

CR-180

SERVICE MANUAL

FIRST EDITION

Canon

SEPT. 2003

MY8-13A0-000

COPYRIGHT © 2003 CANON ELECTRONICS INC.

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

This Service Manual describes necessary basic information for field service and maintenance for maintaining the product quality and functions of the Check Reader CR-180.

Contents

Chapter 1: General description

Features, specifications, name of parts, operation method

Chapter 2: Functions and operation

Description of operation of machine system and electrical system by function

Chapter 3: Disassembly and reassembly

Disassembly method, reassembly method

Chapter 4: Installation and maintenance

Installation method, maintenance method

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.

CONTENTS

CHAPTER 1 GENERAL DESCRIPTION

I. FEATURES	1-1	V. NAME OF PARTS.....	1-9
II. SPECIFICATIONS	1-2	VI. EXPLANATION OF OPERATION	1-11
III. EXPLANATION OF MICR	1-6	VII. REGULAR INSPECTION BY USERS	1-13
IV. PRECAUTIONS	1-8		

CHAPTER 2 FUNCTIONS & OPERATION

I. OUTLINE.....	2-1	V. POWER SUPPLY	2-19
II. READ SYSTEM	2-6	VI. ELECTRIC PARTS PLACEMENT	2-21
III. FEED SYSTEM.....	2-10	VII. CONNECTORS, SWITCHES, AND LEDS	
IV. CONTROL SYSTEM.....	2-14	FOR EACH PCB	2-24

CHAPTER 3 DISASSEMBLY & REASSEMBLY

I. EXTERNAL COVERS	3-1	IV. DRIVE-RELATED	3-22
II. FEED-RELATED	3-8	V. ELECTRICAL	3-29
III. READ-RELATED.....	3-19		

CHAPTER 4 INSTALLATION & MAINTENANCE

I. INSTALLATION	4-1
II. MAINTENANCE	4-4

CHAPTER 5 TROUBLESHOOTING

I. ERROR DISPLAY AND REMEDY	5-1	IV. IMAGE TROUBLESHOOTING.....	5-19
II. SERVICE MODE.....	5-3	V. MICR TROUBLESHOOTING	5-21
III. OPERATION TROUBLESHOOTING	5-16	VI. AFTER REPLACING PARTS	5-22

APPENDIX

I. GENERAL CIRCUIT DIAGRAM.....A-1	III. LIST OF SPECIAL TOOLS.....A-3
II. LIST OF SIGNAL NAMESA-3	

CHAPTER 1

GENERAL DESCRIPTION

I. FEATURES	1-1	V. NAME OF PARTS	1-9
II. SPECIFICATIONS.....	1-2	VI. EXPLANATION OF OPERATION	1-11
III. EXPLANATION OF MICR	1-6	VII. REGULAR INSPECTION BY USERS....	1-13
IV. PRECAUTIONS	1-8		

I. FEATURES

1. **High-speed duplex scanning**
180 sheets/minute (American checks)
2. **Magnetic ink characters (MICR) reading**
Reading of E13B/CMC7 MICR fonts with magnetic head
3. **Dual pockets sorting**
4. **Automatic check alignment with jogger**
5. **Endorsing with imprinter (option)**

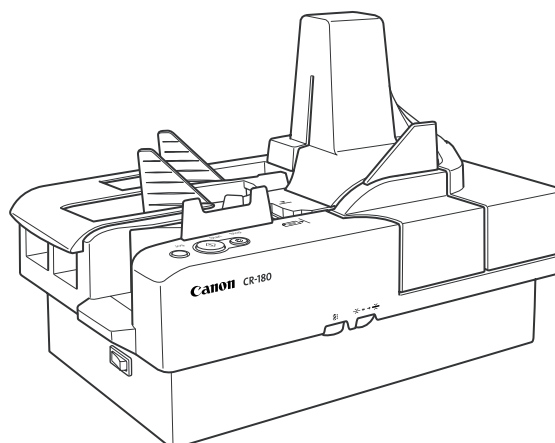


Figure 1-101

Windows is a registered trademark of Microsoft Corporation in the U.S. and other countries. Other company names and products names mentioned in this manual are registered trademarks or trademarks of respective companies.

II. SPECIFICATIONS

1. Appearance/Installation

No.	Item	Specifications
1	Type	Desktop type document feed scanner
2	Product models	1) 100 VAC, 50/60 Hz 2) 120 VAC, 60 Hz 3) 220 to 240 VAC, 50/60 Hz
3	Rating power consumption/current	1) 100 V model: 35 W 2) 120 V model: 0.6 A 3) 220 to 240 V model: 0.5 A Note: "EnergyStar" available. In sleep mode: 12 W or less
4	Performance-guaranteed environment	15 to 27.5 °C (59 to 81.5 °F) 25 to 75% RH Note: No condensation allowed.
5	Noise	1) Sound power level In standby mode: 4.0 B (40 dB) or less In operating mode: 7.5 B (75 dB) or less 2) Sound pressure level: Bystanders In standby mode: 40 dB or less In operating mode: 61 dB or less
6	Dimensions	399 (W) × 242 (D) × 271 (H) mm
7	Weight	Approx. 6.3 kg
8	Interface	1) SCSI-3 (Ultra SCSI compatible) 2) USB 2.0 (Hi-Speed compatible)
9	Bundled software	1) ISIS/TWAIN driver 2) Scanning Utility for CR-180
10	Expected product life	One of the following two items, whichever comes first. 1) 5 years 2) Sheets fed: 24,000,000 sheets (American check) However, some parts must be replaced.
11	Installation	By service technician
12	Ink cartridge	Printer ink cartridges are sold separately. Use Hewlett-Packard Company product number C6602x.

Table 1-201

2. Image Reading

No.	Item	Specifications
1	Type of sensor	Contact Image Sensor (CIS)
2	Picture element	Density of element: 300 dpi, Effective elements: 1404 (118 mm)
3	Sensor output	Two lines analog output
4	Light source	3-color (RGB) LED: Each one LED White (W) LED array
5	Typical wave length	R: 620 nm, G: 530 nm, B: 467 nm
6	Dropout color	Available (R/G/B): Lit selected color LED Note: Lit B and G LED at Red color-emphasize mode.
7	Scanning side	Simplex (front side), Duplex
8	Scanning size (typical = L × H)	1) American check: 157 × 70mm 2) Bill: 216 × 93mm 3) Check 1: 169 × 84mm 4) Check 2: 169 × 76mm 5) Maximum: 230 × 118mm
9	Scanning size (atypical)	Auto-detection 1) Main-scanning direction (H): Min. 60 mm, Max. 118 mm 2) Sub-scanning direction (L): Min. 120 mm, Max. 230 mm
10	Output data style	Grayscale (256 levels), 200 × 200 dpi

Table 1-202

3. MICR/OCR Reading

No.	Item	Specifications
1	Type of sensor for MICR	Magnetic head
2	Reading width of MICR	9 mm
3	Reading fonts of MICR	E13B/CMC7
4	Reading fonts of OCR	E13B/OCR-A/OCR-B/CheckWriter/Typical text font

Table 1-203

4. Documents Feed

No.	Item	Specifications
1	Document size	1) Height: 60 to 118 mm 2) Length: 120 to 230 mm 3) Weight: 60 to 120 g/m ² (Thickness: 0.08 to 0.20 mm)
2	Document requirements	1) Pressure-sensitive paper: Cannot be fed. 2) Carbon-backed paper: Cannot be fed. 3) Curled paper: Can be fed only if curl is 5 mm or less. 4) Creased paper: Can be fed, but crease must be straightened before being fed. 5) Remaining of perforations: Not acceptable.
3	Double feed detection	Thickness/Length
4	Pick-up storage	200 sheets (Thickness must be 20 mm or less including curls.)
5	Pick-up mode	Separation/Non-separation Exchange the modes using the lever, and adjust the thickness of separation using the dial with the main body.
6	Jogger (Organizing documents)	Available (at setting area)
7	Delivery style	Dual pockets sorting Available the sorting based on the result of MICR reading.
8	Delivery storage	200 sheets/pocket (Thickness must be 20 mm or less including curls.)
9	Feeding speed	765mm/sec
10	Reading speed	180 sheets/minute (American checks) Note: This value is based on the conditions "Black&White", "200 dpi", "Duplex", and may differ depending on a computer used and other conditions.

Table 1-204

5. Image Processing/Others

No.	Item	Specifications
1	Output mode	1) Binary (Simple binary/Error diffusion/Advance text enhanced) 2) Grayscale (256 levels)
2	Output resolution	1) 100 × 100 dpi 2) 150 × 150 dpi 3) 200 × 200 dpi 4) 240 × 240 dpi
3	Image processing	1) Brightness adjustment: 256 levels 2) Contrast adjustment: 7 levels (grayscale only) 3) Edge emphasis: 5 levels 4) Gamma correction: Standard/Custom
4	Other function	1) Self-diagnosis function 2) Cumulative counter (stored in the memory) 3) Energy-Saving mode 4) Operation buttons: Start/Stop/Jogger

Table 1-205

The specifications above are subject to change for improvement of the product.

III. EXPLANATION OF MICR

1. Outline

MICR, which stands for Magnetic Ink Character Recognition, is a system for printing with magnetic ink or magnetic toner special fonts called MICR fonts on checks, etc., reading the data thus printed, sorting, and so on.

The CR-180 is equipped with a MICR reading function in addition to its image reading function.

2. MICR Font

There are two MICR fonts, E13B and CMC7. E13B is used principally in North America and East Asia, and CMC7 is used principally in Europe and South America. These fonts and printing specifications are regulated by the ISO and other standards.

1) E13B

E13B consists of 10 numbers and 4 symbols. The characters have a height of 3 mm. Table 1-301 shows the various characters that make up this font.

2) CMC7

CMC7 consists of 10 numbers and 5 symbols. The characters have a height of 3 mm. Table 1-302 shows the various characters that make up this font.















Read Characters	Name
	Zero
	One
	Two
	Three
	Four
	Five
	Six
	Seven
	Eight
	Nine
	Transit
	Amount
	On-Us
	Dash

Table 1-301















Read Characters	Name
	Zero
	One
	Two
	Three
	Four
	Five
	Six
	Seven
	Eight
	Nine
	S-1 (Internal)
	S-2 (Amount)
	S-3 (Terminator)
	S-4 (Not Used)
	S-5 (Routing)

Table 1-302

3) Printing

Figure 1-301 shows the character string printing positions.

The dimension values are for reference only. Actual dimensions are defined by each standard. The character strings indicate the amount, routing number, account number, etc.

The 16-mm wide area from the bottom is called the "clear band". This area can contain only correct MICR character strings. Print characters in the prescribed areas within the clear band.

The character spacing, slant, and alignment tolerances are prescribed by each standard.

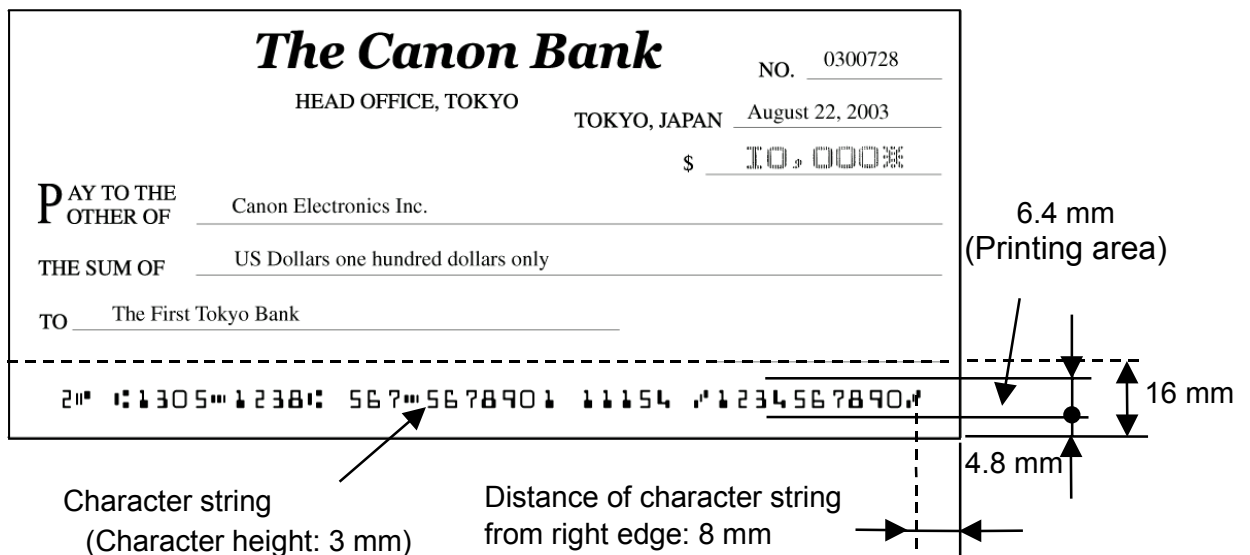


Figure 1-301

IV. 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. Electromagnetic Wave Interference Countermeasures

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

Do not change nor modify this machine. 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 re-assembled, follow the instructions described in this manual or in Service Information Bulletins.

The "CAUTION LABEL" is affixed on the rear of the machine.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

3. User's Manual

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

4. Ink Cartridge

Follow the manufacturer and distributor cautions printed on the ink cartridge package, etc.

5. Disposal

Following local regulations when disposing of the product and parts.

CAUTION LABEL (120 V model)

V. NAME OF PARTS

1. Front View

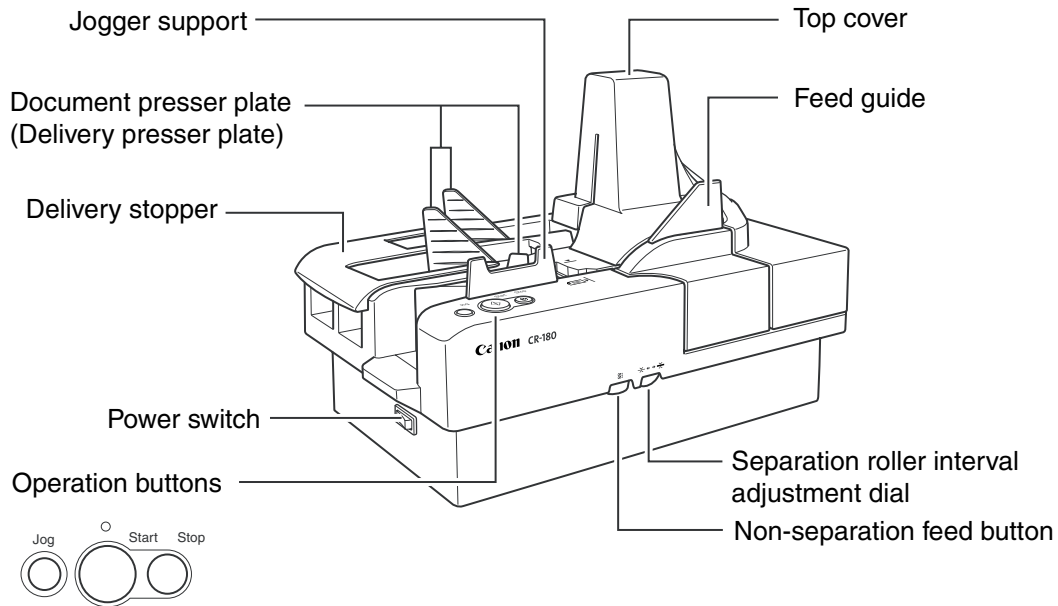


Figure 1-501

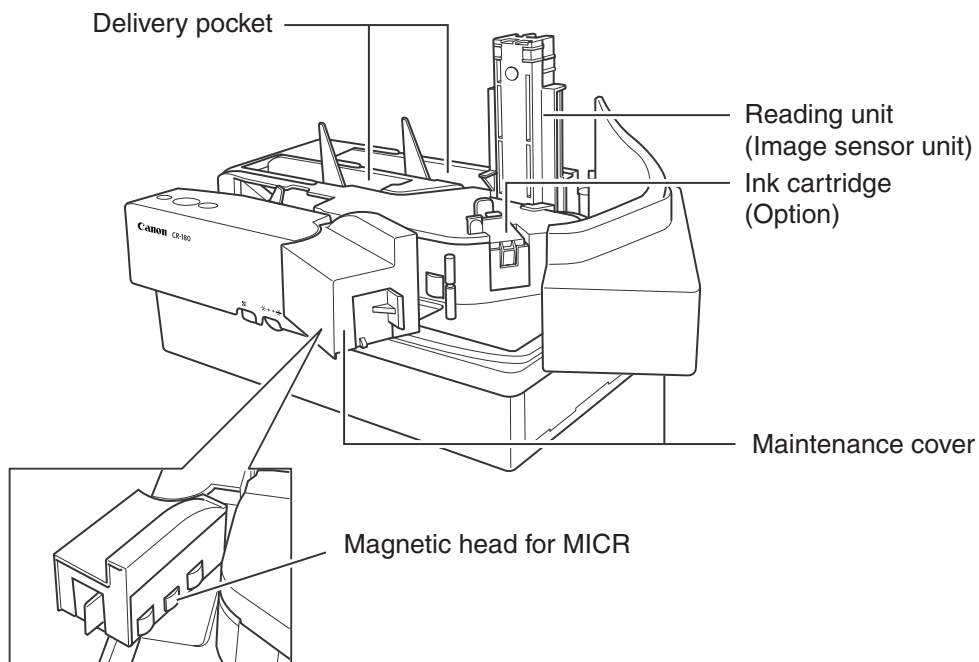


Figure 1-502

2. Rear View

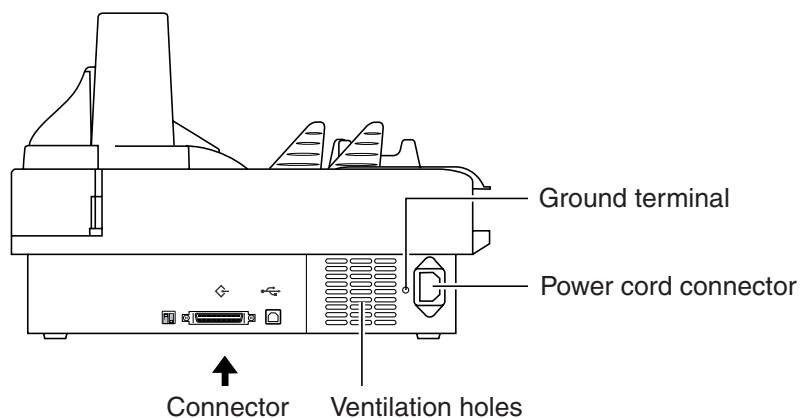


Figure 1-503

3. Connection Area

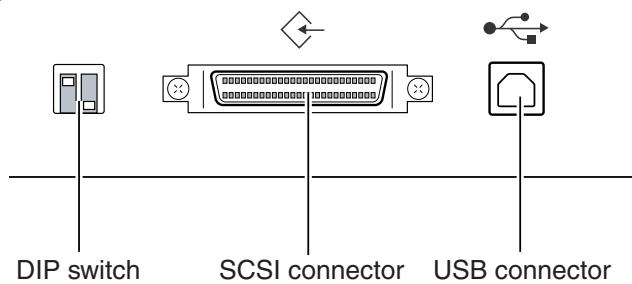


Figure 1-504

VI. EXPLANATION OF OPERATION

For details, refer to user's manuals of the CR-180 and the software to be used.

1. Basic Operation

The basic operation for operating the CR-180 is as follows.

- 1) Turn the CR-180 ON.
- 2) Turn the computer ON.
- 3) Start the software.
- 4) Set the document.
- 5) Execute operation.
- 6) End operation.
- 7) Quit the software.
- 8) Turn the computer OFF.
- 9) Turn the CR-180 OFF.

2. Operation Screen

The basic operation screens are shown below for reference.

1) Scanning Utility for CR-180

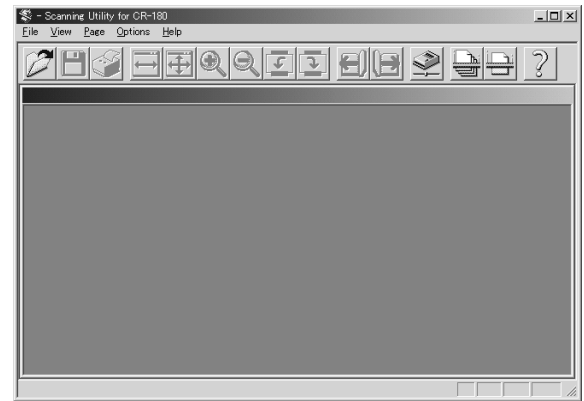


Figure 1-601

2) Scanner Setting

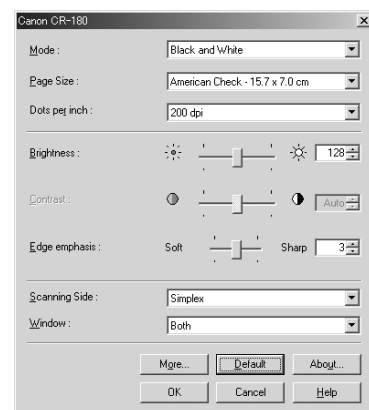


Figure 1-602

3) Advanced Settings

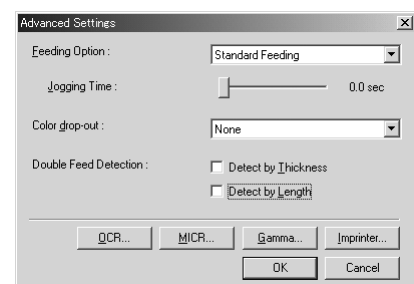


Figure 1-603

3. Document Setting

- 1) Set the documents upright so that their leading edge abuts against the end of the document setting area.

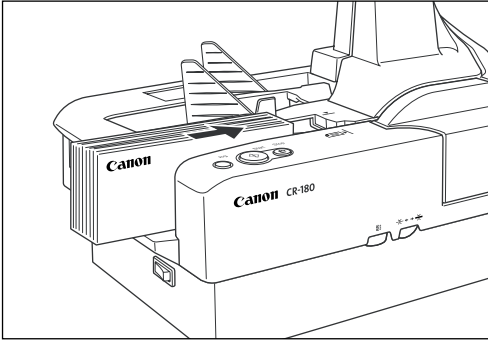


Figure 1-604

- 2) Press the Jog button as necessary to align the documents.

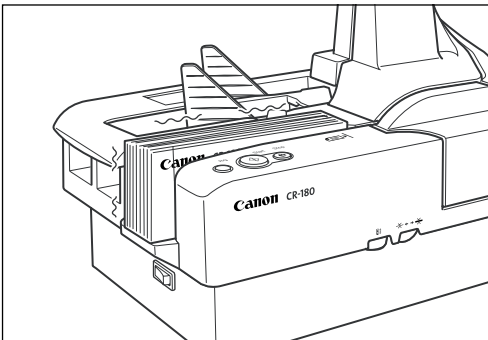


Figure 1-605

4. Jam Handling

- 1) Remove the top cover.

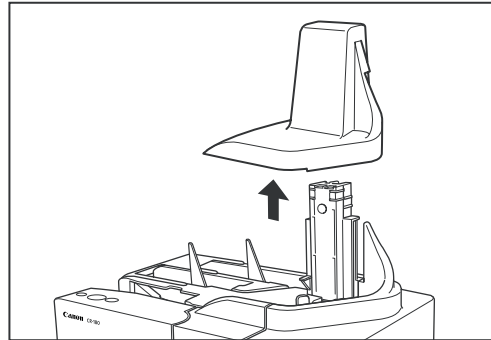


Figure 1-606

- 2) Press the Open/Close button to open the maintenance cover.

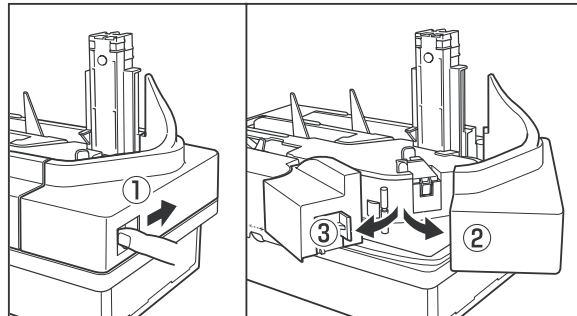


Figure 1-607

- 3) Remove the jammed document.

VII. REGULAR INSPECTION BY USERS

For details, refer to the CR-180 User's Manual.

[△ : Cleaning, ● : Replace, ☆ : Lubricate, □ : Adjust, ◎ : Check]

Unit name	Location/Parts	Intervals	Remarks
		As necessary	
Feed unit	Rollers	△	Wipe with cloth slightly moistened with water, then wipe dry. Use a cotton swab if necessary.
Reading unit	Reading glass	△	
	Magnetic head	△	Wipe the head side with a dry cloth.
Imprinter	Around area of ink drain pad	△	Wipe with cloth slightly moistened with water, then wipe dry.
	Ink cartridge	△	Gently wipe off the ink that adheres to the nozzle plate area with a lint-free cloth or tissue. A cotton swab may also be used. Do not wipe ink over the electrical contact area and do not touch this area.

CHAPTER 2

FUNCTIONS & OPERATION

I. OUTLINE.....	2-1	V. POWER SUPPLY	2-19
II. READ SYSTEM.....	2-6	VI. ELECTRIC PARTS PLACEMENT	2-21
III. FEED SYSTEM.....	2-10	VII. CONNECTORS, SWITCHES, AND LEDS	
IV. CONTROL SYSTEM.....	2-14	FOR EACH PCB	2-24

I. OUTLINE

1. System Configuration

Figure 2-101 shows the system configuration.

For the computer specifications and other operating environment details, refer to the User's Manual.

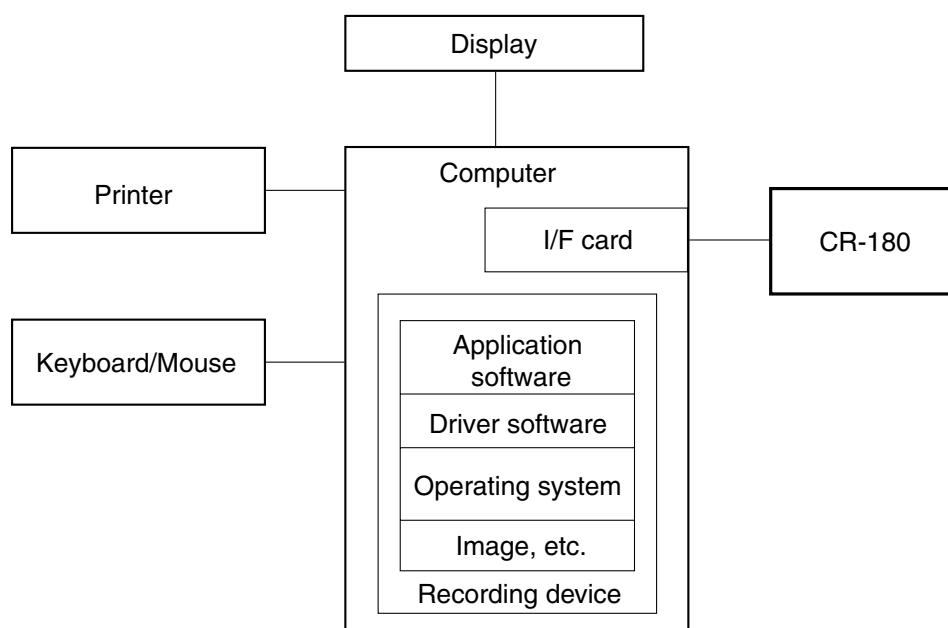


Figure 2-101

2. CR-180 Configuration

Figure 2-102 shows the configuration of the CR-180.

