and the Read pulse motor starts to rotate.
- ② If the Scanner home sensor is not activated **within 14330 pulses** after the Read pulse motor started, it is assumed that the Read pulse motor is locked and the trouble message **"T15: CALL SERVICE"** is displayed on the panel.

2. Pre-scanning System (Check of Original Size)

- Lighting-up of LED arrays

When pressing "Start" button for master-making operation, the LED arrays of the Image scanner are lit up and the Thermal pressure motor rotates to lower the Thermal print head onto the Write roller.

- Shading Compensation Operation

At this time, the Read pulse motor rotates clockwise to shift the Image scanner in the direction of <1>.

When the Scanner home sensor is actuated, the Read pulse motor stops and the "shading compensation" operation is performed.

- Home Positioning of Image Scanner

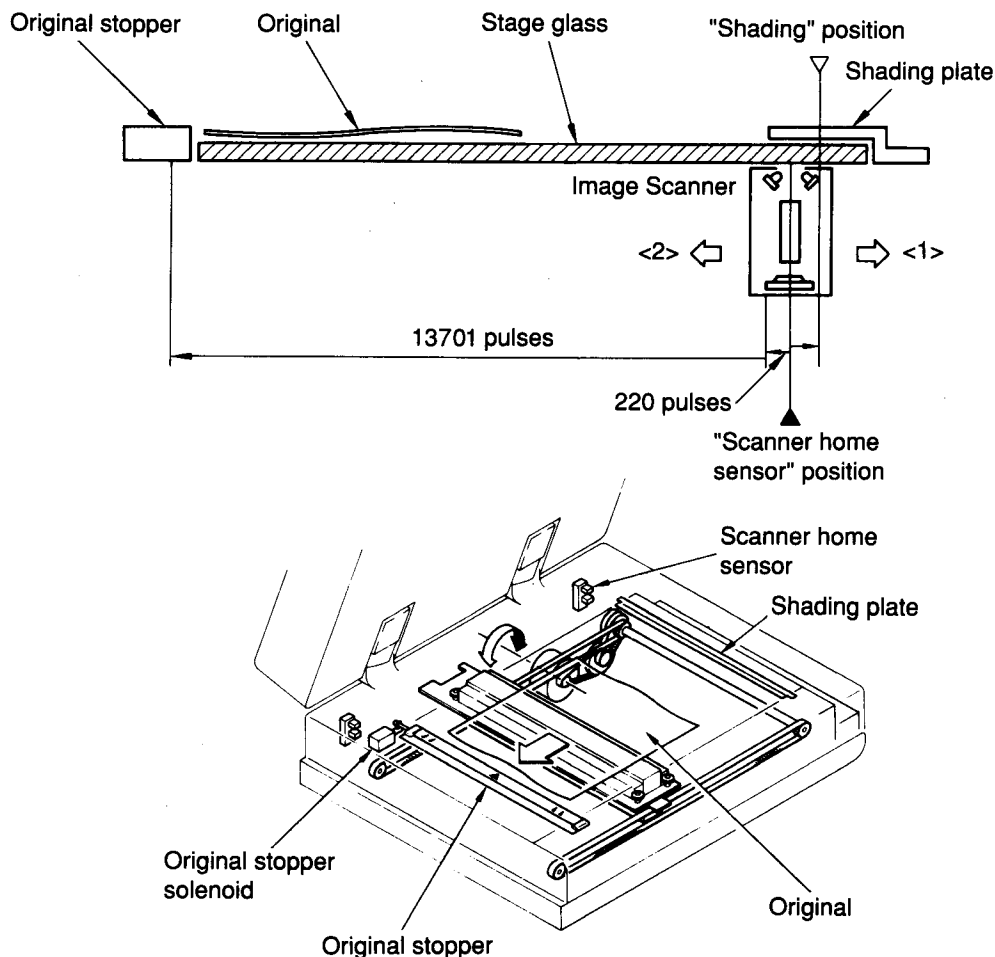
After the "shading compensation" operation is finished, the Read pulse motor rotates counter-clockwise **315 pulses** to shift the Image scanner to the home position [in the direction of <2>].

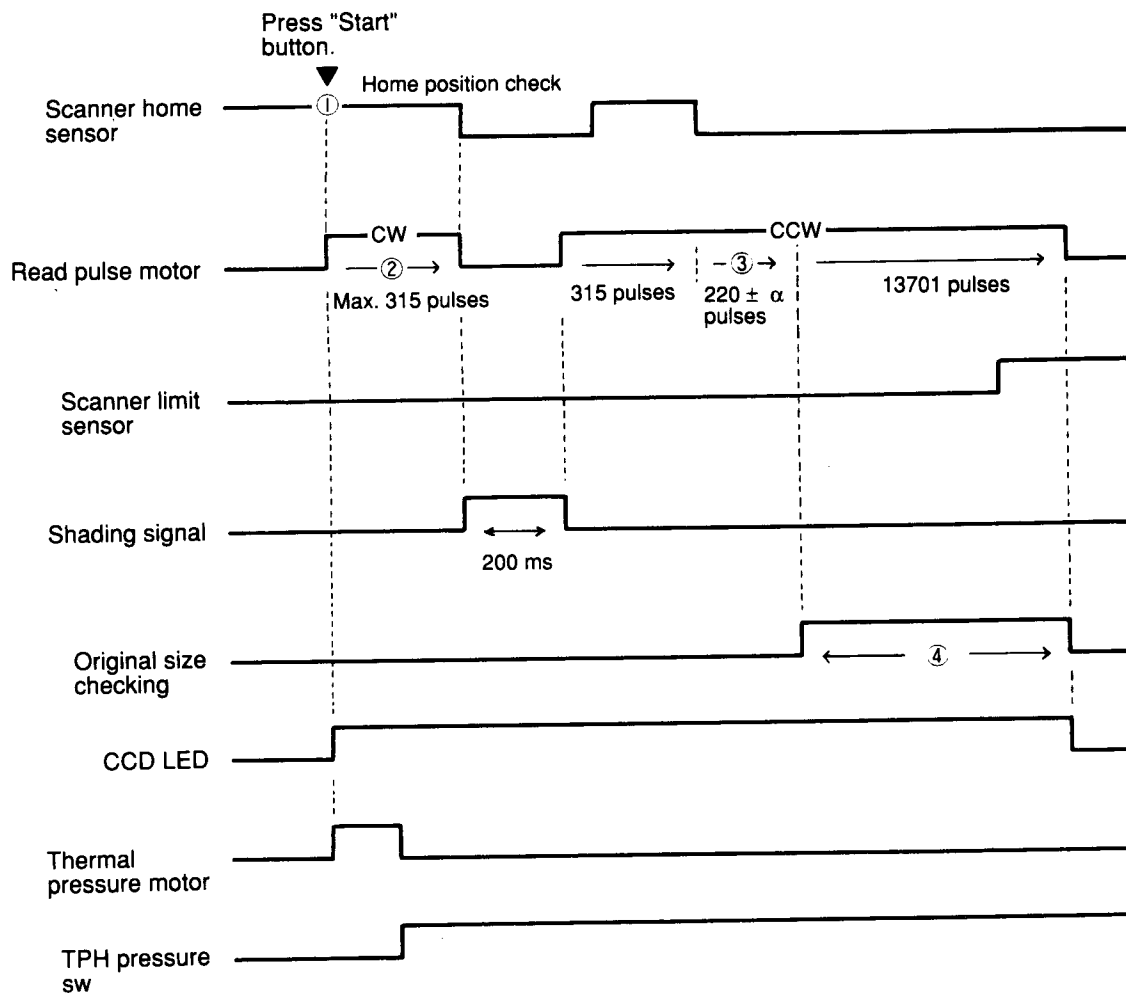
- Check of Original Size

After the Image scanner returns to the home position, the Read pulse motor rotates counter-clockwise **220 pulses** and shift the Image scanner to the start position for original size checking. Next the Read pulse motor rotates **13701 pulses** to check the size of an original placed on the stage glass with the Image scanner.

- Turning-off of LED arrays

After checking the original size, the LED arrays of the Image scanner are turned off.



Pre-scanning System

- ① When the "Start" button is pressed for master-making, the Scanner home sensor is checked. If the Image scanner is not at home, it is returned to the home position ("**Initialization**") and the original size checking ("**Pre-scanning**") is performed.
- ② If the Scanner home sensor is not opened **within 315 pulses** after the Read pulse motor started, it is assumed that the Read pulse motor is locked and the trouble message "**T15: CALL SERVICE**" is displayed on the panel.
- ③ The number of pulses can be adjusted by changing the setting of **SW2** on **Image Processing PCB (58)**.
(Refer to the page of "Scanning (Read) Start Position" adjustment.)
- ④ If no original is detected on the Stage glass in the original size checking operation, the message "**NO ORIGINAL ON THE STAGE**" is displayed on the panel.
This message is only displayed in the following original mode selections: "With margin/Normal" and "With margin/Book".

3. Image Scanning System (Original Reading)

- Image Scanning Operation

After the original size is checked in the "pre-scanning" operation, the LED arrays are lit up and the Read pulse motor rotates clockwise.

The Image scanner moves in the direction of (1), reading the original on the Stage glass.

During the "image scanning" operation, the master-making and master disposal operations are performed.

- Finish of Image Scanning

When the Image scanner reaches the tail edge of the original, the master-making operation is finished.

If the master disposal operation is completed, a newly-made master is loaded onto the drum (and the original is ejected, if the ADF is installed).

- Home Positioning of Image Scanner

After the "image scanning" operation is finished, the Image scanner returns to the home position.

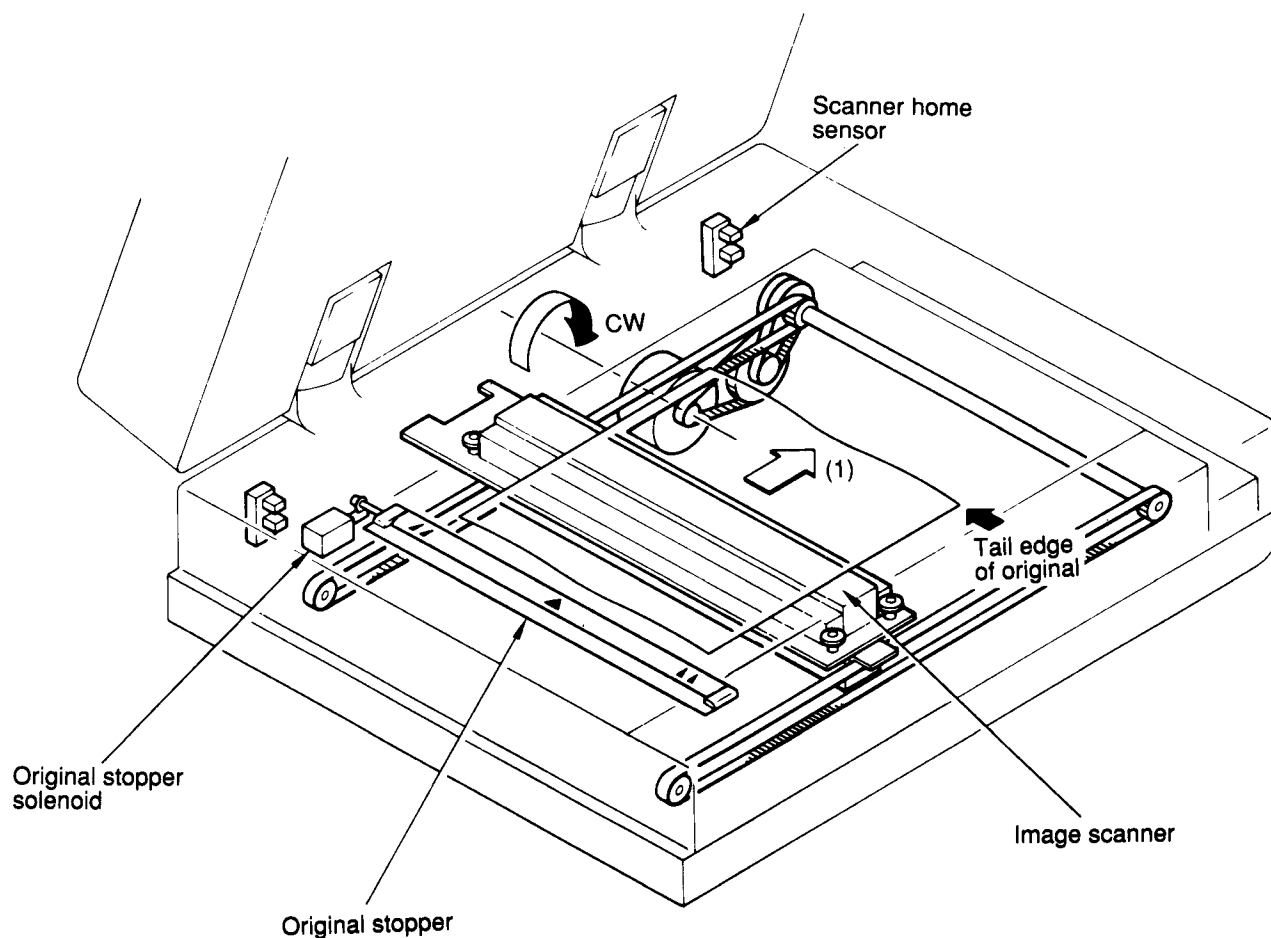
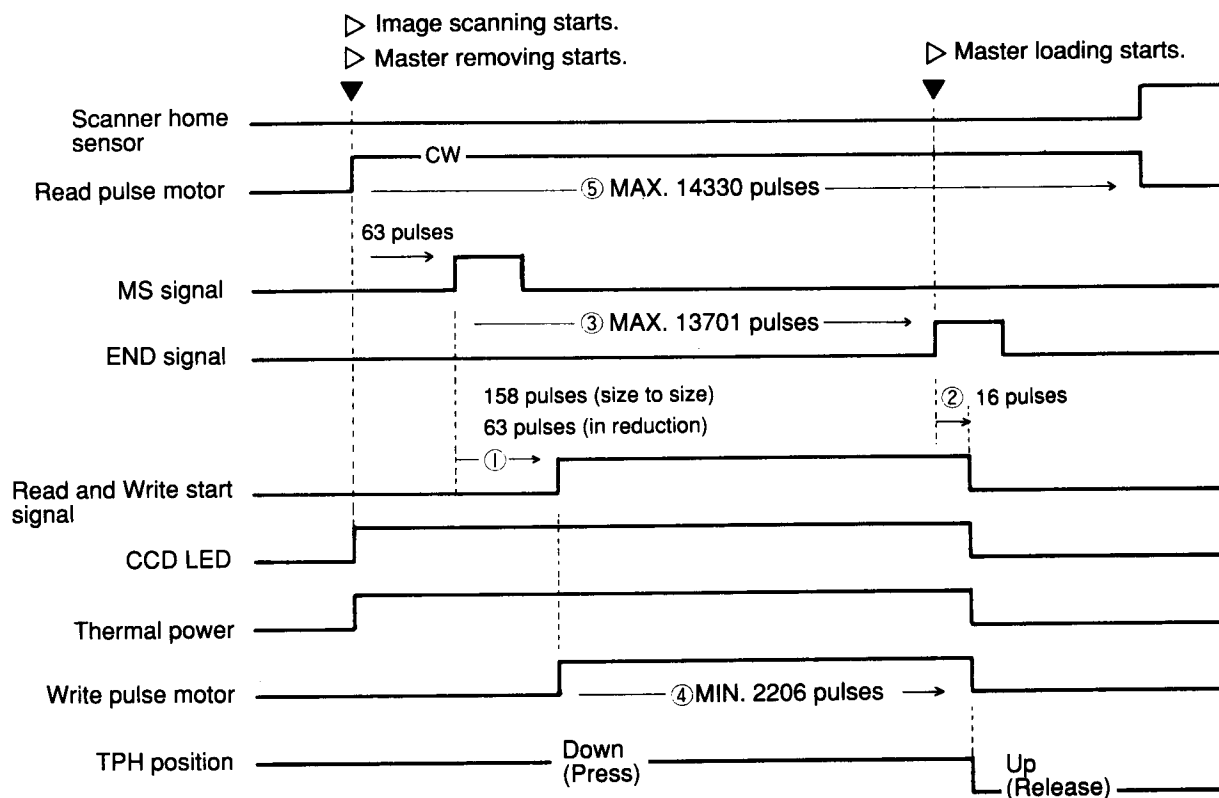


Image Scanning System



- ① In "1:1(size-to size)" or "enlargement", the master-making operation starts **158 pulses (5mm)** after the MS signal's output.
In "reduction", master-making starts **63 pulses (2mm)** after the MS signal's output.
- ② If the master disposal operation is finished when the END signal is output from the Trimming PCB, a newly-made master is loaded onto the drum.
The "Read/Write start signal" turns off **16 pulses** after the END signal's output.
- ③ If the END signal is not output **13701 pulses** after the MS signal's output, the master-making operation is finished and a newly-made master is loaded onto the drum.
- ④ If the END signal is output **within 2206 pulses** after the Write pulse motor started, a newly-made master is not loaded onto the drum but the Write pulse motor rotates further **2206 pulses** to feed a master into the master stocker.
If the END signal is not output within the "pre-selected" pulses, the master-making operation is finished and a newly-made master is loaded onto the drum.
(The "pre-selected" pulses are set according to the selection of the "paper size" on the operation panel.)
- ⑤ If the Image scanner has not been returned to the home position (the Scanner home sensor) by **14330 pulses** after the Read pulse motor started, it is judged that the Read pulse motor is locked and the trouble message "**T15: CALL SERVICE**" is displayed on the panel.

[Note]

- MS Signal : the signal which starts the master-making operation and is output from the **Image processing PCB(58)**.
- END Signal : the signal which indicates the tail edge of the original detected in the pre-scanning operation and is output from the **Trimming PCB**.

REMOVAL & INSTALLATION

1. Image Scanner Table

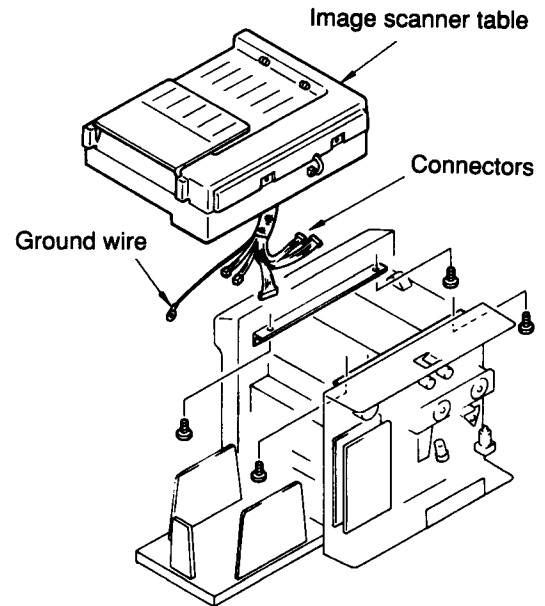
2. Stage Glass

[Removal Procedures & Precautions for Installation]

1. Image Scanner Table

- Removal Procedures -

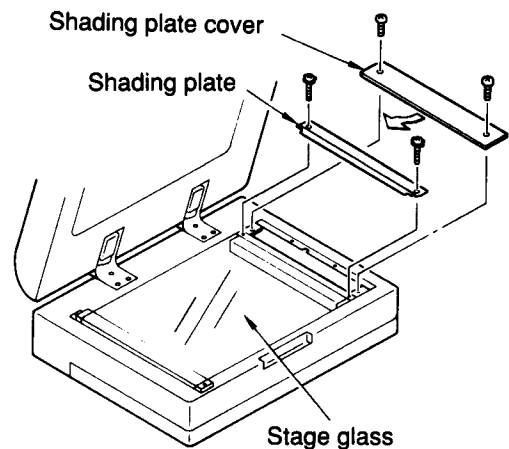
- 1) Remove the Back cover.
 - 2) Disconnect 5 connectors and 1 ground wire coming out of the Image scanner table.
 - 3) Remove 4 mounting screws which attach the Image scanner table onto the Table guide rails from below.
 - 4) Take the table out of the machine by holding it up.
- * Be careful not to let the wire harnesses be caught in the machine when taking out the Image scanner table.
 - * Be careful not to mis-connect the connectors when installing because there are connectors with the same pin-number.



2. Stage Glass

- Removal Procedures -

- 1) Remove 2 mounting screws on the Shading plate cover.
- 2) Remove the Shading plate cover by holding it up a little and shifting it to the direction indicated by an arrow in the figure.
- 3) Remove the Shading plate by removing 2 mounting screws on it.
- 4) Take the Stage glass out of the Image scanner table slowly.



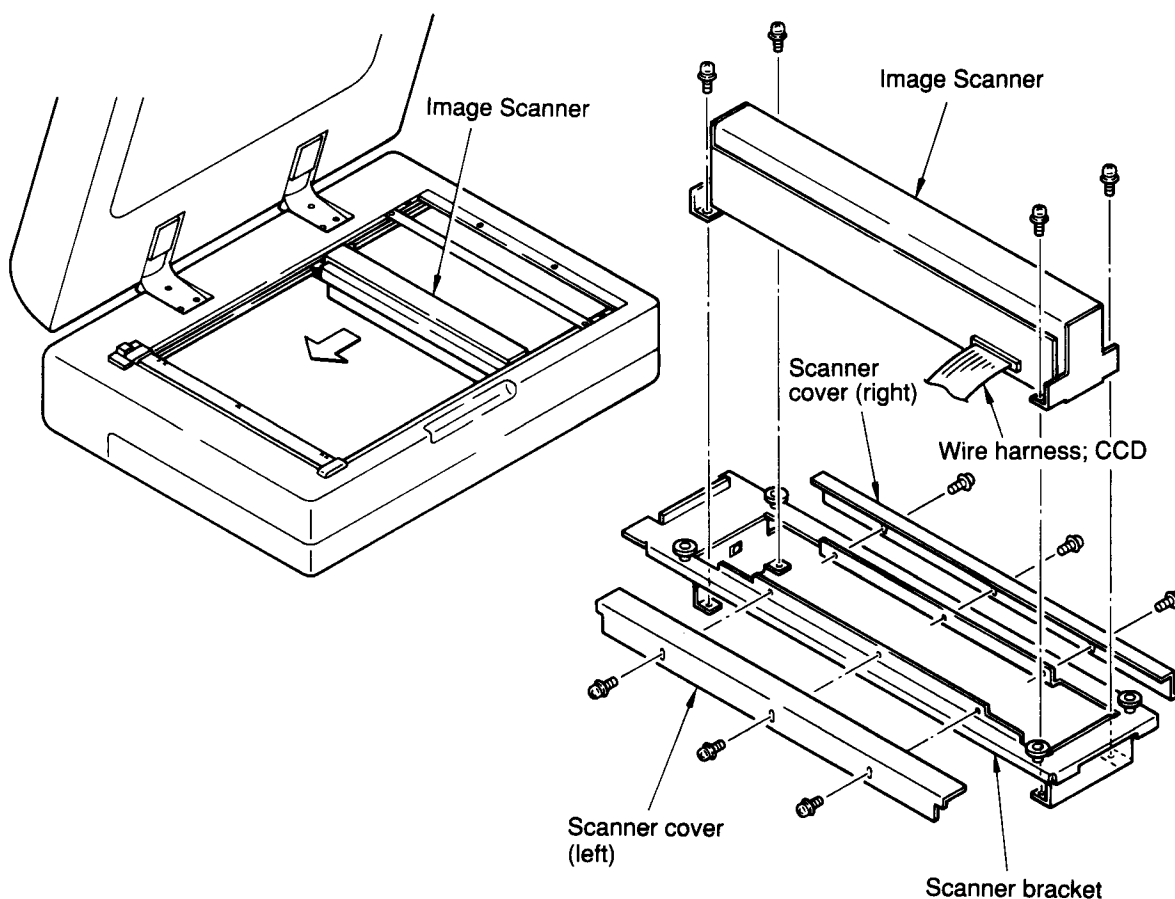
3. Image Scanner Unit

- Removal Procedures -

- 1) Remove the Stage glass. (Refer to the previous page.)
- 2) Shift the Image scanner slowly in the direction indicated by an arrow in the figure below and locate the Image scanner in the center.
- 3) Remove the Scanner cover (right) and Scanner cover (left) from the Scanner bracket by removing 3 fixing screws for each.
- 4) Remove 4 mounting screws which hold the Image scanner onto the Scanner bracket.
- 5) Disconnect the connector going into the Image scanner and lift the Image scanner slowly out of the Scanner bracket.

[Note]

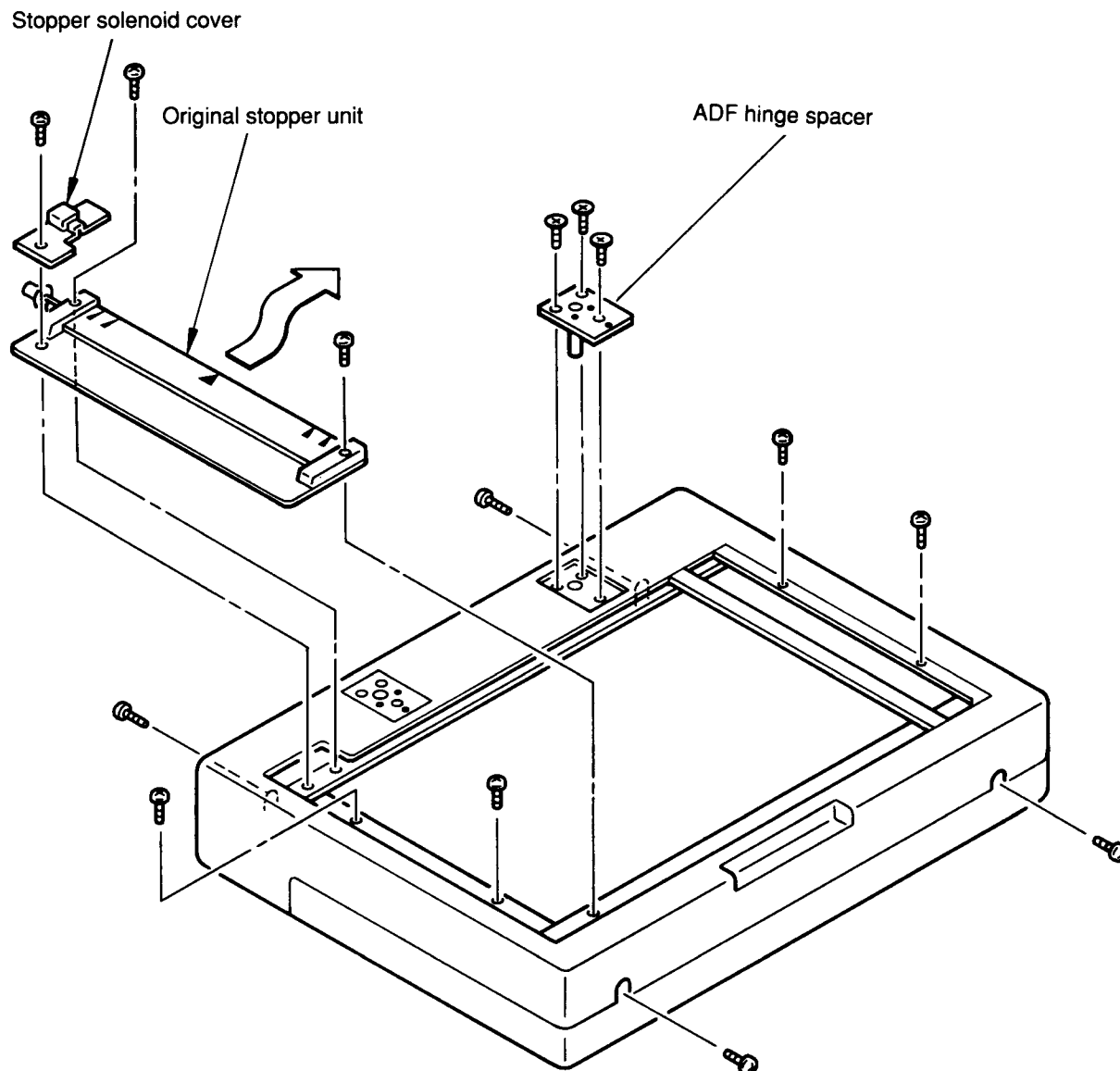
Be careful not to shift the Image scanner quickly; it may cause the belt to slip.



4. Scanner Table Cover

- Removal Procedures -

- 1) Remove the Stage cover (or the ADF) and Stage glass.
(Refer to pages II-8 & III-6.)
- 2) Remove 3 mounting screws which hold the Original stopper unit and Stopper solenoid cover onto the Image scanner table.
Remove the Original stopper unit and Stopper solenoid by holding them up and shifting them to the direction indicated by an arrow in the figure.
- 3) Remove the ADF hinge spacers (2 pcs.) from the Scanner table cover.
- 4) Remove 8 mounting screws on the Scanner table cover, and remove the cover.



5. Image Processing PCBs

[Image Processing PCB(58), Trimming PCB & ACC PCB]

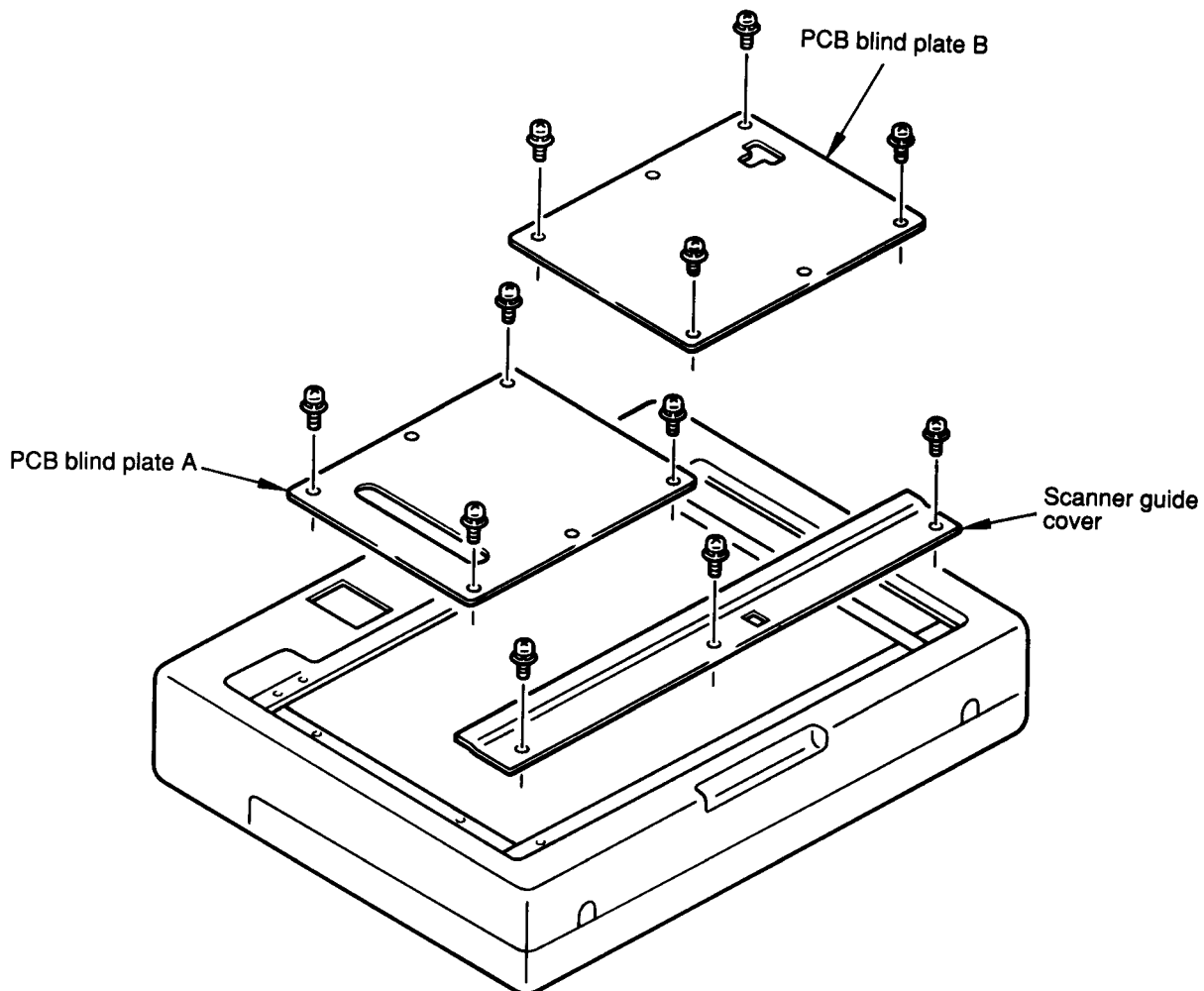
- Removal Procedures -

- 1) Remove the Shading plate cover, Stage glass and Original stopper unit.
(Refer to pages II-8 & 9.)
- 2) Disconnect the connector of the wire harness coming from the Image scanner.
- 3) Remove 11 mounting screws on the PCB blind plate A, PCB blind plate B and Scanner guide cover, and remove the plates and cover.
- 4) Disconnect all connectors on the Image processing PCBs, and remove all mounting screws on the PCBs.

Then take out the PCBs from the Image scanner table carefully.

[Note]

Be careful not to catch the wire harness coming from the Image scanner when removing the Scanner guide cover.



[Adjustment Procedures]

1. Tension of Read Pulse Motor Belt

- Check & Adjustment -

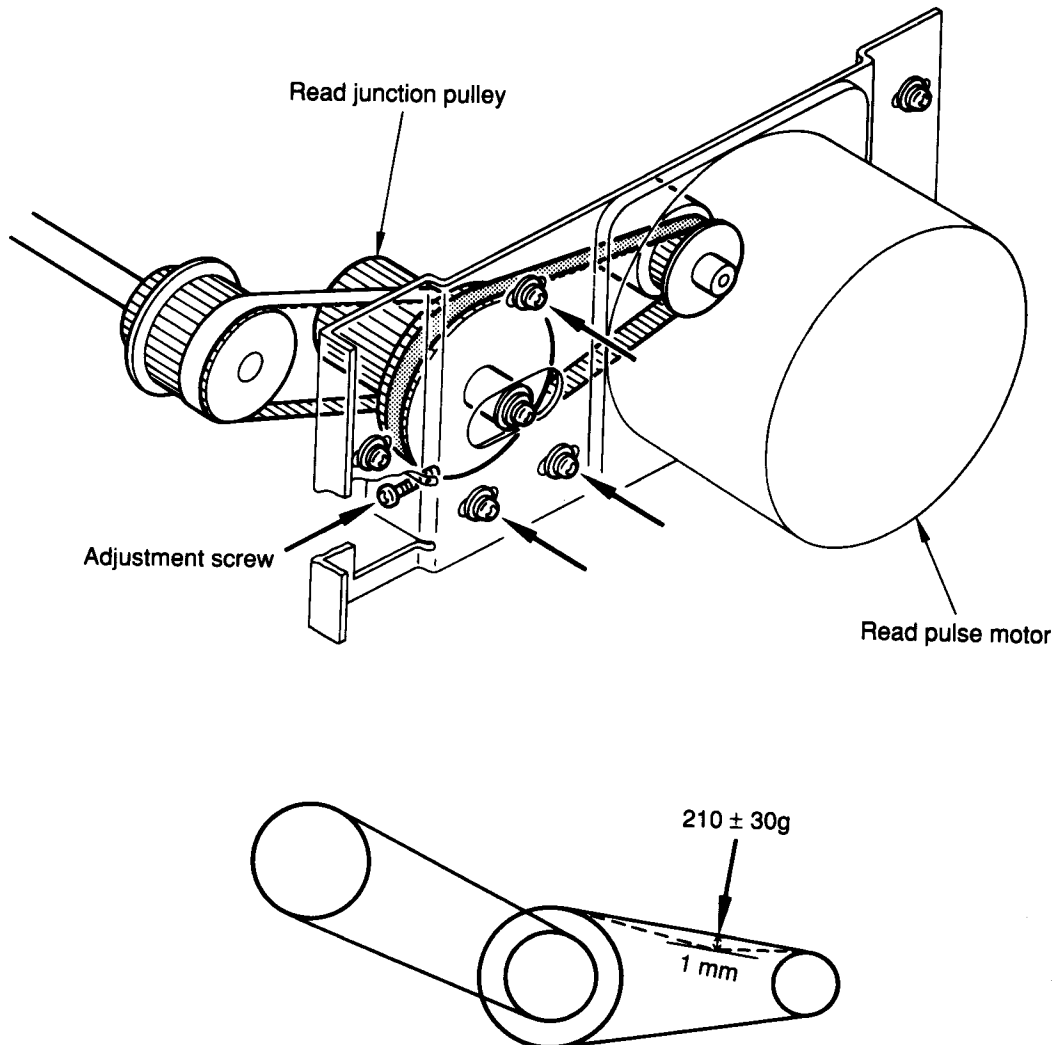
- 1) Remove the Scanner table cover and check the tension of the Read pulse motor belt. The tension should read $210 \pm 30\text{g}$ on the tension gauge when pushing the tension gauge down 1mm in the middle of the belt.
- 2) If the tension is incorrect, loosen the 3 mounting screws on the Read junction pulley and adjust the pulley for proper tension with the adjustment screw.

[Note]

After adjusting the tension of the Read pulse motor belt, always adjust the tension of the Read junction pulley belt.

- Results of Misadjustment -

- 1) If the tension is not adjusted correctly; \Rightarrow the belt may vibrate in rotation causing noise or/and jumping, which could result in deformed or/and missing images on printed copies due to irregular movement of the Image scanner.

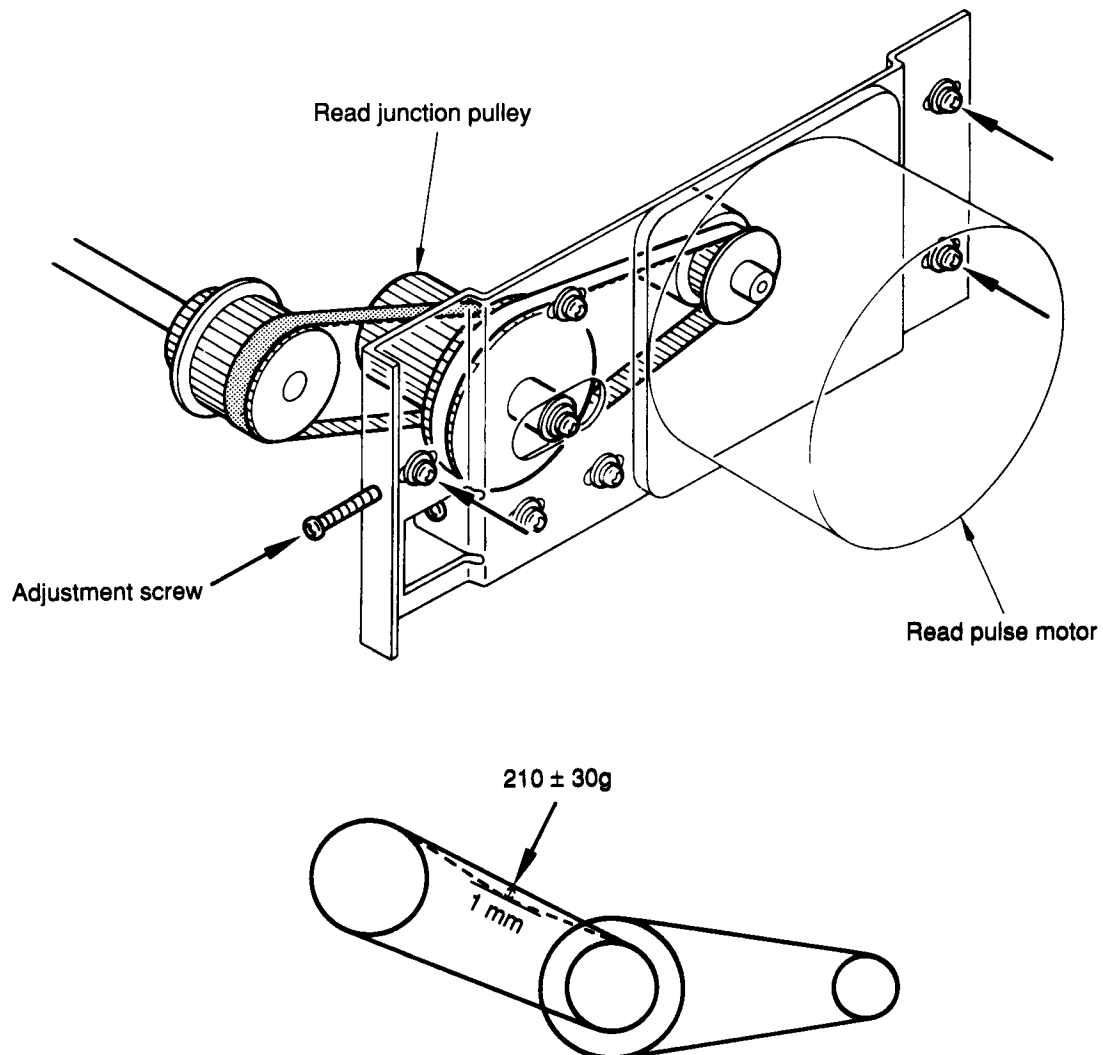


2. Tension of Read Junction Pulley Belt**- Check & Adjustment -**

- 1) Remove the Scanner table cover and check the tension of the Read junction pulley belt. The tension should read $210 \pm 30\text{g}$ on the tension gauge when pushing the tension gauge down 1mm in the middle of the belt.
- 2) If the tension is incorrect, loosen the 3 mounting screws on the Read pulse motor bracket and adjust the bracket for proper tension with the adjustment screw.

- Results of Misadjustment -

- 1) If the tension is not adjusted correctly; \rightarrow
the belt may vibrate in rotation causing noise or/and jumping, which could result in deformed or/and missing images on printed copies due to irregular movement of the Image scanner.



ADJUSTMENT PROCEDURES

3. Position of Scanner Driving Belt

- Procedure -

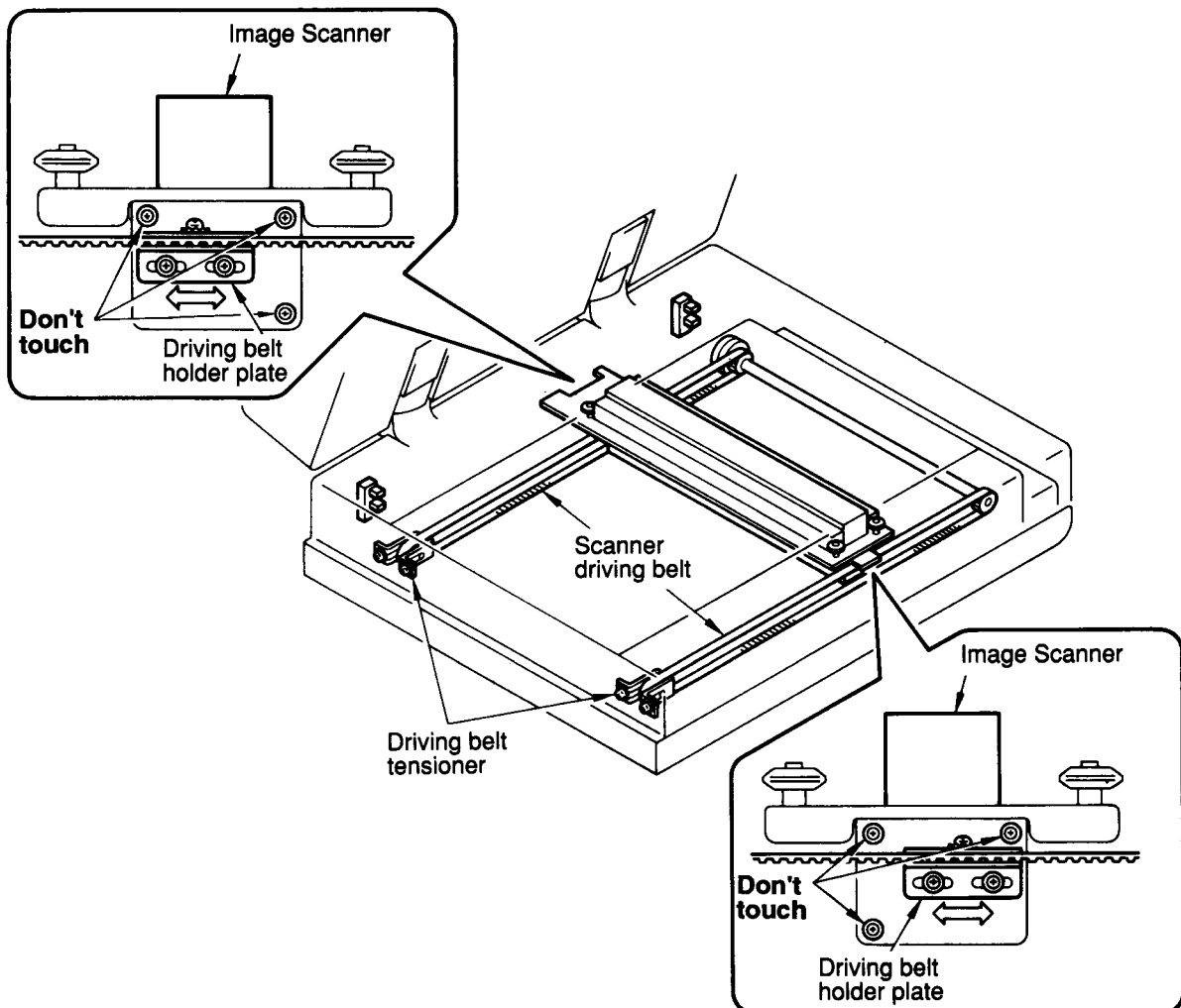
- 1) Remove the Scanner table cover.
- 2) Shift the Image scanner to the position indicated in the figure below.
Loosen the screws on the Driving belt holder plates (on the front and rear sides).
The screws can be accessed from the open part of the Scanner bracket.
- 3) Adjust and tighten the Driving belt holder plates so that the Image scanner can be moved smoothly without vibrating when rotating the Scanner driving belt.

[Note]

If the Driving belt holder plates (on the front and rear sides) are not aligned straight (looking from the front), loosen the mounting screws on the Driving belt tensioner and manually rotate the belt so that the holder plates can be aligned straight.

- Results of Misadjustment -

- 1) If the Image scanner is not adjusted properly ; ➡
the Image scanner vibrates during the Scanner driving belt rotation, which could result in blurred images on printed copies.



4. Position of Image Scanner Unit

- Check & Adjustment -

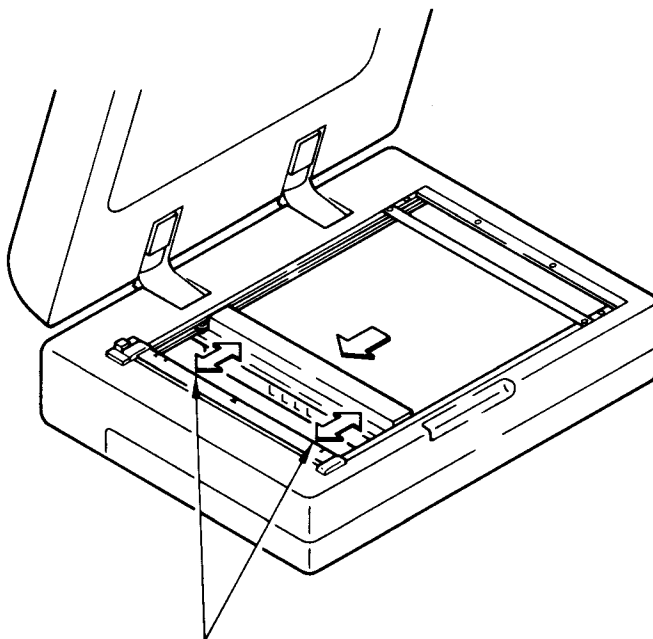
- 1) Remove the Stage glass.
- 2) Shift the Image scanner to the direction indicated by an arrow in the figure 1 below, and remove the Scanner cover (left) and Scanner cover (right).
- 3) Shift the Image scanner close to the Original stopper.
Check if the Image scanner is parallel with the Original stopper.
- 4) If the Image scanner is not parallel with the Original stopper, loosen the 4 mounting screws and adjust the position of the Image scanner. (See the figure 2 below.)
When adjusting the Image scanner, always position the Image scanner as close to the Original stopper as possible.

[Note]

If the Image scanner position adjustment is made to the Image scanner, always adjust the Scanning (Read) start position as well. (Refer to page II-18.)

- Results of Misadjustment -

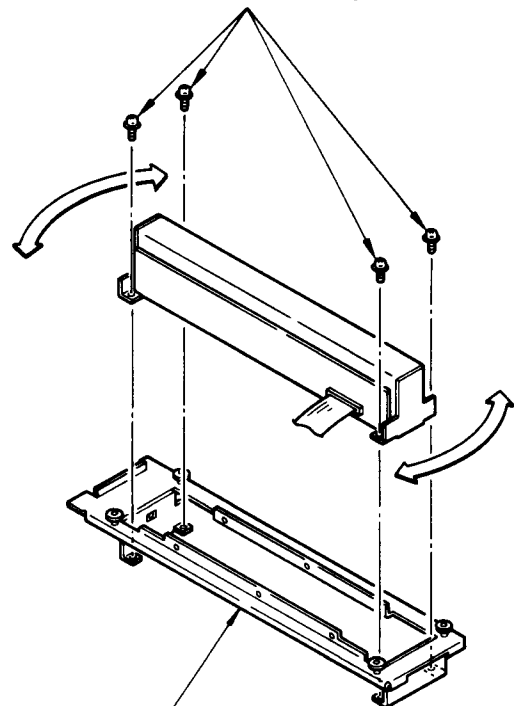
- 1) If the Image scanner is not parallel with the Original stopper ; ➡
slanting images appear on printed copies.



