DR-2080C

SERVICE MANUAL

REVISION 0

Canon

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Use of this manual should be strictly supervised to avoid disclosure of confidential information.

PREFACE

This Service Manual describes necessary basic information for field service and maintenance for maintaining the product quality and functions of the DR-2080C.

Contents

Chapter 1: General Description
Features, specifications, names of parts, operation

Chapter 2: Function & Operations
Description of principle of operation of electrical and mechanical systems

Chapter 3: Disassembly & Reassembly
Disassembly and reassembly

Chapter 4: Installation & Maintenance
Installation and maintenance

Chapter 5: Troubleshooting
Service modes and troubleshooting

Appendix: General circuit diagrams, etc.

Information in this manual is subject to change. Notification of such changes will be given in Service Information Bulletins.

Thoroughly read the information contained in this Service Manual and the Service Information Bulletins to gain a correct and deeper understanding of the machine. This is one way of fostering response for ensuring prolonged quality and function, and for investigating the cause of trouble during troubleshooting.

Quality Assurance Center
Canon Electronics Inc.

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CHAPTER 1

GENERAL DESCRIPTION

I. FEATURES

1. Compact & light-weighted
Dimensions: 298(W) × 98.9(D) × 209.5(H) mm, Weight: 2.5kg

2. High resolution
Optical resolution: 600dpi, firstly employed in the DR series.

3. Various scanning modes available
Scanning side: Simplex (Front/Back), Duplex
Output modes: Binary (Simple binary/Error diffusion/Text enhanced), Grayscale, Color
Output resolution : 100/150/200/240/300/400/600 dpi.

4. Image processing by driver
Most image processing such as binarization or brightness adjustment is performed by the driver.

DR-2080C Appearance

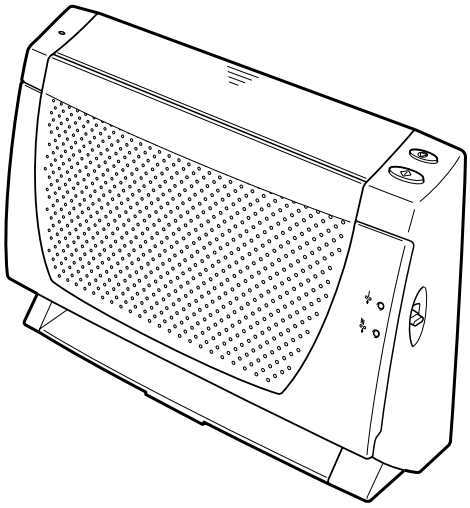

Fig. 1-1

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II. SPECIFICATIONS

1. Appearance & Installation

No.	Item	Specifications
1	Type	Sheet-fed type desktop scanner
2	Models by power supply	1) AC100V, 50/60Hz 2) AC120V, 60Hz 3) AC220-240V, 50/60Hz
3	Power supply	1) Method AC adaptor 2) Input voltage 100V model AC adaptor: AC100-120V 200V model AC adaptor: AC220-240V 3) Rating output: DC15V, 2.0A 4) Maximum input current AC100-120V: 0.7A (AC100V: 62VA) AC220-240V: 0.35A
4	Rated power supply of main unit	DC15V, 1.1A, 17W
5	Performance-guaranteed temperature	15 to 27.5°C (59 to 81.5°F)
6	Performance-guaranteed humidity	25 to 75%RH **Note:** No condensation allowed.
7	Noise	Sound power level: 6.6B or less Sound pressure level: 57 dB or less (Reference value)
8	Dimensions (WxDxH)	With tray closed: 298×98.9×209.5mm With tray open: 298×113.5×331mm (Excluding stand)
9	Weight	2.5kg **Note:** AC adaptor and other accessories excluded.
10	Interface	SCSI-2 (Fast SCSI compatible)
11	Expected product life	One of the following two items, whichever comes first. 1) 5 years 2) Scans: 360,000 sheets (A4 size)
12	Installation	By user

Table 1-1

2. Document reading

No.	Item	Specifications
1	Sensor type	Contact Image Sensor (CIS)
2	Picture element	Density of element: 600dpi, Effective elements: 5104 (216mm)
3	Light source	3-color (RGB) LED
4	Typical wave length	R: 621nm, G: 520nm, B: 465nm
5	Dropout color	Available (R/G/B)
6	Scanning side	Simplex (Front/Back)/Duplex **Note:** Front/back reversing function available.
7	Scanning size (typical)	1) L series: LTR/LGL 2) A series: A4/A5/A6 3) B series: B5/B6 **Note:** Landscape orientation is also available for A5/A6/B6 sizes respectively. For LGL size, only a single sheet can be fed at a time.
8	Scanning size (atypical)	1) Main-scanning direction: Min. 64pixel, Max. 216mm 2) Sub-scanning direction: Min. 64pixel, Max. 355mm
9	Output mode	1) Binary (Simple binary/Error diffusion/Text enhanced) 2) Grayscale (8 bits) 3) Color (24 bits)
10	Output resolution	1) 100×100dpi 2) 150×150dpi 3) 200×200dpi 4) 240×240dpi 5) 300×300dpi 6) 400×400dpi 7) 600×600dpi

Table 1-2

3. Document feeding

No.	Item	Specifications		
1	Document size	1) Width: 55 to 216mm 2) Length: 70 to 297mm, up to355mm for single sheet scan only. 3) Thickness: Separation 0.06 to 0.15mm, Non-separation 0.05 to 0.20mm		
2	Document requirements	1) Pressure-sensitive paper: Can be fed only when backside is faced up. 2) Carbon-backed paper: Cannot be fed. 3) Perforated paper for binder: Can be fed only if there are 2/3/4 holes that are ϕ8mm or less in size. 4) Curled paper: Can be fed only if curl is 5mm or less in height. 5) Creased paper: Can be fed, but crease must be straightened before being fed.		
3	Feeding storage	1) Fine quality paper, Copy paper: 50 sheets (Must be, however, 5 mm or less in height including curls.) 2) Others (Stiff paper/Soft paper, High friction paper, etc.): 10 sheets		
4	Feeding mode	Normal/Auto/Panel		
5	Functions	1) Switching between separation and non-separation: Can be switched by the lever. 2) Scan-ahead mode: Available 3) Batch separation: Can be set when pickup mode is set to the "Auto/Panel" setting. 4) Skew correction: Available 5) Document size detection: Available 6) Document thickness adjustment: Not available 7) Double feed detection: Not available 8) Skew detection: Not available		
6	Feeding speed	Resolution	Binary/Grayscale	Color
		100×100dpi	114.4 mm/sec	101.3 mm/sec
		150×150dpi	114.4 mm/sec	60.1 mm/sec
		200×200dpi	114.4 mm/sec	38.1 mm/sec
		240×240dpi	87.4 mm/sec	29.1 mm/sec
		300×300dpi	61.7 mm/sec	20.6 mm/sec
		400×400dpi	38.9 mm/sec	12.9 mm/sec
		600×600dpi	19.4 mm/sec	6.4 mm/sec

Table 1-3 (continued)

No.	Item	Specifications				
7	Number of scanned document / minute	Document size: A4		Binary	Grayscale	Color
		Simplex (ppm)	100×100dpi	19.5	19.5	17.5
			200×200dpi	19.5	19.5	6.5
			300×300dpi	10.5	10.5	3.5
			400×400dpi	6.5	6.5	2.0
			600×600dpi	3.3	3.3	1.0
		Duplex (ipm)	100×100dpi	38	38	34
			200×200dpi	38	38	12
			300×300dpi	20	20	6
			400×400dpi	12	12	4
			600×600dpi	6	6	1
		* The above values are based on specified conditions and may differ depending on function settings, a Personal computer used and other conditions.				

Table 1-3 (continued)

4. Image processing & Others

No.	Item	Specifications
1	Image processing by driver	1) Brightness adjustment: 255 levels 2) Contrast adjustment: 7 levels 3) Gamma compensation: Standard/Custom 4) Edge emphasis: 5 levels 5) Binarizing: Simple binary/Error diffusion/Text enhanced 6) Shading compensation 7) Skew correction 8) Pre-scan 9) Document size detection 10) Area designation 11) Blank-skip 12) Image compression 13) Frame erasing 14) Black/white reversion 15) Batch separation
2	Other functions	1) Self-diagnosis function 2) Scan panel 3) Cumulative counter (stored in the memory) 4) Power supply monitor (LED)
3	Functions not available	1) Count-only 2) Count verifying 3) Margin scan 4) Add-on 5) Function sheet 6) Patch code 7) Mechanical counter 8) Buzzer
4	Software packed	ISIS/TWAIN Drivers, Scanning Utility 2000
5	SCSI device packed	SCSI card/SCSI cable
6	Consumable	Retard roller/Feed roller (Product code: 7982A001AA)

Table 1-4

Note: These specifications are subject to change for improvements on the product.

III. PRECAUTIONS

This section describes items that require particular care, for example, regarding human safety. These precautions must be observed. Explain to the user items that relate to user safety, and instruct the user to take appropriate actions.

1. Power OFF in emergency

When such abnormalities as abnormal noise, smoke, heat and odor occur, turn the power OFF immediately and unplug the power cord.

As it may cause injury, be careful not to get clothing (ties, long hair, etc.) caught in the machine. If this happens, turn the power OFF immediately.

Also, do not insert your fingers in the feed section while feeding documents.

2. User's Manual

Read the user's manual thoroughly before using this machine.

3. AC Adaptor

Use the packaged AC adaptor. Do not use any other adaptor.

4. Electromagnetic Wave Interference Countermeasures

This machine complies with the electromagnetic wave interference standards (VCCI-B, FCC-B, etc.). However, the user might have to carry out separate countermeasures if the machine causes electromagnetic wave interference.

Do not change nor modify this machine's specifications. If this has been carried out, its use may be forcibly discontinued on site. If this machine's specifications shall be changed, or the machine shall be disassembled and reassembled, follow the instructions described in this manual or in Service Information Bulletins.

5. Disposal

When disposing of the main unit and accessories, obey local regulations.

IV. NAMES OF PARTS

1. Front and right view

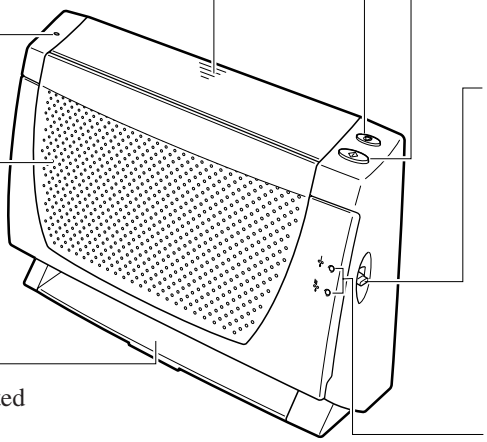


Fig. 1-2

2. Front view (with top cover and paper feed tray open)

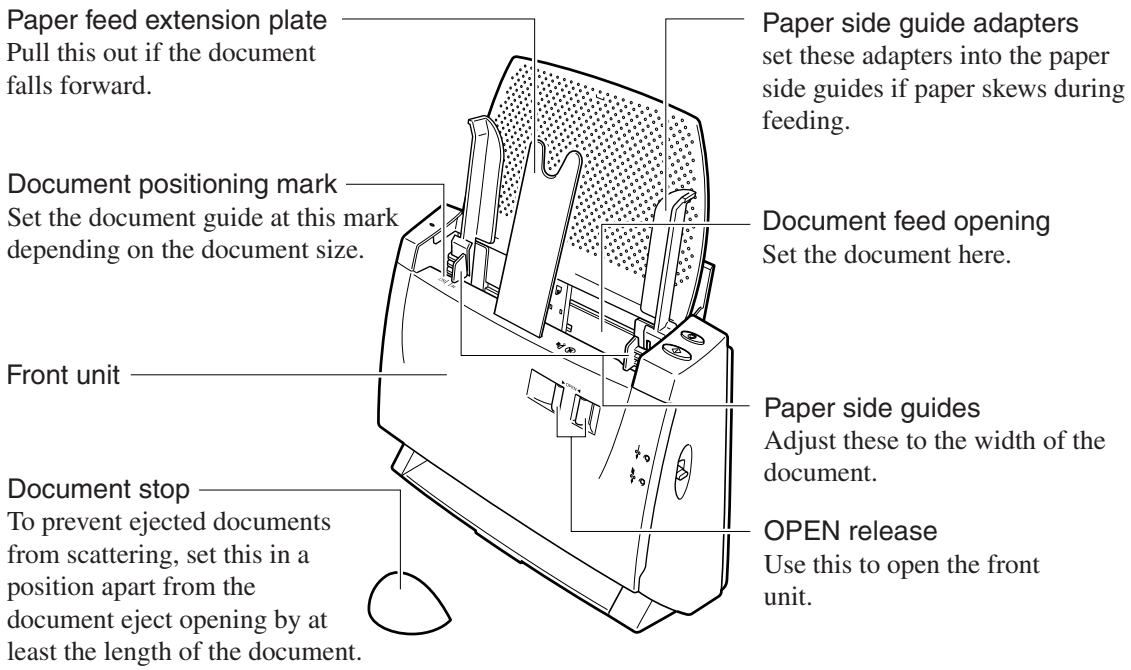


Fig. 1-3

3. Rear and left view

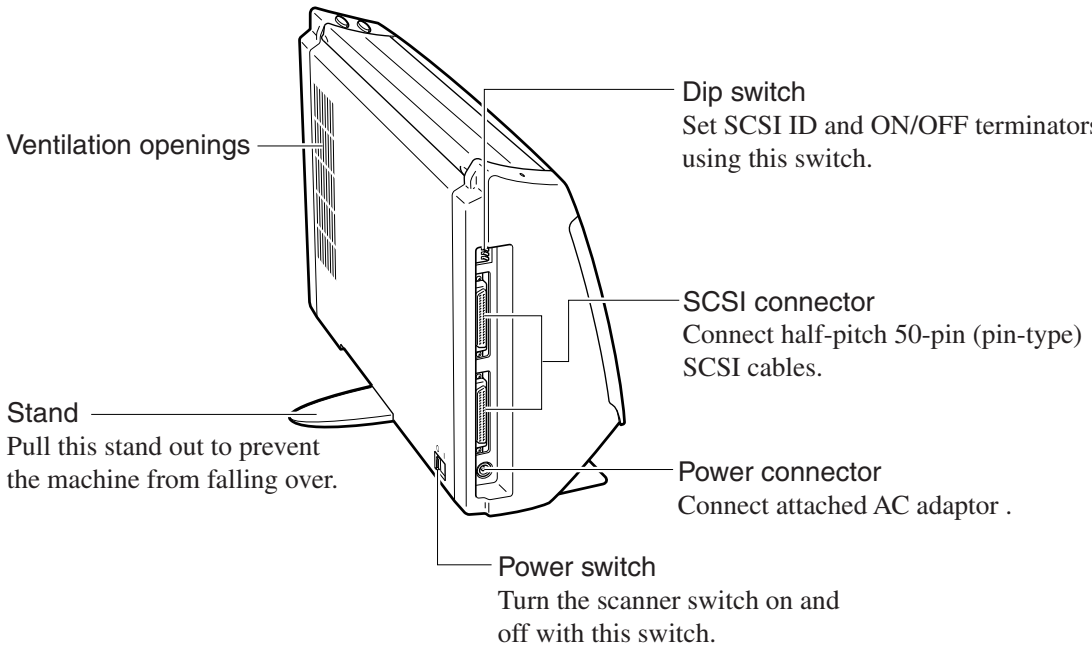
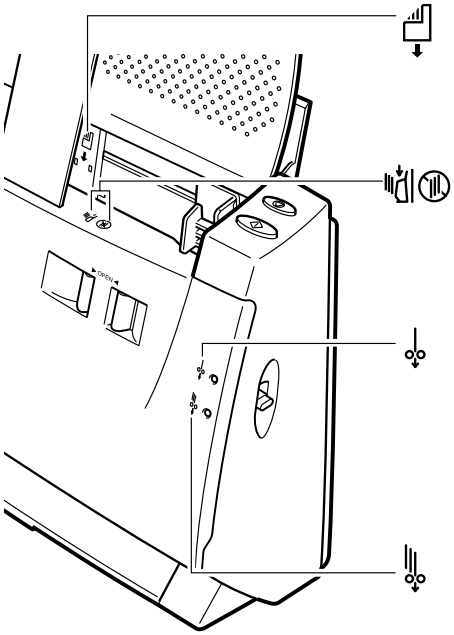


Fig. 1-4

Note: Do not block the ventilation openings, otherwise the temperature will rise inside the machine and a fire might result.

4. Marking



Shows in which way the document is set.

Shows in which way plural documents are arranged.

Shows that the set documents are picked up without being separated (bypass mode).

Shows that the set documents are picked up one at a time (page separation mode).

Fig. 1-5

V. EXPLANATION OF OPERATION

For details, refer to the user's manual.

1. Basic operation

The basic procedure for operating this machine is as follows:

1) Turn the machine ON.
2) Turn the personal computer ON.
3) Start up the application software.
4) Place the document on the machine. Place the paper with the back toward you and the face down.
5) Start reading.
6) Finish reading.
7) Quit the application software.
8) Turn the personal computer OFF.
9) Turn the machine OFF.

Note: For details, refer to the user's manuals of the machine and application software.

2. Operation panel

Fig. 1-6, 1-7, 1-8 and 1-9 show basic operation dialog.

1) Scanning Utility 2000

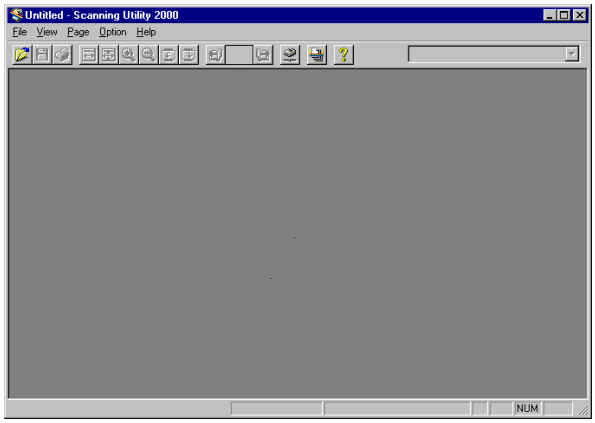


Fig. 1-6

2) Basic setting

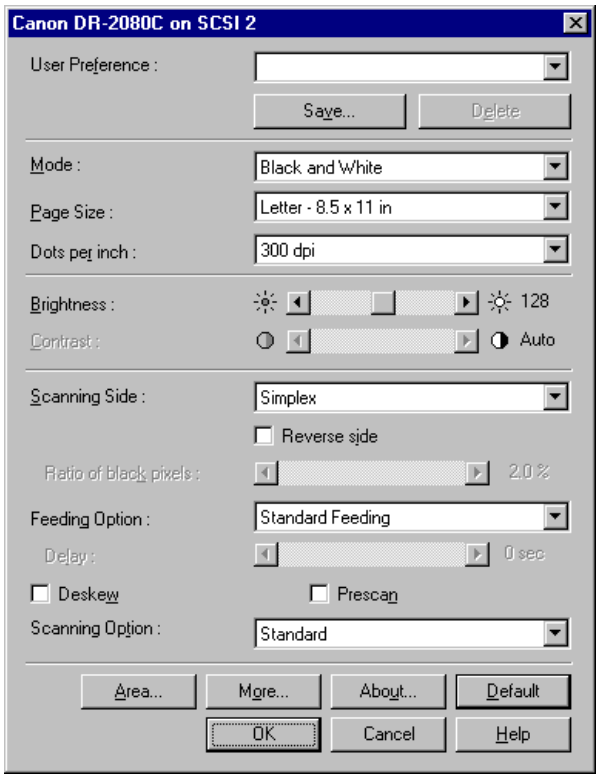


Fig. 1-7

3) Advanced setting

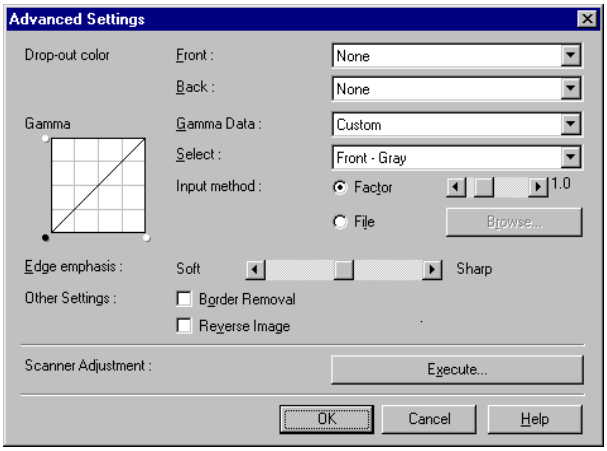


Fig. 1-8

4) Scan panel

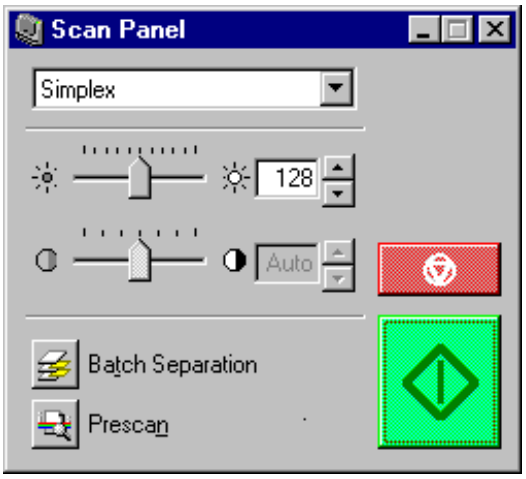


Fig. 1-9

5) About

Select "About" on the basic setting screen.

Fig.1-10

3. Remove document jam

Note: Be careful when removing jammed paper, or you may cut your finger with the edge of the paper.

1) Open the paper feed tray if it is closed.