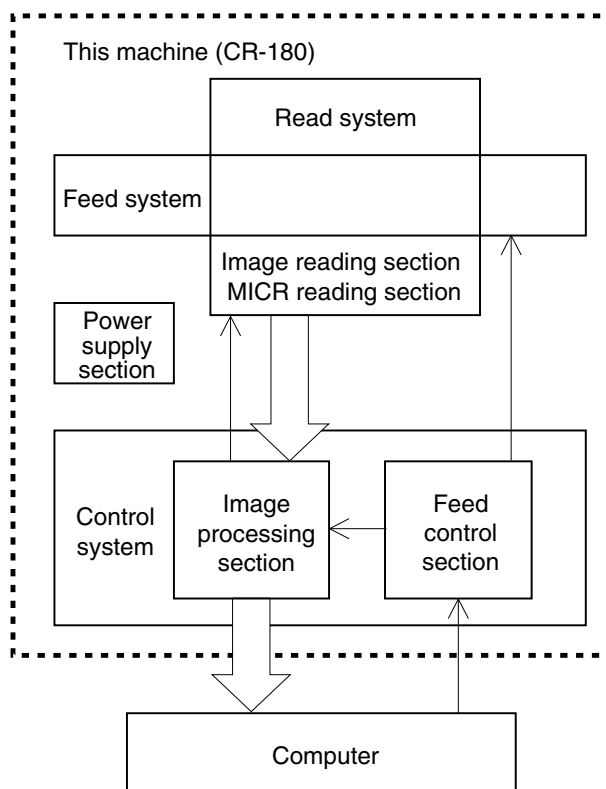


Figure 2-102

- 1) **Feed system**
This system performs from document pick-up to paper delivery.
- 2) **Read system**
This system is comprised of an image reading section that reads image data from image sensors, and a MICR reading section that reads MICR characters from a magnetic head.
- 3) **Control system**
The control system is comprised of an image processing section and a feed control section.
The image processing section controls the read system, processes the read image data, and outputs it to the computer. However, image data processing is also performed by the computer.
The feed control section controls the feed system.
- 4) **Power supply section**
The power supply section converts the AC power supplied from external into the DC power and supplies it to the control PCB.

3. Motor Drive

This CR-180 has two motors, a main motor for feeding documents (M1) and a jog motor for the jogger (M2).

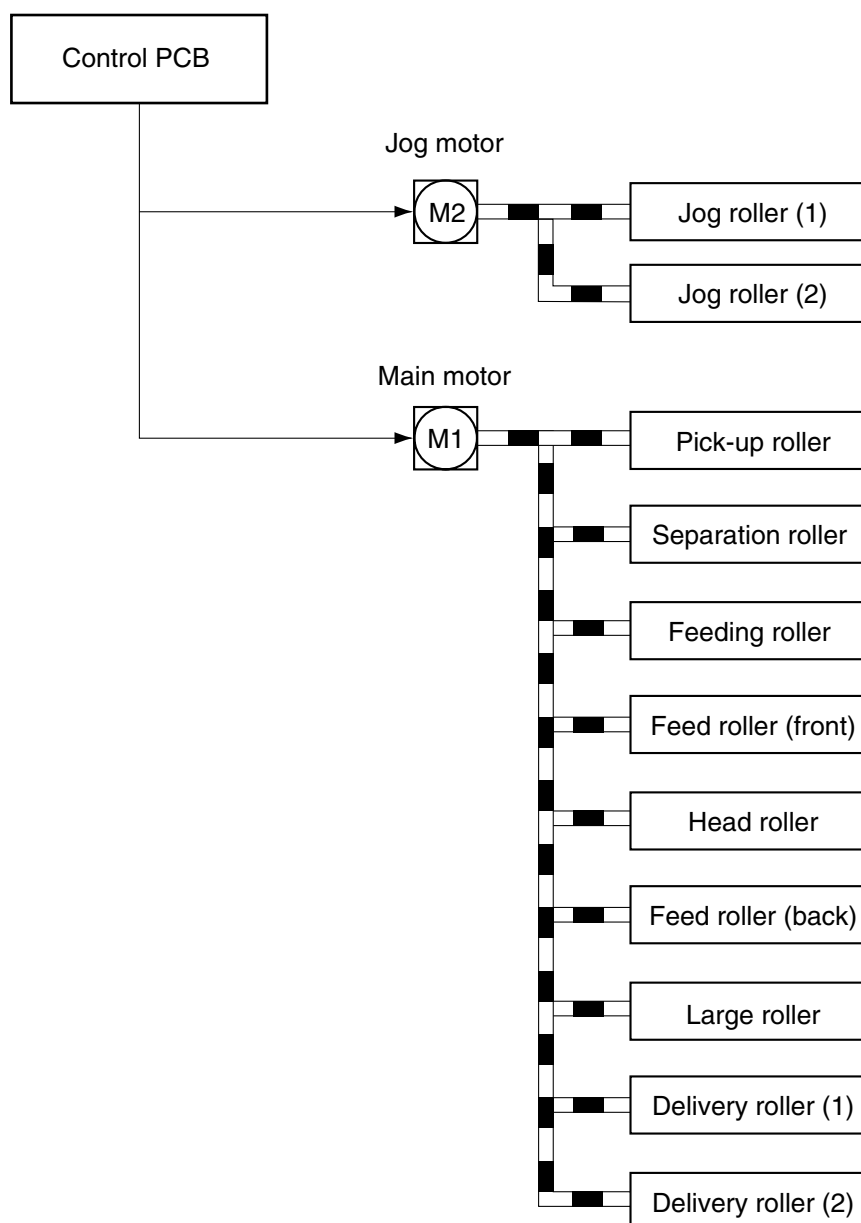


Figure 2-103

4. Electric Circuit Outline

Figure 2-104 shows the block diagram of the electric circuit. Electric control in the CR-180 is mainly performed by the two CPUs on the control PCB.

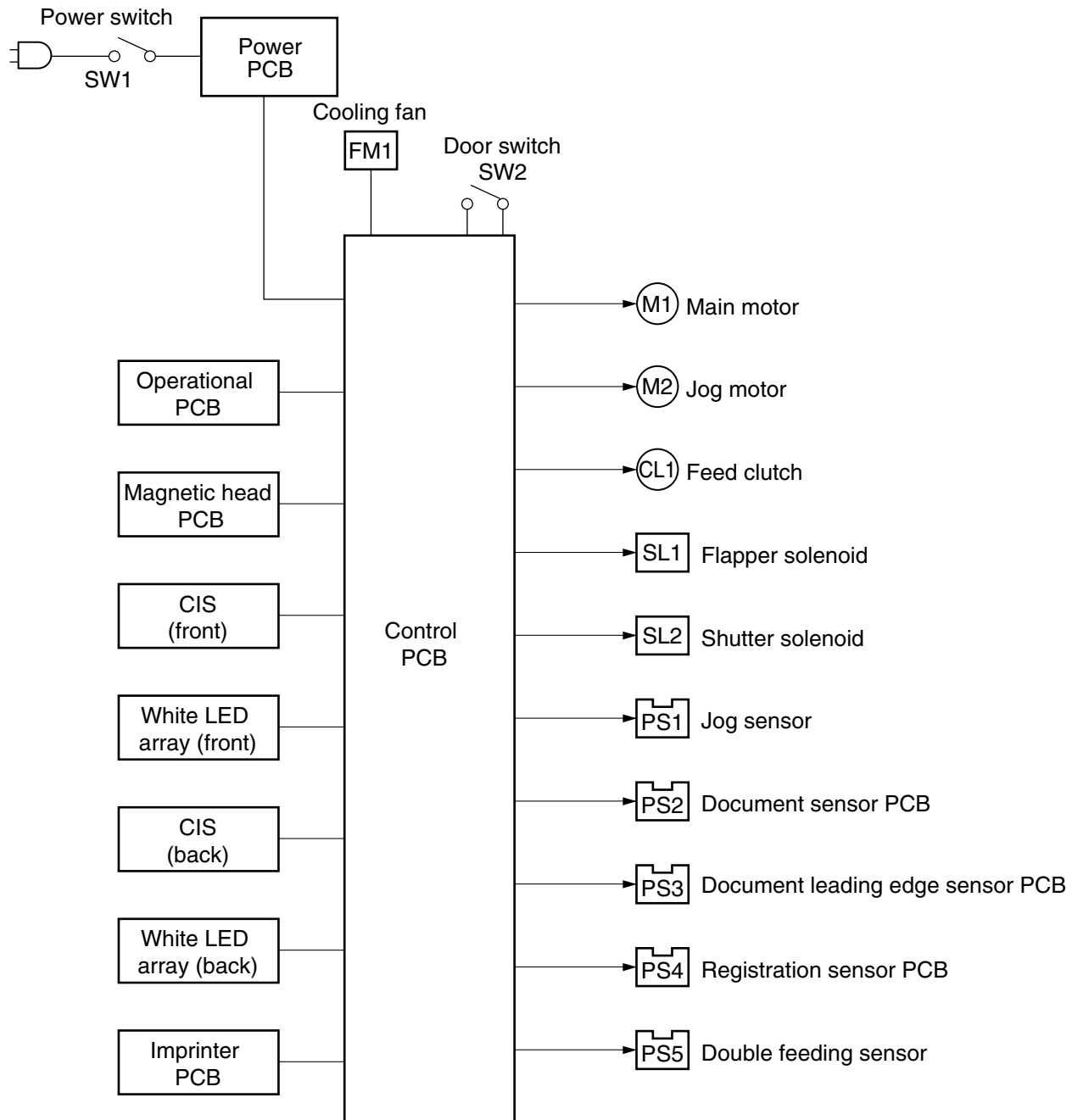


Figure 2-104

5. Timing Chart

Figure 2-105 shows the timing chart for 2 checks, both sides, 200 × 200 dpi, no pause.

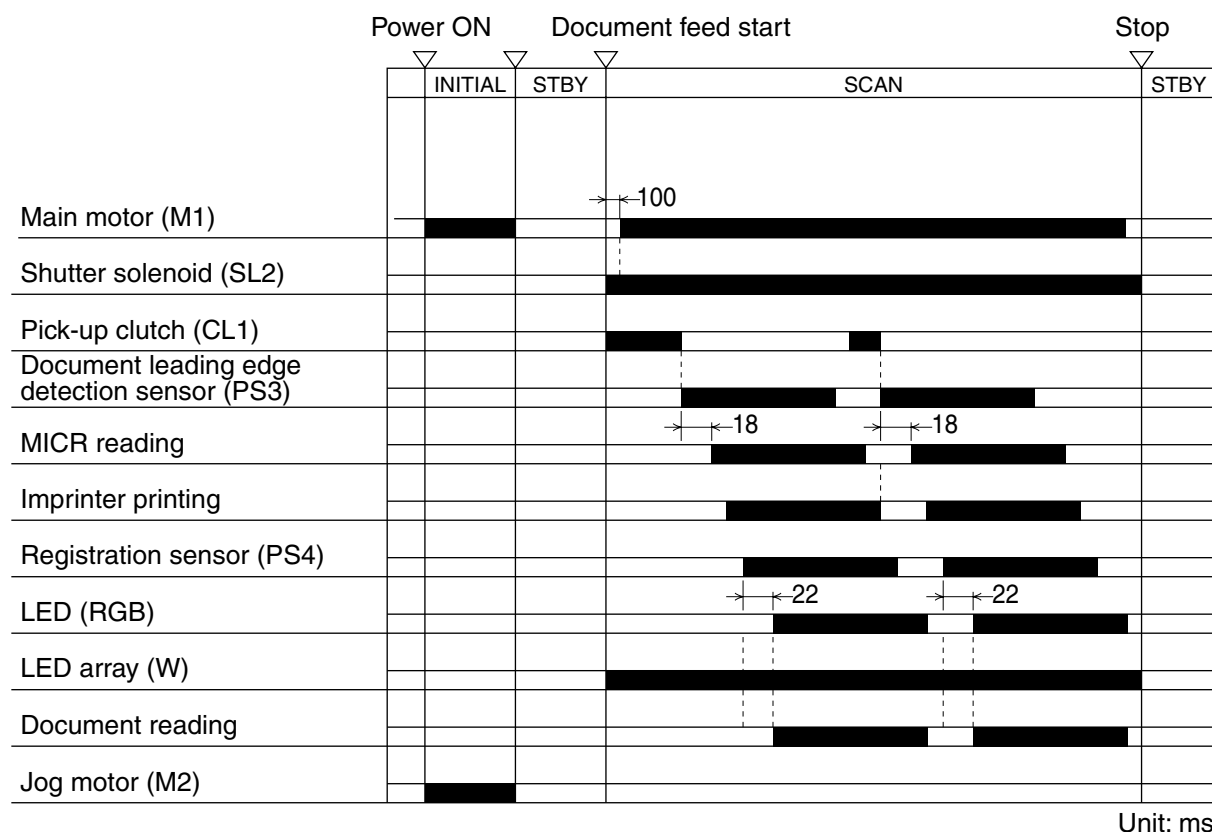


Figure 2-105

Interval		Purpose
INITIAL	Initial operation interval	Check the motor operation. Adjust the sensors.
STBY	Command receive enabled interval	Document feed acceptance preparation
SCAN	Document feed and image reading interval	<ul style="list-style-type: none"> Pick-up documents. Illuminate documents with LEDs and LED arrays, and pick up reflected light with CIS.

Table 2-101

II. READ SYSTEM

1. Outline

The read system of the CR-180 consists of an image reading section that reads the image data from image sensors, and an MICR reading section that reads MICR characters from a magnetic head.

OCR reading of the characters on documents that include MICR characters is done using a suitable application, based on the image data read with the image sensors. This function is not included in the application (Scanning Utility for CR-180) supplied with the CR-180.

2. Image Reading

Figure 2-201 shows the sectional view of the image reading section. The image sensor unit is comprised of a CIS PCB, lens array, light guide, LEDs (RGB), LED array (W), and a case. The LEDs (RGB) (one of each color) are mounted on the PCB. They serve to illuminate the documents that pass through the light guide. In addition to the LEDs (RGB), the CR-180 also incorporates a white LED array (W).

When performing normal scanning, both the LEDs (RGB) and LED array (W) are lit, making it possible to read images prone to shadows in the case of creased documents.

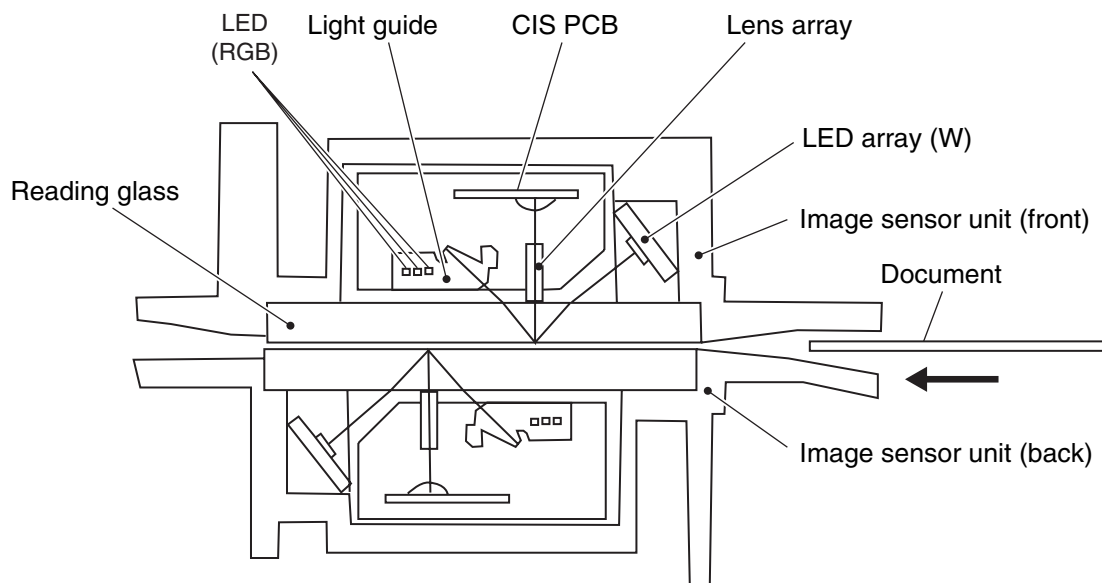


Figure 2-201

However, if scanning of embossed characters is selected, the LED array (W) does not light so as to produce shadows. In the case of dropout color and red emphasis, the most effective lighting is achieved with only the LEDs (RGB) lit, so the LED array (W) remains unlit.

The light reflected from the document passes through the lens array and shines into the sensors on the CIS PCB. The sensor pixel density is 300 dpi, and the effective pixel count is 1404 (effective length 118 mm). An A4 size CIS PCB is used for this function, but the effective pixel range is restricted according to the specifications for the CR-180.

3. MICR Reading

1) Mechanism

Figure 2-202 shows the plan view of the MICR reading section. Magnets are located in front of the feed roller, and a head roller is provided opposite the magnet head for MICR reading.

Figure 2-203 shows the sectional view of the magnetic head section. The documents are fed while in contact with the

base, which serves as the reference. Moreover, a mechanism for pressing documents horizontally against the roller so that they are in contact with the magnetic head is provided. A mechanism for arc rotation is also provided for the magnetic head.

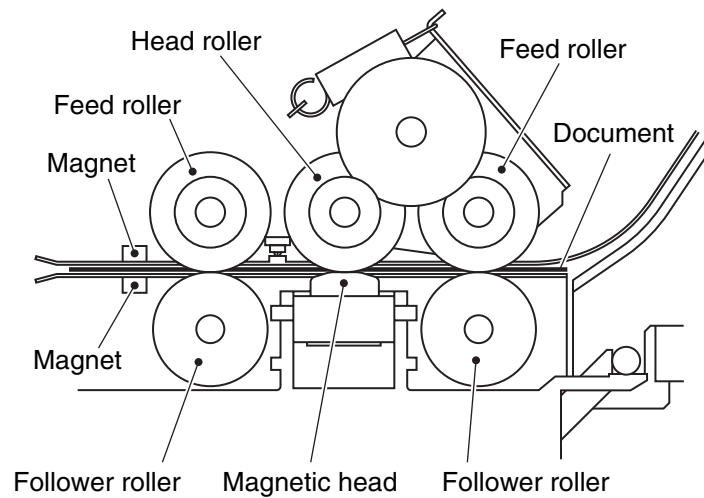


Figure 2-202

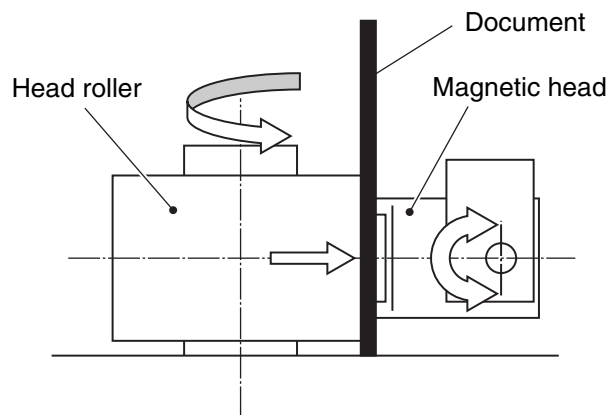


Figure 2-203

2) Data reading

Figure 2-204 shows the line magnetic force of the MICR reading section.

The magnet magnetizes the MICR characters, causing the formation of an N pole at the right of each character. When the magnetized MICR characters pass by the magnetic head, a voltage waveform is produced at the magnetic head. This analog waveform is output to the IC100 (SH2) on the control PCB. The IC100 converts the analog data into

digital data, identifies characters from the characteristics, and outputs the corresponding character code.

The reading height of the magnetic head is 9 mm, so that the MICR characters printed in the clear band can be read in their entirety.

Figure 2-205 shows a typical voltage waveform of the magnetic head.

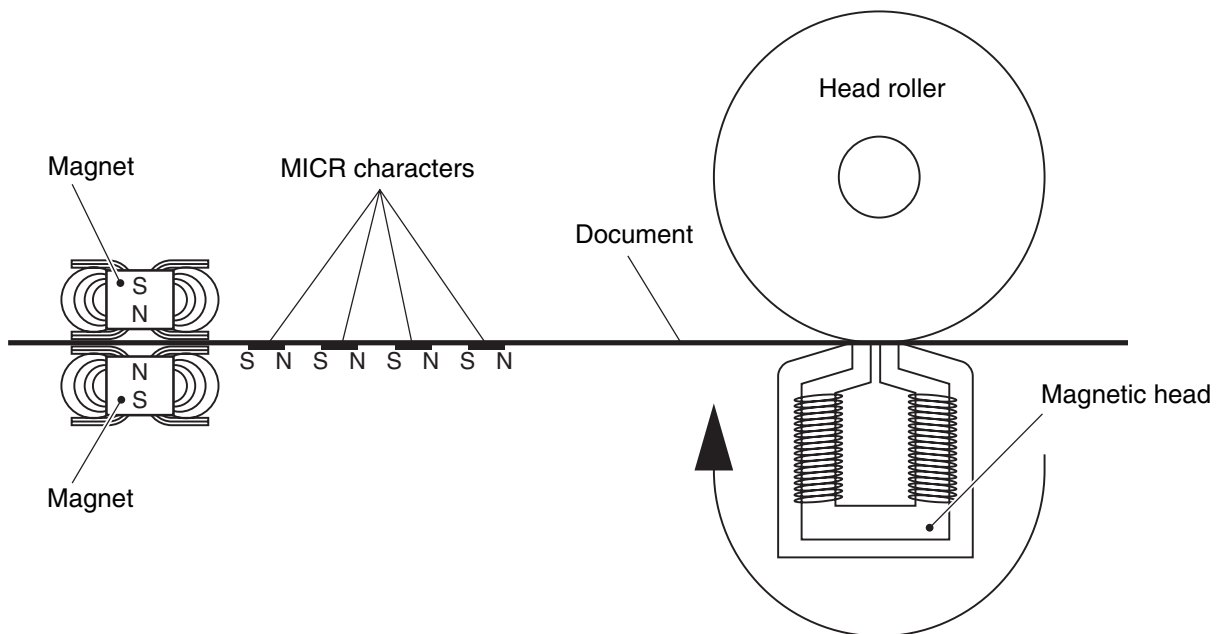


Figure 2-204

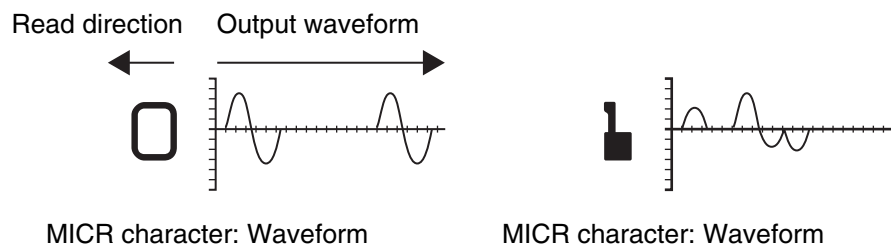


Figure 2-205

III. FEED SYSTEM

1. Outline

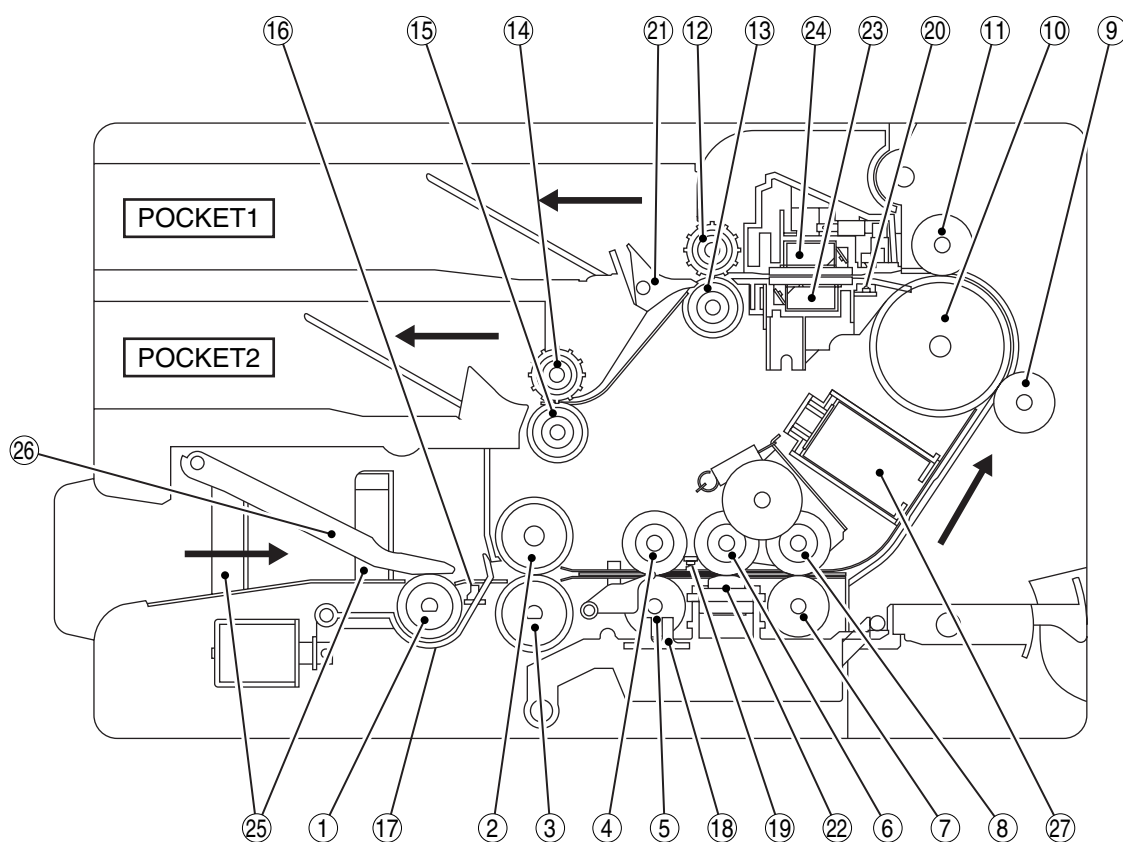
Figure 2-301 shows the sectional view of the feed system.

The CR-180 being designed for feeding documents such as checks, personal checks, and promissory notes, documents are fed, documents are fed upright so that

their bottom edge, which serves as the reference for MICR reading, is in contact with the feed plane.

The CR-180 comes with a jogger mechanism for lining up documents in the document setting section.

Picked up documents pass the separation and feeding rollers and reach the MICR reading section.



- | | | |
|-----------------------|------------------------------|-------------------------------|
| ① : Pick-up roller | ⑪ : Follower roller | ⑳ : Flapper |
| ② : Separation roller | ⑫ : Delivery follower roller | ㉑ : Magnetic head |
| ③ : Feeding roller | ⑬ : Delivery roller | ㉒ : Image sensor unit (back) |
| ④ : Feed roller | ⑭ : Delivery follower roller | ㉓ : Image sensor unit (front) |
| ⑤ : Follower roller | ⑮ : Delivery roller | ㉔ : Jog roller |
| ⑥ : Head roller | ⑯ : Document sensor | ㉕ : Document presser plate |
| ⑦ : Follower roller | ⑰ : Shutter | ㉖ : Imprinter |
| ⑧ : Feed roller | ⑱ : Double feed sensor | |
| ⑨ : Follower roller | ㉑ : Leading edge sensor | |
| ⑩ : Large roller | ㉒ : Registration sensor | |

Figure 2-301

After the MICR characters have been read, the document passes the large roller and reaches the image reading section. The large roller is slightly slanted in order to rectify documents that are traveling obliquely. After the document image has been read in the image reading section, the document is delivered into pocket 1 or pocket 2.

An imprinter section is provided between the MICR reading section and the larger roller.

These feed drives use the main motor. In addition to the main motor, a magnetic clutch is provided for pick-up roller ON/OFF switching, and a solenoid is provided for each of the shutter drive and flapper drive, respectively. A dedicated jog motor is used for the jogger drive.

Read timing and faulty document feed detection sensors are also provided along the feed path.

2. Jogger Mechanism

Figure 2-302 shows the jogger mechanism.

When the Jog button is pressed while the document sensor detects a document, the jog motor starts rotating. As a result, the document presser plate is released, and simultaneously, the jog roller starts moving. Since the profile of the jog roller is square, vibrations are transmitted to the document to align it. Following the lapse of the prescribed time, or when the Stop button is pressed, the jog motor stops. However, the jog roller is controlled by the jog sensor so that the flat part of the jog roller stops at the top side. Then the jog motor reverses and the document presser plate returns to its position.

When the power is switched ON, the CR-180 runs cycles through once, even if no documents are set.