Install the Image Scanner so that it can be parallel with the Original stopper.

[Figure 1]

Loosen these screws to adjust the installation position of the Image Scanner.



Scanner bracket

[Figure 2]

ADJUSTMENT PROCEDURES

5. Position of Stage Glass

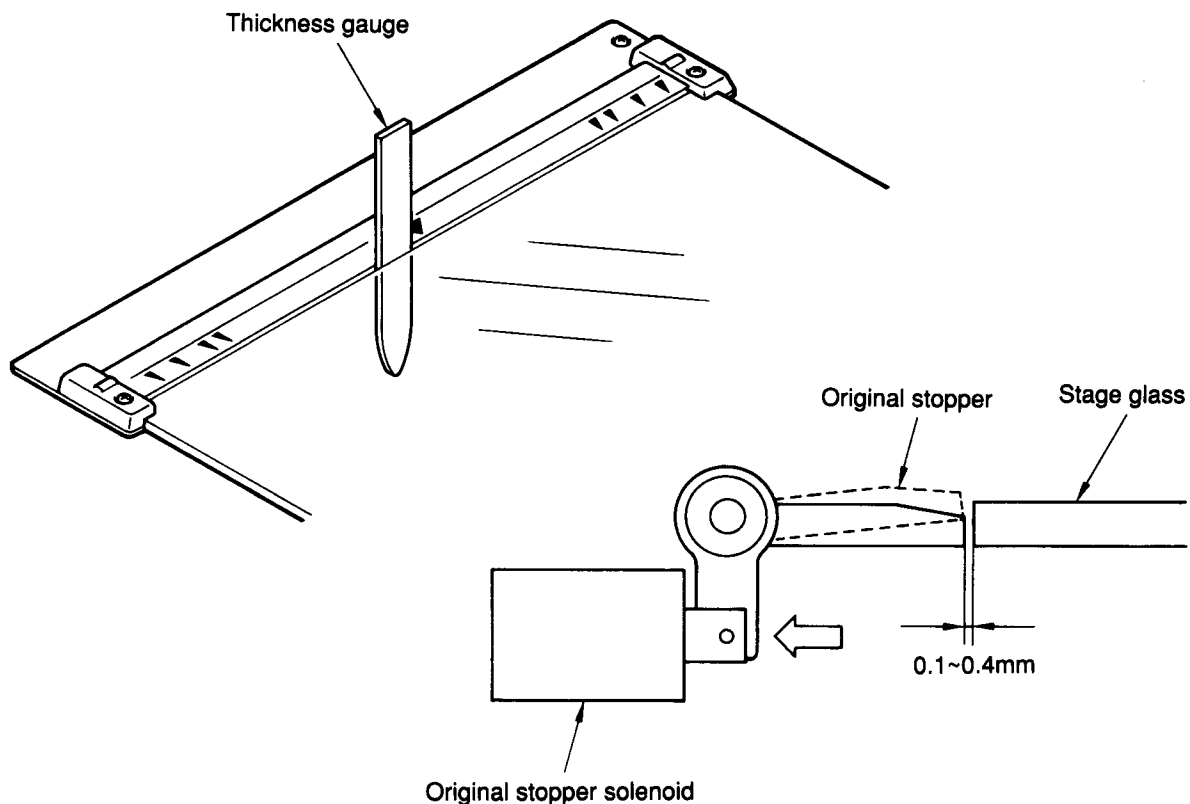
5. Position of Stage Glass

- Procedure & Check -

- 1) Remove the Shading plate cover and Shading plate from the Image scanner table.
- 2) Insert a feeler (thickness) gauge between the Stage glass and Original stopper, and adjust the position of the Stage glass. The gap between the Stage glass and Original stopper should be **0.1 to 0.4 mm**.
Check if the Stage glass is parallel with the Original stopper.
- 3) After adjustment, install the Stage glass with the Shading plate.
- 4) Check for mechanical binds of the Original stopper in Test mode **No.56**.

- Results of Misadjustment -

- 1) If the Stage glass binds with the Original stopper ;
the Original stopper prevents the ejection of a fed-in original in the ADF operation, causing the original ejection jam.



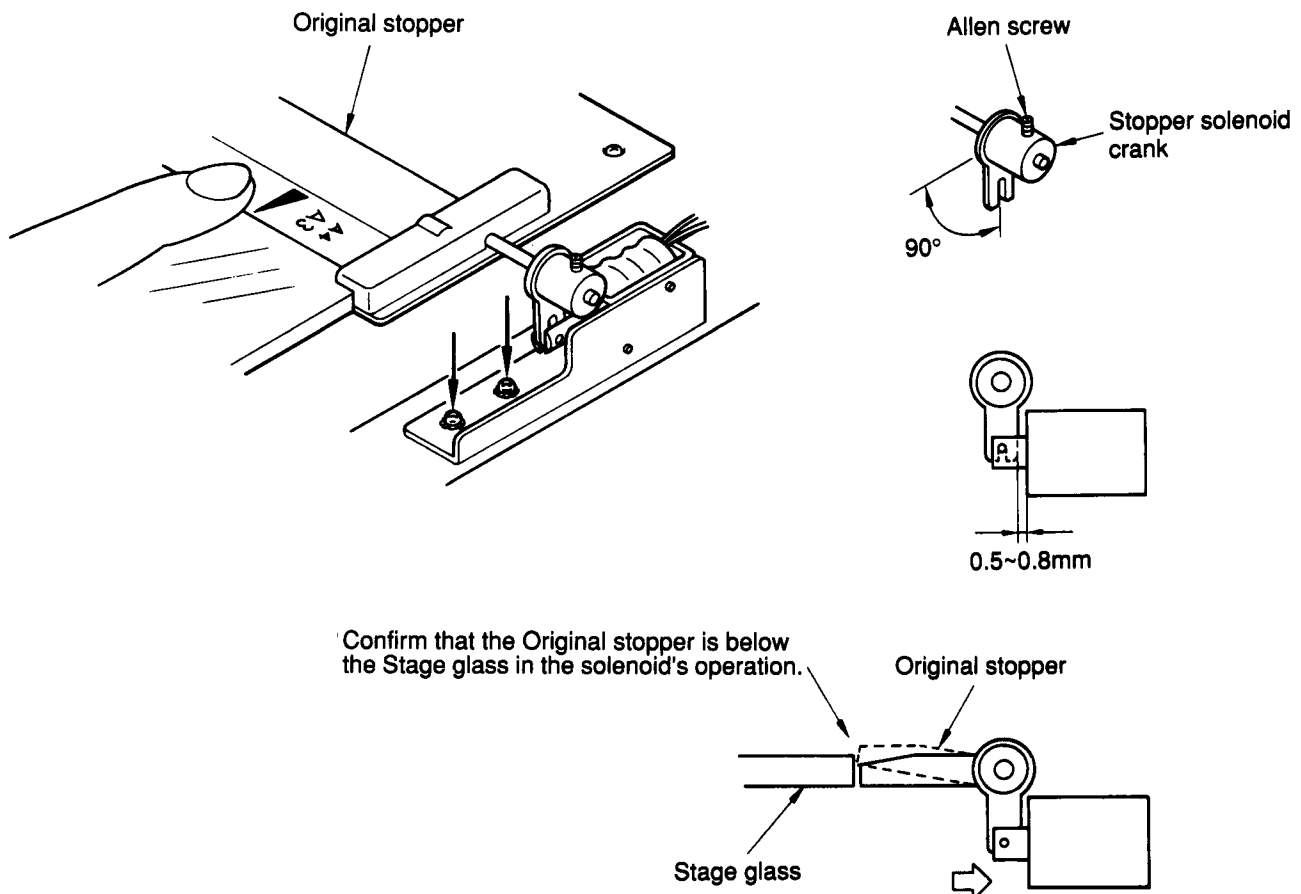
6. Position of Original Stopper Solenoid

- Procedure & Check -

- 1) Remove the Stopper solenoid cover.
- 2) Loosen the allen screw in the Stopper solenoid crank.
Turn the Stopper solenoid crank so that its plunger catch plate points down perpendicularly, and tighten the allen screw in the crank, holding down the Original stopper with a finger.
- 3) Loosen the screws on the Stopper solenoid bracket.
Adjust the position of the Original stopper solenoid so that the distance between the Original stopped solenoid and the Stopper solenoid crank is **0.5 to 0.8mm** when holding down the Original stopper with a finger.
- 4) Check that the Original stopper is below the Stage glass when the plunger of the Original stopper solenoid is pulled in in Test mode **No.56**.

- Results of Misadjustment -

- 1) If the Original stopper stays above the Stage glass when the Original stopper solenoid operates; →
the Original stopper prevents the ejection of a fed-in original in the ADF operation, causing the original ejection jam.



ADJUSTMENT PROCEDURE

7. Scanning (Read) Start Position

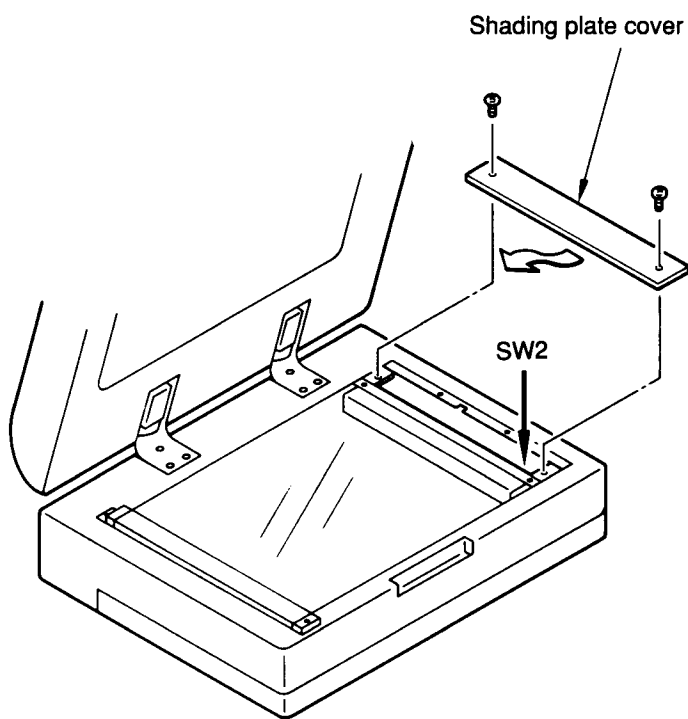
7. Scanning (Read) Start Position

- Check & Adjustment -

- 1) Remove the Shading plate cover from the Image scanner table.
- 2) Select "**No Margin**" with the Original type button on the operation panel and place the **Test chart No.8** on the Stage glass.
Then make a master in 1:1 (size-to-size).
- 3) Check that images on the master start from **5±0.5mm** down from the lead edge of the original (Test chart No.8).
- 4) If images on the master don't start from **5±0.5mm** down from the lead edge of the original, adjust with **SW2(ADF)** on the **Image processing PCB (58)**.

[Note]

Always start up Test Mode **No. 87** when performing this adjustment.



	Pulse No.	Shift Range (mm)
0	296	+2.4
1	286	+2.1
2	277	+1.8
3	267	+1.5
4	258	+1.2
5	248	+0.9
6	239	+0.6
7	229	+0.3
8	220	0
9	211	-0.3
A	201	-0.6
B	192	-0.9
C	182	-1.2
D	173	-1.5
E	163	-1.8
F	154	-2.1

Start Earlier

Scanning Start Position

Start Later

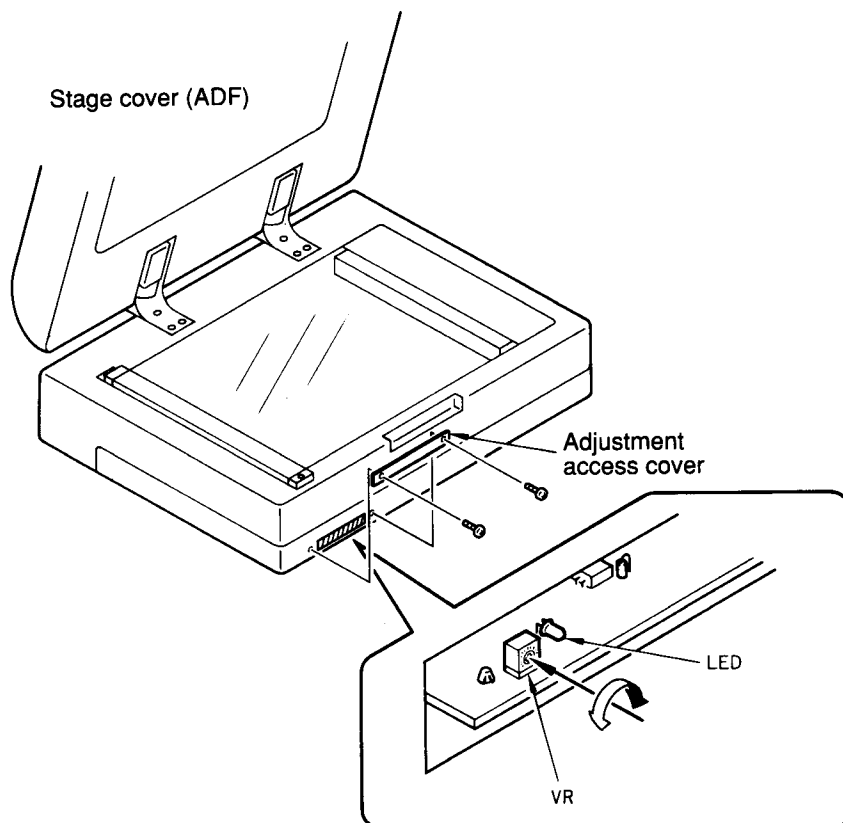
8. Sensitivity of Original Detection Sensor

- Check & Adjustment -

- 1) Slide the Image scanner table towards the paper feed side and remove the Adjustment access cover.
- 2) Check if the **LED on the Original det. sensor PCB** is lit when the Stage cover is closed. If it is not lit, turn the **VR on the Original det. sensor PCB** counter-clockwise until the LED is on.
- 3) Next, place the **Test chart No.10** on the Stage glass, and check that the LED is off when the Stage cover is closed. If it is on, turn the VR clockwise until the LED goes off and set the VR at the exact point where the LED has just gone off.
- 4) After adjustment, recheck that the LED is on without an original placed on the Stage glass and that it is off with Test chart No.10 placed there.

- Results of Misadjustment -

- 1) If the sensitivity is too low; ➡
the sensor can't detect an original when it is placed on the Stage glass. This will prevent master-making operation (except with the ADF on). With ADF on, this will cause the original feed or ejection jam when an original remains on the Stage glass.
- 2) If the sensitivity is too high; ➡
there will be no trouble in operation with an original placed on the Stage glass (except with the ADF), but it is assumed that an original is present even when not, causing the pre-scanning operation start. As a result, the message "**NO ORIGINAL ON THE STAGE**" is displayed on the panel. With ADF on, the message "**ORIGINAL REMAINING ON THE STAGE**" is displayed on the panel when there is no original placed on the Stage glass.



ADJUSTMENT PROCEDURES

9. Thermal Power of Thermal Print Head

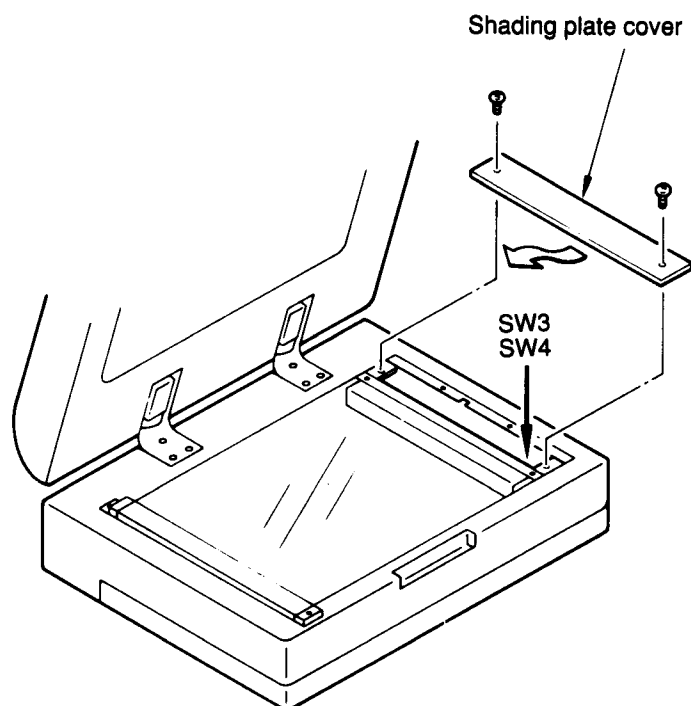
9. Thermal Power of Thermal Print Head

- Check & Adjustment -

- 1) Remove the Shading plate cover from the Image scanner table.
- 2) Remove the Front right cover.
- 3) Slide the Image scanner table towards the paper feed side, and unlock and open the Master loading unit.
Then read the resistance value (Ω) marked on the Thermal print head.
- 4) Measure the voltage between the **TP (GND)** and **TP (+18V)** on the **Power supply PCB** using a voltmeter, and check the table below.
If the value does not match, adjust **VR (+18ADJ)**.
- 5) Check that the setting of **SW3** and **SW4** on the **Image processing PCB (58)** are correct referring to the correlation table below.
- 6) If they are not set correctly, reset **SW3** for **HP1** and **SW4** for **HP2**.

- Results of Misadjustment -

- 1) If the heating time for **HP2** is too short (not enough heat) or the voltage is too low (not enough power); ➡
thin horizontal lines can not be reproduced clearly.
- 2) If the heating time for **HP1** is too long (too much heat) or the voltage is too high (too much power); ➡
the solid print image will be deformed and the Thermal print head may be damaged.



Voltage (V)	Resistance (Ω)	SW3	SW4
17.0 (17.3)	1520~1542	C	B
	1543~1574	D	D
	1575~1601	E	E
17.0 (17.3)	1602~1623	C	C
	1624~1656	D	D
	1657~1686	E	E
17.5 (17.8)	1687~1703	9	9
	1704~1737	A	A
	1738~1775	B	B
17.5 (17.8)	1776~1789	9	9
	1790~1823	A	B
	1824~1858	B	C
	1859~1870	C	D
18.0 (18.3)	1871~1874	6	6
	1875~1911	7	8
	1912~1947	8	9
	1948~1969	9	A
18.0 (18.3)	1970~2002	7	8
	2003~2038	8	9
	2039~2074	9	B
	2075~2093	7	9
18.0 (18.3)	2094~2129	8	A
	2130~2166	9	B
	2167~2184	A	D
	2185~2220	8	B
18.0 (18.3)	2221~2257	9	C
	2258~2300	A	D

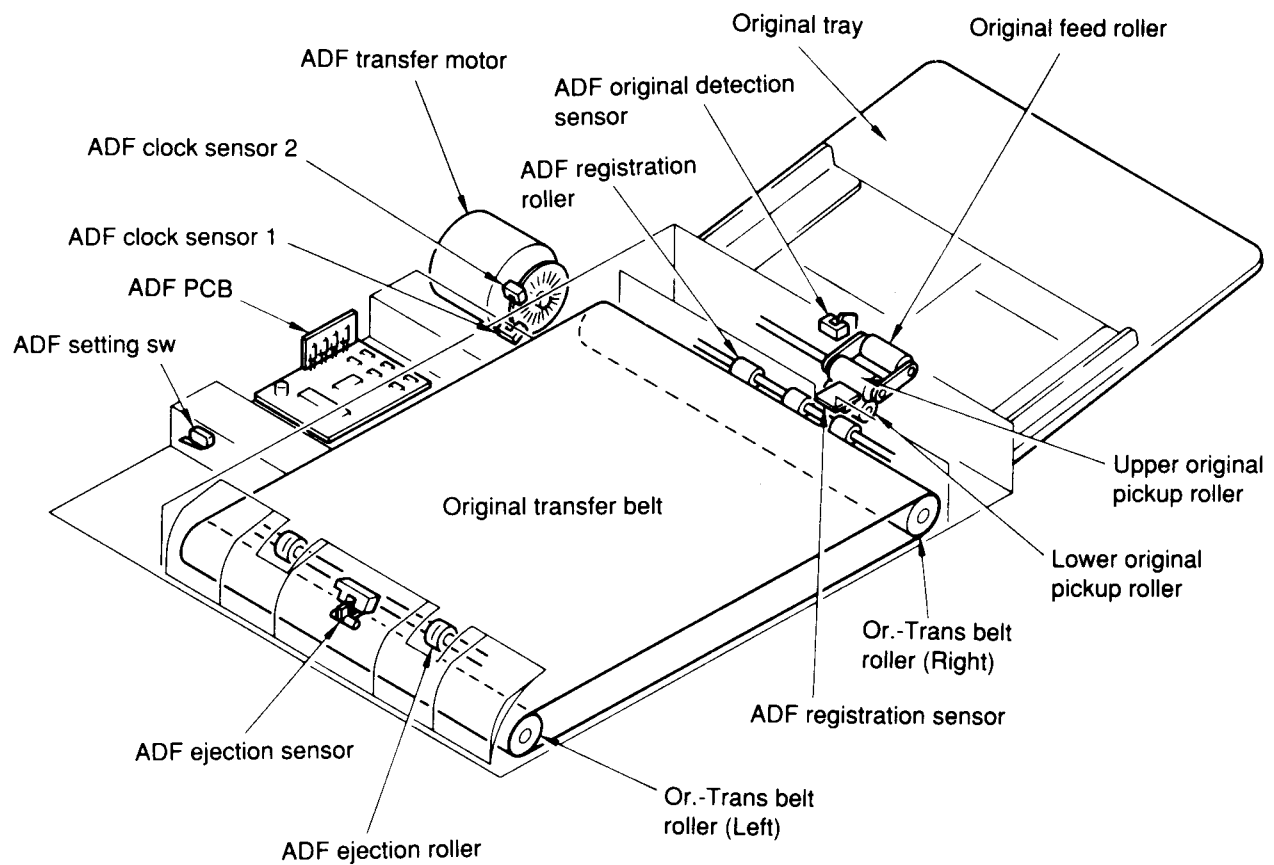
★ Refer to the voltage value in the bracket when a modified "Power supply PCB" is installed.

III. ADF 5800

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[Mechanical Overview]



Part name	Function
ADF transfer motor	Feeds an original into and out of the scanning section via transfer rollers and belts.
ADF original detection sensor	Checks if an original is placed on the Original tray.
ADF registration sensor	Detects original feed jam in ADF.
ADF ejection sensor	Detects original ejection jam in ADF.
ADF setting sw	Checks if the ADF is closed down or opened up.
ADF clock sensor 1	Checks the rotation speed of the ADF transfer motor.
ADF clock sensor 2	Same as above

[Theory of Operation]

1. Original Feed and Ejection System

- Detection of Original Placement

Originals placed on the Original tray are detected by the ADF original detection sensor.

- Pick-up of Original

When "Start" button is pressed for master-making, the ADF transfer motor starts to rotate clockwise, causing the ADF stopper to release originals and simultaneously the Original feed roller to lower onto originals.

When the Original feed roller gets in contact with originals, it starts to rotate clockwise via one-way clutch springs and ADF transfer motor, feeding the top original together with the Upper original pickup roller. (Originals are separated by the braking action caused by an one-way clutch spring of the Lower original pickup roller.)

- Original Feed-in

The original is fed by the Upper original pickup roller to the ADF registration sensor.

After the original reaches the ADF registration sensor, the ADF transfer motor (the Upper original pickup roller) rotates for 45ms to feed the original to the ADF registration roller and stops.

- Placing Original on the Stage

After a short stop, the ADF transfer motor reverses the rotation direction and transfers the original onto the Stage glass using the ADF registration roller and Original transfer belt.

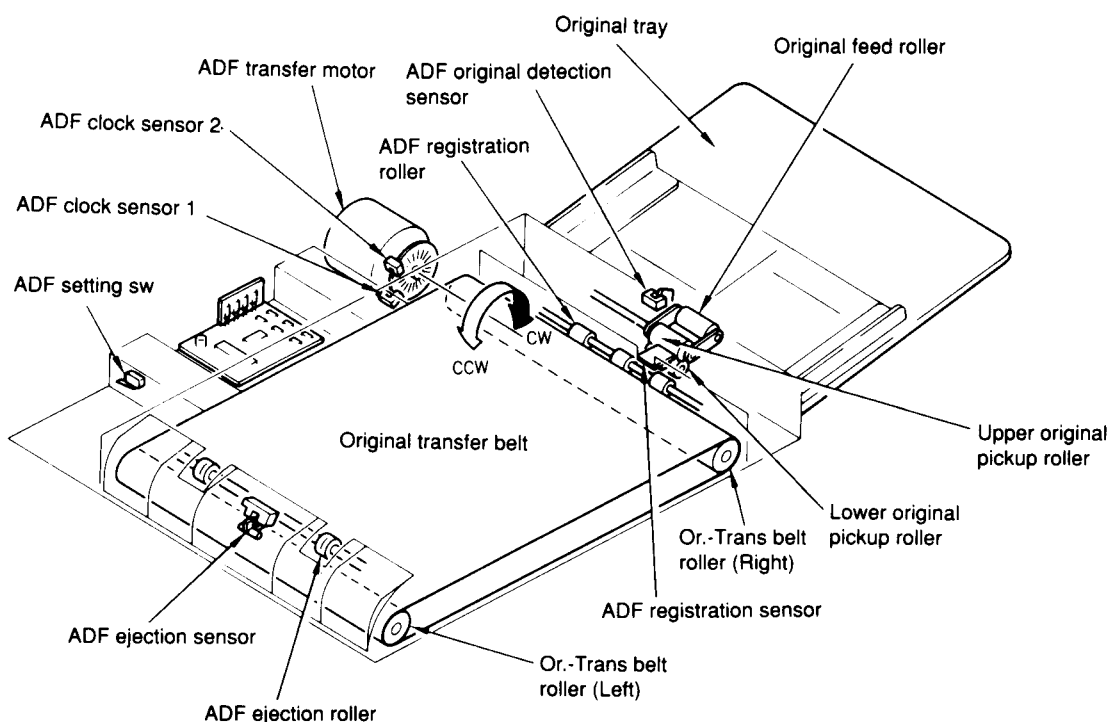
The original transfer range is decided according to the original size detected by the ADF registration sensor.

- Ejection of Original

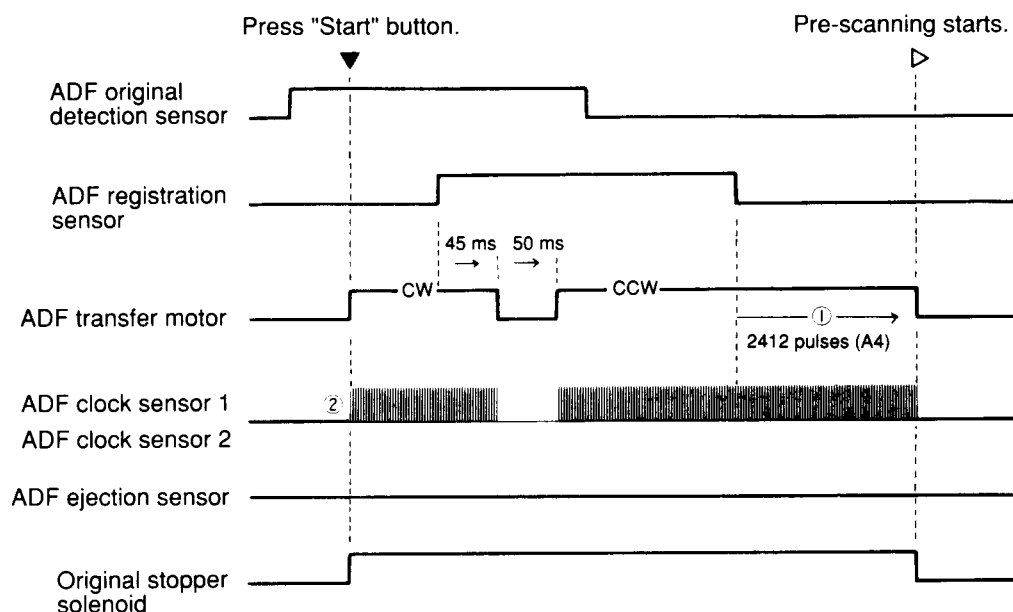
After pre-scanning/scanning/master-making operations, the Original stopper solenoid is activated, causing the Original stopper to lower and open the exit for the original.

Then the ADF transfer motor starts to rotate counter-clockwise and ejects the original from on the Stage glass via the Original transfer belt and ADF ejection roller.

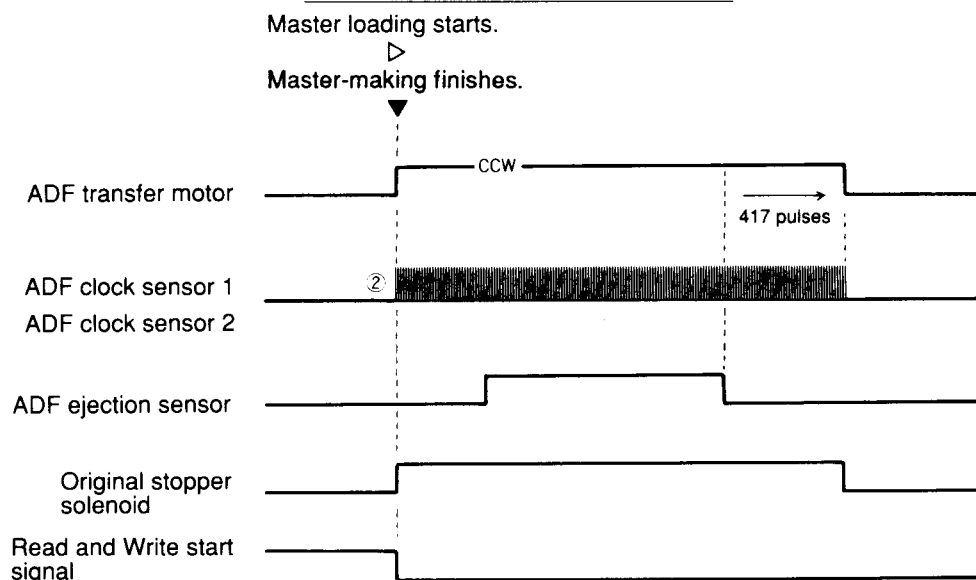
In the above operation, the ADF ejection sensor checks for original jams.



1. Original Feed System



2. Original Ejection System



- ① The original size is detected by counting the time for which the light path of the ADF registration sensor has been blocked by an original.

<Detected original size>

- A3/B4/A4(Wide)/B5/B5(Wide)/A5
- Ledger/Legal/Letter/Statement

According to the detected original size, the original feed range is determined after the trail edge of the original has passed the ADF registration sensor.

(For "A4" original, the original feeds for 2421 pulses <counted by the ADF clock sensor 1 & 2> after its trail edge passed the ADF registration sensor.)

- ② If no pulse signal is sent from the ADF clock sensor 1 for **more than 500 ms** when the ADF transfer motor is in operation, it is determined that the ADF transfer motor is locked and the trouble message "T14: CALL SERVICE" is displayed on the panel.

2. Original Feed Check System

During the original feed operation, the following 4 kinds of original feed troubles are detected by the ADF registration sensor.

In each case, when the trouble occurs, the jam message **"ORIGINAL MISFEED IN ADF-OPEN STAGE COVER/REMOVE ORIGINAL"** is displayed on the panel.

1. [Original stack in entrance at start-up]

If the light path of the ADF registration sensor is blocked when the ADF starts to operate, it is determined that a jammed original remains in the original feed side of the ADF.

2. [No original feed or Original slip]

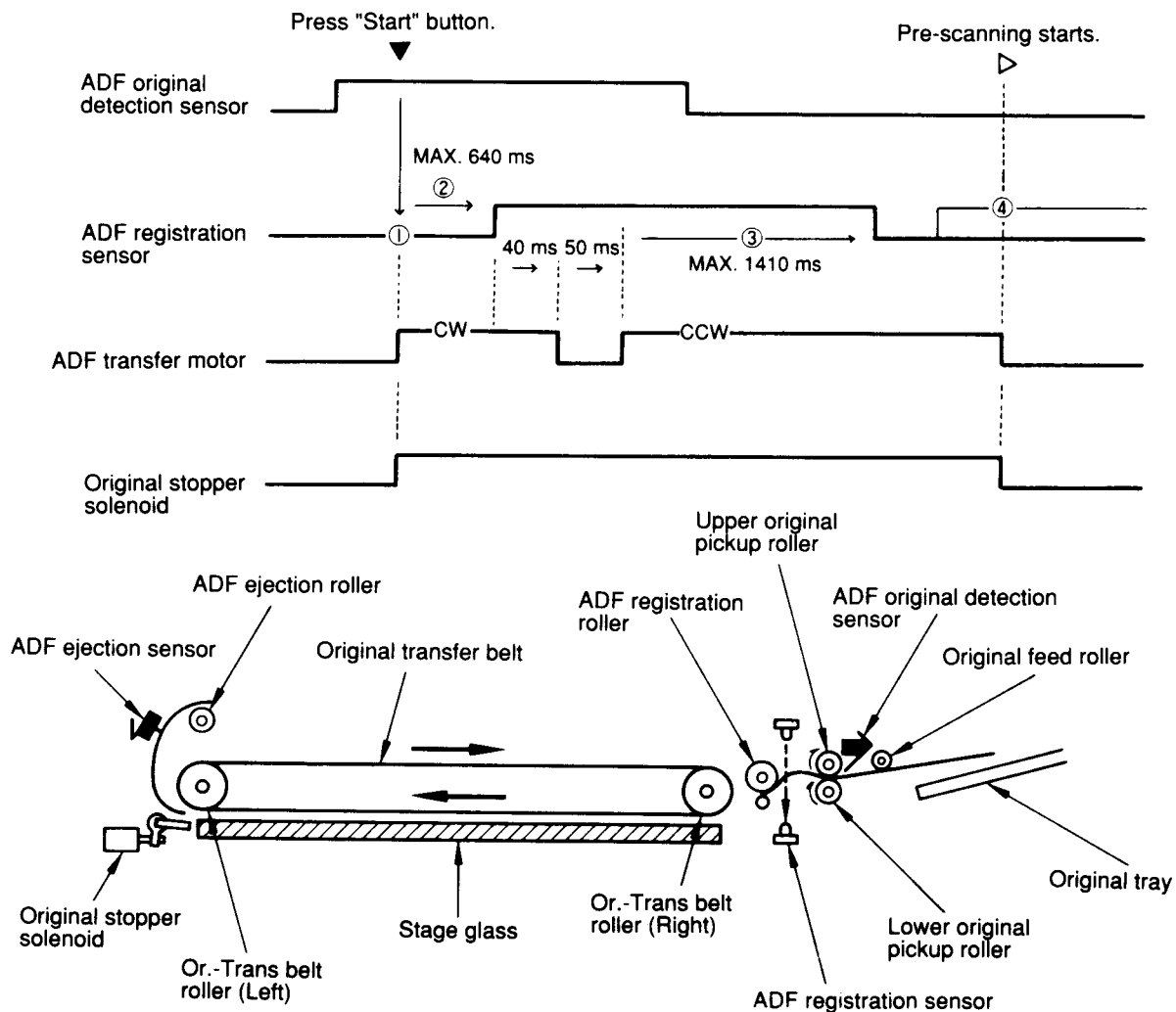
If the light path of the ADF registration sensor is not blocked by the original within **640ms** after the start of the ADF transfer motor (clockwise rotation), it is determined that the original has not been fed.

3. [Original misfeed in ADF]

If the light path of the ADF registration sensor has not been opened within **1410ms** after the ADF transfer motor reversed the rotation direction to counter-clockwise, it is determined that the original has misfed in the ADF.

4. [Original feed jam in ADF]

If the light path of the ADF registration sensor is blocked by the original when the original feed operation finished, it is determined that the original jams in the original feed side of the ADF.



3. Original Ejection Check System

During the original ejection operation, the following 3 kinds of original ejection troubles are detected by the ADF ejection sensor.

In each case, when the trouble occurs, the jam message "**ORIGINAL JAM IN ADF-OPEN STAGE COVER/REMOVE ORIGINAL**" is displayed on the panel.

1. [Original stack in exit at start-up]

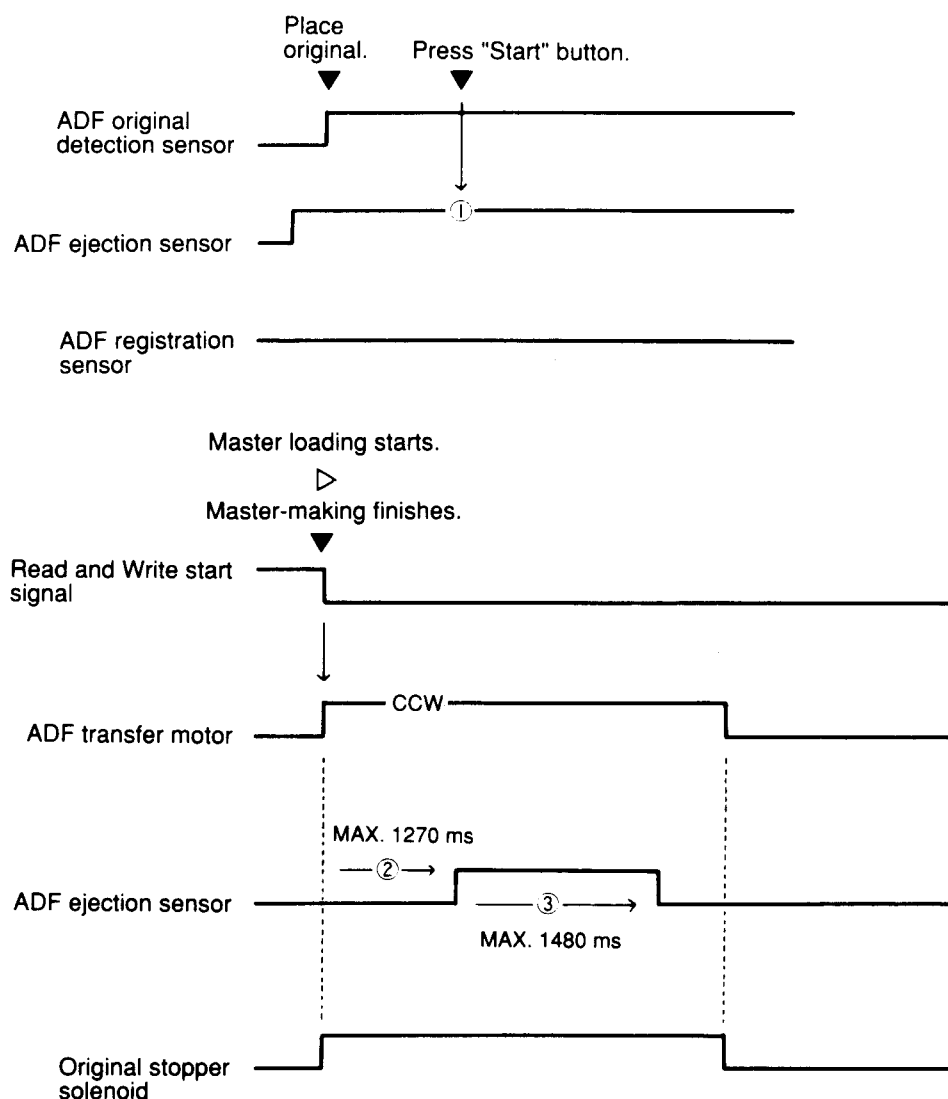
If the actuator of the ADF ejection sensor is held up, when the ADF starts to operate, it is determined that a jammed original remains in the original ejection side of the ADF.

2. [Original mis-ejection in ADF]

If the actuator of the ADF ejection sensor has not been pushed up, within **1270ms** after the ADF transfer motor started rotating counter-clockwise, it is determined that the original has not been ejected into the exit of the ADF.

3. [Original ejection jam in ADF]

If the actuator of the ADF ejection sensor is not released within **1480ms** after it was pushed up, it is determined that the original has jammed in the original ejection side of the ADF.



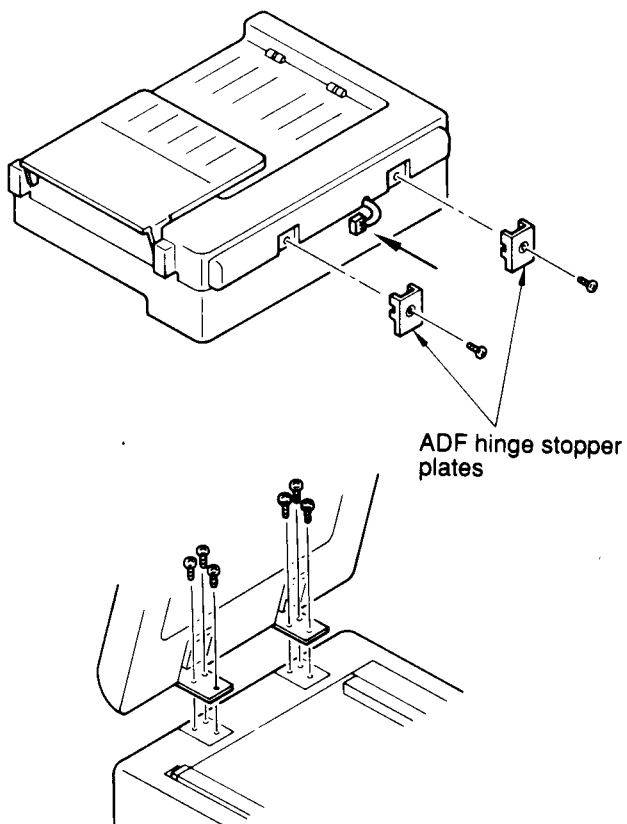
[Removal Procedures & Precautions for Installation]

1. ADF 5800

- Removal Procedures -

- 1) Remove the ADF hinge stopper plates (2 pcs.).
- 2) Disconnect the ADF interface wire.
- 3) Remove 6 mounting screws on the ADF hinges.

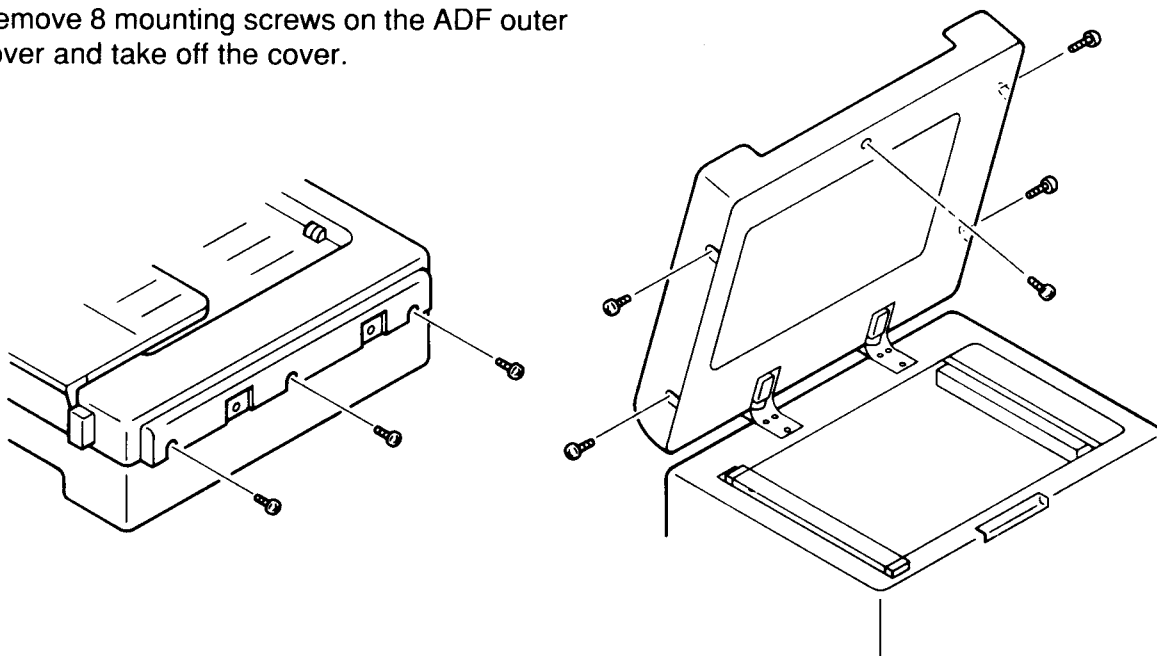
* Remove the ADF spacers if they are inserted under the ADF hinges.



2. ADF Outer Cover

- Removal Procedures -

- 1) Remove 8 mounting screws on the ADF outer cover and take off the cover.



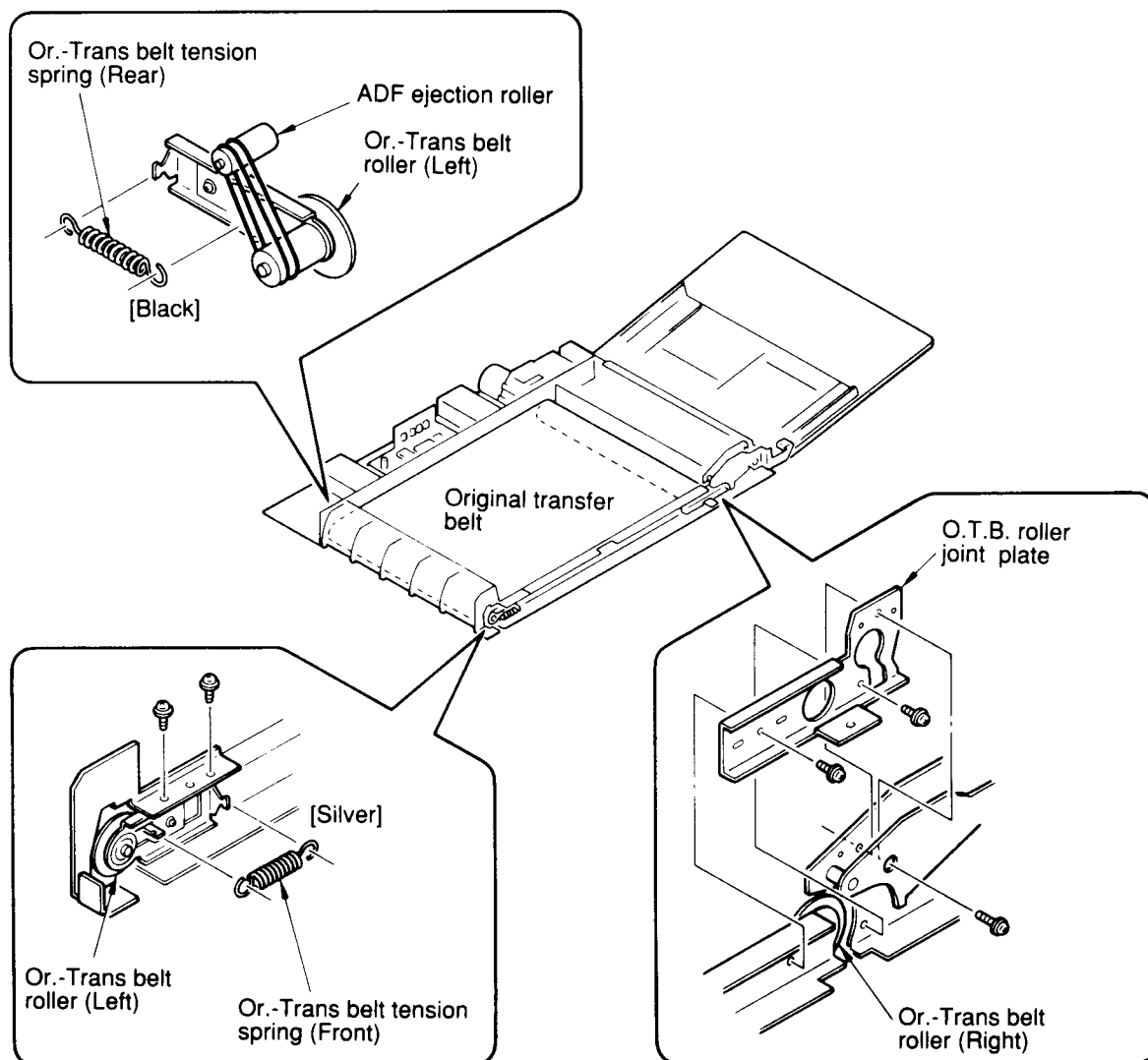
3. Original Transfer Belt

- Removal Procedures -

- 1) Remove the ADF outer cover. (Refer to the previous page.)
- 2) Remove the Or.-Trans belt tension springs (on the front and rear sides) from the Or.-Trans belt roller (Left).
- 3) Remove the O.T.B. roller joint plate by removing the 5 mounting screws indicated in the figure below.
- 4) Pull the Original transfer belt toward you and remove it from the Or.-Trans belt rollers.