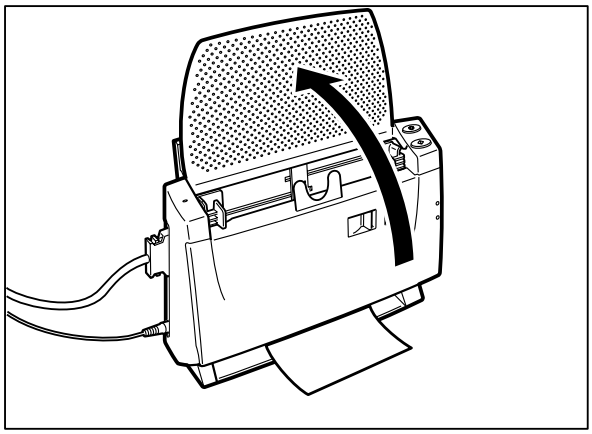


Fig. 1-11

2) While pulling the OPEN release (①), open the front unit forward. (②)

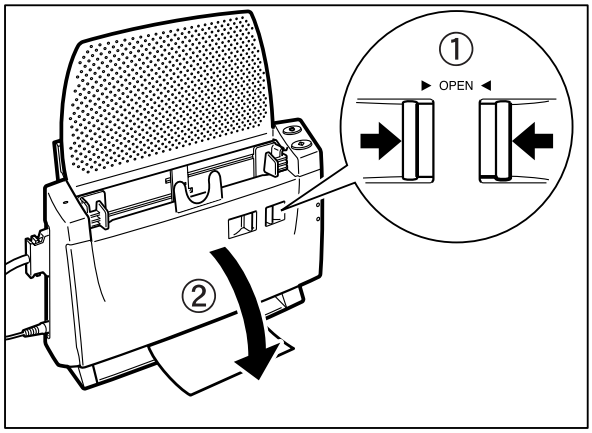


Fig. 1-12

3) Clear the jammed document in the pick-up or delivery section.

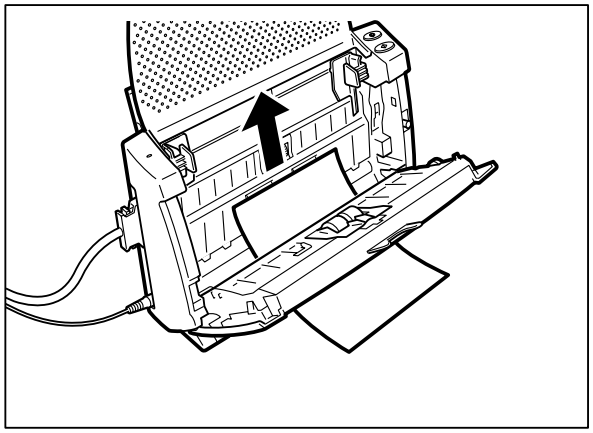


Fig. 1-13

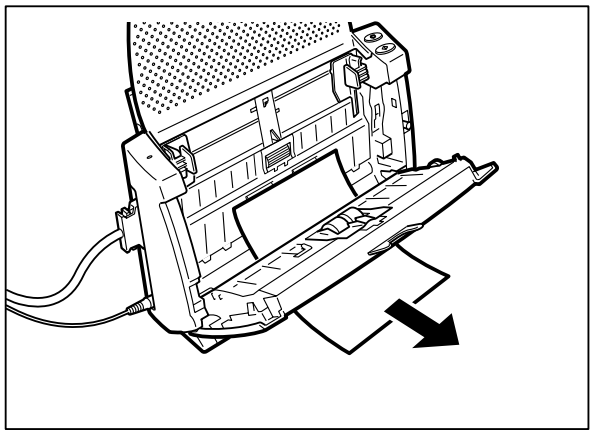


Fig. 1-14

Note: Do not pull the document using force, but carefully. If the document is torn, be sure that no paper remained jammed inside.

4) Slowly push the top of the front unit left and right. Be sure that the cover clicks back into position.

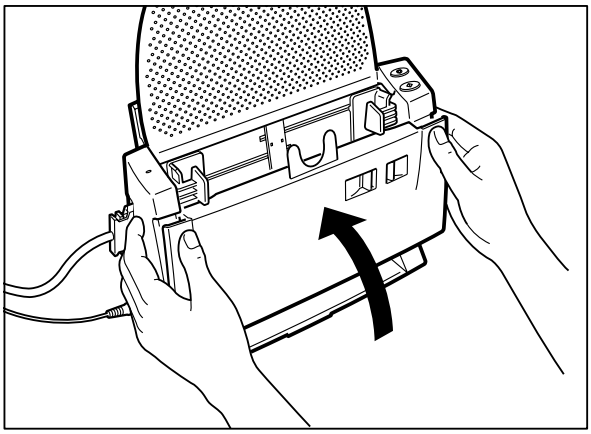


Fig. 1-15

Note: Check that the last page of the document is recorded after removing the jammed document.

4. Remove the retard roller

1) Open the roller cover by holding the inside edge of the front unit.

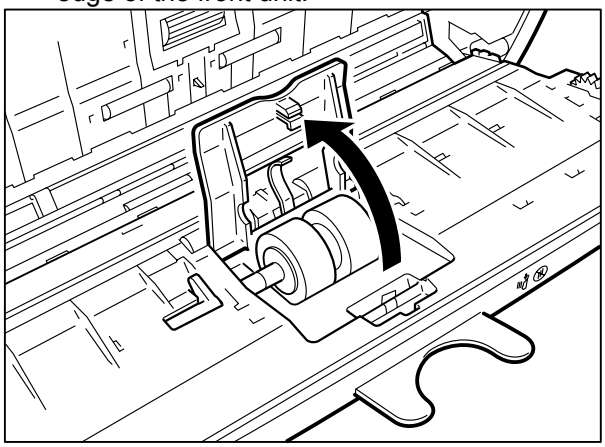


Fig. 1-16

2) Raise the roller fixing lever up (①), and slide it (②).

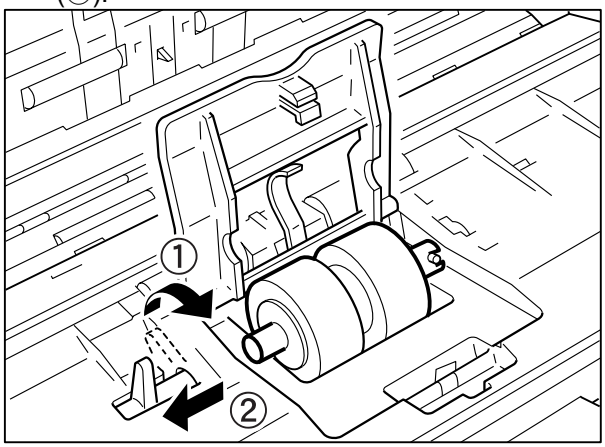


Fig. 1-17

3) Slide the retard roller to the left, and remove it from the shaft.

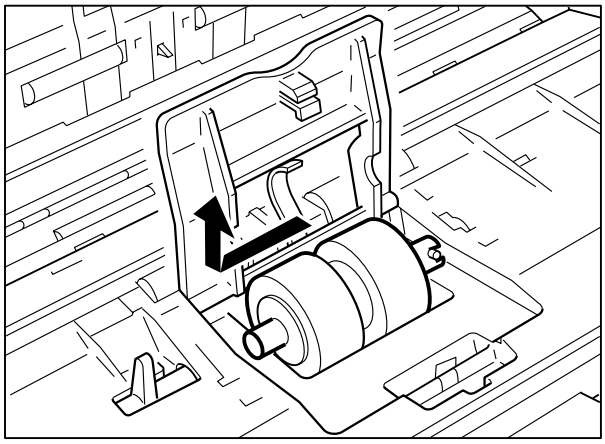


Fig. 1-18

5. Remove the feed roller

1) Open the roller cover on the main body. Put your finger into the recess to open it.

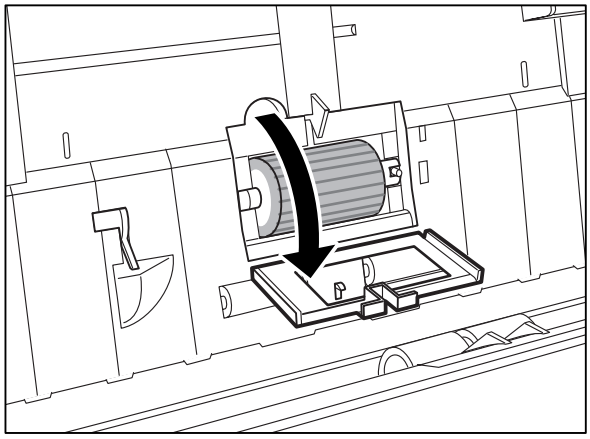


Fig. 1-19

2) Raise the roller fixing lever up (①), and slide it (②).

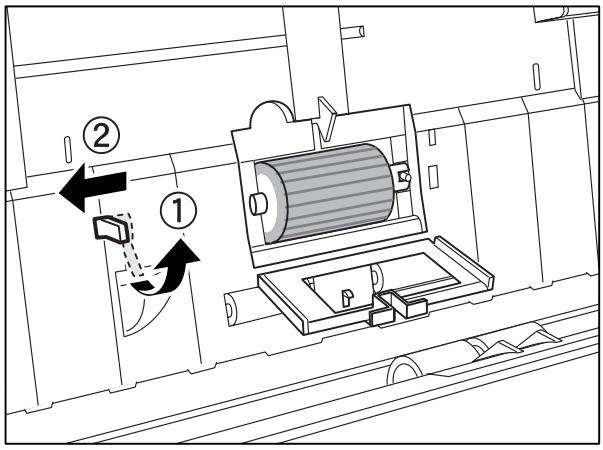


Fig. 1-20

3) Slide the feed roller to the left, and remove it from the shaft.

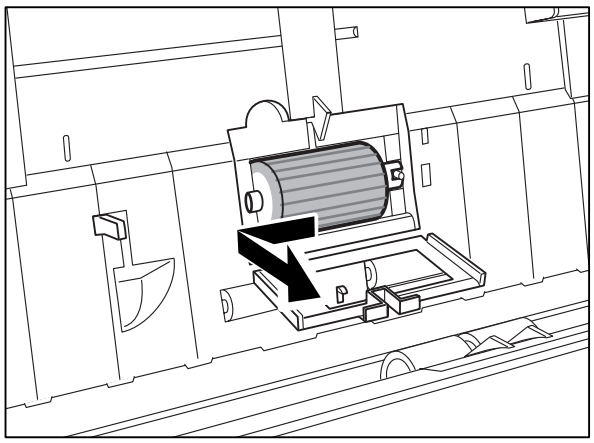


Fig. 1-21

VI. REGULAR INSPECTION BY USERS

1. Main body

The surface of the body should be wiped clean with a cloth moistened with water or neutral detergent, and then wiped with a clean, dry cloth.

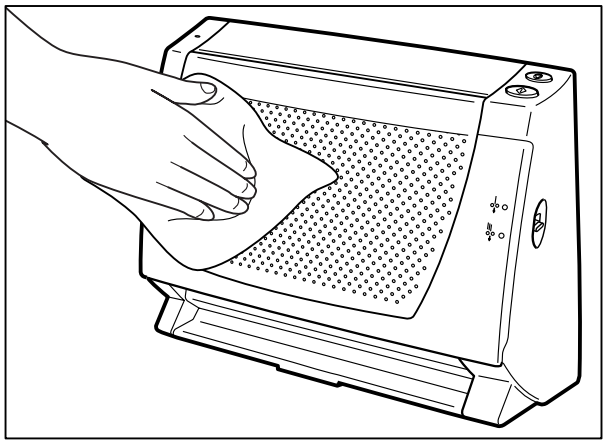


Fig. 1-22

2. Reading glass and rollers

1) Turn the power OFF, and disconnect the power cable from the outlet.
2) Open the paper feed tray.
3) Open the front unit forward by pulling the OPEN release.
4) Wipe the reading glass with a dry, clean cloth.

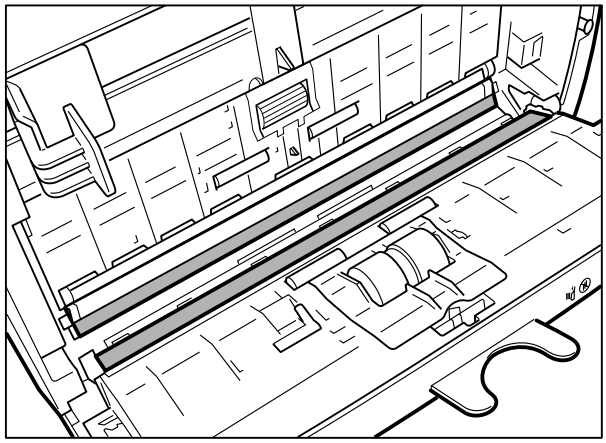


Fig. 1-23

5) Clean the rollers ① to ④. Wipe each roller clean with a cloth moistened with water, and then dry with a clean, dry soft cloth.
   ① : Rotate the roller while wiping.
   ② : Rotate the roller while wiping in the direction of the arrow.
   ③ : The roller is removed from the machine prior to cleaning, and is replaced after cleaning.
   ④ : The roller is removed from the machine prior to cleaning, and is replaced after cleaning.

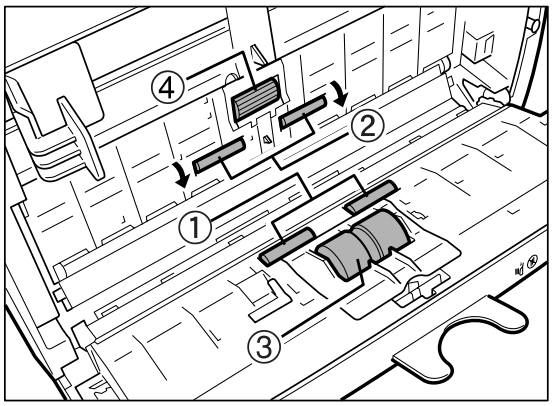


Fig. 1-24

Note: Remove paper powder or dust from the roller ③ , ④ storage areas.

3. Platen roller (metal roller)

1) Turn the power ON.
2) Open the paper feed tray.
3) Open the front unit forward by holding the OPEN release.
4) Wipe the platen roller with a dry, clean cloth. The platen roller is rotated a little by pushing the start key and the stop key simultaneously.

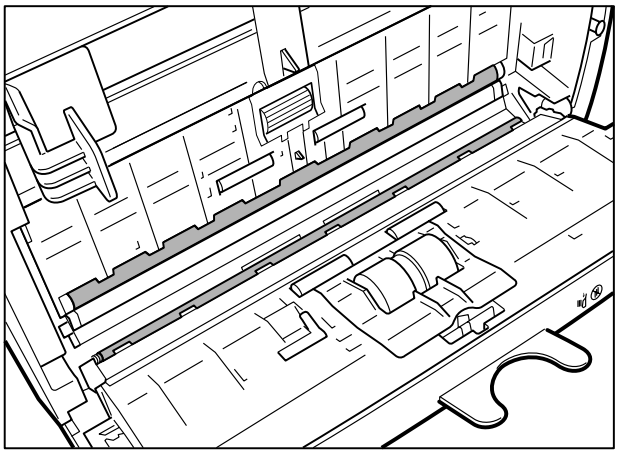


Fig. 1-25

CHAPTER 2

FUNCTIONS & OPERATION

I. CONFIGURATION

1. System configuration

Fig.2-1 and Table 2-1 shows the system configuration.

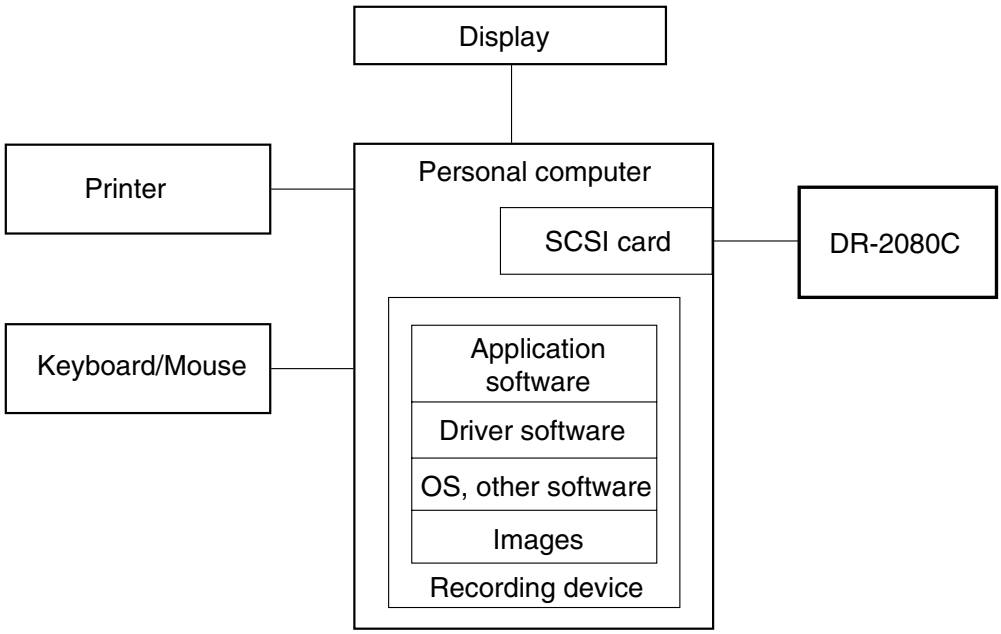


Fig. 2-1

Item	Function/Specification
DR-2080C	Reads images.
Personal computer	Controls system and processes images. PC/AT compatible machine Refer to the User's Manual for details of the system.
Display	Displays images, and displays searching and setting screen, etc. Recommended: Min. 1024×768(XGA)
Printer	Prints out images.
Keyboard/Mouse	Instructs image input, searching, etc.
SCSI card	Inputs SCSI. SCSI board for PC/AT compatible machine and driven by wnaspi32.dll Recommended: Packaged product, Adaptec AHA-2930U /2940U, or other SCSI cards by Adaptec.
Application software	Software for recording images
Driver software	Software for operating DR-2080C

Table 2-1

2. Machine configuration

Fig.2-2 shows the machine configuration.

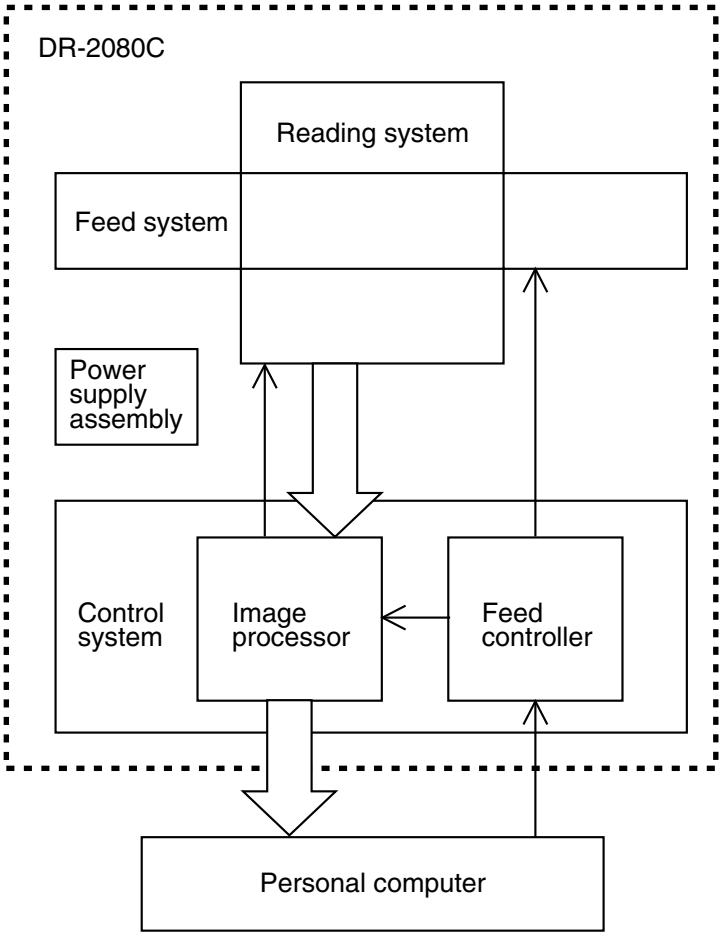


Fig. 2-2

a. Reading system

Reads image data by means of image sensors.

b. Feed system

Picks up, feeds, and delivers documents.

c. Control system

The control system consists of the image processor and the feed controller.

The image processor controls the reading system, processes the image data read, and outputs the data to the personal computer. The personal computer also processes image data.

The feed controller controls the feed system.

d. Power supply assembly

AC power is converted into DC power by the AC adaptor attached to this machine, and the converted power is supplied to the PCB assemblies.

II. READING SYSTEM

1. Outline

Fig.2-3 shows the configuration of the reading system.

Each CIS unit for front and back sides reads images of the document, and the data read are transferred to the image processor.

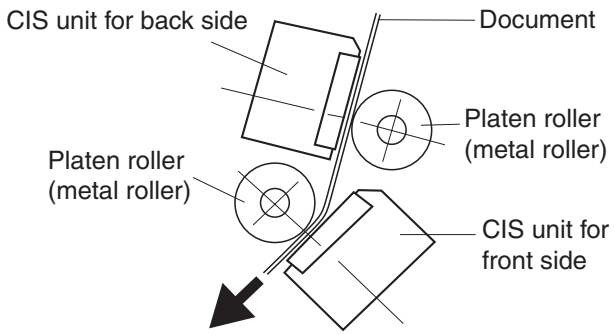


Fig. 2-3

2. CIS unit

Fig.2-4 shows the sectional diagram of the CIS unit, and Fig.2-5 shows the upper diagram of the CIS unit.

CIS (Contact Image Sensor) unit consists of CIS PCB assembly, lens array, LED PCB assembly, light guide, reading glass, and case.

Photosensitive pixels are mounted on the CIS PCB assembly with a density of 600dpi. Valid reading width is 216mm, and the number of valid pixels is 5104.

Three basic color LEDs, red, green, and blue (RGB), are mounted in the LED PCB assembly. In the binary or gray scale modes, image data are scanned with composite light generated by lighting the RGB LEDs simultaneously. In the color mode, the LED is successively lit, and reads image data with each color. As documents are being fed at regular speed while image data are scanned, the reading positions of RGB are shifted slightly.

In the drop-out color mode, only the LED of a designated color lights.

LED light illuminates the document through the light guide.

The reflected light from the document enters photosensitive pixels through the lens array, and converted into electrical signals corresponding to the density of each pixel. The electrical signals are transferred to the image processor as analog data.