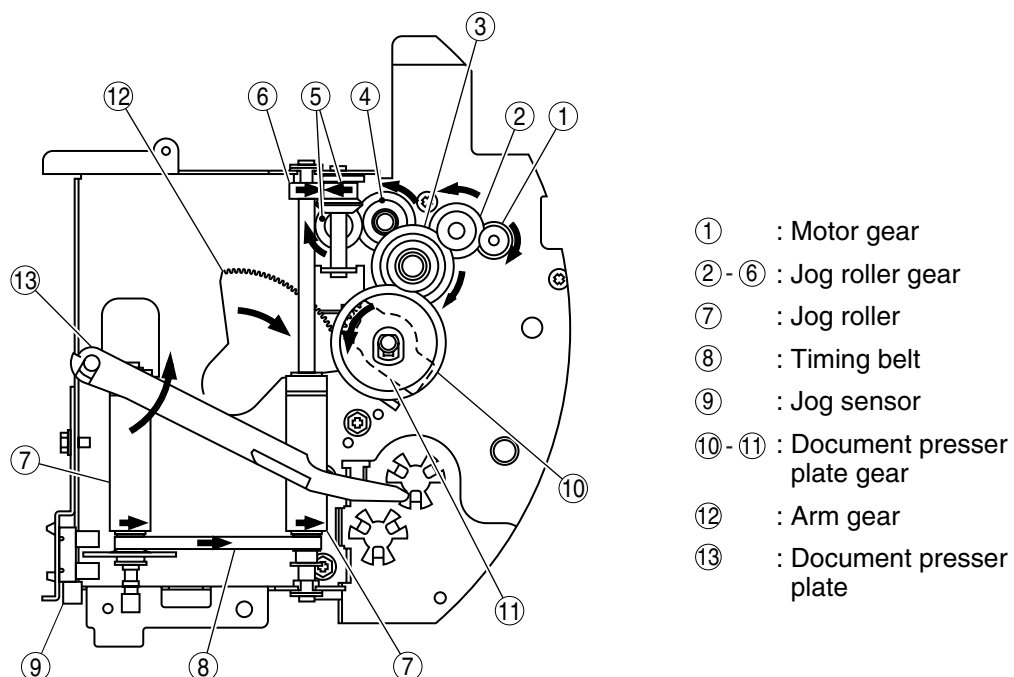


Figure 2-302

3. Separation Section Adjustment Mechanism

Figure 2-303 shows the separation section adjustment mechanism. The space between the separation roller and the feeding roller can be adjusted by changing the position of the feeding roller.

The feeding roller is supported by the feeding roller holder. Since a coil spring is attached to the feeding roller holder, it is pulled in direction F in the figure and rests against part A of the non-separation lever.

When the adjustment dial is turned clockwise, the adjustment dial is screwed in and the non-separation lever gets pushed to

toward the back, so that part A moves backward and the space between the feeding roller and the separation roller decreases.

When the adjustment dial is turned counterclockwise, the adjustment dial returns and the non-separation lever moves forward, so that the space between the feeding roller and the separation roller increases.

In the non-separation mode, by thrusting up the non-separation lever, the contact point of the non-separation lever and the feeding roller holder moves from part A to part B, so that the space increases.

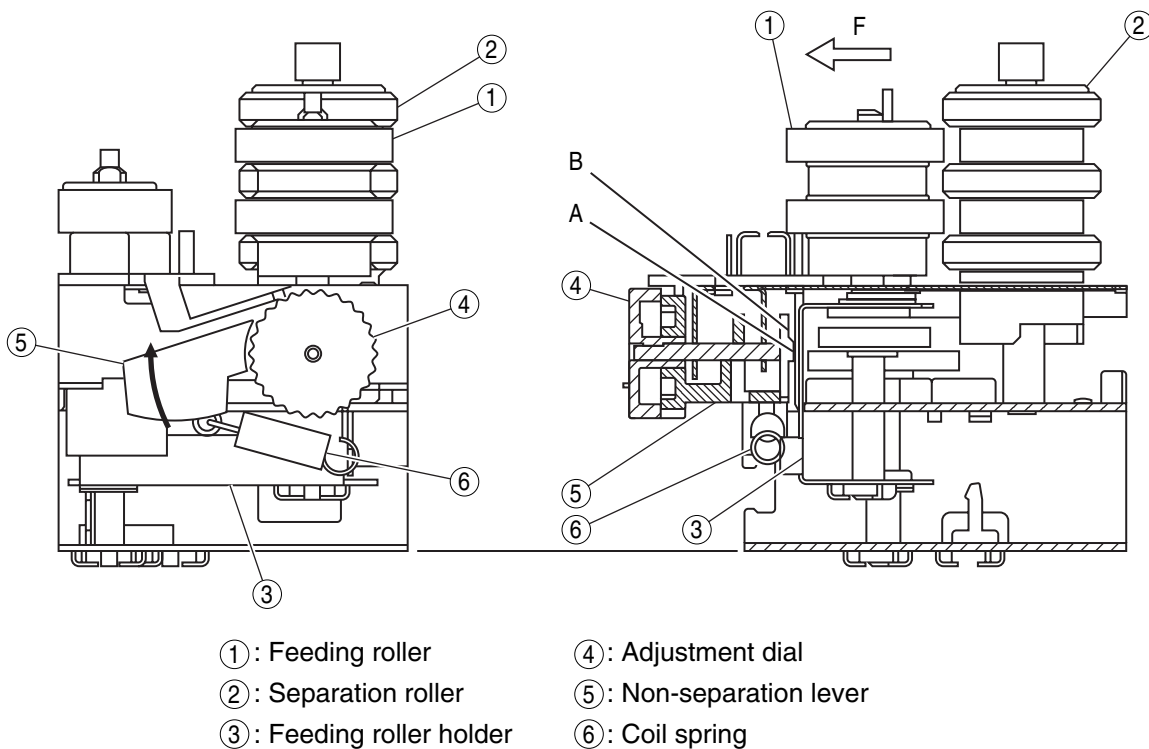


Figure 2-303

4. Fault Document Feed Detection

Figure 2-304 shows the sensor layout diagram.

The CR-180 is provided with a document sensor ① that detects documents at the pick-up section, a leading edge sensor ② that detects documents in the MICR reading section, a registration sensor ③ that detects documents in the image reading section, and a double feeding sensor ④ that detects double feeding of documents before the MICR reading area.

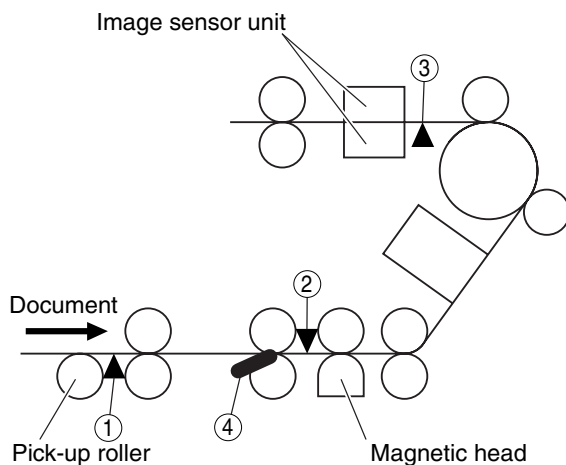


Figure 2-304

5. Mechanical Feed Mode

This mode is used to check the CR-180's feed status without using a computer.

The procedure for entering this mode is described below.

- 1) Switch the power ON while pressing the Start button.
- 2) Continue pressing the Start button. The Power lamp starts flashing.
- 3) As soon as the Power lamp starts flashing, press the Stop button.
- 4) Stop depressing the Stop button. The Power lamp flashes while the mechanical feed mode is active.

To quit this mode, switch the power OFF.

1) Document jam detection

Delay and residual jams are detected by the leading edge sensor and the registration sensor. Each sensor compares the document detection or non-detection timing with the prescribed timing and determined whether a document jam has occurred. Moreover, residual jams are judged to have occurred even if the sensor detect a document while the power is ON.

2) Double feed detection

If double feed detection is set, double feeding is detected by the double feed sensor. Using the thickness and length of the first document as reference values, if the second or subsequent documents exceed the 0.8× to 1.5× thickness range or the ± 20 mm length range, double feeding is judged to have occurred.

IV. CONTROL SYSTEM

1. Control PCB

Control of the CR-180 is performed by the control PCB.

Figure 2-401 shows the block diagram of the control PCB, and Table 2-401 lists the main IC functions.

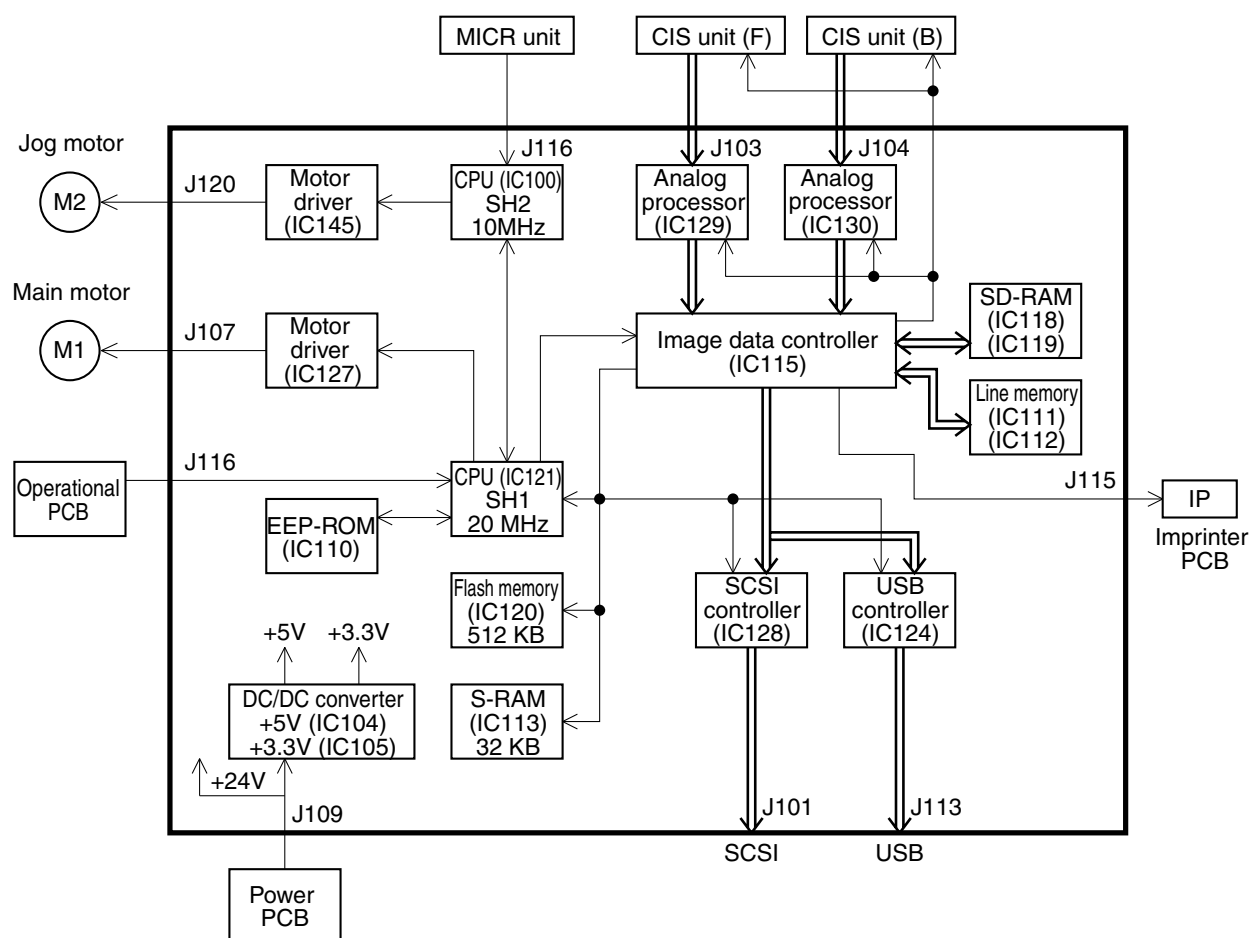


Figure 2-401

IC No.	Name	Function
IC100	CPU (SH2)	MICR, IC145 control
IC104	DC/DC converter	+5 VDC generation
IC105	DC/DC converter	+3.3 VDC generation
IC111	Line memory	For image processing
IC112	Line memory	For image processing
IC113	S-RAM	CPU work memory
IC115	Image data controller	Image data read control
IC118	SD-RAM	Image data memory
IC119	SD-RAM	Image data memory
IC120	Flash memory	Firmware and parameter memory
IC121	CPU (SH1)	General control
IC124	USB controller	USB control
IC127	Motor driver	Main motor driving
IC128	SCSI controller	SCSI control
IC129	Analog processor	Data correction & A/D conversion
IC130	Analog processor	Data correction & A/D conversion
IC145	Motor driver	Jog motor driving

Table 2-401

2. Image Processing inside CR-180

Figure 2-402 shows the block diagram of image processing inside the CR-180.

The read resolution of the CR-180 is 200 × 200 dpi. An analog signal corresponding to the density of each pixel is output from the CIS unit to the analog processor of the control PCB. Here, following offset adjustment and gain adjustment, the image data is converted to a 10-bit digital signal.

Next, the image data is sent to the image controller, and following shading correction (black correction, white correction), gamma correction, brightness adjustment, and edge emphasis are performed according to the set conditions.

Image data for which image processing has been completed is output as 8-bit grayscale data to the computer via the I/F controller.

In the case of gamma correction, brightness adjustment, and edge emphasis, the table used for image data processing is selected according to the user settings. In the case of gamma correction, a binary table and a grayscale tables corresponding to the contrast set by the user are available.

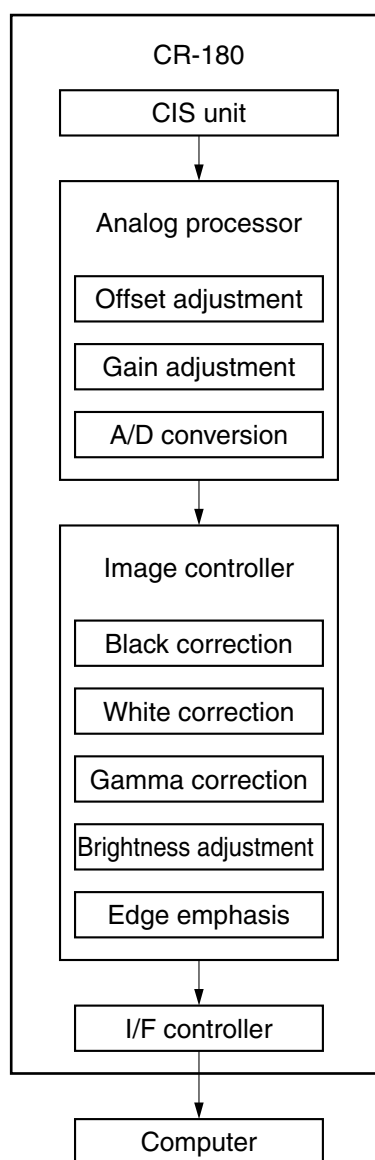


Figure 2-402

3. Image Processing in Computer

Figure 2-403 shows the block diagram of image processing in the computer.

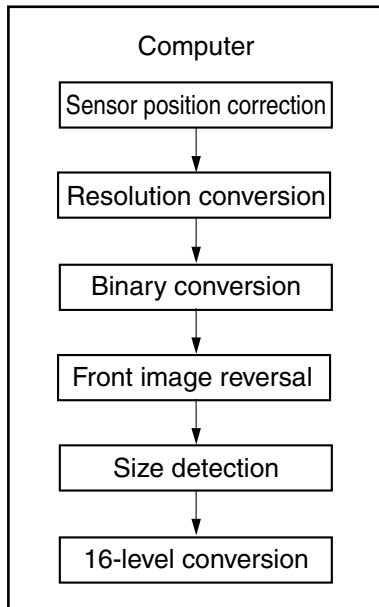


Figure 2-403

- 1) Sensor position correction
The reading positions of the front and back sensors differ by approximately 8 mm. Sensor position correction corrects the image data transmission difference by this amount.
- 2) Resolution conversion
The resolution of the image data sent from the CR-180 is 200 dpi. Resolution conversion converts the image data to image data of a resolution that matches the set resolution value.
- 3) Binary conversion
Binary conversion performs black-and-white (simple binary), error diffusion, or advance text enhancement processing. Advance text enhancement is the same background removal processing as conventional text enhancement, but it is performed with modularized software.
- 4) Front image reversal
Figure 2-404 shows the scanning directions for the front side and the back side. The scanning direction in relation to the orientation of the image on the front side

and the back side differs. If the image data of the front side is saved as is, the displayed image appears in shown in Figure 2-405. This processing is performed only for the image data on the front side, so that it assumes the proper image orientation.

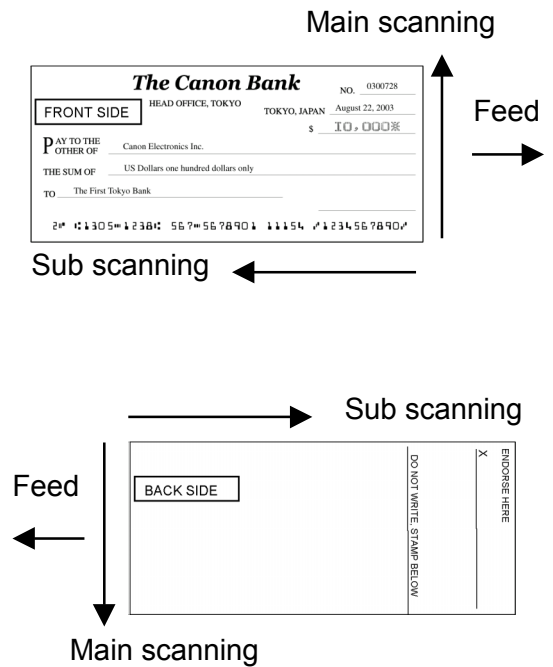


Figure 2-404

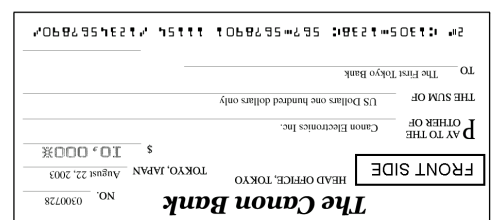


Figure 2-405

5) Size detection

When automatic size detection is selected, the image is read using the maximum size. The pixels other than the black ones are detected starting from the edge of the image, and the black pixel data outside the scanned image is discarded.

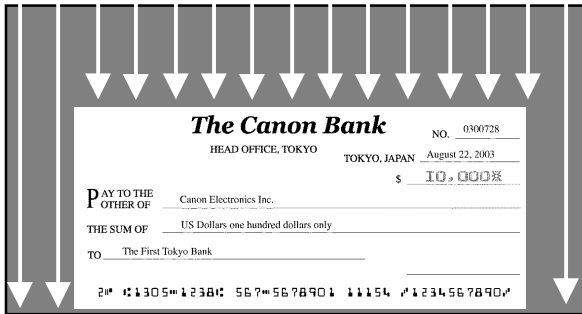


Figure 2-406

6) 16-level conversion

When grayscale 16-level (4-bit) is selected, the image data is converted from 256-level (8-bit) image data. However, this function is not provided for the ISIS driver.

V. POWER SUPPLY

1. Outline

Figure 2-501 shows the block diagram of the power PCB.

The power PCB of the CR-180 supports AC power supply input ranging from 100 V to 240 V. The AC power is supplied to the power PCB by setting the power switch ON.

The supplied AC power (100 V to 240 V) is converted to unsmoothed UN100 V to 240 V with a rectifying bridge and then sent to a transformer. The transformer changes UN100 V to 240 V, and after converting the current to +24 V with a DC/DC converter, outputs it to the control PCB. The power PCB is equipped with a fuse for overcurrent protection.

Only +24 VDC is output from the power PCB, and +5 VDC and +3.3 VDC are generated by the DC/DC converter on the control PCB.

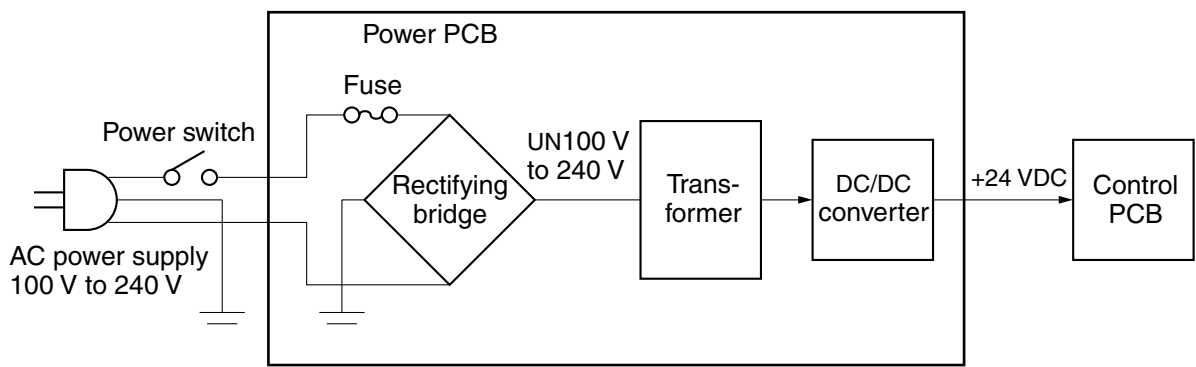


Figure 2-501

2. Power Circuit Protection Function

The power PCB is the switching regulator type.

If, due to an anomaly, the load short-circuits and overcurrent results, the protection function is activated and stops output. Moreover, if the DC/DC converter generating +5 VDC and +3.3 VDC on the control PCB breaks down and a +24 VDC voltage is applied, the protection function kicks in and stops output. While the output is stopped, switch the power switch to OFF.

A fuse is provided on the control PCB. If an overcurrent flows into the DC/DC converter, the fuse blows and the power supply to the board stops.

A fuse is also used to protect the main motor. If an overcurrent flows in the part supplying +24 VDC to the main motor, the fuse blows and power supply to the main motor stops.

The door switch connected to the control PCB changes to OFF when the top cover and the maintenance cover are open. At this time, +24 VDC is not supplied to the main motor.

3. Energy-Saving Mode

The CR-180 is designed so that when document feed and data transmission are not performed, the mode changes to the energy-saving mode, to lower the power consumption.

In the energy-saving mode, the power consumption is 12 W or less, and the control PCB, image processing controller, and motor functions are all stopped.

Recovery from the energy-saving mode occurs automatically when a signal is sent from the computer, or when an operation button on the CR-180 is pressed.

VI. ELECTRIC PARTS PLACEMENT

1. Switches and Sensors

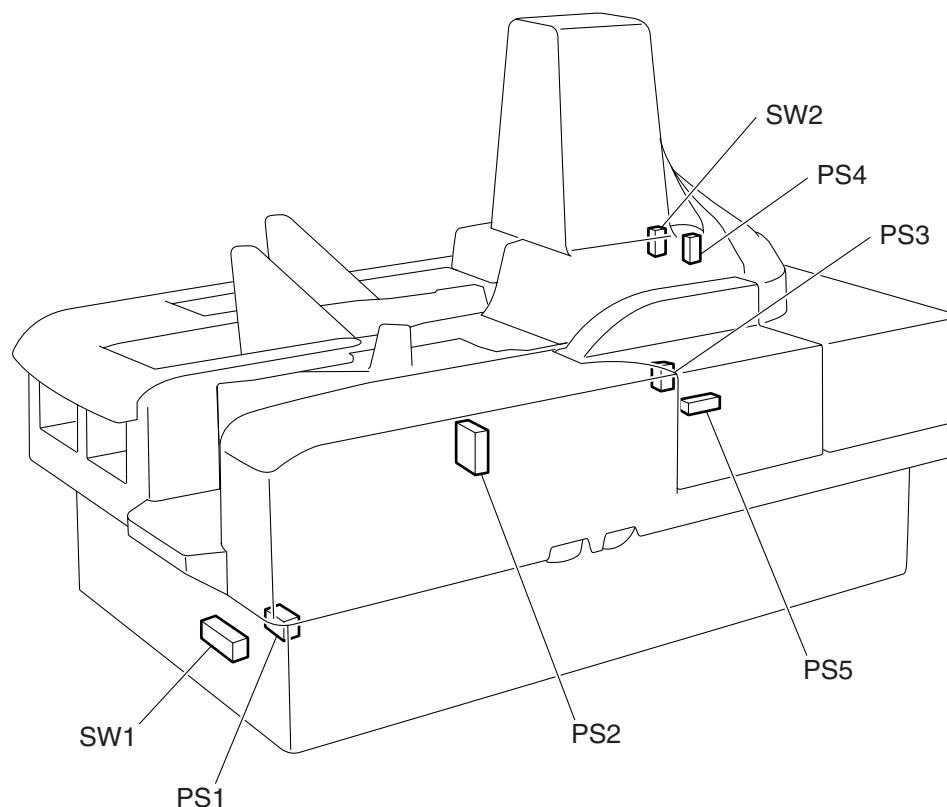


Figure 2-601

Name	Symbol	Function
Switches	SW1	Power ON/OFF
	SW2	Door open/close detection
Photo interrupter	PS1	Jog roller position detection
	PS2	Pick-up section document detection
	PS3	MICR reading section document detection
	PS4	Image reading section document section
	PS5	Double feeding detection

Table 2-601

2. Motors and Clutches

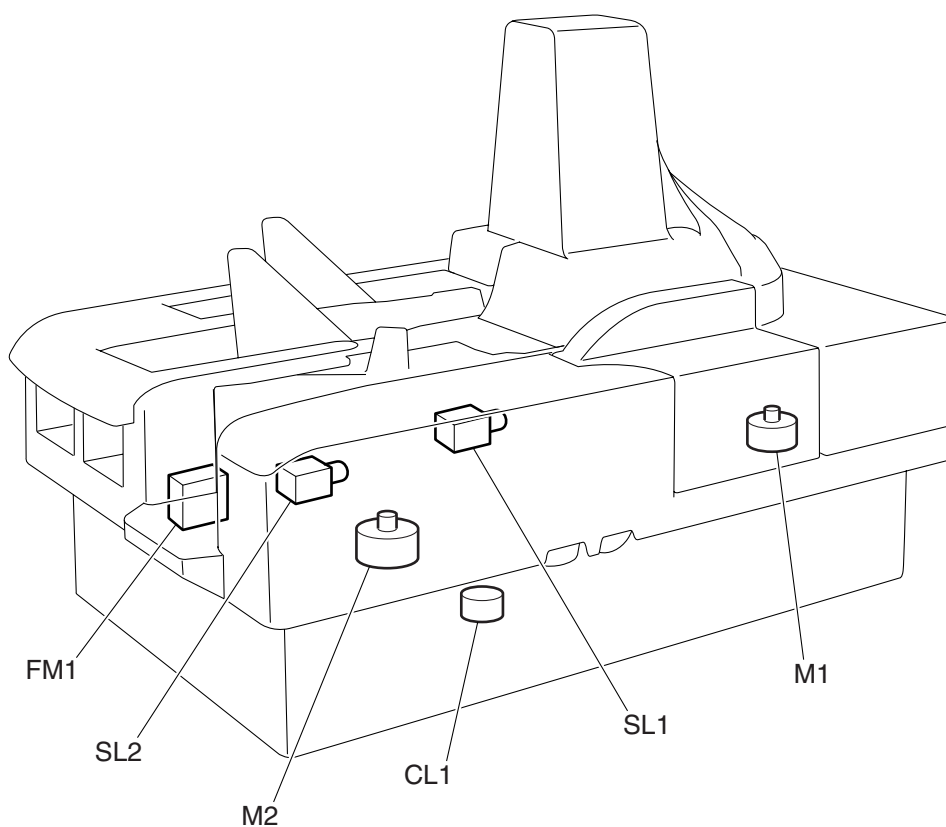


Figure 2-602

Name	Symbol	Function
Motor	M1	Document feed
	M2	Jog roller drive
Fan	FM1	Internal cooling
Clutch	CL1	Pick-up roller drive ON/OFF
Solenoid	SL1	Flapper drive
	SL2	Shutter drive

Table 2-602

3. PCBs and Units

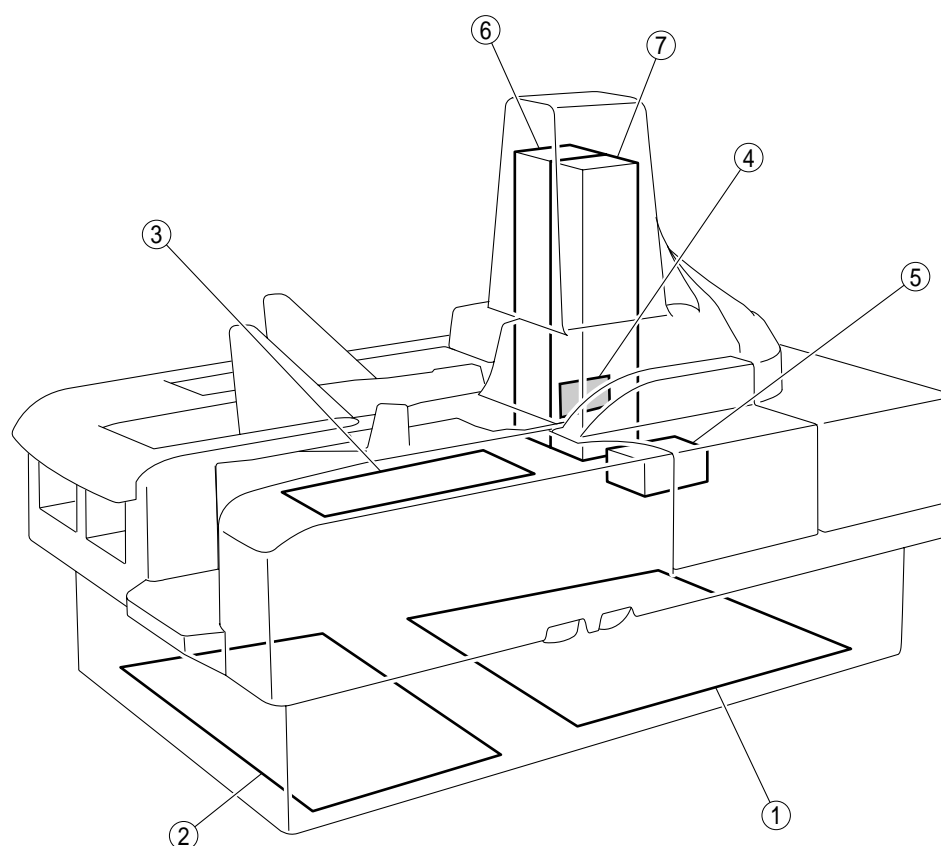


Figure 2-603

Name	Symbol	Function
Control PCB	①	Image processing and control in general
Power PCB	②	DC power supply
Operational PCB	③	Operation input
Imprinter PCB	④	Imprinter drive
MICR reading unit	⑤	MICR reading
Image reading unit (front)	⑥	Image reading unit
Image reading unit (back)	⑦	Image reading unit

Table 2-603

VII. CONNECTORS, SWITCHES, AND LEDS FOR EACH PCB

The connectors, switches, LEDs, etc., mounted on the PCB are shown below.