- Precautions for Installation -

- Two different Or.-Trans belt tension spring are attached on the front and rear sides; be careful not to install it on the wrong side.
(A silver one for the front side and a black one for the rear side)
- After belt installation, always confirm by the ADF 5800 Test mode that the Original transfer belt doesn't shift sideways.



[Adjustment Procedures]

1. Sensitivity of ADF Registration Sensor

- Check & Adjustment -

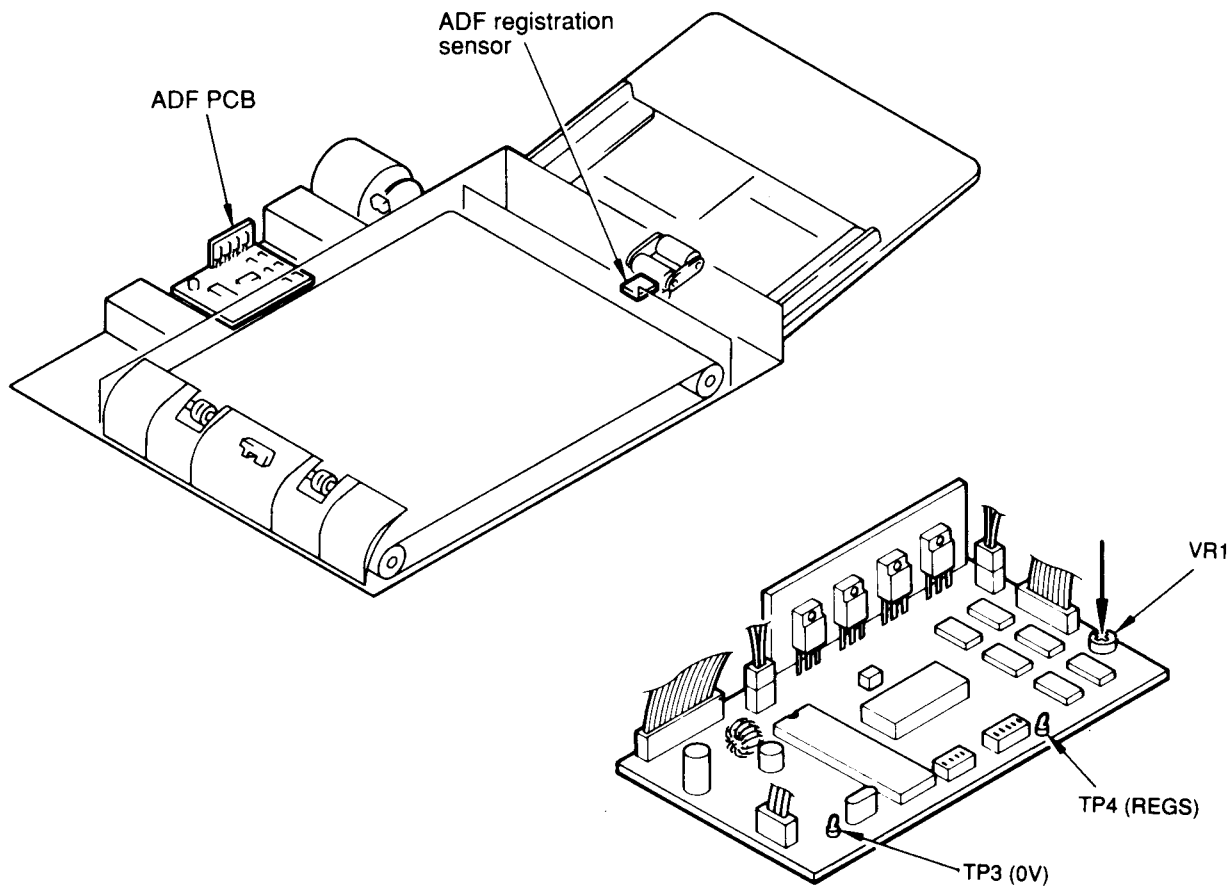
- 1) Remove the ADF outer cover from the ADF.
- 2) Connect the terminals of a voltmeter to **TP3(0V)** and **TP4(REGS)** on the **ADF PCB**.
- 3) Turn the machine on and shut off the ADF registration sensor from the outside light.
- 4) Check that the voltmeter indicates **1.0 to 1.1V** when no original is placed on the Original tray, and that it indicates **3.0V or more** when the light path of the ADF registration sensor is blocked by paper.
- 5) If not, adjust the sensitivity with **VR1** on the **ADF PCB**.
(The voltage is increased by turning VR1 clockwise.)

[Note]

For checking the sensitivity, use a 75 g/m²-thick tracing paper (attached).

- Results of Misadjustment -

- 1) If the sensitivity is too low; ➡
the message **"ORIGINAL MISFEED-OPEN STAGE COVER/REMOVE ORIGINAL"** is displayed on the panel even when no original is jammed in the ADF.
- 2) If the sensitivity is too high; ➡
the message **"ORIGINAL MISFEED-OPEN STAGE COVER/REMOVE ORIGINAL"** is displayed on the panel when an original is normally fed.



2. Stop Position of Original Feed

- Check & Adjustment -

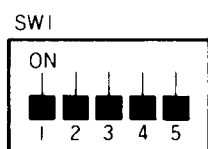
- 1) Remove the ADF outer cover from the ADF.
- 2) Enter the **ADF 5800 Test mode** and select "**Single Original Feeding Mode**".
- 3) Place originals on the Original tray and press **SW3** on the **ADF PCB** to feed an original.
- 4) Check that an original stops with **0 to 2mm** distance between the lead edge of the original and the Original stopper.
- 5) If not, adjust the stop position with **SW1** on the **ADF PCB**.

[Note]

In "Single Original Feeding Mode" the Original stopper solenoid doesn't operate. Always lower the Original stopper below the Stage glass before the above procedure.

- Results of Misadjustment -

- 1) If an original stops too early; ➡
a black line or block appears in the top part of printed copies.
- 2) If an original stops too late; ➡
an original hits against the Original stopper, causing wrinkles, which result in the deformation of images on printed copies.

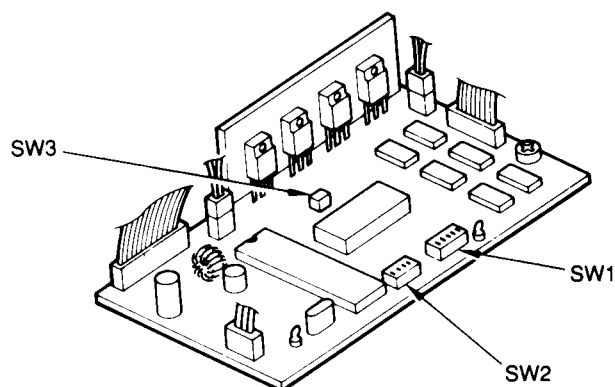


#1-#4 : For adjustment of original feed range

#5 : For selection of adjustment direction

- ON - <+> direction
(Increases original feed range.)
- OFF - <-> direction
(Decreases original feed range.)

[ADF PCB]



"Single Original Feeding Mode" Setting in ADF 5800 Test Mode



- #1: ON
- #2: OFF
- #3: ON
- #4: OFF

★ #4 is "ON" for U.S. model.

○: OFF ●: ON

1	2	3	4	Feed Range
○	○	○	○	0.00mm
●	○	○	○	0.46mm
○	●	○	○	0.92mm
●	●	○	○	1.38mm
○	○	●	○	1.84mm
●	○	●	○	2.30mm
○	●	●	○	2.76mm
●	●	●	○	3.22mm
○	○	○	●	3.68mm
●	○	○	●	4.14mm
○	●	○	●	4.60mm
●	●	○	●	5.06mm
○	○	●	●	5.52mm
●	○	●	●	5.98mm
○	●	●	●	6.44mm
●	●	●	●	6.90mm

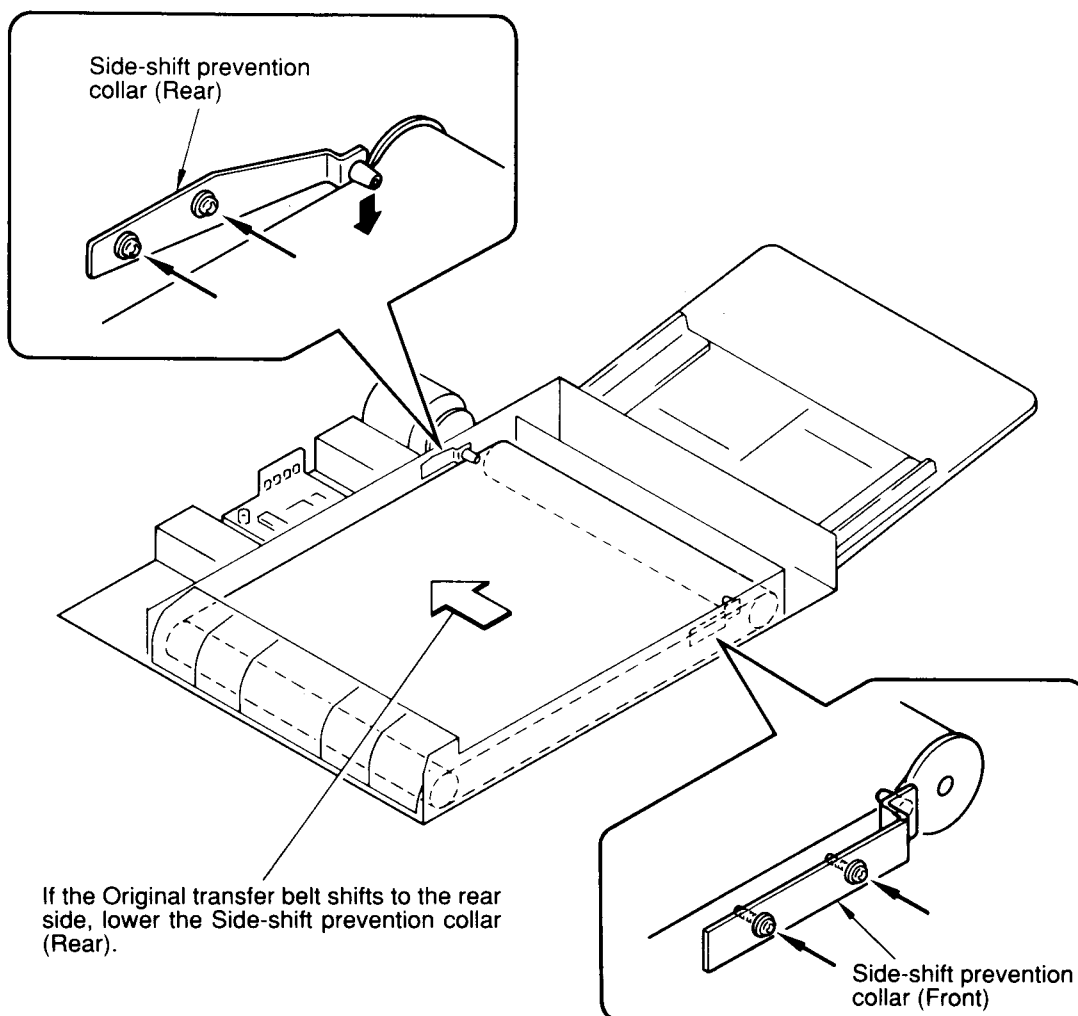
3. Position of Side-Shift Prevention Collar (For preventing the sideways shift of Original transfer belt)

- Check & Adjustment -

- 1) Remove the ADF outer cover from the ADF.
- 2) Loosen the mounting screws on the Side-shift prevention collars (Front and Rear) and adjust the collars at the highest position.
- 3) Enter the **ADF 5800 Test mode** and select “**ADF Transfer Motor Operation Check**” mode.
- 4) Rotate the Original transfer belt counter-clockwise at a high speed in this test mode.
- 5) Check if the Original transfer belt shift sideways.
If it does, adjust the position of the Side-shift prevention collar by shifting down the collar as indicated by an arrow in the figure below.
- 6) Rotate the Original transfer belt counter-clockwise at a high speed for **about 5 minutes**, and check that there is no sideways-shift of the Original transfer belt.

- Results of Misadjustment -

- 1) If the Original transfer belt shifts sideways; ➡
an original is shifted to one side when it is transferred onto the Stage glass, causing images on printed copies to shift sideways.



4. Position of Original Registration Collars (For preventing the original skew)

- Check & Adjustment -

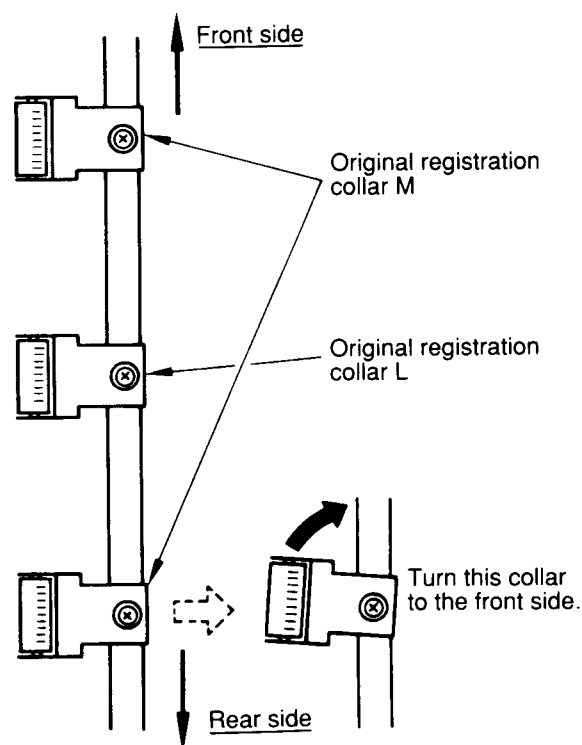
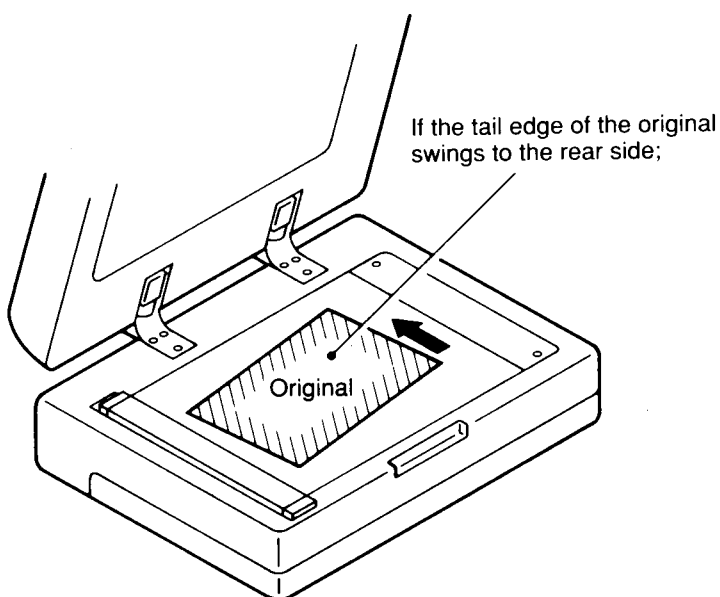
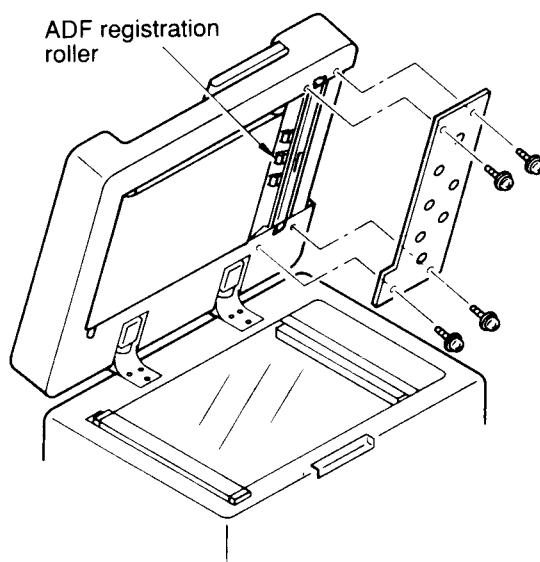
- 1) Check by "**Single Original Feeding Mode**" of the **ADF 5800 Test mode** if the original skew. If it does, adjust by the following procedures.

<Procedure>

1. Remove the metal plate indicated in the figure to the right.
2. Loosen the mounting screws on the **Original registration collar L** and **Original registration collar Ms** (on the front and rear sides) and adjust the collars parallel to the Original registration shaft.
3. If an original still skews;
 - <1> If the trail edge of the original swings to the rear side of the machine, turn the **Original registration collar M** on the rear side to the front side (clockwise).
 - <2> If the trail edge of the original swings to the front side of the machine, turn the **Original registration collar M** on the front side to the rear side (counter-clockwise).

[Note]

When the Original registration collar M is turned for adjustment, always confirm that the collar is not in contact with the cover plate.



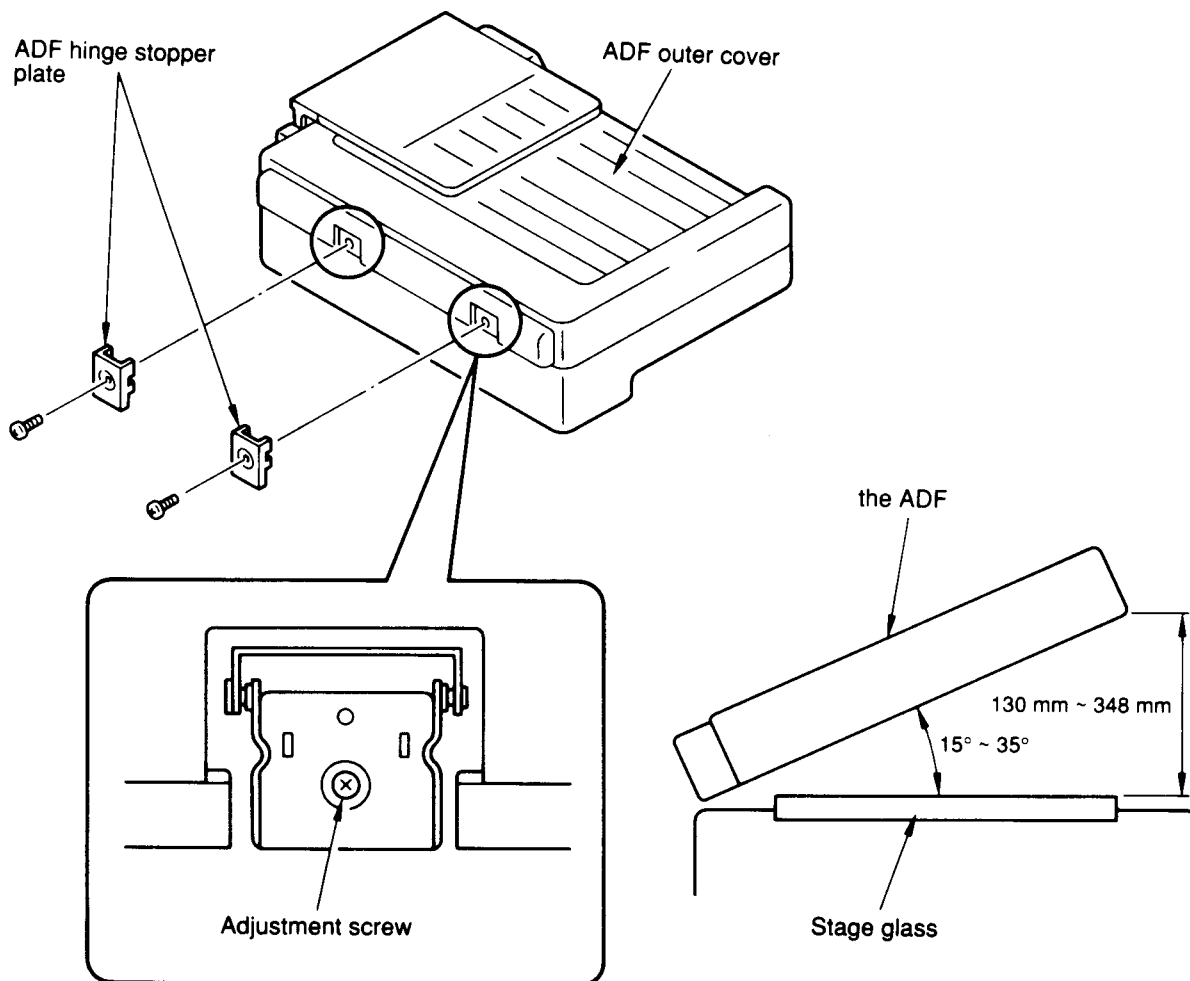
5. Spring Tension of ADF Hinge (For setting the self-closing area of ADF 5800)

- Check & Adjustment -

- 1) Remove the ADF hinge stopper plates from the ADF hinges.
(The ADF outer cover should be on.)
- 2) Check if the ADF closes by its own weight when it is slowly closed down from the full-open position to the position where the angle of the ADF against the Stage glass is **15° to 35°** (the distance is **130 to 348mm** from the Stage glass to the tip of the ADF).
- 3) If not, adjust the spring tension of the ADF hinges by turning the adjustment screw.

[Note]

Balance the spring tension of the ADF hinges on the left and right sides.



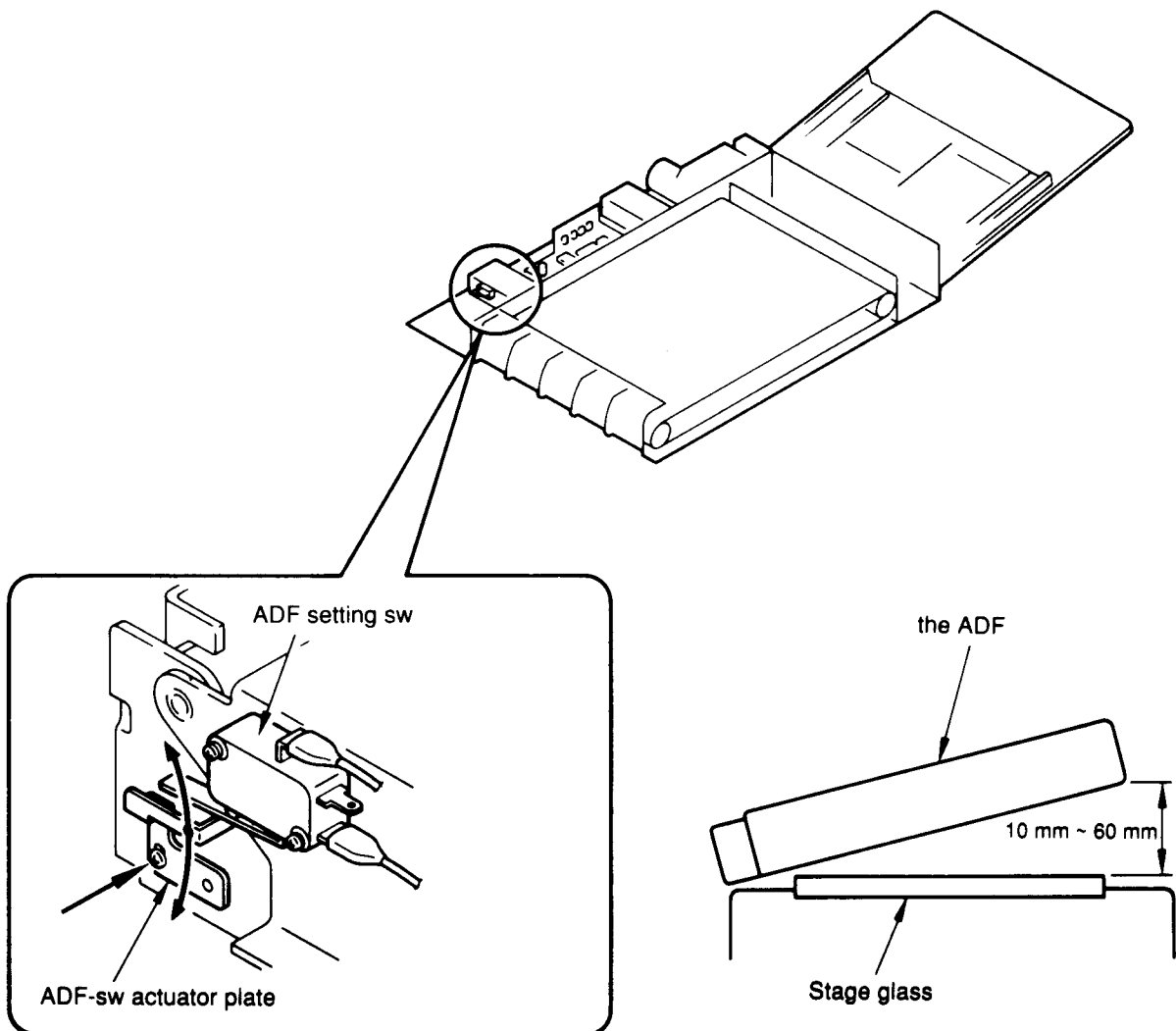
6. Position of ADF Setting Sw

- Check & Adjustment -

- 1) Remove the ADF outer cover from the ADF.
- 2) Check that the ADF setting sw is pressed ON when the ADF is closed down to the position where the distance is **10 to 60mm** from the Stage glass to the tip of the ADF.
- 3) If not, loosen the mounting screw on the ADF-sw actuator plate and adjust it.
- 4) After adjustment, put on the ADF outer cover and confirm that the ADF setting sw is not ON when the ADF stays open.

- Results of Misadjustment -

- 1) If the ADF setting sw is not ON when the ADF is closed ; ➡
the message **"CLOSE STAGE COVER"** is displayed on the panel when the ADF is closed, preventing the ADF operation.
- 2) If the ADF setting sw is ON when the ADF stays open ; ➡
the ADF operation starts when the ADF is not completely closed, causing the original misplacement on the Stage glass and/or original ejection jam.



7. Position of ADF Magnet Catch

- Check & Adjustment -

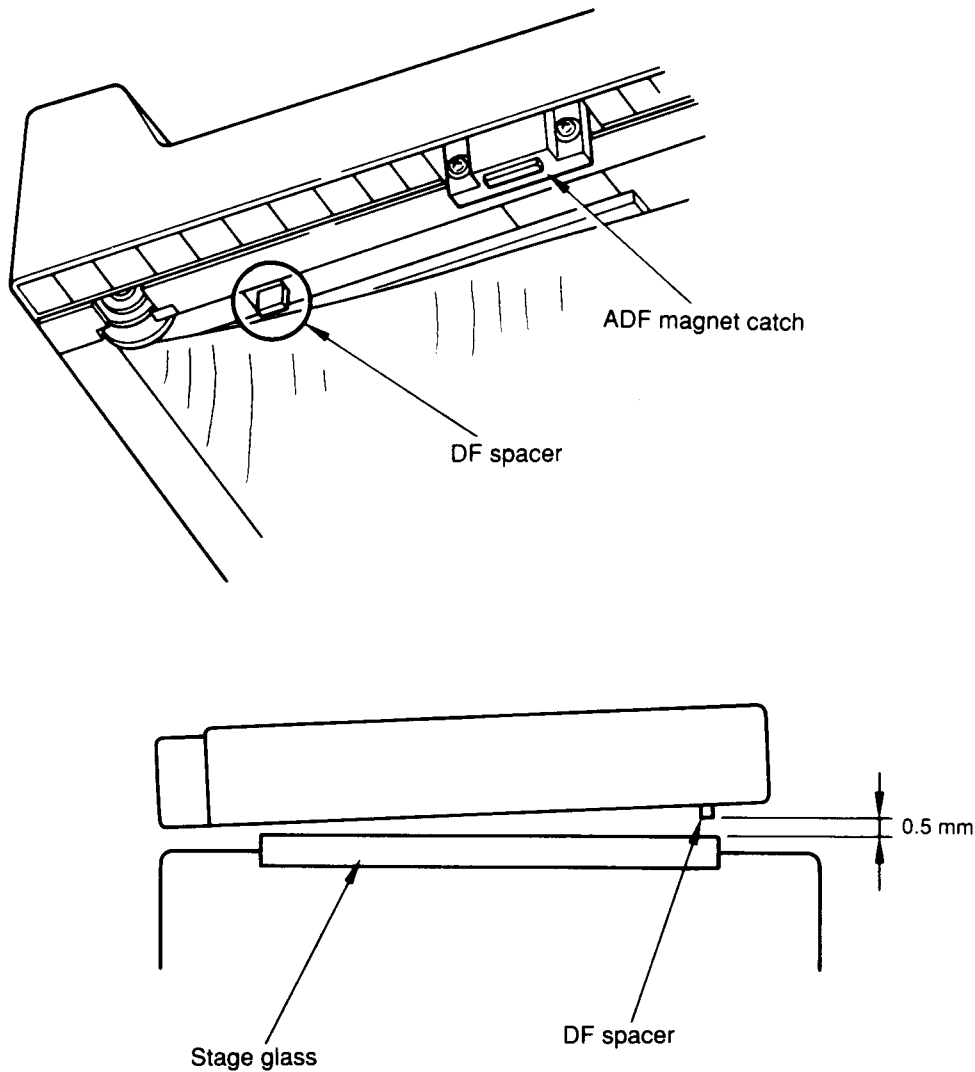
- 1) Check that the gap is **0.5mm or less** between the Stage glass and DF spacer on the front side (as indicated in the figure below) with the ADF closed.
- 2) If not, loosen the mounting screw on the ADF magnet catch and shift it up or down.

[Note]

Be careful to adjust the ADF magnet catch parallel with the magnet catch.

- Results of Misadjustment -

- 1) If the ADF magnet catch is not positioned correctly ; ➡
too much space remains between the Stage glass and Original transfer belt causing the original skew on the Stage glass and/or original ejection jam.



IV. DATA

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2. ADF 5800 Test Mode

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1. Test Mode

1. Operational Procedures

The Test mode program in the machine is to enable a service technician to check the operation of each electrical component.

1. [Starting Up Test Mode]

Turn on the power pressing down the "**P/M**" and "**ORIGINAL**" buttons on the main panel.
In the Test activities the following indication will be displayed in the LCD panel and print quantity displays.

-This is the initial condition of Test Mode.-

TEST MODE			
PANEL	Ver	○	○ ○
SYSTEM	Ver	○	○ ○

0		0	0
---	--	---	---

2. [Checking the Operation of A Component]

To check the operation of a component, select a test No. using panel keys and then press the "**START**" button to start the test.

The figures in the print quantity display mean:

- The right-side two digits: The test No. selected
- The left-side on digit: **0** for the "Test OFF" status
1 for the "Test ON" status

If the test is an one-cycle operation test, it will be automatically stopped after one check.
To stop the test, press the "**START**" button again.

[Print quantity display]

0		0	0
---	--	---	---

⇓

Select test No. **69** using panel keys.

0		6	9
---	--	---	---

⇓

Press the "**START**" button.

1		6	9
---	--	---	---



Press the **"START"** button again.

0		6	9
---	--	---	---

3. [Selecting another Test mode and Exiting the Test mode]

To select another Test mode, clear the set Test No. by pressing the **"C"** or **"STOP"** button and select another Test No..

-To exit the Test mode, turn off the power or perform the following operations:

- 1) Press the **"START"** button to stop the test if in operation.
- 2) Press the **"C"** or **"STOP"** button to return to the initial condition.
- 3) Press the **"RESET"** button.

- 1) Press the **"START"** button.

0		6	9
---	--	---	---



- 2) Press the **"C"** or **"STOP"** button.

0		0	0
---	--	---	---

- 3) Press the **"RESET"** button.

TEST MODE			
PANEL	Ver	○	○
SYSTEM	Ver	○	○

0		0	0
---	--	---	---

READY			
RISOGRAF			
R ⇒ C			

--	--	--	--

2. Test Items and Operations

1) Sensor/Sw Test

A beep sounds in two ways to tell the current condition.

Detection: 0.1 seconds interval beep

No detection: 0.5 seconds interval beep

★ Shaded numbers are special for RC5800.

No.	Test Component	Detection Status	No.	Test Component	Detection Status
01	Paper detection sensor	Light path is blocked.	18	Drum set switch	The actuator is depressed.
02	Elevator upper limit sensor	The actuator is raised to open the light path.	19	Paper receiving sensor 1	Light path is blocked.
03	Elevator lower limit switch	The actuator is depressed.	20	Paper receiving sensor 2	Light path is blocked.
05	Master loading button	The button is pressed.	21	Front cover set sensor	Metal plate is attached.
06	Paper sensor	Light path is blocked.	22	Vertical centering sensor	Light path is NOT blocked.
07	Pressure detection sensor	Light path is blocked.	23	Master end sensor	No reflected light
08	Magnet A detection sensor	Magnetism is detected.	25	Master detection sensor	Reflected light is detected.
09	0° Angular sensor	Magnetism is detected.	26	Original feed-table set switch	The actuator is depressed.
10	180° Angular sensor	Magnetism is detected.	29	Master loading unit switch	The actuator is depressed.
11	Magnet C detection sensor	Magnetism is detected.	31	Master removal sensor	Light path is blocked.
12	Feed-tray down button	The button is pressed.	33	Disposal box set switch	The actuator is depressed.
13	Clamp safety switch	The actuator is pressed.	34	Scanner home sensor	Light path is blocked.
14	Master sensor	Reflected light is detected.	35	Scanner limit sensor	Light path is blocked.
15	Master positioning sensor	Reflected light is detected.	36	Original detection sensor	Reflected light is detected.
16	Drum home position button	The button is pressed.	37	Ink sensor	Ink is detected.
17	Ink bottle switch	The actuator is depressed.	38	Overflow sensor	Ink is detected.

2) Motor/Solenoid Test

To start a test, select a **Test No.** and press the **"START"** button.

To stop the test, press the **"START"** button again.

★ Shaded numbers are special for RC5800.

No.	Test Item	No.	Test Item
40	15 rpm Drum rotation	56	Original stopper solenoid
41	30 rpm Drum rotation	57	Read pulse motor CCW (For Scanner limit sensor)
42	Variable speed Drum rotation	58	Read pulse motor CW (For Scanner home sensor)
47	Paper feed clutch	59	LED arrays in Image scanner ON
48	Pressure solenoid	60	Write pulse motor CCW (Backward)
49	Suction motor (fan)	61	Write pulse motor CW (Feed)
50	Inking motor	62	Thermal pressure motor Up and Down
51	Master removal solenoid and Vertical transport motor	63	Loading pulse motor
53	Clamp solenoid	64	Loading fan
54	Clamp motor CCW (0°)	66	Thermal power supply CTL ON and Storage fan
55	Clamp motor CW (180°)	67	Lock solenoid
		69	Separation fan

[Note]

- 1) The Inking motor (No. 50) operates only when the ink sensor is out of touch with ink.
- 2) The Feed-tray interlock Sw operates even in the Test mode.
- 3) The Paper feed clutch (No. 47) operates only when the light path of the Paper feed clutch sensor is open.

3) Operation Test

To start an operation test, select a **Test No.** and then press the **"START"** button.

To stop the operation test, press the **"START"** button again.

★ Shaded numbers are special for RC5800.

No.	Test Item
70	Elevator motor Up/Down operation The following operations will be repeated while pressing down the Feed-tray down button. <ul style="list-style-type: none"> • When Elevator lower limit switch is ON: Go UP ⇄ Elevator upper limit sensor detection ⇄ Stop • When Elevator lower limit switch is OFF: Go DOWN ⇄ Elevator lower limit switch detection ⇄ Stop
71	Print positioning motor CW/CCW rotation (one-cycle check) Return to vertical center position ⇄ One second half ⇄ CW(+) direction rotation ⇄ One second halt ⇄ CCW (–) direction rotation ⇄ One second halt ⇄ Return to vertical center position ⇄ Stop
72	Clamp plate Open/Close operation Rotate Drum to Home position ⇄ Open Clamp plate (180°) ⇄ Close Clamp plate (0°) ⇄ Rotate Drum to Home position (Then go back to the first step.)
73	Image scanner shifting (Read pulse motor) operation Read pulse motor CCW direction rotation ⇄ Scanner limit sensor detection ⇄ One second halt ⇄ Read pulse motor CW direction rotation ⇄ Scanner home sensor detection ⇄ One second halt ⇄ Read pulse motor CCW direction rotation ⇄ (Go back to the first step.)
75	Confidential operation (Repeated by three cycles) Confidential operation ⇄ Pressure solenoid ON ⇄ Three times Drum rotation ⇄ Confidential operation ⇄ (This cycle will be repeated) ⇄ Three times Drum rotation ⇄ Stop

3) Operation Test

★ Shaded numbers are special for RC5800.

No.	Test Items
77	Paper feed & Printing operation The Paper feed tray raises and the paper is continuously fed until paper supply runs out. Note: <ul style="list-style-type: none"> • The copy counter doesn't operate and paper jam is not detected. • Paper feed tray will be automatically lowered without paper. • Ink can be supplied by Inking motor.
78	Shading compensation operation Image scanner LED arrays ON ⇄ One second ⇄ Shading compensation 200 ms
79	Machine aging operation 130 rpm Drum rotation ⇄ 5000 items Magnet A detection ⇄ Stop
80	Thermal print head check operation 0 Making Master of test pattern #0 memorized in the Image Processing PCB.
81	Thermal print head check operation 1 Making Master of test pattern #1 memorized in the Image processing PCB.
82	Thermal print head check operation 2 Making Master of test pattern #2 memorized in the Image Processing PCB.
83	Thermal print head check operation 3 Making Master of test pattern #3 memorized in the Image processing PCB.
84	Cutter motor ON [One-cut operation]
86	ADF operation Original feed in ⇄ One second halt ⇄ Original feed out ⇄ One second halt ⇄ (Go back to the first step.) Note: <ul style="list-style-type: none"> • ADF operation will be automatically finished without any originals in ADF tray or when original feed jam happens in ADF unit. • ADF operation can be restarted after opening and closing ADF unit when original feed jam happens in ADF unit.

4) Others (Auxiliary Modes)

★ Shaded numbers are special for RC5800.

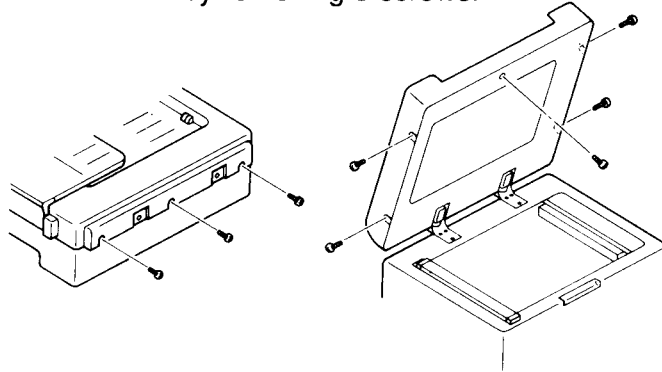
No.	Contents
87	Image processing PCB adjustment mode Shifts the Image scanner to the Scanner limit sensor (CCW) by 20mm after master making operation. <ul style="list-style-type: none"> • In normal operation, the Master count and Copy count signals will not be output, and the Key/card counter set signal will not be checked. ★ The machine will be released from this condition when the power is turned off or the Reset button is pressed for the initial set-up.
88	Release of Test mode No.89 (Clearing of "Remove Stopper screw." message) Clears the panel message, "Remove Stopper Screw", in an unpacking operation.
89	Shift of the Image scanner for Transportation Shifts the Image scanner to the transportation fixing position to protect the Image scanner during transportation.
90	Clearing of Memory All RAM contents on the System Main and Panel Main PCBs will be initialized. (The same operation as when the Memory back-up battery is removed off.)
91	Input of Telephone No. The telephone No., which will be displayed in the LCD panel in case of the trouble messages (T#: CALL SERVICE), can be input. [Procedures for Inputting Tel. No.] <ol style="list-style-type: none"> 1. Press the "C" button. 2. Input Tel. No. using panel keys. 3. Terminate the Test mode. <ul style="list-style-type: none"> ★ If the Test mode No.90 is selected, the telephone No. will be cleared.
92	Prevention of the Master count, Copy count, and Key/card counter set signals output <ul style="list-style-type: none"> • In normal operation, the Master count and Copy count signals will not be output, allowing a service technician to print without increasing the digit of the Master and Copy counters. • The Key/card counter set signal will not be checked, allowing a service technician to print without inserting a counter card into the Key/card counter. • The machine will be released from this condition when the power is turned off or the Reset button is pressed for the initial set-up.

2. ADF 5800 Test Mode

1. Operation Procedures

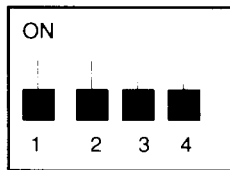
ADF 5800 has its own test mode, enabling service technicians to check the ADF operation independently of the machine.

(1) Remove "ADF Outer Cover" by removing 8 screws.



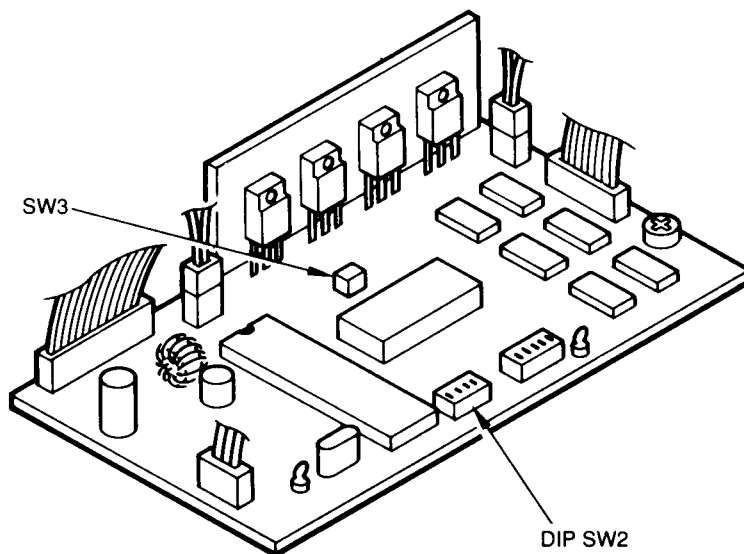
(2) Turn on Switch #1 of DIP SW2 on the ADF PCB and turn on the power.

SW2



- #1 : For Test mode set-up
(Should be set before turning on the power.)
OFF - Normal operation
ON - Test mode
- #2 : Test mode selection (Refer to the chart.)
- #3 : Test mode selection (Refer to the chart.)
- #4 : Original paper size selection
(Should be set before turning on the power.)
OFF - A/B sizes paper
ON - Letter/Legal paper

(3) To start up each Test mode, press SW3 on the ADF PCB.



2. Test Mode Selection

# 2	# 3	Test Item
OFF	OFF	ADF Transfer Motor Operation Check Each time pressing SW3 on the ADF PCB, the ADF transfer motor rotates in the following order. Forward (CW) ⇄ Backward-High (CCW) ⇄ Backward-Low (CCW) ⇄ Backward-Medium (CCW)
OFF	ON	Single Original Feeding Mode Each time pressing SW3 on the ADF PCB, an original is fed into and ejected out of the ADF.
ON	OFF	Multi Original Feeding Mode When pressing SW3 on the ADF PCB, originals on the ADF tray keep being fed into and ejected out of the ADF until no original remains on the tray.
ON	ON	Free Run Operation When pressing SW3 on the ADF PCB, the feeding-in and ejecting-out operation is performed without originals. NOTE: Never feed originals in this mode.

- NOTE:
1. If an other Test mode is desired after one Test mode is performed, open up the ADF or turn off the power before changing DIP switches' setting.
 2. In "Single original feeding mode" and "Multi original feeding mode", the Original stopper in the machine should be manually lowered because the Original stopper solenoid doesn't operate in the ADF Test mode.

2. Advice Displays & the Conditions for Display

1. "CALL SERVICE" indication

T1
CALL SERVICE

- Main Motor Lock -

Displayed to interrupt the machine operation:

- 1) If the Magnet A is still detected by the **Magnet A detection sensor 2 seconds** after the Main motor started.
- 2) If the Magnet A hasn't been detected by the **Magnet A detection sensor within 5 seconds** after the Main motor started.

T2
CALL SERVICE

- Elevator Motor Lock -

Displayed to interrupt the machine operation:

- 1) If the actuator of the **Elevator upper limit sensor** has not been raised to open the light path **within 7 seconds** after the Elevator motor started to rise.
- 2) If the actuator of the **Elevator lower limit switch** has not been depressed **within 7 seconds** after the Elevator motor started to lower.
- 3) If the actuator of the **Elevator lower limit sensor** is still depressed **2 seconds** after the Elevator motor started to rise.
- 4) If the actuator of the **Elevator upper limit sensor** is still raised to open the light path **2 seconds** after the Elevator motor started to lower.

T3
CALL SERVICE

- Clamp Error -

Displayed to interrupt the machine operation:

- 1) If the actuator of the **Clamp safety switch** is still depressed **4 seconds** after the Clamp solenoid was activated (turned on).
- 2) If the actuator of the **Clamp safety switch** has not been depressed **within 4 seconds** after the Clamp solenoid was released (turned off).
- 3) If the Angular magnet has not been detected by the **Angular sensor** (either 0° or 180°) **within 8 seconds** after the Clamp motor started rotating.

Displayed to prevent the machine operation:

- 4) If the actuator of the **Clamp safety switch** is not depressed when the Clamp solenoid is not in operation.

T4
CALL SERVICE

- Ink Overflow -

Displayed after the machine operation finished, immediately stopping the Inking motor.

- 1) If the **Overflow sensor** detects excessive ink in the Squeegee unit.

T5
CALL SERVICE

- Print Positioning Motor Lock -

Displayed after the machine operation finished, immediately stopping the Print positioning motor:

- 1) If the **Vertical centering sensor** status has not been changed from ON to OFF (or OFF to ON) **within 12 seconds** after the Print positioning motor started rotating.

T6
CALL SERVICE

- **Communication Error between Panel and System PCBs -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the Panel and System PCBs.

T7
CALL SERVICE

- **Communication Error between Panel and Digitizer PCBs -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the Panel and Digitizer PCBs.

T8
CALL SERVICE

- **Communication Error between System PCBs and Interface Accessories -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the System PCBs and the interface accessories.

T9
CALL SERVICE

- **Communication Error between System PCBs and RC Sorter -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the System PCBs and the RC sorter.

T10
CALL SERVICE

- **Malfunction of the Magnet A Detection Sensor -**
Displayed to interrupt the machine operation:
1) If the **Magnet A detection sensor** has not detected the Magnet A by the time the Pressure detection sensor status has changed twice from OFF to ON (the light path of the sensor has been blocked twice by the Pressure Disc) after the Main motor started.

T11
CALL SERVICE

- **Pressure Control Motor Lock -**
Displayed to interrupt the machine operation:
1) If the resistance value of the **Print pressure detection potentiometer** has not changed to a specified value within **20 seconds** after the Pressure control motor started.

T13
CALL SERVICE

- **Cutter Motor Lock -**
Displayed:
1) If the error message "**MASTER CUT MALFUNCTION/PRESS RESET BUTTON**" has been displayed twice in master making operation.

T14
CALL SERVICE

- ADF Transfer Motor Lock -

Displayed to interrupt the ADF operation:

- 1) If no pulse signal is sent from the **ADF clock sensor 1 more than 500 ms** after the ADF transfer motor is in operation.

T15
CALL SERVICE

- Read Pulse Motor Lock -

Displayed to interrupt the machine operation:

- 1) If the light path of the **Scanner home sensor** is not blocked **within 14330 pulses** after the Read pulse motor started in the Image scanner home positioning (initializing) operation.
- 2) If the light path of the **Scanner home sensor** is not opened **within 315 pulses** after the Read pulse motor started in the pre-scanning operation.
- 3) If the Image scanner has not been returned to the home position (the **Scanner home sensor**) **14330 pulses** after the Read pulse motor started in the image scanning operation.

T16
CALL SERVICE

- Malfunction of the Trimming PCB -

Displayed to interrupt the machine operation:

- 1) If the data signals such as original size, are not output from the **Trimming PCB** at the start of the image scanning operation.

2. "JAM or ERROR" indication

PAPER JAM
CHECK PAPER FEED AREA

- Paper Jam in the Paper Feed Area -

[In Master-making]

Displayed after the master has been loaded on the Drum:

- 1) If the light path of the **Paper sensor** is blocked at the second Magnet A detection after cutting operation.

Note:

- If the light path of the **Paper receiving sensor 1** was open at the first Magnet A detection after cutting, it is judged that the first sheet is stuck in the second paper feed area.
- If the light path of the **Paper receiving sensor 1** was blocked at the first Magnet A detection after cutting, it is judged that some sheets have been fed with lead and trail edges stuck to each other.

[In Printing]

Displayed in the following cases:

- 1) If the light path of the **Paper receiving sensor 1** is open at the first Magnet A detection after the light path blocking of the Paper sensor, and if the light path of the **Paper sensor** is still blocked at the second Magnet A detection.