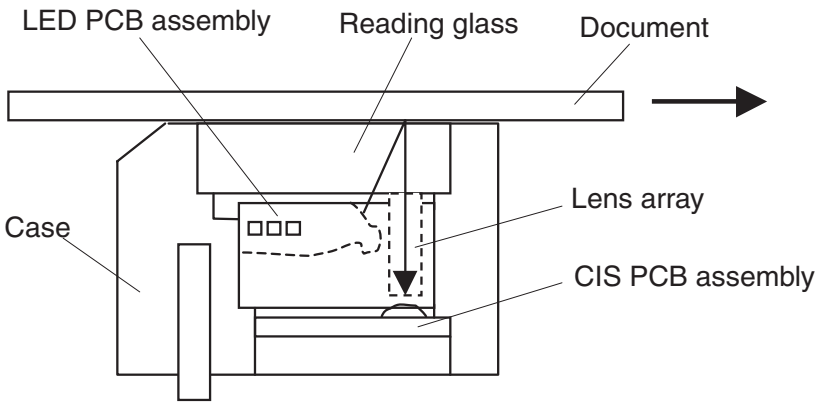


Fig. 2-4

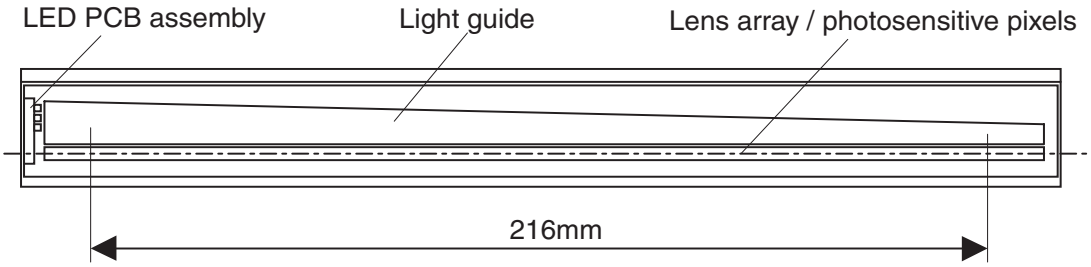


Fig. 2-5

III. FEED SYSTEM

1. Outline

Fig.2-6 shows the sectional diagram of the feed system.

The vertical design of the feed system contributes to the characteristics of this machine of compactness and space-saving.

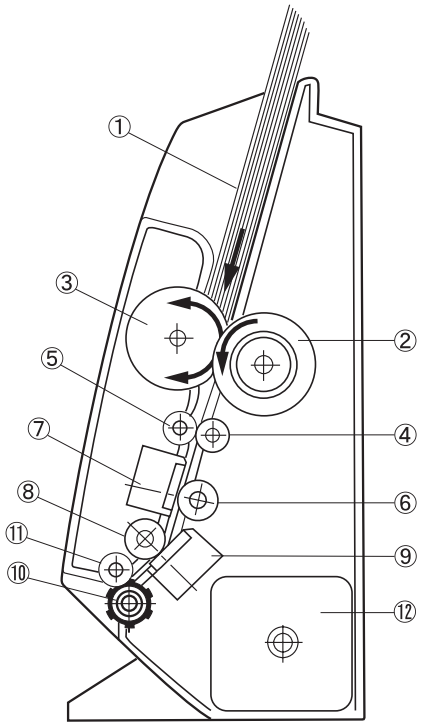
This machine has no elevation system nor a pickup roller in the document holder, so a document directly touches the feed roller and the retard roller (separation roller). A separation roller is called a retard roller in this manual.

The separated and fed document reaches the registration roller and the follower roller, and feeding continues.

Then, the document reaches the platen roller and the CIS unit for back side, and reaches the platen roller and the CIS unit for front side. Each CIS unit reads image data. Because the platen roller is made of metal, the outside of the document processed gets black.

The delivery exit is installed with the delivery roller and the follower roller.

These feed drives are powered by a single motor. The document sensor and the registration sensor are installed for control.



① Document
② Feed roller
③ Retard roller
④ Registration roller
⑤ Follower roller (registration)
⑥ Platen roller (back)
⑦ CIS unit (back)
⑧ Platen roller (front)
⑨ CIS unit (front)
⑩ Delivery roller
⑪ Follower roller (delivery)
⑫ Motor

Fig. 2-6

2. Separation function

Fig.2-7 shows the separation assembly.

The retard roller consists of an elastic body, to which the drive is transmitted in the reverse feeding direction to the feed roller. As the torque limiter is set in the drive transmission assembly, the retard roller begins to rotate in the same feeding direction as the feed roller when the friction between the feed roller and the document is in excess of the restrictive force.

As shown in the Fig.2-7-a, when plural documents enter the nip area between the feed roller and the retard roller, the documents touching the feed roller are fed in the feeding direction, and the documents touching the retard roller are drawn back as the retard roller rotates in reverse.

As shown in the Fig.2-7-b, when a single document enters, the retard roller rotates following the feed roller and the document.

The separation method of DR-2080C is called the retard separation method, and that of conventional models, such as DR-3060/3080C, is called a comb separation method.

A switchover lever is installed to invalidate the separation function. The lever can break the drive transmission to the retard roller.

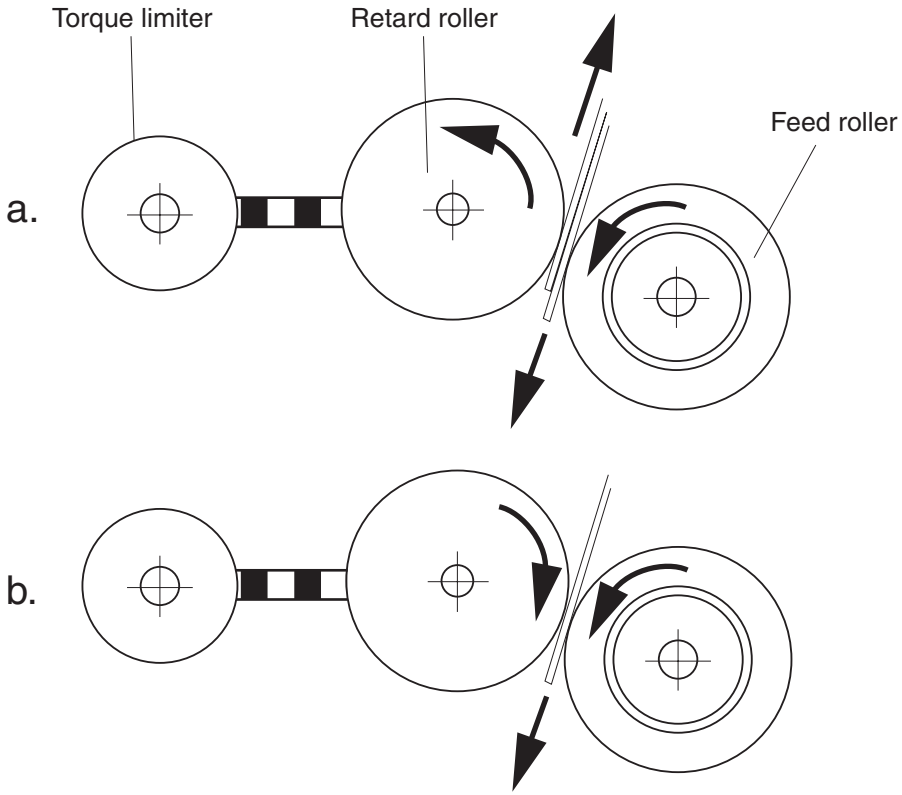


Fig. 2-7

3. Detection of faulty document feed

This machine has two sensors installed in it. The document sensor detects whether or not a document is present in the document feed opening, and the registration sensor is in the registration roller section. These sensors themselves are mounted on the Control PCB assembly, and the sensor levers are installed both in the document feed opening and the registration roller section.

Faulty document feed is detected as follows.

The registration sensor detects a paper feeding failure.

1) Delay jam
   when the registration sensor does not detect the leading edge of the document, even after the motor drives the specified length (about 400 mm).

2) Early reach jam
   when the registration sensor detects the leading edge of the following document after the tail of the proceeding document is detected before the motor finishes driving the specified length (about 19 mm).

3) Residual jam
   when the registration sensor does not detect the tail of the document after the leading edge of the document is detected, although the motor drives the specified length (460 mm).

4) Early start jam
   when the registration sensor detects the tail of the document after the leading edge of the document is detected before the motor drives the specified length (about 17 mm).

Besides, when the registration sensor detects the presence of the document when the power is ON, it is detected as fault.

4. Special feed mode

1) Mechanical feed mode
   Feed status can be checked without the personal computer in this mode. This mode should not be open to users.
   Turn the power switch on while pushing the start key, and the power indicator begins flashing. Then, push the stop switch, and the mode starts. With the power indicator still flashing, set the paper and push the start key. The paper will begin feeding. To cancel, turn the power switch OFF.
2) Roller cleaning mode
   Clean the platen roller (metal roller) in this mode. This mode is mentioned in the User's Manual.
   Push the start and the stop key simultaneously with the front unit open, and the platen roller (metal roller) rotates slightly. Other drive rollers also rotate.

IV. CONTROL SYSTEM

1. Outline

Fig.2-8 shows a block diagram of the control system.

Electrical control of this machine is carried out by a CPU on the Control PCB assembly. The CPU, ICs, sensors, and switches are mounted on it. The CIS units and motors are connected to the Control PCB assembly.

The SCSI connectors are also mounted on the Control PCB assembly for connection to the personal computer, and DC power is supplied to the Control PCB assembly via the AC adaptor.

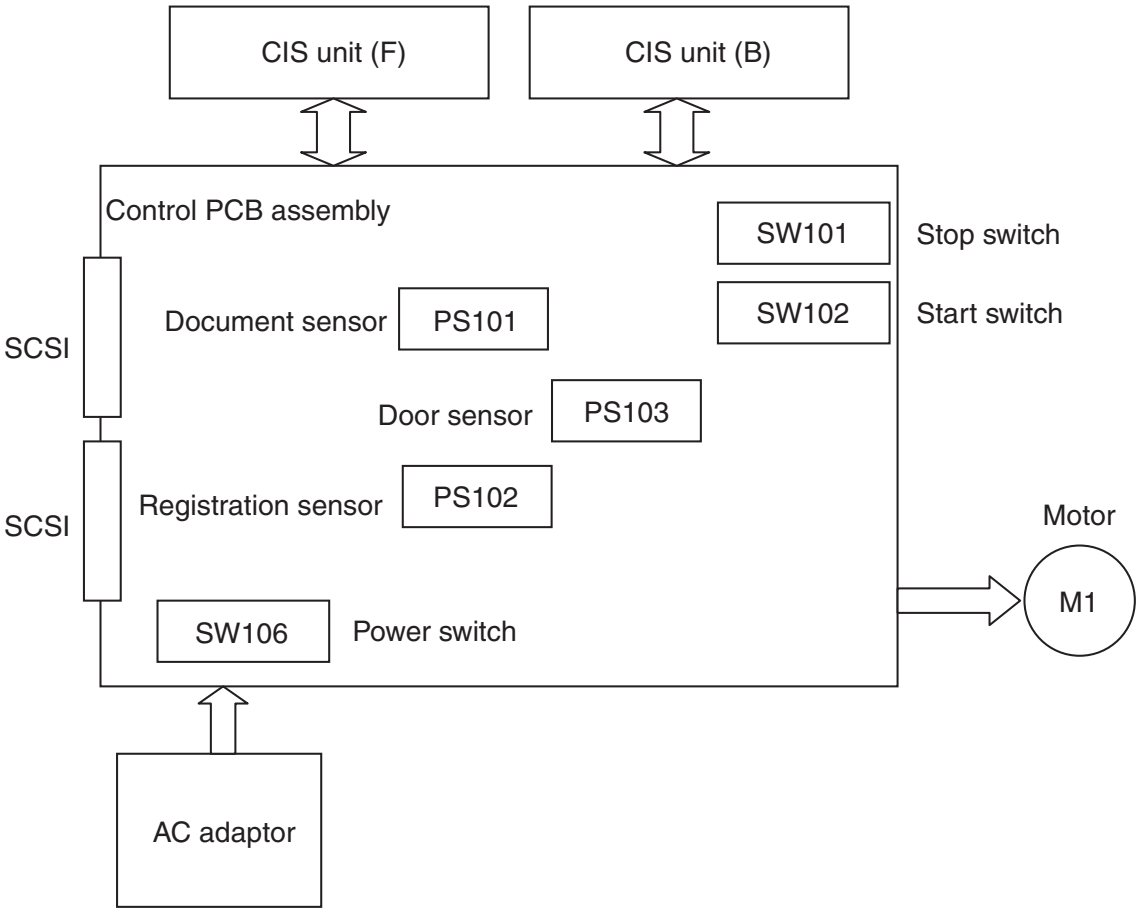


Fig. 2-8

2. Control PCB assembly

Fig.2-9 shows a block diagram of the Control PCB assembly. Table 2-2 shows a reference list of ICs. Main controls carried out on the assembly are as follows:

- Document feed
- Image data
- SCSI
- Power source

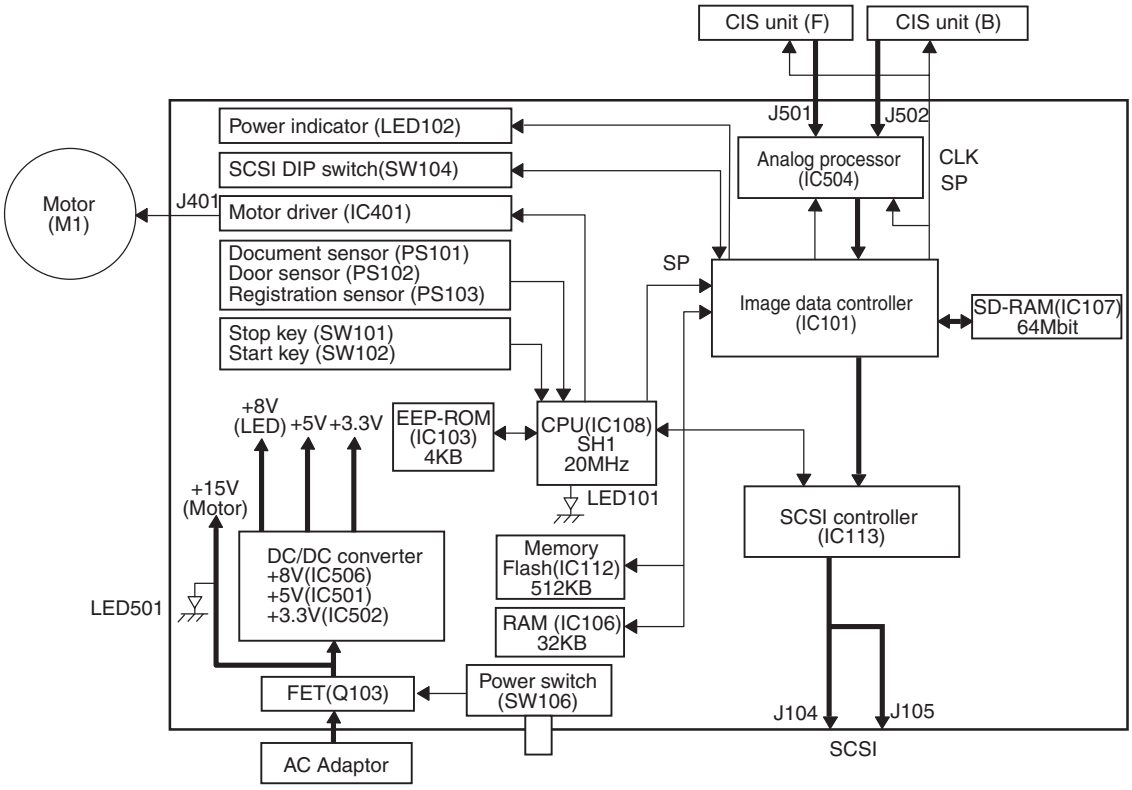


Fig. 2-9

IC No.	Name	Function
IC101	Image data controller	Controls image data reading, 12bit→8bit
IC103	EEPROM	Memory for log writing (4KB)
IC106	RAM	Memory for CPU work (32KB)
IC107	SD-RAM	Memory for image data reading (64Mbit)
IC108	CPU(SH1)	Overall control (20MHz)
IC112	Flash memory	Memory for firmware and each parameter (512KB)
IC113	SCSI controller	SCSI control
IC401	Motor driver	Drives a motor
IC501	DC/DC converter	+5VDC generation
IC502	DC/DC converter	+3.3VDC generation
IC504	Analog processor	Data compensation, A/D conversion (12bit)
IC506	DC/DC converter	+8VDC generation

Table 2-2

3. Resolution Conversion

This machine has an image sensor with a resolution of 600dpi. The output resolution of the scanned image can be selected from among:
・600 × 600dpi ・400 × 400dpi ・300 × 300dpi
・240 × 240dpi ・200 × 200dpi ・150 × 150dpi
・100 × 100dpi

Resolution conversion in the main-scanning and the sub-scanning direction is controlled as follows:

1) Main-scanning direction
The resolution of main scanning is controlled by clock signals (CLK_1) transferred from the image data controller to the CIS unit. Some of the clock signals are narrowed in accordance with the selected resolution. With a narrowed pulse, photosensitive pixels data cannot be obtained correctly. So, the internal clock signals (CLK_2) time-out the narrowed pulses. The time required to input a line of image data can be reduced by lowering resolution as well as by converting it.
Fig. 2-10 shows the timing chart of 600dpi and 300dpi.

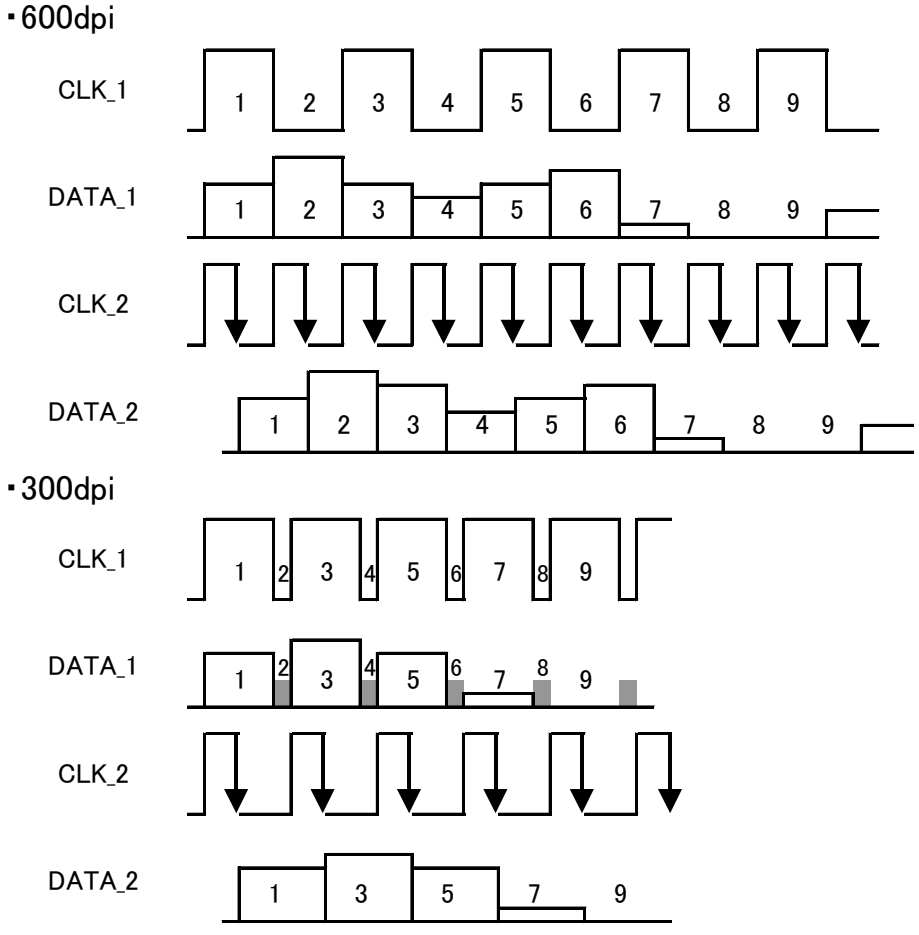


Fig. 2-10

2) Sub-scanning direction

The resolution of sub-scanning is controlled by the document feed speed and the start signals (SP) transferred from the image data controller. Generally, resolution is converted by increasing the feed speed in accordance with the resolution compared to 600dpi. The specification of the feed motor, however, does not permit the feed speed dealing with 150dpi and 100dit in binary or gray scale mode. In these cases, resolution is converted by delaying the output timing of a start signal.

With conventional scanners such as DR-3060/3080C, the feed speed of 150dpi (300dpi high speed) is made twice that of 300dpi. As previously described in "main-scanning direction," the data input time can be reduced by lowering resolution, and the feed speed increases. With this machine, data input time for 1 line in the case of 300dpi is shorter than that in 600dpi by approximately 60%. Moreover, as the resolution of 300dpi is half of 600dpi, the feed speed of 300dpi is about 3.2 times that of 600dpi.

Fig.2-11 illustrates the cases of 600dpi, 300dpi, 200dpi and 100dpi.

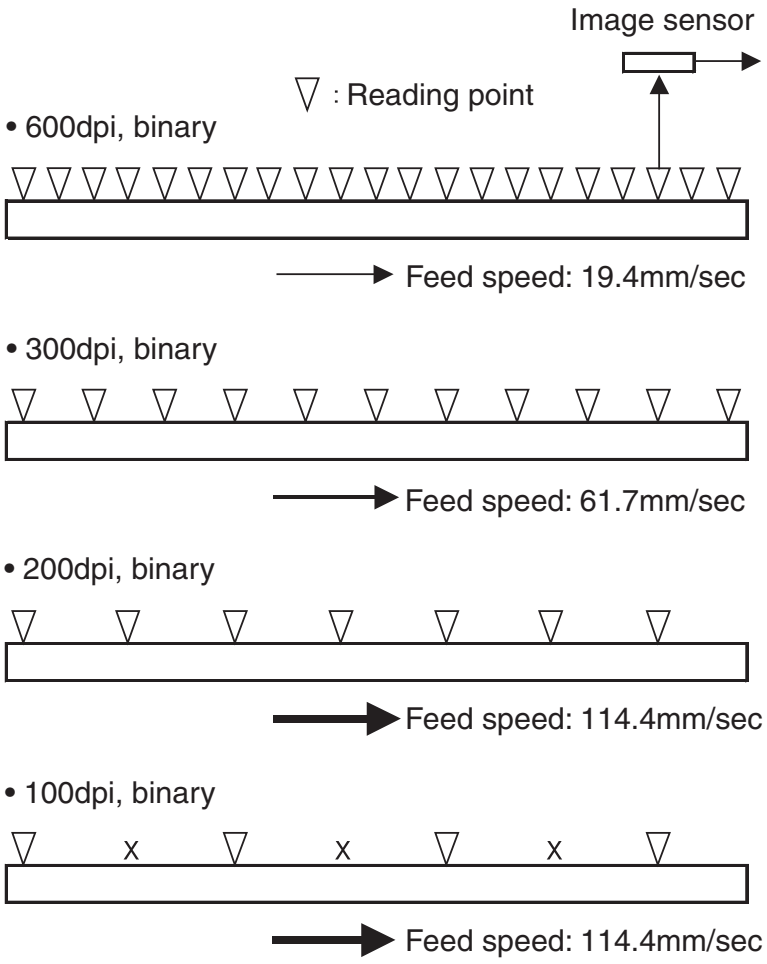


Fig. 2-11

4. Image processing inside the unit

Fig.2-12 shows a block diagram of image processing.