Items not listed in the tables on the next page are for factory use only. Special tools and measuring instruments are required to

perform adjustments and checks using these items, and often a high degree of accuracy is required. Therefore they should not be handled in the field.

Moreover, items marked as prohibited for use must not be used.

Note: The CR-180 does not have any VRs (variable resistors) that require adjustment in the field.

1. Control PCB

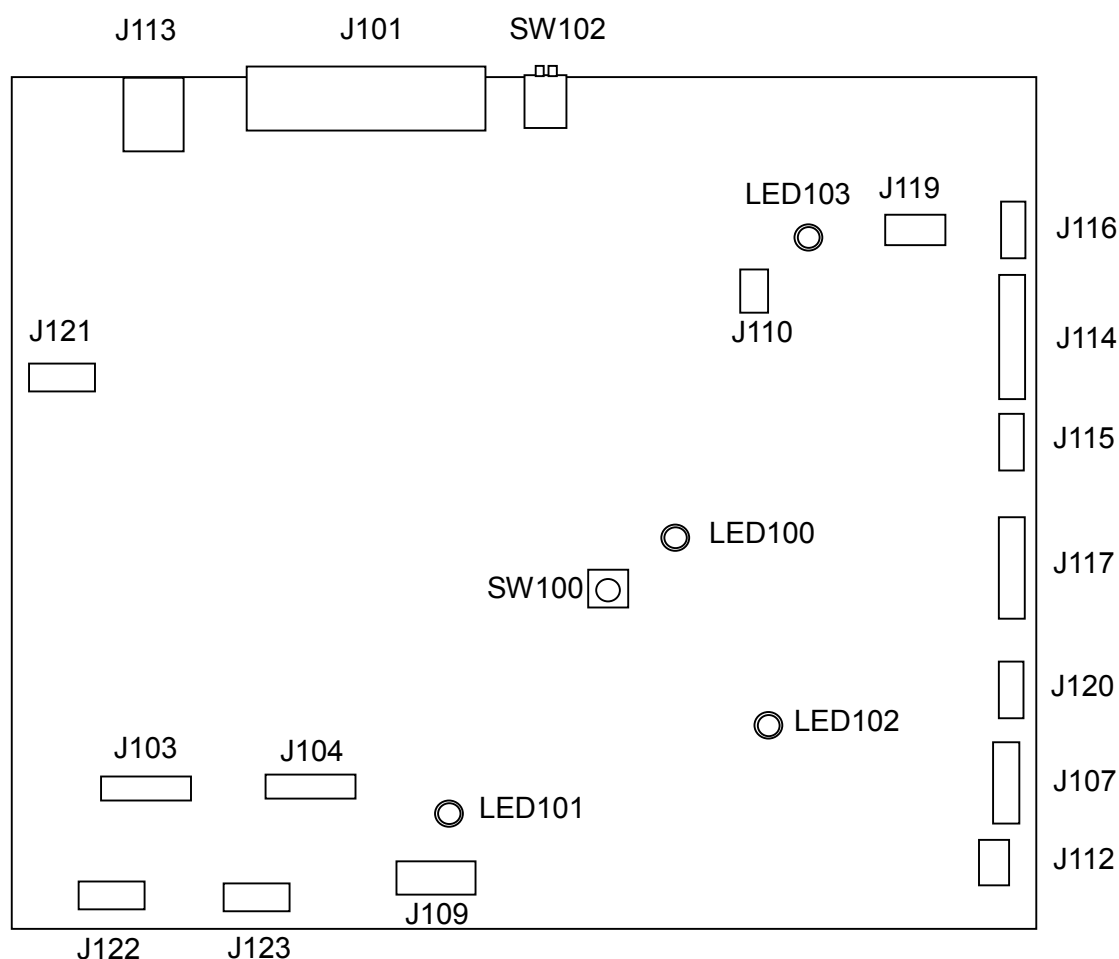


Figure 2-701

Connector		Description
J101	50P	SCSI
J103	12P	CIS unit (front)
J104	12P	CIS unit (back)
J107	14P	M1: Main motor
J109	4P	Power PCB
J110	--	(For factory/design)
J112	2P	SW2: Door switch
J113	4P	USB
J114	13P	PS2/PS3/PS4/PS5
J115	6P	Imprinter PCB
J116	8P	Operational PCB/magnetic head PCB
J117	9P	PS1/SL1/SL2/CL1
J119	--	(For factory/design)
J120	4P	M2: Jog motor
J121	3P	FM1: Cooling fan
J122	5P	LED array (front)
J123	5P	LED array (back)

Table 2-701

LED	Description
LED100	CPU (SH1) normal operation: Flashing
LED101	+24 VDC supply: Lit
LED102	For factory/design
LED103	CPU (SH2) normal operation: Flashing

Table 2-703

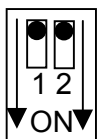
Switch	Description															
SW100	For factory/design Do not use in field.															
SW102	SCSI ID settings <table><tr><td></td><td>1</td><td>2</td></tr><tr><td>ID2</td><td>OFF</td><td>OFF</td></tr><tr><td>ID3</td><td>ON</td><td>OFF</td></tr><tr><td>ID4</td><td>OFF</td><td>ON</td></tr><tr><td>ID5</td><td>ON</td><td>ON</td></tr></table> <p>At shipping: ID2</p> 		1	2	ID2	OFF	OFF	ID3	ON	OFF	ID4	OFF	ON	ID5	ON	ON
	1	2														
ID2	OFF	OFF														
ID3	ON	OFF														
ID4	OFF	ON														
ID5	ON	ON														

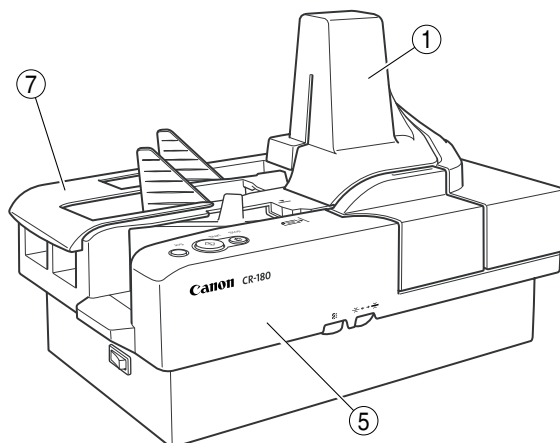
Table 2-702

CHAPTER 3

DISASSEMBLY & REASSEMBLY

I. EXTERNAL COVERS	3-1	IV. DRIVE-RELATED	3-22
II. FEED-RELATED	3-8	V. ELECTRICAL	3-29
III. READ-RELATED	3-19		

I. EXTERNAL COVERS

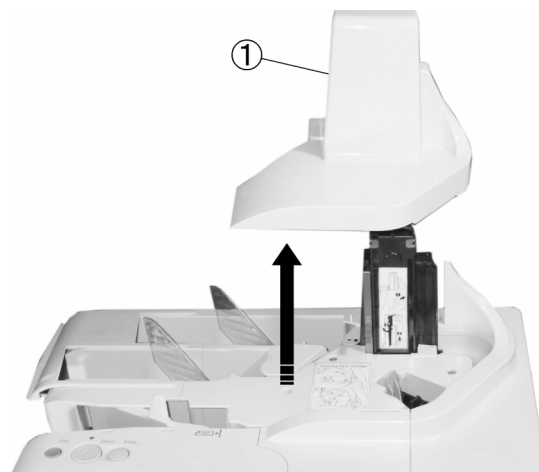


- ① Top cover
- ② Maintenance cover 1
- ③ Maintenance cover 2
- ④ Middle cover
- ⑤ Main cover
- ⑥ Delivery cover
- ⑦ Delivery stop cover
- ⑧ Maintenance plate

Figure 3-101

1. Top Cover

- 1) Lift the top cover ① straight up.

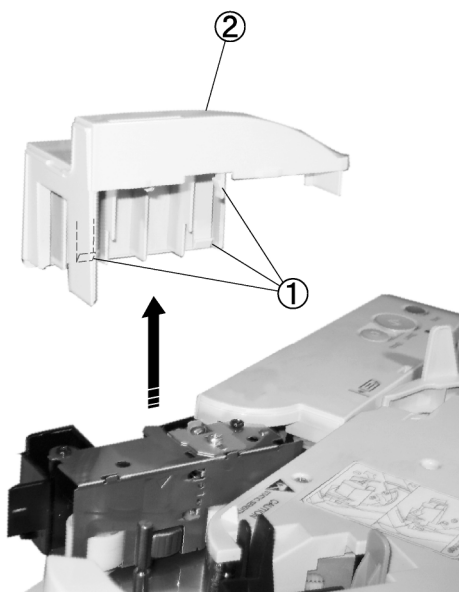


- ① Top cover

Figure 3-102

2. Maintenance Cover 1

- 1) Remove the top cover.
- 2) Press the Open/Close button to open the maintenance cover.
- 3) Remove the three hooks ① and remove maintenance cover 1 ②.



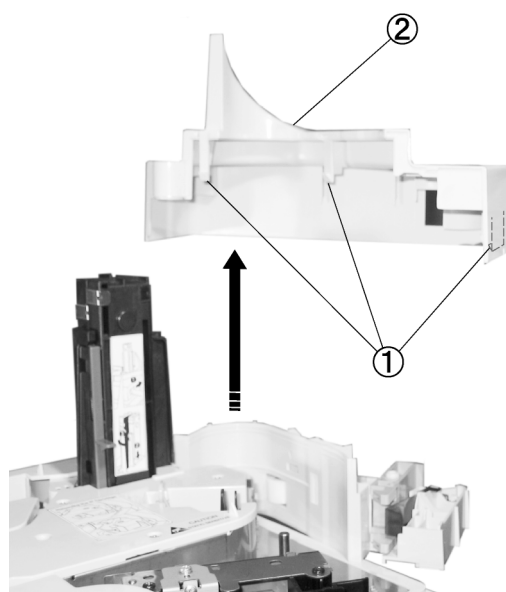
① Hook

② Cover 1

Figure 3-103

3. Maintenance Cover 2

- 1) Remove the top cover.
- 2) Press the Open/Close button to open the maintenance cover.
- 3) Remove the three hooks ① and remove maintenance cover 2 ②.



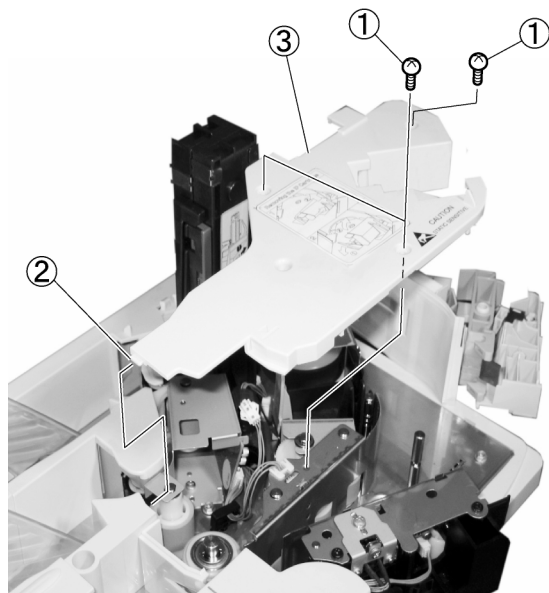
① Hook

② Cover 2

Figure 3-104

4. Middle Cover

- 1) Remove the top cover.
- 2) After removing the three screws ①, pull out the middle cover ③ while pulling away the fitting part ②.



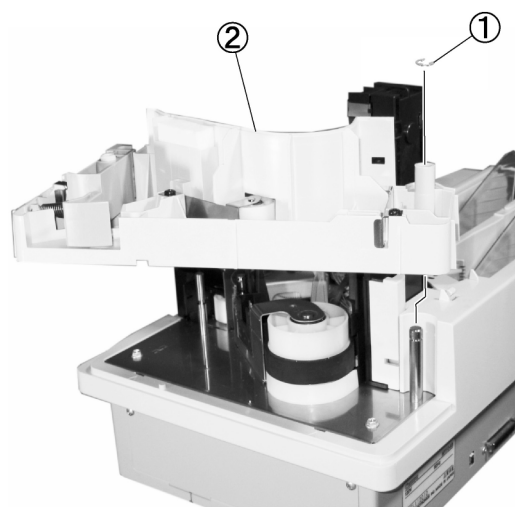
- ① Screw ② Fitting part
③ Middle cover

Figure 3-105

5. Main Cover

- 1) Remove the top cover.
- 2) Remove maintenance cover 1.
- 3) Remove maintenance cover 2.
- 4) Remove the middle cover.
- 5) Remove the E-ring ① and then remove the feed guide assembly ②.

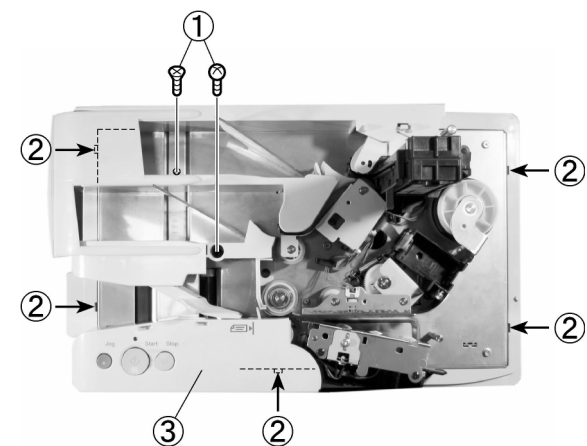
Note: During reassembly, do not forget the E-ring.



- ① E-ring
② Feed guide assembly

Figure 3-106

6) After removing the two screws ① (one of which is a flat head screw), remove the five hooks ② and remove the main cover ③.



- ① Screw
② Hook
③ Main cover

Figure 3-107

6. Delivery Cover

- 1) Remove the main cover.
- 2) After removing the screw ① (black TP), slide the delivery cover ② in the direction of the arrow, and pull it out while pulling away the fitting part ③.

Note: The delivery cover includes a document presser plate ④ and a coil spring.

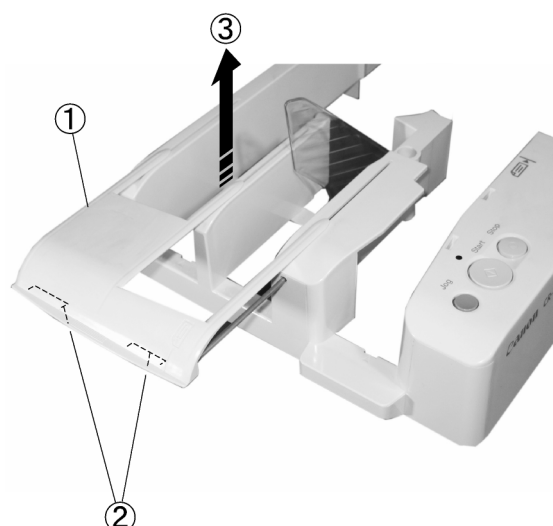


- ① Screw
② Delivery cover
③ Fitting part
④ Document presser plate

Figure 3-108

7. Delivery Stop Cover

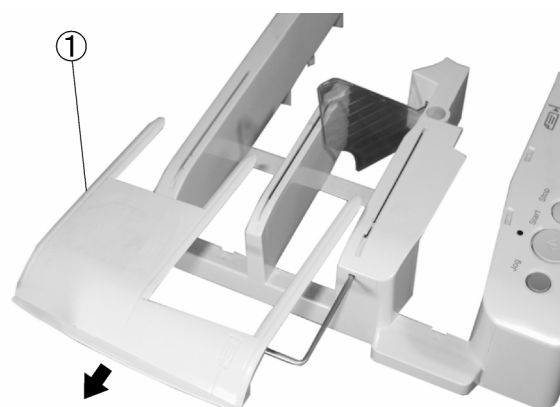
- 1) Pull out the delivery stop cover ① about midway. After removing the two hooks ② on the back side, pull out the center tab ③ from the groove.



- ① Stop cover ② Hook
③ Center tab

Figure 3-109

- 2) Slide out the delivery stop cover ① in the direction of the arrow.



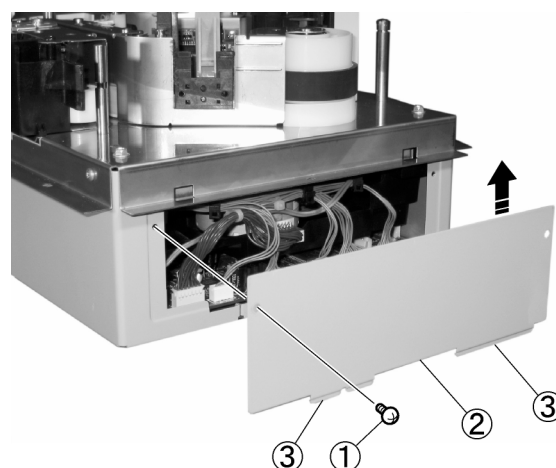
- ① Stop cover

Figure 3-110

Note: During reassembly, first insert the tabs at both sides of the deliver stop cover into the groove and slide the stop cover midway.

8. Maintenance Plate

- 1) After removing the two screws ①, slide the maintenance plate ② in the direction of the arrow, pull away the two fitting parts ③ at the bottom, and remove the maintenance plate.



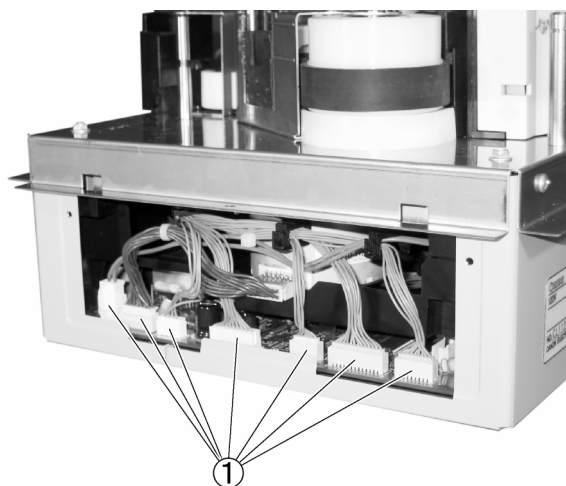
- ① Screw ② Maintenance plate
③ Fitting part

Figure 3-111

9. Top Unit

- 1) Remove the main cover.
- 2) Remove the maintenance plate.
- 3) Remove the seven connectors ①.

Note: The left-most connector has a lock. During reassembly, be careful not to scrape your fingers against the edge of the metal plate.

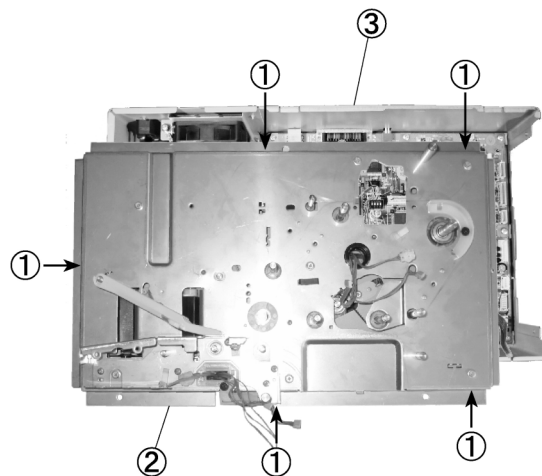


① Connector

Figure 3-112

- 4) After removing the five screws ①, slightly lift the top unit ② and pull it away from the bottom unit ③.

Note: Since the cables are connected on the inside, do not lift the top unit too high.



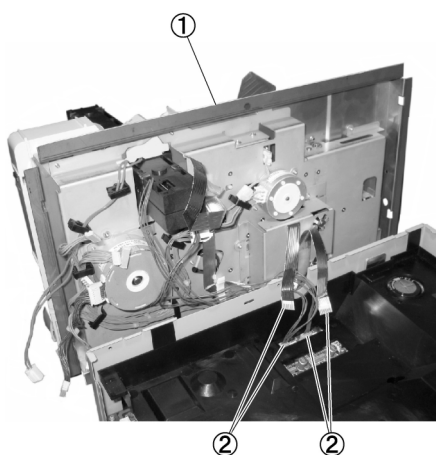
① Screw

② Top unit

③ Bottom unit

Figure 3-113

- 5) Place down the top unit ①, remove the four connectors ②, and remove the top unit.

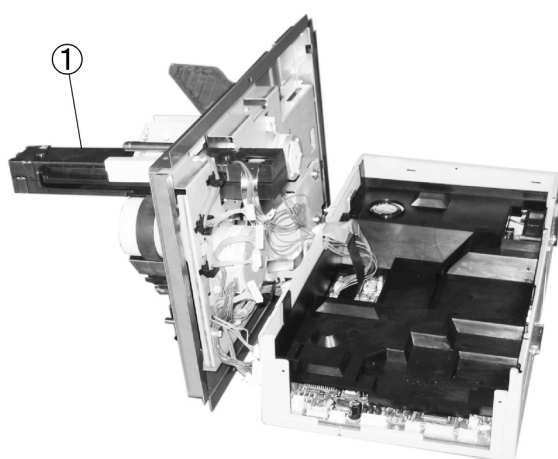


① Top unit

② Connector

Figure 3-114**Note:**Top unit placement

When placing down the top unit, in order to protect the image sensor unit ①, place the operation panel side downward as shown in the figure, on a flat surface. Also be careful not to apply excessive force and keep the top unit from falling over.

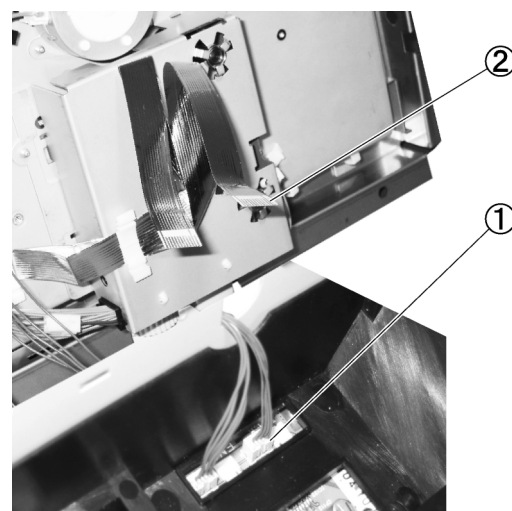


① Image sensor unit

Figure 3-115**Note:**Connector connections

During reassembly, connect the cable of the image sensor unit for the front side to the connector located on the right side in the figure, and connect the cable for the back side image sensor unit to the connector located on the left side.

The front side LED array cable ① is shorter than the cable for the back side, and its connector has a blue mark. Also, the back of the front image sensor cable (FPC) ② socket is colored blue, while the back of the back image sensor cable is colored white.



① LED array cable

② Image sensor cable (FPC)

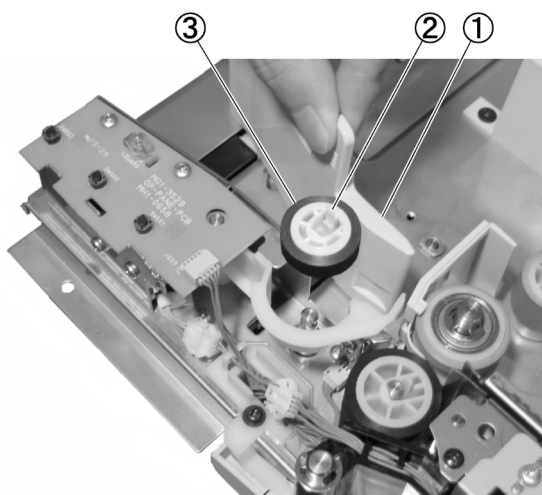
Figure 3-116

II. FEED-RELATED

1. Pick-Up Roller

- 1) Remove the main cover.
- 2) Open the document presser plate ① and remove the pick-up roller ③ while pulling up the hook ②.

Note: During reassembly, mount the pick-up roller on the shaft carefully aligning its opening with the D cut of the shaft.

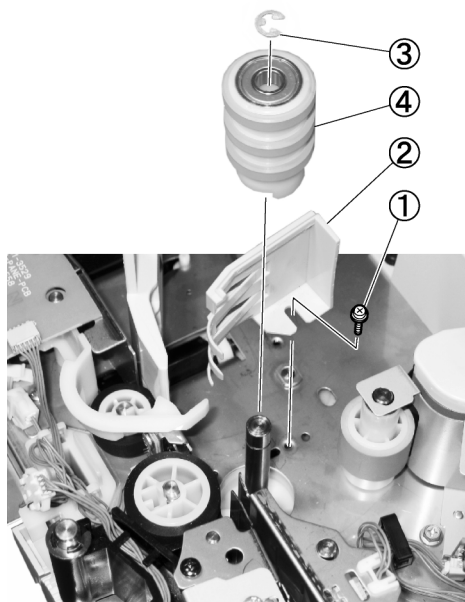


- ① Document presser plate
- ② Hook
- ③ Pick-up roller

Figure 3-201

2. Separation Roller

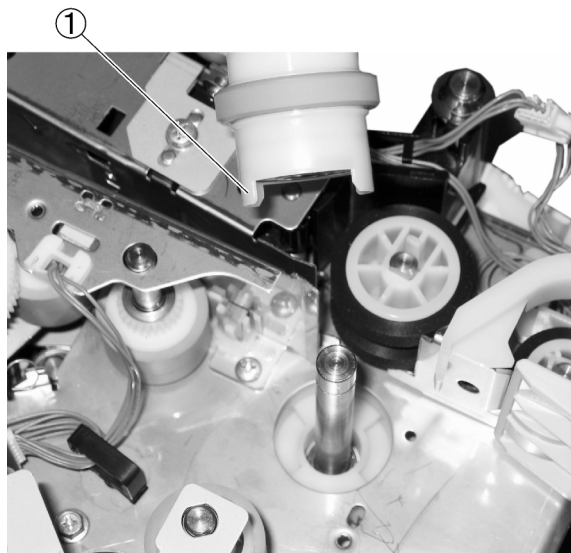
- 1) Remove the screw ① (black TP), and remove the guide ②. Then remove the E-ring ③ and remove the separation roller ④.