Note:

- At the first Magnet A detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
 - Judged that paper is stuck in the second paper feed area.
- 2) If the light path of the **Pressure detection sensor** has been blocked twice while that of **Paper sensor** is kept blocked from the first blocking after the start of printing.

The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the light path blocking of the Pressure detection sensor, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
 - Judged that some sheets have been fed with lead and trail edges stuck to each other.
- 3) If the light paths of the **Paper receiving sensor 1** and **Paper sensor** are both open at a Magnet A detection, and if the light path of the **Paper sensor** has been open during the following 2 Magnet A detections.

The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the first Magnet A detection following the above (at the fourth one counted from the beginning), the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
- Judged that paper has misfed or slipped in feeding.

PAPER JAM UNDER DRUM
PULL OUT DRUM

**- Paper Jam under the Drum or in the Paper Receiving Area -
[In Master-making]**

Displayed after the master has been loaded on the Drum:

- 1) If the light path of the **Paper receiving sensor 1** is blocked at the start of the light path blocking of the **Pressure detection sensor**.

Note:

- Judged that the previous jammed paper still remains under the Drum.

- 2) If the light path of the **Paper receiving sensor 1** was open at the first Magnet A detection after cutting, and if the light path of the **Paper sensor** is also open at the second Magnet A detection.

Note:

- Judged that the first copy was not separated from the Drum and has stuck onto it.

[In Printing]

Displayed in the following cases:

- 1) If the light path of the **Paper receiving sensor 1** is blocked at the start of the light path blocking of the **Pressure detection sensor**.

The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the start of the light path blocking of the Pressure detection sensor, the Print signal is immediately interrupted to stop the first paper feed (Paper feed clutch's operation). Judged that the printed copy has jammed around the Separator.

- 2) If the light path of the **Paper receiving sensor 1** is open at the first Magnet A detection after the light path blocking of the **Paper sensor**, and if the light path of the **Paper sensor** is open at the second Magnet A detection.

Note:

- At the first Magnet A detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation). Judged that the printed copy was not separated from the Drum and has stuck onto it.

- 3) If the light path of the **Paper receiving sensor 2** has been kept blocked while that of the **Paper receiving sensor 1** has been blocked twice.

The jam message will be displayed when the Drum stops after the Magnet A has been detected three times by the detection sensor following the above.

Note:

- At the first Magnet A detection following the above, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
- Judged that the printed copy has jammed around the exit of the paper receiving side or on the Paper receiving tray.

MASTER CLAMP ERROR
PRESS RESET BUTTON

- **The Master has Not been Loaded onto the Drum -**

Displayed in master-making and confidential processes after the following display message is cleared:

[REMOVE CUT MASTER STRIP]

Note: The above message will be displayed:

- 1) If the **Master sensor** did not detect the master on the Drum at the Magnet C-1 detection in master loading process (preventing the first paper feed-Paper feed clutch's operation), and then if the **Master positioning sensor** detects the master at the Magnet A detection after master-cutting operation at the Magnet C-2 detection.

If the **Master positioning sensor** does not detect the master at the Magnet A detection after master-cutting operation, the above message **[REMOVE CUT MASTER STRIP]** will not be displayed.

MASTER CUT
MALFUNCTION
PRESS RESET BUTTON

- **Master Cut Error -**

Displayed to interrupt the machine operation in master-making and confidential processes:

- 1) If the **Master sensor** detected the master on the Drum at the Magnet C-1 detection in master loading process, and then if the **Master positioning sensor** detects the master at the Magnet A detection after master-cutting operation (the Magnet C-2 detection).

MASTER MIS-FEED
RESET MASTER

- **Master has Not been Properly Fed or Loaded -**

Displayed after the master has been loaded onto the Drum in master making or confidential process:

- 1) If the **Master positioning sensor** has not detect the master material **within 536 pulses** after the Loading pulse motor started rotating following the master cutting operation.

Note:

- The Loading and Write pulse motors are turned off following the above.

Displayed to interrupt the machine operation when the Master loading button was pressed:

- 2) If the **Master positioning sensor** has not detected the master material **within 2426 pulses** after the Loading pulse motor was turned on.
- 3) If the **Master positioning sensor** has not detected the master **within 536 pulses** after the Loading pulse motor was turned on following the operation of the Cutter motor.

USED MASTER NOT
DISCHARGED
PULL OUT DRUM
AND CHECK

- **The Used Master has Not been Removed from the Drum -**

Displayed after the Image scanning and Master making operations are completed or in the confidential operation:

- 1) If the light path of the **Master removal sensor** has been open until the Magnet A detection sensor detects the Magnet A after the detection of the master by the Master sensor at the Magnet C-1 detection, during master removal.

Note:

- If the Master sensor does not detect the master at the Magnet C-1 detection, in the above case, the Master removal sensor is prevented from operating and the message will not be displayed.

ORIGINAL MISFEED IN ADF
OPEN STAGE COVER/
REMOVE ORIGINAL

- Original has Misfed or Jammed in the ADF Feed Side -

Displayed to immediately interrupt the machine operation:

- 1) If the **ADF registration sensor** is blocked when the ADF starts to operate.
- 2) If the **ADF registration sensor** is not blocked by the original **within 640ms** after the start of the ADF transfer motor (clock-wise rotation) in the original feed operation.
- 3) If the **ADF registration sensor** has not been opened **within 1410ms** after the ADF transfer motor reversed the rotation direction to counter-clockwise in the original feed operation.
- 4) If the **ADF registration sensor** is blocked by the original when the original feed operation finished.

ORIGINAL JAM IN ADF
OPEN STAGE COVER/
REMOVE ORIGINAL

- Original has Misedected or Jammed in the ADF Ejection Side -

Displayed after the master has been loaded onto the Drum:

- 1) If the actuator of the **ADF ejection sensor** is held up, when the ADF starts to operate.
- 2) If the actuator of the **ADF ejection sensor** has not been pushed up, **within 1270ms** after the ADF transfer motor started rotating counter-clockwise in the original ejection operation.
- 3) If the actuator of the **ADF ejection sensor** is not released **within 1480ms** in the original ejection operation.

ORIGINAL REMAINING
ON THE STAGE

- Original Remains on the Stage Glass in ADF Operation -

Displayed immediately after originals have been placed on the Original tray:

- 1) If the **Original detection sensor** detects the original placed on the Stage glass when the **ADF original detection sensor** detects the originals placed on the Original tray.

NO MASTER ON DRUM
SET ORIGINAL IN PLACE
AND PRESS START BUTTON

- The Master is Not Attached to the Drum -

Displayed **for 2 seconds** after the Drum has stopped at the Magnet A detection:

- 1) If the **Master sensor** does not detect the master (the reflected light) when the Magnet C-1 has been detected by the Magnet C detection sensor just after the print started.

Note:

- At the Magnet C-1 detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).

MASTER JAM IN
MASTER DISPOSAL UNIT

- The Used Master is Jammed and Blocked at the entrance of Master disposal box -

Displayed when "START" button is pressed for master-making operation.

- 1) If the light path of the **Master removal sensor** is blocked at the start of master-making operation.

3. "CHECK SETTING" indication

SET DRUM IN PLACE	Displayed to prevent the machine operation: <ul style="list-style-type: none">• If the actuator of the Drum set switch is not depressed.
SET INK BOTTLE IN PLACE	Displayed to prevent the machine operation: <ul style="list-style-type: none">• If the actuator of the Ink bottle switch is not depressed.
ADD PAPER	Displayed to interrupt the Print signal (the first paper feed) in printing: 1) If the light path of the Paper detection sensor is open when that of the Pressure detection sensor has been opened in printing. Displayed to prevent the machine operation: 2) If the light path of the Paper detection sensor is open.
SET LEAD EDGE OF MASTER UNDER GREEN FILM	Displayed to prevent the machine operation: <ul style="list-style-type: none">• If the Master detection sensor does not detect the master material (the reflected light).
CLOSE FRONT COVER	Displayed to prevent the machine operation: <ul style="list-style-type: none">• If the metal plate is not attached to the Front cover set sensor.
SET MASTER DISPOSAL BOX IN PLACE	Displayed to prevent the machine operation: <ul style="list-style-type: none">• If the actuator of the Disposal box set switch is not depressed.
SET ORIGINAL FEED TABLE IN PLACE	Displayed to prevent the machine operation: <ul style="list-style-type: none">• If the actuator of the Original-feed table set switch is not depressed.
CLOSE MASTER LOADING UNIT	Displayed to prevent the machine operation: <ul style="list-style-type: none">• If the actuator of the Master loading unit switch is not depressed.
CLOSE STAGE COVER	Displayed to prevent the machine operation: <ul style="list-style-type: none">• If the ADF setting sw is not ON when the ADF original detection sensor detects the originals placed on the Original tray.

4. Others

REPLACE INK BOTTLE

Displayed after the machine operation is finished:

- If the **Ink sensor** has not detected ink in the Squeegee unit **within 30 seconds** after the Inking motor was started rotating by the detection of scarce ink in the unit.

REPLACE MASTER ROLL

Displayed after the machine operation is finished:

- If the black tape attached at the end of the Master roll has been detected by the **Master end sensor** during master making or the confidential operation.

EMPTY DISPOSAL BOX

Displayed after the machine operation is finished:

- If the **Internal counter** for disposed masters on the **Panel PCB** has counted 30 through the detection of disposed masters by the **Master removal sensor**.

REMOVE CUT MASTER STRIP

Displayed:

- If the **Master positioning sensor** detects the master material (the reflected light) just after the master cut operation is completed.

SELECT PRINT QUANTITY

Displayed:

- If the "START" button is pressed for printing when the print quantity is set to **0**.

PRESS RESET BUTTON

Displayed:

- When jam has occurred.

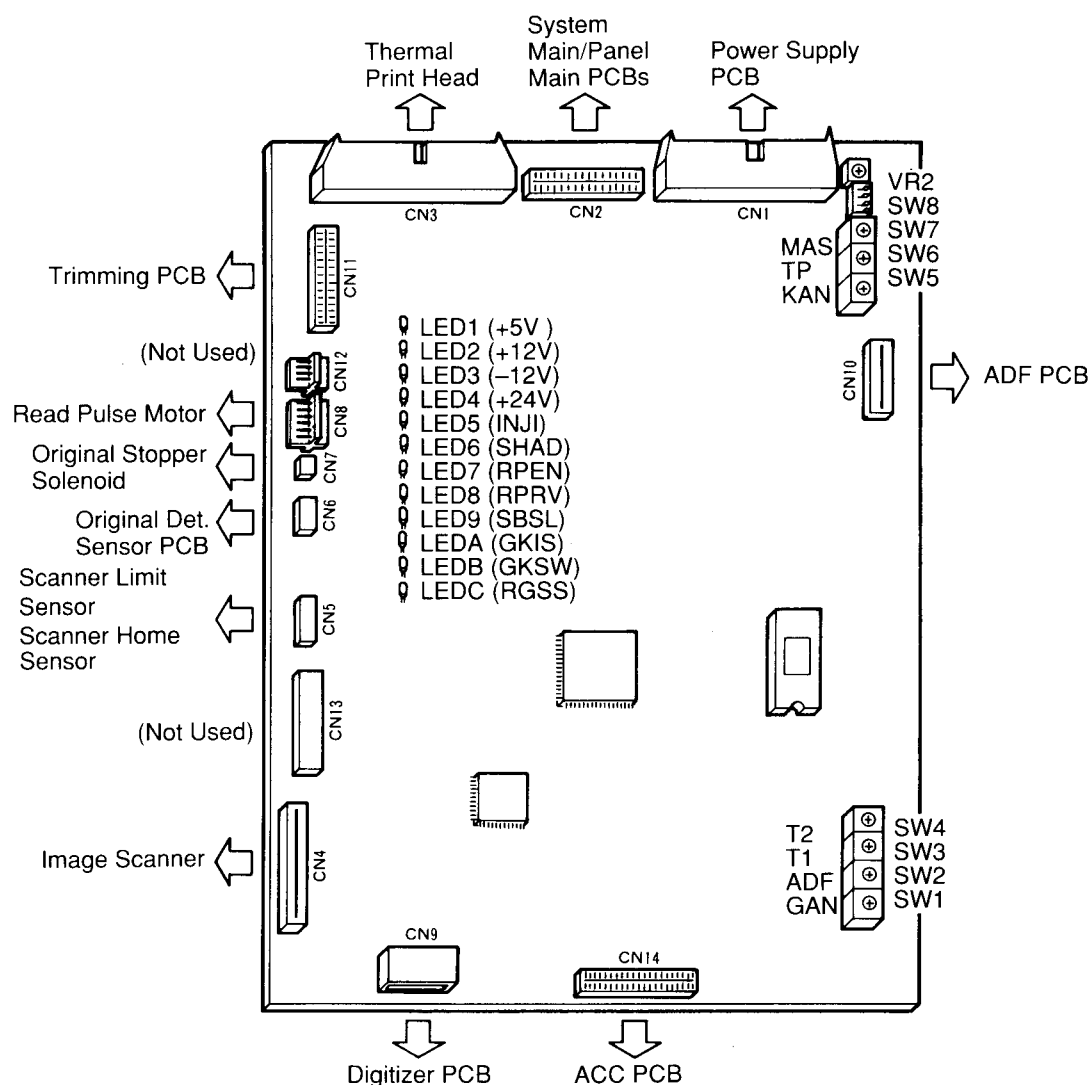
TO RESUME
PRESS START BUTTON

Displayed:

- If the "REST" button has been pressed after the error or jam occurred.

4. Description of PCBs

1. IMAGE PROCESSING PCB (58)



LED

- When LED is ON -

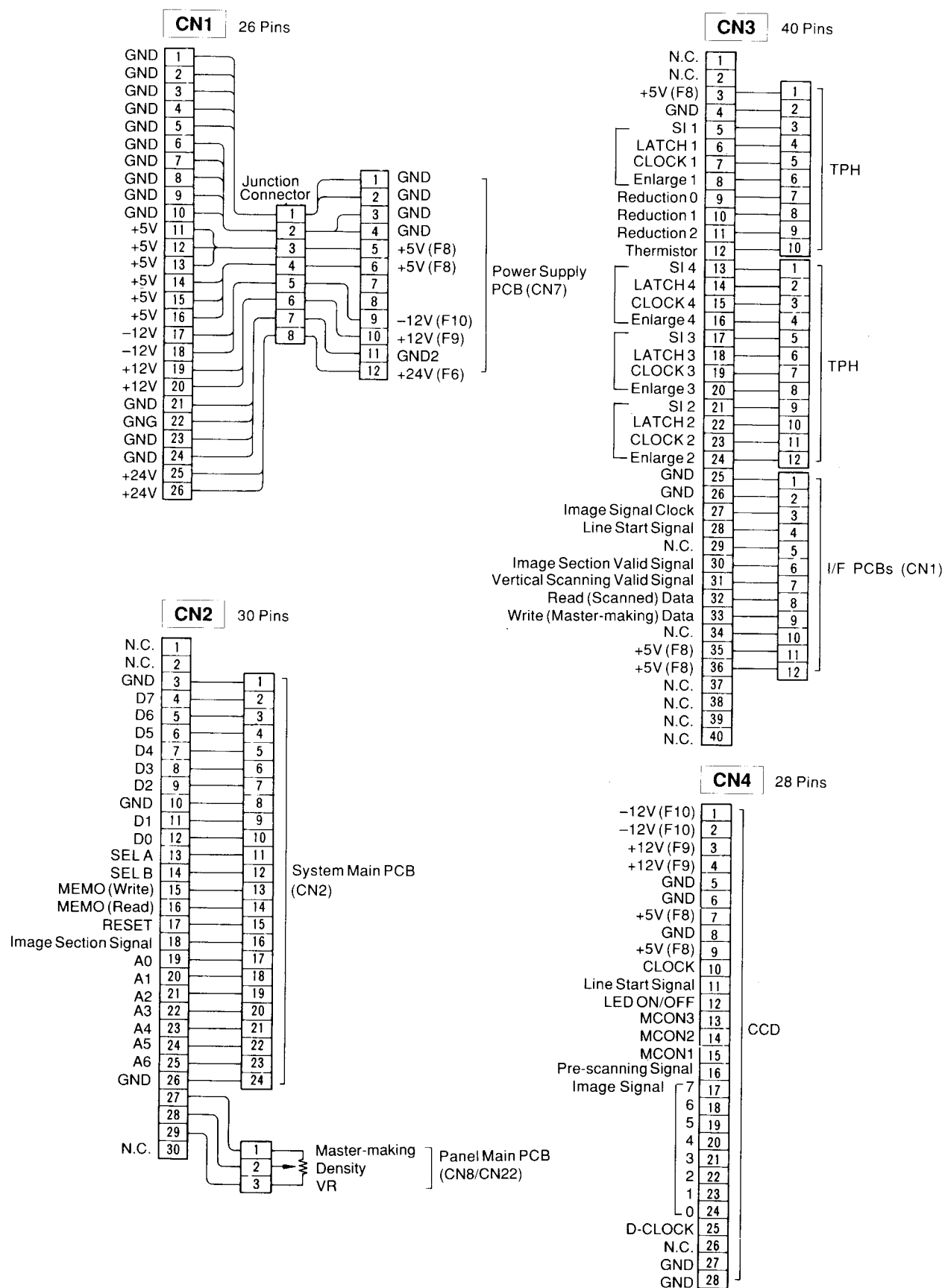
LED1 (+5V)	: +5V is supplied into PCB.
LED2 (+12V)	: +12V is supplied into PCB.
LED3 (-12V)	: -12V is supplied into PCB.
LED4 (+24V)	: +24V is supplied into PCB.
LED5 (INJI)	: "Read/Write Start Signal" is output.
LED6 (SHAD)	: "Shading Compensation Signal" is output.
LED7 (RPEN)	: Read Pulse Motor is ON.
LED8 (RPRV)	: Read Pulse Motor is rotating CCW.
LED9 (SBSL)	: Original Stopper Solenoid is ON.
LEDA (GKIS)	: Original Det. Sensor is detecting reflected light.
LEDB (GKSW)	: Scanner Home Sensor is activated.
LEDC (RGSS)	: Scanner Limit Sensor is activated.

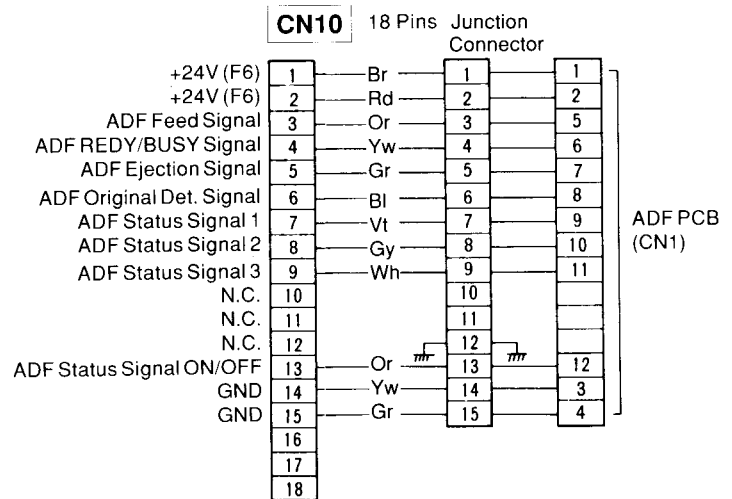
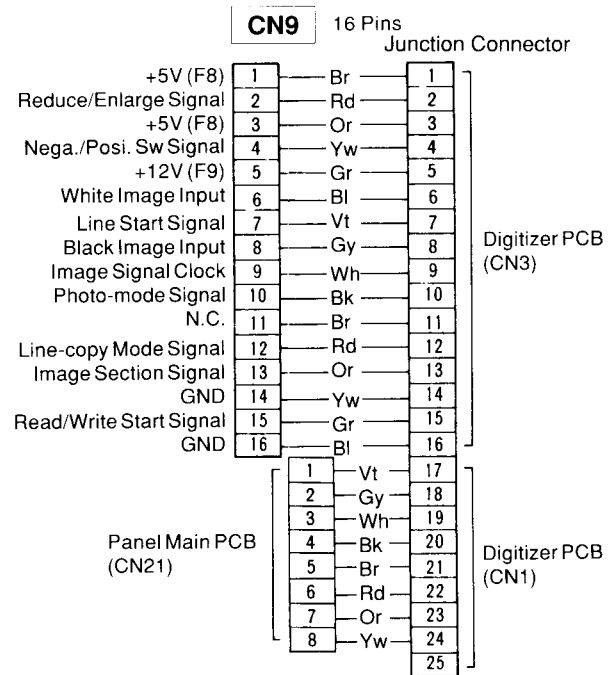
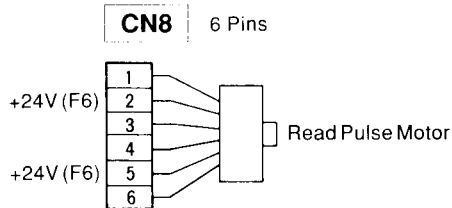
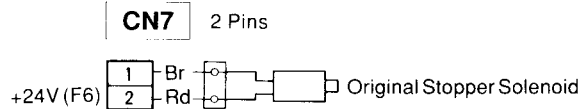
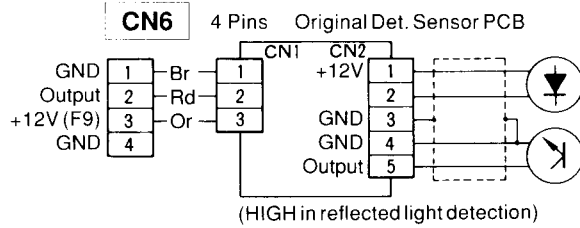
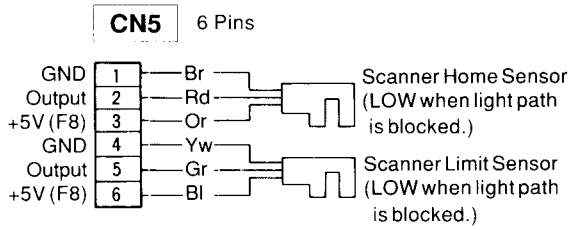
VR

VR2 (NDD)	: For contrast level adjustment in image scanning. (The contrast will be darker by turning it clockwise.)
-----------	--

SW

SW1 (GAN)	: For contrast balance (γ compensation) adjustment in image scanning.
SW2 (ADF)	: For adjustment of scanning (read)-start position.
SW3 (T1)	: For adjustment of heating power (HP1) of Thermal Print Head
SW4 (T2)	: For adjustment of heating power (HP2) of Thermal Print Head
SW5 (KAN)	: Not Used
SW6 (TP)	: Not Used
SW7 (MAS)	: For adjustment of "Line-copy mode slice level."
SW8 (Dip SW)	: Used only for adjustment in factory





CN11 26 Pins

+5V (F8)	1
+5V (F8)	2
Line Start Signal	3
Image Signal Clock	4
Image Valid Signal	5
Image Data	6
White Signal	7
PS Signal	8
Read/Write Start Signal	9
Reduce/Enlarge Signal	10
READY/BUSY Signal	11
END Signal	12
SIZE Signal 1	13
SIZE Signal 2	14
SIZE Signal 3	15
MS Signal	16
CLEAR Signal	17
TOP Signal	18
N.C.	19
SM Signal	20
PHOTO Signal	21
CP Signal	22
GND	23
GND	24
GND	25
GND	26

Trimming PCB (CN1)

CN14 30 Pins

GND	1
+5V (F8)	2
GND	3
N.C.	4
N.C.	5
Image Signal Clock	6
D0	7
D1	8
D2	9
D3	10
D4	11
D5	12
D6	13
D7	14
A0	15
A1	16
A2	17
A3	18
A4	19
A5	20
A6	21
A7	22
Character Signal	23
N.C.	24
ACC ON	25
N.C.	26
Character Signal	27
N.C.	28
N.C.	29
N.C.	30

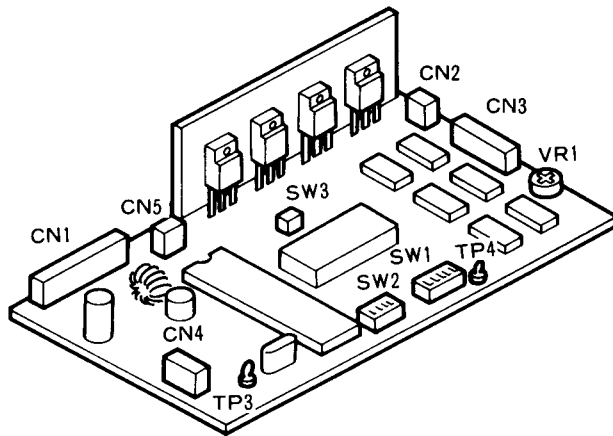
ACC PCB (CN1)

CN12 4 Pins

+24V (F6)	1
+24V (F6)	2
	3
	4

(Not Used)

2. ADF PCB



VR

VR1 : For sensitivity adjustment of ADF registration sensor

LED

- When LED is ON -

LED1 : +24V is supplied into PCB

TP

TP1 (+24V) : +24V

TP2 (+5V) : +5V

TP3 (0V) : GND

TP4 (REGS) : OADF registration sensor's Output

TP5 (X4) : Clock Sensor's Output

TP6 (MCK2) : ADF clock Sensor 1's Output

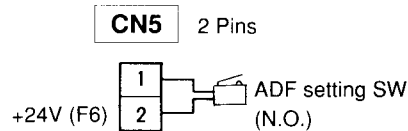
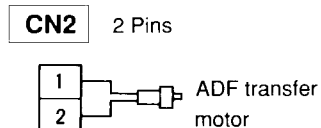
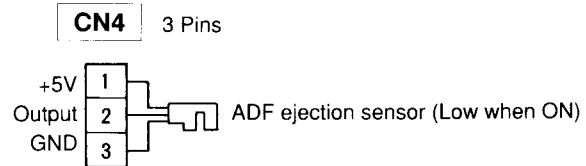
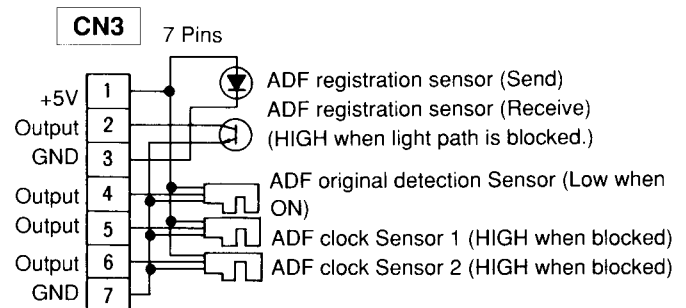
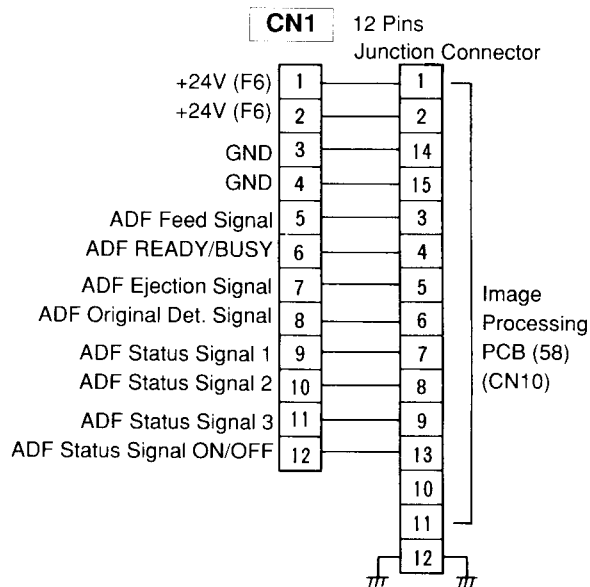
TP7 (MCK1) : ADF clock Sensor 2's Output

SW

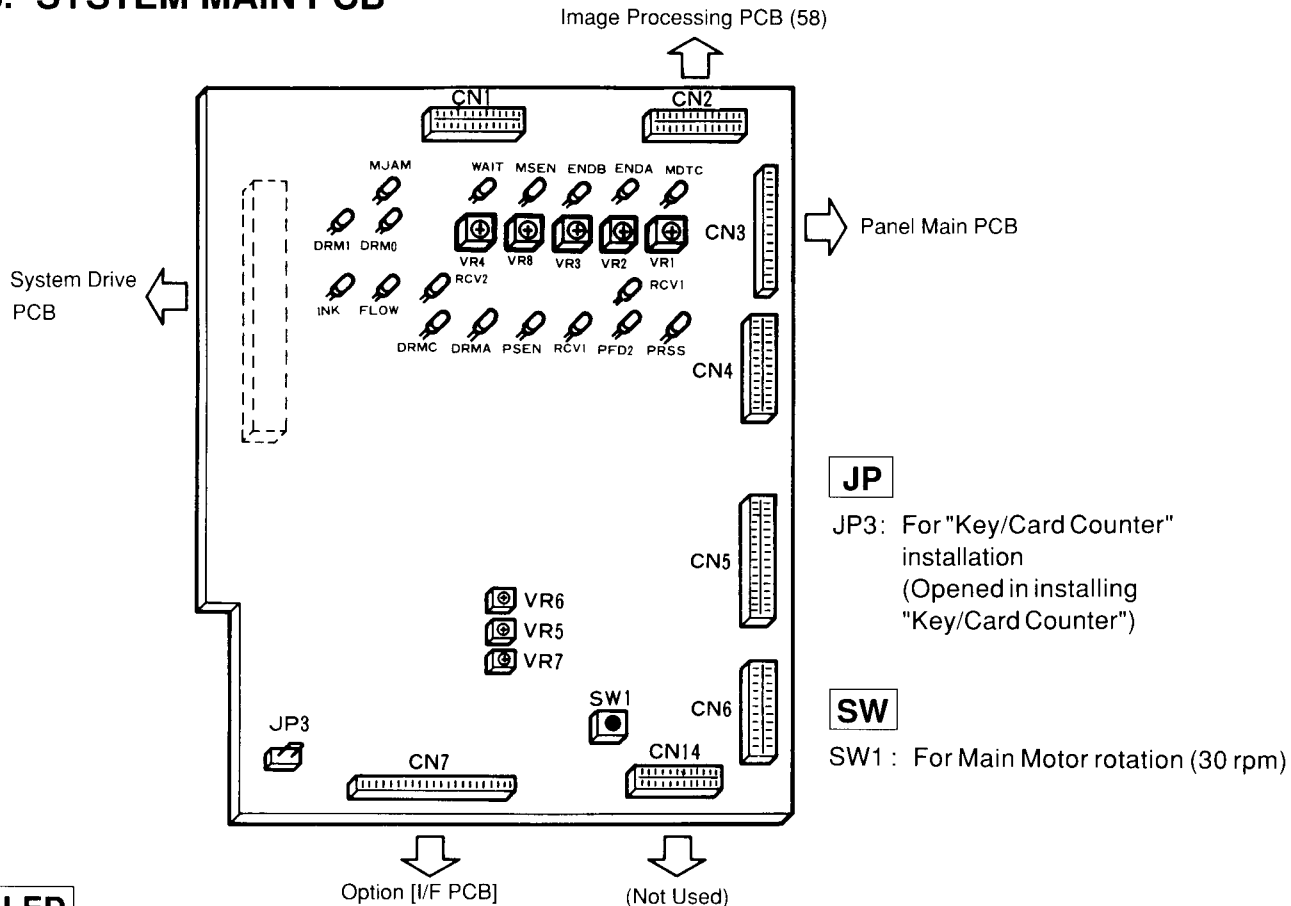
SW1 : For stop position adjustment of original feed

SW2 : For ADF Test Mode

SW3 : For ADF Test Mode



3. SYSTEM MAIN PCB



LED

LED - When LED is ON -

- MDTC : Master Det. Sensor is detecting reflected light (Master).
- ENDA : Master End Sensor (A4) is NOT detecting reflected light.
- ENDB : Master End Sensor (B4) is NOT detecting reflected light.
- MSEN : Master Sensor is detecting reflected light (Master).
- WAIT : Master Positioning Sensor is detecting reflected light (Master).
- MJAM : The light path of Master Removal Sensor is blocked.
- DRM0 : 0° Angular Sensor is detecting magnetism (Angular Magnet).
- DRM1 : 180° Angular Sensor is detecting magnetism (Angular Magnet).
- PFD1 : The actuator of Paper Buckle Det. Sensor is raised to open the light path.
- RCV2 : The light path of Paper Receiving Sensor 2 is blocked.
- FLOW : Overflow Sensor is detecting ink.
- INK : Ink Sensor is NOT detecting ink.
- PRSS : The light path of Pressure Detection Sensor is blocked.
- PFD2 : The light path of Paper Feed Clutch Sensor is open.
- RCV1 : The light path of Paper Receiving Sensor 1 is blocked.
- PSEN : The light path of Paper Sensor is blocked.
- DRMA : Magnet A Detection Sensor is detecting magnetism (Magnet A).
- DRMC : Magnet C Detection Sensor is detecting magnetism (Magnet C-1 or -2).

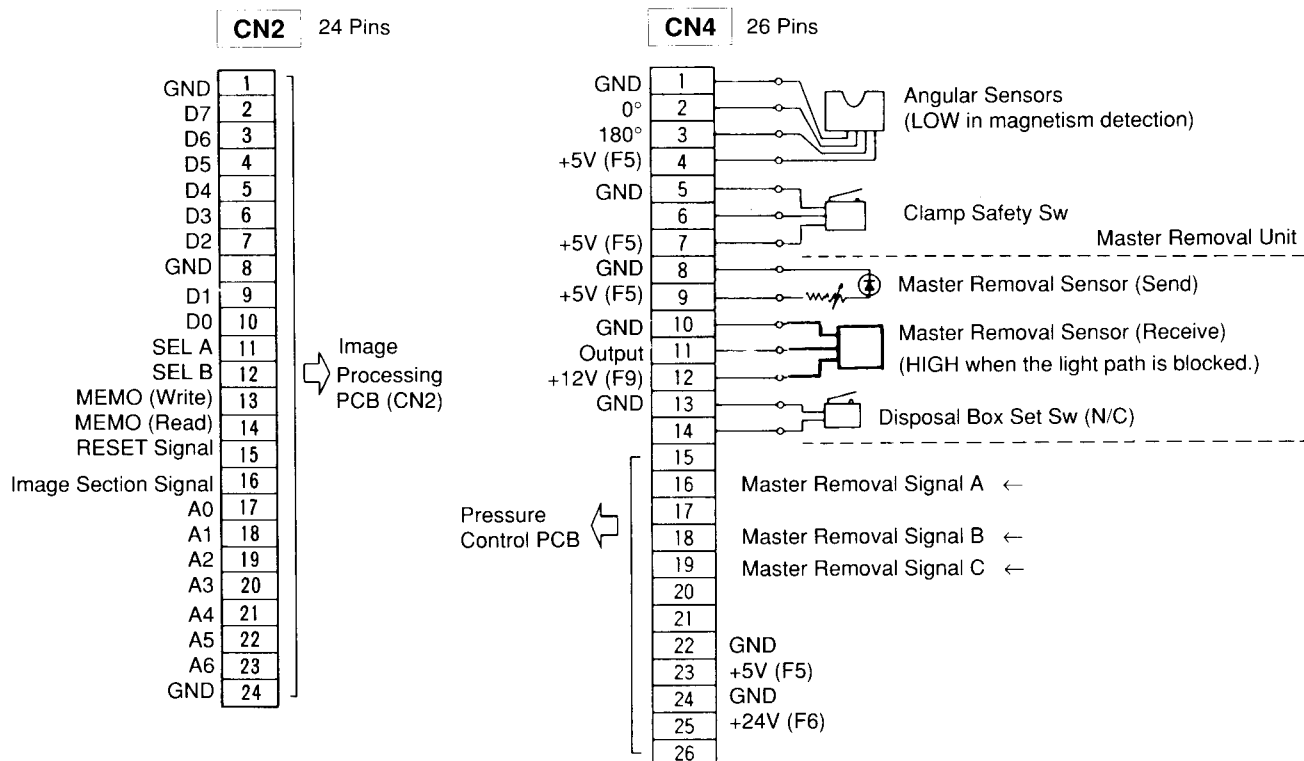
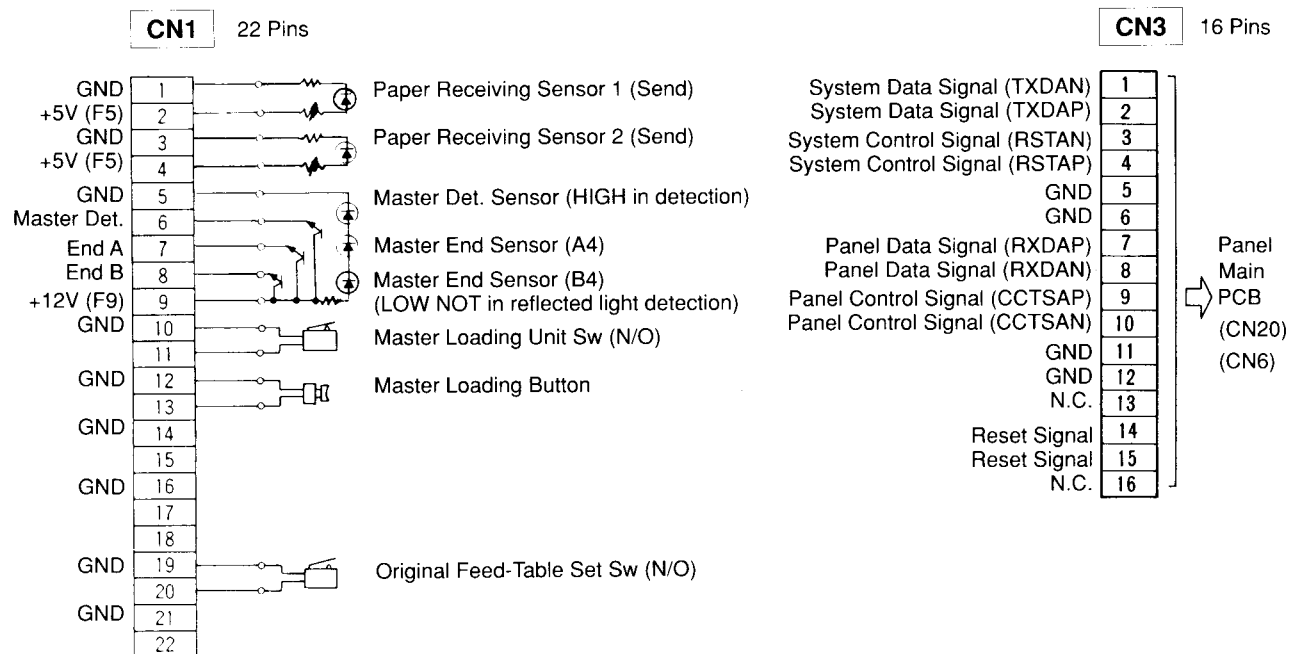
VR

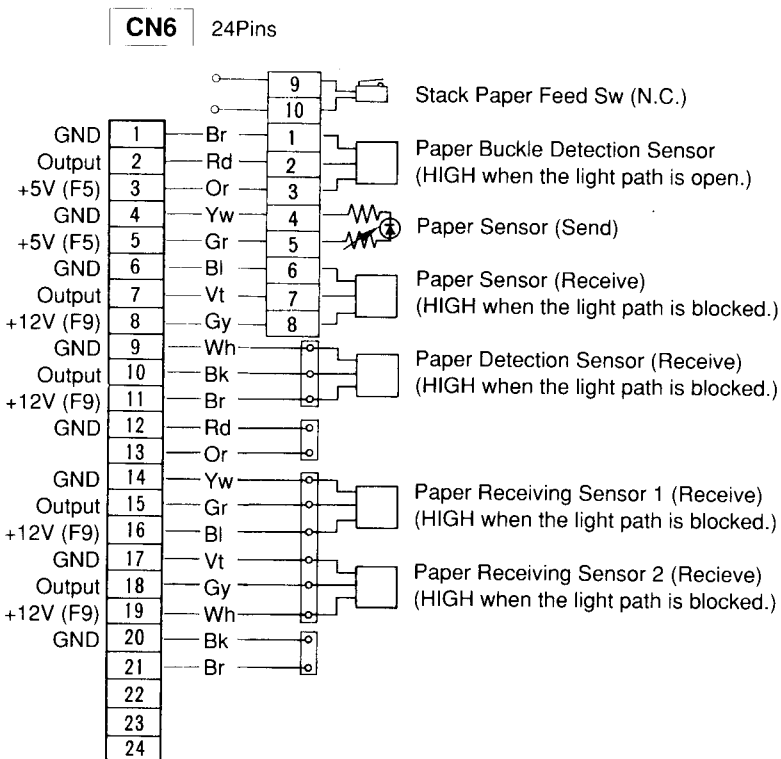
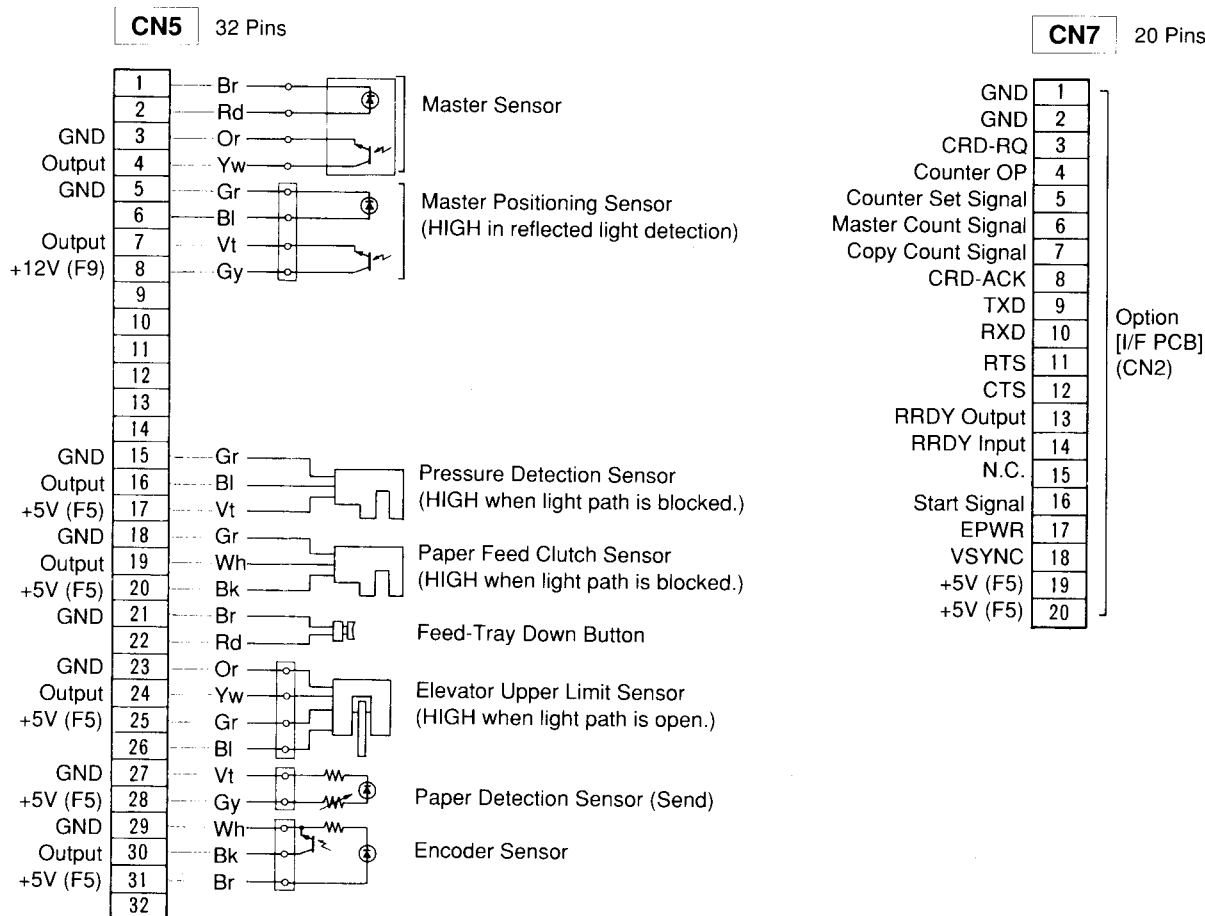
- VR1 : For detection sensitivity adjustment of Master Det. Sensor (Sensitivity goes up by clockwise rotation.)
- VR2 : For detection sensitivity adjustment of Master End Sensor-A4 (Sensitivity goes up by clockwise rotation.)
- VR3 : For detection sensitivity adjustment of Master End Sensor-B4 (Sensitivity goes up by clockwise rotation.)
- VR4 : For detection sensitivity adjustment of Master Positioning Sensor (Sensitivity goes up by clockwise rotation.)
- VR5 : For adjustment of "Free rotation speed" (30 rpm) (The speed goes up by clockwise rotation.)
- VR6 : For adjustment of "Master loading speed" (15 rpm) (The speed goes up by clockwise rotation.)
- VR7 : For adjustment of "Print speed" (130 rpm) (The speed goes up by clockwise rotation.)
- VR8 : For detection sensitivity adjustment of Master Sensor (Sensitivity goes up by clockwise rotation.)