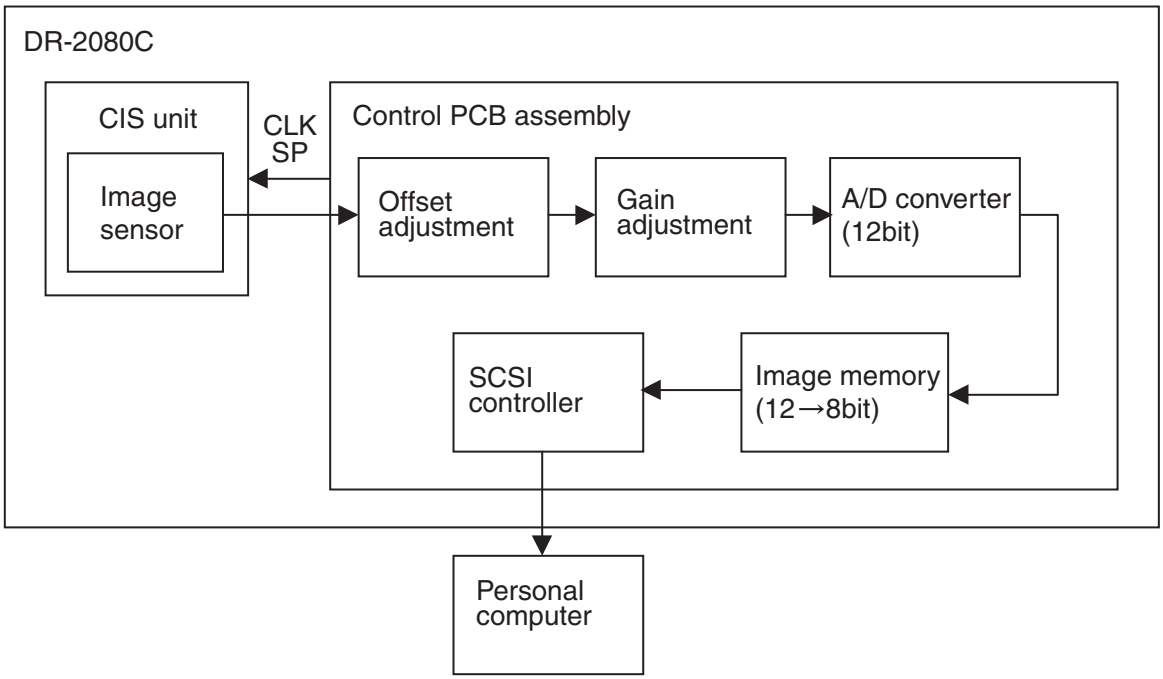


Fig. 2-12

Analog signals proportionate to the density of each pixel are output to the analog processor on the Control PCB assembly. These signals are output in the order of the pixels. When both sides of the document are read, the order is: "the front pixel 1, the back pixel 1, the front pixel 2 and the back pixel 2…"

The analog processor carries out offset adjustment, gain adjustment, and A/D conversion. Analog signals are converted into 12-bit digital signals. Then the image data are transferred to the image data controller, and temporarily stored in the SD-RAM, when 12bit-image data are converted into 8bit image data.

Then, the image data are output to the personal computer through a SCSI controller.

All the image processes carried out in this machine are described above. Other image processes are carried out inside the personal computer.

1) Offset adjustment
Offset adjustment is carried out on analog signals for the whole image sensor. Black compensation is adjusted so that the minimum output value of the overall black level matches the specified value.

2) Gain adjustment
Gain adjustnent is carried out on analog signals for the whole image sensor. White compensation is adjusted so that the maximum output value of the overall white level matches the specified value.

Note: Offset and gain adjustment are used to perform A/D conversion properly.

3) A/D conversion
This process converts analog signals into digital signals. The analog processor unique to this machine converts analog signals into 12bit digital signals. Then digital data are converted into 8bit-data when the image data controller writes to SD-RAM.

Note: Compensation for digital signals is carried out in a personal computer, however, compensation values are stored in the flash memory of the Control PCB assembly. The compensation values are output to the personal computer.

V. LAYOUT OF ELECTRICAL COMPONENTS

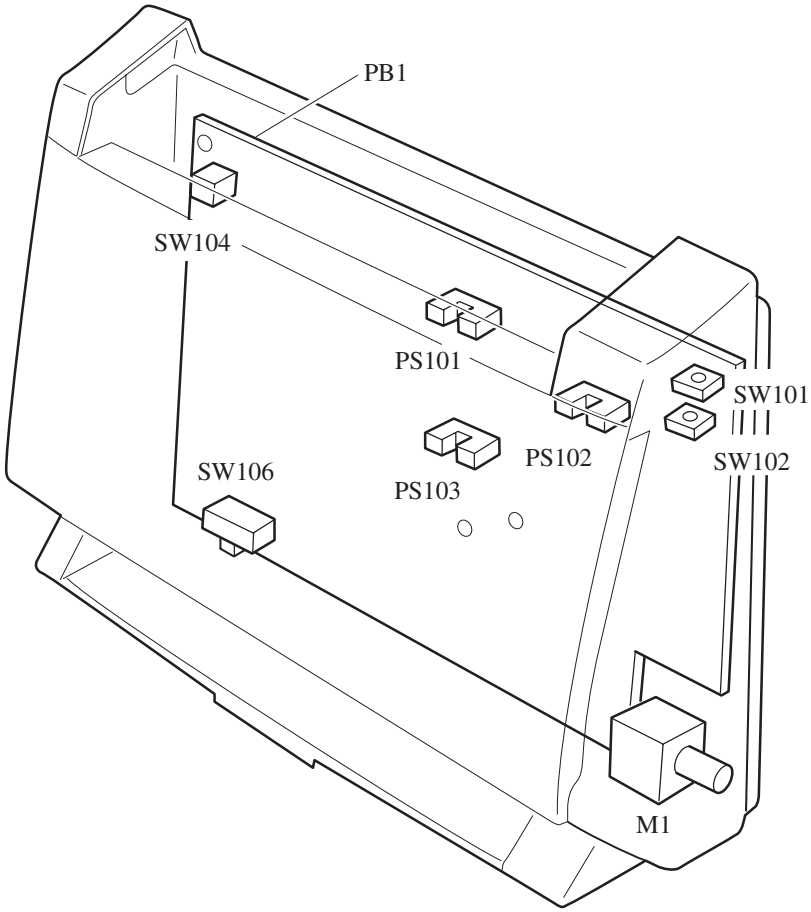


Fig. 2-13

Code	Name	Remarks
PB1	Control PCB assembly	
SW101	Stop switch	Control PCB assembly
SW102	Start switch	Control PCB assembly
SW104	SCSI DIP switch	Control PCB assembly
SW106	Power switch	Control PCB assembly
PS101	Document sensor	Control PCB assembly
PS102	Door sensor	Control PCB assembly
PS103	Registration sensor	Control PCB assembly
M1	Motor	Feed drive

Table 2-3

VI. LIST OF CONNECTORS, SW & LEDS FOR PCB ASSEMBLY

Connector, switches and LEDs mounted on the PCB assembly are listed below.

Components not listed in the table are for factory adjustment only. Special tools and measuring instruments are required to perform adjustments and check these components, and often a high degree of accuracy is required. So, do not touch them or the check pins in the field.

Also, do not use components described as "Prohibited."

Note: This machine does not have any VRs (variable resistors) that require adjustment in the field.

1. Control PCB assembly

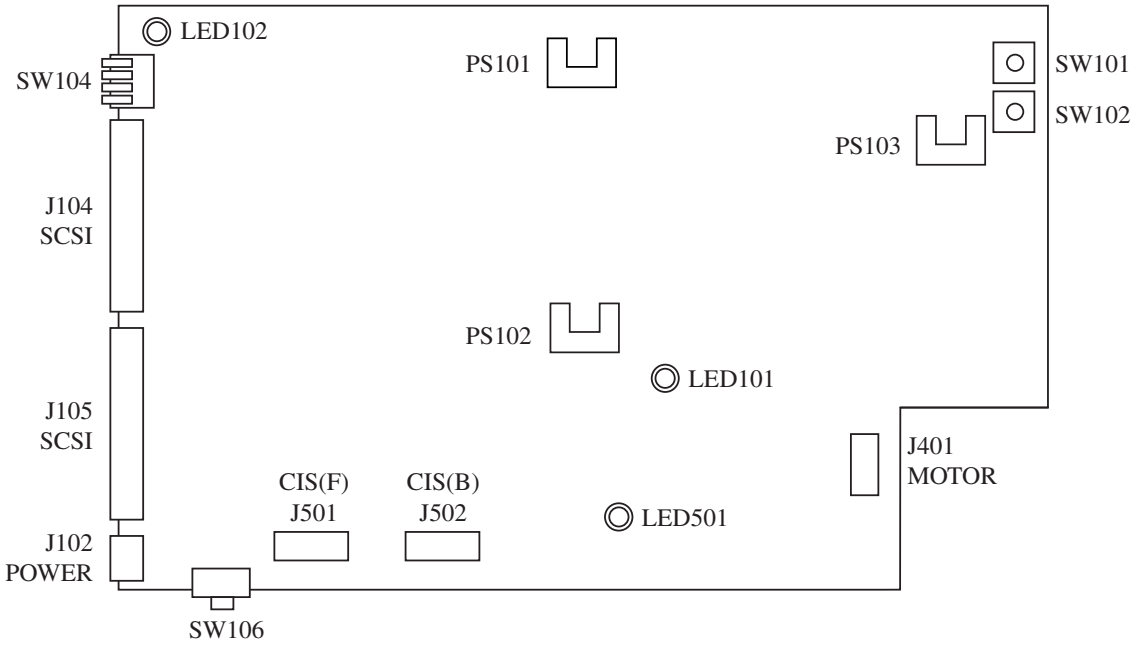
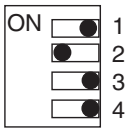


Fig. 2-14

<table>
<tr><th>Code</th><th>Name</th><th>Function</th></tr>
<tr><td>SW101</td><td>Stop switch</td><td>• Stops feeding</td></tr>
<tr><td>SW102</td><td>Start switch</td><td>• Starts feeding</td></tr>
<tr><td>SW104</td><td>SCSI DIP switch</td><td>• SCSI setting
 

List of SCSI-ID settings
<table>
<tr><td>SW</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>3</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
</table>
1~3: SCSI-ID setting
Initial setting [2]
4: Terminator ON/OFF
Initial setting [OFF]
For details, refer to the user's manual.</td></tr>
<tr><td>SW106</td><td>Power switch</td><td>• Power switch ON/OFF</td></tr>
</table>

Table 2-4

Code	Name	Function
LED101	CPU operation LED	• Checks CPU operation Flashing →Normal operation
LED102	Power indicator	• Checks power ON/OFF Lit →Power is ON
LED501	DC power LED	• Checks DC15V supply Lit →Supplied

Table 2-5

Special mode	Operation method
Mechanical feeding mode	Turns the power switch (SW106) ON with pushing the start switch (SW102), and the power indicator (LED102) begins to flash. Immediately push the stop switch (SW101), and a document is fed. To cancel feeding, turn the power switch OFF.
Roller cleaning mode	Pushes the start switch (SW102) and the stop switch (SW101) simultaneously with the front unit open, and the platen roller (metal roller) rotates slightly.

Table 2-6

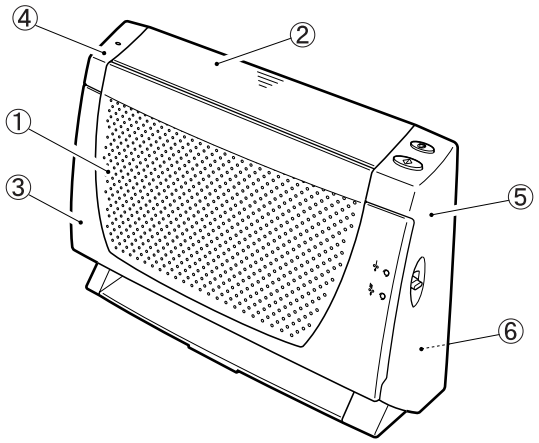
CHAPTER 3

DISASSEMBLY & REASSEMBLY

* Note on disassembling and reassembling this machine
This machine uses fewer screws by adopting snap-fit fasteners, so it has a lot of fitted parts. Special care is required when disassembling and reassembling to avoid excessive deformation of parts, and creating spaces between parts if they are joined improperly. When direction and position for moving parts are determined, follow the instructions. Be careful to avoid being injured by the edge of parts when pushing them.

I. EXTERNAL

External appearance



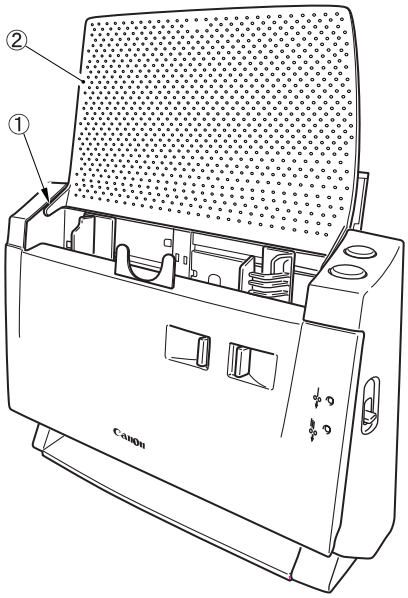
① Paper feed tray
② Top cover
③ Front cover
④ Left cover
⑤ Right cover
⑥ Rear cover

Fig. 3-101

1. Paper feed tray

1) Detach the left or right fitting ①, and remove the paper feed tray ②.

Note: When detaching a fitting, carefully bend parts so that they do not break.



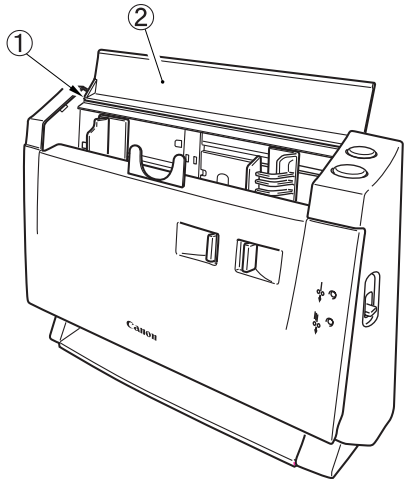
① Fitting
② Paper feed tray

Fig. 3-102

2. Top cover

1) Detach the left or right fitting ①, and remove the top cover ②.

Note: When detaching a fitting, carefully bend it so that it does not break. If you're afraid you might break it, remove the left or right cover assembly first.

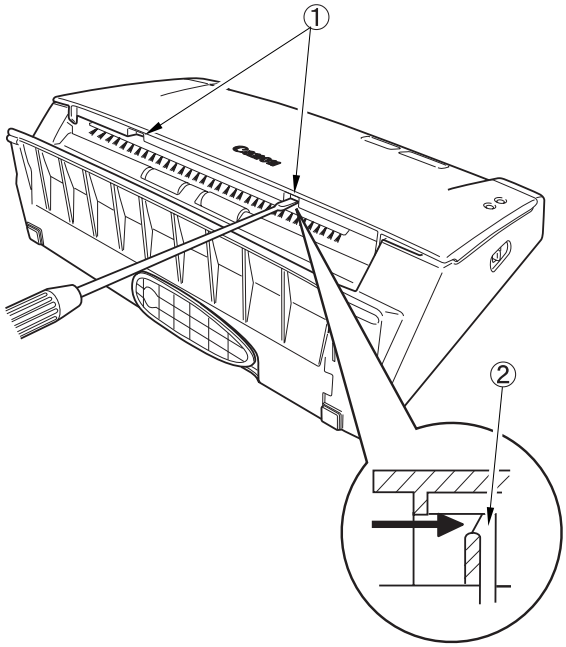


① Fitting ② Top cover

Fig. 3-103

3. Front cover (assembly)

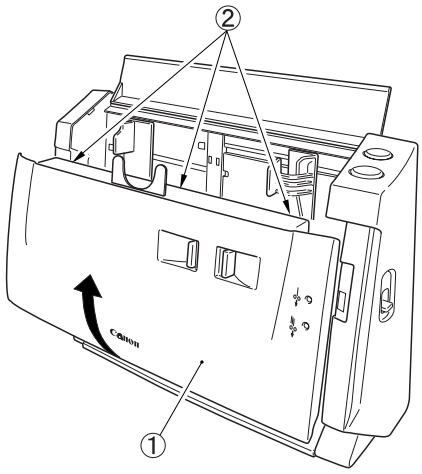
1) Remove the two inner hooks ② by pushing them from lower openings ①.



① Opening ② Hook

Fig. 3-104

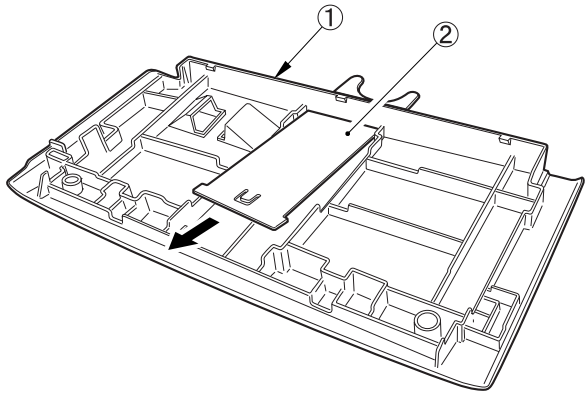
2) To remove the front cover assembly, open the front unit, and while rotating the lower part of the front cover assembly ①, detach upper fittings at the three locations ②.



① Front cover assembly ② Fitting

Fig. 3-105

3) Separate the paper feed extension plate ② from the front cover ①.



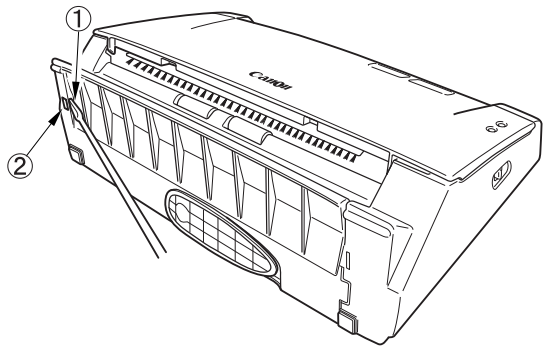
① Front cover ② Paper feed extension plate

Fig. 3-106

Note: When reassembling, adjust the OPEN release first. Make sure there has no space both with fittings and hooks.

4. Left cover (assembly)

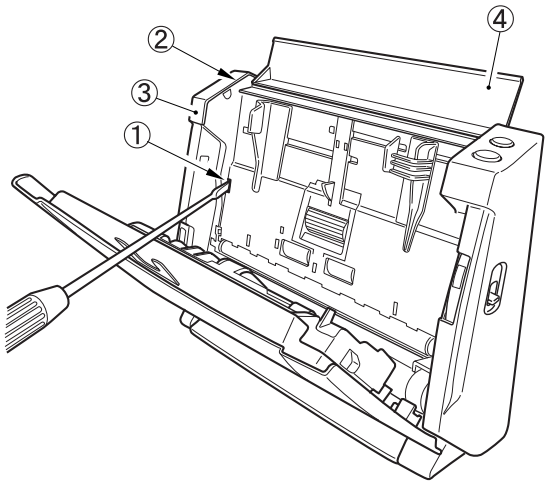
1) Remove the paper feed tray.
2) Insert a tool with a thin, flat point in the chamfer at the back ①, and detach the lower fitting ②.



① Chamfer ② Fitting

Fig. 3-107

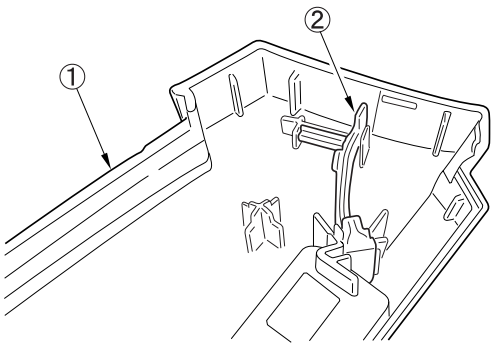
3) Push and remove the hook from the opening ①, and remove the left cover assembly ③ while detaching the fitting ②. Then, also remove the top cover ④.



① Opening ② Fitting
③ Left cover assembly ④ Top cover

Fig. 3-108

4) Separate the transparent light guide ② from the left cover ①.



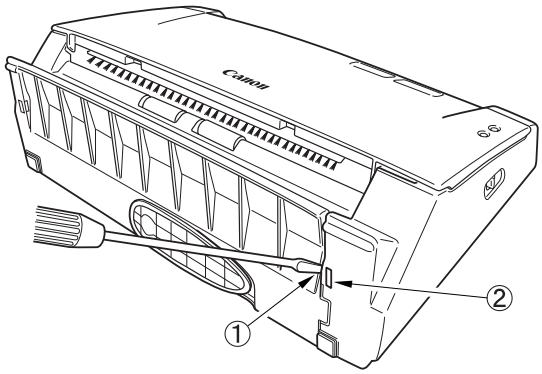
① Left cover ② Light guide

Fig. 3-109

Note: Be careful not to get the CIS unit cables caught in the machine. It is recommended to keep the front unit slightly open while reassembling.