- ① Screw
- ② Guide
- ③ E-ring
- ④ Separation roller

Figure 3-202

Note:When mounting a roller on a shaft, insert the rotating tabs ① at the bottom in the depression on the drive side. This applies to all the rollers that have rotating tabs at the bottom.



① Rotating tab

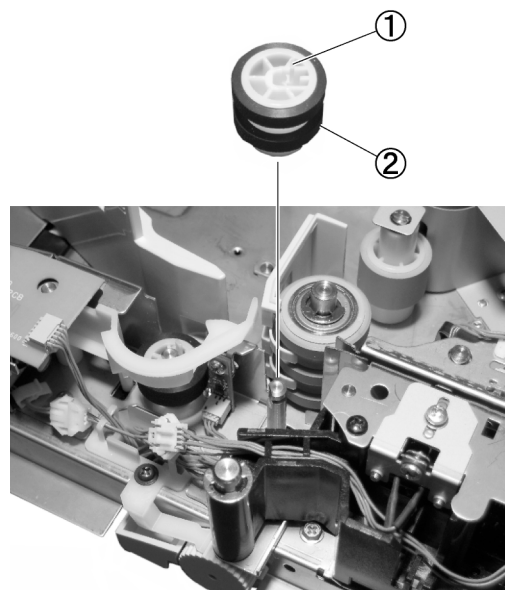
Figure 3-203

Note:When attaching the guide, align the positioner on the back side of the guide with the hole in the mounting plate.

3. Feeding Roller

- 1) Remove the separation roller.
- 2) Remove the feeding roller ② while pulling up the hook ①.

Note:During reassembly, mount the feeding roller on the shaft carefully aligning its opening with the D cut part of the shaft.



① Hook

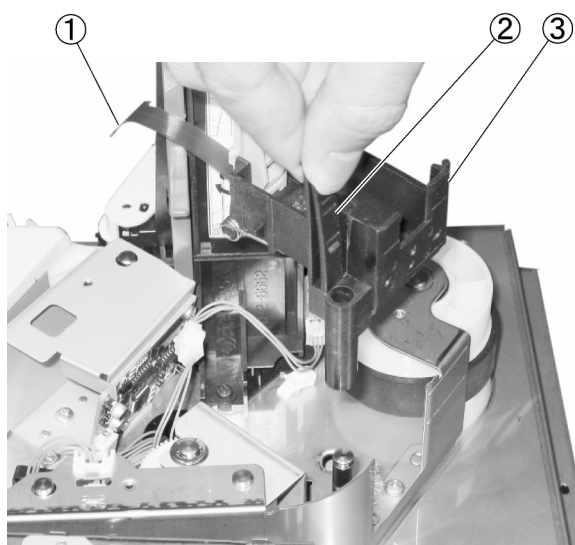
② Feeding roller

Figure 3-204

4. Feed Guide Plate

- 1) Remove the middle cover.
- 2) Remove the connector ① and remove the ink cartridge holder ③ by lifting it straight up while pressing the lever ② from both sides.

Note: Following reassembly, the holder should be able to smoothly move up and down.

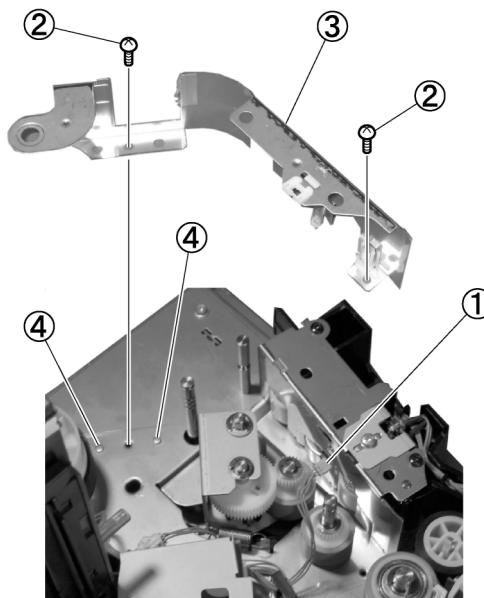


- ① Connector
- ② Lever
- ③ Ink cartridge holder

Figure 3-205

- 3) Remove the connector ① and two screws ②, and then remove the guide plate ③.

Note: During reassembly, align the guide plate with the two positioners ④.

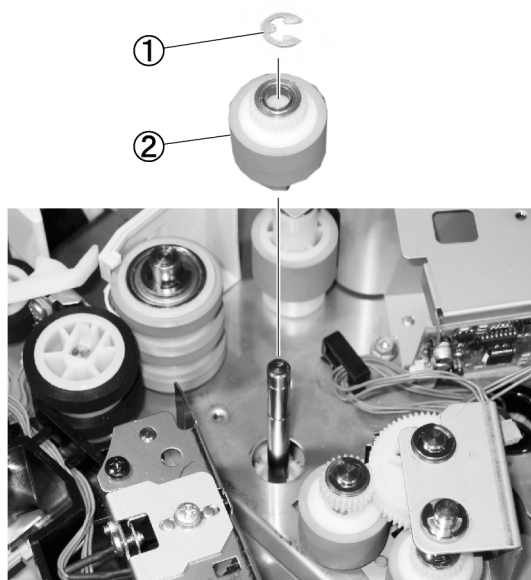


- ① Connector
- ② Screw
- ③ Guide plate
- ④ Positioner

Figure 3-206

5. Feed Roller (Front)

- 1) Remove the feed guide plate.
- 2) Remove the E-ring ① and then remove the feed roller (front) ②.



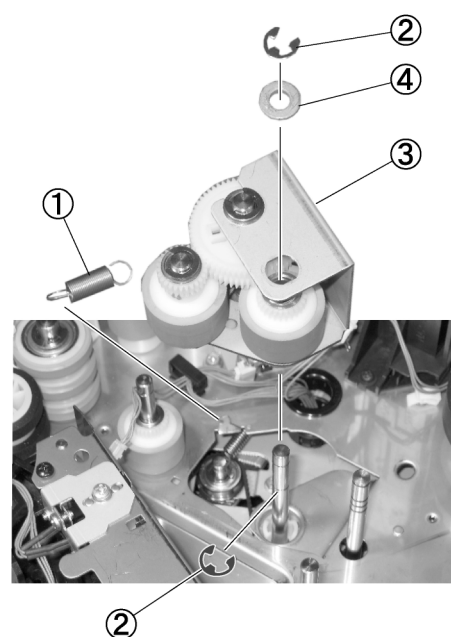
① E-ring ② Feed roller (front)
Figure 3-207

6. Roller Assembly

Note: This part includes a head roller, feed roller (back), and torque limiter.

- 1) Remove the coil spring ① and the two E-rings ②, and then remove the roller assembly ③ by lifting it straight up.

Note: Remove the bearing ④ from the roller assembly.



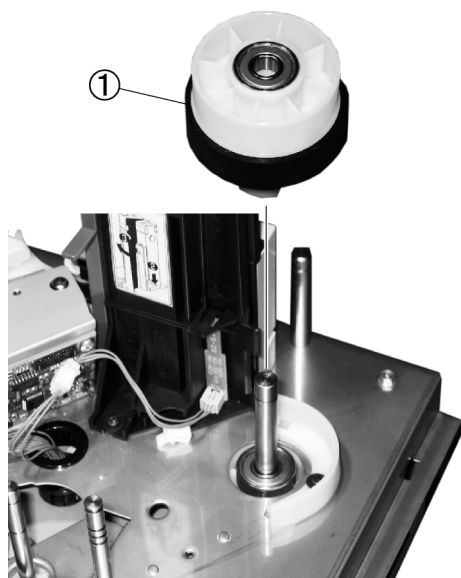
① Coil spring ② E-ring
 ③ Roller assembly ④ Bearing

Figure 3-208

Note: This coil spring has weak tension. During reassembly, be sure to set the correct coil spring.

7. Large Roller

- 1) Remove the feed guide plate.
- 2) Remove the large roller ① by lifting it straight up.



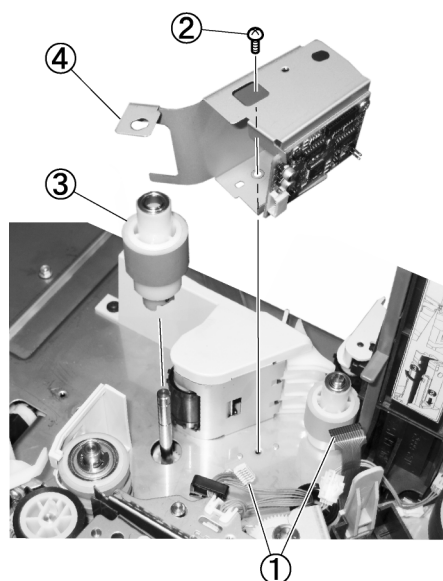
① Large roller

Figure 3-209

8. Delivery Roller

- 1) Remove the middle cover.
- 2) Remove the two connectors ① and the screw ②, and then remove the delivery roller (left) ③ and the guide plate ④ together by lifting them straight up.

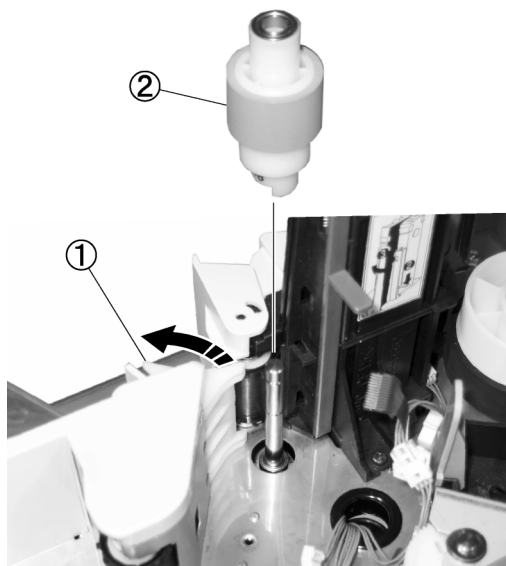
Note: Lifting only the guide plate may damage the roller, so be sure to lift it together with the delivery roller.



- | | |
|--------------------------|---------------|
| ① Connector | ② Screw |
| ③ Delivery roller (left) | ④ Guide plate |

Figure 3-210

- 3) Move the flapper ① out of the way and remove the delivery roller (right) ②.

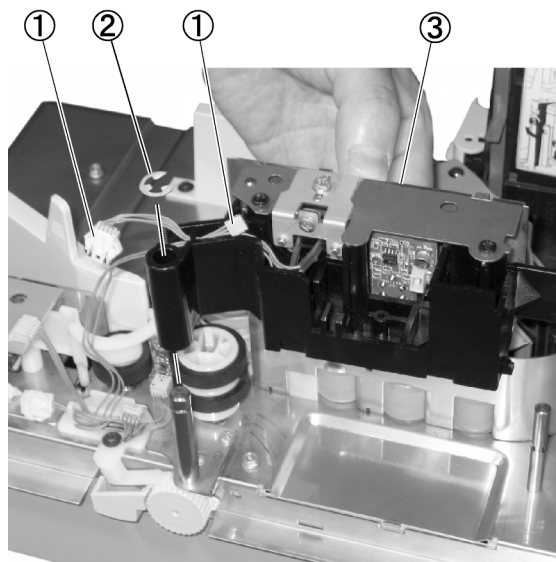


- ① Flapper
② Delivery roller (right)

Figure 3-211

9. Head Feed Unit

- 1) Remove the main cover.
2) Remove the two connectors ① and the E-ring ②, and then remove the head feed unit ③.



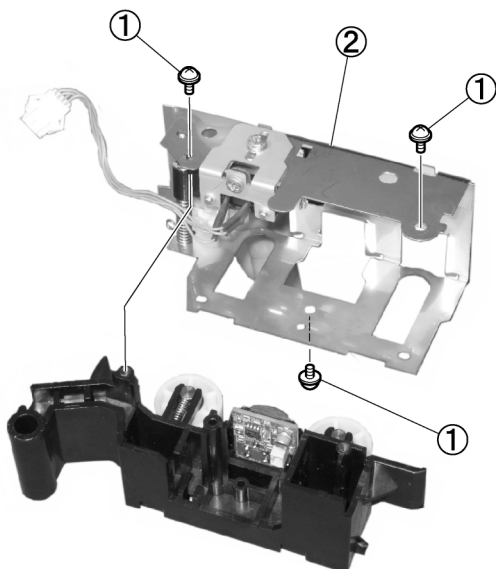
- ① Connector ② E-ring
③ Head feed unit

Figure 3-212

Note: During reassembly, route the cables so that they not touch the roller.

10. Follower Roller A (MICR)

- 1) Remove the head feed unit.
- 2) Remove the three screws ① (black) and remove the guide plate ②.



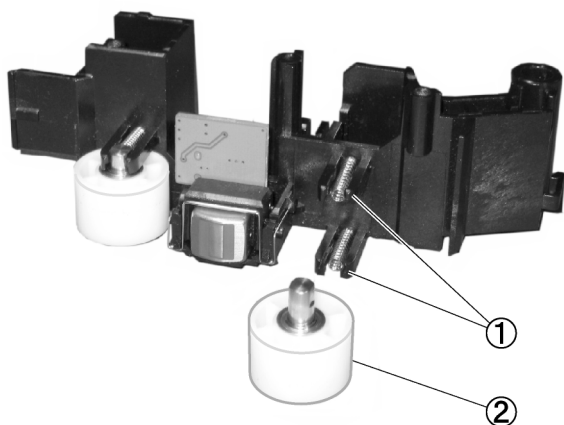
① Screw

② Guide plate

Figure 3-213

- 3) Open the extremities of the shaft guides ① and remove follower roller A ②.

Note: Removing follower roller A also removes the shaft and the coil spring.



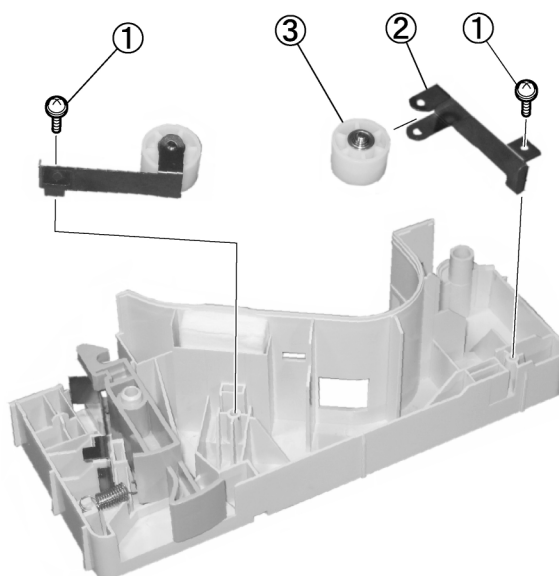
① Shaft guide

② Follower roller A

Figure 3-214**11. Follower Roller B (Large Roller)**

- 1) Remove maintenance cover 2.
- 2) After removing the screw ① (black) and the roller mounting plate ②, open slightly the extremities of the roller mounting plate and remove follower roller B ③.

Note: Removing follower roller B also removes the shaft. Be careful not to deform the roller mounting plate.



① Screw

② Roller mounting plate

③ Follower roller B

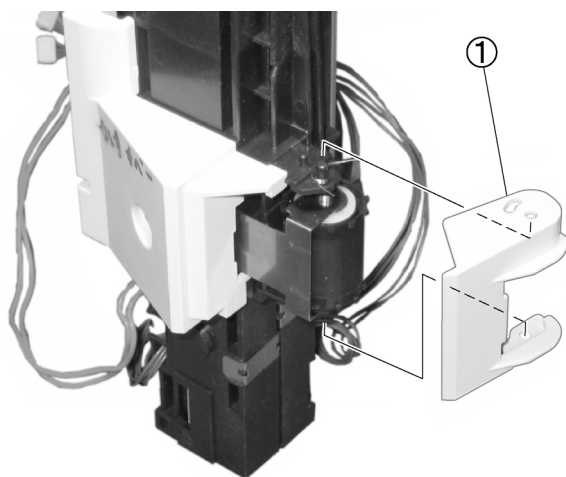
Figure 3-215

Note: During reassembly, align the shaft side with the D cut and the D hole of the roller mounting plate.

12. Follower Roller C1 (Delivery)

- 1) Remove the top unit. See section I. EXTERNAL COVERS.
- 2) Remove the image sensor unit. See section III. READ-RELATED.
- 3) Remove the fitting part by widening the extremities of the roller cover ①, and remove the roller cover.

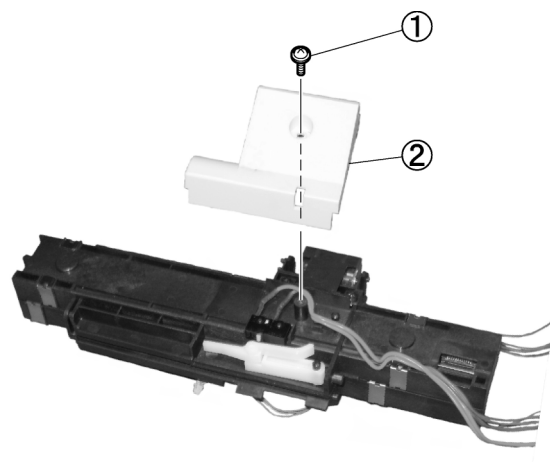
Note: Removing the roller cover also removes the coil spring. During reassembly, remove the coil spring so that the roller cover opens.



① Roller cover

Figure 3-216

- 4) Remove the screws ① (black) and remove the sensor cover ②.



① Screw

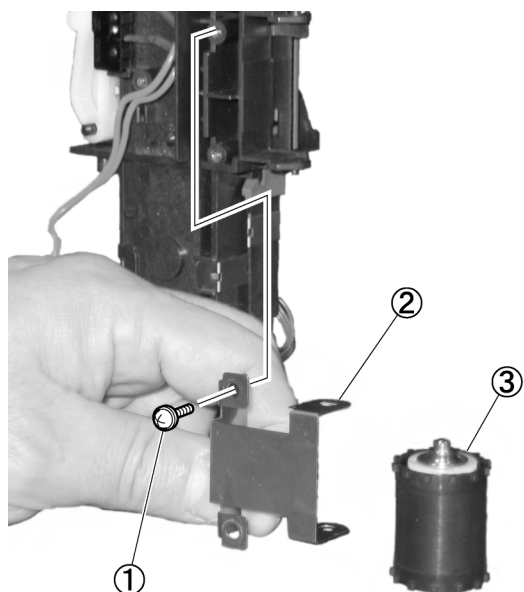
② Sensor cover

Figure 3-217

Note: Removing the sensor cover also removes the door sensor lever.

- 5) After removing the screw ① (black) and the roller mounting plate ②, open slightly the extremities of the roller mounting plate and remove follower roller C1 ③.

Note: Removing follower roller C1 also removes the shaft. Be careful not to deform the roller mounting plate.



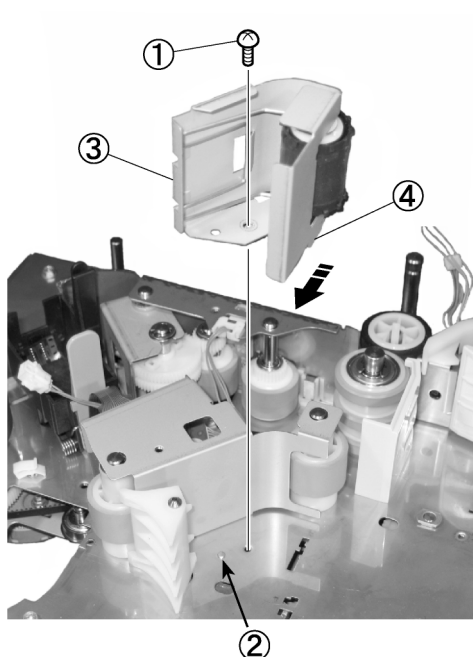
- ① Screw
② Roller mounting plate
③ Follower roller C1

Figure 3-218

Note: During reassembly, align the shaft side with the D cut and the D hole of the roller mounting plate.

13. Follower Roller C2 (Delivery)

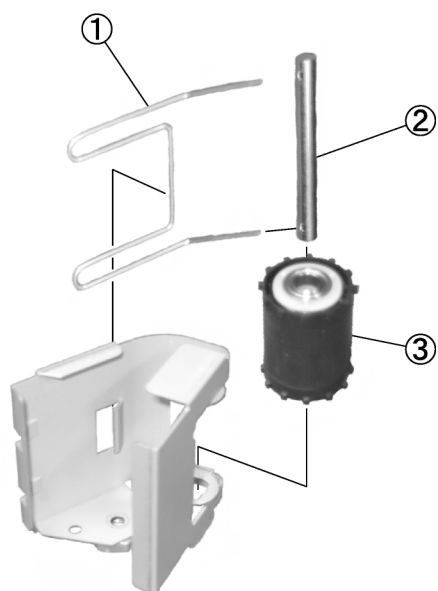
- 1) Remove the main cover.
- 2) Remove the delivery cover.
- 3) After removing the screw ① and the positioner ②, slide the roller mounting plate ③ in the direction of the arrow, and remove the roller mounting plate while pulling up the hook ④.



- ① Screw
② Positioner
③ Roller mounting plate
④ Hook

Figure 3-219

- 4) After removing the stopper ①, remove the shaft ②, and then remove follower roller C2 ③.

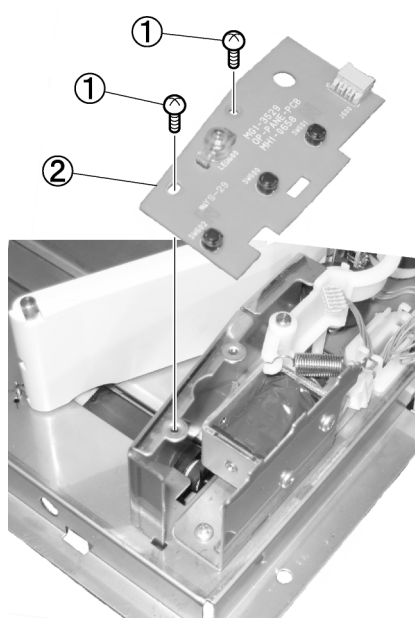


- ① Stopper
③ Follower roller C2
② Shaft

Figure 3-220

14. Shutter Solenoid

- 1) Remove the main cover.
2) Remove the two screws ① and then remove the operational PCB ②.

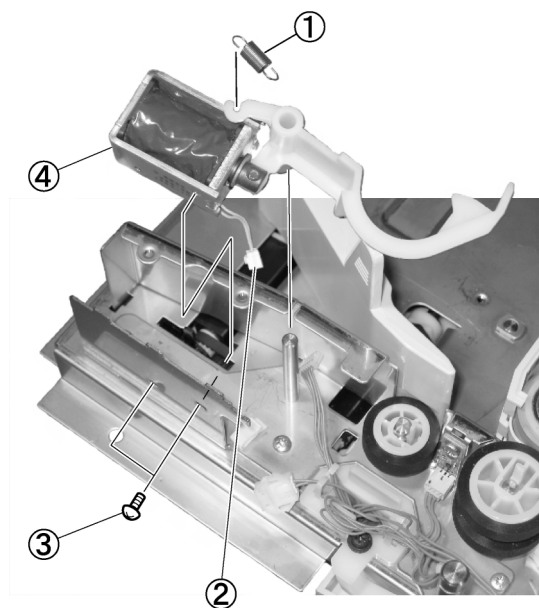


- ① Screw
② Operational PCB

Figure 3-221

- 3) Remove the coil spring ①, the connector ②, and the two screws ③, and then remove the shutter solenoid ④ by lifting it straight up.

Note: The shutter can be removed by pulling it out from the solenoid's plunger.

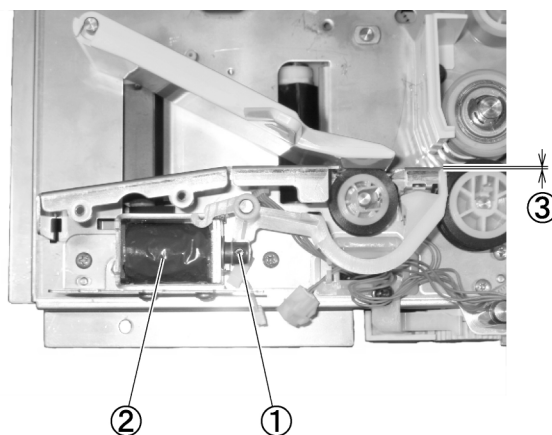


- ① Coil spring
② Connector
③ Screw
④ Shutter solenoid

Figure 3-222

Note: Position adjustment

Position adjustment is required when fixing the shutter solenoid. With the plunger ① inserted all the way into the solenoid body ②, fix the solenoid body so that the distance ③ from the extremity of the shutter until the guide plate is 1 to 2 mm. If the extremity of the shutter projects out from the guide plate, documents will not be picked up.



- ① Plunger
② Solenoid body
③ Distance

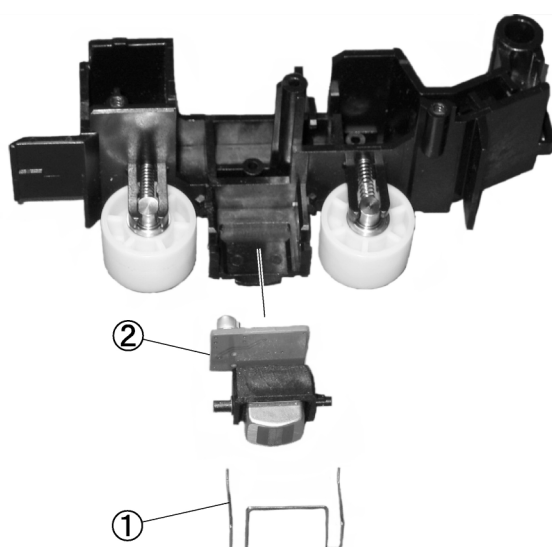
Figure 3-223

III. READ-RELATED

1. Magnetic Head

- 1) Remove the head feed unit. See section II. FEED-RELATED.
- 2) Remove the stopper ① and then remove the magnetic head ②.

Note: Be careful not to soil or scratch the read surface of the magnetic head. After mounting the stopper, rotate it a little to improve contact between the magnetic head and documents.

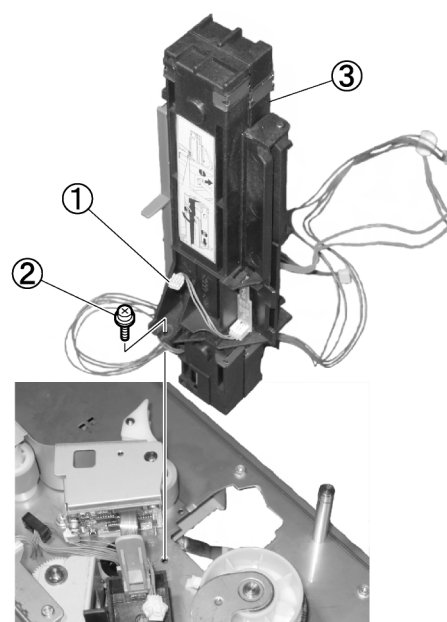


① Stopper ② Magnetic head

Figure 3-301

2. Image Sensor Unit (Front)

- 1) Remove the top unit. See section I. EXTERNAL COVERS.
- 2) Remove the connector ① and the screw ②, and then remove the image sensor unit ③.



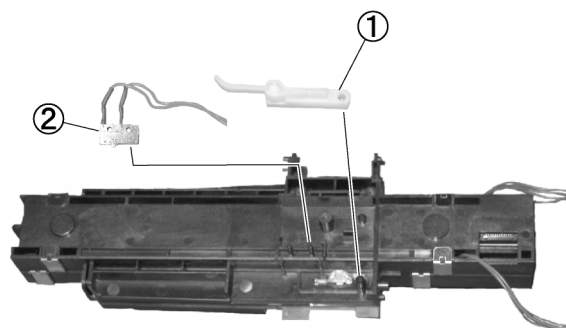
① Connector ② Screw
③ Image sensor unit

Figure 3-302

- 3) Push down the lock lever and open the image sensor unit.
- 4) Remove follower roller C2. See section II. FEED-RELATED.