SW

- SW1 : For Main Motor rotation (30 rpm)

- JP3: For "Key/Card Counter" installation
(Opened in installing "Key/Card Counter")





CNA 96 Pins

System
Drive
PCB
(CNA)



1	GND
2	GND
3	GND
4	GND
5	GND
6	GND
7	+5V (F5)
8	+5V (F5)
9	+5V (F5)
10	Sorter Connect Signal
11	Ink Sensor
12	Overflow Sensor
13	Ink Data Signal
14	Drum Home Position SW
15	Ink Bottle SW
16	Drum Set SW
17	Drum Data Signal
18	Tape End Signal
19	Vertical Centering Sensor
20	
21	
22	
23	Paper Full Stack Signal
24	Sorter Set Signal
25	Print Position Motor Busy
26	Write Pulse Motor CW/CCW
27	Write Pulse Motor (Enable Signal)
28	Loading Pulse Motor (Enable Signal)
29	Separation Fan
30	
31	Inking Motor
32	Lock Solenoid
33	Drum Home Position Lamp
34	Master Count Signal
35	Copy Count signal
36	Storage Fan
37	Thermal Pressure Motor
38	Suction Fan Control
39	Loading Fan
40	Reset
41	Cutter Motor
42	Clamp Motor CW/CCW
43	Clamp Motor ON/OFF
44	Print Position Motor TRIGGER
45	Print Position Motor CW/CCW
46	Print Signal
47	Pressure Solenoid
48	M.-Rmv. Vertical Transport Motor
49	
50	Elevator Lower Limit SW

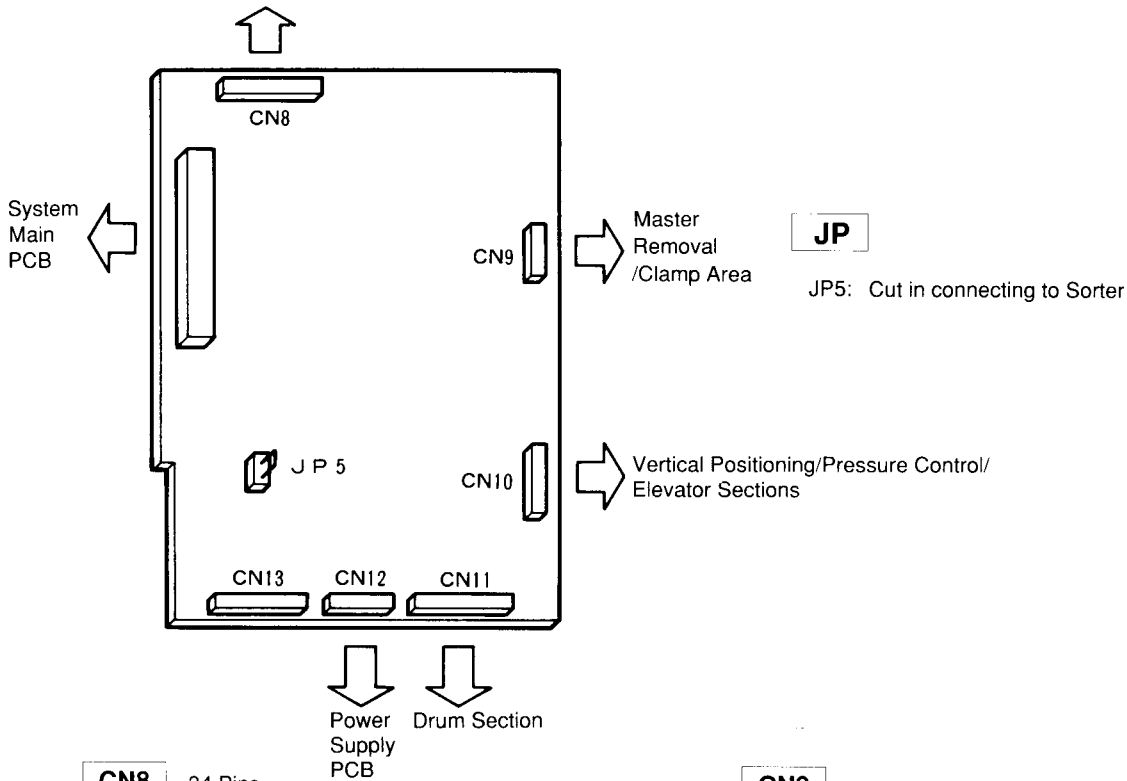
System
Drive
PCB
(CNA)



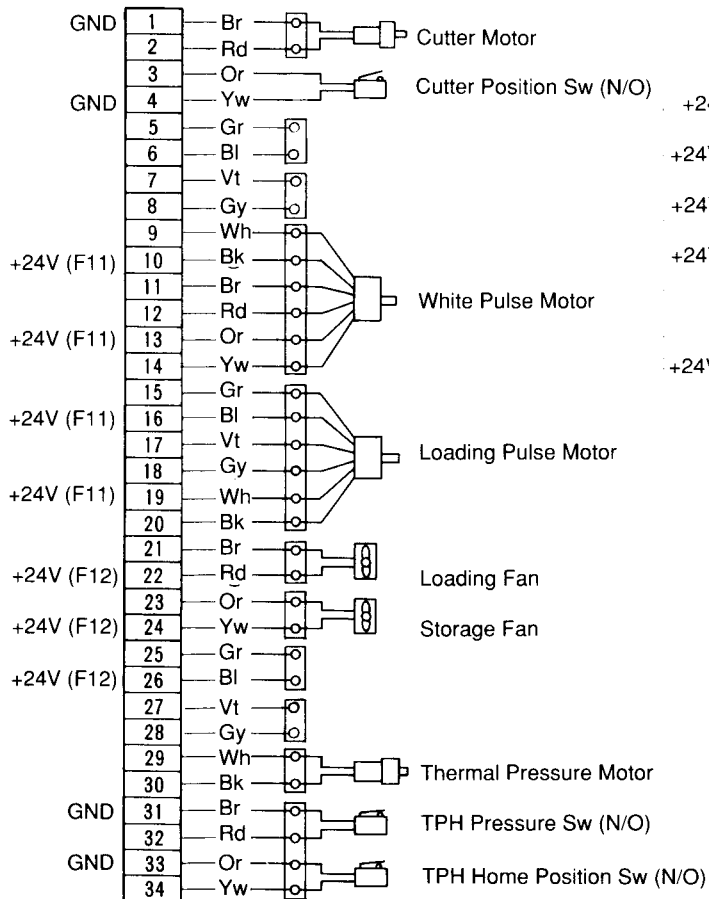
51	Elevator Motor UP/DOWN
52	Elevator Motor ON/OFF
53	Clamp Solenoid
54	Pressure Control Motor CTL 3
55	N.C.
56	Master-make Start/Stop Signal
57	Print Start/Stop Signal
58	Pressure Control Motor CTL 2
59	Pressure Control Motor CTL 1
60	Cluster Signal A
61	Cluster Signal B
62	Status 1
63	Status 2
64	Magnet A Det. Sensor
65	Paper Sensor
66	Paper Receiving Sensor 2
67	Counter Set Signal
68	TXDB
69	Main Motor Pulse K
70	Magnet C Det. Sensor
71	RXDB
72	Main Motor Pulse A
73	Magnet A Det. Sensor
74	RTSB
75	Main Motor Brake A
76	Power Fail
77	CTSB
78	Main Motor Brake K
79	Clock
80	Write Pulse Motor Clock
81	Front Cover Set Signal
82	P.-F. Clutch/Paper Buckle Det. Sensor
83	N.C.
84	N.C.
85	+12V (F9)
86	+12V (F9)
87	+12V (F9)
88	-12V (F10)
89	-12V (F10)
90	-12V (F10)
91	+24V (F6)
92	+24V (F6)
93	+24V (F6)
94	GND
95	GND
96	GND

4. SYSTEM DRIVE PCB

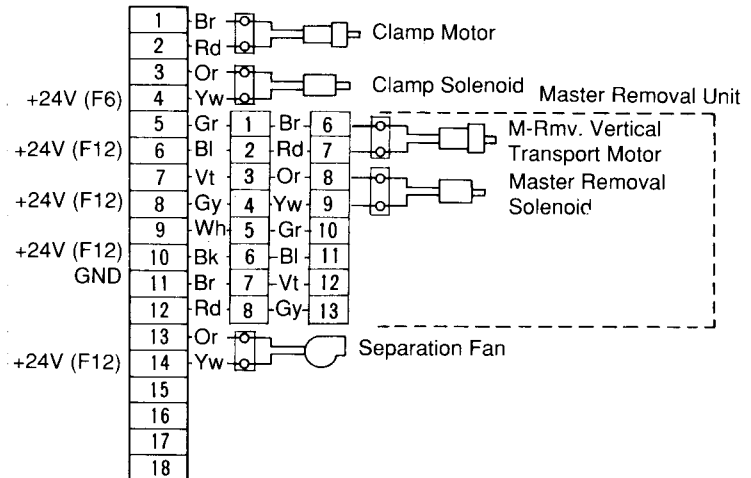
Cutter/Master-Making Sections

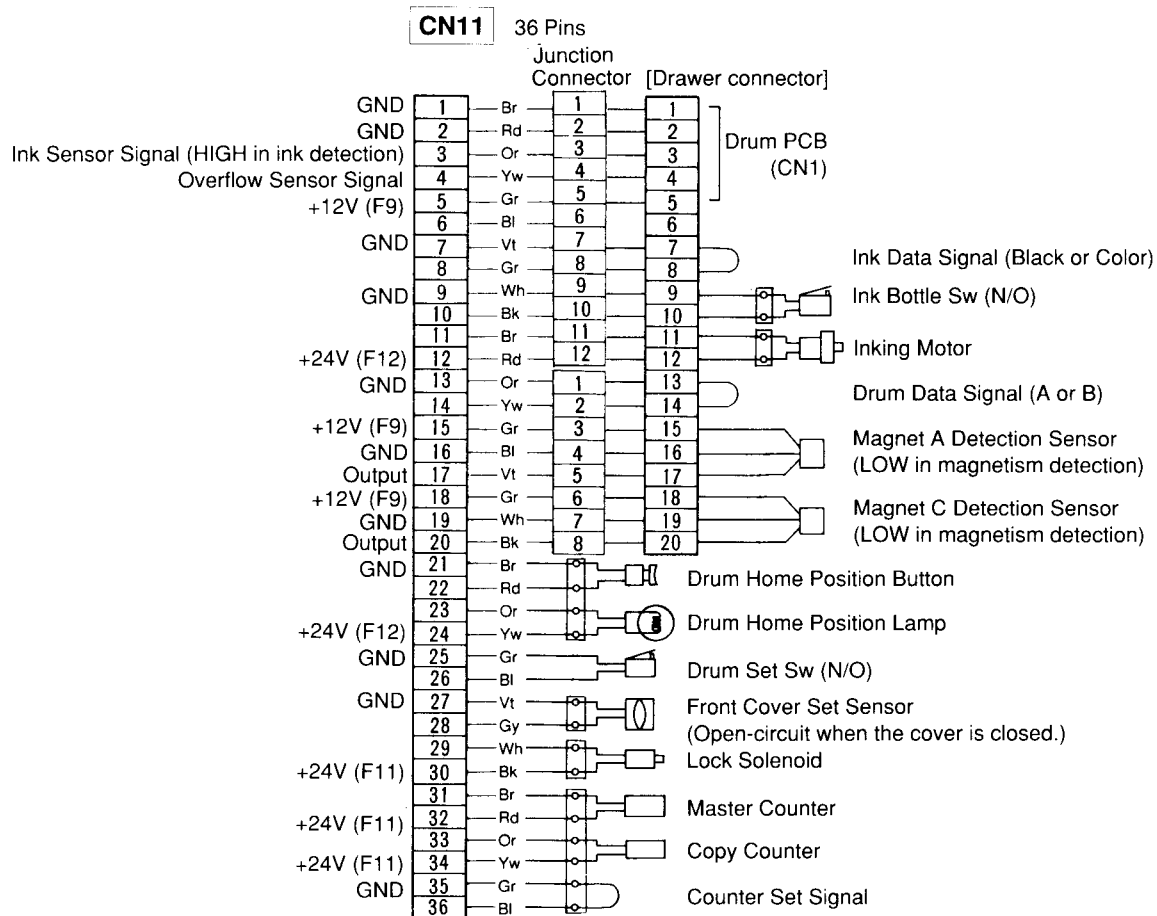
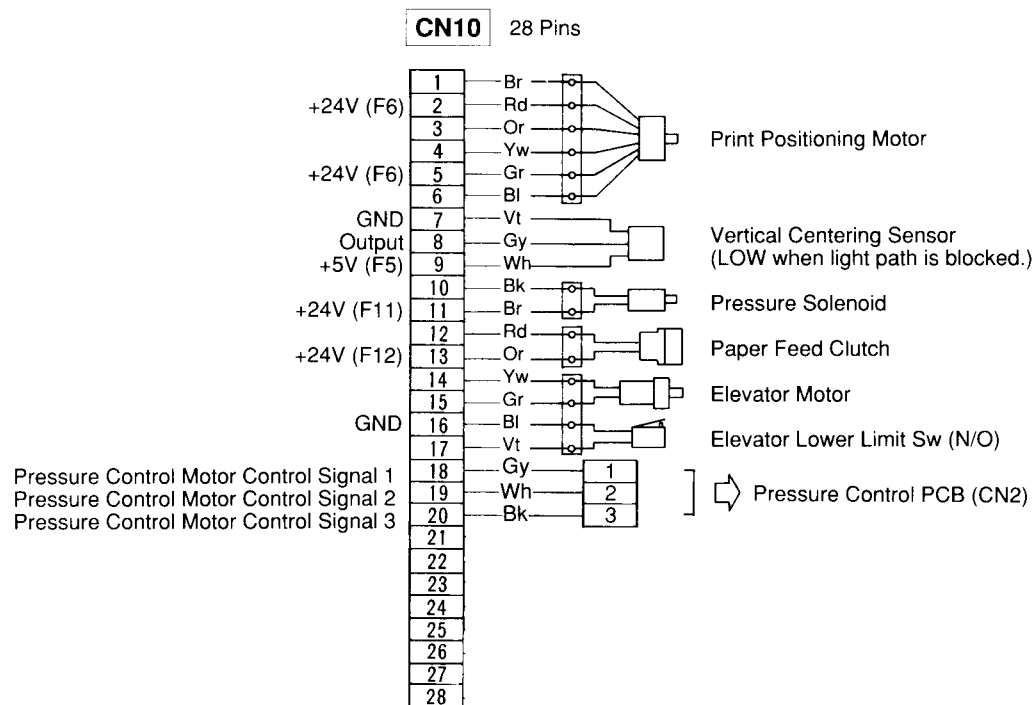


CN8 34 Pins



CN9 18 Pins





CN12 22 Pins

1	Br	1	GND	
2	Rd	2	GND	
3	Or	3	GND	
4	Yw	4	GND	
5	Gr	5	+5V (F5)	
6	Bl	6	+5V (F5)	
7	Vt	7	System Reset Signal	
8	Gy	8	Power Fail Signal	
9	Wh	9	-12V (F10)	
10	Bk	10	+12V (F9)	
11	Br	11	GND	
12	Rd	12	+24V (F6)	
13	Or	1	Thermal Print Head Control Signal	
14	Yw	2	Suction Fan Control Signal	
15	Gr	3	Main Motor Control Signal	
16	Bl	4	Main Motor Control Signal	
17	Vt	5	Main Motor Control Signal	
18	Gy	6	Main Motor Control Signal	
19	Wh	7	+24V (F12)	
20	Bk	8	+24V (F11)	
21	Br	9	GND	
22	Rd	10	GND	

Power Supply
PCB (CN8)

Power Supply
PCB (CN5)

CN13 34 Pins

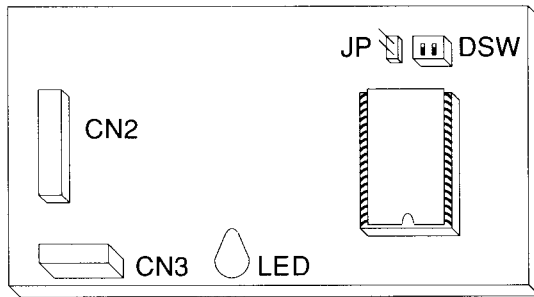
RC SORTER					
Shielded Ground	1	Br	1		
GND	2	Rd	2		
GND	3	Or	3		
TXD	4	Yw	4		
RXD	5	Gr	5		
RTS	6	Bl	6		
CTS	7	Vt	7		
Sorter Connect Signal	8	Gy	8		
+5V(F5)	9	Wh	9		
+12V(F9)	10	Bk			
-12V(F10)	11	Br			
GND	12	Rd	12		
GND	13	Or	13		
Sorter Starter (+24V) (F12)	14	Yw	14		
GND	15	Gr	15	1	1
+5V (F5)	16	Bl		2	2
Sorter Set Signal	17	Vt	17	3	
Cluster Signal A	18	Gy		4	4
Paper Sensor Signal	19	Wh	19	5	
Paper Rcv. Sensor 2 Signal	20	Bk	20	6	
Print Signal	21	Br		7	
Magnet A Det. Signal	22	Rd		8	
Copy Count Signal	23	Or		9	
Master Count Signal	24	Yw		10	
Print Start/Stop Signal	25	Gr		11	
GND	26	Bl	26	12	
GND	27	Vt	27		13
+24V (F12)	28	Gy	28		14
Cluster Signal B	29	Wh	29	15	15
Tape End Signal	30	Bk			
STATUS 1 Signal	31	Br			
STATUS 2 Signal	32	Rd			
Master-making Start/Stop Signal	33	Or			
Paper Full Stack Signal	34	Yw			

*The not-numbered pins are not used.

FRISORTER

JOBSEPARATOR

5. PRESSURE CONTROL PCB



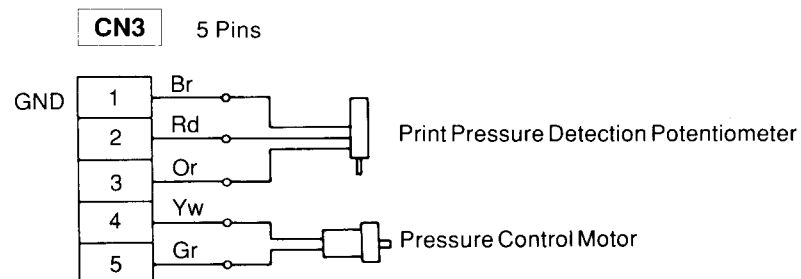
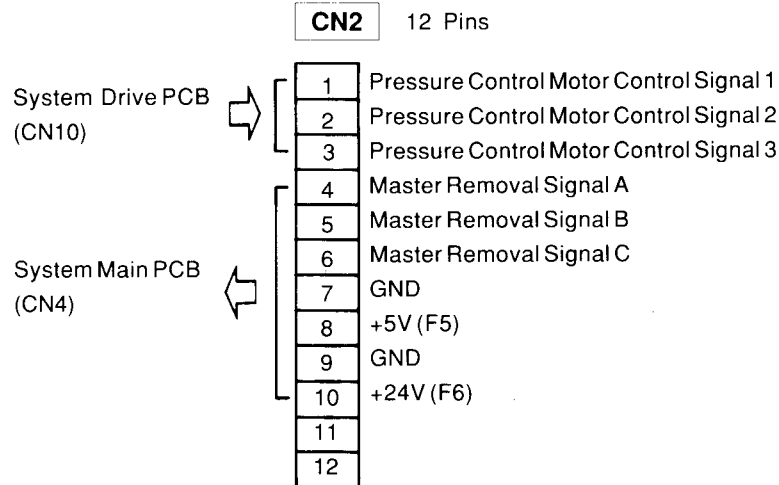
DIP SW

Type of Drum	SW1	SW2
A4 Drum	OFF	OFF
Legal Drum	OFF	OFF
B4 Drum	OFF	ON

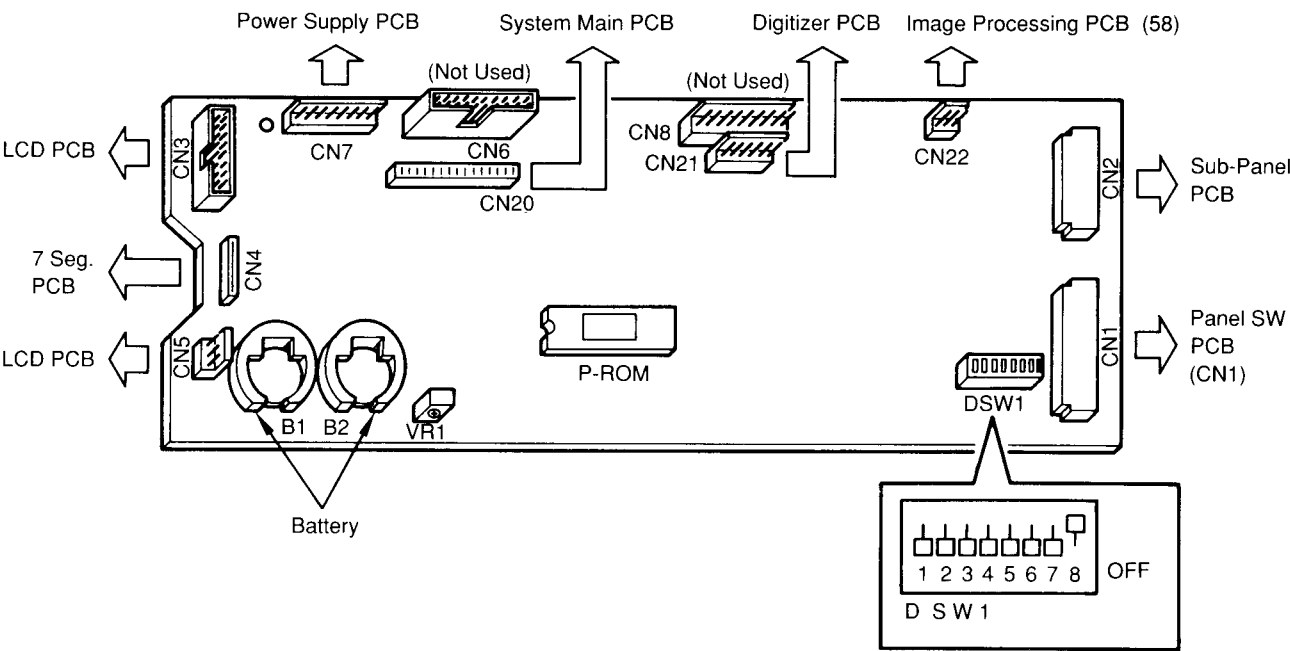
VR1 : For luminosity adjustment of LCD panel

LED

LED is ON when the print pressure is set at the standard value.
(When step 3 is selected in the density mode.)



6. PANEL MAIN PCB



VR

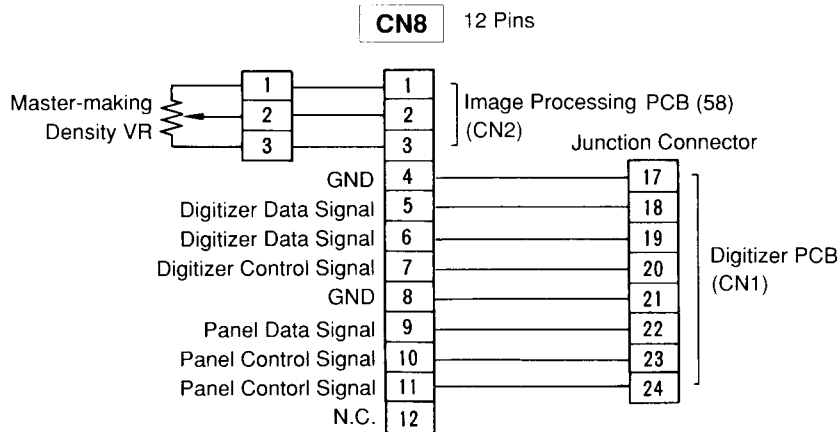
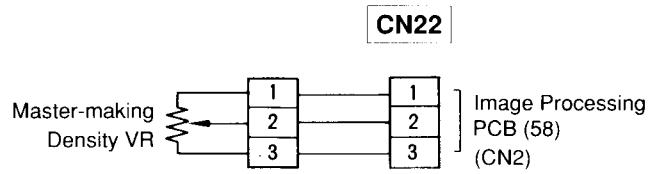
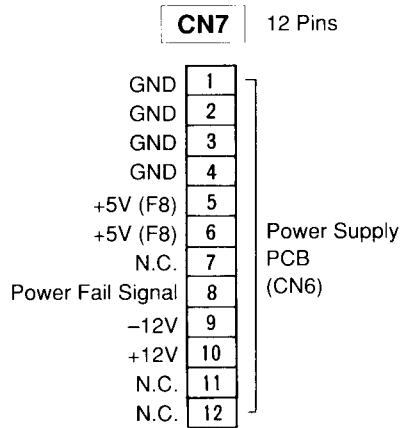
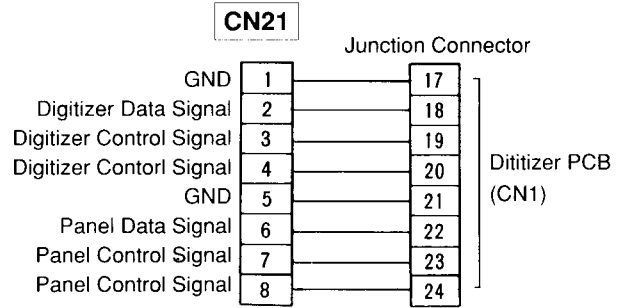
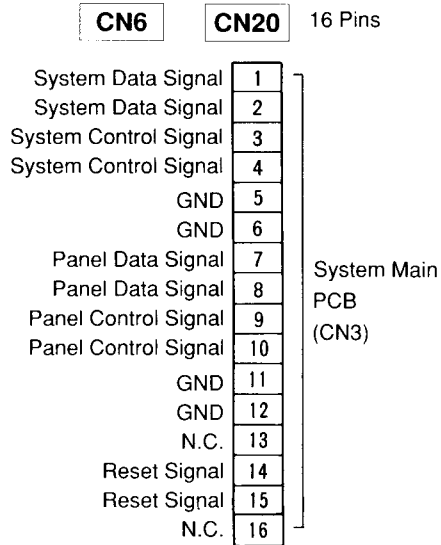
VR1 : For luminosity adjustment of LCD panel

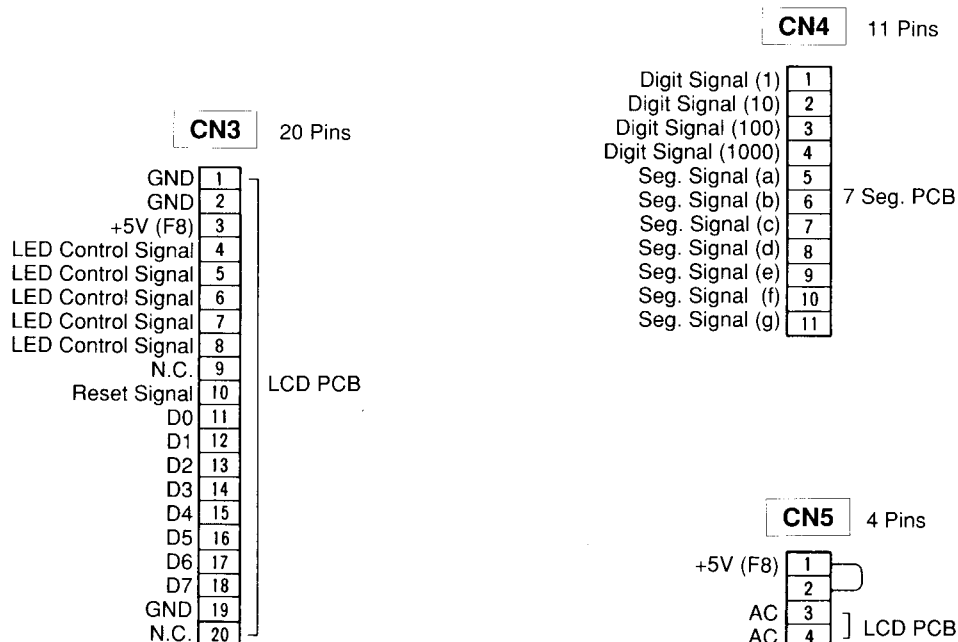
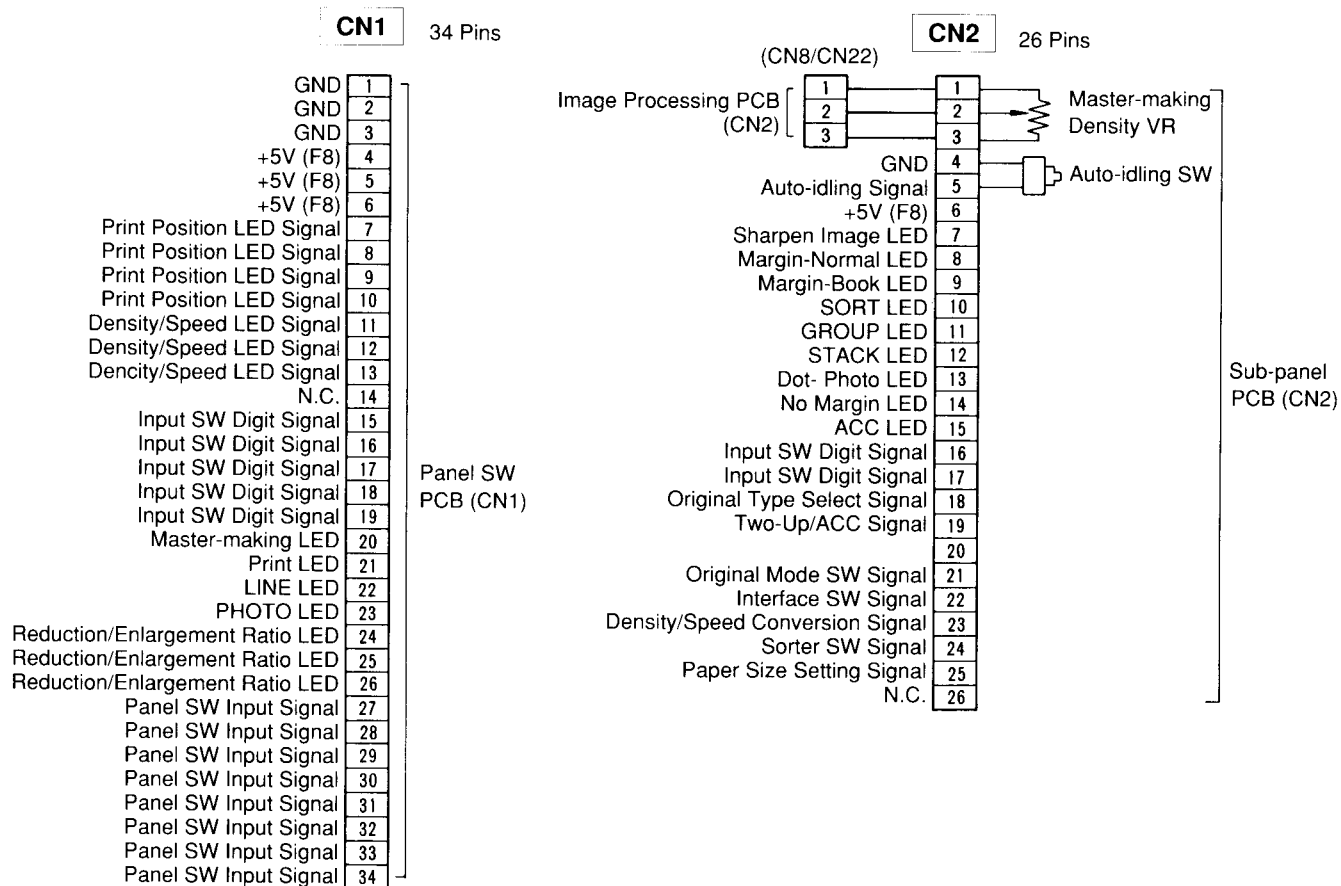
SW

SW	FUNCTION	OFF	[ON]
DSw1-1	The initial print speed selection * 1	100RPM	60RPM
DSw1-2	The initial paper size selection	A4 or B4 or Legal *2	Setting before Power OFF or Reset
DSw1-3	The initial ACC setting selection	ACC ON	ACC OFF
DSw1-4	Priority selection between Density- and Speed-Change modes	Density-Change mode	Speed-Change mode
DSw1-5	* 3		
DSw1-6			
DSw1-7			
DSw1-8			

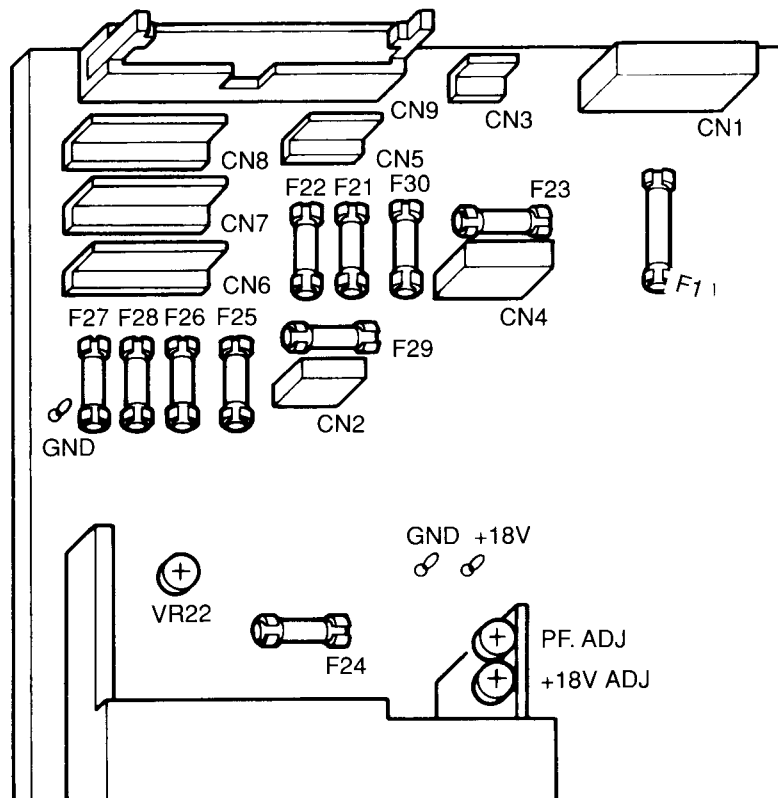
* 1 Functions only in Speed-Change mode.
In Density-Chage mode, the print speed is fixed at 100 rpm.

* 2	*3			
A4	Picture Panel	U.S.A.	A4 Drum Type	B4 Drum Type
B4	Metric Panel	DSw1-5	OFF	ON
Legal	Inch Panel	DSw1-6	OFF	OFF
		DSw1-7	OFF	ON
		DSw1-8	OFF	OFF





7. POWER SUPPLY PCB



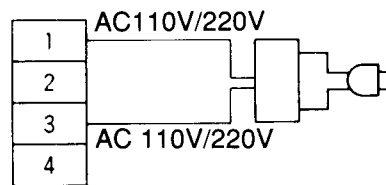
CN	CN1	From Main Power Sw
	CN2	To Main Motor
	CN3	To Suction Fan
	CN4	To Thermal Print Head
	CN5	From System Drive PCB
	CN6	Not Used
	CN7	To Panel Main PCB
	CN8	To System Drive PCB
	CN9	To Image Processing PCB (58)
TP	GND	Ground
	+18V	For check of +18V output
VR	VR22	For adjustment of +5V output
	PFADJ	Used only for adjustment in factory
	+18VADJ	For adjustment of +18V output
		(TPH Input Voltage)

FUSE

No.	Rate	Protected line	Symptoms in case of open-circuited fuse	Relevant components
F1	10A (110V) 5A (220V)	Main Power	No Power	Main Power Sw
F21	3.15A	DC24V	No problem in printing. Master mis-feed in master-making or confidential operation.	Loading pulse motor, Loading fan, Storage fan, Thermal pressure motor, Cutter motor, Write pulse motor
F22	3.15A	DC24V	[T2: Call Service], Paper feed jam, Master removal error	M.-Rmv. vertical transport motor, Master removal solenoid, Separation fan, Pressure solenoid, Paper feed clutch, Elevator motor, Lock solenoid, Inking motor, Counters, Drum home position lamp
F23	1A	DC24 – 18V	Paper receiving jam	Suction fan
F24	8A	DC24V	[T1: Call Service]	Main Motor
F25	3.15A	DC+12V	[T4: Call Service]	Various sensors
F26	3.15A	DC–12V	No LCD indication	
F27	5A	DC5V	No Background light in LCD panel & No Print quantity indication	
F28	5A	DC5V	No power except for Suction fan	
F29	3.15A	DC24V		For optional equipments
F30	3.15A	DC24V	[T5: Call Service]	Clamp motor, Clamp solenoid, Print positioning motor, Pressure control motor, Read pulse motor, ADF Transfer motor

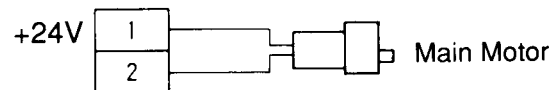
CN1

4 pins



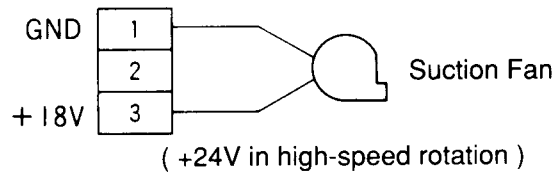
CN2

2 pins



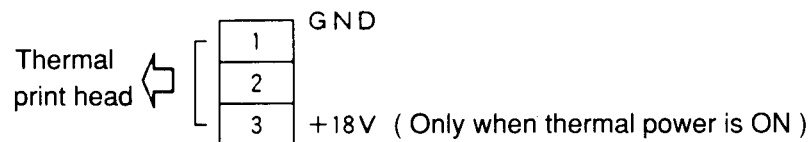
CN3

3 pins



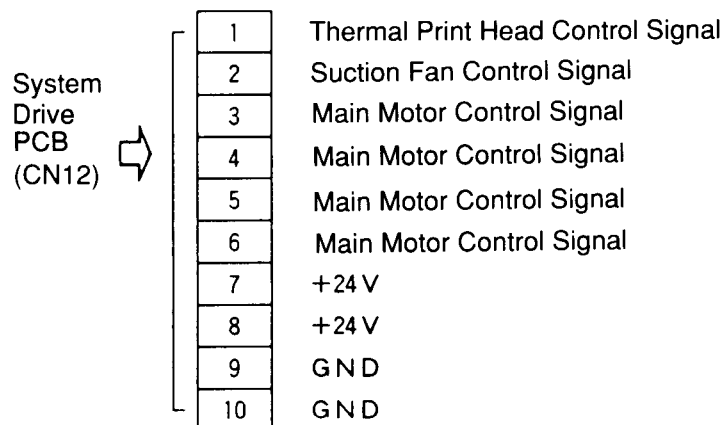
CN4

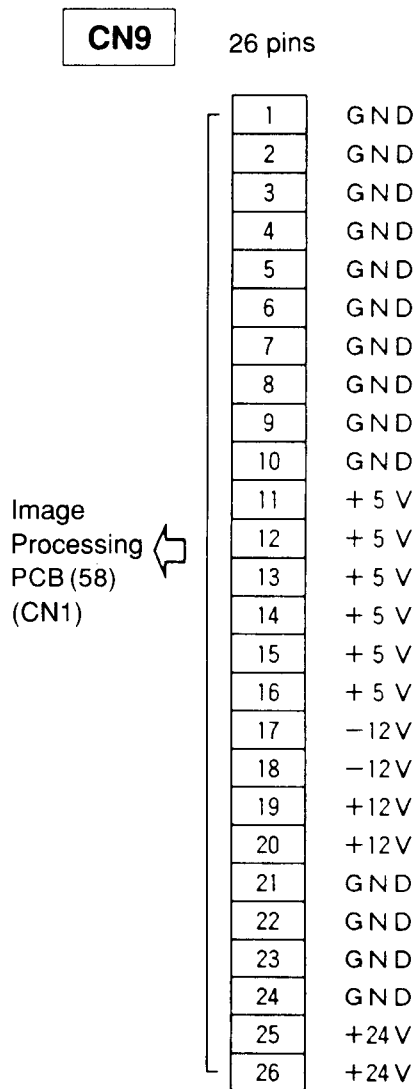
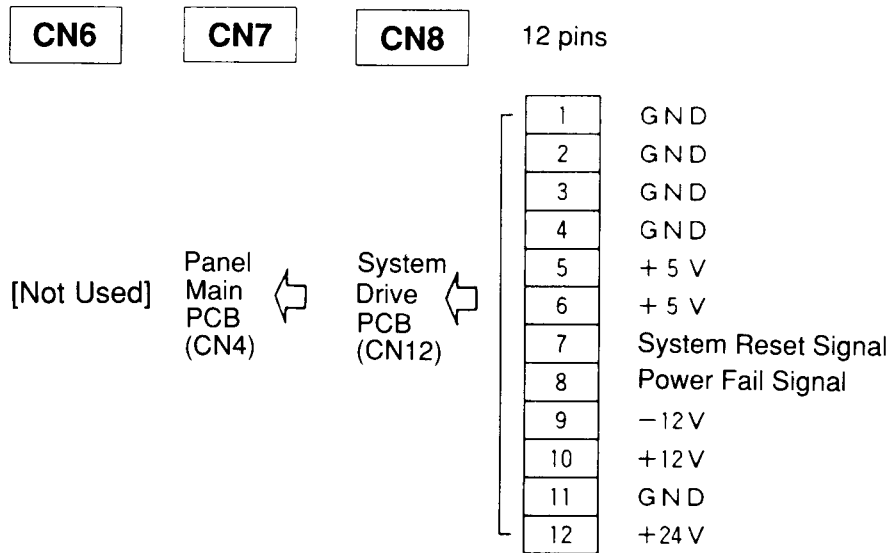
3 pins



CN5

10 pins





RC 6300

TECHNICAL MANUAL

VERSION 1.0
JULY, 1992

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I. SPECIFICATIONS

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1. RC6300

- Master-making system: High-speed Digital Scanning and Thermal Screening system
- Printing system: Automatic Stencil Duplicating system
- Image scanning system: Flat-bed, Scanner-moving system
- Original type: Books & sheets
- Original size: Maximum/A3(297mm × 431mm) size(11.7" × 17")
Minimum/Business card(55mm × 90mm) size(2" × 3.5")
- Paper size: Maximum/A3(297mm × 431mm) size (11.7" × 17")
Minimum/A6(100mm × 148mm) size(4" × 5.8")
- Paper weight: Maximum/210 g/m² (115.8 lbs Index)
Minimum/46 g/m² (12.4 lbs Bond)
- Print area: Ledger Drum/273 × 420 mm (10.7" × 16.5")
A3 Drum/290 × 412 mm
- Print speed: Selectable/5-speed positions
(55 ± 5 ~ 120 ± 2 copies/min.)
- First copy time: A4 (8.3" × 11.7") original size/About 35 sec. (size-to-size)
- Print position adjustment: Vertical positioning/±10 mm
Horizontal positioning/±20 mm
[±10 mm for A6 (4" × 5.8") paper]
- Scanning resolution: 400 dots/inch
Line and photograph modes changeable
- Maximum paper capacity: 1000 sheets
[Based on 64 g/m² (17 lbs Bond) paper]

SPECIFICATIONS

1. RC6300

- Machine dimensions:
 - In storage/ 650(W) × 675(D) × 617(H) mm
25.6" × 26.6" × 24.3"
 - In use/ 1295(W) × 675(D) × 617(H) mm
51" × 26.6" × 24.3"
 - [With ADF 5800]-**
 - In storage/ 670(W) × 685(D) × 695(H) mm
26.4" × 27" × 27.4"
 - In use/ 1295(W) × 685(D) × 695(H) mm
51" × 27" × 27.4"
- Machine weight:
 - 101 kg (223 lbs)
 - [With ADF 5800]-**
 - 117 kg (258 lbs)
- Power requirements:
 - 220 to 240 VAC, 50/60 Hz, 3A
 - 100 to 120 VAC, 50/60 Hz, 5A
- Reduction/Enlargement percentages:
 - Size-to-size/ 100%
 - Reduction/ (U.S.) 96%, 77%, 74%, 64%
95%, 87%, 82%, 71%
 - Enlargement/ (U.S.) 121%, 127%, 141%
116%, 122%, 141%
- Original mode selection:
 - Line-copy, Photograph, Dot-photo, Sharpen-image, Margin erasing, Shadowed book-center erasing, Fine enhancement
- Print density control:
 - 5 steps
- Auxiliary function:
 - Confidential, Two-up function, Memory program, Automatic idling, Automatic printing, Computer interface, Integrated sorter control
 - Option -**
 - ADF, Digitizer
- Liquid crystal display:
 - 240 × 64 dot graphic display (with self-diagnosis function)
- Color change:
 - Cartridge-type drum replacement
 - 6 colors/black, red, blue, green, brown, and yellow

2. Supplies

- (1) **Ink:** Risograph RC Ink (Emulsion type)
- Capacity: 1000 cc
 - Ink bottle: Cylinder following piston method
 - Color: 6 color/ black, red, blue, green, brown, and yellow
 - Ink package unit: Two bottles per box, five boxes per carton
- (2) **Master:** Risograph RC Master 56W
- Length: Approx. 104 m (341 ft.)
A3 drum/About 200 masters
 - Width: 320 mm (12.6")
 - Master package unit: Two master rolls per box, 5 boxes per carton

SPECIFICATIONS

3. ADF 5800
4. Optional Equipment

3. ADF 5800

- Original type: Sheets
- Original size: A3/B4/Foolscap/A4/A4(Wide)/B5/B5(Wide)/A5 sizes
- U.S. -
Ledger/Legal/Letter/Statement
- Maximum original capacity: 50 sheets
[Based on 64 g/m² (17 lbs Bond) paper]
- Original paper weight: 50 g/m² to 128 g/m² (13 lbs to 34 lbs)

4. Optional Equipment

- ADF 5800
- Digitizer 5800
- RC/CI I/F Board - For computer interface
- Job Separator
- Key/Card Counter
- RC Sorter (maximum paper size = B4)
- Color Drum (6 colors - including "black")

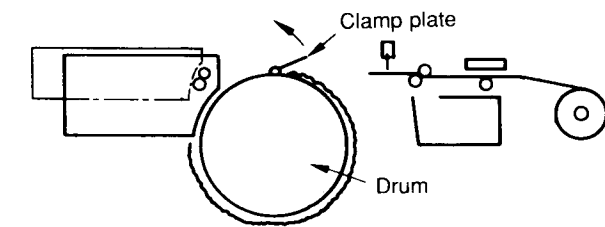
— II. MASTER HANDLING SECTION —

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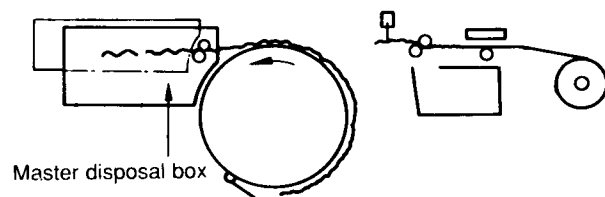
1. Mechanical Overview

[Master Removal and Feed]

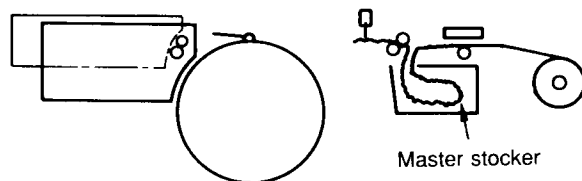


Master Removal

When the "START" button is pressed for master-making, the Drum rotates to the home position and the Clamp plate opens.

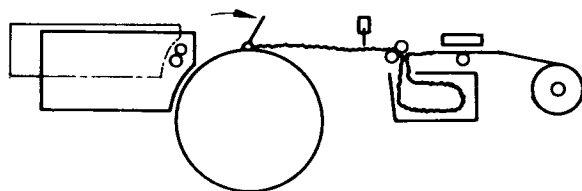


The Master removal hooks activate. The Drum rotates one revolution to remove the used master, placing it into the Master disposal box.

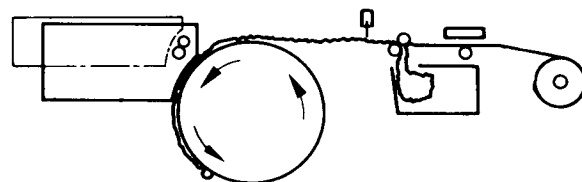


Master Feed

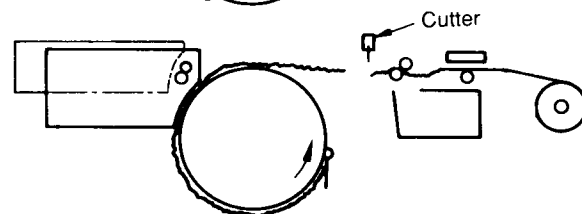
Master making starts and the newly made master is fed into the Master stocker.



The leading edge of the master advances to the Drum, and the Clamp plate is closed to hold the master.



The Drum rotates intermittently to load the master material while the master making is continued.



When the master making is finished, the drum rotates until the prime surface of the Drum is covered. Then the Cutter cuts the master material.

2. Master Making Section

[Theory of Operation]

1. Master making operation

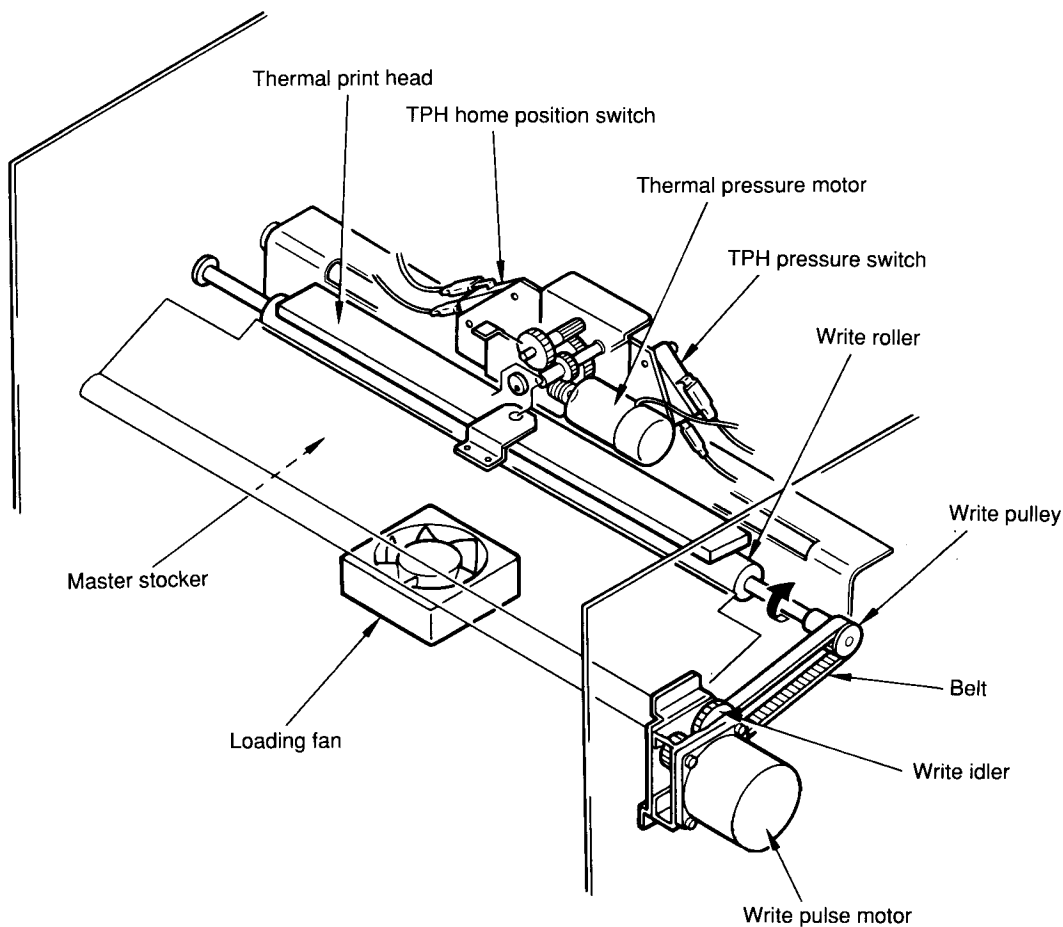
When the original is set in position and the "START" button is pressed, the pre-scanning starts and the Thermal print head is lowered by the Thermal pressure motor until the TPH pressure switch is activated.