5. Right cover (assembly)

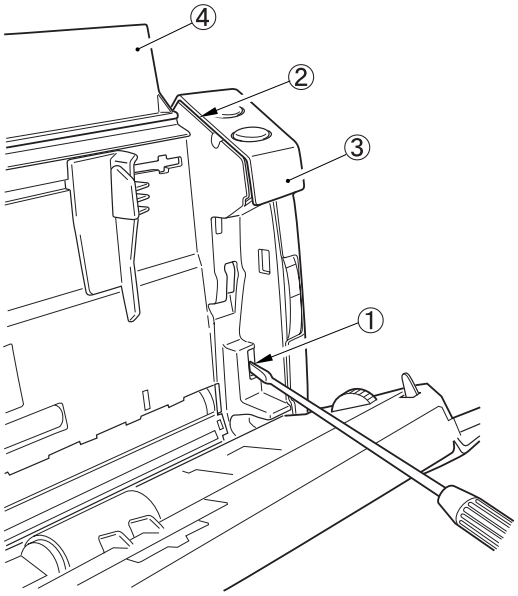
1) Remove the paper feed tray.
2) Insert a tool with a thin, flat point in the chamfer at the back ①, and detach the lower fitting ②.



① Chamfer ② Fitting

Fig. 3-110

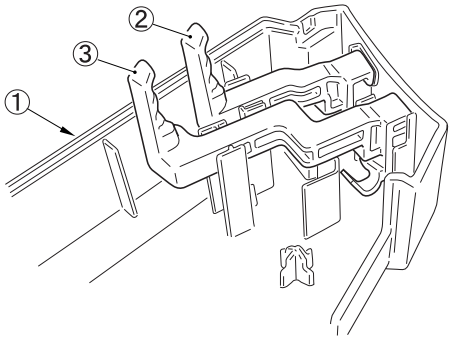
3) Push and remove the hook from the opening ①, remove the right cover assembly ③ while removing the upper fitting ②. Then, also remove the top cover ④.



① Opening ② Fitting
③ Right cover assembly ④ Top cover

Fig. 3-111

4) Separate the right cover ①, the stop button ②, and the start button ③.

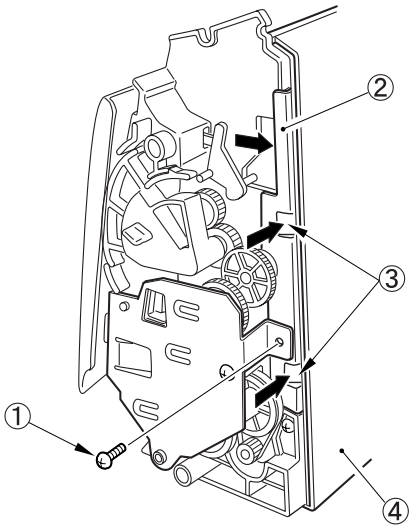


① Right cover ② Stop button
③ Start button

Fig. 3-112

6. Rear cover (assembly)

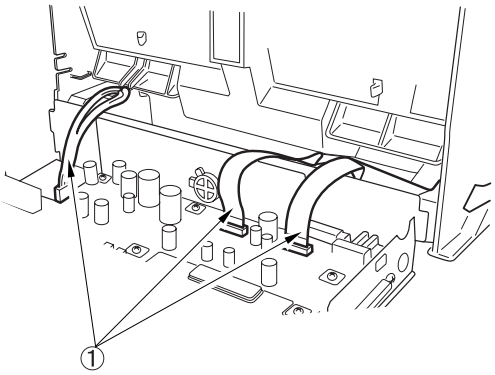
1) Remove the right and left cover assemblies.
2) To remove the rear cover assembly ④, remove the screw ①, and push and remove the two hooks ③ while pushing the metal plate ②. As cables are connected, special care is required.



① Screw ② Metal plate
③ Hook ④ Rear cover assembly

Fig. 3-113

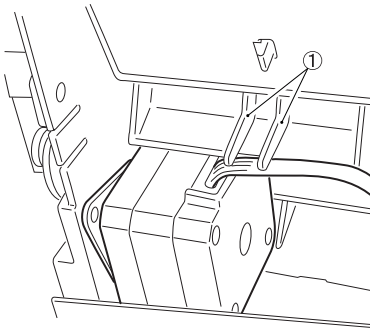
3) Remove the three cables ①.



① Cable

Fig. 3-114

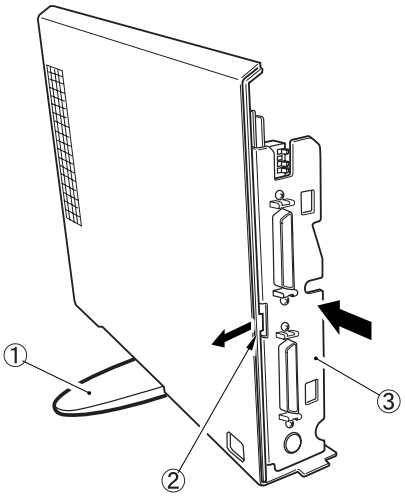
Note: During assembly, insert the cable straight into the connector to avoid breaking wires. Keep the motor cable under the lib ①.



① Lib

Fig. 3-115

4) Rotate the stand ①, and eject the projection ② to slide the control unit ③ in the direction of the arrow for about 8mm until it stops. Ejecting the projection detaches the inner fitting.

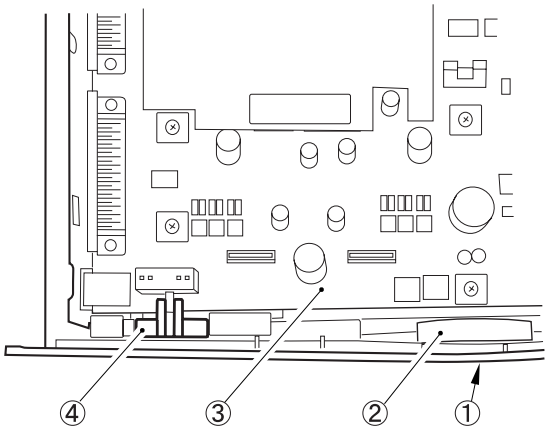


① Stand ② Projection
③ Control unit

Fig. 3-116

5) To remove the control unit ③, bend the bottom of the rear cover ① to detach it from the stand ②. Then, also remove the power switch key ④.

Note: Bend the bottom of the rear cover with care.



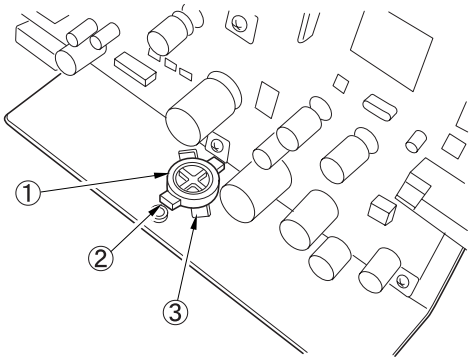
① Bottom of the rear cover ② Stand
③ Control unit ④ Power switch key

Fig. 3-117

Note: When reassembling, be careful to avoid breaking the bottom of the rear cover. Be sure to attach the power switch key, and connect cables properly.

7. Stand

1) Remove the control unit. (Refer to "6. Rear cover.")
2) To remove the stand, rotate the stand ① to align the projection ② with the opening ③.



① Stand ② Projection
③ Opening

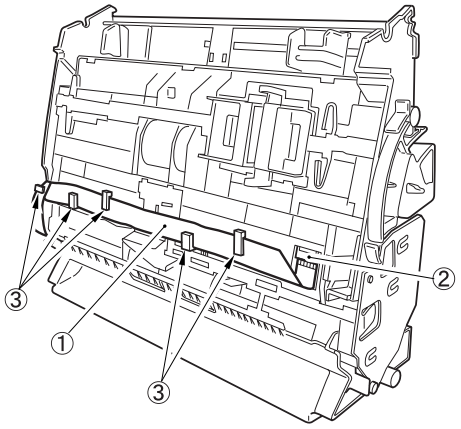
Fig. 3-118

II. FEEDING

1. Front unit

1) Remove the right and left cover assemblies. (Refer to " Ⅰ. External".)
2) Remove the front cover assembly. (Refer to " Ⅰ. External".)
3) Remove the cable ① from the connector ② and the guide ③.

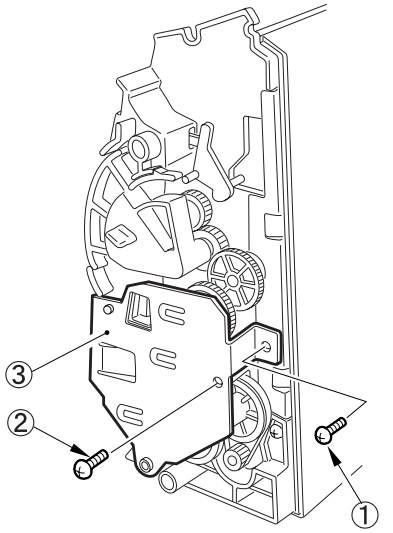
Note: Handle the cable with care to avoid breaking wires.



① Cable ② Connector
③ Guide

Fig. 3-201

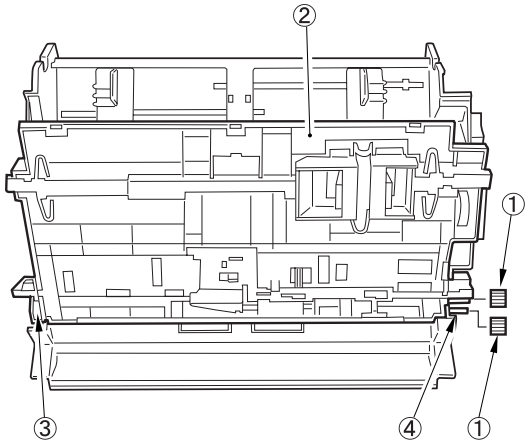
4) Remove the screw A ① and B ② (self-tapping), and remove the gear plate ③. Be careful as the gear is loosened when the gear plate is removed.



① Screw A ② Screw B
③ Gear plate

Fig. 3-202

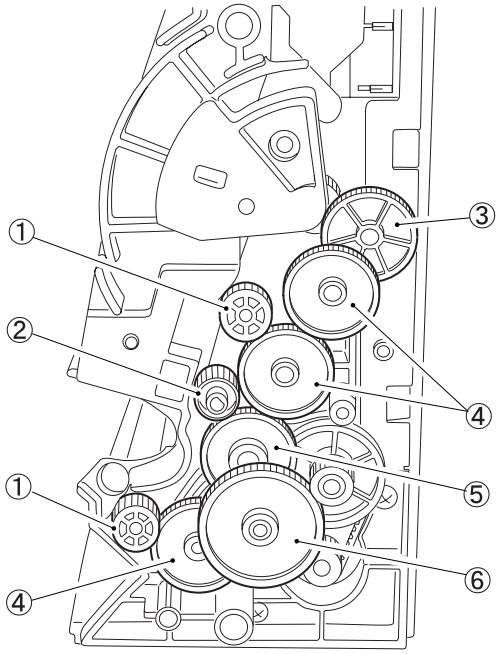
5) Remove the two gears ①. Fully open the front unit ②, and slide it to the right until the left fitting ③ is detached. Next, detach the right fitting ④, and remove the front unit.



① Gear ② Front unit
③ Left fitting ④ Right fitting

Fig. 3-203

Note: Attach the detached gears to their proper positions referring to the following figure.

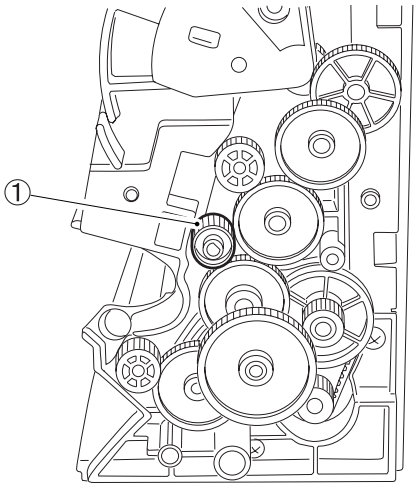


① White one-ways (two) ② Black D cut
③ Black A ④ Black B (three)
⑤ Black C (Large internal diameter)
⑥ White

Fig. 3-204

2. Platen roller (in the main body)

1) Remove the front unit. It's not necessary to remove the cable for the CIS unit.
2) Remove the gear ① mounted on the platen roller.

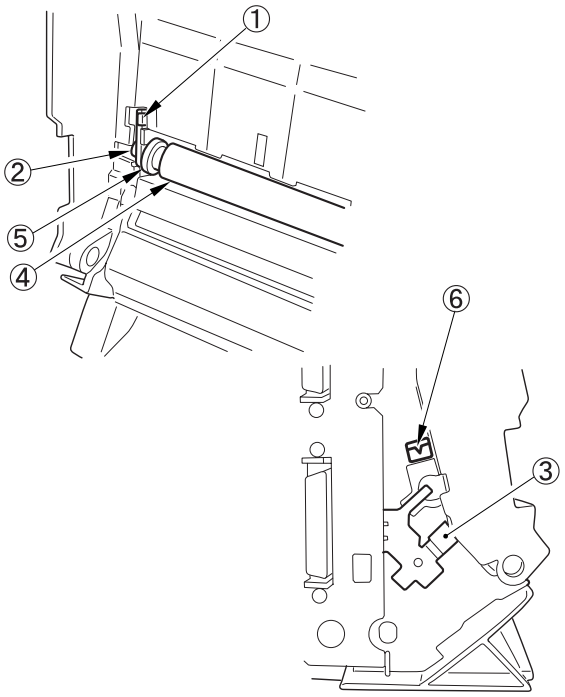


① Gear

Fig. 3-205

3) Rotate the stopper ② while removing the left hook ①. Draw out the stopper forward while removing the fitting ③ on the ground plate, and remove the platen roller ④ and the right and left spacers ⑤.

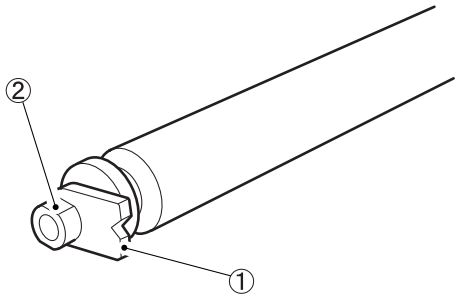
Note: It is recommended to use the notch ⑥ in the stopper from the side when rotating the stopper.



① Hook ② Stopper
③ Fitting ④ Platen roller
⑤ Spacer ⑥ Notch

Fig. 3-206

Note: When reassembling, push in the platen roller with the stopper arm ① inside and the guide ② outside, while removing the fitting of the ground plate.



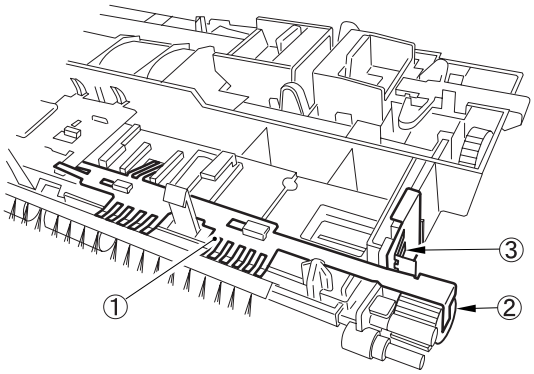
① Arm ② Guide

Fig. 3-207

3. Platen roller (in the front unit side)

1) Remove the front unit.
2) Bend the ground plate ①, and remove the gear ②.

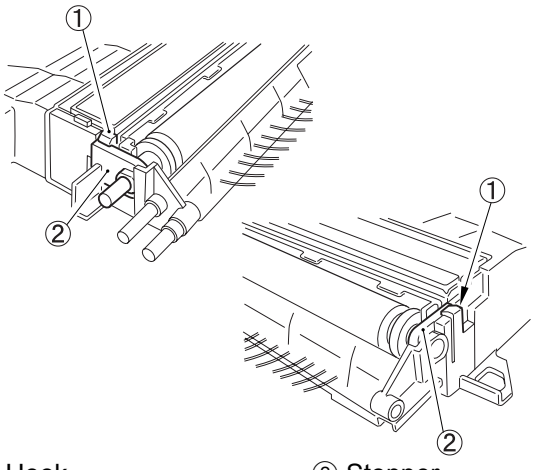
Note: Handle the ground plate with care not to break it. Be sure to reassemble the fitting ③ of the ground plate to the original position.



① Ground plate ② Gear
③ Fitting

Fig. 3-208

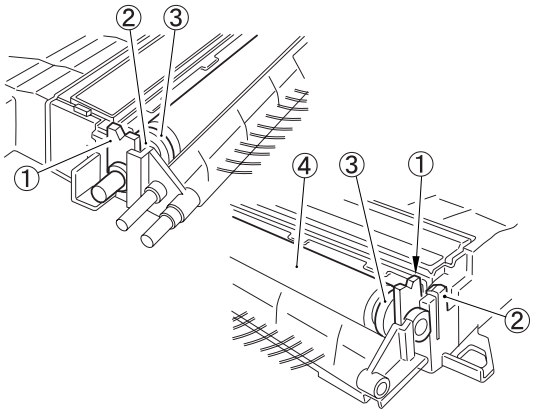
3) Remove the right and left hooks ①, and rotate the stopper ②.



① Hook ② Stopper

Fig. 3-209

4) Align the right and left stoppers ① with the openings ② to raise the stoppers, and remove the spacer ③ and the platen roller ④.



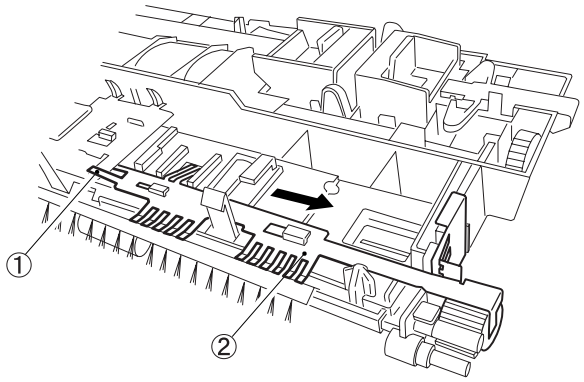
① Stopper ② Opening
③ Spacer ④ Platen roller

Fig. 3-210

4. Follower roller

1) Remove the front unit.
2) While removing the hook ①, slide the ground plate ② to the right until can be removed.

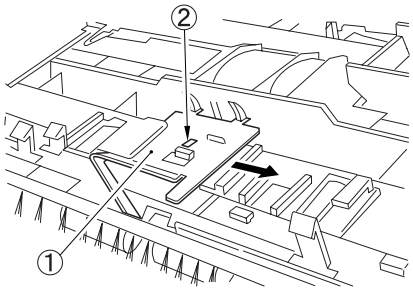
Note: Handle the ground plate with care. Be careful to avoid being injured by the edge of the ground plate. Be sure to reassemble the hook, the fitting, and the ground area properly.



① Hook ② Ground plate

Fig. 3-211

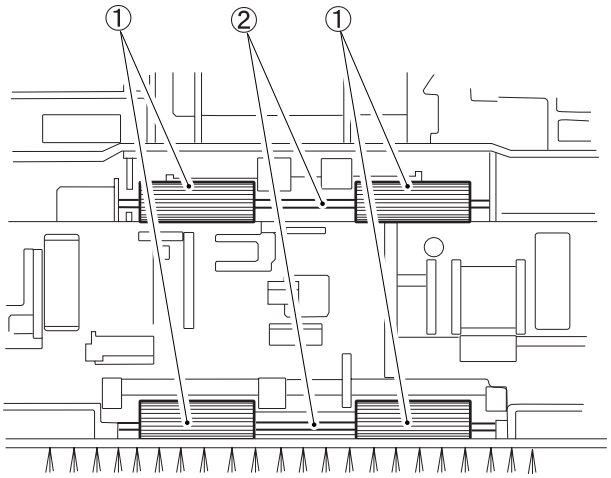
3) While pushing the roller pressure plate ① to the right, push and remove the hook from the center opening ②, and remove the roller pressure plate.



① Roller pressure plate ② Opening

Fig. 3-212

4) Remove the follower rollers ① and the roller shafts ②.



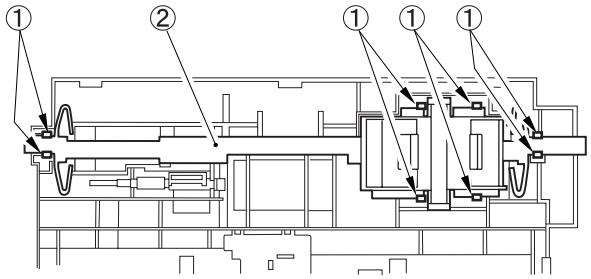
① Follower rollers ② Roller shafts

Fig. 3-213

Note: Make sure the flat part of the roller shaft makes contact with the tip of the roller pressure plate. Reassemble the fitting of the roller pressure plate properly. Then, check if the follower roller rotates smoothly.

5. Retard roller shaft

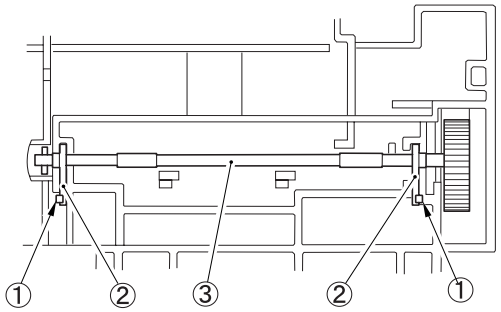
1) Remove the front unit.
2) Remove the retard roller.
3) Remove the eight hooks ①, and remove the OPEN release ②.



① Hook ② OPEN release

Fig. 3-214

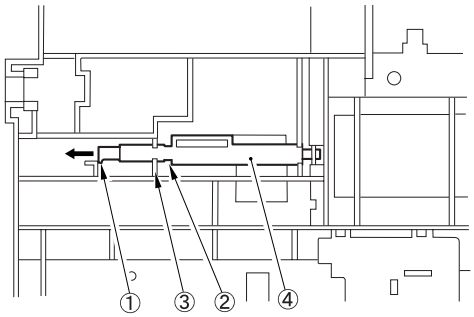
4) Remove the right and left hooks ①, and rotate the stoppers ② to remove the retard roller shaft A ③.



① Hook ② Stopper
③ Retard roller shaft A

Fig. 3-215

5) Remove the hook ① and slide it to the left until the groove ② is aligned with the rib ③, and then remove the retard roller shaft B ④.