- 5) Remove the switch lever ① and remove the switch ② by lifting it straight up.

Note: The switch lever consists of two parts.

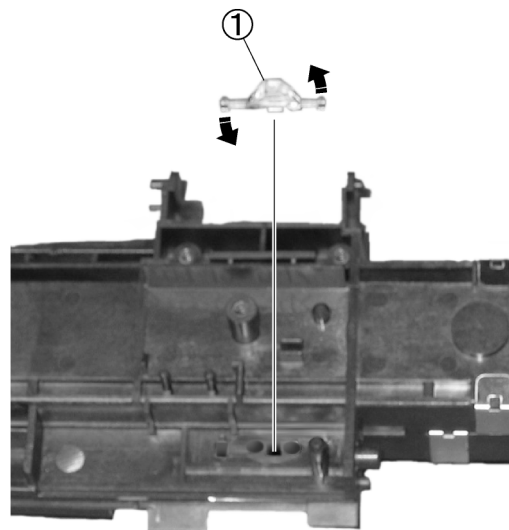


① Switch lever ② Switch

Figure 3-303

- 6) Widen slightly the arms of the light guide ① in the directions of the arrows and remove the light guide.

Note: Be careful not to excessively deform the arms of the light guide.



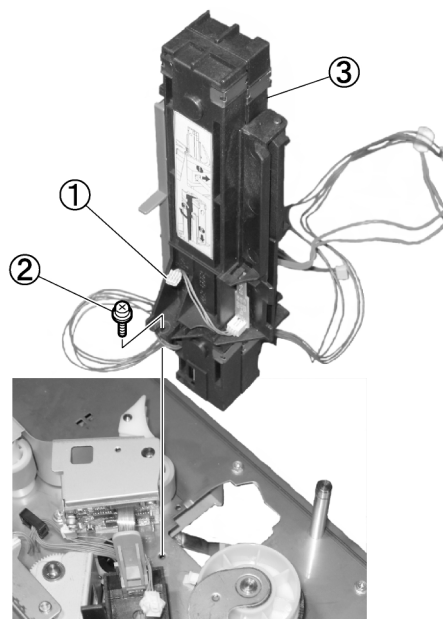
① Light guide

Figure 3-304

Note: Be careful not to soil or scratch the reading glass. Do not remove the reading glass as this would allow dust in.

2. Image Sensor Unit (Back)

- 1) Remove the top unit. See section I. EXTERNAL COVERS.
- 2) Remove the connector ① and the screw ②, and then remove the image sensor unit ③.

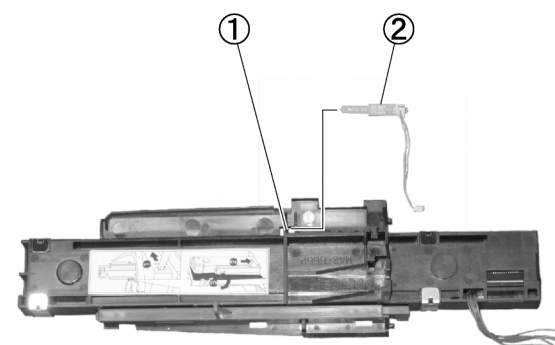


① Connector ② Screw
③ Image sensor unit

Figure 3-305

- 3) Press down the lock lever and open the image sensor unit.
- 4) Remove the hook ① and remove the sensor PCB ②.

Note: Be careful not to break the hook.



① Hook

② Sensor PCB

Figure 3-306

Note: Be careful not to soil or scratch the reading glass. Do not remove the reading glass as this would allow dust in.

IV. DRIVE-RELATED

1. Feed Plate

- 1) Remove the top unit. See section I. EXTERNAL COVERS.
- 2) Remove the image sensor unit, the rollers, and all the parts attached to the top side of the top unit. See sections I. EXTERNAL COVERS, II. FEED-RELATED, and III. READ-RELATED.
- 3) Remove the coil spring ①.

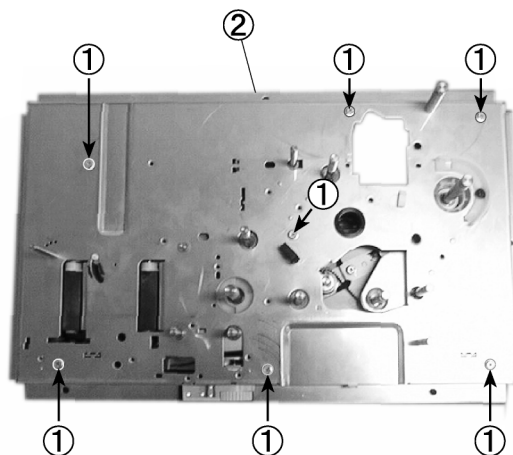


① Coil spring

Figure 3-401

Note: This coil spring has strong tension. During reassembly, be sure to set the correct coil spring.

- 4) Remove the seven screws ① (RS type) and then remove the feed plate ② by lifting it straight up.



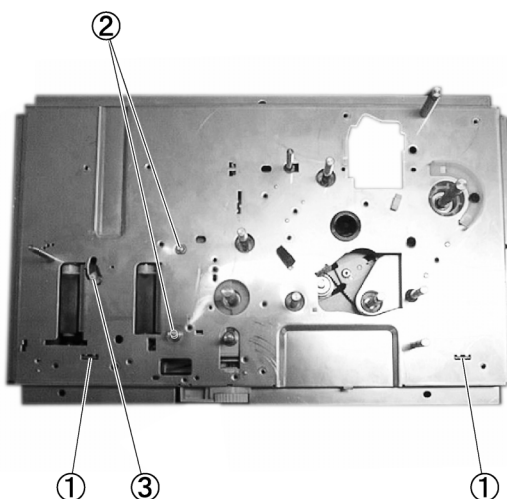
① Screw

② Feed plate

Figure 3-402

Note: During reassembly, assemble the feed plate paying attention to correct positioning of the various elements. There are two plate positioners ① and there are two bearings ②. Also insert the shaft ③ in the document presser plate groove.

The bearing is inserted from the rear of the feed plate.



① Plate positioner

② Bearing

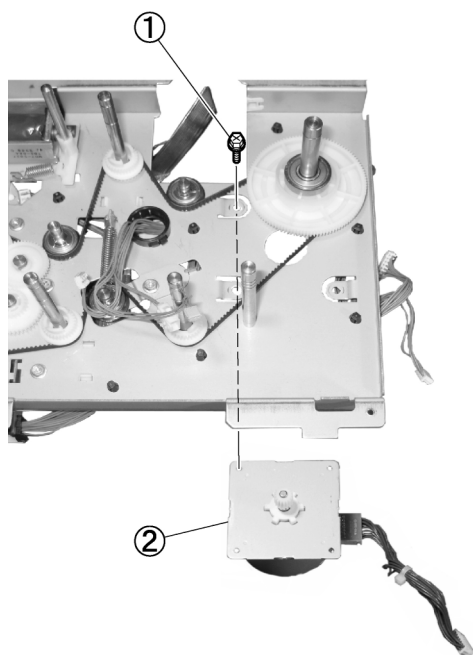
③ Shaft

Figure 3-403

2. Main Motor

- 1) Remove the feed plate.
- 2) Remove the three screws ① (RS type) and then remove the main motor ②.

Note: After attaching the motor, check manually if the connected gear moves smoothly.



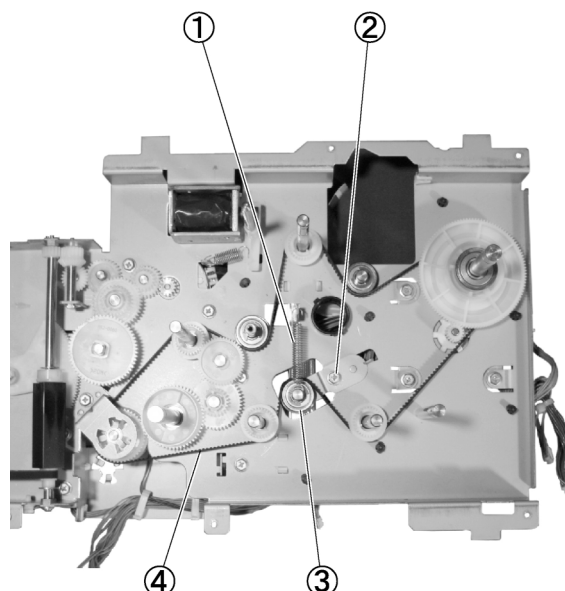
① Screw

② Main motor

Figure 3-404

3. Timing Belt

- 1) After removing the coil spring ① and the screw ② (RS type), remove the tensioner ③, and remove the timing belt ④.



① Coil spring

② Screw

③ Tensioner

④ Timing belt

Figure 3-405

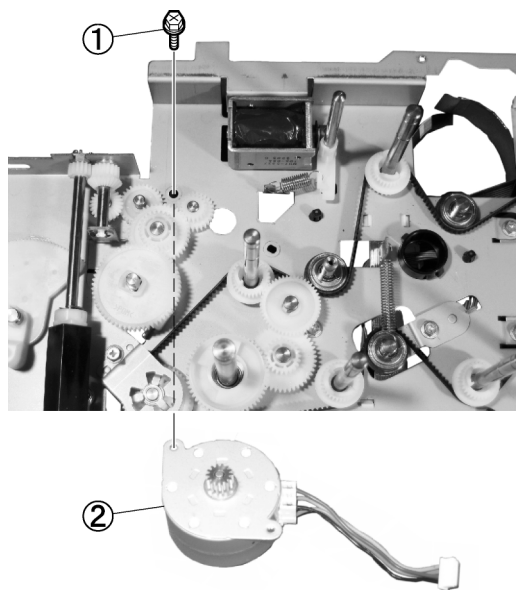
Note: Tension adjustment

During reassembly, tension adjustment is performed with the coil spring. Attach the coil spring and with the tension balanced, fix the tensioner.

4. Jog Motor

- 1) Remove the feed plate.
- 2) Remove the two screws ① (RS type) and then remove the jog motor ②.

Note: After attaching the motor, check manually if the connected gear moves smoothly.



① Screw

② Jog motor

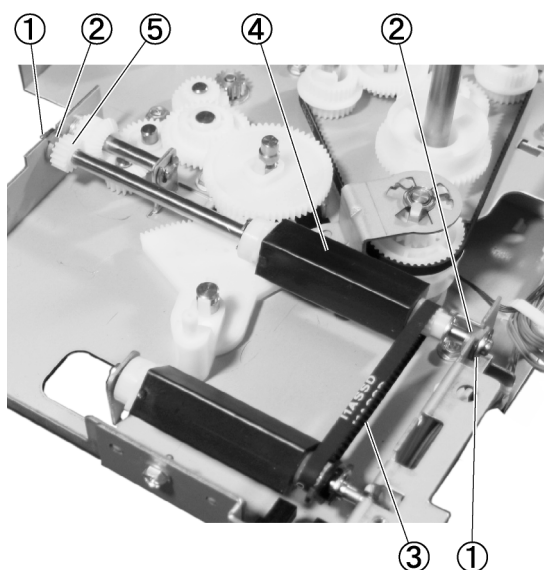
Figure 3-406

5. Jog Roller (Front)

Note: Since a one-way bearing is incorporated in the jog roller, do not try to force it to turn in the opposite direction.

- 1) Remove the feed plate.
- 2) After removing the two E-rings ① and the two bearings ②, remove the timing belt ③, and then remove the jog roller assembly ④.

Note: Removing the roller assembly also removes the gear ⑤.



① E-ring

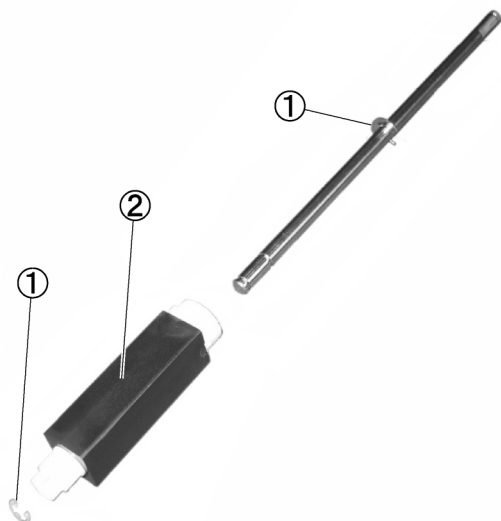
② Bearing

③ Timing belt

④ Jog roller assembly ⑤ Gear

Figure 3-407

- 3) Remove the two E-rings ① and then remove the jog roller ②.

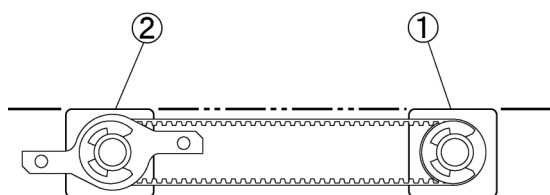


① E-ring

② Jog roller

Figure 3-408

Note: During reassembly, set the jog roller (front) ① and the jog roller (back) ② so that their cross sections have the same orientation. These two rollers consist of identical parts.



① Jog roller (front)

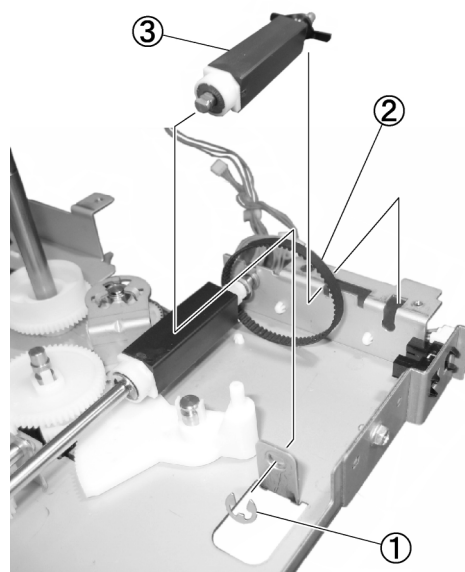
② Jog roller (back)

Figure 3-409

6. Jog Roller (Back)

Note: Since a one-way bearing is incorporated in the jog roller, do not try to force it to turn in the opposite direction.

- 1) Remove the feed plate.
- 2) After removing the E-ring ①, remove the timing belt ② and then remove the jog roller assembly ③.



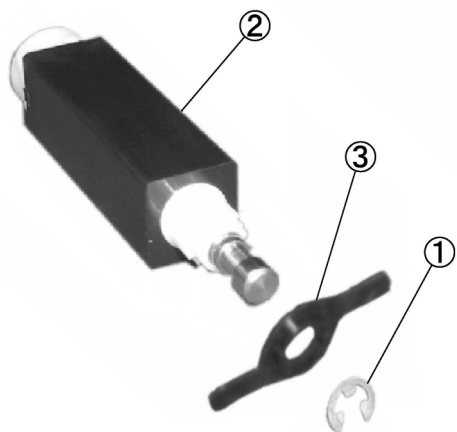
① E-ring

② Timing belt

③ Jog roller assembly

Figure 3-410

- 3) Remove the E-ring ① and then remove the sensor lever ② and the jog roller ③.



- ① E-ring
② Sensor lever
③ Jog roller

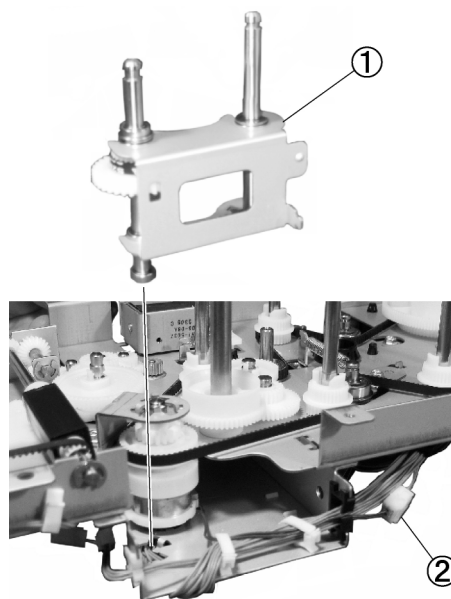
Figure 3-411

Note: During reassembly, set the jog roller (front) and the jog roller (back) so that their cross sections have the same orientation. See section for Jog Roller (Front).

7. Pick-Up Clutch

- 1) Remove the feed plate.
- 2) Remove the gear assembly ① by lifting it straight up. Also remove the connector ②.

Note: Removing the gear assembly also removes the ball bearing at the bottom.

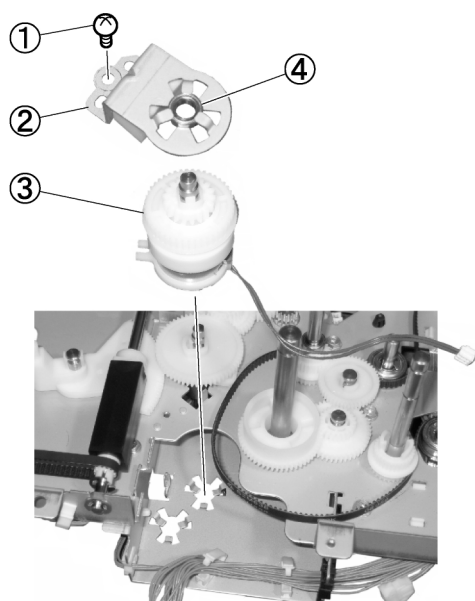


- ① Gear assembly ② Connector

Figure 3-412

- 3) After removing the screw ① (RS type) and the stopper ②, remove the clutch assembly ③.

Note: Removing the stopper also removes the ball bearing ④. Moreover, removing the clutch assembly also removes the ball bearing at the bottom.

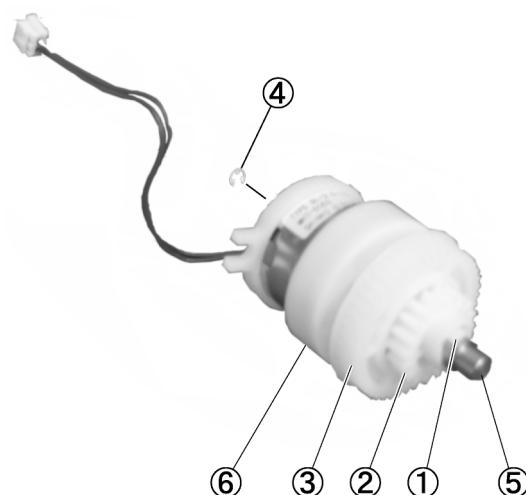


- ① Screw ② Stopper
③ Clutch assembly ④ Ball bearing

Figure 3-413

- 4) After removing the gear hook ①, the gear ②, and the pulley ③, remove the E-ring ④ and then remove the shaft ⑤ from the pick-up clutch ⑥.

Note: A ball bearing is incorporated in the pulley.



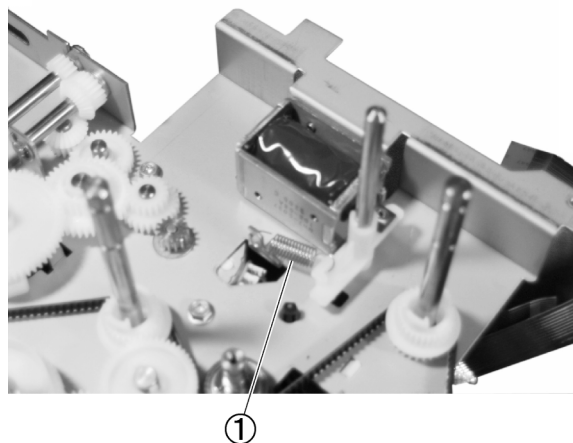
- ① Hook ② Gear
③ Pulley ④ E-ring
⑤ Shaft ⑥ Pick-up clutch

Figure 3-414

Note: During reassembly, mount the gear on the shaft carefully aligning its opening with the D cut of the shaft. Also, after reassembly, check that the timing belt rotates smoothly.

8. Flapper Solenoid

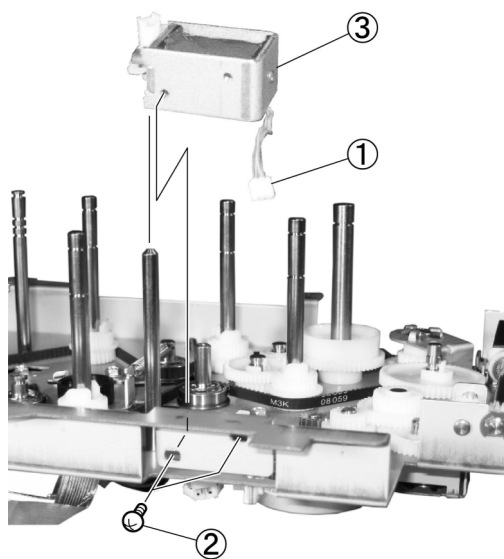
- 1) Remove the feed plate.
- 2) Remove the coil spring ①.



① Coil spring

Figure 3-415

- 3) Remove the connector ① and the two screws ②, and then remove the flapper solenoid ③ by lifting it straight up.

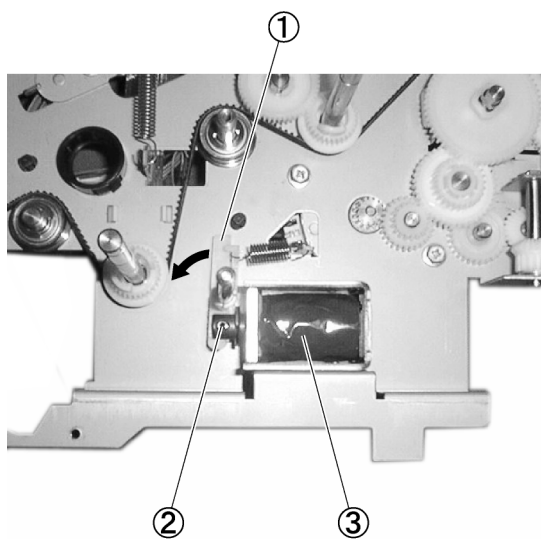


① Connector ② Screw
③ Flapper solenoid

Figure 3-416

Note: Position adjustment

Position adjustment is required when fixing the flapper solenoid. Turn the solenoid until the arm ① stops in the direction of the arrow, and in this state fix the solenoid body at the position where the plunger ② is fully inserted in the solenoid body ③.



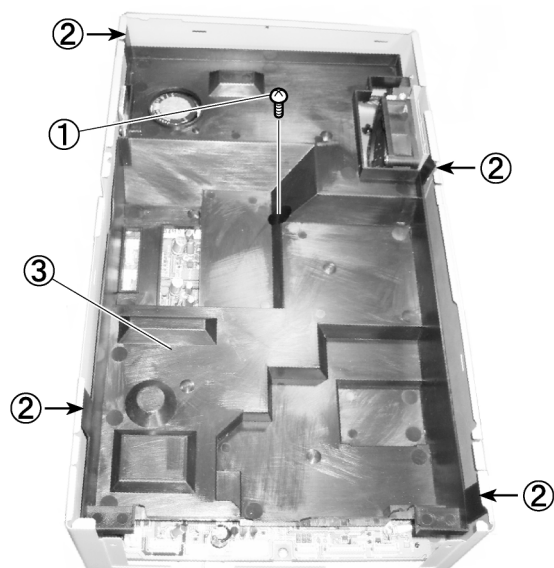
① Arm ② Plunger
③ Solenoid body

Figure 3-417

V. ELECTRICAL

1. Protection Cover

- 1) Remove the top unit. See I. EXTERNAL COVERS.
- 2) After removing the screw ① (6 mm), remove the four stoppers ②, and then remove the protection cover ③.

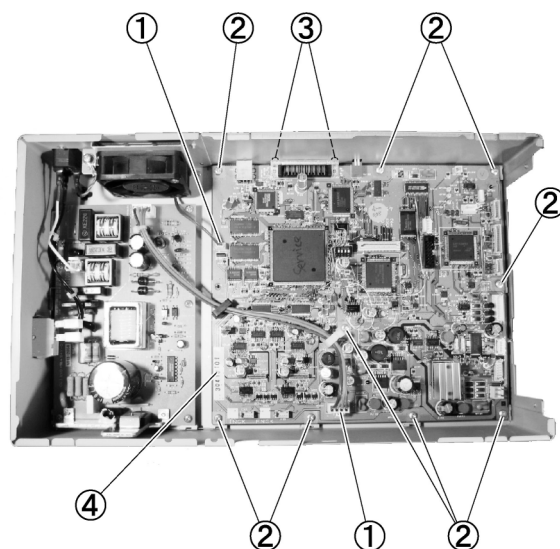


- ① Screw ② Stopper
③ Protection cover

Figure 3-501

2. Control PCB

- 1) Remove the protection cover.
- 2) Remove the 2 connectors ① (the power supply one has a lock), and the nine 6-mm screws ② and the two M2.5 screws ③, and then remove the control PCB ④.

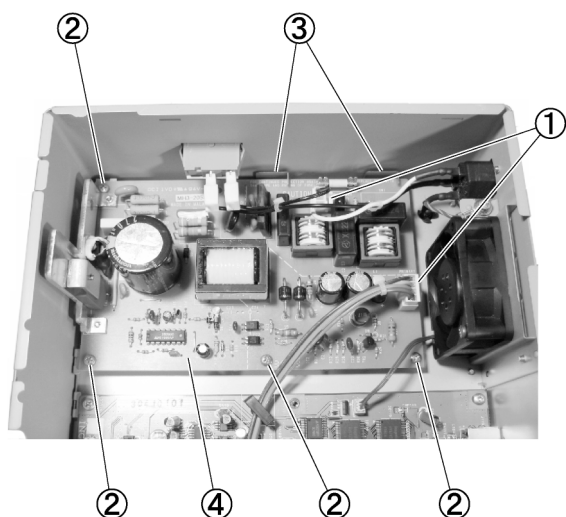


- ① Connector ② Screw (6mm)
③ Screw (M2.5) ④ Control PCB

Figure 3-502

3. Power Supply PCB

- 1) Remove the protection cover.
- 2) After removing the two connectors ① (with locks) and the four screws ②, remove the power supply PCB ④ while removing the two fitting parts ③.

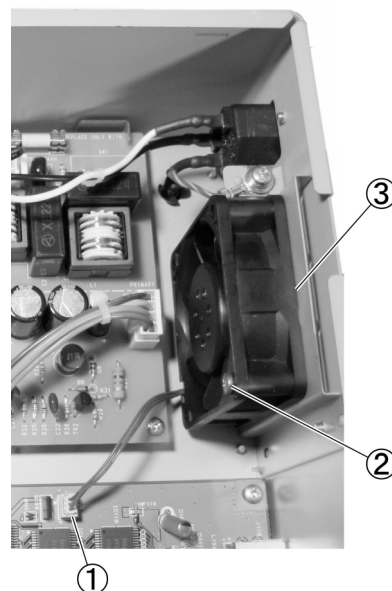


- | | |
|----------------|--------------------|
| ① Connector | ② Screw |
| ③ Fitting part | ④ Power supply PCB |

Figure 3-503

4. Cooling Fan

- 1) Remove the protection cover.
- 2) Remove the connector ① and screw ② (25 mm), and then remove the cooling fan ③.



- | | |
|---------------|---------|
| ① Connector | ② Screw |
| ③ Cooling fan | |

Figure 3-504

Note: During reassembly, insert the positioner guide in the two mounting holes located under the cooling fan.

CHAPTER 4

INSTALLATION & MAINTENANCE

I.	INSTALLATION	4-1
II.	MAINTENANCE	4-4

I. INSTALLATION

1. Selection of Location

It is recommended that the service technician personally inspects the user's premises before installing the machine. The location should meet the following requirements.

- The power supply should be connected to an outlet capable of supplying the voltage shown on the rating plate plus or minus 10%. A grounding plug must be used.

Ground Items

- 1) Power outlet ground terminal
- 2) Lead that has been grounded for office equipment

- The temperature should be between 15 to 27.5 °C (59 to 81.5 °F), and relative humidity between 25 to 75% RH. In particular, do not install the machine near water faucets, humidifiers, hot water heaters, and refrigerators.
- The machine should not be exposed to open flame, dust, ammonia or other corrosive gases, direct sunlight, intensive vibration or near machinery that generates electromagnetic waves.
 - * Prevent cigarette smoke from coming into direct contact with the machine.
 - * At the places where installation of the machine in the direct sunlight is unavoidable, a heavy curtain should be installed on the windows to protect the machine.