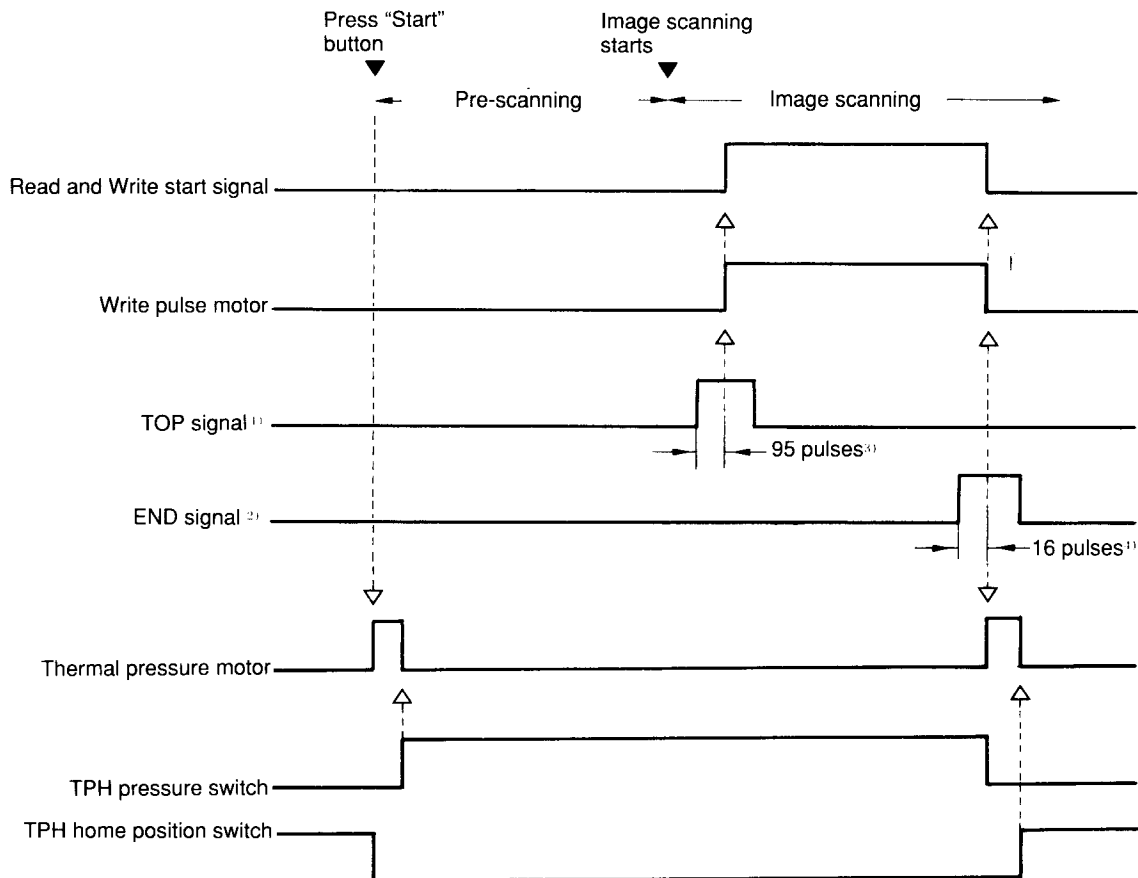
As the image scanning starts, the Read and Write start signal and the Write pulse motor is activated to create the master.

The Write pulse motor rotates the Write roller via the Write idler, Belt, and Write pulley. The newly created master is fed into the Master stocker.

The master making operation is finished when the Read and Write start signal and the Write pulse motor is turned off either by the END signal from the Trimming PCB or after the Write pulse motor has rotated for the given pulses.

As the master making operation is finished, the Thermal print head is elevated by the Thermal pressure motor until the TPH home position switch is pressed.



Master Making Operation (when “Margin Erasing” is selected)

- ① The master making is finished when **Write pulse motor** has activated for a **given pulse** interval for the paper size selected or the **END signal** is sent out from the Trimming PCB.
- 1) The **TOP signal** is the signal which starts the master-making operation and is output from the Trimming PCB.
 - 2) The **END signal** is the signal which indicates the tail edge of the original detected in the pre-scanning operation and is output from the Trimming PCB.
 - 3) The **Read and Write start signal** and the **Write pulse motor** is activated as the **Read pulse motor** turns for **95 pulses** after the **TOP signal** is output.
 - 4) The **Read and Write start signal** and the **Write pulse motor** is deactivated as the **Read pulse motor** turns for **16 pulses** after the **END signal** is output.

[Removal Procedures & Precautions for Installation]**1. Thermal Print Head****- Removal Procedures -**

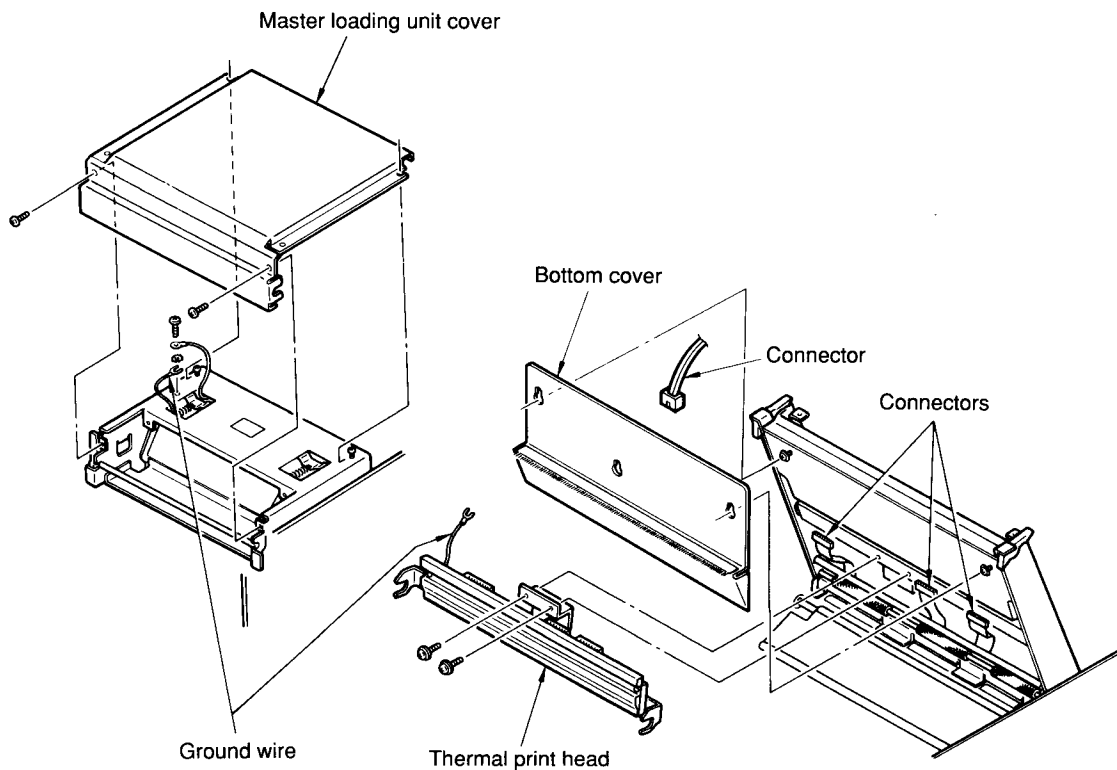
- 1) Turn off the machine power and slide the Image Scanning section towards the paper feed side.
- 2) Loosen the two mounting screws of the Master loading unit cover and remove the cover.
- 3) Loosen the mounting screw for the ground wire and remove the ground wire of the Thermal print head.
- 4) Loosen the two screws holding the Bottom cover of the TPH unit and slide the Bottom cover off.
Disconnect the Connector of the sensor.
- 5) Remove the two screws holding the Thermal print head, and disconnect the three connectors.

Cautions:

- ★ Be careful not to damage the heating area of the Thermal print head.
- ★ Take extra precautions not to allow any static electricity to pass through the connectors on the Thermal print head when removed.
It will damage the Thermal print head.

Cautions in Installation:

- ★ Make sure to connect the Ground wire.
- ★ After replacing the TPH unit, be sure to make the thermal power adjustment of the Thermal print head.



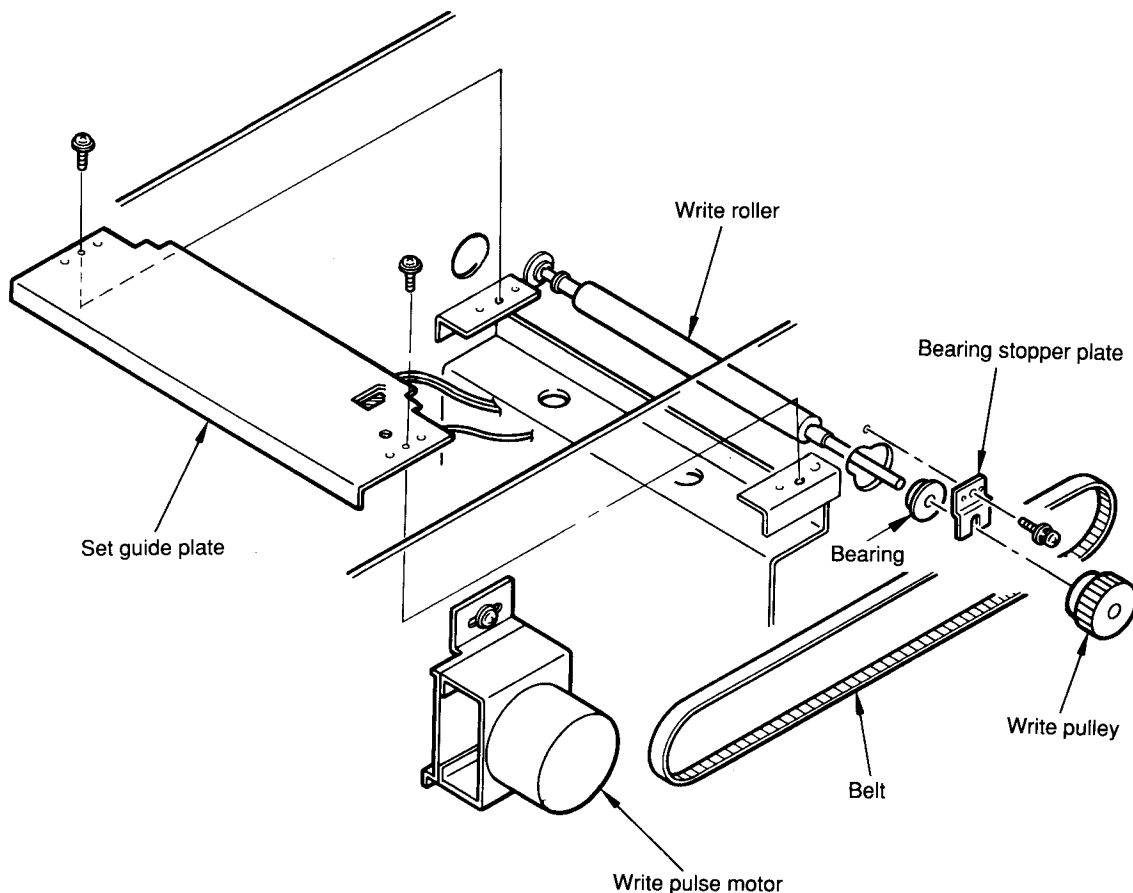
2. Write Roller

- Removal Procedures -

- 1) Turn off the machine power and remove the Back cover.
- 2) Slide the Image scanning section towards the paper feed side, and unlock and open the Master loading unit.
- 3) Remove the two screws on the Set guide plate and lift the plate.
- 4) Loosen the belt tension by shifting the Write pulse motor to the right after loosening the mounting screws and remove the belt from the Write pulley.
- 5) Loosen the allen screw on the Write pulley and remove the pulley.
- 6) Remove the Bearing stopper plate.
- 7) Remove the bearing from the shaft of the Write roller and slide the Write roller out.

Cautions in Installation:

- ★ Do not put the bearings on the shaft facing the wrong way.
- ★ The Write pulley should be attached on the tip end of the Write roller shaft.
- ★ Remember to adjust the tension of the belt of the Write pulse motor.
- ★ Take extra precautions not to damage the Write roller.



Adjustment Procedures
1. Thermal Power of Thermal Print Head

[Adjustment Procedures]

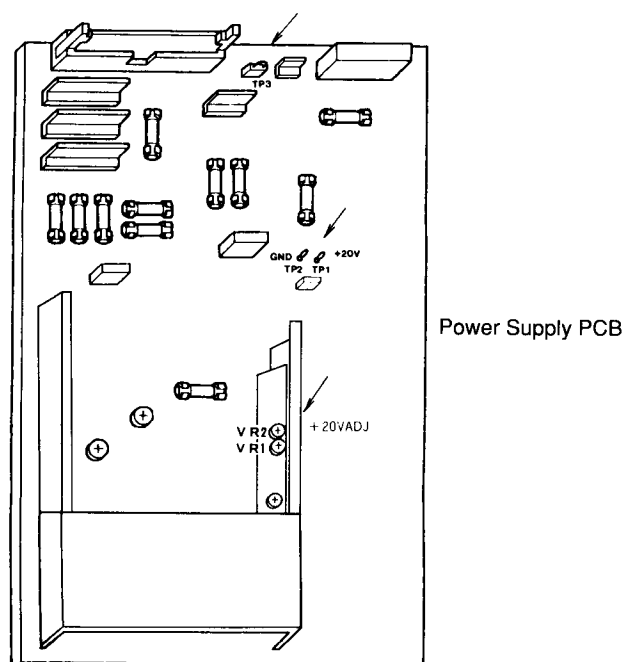
1. Thermal Power of Thermal Print Head

- Check & Adjustment -

- 1) Turn the power off and remove Shading plate cover from the Image scanner table.
 - 2) Remove the Front right cover.
 - 3) Connect the terminals of a voltmeter to **TP1 (+20V)** and **TP2 (GND)** on the **Power Supply PCB** and remove the jumper connector from **TP3** on the **Power Supply PCB**.
 - 4) Slide the Image scanner table towards the paper feed side, and unlock and open the Master loading unit. Then read the resistance value (Ω) marked on the Thermal print head.
 - 5) Turn on the machine power and measure the voltage between the **TP1** and **TP2**.
If the voltage does not match with the value on the chart (next page), adjust **VR2 (+20VADJ** coarse adjustment) and **VR1 (+20VADJ** fine adjustment) until the correct voltage is read on the voltmeter.
 - 6) Connect the jumper connector back on the "TP3" of the **Power Supply PCB**.
 - 7) Confirm that **SW8-2** of the **Image Processing PCB** is selected to "ON".
 - 8) Check that the setting of **SW3 (T1)** and **SW4 (T2)** on **Image Processing PCB** are correct, referring to the correlation table on the next page. If not, set them correctly.
- ★ Turn the machine power off before connecting or disconnecting the voltmeter or jumper connector.
- ★ Be sure to place the jumper connector back to TP3 after voltage adjustment.

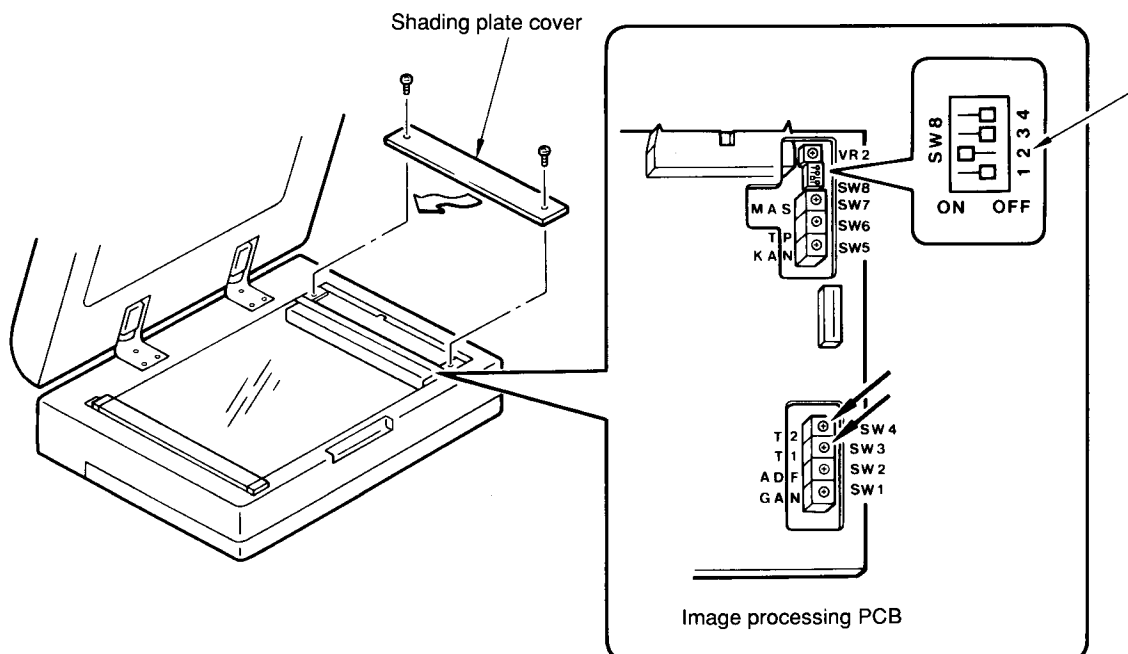
- Results of Misadjustment -

- 1) If **SW3** and **SW4** setting is too low (not enough heat) or the voltage level is too low (not enough power); ➡ thin lines and solid prints can not be reproduced clearly.
- 2) If **SW3** and **SW4** setting is too high (too much heat) or the voltage level is too high (too much power); ➡ the Thermal print head may be damaged.



CORRELATION CHART

Voltage (v)	Resistance (Ω)	SW3 (T1)	SW4 (T2)
20.0	2550 ~ 2582	A	C
	2583 ~ 2627	B	C
	2628 ~ 2647	C	D
20.5	2648 ~ 2666	9	C
	2667 ~ 2713	A	C
	2714 ~ 2749	B	C
21.0	2750 ~ 2797	9	C
	2798 ~ 2847	A	C
	2848 ~ 2855	B	C
21.0	2856 ~ 2883	B	C
	2884 ~ 2949	C	D
	2950 ~ 2965	D	D
21.5	2966 ~ 2984	A	C
	2985 ~ 3036	B	C
	3047 ~ 3079	C	D
22.0	3080 ~ 3124	A	C
	3125 ~ 3178	B	D
	3179 ~ 3198	C	D
22.5	3199 ~ 3211	9	C
	3212 ~ 3268	A	C
	3269 ~ 3321	B	C
23.0	3322 ~ 3355	9	C
	3356 ~ 3415	A	C
	3416 ~ 3450	B	C



MASTER LOADING SECTION

Theory of Operation

1. Master Loading (On the Drum) System

3. Master Loading Section

[Theory of Operation]

1. Master Loading (On the Drum) System

400ms after the Master clamp plate operation is completed, the length of the master inside the Master stocker is "Calculated" and the master loading is activated by rotating the Main motor for the equivalent of the calculated master length.

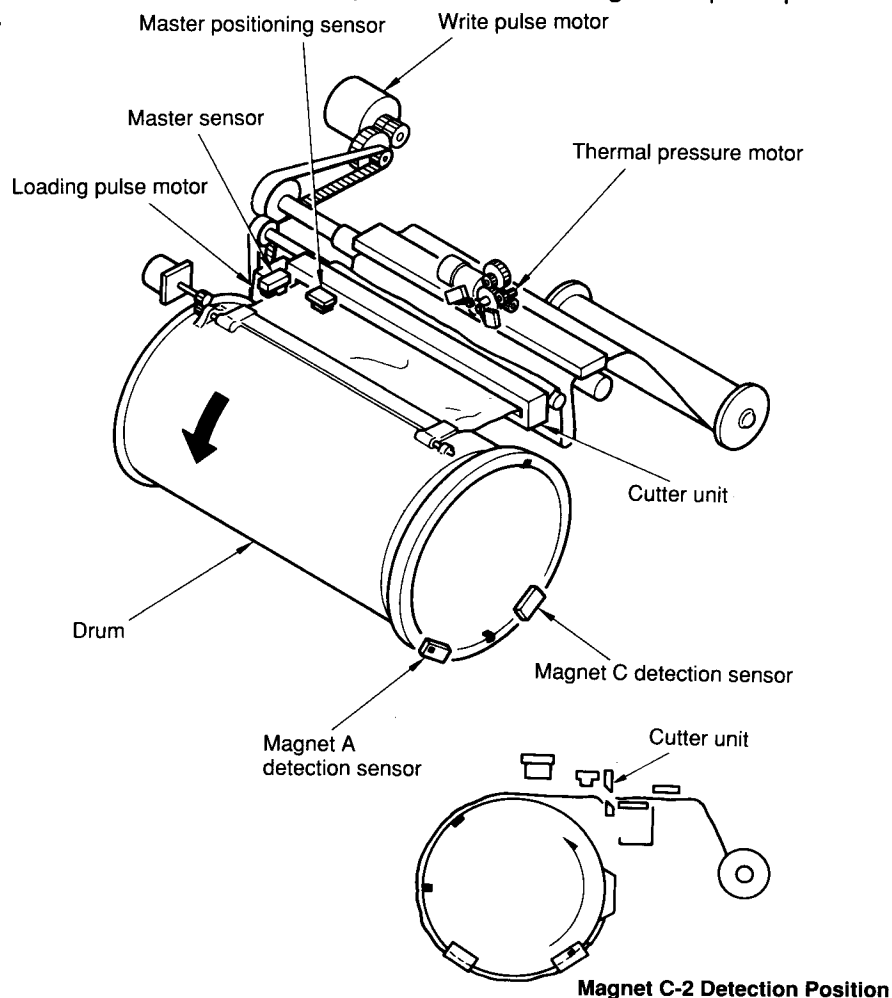
Then until the master making is completed, the Main motor is turned "ON" and "OFF" to load the master on the Drum intermittently.

When the Write pulse motor is turned "OFF" as the master making is completed, the Main motor rotates to wrap the remaining master on the Drum.

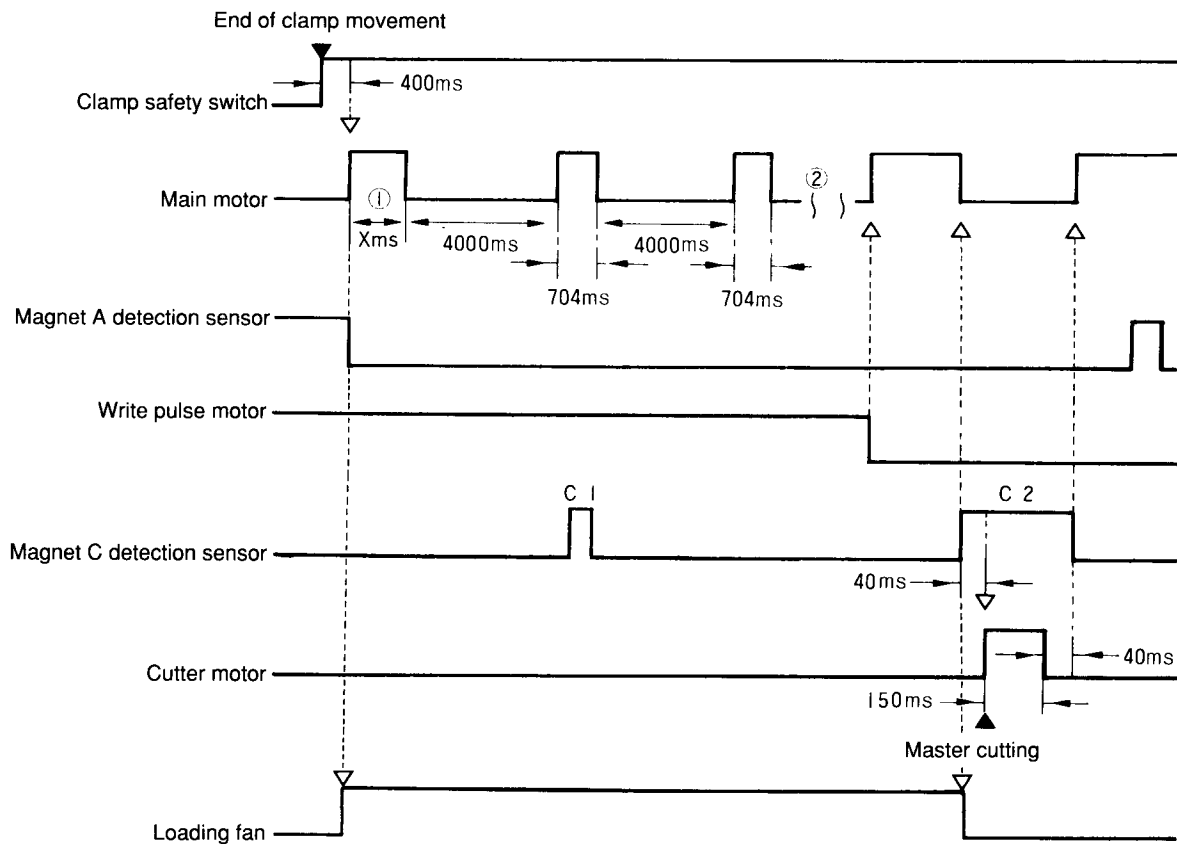
The Main motor is turned "OFF" at the Magnet C-2 detection position and the master is cut by activating the Cutter motor for 40ms.

The Main motor is reactivated, once again, to wrap the rest of the remaining master on the Drum.

The Loading fan is turned "ON" during the master loading to help keep the back tension on the master.



Master Loading (On the Drum) System



- ① How long the Main motor stays activated varies on the amount of master in the Master stocker when the Master clamp plate operation is completed.
- ② The Main motor repeats the ON and OFF movement until the write pulse motor stops.

Theory of Operation
2. Master Loading Check

2. Master Loading (On the Drum) Check

After the master is cut and wrapped completely around the Drum and as the Drum returns to the Magnet A detection position, the print signal is turned "ON" and the rotation of the Drum is continued.

The Master sensor and the Master positioning sensor are activated when the Drum comes to the Magnet C-1 detection position.

The Master sensor checks the status of the master on the Drum to determine if a master (on-drum) loading error has occurred.

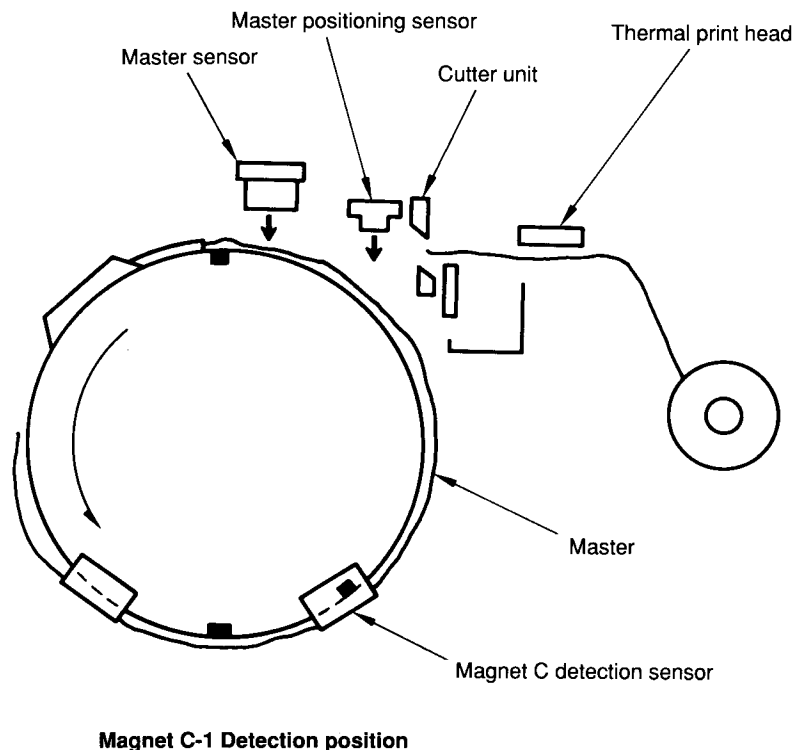
The Master positioning sensor determines if a master cut error has occurred.

If the master loading error and the cutting error are both undetected, the Thermal pressure motor is turned "ON" to lower the Thermal print head until the TPH pressure switch is pressed, at the same time the first print is made.

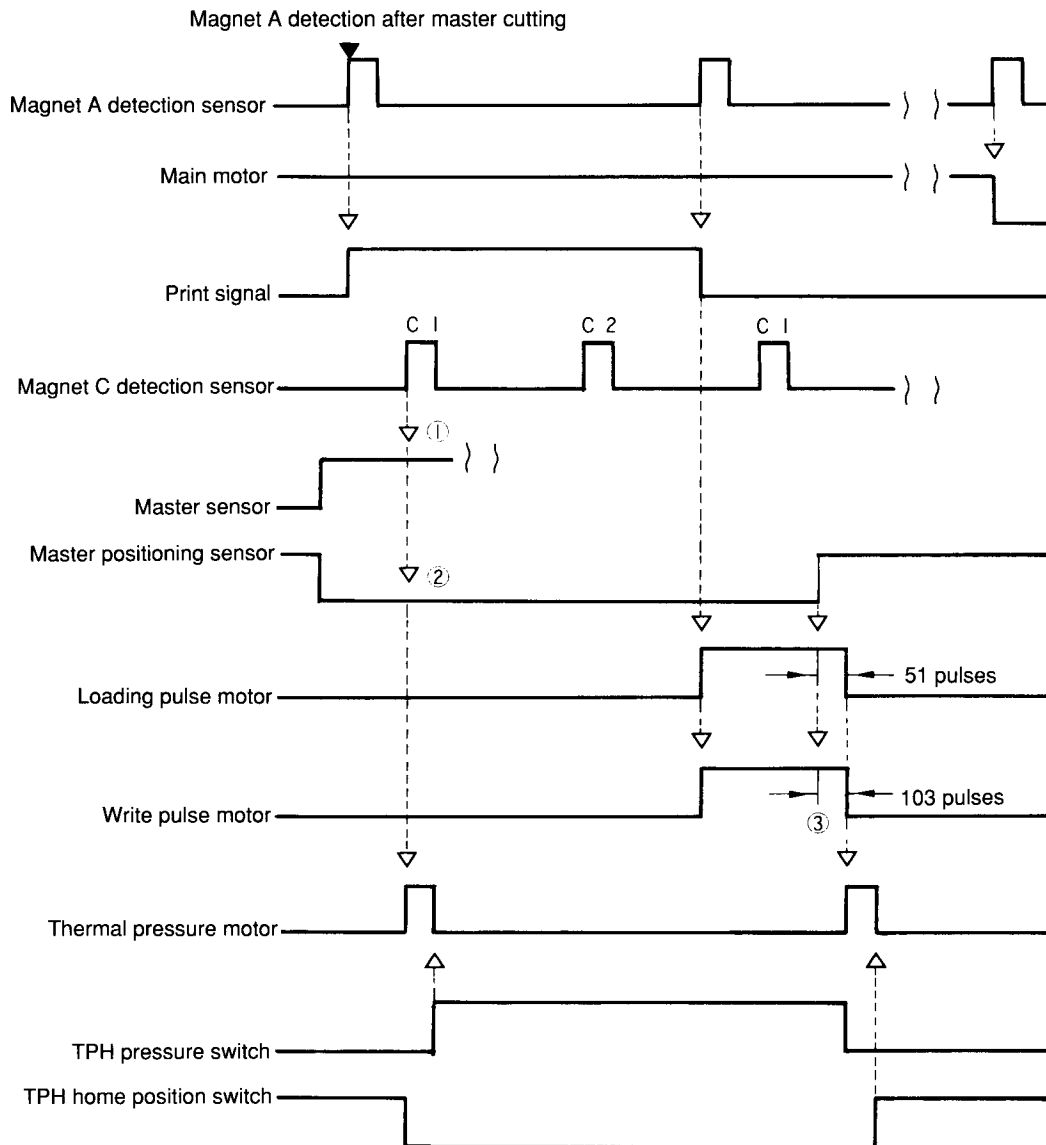
As the drum comes to the Magnet A detection position, the Load and Write pulse motors rotate to advance the master material into position for the next master making operation.

The advance of the master material stops after 103 pulses from the time the Master positioning sensor detects the master material.

At the same time, the Thermal pressure motor is activated and elevates the Thermal print head until the TPH home position switch is pressed.



Master Loading (On the Drum) Check



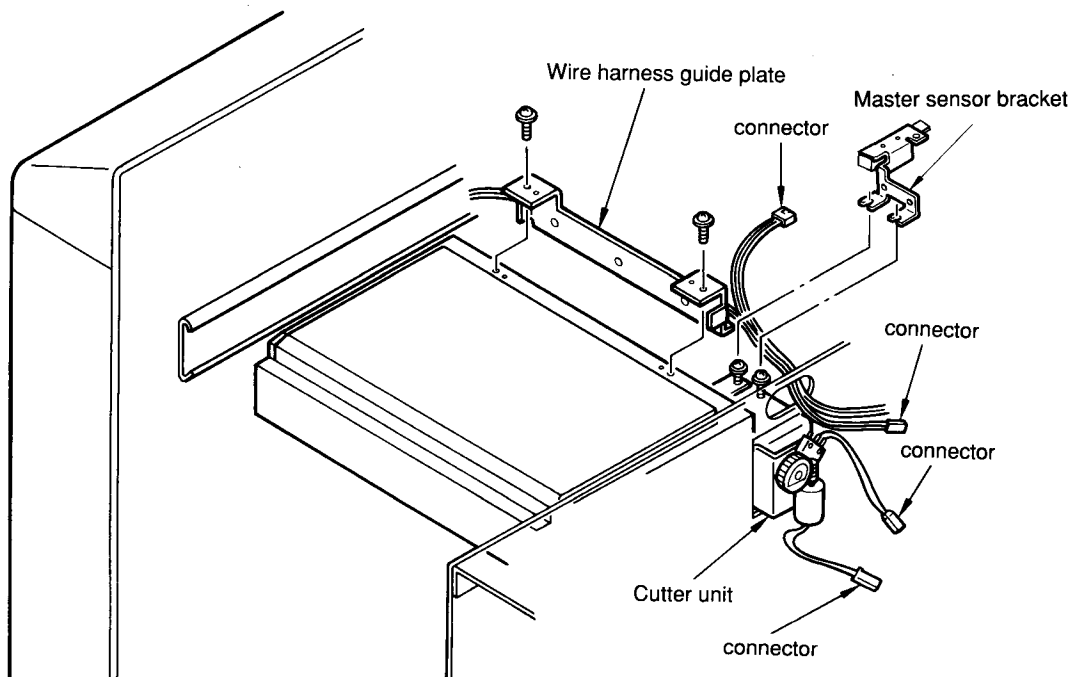
- ① If the Master sensor detects no master on the Drum at the Magnet C-1 detection position, following three messages will appear on the display panel in the given order.
“MASTER CLAMP ERROR/REMOVE CUT MASTER STRIP” ➡ “MASTER CLAMP ERROR/RESET MASTER” ➡ “TO RETURN TO START/PRESS START BUTTON”.
- ② If the Master positioning sensor detects the master material at the Magnet C-1 detection position, it is judged that a **master cut error** has occurred.
 The Main motor stops and the Cutter motor is reactivated.
 The Main motor turns again and brings the Drum to Magnet C-2 detection position and the Master Positioning sensor looks for the master material. If the master material is not detected, the message **“PULL OUT DRUM AND CHECK MASTER ON IT”** will be displayed.
 If the master material is still detected by the Master positioning sensor, the message **“T13: CALL SERVICE”** is displayed on the panel.
- ③ If the Master positioning sensor does not detect the master material within 460 pulses after the Write pulse motor is turned on, the message **“MASTER MIS-FEED/RESET MASTER”** is displayed on the panel.

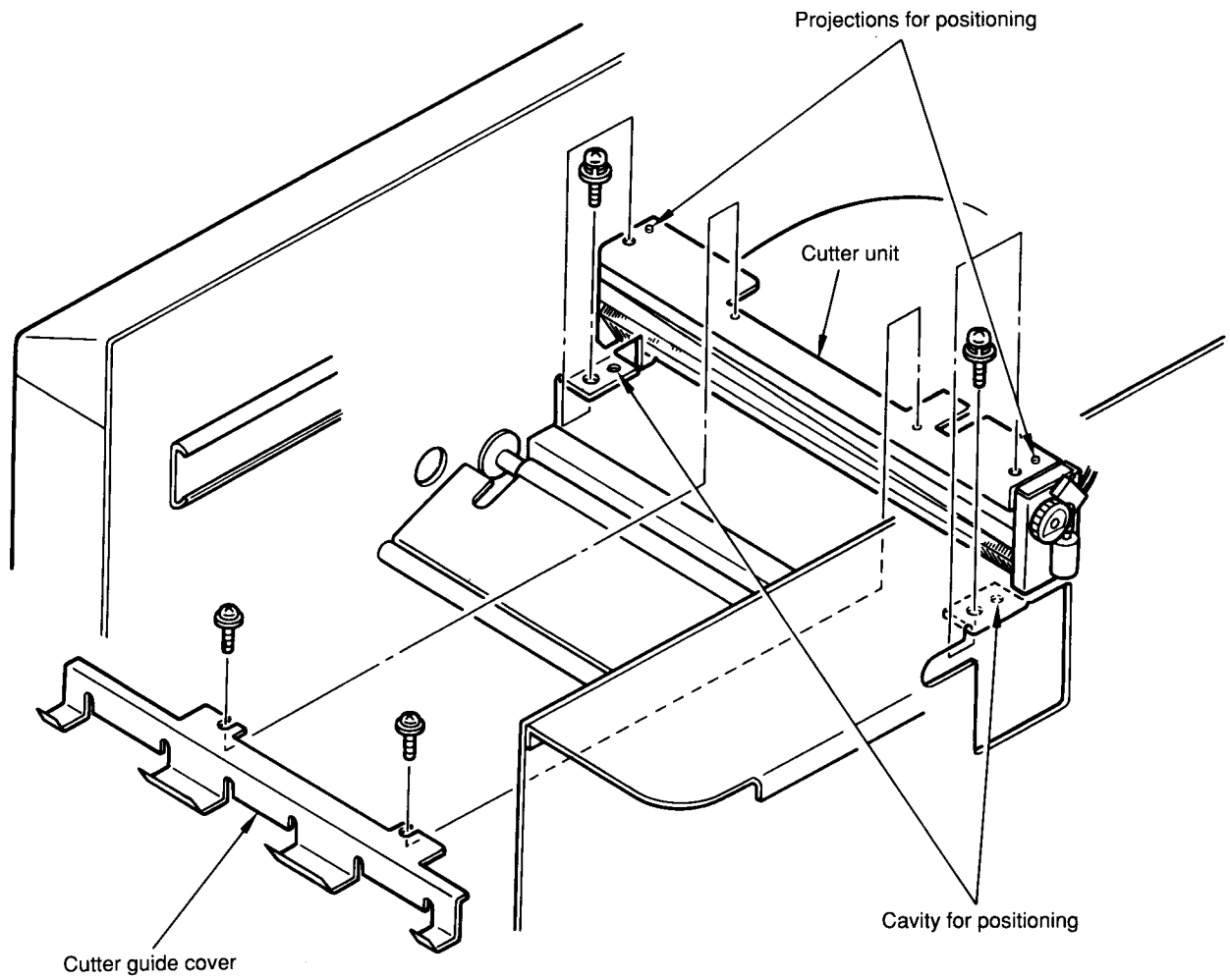
[Removal Procedures & Precautions for Installation]**1. Cutter Unit****- Removal Procedures -**

- 1) Remove the Drum from the machine.
- 2) Turn off the machine power.
- 3) Slide the Image scanner section to the paper receiving side and free the Master removal guide sheet by removing the Master removal guide plate (refer to the page on the **Removal & Installation of the Master Removal Unit**).
- 4) Remove the Back cover.
- 5) Disconnect the Connectors of the Cutter motor, Cutter position switch and Master positioning sensor. Remove the wire harness guard (black) to free the Master positioning sensor wire.
- 6) Slide the Image scanner section to the paper feed side, loosen the two mounting screws (short) of the Master sensor bracket and slide out the bracket.
- 7) Remove the two screws (long) holding the Wire harness guide plate and lift the plate.
- 8) Remove the two screws (short) holding the Cutter guide cover and remove the cover, and at the same time remove the Master removal guide sheet from the machine.
- 9) Remove the two Cutter unit mounting screws holding the unit and extract the Cutter unit from the opening on the Drum side of the machine, pushing the unit out through the transparent Aero guide sheet.

Cautions in Installation:

- ★ Take extra precautions not to pinch the Aero guide sheet.
- ★ Match the cavity on the machine and the projection on the Cutter unit to obtain the correct positioning.
- ★ Make sure to use the correct size screws. If the screws are too long, the screws will hit the Cutter blade and lock Cutter movement.
- ★ Be sure to use Test Mode No. 84 to check the Cutter unit operation after completion of the Cutter unit installation.



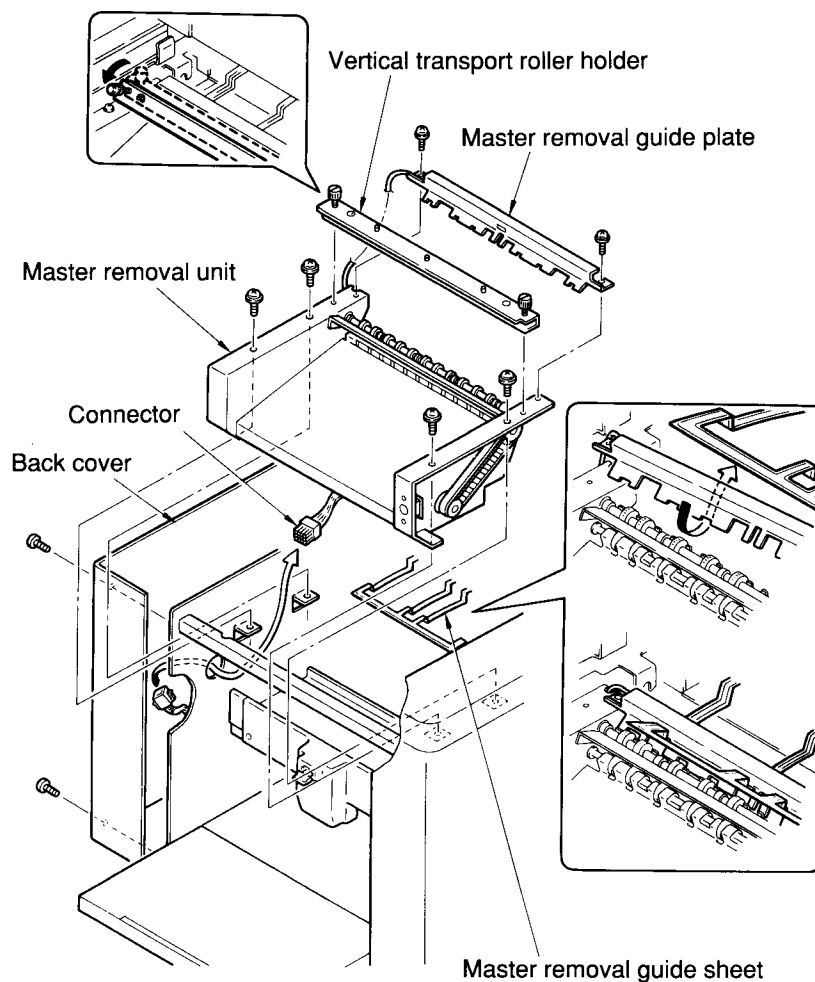


[Removal Procedures & Precautions for Installation]**1. Master Removal Unit****- Removal Procedures -**

- 1) Turn off the machine power.
- 2) Remove the Back cover from the machine.
- 3) Disconnect the 15 pin connector of the Master removal wire harness.
- 4) Remove the Master disposal box from the Master removal unit.
- 5) Slide the Image Scanning section towards the paper receiving side and loosen the two straight knurl screws fixing the Vertical transport roller holder to the Master removal unit. Then place the roller holder aside.
- 6) Remove the two screws fixing the Master removal guide plate onto the Master removal side frames. Lift the guide plate and slide out and free the Master removal guide sheet.
- 7) Remove the four mounting screws on the Master removal unit. Slide the unit towards the paper feed side and remove it from the machine.

Cautions:

- ★ Take extra precautions not to rip or deform the Master removal guide sheet.



[Adjustment Procedures]

1. Projected Position of Master Removal Hooks

- Procedure -

- 1) Remove the Master removal unit from the machine.
- 2) Check that the plunger can move smoothly inside the Master removal solenoid.
If not, adjust the position of the Master removal solenoid.
- 3) Loosen the allen screw fixing the Linking plate on the Master removal hook shaft.
- 4) Pressing the plunger of the Master removal solenoid (but not the Linking plate) with your finger, push out the Master removal hooks manually to obtain the gap of **17 mm to 18 mm** between the tips of the Master removal hooks and the Upper vertical transport roller shaft (not the metal collar, but the shaft).
- 5) In the above condition, tighten the allen screw on the Linking plate, taking care not to release the plunger and hooks.

- Check -

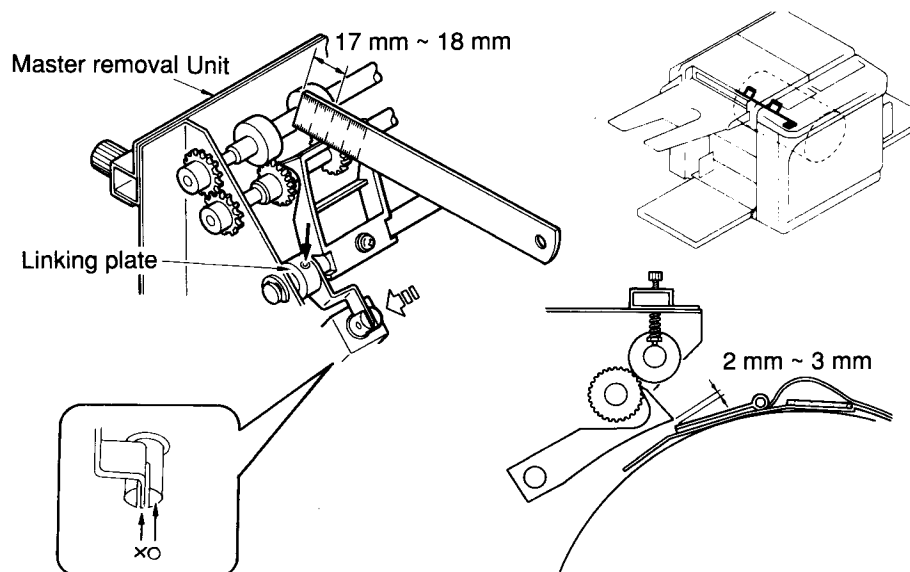
After installing the Master removal unit into the machine, flip the Clamp plate 180 degrees to the other side.

Select Test mode **No. 51** to project the Master removal hooks.

Then check by manually rotating the Drum that the tip of the projected Master removal hook is **2 to 3 mm** off the Clamp plate on the Drum.

- Results of Misadjustment -

- 1) If the Master removal hooks are not projected enough (the gap is adjusted to be **much less than 17 mm**); ➡
the used master cannot be removed from the Drum into the Master disposal box, causing a master removal error.
- 2) If the Master removal hooks are projected too much (the gap is adjusted to be **much more than 18 mm**); ➡
the tip of the hooks will contact the Clamp plate, causing the hooks and/or Clamp plate to be deformed, or the Clamp plate may be caught between the Vertical transport rollers, causing the Drum to be stuck in rotation, which will result in the trouble message **"T1: CALL SERVICE"** indication on the panel.



III. DATA

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1. Test Mode

1. Operational Procedures

The Test mode program in the machine is to enable a service technician to check the operation of each electrical component.

1. [Starting Up Test Mode]

Turn on the power while pressing down on the “P/M” and “ORIGINAL” buttons on the main panel.

In Test activities, the following indication will be displayed in the LCD panel and print quantity displays.

- This is the initial condition of Test Mode. -

TEST MODE			
PANEL	Ver	○	○
SYSTEM	Ver	○	○

0		0	0
---	--	---	---

2. [Checking the Operation of A Component]

To check the operation of a component, select a test No. using panel keys and then press the “START” button to start the test.

The figures in the print quantity display mean:

- The right-side two digits: The test No. selected
- The left-side on digit: **0** for the "Test OFF" status
1 for the "Test ON" status

If the test is a one-cycle operation test, it will be automatically stopped after one check.
To stop the test, press the “START” button again.

[Example]- In selecting Test mode No. 69

[Print quantity display]

0		0	0
---	--	---	---

↓

Select test No. **69** using panel keys.

0		6	9
---	--	---	---

↓

Press the “START” button.

1		6	9
---	--	---	---

TEST MODE

1. Operational Procedures



Press the **"START"** button again.

0		6	9
---	--	---	---

3. [Selecting another Test mode and Exiting the Test mode]

To select another Test mode, clear the set Test No. by pressing the **"C"** or **"STOP"** button and select another Test No..

-To exit the Test mode, turn off the power or perform the following operations:

- 1) Press the **"START"** button to stop the test if in operation.
- 2) Press the **"C"** or **"STOP"** button to return to the initial condition.
- 3) Press the **"RESET"** button.

- 1) Press the **"START"** button.

0		6	9
---	--	---	---



- 2) Press the **"C"** or **"STOP"** button.

0		0	0
---	--	---	---

- 3) Press the **"RESET"** button.

TEST MODE			
PANEL	Ver	○	. ○ ○
SYSTEM	Ver	○	. ○ ○

0		0	0
---	--	---	---

READY			
RISOGRAPH			
R ⇒ C			

--	--	--	--

2. Test Items and Operations

1) Sensor/Sw Test

A beep sounds in two ways to tell the current condition.