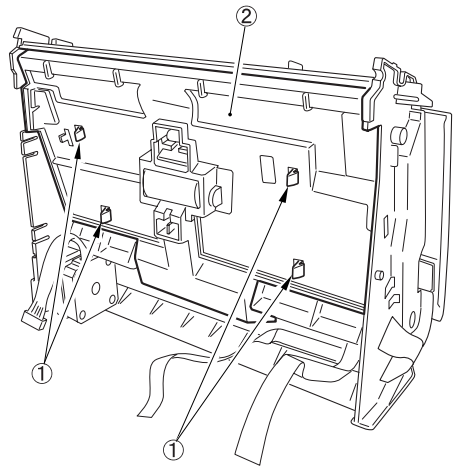


① Hook ② Groove
③ Rib ④ Retard roller shaft B

Fig. 3-216

6. Roller cover

1) Remove the rear cover assembly. (Refer to " Ⅰ. External".)
2) Remove the four hooks ① to remove the roller cover ②.



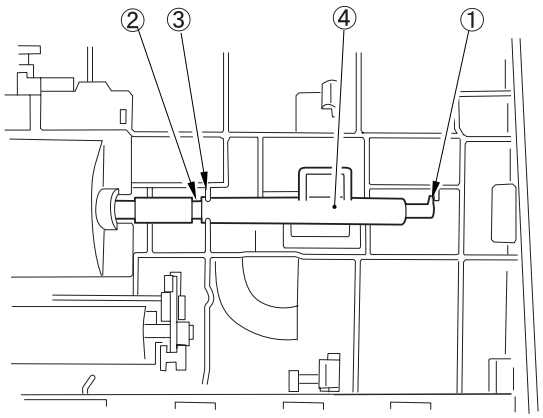
① Hook ② Roller cover

Fig. 3-217

Note: Slide the paper side guide inside before reassembling the roller cover. When assembling with the paper side guides fully open, the paper side guides will get stuck.

7. Feed roller shaft

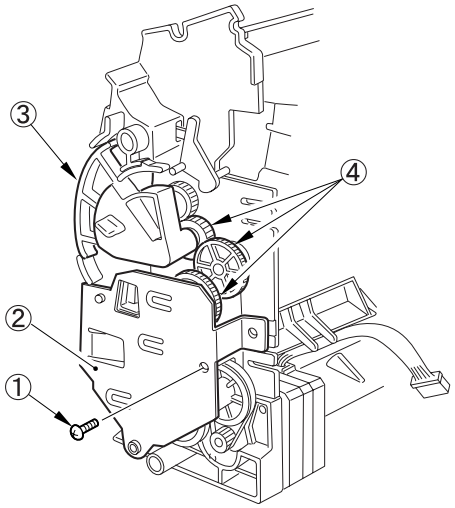
1) Remove the roller cover.
2) Remove the feed roller.
3) Remove the hook ① and slide the shaft to the right until the groove ② is aligned with the rib ③ then remove the feed roller shaft A ④.



① Hook ② Groove
③ Rib ④ Feed roller shaft A

Fig. 3-218

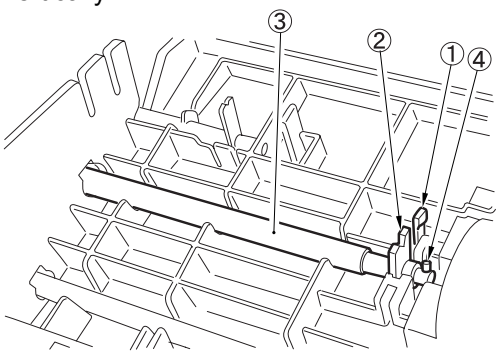
4) Remove the screw ① (self-tapping), and remove the gear plate ②, the switching lever ③, and the three gears ④.



① Screw ② Gear plate
③ Switching lever ④ Gear

Fig. 3-219

5) Remove the hook ①, and rotate the stopper ② to remove the feed roller shaft B ③. Make sure the pin ④ of the feed roller shaft stands vertically.

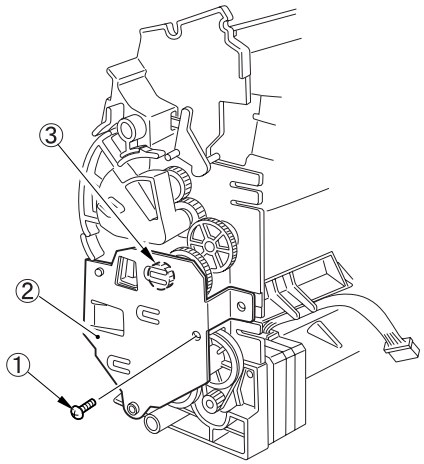


① Hook ② Stopper
③ Feed roller shaft B ④ Pin

Fig. 3-220

8. Registration roller

1) Remove the roller cover.
2) Remove the screw ① (self-tapping) to remove the gear plate ②. Remove the gear ③ mounted on the registration roller shaft.

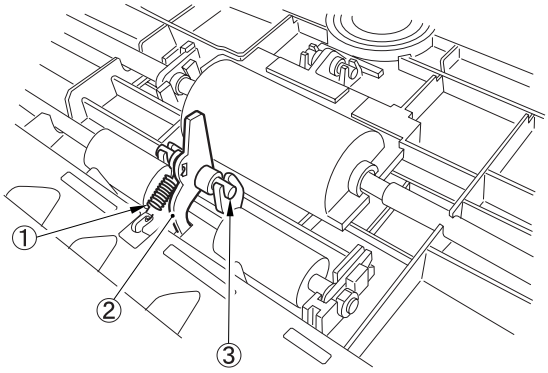


① Screw ② Gear plate
③ Gear

Fig. 3-221

3) Remove the hook on the coil spring ① and pull the sensor lever ② to detach it from the fitting ③.

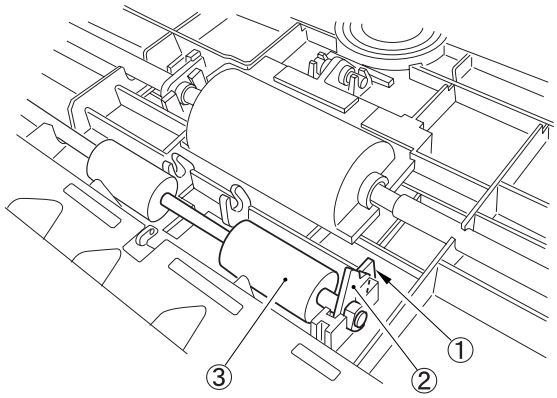
Note: Do not lose the coil spring.



① Coil spring ② Sensor lever
③ Fitting

Fig. 3-222

4) Remove the hook ① and rotate the stopper ②, and pull up and remove the registration roller ③ .



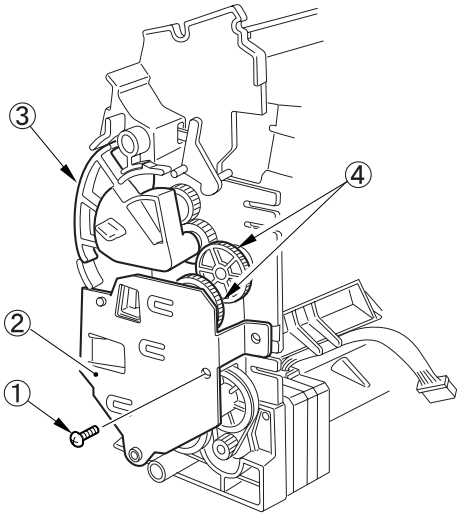
① Hook ② Stopper
③ Registration roller

Fig. 3-223

Note: In reassembling the sensor lever, make sure the tip of the lever comes out to the rear side through the hole. Remember to attach the coil spring.

9. Delivery roller

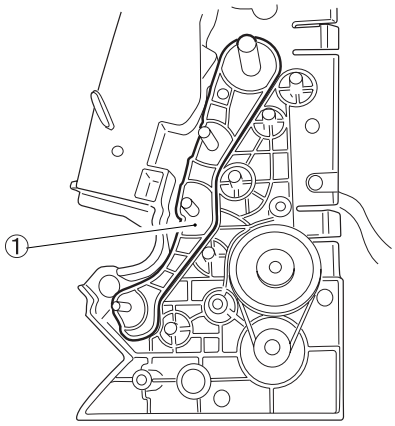
1) Remove the roller cover.
2) Remove the screw ① (self-tapping), and remove the gear plate ②, the switching lever ③, and the ten gears ④.



① Screw ② Gear plate
③ Switching lever ④ Gear

Fig. 3-224

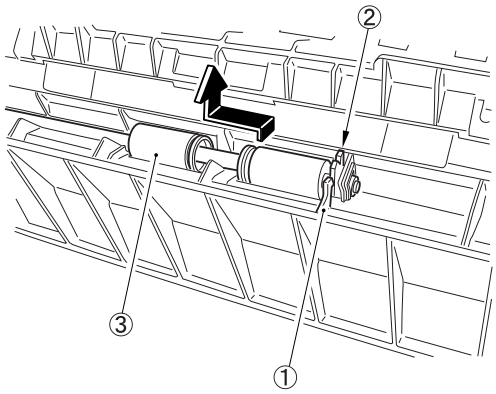
3) Remove the shaft guide plate ①.



① Shaft guide plate

Fig. 3-225

4) Remove the hook ①, and rotate the stopper ②. Then, pull up the delivery roller ③ from the opening to slide it to the left, and pull up again to remove it.

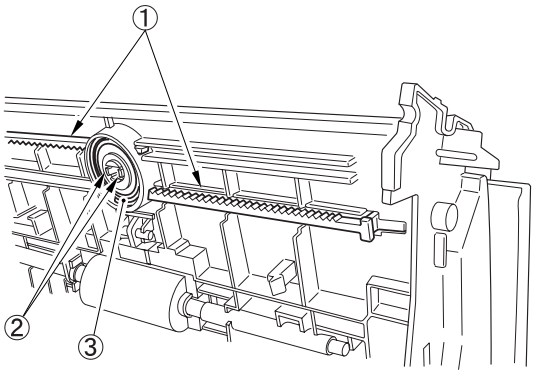


① Hook ② Stopper
③ Delivery roller

Fig. 3-226

10. Paper side guide

1) Remove the roller cover.
2) Open the front unit.
3) Fully open the right and left paper side guides ① outward. While removing the two hooks ②, remove the guide gear ③, and remove the right and left paper side guides.



① Paper side guide ② Hook
③ Guide gear

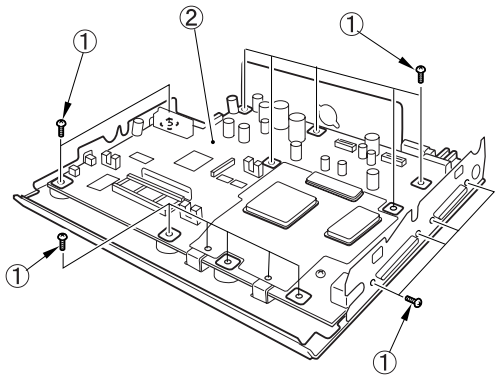
Fig. 3-227

Note: Be sure to place the right and left paper side guides symmetrically. Slide the paper side guides inside before attaching the roller cover. When assembling with the paper side guides fully open, the paper side guides will get stuck.

III. ELECTRICAL

1. Control PCB assembly

1) Remove the rear cover assembly and the stand. (Refer to " Ⅰ. External".)
2) Remove the sixteen screws ① (M2.5) and remove the Control PCB assembly ②.

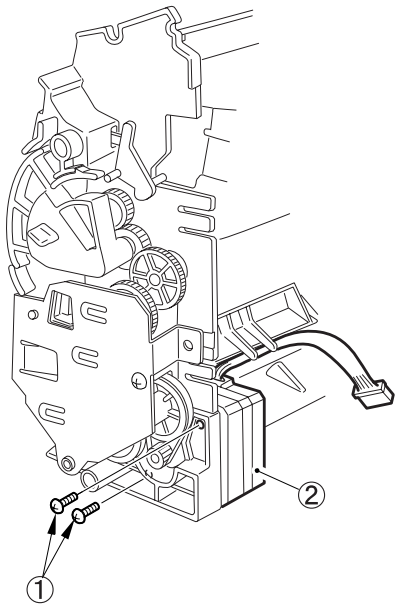


① Screw ② Control PCB assembly

Fig. 3-301

2. Motor

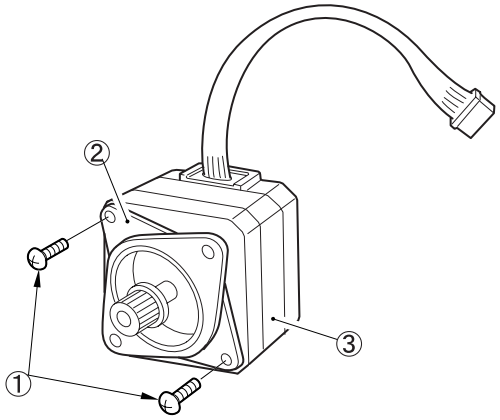
1) Remove the rear cover assembly. (Refer to " Ⅰ. External".)
2) Remove the two screws ① to remove the motor assembly ②.



① Screw ② Motor assembly

Fig. 3-302

3) Remove the two screws ① to separate the motor mount ② from the motor ③.



① Screw ② Motor mount
③ Motor

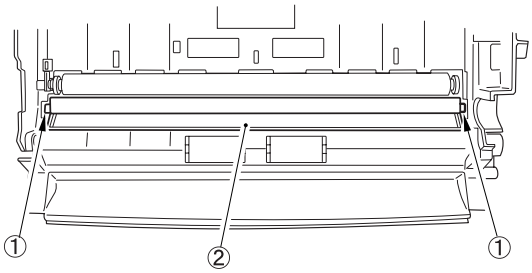
Fig. 3-303

Note: When reassembling, put the belt on the gear, and adjust tension so that you do not miss any sprockets.

3. CIS unit (in the main body)

1) Remove the front unit. (Refer to "Ⅱ. Feed".)
2) Remove the cable for the CIS unit at the back. Then, take the right and left hooks ① by pushing them from the back, and remove the CIS unit assembly ②.

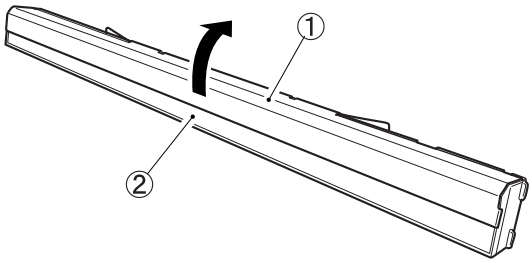
Note: Handle the cable with care to avoid breaking wires.



① Hook ② CIS unit assembly

Fig. 3-304

3) Remove the front side of the guide plate ① to remove the projection on the back, and separate the guide plate from the CIS unit ②.



① Guide plate ② CIS unit

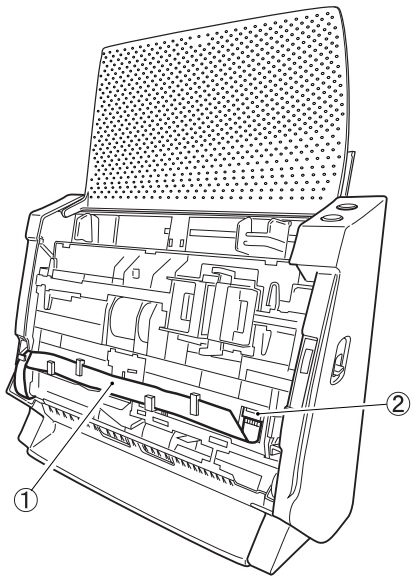
Fig. 3-305

Note: Clean the glass face after attaching the CIS unit assembly.

4. CIS unit (in the front unit)

1) Remove the front cover assembly. (Refer to " Ⅰ. External".)
2) Remove the cable ① from the connector ②.

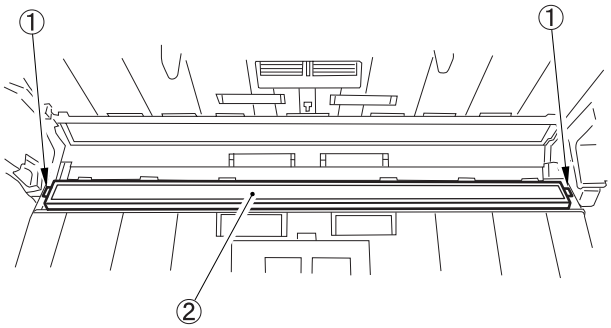
Note: Handle the cable with care to avoid breaking wires.



① Cable ② Connector

Fig. 3-306

3) Remove the right and left hooks ① to remove the CIS unit ②. When the hooks are removed, the unit will pop out.



① Hook ② CIS unit

Fig. 3-307

Note: Clean the glass face after attaching the CIS unit.

CHAPTER 4

INSTALLATION & MAINTENANCE

I. INSTALLATION

This machine is installed by users. Instruct them to observe the user's manual.

If a service person carries out installation, he/she must consult the user's manual. An outline of installation is as follows:

1. Selection of location

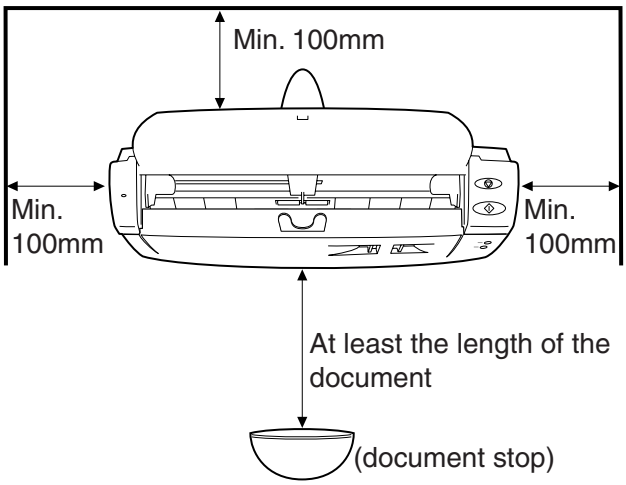
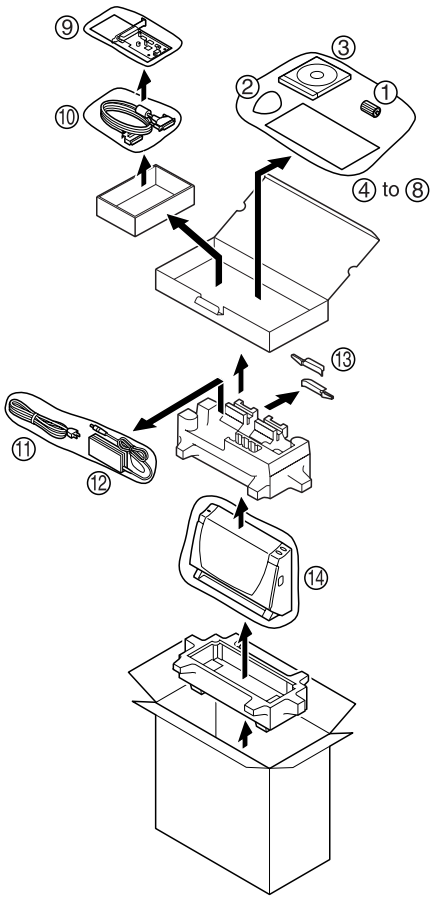


Fig. 4-1

- Leave enough space around this machine for cables, operation, and ventilation.
- This machine delivers a document on the surface of the table, so set up the machine on a smooth surface.

2. Unpacking

Open the package box, and take out the components. Package weight is about 4.7kg and the dimensions are 435(W)×228(D)×423(H)mm.



① Feed roller
② Document stop
③ Setup disc
④ Startup manual
⑤ Adjustment sheet
⑥ Quick Reference Guide
⑦ Software license agreement
⑧ Warranty card (120V model only)
⑨ SCSI board
⑩ SCSI cable
⑪ Power cord
⑫ AC adaptor
⑬ Paper sid guide adaptor
⑭ Scanner

Fig. 4-2

- Do not throw the package box and shock absorber away, as they are needed when storing or transporting the machine.

3. Remove protective packaging

1) Dispose of protective tapes attached around the body.

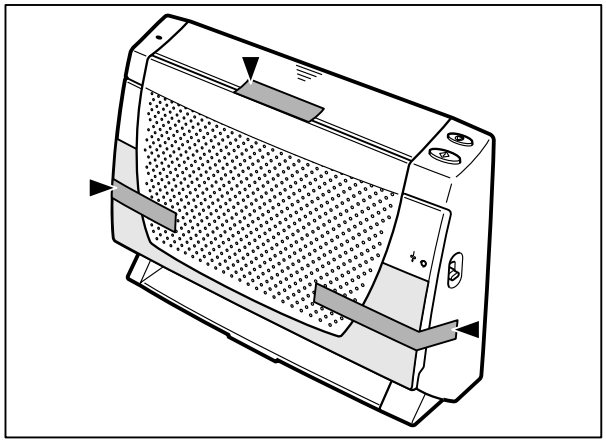


Fig. 4-3

2) Dispose of protective sheets inserted between the paper feed tray and the body.

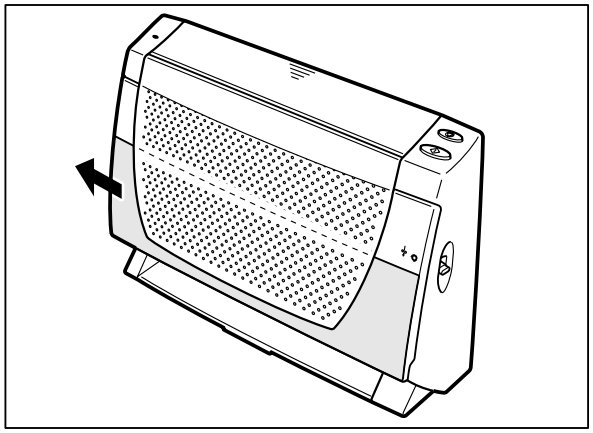


Fig. 4-4

4. Install feed roller

Open the front unit and set the packaged feed roller.

1) Open the roller cover on the main body.
Put your finger in the recess to open it.