- Maintain sufficient space around the machine during operation and maintenance, and to allow ventilation.
- * The rear panel has a power cord and ventilation holes, therefore do not press it against a wall.

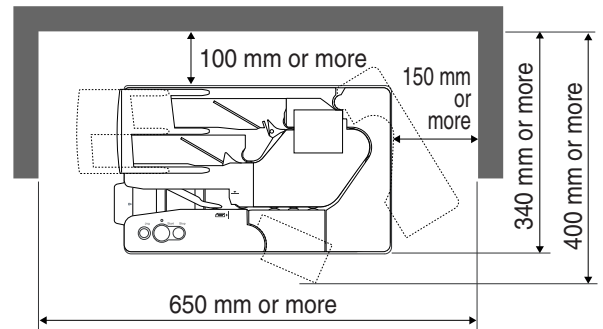


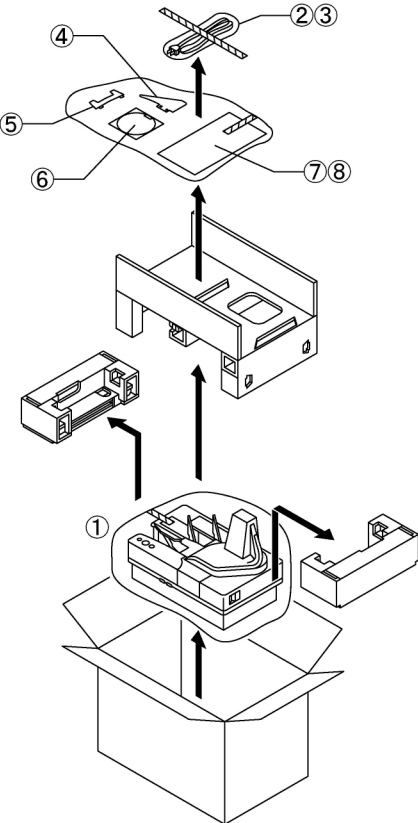
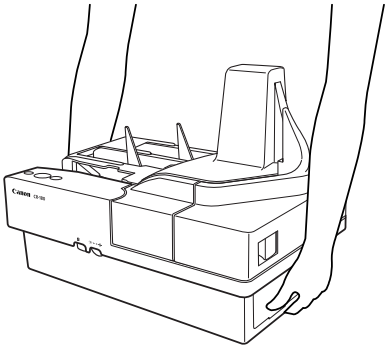
Figure 4-101

2. Unpacking and Installation

Water droplets sometimes form on the surface of metal parts when the machine is brought into a warm place from a cold place. This phenomenon is called "condensation." Using the machine when condensation has

occurred might cause machine trouble.

At least one hour should be allowed for the machine to warm up to room temperature before the shipping container is opened after it has been moved to a warm place from a cold place.

No.	Procedure	Check Items/Remarks
1	<p>Open the outer packaging box and take out the main body and other items packed with it. Check that there are no missing items. The packed weight is approx. 8 kg, and the external dimensions are approx. 330 (W) × 500 (D) × 360 (H) mm.</p> <p>① Main body ② Power cord ③ Grounding cord (only for 100 V model) ④ Feed guide ⑤ Jogger support ⑥ Setup disk ⑦ User's Manual ⑧ Warranty card (only for 100 V and 120 V models)</p>	
2	<p>Move the main body to the desired installation location. When moving the main body, hold it firmly from both sides. The main body weighs approx. 6.3 kg.</p>	

No.	Procedure	Check Items/Remarks
3	Peel off all the protective tapes securing the various parts. Remove the spacer between the separation roller and feeding roller.	Check the covers for damage during shipping.
4	Connect the power cord. In the case of the 100 V model, connect also the grounding cord.	
5	Connect the CR-180 to the computer using an SCSI cable or USB cable. Change the SCSI ID of the CR-180 if necessary.	For details, see the User's Manual. Note: If using an imprinter, prepare an ink cartridge. If documents are jammed in the separation section, perform the "separation roller space adjustment".
6	After turning the CR-180 ON, turn the computer ON.	
7	Install the driver and application software in the computer.	
8	Check if the CR-180 operates normally.	

II. MAINTENANCE

1. Periodically Replaced Parts

There are no parts that must be replaced periodically. However, there are consumable parts.

Reference: Differences between consumables, consumable parts and periodically replaced parts

1. Consumables are the parts which are assigned as commercially available products and shall be replaced (usually by users) when becoming no good.
2. Consumable parts are the parts which are assigned as service parts and shall be replaced (by users or service technicians) when becoming no good.
3. Periodically replaced parts are the parts which are usually assigned as service parts and shall be replaced by service technicians. However, if the storage period is limited, parts are assigned as commercially available products.

2. Consumables Parts

Have a service technician perform replacements.

No.	Part Name	Part No.	Q'ty	Replace- ment Cy- cle	Remark
1	Pick-up roller	MF1-4209-000	1	500,000 documents	
2	Separation roller	MG1-3530-000	1	500,000 documents	
3	Feeding roller	MF1-4210-000	1	500,000 documents	
4	Magnetic head unit	MF1-4232-000	1	1,000,000 documents	
5	Head roller unit	MG1-3525-000	1	1,000,000 documents	Including torque limiter
6	Double feeding sensor lever 2	MA2-5545-000	1	3,000,000 documents	
7	Main motor	MF1-4213-000	1	6,000,000 documents	
8	Jog motor	RH7-1278-000	1	6,000,000 documents	
9	Image sensor unit (front)	MG1-8254-000	1	6,000,000 documents	
10	Image sensor unit (back)	MG1-8255-000	1	6,000,000 documents	
11	Ink drain pad	MA2-6690-000	1	500,000 documents	For imprinter

Table 4-201

Note: Replace the magnetic head unit and the head roller unit at the same time.

3. Consumables (sold separately)

The imprinter's ink cartridges are consumables.

Purchase and use Hewlett-Packard Company product number C6602x.

No.	Part Name	Replacement Cycle	Remark
1	Ink cartridge	1,850,000 characters (77,000 documents)	Replace the ink cartridge when it runs out of ink. The replacement schedule is for small font (42 dots/character), 24 alphanumerics, 100 documents/batch, and preliminary discharge.

Table 4-202

4. Periodic Servicing List

[△: Cleaning, ●: Replace, ☆: Lubricate, □: Adjust, ◎ : Check]

Unit name	Location/Parts	Intervals				Remarks
		0.5 million	one million	three millions	six millions	
Feed unit	Pick-up/Separation/Feeding roller	●				
	Head roller unit		●			
	Other rollers	△				Wipe with cloth slightly moistened with water, then wipe dry.
	Leading edge sensor	△				Clean with an air blower.
	Double feed lever 2			●		
Reading unit	Reading glass	△				Wipe with cloth slightly moistened with water, then wipe dry.
	Image sensor unit		□		●	Perform optical adjustment each one million sheets. Replace every 6,000,000 documents.
	Magnetic head unit	△	●			Wipe the head side every 500,000 documents. Replace every 1,000,000 documents.
Drive unit	Main motor				●	
	Jog motor				●	
Imprinter	Around area of ink drain pad	△				Wipe with cloth slightly moistened with water, then wipe dry.
	Ink cartridge	△				Gently wipe off the ink that adheres to the nozzle plate area with a lint-free cloth or tissue. A cotton swab may also be used. Do not wipe ink over the electrical contact area and do not touch this area.
	Ink drain pad	●				Replacement is possible after removing maintenance cover 2.

Table 4-203

Note: Replace the magnetic head unit and head roller unit at the same time. Replacing only one of these units will result in poor head and roller contact.

CHAPTER 5

TROUBLESHOOTING

I. ERROR DISPLAY AND REMEDY	5-1	IV. IMAGE TROUBLESHOOTING	5-19
II. SERVICE MODE.....	5-3	V. MICR TROUBLESHOOTING	5-21
III. OPERATION TROUBLESHOOTING	5-16	VI. AFTER REPLACING PARTS	5-22

I. ERROR DISPLAY AND REMEDY

1. CR-180 Operation Panel

The CR-180 does not have an error display area, but some errors are indicated by the Power lamp on the operation panel of the CR-180.

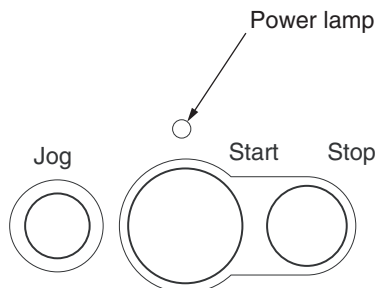


Figure 5-101

When the CR-180 is powered ON, the CR-180 performs self-diagnosis. At this time, if there are errors related to sensors other than the door switch, the Power lamp continues to flash. If there is no anomaly, the Power lamp lights after flashing.

If the Power lamp does not change from a flashing to a lit state, check if the sensors are correctly connected and attached.

2. Error Messages

Error messages are displayed on the display connected to the computer.

The contents of the error message differ depending on the software that is used.

Most error messages are related to improper user operation and document jams. The user shall perform the remedy according to the error message. If the error does not recover in spite of remedy by the user, the matter must be referred to a service technician.

Figure 5-102 and Table 5-101 show the main error messages displayed when the "Scanning Utility for CR-180" is used.

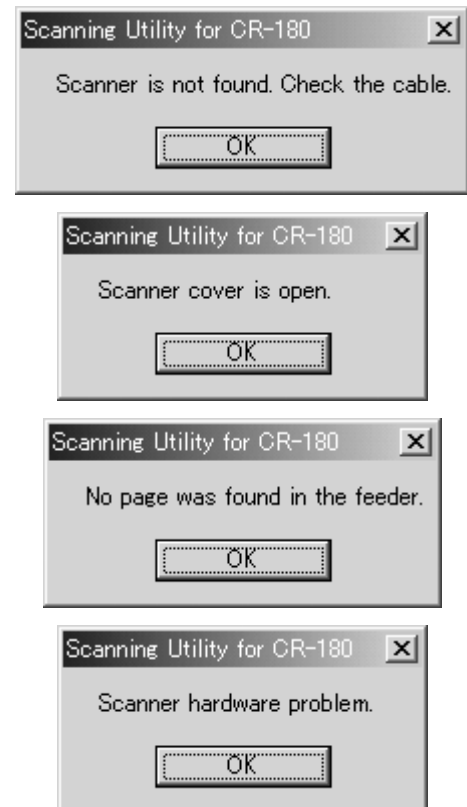


Figure 5-102

Error Message	Cause → Action
Scanner is not found. Check the cable.	No scanner can be detected. → Check if the scanner is powered ON. → Check the SCSI or USB cable connection. → Check the SCSI ID. → Power ON the CR-180 and the computer.
Scanner cover is open.	The door switch cannot detect that the top cover and maintenance cover are closed. → Close these covers. → Check the door switch.
No page was found in the feeder.	The document sensor cannot detect any documents. Or, even when document feeding starts, the leading edge sensor cannot detect documents. → Set documents. → Check the pick-up roller, separation rollers, and feeding roller. → Adjust the space between the separation rollers. (See the User's Manual or this manual.) → Check the sensor. → Check the shutter solenoid.
Paper jammed in scanner; clear paper and continue.	The sensor detected a document jam. → Open the maintenance cover and remove the jammed document(s). → Check the documents. → Check the rollers. → Check the sensor.
Scanner hardware problem.	The main motor does not function. → Power ON the CR-180 and the computer. (This is the only action doable by the user.) → Check the main motor.

Table 5-101

II. SERVICE MODE

1. Outline

The service mode of the CR-180 can be executed by installing on the service computer the service mode software located in the setup disk provided with the CR-180.

The system conditions for the computer to be used are the same as those described in the User's Manual. The lower the CPU performance or memory capacity, the longer the processing time, but the service mode can still be used.

Figure 5-201 shows the service screen.

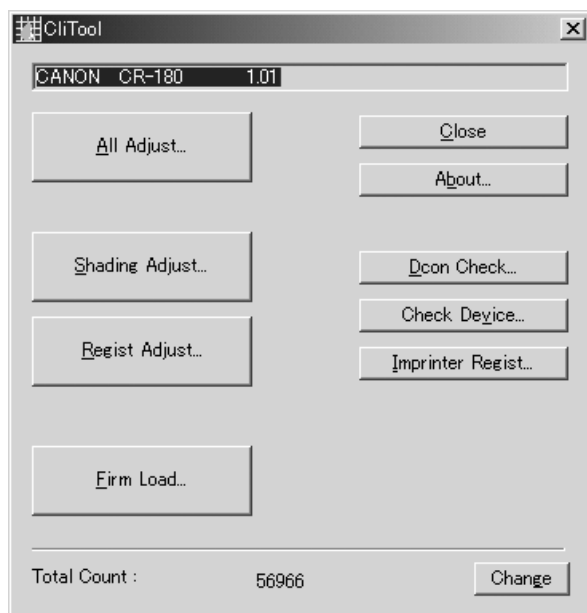


Figure 5-201

The service screen displays the buttons for selecting the various modes. Each service mode is started from this screen.

- 1) All Adjust
Perform all adjustments related to image reading.
- 2) Regist Adjust
Perform regist adjustment for image reading.

- 3) About
Display the version of this service tool.
- 4) Dcon check
Check the operation of the hardware connected to the control PCB (DCON).
- 5) Check Device
Display the version of the devices in the CR-180 and check the imprinter.
- 6) Imprinter Regist
Adjust the imprinter printing position.
- 7) Firm Load
Change the firmware.
- 8) Change
Change the display of the cumulative number of fed documents.

Note: The [Shading Adjust] button cannot be used in the field.

2. Installation Procedure

The service mode software installation procedure is described below. Do not install the service mode software on the user's computer.

- 1) Power ON the service computer and start up the OS (Windows).
- 2) Set the setup disk supplied with the CR-180.
- 3) Copy the "\Driver\Tools" folder in the setup disk to one of the drives of the service computer.

Note: To check the operation of the CR-180 with the service computer, the required software must be installed. For how to install the software provided with the CR-180, refer to the User's Manual. However, for the specifications, such as the maximum number of documents that can be scanned at one time, see the computer system conditions described in the User's Manual.

3. Starting Up and Exiting Service Mode

The procedure for starting up the service mode is described below.

- 1) Connect the computer with the CR-180 using a SCSI cable or a USB cable.
- 2) After powering ON the CR-180, power ON the computer.
- 3) Open the installed "Tools" folder and start up the "CliTool.exe" file. (See Figure 5-202.)
- 4) The password screen is displayed, so after inputting "cli", select [OK]. (See Figure 5-203.)
- 5) The service screen is displayed.

To exit the service mode, select [Close] in the service screen.



Figure 5-202

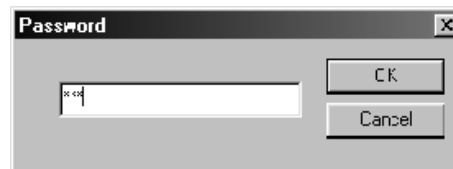


Figure 5-203

Note:After the CR-180 is connected to the computer and the computer is powered ON for the first time, a screen requesting installation of "New Hardware" or a "Device Driver" is displayed. In this case, perform the following procedure.

- a) If only the service mode software has been installed, first click [Cancel] to close the screen.
- b) If the driver provided with the CR-180 has been installed, perform the actions indicated in the User's Manual.

Note:To execute the service mode with the user's computer, start up "\Driver\Tools\CliTool.exe" on the setup disk supplied with the CR-180. Do not copy this program. Do not let the user know the folder name and password to be used.

4. All Adjustment

This mode is used to adjust all the image sensor units. Be sure to execute this mode if image sensor units or the control PCB have been replaced.

This mode consists of "optical adjustment" and "regist adjustment" of the image sensor units.

For "optical adjustment", determine the correction value to be used for the shading correction performed for the image's digital signal. This correction value is determined to all the pixels for each one of the LED lighting conditions. The outline of the setting procedure is given below.

- LED intensity adjustment
- Offset adjustment
- Gain adjustment
- Write adjustment value
- Determine black correction value for above adjustment value
- Determine white correction value for above adjustment value

For "Regist Adjustment", determine the detection timing of the registration sensor and the document read start and stop timing.

The determined value is saved in the flash memory (IC120) of the control PCB of the CR-180.

Note:Only the gain adjustment and white correction values are determined in "Shading Adjust" in the service screen, so this mode must not be used in the field. Also, "Regist Adjust" in the service screen is the same thing as "Regist Adjust" in this mode. "Regist adjustment" can be performed using the "Regist adjust" mode instead of this mode.

- Operating Procedure

- 1) Clean the rollers and the reading glass.
- 2) Set a shading sheet (TKM-0335) as the first sheet, and regular paper (a piece of white copy paper cut to the size of a shading sheet or the size of a check) as the second sheet. Alternatively, two shading sheets can be used. However, none of the sheets must have stains or creases.
- 3) Move the delivery stopper to match the length of the shading sheet.
- 4) Select [All Adjust] in the service screen.

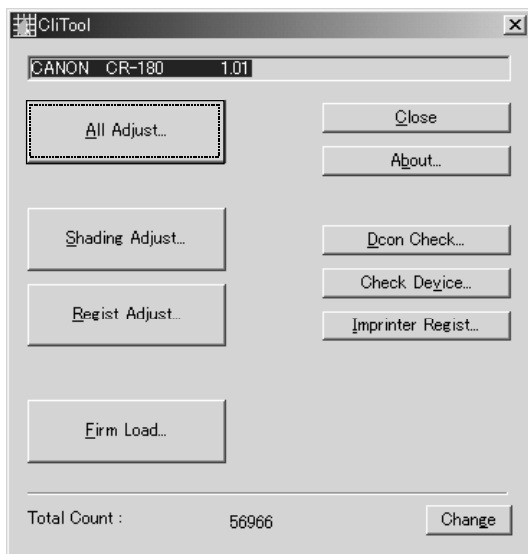


Figure 5-204

- 5) Optical adjustment is automatically performed. A progress screen appears on the display.

Sample displays are shown below.

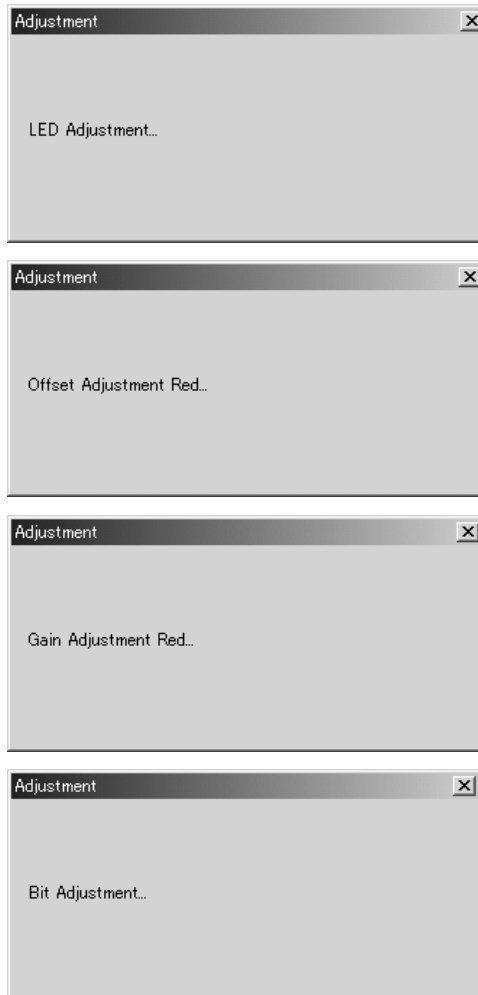


Figure 5-205

In the case of a SCSI-3 (Ultra) connection, optical adjustment takes approximately 4 minutes to complete. In the case of a USB1.1 (Full-Speed) connection, it takes approximately 10 minutes to complete.

Note: If the set sheet of paper cannot be picked up properly, perform the "separation roller space adjustment".

- 6) Regist adjustment is then performed. A progress screen appears on the display. Sample displays are shown below.

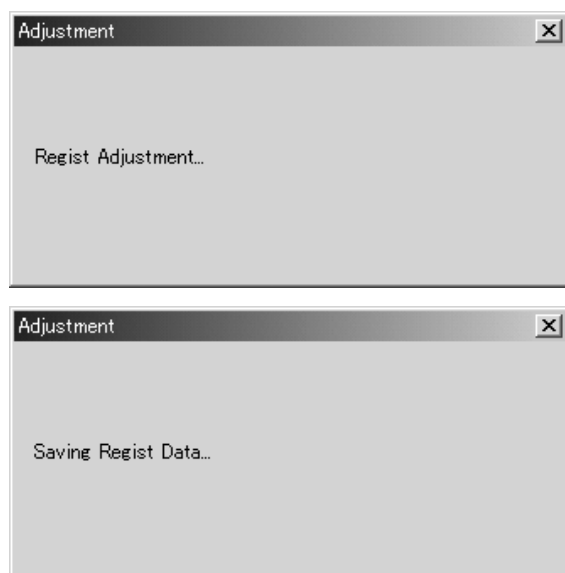


Figure 5-206

Regist adjustment takes approximately 10 seconds to complete.

Note: If a second sheet has not been set, an error screen is displayed. When [OK] is selected in the screen, only the compensation value obtained through optical adjustment is written and the procedure ends.



Figure 5-207

- 7) When regist adjustment completes, the progress screen disappears and the service screen is displayed.
- 8) The image is read and the system checks that there are no problems.

- Errors

If an anomaly occurs in the adjustment value while executing this mode, an error screen is displayed, and adjustment is interrupted. If an error screen is displayed, select [OK] in the screen to stop adjustment. Then after checking the shading sheet and the operating procedure, perform adjustment again. If adjustment is interrupted, the correction value remains the value prior to adjustment.

Sample error screens are shown below.

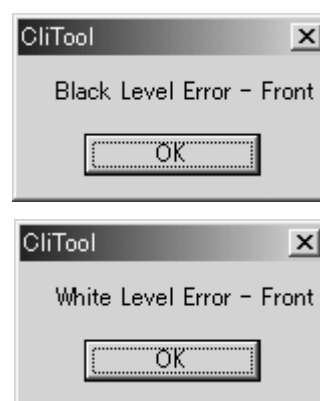


Figure 5-208

5. Regist Adjustment

This mode is used when wishing to perform regist adjustment only. Execute this mode if a problem occurs at the leading edge or trailing edge of read images.

- Operating Procedure

- 1) Set one sheet of regular paper (a piece of white paper cut to the size of a shading sheet or the size of a check). The sheet of paper must be free of stains and creases.
- 2) Select [Regist Adjust] in the service screen.
- 3) Regist adjustment is automatically performed.
A progress screen appears on the display.
Regist adjustment takes approximately 10 minutes to complete.
- 4) Upon completion, the progress screen disappears and the service screen is displayed.
- 5) The image is read and the system checks that there are no problems.

6. DCON Check

This mode is used to check the operation of the hardware controlled by the control PCB.

- Operation screen

The operation screen is displayed when [Dcon Check] is selected in the service screen.

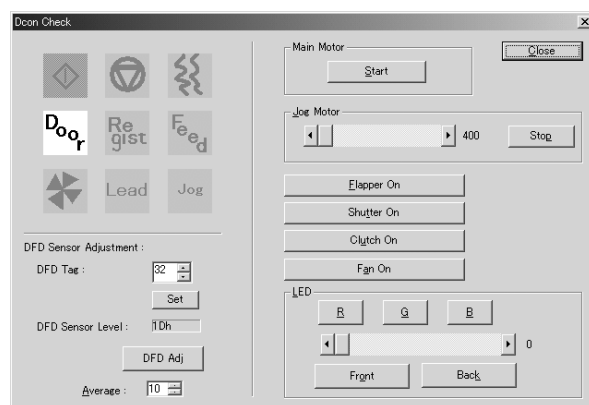


Figure 5-209

- Operation buttons

When an operation button is pressed, the corresponding mark lights. Figure 5-210 shows the appearance of the operation buttons when the [Jog] button has been pressed.

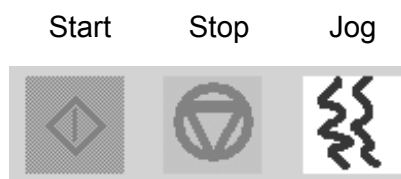


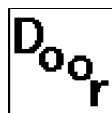
Figure 5-210

b) Sensors

When the sensors, including the door switch, are in a detect-enabled state, the corresponding marks are lit. Figure 5-211 shows the case when the door switch and the document sensor are in a detect-enabled state. The double feed sensor is described elsewhere.



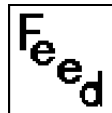
Figure 5-211



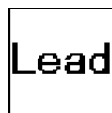
Door switch



Registration sensor



Feed sensor



Leading edge sensor



Jog sensor

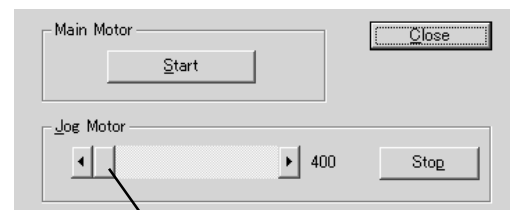


(Fan)

c) Motor

When the [Start] button of the main motor is selected, the main motor starts. Also, the [Start] display changes to [Stop]. To stop the main motor, select the [Stop] button.

Moving the jog motor slider causes the jog motor to rotate the corresponding number of times. To stop the jog motor, select the [STOP] button. Figure 5-212 shows the related part of the operation screen.



Slider

Figure 5-212

d) Solenoids, etc.

Selecting the [ON] button in the operation screen causes the corresponding solenoid/clutch/fan to start operating. Also, the [ON] display changes to [OFF]. To stop, select the [OFF] button. Figure 5-213 shows the related part of the operation screen.

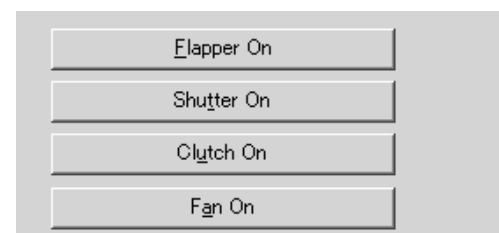


Figure 5-213

e) LED of image sensor unit

Selecting the [Front] or [Back] button of the operation screen determines the front side or the back side. Next, selecting a [LED (R/G/B)] button causes the corresponding LED to light up. However, in the case of the back side, regardless of whether it is the R, G, or B button that is selected, all colors light up. Moving the slider to the right lights up the white LED array (W) corresponding the light intensity. To put out the LED, move the slider to its leftmost position. Selecting a LED button again causes that LED to go out. Figure 5-214 shows the related part of the operation screen.

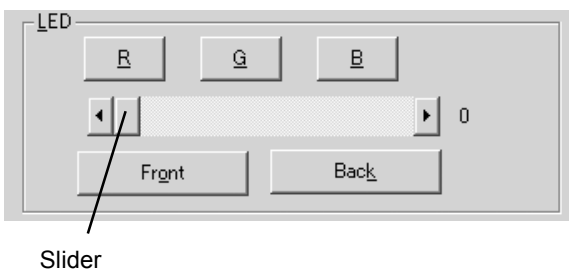


Figure 5-214

7. DFD Sensor Adjustment

This mode is used to check the output value of the double feed sensor and to adjust the mounting position of the double feed sensor.

Selecting [Dcon Check] in the service screen displays the operation screen. Figure 5-215 shows the related part of the operation screen.

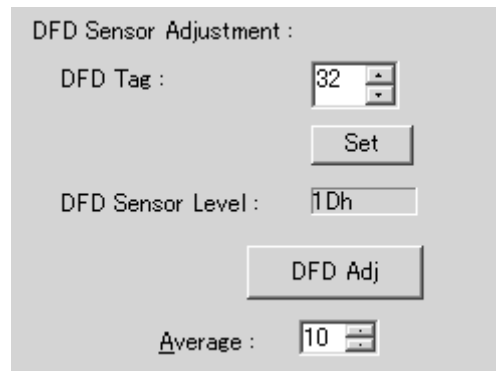


Figure 5-215

- Adjustment procedure
- 1) Remove the maintenance cover 1.