Detection: 0.1 seconds interval beep

No detection: 0.5 seconds interval beep

No.	Test Component	Detection Status	No.	Test Component	Detection Status
01	Paper detection sensor	Light path is blocked.	18	Drum set switch	The actuator is depressed.
02	Elevator upper limit sensor	The actuator is raised to open the light path.	19	Paper receiving sensor 1	Light path is blocked.
03	Elevator lower limit switch	The actuator is depressed.	20	Paper receiving sensor 2	Light path is blocked.
05	Master loading button	The button is pressed.	21	Front cover set sensor	Metal plate is attached.
06	Paper sensor	Light path is blocked.	22	Vertical centering sensor	Light path is NOT blocked.
07	Pressure detection sensor	Light path is blocked.	23	Master end sensor	No reflected light
08	Magnet A detection sensor	Magnetism is detected.	25	Master detection sensor	Reflected light is detected.
09	0° Angular sensor	Magnetism is detected.	26	Original feed-table set switch	The actuator is depressed.
10	180° Angular sensor	Magnetism is detected.	29	Master loading unit switch	The actuator is depressed.
11	Magnet C detection sensor	Magnetism is detected.	31	Master removal sensor	Light path is blocked.
12	Feed-tray down button	The button is pressed.	33	Disposal box set switch	The actuator is depressed.
13	Clamp safety switch	The actuator is pressed.	34	Scanner home sensor	Light path is blocked.
14	Master sensor	Reflected light is detected.	35	Scanner limit sensor	Light path is blocked.
15	Master positioning sensor	Reflected light is detected.	36	Original detection sensor	Reflected light is detected.
16	Drum home position button	The button is pressed.	37	Ink sensor	Ink is detected.
17	Ink bottle switch	The actuator is depressed.	38	Overflow sensor	Ink is detected.

TEST MODE

2. Test Items and Operations

2) Motor/Solenoid Test

2) Motor/Solenoid Test

To start a test, select a **Test No.** and press the "**START**" button.

To stop the test, press the "**START**" button again.

No.	Test Item	No.	Test Item
40	15 rpm Drum rotation	56	Original stopper solenoid
41	30 rpm Drum rotation	57	Read pulse motor CCW (For Scanner limit sensor)
42	Variable speed Drum rotation	58	Read pulse motor CW (For Scanner home sensor)
47	Paper feed clutch	59	LED arrays in Image scanner ON
48	Pressure solenoid	60	Write pulse motor CCW (Backward)
49	Suction motor (fan)	61	Write pulse motor CW (Feed)
50	Inking motor	62	Thermal pressure motor Up and Down
51	Master removal solenoid and Vertical transport motor	63	Loading pulse motor
53	Clamp solenoid	64	Loading fan
54	Clamp motor CCW (0°)	66	Thermal power supply CTL ON and Storage fan
55	Clamp motor CW (180°)	67	Lock solenoid
		69	Separation fan

[Note]

- 1) The Variable speed Drum rotation (No. 42) can be made by pressing the Speed/Density adjust button in regardless to whether Speed or Density is selected.
- 2) The Paper feed clutch (No. 47) operates only when following all three conditions are met. → The light path of the Paper feed clutch sensor is open, the Paper buckle detection sensor is not activated and the Stack paper feed switch is not activated.
- 3) The Inking motor (No. 50) activates the Inking motor only and does not rotate the Drum and **may cause the ink to overflow**. Use the test mode **No.95** for the purpose of ink supplying.
- 4) The Thermal pressure motor (No. 62) repeats the Up and Down motion each time the START button is pressed.

3) Operation Test

To start an operation test, select a **Test No.** and then press the **"START"** button.

To stop the operation test, press the **"START"** button again.

No.	Test Item
70	<p>Elevator motor Up/Down operation</p> <p>The following operations will be repeated while pressing down the Feed-tray down button.</p> <ul style="list-style-type: none"> • When Elevator lower limit switch is ON: Go UP ⇄ Elevator upper limit sensor detection ⇄ Stop • When Elevator lower limit switch is OFF: Go DOWN ⇄ Elevator lower limit switch detection ⇄ Stop
71	<p>Print positioning motor CW/CCW rotation (one-cycle check)</p> <p>Return to vertical center position ⇄ One second halt ⇄ CW(+) direction rotation ⇄ One second halt ⇄ CCW (–) direction rotation ⇄ One second halt ⇄ Return to vertical center position ⇄ Stop</p>
72	<p>Clamp plate Open/Close operation</p> <p>Rotate Drum to Home position ⇄ Open Clamp plate (180°) ⇄ Close Clamp plate (0°) ⇄ Rotate Drum to Home position (Then go back to the first step.)</p>
73	<p>Image scanner shifting (Read pulse motor) operation</p> <p>Read pulse motor CCW direction rotation ⇄ Scanner limit sensor detection ⇄ One second halt ⇄ Read pulse motor CW direction rotation ⇄ Scanner home sensor detection ⇄ One second halt ⇄ Read pulse motor CCW direction rotation ⇄ (Go back to the first step.)</p>
75	<p>Confidential operation (Repeated by three cycles)</p> <p>Confidential operation ⇄ Pressure solenoid ON ⇄ Three times Drum rotation ⇄ Confidential operation ⇄ (This cycle will be repeated) ⇄ Three times Drum rotation ⇄ Stop</p>

TEST MODE

2. Test Items and Operations

3) Operation Test

3) Operation Test

No.	Test Items
77	Paper feed & Printing operation The Paper feed tray raises and the paper is continuously fed until paper supply runs out. Note: <ul style="list-style-type: none">• The copy counter doesn't operate and paper jam is not detected.• Paper feed tray will be automatically lowered without paper.• Ink can be supplied by Inking motor.
79	Machine aging operation 120 rpm Drum rotation ⇄ 5000 times Magnet A detection ⇄ Stop
80	Thermal print head check operation 0 Making Master of test pattern #0 memorized in the Image processing PCB.
81	Thermal print head check operation 1 Making Master of test pattern #1 memorized in the Image processing PCB.
82	Thermal print head check operation 2 Making Master of test pattern #2 memorized in the Image Processing PCB.
83	Thermal print head check operation 3 Making Master of test pattern #3 memorized in the Image processing PCB.
84	Cutter motor ON [One-cut operation]
86	ADF operation Original feed in ⇄ One second halt ⇄ Original feed out ⇄ One second halt ⇄ (Go back to the first step.) Note: <ul style="list-style-type: none">• ADF operation will be automatically finished without any originals in ADF tray or when original feed jam happens in ADF unit.• ADF operation can be restarted after opening and closing ADF unit when original feed jam happens in ADF unit.

4) Others (Auxiliary Modes)

★ Shaded number are special for RC 6300.

No.	Contents
87	Image processing PCB adjustment mode Shifts the Image scanner to the Scanner limit sensor (CCW) by 20mm after master making operation. <ul style="list-style-type: none"> In normal operation, the Master count and Copy count signals will not be output, and the Key/card counter set signal will not be checked. * The machine will be released from this condition when the power is turned off.
88	Release of Test mode No.89 (Clearing of "Remove Stopper screw." message) Clears the panel message, "Remove Stopper Screw", in an unpacking operation.
89	Release of the Image scanner for Transportation Shifts the Image scanner to the transportation fixing position to protect the Image scanner during transportation. <ul style="list-style-type: none"> Buzzer buzzes till the power is turned off.
90	Clearing of Jam/Trouble Memory RAM contents in the System Main and Panel Main PCBs on only the Jam and Trouble message will be initialized.
91	Input of Telephone No. The telephone No., which will be displayed in the LCD panel in case of the trouble messages (T#: CALL SERVICE), can be input. [Procedures for Inputting Tel. No.] <ol style="list-style-type: none"> Press the "C" button. Input Tel. No. using panel keys. Terminate the Test mode. <ul style="list-style-type: none"> * If the Test mode No.97 is selected, the telephone No. will be cleared.
92	Prevention of the Master count, Copy count, and Key/card counter set signals output <ul style="list-style-type: none"> In normal operation, the Master count and Copy count signals will not be output, allowing a service technician to print without increasing the digit of the Master and Copy counters. The Key/card counter set signal will not be checked, allowing a service technician to print without inserting a counter card into the Key/card counter. The machine will be released from this condition when the power is turned off.
95	Ink supply mode Rotates the Drum at 30 RPM and activates the Inking motor till the Ink sensor senses the ink.
97	All Memory Clear All RAM contents in the System Main and Panel Main PCBs will be initialized.

[Note]

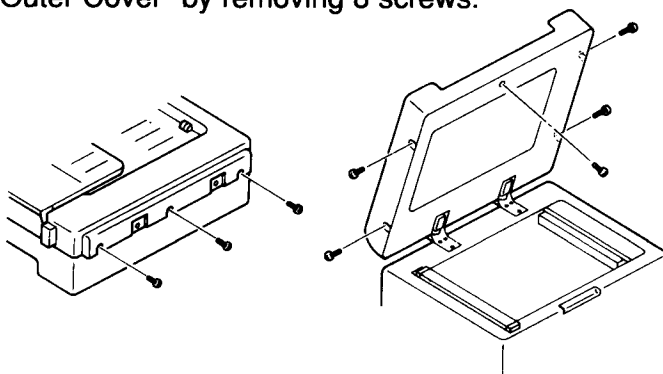
- 1) Clearing of Jam/Trouble Memory (No. 90) is same as turning the power ON while pressing All Reset Button.
- 2) All Memory Clear (No. 97) must be done each time a ROM is changed.

2. ADF 5800 Test Mode

1. Operation Procedures

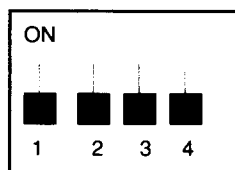
The **ADF 5800** has its own test mode, enabling service technicians to check the ADF operation independently of the machine.

- (1) Remove "ADF Outer Cover" by removing 8 screws.



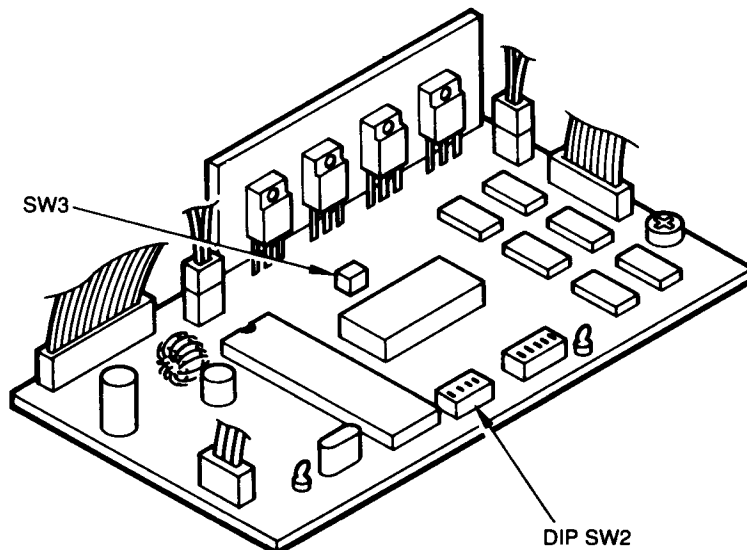
- (2) Turn on Switch #1 of DIP SW2 on the ADF PCB and turn on the power.

SW2



- #1 : For Test mode set-up
(Should be set before turning on the power.)
OFF - Normal operation
ON - Test mode
- #2 : Test mode selection (Refer to the chart.)
- #3 : Test mode selection (Refer to the chart.)
- #4 : Original paper size selection
(Should be set before turning on the power.)
OFF - A/B sizes paper
ON - Letter/Legal paper

- (3) To start up each Test mode, press SW3 on the ADF PCB.



2. Test Mode Selection

# 2	# 3	Test Item
OFF	OFF	ADF Transfer Motor Operation Check Each time pressing SW3 on the ADF PCB, the ADF transfer motor rotates in the following order. Forward (CW) ⇔ Backward-High (CCW) ⇔ Backward-Low (CCW) ⇔ Backward-Medium (CCW)
OFF	ON	Single Original Feeding Mode Each time pressing SW3 on the ADF PCB, an original is fed into and ejected out of the ADF.
ON	OFF	Multi Original Feeding Mode When pressing SW3 on the ADF PCB, originals on the ADF tray keep being fed into and ejected out of the ADF until no original remains on the tray.
ON	ON	Free Run Operation When pressing SW3 on the ADF PCB, the feeding-in and ejecting-out operation is performed without originals. NOTE: Never feed originals in this mode.

- NOTE:
1. If another Test mode is desired after one Test mode is performed, open up the ADF or turn off the power before changing DIP switch settings.
 2. In "Single original feeding mode" and "Multi original feeding mode" the Original stopper in the machine should be manually lowered because the Original stopper solenoid doesn't operate in the ADF Test mode.

3. Advice Displays & the Conditions for Display

1. "CALL SERVICE" indication

T1
CALL SERVICE

- Main Motor Lock -

Displayed to interrupt the machine operation:

- 1) If the Magnet A is still detected by the **Magnet A detection sensor 2 seconds** after the Main motor started.
- 2) If the Magnet A hasn't been detected by the **Magnet A detection sensor within 5 seconds** after the Main motor started.

T2
CALL SERVICE

- Elevator Motor Lock -

Displayed to interrupt the machine operation:

- 1) If the actuator of the **Elevator upper limit sensor** has not been raised to open the light path **within 7 seconds** after the Elevator motor started to rise.
- 2) If the actuator of the **Elevator lower limit switch** has not been depressed **within 7 seconds** after the Elevator motor started to lower.
- 3) If the actuator of the **Elevator lower limit sensor** is still depressed **2 seconds** after the Elevator motor started to rise.
- 4) If the actuator of the **Elevator upper limit sensor** is still raised to open the light path **2 seconds** after the Elevator motor started to lower.

T3
CALL SERVICE

- Clamp Error -

Displayed to interrupt the machine operation:

- 1) If the actuator of the **Clamp safety switch** is still depressed **4 seconds** after the Clamp solenoid was activated (turned on).
- 2) If the actuator of the **Clamp safety switch** has not been depressed **within 4 seconds** after the Clamp solenoid was released (turned off).
- 3) If the Angular magnet has not been detected by the **Angular sensor** (either 0° or 180°) **within 8 seconds** after the Clamp motor started rotating.

Displayed to prevent the machine operation:

- 4) If the actuator of the **Clamp safety switch** is not depressed when the Clamp solenoid is not in operation.

T4
CALL SERVICE

- Ink Overflow -

Displayed after the machine operation finished, immediately stopping the Inking motor.

- 1) If the **Overflow sensor** detects excessive ink in the Squeegee unit.

T5
CALL SERVICE

- Print Positioning Motor Lock -

Displayed after the machine operation finished, immediately stopping the Print positioning motor:

- 1) If the **Vertical centering sensor** status has not been changed from ON to OFF (or OFF to ON) **within 12 seconds** after the Print positioning motor started rotating.

T6
TURN OFF POWER
& THEN ON AGAIN

- **Communication Error between Panel and System PCBs -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the Panel and System PCBs.

T7
TURN OFF POWER
& THEN ON AGAIN

- **Communication Error between Panel and Digitizer PCBs -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the Panel and Digitizer PCBs.

T8
TURN OFF POWER
& THEN ON AGAIN

- **Communication Error between System PCBs and Interface Accessories -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the System PCBs and the interface accessories.

T9
TURN OFF POWER
& THEN ON AGAIN

- **Communication Error between System PCBs and RC Sorter -**
Displayed to interrupt the machine operation:
1) If a communication error has occurred between the System PCBs and the RC sorter.

T10
CALL SERVICE

- **Malfunction of the Magnet A Detection Sensor -**
Displayed to interrupt the machine operation:
1) If the **Magnet A detection sensor** has not detected the Magnet A by the time the Pressure detection sensor status has changed twice from OFF to ON (the light path of the sensor has been blocked twice by the Pressure Disc) after the Main motor started.

T11
CALL SERVICE

- **Pressure Control Motor Lock -**
Displayed to interrupt the machine operation:
1) If the resistance value of the **Print pressure detection potentiometer** has not changed to a specified value within **20 seconds** after the Pressure control motor started.

T13
CALL SERVICE

- **Cutter Motor Lock -**
Displayed:
1) If the error message "**MASTER CUT MALFUNCTION/PRESS RESET BUTTON**" has been displayed twice in master making operation.

ADVICE DISPLAYS

1. "CALL SERVICE"

T14
CALL SERVICE

- ADF Transfer Motor Lock -

Displayed to interrupt the ADF operation:

- 1) If no pulse signal is sent from the **ADF clock sensor 1 more than 500 ms** after the ADF transfer motor is in operation.

T15
CALL SERVICE

- Read Pulse Motor Lock -

Displayed to interrupt the machine operation:

- 1) If the light path of the **Scanner home sensor** is not blocked **within 14330 pulses** after the Read pulse motor started in the Image scanner home positioning (initializing) operation.
- 2) If the light path of the **Scanner home sensor** is not opened **within 315 pulses** after the Read pulse motor started in the pre-scanning operation.
- 3) If the Image scanner has not been returned to the home position (the **Scanner home sensor**) **14330 pulses** after the Read pulse motor started in the image scanning operation.

T16
CALL SERVICE

- Malfunction of the Trimming PCB -

Displayed to interrupt the machine operation:

- 1) If the data signals such as original size, are not output from the **Trimming PCB** at the start of the image scanning operation.

2. "JAM or ERROR" indication

PAPER JAM
CHECK PAPER FEED AREA

- Paper Jam in the Paper Feed Area -

[In Master-making]

Displayed after the master has been loaded on the Drum:

- 1) If the light path of the **Paper sensor** is blocked at the second Magnet A detection after cutting operation.

Note:

- If the light path of the **Paper receiving sensor 1** was open at the first Magnet A detection after cutting, it is judged that the first sheet is stuck in the second paper feed area.
- If the light path of the **Paper receiving sensor 1** was blocked at the first Magnet A detection after cutting, it is judged that some sheets have been fed with lead and trail edges stuck to each other.

[In Printing]

Displayed in the following cases:

- 1) If the light path of the **Paper receiving sensor 1** is open at the first Magnet A detection after the light path blocking of the Paper sensor, and if the light path of the **Paper sensor** is still blocked at the second Magnet A detection.

Note:

- At the first Magnet A detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
 - Judged that paper is stuck in the second paper feed area.
- 2) If the light path of the **Pressure detection sensor** has been blocked twice while that of **Paper sensor** is kept blocked from the first blocking after the start of printing.
The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the light path blocking of the Pressure detection sensor, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
 - Judged that some sheets have been fed with lead and trail edges stuck to each other.
- 3) If the light paths of the **Paper receiving sensor 1** and **Paper sensor** are both open at a Magnet A detection, and if the light path of the **Paper sensor** has been open during the following 2 Magnet A detections.
The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the first Magnet A detection following the above (at the fourth one counted from the beginning), the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
- Judged that paper has misfed or slipped in feeding.

PAPER JAM UNDER DRUM PULL OUT DRUM

- Paper Jam under the Drum or in the Paper Receiving Area - [In Master-making]

Displayed after the master has been loaded on the Drum:

- 1) If the light path of the **Paper receiving sensor 1** is blocked at the start of the light path blocking of the **Pressure detection sensor**.

Note:

- Judged that the previous jammed paper still remains under the Drum.

- 2) If the light path of the **Paper receiving sensor 1** was open at the first Magnet A detection after cutting, and if the light path of the **Paper sensor** is also open at the second Magnet A detection.

Note:

- Judged that the first copy was not separated from the Drum and has stuck onto it.

[In Printing]

Displayed in the following cases:

- 1) If the light path of the **Paper receiving sensor 1** is blocked at the start of the light path blocking of the **Pressure detection sensor**.

The jam message will be displayed when the Drum stops after the Magnet A has been detected twice by the detection sensor following the above.

Note:

- At the start of the light path blocking of the Pressure detection sensor, the Print signal is immediately interrupted to stop the first paper feed (Paper feed clutch's operation). Judged that the printed copy has jammed around the Separator..

- 2) If the light path of the **Paper receiving sensor 1** is open at the first Magnet A detection after the light path blocking of the **Paper sensor**, and if the light path of the **Paper sensor** is open at the second Magnet A detection.

Note:

- At the first Magnet A detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation). Judged that the printed copy was not separated from the Drum and has stuck onto it.

- 3) If the light path of the **Paper receiving sensor 2** has been kept blocked while that of the **Paper receiving sensor 1** has been blocked twice.

The jam message will be displayed when the Drum stops after the Magnet A has been detected three times by the detection sensor following the above.

Note:

- At the first Magnet A detection following the above, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).
- Judged that the printed copy has jammed around the exit of the paper receiving side or on the Paper receiving tray.

**MASTER CLAMP ERROR
RESET MASTER**

- The Master has Not been Loaded onto the Drum -

Displayed in master-making and confidential processes after the following display message is cleared:

[MASTER CLAMP ERROR/REMOVE CUT MASTER STRIP]

Note: The above message will be displayed:

- 1) If the **Master sensor** did not detect the master on the Drum at the Magnet C-1 detection in master loading process (preventing the first paper feed-Paper feed clutch's operation), and then if the **Master positioning sensor** detects the master at the Magnet A detection after master-cutting operation at the Magnet C-2 detection. If the **Master positioning sensor** does not detect the master at the Magnet A detection after master-cutting operation, the above message **[MASTER CLAMP ERROR/REMOVE CUT MASTER STRIP]** will not be displayed.

**PULL OUT DRUM AND
CHECK MASTER ON IT**

- Master Cut Error -

Displayed to interrupt the machine operation in master-making and confidential processes:

- 1) If the **Master positioning sensor** detects the master material at the Magnet C-1 detection position after the master making, the Cutter motor is reactivated, and then if the **Master positioning sensor** does not detect the master material at Magnet C-2 detection position, the message is displayed. (If the master material is still detected by the **Master positioning sensor**, the message **"T13: CALL SERVICE"** is displayed.)

**MASTER MIS-FEED
RESET MASTER**

- Master has Not been Properly Fed or Loaded -

Displayed after the master has been loaded onto the Drum in master making or confidential process:

- 1) If the **Master positioning sensor** has not detect the master material **within 460 pulses** after the Loading pulse motor started rotating following the master cutting operation.

Note:

- The Loading and Write pulse motors are turned off following the above.

Displayed to interrupt the machine operation when the Master loading button was pressed:

- 2) If the **Master positioning sensor** has not detected the master material **within 630 pulses** after the Loading pulse motor was turned on.
- 3) If the **Master positioning sensor** has not detected the master **within 460 pulses** after the Loading pulse motor was turned on following the operation of the Cutter motor.

**USED MASTER NOT
DISCHARGED
PULL OUT DRUM
AND CHECK**

- The Used Master has Not been Removed from the Drum -

Displayed after the Image scanning and Master making operations are completed or in the confidential operation:

- 1) If the light path of the **Master removal sensor** has been open until the Magnet A detection sensor detects the Magnet A after the detection of the master by the Master sensor at the Magnet C-1 detection, during master removal.

Note:

- If the Master sensor does not detect the master at the Magnet C-1 detection, in the above case, the Master removal sensor is prevented from operating and the message will not be displayed.

ADVICE DISPLAYS

2. "JAM or ERROR"

ORIGINAL MISFEED IN ADF
OPEN STAGE COVER/
REMOVE ORIGINAL

- Original has Misfed or Jammed in the ADF Feed Side -

Displayed to immediately interrupt the machine operation:

- 1) If the **ADF registration sensor** is blocked when the ADF starts to operate.
- 2) If the **ADF registration sensor** is not blocked by the original **within 640ms** after the start of the ADF transfer motor (clockwise rotation) in the original feed operation.
- 3) If the **ADF registration sensor** has not been opened **within 1410ms** after the ADF transfer motor reversed the rotation direction to counter-clockwise in the original feed operation.
- 4) If the **ADF registration sensor** is blocked by the original when the original feed operation finished.

ORIGINAL JAM IN ADF
OPEN STAGE COVER/
REMOVE ORIGINAL

- Original has Misejected or Jammed in the ADF Ejection Side -

Displayed after the master has been loaded onto the Drum:

- 1) If the actuator of the **ADF ejection sensor** is held up, when the ADF starts to operate.
- 2) If the actuator of the **ADF ejection sensor** has not been pushed up, **within 1270ms** after the ADF transfer motor started rotating counter-clockwise in the original ejection operation.
- 3) If the actuator of the **ADF ejection sensor** is not released **within 1480ms** in the original ejection operation.

ORIGINAL REMAINING
ON THE STAGE

- Original Remains on the Stage Glass in ADF Operation -

Displayed immediately after originals have been placed on the Original tray:

- 1) If the **Original detection sensor** detects the original placed on the Stage glass when the **ADF original detection sensor** detects the originals placed on the Original tray.

NO MASTER ON DRUM
SET ORIGINAL IN PLACE
AND PRESS START BUTTON

- The Master is Not Attached to the Drum -

Displayed **for 2 seconds** after the Drum has stopped at the Magnet A detection:

- 1) If the **Master sensor** does not detect the master (the reflected light) when the Magnet C-1 has been detected by the Magnet C detection sensor just after the print started.

Note:

- At the Magnet C-1 detection, the Print signal is interrupted to stop the first paper feed (Paper feed clutch's operation).

REMOVE JAMMED
MASTER IN DISPOSAL
UNIT

- The Used Master is Jammed and Blocked at the entrance of Master disposal box -

Displayed immediately after used master is jammed.

- 1) If the light path of the **Master removal sensor** is blocked.

3. "CHECK SETTING" indication

SET DRUM IN PLACE

Displayed to prevent the machine operation:

- If the actuator of the **Drum set switch** is not depressed.

SET INK BOTTLE IN PLACE

Displayed to prevent the machine operation:

- If the actuator of the **Ink bottle switch** is not depressed.

ADD PAPER

Displayed to interrupt the Print signal (the first paper feed) in printing:

- 1) If the light path of the **Paper detection sensor** is open when that of the Pressure detection sensor has been opened in printing.

Displayed to prevent the machine operation:

- 2) If the light path of the **Paper detection sensor** is open.

SET LEAD EDGE OF
MASTER UNDER
GREEN FILM

Displayed to prevent the machine operation:

- If the **Master detection sensor** does not detect the master material (the reflected light).

CLOSE FRONT COVER

Displayed to prevent the machine operation:

- If the metal plate is not attached to the **Front cover set sensor**.

SET MASTER DISPOSAL
BOX IN PLACE

Displayed to prevent the machine operation:

- If the actuator of the **Disposal box set switch** is not depressed.

SET ORIGINAL FEED
TABLE IN PLACE

Displayed to prevent the machine operation:

- If the actuator of the **Original-feed table set switch** is not depressed.

CLOSE MASTER
LOADING UNIT

Displayed to prevent the machine operation:

- If the actuator of the **Master loading unit switch** is not depressed.

CLOSE STAGE COVER

Displayed to prevent the machine operation:

- If the **ADF setting sw** is not ON when the **ADF original detection sensor** detects the originals placed on the Original tray.

NO ORIGINAL
ON THE STAGE

Displayed to prevent the machine operation:

- If the Image scanner does not detect an original on the Stage glass during the pre-scanning motion when "MARGIN NORMAL" is selected.

4. Others

REPLACE INK BOTTLE

Displayed after the machine operation is finished:

- If the **Ink sensor** has not detected ink in the Squeegee unit **within 30 seconds** after the Inking motor was started rotating by the detection of scarce ink in the unit.

REPLACE MASTER ROLL

Displayed after the machine operation is finished:

- If the black tape attached at the end of the Master roll has been detected by the **Master end sensor** during master making or the confidential operation.

EMPTY DISPOSAL BOX

Displayed after the machine operation is finished:

- If the **Internal counter** for disposed masters on the **Panel PCB** has counted 30 through the detection of disposed masters by the **Master removal sensor**.

REMOVE CUT MASTER STRIP

Displayed:

- If the **Master positioning sensor** detects the master material (the reflected light) just after the master cut operation is completed.

SELECT PRINT QUANTITY

Displayed:

- If the "START" button is pressed for printing when the print quantity is set to **0**.

PRESS RESET BUTTON

Displayed:

- When jam has occurred.

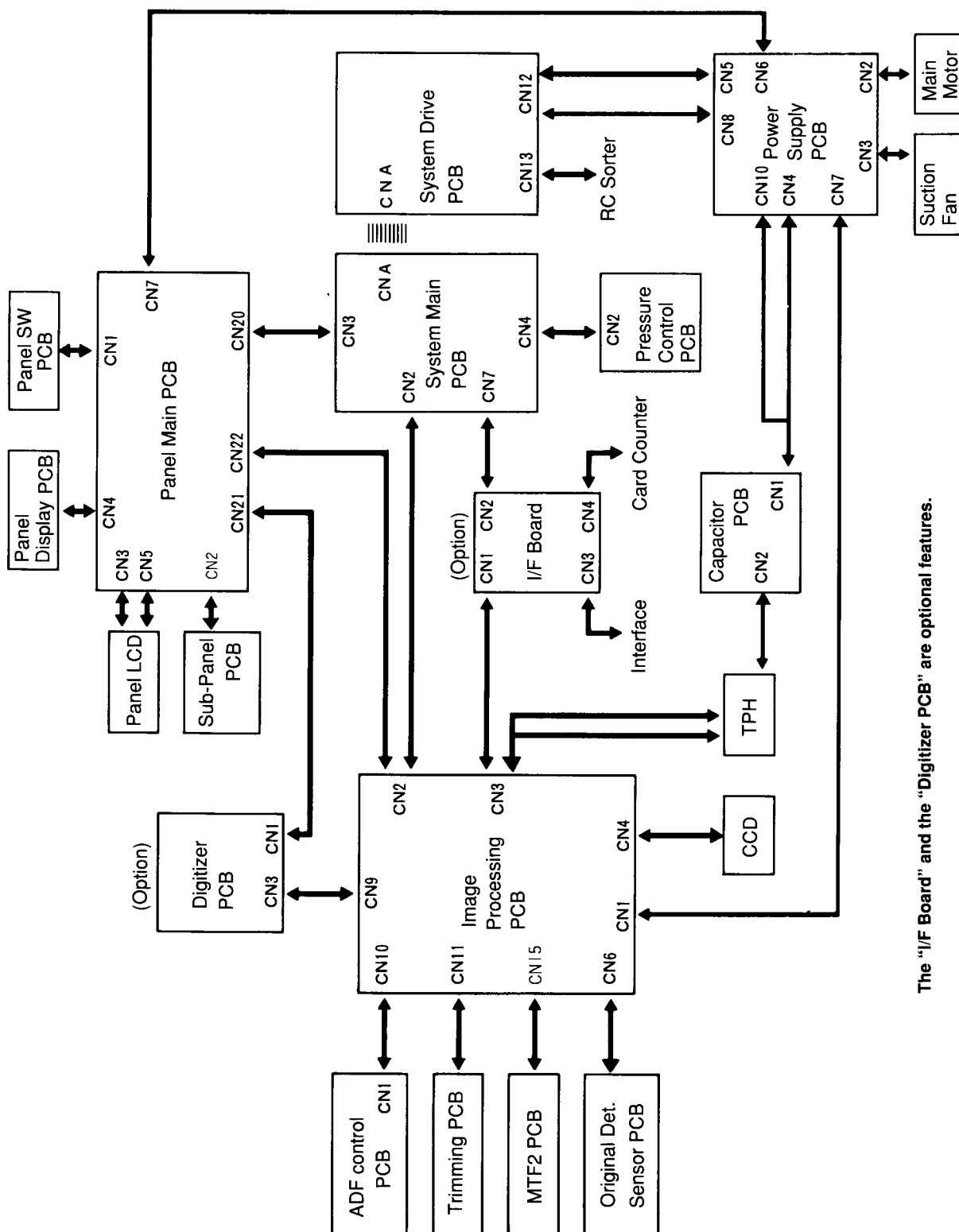
TO RESUME
PRESS START BUTTON

Displayed:

- If the "REST" button has been pressed after the error or jam occurred.

4. Description of PCBs

1. BLOCK CHART



The "I/F Board" and the "Digitizer PCB" are optional features.

2. LOCATION OF PCBs

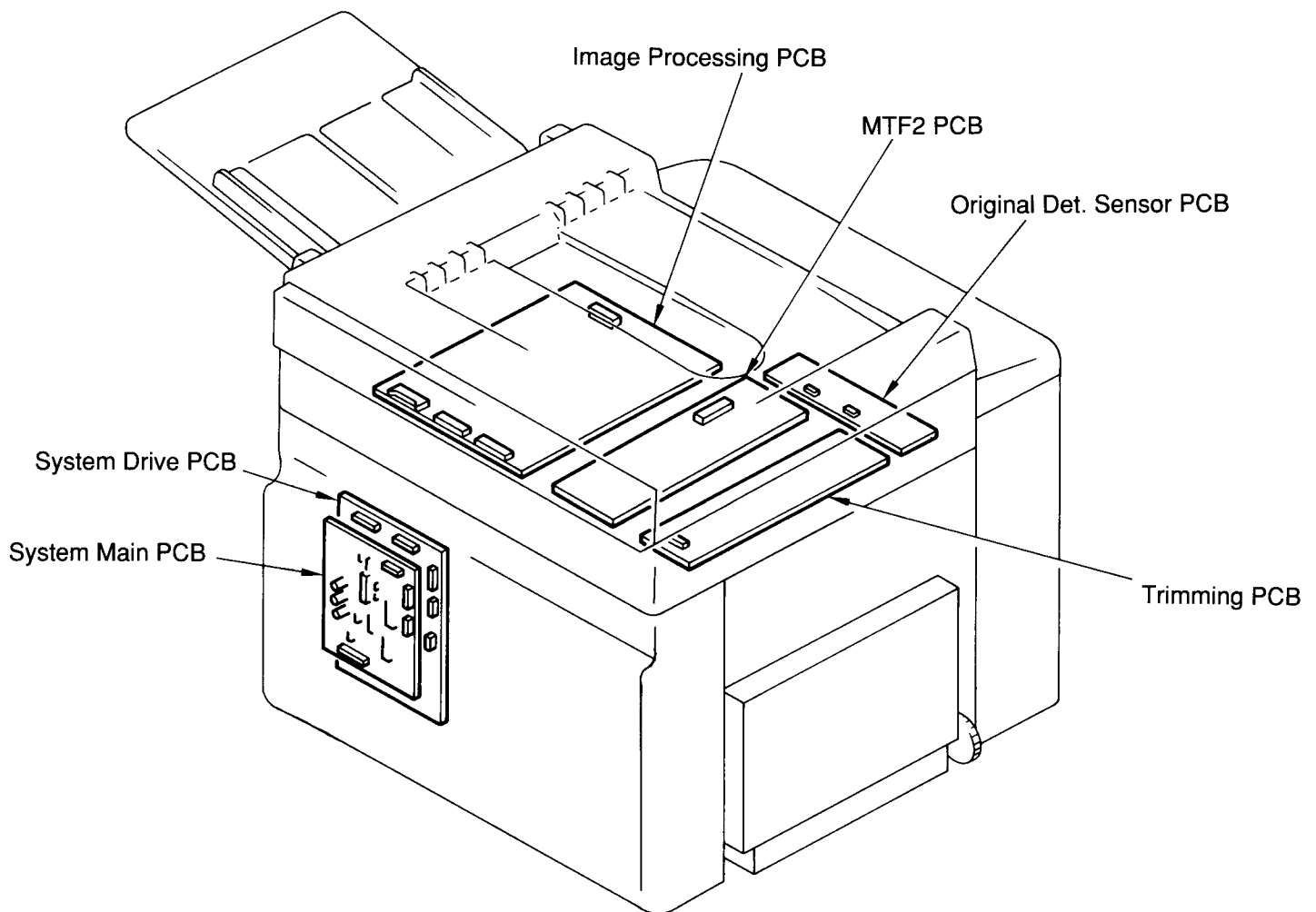
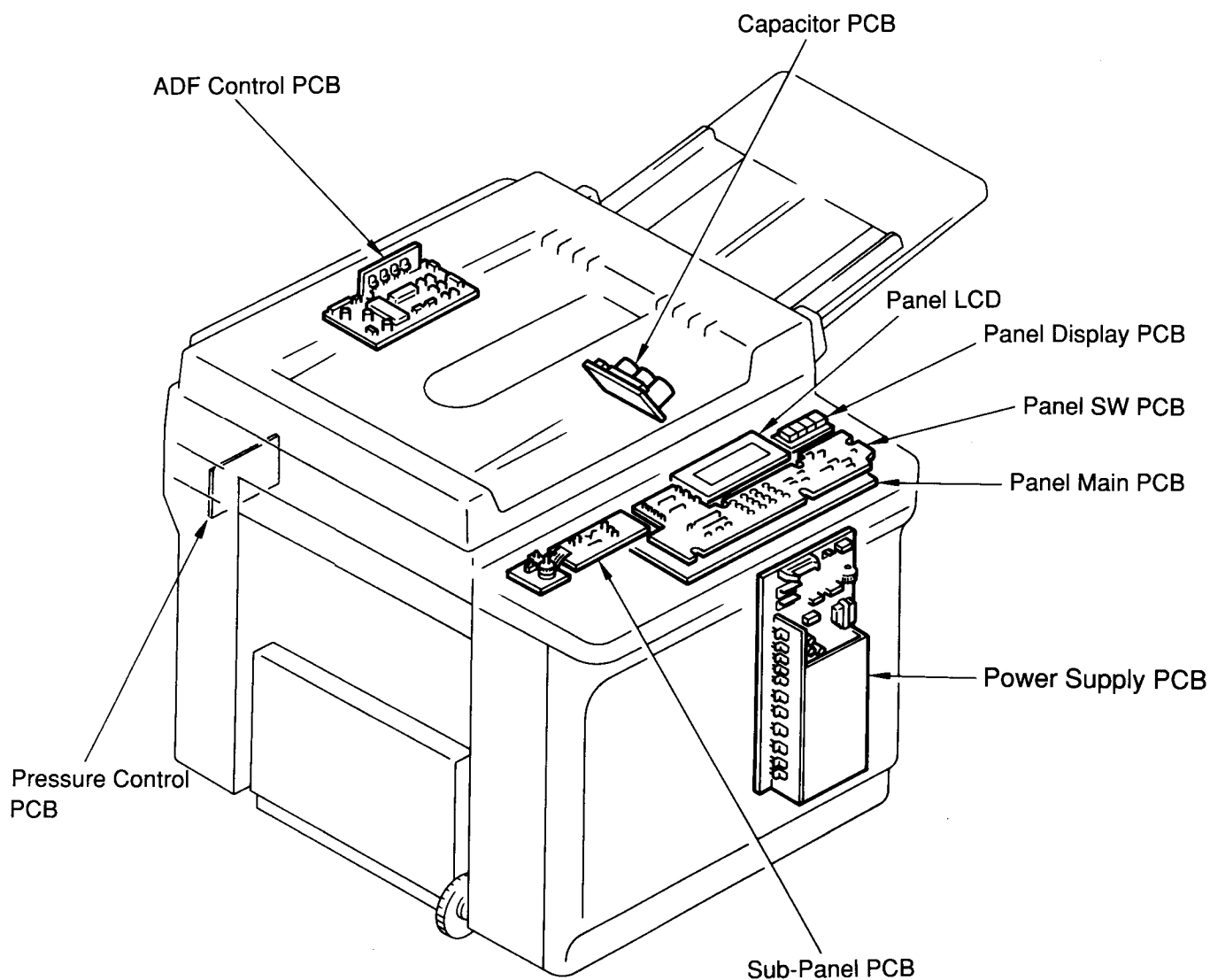
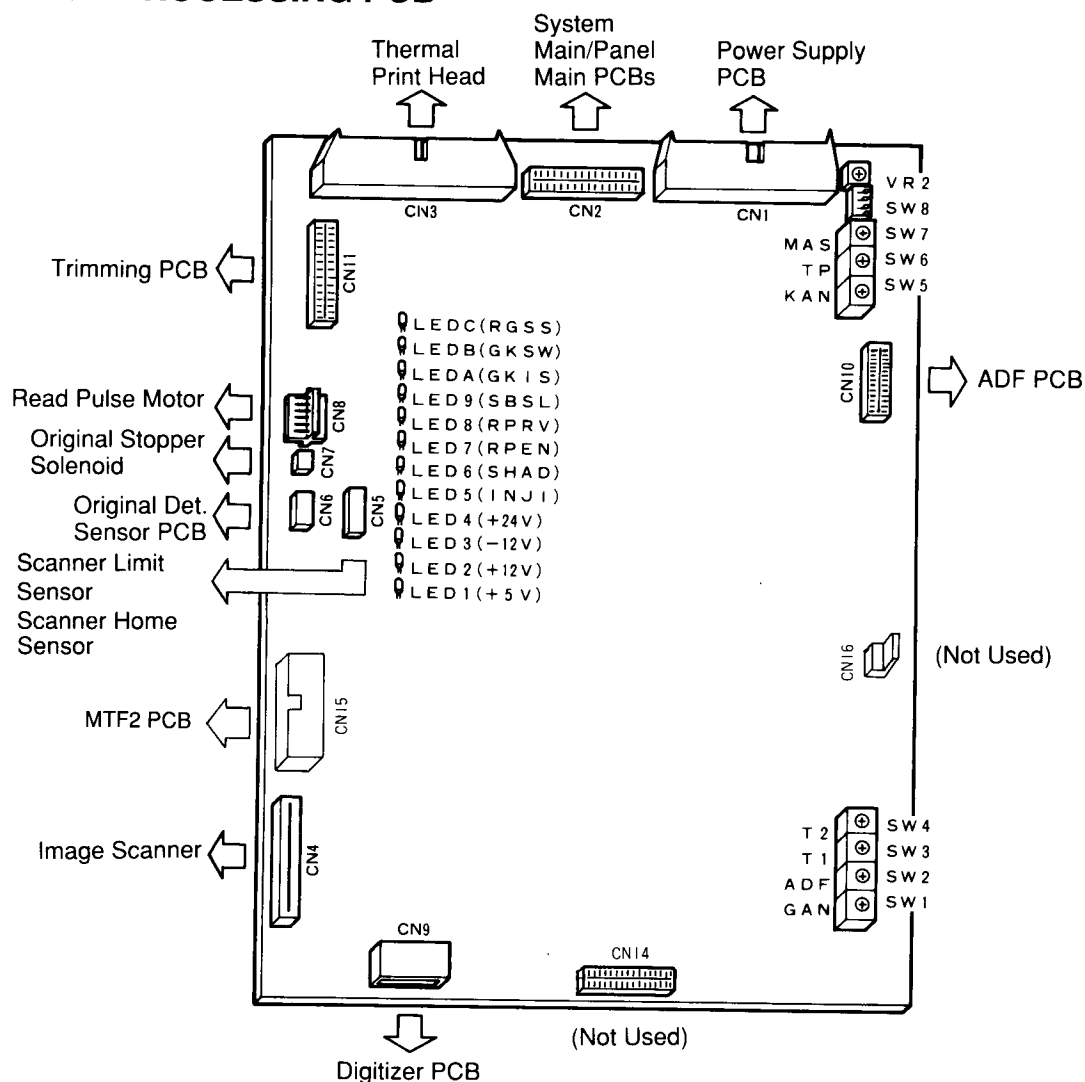


Image Processing PCB	For image processing
MTF2 PCB (for Fine Enhancement)	
Trimming PCB	
Original Det. Sensor PCB	To control and for sensivity adjustment of Orig. Det. Sensor
System Main PCB	To control the Main motor and to process the signals from sensors
System Drive PCB	To control the operation to drive the motors and solenoids



Panel Main PCB	To control the machine operations
Panel LCD	For display control
Panel Display PCB	
Sub-Panel PCB	For control input
Panel SW PCB	
Power Supply PCB	To convert the input power to 5V, 12V and 24V and supply them to circuitry
Pressure Control PCB	To control the Pressure control motor
Capacitor PCB	To stabilize the electric power to the Thermal print head
ADF Control PCB	To control the ADF operations

3. IMAGE PROCESSING PCB

**LED****- When LED is ON -**

LED1 (+5V)	: +5V is supplied into PCB.
LED2 (+12V)	: +12V is supplied into PCB.
LED3 (-12V)	: -12V is supplied into PCB.
LED4 (+24V)	: +24V is supplied into PCB.
LED5 (INJI)	: "Read/Write Start Signal" is output.
LED6 (SHAD)	: "Shading Compensation Signal" is output.
LED7 (RPEN)	: Read Pulse Motor is ON.
LED8 (RPRV)	: Read Pulse Motor is rotating CCW.
LED9 (SBSL)	: Original Stopper Solenoid is ON.
LEDA (GKIS)	: Original Det. Sensor is detecting reflected light.
LEDB (GKSW)	: Scanner Home Sensor is activated.
LEDC (RGSS)	: Scanner Limit Sensor is activated.