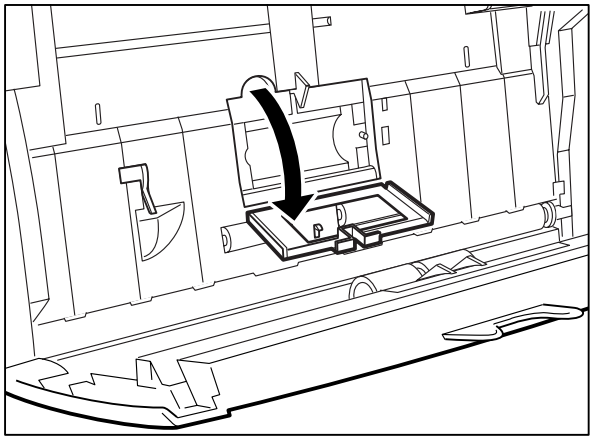


Fig. 4-5

2) Raise the roller fixing lever up ①, and slide it ②.

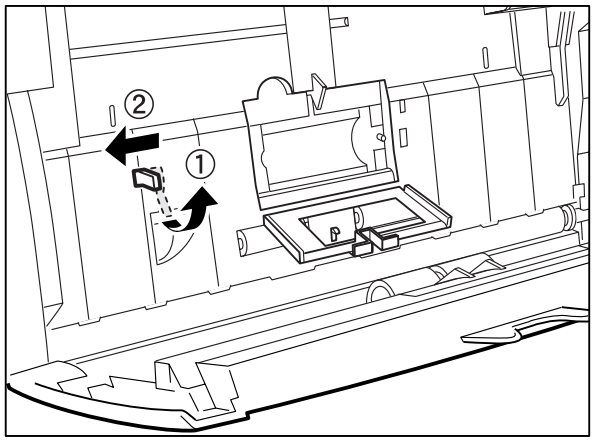


Fig. 4-6

3) Set the feed roller in the recess inside the roller cover, and align the notch of the roller with the shaft on the body.

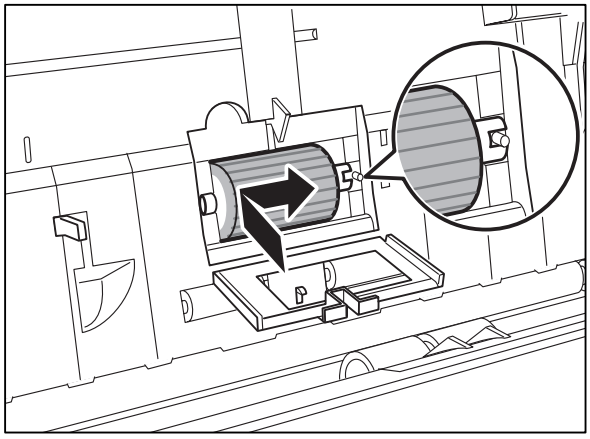


Fig. 4-7

4) Slide the roller fixing lever to the right until it fits into the hole at the left side of the feed roller.

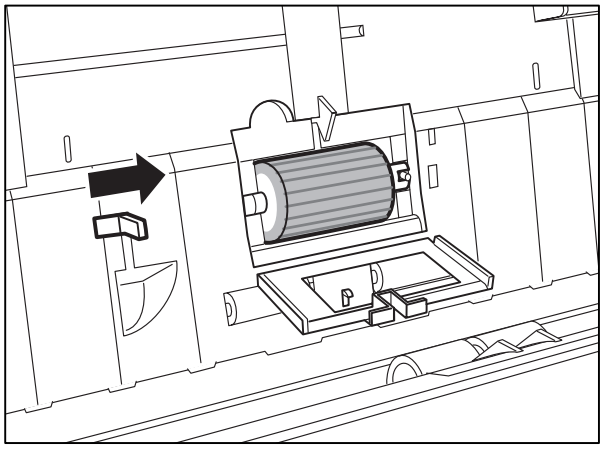


Fig. 4-8

5) Fix the feed roller shaft by pulling the lever down.

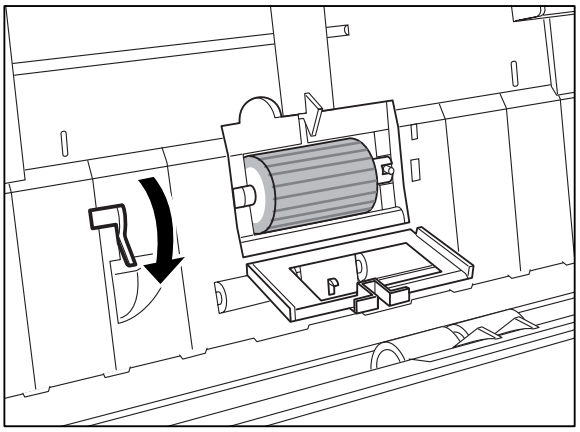


Fig. 4-9

6) Close the roller cover. Make sure the cover clicks, and returns to its original position.

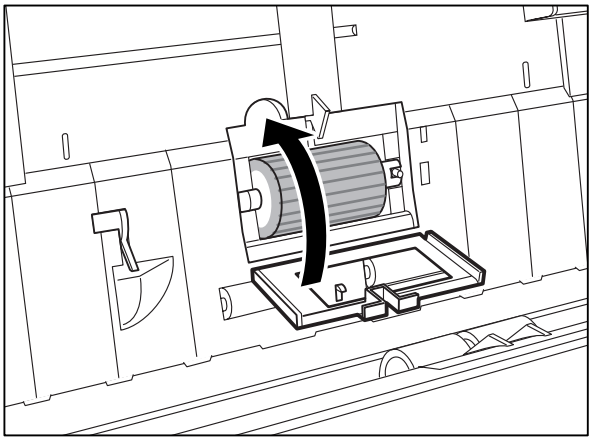


Fig. 4-10

7) Close the front unit by slowly pushing both sides of the upper part. Make sure the front unit clicks and returns to its original position.

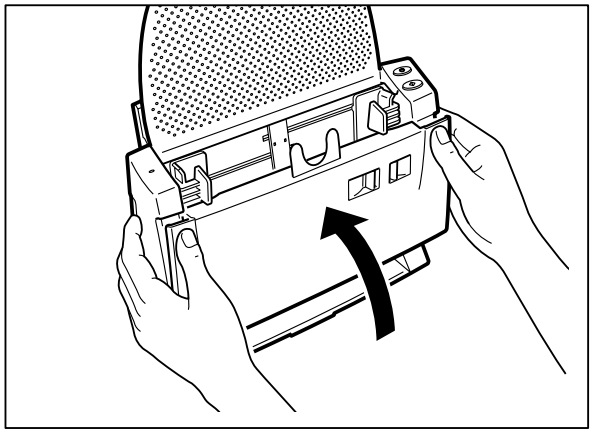


Fig. 4-11

5. Connection to the personal computer

For details, refer to the user's manual of the machine used, and other peripheral devices.

1) Check the SCSI card for the personal computer, and install it if necessary. Use the SCSI card packaged or recommended.
2) Connect the SCSI cable. Use the SCSI cable packaged or in a proper form.
   This machine has a half-pitch 50 pin (pin type) SCSI connector. The connector of the SCSI card packaged with this machine is a D-sub 25 pin type.
3) Set up the SCSI-ID and the terminator of this machine.
4) Be sure to connect the packaged power cord and the AC adaptor.
5) After turning on the power, start up the personal computer.
6) Install software required for the personal computer (drivers and applications) .
7) Re-start the personal computer.

6. Operation check

1) Prepare the paper side guide adaptor and the document stop packaged when necessary.
2) Set the document.
3) Operate application software by following each procedure.
4) Check operation results.

II. MAINTENANCE

Maintenance of this machine is carried out by users. Instruct them to observe the user's manual to carry out maintenance properly.

If a service person provides a maintenance service, the user's manual and this service manual should be followed. An outline of maintenance is as follows:

1. Parts to be replaced

1) Consumable products

No.	Name	Product code	Replacement cycle	Remarks
1	Retard roller	7982A001AA	Around 30,000 sheets	These parts should be replaced when feeding failure such as jam and skew often occurs.
2	Feed roller		Around 30,000 sheets	

Table 4-1

Note: A product consists of a pair of retard and feed rollers.

2) Consumable parts
This machine has no consumable parts.

3) Parts to be replaced periodically
This machine has no parts that need to be periodically replaced.

Reference: Differences among consumable products, consumable parts, and parts to be replaced periodically

1. Consumable products are parts (unit) to be replaced at the point they no longer function. They are defined as a commodity, and users can replace them under normal conditions.
2. Consumable parts are parts (unit) to be replaced at the point when they no longer function. They are defined as service parts, and users can replace them under normal conditions.
3. Parts (unit) to be replaced periodically are defined as service parts and a service person is responsible for replacement. If there is a limitation on storage period, they are defined as commodities.

2. Maintenance list

[△: Cleaning, ●: Replacement, ☆: Oiling, □: Adjustment, ◎: Inspection]

Unit Name	Location	Maintenance Cycle		Remarks
		When needed	Other	
Optical system	Reading glass	△		Refer to the User's Manual and this service manual for the method. The retard roller and the feed roller should be replaced after about 30,000 sheets are fed.
	CIS unit	□		
Feeding system	Retard roller	△	●	
	Feed roller	△	●	
	Registration roller	△		
	Follower roller (Registration)	△		
	Platen roller	△		

Table 4-2

CHAPTER 5

TROUBLESHOOTING

I. ERROR MESSAGES & SOLUTIONS

This machine has no error display. Error messages are displayed on the display connected to a personal computer. Contents of messages differ from one software to another. Many of them indicate problems caused by user's operation failure or document jam which users are supposed to deal with. Error messages show how to solve problems or restart operation properly. For more details, refer to the user's manual and read Help of your software. In case users can't deal with a problem, a service person should be called.

Fig. 5-1 shows the examples of error messages.

Table 5-1 shows major error messages when using a driver and Scanning Utility 2000, which are packaged with this machine.

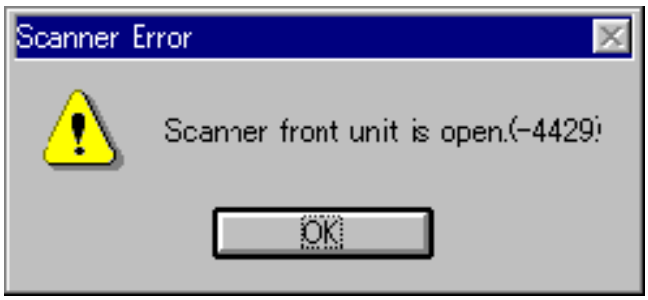


Fig. 5-1

Category	Message	Cause → Solution
Feed document	Scanner front unit is open.	Door sensor doesn't detect the front unit. →Close the front unit. →Check operation of the sensor lever.
	No page in the scanner, add page to the scanner?	Document sensor doesn't detect a document. →Set documents. →Check operation of the sensor lever.
	No page was found in the feeder.	Registration sensor detects no document. No documents fed. →Check the thickness and type of documents. →Check installation of rollers, or clean rollers. →Check position of the feed selection lever. →Check operation of the sensor lever. →Check motor connection and installation of gears.

Table 5-1(Continued)

Category	Message	Cause → Solution
Feed document	Paper jammed in the scanner, clear paper and continue.	Registration sensor detects jammed documents. →Check no jammed documents remained. →Check the thickness and type of documents. →Check installation of rollers, or clean rollers. →Check position of the feed selection lever. →Check operation of the sensor lever.
Search scanner	Can't locate SCSI device; check cable and power.	No scanner is found. →Check the power supply. →Check connection of SCSI cable. →Check the SCSI card. →Check setting of SCSI ID and the terminator. →Turn the scanner and the personal computer over again.
	Scanner is not ready. Try operation again.	No scanner is found. →Try operation again. →Restart the application.
	Unknown error.	No response, even the scanner is found. →Check the power supply. →Check connection of the SCSI cable.
Hardware	Scanner hardware problem.	Failure in the motor and/or the Control PCB assembly. →Reset the power. →Check connection of the motor. →Replace the motor and Contorol PCB assembly.
Adjust Scanner	Scanner adjustment is cancelled. Please check the following. ・Clean the scanner glass or the adjusting paper. ・Load the adjusting paper with proper size.	Adjustment results in failure. →Clean the roller and the scanner glass. →Clean the adjusting paper. →Load an exclusive adjusting paper. **Note:** Use adjusting paper packaged with this machine. If it is missing or is unusable, acquire the same one specified as a service tool.

Table 5-1(continued)

II. SERVICE MODES

1. Outline

To execute the service mode, install the software for the service mode, which is stored in the packaged setup disk in the personal computer for service use that the service personnel bring. Fig. 5-2 shows the servicemenu. The executable functions are as follow:

1) Adjust scanner: All
2) Adjust scanner: Individually
3) Hardwear checking
4) Clear counter
5) Load the firmware
6) Search scanner

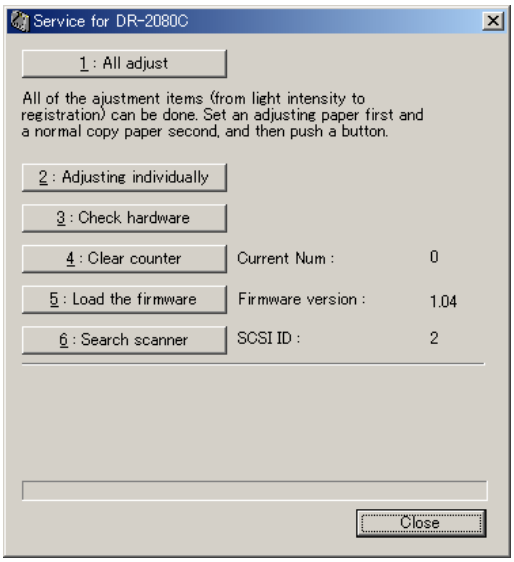


Fig. 5-2

The specification of a personal computer for this function must fulfill the following system requirements.
CPU: Pentium 133Hz or faster
RAM: At least 128MB
OS: Windows95/98/Me/XP
/NT4.0 Workstation/2000 Professional
SCSI card: Driven by ASPI(wnaspi32.dll)
Display: Display : SVGA resolution or higher

Note: ASPI(wnaspi32.dll) can be installed by installing the driver packaged with this machine. Especially, attention is required for the OS such as Windows XP, NT4.0 Workstation, and 2000 Professional.

2. How to install

Procedure to install service software:
Never install it in the user's personal computer.

1) Turn on the personal computer for the service to start OS (Windows).
2) Install the setup disk packaged with this machine.
3) Copy the folder "\Driver\Tools" in the setup disc on any drive in the personal computer for service use.

Note: To execute operation check of this machine on the personal computer for service use, you need to install the software required. Please refer to the user's manual on installation of packaged software.
However, when checking a specification such as the number of scanned document, the system requirements for a personal computer described in the User's Manual should be satisfied.

3. How to start and finish

Procedure to start the service mode:

1) Connect this machine to your personal computer with a SCSI cable.
2) Turn on this machine first, and then the personal computer.
3) Open the installed folder [Tools], and then start the file "DR2KTOOL.exe". (See Fig. 5-3)
4) Password dialogue box appears, and enter three characters as "pan" and click [OK]. (See Fig. 5-4)
5) Service menu appears.

To finish the service mode, click [Close] on the service menu on the display.

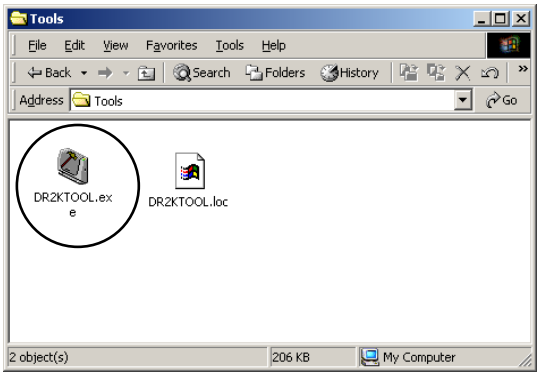


Fig. 5-3

Fig. 5-4

Note: When turning on your personal computer for the first time after connecting to this machine, the display appears requiring "new hardware" or "device driver" installation. Then, follow the procedure below:

a) When only the software on the service mode is installed, click [Cancel] to close.
b) When the packaged driver is installed, follow the instructions on the user's manual.

Note: If it is necessary to start the service mode on the user's personal computer, start up "\Drive\Tools\DR2Ktool.exe" in the packaged set-up disk. It must not be copied. Keep the name of the folder and the password confidential from the user.

4. Service menu

On the service mode display, there are buttons to select each specified mode. Each mode starts from this display.

When this machine is identified, the cumulative number of scanned document, the version number of the firmware, and the SCSI ID number are displayed.

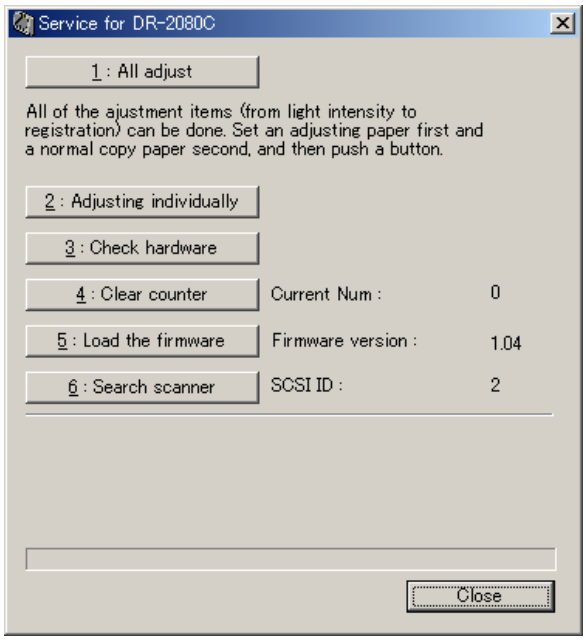


Fig. 5-5

5. Adjust scanner: All

All of the following adjustment items are done in this mode. Make sure to carry out them when CIS unit or Control PCB assembly is replaced.

Adjustment items:

- Light intensity adjustment
- Black level adjustment
- White level adjustment
- Registration adjustment

This mode specifies compensation value and registration adjustment value for adjusting image data input from this machine to a personal computer. This machine performs offst adjustment and gain adjustment on analog signals for the whole image sensor, not dispersion of particles of the image sensor. Dispersion of particles is adjusted for digital signals input to personal computers. The compensation value for this adjustment is specified in this mode. Compensation of digital signals is called shading compensation. First, perform LED light intensity adjustment for the CIS unit first in order to get the proper compensation value. Next, decide shading compensation. Then, decide registration adjustment. Registration adjustment values are timing parameters to adjust ON/OFF detection of registration sensors, and start and end of reading.

Specified image data compensation and registration adjustment values are stored in the control PCB assembly of this machine. They are transferred to a personal computer when connected to this machine, and shading compensation is carried out on each image datum inside the personal computer.

Operating procedure in this mode is following.

1) Clean the roller and the scanner glass.
2) Push the feed selection lever down to make individual pickup available.
3) Set an adjusting paper (219x175mm) packaged with this machine first, and a normal copy paper second (standard white copy paper, with the same size as the adjusting paper). Insert them properly not to cause skew.
4) Click "1. All adjust" on the service menu. The normal copy paper is delivered following the adjusting paper. At the bottom of the service menu, adjustment items and a status are displayed. Do not perform another operation in the service mode.
5) Whole process takes about three minutes. When it's finished, "All adjustment finished." appears. (See Fig. 5-6)
   An error message appears when a failure occurs. Please refer to Item d) in the "Notes."

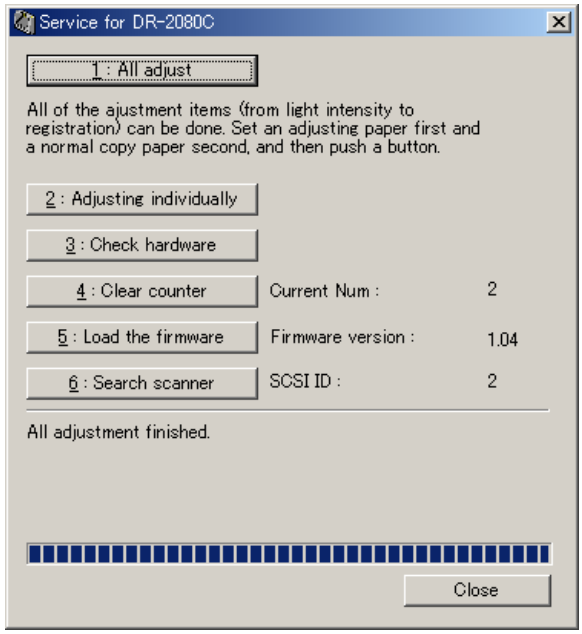


Fig.5-6

Notes:

a. Adjusting paper

This paper is used for light intensity adjustment, and black and white level adjustment. Make sure to use the adjusting paper packaged with this machine. The paper must have no stains, wrinkles, or tears. If the paper is missing or gets stained, acquire the same type of paper specified as a service tool. The tool number is TKM-0326 (Shading paper).

b. Normal copy paper

This paper is used for registration adjustment. Although there is no color requirement, use a copy paper normally used. Even if it is different in size from an adjusting paper, registration adjustment can be done however, difference in width may cause skew. So, cut a normal copy paper into about the same size as an adjusting paper. You can set two sheets of adjusting paper.

c. Scanner adjustment for users

Scanner adjustment for users (DR-2080C Adjustment Tool) makes black and white level adjustment in the service mode. Light intensity adjustment and registration level adjustment is not done.

Please refer to the user's manual and the "Help" of the driver for handling "DR-2080C Adjustment Tool."

d. Error

Error dialogue is displayed when an adjustment is not done properly due to some reason such as the adjusting paper is terribly stained, or only one sheet was found. Figure 5-7 shows examples of error dialogues. When they are displayed, click [OK]. Then, "Adjustment failed" appears at the bottom of the service menu page. (See Fig. 5-8). Click [Close] when "adjustment failed" appears, and check the adjusting paper and the operating procedure, and then restart adjustment. Refer to the article e if an error still occurs.