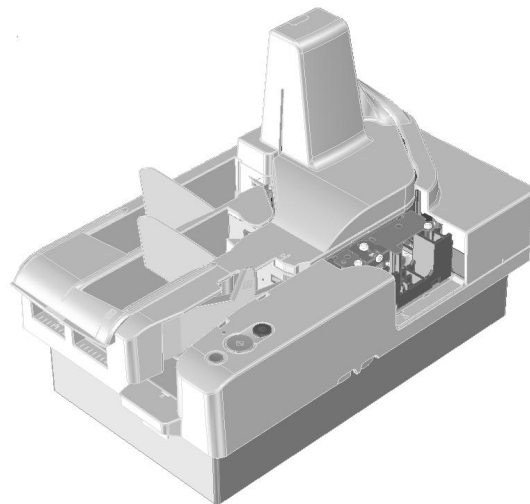


Figure 5-216

- 2) Start the service mode and select [Dcon Check] in the service screen.
- 3) Read the value displayed by a tag on the double feed sensor harness.

- 4) Input the read value in the [DFD Tag] box in the operation screen. Then select the [Set] button.
However, the existing value can be left unchanged if the value is the same.
- 5) Select the [DFD Adj] button to set the adjustment enabled state. Make the value in the [Average] box "10".
- 6) If the value in the [DFD Sensor Level] box is between "40h" and "90h", no adjustment is needed, so proceed to step 10.
- 7) Loosen slightly the fixing screw so that the sensor unit can move.

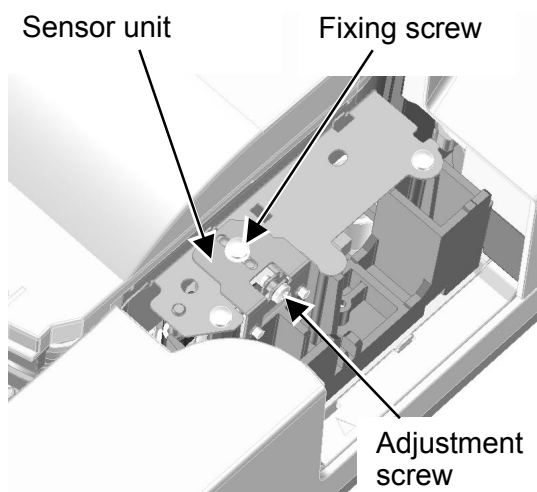


Figure 5-217

- 8) Turn the adjustment screw so that the value in the [DFD Sensor Level] box changes from "40h" to "90h".
Turning the adjustment screw to the right and left increases and decreases the value, respectively.

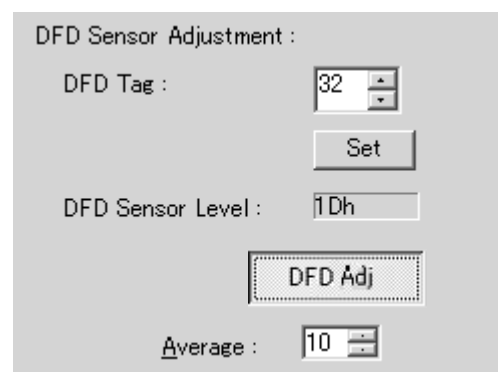


Figure 5-218

- 9) Tighten the fixing screw and mount the maintenance cover 1.
- 10) Check that the value is within range by opening and closing the maintenance cover several times. The value when the door is closed can be from "30h" to "D0h". If the value is out of range, perform adjustment again from step 7.
- 11) Select the [DFD Adj] button again.
This completes the adjustment.
When this button is selected, the value in the [DFD Sensor Level] box changes, but this is normal.

8. Check Device

This mode is used to display the version of the devices in the CR-180. Selecting [Check Device] in the service screen displays the display screen.

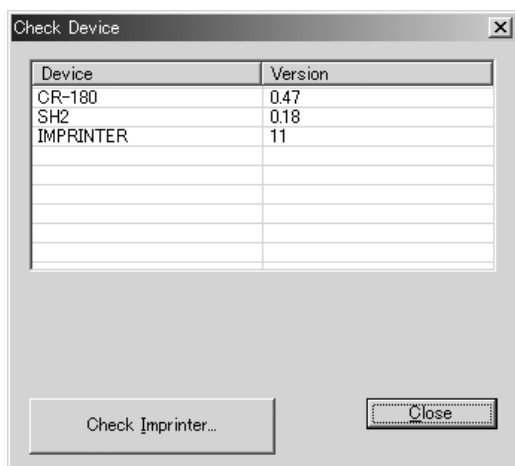


Figure 5-219

Selecting [Check Imprinter] in the display screen displays the imprinter check screen.

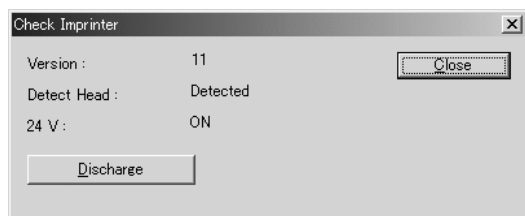


Figure 5-220

When an ink cartridge is set, "Detect Head: Detected" is displayed. Selecting the [Discharge] button causes ink to be discharged. The ink discharge operation can be checked by applying paper to the ink discharge area and then selecting this button.

9. Imprinter Regist

This mode is used to adjust the printing position of the imprinter. Selecting [Imprinter Regist] in the service screen displays the adjustment screen.

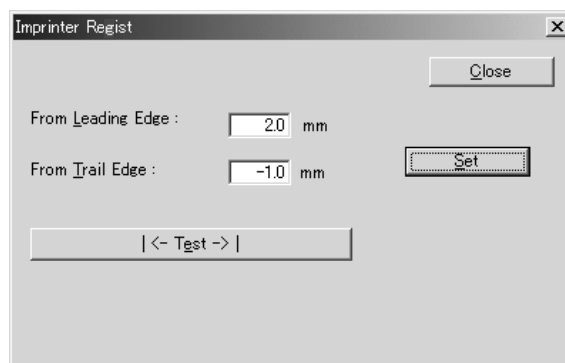


Figure 5-221

An error between the printing position of the imprinter specified in the user's operation screen and the actual printed position may occur. If the printing position needs to be corrected, this can be done with the following procedure.

- Operation procedure

The procedure when the required amount of correction is not known is described below. If the correction amount is already known, go to step 6.

- 1) Input "0" in the [From Leading Edge] and [From Trail Edge] boxes.
- 2) Set several documents that can be printed, and then select [Test]. Align the documents using the jogger. If the documents are oblique, the right correction amount will not be obtained.
- 3) The documents are fed and "H-H" is printed on them.

- 4) Check the printed position. The situation shown in Figure 5-222 does not require correction.

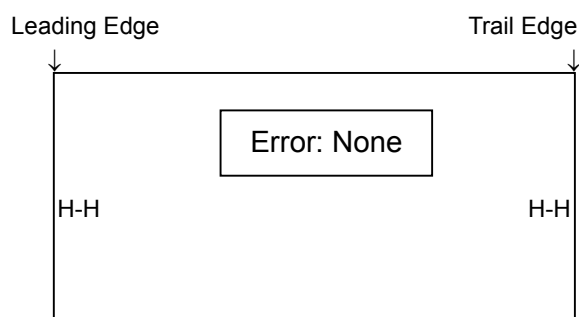


Figure 5-222

- 5) In the case of an error of several mm, perform correction. In the situations shown in Figure 5-223, correction of "-4 mm" on the leading edge side, and correction of "+2 mm" on the trail edge side, are required. To move to the left, use "-" (minus)".

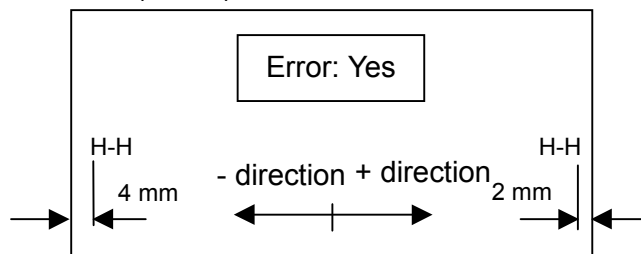


Figure 5-223

- 6) Input the correction values in the [From Leading Edge] and [From Trail Edge] boxes.

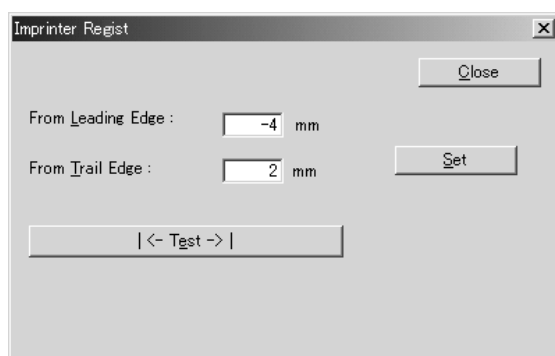


Figure 5-224

- 7) Select [Set] to write the correction value.



Figure 5-225

- 8) Select [Test] to print several sheets.

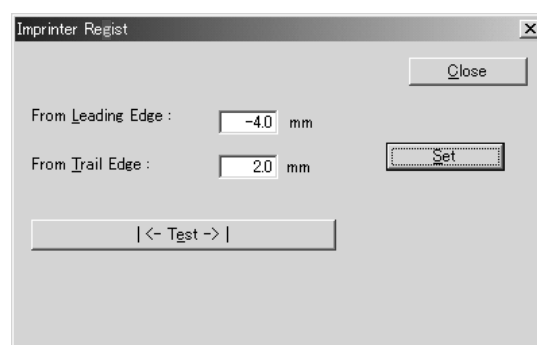


Figure 5-226

- 9) Check that the printing position has been corrected.

Note: Note that the printing position varies slightly each time a document is fed.

10. Total Count

This mode is used to change the cumulative number of fed sheets (total count). Figure 5-227 shows the related part of the service screen.

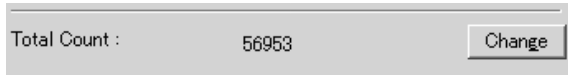


Figure 5-227

- Change

The total count data is recorded in the control PCB. Therefore this data changes when the control PCB is replaced, so restoring the previous value is required.

- 1) When replacing the control PCB, record the total count. If the control PCB is broken and the total count cannot be read, use an estimate.
- 2) After replacing the control PCB, select [Change] to display the operation screen.

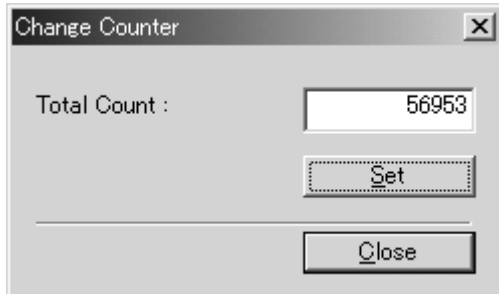


Figure 5-228

- 3) Input the value in the [Total Count] box. Then select [Set] to write the value.
- 4) Check if the value was changed in the service screen.

Reference:

Even if the service mode is not selected, the total count can be checked in the user's operation screen, so this is shown for reference purposes.

Select [About] in the scanner setting screen to display the total count, the firm-ware version, etc.

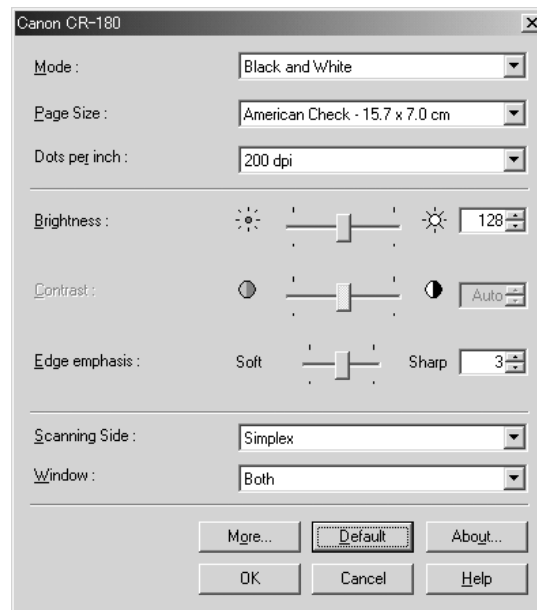


Figure 5-229

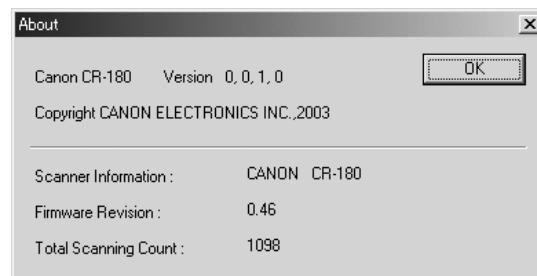


Figure 5-230

11. Firmware Load

This mode is used to change the firmware of the CR-180. For details, refer to the service information issued during firmware changes. Be careful not to execute this mode by mistake.

- Operation procedure outline
 - 1) Select [Firm Load] in the service screen.
 - 2) The screen for selecting the file in which the firmware is saved is displayed.
 - 3) Select and open the file.
 - 4) The firmware is loaded to the CR-180.

12. Service Mode Version

Select the [About] in the service screen to display the software version for this service mode.

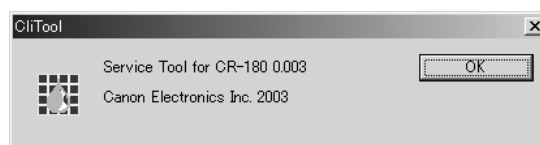


Figure 5-231

III. OPERATION TROUBLESHOOTING

1 AC power does not come on

The Power lamp of the CR-180 does not light. The CR-180 does not go into standby.

Cause/Fault Location	Step	Check Item	Result	Action
Power cord connection	1	Is power cord correctly connected?	NO	Correctly connect power cord.
Power switch ON	2	Is Power switch ON?	NO	Set Power switch to ON.
AC power supply voltage	3	Is the proper voltage supplied to the outlet?	NO	Explain to user that problems does not lie with CR-180.
Connector connection	4	Is connector on PCB properly connected?	NO	Properly connect connector.
Power supply PCB	5	Does LED101 light on control PCB?	NO	Replace power supply PCB.
Control PCB	6	Is problem solved when control PCB replaced?	YES	End.

Table 5-301

2 Computer does not detect CR-180

The error message "Scanner is not found. Check the cable." is displayed on the display connected to the computer.

Cause/Fault Location	Step	Check Item	Result	Action
Power supply	1	Is CR-180 powered on?	NO	Power ON again CR-180 and computer, starting with CR-180.
I/F cable connection	2	Is I/F cable correctly connected?	NO	Connect I/F cable correctly.
SCSI ID	3	Is SCSI ID setting appropriate?	NO	Perform correct setting.
Computer, I/F card	4	Are specifications of computer and I/F card suitable?	NO	Use computer and I/F card with suitable specifications. For details, see User's Manual.

Table 5-302

3 Main motor (M1) does not operate

The Power lamp does not change from flashing to lit. The rollers do not turn.

Cause/Fault Location	Step	Check Item	Result	Action
Door switch	1	Are top cover and maintenance cover completed closed?	NO	Close top cover and maintenance cover completely.
Connector connection	2	Is main motor connector correctly connected?	NO	Correctly connect connector.
Drive transmission system	3	Is transmission system (gears, belts, rollers, etc.) in normal state?	NO	Remove all abnormal loads. Mount properly.
Main motor	4	Improve when motor is replaced?	YES	End.
Control PCB	5	Improve when control PCB is replaced?	YES	End.

Table 5-303**4 Document feed problem (jam, double feed, creases)**

Cause/Fault Location	Step	Check Item	Result	Action
Document	1	Do documents match specifications? (thickness, size, crease, curls, etc.)	NO	Use documents that match specifications. If required, install jogger support and/or feed guide.
Rollers	2	Is space between separation rollers correct?	NO	Perform "separation roller space adjustment". See the next page.
	3	Dirty or worn?		Clean or replace rollers.
Feed path parts	4	Are parts that contact documents properly mounted?	NO	Mount them properly.
	5	Are surfaces in contact with documents smooth?		Replace defective parts.
Drive transmission system	6	Does abnormal sound occur during feed? Are gears broken or belt lose?	YES	Perform assembly adjustment or replace defective parts.

Table 5-304

Reference: "Separation roller space adjustment" procedure

- 1) Set two sheets of documents in the pick-up area and then keep pressing the [Stop] button until the shutter opens. (Approx. 5 seconds)

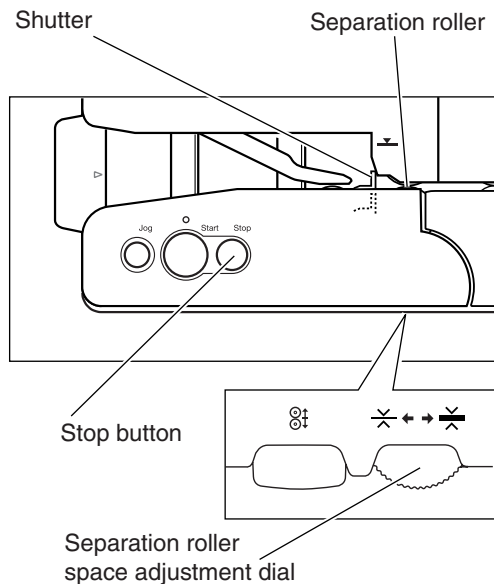


Figure 5-301

- 2) Pass the first document between the separation roller and the feeding roller, and adjust the adjustment dial so that the document passes smoothly between the rollers.
- 3) After the first document has passed between the rollers, adjust the adjustment dial so that the second document cannot pass between the rollers.
- 4) Removing the documents from the pick-up area and closes the shutter.

IV. IMAGE TROUBLESHOOTING

Note 1: Image problems may be caused by the display and the printer used by the user. In such a case, the problem cannot be corrected on the CR-180.

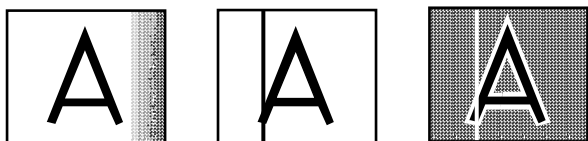
Note 2: Depending on the type of image and on the setting, document reproducibility is impaired. In such a case, the image may be improved by changing the setting items.

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



Cause/Fault Location	Step	Check Item	Result	Action
"Brightness" setting	1	Is "Brightness" setting appropriate?	NO	Change the setting. Also change the "Contrast" setting if necessary.
Image sensor unit connection	2	Is cable correctly connected?	NO	Correctly connect cable.
Image sensor unit adjustment	3	Is problem solved when "All Adjust" performed in service mode?	YES	End.
Image sensor unit	4	Is problem solved when reading unit is replaced?	YES	End.
Control PCB	5	Is problem solved when control PCB is replaced?	YES	End.

Table 5-401

2 Uneven density, streak (main scanning direction)

Cause/Fault Location	Step	Check Item	Result	Action
Roller	1	Dirty or worn?	NO	Clean or replace roller.
Gear, belt	2	Turning smoothly?	NO	Adjust assembly or replace part.
Main motor	3	Is problem solved when main motor is replaced?	YES	End.
Image sensor unit	4	Is problem solved when image sensor unit is replaced?	YES	End.
Control PCB	5	Is problem solved when control PCB is replaced?	YES	End.

Table 5-402**3 Uneven density, streak (sub scanning direction)**

Cause/Fault Location	Step	Check Item	Result	Action
Reading glass	1	Is reading glass clean?	NO	Clean reading glass. Also clean rollers if necessary.
Image sensor unit adjustment	2	Is problem solved when "All Adjust" is performed in service mode?	YES	End.
Image sensor unit	3	Is problem solved when image sensor unit is replaced?	YES	End.
Control PCB	4	Is problem solved when control PCB is replaced?	YES	End.

Table 5-403

V. MICR TROUBLESHOOTING

Cannot read MICR or low read percentage.

Cause/Fault Location	Step	Check Item	Result	Action
MICR characters	1	Are MICR characters correctly printed?	NO	Explain to user that problem does not lie with CR-180.
MICR settings	2	Are MICR read settings correct? Perform correct settings.	NO	Perform correct setting.
Document setting	3	Are documents properly set?	NO	Properly set documents. Use jogger.
Jog roller position	4	Is the jog roller stopped in the correct position?	NO	Correctly assemble the jog roller. Check the jog sensor.
Dirty magnetic head	5	Is magnetic head clean?	NO	Clean magnetic head.
Head contact	6	Does the head roller correctly touch the magnetic head?	NO	Correctly assemble the head roller.
Magnetic head unit connection	7	Is cable correctly connected?	NO	Correctly connect cable.
Magnetic head unit	8	Is problem solved when magnetic head unit is replaced?	YES	End.
Control PCB	9	Is problem solved when control PCB is replaced?	YES	End.

Table 5-501

VI. AFTER REPLACING PARTS

Some of the parts used in the CR-180 need to be adjusted following replacement.

1. Control PCB

- 1) When using the SCSI cable, set the SCSI ID.
- 2) Perform the following in the service mode.
 - All adjust
 - Total count change
 - DFD sensor adjustment
 - Imprinter registFor details, see section II. SERVICE MODE.
- 3) When using custom gamma data, install this data again.

2. Image Sensor Unit

Perform [All Adjust] in the service mode.
For details, see II. SERVICE MODE.

3. Double Feed Sensor

Perform [DFD Sensor Adjustment] in the service mode. For details, see II. SERVICE MODE.

4. Feed Guide Plate

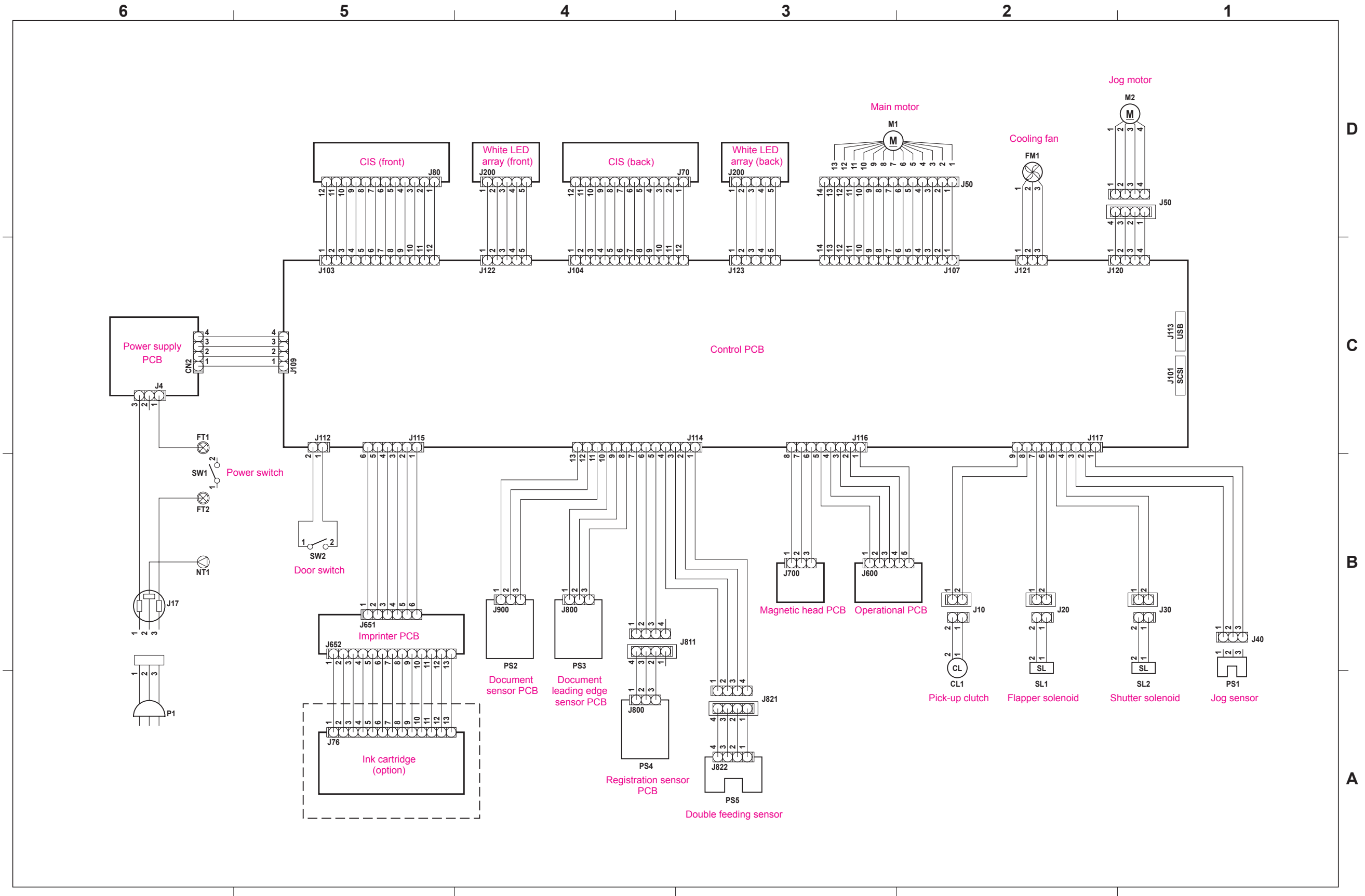
If the position of the feed guide plate touched by the tip of the double feed sensor lever changes, [DFD Sensor Adjustment] must be performed again. If the feed guide plate has been replaced or reassembled, perform [DFD Sensor Adjustment].

APPENDIX

I.	GENERAL CIRCUIT DIAGRAM.....	A-1	III.	LIST OF SPECIAL TOOLS	A-4
II.	LIST OF SIGNAL NAMES.....	A-3			

I. GENERAL CIRCUIT DIAGRAM

General Circuit Diagram



II. LIST OF SIGNAL NAMES

The names of the signals connected to the control PCB are listed below.

Pin No.		Signal Name
J101	1	SCSI
	to	
	50	
J103	1	F GND
	2	LED R
	3	LED G
	4	LED B
	5	LED COM
	6	CLK
	7	SP
	8	V REF
	9	V CC
	10	V OUT1
	11	GND A
	12	V OUT2
J104	1	F GND
	2	LED R
	3	LED G
	4	LED B
	5	LED COM
	6	CLK
	7	SP
	8	V REF
	9	V CC
	10	V OUT1
	11	GND A
	12	V OUT2
J107	1	GND
	2	HV+
	3	HU-
	4	HU+
	5	HW-
	6	HV-
	7	U
	8	VCC 5V
	9	W
	10	HW+
	11	V
	12	V02
	13	COMMON
	14	V01

Pin No.		Signal Name
J109	1	POWER OFF
	2	24V
	3	GND
	4	GND
J112	1	24R
	2	24U
J113	1	VBUS
	2	DM
	3	DP
	4	GND
	5	FGND
J114	1	DB SEN
	2	GND
	3	LED P
	4	5V
	5	GND
	6	5R
	7	DEL SEN*
	8	GND
	9	5R
	10	REG SEN*
	11	GND
	12	PAPER SEN*
	13	5V
J115	1	GND
	2	DRUG TXD
	3	DRUG RXD
	4	GND
	5	5R
	6	24R
J116	1	LED
	2	STRATKEY*
	3	STOPKEY*
	4	JOG ON*
	5	GND
	6	5U
	7	MICR
	8	GND

Pin No.		Signal Name
J117	1	GND
	2	JOG SEN
	3	5V
	4	24V
	5	SOL PWM1
	6	24V
	7	SOL PWM2
	8	24V
	9	CL PWM
J120	1	OUTA-
	2	OUTA
	3	OUTB
	4	OUTB-
J121	1	FAN ON
	2	FAN READY*
	3	GND
J122	1	24V RGV13
	2	F LED1
	3	F LED2
	4	F LED3
	5	F LED4
J123	1	24V RGV13
	2	B LED1
	3	B LED2
	4	B LED3
	5	B LED4

III. LIST OF SPECIAL TOOLS

The special tools that are required when servicing the CR-180 are listed below.

No.	Tool Name	Tool No.	Dimensions	Rank	Purpose/Remarks
1	Shading sheet	TKM-0335	230 × 120 mm t = 0.3 mm	B	<ul style="list-style-type: none">• 10 sheets/set• For image sensor adjustment

Remark: Rank Designation

A = Every service technician must carry one of these tools.

B = One such tool can be shared by group of 5 service technicians.

C = Each workshop should have one of these tools.

Prepared by

**Quality Assurance Center
Canon Electronics Inc.**

**1248 Shimokagemori, Chichibu-shi
Saitama 369-1892, Japan**

FIRST EDITION (SEPT. 2003) [63999]

Canon