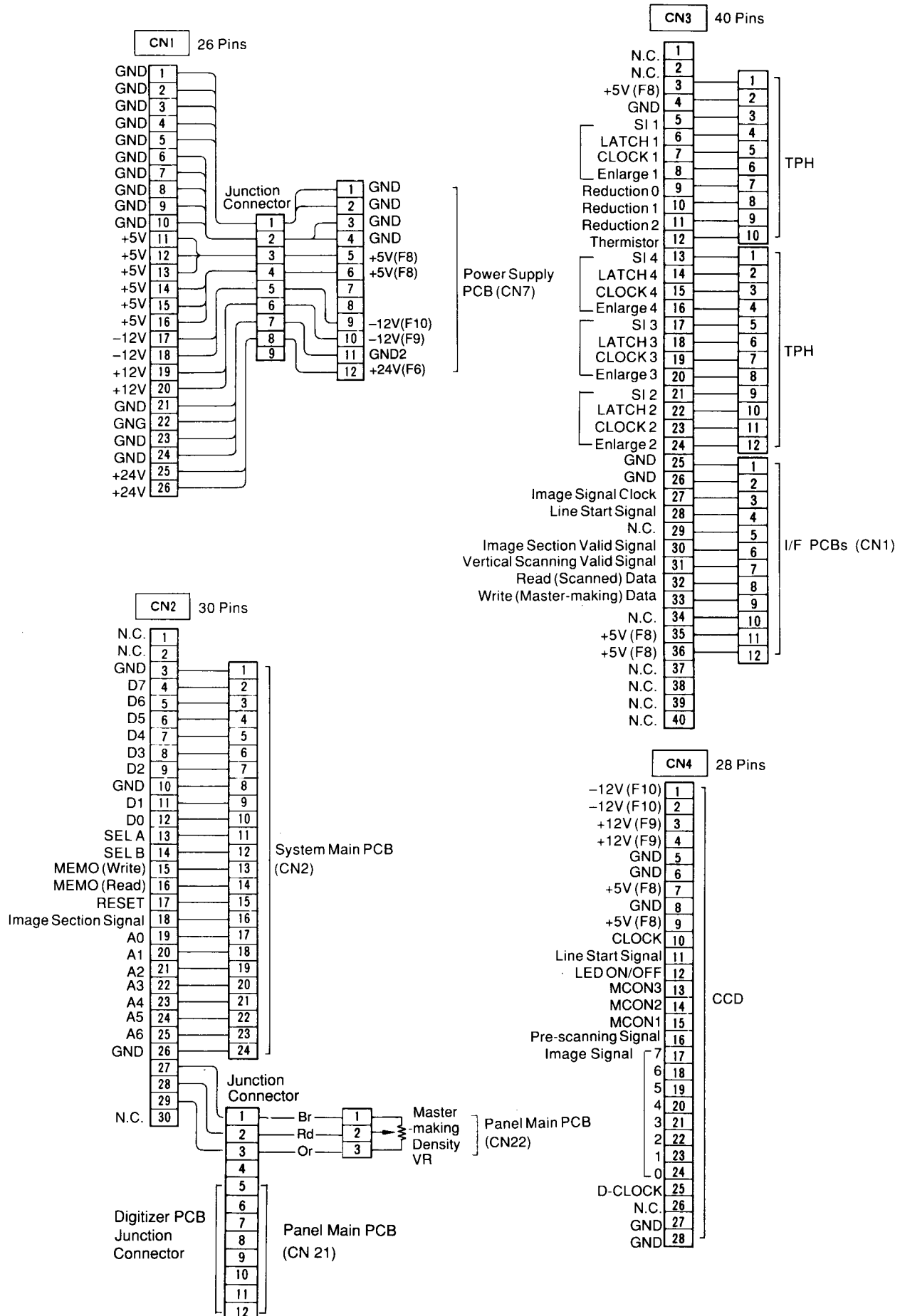
VR

VR2 (NDD)	: For contrast level adjustment in image scanning. (The contrast will be darker by turning it clockwise.)
-----------	--

SW

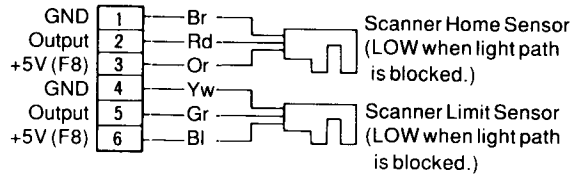
SW1 (GAN)	: For contrast balance (γ compensation) adjustment in image scanning.
SW2 (ADF)	: For adjustment of scanning (read)-start position.
SW3 (T1)	: For adjustment of heating power (HP1) of Thermal Print Head
SW4 (T2)	: For adjustment of heating power (HP2) of Thermal Print Head
SW5 (KAN)	: Not Used
SW6 (TP)	: Not Used
SW7 (MAS)	: For adjustment of "Line-copy mode slice level."
SW8 (Dip SW)	: Used only for adjustment in factory

3. Image Processing PCB

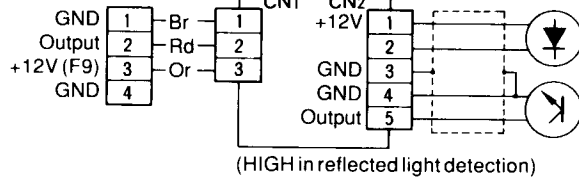


3. Image Processing PCB

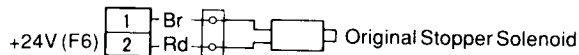
CN5 6 Pins



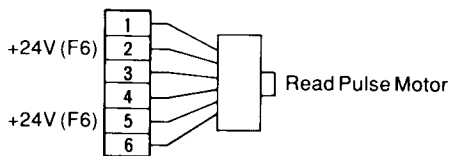
CN6 4 Pins Original Det. Sensor PCB



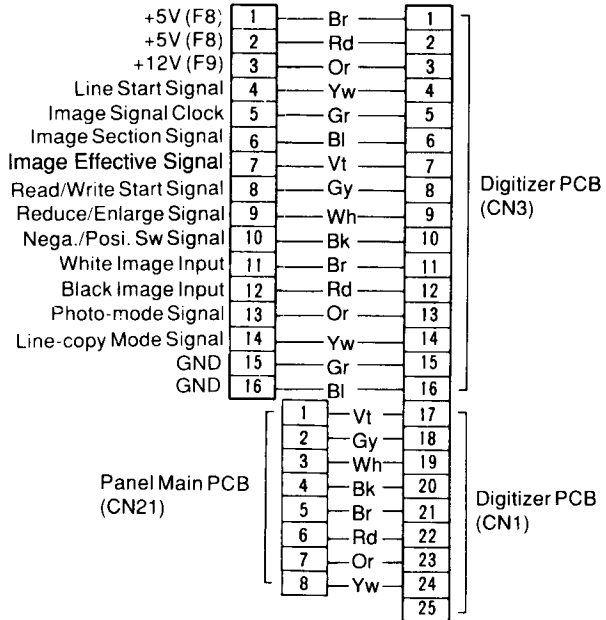
CN7 2 Pins



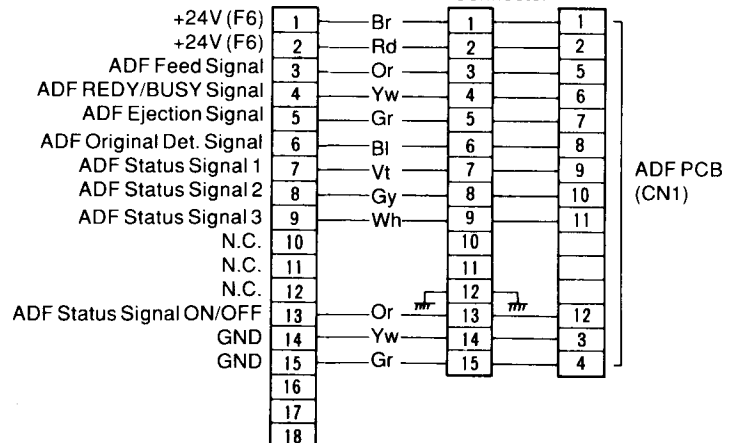
CN8 6 Pins



CN9 16 Pins Junction Connector



CN10 18 Pins Junction Connector



3. Image Processing PCB

CN11 26 Pins

+5V (F8)	1
+5V (F8)	2
Line Start Signal	3
Image Signal Clock	4
Image Valid Signal	5
Image Data	6
White Signal	7
PS Signal	8
Read/Write Start Signal	9
Reduce/Enlarge Signal	10
READY/BUSY Signal	11
END Signal	12
SIZE Signal 1	13
SIZE Signal 2	14
SIZE Signal 3	15
MS Signal	16
CLEAR Signal	17
TOP Signal	18
N.C.	19
SM Signal	20
PHOTO Signal	21
CP Signal	22
GND	23
GND	24
GND	25
GND	26

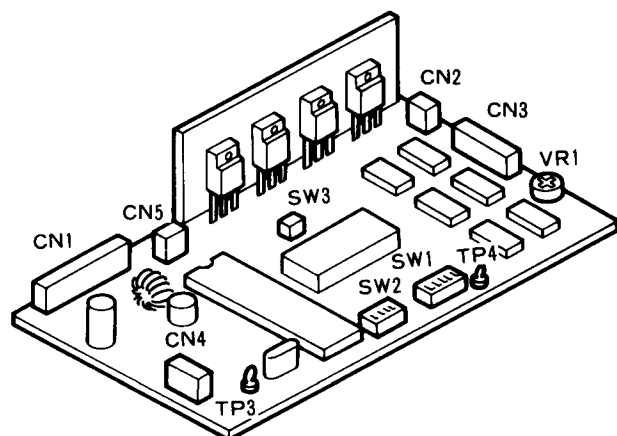
Trimming PCB
(CN1)**CN15** 50Pins

+ 5 V	1
+ 5 V	2
+ 5 V	3
+ 5 V	4
GND	5
DOUT 7	6
GND	7
DOUT 6	8
	9
DOUT 5	10
MTF ON	11
DOUT 4	12
	13
DOUT 3	14
	15
DOUT 2	16
A12	17
DOUT 1	18
A11	19
DOUT 0	20
A10	21
GND	22
GND	23
GND	24
GND	25
CLK 8M	26
A9	27
GND	28
A8	29
	30
A7	31
DATA 7	32
A6	33
DATA 6	34
A5	35
DATA 5	36
GND	37
GND	38
A4	39
DATA 4	40
A3	41
DATA 3	42
A2	43
DATA 2	44
A1	45
DATA 1	46
A0	47
DATA 0	48
GND	49
GND	50

MTF2 PCB
(CN1)

4. ADF PCB

4. ADF PCB

**VR**

VR1 : For sensitivity adjustment of
ADF registration sensor

LED

- When LED is ON -

LED1 : +24V is supplied into PCB

TP

TP1 (+24V) : +24V

TP2 (+5V) : +5V

TP3 (0V) : GND

TP4 (REGS) : OADF registration sensor's
Output

TP5 (X4) : Clock Sensor's Output

TP6 (MCK2) : ADF clock Sensor 1's Output

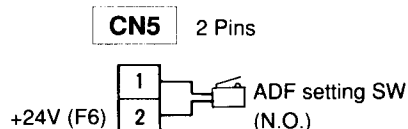
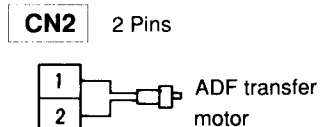
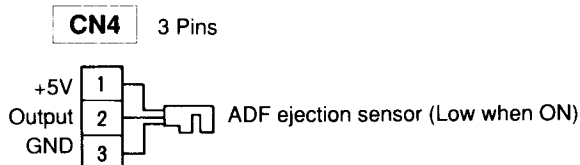
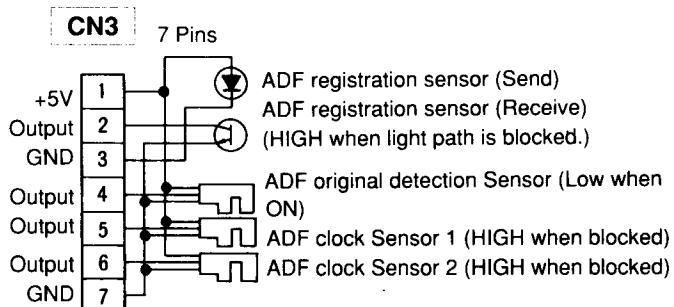
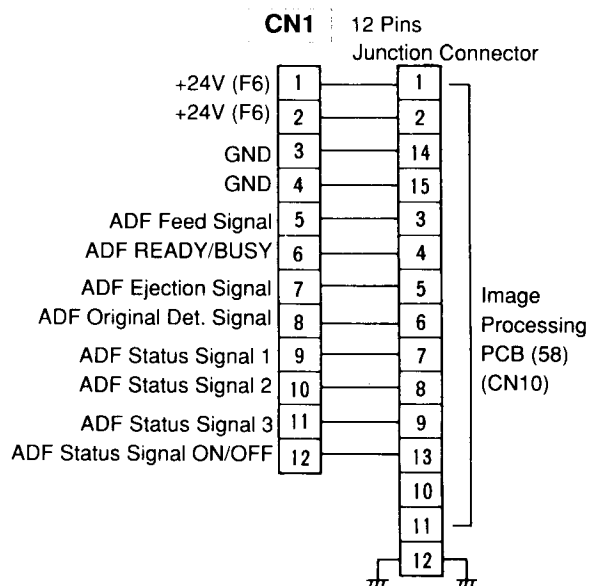
TP7 (MCK1) : ADF clock Sensor 2's Output

SW

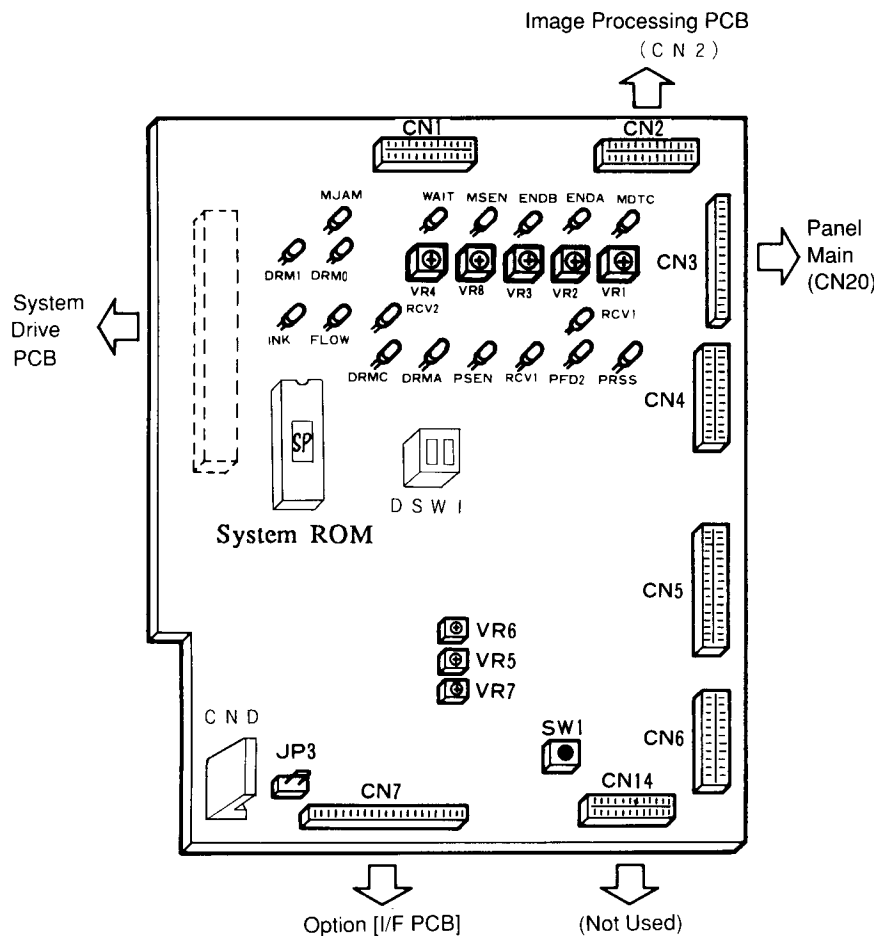
SW1 : For stop position adjustment of
original feed

SW2 : For ADF Test Mode

SW3 : For ADF Test Mode



5. SYSTEM MAIN PCB

**LED****LED – When LED is ON –**

- MDTC : Master Det. Sensor is detecting reflected light (Master).
 ENDA : Not used
 ENDB : Master End Sensor is NOT detecting reflected light.
 MSEN : Master Sensor is detecting reflected light (Master).
 WAIT : Master Positioning Sensor is detecting reflected light (Master).
 MJAM : The light path of Master Removal Sensor is blocked.
 DRM0 : 0° Angular Sensor is detecting magnetism (Angular Magnet).
 DRM1 : 180° Angular Sensor is detecting magnetism (Angular Magnet).
 PFD1 : The actuator of Paper Buckle Det. Sensor is raised to open the light path.
 RCV2 : The light path of Paper Receiving Sensor 2 is blocked.
 FLOW : Overflow Sensor is detecting ink.
 INK : Ink Sensor is NOT detecting ink.
 PRSS : The light path of Pressure Detection Sensor is blocked.
 PFD2 : The light path of Paper Feed Clutch Sensor is open.
 RCV1 : The light path of Paper Receiving Sensor 1 is blocked.
 PSEN : The light path of Paper Sensor is blocked.
 DRMA : Magnet A Detection Sensor is detecting magnetism (Magnet A).
 DRMC : Magnet C Detection Sensor is detecting magnetism (Magnet C-1 or -2).

VR**VR**

- VR1 : For detection sensitivity adjustment of Master Det. Sensor (Sensitivity goes up by clockwise rotation.)
 VR2 : Not used
 VR3 : For detection sensitivity adjustment of Master End Sensor (Sensitivity goes up by clockwise rotation.)
 VR4 : For detection sensitivity adjustment of Master Positioning Sensor (Sensitivity goes up by clockwise rotation.)
 VR5 : For adjustment of "Free rotation speed" (30 rpm) (The speed goes up by clockwise rotation.)
 VR6 : For adjustment of "Master loading speed" (15 rpm) (The speed goes up by clockwise rotation.)
 VR7 : For adjustment of "Print speed" (130 rpm) (The speed goes up by clockwise rotation.)
 VR8 : For detection sensitivity adjustment of Master Sensor (Sensitivity goes up by clockwise rotation.)

SW

SW1 For Main Motor rotation (30rpm)

DSW1-1 Drum data signal

DSW1-2 Drum data signal

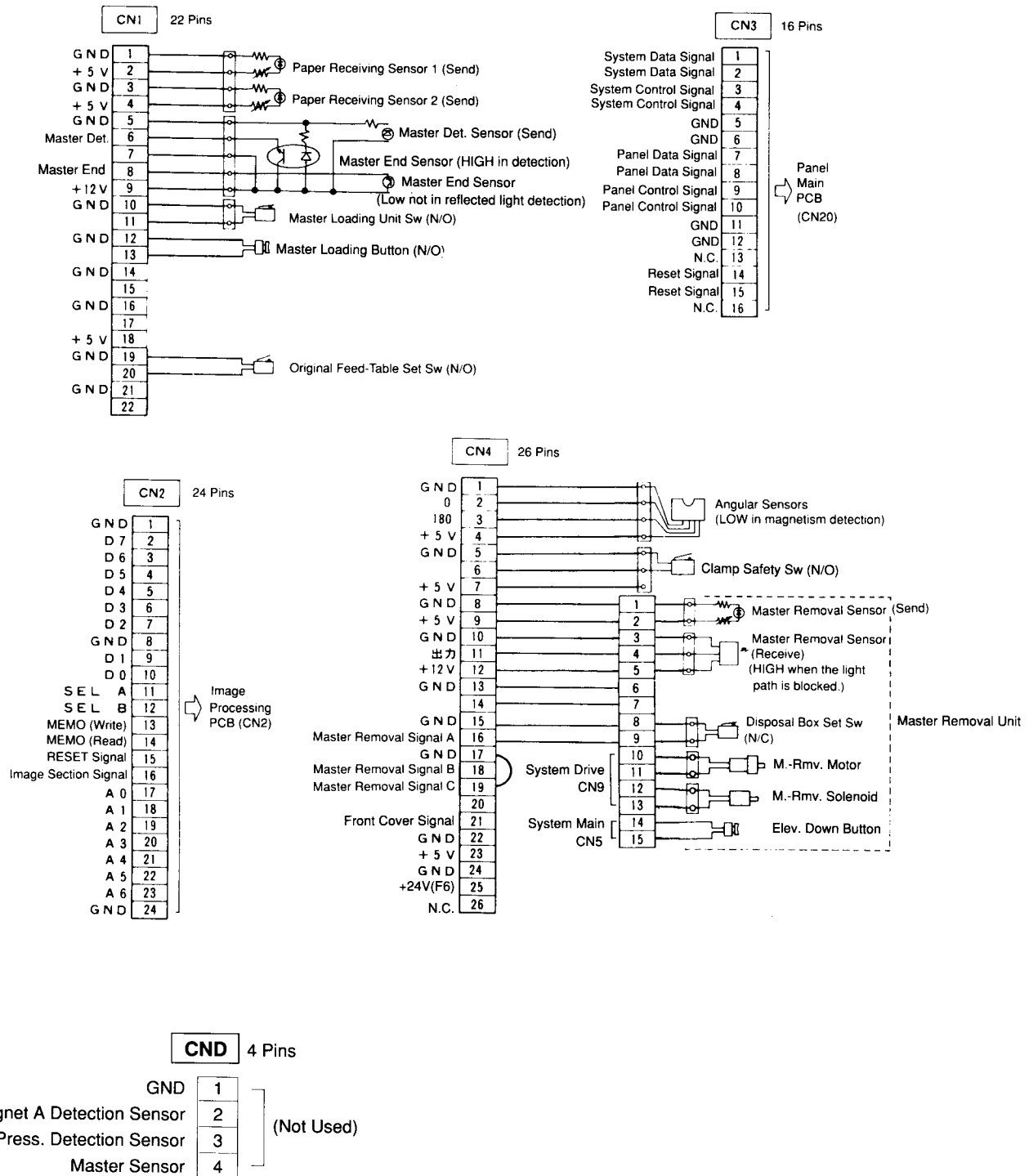
MODELS	DSW1-1	DSW1-2
RC4000/RC4500 RC5600/RC5800	ON	ON
RC6300	OFF	OFF

JP

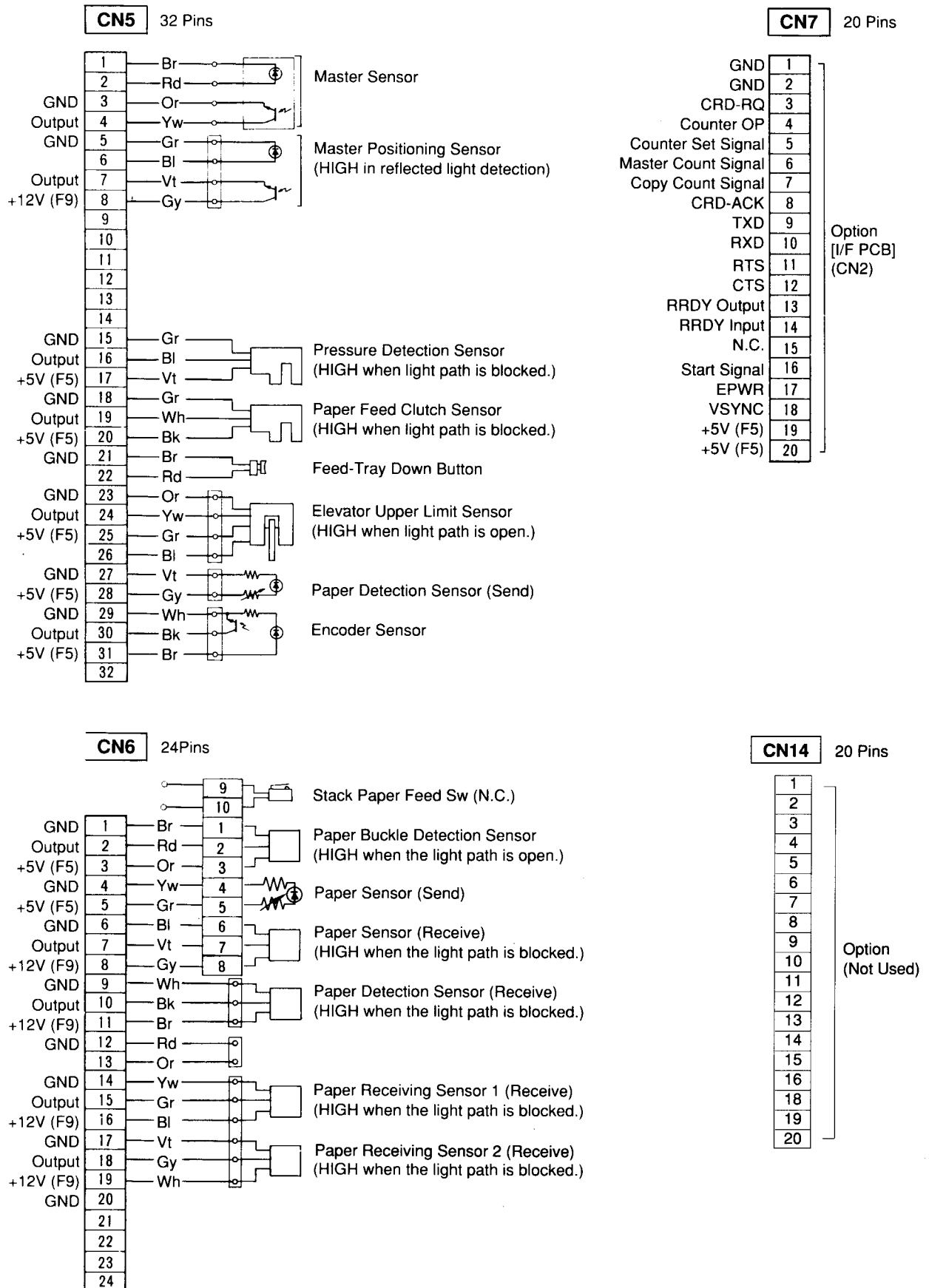
JP3: For "Key/Card Counter" installation
 (Opened in installing "Key/Card Counter")

DESCRIPTION OF PCBs

5. System Main PCB



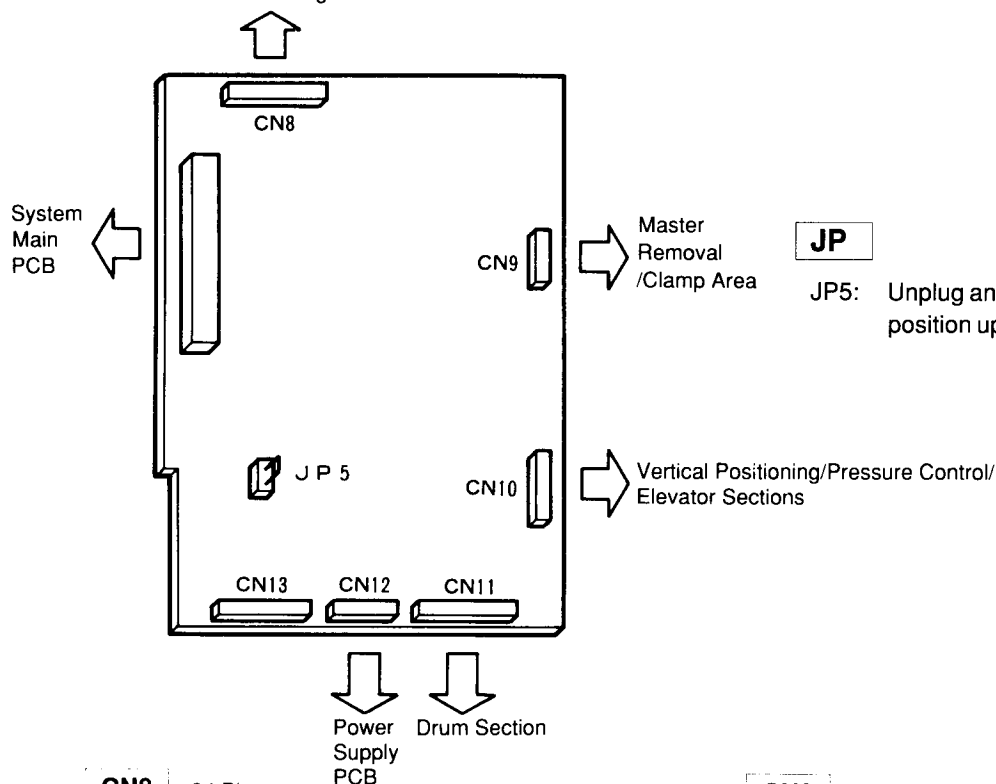
5. System Main PCB



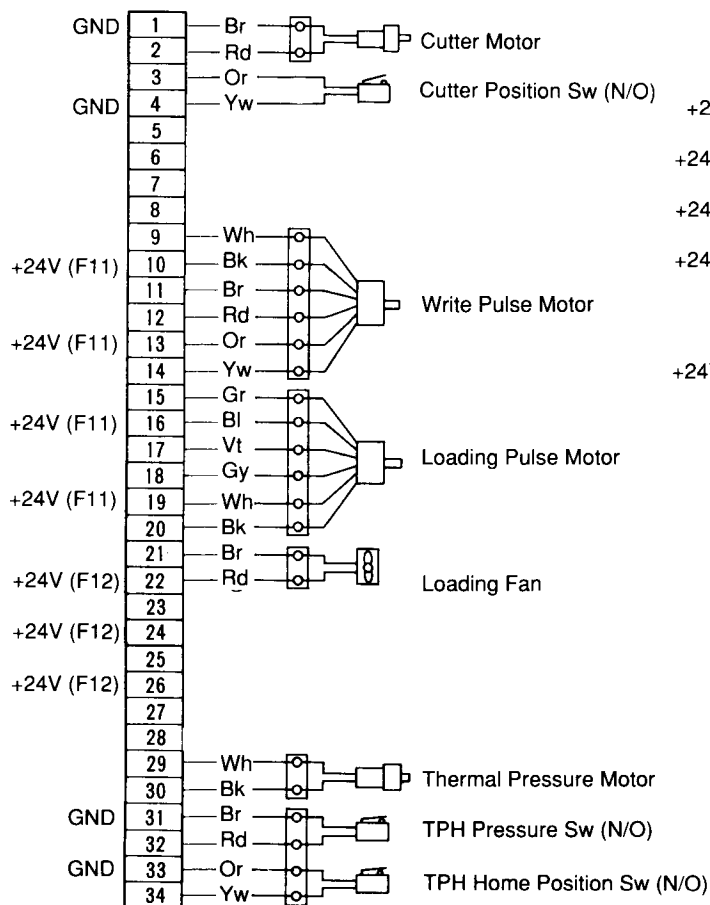
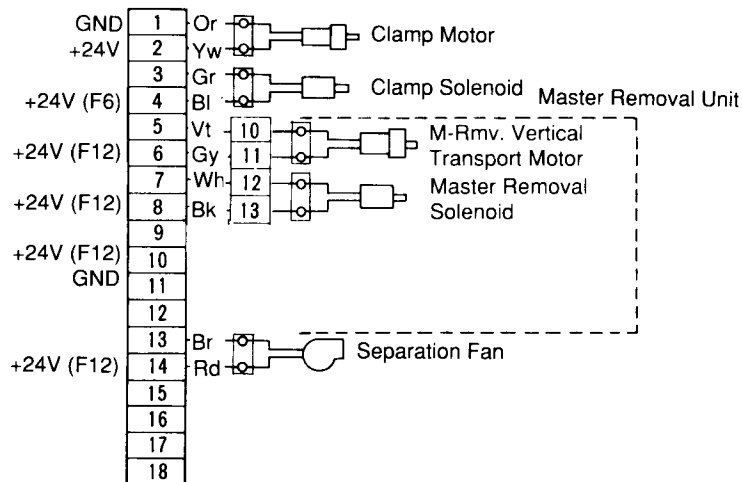
6. System Drive PCB

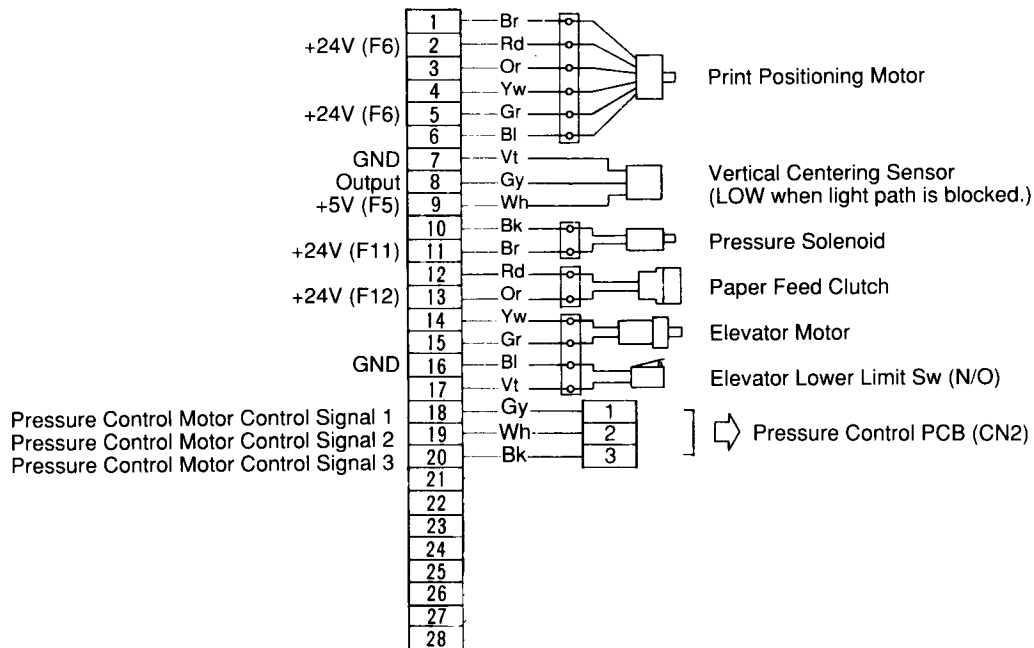
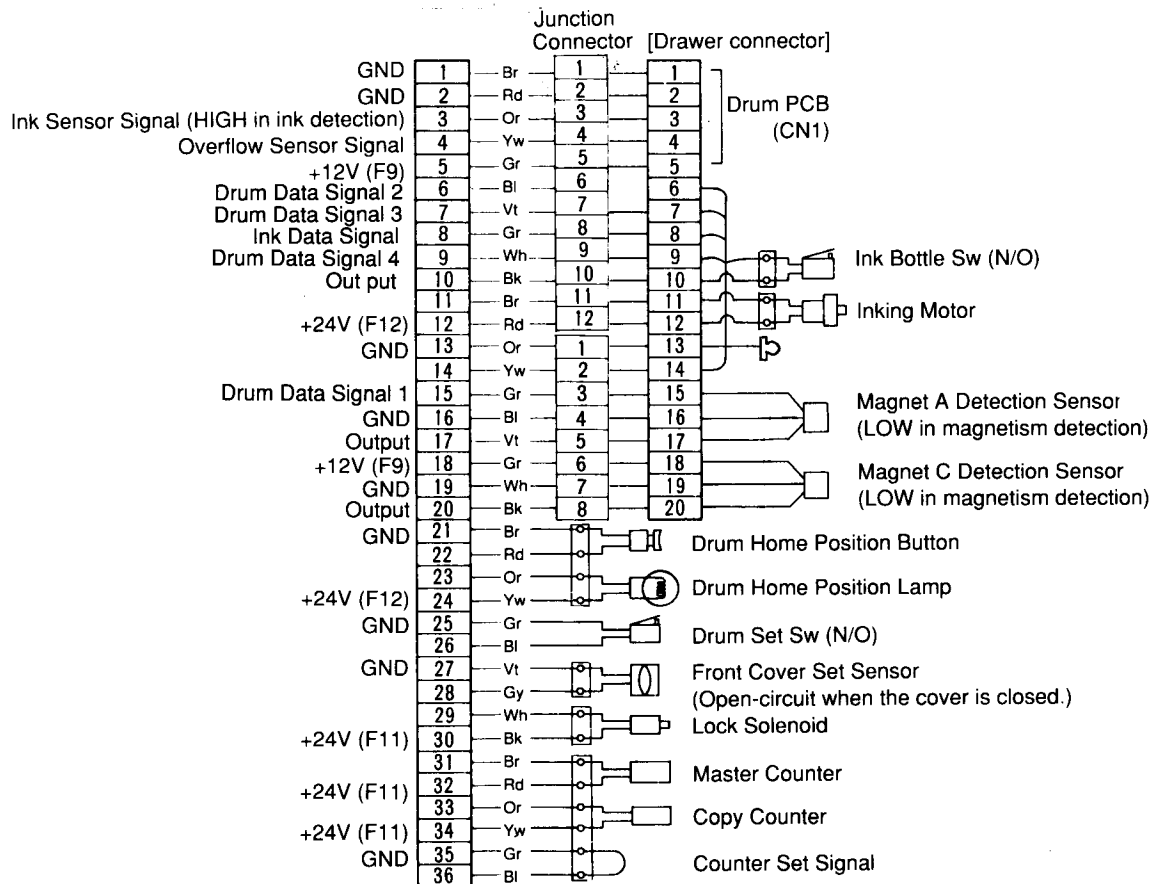
6. SYSTEM DRIVE PCB

Cutter/Master-Making Sections

**JP**

JP5: Unplug and reattach the connector one position up when connecting to Sorter.

CN8 34 Pins**CN9** 18 Pins

CN10 28 Pins**CN11** 36 Pins

6. System Drive PCB

CN12 22 Pins

1	Br	1	GND	
2	Rd	2	GND	
3	Or	3	GND	
4	Yw	4	GND	
5	Gr	5	+5V (F5)	
6	Bl	6	+5V (F5)	
7	Vt	7	N.C.	
8	Gy	8	Power Fail Signal	
9	Wh	9	-12V (F10)	
10	Bk	10	+12V (F9)	
11	Br	11	GND	
12	Rd	12	+24V (F6)	
13	Or	1	Thermal Print Head Control Signal	
14	Yw	2	Suction Fan Control Signal	
15	Gr	3	Main Motor Control Signal	
16	Bl	4	Main Motor Control Signal	
17	Vt	5	Main Motor Control Signal	
18	Gy	6	Main Motor Control Signal	
19	Wh	7	+24V (F12)	
20	Bk	8	+24V (F11)	
21	Br	9	GND	
22	Rd	10	GND	

Power Supply PCB (CN8)

Power Supply PCB (CN5)

CN13 34 Pins

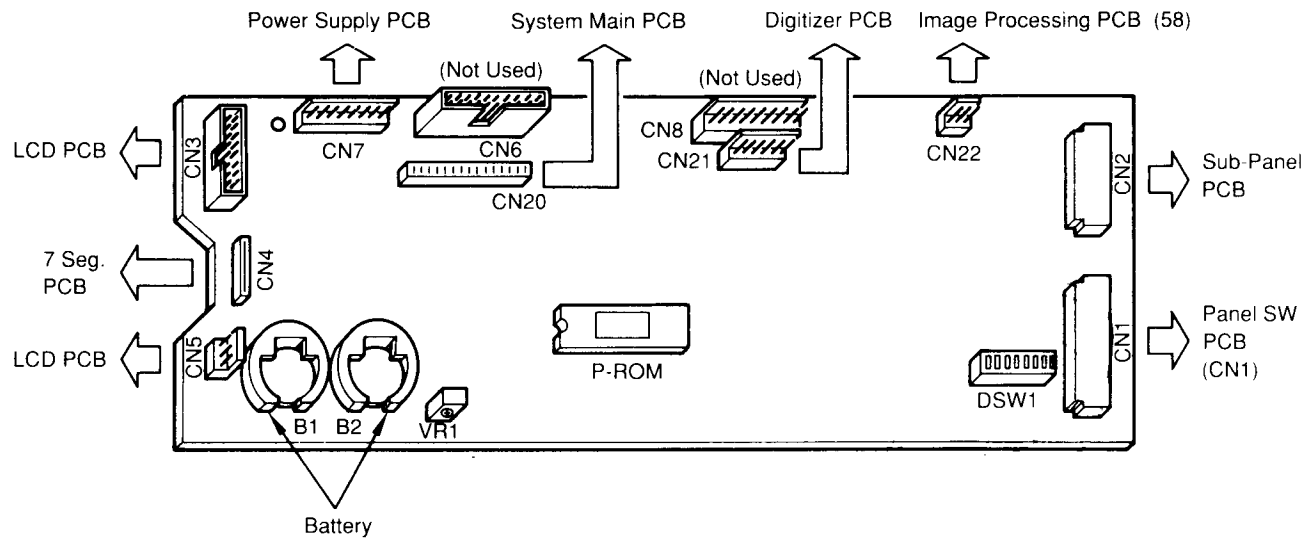
RC SORTER					
Shielded Ground	1	Br	1		
GND	2	Rd	2		
GND	3	Or	3		
TXD	4	Yw	4		
RXD	5	Gr	5		
RTS	6	Bl	6		
CTS	7	Vt	7		
Sorter Connect Signal	8	Gy	8		
+5V(F5)	9	Wh	9		
+12V(F9)	10	Bk			
-12V(F10)	11	Br			
GND	12	Rd	12		
GND	13	Or	13		
Sorter Starter (+24V) (F12)	14	Yw	14		
GND	15	Gr	15		
+5V (F5)	16	Bl			
Sorter Set Signal	17	Vt	17		
Cluster Signal A	18	Gy			
Paper Sensor Signal	19	Wh	19		
Paper Rcv. Sensor 2 Signal	20	Bk	20		
Print Signal	21	Br			
Magnet A Det. Signal	22	Rd			
Copy Count Signal	23	Or			
Master Count Signal	24	Yw			
Print Start/Stop Signal	25	Gr			
GND	26	Bl	26		
GND	27	Vt	27		
+24V (F12)	28	Gy	28		
Cluster Signal B	29	Wh	29		
Tape End Signal	30	Bk			
STATUS 1 Signal	31	Br			
STATUS 2 Signal	32	Rd			
Master-making Start/Stop Signal	33	Or			
Paper Full Stack Signal	34	Yw			

FRI SORTER

JOB SEPARATOR

*The not-numbered pins are not used.

7. PANEL MAIN PCB



VR

VR1: For luminosity adjustment of LCD panel

SW

SW	FUNCTION	OFF	ON
DSw1 - 1	The initial print speed selection ※ 1	100RPM	60RPM
DSw1 - 2	The initial paper size selection ※ 2	A4 or 8.5" x 11"	A3 or 11" x 17"
DSw1 - 3	The initial Fine enhancement setting selection	Fine enhancement ON	Fine enhancement OFF
DSw1 - 4	Priority selection between density-and Speed-Change modes	Density-Change mode	Speed-Change mode
DSw1 - 5	※ 3		
DSw1 - 6			
DSw1 - 7			
DSw1 - 8			

※ 1 Functions only in Speed-Change mode.
In Density-Change mode, the print speed is fixed at 100 rpm.

※ 2

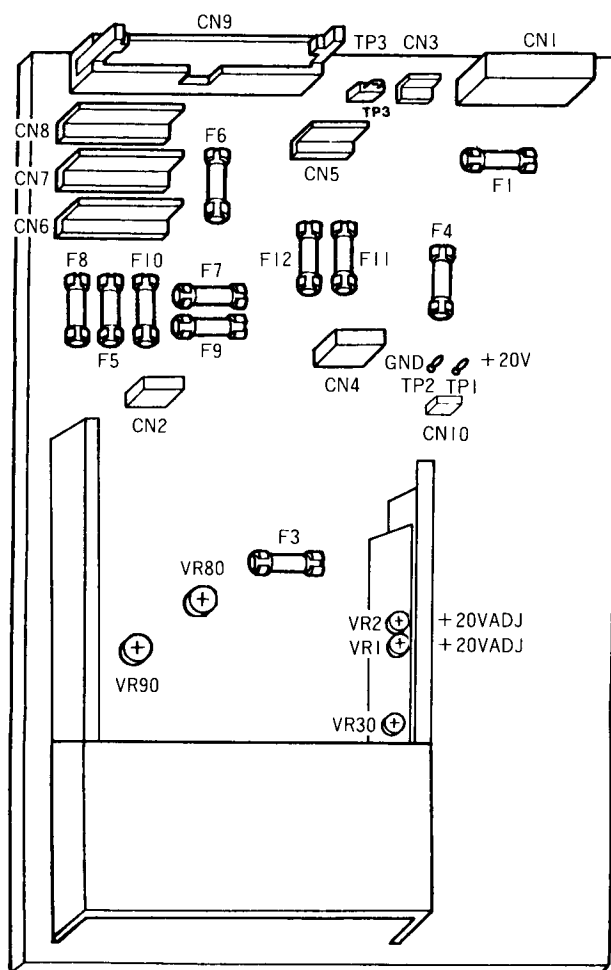
A3	Picture Panel
A3	Metric Panel
11" x 17"	Inch Panel

※ 3

	Inch Panel	Picture & Metric Panel
DSw1 - 5	OFF	ON
DSw1 - 6	OFF	OFF
DSw1 - 7	OFF	OFF
DSw1 - 8	OFF	OFF

8. Power Supply PCB

8. POWER SUPPLY PCB



A circuit protector cuts the power off when a voltage of 25V or larger is fed into CN4.

(Wait 1 minute before switching the power back on.)

TP

TP1 (+20V) } For TPH voltage check
TP2 (GNP) }

VR

VR1 (+20V): TPH voltage - fine adjustment
VR2 (+20V): TPH voltage - rough adjustment
VR30(+25V): Fixed (Do not touch)
VR80(+ 5V): Fixed (Do not touch)
VR90(+12V): Fixed (Do not touch)

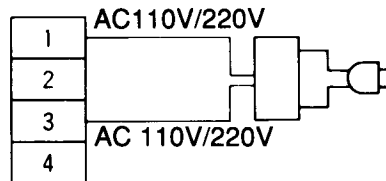
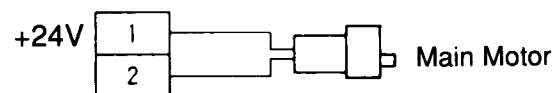
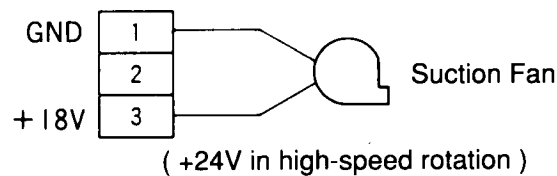
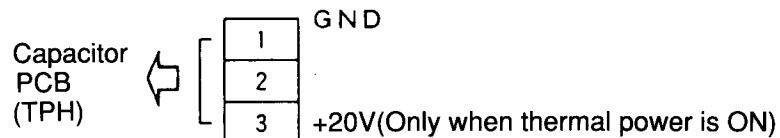
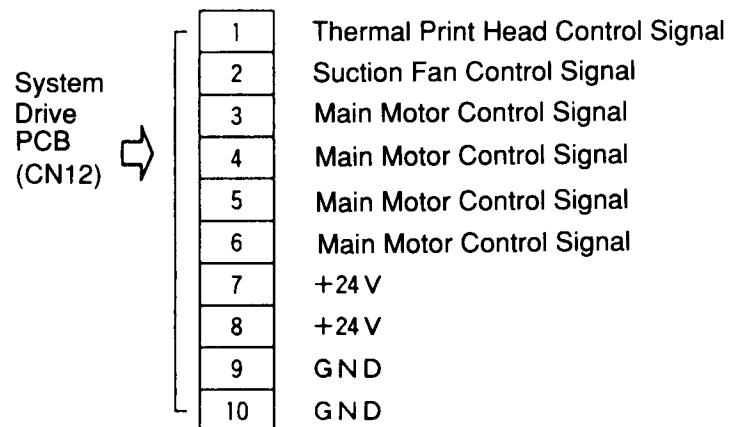
CN

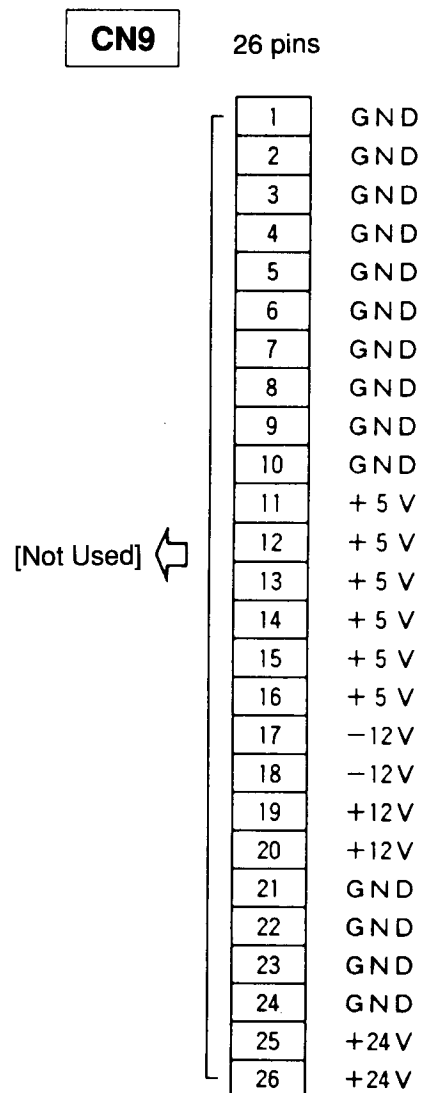
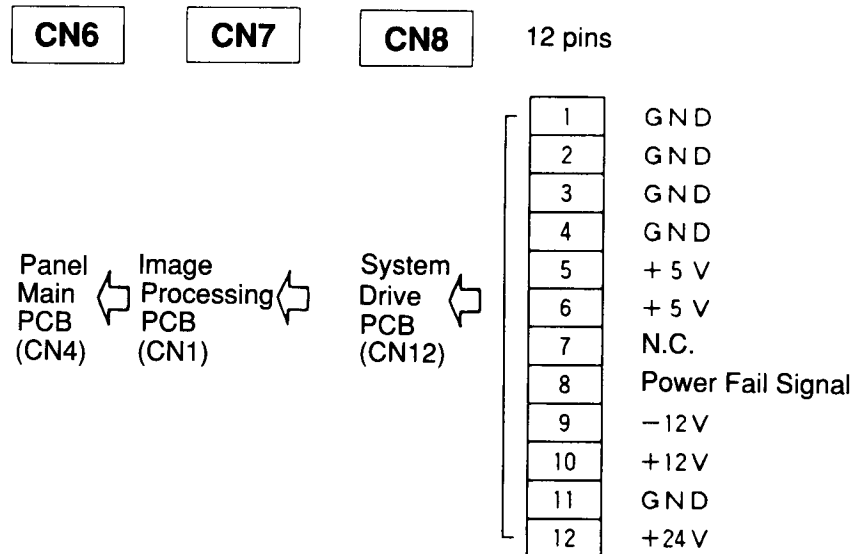
CN1: From Main Power SW
CN2: To Main Motor
CN3: To Suction Fan
CN4: To Capacitor PCB (TPH)
CN5: From System Drive PCB
CN6: To Panel Main PCB
CN7: To Image Processing PCB
CN8: To System Drive PCB
CN9: Not Used
CN10: To Capacitor PCB (TPH)

FUSE

No.	Rate	Protected line	Symptoms in case of open-circuited fuse	Relevant components
F1	10A (110V) 5A (220V)	Main Power	No Power	Main Power Sw
F11	3.15A	DC24V	[T3: Call Service] Master mis-feed in master-making or confidential operation. Paper feed jam in printing.	Loading pulse motor, Loading fan, storage fan, Thermal pressure motor, Cutter motor, Write pulse motor
F12	3.15A	DC24V	[T2: Call Service], Paper feed jam, Master removal error	M.-Rmv. vertical transport motor, Master removal solenoid, Separation fan, Pressure solenoid, Paper feed clutch, Elevator motor, Lock solenoid, Inking motor, Counters, Drum home position lamp
F4	1A	DC24 – 18V	Paper receiving jam	Suction fan
F3	8A	DC24V	[T1: Call Service]	Main Motor
F9	3.15A	DC + 12V	[T4: Call Service]	Various sensors
F10	3.15A	DC – 12V	No LCD indication	
F5	5A	DC5V	[T15 Call Service]	
F8	5A	DC5V	No power except for Suction fan	
F7	3.15A	DC24V		For optional equipments
F6	3.15A	DC24V	[T5: Call Service]	Clamp motor, Clamp solenoid, Print positioning motor, Pressure control motor, Read pulse motor, ADF Transfer motor

8. Power Supply PCB

CN1 4 pins**CN2** 2 pins**CN3** 3 pins**CN4** 3 pins**CN5** 10 pins



1. Changing the ROMs

2. Reset of Display

5. Others

1. Changing the ROMs (on RC6300)

1. Turn OFF the machine power.
2. Remove the Back cover and Front right cover.
3. Replace the System program ROM and Panel message ROM.
4. Turn ON the power and start up the Test Mode and execute mode (No. 97).

CAUTION: The test mode (No. 97) must be executed each time a ROM is changed.

Note: Test mode (No. 97) on RC6300 is equal to the Test mode (No. 90) on other RC models.

2. Compulsive reset of the Jam/Trouble Display only (common for all RC models)

1. Turn OFF the machine power.
2. Turn the power back ON while pressing the All Reset button.

Note: The above procedure is equal to executing test mode (No. 90) on RC6300.