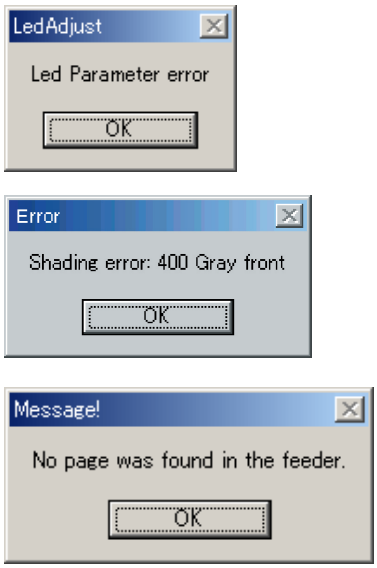


Fig. 5-7

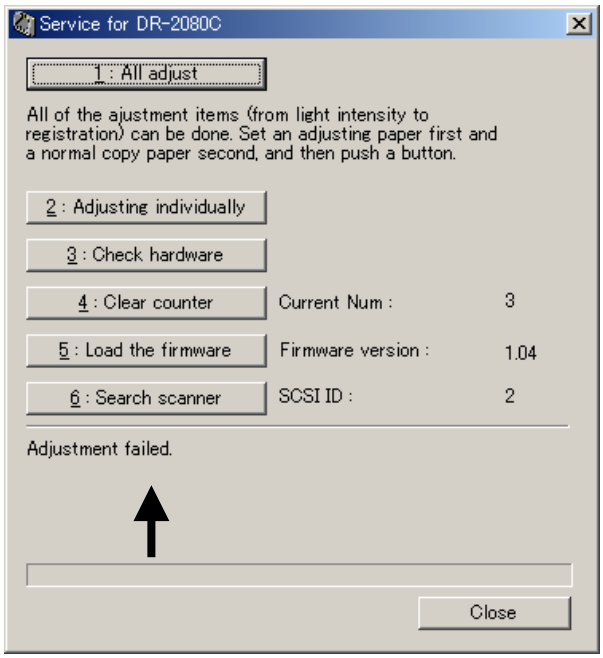


Fig. 5-8

e. Changing judgment value

If an error still occurs during normal operation, the following failures can be suspected.
In these cases, you need to clean the machine again, or replace the CIS unit, rollers, or the adjusting paper.

- The reading glass is dirty, stained, or scratched.
- Paper powder or dust is found in the paper feeding area, rollers, or roller storage areas.
- Adjusting paper is dirty, stained, or crumpled.

If replacement parts are not available and the user needs to use this machine at once, there is a temporary measure to reduce the error judgment value a little. This involves making a setting file in which a new error judgment value is described. The procedure is as follows:

1) Open a text editor, such as "Notepad."
2) Type the following settings.

```
[lab]
cmpnb_slice=10
cmp600_slice=30
cmp600img_slice=30
```

3) Set the file name to "DR2KTOOL.ini," and store the file in the folder in which the file for the service mode, "DR2KTOOL.exe," is stored.
4) Start up the service mode, and adjust the scanner.
5) View the scanned image. If you find that the quality of the image is inferior, explain the reason to the user.
6) After replacing parts, delete the setting file you made, and then adjust the scanner.

The defaults of a judgment value are;
cmpnb_slice=7
cmp600_slice=10
cmp600img_slice=20

6. Adjust scanner: Individually

The scanner adjustment and other functions can be carried out individually in this mode. When making a scanner adjustment in the field, click "All adjust" previously mentioned. However, "4. Registration adjustment" or "5. Set counter" should be done in this mode.

a. Registration adjustment

Only when the head or the end of the image scanned has any defect, "4. Registration adjustment" should be done in this mode. The procedure is as follows:

1) Set a sheet of A4 or LTR sized normal paper (standard white copy paper) on the document feed opening. Set it properly to avoid skew.
2) Click "2. Adjusting individually" on the service menu.
3) The adjustment display appears, and click "4. Registration adjustment". (See the Fig.5-9)
4) The normal paper is delivered, and adjustment begins. The status is displayed at the bottom of the page.
5) The whole process takes about twenty seconds. When it's finished, "Registration adjustment finished" appears. (See Fig. 5-10)

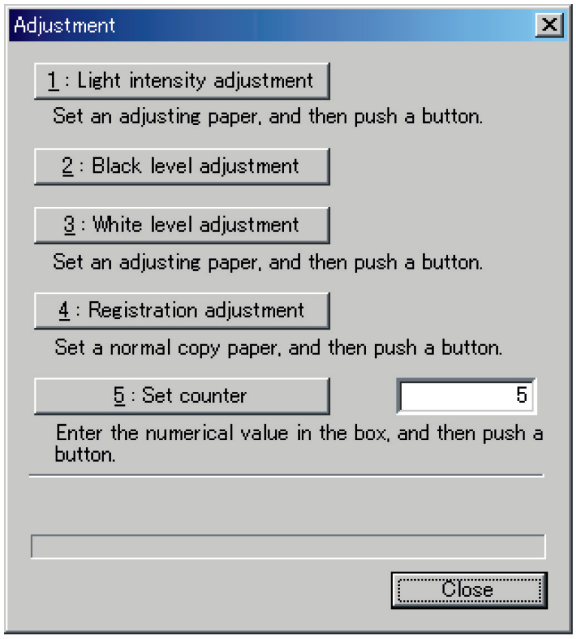


Fig. 5-9

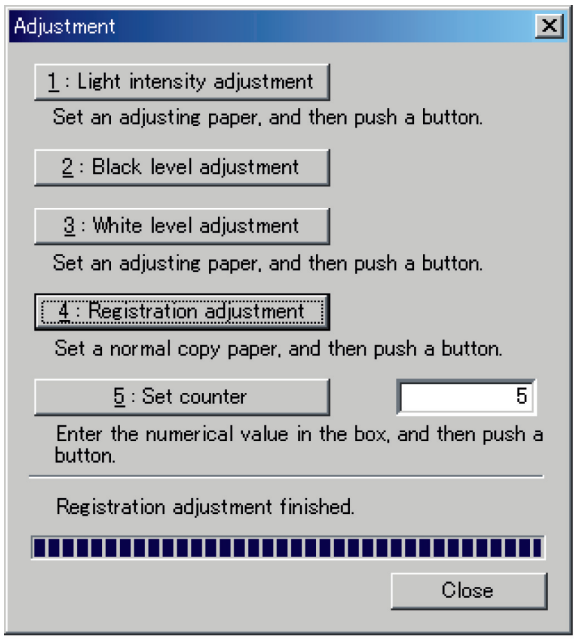


Fig. 5-10

b. Set counter

Only when a new numerical value is set, click "5. Set counter" in this mode. When the Control PCB assembly is replaced, the counter should be reset to the value before replacement. The procedure is as follow:

1) Click "2. Adjusting individually" on the service menu.
2) When the adjustment menu appears, enter the number of pages to be adjusted in the dialogue box on the right hand side of "5. Set counter".
3) Click "5. Set counter". Status is displayed at the bottom of the page.
4) When it's finished, "Set counter" appears. (See Fig. 5-11)

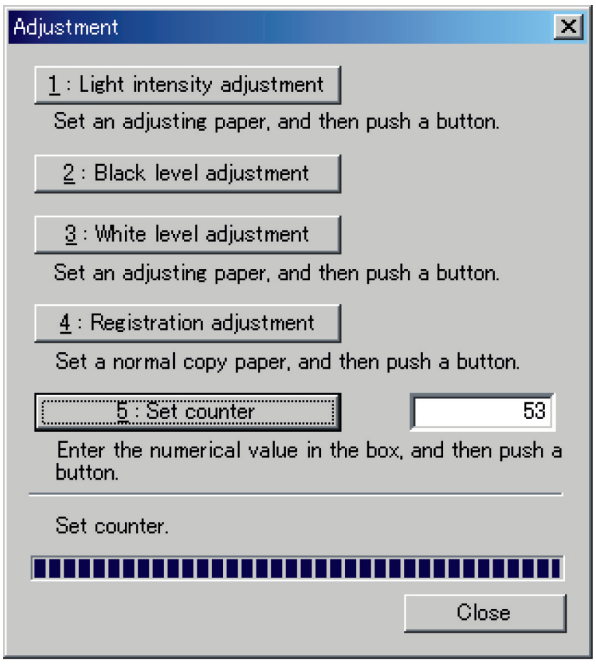


Fig. 5-11

7. Hardware checking

The operation of the I/O sections allocated to each port is checked in this mode. Click "3. Check hardware", and the Hardware checking menu appears.

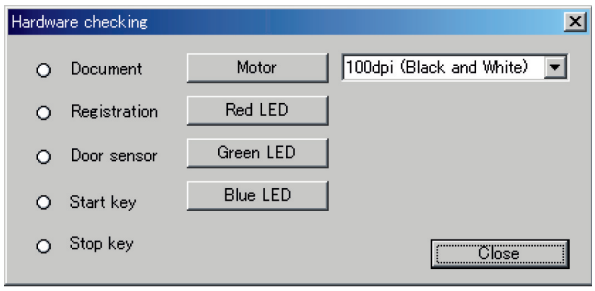


Fig. 5-12

Each procedure and operation is as follow:

1) Sensor and key switch
   When it's ON, the white circle [○] located on the left side of each title changes into a red circle [●]. Operation condition can be checked by trying to operate the equipment.
2) Motor
   Click "Motor", and it begins to operate. To stop it, cancel the selection. You can change operation speed on the selection box located on the right side. Operation condition of the motor can be checked by trying to operate the equipment.
3) LED
   Click "LED" of each color, and LED of the corresponding CIS unit is lit. If the selection is canceled, the light is off. This operation lets you confirm whether or not LED of the CIS unit lights normally.
4) Close
   Click [Close] to stop operation and return to the service menu screen.

Note: The feeding process can be checked without a personal computer. For details, refer to "Chapter 2 III-4. Special feed mode. "

8. Clear counter

A cumulative counter to show the number of delivered paper is set to [0] in this mode. This mode isn't necessary in the market. Use the mode only for some special reasons to set the counter [0]. The procedure is as follow:

1) Click "4. Clear counter" on the service menu.
2) When it's finished, "Counter cleared" appears. (See Fig. 5-13)

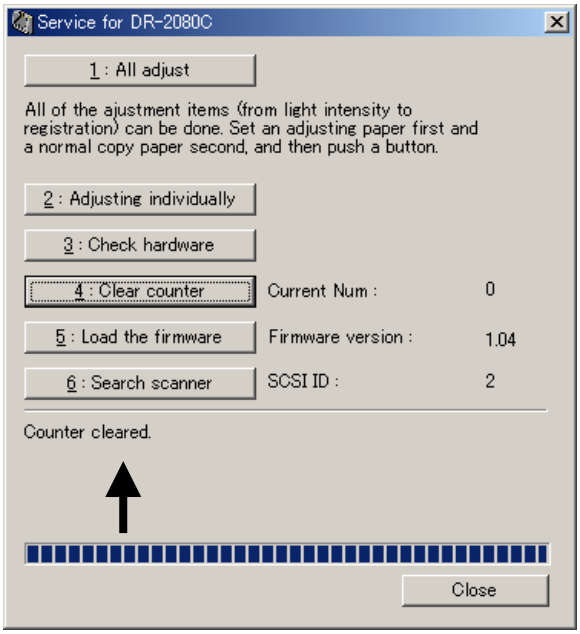


Fig. 5-13

9. Load the firmware

Firmware is changed in this mode. For details, refer to service information provided when firmware is changed. Do not misuse this mode.

The outline of the procedure is as follow:

1) Click "5. Load the firmware" on the service menu.
2) The screen is displayed requiring the file in which firmware is stored.
3) Select and open the file.
4) The firmware is loaded on this machine.
5) It is indicated that the roading has finished.

10. Search scanner

This mode is used if a personal computer cannot locate a scanner. When items mentioned in the article "3. How to start and finish" are carried out properly, the personal computer will find this machine and there is no need to use this mode.

Note: If this machine has been identified, the cumulative counter, the version number of firmware and the SCSI ID number are displayed on the right side of the service menu screen.

All you have to do is click "6. Search scanner". If no scanner is found in this mode, carry out the procedure on "3. How to start snd finish" again.

III. OPERATION TROUBLESHOOTING

1 Power does not come ON

The power indicator is not lit.

Cause/Faulty Location	Step	Check Item	Result	Action
Connection of power code	1	Power code connected properly?	NO	Connect power code properly.
Power switch	2	Power switch ON? Slide to " | " side to turn on.	NO	Turn the power switch ON.
Power voltage	3	Specified voltage supplied to the outlet?	NO	Explain to users it's not this machine's problem.
Replacing the AC adaptor	4	The problem was solved by replacing the AC adaptor ?	YES	Done
Control PCB assembly	5	Replacement of Control PCB assembly works?	YES	Done

Table 5-2

2 No scanner is found

The error message "Can't locate SCSI device; check cable and power" is displayed on the display connected to the personal computer.

Cause/Faulty Location	Step	Check Item	Result	Action
Power supply	1	Power ON?	NO	Turn on this machine first and then personal computer.
SCSI cable connection	2	SCSI cable connected properly?	NO	Connect properly.
Setup of SCSI ID, terminator	3	SCSI ID and terminator setup properly?	NO	Setup properly. "ID:2, Terminator:OFF" as in the initial setup.
Setup of personal computer, SCSI card	4	Personal computer and SCSI card setup properly?	NO	Setup properly. Refer to the user's manual for details.

Table 5-3

3	Document feed failure (jam, double feed, crinkled)

Cause/Faulty Location	Step	Check Item	Result	Action
Document	1	Specified document? (thickness, size, fold or curl)	NO	Use documents compliant with the apecified.
Roller	2	Retard roller and feed roller installed properly?	NO	Assemble rollers properly.
	3	Rollers clean and undeformed?	NO	Clean or replace rollers.
Parts touching documents	4	Parts touching documents installed properly? (no float or slant)	NO	Assemble properly.
	5	Is the surface touching documents smooth? (no flaw or burr)	NO	Replace inferior parts.
Driving unit	6	Abnormal sound while feeding? Any damaged or loosened belts.	YES	Adjust assembly, or replace parts.

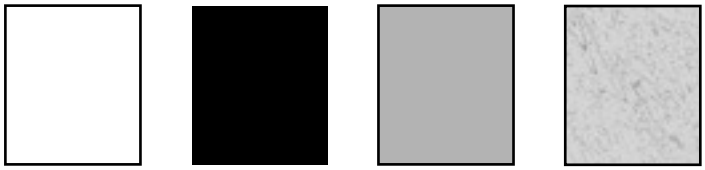
Table 5-4

IV. IMAGE TROUBLE-SHOOTING

Note 1: Image problems may occur due to user's display or printer. In that case, an adjustment from this machine doesn't work.

Note 2: The level of reproducing the image depends on types and setup of images. Especially, uneven color occurs more frequently when printing out high resolution images in color mode. Changing setup sometimes works.

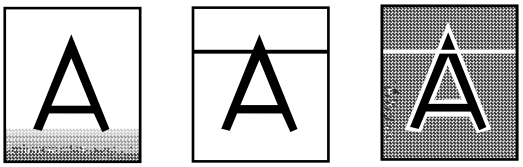
1	**Image is not output (completely white, completely black, all gray, mottled)**



Cause/Faulty Location	Step	Check Item	Result	Action
Setup of "Brightness"	1	"Brightness" setup properly?	NO	Change the setup. Change "Contrast" if necessary.
Reading glass	2	Reading glass clean?	NO	Clean the reading glass, Clean rollers if necessary.
CIS unit connection	3	CIS unit connected properly?	NO	Connect properly.
Scanner adjustment	4	Scanner adjustment works?	YES	Done
CIS unit	5	Replacement of CIS unit works?	YES	Done
Control PCB assembly	6	Replacement of Control PCB assembly works?	YES	Done

Table 5-5

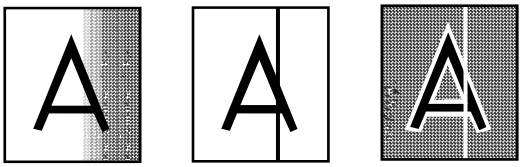
2 Uneven density, streak (main-scanning direction)



Cause/Faulty Location	Step	Check Item	Result	Action
Roller	1	Retard roller and feed roller installed properly?	NO	Install rollers properly.
	2	Stains or deformation?	NO	Clean or replace rollers.
Gear, belt	3	Rotate smoothly?	NO	Adjust assembly or replace parts.
Motor (M1)	4	Replacement motor works?	YES	Done
CIS unit	5	Replacement of CIS unit works?	YES	Done
Control PCB assembly	6	Replacement of Control PCB assembly works?	YES	Done

Table 5-6

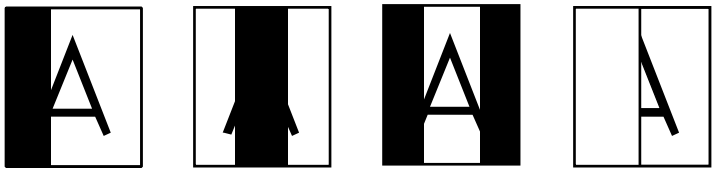
3 Uneven density, streak (sub-scanning direction)



Cause/Faulty Location	Step	Check Item	Result	Action
Reading glass	1	Reading glass clean?	NO	Clean the reading glass. Clean rollers if necessary.
Scanner adjustment	2	Scanner adjustment works?	YES	Done
CIS unit	3	Replacement of CIS unit works?	YES	Done
Control PCB assembly	4	Replacement of Control PCB assembly works?	YES	Done

Table 5-7

4	Part of image is not output



Cause/Faulty Location	Step	Check Item	Result	Action
Scanner adjustment	1	Scanner adjustment works?	YES	Done
CIS unit	2	Replacement of CIS unit works?	YES	Done
Control PCB assembly	3	Replacement of Control PCB assembly works?	YES	Done

Table 5-8

V. AFTER REPLACING PARTS

This machine has some parts to be adjusted after replacing or reassembling.

1. Control PCB assembly

1) Setup SCSI ID and terminator.
2) Do [All adjust] on the service mode. For details, refer to" II-5. Adjust scanner : All" .
3) Do [Set counter] if necessary. For details, refer to "II-6. Adjust scanner : Individually" .
4) When customized gamma data are used, reinstall the data.

2. CIS unit

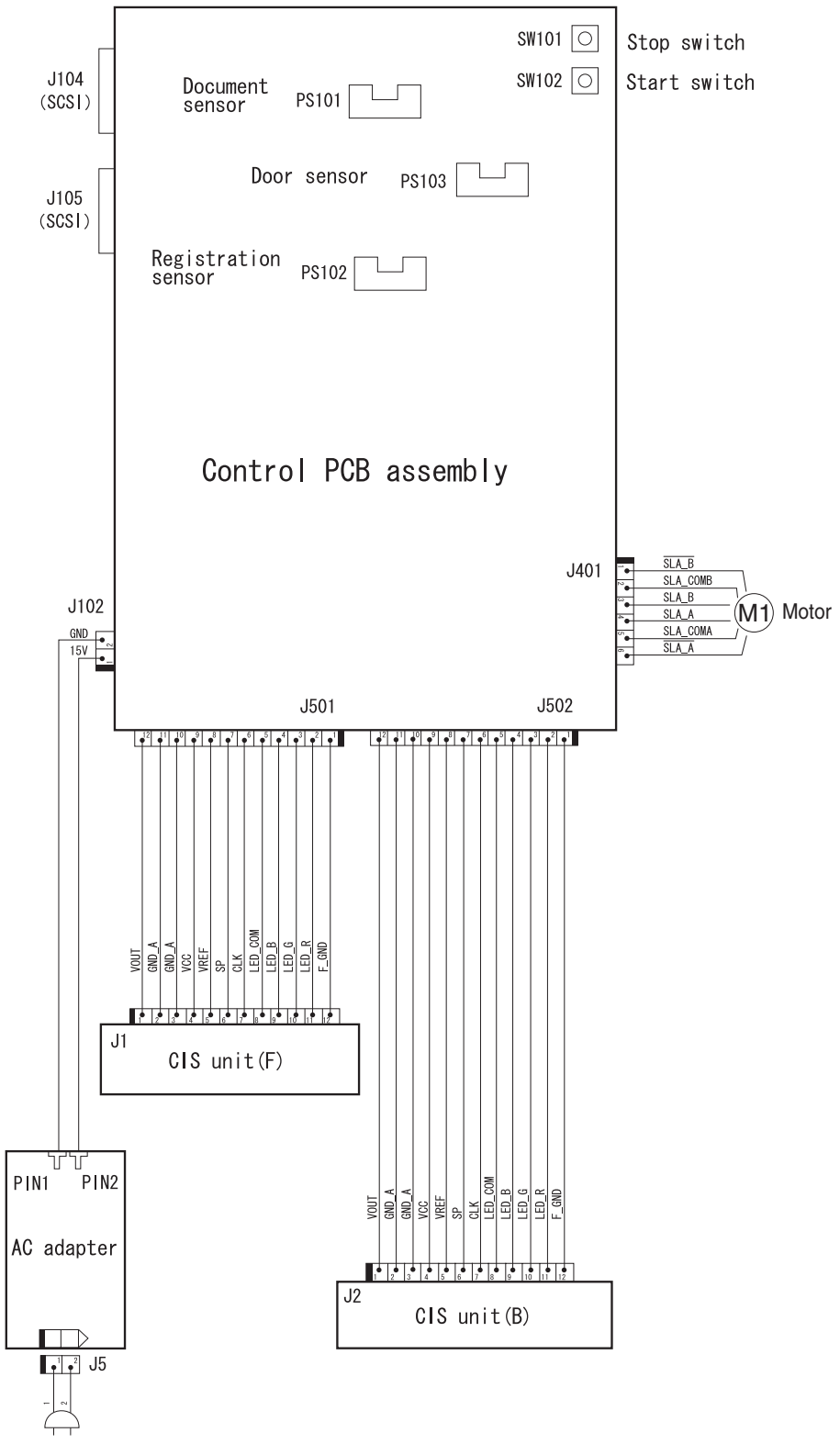
1) Do [All adjust] on the service mode. For details, refer to "II-5. Adjust scanner : All" .

3. Registration adjustment

Do [Registration adjustment] when failures occur on the head or end of scanned images after replacing or reassembling parts related to registration such as a registration sensor lever. For details, refer to "II-6. Adjust scanner : Individually"

APPENDIX

I. GENERAL CIRCUIT DIAGRAM



II. LIST OF SPECIAL EQUIPMENT

The special equipment shown below is needed for servicing.

Shading paper(TKM-0326) is the same type of adjusting paper as the one packaged with this machine. If the packaged adjusting paper is at hand, there is no need to buy any.

No.	Equipment Name	Equipment Number	Type	Rank	Note
1	Test sheet	TKM-0271	A4 Copy Size	A	• 10 sheets/set • Single sided print • For checking transfer and images
2	Shading paper	TKM-0326	Special size (219 x 175 mm)	B	• 10 sheets/set • For adjusting scanner

Note: Rank

A = Equipment that each service person must carry.

B = Equipment that can be shared among a group of 5 service persons.

C = Equipment that each workshop needs to have.

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